

INFORMATION HANDOUT

For Contract No. 09-352404

At 09-Mno-5710

Identified by

Project ID 0900020100

MATERIALS INFORMATION

Asbestos and Lead-Containing Paint Survey Report

Foundation Report

Asbestos and Lead-Containing Paint Survey Report

ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT



Lee Vining Maintenance Station -
Truck Shed Upgrades
Lee Vining, California

PREPARED FOR:

**CALIFORNIA DEPARTMENT OF TRANSPORTATION – DISTRICT 9
ENVIRONMENTAL PLANNING/HAZARDOUS WASTE
500 SOUTH MAIN STREET
BISHOP, CALIFORNIA 93514**



PREPARED BY:

**GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DRIVE, SUITE 800
RANCHO CORDOVA, CALIFORNIA 95742**



**GEOCON PROJECT NO. S9800-01-10
TASK ORDER NO. 10
E-FIS 09 0002 0100 (EA 09-352401)
CONTRACT NO 06A1895**

NOVEMBER 2013



Project No. S9800-01-10
November 20, 2013

Mark Heckman, Task Order Manager
Environmental Planning/Hazardous Waste
500 South Main Street
Bishop, California 93514

Subject: ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT
LEE VINING MAINTENANCE STATION – TRUCK SHED UPGRADES
LEE VINING, CALIFORNIA
CONTRACT NO. 06A1895, TASK ORDER NO. 10, EA NO. 09-352401
E-FIS PROJECT NO. 09 0002 0100

Dear Mr. Heckman:

In accordance with California Department of Transportation Contract No. 06A1895 and Task Order No. 10, we have performed an asbestos and lead-containing paint (LCP) survey of the subject project in Lee Vining, California. The scope of services included surveying the Lee Vining Maintenance Station (MS) Truck Shed on State Route 395 for suspect asbestos-containing materials and LCP, collecting bulk samples, and submitting the samples to laboratories for analysis.

The accompanying report summarizes the services performed and laboratory analysis.

The contents of this report reflect the views of Geocon Consultants, Inc., who are 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 you have questions concerning the contents of this report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

David Watts, CAC No. 98-2404
Senior Project Scientist

(2 + 1 electronic) Addressee

John E. Juhrend, PE, CEG
Principal/Senior Engineer



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- A. Analytical Laboratory Reports and Chain-of-custody Documentation

ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT

1.0 INTRODUCTION

This asbestos and lead-containing paint (LCP) survey report was prepared by Geocon Consultants, Inc. under Caltrans Contract No. 06A1895, Task Order No. 10 (TO-10).

1.1 Project Description

The Lee Vining Maintenance Station (MS), EA 09-352401, E-FIS Project No. 09 0002 0100, is located at Post Mile 51.53 on State Route 395 in Lee Vining, Mono County, California. We performed asbestos and LCP survey activities of the Lee Vining MS Truck Shed at the project location. The project location is depicted on the Vicinity Map, Figure 1, and Site Plan, Figure 2.

1.2 General Objectives

The purpose of the scope of services outlined in TO-10 was to determine the presence and quantity of asbestos construction materials and LCP at the project location prior to various improvements. The information obtained from this investigation will be used by Caltrans for waste profiling, determining California Occupational Safety and Health Administration (Cal/OSHA) applicability, and coordinating asbestos and LCP disturbance activities.

It was not Geocon's intent during this inspection to conduct an evaluation of lead-based paint hazards in accordance with U.S. Department of Housing and Urban Development (HUD) guidelines.

2.0 BACKGROUND

2.1 Asbestos

The *Code of Federal Regulations* (CFR), 40 CFR 61, Subpart M, National Emissions Standards for Hazardous Air Pollutants (NESHAP) and Federal Occupational Safety and Health Administration (FED OSHA) classify asbestos-containing material (ACM) as any material or product that contains *greater than 1%* asbestos. Nonfriable ACM is classified by NESHAP as either Category I or Category II material defined as follows:

- **Category I** – asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products.
- **Category II** – all remaining types of nonfriable asbestos-containing material not included in Category I that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Regulated asbestos-containing material (RACM), a hazardous waste when friable, is classified as any manufactured material that contains *greater than* 1% asbestos by dry weight *and* is:

- Friable (can be crumbled, pulverized, or reduced to powder by hand pressure); or
- Category I material that has become friable; or
- Category I material that has been subjected to sanding grinding, cutting or abrading; or
- Category II nonfriable material that has a high probability of becoming crumbled, pulverized, or reduced to a powder during demolition or renovation activities.

Activities that disturb materials containing *any* amount of asbestos are subject to certain requirements of the Cal/OSHA asbestos standard contained in Title 8, CCR §1529. Typically, removal or disturbance of more than 100 square feet of material containing more than 0.1% asbestos must be performed by a registered asbestos abatement contractor, but associated waste labeling is not required if the material contains 1% or less asbestos. When the asbestos content of a material exceeds 1%, virtually all requirements of the standard become effective.

Materials containing greater than 1% asbestos are also subject to NESHAP regulations (40 CFR Part 61, Subpart M). RACM (friable ACM and nonfriable ACM that will become friable during demolition operations) must be removed from structures prior to demolition. Certain nonfriable ACM and materials containing 1% or less asbestos may remain in structures during demolition; however, there are waste handling/disposal issues and Cal/OSHA work requirements that must be addressed. Contractors are responsible for segregating and characterizing waste streams prior to disposal.

With respect to potential worker exposure, notification, and registration requirements, Cal/OSHA defines asbestos-containing construction material (ACCM) as construction material that contains greater than 0.1% asbestos (Title 8, CCR 341.6).

2.2 Lead Paint

Construction activities (including demolition) that disturb materials or paints containing *any* amount of lead are subject to certain requirements of the Cal/OSHA lead standard contained in Title 8, CCR, §1532.1. Deteriorated paint is defined by Title 17, CCR, Division 1, Chapter 8, §35022 as a surface coating that is cracking, chalking, flaking, chipping, peeling, non-intact, failed, or otherwise separated from a component. Demolition of a deteriorated LCP component would require waste characterization and appropriate disposal. Intact LCP on a component is currently accepted by most landfills and recycling facilities; however, contractors are responsible for segregating and characterizing waste streams prior to disposal.

For a solid waste containing lead, the waste is classified as California hazardous when: 1) the total lead content equals or exceeds the respective Total Threshold Limit Concentration (TTLC) of 1,000 milligrams per kilogram (mg/kg); or 2) the representative soluble lead content equals or exceeds the respective Soluble Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/l) based on the standard Waste Extraction Test (WET). A waste has the potential for exceeding the lead STLC when the waste's total lead content is greater than or equal to ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when total lead is detected at a concentration greater than or equal to 50 mg/kg, and assuming that 100 percent of the total lead is soluble, soluble lead analysis is required. Lead-containing waste is classified as "Resource, Conservation, and Recovery Act" (RCRA) hazardous, or Federal hazardous, when the representative soluble lead content equals or exceeds the Federal regulatory level of 5 mg/l based on the Toxicity Characteristic Leaching Procedure (TCLP).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability; however, for the purposes of this investigation, toxicity (i.e., lead concentrations) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or other criteria. Waste that is classified as either California hazardous or RCRA hazardous requires management as a hazardous waste.

Potential hazards exist to workers who remove or cut through LCP coatings during demolition. Dust containing hazardous concentrations of lead may be generated during scraping or cutting materials coated with lead-containing paint. Torching of these materials may produce lead oxide fumes. Therefore, air monitoring and/or respiratory protection may be required during the demolition of materials coated with LCP. Guidelines regarding regulatory provisions for construction work where workers may be exposed to lead are presented in the Title 8, CCR, §1532.1.

2.3 As-Built Drawings and Previous Survey Activities

As-built drawings and previous survey reports for the project were not available for our review.

3.0 SCOPE OF SERVICES

Mr. David Watts, a California-Certified Asbestos Consultant (CAC), certification No. 98-2404 (expiration September 16, 2014), and Certified Lead Paint Inspector/Assessor and Project Monitor with the California Department of Public Health (DPH), certification numbers I-1734 and M-1734 (expiration December 4, 2014), performed the asbestos and LCP survey activities at the project location on October 1, 2013.

3.1 Asbestos

Suspect ACM were grouped into homogeneous areas with representative samples randomly collected from each. In addition, each potential ACM was evaluated for friability. A total of fifteen bulk asbestos samples representing seven material types were collected.

Our procedures for inspection and sampling in accordance with TO-10 are discussed below:

- Collected bulk asbestos samples after first wetting friable suspect materials with a light mist of water. The samples were then cut from the substrate and transferred to labeled containers. Note that when multiple samples were collected, the sampling locations were distributed throughout the homogeneous area (spaces where the material was observed).
- Relinquished bulk asbestos samples under chain-of-custody protocol to EMSL Analytical, Inc., a California-licensed and Caltrans-approved subcontractor, for asbestos analysis in accordance with United States Environmental Protection Agency (EPA) Test Method 600/R-93/116 using polarized light microscopy (PLM). EMSL is a laboratory accredited by the National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program (NIST-NVLAP) for bulk asbestos fiber analysis. The laboratory analyses were requested on a turnaround time of five days.

Sample group identification numbers, material descriptions, approximate quantities, friability assessments, and photo references are summarized on Table 1. Approximate sample locations are presented on Figure 2. Materials represented by the samples collected are shown in the attached photographs.

3.2 Lead Paint

A total of six bulk paint samples were collected from suspect LCP observed at the project location. Mr. Watts field-composited the suspect LCP samples into three paint schemes prior to submittal to the laboratory. Our sampling procedures in accordance with TO-10 are discussed below:

- Collected bulk samples of suspect LCP using techniques presented in HUD guidelines. In addition, the painted areas were evaluated for evidence of deterioration such as flaking or cracking.
- Relinquished bulk LCP samples under chain-of-custody protocol to Advanced Technology Laboratories, a California-licensed and Caltrans-approved subcontractor, for total lead analysis in accordance with EPA Test Method 6010B. Advanced Technology Laboratories is accredited by the DPH for lead analysis. The laboratory analyses were requested on a turnaround time of five days.

Paint sample identification numbers, descriptions, peeling and flaking quantities, and photo references are summarized on Table 2. Approximate sample locations are presented on Figure 2. Materials represented by the samples collected are shown in the attached photographs.

4.0 INVESTIGATIVE RESULTS

4.1 Asbestos Analytical Results

Chrysotile asbestos at a concentration of <0.25% was detected in samples representing approximately 40 square feet of nonfriable window putty. The asbestos content was determined using PLM point count analysis (400 points).

Chrysotile asbestos at a concentration of 2% was detected in samples representing joint compound associated with approximately 2,500 square feet of friable gypsum board systems. The composite asbestos content (gypsum board and joint compound composite) was determined to be <0.25% using PLM point count analysis (400 points).

No asbestos was detected in samples of the remaining suspect materials collected during our survey. A summary of the analytical laboratory test results for asbestos is presented on Table 1. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix A.

4.2 Paint Analytical Results

The composite sample representing intact beige exterior paint exhibited a total lead concentration of 4.6 mg/kg.

The composite sample representing approximately 20 square feet of deteriorated yellow exterior trim on the attached shed exhibited a total lead concentration of 5.5 mg/kg.

The composite sample representing intact multi-layer/multi-color interior paint exhibited a total lead concentration of 6,700 mg/kg and a TCLP lead concentration of 1.8 mg/l.

A summary of the analytical laboratory test results for paint is presented on Table 2. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix A.

5.0 RECOMMENDATIONS

Based on our findings, we recommend the following:

5.1 Asbestos

NESHAP regulations do not require that materials containing 1% or less asbestos (i.e., window putty and gypsum board systems) identified during our survey be removed prior to demolition or be treated as hazardous waste. However, the disturbance of these materials is still covered by the Cal/OSHA asbestos standard (Title 8, CCR §1529). Renovation activities that disturb the window putty and/or gypsum board systems must be performed by a licensed and certified asbestos abatement contractor.

Contractors are responsible for informing landfills and recycling facilities of the contractor's intent to dispose of asbestos waste. Landfills and recycling facilities may require additional waste characterization. Contractors are responsible for segregating and characterizing waste streams prior to disposal.

We also recommend the notification of contractors (that will be conducting demolition, renovation, or related activities) and building occupants of the presence of asbestos in their work areas (i.e., provide the contractor[s] and building occupants with a copy of this report and a list of asbestos removed by contractor[s] during subsequent abatement activities). Personnel not trained for asbestos work should be instructed not to disturb asbestos.

In accordance with Great Basin Unified Air Pollution Control District (GBUAPCD) requirements, written notification to the GBUAPCD is required ten working days prior to commencement of *any* demolition activity (whether asbestos is present or not), and for activities involving specified quantities of RACM. In accordance with Title 8, CCR 341.9, written notification to the nearest Cal/OSHA district office is required at least 24 hours prior to certain asbestos-related work.

5.2 Lead Paint

Interior LCP identified during our survey would be considered a California hazardous waste based on lead content if stripped, blasted, or otherwise separated from the substrate.

Exterior LCP identified during our survey would not be considered a California or Federal hazardous waste based on lead content.

We recommend that all paints at the project location be treated as lead-containing for purposes of determining the applicability of the Cal/OSHA lead standard during maintenance, renovation, and demolition activities. This recommendation is based on LCP sample results and the fact that lead was a common ingredient of paints manufactured before 1978 and is still an ingredient of some paints. Compliance and training requirements regarding construction activities where workers may be exposed to lead are presented in Title 8, CCR, § 1532.1, subsections (e) and (l), respectively. Contractors are responsible for segregating and characterizing waste streams prior to disposal.

6.0 REPORT LIMITATIONS

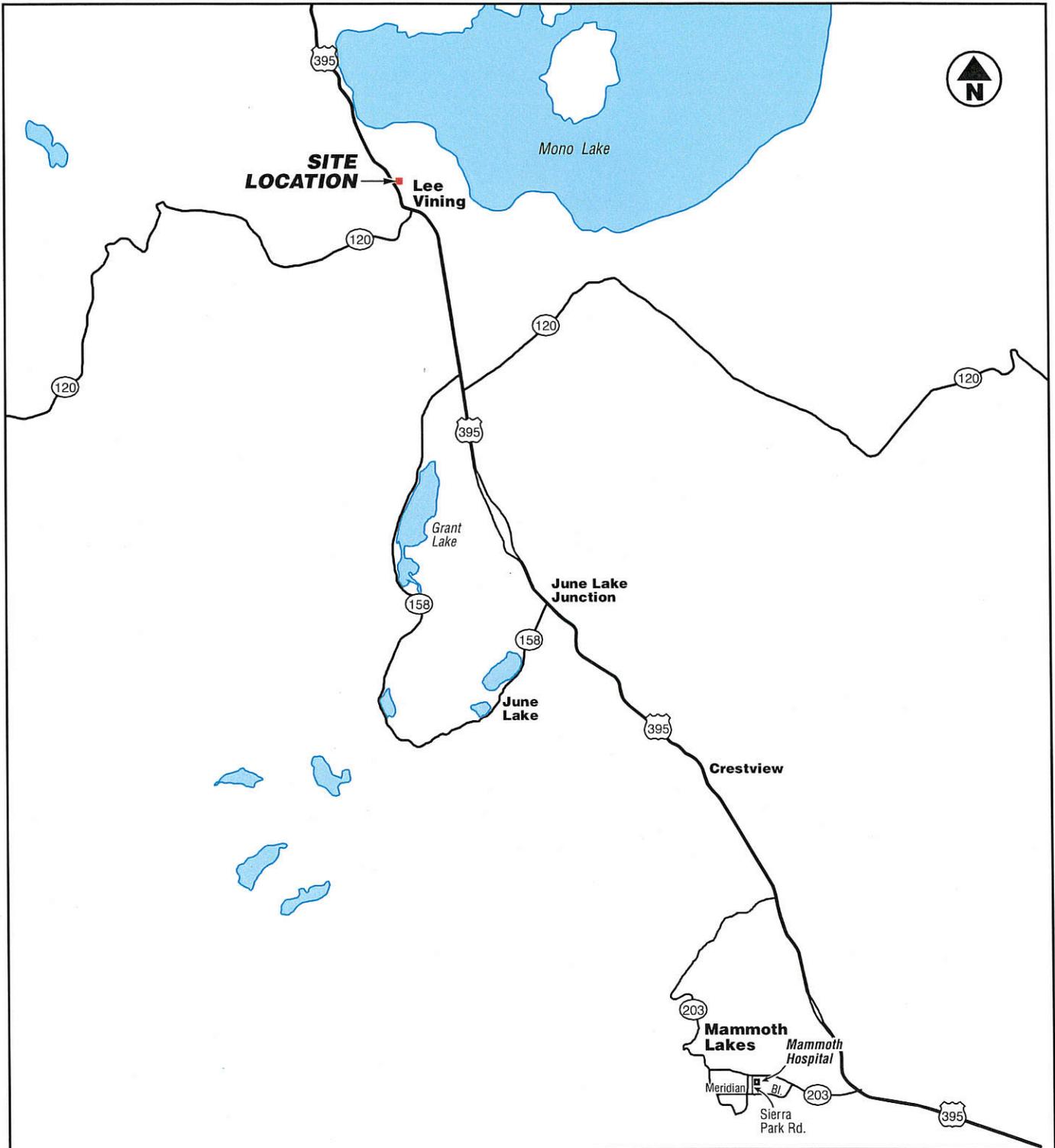
This asbestos and LCP survey was conducted in conformance with generally accepted standards of practice for identifying and evaluating asbestos and LCP in structures. The survey addressed only the structures identified in Section 1.1. Due to the nature of structure surveys, asbestos and LCP use, and laboratory analytical limitations, some ACM or LCP at the project location may not have been identified. Spaces such as cavities, voids, crawlspaces, and pipe chases may have been concealed to our investigator. Previous renovation work may have concealed or covered spaces or materials or may have partially demolished materials and left debris in inaccessible areas. Additionally, renovation activities may have partially replaced ACM with indistinguishable non-ACM. Asbestos and/or LCP may exist in areas of the structures that were not accessible or sampled in conjunction with this TO.

During renovation or demolition operations, suspect materials may be uncovered which are different from those accessible for sampling during this assessment. Personnel in charge of renovation/demolition should be alerted to note materials uncovered during such activities that differ substantially from those included in this or previous assessment reports. If suspect ACM and/or LCP are found, additional sampling and analysis should be performed to determine if the materials contain asbestos or lead.

This report has been prepared exclusively for Caltrans. The information contained herein is only valid as of the date of the report and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing 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 be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. 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.

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.



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Lee Vining Maintenance Station – Truck Shed Upgrades

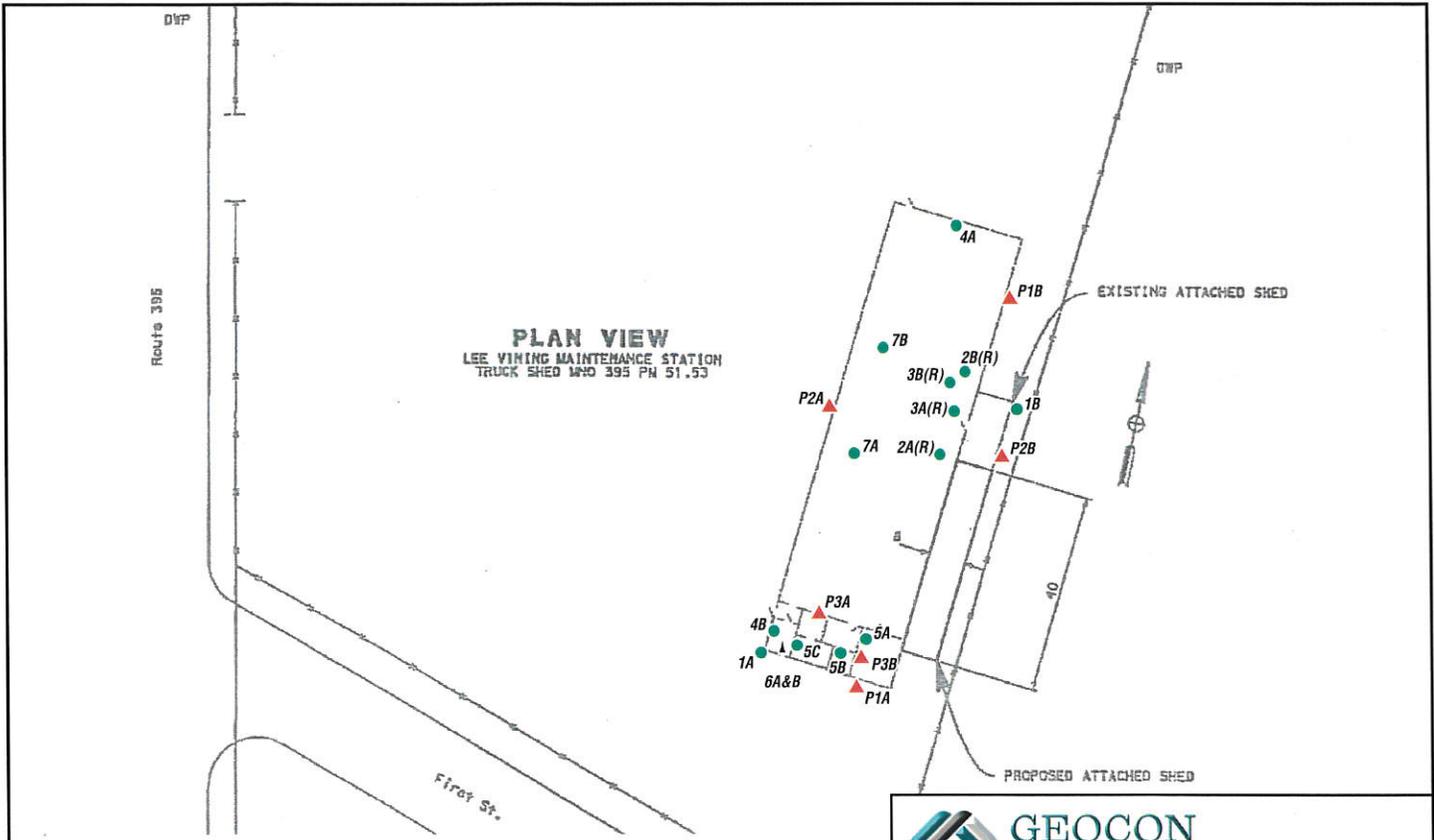
Lee Vining,
California

VICINITY MAP

GEOCON Proj. No. S9800-01-10
Task Order No. 10
E-FIS 09 0002 0100 (EA 09-352401)
Caltrans Contract 06A1895

November 2013

Figure 1



PLAN VIEW
 LEE VINING MAINTENANCE STATION
 TRUCK SHED MHO 395 PH 51.53

LEGEND:

- Approximate Asbestos Sample Location
- ▲ Approximate Paint Sample Location
- (R) Roof

 GEOCON CONSULTANTS, INC. <small>3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742 PHONE 916.852.9118 - FAX 916.852.9132</small>	
Lee Vining Maintenance Station – Truck Shed Upgrades	
Lee Vining, California	SITE PLAN
<small>GEOCON Proj. No. S9800-01-10 Task Order No. 10 E-FIS 09 0002 0100 (EA 09-352401) Caltrans Contract 06A1895</small>	
November 2013	Figure 2

TABLE 1
 SUMMARY OF ASBESTOS ANALYTICAL RESULTS
 LEE VINING MAINTENANCE STATION - TRUCK SHED UPGRADES
 CALTRANS CONTRACT 06A1895, TASK ORDER NO. 10, EA 09-352401
 LEE VINING, CALIFORNIA

Polarized Light Microscopy (PLM) - EPA Test Method 600/R-93/116

Sample Group No.	Description of Material	Approximate Quantity	Friable	Site Photos	Asbestos Content
1	Block and mortar system (painted)	NA	NA	1 and 2	ND
2	Vapor barrier (roofing)	NA	NA	3	ND
3	Roofing mastic	NA	NA	3	ND
4	Window putty	40 square feet	No	4	<0.25%*
5	Gypsum board system (painted)	2,500 square feet	Yes	5 and 6	0.25% (GB/JC)*
6	Acoustic ceiling tiles	NA	NA	6	ND
7	Concrete	NA	NA	7	ND

Notes:

NA = Not applicable (no asbestos detected)

ND = Not detected

* Material analyzed using PLM point count methodology (400 points)

GB/JC = Gypsum board and joint compound composite

TABLE 2
SUMMARY OF PAINT ANALYTICAL RESULTS - TOTAL AND SOLUBLE LEAD
LEE VINING MAINTENANCE STATION - TRUCK SHED UPGRADES
CALTRANS CONTRACT 06A1895, TASK ORDER NO. 10, EA 09-352401
LEE VINING, CALIFORNIA

Paint Sample No.	Paint Description	Approximate Quantity Peeling/Flaking	Site Photos	Total Lead (mg/kg)	TCLP Lead (mg/l)
P1A/B	Beige exterior paint	Intact	1 and 2	4.6	---
P2A/B	Yellow exterior trim	20 square feet (attached shed)	1 and 2	5.5	---
P3A/B	Multi-layer/color interior paint	Intact	5 and 6	6,700	1.8

Notes:

mg/kg = milligrams per kilogram (EPA Test Method 6010B)

mg/l = milligrams per liter

TCLP = Toxicity Characteristic Leaching Procedure (EPA Test Method 7420)

--- = Not analyzed



Photo 1 – Lee Vining Maintenance Station (Truck Shed)

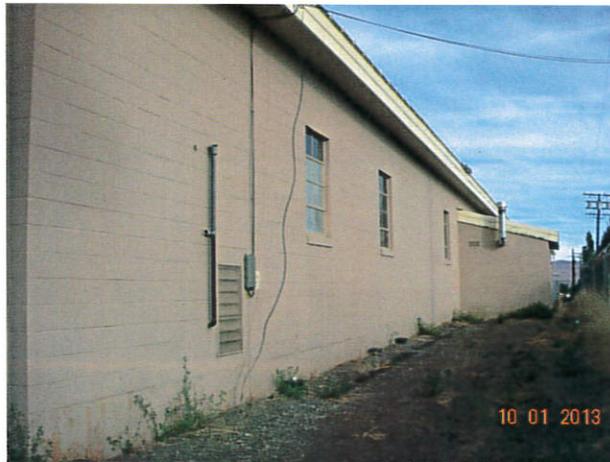


Photo 2 – Truck shed east exterior

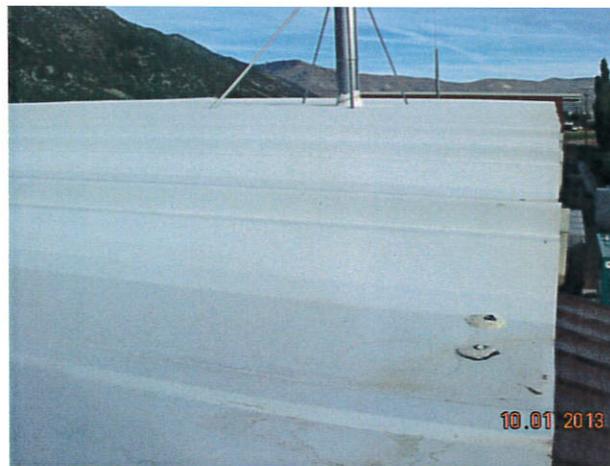


Photo 3 – Truck shed roof



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PHOTOGRAPHS 1, 2, & 3		
Lee Vining Maintenance Station (Truck Shed) Lee Vining, California		
S9800-01-10		November 2013



Photo 4 – Window putty

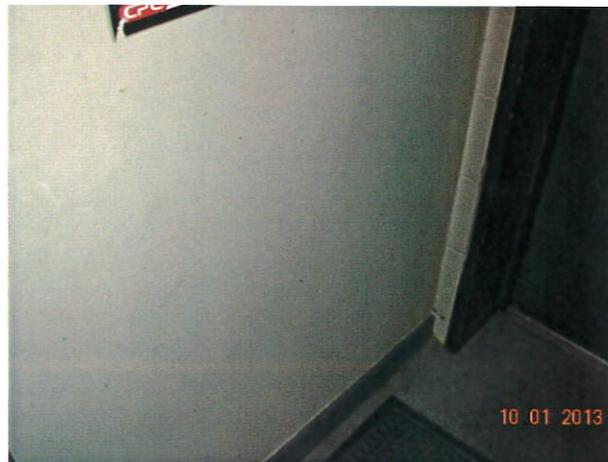


Photo 5 – Gypsum board system



Photo 6 – Acoustic ceiling tiles



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PHOTOGRAPHS 4, 5, & 6

Lee Vining Maintenance Station (Truck Shed)
Lee Vining, California

S9800-01-10

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Photo 7 – Truck bays (fiberglass pipe insulation throughout)



Photo 8 – Boiler room with non-suspect pipe insulation



Photo 9 – Hot water piping in restroom wall cavity (no insulation observed)



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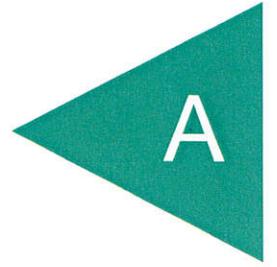
PHOTOGRAPHS 7, 8, & 9

Lee Vining Maintenance Station (Truck Shed)
Lee Vining, California

S9800-01-10

November 2013

APPENDIX





EMSL Analytical, Inc

2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
<http://www.EMSL.com> sanleandrolab@emsl.com

EMSL Order: 091315858
CustomerID: GECN21
CustomerPO: S9800-01-10
ProjectID:

Attn: **Dave Watts**
Geocon Consultants, Inc.
6671 Brisa Street

Livermore, CA 94550

Project: LEE VINING MS S9800-01-10

Phone: (925) 371-5900
Fax: (925) 371-5915
Received: 10/02/13 9:15 AM
Analysis Date: 10/7/2013
Collected: 10/1/2013

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
1A-Block 091315858-0001	BLOCK & MORTAR SYSTEM	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
1A-Mortar 091315858-0001A	BLOCK & MORTAR SYSTEM	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
1B-Block 091315858-0002	BLOCK & MORTAR SYSTEM	Gray/Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
1B-Mortar 091315858-0002A	BLOCK & MORTAR SYSTEM	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
2A-Vapor Barrier 091315858-0003	VAPOR BARRIER	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
2B-Vapor Barrier 091315858-0004	VAPOR BARRIER	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
3A-Roofing Mastic 091315858-0005	ROOFING MASTIC	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
3B-Roofing Mastic 091315858-0006	ROOFING MASTIC	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)
Matthew Batongbacal (26)


Baojia Ke, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%
Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from 10/08/2013 10:58:58



EMSL Analytical, Inc

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EMSL Order: 091315858
CustomerID: GECN21
CustomerPO: S9800-01-10
ProjectID:

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Fax: (925) 371-5915
Received: 10/02/13 9:15 AM
Analysis Date: 10/7/2013
Collected: 10/1/2013

Livermore, CA 94550

Project: **LEE VINING MS S9800-01-10**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
4A-Window Putty 091315858-0007	WINDOW PUTTY	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	<1% Chrysotile
4B-Window Putty 091315858-0008	WINDOW PUTTY	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	<1% Chrysotile
5A-Gypsum Board 091315858-0009	GYPSUM BOARD SYSTEM	White Fibrous Homogeneous	5% Cellulose 5% Glass	90% Non-fibrous (other)	None Detected
5A-Joint Compound 1 091315858-0009A	GYPSUM BOARD SYSTEM	Tan/White Non-Fibrous Homogeneous		98% Non-fibrous (other)	2% Chrysotile
5A-Joint Compound 2 091315858-0009B	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	<1% Chrysotile
5B-Gypsum Board 091315858-0010	GYPSUM BOARD SYSTEM	White Fibrous Homogeneous	5% Cellulose 5% Glass	90% Non-fibrous (other)	None Detected
5B-Joint Compound 1 091315858-0010A	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		98% Non-fibrous (other)	2% Chrysotile
5B-Joint Compound 2 091315858-0010B	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		98% Non-fibrous (other)	2% Chrysotile

Analyst(s)

Matthew Batongbacal (26)

Baojia Ke, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from 10/08/2013 10:58:58



EMSL Analytical, Inc

2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577

Phone/Fax: (510) 895-3675 / (510) 895-3680

<http://www.EMSL.com>

sanleandrolab@emsl.com

EMSL Order:	091315858
CustomerID:	GECN21
CustomerPO:	S9800-01-10
ProjectID:	

Attn: **Dave Watts**
Geocon Consultants, Inc.
6671 Brisa Street

Livermore, CA 94550

Project: LEE VINING MS S9800-01-10

Phone: (925) 371-5900
 Fax: (925) 371-5915
 Received: 10/02/13 9:15 AM
 Analysis Date: 10/7/2013
 Collected: 10/1/2013

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
5C-Gypsum Board 091315858-0011	GYPSUM BOARD SYSTEM	White Fibrous Homogeneous	5% Cellulose 5% Glass	90% Non-fibrous (other)	None Detected
5C-Joint Compound 1 091315858-0011A	GYPSUM BOARD SYSTEM	Tan/White Non-Fibrous Homogeneous		98% Non-fibrous (other)	2% Chrysotile
5C-Joint Compound 2 091315858-0011B	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
5C-Joint Compound 3 091315858-0011C	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
6A-Ceiling Tile 091315858-0012	CEILING TILE + MASTIC	Brown/Gray Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (other)	None Detected
6A-Mastic 091315858-0012A	CEILING TILE + MASTIC	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
6B-Ceiling Tile 091315858-0013	CEILING TILE + MASTIC	Brown/Gray Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (other)	None Detected
6B-Mastic 091315858-0013A	CEILING TILE + MASTIC	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)

Matthew Batongbacal (26)

Baojia Ke, Laboratory Manager
or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from 10/08/2013 10:58:58



EMSL Analytical, Inc

2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
<http://www.EMSL.com> sanleandrolab@emsl.com

EMSL Order: 091315858
CustomerID: GECN21
CustomerPO: S9800-01-10
ProjectID:

Attn: **Dave Watts**
Geocon Consultants, Inc.
6671 Brisa Street

Livermore, CA 94550
Project: LEE VINING MS S9800-01-10

Phone: (925) 371-5900
Fax: (925) 371-5915
Received: 10/02/13 9:15 AM
Analysis Date: 10/7/2013
Collected: 10/1/2013

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
7A-Concrete <i>091315858-0014</i>	CONCRETE	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
7B-Concrete <i>091315858-0015</i>	CONCRETE	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)
Matthew Batongbacal (26)


Baojia Ke, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from 10/08/2013 10:58:58

**EMSL Analytical, Inc**

2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577
 Phone/Fax: (510) 895-3675 / (510) 895-3680
<http://www.EMSL.com> sanleandrolab@emsl.com

EMSL Order: 091315858
 CustomerID: GECN21
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 ProjectID:

Attn: **Dave Watts**
Geocon Consultants, Inc.
6671 Brisa Street

Livermore, CA 94550
 Project: LEE VINING MS S9800-01-10

Phone: (925) 371-5900
 Fax: (925) 371-5915
 Received: 10/02/13 9:15 AM
 Analysis Date: 10/15/2013
 Collected: 10/1/2013

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy. Quantitation using 400 Point Count Procedure

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
4A-Window Putty 091315858-0007	WINDOW PUTTY	Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
4B-Window Putty 091315858-0008	WINDOW PUTTY	Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
5A-GB/JC Composite 091315858-0009C	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
5B-GB/JC Composite 091315858-0010C	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
5C-GB/JC Composite 091315858-0011D	GYPSUM BOARD SYSTEM	White Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile

Analyst(s)

Jorge Leon (5)

Baojia Ke, Laboratory Manager
or other approved signatory

Disclaimer: Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government. EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.
 Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from 10/15/2013 15:36:29

#091315858



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

Asbestos Chain of Custody
EMSL Order Number (Lab Use Only):

[Empty box for EMSL Order Number]

EMSL ANALYTICAL, INC.
2235 POLVOROSA DR., STE. 230
SAN LEANDRO, CA 94577
PHONE: (510) 895-3675
FAX: (510) 895-3680

Company: <u>GEOCON</u>		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: <u>6671 BRISA ST</u>		Third Party Billing requires written authorization from third party	
City: <u>LIVERMORE</u>	State/Province: <u>CA</u>	Zip/Postal Code: <u>94550</u>	Country: <u>USA</u>
Report To (Name): <u>WATTS (925-371-5900)</u>		Fax #: <u>925-371-5915</u>	
Telephone #: <u>GEOCON-LIV</u>		Email Address: <u>WATTS@GEOCONINC.COM</u>	
Project Name/Number: <u>LEE VINING MD / 59800-01-10</u>			
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		Purchase Order:	U.S. State Samples Taken: <u>CA</u>

Turnaround Time (TAT) Options* - Please Check

3 Hour 6 Hour 24 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week

*For TEM Air 3 hours/6 hours, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

<p>PCM - Air</p> <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA	<p>TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only)</p> <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312	<p>TEM - Dust</p> <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)
<p>PLM - Bulk (reporting limit)</p> <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	<p>TEM - Bulk</p> <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5	<p>Soil/Rock/Vermiculite</p> <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative)
<p>TEM - Water: EPA 100.2</p> Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking		<p>Other:</p> <input type="checkbox"/>

Check For Positive Stop - Clearly Identify Homogenous Group

Samplers Name: D. WATTS Samplers Signature: [Signature]

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
1 A/B	Block + MORTAR SYSTEM (PAINTED)	NA	10/1/13
2	VAPOR BARRIER	}	}
3	ROOFING MASTIC		
4 ↓	WINDOW PUTTY		
5 A-C	Gypsum BOARD SYSTEM (PAINTED)		
6 A/B	CEILING TILE + MASTIC		
7 ↓	CONCRETE		

Client Sample # (s): 1A - 7B Total # of Samples: 15

Relinquished (Client): [Signature] Date: 10/1/13 Time: 1700

Received (Lab): FED EX Date: 10/1/13 Time: 1700

Comments/Special Instructions: 2 42/13 9:15 FX


ADVANCED TECHNOLOGY
LABORATORIES

October 09, 2013

Dave Watts
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 961-5273
Fax: (925) 371-5915



ELAP No.: 1838
NELAP No.: 02107CA
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No.: T104704502

Re: ATL Work Order Number : 1303040

Client Reference : LEE VINING MS, S9800-01-10

Enclosed are the results for sample(s) received on October 02, 2013 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,



Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

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www.atlglobal.com



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : LEE VINING MS, S9800-01-10

Report To : Dave Watts

Reported : 10/09/2013

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
P1A/B	1303040-01	Paint	10/01/13 0:00	10/02/13 13:41
P2A/B	1303040-02	Paint	10/01/13 0:00	10/02/13 13:41
P3A/B	1303040-03	Paint	10/01/13 0:00	10/02/13 13:41



Certificate of Analysis

Geocon Consultants, Inc. 6671 Brisa Street Livermore, CA 94550	Project Number : LEE VINING MS, S9800-01-10 Report To : Dave Watts Reported : 10/09/2013
--	--

Total Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: AG

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time	
									Analyzed	Notes
1303040-01	P1A/B	4.6	mg/kg	4.0	NA	1	B3J0171	10/08/2013	10/08/13 16:30	
1303040-02	P2A/B	5.5	mg/kg	4.0	NA	1	B3J0171	10/08/2013	10/08/13 16:34	
1303040-03	P3A/B	6700	mg/kg	130	NA	20	B3J0171	10/08/2013	10/08/13 15:56	D6



Certificate of Analysis

Geocon Consultants, Inc.
 6671 Brisa Street
 Livermore, CA 94550

Project Number : LEE VINING MS, S9800-01-10
 Report To : Dave Watts
 Reported : 10/09/2013

QUALITY CONTROL SECTION

Total Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B3J0171 - EPA 3050B									
Blank (B3J0171-BLK1)					Prepared: 10/8/2013 Analyzed: 10/8/2013				
Lead	ND	1.0							NR
LCS (B3J0171-BS1)					Prepared: 10/8/2013 Analyzed: 10/8/2013				
Lead	47.6708	1.0	50.0000		95.3	80 - 120			
Duplicate (B3J0171-DUP1)					Prepared: 10/8/2013 Analyzed: 10/8/2013				
Lead	3.94861	1.0		6.43904	NR		47.9	20	R
Matrix Spike (B3J0171-MS1)					Prepared: 10/8/2013 Analyzed: 10/8/2013				
Lead	107.735	1.0	125.000	6.43904	81.0	51 - 106			
Matrix Spike Dup (B3J0171-MSD1)					Prepared: 10/8/2013 Analyzed: 10/8/2013				
Lead	107.261	1.0	125.000	6.43904	80.7	51 - 106	0.441	20	
Batch S3J0087 - B3J0151									
Instrument Blank (S3J0087-IBL1)					Prepared: 10/8/2013 Analyzed: 10/8/2013				
Lead	ND	1.0							NR



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : LEE VINING MS, S9800-01-10

Report To : Dave Watts

Reported : 10/09/2013

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
D6	Sample required dilution due to high concentration of target analyte.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA1	CA-NELAP (CDPH)
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

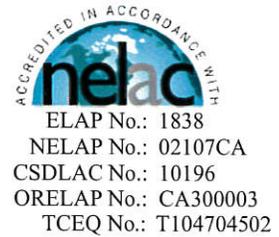
Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.


ADVANCED TECHNOLOGY
LABORATORIES

October 15, 2013

Dave Watts
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 961-5273
Fax: (925) 371-5915



Re: ATL Work Order Number : 1303040
Client Reference : LEE VINING MS, S9800-01-10

Enclosed are the results for sample(s) received on October 02, 2013 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

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Sincerely,



Eddie Rodriguez
Laboratory Director

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Certificate of Analysis

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6671 Brisa Street
Livermore, CA 94550

Project Number : LEE VINING MS, S9800-01-10

Report To : Dave Watts

Reported : 10/15/2013

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
P3A/B	1303040-03	Paint	10/01/13 0:00	10/02/13 13:41



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : LEE VINING MS, S9800-01-10
Report To : Dave Watts
Reported : 10/15/2013

TCLP Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: AG

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time	Notes
									Analyzed	
1303040-03	P3A/B	1.8	mg/L	0.18	NA	1	B3J0317	10/15/2013	10/15/13 12:47	



Certificate of Analysis

Geocon Consultants, Inc. 6671 Brisa Street Livermore, CA 94550	Project Number : LEE VINING MS, S9800-01-10 Report To : Dave Watts Reported : 10/15/2013
--	--

QUALITY CONTROL SECTION

TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B3J0317 - EPA 3010A_SOIL									
Blank (B3J0317-BLK1)					Prepared: 10/15/2013 Analyzed: 10/15/2013				
Lead	ND	0.050							NR
Blank (B3J0317-BLK2)					Prepared: 10/15/2013 Analyzed: 10/15/2013				
Lead	ND	0.050							NR
LCS (B3J0317-BS1)					Prepared: 10/15/2013 Analyzed: 10/15/2013				
Lead	0.998060	0.050	1.00000		99.8	80 - 120			
LCS Dup (B3J0317-BSD1)					Prepared: 10/15/2013 Analyzed: 10/15/2013				
Lead	1.00222	0.050	1.00000		100	80 - 120	0.416	20	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : LEE VINING MS, S9800-01-10
Report To : Dave Watts
Reported : 10/15/2013

Notes and Definitions

ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA1	CA-NELAP (CDPH)
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.

Diane Galvan

From: David Watts [watts@geoconinc.com]
Sent: Wednesday, October 09, 2013 12:59 PM
To: Diane Galvan
Subject: Re: Results/EDD/Invoice - LEE VINING MS (1303040)

Tclp on p3-std tat. Thx.

Sent from my iPhone

Foundation Report

Memorandum

*Flex your power!
Be energy efficient!*

To: SEAN SAMUEL
Branch Chief, Structural Design Section 2
Office of Transportation Architecture
Structure Design Services &
Earthquake Engineering
Division of Engineering Services

Date: August 12, 2011

File: 09-MNO-395
0900020099
Lee Vining MS
Mechanics and Crew Buildings

Attention: Edward Zhang

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Report

Introduction

Per your request, the Office of Geotechnical Design – North (OGDN) has prepared this Foundation Report (FR) for the proposed mechanics building and crew building project in Lee Vining Maintenance Station located on Highway 395 in Mono County.

The purpose of this report is to document and discuss site subsurface geotechnical conditions, and provide geotechnical design and construction recommendations.

Existing Facilities and Proposed Improvement

The existing facilities at Lee Vining MS include an equipment building, a warehouse/crew building, a sand storage building, an oil storage building, and two fuel canopies. All of these structures are steel framed structures supported on conventional spread footing foundations.

The proposed project will add a mechanics building and a crew building to the station in the areas adjacent to the existing warehouse building. The mechanics building will be a pre-engineered steel framed building and the crew building will be a wood framed building. Spreading footing foundation is considered for supports of both buildings.

Pertinent Report and Investigation

The following documents and maps were reviewed to assist in assessment of the proposed project site conditions:

- Geology Map of California, Walker Lake Sheet, Scale 1:250,000, CDMG, 1963,
- State of California Special Studies Zones, Delineated in Compliance with Chapter 7.5,

- Division 2 of the California Public Resources Code (Alquist Priolo Special Studies Zones Act), NE Mono Craters Quadrangle, Official Map, Effective January 1, 1985, CDMG,
- Groundwater level Data of Well 01S26E03C001M, Department of Water Resource, 1965 - 1984,
 - Geotechnical Services Design Manual, V1.0, August 2009,
 - 2007 California Building Code (2007 CBC) January 2008 Revision, CBSC, 2008,
 - As-Built, Foundation Plan, Details & Notes, New Storage Buildings At Lee Vining and Mojave Maintenance Stations; April 1977

Physical Setting

Topography and Drainage

The site is located in the Sierra Nevada Mountain Range. The general terrain is mountainous with an average elevation of approximately 6766 feet above mean sea level (MSL) in the project area. The immediate project site is essentially flat with gentle downward slope toward northeast. No drainage feature is observed in the immediate project area.

Geology

The site is in the northern portion of the Sierra Nevada Mountain range of California. The Sierra is about 400 miles long north to south and about 70 miles wide east to west. The granitic rocks of the Sierra formed deep underground at more than 100 million years ago. Uplift of these rocks due to tectonic movements formed the Sierra Nevada at about 4 million years ago. At about 2.5 million years ago, glaciers carved out deep canyons throughout the Sierra. Glacier erosion also exposed the granite and formed the light-colored mountains and cliffs that make up the range. Locally, the project area is underlain by Quaternary Recent Alluvium and Quaternary Lake Deposits.

Seismicity

Based on the Seismic Design Procedure, the nearest active fault for the site is the Mono Lake fault (Fault ID 170) located west of the project site. The Mono Lake fault is a normal fault with a maximum magnitude (M_{max}) of 6.6. Based on the Alquist – Priolo Earthquake Zones map, the site is not in a special study zone. The potential for subsurface rupture due to fault movement is considered insignificant since there is no known fault projecting toward or passing through the project site. Liquefaction potential is considered negligible due to groundwater being absent or significantly deep in the project area. The project site and its immediate vicinity are essentially flat. Therefore, lateral spreading potential is considered limited at the site.

Project Site Conditions

Surface Condition

The areas to receive the proposed buildings are in the northeast corner of the MS. Currently, the area is partially paved with asphalt concrete and partially covered with gravelly fill materials. The area is essentially flat and is used as a lay-down storage ground. A surface runoff collection unit and its associated underground conduit are located near the northeast boundary corner of the site. Overhead lighting and its associated underground electrical lines are located along the northern and eastern boundary fence. Several above-ground electrical control units exist in the area to the east of existing warehouse building.

Subsurface Soil Conditions

The proposed project site was explored with two hand auger borings HA-11-001 and HA-11-002. The borings were extended to depths of 6 and 8 feet below the existing ground surface. The borings encountered fill materials consisting predominantly of medium dense sands with varying gravel contents.

The full sized LOTB of the two hand auger borings which is to be incorporated in the project plans is being prepared by Geotechnical Services, Office of Geotechnical Support Branch D – Contracts, Graphics & Records, and will be forwarded when completed. Mrs. Irma Gamarra-Remmen of the Contracts, Graphics, & Records branch may be contacted directly for information on the LOTB.

Groundwater

Groundwater was not encountered in the hand auger borings at the time of our field exploration. A groundwater monitoring well (Well No. 01S26E03C001M) of Department of Water Resources (DWR) is located at about 6 miles south of the project site. Based on the data recorded in the well, groundwater varied from 33 to 119 feet below the ground surface in the area between 1965 and 1984.

Corrosivity

Samples collected from the site are being tested for corrosion evaluation, results of which will be provided upon availability. Based on previous projects in the area, the subsurface materials are considered non-corrosive to the proposed concrete foundation elements.

Design Recommendations

Seismic Design

Based on Table 1613.5.2 of 2007 CBC, the site is judged to be *Class D*.

The following mapped spectral response accelerations and site coefficients were interpreted based on Figures 1613.5(3) and 1613.5(4) and Tables 1613.5.3(1) and 1613.5.3(2) of 2007 CBC.

Mapped 0.2 second spectral acceleration, S_s ,	1.78g
Mapped 1.0 second spectral acceleration, S_1 ,	0.62g
Site Coefficient, F_v ,	1.0
Site Coefficient, F_a ,	1.5

The following five-percent damped design spectral response acceleration parameters are recommended based on Equations 16-37, 16-38, 16-39, and 16-40 of 2007 CBC.

Design spectral acceleration at short period, S_{DS} ,	1.19g
Design spectral acceleration at 1-second period, S_{D1} ,	0.62g

Frost Depth

According to Mono County Building Code, the frost depth is 18 inches below finish grade at the site.

Footing Foundations

The proposed Mechanics building and the crew building can be supported on conventional spread and strip footing foundations using an allowable soil bearing pressure of 2,000 pounds per square foot (psf).

The footing should have a minimum width of 12 inches and should be founded at least 18 inches below the adjacent finish grade to prevent frost effect. Footing excavation should be inspected and approved by the Engineer prior to placement of concrete.

Total and differential settlements of the footings constructed per recommendations are estimated to be on the order of $\frac{3}{4}$ and $\frac{1}{2}$ inch, respectively.

Lateral Earth Pressure and Resistance

An active earth pressure equal to an equivalent fluid pressure of 36 pounds per square foot per foot (psf/ft) and a passive earth pressure equal to an equivalent fluid pressure of 360 (psf/ft) may be used for design. A friction coefficient of 0.4 may be used for sliding resistance between foundation bottom and subgrade soil.

Slab-on-Grade

Soil supported slab may be designed using a subgrade reaction modulus, k , of 120 pounds per square inch per inch (pci).

Due to elevated moisture by snow in winter season, a moisture barrier may be implemented. A vinyl membrane with a minimum thickness of 6 mils may be placed over 4 inches of clean sand. The membrane should be covered by 3 inches of sand to aid in a uniform concrete cure.

Construction Considerations

The site should be cleared of all obstructions, including asphalt concrete, concrete, and utilities. All underground utilities should be properly removed or abandoned prior to foundation construction at the site. Excavation resulted from utility removal should be properly backfilled according to Caltrans Standard Specification.

All footing excavation shall be inspected and approved by the Engineer prior to the placement of concrete. The bottoms of the footing excavations shall be level, smooth, and clear of loose materials, water, and other debris prior to placement of concrete.

Mr. Sean Samuel
August 12, 2011
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Foundation Report
Lee Vining M.S.
Mechanics Building and Crew Building
0900020099

The recommendations contained in this memorandum are based on specific project information regarding structure type, location, and design loads. If any changes to the structure are proposed during final project design, OGDN should review the changes to determine if the recommendations contained herein are still applicable.

If you have any questions or comments, please contact me at (916) 227-1054 or Mr. Qiang Huang at (916) 227-1037.



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