

**AERIALLY DEPOSITED LEAD  
SITE INVESTIGATION REPORT**

**WESTBOUND AND EASTBOUND DIRECTIONS OF  
MARINA FREEWAY (SR-90), PM R1.74/2.646  
CITY OF LOS ANGELES,  
LOS ANGELES COUNTY, CALIFORNIA**

**PREPARED FOR:**  
CALIFORNIA DEPARTMENT OF TRANSPORTATION  
DISTRICT 7  
100 SOUTH MAIN STREET  
LOS ANGELES, CALIFORNIA

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CALTRANS CONTRACT 07A2730  
TASK ORDER NO. 7  
EA No. 07-275801

GEOCON PROJECT NO. S9500-06-03



February 22, 2011



Project No. S9500-06-03  
February 22, 2011

Mr. Calvin Hardcastle, P.E.  
Amec Geomatrix, Inc.  
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Subject: WESTBOUND AND EASTBOUND DIRECTIONS OF  
MARINA FREEWAY (SR-90), PM R1.74/2.646  
CITY OF LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA  
CONTRACT NO. 07A2730, TASK ORDER NO. 7, EA. 07-275801  
AERIALY DEPOSITED LEAD SITE INVESTIGATION REPORT

Dear Mr. Hardcastle:

In accordance with Caltrans Contract No. 07A2730, Task Order No. 7 and the AMEC Geomatrix Agreement Number 2010-5005-15324 executed on December 16, 2010, Geocon Consultants, Inc. performed an aerially deposited lead investigation along the right shoulders of both westbound and eastbound directions of the Marina Freeway, State Route 90 (SR-90), from Centinela Avenue UC (PM R1.74) to the junction with Interstate 405 (I-405) (PM 2.646), within the Del Rey Community in the City of Los Angeles, Los Angeles County, California. The accompanying report summarizes the services performed, including the advancement of hand-auger borings, soil sampling, laboratory analyses, statistical analyses, and global positioning system surveying.

*The contents of this report reflect the views of the author, 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.*

Please contact us if there are questions concerning this report or if we may be of further service.

Sincerely,

**GEOCON CONSULTANTS, INC.**

Mike Akoto  
Staff Geologist

Michael P. Conkle, PG  
Project Manager



(6/1CD) Addressee

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## EXECUTIVE SUMMARY

Geocon Consultants, Inc. performed an aerially deposited lead (ADL) investigation in exposed soil along right shoulders of both the eastbound and westbound directions of the Marina Freeway (SR-90), from the Centinela Avenue under crossing (UC) to the junction with I-405, Post Mile (PM) R1.74 to 2.646 within the Del Rey Community in the City of Los Angeles, Los Angeles County, California. Department of Transportation (Caltrans) plans to install guard rail along the shoulders described above. The objective of the investigation was to evaluate soil at the Site for the potential presence of hazardous concentrations of lead suspected due to impact from vehicle exhaust emissions when leaded gasoline was used. Caltrans will use information obtained from the investigation to determine soil disposal options and identify health and safety concerns during construction activities at the Sites.

### Predicted WET Lead Results

Waste classifications are evaluated based on the 90% UCL of the lead content for the relevant excavation depths; this has historically been considered sufficient to satisfy a good faith effort by the EPA as discussed in SW 846. Risk assessment characterization is based on the 95% UCL of the lead content in the waste for the relevant depths; this is in accordance with the Risk Assessment Guidance for Superfund (RAGS) Volume 1 Documentation for Exposure Assessment. Per Caltrans, the 90% UCLs are to be used to evaluate onsite reuse and the 95% UCLs are to be used to evaluate offsite disposal.

The 90% and 95% UCLs for total lead and predicated WET lead concentrations for the eastbound and westbound directions are summarized in Tables 3 and 4, respectively. Waste classifications based on Caltrans Type are discussed below.

### Eastbound

Based upon the predicted WET lead concentrations, excavated soil from the surface to a depth of 3.0 feet would be classified as a hazardous waste since the predicted WET lead concentrations are greater than the STLC of 5.0 mg/l. The top 3.0 feet of soil is not considered a RCRA hazardous waste based on the TCLP lead results. Based on the DI-WET lead and pH results, the top 3.0 feet of soil may be reused onsite (as Caltrans Type Y-1) by placing the lead-impacted soil under at least one foot of clean soil or a pavement structure maintained by Caltrans.

### Westbound

Based upon the predicted WET lead concentrations, excavated soil from the surface to a depth of 1.0 foot would be classified as a hazardous waste since the 90% UCL-predicted WET lead concentration is greater than the STLC of 5.0 mg/l. The top 1.0 foot of soil is not considered a RCRA hazardous waste based on the TCLP lead results. Based on the DI-WET lead and pH results, the top 1.0 foot of soil may be

reused onsite (as Caltrans Type Y-1) by placing the lead-impacted soil under at least one foot of clean soil or a pavement structure maintained by Caltrans.

Underlying soil, between 1.0 and 3.0 feet, could be reused or disposed as non-hazardous with respect to lead content if the entire underlying soil column were excavated as a single unit.

### **Title 22 Metals**

Analysis of selected soil samples for CCR Title 22 metals did not indicate the presence of metals (other than lead) at or above their respective TTLCs or 10 times their respective STLCs. The concentrations of metals, other than lead and arsenic, reported in the soil samples were below their respective California Human Health Screening Levels (CHHSLs) for residential land use. The concentrations of metals (other than lead) in the soil samples were within the reported range of background concentrations for California soils. Based on the reported concentrations, offsite reuse and disposal of excavated soil may be restricted based on lead content

### **pH**

Analysis of selected soil samples indicate that the pH of the soil ranged from 8.1 to 8.7 and the soil is suitable for reuse under the DTSC Variance. If the soil is to be transported offsite it will not be considered as hazardous based on soil pH.

### **Worker Protection**

Per Caltrans' requirements, contractor(s) should prepare a project-specific Lead Compliance Plan to prevent or minimize worker exposure to lead-impacted soil. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other appropriate health and safety protocols and procedures for the handling of lead-impacted soil.

# AERIALY DEPOSITED LEAD SITE INVESTIGATION REPORT

## 1. INTRODUCTION

Geocon Consultants, Inc. performed an aerially deposited lead (ADL) site investigation in exposed soil along the right shoulders of both the eastbound and westbound directions of the Marina Freeway (SR-90), from the Centinela Avenue under crossing (UC) to the junction with I-405 Post Mile R1.74 to 2.646 (the Site) within the Del Rey Community in the City of Los Angeles, Los Angeles County, California (Figure 1). The investigation was conducted under California Department of Transportation (Caltrans) Contract No. 07A2730, Task Order (TO) No. 7, and Expense Authorization 07-275801. A general description of the project and the investigation objection are summarized below.

### 1.1 Project Description

SR-90 is an east-west state highway in Southern California which links Marina Del Rey to the Greater Los Angeles area. SR-90 begins as an expressway at Lincoln Boulevard (State Route 1) in the Del Rey district of the City of Los Angeles; it becomes a freeway after crossing Ballona Creek, and ends at Slauson Avenue, after intersecting with Centinela Avenue and Interstate 405.

SR-90 is part of the California Freeway and Expressway System and serves as an access route to the National Truck Network and the California Interregional Road System. The segment of SR-90 within the project limits consists of four mixed flow lanes in each travel direction. East and westbound directions are separated with concrete barrier on a paved asphalt concrete (AC) median. The roadway lanes are paved with Portland cement concrete (PCC). There are AC paved shoulders and several isolated sections of metal beam guardrails (MBGR) along the right side of the roadway.

This project was initiated as a result of requests from the California Highway Patrol (CHP) West Los Angeles Region expressing concerns about the potential of out of control vehicles leaving the roadway and going over the embankment at the unprotected portions of the freeway.

Caltrans plans to install concrete guard rail along right shoulders of both the westbound and eastbound directions of SR-90, from the Centinela Avenue UC to the junction with I-405. Existing median barriers will be upgraded to concrete barriers, therefore reducing the risk of vehicular crossovers. Construction of maintenance pullouts will also reduce exposure of maintenance personnel to traffic and enhance safety.

### 1.2 Investigation Objective

The objective of the investigation was to evaluate soil at the Site for the potential presence of hazardous concentrations of lead suspected due to impact from vehicle exhaust emissions when leaded gasoline was used. Caltrans will use information obtained from the investigation to determine soil

management options (e.g., disposal or onsite reuse) and identify health and safety concerns during proposed construction activities at the Sites.

## **2. BACKGROUND**

### **2.1 Aerially Deposited Lead in Soil**

Testing by Caltrans throughout the State has shown that ADL exists in soil along major highway routes due to vehicle exhaust containing lead from the combustion of leaded gasoline. The concentration and distribution of ADL in soil is a function of many variables, but in general, highway age and traffic volume appear to be primary factors.

### **2.2 Hazardous Waste Classification Criteria**

Regulatory criteria to classify a waste as “California hazardous” for handling and disposal purposes are contained in the California Code of regulations (CCR), Title 22, Division 4.5, Chapter 11, Article 3, §66261.24. Criteria to classify a waste as “Resource, Conservation and Recovery Act (RCRA) hazardous” are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), §261.

For a waste containing metals, the waste is classified as “California hazardous” when: (1) the total metal content exceeds the respective Total Threshold Limit Concentration (TTLC); or (2) the soluble metal content exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard Waste Extraction Test (WET). A waste may have the potential of exceeding the STLC when the waste’s total metal content is greater than or equal to ten times the respective STLC value, since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is typically performed. A material is classified as “RCRA hazardous” when the soluble metal content exceeds the Federal Regulatory Level based on the Toxicity Characteristic Leaching Procedure (TCLP). The TTLC value for lead is 1,000 milligrams per kilogram (mg/kg). The STLC and TCLP values for lead are both 5.0 milligrams per liter (mg/l).

The above regulatory criteria are based on toxicity. Wastes may also be classified as hazardous based on other criteria such as ignitability, corrosivity, and reactivity. For the purposes of ADL investigations, toxicity and corrosivity (e.g., chemical concentrations and soil pH values, respectively) are the primary factors considered for waste classification. Waste that is classified as either “California hazardous” or “RCRA hazardous” requires management as a hazardous waste and disposal at an appropriately permitted disposal facility.

The Department of Toxic Substances Control (DTSC) regulates and interprets hazardous waste laws in California. DTSC generally considers excavated or transported materials that exhibit “hazardous waste” characteristics to be a “waste” requiring proper management, treatment and disposal. Soil that

contains lead above hazardous waste thresholds and is left in-place would not be necessarily classified by DTSC as a “waste.” The DTSC has provided site-specific determinations that “movement of wastes within an area of contamination does not constitute “land disposal” and, thus, does not trigger hazardous waste disposal requirements.” Therefore, lead-impacted soil that is scarified in-place, moisture-conditioned, and re-compacted during roadway improvement activities might not be considered a “waste.” DTSC should be consulted to confirm waste classification. It is noted that in addition to DTSC regulations, health and safety requirements and other local agency requirements may also apply to the handling and disposal of lead-impacted soil.

### 2.3 DTSC Variance

Effective July 1, 2009, the DTSC issued a statewide Variance regarding the reuse of ADL-impacted soils within Caltrans right-of-way. According to the Variance, soil classified as a non-RCRA hazardous waste (based primarily on ADL content) may be suitable for reuse within Caltrans right-of-way. ADL-impacted soil classified as a RCRA hazardous waste is not eligible for reuse under the Variance and must be disposed of as a RCRA hazardous waste (Caltrans Type Z-3).

ADL-impacted soil reused under the Variance must always be at least 5 feet above the highest groundwater elevation and, depending on lead concentrations, must be covered with at least one foot of non-hazardous soil or a pavement structure. The ADL-impacted soil may not be placed in areas where it might contact groundwater or surface water (such as streams and rivers), and must be buried in locations that are protected from erosion that may result from storm water run-on and run-off.

Review of the statewide Variance indicates the following conditions regarding the reuse and management of ADL-impacted soil as fill material for construction and maintenance operations. If ADL-impacted soil meets the Variance criteria but is not intended to be reused within Caltrans right-of-way, then the excavated soil must be disposed of as a California hazardous waste (Caltrans Type Z-2). A copy of the Variance is in Appendix A. Soil management categories are summarized below:

- **Caltrans Type Y-1:** ADL-impacted soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a DI-WET (WET using deionized water as the extractant) soluble lead concentration less than or equal to 1.5 mg/l, and a pH value greater than or equal to 5.5 may be reused within the same Caltrans corridor and must be covered with at least one foot of non-hazardous soil.
- **Caltrans Type Y-2:** ADL-impacted soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a DI-WET lead concentration less than or equal to 1.5 mg/l, and a pH value greater than 5 and less than 5.5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

ADL-impacted soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a DI-WET lead concentration greater than 1.5 mg/l and less than or equal to 150 mg/l, and a pH

value greater than 5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

ADL-impacted soil exhibiting a total lead concentration greater than 1,411 mg/kg and less than or equal to 3,397 mg/kg, a DI-WET lead concentration less than or equal to 150 mg/l, and a pH value greater than 5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

- **Caltrans Type Z-2:** ADL-impacted soil exhibiting a total lead concentration greater than 3,397 mg/kg, or a DI-WET lead concentration greater than 150 mg/l, or a pH value less than or equal to 5 is not eligible for reuse under the Variance and must be disposed of as a California hazardous waste. Surplus Type Y-1 and Type Y-2 soil which requires offsite disposal is also classified as Type Z-2.
- **Caltrans Type Z-3:** ADL-impacted soil exhibiting a TCLP lead concentration greater than or equal to 5 mg/l is not eligible for reuse under the Variance and must be disposed of as a RCRA hazardous waste.

### 3. SCOPE OF SERVICES

We performed the scope of services summarized below as requested by Caltrans in TO No.7.

#### 3.1 Pre-field Activities

- Prepared a Health and Safety Plan (HSP) dated December 16, 2010 to provide guidelines on the use of personal protective equipment and the health and safety procedures to be implemented by Geocon personnel during field activities. The HSP specified the safety procedures for field work, summarized chemical hazard information, and identified site safety officers, emergency contacts, and the locations of emergency medical care facilities.
- Contacted Underground Service Alert (USA) to notify utility companies of the field activities. The USA ticket number is A03540086.

#### 3.2 Field Activities

Field activities consisted of collecting 51 soil samples from 17 hand-auger borings advanced at the Site on December 23, 2010. The 17 borings were advanced at the approximate locations, selected by Caltrans, as shown on Figures 2a through 2c. Soil samples were collected from boreholes at depth intervals of 0 to 0.5 foot, 1.0 to 1.5 foot, and 2.5 to 3.0 feet. Soil samples were homogenized in the field and placed in laboratory-provided sample containers for subsequent laboratory analysis.

#### 3.3 GPS Surveying

Boring locations were surveyed with a Trimble GeoXT Global Positioning System (GPS) receiver using State Plane 83 coordinates and TerraSync™ software. Boring location latitude/longitude coordinates are provided in Table 1.

### **3.4 Laboratory Analyses**

Sample laboratory analyses were performed by ATL. Copies of laboratory reports and chain-of-custody (COC) documentation are in Appendix B. Based on the sample analyses requested by Caltrans in TO No.7, samples were analyzed as follows:

- All of the 51 soil samples collected from the Site were analyzed for total lead using Environmental Protection Agency (EPA) Test Method 6010.
- Twenty-nine soil samples were analyzed for soluble lead by the California Waste Extraction Test (WET) using citrate acid as the extractant.
- Eighteen samples had soluble lead concentrations greater than 5.0 mg/l and were analyzed for soluble lead using the WET with de-ionized water as the extractant (DI-WET).
- The six soil samples with the highest total lead concentrations were also tested for soluble lead using the Toxicity Characteristic Leaching Procedure (TCLP) to provide characterization data for disposal purposes.
- Three soil samples were analyzed for Title 22 metals according to Title 22 CCR, EPA Test Method 6010.
- Six soil samples were tested for pH using EPA Test Method 9045.
- Three equipment blank water samples were analyzed for total lead using EPA Test Method 6010.

### **3.5 Report Preparation**

This report was prepared to summarize the objectives, procedures, and results of the ADL investigation activities requested by Caltrans.

## **4. INVESTIGATIVE METHODS**

### **4.1 Soil Sampling**

Soil samples were collected from borings advanced with 2.5-inch-diameter stainless steel hand-augers. Surface vegetation (e.g., native grasses/forbs and landscaping plants) at the boring locations was removed prior to boring/sampling activities. Soil collected from each depth interval was placed into to a new re-sealable plastic bag and the soil was field homogenized within the sample bag. Homogenized soil within the bag was then transferred into a new 4-ounce, laboratory-provided, glass soil jar which was subsequently capped, labeled with the sample date/time and a unique soil sample number, placed in a chilled ice chest, and delivered to the analytical laboratory the same day the sample was collected.

Soil boring numbers were assigned based on a 4-digit unique identification number provided by Caltrans (1118) and a sequential location number (101 through 117). Soil sample numbers were designated by the boring number and the 6-inch depth interval from which the sample was collected.

For example, the soil sample designated 1118-105-1-1.5 was obtained from a depth of approximately 1.0 to 1.5 foot from boring 1118-105.

Quality Assurance/Quality Control (QA/QC) procedures conducted during field activities included decontamination of sampling equipment before each boring was advanced, single use of new re-sealable plastic bags and soil jars, and sample COC documentation. Hand-augers were cleansed between borings by washing the equipment with an Alconox™ tap water solution followed by a tap water rinse and a final rinse with distilled/purified water. Sampling activities were conducted under supervision of Geocon's field manager.

The borings were backfilled with surface soil from the immediate vicinity of the boring location. Decontamination water was discharged to the ground surface away from areas potentially associated with surface water bodies or storm drain inlets. Photographs of the boring locations collected during the investigation are provided in Appendix C.

#### **4.2 Equipment Blank Sampling**

Three equipment blank samples were collected (one before, one approximately mid-way through field activities, and one at the end) to verify proper cleaning of the hand-augers. The equipment blank samples were obtained by collecting distilled/purified water passed over the hand-augers into unpreserved, laboratory-provided containers.

#### **4.3 Deviations from the Task Order**

The TO served as the work plan for this investigation. Geocon performed the scope of work as generally summarized in the TO without exceptions that would materially affect investigation results.

### **5. FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS**

#### **5.1 Site Conditions**

Soil conditions encountered at the Site generally ranged from very dark brown sandy silt with gravel to very dark brown clayey sand. Surface and groundwater was not encountered at the boring locations. Boring logs are presented in Appendix D.

#### **5.2 Soil Sample Analytical Results**

Soil sample analytical results for total lead, WET lead, DI-WET lead, TCLP lead, and pH analyses are summarized in Table 1. Soil sample analytical results for Title 22 metals are summarized in Table 2. The three equipment blank samples did not contain lead concentrations above the laboratory reporting limit of 0.25 mg/l (those results are not tabulated). Copies of laboratory reports and COC documentation are in Appendix B. The following summarizes the soil sample analytical results:

- **Total lead** was reported for 50 of the 51 soil samples at concentrations ranging from 9.3 to 1,200 mg/kg. Total lead was not reported above the laboratory reporting limit of 5.0 mg/kg in one sample.
- **WET lead** was reported for 28 of the 29 samples at concentrations ranging from 1.7 to 79 mg/l. WET lead was not reported above the laboratory reporting limit of 1.0 mg/l in one sample. WET lead concentrations that exceed the STLC value of 5.0 mg/l were reported for 18 of the samples.
- **DI-WET lead** was reported for 2 of the 18 samples analyzed at concentrations of 0.16 and 0.15 mg/l. DI-WET lead was not reported above the laboratory reporting limit of 0.10 mg/l for the other samples analyzed.
- **TCLP lead** was reported for the six samples analyzed at concentrations ranging from 0.27 to 1.3 mg/l.
- **Title 22 metals** antimony, beryllium, cadmium, mercury, selenium, silver, and thallium were not detected in the three samples analyzed at concentration above their respective laboratory reporting limits. Excluding lead, concentrations of the other reported Title 22 metals were less than ten times their respective STLCs.
- **Soil pH** values in the six samples tested ranged from 8.1 to 8.7.

### 5.3 Data Validation

Geocon and ATL use QA/QC measures to minimize and control errors associated with field and laboratory methods. Field QA/QC measures consist of cleaning sampling equipment between each use with a detergent solution followed by tap and distilled/purified water rinses. Based on the equipment blank sample analytical results, it appears that the field investigation was free from potential cross-contamination resulting from inadequate equipment decontamination.

Laboratory QA/QC measures include the use of matrix spikes, duplicates, and method blanks, in addition to calculation of percent recovery and relative percentage difference (RPD). A review of the laboratory QA/QC results indicates satisfactory data reporting, and the data are of sufficient quality for the purposes of this report. A data validation report based on review of the laboratory QA/QC results is provided in Appendix E.

## 6. DATA EVALUATION

### 6.1 Statistical Evaluation for Lead

The lead data for the Site were treated as two separate sample populations (based on geographic location) for statistical evaluation, which consisted of the following groups of soil samples:

- Eastbound Shoulder – Borings 1118-101 to 1118-110
- Westbound Shoulder – Borings 1118-111 to 1118-117

Statistical methods were applied to the total lead data to evaluate: 1) the upper confidence limits (UCLs) of the arithmetic means of the total lead concentrations for each direction; and 2) if an acceptable correlation between total and WET lead concentrations exists that would allow the prediction of WET lead concentrations based on calculated UCLs.

### **6.1.1 Calculating the UCLs for the Arithmetic Mean**

The upper one-sided 90% and 95% UCLs of the arithmetic mean are defined as the values that, when calculated repeatedly for randomly drawn subsets of site data, equal or exceed the true mean 90% and 95% of the time, respectively. Statistical confidence limits are the classical tool for addressing uncertainties of a distribution mean. The UCLs of the arithmetic mean concentration are used as the mean concentrations because it is not possible to know the true mean due to the essentially infinite number of soil samples that could be collected from a site. The UCLs therefore account for uncertainties due to limited sampling data. As data become less limited at a site, uncertainties decrease, and the UCLs move closer to the true mean.

Non-parametric bootstrap techniques were used to calculate the UCLs. The bootstrap test results are included in Appendix F. For the sample in which total lead was not detected at a concentration exceeding the laboratory reporting limit of 5.0 mg/kg, a value equal to one-half of the reporting limit was used in the UCL calculation.

### **6.1.2 Correlation of Total and WET Lead**

Total and corresponding WET lead concentrations are bivariate data with a linear structure. This linear structure should allow for the prediction of WET lead concentrations based on the UCLs calculated above in Section 6.1.1.

To estimate the degree of interrelation between total and corresponding WET lead values ( $x$  and  $y$ , respectively), the *correlation coefficient* [ $r$ ] is used. The correlation coefficient is a ratio that ranges from +1 to -1. A *correlation coefficient* of +1 indicates a perfect direct relationship between two variables; a *correlation coefficient* of -1 indicates that one variable changes inversely with relation to the other. Between the two extremes is a spectrum of less-than-perfect relationships, including zero, which indicates the lack of any sort of linear relationship at all. The *correlation coefficient* was calculated for the 29 ( $x$ ,  $y$ ) data points (i.e., soil samples analyzed for both total lead [ $x$ ] and WET lead [ $y$ ]). The resulting *coefficient of determination* ( $r^2$ ) equaled 0.8862, which yields a corresponding *correlation coefficient* ( $r$ ) of 0.9414.

For the *correlation coefficient* that indicates a linear relationship between total and WET lead concentrations, it is possible to compute the line of dependence or a best-fit line between the two variables. A least squares method was used to find the equation of a best-fit line (regression line) by forcing the y-intercept equal to zero since that is a known point. The equation of the regression line was determined to be  $y = 0.0647(x)$ , where  $x$  represents total lead concentrations and  $y$  represents predicted

WET lead concentrations. This equation was used to estimate the expected WET lead concentrations for the UCLs calculated for samples collected from the Site (see Section 6.1.1). Regression analysis results and a scatter plot depicting the (x, y) data points along with the regression line are included in Appendix F.

The predicted WET lead concentrations for the eastbound and westbound sample groups are based on the calculated UCL total lead concentrations for each sample interval and weighted averages for combined layers. Weighted averages are calculated by using the total lead concentration for each 0.5-foot depth interval as the value for the underlying 0.5-foot depth interval (unless a sample was collected from the underlying depth interval). For the sample where total lead was not detected above the laboratory reporting limit of 5.0 mg/kg, half of the reporting limit value was used. The calculated total lead UCLs and predicted WET lead concentrations for the eastbound and westbound groups are summarized in the Tables 3 and 4.

## 6.2 Title 22 Metals

Analysis of selected soil samples for CCR Title 22 metals did not indicate the presence of metals (other than lead) at or above their respective TTLCs or 10 times their respective STLCs. The concentrations of metals, other than lead and arsenic, reported in the soil samples were below their respective California Human Health Screening Levels (CHHSLs) for residential land use.

Arsenic was detected in soil samples 1118-102-0-0.5 and 1118-111-0-0.5 at concentrations of 2.7 mg/kg and 1.8 mg/kg, respectively. These results are greater than the residential soil CHHSL for arsenic of 0.07 mg/kg. Arsenic is a naturally occurring element; therefore the concentrations reported at the Site are compared to regional background concentrations. The March 2008 DTSC publication *Determination of a Southern California Regional Background Arsenic Concentration in Soil* establishes a regional background for arsenic within Southern California including Los Angeles County using naturally occurring and anthropogenic concentrations of arsenic. The report finds that the upper-bound background concentration for arsenic within Los Angeles County is 12 mg/kg. None of the detected arsenic concentrations exceeded 12 mg/kg, and therefore, the arsenic concentrations are considered to be consistent with background concentrations of arsenic in Los Angeles County.

Reported metals concentrations were compared with published background levels typically present in California soils as presented in *Background Concentrations of Trace and Major Elements in California Soils* (Kearney Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California, March 1996). Concentrations of metals, other than lead, reported in soil at the Site are within the published background ranges.

## 6.3 pH

Soil with a pH of less than 5.0 is not acceptable for reuse under the DTSC Variance. Analysis of selected soil samples indicate that the pH of the soil ranged from 8.1 to 8.7 and the soil is suitable for

reuse under the DTSC Variance.

Soil with a pH less than 2.0 or greater than 12.5 is classified as a hazardous waste. Based on the reported soil pH, if the soil is to be transported offsite, it will not be considered as hazardous based on soil pH.

## 7. CONCLUSIONS AND RECOMMENDATIONS

### 7.1 Predicted WET Lead Results

Waste classifications are evaluated based on the 90% UCL of the lead content for the relevant excavation depths; this has historically been considered sufficient to satisfy a good faith effort by the EPA as discussed in SW 846. Risk assessment characterization is based on the 95% UCL of the lead content in the waste for the relevant depths; this is in accordance with the Risk Assessment Guidance for Superfund (RAGS) Volume 1 Documentation for Exposure Assessment. Per Caltrans, the 90% UCLs are to be used to evaluate onsite reuse and the 95% UCLs are to be used to evaluate offsite disposal. Disposal and reuse options for the eastbound and westbound directions are discussed below.

The 90% and 95% UCLs for total lead and predicated WET lead concentrations for the eastbound and westbound directions are summarized in Tables 3 and 4, respectively. Waste classifications based on Caltrans Type are discussed below.

#### Eastbound (Borings 1118-101 to 1118-110)

The total and predicted WET lead calculations for the eastbound group are summarized in Table 3. Excavation scenarios by layer are presented below. Block diagrams are presented in Appendix F.

Combined Layer (s)	Total Lead (mg/kg)		Predicted WET Lead (mg/l)		SOIL TYPE	
	Max/90% UCL (mg/kg)	Max/95% UCL (mg/kg)	Max/90% UCL (mg/l)	Max/95% UCL (mg/l)	Invoke Variance	Surplus Soil
0 to 1.0 foot	553	594	35.8	38.4	Type Y-1	Type Z-2
<i>1.0 to 3.0 feet</i>	<i>98</i>	<i>105</i>	<i>6.4</i>	<i>6.8</i>	<i>Type Y-1</i>	<i>Type Z-2</i>
0 to 1.5 feet	401	430	25.9	27.8	Type Y-1	Type Z-2
<i>1.5 to 3.0 feet</i>	<i>67</i>	<i>77</i>	<i>5.0</i>	<i>5.7</i>	<i>Type Y-1</i>	<i>Type Z-2</i>
0 to 2.5 feet	279	299	18.0	19.3	Type Y-1	Type Z-2
<i>2.5 to 3.0 feet</i>	<i>105</i>	<i>116</i>	<i>6.8</i>	<i>7.5</i>	<i>Type Y-1</i>	<i>Type Z-2</i>
0 to 3.0 feet	250	268	16.2	17.3	Type Y-1	Type Z-2

Based upon the predicted WET lead concentrations, excavated soil from the surface to a depth of 3.0 feet would be classified as a hazardous waste since the predicted WET lead concentrations are greater than the STLC of 5.0 mg/l. The top 3.0 feet of soil is not considered a RCRA hazardous waste based on the TCLP

lead results. Based on the DI-WET lead and pH results, the top 3.0 feet of soil may be reused onsite (as Caltrans Type Y-1) by placing the lead-impacted soil under at least one foot of clean soil or a pavement structure maintained by Caltrans.

**Westbound (Borings 1118-111 to 1118-117)**

The total and predicted WET lead calculations for the westbound group are summarized in Table 4. Excavation scenarios by layer are presented below. Block diagrams are presented in Appendix F.

Layer (s)	Total Lead (mg/kg)		Predicted WET Lead (mg/l)		SOIL TYPE	
	90% UCL (mg/kg)	95% UCL (mg/kg)	90% UCL (mg/l)	95% UCL (mg/l)	Invoke Variance	Surplus Soil
0 to 1.0 foot	602	651	39.0	42.1	Type Y-1	Type Z-2
<i>1.0 to 3.0 feet</i>	<i>71</i>	<i>76</i>	<i>4.6</i>	<i>4.9</i>	<i>Type X</i>	<i>Type X</i>
0 to 1.5 feet	428	463	27.7	29.9	Type Y-1	Type Z-2
<i>1.5 to 3.0 feet</i>	<i>68</i>	<i>73</i>	<i>4.4</i>	<i>4.5</i>	<i>Type X</i>	<i>Type X</i>
0 to 2.5 feet	289	312	18.7	20.2	Type Y-1	Type Z-2
<i>2.5 to 3.0 feet</i>	<i>45.3</i>	<i>49.8</i>	<i>2.9</i>	<i>3.2</i>	<i>Type X</i>	<i>Type X</i>
0 to 3.0 feet	248	268	16.0	17.3	Type Y-1	Type Z-2

Based upon the predicted WET lead concentrations, excavated soil from the surface to a depth of 1.0 foot would be classified as a hazardous waste since the 90% UCL-predicted WET lead concentration is greater than the STLC of 5.0 mg/l. The top 1.0 foot of soil is not considered a RCRA hazardous waste based on the TCLP lead results. Based on the DI-WET lead and pH results, the top 1.0 foot of soil may be reused onsite (as Caltrans Type Y-1) by placing the lead-impacted soil under at least one foot of clean soil or a pavement structure maintained by Caltrans. Underlying soil, between 1.0 and 3.0 feet, could be reused or disposed as non-hazardous with respect to lead content if the entire underlying soil column were excavated as a single unit.

It is our understanding that excavations for the proposed foundation supporting the concrete guardrails will extend to a depth of 14-inches below existing grade. Based on the results presented above, material excavated to a depth of 14-inches will be considered as Type Y-1.

**7.2 Title 22 Metals**

Analysis of selected soil samples for CCR Title 22 metals did not indicate the presence of heavy metal concentrations (other than lead) at or above their respective TTLCs or 10 times their respective STLCs. The concentrations of metals (other than lead) reported in the soil samples were below their respective residential land use CHHSLs.

Arsenic was detected in soil samples 1118-102-0-0.5 and 1118-111-0-0.5 at concentrations of 2.7 mg/kg and 1.8 mg/kg, respectively. These results are greater than the residential soil CHHSL for arsenic of 0.07 mg/kg. For the Los Angeles area, the DTSC generally considers arsenic concentrations less than 12 mg/kg to be background concentrations. On the basis that arsenic was not detected in the

soil samples at concentrations greater than or equal to the accepted background concentration for arsenic in the Los Angeles area, it is our opinion that no further assessment with respect to arsenic is warranted.

The concentrations of metals that were detected in the soil samples are within the reported range of background concentrations for California soils. Based on the reported concentrations, offsite reuse and disposal of excavated soil may be restricted based on lead content.

### **7.3 pH**

Soil with a pH of less than 5.0 is not acceptable for reuse under the DTSC Variance. Analysis of selected soil samples indicate that the pH of the soil ranged from 8.1 to 8.7 and the soil is suitable for reuse under the DTSC Variance.

Soil with a pH less than 2.0 or greater than 12.5 is classified as a hazardous waste. Based on the reported soil pH, if the soil is to be transported offsite, it will not be considered as hazardous based on soil pH.

### **7.4 Worker Protection**

Per Caltrans' requirements, contractor(s) should prepare a project-specific Lead Compliance Plan to prevent or minimize worker exposure to lead-impacted soil. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other appropriate health and safety protocols and procedures for the handling of lead-impacted soil.

## 8. REPORT LIMITATIONS

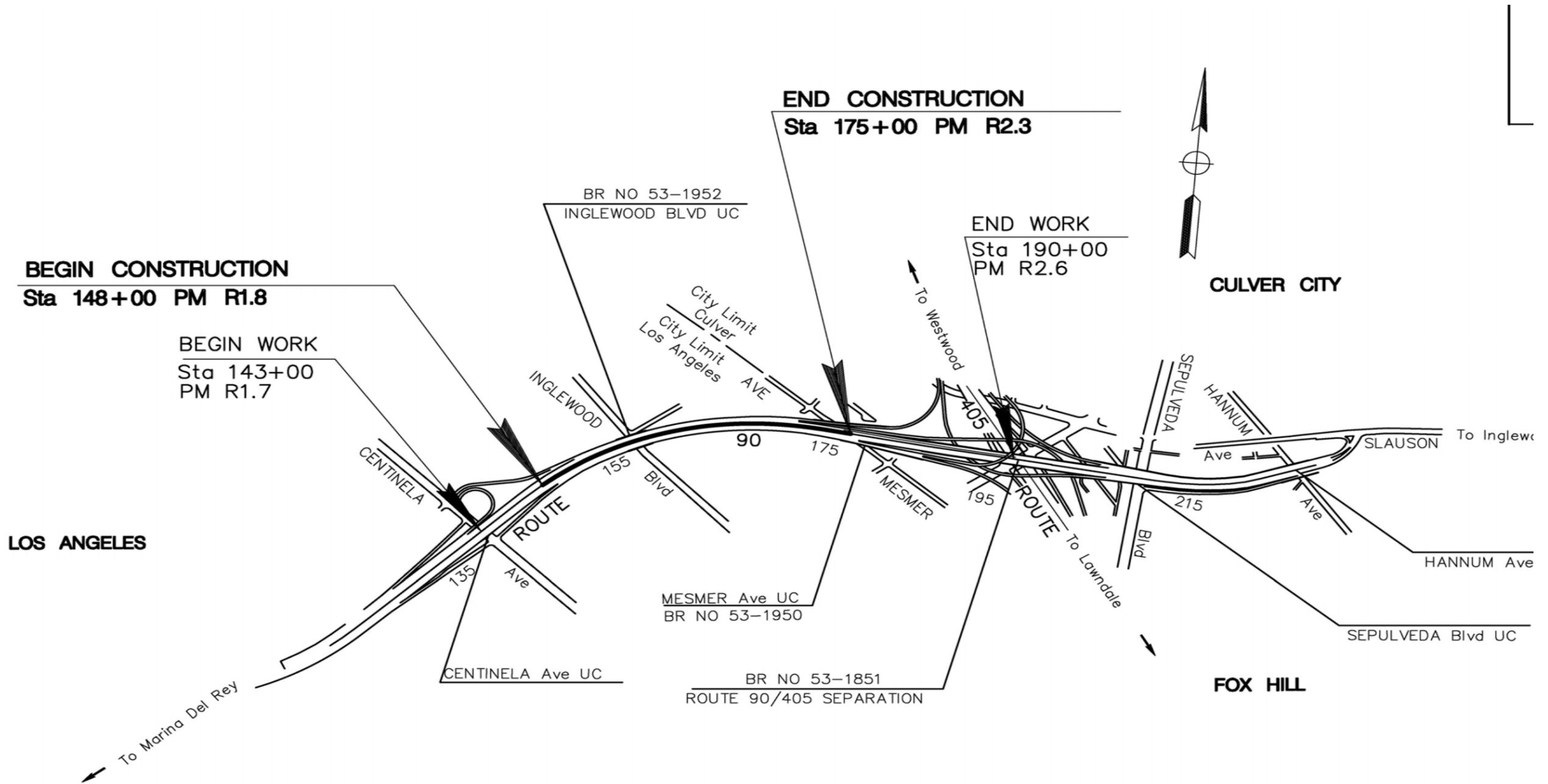
This report has been prepared exclusively for AMEC and Caltrans. The information obtained is only relevant as of the date of the latest site visit and will require an update to reflect additional information obtained.

The conclusions and recommendations presented herein are based on a limited number of samples collected from in-place soil and from widely spaced locations according to Caltrans-prescribed protocol. The purpose of these sampling and characterization activities was to reasonably predict the character of soil to be disturbed for planned construction activities within the described limits of the Caltrans right-of-way.

The Client should recognize that this report is not a comprehensive site characterization and should not be construed as such. The appropriate regulatory agency may require additional investigations. The findings and conclusions as presented in this report are predicated on the results of the limited soil sampling and laboratory analyses performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein.

Therefore, the report should only be deemed conclusive with respect to the information obtained. No guarantee or warranty of the results of the report is implied within the intent of this report or any subsequent reports, correspondence, or consultation, either express or implied. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

PLAN BY: (CALTRANS)



**GEOCON**  
CONSULTANTS, INC.

ENVIRONMENTAL GEOTECHNICAL MATERIALS  
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504  
PHONE (818) 841-8388 - FAX (818) 841-1704

HHD	8000
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**Site Vicinity Map**

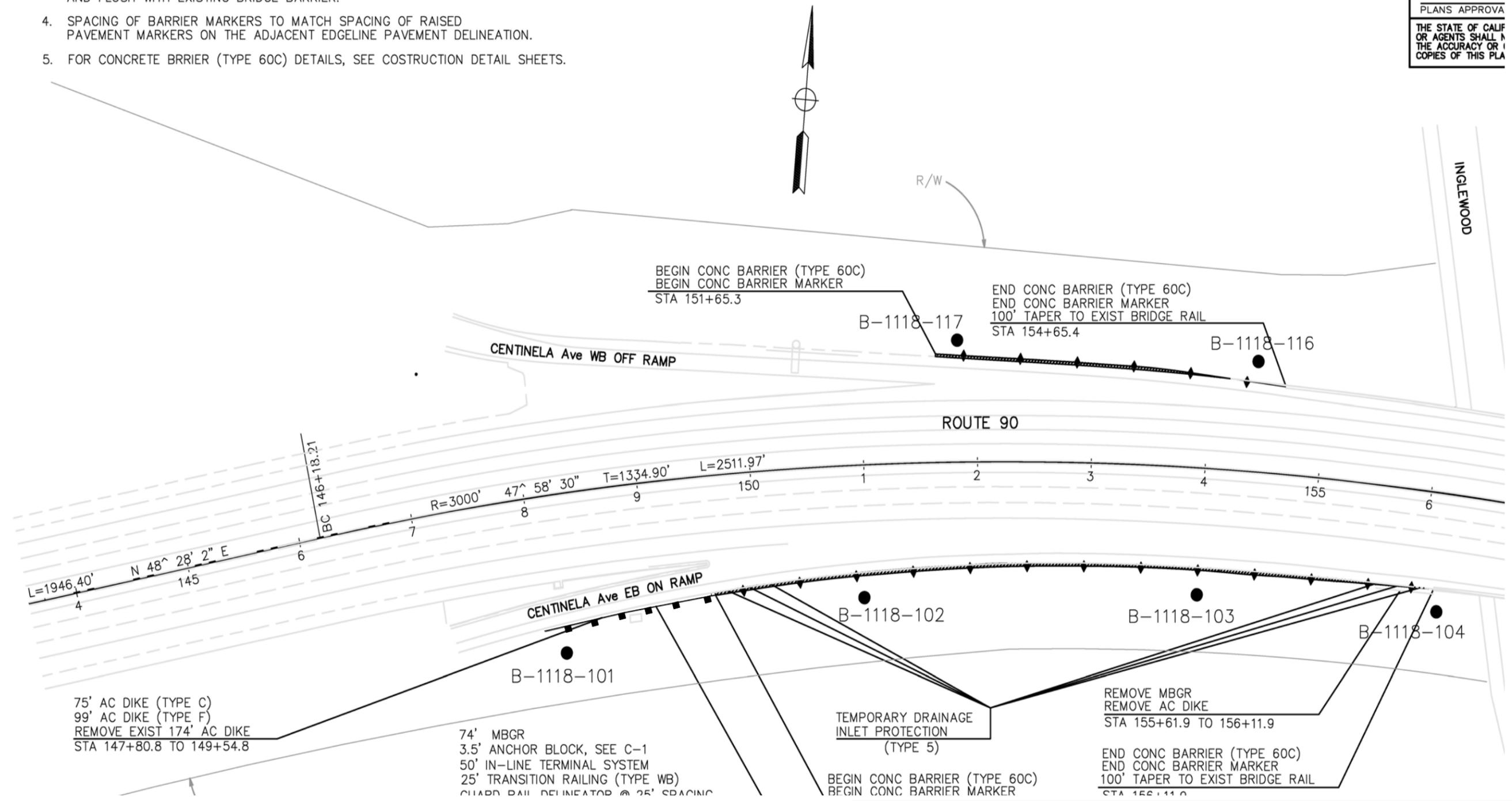
CALTRANS  
STATE ROUTE 90  
PM R1.74/2.646  
LOS ANGELES COUNTY, CA

FEB 2011	PROJECT NO. S9500-06-03	FIG. 1
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PLAN BY: (CALTRANS)

- AND FLUSH WITH EXISTING BRIDGE BARRIER.
- 4. SPACING OF BARRIER MARKERS TO MATCH SPACING OF RAISED PAVEMENT MARKERS ON THE ADJACENT EDGELINE PAVEMENT DELINEATION.
- 5. FOR CONCRETE BARRIER (TYPE 60C) DETAILS, SEE CONSTRUCTION DETAIL SHEETS.

PLANS APPROVA  
 THE STATE OF CALIF  
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 COPIES OF THIS PLA



**GEOCON**  
 CONSULTANTS, INC.

ENVIRONMENTAL GEOTECHNICAL MATERIALS  
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504  
 PHONE (818) 841-8388 - FAX (818) 841-1704

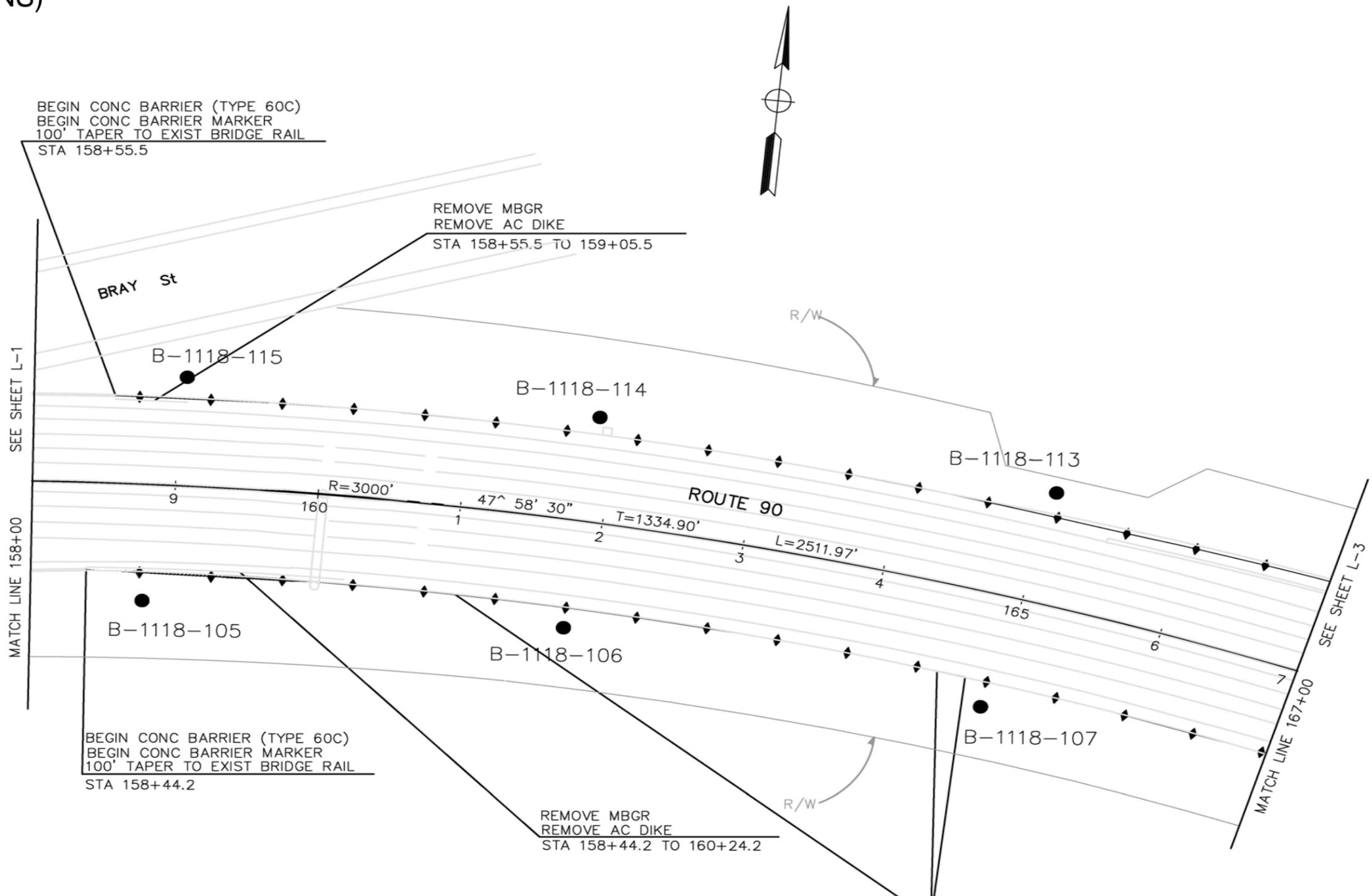
HHD 8000

**BORING LOCATION MAP**

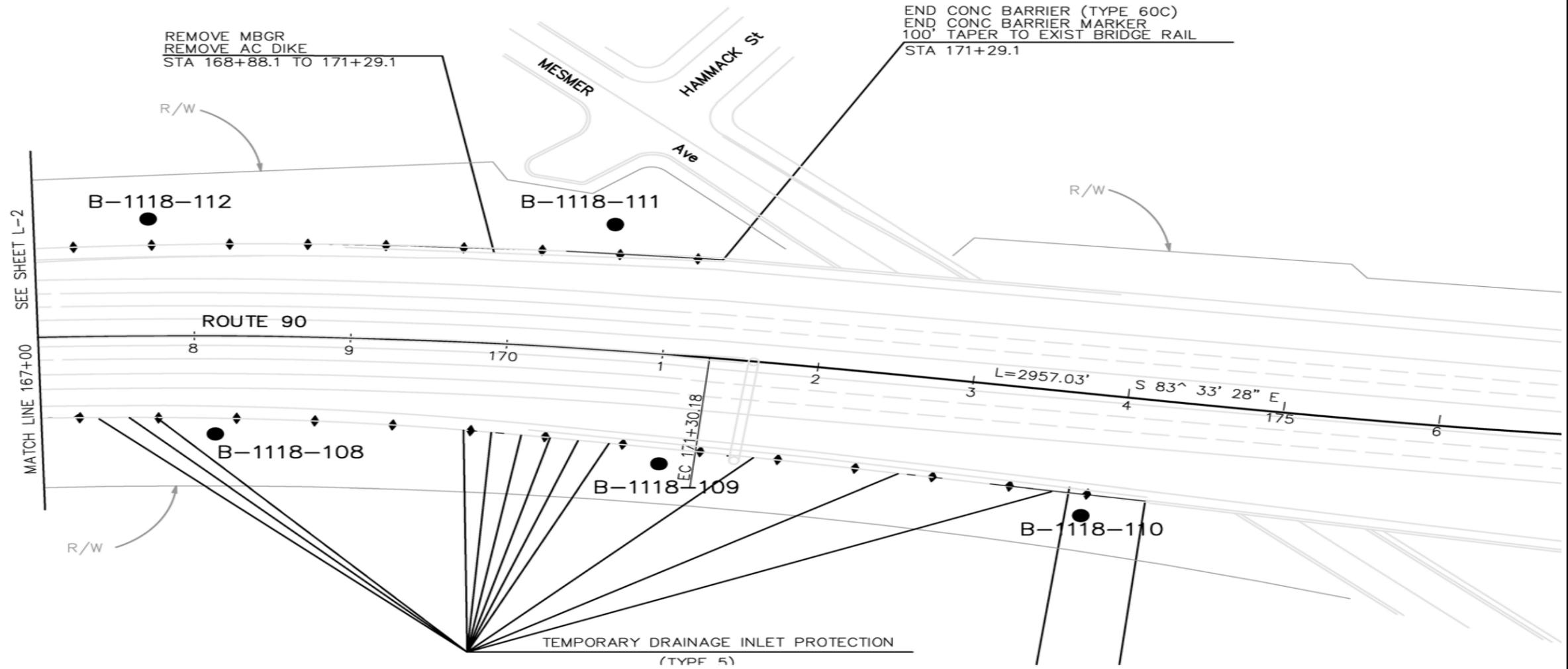
CALTRANS  
 STATE ROUTE 90  
 PM R1.74/2.646  
 LOS ANGELES COUNTY, CA

FEB 2011 PROJECT NO. S9500-06-03 FIG. 2a

PLAN BY: (CALTRANS)



<p><b>GEOCON</b> CONSULTANTS, INC.</p> <p>ENVIRONMENTAL GEOTECHNICAL MATERIALS 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504 PHONE (818) 841-8388 - FAX (818) 841-1704</p>		<p><b>BORING LOCATION MAP</b></p> <p>CALTRANS STATE ROUTE 90 PM R1.74/2.646 LOS ANGELES COUNTY, CA</p>		
		HHD	8000	FEB 2011



PLAN BY: (CALTRANS)

		<b>BORING LOCATION MAP</b>	
ENVIRONMENTAL GEOTECHNICAL MATERIALS 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504 PHONE (818) 841-8388 - FAX (818) 841-1704		CALTRANS STATE ROUTE 90 PM R1.74/2.646 LOS ANGELES COUNTY, CA	
HHD		8000	FEB 2011 PROJECT NO. S9500-06-03 FIG. 2c

TABLE 1  
 BORING COORDINATES AND SUMMARY OF LEAD AND pH ANALYTICAL RESULTS  
 STATE ROUTE 90 FROM CENTINELA AVENUE UC TO JUNCTION WITH I-405  
 DEL REY COMMUNITY, LOS ANGELES, CALIFORNIA

Sample ID	LONGITUDE	LATITUDE	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	DI-WET Lead (mg/l)	TCLP Lead (mg/l)	pH
<b>EASTBOUND</b>								
1118-101-0-0.5	-118.411968	33.986433	0-0.5	920 J	58 J	0.16	1.5	---
1118-101-1-1.5			1-1.5	22 J	---	---	---	8.7
1118-101-2.5-3			2.5-3	38 J	---	---	---	---
1118-102-0-0.5	-118.411384	33.986808	0-0.5	1,200 J	79 J	<0.10	1.0	---
1118-102-1-1.5			1-1.5	160 J	10 J	<0.10	---	---
1118-102-2.5-3			2.5-3	120 J	2.3 J	---	---	---
1118-103-0-0.5	-118.410713	33.987152	0-0.5	540 J	29 J	<0.10	0.27	---
1118-103-1-1.5			1-1.5	150 J	5.6 J	<0.10	---	---
1118-103-2.5-3			2.5-3	26 J	---	---	---	---
1118-104-0-0.5	-118.410061	33.987426	0-0.5	510 J	25 J	<0.10	---	---
1118-104-1-1.5			1-1.5	130 J	3.4 J	---	---	---
1118-104-2.5-3			2.5-3	12 J	---	---	---	---
1118-105-0-0.5	-118.408463	33.987901	0-0.5	180 J	19	<0.10	---	---
1118-105-1-1.5			1-1.5	56 J	3.7	---	---	---
1118-105-2.5-3			2.5-3	330 J	2.8	---	---	---
1118-106-0-0.5	-118.407583	33.988044	0-0.5	67 J	26	<0.10	---	---
1118-106-1-1.5			1-1.5	56 J	2.5	---	---	---
1118-106-2.5-3			2.5-3	9.3 J	---	---	---	---
1118-107-0-0.5	-118.406627	33.988143	0-0.5	35 J	---	---	---	8.7
1118-107-1-1.5			1-1.5	37 J	---	---	---	---
1118-107-2.5-3			2.5-3	14 J	---	---	---	---
1118-108-0-0.5	-118.405911	33.988145	0-0.5	280 J	16	<0.10	---	---
1118-108-1-1.5			1-1.5	17 J	---	---	---	---
1118-108-2.5-3			2.5-3	79 J	<1.0	---	---	---
1118-109-0-0.5	-118.405216	33.93374	0-0.5	200 J	13	<0.10	---	---
1118-109-1-1.5			1-1.5	20 J	---	---	---	8.6
1118-109-2.5-3			2.5-3	16 J	---	---	---	---
1118-110-0-0.5	-118.404268	33.987960	0-0.5	140 J	7.1	<0.10	---	---
1118-110-1-1.5			1-1.5	99 J	3.9	---	---	---
1118-110-2.5-3			2.5-3	35 J	---	---	---	---
<b>WESTBOUND</b>								
1118-111-0-0.5	-118.405249	33.988541	0-0.5	980 J	67	0.15	0.98	---
1118-111-1-1.5			1-1.5	99 J	12	<0.10	---	---
1118-111-2.5-3			2.5-3	35 J	---	---	---	---
1118-112-0-0.5	-118.405932	33.988556	0-0.5	200 J	14	<0.10	---	---
1118-112-1-1.5			1-1.5	39 J	---	---	---	---
1118-112-2.5-3			2.5-3	26 J	---	---	---	---
1118-113-0-0.5	-118.406675	33.988561	0-0.5	500 J	30	<0.10	---	---
1118-113-1-1.5			1-1.5	85 J	4.8	---	---	---
1118-113-2.5-3			2.5-3	20 J	---	---	---	8.1
1118-114-0-0.5	-118.407680	33.988421	0-0.5	91 J	4.8	---	---	---
1118-114-1-1.5			1-1.5	38 J	---	---	---	---
1118-114-2.5-3			2.5-3	12 J	---	---	---	8.2
1118-115-0-0.5	-118.408970	33.988211	0-0.5	750 J	62	<0.10	1.3	---
1118-115-1-1.5			1-1.5	120 J	19	<0.10	---	---
1118-115-2.5-3			2.5-3	100 J	1.7	---	---	---
1118-116-0-0.5	-118.410755	33.987631	0-0.5	93 J	3.9	---	---	---
1118-116-1-1.5			1-1.5	40 J	---	---	---	---
1118-116-2.5-3			2.5-3	23 J	---	---	---	---
1118-117-0-0.5	-118.411326	33.987398	0-0.5	540 J	26	<0.10	0.27	---
1118-117-1-1.5			1-1.5	15 J	---	---	---	8.6
1118-117-2.5-3			2.5-3	<5.0 UJ	---	---	---	---

**Notes:**  
 mg/kg = Milligram per kilogram  
 mg/l = Milligram per liter  
 WET = Waste Extraction Test using citric acid as the extraction fluid  
 < = Analyte was not detected above the laboratory reporting limit  
 DI-WET = Waste Extraction Test using water as the extraction fluid  
 TCLP = Toxicity Characteristic Leaching Procedure  
 J and UJ = Result qualified as an estimated value due to analytical bias in precision or accuracy.

TABLE 2  
 SUMMARY OF TITLE 22 METALS RESULTS  
 STATE ROUTE 90 FROM CENTINELA AVENUE UC TO JUNCTION WITH I-405  
 DEL REY COMMUNITY, LOS ANGELES, CALIFORNIA

Sample ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	
1118-101-0-0.5	<2.0	<1.0	55 J	<1.0	<1.0	13	4.5	22	920	<0.10 UJ	<1.0	9.2	<1.0	<1.0	<1.0	19	120	
1118-102-0-0.5	<2.0	2.7	79 J	<1.0	<1.0	15	5.1	75	1,200	<0.10 UJ	1.3	27	<1.0	<1.0	<1.0	19	240	
1118-111-0-0.5	<2.0	1.8	64 J	<1.0	<1.0	22	4.3	43	980	<0.10 UJ	1.3	13	<1.0	<1.0	<1.0	20	210	
TTLIC	500	500	10,000	75	100	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000	
STLIC	15	5.0	100	0.75	1.0	5	80	25	5.0	0.2	350	20	1.0	5	7.0	24	250	
CHHSLs	Ind/ Res	380/ 0.24/ 0.07	6,300/ 5,200	1,700/ 150	7.5/ 1.7	10,000/ 10,000	3,200/ 600	38,000/ 3,000	3,500/ 150	180/ 18	4,800/ 380	16,000/ 1,600	4,800/ 380	4,800/ 380	63/ 5.0	6,700/ 530	100,000/ 23,000	
Background Concentrations																		
Minimum		0.15	0.6	133	0.25	0.05	23	2.7	9.1	12.4	0.05	0.10	9	0.015	0.1	5.3	39	88
Maximum		1.95	11.0	1400	2.70	1.7	1,579	46.9	96.4	97.1	0.90	9.6	509	0.43	8.3	36.2	288	236
Mean		0.60	3.5	509	1.28	0.36	122	14.9	28.7	23.9	0.26	1.3	57	0.058	0.8	15.7	112	149

Notes:

Results shown in milligrams per kilogram.

< = Not detected above the laboratory reporting limit

J and UJ = Result qualified as an estimated value due to analytical bias in precision or accuracy.

TTLIC = Total Threshold Limit Concentration

STLIC = Soluble Threshold Limit Concentration

CHHSLs = California Environmental Protection Agency, California Human Health Screening Levels for industrial (Ind) and residential (Res) use

TTLIC, STLIC, and CHHSLs show for chromium are for chromium III.

*Background Concentrations of Trace and Major Elements in California Soils*

(Kearney Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California, March 1996)

TABLE 3  
 SUMMARY OF LEAD STATISTICAL ANALYSIS - EASTBOUND (BORINGS 1118-101 TO 1118-110)  
 STATE ROUTE 90 FROM CENTINELA AVENUE UC TO JUNCTION WITH I-405  
 DEL REY COMMUNITY, LOS ANGELES, CALIFORNIA

	Total Lead (mg/kg)		Predicted WET Lead (mg/l)		Classification	
	90% UCL	95% UCL	90% UCL	95% UCL	On Site Reuse Classification	Off Site Disposal Classification
<b>Each Layer</b>						
0 to 0.5 foot	552.9	593.5	35.8	38.4	Type Y-1	CA Hazardous (Type Z-2)
1.0 to 1.5 feet	96.1	101.9	6.2	6.6	Type Y-1	CA Hazardous (Type Z-2)
2.5 to 3.0 feet	104.6	115.8	6.8	7.5	Type Y-1	CA Hazardous (Type Z-2)
<b>Combined Layer(s)</b>						
0 to 1.0 foot	553	594	35.8	38.4	Type Y-1	CA Hazardous (Type Z-2)
1.0 to 3.0 feet	98	105	6.4	6.8	Type Y-1	CA Hazardous (Type Z-2)
0 to 1.5 feet	401	430	25.9	27.8	Type Y-1	CA Hazardous (Type Z-2)
1.5 to 3.0 feet	99	107	6.4	6.9	Type Y-1	CA Hazardous (Type Z-2)
0 to 2.5 feet	279	299	18.0	19.3	Type Y-1	CA Hazardous (Type Z-2)
2.5 to 3.0 feet	105	116	6.8	7.5	Type Y-1	CA Hazardous (Type Z-2)
0 to 3.0 feet	250	268	16.2	17.3	Type Y-1	CA Hazardous (Type Z-2)

**Notes:**

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

Type Y-1 = May be reused within Caltrans ROW and must be covered with at least one foot of non-hazardous soil.

Type Z-2 = California Hazardous Waste

Soluble (WET) lead concentrations are predicted using slope of regression line,

where  $y$  = predicted soluble (WET) lead and  $x$  = total lead.

Regression Line Slope:  $0.0647 x$

TABLE 4  
 SUMMARY OF LEAD STATISTICAL ANALYSIS - WESTBOUND (BORINGS 1118-111 TO 1118-117)  
 STATE ROUTE 90 FROM CENTINELA AVENUE UC TO JUNCTION WITH I-405  
 DEL REY COMMUNITY, LOS ANGELES, CALIFORNIA

	Total Lead (mg/kg)		Predicted WET Lead (mg/l)		Classification	
	90% UCL	95% UCL	90% UCL	95% UCL	On Site Reuse Classification	Off Site Disposal Classification
<b>Each Layer</b>						
0 to 0.5 foot	602.3	651.3	39.0	42.1	Type Y-1	CA Hazardous (Type Z-2)
1.0 to 1.5 feet	79.4	85.0	5.1	5.5	Type Y-1	CA Hazardous (Type Z-2)
2.5 to 3.0 feet	45.3	49.8	2.9	3.2	Type X	Non-Hazardous
<b>Combined Layer(s)</b>						
0 to 1.0 foot	602	651	39.0	42.1	Type Y-1	CA Hazardous (Type Z-2)
1.0 to 3.0 feet	71	76	4.6	4.9	Type X	Non-Hazardous
0 to 1.5 feet	428	463	27.7	29.9	Type Y-1	CA Hazardous (Type Z-2)
1.5 to 3.0 feet	68	73	4.4	4.5	Type X	Non-Hazardous
0 to 2.5 feet	289	312	18.7	20.2	Type Y-1	CA Hazardous (Type Z-2)
2.5 to 3.0 feet	45.3	49.8	2.9	3.2	Type X	Non-Hazardous
0 to 3.0 feet	248	268	16.0	17.3	Type Y-1	CA Hazardous (Type Z-2)

**Notes:**

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

Type X = Non-hazardous, suitable for onsite reuse

Type Y-1 = May be reused within Caltrans ROW and must be covered with at least one foot of non-hazardous soil.

Type Z-2 = California Hazardous Waste

Soluble (WET) lead concentrations are predicted using slope of regression line,

where  $y$  = predicted soluble (WET) lead and  $x$  = total lead.

Regression Line Slope:  $0.0647 x$

# APPENDIX A



*California Environmental Protection Agency  
Department of Toxic Substances Control*

**VARIANCE**

Applicant Names:

Variance No. V09HQSCD006

State of California  
Department of Transportation  
(Caltrans)  
1120 N Street  
Sacramento, California 95814

Effective Date: July 1, 2009

Expiration Date: July 1, 2014

Modification History:

Pursuant to California Health and Safety Code, Section 25143, the Department of Toxic Substances Control hereby issues the attached Variance consisting of 9 pages to the Department of Transportation.

A handwritten signature in cursive script that reads "Beverly Rikala".

Beverly Rikala  
Team Leader, Operating Facilities Team  
Department of Toxic Substances Control

Date: 6/30/09

**VARIANCE**

1. INTRODUCTION.

a) Pursuant to Health and Safety Code, section 25143, the California Department of Toxic Substances Control (DTSC) grants this variance to the applicant below for waste considered to be hazardous solely because of its lead concentrations and as further specified herein.

b) DTSC hereby grants this variance only from the requirements specified herein and only in accordance with all terms and conditions specified herein.

2. IDENTIFYING INFORMATION.

APPLICANT/OWNER/OPERATOR

State of California  
Department of Transportation, (Caltrans)  
All Districts

3. TYPE OF VARIANCE.

Generation, Manifest, Transportation, Storage and Disposal.

4. ISSUANCE AND EXPIRATION DATES.

DATE ISSUED: July 1, 2009      EXPIRATION DATE: July 1, 2014

5. APPLICABLE STATUTES AND REGULATIONS. The hazardous waste that is the subject of this variance is fully regulated under Health and Safety Code, section 25100, et seq. and California Code of Regulations, title 22, division 4.5 except as specifically identified in Section 8 of this variance.

6. DEFINITION. For purposes of this variance, "lead-contaminated soil(s)" shall mean soil that meets the criteria for hazardous waste but contains less than 3397 mg/kg total lead and is hazardous primarily because of aeriially-deposited lead contamination associated with exhaust emissions from the operation of motor vehicles.

7. FINDINGS/DETERMINATIONS. DTSC has determined that the variance applicant meets the requirements set forth in Health and Safety Code, section 25143 for a variance from specific regulatory requirements as outlined in Section 8 of this variance. The specific determinations and findings made by DTSC are as follows:

a) Caltrans intends to excavate, stockpile, transport, bury and cover large volumes of soil associated with highway construction projects. In the more urbanized highway corridors around the State this soil is contaminated with lead, primarily due to historic emissions from automobile exhausts. In situ sampling and laboratory testing has shown that some of the soil contains concentrations of lead in excess of State regulatory thresholds, and thus any generated waste from disturbance of the soil

would be regulated as hazardous waste. Such soil contains a Total Threshold Limit Concentration (TTL) of 1000 milligrams per kilogram (mg/kg) or more lead and/or it meets or exceeds the Soluble Threshold Limit Concentration (STLC) for lead of 5 milligrams per liter (mg/l). A Human Health Risk Assessment prepared for this variance concludes that soil contaminated with elevated concentrations of lead can be managed in a way that presents no significant risk to human health.

b) The lead-contaminated soil will be placed only in Caltrans' right-of-way. Depending on concentration levels, the wastes will be covered with a minimum thickness of one (1) foot of non-hazardous soil or asphalt/concrete cover and will always be at least five (5) feet above the highest groundwater elevation. Caltrans will assure that proper health and safety procedures will be followed for workers, including any persons engaged in maintenance work in areas where the waste has been buried and covered.

c) DTSC finds and requires that the lead-contaminated soil excavated, stockpiled, transported, buried and covered pursuant to this variance is a non-RCRA hazardous waste, and that the waste management activity is insignificant as a potential hazard to human health and safety and the environment, when managed in accordance with the conditions, limitations and other requirements specified in this variance.

8. PROVISIONS WAIVED.

Provided Caltrans meets the terms and conditions of this variance, DTSC waives the hazardous waste management requirements of Health and Safety Code, Chapter 6.5 and California Code of Regulations, title 22 for the lead-contaminated soil that Caltrans reuses in projects that would require Caltrans to obtain a permit for a disposal facility and any other generator requirements that concern the transportation, manifesting, storage and land disposal of hazardous waste.

9. SPECIFIC CONDITIONS, LIMITATIONS AND OTHER REQUIREMENTS.

In order for the provisions discussed in section 8 to be waived, lead-contaminated soil must not exceed the contaminant concentrations discussed below and Caltrans management practices must meet all the following conditions:

a) Caltrans implementation of this variance shall comply with all applicable state laws and regulations for water quality control, water quality control plans, waste discharge requirements (including storm water permits), and others issued by the State Water Resources Control Board (SWRCB) and/or a California Regional Water Quality Control Board (RWQCB). Caltrans shall provide written notification to the appropriate RWQCB at least 30 days prior to advertisement for bids of projects that involve invocation of this variance, or as otherwise negotiated with the SWRCB or appropriate RWQCB.

b) The waivers in this variance shall only be applied to lead-contaminated soil that is not a RCRA hazardous waste and is hazardous primarily because of aerially-

deposited lead contamination associated with exhaust emissions from the operation of motor vehicles. The variance is not applicable to any other hazardous waste.

c) Soil containing 1.5 mg/l extractable lead or less (based on a modified waste extraction test using deionized water as the extractant) and 1411 mg/kg or less total lead may be used as fill provided that the lead-contaminated soil is placed a minimum of five (5) feet above the maximum historic water table elevation and covered with at least one (1) foot of nonhazardous soil that will be maintained by Caltrans to prevent future erosion.

d) Soil containing 150 mg/L extractable lead or less (based on a modified waste extraction test using deionized water as the extractant) and 3397 mg/kg or less total lead may be used as fill provided that the lead-contaminated soils are placed a minimum of five (5) feet above the maximum historic water table elevation and protected from infiltration by a pavement structure which will be maintained by Caltrans.

e) Lead-contaminated soil with a pH less than 5.5 but greater than 5.0 shall only be used as fill material under the paved portion of the roadway. Lead-contaminated soil with a pH at or less than 5.0 shall be managed as a hazardous waste.

f) For each project that has the potential to generate waste by disturbing lead-contaminated soil (as defined in 6), Caltrans shall conduct sampling and analysis to adequately characterize the soils containing aerially deposited lead in the areas of planned excavation along the project route. Such sampling and analysis shall include the Toxicity Characteristic Leaching Procedure (TCLP) as prescribed by the United States Environmental Protection Agency to determine whether concentrations of contaminants in soil exceed federal criteria for classification as a hazardous waste.

g) Lead-contaminated soil managed pursuant to this variance shall not be moved outside the designated corridor boundaries (see paragraph t) below. All lead-contaminated soil not buried and covered within the same Caltrans corridor where it originated is not eligible for management under this variance and shall be managed as a hazardous waste.

h) Lead-contaminated soil managed pursuant to this variance shall not be placed in areas where it would become in contact with groundwater or surface water (such as streams and rivers).

i) Lead-contaminated soil managed pursuant to this variance shall be buried and covered only in locations that are protected from erosion that may result from storm water run-on and run-off.

j) The lead-contaminated soil shall be buried and covered in a manner that will prevent accidental or deliberate breach of the asphalt, concrete, and/or cover soil.

k) The presence of lead-contaminated soil shall be incorporated into the projects' as-built drawings. The as-built drawings shall be annotated with the location, representative analytical data, and volume of lead-contaminated soil. The as-built drawings shall also state the depth of the cover. These as-built drawings shall be retained by Caltrans.

l) Caltrans shall ensure that no other hazardous wastes, other than the lead-contaminated hazardous waste soil, are placed in the burial areas.

m) Lead-contaminated soil shall not be buried within ten (10) feet of culverts or locations subject to frequent worker exposure.

n) Excavated lead-contaminated soil not placed into the designated area (fill area, roadbed area) by the end of the working day shall be stockpiled and covered with sheets of polyethylene or at least one foot of non-hazardous soil. The lead-contaminated soil, while stockpiled or under transport, shall be protected from contacting surface water and from being dislodged or transported by wind or storm water. The stockpile covers shall be inspected at least once a week and within 24 hours after rainstorms. If the lead-contaminated soil is stockpiled for more than 4 days from the time of excavation, Caltrans shall restrict public access to the stockpile by using barriers that meet the safety requirements of the construction zone. The lead-contaminated soil shall be stockpiled for no more than 90 days from the time the soil is first excavated. If the contaminated soil is stockpiled beyond the 90 day limit Caltrans shall:

1. notify DTSC in writing of the 90 day exceedance and expected date of removal;
2. perform weekly inspections of the stockpiled material to ensure that there is adequate protection from run-on, runoff, public access, and wind dispersion; and
3. notify DTSC on weekly basis of the stockpile status until the stockpile is removed.

The lead-contaminated soil shall be stockpiled for no more than 180 days from the time the soil is first excavated.

o) Caltrans shall ensure that all stockpiling of lead-contaminated soil remains within the project area of the specified corridor. Stockpiling of lead-contaminated soil within the specified corridor, but outside the project area, is prohibited.

p) Caltrans shall conduct confirmatory sampling of any stockpile area in areas not known or expected to contain lead-contaminated soil after removal of the lead-contaminated soil to ensure that contamination has not been left behind or has not migrated from the stockpiled material to the surrounding soils.

q) Caltrans shall stockpile lead-contaminated soil only on high ground (i.e. no sump areas or low points) so that stockpiled soil will not come in contact with surface

water run-on or run-off.

r) Caltrans shall not stockpile lead-contaminated soil in environmentally and ecologically sensitive areas.

s) Caltrans shall ensure that storm/rain run-off that has come into contact with stockpiled lead-contaminated soil will not flow to storm drains, inlets, or waters of the State.

t) Caltrans may dispose of the lead-contaminated soil only within the operating right-of-way of an existing highway, as defined in Streets and Highways Code, section 23. Caltrans may move lead-contaminated soil from one Caltrans project to another Caltrans project only if the lead-contaminated soil remains within the same designated corridor.

Caltrans shall record any movement of lead-contaminated soil by using a bill of lading. The bill of lading must contain: 1) the US DOT description including shipping name, hazard class and ID number; 2) handling codes; 3) quantity of material; 4) volume of material; 5) date of shipment; 6) origin and destination of shipment; and 7) any specific handling instructions. The bill of lading shall be referenced in and kept on file with the project's as-built drawings. The lead-contaminated soil must be kept covered during transportation.

u) For each specific corridor where this variance is to be implemented, all of the following information shall be submitted in writing to DTSC at least five (5) days before construction of any project begins:

1. plan drawing designating the boundaries of the corridor where lead-contaminated soils will be excavated, stockpiled, buried and covered;
2. a list of the Caltrans projects that the corridor encompasses;
3. a list of Caltrans contractors that will be conducting any phase of work on any project affected by this variance;
4. duration of corridor construction;
5. location where sampling and analytical data used to make lead concentration level determinations are kept (e.g. a particular Caltrans project file);
6. name and phone number (including area code) of project resident engineer and project manager;
7. location where Caltrans and contractor health and safety plan and records are kept;

8. location of project special provisions (including page or section number) for soil excavation, transportation, stockpile, burial and placement of cover material;

9. location of project drawings (including drawing page number) for soil excavation, burial and placement of cover in plan and cross section (for example, "The project plans are located at the resident engineer's office located at 5th and Main Streets, City of Fresno, See pages xxxxx of contract xxx");

10. updated information if a Caltrans project within the corridor is added, changed or deleted; and

11. type of environmental document prepared for each project, date of adoption, document title, Clearing House number and where the document is available for review. A copy of the Caltrans Categorical Exemption, Categorical Exclusion Form, or if filed, the Notice of Exemption for any project shall be submitted to the DTSC Headquarters Project Manager.

v) Changes in location of lead-contaminated soil placement, quantities or protection measures (field changes) shall be noted in the resident engineer's project log within five (5) days of the field change.

w) Caltrans shall ensure that field changes are in compliance with the requirements of this variance.

x) Operational procedures described in the California Environmental Quality Act (CEQA) Special Initial Study shall be followed by Caltrans for activities conducted under this variance.

y) Caltrans shall implement appropriate health and safety procedures to protect its employees and the public, and to prevent or minimize exposure to potentially hazardous wastes. A project-specific health and safety plan must be prepared and implemented. The monitoring and exposure standards shall be based on construction standards for exposure to lead in California Code of Regulations, title 8, section 1532.1.

z) Caltrans shall provide a district Coordinator for this variance. This Coordinator will be the primary point of contact for information flowing to, or received from, DTSC regarding any matter or submission under this variance. Caltrans shall promptly notify DTSC of the name of Coordinator and any change in the Coordinator.

aa) Caltrans shall conduct regular inspections, consistent with Caltrans' Maintenance Division's current Pavement Inspection and Slope Inspection programs, of the locations where lead-contaminated soil has been buried and/or covered pursuant to this variance. If site inspection reveals deterioration of cover so that conditions in the variance are not met, Caltrans shall repair or replace the cover.

bb) Caltrans shall develop and implement a record keeping mechanisms to record and retain permanent records of all locations where lead-contaminated soil has been buried per this variance. The records shall be made available to DTSC.

cc) If areas subject to the terms of this variance are sold, relinquished or abandoned (including roadways), all future property owners shall be notified in writing in advance by Caltrans of the requirements of this variance, and Caltrans shall provide the owner with a copy of the variance. A copy of such a notice shall be sent to DTSC and contain the corridor location and project. Caltrans shall also disclose to DTSC and the new owner the location of areas where lead-contaminated soil has been buried. Future property owners shall be subject to the same requirements as Caltrans.

dd) For the purposes of informing the public about instances where the variance is implemented, Caltrans shall:

1. maintain current fact sheets at all Caltrans resident engineer offices and the Caltrans District office. Caltrans shall make the fact sheets available to anyone expressing an interest in variance-related work.
2. maintain a binder(s) containing copies of all reports submitted to DTSC at the District office. Caltrans shall ensure that the binders are readily accessible to the public.
3. carry out the following actions when it identifies additional projects:
  - (A) notify the public via a display advertisement in a newspaper of general circulation in that area.
  - (B) update and distribute the fact sheet to the mailing list and repository locations.

ee) Lead-contaminated soil may be buried only in areas where access is limited or where lead-contaminated soil is covered and contained by a pavement structure.

ff) Dust containing lead-contaminated soil must be controlled. Water or dust palliative may be applied to control dust. If visible dust migration occurs, all excavation, stockpiling and truck loading and burying must be stopped. The granting of this variance confers no relief on Caltrans from compliance with the laws, regulations and requirements enforced by any local air district or the California Air Resources Board.

gg) Sampling and analysis is required to show the lead-contaminated soil meets the variance criteria. All sampling and analysis must be conducted in accordance with the appropriate methods specified in U.S. EPA SW-846.

hh) DTSC retains the right to require Caltrans or any future owner to remove, and properly dispose of, lead-contaminated soil in the event DTSC determines it is necessary for protection of public health, safety or the environment.

ii) DTSC finds that some projects involving lead-contaminated soil are joint projects between Caltrans and other government entities. In these joint projects, Caltrans may not be the lead agency implementing the project although Caltrans is still involved if the project occurs on its right-of-way.

Caltrans may invoke this variance for joint projects where Caltrans and local government entity are involved provided that 1) the project is within the Caltrans Right-of-Way; 2) Caltrans reviews/ oversees all phases of the project including design, contracting, environmental assessment, construction, operation, and maintenance; and 3) Caltrans oversees the project to verify all variance conditions are complied with. Caltrans will be fully responsible for the variance notification and implementation in these joint projects.

jj) All correspondence shall be directed to the following office:

Hazardous Waste Permitting  
Department of Toxic Substances Control  
8800 Cal Center Drive  
Sacramento, CA 95826

Attn: Caltrans Lead Variance Notification Unit

10. DISCLAIMER.

a) The issuance of this variance does not relieve Caltrans of the responsibility for compliance with Health and Safety Code, chapter 6.5, or the regulations adopted thereunder, and any other laws and regulations other than those specifically identified in Section 8 of this variance. Caltrans is subject to all terms and conditions herein. The granting of this variance confers no relief from compliance with any federal, State or local requirements other than those specifically provided herein.

b) The issuance of this variance does not release Caltrans from any liability associated with the handling of hazardous waste, except as specifically provided herein and subject to all terms and conditions of this variance.

11. VARIANCE MODIFICATION OR REVOCATION. This variance is subject to review at the discretion of DTSC and may be modified or revoked by DTSC upon change of ownership and at any other time pursuant to Health and Safety Code, section 25143.
12. CEQA DETERMINATION. DTSC adopted a Negative Declaration on June 30, 2009.

Approved:

6/30/09  
Date

Beverly Rikala  
Beverly Rikala  
Operating Facilities Team  
Department of Toxic Substances Control

# APPENDIX B

January 20, 2011



Vinnie Robino  
AMEC Geomatrix  
510 Superior Avenue, Suite 200  
Newport Beach, CA 92663-3627  
TEL: (949) 274-6516  
FAX: (949) 642-4474

ELAP No.: 1838  
NELAP No.: 02107CA  
CSDLAC No.: 10196  
ORELAP No.: CA300003  
  
Workorder No.: 115495

RE: State Route 90 ADL, 153240070

Attention: Vinnie Robino

Enclosed are the results for sample(s) received on December 23, 2010 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

Eddie F. Rodriguez  
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories.



**CLIENT:** AMEC Geomatrix  
**Project:** State Route 90 ADL, 153240070  
**Lab Order:** 115495

**CASE NARRATIVE**

Results were J-Flag. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" Flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.

**Analytical Comments for Method 6010**

Dilution was necessary for samples 115495-001A, 115495-004A, 115495-005A, 115495-006A, 115495-007A, 115495-008A, 115495-010A, 115495-011A, 115495-013A, 115495-014A, 115495-015A, 115495-016A, 115495-017A, 115495-022A, 115495-024A, 115495-025A, 115495-028A, 115495-029A, 115495-031A, 115495-032A, 115495-034A, 115495-037A, 115495-038A, 115495-040A, 115495-043A, 115495-044A, 115495-045A, 115495-046A and 115495-049A, due to sample matrix.

Matrix Spike (MS) and /or Matrix Spike Duplicate (MSD) are/is outside recovery criteria for samples 115495-049AMS and 115495-049AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

RPD for Duplicate (DUP) is outside criteria for samples 115495-001ADUP, 115495-010ADUP, 115495-011ADUP, 115495-020ADUP, 115495-029ADUP, 115495-030ADUP, 115495-040ADUP, 115495-050ADUP, 115495-051ADUP; however, the Laboratory Control Sample (LCS) validated the analytical batch.

**Analytical Comments for Method 7471**

Matrix Spike (MS) and /or Matrix Spike Duplicate (MSD) are/is outside recovery criteria for samples 115709-010AMS and 115709-010AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).



**ANALYTICAL RESULTS**

<b>CLIENT:</b>	AMEC Geomatrix	<b>Lab Order:</b>	115495
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Date Received</b>	12/23/2010 6:55:00 PM
<b>Project No:</b>		<b>Matrix:</b>	Soil
<b>Analyte:</b>	Lead	<b>Analyst:</b>	RQ

Laboratory ID	Client Sample ID	Results	Units	QC Batch	MDL	PQL	Qual	DF	Date Collected	Date Analyzed
115495-001A	1118-101-0-0.5	920	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-002A	1118-101-1-1.5	22	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-003A	1118-101-2.5-3	38	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-004A	1118-102-0-0.5	1200	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-005A	1118-102-1-1.5	160	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-006A	1118-102-2.5-3	120	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-007A	1118-103-0-0.5	540	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-008A	1118-103-1-1.5	150	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-009A	1118-103-2.5-3	26	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-010A	1118-104-0-0.5	510	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-011A	1118-104-1-1.5	130	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-012A	1118-104-2.5-3	12	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-013A	1118-105-0-0.5	180	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-014A	1118-105-1-1.5	56	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-015A	1118-105-2.5-3	330	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-016A	1118-106-0-0.5	67	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-017A	1118-106-1-1.5	56	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-018A	1118-106-2.5-3	9.3	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



**LEAD BY ICP  
EPA 6010B**

**ANALYTICAL RESULTS**

<b>CLIENT:</b>	AMEC Geomatrix	<b>Lab Order:</b>	115495
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Date Received</b>	12/23/2010 6:55:00 PM
<b>Project No:</b>		<b>Matrix:</b>	Soil
<b>Analyte:</b>	Lead	<b>Analyst:</b>	RQ

Laboratory ID	Client Sample ID	Results	Units	QC Batch	MDL	PQL	Qual	DF	Date Collected	Date Analyzed
115495-019A	1118-107-0-0.5	35	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-020A	1118-107-1-1.5	37	mg/Kg	69308	0.11	5.0	1		12/23/2010	12/30/2010
115495-021A	1118-107-2.5-3	14	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-022A	1118-108-0-0.5	280	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-023A	1118-108-1-1.5	17	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-024A	1118-108-2.5-3	79	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-025A	1118-109-0-0.5	200	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-026A	1118-109-1-1.5	20	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-027A	1118-109-2.5-3	16	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-028A	1118-110-0-0.5	140	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-029A	1118-110-1-1.5	99	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-030A	1118-110-2.5-3	35	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-031A	1118-111-0-0.5	980	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-032A	1118-111-1-1.5	99	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-033A	1118-111-2.5-3	35	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-034A	1118-112-0-0.5	200	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-035A	1118-112-1-1.5	39	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-036A	1118-112-2.5-3	26	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



*Advanced Technology  
Laboratories*

3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562.989.4045 Fax: 562.989.4040

**ANALYTICAL RESULTS**

<b>CLIENT:</b>	AMEC Geomatrix	<b>Lab Order:</b>	115495
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Date Received</b>	12/23/2010 6:55:00 PM
<b>Project No:</b>		<b>Matrix:</b>	Soil
<b>Analyte:</b>	Lead	<b>Analyst:</b>	RQ

Laboratory ID	Client Sample ID	Results	Units	QC Batch	MDL	PQL	Qual	DF	Date Collected	Date Analyzed
115495-037A	1118-113-0-0.5	500	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-038A	1118-113-1-1.5	85	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-039A	1118-113-2.5-3	20	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-040A	1118-114-0-0.5	91	mg/Kg	69309	0.11	5.0	1		12/23/2010	12/30/2010
115495-041A	1118-114-1-1.5	38	mg/Kg	69310	0.11	5.0	1		12/23/2010	12/30/2010
115495-042A	1118-114-2.5-3	12	mg/Kg	69310	0.11	5.0	1		12/23/2010	12/30/2010
115495-043A	1118-115-0-0.5	750	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-044A	1118-115-1-1.5	120	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-045A	1118-115-2.5-3	100	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-046A	1118-116-0-0.5	93	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-047A	1118-116-1-1.5	40	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-048A	1118-116-2.5-3	23	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-049A	1118-117-0-0.5	540	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-050A	1118-117-1-1.5	15	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011
115495-051A	1118-117-2.5-3	ND	mg/Kg	69310	0.11	5.0	1		12/23/2010	1/3/2011

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



**ANALYTICAL RESULTS**

**pH  
EPA 9045C**

<b>CLIENT:</b>	AMEC Geomatrix	<b>Lab Order:</b>	115495
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Date Received</b>	12/23/2010 6:55:00 PM
<b>Project No:</b>		<b>Matrix:</b>	Soil
<b>Analyte:</b>	pH	<b>Analyst:</b>	CBB

Laboratory ID	Client Sample ID	Results	Units	QC Batch	MDL	PQL	Qual	DF	Date Collected	Date Analyzed
115495-002A	1118-101-1-1.5	8.7	pH Units	R128813	0.10	0.10	1		12/23/2010	1/14/2011
115495-019A	1118-107-0-0.5	8.7	pH Units	R128813	0.10	0.10	1		12/23/2010	1/14/2011
115495-026A	1118-109-1-1.5	8.6	pH Units	R128813	0.10	0.10	1		12/23/2010	1/14/2011
115495-039A	1118-113-2.5-3	8.1	pH Units	R128813	0.10	0.10	1		12/23/2010	1/14/2011
115495-042A	1118-114-2.5-3	8.2	pH Units	R128813	0.10	0.10	1		12/23/2010	1/14/2011
115495-050A	1118-117-1-1.5	8.6	pH Units	R128813	0.10	0.10	1		12/23/2010	1/14/2011

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



**Advanced Technology Laboratories**

**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix  
**Lab Order:** 115495  
**Project:** State Route 90 ADL, 153240070  
**Lab ID:** 115495-001A

**Client Sample ID:** 1118-101-0-0.5  
**Collection Date:** 12/23/2010 8:15:00 AM  
**Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	0.16	0.0046	0.10		mg/L	1	1/19/2011 12:48 PM

**ICP METALS**

**EPA 3050B**

**EPA 6010B**

RunID: <b>ICP8_110112B</b>	QC Batch: <b>69652</b>				PrepDate:	<b>1/11/2011</b>	Analyst: <b>JSD</b>
Antimony	ND	0.28	2.0		mg/Kg	1	1/12/2011 09:42 AM
Arsenic	ND	0.27	1.0		mg/Kg	1	1/12/2011 09:42 AM
Barium	55	0.13	1.0		mg/Kg	1	1/12/2011 09:42 AM
Beryllium	ND	0.055	1.0		mg/Kg	1	1/12/2011 09:42 AM
Cadmium	ND	0.0064	1.0		mg/Kg	1	1/12/2011 09:42 AM
Chromium	13	0.088	1.0		mg/Kg	1	1/12/2011 09:42 AM
Cobalt	4.5	0.014	1.0		mg/Kg	1	1/12/2011 09:42 AM
Copper	22	0.26	2.0		mg/Kg	1	1/12/2011 09:42 AM
Molybdenum	ND	0.043	1.0		mg/Kg	1	1/12/2011 09:42 AM
Nickel	9.2	0.032	1.0		mg/Kg	1	1/12/2011 09:42 AM
Selenium	ND	0.43	1.0		mg/Kg	1	1/12/2011 09:42 AM
Silver	ND	0.017	1.0		mg/Kg	1	1/12/2011 09:42 AM
Thallium	ND	0.23	1.0		mg/Kg	1	1/12/2011 09:42 AM
Vanadium	19	0.019	1.0		mg/Kg	1	1/12/2011 09:42 AM
Zinc	120	0.19	1.0		mg/Kg	1	1/12/2011 09:42 AM

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	58	0.042	1.0		mg/L	20	1/11/2011 12:08 PM

**ICP METALS BY TCLP EXTRACTION**

**EPA3010A**

**EPA 1311/ 6010B**

RunID: <b>ICP8_110112F</b>	QC Batch: <b>69681</b>				PrepDate:	<b>1/12/2011</b>	Analyst: <b>JSD</b>
Lead	1.5	0.0046	0.050		mg/L	1	1/12/2011 02:57 PM

**MERCURY BY COLD VAPOR TECHNIQUE**

**EPA 7471A**

RunID: <b>AA1_110111B</b>	QC Batch: <b>69653</b>				PrepDate:	<b>1/11/2011</b>	Analyst: <b>VV</b>
Mercury	ND	0.0076	0.10		mg/Kg	1	1/11/2011 04:52 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix  
**Lab Order:** 115495  
**Project:** State Route 90 ADL, 153240070  
**Lab ID:** 115495-004A

**Client Sample ID:** 1118-102-0-0.5  
**Collection Date:** 12/23/2010 8:26:00 AM  
**Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10		mg/L	1	1/19/2011 12:51 PM

**ICP METALS**

**EPA 3050B**

**EPA 6010B**

RunID: <b>ICP8_110112B</b>	QC Batch: <b>69652</b>				PrepDate:	<b>1/11/2011</b>	Analyst: <b>JSD</b>
Antimony	ND	0.28	2.0		mg/Kg	1	1/12/2011 09:56 AM
Arsenic	2.7	0.27	1.0		mg/Kg	1	1/12/2011 09:56 AM
Barium	79	0.13	1.0		mg/Kg	1	1/12/2011 09:56 AM
Beryllium	ND	0.055	1.0		mg/Kg	1	1/12/2011 09:56 AM
Cadmium	1.0	0.0064	1.0		mg/Kg	1	1/12/2011 09:56 AM
Chromium	15	0.088	1.0		mg/Kg	1	1/12/2011 09:56 AM
Cobalt	5.1	0.014	1.0		mg/Kg	1	1/12/2011 09:56 AM
Copper	75	0.26	2.0		mg/Kg	1	1/12/2011 09:56 AM
Molybdenum	1.3	0.043	1.0		mg/Kg	1	1/12/2011 09:56 AM
Nickel	27	0.032	1.0		mg/Kg	1	1/12/2011 09:56 AM
Selenium	ND	0.43	1.0		mg/Kg	1	1/12/2011 09:56 AM
Silver	ND	0.017	1.0		mg/Kg	1	1/12/2011 09:56 AM
Thallium	ND	0.23	1.0		mg/Kg	1	1/12/2011 09:56 AM
Vanadium	19	0.019	1.0		mg/Kg	1	1/12/2011 09:56 AM
Zinc	240	0.19	1.0		mg/Kg	1	1/12/2011 09:56 AM

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	79	0.042	1.0		mg/L	20	1/11/2011 12:10 PM

**ICP METALS BY TCLP EXTRACTION**

**EPA3010A**

**EPA 1311/ 6010B**

RunID: <b>ICP8_110112F</b>	QC Batch: <b>69681</b>				PrepDate:	<b>1/12/2011</b>	Analyst: <b>JSD</b>
Lead	1.0	0.0046	0.050		mg/L	1	1/12/2011 03:01 PM

**MERCURY BY COLD VAPOR TECHNIQUE**

**EPA 7471A**

RunID: <b>AA1_110111B</b>	QC Batch: <b>69653</b>				PrepDate:	<b>1/11/2011</b>	Analyst: <b>VV</b>
Mercury	ND	0.0076	0.10		mg/Kg	1	1/11/2011 04:57 PM

**Qualifiers:** B Analyte detected in the associated Method Blank E Value above quantitation range  
H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit  
S Spike/Surrogate outside of limits due to matrix interference Results are wet unless otherwise specified  
DO Surrogate Diluted Out



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix  
**Lab Order:** 115495  
**Project:** State Route 90 ADL, 153240070  
**Lab ID:** 115495-005A

**Client Sample ID:** 1118-102-1-1.5  
**Collection Date:** 12/23/2010 8:30:00 AM  
**Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 12:53 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	10	0.042	1.0	mg/L	20	1/11/2011 12:13 PM	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-102-2.5-3
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 8:33:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-006A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	2.3	0.042	1.0	mg/L	20	1/11/2011 12:15 PM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-103-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 9:17:00 AM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-007A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:	Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 12:55 PM

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>				PrepDate:	Analyst: <b>JSD</b>
Lead	29	0.042	1.0	mg/L	20	1/11/2011 12:18 PM

**ICP METALS BY TCLP EXTRACTION**

**EPA3010A**

**EPA 1311/ 6010B**

RunID: <b>ICP8_110112F</b>	QC Batch: <b>69681</b>				PrepDate: <b>1/12/2011</b>	Analyst: <b>JSD</b>
Lead	0.27	0.0046	0.050	mg/L	1	1/12/2011 03:04 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-103-1-1.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 9:20:00 AM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-008A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 12:58 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	5.6	0.042	1.0	mg/L	20	1/11/2011 12:20 PM	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-104-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 9:09:00 AM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-010A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:00 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	25	0.042	1.0	mg/L	20	1/11/2011 12:23 PM	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-104-1-1.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 9:13:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-011A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ICP METALS BY STLC

### WET/ EPA 6010B

RunID: <b>ICP10_110111C</b>	QC Batch: <b>R128719</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	3.4	0.042	1.0	mg/L	20	1/11/2011 12:29 PM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-105-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 10:18:00 AM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-013A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:03 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	19	0.042	1.0	mg/L	20	1/11/2011 10:38 AM	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-105-1-1.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 10:21:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-014A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ICP METALS BY STLC

### WET/ EPA 6010B

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	3.7	0.042	1.0	mg/L	20	1/11/2011 10:41 AM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-105-2.5-3
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 10:24:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-015A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ICP METALS BY STLC

### WET/ EPA 6010B

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	2.8	0.042	1.0	mg/L	20	1/11/2011 10:43 AM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

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<b>CLIENT:</b> AMEC Geomatrix	<b>Client Sample ID:</b> 1118-106-0-0.5
<b>Lab Order:</b> 115495	<b>Collection Date:</b> 12/23/2010 10:05:00 AM
<b>Project:</b> State Route 90 ADL, 153240070	<b>Matrix:</b> SOIL
<b>Lab ID:</b> 115495-016A	

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:05 PM

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	26	0.042	1.0	mg/L	20	1/11/2011 10:45 AM

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<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-106-1-1.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 10:13:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-017A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ICP METALS BY STLC

### WET/ EPA 6010B

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	2.5	0.042	1.0	mg/L	20	1/11/2011 10:48 AM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-108-0-0.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 11:00:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-022A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:12 PM

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	16	0.042	1.0	mg/L	20	1/11/2011 10:50 AM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-108-2.5-3
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 11:06:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-024A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ICP METALS BY STLC

### WET/ EPA 6010B

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>	PrepDate:	Analyst: <b>JSD</b>
Lead	ND 0.042	1.0 mg/L	20 1/11/2011 10:53 AM

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<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-109-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 11:40:00 AM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-025A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:15 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	13	0.042	1.0	mg/L	20	1/11/2011 10:55 AM	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-110-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 11:40:00 AM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-028A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:22 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	7.1	0.042	1.0	mg/L	20	1/11/2011 10:58 AM	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-110-1-1.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 11:43:00 AM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-029A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ICP METALS BY STLC

### WET/ EPA 6010B

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	3.9	0.042	1.0	mg/L	20	1/11/2011 11:04 AM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix  
**Lab Order:** 115495  
**Project:** State Route 90 ADL, 153240070  
**Lab ID:** 115495-031A

**Client Sample ID:** 1118-111-0-0.5  
**Collection Date:** 12/23/2010 1:18:00 PM  
**Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	0.15	0.0046	0.10		mg/L	1	1/19/2011 01:25 PM

**ICP METALS**

**EPA 3050B**

**EPA 6010B**

RunID: <b>ICP8_110112B</b>	QC Batch: <b>69652</b>				PrepDate:	<b>1/11/2011</b>	Analyst: <b>JSD</b>
Antimony	ND	0.28	2.0		mg/Kg	1	1/12/2011 10:00 AM
Arsenic	1.8	0.27	1.0		mg/Kg	1	1/12/2011 10:00 AM
Barium	64	0.13	1.0		mg/Kg	1	1/12/2011 10:00 AM
Beryllium	ND	0.055	1.0		mg/Kg	1	1/12/2011 10:00 AM
Cadmium	ND	0.0064	1.0		mg/Kg	1	1/12/2011 10:00 AM
Chromium	22	0.088	1.0		mg/Kg	1	1/12/2011 10:00 AM
Cobalt	4.3	0.014	1.0		mg/Kg	1	1/12/2011 10:00 AM
Copper	43	0.26	2.0		mg/Kg	1	1/12/2011 10:00 AM
Molybdenum	1.3	0.043	1.0		mg/Kg	1	1/12/2011 10:00 AM
Nickel	13	0.032	1.0		mg/Kg	1	1/12/2011 10:00 AM
Selenium	ND	0.43	1.0		mg/Kg	1	1/12/2011 10:00 AM
Silver	ND	0.017	1.0		mg/Kg	1	1/12/2011 10:00 AM
Thallium	ND	0.23	1.0		mg/Kg	1	1/12/2011 10:00 AM
Vanadium	20	0.019	1.0		mg/Kg	1	1/12/2011 10:00 AM
Zinc	210	0.19	1.0		mg/Kg	1	1/12/2011 10:00 AM

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	67	0.042	1.0		mg/L	20	1/11/2011 11:17 AM

**ICP METALS BY TCLP EXTRACTION**

**EPA3010A**

**EPA 1311/ 6010B**

RunID: <b>ICP8_110112F</b>	QC Batch: <b>69681</b>				PrepDate:	<b>1/12/2011</b>	Analyst: <b>JSD</b>
Lead	0.98	0.0046	0.050		mg/L	1	1/12/2011 03:08 PM

**MERCURY BY COLD VAPOR TECHNIQUE**

**EPA 7471A**

RunID: <b>AA1_110111B</b>	QC Batch: <b>69653</b>				PrepDate:	<b>1/11/2011</b>	Analyst: <b>VV</b>
Mercury	ND	0.0076	0.10		mg/Kg	1	1/11/2011 04:59 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-111-1-1.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 1:20:00 PM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-032A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:27 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	12	0.042	1.0	mg/L	20	1/11/2011 11:19 AM	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-112-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 1:25:00 PM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-034A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:29 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	14	0.042	1.0	mg/L	20	1/11/2011 11:21 AM	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-113-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 1:50:00 PM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-037A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:32 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	30	0.042	1.0	mg/L	20	1/11/2011 11:24 AM	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-113-1-1.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 1:52:00 PM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-038A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>	PrepDate:	Analyst: <b>JSD</b>
Lead	4.8 0.042	1.0 mg/L	20 1/11/2011 11:26 AM

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<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-114-0-0.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 1:57:00 PM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-040A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>	PrepDate:	Analyst: <b>JSD</b>
Lead	4.8 0.042	1.0 mg/L	20 1/11/2011 11:33 AM

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<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	ND Not Detected at the Reporting Limit
	S Spike/Surrogate outside of limits due to matrix interference	Results are wet unless otherwise specified
	DO Surrogate Diluted Out	



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-115-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 3:00:00 PM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-043A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 01:34 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	62	0.042	1.0	mg/L	20	1/11/2011 11:35 AM	

**ICP METALS BY TCLP EXTRACTION**

**EPA3010A**

**EPA 1311/ 6010B**

RunID: <b>ICP8_110112F</b>	QC Batch: <b>69681</b>				PrepDate: <b>1/12/2011</b>		Analyst: <b>JSD</b>
Lead	1.3	0.0046	0.050	mg/L	1	1/12/2011 03:11 PM	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-115-1-1.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 3:03:00 PM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-044A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 02:25 PM	

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>				PrepDate:		Analyst: <b>JSD</b>
Lead	19	0.042	1.0	mg/L	20	1/11/2011 11:38 AM	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-115-2.5-3
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 3:06:00 PM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-045A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ICP METALS BY STLC

### WET/ EPA 6010B

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	1.7	0.042	1.0	mg/L	20	1/11/2011 11:40 AM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ANALYTICAL RESULTS**

Print Date: 20-Jan-11

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<b>CLIENT:</b>	AMEC Geomatrix	<b>Client Sample ID:</b>	1118-116-0-0.5
<b>Lab Order:</b>	115495	<b>Collection Date:</b>	12/23/2010 2:32:00 PM
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	115495-046A		

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Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111B</b>	QC Batch: <b>R128717</b>			PrepDate:		Analyst: <b>JSD</b>
Lead	3.9	0.042	1.0	mg/L	20	1/11/2011 11:43 AM

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<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562.989.4045 Fax: 562.989.4040

# Advanced Technology Laboratories

# ANALYTICAL RESULTS

Print Date: 20-Jan-11

**CLIENT:** AMEC Geomatrix

**Client Sample ID:** 1118-117-0-0.5

**Lab Order:** 115495

**Collection Date:** 12/23/2010 2:35:00 PM

**Project:** State Route 90 ADL, 153240070

**Matrix:** SOIL

**Lab ID:** 115495-049A

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ICP METALS**

**WET DI/ EPA 6010B**

RunID: <b>ICP10_110119A</b>	QC Batch: <b>R128952</b>				PrepDate:	Analyst: <b>JSD</b>
Lead	ND	0.0046	0.10	mg/L	1	1/19/2011 02:27 PM

**ICP METALS BY STLC**

**WET/ EPA 6010B**

RunID: <b>ICP10_110111D</b>	QC Batch: <b>R128721</b>				PrepDate:	Analyst: <b>JSD</b>
Lead	26	0.042	1.0	mg/L	20	1/11/2011 02:14 PM

**ICP METALS BY TCLP EXTRACTION**

**EPA3010A**

**EPA 1311/ 6010B**

RunID: <b>ICP8_110112F</b>	QC Batch: <b>69681</b>				PrepDate: <b>1/12/2011</b>	Analyst: <b>JSD</b>
Lead	0.27	0.0046	0.050	mg/L	1	1/12/2011 03:15 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

**ANALYTICAL QC SUMMARY REPORT**

**TestCode: 6010\_DI**

Sample ID: <b>MB-69771A</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>		Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090249</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead ND 0.10

Sample ID: <b>115495-025A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>1118-109-0-0.5</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>		Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090261</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 0.015 0.10 0.03413 0 20

Sample ID: <b>MB-69771B</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>		Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090262</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead ND 0.10

Sample ID: <b>115495-049A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>		Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090271</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

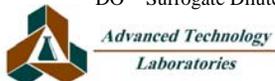
Lead 0.093 0.10 0.09280 0 20

Sample ID: <b>115495-049A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>		Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090272</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 2.488 0.10 2.500 0.09280 95.8 80 118

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits
- Calculations are based on raw values
- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_DI**

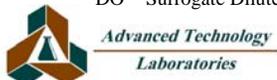
Sample ID: <b>115495-049A-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>	Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090273</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	2.485	0.10	2.500	0.09280	95.7	80	118	2.488	0.115	20	

Sample ID: <b>LCS-69771</b>	SampType: <b>LCS</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>	Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090365</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.983	0.10	1.000	0	98.3	85	115				

Sample ID: <b>115495-025A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_DI</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128952</b>						
Client ID: <b>1118-109-0-0.5</b>	Batch ID: <b>R128952</b>	TestNo: <b>WET DI/ EPA</b>	Analysis Date: <b>1/19/2011</b>	SeqNo: <b>2090366</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	2.469	0.10	2.500	0.03413	97.4	80	118				

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

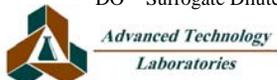
**TestCode: 6010\_S**

Sample ID: <b>MB-69652</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128740</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69652</b>	TestNo: <b>EPA 6010B EPA 3050B</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086371</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	ND	1.0									
Chromium	ND	1.0									
Cobalt	0.041	1.0									
Copper	ND	2.0									
Lead	ND	1.0									
Molybdenum	0.059	1.0									
Nickel	0.097	1.0									
Selenium	ND	1.0									
Silver	0.050	1.0									
Thallium	ND	1.0									
Vanadium	ND	1.0									
Zinc	ND	1.0									

Sample ID: <b>LCS-69652</b>	SampType: <b>LCS</b>	TestCode: <b>6010_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128740</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>69652</b>	TestNo: <b>EPA 6010B EPA 3050B</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086372</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	50.335	2.0	50.00	0	101	80	120				
Arsenic	49.214	1.0	50.00	0	98.4	80	120				
Barium	53.255	1.0	50.00	0	107	80	120				
Beryllium	51.154	1.0	50.00	0	102	80	120				
Cadmium	50.816	1.0	50.00	0	102	80	120				
Chromium	47.745	1.0	50.00	0	95.5	80	120				
Cobalt	51.505	1.0	50.00	0.04127	103	80	120				
Copper	51.628	2.0	50.00	0	103	80	120				
Lead	50.690	1.0	50.00	0	101	80	120				

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

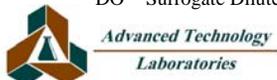
**TestCode: 6010\_S**

Sample ID: <b>LCS-69652</b>	SampType: <b>LCS</b>	TestCode: <b>6010_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128740</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>69652</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050B</b>	Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086372</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	52.884	1.0	50.00	0.05904	106	80	120				
Nickel	50.170	1.0	50.00	0.09656	100	80	120				
Selenium	46.481	1.0	50.00	0	93.0	80	120				
Silver	50.180	1.0	50.00	0.05037	100	80	120				
Thallium	48.672	1.0	50.00	0	97.3	80	120				
Vanadium	51.557	1.0	50.00	0	103	80	120				
Zinc	50.939	1.0	50.00	0	102	80	120				

Sample ID: <b>115495-001A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128740</b>						
Client ID: <b>1118-101-0-0.5</b>	Batch ID: <b>69652</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050B</b>	Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086374</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.599	2.0						0.7338	0	20	
Arsenic	ND	1.0						0.6397	0	20	
Barium	67.687	1.0						54.71	21.2	20	R
Beryllium	ND	1.0						0	0	20	
Cadmium	0.577	1.0						0.4824	0	20	
Chromium	14.123	1.0						12.60	11.4	20	
Cobalt	4.918	1.0						4.510	8.65	20	
Copper	21.338	2.0						21.84	2.34	20	
Lead	1297.589	1.0						1066	19.6	20	
Molybdenum	0.631	1.0						0.4192	0	20	
Nickel	10.356	1.0						9.179	12.0	20	
Selenium	ND	1.0						0	0	20	
Silver	ND	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	20.292	1.0						18.91	7.05	20	
Zinc	139.832	1.0						122.8	12.9	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

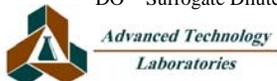
**TestCode: 6010\_S**

Sample ID: <b>115709-010A-MS</b>		SampType: <b>MS</b>		TestCode: <b>6010_S</b>		Units: <b>mg/Kg</b>		Prep Date: <b>1/11/2011</b>		RunNo: <b>128740</b>	
Client ID: <b>ZZZZZZ</b>		Batch ID: <b>69652</b>		TestNo: <b>EPA 6010B EPA 3050B</b>		Analysis Date: <b>1/12/2011</b>		SeqNo: <b>2086383</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	107.310	2.0	125.0	0.3350	85.6	32	105				
Arsenic	110.345	1.0	125.0	0	88.3	49	106				
Barium	170.642	1.0	125.0	52.40	94.6	31	133				
Beryllium	114.948	1.0	125.0	0	92.0	56	106				
Cadmium	115.770	1.0	125.0	0.1884	92.5	51	103				
Chromium	120.027	1.0	125.0	10.11	87.9	45	114				
Cobalt	122.991	1.0	125.0	6.282	93.4	52	106				
Copper	134.361	2.0	125.0	8.091	101	54	125				
Lead	116.242	1.0	125.0	2.941	90.6	34	126				
Molybdenum	119.111	1.0	125.0	0	95.3	54	106				
Nickel	123.252	1.0	125.0	8.348	91.9	45	111				
Selenium	107.462	1.0	125.0	0	86.0	47	104				
Silver	120.647	1.0	125.0	0	96.5	56	112				
Thallium	103.647	1.0	125.0	0	82.9	46	101				
Vanadium	145.853	1.0	125.0	23.91	97.6	54	114				
Zinc	144.426	1.0	125.0	32.87	89.2	28	125				

Sample ID: <b>115709-010A-MSD</b>		SampType: <b>MSD</b>		TestCode: <b>6010_S</b>		Units: <b>mg/Kg</b>		Prep Date: <b>1/11/2011</b>		RunNo: <b>128740</b>	
Client ID: <b>ZZZZZZ</b>		Batch ID: <b>69652</b>		TestNo: <b>EPA 6010B EPA 3050B</b>		Analysis Date: <b>1/12/2011</b>		SeqNo: <b>2086384</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	108.405	2.0	125.0	0.3350	86.5	32	105	107.3	1.02	20	
Arsenic	111.940	1.0	125.0	0	89.6	49	106	110.3	1.44	20	
Barium	170.102	1.0	125.0	52.40	94.2	31	133	170.6	0.317	20	
Beryllium	114.448	1.0	125.0	0	91.6	56	106	114.9	0.435	20	
Cadmium	116.092	1.0	125.0	0.1884	92.7	51	103	115.8	0.278	20	
Chromium	121.050	1.0	125.0	10.11	88.8	45	114	120.0	0.849	20	
Cobalt	123.272	1.0	125.0	6.282	93.6	52	106	123.0	0.229	20	
Copper	134.585	2.0	125.0	8.091	101	54	125	134.4	0.166	20	
Lead	117.349	1.0	125.0	2.941	91.5	34	126	116.2	0.948	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_S**

Sample ID: <b>115709-010A-MSD</b>		SampType: <b>MSD</b>		TestCode: <b>6010_S</b>		Units: <b>mg/Kg</b>		Prep Date: <b>1/11/2011</b>		RunNo: <b>128740</b>	
Client ID: <b>ZZZZZZ</b>		Batch ID: <b>69652</b>		TestNo: <b>EPA 6010B EPA 3050B</b>		Analysis Date: <b>1/12/2011</b>		SeqNo: <b>2086384</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	120.648	1.0	125.0	0	96.5	54	106	119.1	1.28	20	
Nickel	124.554	1.0	125.0	8.348	93.0	45	111	123.3	1.05	20	
Selenium	108.937	1.0	125.0	0	87.1	47	104	107.5	1.36	20	
Silver	121.048	1.0	125.0	0	96.8	56	112	120.6	0.332	20	
Thallium	104.982	1.0	125.0	0	84.0	46	101	103.6	1.28	20	
Vanadium	149.060	1.0	125.0	23.91	100	54	114	145.9	2.17	20	
Zinc	144.064	1.0	125.0	32.87	89.0	28	125	144.4	0.251	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



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**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_SPB**

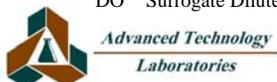
Sample ID: <b>115495-020A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128363</b>						
Client ID: <b>1118-107-1-1.5</b>	Batch ID: <b>69308</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078382</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	24.035	5.0						37.35	43.4	20	R

Sample ID: <b>115495-020A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128363</b>						
Client ID: <b>1118-107-1-1.5</b>	Batch ID: <b>69308</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078383</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	270.218	5.0	250.0	37.35	93.1	34	126				

Sample ID: <b>115495-020A-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128363</b>						
Client ID: <b>1118-107-1-1.5</b>	Batch ID: <b>69308</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078384</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	264.961	5.0	250.0	37.35	91.0	34	126	270.2	1.96	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_SPB**

Sample ID: <b>MB-69309A</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078385</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.170	5.0									

Sample ID: <b>LCS-69309</b>	SampType: <b>LCS</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078386</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	241.087	5.0	250.0	0.1698	96.4	80	120				

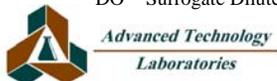
Sample ID: <b>115495-030ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>1118-110-2.5-3</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078397</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	59.284	5.0						34.97	51.6	20	R

Sample ID: <b>115495-030AMS</b>	SampType: <b>MS</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>1118-110-2.5-3</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078398</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	220.790	5.0	250.0	34.97	74.3	34	126				

Sample ID: <b>MB-69309B</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078399</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.116	5.0									

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_SPB**

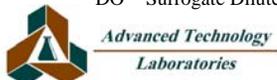
Sample ID: <b>115495-040ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>1118-114-0-0.5</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078410</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	129.874	5.0						90.51	35.7	20	R

Sample ID: <b>115495-040AMS</b>	SampType: <b>MS</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>1118-114-0-0.5</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078411</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	255.532	5.0	250.0	90.51	66.0	34	126				

Sample ID: <b>115495-040AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128364</b>						
Client ID: <b>1118-114-0-0.5</b>	Batch ID: <b>69309</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078412</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	226.891	5.0	250.0	90.51	54.6	34	126	255.5	11.9	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_SPB**

Sample ID: <b>MB-69310A</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078413</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.253	5.0									

Sample ID: <b>LCS-69310</b>	SampType: <b>LCS</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>12/30/2010</b>	SeqNo: <b>2078414</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	233.195	5.0	250.0	0.2533	93.2	80	120				

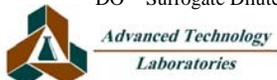
Sample ID: <b>115495-050ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>1118-117-1-1.5</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>1/3/2011</b>	SeqNo: <b>2078450</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	26.487	5.0						15.48	52.5	20	R

Sample ID: <b>115495-050AMS</b>	SampType: <b>MS</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>1118-117-1-1.5</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>1/3/2011</b>	SeqNo: <b>2078451</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	209.461	5.0	250.0	15.48	77.6	34	126				

Sample ID: <b>MB-69310B</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>1/3/2011</b>	SeqNo: <b>2078452</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.142	5.0									

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_SPB**

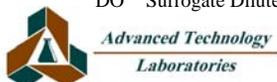
Sample ID: <b>115495-051ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>1118-117-2.5-3</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>1/3/2011</b>	SeqNo: <b>2078454</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	6.200	5.0						3.117	66.2	20	R

Sample ID: <b>115495-051AMS</b>	SampType: <b>MS</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>1118-117-2.5-3</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>1/3/2011</b>	SeqNo: <b>2078455</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	212.311	5.0	250.0	3.117	83.7	34	126				

Sample ID: <b>115495-051AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_SPB</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/29/2010</b>	RunNo: <b>128365</b>						
Client ID: <b>1118-117-2.5-3</b>	Batch ID: <b>69310</b>	TestNo: <b>EPA 6010B</b>	<b>EPA 3050M</b>	Analysis Date: <b>1/3/2011</b>	SeqNo: <b>2078456</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	182.927	5.0	250.0	3.117	71.9	34	126	212.3	14.9	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_ST**

Sample ID: <b>MB-69606A</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128717</b>						
Client ID: <b>PBS</b>	Batch ID: <b>R128717</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2085931</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.010	0.050									

Sample ID: <b>MB-69606A STLC</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128717</b>						
Client ID: <b>PBS</b>	Batch ID: <b>R128717</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2085932</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.051	1.0									

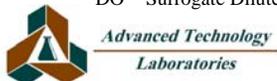
Sample ID: <b>LCS-69606</b>	SampType: <b>LCS</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128717</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>R128717</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2085933</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.129	0.050	1.000	0.009597	112	85	115				

Sample ID: <b>115495-029A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128717</b>						
Client ID: <b>1118-110-1-1.5</b>	Batch ID: <b>R128717</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2085944</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	2.914	1.0						3.890	28.7	20	R

Sample ID: <b>115495-029A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128717</b>						
Client ID: <b>1118-110-1-1.5</b>	Batch ID: <b>R128717</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2085945</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	6.118	1.0	2.500	3.890	89.1	80	118				

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |





**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_ST**

Sample ID: <b>MB-69605A</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128719</b>						
Client ID: <b>PBS</b>	Batch ID: <b>R128719</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086004</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.003	0.050									

Sample ID: <b>MB-69605A STLC</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128719</b>						
Client ID: <b>PBS</b>	Batch ID: <b>R128719</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086005</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	1.0									

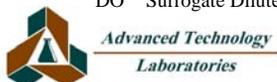
Sample ID: <b>LCS-69605</b>	SampType: <b>LCS</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128719</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>R128719</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086006</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.073	0.050	1.000	0.003177	107	85	115				

Sample ID: <b>115495-011A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128719</b>						
Client ID: <b>1118-104-1-1.5</b>	Batch ID: <b>R128719</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086017</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.819	1.0						3.423	51.9	20	R

Sample ID: <b>115495-011A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128719</b>						
Client ID: <b>1118-104-1-1.5</b>	Batch ID: <b>R128719</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086018</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.774	1.0	2.500	3.423	94.1	80	118				

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 6010\_ST

Sample ID: <b>115495-011A-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128719</b>						
Client ID: <b>1118-104-1-1.5</b>	Batch ID: <b>R128719</b>	TestNo: <b>WET/ EPA 60</b>	Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086019</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.889	1.0	2.500	3.423	98.7	80	118	5.774	1.97	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



*Advanced Technology  
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3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562.989.4045 Fax: 562.989.4040

**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_ST**

Sample ID: <b>MB-69607</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128721</b>						
Client ID: <b>PBS</b>	Batch ID: <b>R128721</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086057</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.050									

Sample ID: <b>MB-69607 STLC</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128721</b>						
Client ID: <b>PBS</b>	Batch ID: <b>R128721</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086058</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	1.0									

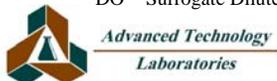
Sample ID: <b>LCS-69607</b>	SampType: <b>LCS</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128721</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>R128721</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086059</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.059	0.050	1.000	0	106	85	115				

Sample ID: <b>115495-049A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128721</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>R128721</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086061</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	30.060	1.0						25.82	15.2	20	

Sample ID: <b>115495-049A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128721</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>R128721</b>	TestNo: <b>WET/ EPA 60</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086062</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	27.590	1.0	2.500	25.82	70.7	80	118				S

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 6010\_ST

Sample ID: <b>115495-049A-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_ST</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>128721</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>R128721</b>	TestNo: <b>WET/ EPA 60</b>	Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086063</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	26.955	1.0	2.500	25.82	45.3	80	118	27.59	2.33	20	S

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



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**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_TC**

Sample ID: <b>MB-69681</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_TC</b>	Units: <b>mg/L</b>	Prep Date: <b>1/12/2011</b>	RunNo: <b>128761</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69681</b>	TestNo: <b>EPA 1311/ 60 EPA3010A</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086665</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.050									

Sample ID: <b>MB-69681 TCLP</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_TC</b>	Units: <b>mg/L</b>	Prep Date: <b>1/12/2011</b>	RunNo: <b>128761</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69681</b>	TestNo: <b>EPA 1311/ 60 EPA3010A</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086666</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.050									

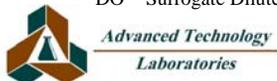
Sample ID: <b>LCS-69681</b>	SampType: <b>LCS</b>	TestCode: <b>6010_TC</b>	Units: <b>mg/L</b>	Prep Date: <b>1/12/2011</b>	RunNo: <b>128761</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>69681</b>	TestNo: <b>EPA 1311/ 60 EPA3010A</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086667</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.099	0.050	1.000	0	110	85	115				

Sample ID: <b>115495-049A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_TC</b>	Units: <b>mg/L</b>	Prep Date: <b>1/12/2011</b>	RunNo: <b>128761</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>69681</b>	TestNo: <b>EPA 1311/ 60 EPA3010A</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086674</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.273	0.050						0.2730	0.179	20	

Sample ID: <b>115495-049A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_TC</b>	Units: <b>mg/L</b>	Prep Date: <b>1/12/2011</b>	RunNo: <b>128761</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>69681</b>	TestNo: <b>EPA 1311/ 60 EPA3010A</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086695</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	2.947	0.050	2.500	0.2730	107	80	118				

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 6010\_TC

Sample ID: <b>115495-049A-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_TC</b>	Units: <b>mg/L</b>	Prep Date: <b>1/12/2011</b>	RunNo: <b>128761</b>						
Client ID: <b>1118-117-0-0.5</b>	Batch ID: <b>69681</b>	TestNo: <b>EPA 1311/ 60 EPA3010A</b>		Analysis Date: <b>1/12/2011</b>	SeqNo: <b>2086696</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	2.944	0.050	2.500	0.2730	107	80	118	2.947	0.0800	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



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**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 7471\_S**

Sample ID: <b>MB-69653</b>	SampType: <b>MBLK</b>	TestCode: <b>7471_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128729</b>						
Client ID: <b>PBS</b>	Batch ID: <b>69653</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086198</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.011	0.10									

Sample ID: <b>LCS-69653</b>	SampType: <b>LCS</b>	TestCode: <b>7471_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128729</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>69653</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086198</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.922	0.10	0.8300	0.01064	110	80	120				

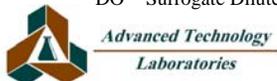
Sample ID: <b>115709-010A-MS</b>	SampType: <b>MS</b>	TestCode: <b>7471_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128729</b>						
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>69653</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086200</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.029	0.10	0.8300	0.6858	41.4	70	130				S

Sample ID: <b>115709-010A-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>7471_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128729</b>						
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>69653</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086201</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.017	0.10	0.8300	0.6858	39.9	70	130	1.029	1.18	20	S

Sample ID: <b>115495-001A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>7471_S</b>	Units: <b>mg/Kg</b>	Prep Date: <b>1/11/2011</b>	RunNo: <b>128729</b>						
Client ID: <b>1118-101-0-0.5</b>	Batch ID: <b>69653</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>1/11/2011</b>	SeqNo: <b>2086204</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.045	0.10						0.04501	0	20	

**Qualifiers:**

- |   |  |  |
|---|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range       | H Holding times for preparation or analysis exceeded           |
| ND Not Detected at the Reporting Limit            | R RPD outside accepted recovery limits | S Spike/Surrogate outside of limits due to matrix interference |
| DO Surrogate Diluted Out                          | Calculations are based on raw values   |  |



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115495  
**Project:** State Route 90 ADL, 153240070

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 9045\_S**

Sample ID: <b>115495-050ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>9045_S</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>128813</b>						
Client ID: <b>1118-117-1-1.5</b>	Batch ID: <b>R128813</b>	TestNo: <b>EPA 9045C</b>	Analysis Date: <b>1/14/2011</b>	SeqNo: <b>2087503</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	8.480	0.10						8.550	0.822	20	

**Qualifiers:**

- |    |   |   |                                      |   |  |
|----|---|---|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           |   | Calculations are based on raw values |   |  |



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# CHAIN OF CUSTODY RECORD

 <p><b>Advanced Technology Laboratories</b></p> <p>3275 Walnut Avenue Signal Hill, CA 90755 Tel: (562) 989-4045 • Fax: (562) 989-4040</p>		<b>FOR LABORATORY USE ONLY</b>											
		P.O. #: _____		Method of Transport Client <input checked="" type="checkbox"/> ATL <input type="checkbox"/> CA OverN <input type="checkbox"/> FedEx <input type="checkbox"/> Other: _____		Sample Condition Upon Receipt 1. CHILLED Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 4. SEALED Y <input type="checkbox"/> N <input type="checkbox"/> 2. HEADSPACE (VOA) Y <input type="checkbox"/> N <input type="checkbox"/> 5. # OF SPLS MATCH COC Y <input type="checkbox"/> N <input type="checkbox"/> 3. CONTAINER INTACT Y <input type="checkbox"/> N <input type="checkbox"/> 6. PRESERVED Y <input type="checkbox"/> N <input type="checkbox"/>						Logged By: _____ Date: _____	
Client: AMEC Geomatrix Attention: VINNIE ROBINO				Address: 510 SUPERIOR AVENUE, SUITE 200 City: NEWPORT BEACH State: CA Zip Code: 92663				Tel: 949-642-0245 Fax: 949-642-4474					
Project Name: State Route 90 ADL		Project #: 153240070		Sampler: _____		(Signature) _____							
Relinquished by: (Signature and Printed Name) <i>[Signature]</i>		Date: 12/23/10		Time: 6:55		Received by: (Signature and Printed Name) <i>[Signature]</i>		Date: 12/23/10		Time: 1:55			
Relinquished by: (Signature and Printed Name)		Date:		Time:		Received by: (Signature and Printed Name)		Date:		Time:			
Relinquished by: (Signature and Printed Name)		Date:		Time:		Received by: (Signature and Printed Name)		Date:		Time:			
I hereby authorize ATL to perform the work indicated below: Project Mgr /Submitter: Vinnie Robino Print Name _____ Date _____ Signature _____		Send Report To: Attn: Vinnie Robino, CC Mike Conkle (Geocon) Burbank Co: Amec Geomatrix, Inc. Addr: 510 SUPERIOR AVENUE, SUITE 200 City: NEWPORT BEAC Stat: CA Zip: 92663		Bill To: Attn: Vinnie Robino Co: Amec Geomatrix, Inc. Addr: 510 SUPERIOR AVENUE, SUITE 200 City: NEWPORT BEACH State: CA Zip: 92663		Special Instructions/Comments: CT Contract 07A2730 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Filter and preseve water samples at lab.							
<b>Sample/Records - Archival &amp; Disposal</b> Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report. <b>Storage Fees (applies when storage is requested):</b> ■ Sample: \$2.00 / sample /mo (after 45 days) ■ Records: \$1 /ATL workorder /mo (after 1 year)				Circle or Add Analysis(es) Requested				SPECIFY APPROPRIATE MATRIX				P. PRESERVATION	
				Lead				SOIL WATER GROUND WATER WASTEWATER				Q A / Q C RTNE <input type="checkbox"/> CT <input type="checkbox"/> SWRCB <input type="checkbox"/> Logcode _____ OTHER _____ REMARKS	
I M T E	LAB USE ONLY: Batch #:	Sample Description				Container(s)	TAT	#	Type	P. PRESERVATION	Q A / Q C	REMARKS	
	Lab No.	Sample ID / Location	Date	Time									
	115495-21	B-1118-107-2.5-3	12/23/10	1055	x					E 1 G J			
	22	B-1118-108-0-0.5	↓	1100	x					E 1 G J			
	23	B-1118-108-1-1.5	↓	1103	x					E 1 G J			
	24	B-1118-108-2.5-3	↓	1106	x					E 1 G J			
	25	B-1118-109-0-0.5	↓	1140	x					E 1 G J			
	26	B-1118-109-1-1.5	↓	1142	x					E 1 G J			
	27	B-1118-109-2.5-3	↓	1145	x					E 1 G J			
	28	B-1118-110-0-0.5	↓	1140	x					E 1 G J			
	29	B-1118-110-1-1.5	↓	1143	x					E 1 G J			
	30	B-1118-110-2.5-3	↓	1146	x					E 1 G J			
	31	B-1118-111-0-0.5	↓	1318	x					E 1 G J			
	32	B-1118-111-1-1.5	↓	1320	x					E 1 G J			
	33	B-1118-111-2.5-3	↓	1323	x					E 1 G J			
	34	B-1118-112-0-0.5	↓	1325	x					E 1 G J			
	35	B-1118-112-1-1.5	↓	1328	x					E 1 G J			
	36	B-1118-112-2.5-3	↓	1331	x					E 1 G J			
	37	B-1118-113-0-0.5	↓	1350	x					E 1 G J			
	38	B-1118-113-1-1.5	↓	1352	x					E 1 G J			
	39	B-1118-113-2.5-3	↓	1354	x					E 1 G J			
	40	B-1118-114-0-0.5	↓	1357	x					E 1 G J			
■ TAT starts 8AM the following day if samples received after 3 PM TAT: <input type="checkbox"/> A = Overnight ≤ 24 hrs <input type="checkbox"/> B = Emergency Next Workday <input type="checkbox"/> C = Critical 2 Workdays <input type="checkbox"/> D = Urgent 3 Workdays <input checked="" type="checkbox"/> E = Routine 7 Workdays		Preservatives: H=HCl N=HNO <sub>3</sub> S=H <sub>2</sub> SO <sub>4</sub> C=4°C		Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal		Z=Zn(AC) <sub>2</sub> O=NaOH T=Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>							



January 19, 2011



Vinnie Robino  
AMEC Geomatrix  
510 Superior Avenue, Suite 200  
Newport Beach, CA 92663-3627  
TEL: (949) 274-6516  
FAX: (949) 642-4474

ELAP No.: 1838  
NELAP No.: 02107CA  
CSDLAC No.: 10196  
ORELAP No.: CA300003  
  
Workorder No.: 115494

RE: State Route 90 ADL, 153240070

Attention: Vinnie Robino

Enclosed are the results for sample(s) received on December 23, 2010 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

This is an amended report. Please disregard all previous documentation that corresponds to the page(s) enclosed.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

Eddie F. Rodriguez  
Laboratory Director

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**CLIENT:** AMEC Geomatrix  
**Project:** State Route 90 ADL, 153240070  
**Lab Order:** 115494

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**CASE NARRATIVE**

Results were J-Flag. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" Flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



**ANALYTICAL RESULTS**

<b>CLIENT:</b>	AMEC Geomatrix	<b>Lab Order:</b>	115494
<b>Project:</b>	State Route 90 ADL, 153240070	<b>Date Received</b>	12/23/2010 6:55:00 PM
<b>Project No:</b>		<b>Matrix:</b>	Water
<b>Analyte:</b>	Lead	<b>Analyst:</b>	SRB

Laboratory ID	Client Sample ID	Results	Units	QC Batch	MDL	PQL	Qual	DF	Date Collected	Date Analyzed
115494-001A	1118-100-FB-12232010-1	ND	mg/L	69402	0.0046	0.25	1		12/23/2010	1/4/2011
115494-002A	1118-100-FB-12232010-2	ND	mg/L	69402	0.0046	0.25	1		12/23/2010	1/4/2011
115494-003A	1118-100-FB-12232010-3	ND	mg/L	69402	0.0046	0.25	1		12/23/2010	1/4/2011
115494-004A	1118-100-EB-12232010-1	ND	mg/L	69402	0.0046	0.25	1		12/23/2010	1/4/2011
115494-005A	1118-100-EB-12232010-2	ND	mg/L	69402	0.0046	0.25	1		12/23/2010	1/4/2011
115494-006A	1118-100-EB-12232010-3	ND	mg/L	69402	0.0046	0.25	1		12/23/2010	1/4/2011

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	S Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified	DO Surrogate Diluted Out



**CLIENT:** AMEC Geomatrix  
**Work Order:** 115494  
**Project:** State Route 90 ADL, 153240070

**ANALYTICAL QC SUMMARY REPORT**

**TestCode: 6010\_WPB**

Sample ID: <b>MB-69402</b>	SampType: <b>MBLK</b>	TestCode: <b>6010_WPB</b>	Units: <b>mg/L</b>	Prep Date: <b>1/4/2011</b>	RunNo: <b>128415</b>
Client ID: <b>PBW</b>	Batch ID: <b>69402</b>	TestNo: <b>EPA 6010B EPA 3010A</b>		Analysis Date: <b>1/4/2011</b>	SeqNo: <b>2079678</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Lead ND 0.25

Sample ID: <b>LCS-69402</b>	SampType: <b>LCS</b>	TestCode: <b>6010_WPB</b>	Units: <b>mg/L</b>	Prep Date: <b>1/4/2011</b>	RunNo: <b>128415</b>
Client ID: <b>LCSW</b>	Batch ID: <b>69402</b>	TestNo: <b>EPA 6010B EPA 3010A</b>		Analysis Date: <b>1/4/2011</b>	SeqNo: <b>2079679</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Lead 1.079 0.25 1.000 0 108 85 115

Sample ID: <b>115494-001A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>6010_WPB</b>	Units: <b>mg/L</b>	Prep Date: <b>1/4/2011</b>	RunNo: <b>128415</b>
Client ID: <b>1118-100-FB-122320</b>	Batch ID: <b>69402</b>	TestNo: <b>EPA 6010B EPA 3010A</b>		Analysis Date: <b>1/4/2011</b>	SeqNo: <b>2079681</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Lead ND 0.25 0 0 20

Sample ID: <b>115494-006A-MS</b>	SampType: <b>MS</b>	TestCode: <b>6010_WPB</b>	Units: <b>mg/L</b>	Prep Date: <b>1/4/2011</b>	RunNo: <b>128415</b>
Client ID: <b>1118-100-EB-122320</b>	Batch ID: <b>69402</b>	TestNo: <b>EPA 6010B EPA 3010A</b>		Analysis Date: <b>1/4/2011</b>	SeqNo: <b>2079687</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

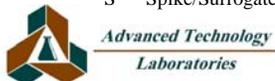
Lead 2.229 0.25 2.500 0 89.2 80 118

Sample ID: <b>115494-006A-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>6010_WPB</b>	Units: <b>mg/L</b>	Prep Date: <b>1/4/2011</b>	RunNo: <b>128415</b>
Client ID: <b>1118-100-EB-122320</b>	Batch ID: <b>69402</b>	TestNo: <b>EPA 6010B EPA 3010A</b>		Analysis Date: <b>1/4/2011</b>	SeqNo: <b>2079688</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Lead 2.468 0.25 2.500 0 98.7 80 118 2.229 10.2 20

**Qualifiers:**

- B Analyte detected in the associated Method Blank
  - J Analyte detected below quantitation limits
  - S Spike/Surrogate outside of limits due to matrix interference
  - E Value above quantitation range
  - ND Not Detected at the Reporting Limit
  - DO Surrogate Diluted Out
  - H Holding times for preparation or analysis exceeded
  - R RPD outside accepted recovery limits
- Calculations are based on raw values



# CHAIN OF CUSTODY RECORD

<p><b>Advanced Technology Laboratories</b></p> <p>3275 Walnut Avenue Signal Hill, CA 90755 Tel: (562) 989-4045 • Fax: (562) 989-4040</p>		<b>FOR LABORATORY USE ONLY</b>											
		Method of Transport Client <input checked="" type="checkbox"/> ATL <input type="checkbox"/> CA OverN <input type="checkbox"/> FedEx <input type="checkbox"/> Other: _____		Sample Condition Upon Receipt 1. CHILLED <input checked="" type="checkbox"/> N <input type="checkbox"/> 4. SEALED <input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 2. HEADSPACE (VOA) <input type="checkbox"/> N <input type="checkbox"/> 5. # OF SPLS MATCH COC <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> 3. CONTAINER INTACT <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> 6. PRESERVED <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/>									
P.O. #: _____ Logged By: <i>[Signature]</i> Date: <i>12/23/10</i>		Address: 510 SUPERIOR AVENUE, SUITE 200 City: NEWPORT BEACH State: CA Zip Code: 92663		Tel: 949-642-0245 Fax: 949-642-4474									
Client: AMEC Geomatrix Attention: VINNIE ROBINO		Project Name: State Route 90 ADL Project #: 153240070 Relinquished by: (Signature and Printed Name) <i>[Signature]</i> Date: <i>12/23/10</i> Time: <i>6:55</i>		Sampler: <i>[Signature]</i> (Signature) Received by: (Signature and Printed Name) <i>[Signature]</i> Date: <i>12/23/10</i> Time: <i>1:55</i>									
Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____ Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____		I hereby authorize ATL to perform the work indicated below: Project Mgr /Submitter: Vinnie Robino Date: _____ Signature: _____ Date: _____		Send Report To: Attn: Vinnie Robino, CC Mike Conkle (Geocon) Burbank Co: Amec Geomatrix, Inc. Addr: 510 SUPERIOR AVENUE, SUITE 200 City: NEWPORT BEAC State: CA Zip: 92663									
Bill To: Attn: Vinnie Robino Co: Amec Geomatrix, Inc. Addr: 510 SUPERIOR AVENUE, SUITE 200 City: NEWPORT BEACH State: CA Zip: 92663		Special Instructions/Comments: CT Contract 07A2730 FILTER AND PRESEVE WATER SAMPLES AT LAB.		Circle or Add Analysis(es) Requested: _____ SPECIFY APPROPRIATE MATRIX: _____ SOIL _____ WATER _____ GROUND WATER _____ WASTEWATER _____									
Sample/Records - Archival & Disposal Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report. Storage Fees (applies when storage is requested): ■ Sample :\$2.00 / sample /mo (after 45 days) ■ Records: \$1 /ATL workorder /mo (after 1 year)		Q A / Q C RTNE <input type="checkbox"/> CT <input type="checkbox"/> SWRCB <input type="checkbox"/> Logcode _____ OTHER _____ REMARKS _____		PRESERVATION _____									
ITEM	LAB USE ONLY:	Sample Description											
	Batch #:												
	Lab No.	Sample ID / Location	Date	Time	Lead	Soil	Water	Ground Water	Wastewater	TAT	#	Type	REMARKS
	115494-01	FB-01	12/23/10	0800	x		x			E	1	P	
	2	FB-02	12/23/10	1135	x		x			E	1	P	
	3	FB-03	12/23/10	1515	x		x			E	1	P	
	4	EB-01	12/23/10	0800	x		x			E	1	P	
	5	EB-02	12/23/10	1135	x		x			E	1	P	
	6	EB-03	12/23/10	1515	x		x			E	1	P	
■ TAT starts 8AM the following day if samples received after 3 PM		TAT: <input type="checkbox"/> A = Overnight ≤ 24 hrs <input type="checkbox"/> B = Emergency Next Workday <input type="checkbox"/> C = Critical 2 Workdays <input type="checkbox"/> D = Urgent 3 Workdays <input checked="" type="checkbox"/> E = Routine 7 Workdays		Preservatives: H=HCl N=HNO <sub>3</sub> S=H <sub>2</sub> SO <sub>4</sub> C=4°C Z=Zn(AC) <sub>2</sub> O=NaOH T=Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>									
Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal													

## Diane Galvan

---

**From:** Robino, Vinnie [Vinnie.Robino@amec.com]  
**Sent:** Wednesday, January 19, 2011 1:04 PM  
**To:** Diane Galvan  
**Cc:** Mike Conkle; Paul, Duane  
**Subject:** Caltrans - TO7 final lab data

Hi Diane,

This email is a follow up to a message I left for you this morning regarding the final lab reports for TO7 (SR90 ADL Investigation). Prior to issuing the final analytical reports, please revise the sample IDs provided in ATL lab order #115494 to the following new sample IDs:

1. FB-01 becomes 1118-100-FB-12232010-1
2. FB-02 becomes 1118-100-FB-12232010-2
3. FB-03 becomes 1118-100-FB-12232010-3
4. EB-01 becomes 1118-100-EB-12232010-1
5. EB-02 becomes 1118-100-EB-12232010-2
6. EB-03 becomes 1118-100-EB-12232010-3

Please call me with any questions.

Thanks,

Vinnie

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# APPENDIX C



**Photo 1 – View of boring 1118-101 location**



**Photo 2 – Vicinity of boring 1118-101 location**

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**SITE PHOTOS 1 and 2**

ADL Soil Investigation  
State Route 90 Freeway  
Los Angeles, California

S9500-06-03

February 2011



**Photo 3 – View of boring 1118-102 location**



**Photo 4 – Vicinity of boring 1118-102 location**

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**SITE PHOTOS 3 & 4**

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January 2011



**Photo 5 – View of boring 1118-103 location**



**Photo 6 – Vicinity of boring 1118-103 location**

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**SITE PHOTOS 5 & 6**

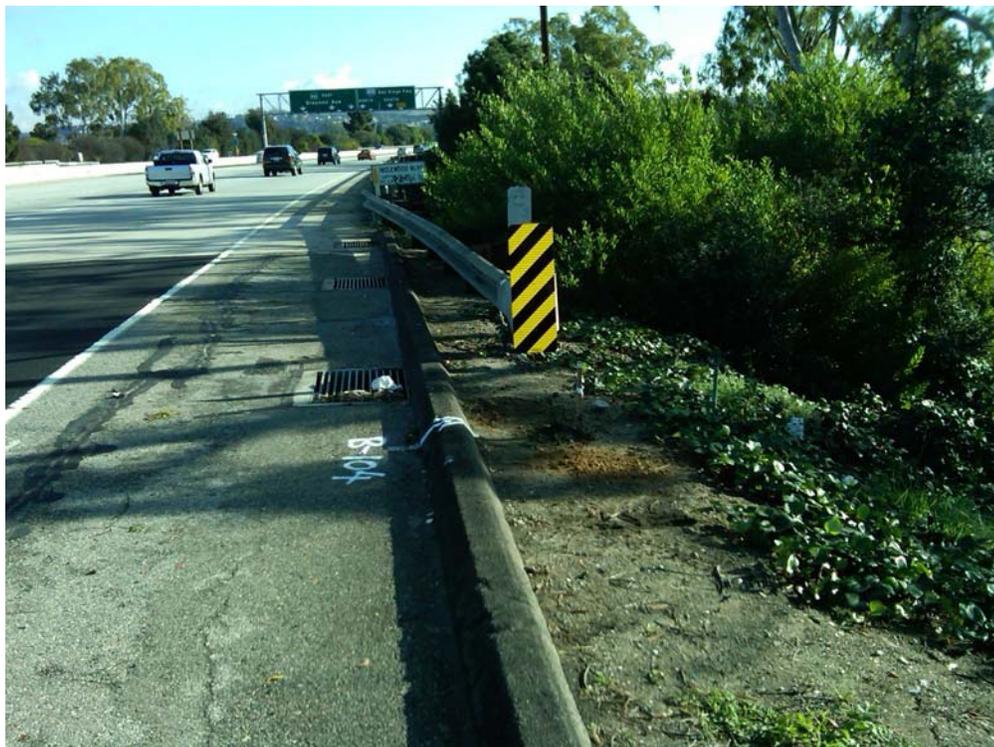
ADL Soil Investigation  
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February 2011



**Photo 7 – View of boring 1118-104 location**



**Photo 8 – Vicinity of boring 1118-104 location**

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**SITE PHOTOS 7 & 8**

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**Photo 9 – View of boring 1118-105 location**



**Photo 10 – Vicinity of boring 1118-105 location**

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**SITE PHOTOS 9 & 10**

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**Photo 11 – View of boring 1118-106 location**



**Photo 12 – Vicinity of boring 1118-106 location**

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**SITE PHOTOS 11 & 12**

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**Photo 13 – View of boring 1118-107 location**



**Photo 14 – Vicinity of boring 1118-107 location**

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**SITE PHOTOS 13 & 14**

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**Photo 15 – View of boring 1118-108 location**



**Photo 16 – Vicinity of boring 1118-108 location**

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**SITE PHOTOS 15 & 16**

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**Photo 17 – View of boring 1118-109 location**



**Photo 18 – Vicinity of boring 1118-109 location**

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**SITE PHOTOS 17 & 18**

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**Photo 19 – View of boring 1118-110 location**



**Photo 20 – Vicinity of boring 1118-110 location**

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**SITE PHOTOS 19 & 20**

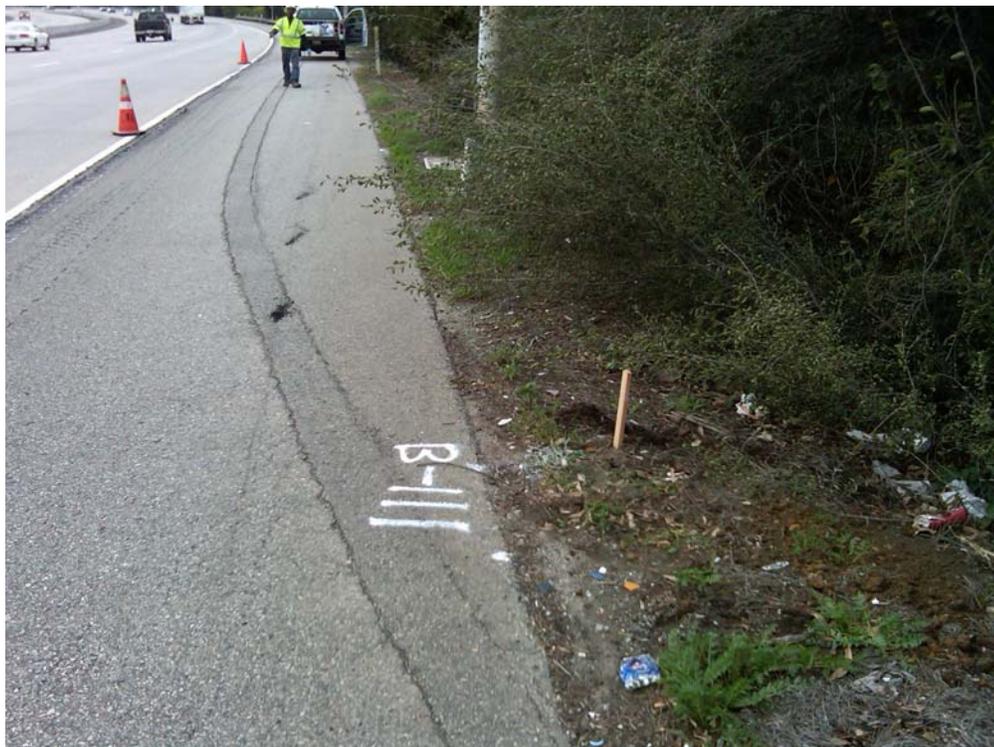
ADL Soil Investigation  
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**Photo 21 – View of boring 1118-111 location**



**Photo 22 – Vicinity of boring 1118-111 location**

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**SITE PHOTOS 21 & 22**

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**Photo 23 – View of boring 1118-112 location**



**Photo 24 – Vicinity of boring 1118-112 location**

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**SITE PHOTOS 23 & 24**

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Photo 25 – View of boring 1118-113 location



Photo 26 – Vicinity of boring 1118-113 location

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**SITE PHOTOS 25 & 26**

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Photo 27 – View of boring 1118-114 location



Photo 28 – Vicinity of boring 1118-114 location

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**SITE PHOTOS 27 & 28**

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**Photo 29 – View of boring 1118-115 location**



**Photo 30 – Vicinity of boring 1118-115 location**

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**SITE PHOTOS 29 & 30**

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**Photo 31 – View of boring 1118-116 location**



**Photo 32 – Vicinity of boring 1118-116 location**

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**SITE PHOTOS 31 & 32**

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Los Angeles, California

S9500-06-03

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**Photo 33 – View of boring 1118-117 location**



**Photo 34 – Vicinity of boring 1118-117 location**

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**SITE PHOTOS 33 & 34**

ADL Soil Investigation  
State Route 90 Freeway  
Los Angeles, California

S9500-06-03

February 2011

# APPENDIX D



**GEOCON**  
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# BORING 1118-101

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-101-0.0	0815	0 --	<b>SP-SM</b>	Sand with Silt with Gravel, very dark brown, (10YR 2/2/3), moist, fine- to coarse -grained, 10% fines, no plasticity
G	1118-101-1.0	0816	1 --	<b>SM</b>	Silty Sand, dark brown, (10YR 3/3), moist, fine-grained, some gravel, 15% fines, no plasticity
G	1118-101-2.5	0820	2 --		
			3 --		Silty Sand, yellowish brown (10YR 5/6), moist, fine-grained, some gravel, 15% fines, no plasticity
			4 --		End at 3.0 feet
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-102

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-102-0.0	0826	0 --	<b>SM</b>	Silty Sand with Gravel, very dark brown (10YR 2/2/3), moist, fine- to coarse-grained, 15% fines, no plasticity
G	1118-102-1.0	0830	1 --		
			2 --		-----
G	1118-102-2.5	0833	-	<b>SC</b>	Clayey sand, dark grayish brown, (10YR 4/2), moist, trace gravel, 20% fines, low to medium plasticity
			3 --		
			-		End at 3.0 feet
			4 --		
			-		
			5 --		
			-		
			6 --		
			-		
			7 --		
			-		
			8 --		
			-		
			9 --		
			-		
			10 --		
			-		
			11 --		
			-		
			12 --		
			-		
			13 --		
			-		
			14 --		
			-		
			15 --		
			-		
			16 --		
			-		
			17 --		
			-		
			18 --		
			-		
			19 --		
			-		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-103

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-103-0.0	0917	0 --	SM	Silty Sand with Gravel, very dark brown (10YR 2/2/3), moist, fine- to coarse-grained, 10% fines, no plasticity
G	1118-103-1.0	0920	1 --		
			2 --		
G	1118-103-2.5	0924	3 --	SC	Clayey Sand, dark grayish brown, (10YR 4/2), moist, fine grained, trace gravel, 30% fines, low to medium plasticity
			4 --		End at 3.0 feet
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-104

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-104-0.0	0909	0 --	<b>SM</b>	Silty Sand with Gravel, very dark brown (10YR 2/2/3), moist, fine- to coarse-grained, 15% fines, no plasticity
G	1118-104-1.0	0913	1 --	<b>SP-SM</b>	Sand with Silt with Gravel, very dark brown (10YR 2/2/3), moist, fine- to coarse-grained, 10 % fines, no plasticity
G	1118-104-2.5	0916	2 --	<b>SC</b>	Clayey sand, dark yellowish brown, (10YR 3/6), moist, trace gravel, 40% fines, low to medium plasticity
			3 --		End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-105

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-105-0.0	1018	0 --	<b>SP-SM</b>	Sand with Silt with Gravel, very dark brown (10YR 2/2/3), moist, fine to coarse-grained, 10 % fines, no plasticity
G	1118-105-1.0	1021	1 --	<b>ML</b>	Sandy Silt with Gravel, dark brown (10YR 3/3), moist, fine to coarse-grained, 10 % fines, no plasticity
G	1118-105-2.5	1024	2 --	<b>SC</b>	Clayey sand, very dark grayish brown (10YR 3/2), moist, trace gravel, 30% fines, low to medium plasticity
			3 --		End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --	<b>ML</b>	
			13 --		
			14 --	<b>SM</b>	
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-106

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-106-0.0	1005	0 --	<b>SP-SM</b>	Sand with Silt with Gravel, very dark brown (7.5YR 2.5/3), moist, fine to coarse - grained, 10% fines, no plasticity
G	1118-106-1.0	1013	1 --	<b>SM</b>	Silty Sand with Gravel, very dark brown, (7.5YR 2.5/3), moist, fine-to coarse-grained, 10% fines, no plasticity
G	1118-106-2.5	1016	2 --	<b>SC</b>	Clayey sand, dark brown (7.5YR 3/2), moist, trace gravel, 30% fines, low to medium plasticity
			3 --		End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-107

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-107-0.0	1051	0 --	<b>SP-SM</b>	Sand with Silt with Gravel, very dark brown, (10YR 2/2/3), moist, fine to coarse-grained, 15% fines, no plasticity
G	1118-107-1.0	1053	1 --	<b>ML</b>	Sandy Silt with Gravel, very dark brown, (7.5YR 2.5/2/3), moist, fine- to coarse-grained, 10% fines, no plasticity
G	1118-107-2.5	1055	2 --	<b>SC</b>	Clayey sand, dark brown (7.5YR 3/3), moist, fine-grained, trace garavel, low to medium plasticity
			3 --		End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-108

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-108-0.0	1100	0 --	<b>SP-SM</b>	Sand with Silt with Gravel, very dark brown (10YR 2/2/3), moist, fine-to coarse-grained, 10% fines, no plasticity
G	1118-108-1.0	1103	1 --		Silty Sand, very dark grayish brown (10YR 3/2), moist, trace gravel, fine-grained, trace gravel, 15% fines, no plasticity
G	1088-316-3.0	1106	2 --		
			3 --		Clayey Sand, dark brown (10YR 3/3), moist, fine-grained, trace gravel, 30% fines low to medium plasticity
			4 --		End at 3.0 feet.
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-109

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-109-0.0	1140	0 --	SM	Silty Sand, very dark gray (7.5YR 3/1), moist, fine-grained, trace gravel, 10% fines no plasticity
G	1118-109-1.0	1142	1 --		
			2 --		
G	1088-317-2.5	1145	-	SC	Clayey Sand, dark yellowish brown, (10YR 4/4), moist, fine-grained, trace gravel, 30% fines, low to medium plasticity
			3 --		
			4 --		End at 3.0 feet.
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-110

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-110-0.0	1140	0 --	<b>SM</b>	Silty Sand with Gravel, very dark gray (10YR 3/1), moist, fine- to coarse-grained, 30% fines, low plasticity
G	1118-110-1.0	1143	1 --		
G	1118-110-2.5	1146	2 --	<b>ML</b>	Sandy Silt, very dark grey (10YR 3/1), moist, fine-grained, trace gravel, 15% fines no plasticity End at 3.0 feet
			3 --		
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-111

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-111-0.0	1318	0 --	<b>ML</b>	Sandy Silt with Gravel, very dark gray (7.5 YR 3/1), moist, fine-to coarse-grained, 15 % fines, no plasticity
G	1118-111-1.0	1320	1 --	<b>SM</b>	Silty Sand with Gravel, very dark brown (7.5 YR 2.5/3), moist, fine- to coarse-grained, 15% fines, no plasticity
G	1118-111-2.5	1323	2 --	<b>SC</b>	Clayey Sand, strong brown, (7.5YR 5/6) moist, fine-grained, trace gravel, 30% fines, low to medium plasticity
			3 --		End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-112

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-112-0.0	1325	0 --	<b>SM</b>	Silty Sand with Gravel, very dark brown (10YR 2/2/3), moist, fine- to coarse-grained, 15% fines, no plasticity
G	1118-112-1.0	1328	1 --	<b>ML</b>	Sandy Silt, very dark grayish brown (10YR 3/2), moist, fine-grained, 20% fines, no plasticity
G	1118-112-2.5	1331	2 --	<b>SC</b>	Clayey Sand, dark brown (10YR 3/3), moist, fine-grained, trace gravel, 30% fines, low to medium plasticity
			3 --		
			4 --		End at 3.0 feet
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-113

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-113-0.0	1350	0 --	SM	Silty Sand with Gravel, very dark brown (10YR 2/2/4), moist, fine to coarse-grained, 15% fines, low plasticity
G	1118-113-1.0	1352	1 --		
			2 --		
G	1118-113-2.5	1354	3 --	SC	Clayey Sand, dark yellowish brown, (10YR 4/6), moist, fine-grained, trace gravel, 30% fines, low to medium plasticity
			4 --		End at 3.0 feet
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-114

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-114-0.0	1357	0 --	<b>SP-SM</b>	Sand with Silt with Gravel, very dark brown (10YR 2/2/4), moist, fine- to coarse-grained, 10% fines, no plasticity
G	1118-114-1.0	1400	1 --	<b>SM</b>	Silty Sand with Gravel, very dark gray (10YR 3/1), moist, fine- to coarse-grained, 15% fines, no plasticity
G	1118-114-2.5	1403	2 --	<b>SC</b>	Clayey sand, dark brown (10YR 3/3), moist, fine-grained, trace gravel, 40% fines, low to medium plasticity
			3 --		End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-115

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-115-0.0	1500	0 --	SM	Silty Sand with Gravel, very dark grayish brown (10YR 3/2), moist, fine-to coarse-grained, 15% fines, no plasticity
G	1118-115-1.0	1503	1 --		
			2 --		
G	1118-115-2.5	1506	3 --	SC	Clayey Sand, dark brown, (10YR 3/3), moist, fine-grained, trace gravel, 40% fines Low to medium plasticity End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-116

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto  
**Reviewed By:**

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-116-0.0	1432	0 --	<b>SM</b>	Silty Sand with Gravel, very dark brown (10YR 2/2), moist, fine to coarse-grained, 15% fines, no plasticity
G	1118-116-1.0	1434	1 --	<b>ML</b>	Sandy Silt, dark yellowish brown (10YR 4/6), moist, fine- to coarse-grained, 10 % fines, no plasticity
G	1118-116-2.5	1436	2 --	<b>GP</b>	Sand, poorly graded, dark yellowish brown (10YR 3/6), moist, fine-grained, trace of gravel, 15% fines, no plasticity
			3 --		End at 3.0 feet
			4 --		
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
			15 --		
			16 --		
			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample



**GEOCON**  
CONSULTANTS, INC.

# BORING 1118-117

**Project No.** S9500-06-03  
**Client:** Caltrans  
**Location:** 90 Fwy  
 Los Angeles, California

**Excavation Date:** December 23, 2010  
**Excavation Method:** Hand Auger  
**Excavation Size:** 3-inch diameter  
**Logged By:** Mike Akoto  
**Reviewed By:**

Sample Type	Sample Number	Time	Depth (in feet)	USCS Class.	Surface Conditions: Bare ground Description
G	1118-117-0.0	1435	0 --	SP-SM	Sand with Silt with Gravel, very dark grayish brown (10YR 3/2), moist, fine to coarse-grained, 15 % fines, no plasticity
G	1118-117-1.0	1438	1 --		Silty Sand with Gravel, very dark gray (10YR 3/1), moist, fine to coarse-grained, 15% fines, no plasticity
G	1118-117-2.5	1441	2 --		
			3 --		Sand poorly graded, dark yellowish brown (10YR 4/6), moist, fine to medium coarse grained, 10% fines, no plasticity
			4 --		End at 3.0 feet
			5 --		
			6 --		
			7 --		
			8 --		
			9 --		
			10 --		
			11 --		
			12 --		
			13 --		
			14 --		
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			17 --		
			18 --		
			19 --		
			20 --		

G - Grab Sample

# APPENDIX E

## **APPENDIX E**

### **DATA VALIDATION REPORT AERIALY DEPOSITED LEAD (ADL) INVESTIGATION REPORT STATE ROUTE 90 CONCRETE GUARD RAIL INSTALLATION 07-LA-90 PM 1.74/2.65 Caltrans Contract Number 07A2730, Task Order # 7 EA 07-275801 Los Angeles County, California**

#### **INTRODUCTION**

This report summarizes the finding of the data validation for soil samples collected by Geocon Consultants, Inc. (Geocon), on behalf of the California Department of Transportation (Caltrans), for the Route 90 Concrete Guard Rail Installation Project (Project) located in Los Angeles County, California. Samples were submitted to Advanced Technology Laboratories in Signal Hill, California (ATL) for laboratory analysis; a State of California laboratory certified by the National Environmental Laboratory Accreditation Program (NELAP).

Field Quality Assurance and Quality Control (QA/QC) samples for soil samples collected within the Project area consisted of equipment blanks, and field blanks. Laboratory QA/QC samples consisted of method blanks, matrix spike / matrix spike duplicate (MS/MSDs) recoveries, and laboratory control samples (LCS).

The field quality control samples were submitted to the laboratory for analyses along with the primary soil samples collected in the Project area. Data verification was performed in accordance with the United States Environmental Protection Agency (U.S. EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (U.S. EPA, 2010). The data quality evaluation for the soil samples analyzed is described below.

Data qualified as estimated (J, J+, and J-) are likely to be quantitatively biased to some degree. Such data provide only an approximate measure of the respective analyte concentration(s). These data qualifiers have been appended to the respective data and are reflected in the data summary tables. The data, as qualified, are acceptable and can be used for decision-making purposes; however, the limitations identified by the applied qualifiers should be considered when using the data.

## **1.1 DATA COMPLETENESS**

A total of 57 soil samples (including field QC samples) were submitted to ATL for analysis. Results for all samples were reported by ATL. The project goal of a minimum of 90% completeness for collected data was achieved. A total of 57 soil samples (including field QC samples) listed on the chain-of-custody were analyzed and reported by ATL.

## **1.2 SAMPLE HOLD TIMES**

All samples submitted to the laboratory for analysis were properly preserved according to guidelines established by the appropriate methods as verified by the laboratory. Recommended hold times were achieved for all analyses performed.

Shallow soil samples were collected at depths of approximately 0-0.5 feet, 1.0-1.5 feet, and 2.5-3.0 feet using a hand auger. Soil samples were placed into laboratory-provided 4 ounce glass sample jars.

## **1.3 BLANK SAMPLES**

### ***Equipment Blank Samples***

Equipment blank samples are used to evaluate for potential residual contamination on sampling equipment. The equipment blank samples were obtained by collecting de-ionized water passed over the hand-augers into unpreserved, laboratory-provided containers. A total of three equipment blank samples were collected over one day of field work. The field blanks were analyzed for total lead using EPA Method 6010B. The Project met the frequency of collection requirements as specified in the Caltrans Contract #07A2730, Task Order #7 (Task Order) (Caltrans, 2010). Lead was not detected in any of the equipment blanks collected.

### ***Field Blank Samples***

Preparing blank samples in the field identifies ambient atmospheric contamination that could potentially become entrained in the samples during collection. The field blank samples were collected at the site by directly filling the laboratory-provided sample containers with distilled or purified water. A total of three field blanks were collected over one day of field work. Field blank samples were collected at a frequency of one field blank for every chain-of-custody. The field blanks were analyzed for total lead using EPA Method 6010B. Lead was not detected in any of the field blanks collected.

## **Method Blank Samples**

The laboratory also analyzed method blanks to provide an additional measure of internal quality control. Method blank results for all analytes were less than the reported PQLs, however some were detected above the method detection limit (MDL). Analytes detected in the method blanks include: mercury, cobalt, molybdenum, nickel, silver, and lead. Analytes associated with these method blanks were reported in the project samples at concentrations which are either greater than the PQL or non-detect at the MDL; therefore, data qualification for these samples was not required.

### **1.4 LABORATORY CONTROL SAMPLES**

LCSs were analyzed as a measure of data accuracy. Internal laboratory QA/QC data associated with these analyses met criteria, including percent recoveries (%Rs). The Project laboratory met the frequency requirements for LCS analyses established by U.S. EPA National Functional Guidelines.

### **1.5 LABORATORY DUPLICATE SAMPLES**

As another estimate of precision, the laboratory performed duplicate analyses of unspiked project samples at the frequency of collection requirements established by U.S. EPA National Functional Guidelines. The relative percent differences (RPDs) did not exceed the control limit of 20% (revise the list below accordingly if necessary) established by the National Functional Guidelines (U.S. EPA, 2004) for the technical review of non-homogenous soil samples, with the following exceptions.

- Laboratory batch ID 69652 – Method 6010B barium analysis; the RPD for barium results in the laboratory duplicate sample 115495-001ADUP was 21.2%. The RPD value exceeds the control limit of 20%, therefore, barium results in soil samples associated with this QA/QC batch were qualified as estimated “J.”
- Laboratory batch ID 69308 – Method 6010B lead analysis; the RPD for lead results in the laboratory duplicate sample 115495-010ADUP was 42.2%, and the RPD for lead results in the laboratory duplicate sample 115495-020ADUP was 37.35%. Both of these RPD values exceed the control limit of 20%. Therefore, lead results in soil samples associated with this QA/QC batch were qualified as estimated “J.”
- Laboratory batch ID 69309 – Method 6010B lead analysis; the RPD for lead results in the laboratory duplicate sample 115495-030ADUP was 51.6%, and the RPD for lead results in the laboratory duplicate sample 115495-040ADUP was 35.7%. Both of these RPD values exceed the control limit of 20%. Therefore, lead results in soil samples associated with this QA/QC batch were qualified as estimated “J.”

- Laboratory batch ID 69310 – Method 6010B lead analysis; the RPD for lead results in the laboratory duplicate sample 115495-050ADUP was 52.5%, and the RPD for lead results in the laboratory duplicate sample 115495-051ADUP was 66.2%. Both of these RPD values exceed the control limit of 20%. Therefore, lead results in soil samples associated with this QA/QC batch were qualified as estimated “J.”
- Laboratory batch ID R128717 – Method WET 6010B lead analysis; the RPD for lead results in the laboratory duplicate sample 115495-029ADUP was 28.7%, which exceeds the control limit of 20%. However, because the original and duplicate sample were both less than five times the PQL and the absolute difference between the sample and the duplicate is less than the PQL, therefore, the results are acceptable and none of the results in association with the batch were qualified.
- Laboratory batch ID R128719 – Method WET 6010B lead analysis; the RPD for lead results in the laboratory duplicate sample 115495-011ADUP was 51.9%, which exceeds the control limit of 20%. Therefore, soluble WET lead results in soil samples associated with this QA/QC batch were qualified as estimated “J.”

#### **1.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES**

The laboratory also analyzed MS/MSD samples to assess data accuracy. The purpose of spiked samples is to evaluate the effect of the matrix on a method's recovery efficiency (percent recovery). A sample prepared by adding a known concentration of a target analyte to an aliquot of a specific homogenized environmental sample for which an independent estimate of the target analyte concentration is available. The matrix spike is accompanied by an independent analysis of the unspiked aliquot of the environmental sample. Only MS/MSD samples collected on site are considered appropriate for assessing matrix conditions. When recoveries from MS/MSD samples exceeded acceptance limits for both the primary and duplicate samples, the detections are qualified as estimated biased high (J+), and the non-detects are not qualified. When recoveries from MS/MSD samples were less than compound-specific acceptance limits, the detections are qualified as estimated biased low (J-) and non-detects are qualified as estimated (UJ).

The purpose of matrix spike duplicate (MSD) samples is to evaluate the precision of the intralaboratory analytical process for specific analytes in a sample matrix. The duplicate sample is prepared simultaneously as a split with the matrix spike sample, and each is spiked with identical, known concentrations of targeted analyte(s). The precision is measured by the RPD between the spiked results.

The percent recoveries and RPDs of target analytes were within the laboratory determined control limits with the following exception:

- Laboratory work order 69653 – Method 7471 mercury analysis; the RPD for mercury results in matrix spike sample 115709-010A-MS and 115709-010A-MSD was 41.4% and 39.9%, respectively, which exceeds the control limit of 30%. The non-detect analytical results associated with the analyte within the batch were qualified as estimated “UJ.”

## 1.7 Summary of Qualified Data

All other quality assurance data met the acceptance criteria for soil samples. Except for the qualified data discussed above, the results of field and laboratory quality control indicate that the sampling and analysis were performed consistent with the analytical methods. Overall, the results of the QA/QC review indicate that the test results are valid and usable. The following table summarizes the sample data warranting qualification based on the data review elements discussed above.

Sample ID	Compound	Laboratory Work Order Number	Analytical Method	Qualified Result	Units
1118-101-0-0.5	Lead	115495	USEPA Method 6010B	920 J	mg/kg
1118-101-0-0.5	WET Lead	115495	USEPA Method 6010B	58 J	mg/l
1118-101-0-0.5	Barium	115495	USEPA Method 6010B	55 J	mg/kg
1118-101-0-0.5	Mercury	115495	USEPA Method 7471A	<0.10 UJ	mg/kg
1118-101-1-1.5	Lead	115495	USEPA Method 6010B	22 J	mg/kg
1118-101-2.5-3	Lead	115495	USEPA Method 6010B	38 J	mg/kg
1118-102-0-0.5	Lead	115495	USEPA Method 6010B	1,200 J	mg/kg
1118-102-0-0.5	WET Lead	115495	USEPA Method 6010B	79 J	mg/l
1118-102-0-0.5	Barium	115495	USEPA Method 6010B	79 J	mg/l
1118-102-0-0.5	Mercury	115495	USEPA Method 7471A	<0.10 UJ	mg/l
1118-102-1-1.5	Lead	115495	USEPA Method 6010B	160 J	mg/kg
1118-102-1-1.5	WET Lead	115495	USEPA Method 6010B	10 J	mg/l
1118-102-2.5-3	Lead	115495	USEPA Method 6010B	120 J	mg/kg
1118-102-2.5-3	WET Lead	115495	USEPA Method 6010B	2.3 J	mg/l
1118-103-0-0.5	Lead	115495	USEPA Method 6010B	540 J	mg/kg
1118-103-0-0.5	WET Lead	115495	USEPA Method 6010B	29 J	mg/l
1118-103-1-1.5	Lead	115495	USEPA Method 6010B	150 J	mg/kg
1118-103-1-1.5	WET Lead	115495	USEPA Method 6010B	5.6 J	mg/l
1118-103-2.5-3	Lead	115495	USEPA Method 6010B	26 J	mg/kg
1118-104-0-0.5	Lead	115495	USEPA Method 6010B	510 J	mg/kg
1118-104-0-0.5	WET Lead	115495	USEPA Method 6010B	25 J	mg/l
1118-104-1-1.5	Lead	115495	USEPA Method 6010B	130 J	mg/kg
1118-104-1-1.5	WET Lead	115495	USEPA Method 6010B	3.4 J	mg/l
1118-104-2.5-3	Lead	115495	USEPA Method 6010B	12 J	mg/kg
1118-105-0-0.5	Lead	115495	USEPA Method 6010B	180 J	mg/kg

Sample ID	Compound	Laboratory Work Order Number	Analytical Method	Qualified Result	Units
1118-105-1-1.5	Lead	115495	USEPA Method 6010B	56 J	mg/kg
1118-105-2.5-3	Lead	115495	USEPA Method 6010B	330 J	mg/kg
1118-106-0-0.5	Lead	115495	USEPA Method 6010B	67 J	mg/kg
1118-106-1-1.5	Lead	115495	USEPA Method 6010B	56 J	mg/kg
1118-106-2.5-3	Lead	115495	USEPA Method 6010B	9.3 J	mg/kg
1118-107-0-0.5	Lead	115495	USEPA Method 6010B	35 J	mg/kg
1118-107-1-1.5	Lead	115495	USEPA Method 6010B	37 J	mg/kg
1118-107-2.5-3	Lead	115495	USEPA Method 6010B	14 J	mg/kg
1118-108-0-0.5	Lead	115495	USEPA Method 6010B	280 J	mg/kg
1118-108-1-1.5	Lead	115495	USEPA Method 6010B	17 J	mg/kg
1118-108-2.5-3	Lead	115495	USEPA Method 6010B	79 J	mg/kg
1118-109-0-0.5	Lead	115495	USEPA Method 6010B	200 J	mg/kg
1118-109-1-1.5	Lead	115495	USEPA Method 6010B	20 J	mg/kg
1118-109-2.5-3	Lead	115495	USEPA Method 6010B	16 J	mg/kg
1118-110-0-0.5	Lead	115495	USEPA Method 6010B	140 J	mg/kg
1118-110-1-1.5	Lead	115495	USEPA Method 6010B	99 J	mg/kg
1118-110-2.5-3	Lead	115495	USEPA Method 6010B	35 J	mg/kg
1118-111-0-0.5	Lead	115495	USEPA Method 6010B	980 J	mg/kg
1118-111-0-0.5	Barium	115495	USEPA Method 6010B	64 J	mg/kg
1118-111-0-0.5	Mercury	115495	USEPA Method 7471A	<0.10 UJ	mg/kg
1118-111-1-1.5	Lead	115495	USEPA Method 6010B	99 J	mg/kg
1118-111-2.5-3	Lead	115495	USEPA Method 6010B	35 J	mg/kg
1118-112-0-0.5	Lead	115495	USEPA Method 6010B	200 J	mg/kg
1118-112-1-1.5	Lead	115495	USEPA Method 6010B	39 J	mg/kg
1118-112-2.5-3	Lead	115495	USEPA Method 6010B	26 J	mg/kg
1118-113-0-0.5	Lead	115495	USEPA Method 6010B	500 J	mg/kg
1118-113-1-1.5	Lead	115495	USEPA Method 6010B	85 J	mg/kg
1118-113-2.5-3	Lead	115495	USEPA Method 6010B	20 J	mg/kg
1118-114-0-0.5	Lead	115495	USEPA Method 6010B	91 J	mg/kg
1118-114-1-1.5	Lead	115495	USEPA Method 6010B	38 J	mg/kg
1118-114-2.5-3	Lead	115495	USEPA Method 6010B	12 J	mg/kg
1118-115-0-0.5	Lead	115495	USEPA Method 6010B	750 J	mg/kg
1118-115-1-1.5	Lead	115495	USEPA Method 6010B	120 J	mg/kg
1118-115-2.5-3	Lead	115495	USEPA Method 6010B	100 J	mg/kg
1118-116-0-0.5	Lead	115495	USEPA Method 6010B	93 J	mg/kg
1118-116-1-1.5	Lead	115495	USEPA Method 6010B	40 J	mg/kg
1118-116-2.5-3	Lead	115495	USEPA Method 6010B	23 J	mg/kg
1118-117-0-0.5	Lead	115495	USEPA Method 6010B	540 J	mg/kg
1118-117-1-1.5	Lead	115495	USEPA Method 6010B	15 J	mg/kg
1118-117-2.5-3	Lead	115495	USEPA Method 6010B	<5.0 UJ	mg/kg

## **2.0 REFERENCES**

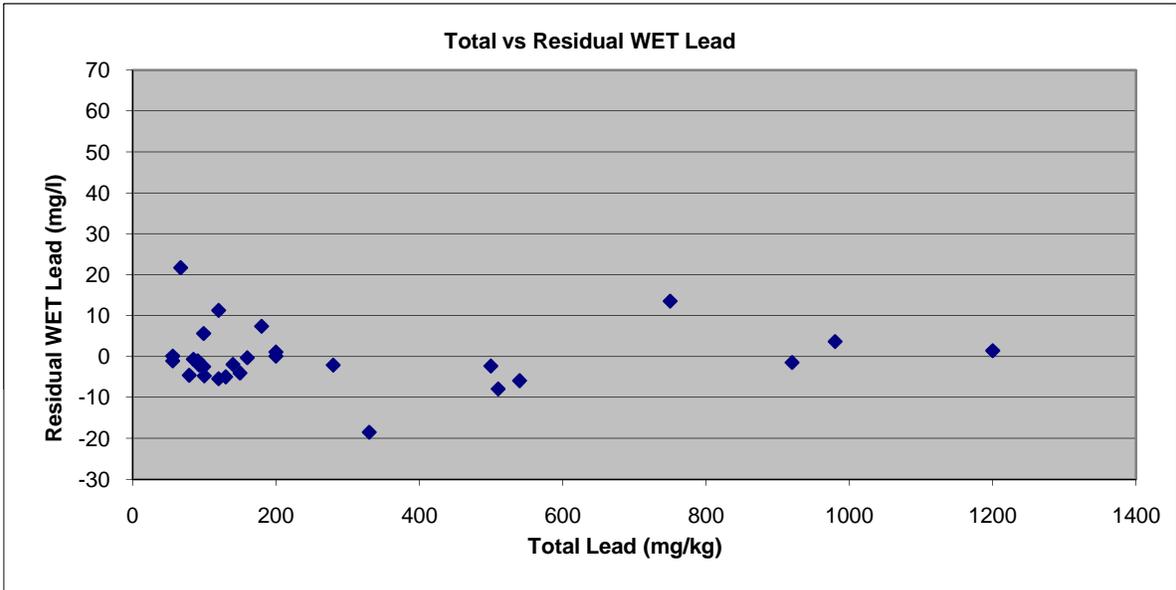
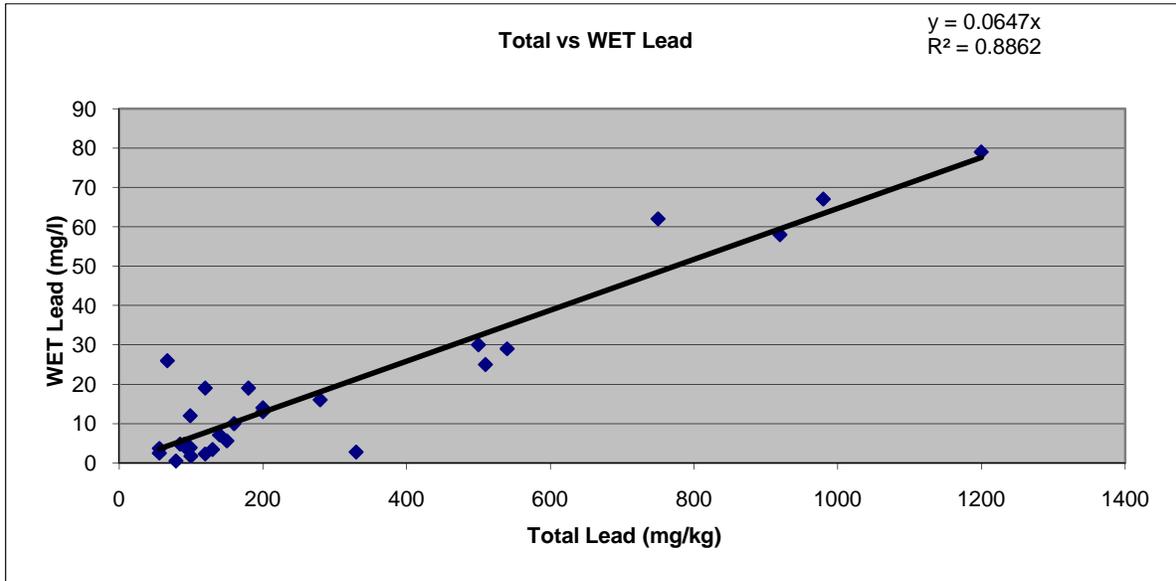
- California Department of Transportation (Caltrans), 2010, Contract 07A2730 Task Order No. 7 – Aerially Deposited Lead (ADL) Site Investigation, State Route 90, Concrete Guard Rail Installation Along Right Shoulder of Both Westbound and Eastbound Directions of Marina Freeway (SR-90), From Centinela Avenue UC to Junction with I-405, Within Dely Rey Community in the City of Los Angeles, 07-LA-90 PM 1.74/2.646, EA 07-275801, December 15, 2010.
- U.S. EPA, 2010, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., January.

# APPENDIX F

APPENDIX F - Lead Regression Analysis

<b>Sample ID</b>	<b>Sample Depth (feet)</b>	<b>Total Lead (mg/kg)</b>	<b>WET Lead (mg/l)</b>	<b>Residual WET Lead (mg/l)</b>	<b>Squared Residual WET Lead (mg/l)</b>
1118-101-0-0.5	0-0.5	920	58	-1.49	2.23
1118-102-0-0.5	0-0.5	1,200	79	1.40	1.96
1118-102-1-1.5	1-1.5	160	10	-0.35	0.12
1118-102-2.5-3	2.5-3	120	2.3	-5.46	29.81
1118-103-0-0.5	0-0.5	540	29	-5.92	35.04
1118-103-1-1.5	1-1.5	150	5.6	-4.10	16.81
1118-104-0-0.5	0-0.5	510	25	-7.98	63.68
1118-104-1-1.5	1-1.5	130	3.4	-5.01	25.07
1118-105-0-0.5	0-0.5	180	19	7.36	54.17
1118-105-1-1.5	1-1.5	56	3.7	0.08	0.01
1118-105-2.5-3	2.5-3	330	2.8	-18.54	343.73
1118-106-0-0.5	0-0.5	67	26	21.67	469.47
1118-106-1-1.5	1-1.5	56	2.5	-1.12	1.26
1118-108-0-0.5	0-0.5	280	16	-2.11	4.44
1118-108-2.5-3	2.5-3	79	0.5	-4.61	21.24
1118-109-0-0.5	0-0.5	200	13	0.07	0.00
1118-110-0-0.5	0-0.5	140	7.1	-1.95	3.82
1118-110-1-1.5	1-1.5	99	3.9	-2.50	6.26
1118-111-0-0.5	0-0.5	980	67	3.63	13.15
1118-111-1-1.5	1-1.5	99	12	5.60	31.34
1118-112-0-0.5	0-0.5	200	14	1.07	1.14
1118-113-0-0.5	0-0.5	500	30	-2.33	5.44
1118-113-1-1.5	1-1.5	85	4.8	-0.70	0.49
1118-114-0-0.5	0-0.5	91	4.8	-1.08	1.18
1118-115-0-0.5	0-0.5	750	62	13.50	182.25
1118-115-1-1.5	1-1.5	120	19	11.24	126.34
1118-115-2.5-3	2.5-3	100	1.7	-4.77	22.72
1118-116-0-0.5	0-0.5	93	3.9	-2.11	4.47

## APPENDIX F - Lead Regression Analysis



### Notes:

The Total vs. WET Lead graph is a linear regression scatter plot with a best-fit line using the least squares method and forcing the y-intercept through zero. The least squares method minimizes the sum of squared distances between the observed points in the dataset and the points predicted by the linear approximation. A test for data correlation is used to verify the quality of the equation used to predict soluble lead concentrations. There should be a correlation coefficient (“r”) of 0.8 or greater between total and soluble lead (WET) analytical results. The correlation coefficient for these results is 0.9414. The slope of the line obtained from this graph is used to calculate the predicted soluble lead concentration.

The Total vs. Residual WET lead graph depicts the error, or residual variation, after fitting the regression line. The residual value is the difference (or left over) between the observed value of the variable and the value suggested by the regression line. The squared residual is the standardized error value. This plot is used to assist in identifying anomalous outliers in the data set.

APPENDIX F - Lead UCL Output

EB 0		WB 0	
Number of Valid Observations	10	Number of Valid Observations	7
Number of Distinct Observations	10	Number of Distinct Observations	7
Minimum	35	Minimum	91
Maximum	1200	Maximum	980
Mean	407.2	Mean	450.6
Median	240	Median	500
SD	388.2	SD	341.6
Variance	150677	Variance	116721
Coefficient of Variation	0.953	Coefficient of Variation	0.758
Skewness	1.197	Skewness	0.399
Mean of log data	5.527	Mean of log data	5.765
SD of log data	1.124	SD of log data	0.982
90% Standard Bootstrap UCL	552.9	90% Standard Bootstrap UCL	602.3
95% Standard Bootstrap UCL	593.5	95% Standard Bootstrap UCL	651.3
EB1		WB1	
Number of Valid Observations	10	Number of Valid Observations	7
Number of Distinct Observations	9	Number of Distinct Observations	7
Minimum	17	Minimum	15
Maximum	160	Maximum	120
Mean	74.7	Mean	62.29
Median	56	Median	40
SD	55.59	SD	38.86
Variance	3090	Variance	1510
Coefficient of Variation	0.744	Coefficient of Variation	0.624
Skewness	0.535	Skewness	0.436
Mean of log data	4.013	Mean of log data	3.932
SD of log data	0.858	SD of log data	0.724
90% Standard Bootstrap UCL	96.08	90% Standard Bootstrap UCL	79.37
95% Standard Bootstrap UCL	101.9	95% Standard Bootstrap UCL	85.01
EB 2.5		WB 2.5	
Number of Valid Observations	10	Number of Valid Observations	7
Number of Distinct Observations	10	Number of Distinct Observations	7
Minimum	9.3	Minimum	2.5
Maximum	330	Maximum	100
Mean	67.93	Mean	31.21
Median	30.5	Median	23
SD	98.56	SD	32.04
Variance	9714	Variance	1027
Coefficient of Variation	1.451	Coefficient of Variation	1.026
Skewness	2.514	Skewness	2.076
Mean of log data	3.553	Mean of log data	2.993
SD of log data	1.138	SD of log data	1.124
90% Standard Bootstrap UCL	104.6	90% Standard Bootstrap UCL	45.32
95% Standard Bootstrap UCL	115.8	95% Standard Bootstrap UCL	49.78

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**SUMMARY OF LEAD STATISTICAL ANALYSIS  
STATE ROUTE 90 FROM CENTINELA AVENUE UC TO JUNCTION WITH I-405  
DEL REY COMMUNITY, LOS ANGELES, CALIFORNIA**

**EASTBOUND  
Borings 1118-101 to 1118-110**

**TOTAL LEAD UCLs**

	Total Lead (mg/kg)	
	90% UCL	95% UCL
0 to 0.5 ft.	552.9	593.5
1.0 to 1.5 ft.	96.08	101.9
2.5 to 3.0 ft.	104.6	115.8

**EXCAVATION SCENARIOS**

Excavation Depth	Weighted Averages		95% UCL	
	90% UCL Total Lead (mg/kg)	WET Lead (mg/l)	Total Lead (mg/kg)	WET Lead (mg/l)
0 to 1.0 ft <i>Underlying Soil (1.0 to 3.0 ft.)</i>	552.9 98.21	35.75 6.35	593.5 105.38	38.38 6.81
0 to 1.5 ft <i>Underlying Soil (1.5 to 3.0 ft.)</i>	400.63 98.92	25.91 6.40	429.63 106.53	27.78 6.89
0 to 2.5 ft <i>Underlying Soil (2.5 to 3.0 ft.)</i>	278.81 104.6	18.03 6.76	298.54 115.8	19.31 7.49
0 to 3.0 ft.	249.77	16.15	268.08	17.34

Weighted average values are based upon calculated UCLs for each depth interval.

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

\* = Soluble (WET) lead concentrations are predicted using slope of regression line,  
where  $y$  = predicted soluble (WET) lead and  $x$  = total lead.

Regression Line Slope:  $y = 0.0647 x$

**SUMMARY OF LEAD STATISTICAL ANALYSIS  
STATE ROUTE 90 FROM CENTINELA AVENUE UC TO JUNCTION WITH I-405  
DEL REY COMMUNITY, LOS ANGELES, CALIFORNIA**

**WESTBOUND  
Borings 1118-111 to 1118-117**

**TOTAL LEAD UCLs**

	Total Lead (mg/kg)	
	90% UCL	95% UCL
0 to 0.5 ft.	602.3	651.3
1.0 to 1.5 ft.	79.37	85.01
2.5 to 3.0 ft.	45.32	49.78

**EXCAVATION SCENARIOS**

Excavation Depth	Weighted Averages		95% UCL	
	90% UCL Total Lead (mg/kg)	WET Lead (mg/l)	Total Lead (mg/kg)	WET Lead (mg/l)
0 to 1.0 ft <i>Underlying Soil (1.0 to 3.0 ft.)</i>	602.3 70.86	38.95 4.58	651.3 76.20	42.12 4.93
0 to 1.5 ft <i>Underlying Soil (1.5 to 3.0 ft.)</i>	427.99 68.02	27.68 4.40	462.54 73.27	29.911 4.74
0 to 2.5 ft <i>Underlying Soil (2.5 to 3.0 ft.)</i>	288.54 45.32	18.66 2.93	311.53 49.78	20.15 3.22
0 to 3.0 ft.	248.01	16.04	267.90	17.32

Weighted average values are based upon calculated UCLs for each depth interval.

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

\* = Soluble (WET) lead concentrations are predicted using slope of regression line,  
where  $y$  = predicted soluble (WET) lead and  $x$  = total lead.

Regression Line Slope:  $y = 0.0647 x$

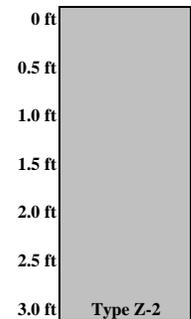
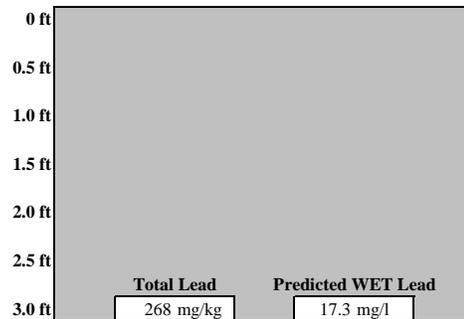
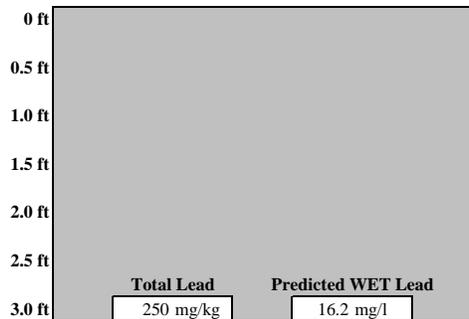
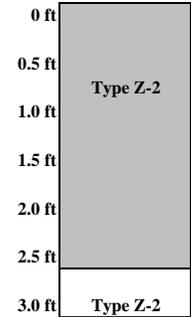
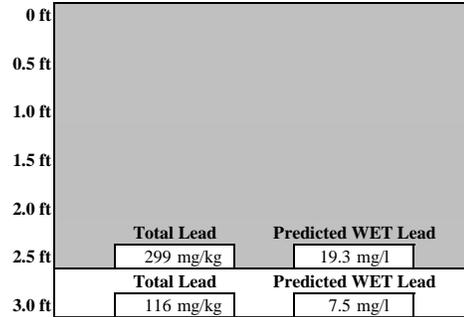
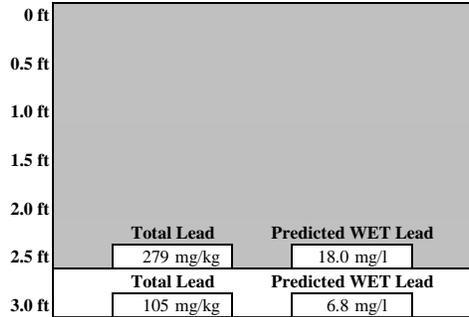
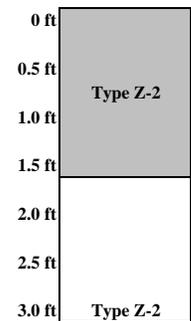
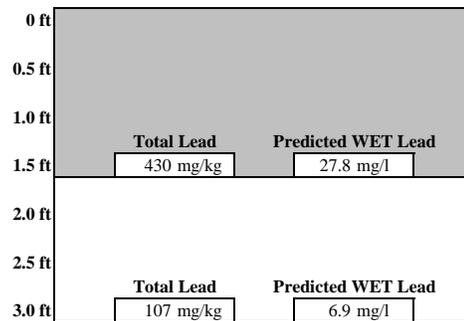
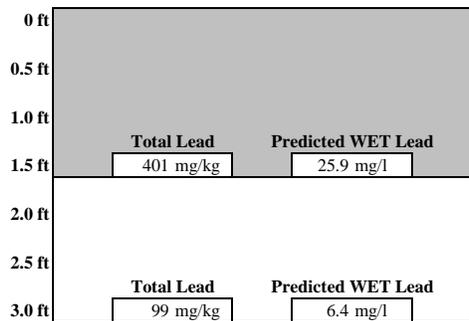
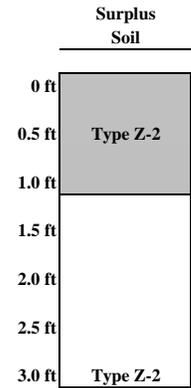
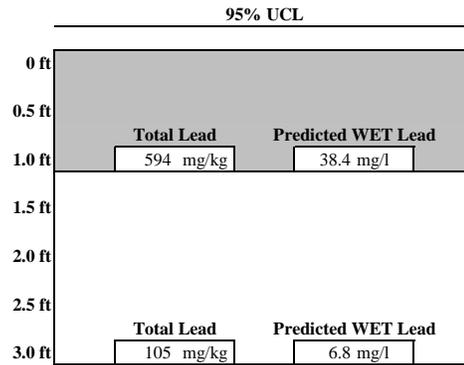
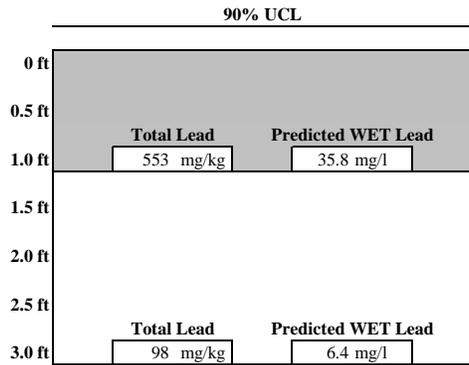
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EA: 07-275801

Project Name: State Route 90 PM 1.74 to 2.646

Project No.: S92500-06-03

Eastbound  
Borings 1118-101 to 1118-110



Task Order Number: 7  
 EA: 07-275801  
 Project Name: State Route 90 PM 1.74 to 2.646  
 Project No.: S92500-06-03

Westbound  
 Borings 1118-111 to 1118-117

