

FOR CONTRACT NO: 03-2F2604
PROJECT ID: 0300020580

INFORMATION HANDOUT

MATERIALS INFORMATION

FOUNDATION REPORT

NATURALLY OCCURRING ASBESTOS SURVEY LETTER REPORT

ROUTE: 03-PLA-80-34.9

Memorandum

*Flex your power!
Be energy efficient!*

To: TAREK TABSHOURI
BRANCH CHIEF
NORTH REGION DIVISION OF ENGINEERING

Date: September 1, 2011

File: 03-PLA-80 PM34.8/34.9
03-2F260
0300020580
Long Ravine

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

Subject: Foundation Report for Long Ravine Rock Slide Project

A Foundation Report is provided for an anchored mesh design to control rock slides on the existing cut slope at the above referenced project location. This Foundation Report is based upon field mapping, field testing, and survey data.

Overview

The project is located in Placer County on Interstate 80 just east of the town of Colfax, California. Over the course of the last 4 years several rock slides have occurred on the hillside above the westbound lanes of Interstate 80. A hand scaling project was completed on a portion of the slope in 2007 and earthwork was performed with heavy equipment in 2011 in attempts to slow the reoccurrence interval of the rock slides. K-rail has temporarily been placed at the base of the slope to prevent debris from reaching the roadway. Due to the foliated nature of the rock, dip and dip direction of the foliation and annual rainfall within the area, this rock slope is susceptible to high decomposition rates with future rock slide associated with the decomposition. It is proposed to install an anchored cable mesh as the erosion control technique to stabilize and control the outer 5 feet of slope face. The slope face area to be covered under this project is approximately 37,000 square feet.

General Geological Setting and Subsurface Conditions

The project is located in the Sierra Nevada geologic province and is characterized by its rugged, steep terrain with steeply incised drainages. The native slope above the existing cut consists of clayey-sand/sandy-clay soil overlying partially decomposed slate. The existing cut face consists of the Mariposa Formation (Late Jurassic) Slate that locally

weathers to clayey sand with gravel. Material samples were collected in the field and tested for unit weight.

Ground Water

No springs or seeps were observed emanating from the slope face during our field reviews.

Corrosion

Because there has been no testing it is recommended that the site be considered corrosive and that full corrosion protection is used on the nails.

Design Requirements and Approach

The following design assumptions and approaches have been utilized:

- An overall slope angle of 45 degrees.
- For the entire area of the project $S_V \times S_H$
 - S_V is the vertical spacing of nails = 10 feet
 - S_H is the horizontal spacing of nails = 10 feet
 - Alternating horizontal rows of nails will be stagger 5 feet to create an overall diamond pattern
- The declination angle of the nails from the horizontal = 45°
- The design strength and nail pullout characteristics of the soil in the nailing zone are assumed as follows:

Rock

Unit Weight = 165 pcf
Cohesion = 0 psf (0 kPa)
Friction Angle = 40°

The following design requirements have been determined for the anchors:

- Pullout resistance of the anchor 20 ton

Design Recommendations

Based upon our analysis the recommended anchored cable mesh system consists of cable nets overlying double twisted wire mesh. The double twist wire mesh backing should be

securely fastened to the cable nets prior to placement on the slope. The cable mesh should be anchored to the ground by 1-inch diameter Grade 75 threaded steel bar grouted in the ground. The cable mesh shall be securely held to the anchor utilizing a bearing plate and hex nut.

The horizontal and vertical spacing of the nails should be 10 feet. The 10 foot spacing takes into account the undulating and varied slope surface providing conservative nail spacing. The un-bonded portion of the anchor shall be a minimum of 5 feet. Total length of the anchor shall be determined by the contractor to meet the design pullout strength. The ultimate pullout strength of each anchor should be a minimum of 20 ton. Maximum surface ground contact of the cable mesh is required.

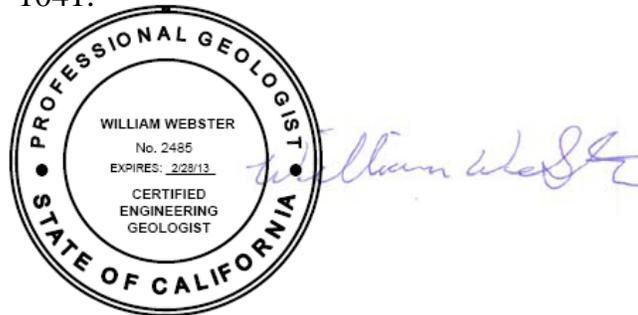
Field verification and proof testing of the pullout resistance of selected anchors shall be performed. Verification pullout tests on one sacrificial test anchor assembly shall be performed at a designated locations determined by the contractor and engineer in order to ensure consistency of the quality of drilling, installation and grouting technique. At least 20 percent of the anchors should be tested. At least one verification pullout test will be performed in each soil stratigraphic zone. The locations of the test anchors will be selected in the field based upon the observed soil and drilling conditions.

Temporary unbonded lengths shall be provided for each test anchor. The test anchor shall be isolated from the reaction frame during testing. Where temporary casing of the unbonded length of the test anchor is provided, the casing shall be installed in a manner that prevents any reaction between the casing and the grouted bond length of the anchor and/or stressing apparatus. Test anchors shall be constructed using the same equipment, methods, and hole diameter as planned for the production anchors. If the test anchors fail to meet the requirements stated in the special provisions, Geotechnical Design North shall be contacted immediately for assessment and modification of the anchored cable mesh design.

Proposed Future Investigations

No other fieldwork is proposed at this time. Our Office is available to assist District Construction with over site during installation of the Anchored Cable Mesh.

The recommendations contained in this report are based on the specific project information provided to this office through August, 2011. If any conceptual changes are made during final design or in the field that could relate to or are related to geotechnical issues, the Office of Geotechnical Design North should review those changes to determine if these recommendations still apply. If you have any questions, comments, or would like to request our assistance during construction for this project please call Bill Webster at (916) 227-1041.



William Webster, CEG
Engineering Geologist
Office of Geotechnical Design North
Branch C

Attachments

1. Anchored Cable Mesh nSSP - Concurrence Memo
2. Anchored Cable Mesh – nSSP
3. Anchored Cable Mesh – Construction Details

C: Doug Brittsan, (OGDN)
e-Copy: Dakak Najed, (D3-PM)
Eskinder Tadesse, (PCE)
Mark Willian, GS Corporate
D3 - OE (c/o Takek Tabshouri)
D3 - RE Pending Files (c/o Takek Tabshouri)
Joseph Peterson, (D3-DME)



Project No. S9300-06-166
August 9, 2011

Ms. Alicia Beyer
California Department of Transportation – District 3
Environmental Engineering Office
703 B Street
P.O. Box 911
Marysville, California 95901

Subject: NATURALLY OCCURRING ASBESTOS SURVEY LETTER REPORT
COLFAX SLOPE REPAIR
INTERSTATE 80, POST MILE 34.5 TO 35.5
PLACER COUNTY, CALIFORNIA
CONTRACT NO. 03A1368, TASK ORDER NO. 166, EA 03-2F2601

Dear Ms. Beyer:

In accordance with California Department of Transportation (Caltrans) Contract No. 03A1368 and Task Order (TO) No. 166, Geocon Consultants, Inc. is submitting this letter report with results for a naturally occurring asbestos (NOA) survey conducted for slope repairs within a portion of the Interstate 80 (I-80) corridor in Placer County, California. This report outlines the procedures and methods employed by Geocon to complete the survey.

PROJECT LOCATION AND PROPOSED IMPROVEMENTS

The project is located along the I-80 right-of-way between Post Mile (PM) 34.5 and PM 35.0 east of Colfax. A slide area is located between PM 34.8 and PM 34.9 on the westbound side of the highway. An associated soil disposal site is located at approximately PM 34.56 on the westbound side. Caltrans plans to lay the slope back in the slide area and place the cut slope material at the disposal site. As requested by the Caltrans TO Manager, the NOA survey was conducted from approximately PM 34.5 to PM 35.5. The approximate project location is depicted on the Vicinity Map, Figure 1.

PURPOSE

The purpose of the scope of services performed for TO No. 166 was to evaluate whether NOA-containing soil or rock is present at the site. The investigative results will be used by Caltrans to inform construction contractors of whether potentially NOA-containing soil and/or rock is present within the project boundaries for health, safety and disposal purposes. Accordingly, Caltrans requested a survey of the site to provide data regarding the presence of NOA-containing soil or rock within the project limits.

BACKGROUND

Construction activities proposed by Caltrans will require the disturbance of soil and rock on the project site. Geologic mapping by the California Geological Survey (CGS) depicts a fault east of the site and ultramafic rock formations to the southeast of the site, the alteration of which can lead to the formation of NOA minerals. If not managed, disturbance of NOA during construction activities may potentially pose an inhalation risk to the health of construction personnel.

PROJECT SCOPE

Outlined below is a summary of the scope of services performed by Geocon under TO No. 166.

Pre-field Activities

- Participated in a Task Order Meeting via phone and email on June 28, 2011. Caltrans Task Order Manager Alicia Beyer, Caltrans Project Engineer Tarek Tabshouri, and Geocon representative John Pfeiffer were present at the meeting. The purpose of the Task Order Meeting was to identify and discuss the project boundaries and conditions and the Task Order scope of services.
- Reviewed geological maps and studies of the general project area for information on the potential presence of NOA.
- Retained the services of EMSL Analytical Inc. (EMSL), a Caltrans-approved and California-certified analytical laboratory, to perform the asbestos analyses of samples.

Field Activities

Naturally Occurring Asbestos

John Pfeiffer, a California Certified Engineering Geologist (CEG 2372) with experience in the assessment of NOA, conducted the survey to identify potentially NOA-containing geological units within the project limits. A total of seven distributed samples were collected from hand-excavated soil sampling locations on the site. The individual sample locations were chosen in the field by the Geocon Geologist based on field observations, prior discussion with the Caltrans Task Order Manager, and safety considerations. Seven representative soil/rock samples were collected from locations distributed through the project area between PM 34.5 and PM 35.5. Four of the samples were collected from the westbound side of the roadway, and three were collected from the eastbound side. The approximate sample locations are depicted on the Site Plan, Figure 2.

Five of the samples (WB1, WB4, EB1, EB2, and EE3) were collected from the face of bedrock cut-slopes after removing approximately 6 to 8 inches of surficial material (colluvium) using a hoe and rock hammer. Two samples (WB2 and WB3) were collected from fill material adjacent to the roadway shoulder after removing approximately 8 to 12 inches of surficial material using a hand-auger or shovel and hoe. After removing surficial material, the soil samples were collected directly from the excavation or hand-auger bucket and placed into resealable plastic bags for field homogenization. Each soil sample bag was marked with a unique sample identification number, the TO number, and the date and time the sample was collected. The samples were delivered to EMSL for asbestos analysis under chain-of-custody (COC) protocol. The sample locations were backfilled with excess soil from the sampling.

Sampling Point Location

The approximate location of each sample was determined during the field sampling activities with reference to features identifiable on aerial photographs of the area.

Quality Assurance/Quality Control Procedures

Quality assurance/quality control procedures were performed during the field exploration activities. These procedures included decontamination of sampling equipment before use, collection of each sample using new disposable gloves, and providing COC documentation for each sample submitted to the laboratory. The soil sampling equipment was cleansed prior to use by double rinse with deionized water. Soil and rock types from each sample location were noted on the field project log.

Laboratory Analyses

The soil samples were submitted to EMSL for asbestos fiber analysis by California Air Resources Board (CARB) Method 435 using polarized light microscopy (PLM). The CARB 435 preparation includes milling the sample to a minus 200-mesh size, which also homogenizes the sample. The analytical sensitivity of the PLM analysis was 0.25% by area. The samples were analyzed on a five-day turnaround time.

FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS

Site Geology

We reviewed the CGS 1992 *Geologic Map of the Chico Quadrangle, California* (Chico Sheet) for information on the geologic units on the site. According to the Chico Sheet, the rock units underlying the site are Mesozoic metasedimentary rocks of the Mariposa Formation. The Gillis Hill Fault is depicted east of the site and an ultramafic rock unit is depicted approximately ¾-mile to the southeast of the site.

John Pfeiffer performed the geologic assessment of the outcrops visible on the site. The observed geology was generally consistent with that depicted on the Chico Sheet. The bedrock exposures observed in cut slopes on the site appeared to be comprised of highly to moderately weathered metasedimentary rock (sandstone, shale, siltstone). The fill material on the disposal site was observed to consist of similar metasedimentary rock. The samples submitted for laboratory analysis consisted of a representative mix of weathered metasedimentary rock fragments and associated residual soil. Materials and features indicative of a geological environment conducive to the formation of NOA were not observed at the site.

Asbestos Analytical Results

The samples were analyzed by EMSL for asbestos by PLM using the CARB 435 method. None of the samples from the site were reported to contain asbestos at or above the laboratory reporting limit. A summary of asbestos analytical results is presented on Table 1. A copy of the laboratory report and COC documentation is attached to this report.

CONCLUSIONS AND RECOMMENDATIONS

The mapped and observed geology at the site are not indicative of a geologic environment where NOA minerals are likely to occur. None of the samples submitted for analysis from the site were reported to contain asbestos at or above the regulatory threshold of 0.25% by the PLM method. Since geologic conditions conducive to the formation of NOA were not observed on the site and the laboratory did not report asbestos in the samples, engineering controls to minimize the aerial dispersion of NOA are not required for operations in the project area, and soils generated from the site during construction can be reused or disposed of without restrictions with regards to NOA.

The contents of this report reflect the views of Geoccon 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 any questions concerning the contents of this report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.


John C. Pfeiffer, PG, CEG
Senior Geologist




John E. Juhrendt, PE, CEG
Principal

(2 + 4 on CD) Addressee

Attachments: Figure 1, Vicinity Map
Figure 2, Site Plan
Table 1, Summary of NOA Analytical Results
Asbestos Analytical Results and Chain-of-custody Documentation

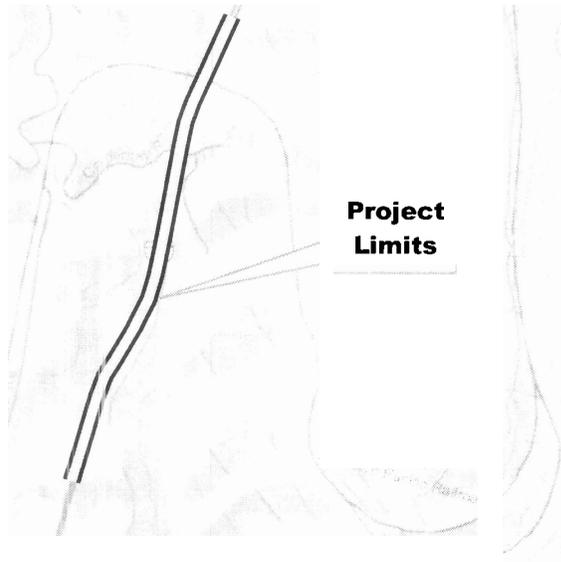
Rollins Reservoir



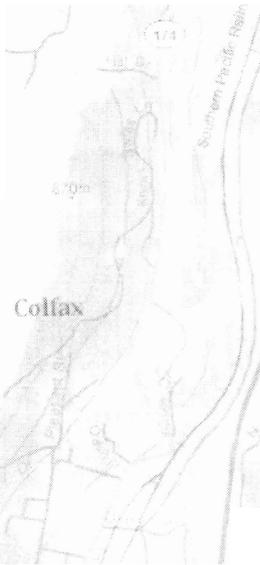
174



Shady Glen



Project Limits



Colfax

174

6.70m

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1.0



0 0.125 0.25 0.5 Miles



GEOCON
CONSULTANTS, INC.

3160 GOLD VALLEY DR - SUITE 305 - RANCHO DORADO, CA 95742
PHONE: 916 852 8118 - FAX: 916 852 8117

VICINITY MAP

Placer 80 NOA - PM 34.5 - 35.5

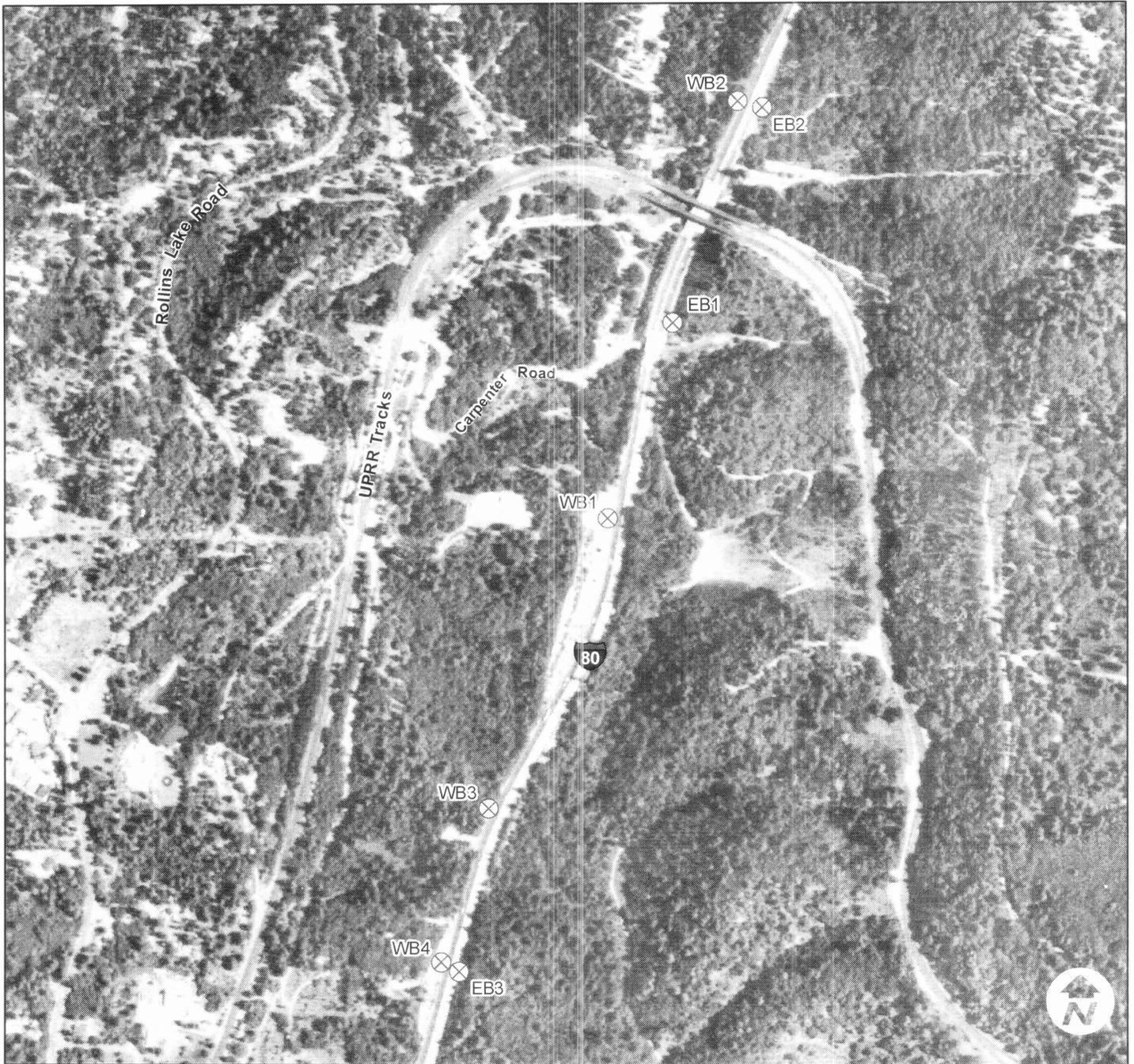
Geocon Proj. No. S9300-06-166

Placer County, California

Task Order No. 166

August 2011

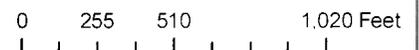
Figure 1



Aerial Photo: ESRI Imagery, May, 2010

LEGEND:

X Sample Location



SITE PLAN

Placer 80 NOA - PM 34.5 - 35.5



GEOCON
CONSULTANTS, INC

2160 GOLD VALLEY DR - SUITE 600 - RANCHO CERRITOS, CA 95742
PHONE 916 852 3118 - FAX 916 852 9132

Geocon Proj. No. S9300-06-166

Placer County, California

Task Order No. 166

August 2011

Figure 2

TABLE 1
SUMMARY OF NOA ANALYTICAL RESULTS
CALTRANS TASK ORDER NO. 166, EA 03-2F2601
HIGHWAY 80 POST MILE 34.5-35.5
PLACER COUNTY, CALIFORNIA

| SAMPLE I.D. | SAMPLE DATE | ANALYTICAL METHOD | ASBESTOS % | ASBESTOS TYPE |
|-------------|-------------|-------------------|------------|---------------|
| WB1 | 7/7/2011 | PLA | ND | None Reported |
| WB2 | 7/7/2011 | PLM | ND | None Reported |
| WB3 | 7/7/2011 | PLM | ND | None Reported |
| WB4 | 7/7/2011 | PLM | ND | None Reported |
| EB1 | 7/7/2011 | PLM | ND | None Reported |
| EB2 | 7/7/2011 | PLM | ND | None Reported |
| EB3 | 7/7/2011 | PLM | ND | None Reported |

Notes: PLM = Polarized Light Microscopy
NOA = Naturally occurring asbestos
ND = Not detected



EMSL Analytical, Inc

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

Phone: (510) 895-3675 Fax: (510) 895-3680 Email: sanleandro@emsl.com

Attn: John Pfeiffer
Geocon Consultants, Inc.
3160 Gold Valley Drive
Suite 800
Rancho Cordova, CA 95742

Customer ID: GECN80
Customer PO: S9300-06-166
Received: 07/11/11 9:00 AM
EMSL Order: 091107567

Fax: (916) 852-9132 Phone: (916) 852-9118
Project: S9300-06-166

EMSL Proj: S9300-06-**
Analysis Date: 7/18/2011

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Table with 7 columns: Sample, Description, Appearance, % Fibrous, Non-Asbestos (% Non-Fibrous), Asbestos (% Type). Rows include samples WB1, EB1, EB2, WB2, WB3, WB4, and EB3, all showing 100.00% Non-fibrous (other) and None Detected for Asbestos.

Initial report from 07/18/2011 17:45:15

Analyst(s)

Jason Mcgriff (7)

Baojia Ke, Laboratory Manager
or other approved signatory

This report relates only to the samples listed above and may not be reproduced except in full, without EMSL's written approval. 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. EMSL is not responsible for sample collection activities or method limitations. Some samples may contain asbestos fibers below the resolution limit of PLM. EMSL recommends that samples reported as none detected or less than the limit of detection undergo additional analysis via TEM. Samples received in good condition unless otherwise noted.
Samples analyzed by EMSL Analytical, Inc San Leandro, CA



Asbestos Lab Services Chain of Custody

EMSL Order Number (Lat. Use Only)

091107502

Sample No. _____
 Project No. _____
 FAX No. _____

Company: Geoco Consultants, Inc.
Street: 3160 Gold Valley Drive, Suite 800
City/State/Zip: Rancho Cordova, CA 95742
Report To (Name): John Pfeiffer
Telephone: (916) 852-9118
Project Name/Number: S9300-06-166

EMSL Bill to: Same Different
If Bill to is Different, please include instructions in comments**
 Third Party Billing requires written authorization from third party

Please Provide Results: Email _____ **Purchase Order:** _____ **State Samples Taken:** CA

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

| | | |
|--|---|--|
| PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA PLM - Bulk (reporting limit) <input 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%) | TEM - Air <input type="checkbox"/> 4-4.5h TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312 TEM - Bulk <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 TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking | TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167) Soil/Rock/Vermiculite 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) Other: |
|--|---|--|

Check For Positive Stop - Clearly Identify Homogenous Group

Samplers Name: _____ **Samplers Signature:** _____

| Sample # | Sample Description | Volume/Area (Air) HA # (Bulk) | Date/Time Sampled |
|----------|---------------------------------|----------------------------------|----------------------|
| WB1 | Light brown siltstone/sandstone | | 7/7/11 0925 |
| EB1 | Light brown siltstone | | 7/7/11 0945 |
| EB2 | Light brown siltstone | | 7/7/11 1005 |
| WB2 | Light brown siltstone + quartz | | 7/7/11 1020 |
| WB3 | Red-brown silty sand w/gravel | | 7/7/11 1105 |
| WB4 | brown, silty sand | | 7/7/11 1115 |
| EB3 | brown silty sand | | 7/7/11 1145 |

Client Sample # (s): _____ **Total # of Samples:** 7

Relinquished (Client): *John Pfeiffer* **Date:** 7-8-11 **Time:** 1500

Received (Lab): _____ **Date:** 7/14/11 **Time:** 0045

Comments/Special Instructions:
 Provide photodocumentation of positive results.
 For positive results, confirm morphology via TEM CARB 435-B