

**SUMMARY REPORT: AMBIENT AIR MONITORING  
FOR ASBESTOS AND RESPIRABLE DUSTS  
BAY AREA RAPID TRANSIT  
SYSTEM-WIDE STATIONS WITH ASBESTOS-  
CONTAINING FIREPROOFING**

**PREPARED FOR:**

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SYSTEM SAFETY DEPARTMENT  
300 LAKESIDE DRIVE, 18<sup>TH</sup> FLOOR  
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**SCA PROJECT NO.: K-11983**

**MARCH 15, 2016**

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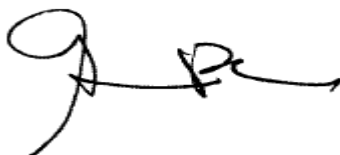
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A handwritten signature in black ink, appearing to read 'Glenn R. Cass', with a horizontal line extending to the right from the end of the signature.

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**GLENN R. CASS, PE, CIH, CAC #92-0092  
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## Abstract

This report summarizes the observations and results of ambient air testing for asbestos and total respirable dust conducted at the various Bay Area Rapid Transit (BART) stations with asbestos-containing fireproofing and/or vinyl asbestos floor tiles and mastics. The monitoring was conducted from February 22-24, 2016. The purpose of monitoring the stations with asbestos-containing fireproofing was to determine the level of airborne asbestos in the stations and to assess the potential hazards to occupants.

The sample results revealed airborne asbestos fiber levels ranging from <0.001 to 0.002 fibers/cc based on Phase Contrast Microscopy (PCM) analyses. These results indicate that the airborne asbestos concentration at all sites tested is statistically comparable to background levels, and is not affected by the presence of asbestos-containing construction materials, such as asbestos-containing fireproofing found throughout the structural members.

The downtown San Francisco stations experience black soot from the Muni-Metro system sharing a similar tunnel and ventilation system and from rail grinding activities. Airborne sampling was conducted for total respirable dust. In summary, total respirable dust concentrations were found to be as follows:

- Total respirable dust levels at the Embarcadero Center Station's Service Area adjacent to the Bike Room on the Concourse Level had a concentration ranging from 0.01 to 0.112 mg/m<sup>3</sup> with a median concentration of 0.063 mg/m<sup>3</sup>, or well under the OSHA Permissible Exposure Limit of 5.0 mg/m<sup>3</sup>.
- Total respirable dust levels at the Embarcadero Center Station's Station Agent's Booth on the Concourse Level had a concentration ranging from 0.008 to 0.171 mg/m<sup>3</sup> with a median concentration of 0.077 mg/m<sup>3</sup>, or well under the OSHA Permissible Exposure Limit of 5.0 mg/m<sup>3</sup>.
- Total respirable dust levels at the Montgomery Station's Fan Room 301 on the Platform Level had a concentration ranging from 0.011 to 0.103 mg/m<sup>3</sup> with a median concentration of 0.068 mg/m<sup>3</sup>, or well under the OSHA Permissible Exposure Limit of 5.0 mg/m<sup>3</sup>.
- Total respirable dust levels at the Montgomery Station's Station Agent's Booth on the Concourse Level had a concentration ranging from 0.008 to 0.116 mg/m<sup>3</sup> with a median concentration of 0.06 mg/m<sup>3</sup>, or well under the OSHA Permissible Exposure Limit of 5.0 mg/m<sup>3</sup>.

Finally, settled dust samples from the track bed at the Montgomery, Powell and Civic Center Station and the Glen Park Station Fan Room were analyzed for metal content with the following results (see Table 1):

- The Montgomery Street trackside soot sample has an elevated concentration (8,400 mg/kg) of zinc over the TTLC concentration of 5,000mg/kg, defining this material as a hazardous waste. STLC testing of cadmium, chromium, copper, lead and zinc are needed to determine the leachability of these metals. Previous soot sampling in 2011 showed similar concentrations for chromium, copper, lead and zinc for this station.
- The Powell Street trackside soot sample has an elevated concentration of cadmium (390 mg/kg), chromium (670 mg/kg), copper (3,100 mg/kg) and zinc (12,000 mg/kg) exceeding the Title 22 TTLC for each (see Table 7). STLC testing of cadmium, chromium, copper, lead, nickel and zinc are needed to determine the leachability of these metals. Previous soot sampling in 2011 showed similar concentrations for chromium, copper, lead, nickel and zinc for this station.
- The Civic Center trackside soot sample has an elevated concentration of antimony and copper over the TTLC concentrations of 500 and 2,500 mg/kg, respectively, defining this material as a hazardous waste. STLC testing of cadmium, chromium, copper, lead and zinc are needed to determine the leachability of these metals. Previous soot sampling in 2011 showed similar concentrations for chromium, copper, lead and zinc.

**Table 1: CAM-17 Settled Dust Analyses**

<b>Metal</b>	<b>Glen Park Fan Room Soot TTLC (mg/kg)</b>	<b>Glen Park Fan Rm. Soot STLC (mg/l)</b>	<b>Mont-gomery Track Soot TTLC (mg/kg)</b>	<b>Powell Station Track Soot TTLC (mg/kg)</b>	<b>Civic Center Track Soot TTLC (mg/kg)</b>	<b>Title 22 Hazardous Waste TTLC Standard (mg/kg)</b>	<b>Title 22 Hazardous Waste STLC Std. (mg/l)</b>	<b>Comments</b>
Antimony	50	NR	21	40	17,000 <sup>(1)</sup>	500	1.5	<b>Below Title 22 TTLC Std. except Civic Center</b>
Arsenic	18	NR	11	25	75	500	5.0	Below Title 22 TTLC Std.
Barium	460	NR	160	570	1,500	10000	100	Below Title 22 TTLC Std.
Beryllium	ND	NR	ND	ND	ND	75	0.75	Below Title 22 TTLC Std.
<b>Cadmium</b>	58	<b>2.9</b>	45 <sup>(1)</sup>	<b>390<sup>(1)</sup></b>	ND	100 <sup>(1)</sup>	1.0	<b>Above Title 22 STLC Std. @ Glenn Park &amp; TTLC Std. @ Powell</b>
<b>Chromium</b>	260	<b>9.2</b>	98 <sup>(1)</sup>	<b>670<sup>(1)</sup></b>	310 <sup>(1)</sup>	500 (CrVI)	5	<b>Above Title 22 STLC Std. @ Glen Park &amp; TTLC Std. @ Powell</b>
Cobalt	30	NR	14	21	19	8000	80	Below Title 22 TTLC Std.
<b>Copper</b>	<b>3,700</b>	6.1	530 <sup>(1)</sup>	<b>3,100<sup>(1)</sup></b>	<b>8,100(1)</b>	2,500	25	<b>Above Title 22 TTLC Std. for Glen Park, Powell &amp; Civic Center</b>
Lead	480	1.7 STLC & 0.14 TCLP	170 <sup>(1)</sup>	410 <sup>(1)</sup>	420 <sup>(1)</sup>	1,000	5.0	Below Title 22 TTLC & STLC Stds.
Mercury	ND	NR	0.32	0.58	0.43	20	0.2	Below Title 22 TTLC Std.
Molybdenum	57	NR	17	100	84	3500	350	Below Title 22 TTLC Std.
Nickel	190	NR	52	430 <sup>(1)</sup>	230 <sup>(1)</sup>	2000	20	Below Title 22 TTLC Std.
Selenium	ND	NR	ND	ND	ND	100	1.0	Below Title 22 TTLC Std.
Silver	ND	NR	0.99	1.9	8.1	500	5	Below Title 22 TTLC Std.
Thallium	ND	NR	ND	ND	ND	700	7.0	Below Title 22 TTLC Std.
Vanadium	34	NR	12	22	16	5000	24	Below Title 22 TTLC Std.
<b>Zinc</b>	<b>9,800</b>	<b>790</b>	<b>8,400<sup>(1)</sup></b>	<b>12,000<sup>(1)</sup></b>	1,800 <sup>(1)</sup>	2400	250	<b>Above Title 22 TTLC &amp; STLC Stds. @ Glen Park &amp; Above TTLC Std. @ Montgomery &amp; Powell St. Stations</b>

NR = None Recorded

ND = None Detected

(1) Requires STLC and TCLP analyses to fully characterize waste disposal requirement, but generally is considered a hazardous waste

**Project Personnel**

BAY AREA RAPID TRANSIT (BART)

Certified Industrial Hygienist ..... Jonathan Rossen, CIH, CSP

SCA ENVIRONMENTAL, INC. (SCA)

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## 1.0 Introduction

This report summarizes the sampling results collected during the ambient air monitoring for asbestos conducted in the Bay Area Rapid Transit's system-wide stations with asbestos-containing fireproofing. The airborne asbestos sampling included the following stations:

- Powell Street Station, San Francisco, CA
- Montgomery Street Station, San Francisco, CA
- 12th Street Station, Oakland, CA
- 19th Street Station, Oakland, CA
- MacArthur Station, Oakland, CA
- Berkeley Main Station, Berkeley, CA
- Ashby Station, Berkeley, CA
- 16<sup>th</sup> Street Station, San Francisco, CA
- 24<sup>th</sup> Street Station, San Francisco, CA
- Rockridge Station, Oakland, CA
- Lafayette Station, Lafayette, CA

SCA Environmental, Inc. (SCA) conducted the monitoring from February 22, 2016 to February 24, 2016 at the request of the Bay Area Rapid Transit District's System Safety Department.

Portions of the systems' structural steel are protected with fireproofing that contains 5 to 10% Chrysotile asbestos. In addition, several other construction materials contain asbestos (including various vinyl floor tiles and mastics in various Train Control Rooms throughout the legacy stations. Asbestos is regulated as a respiratory carcinogen. In order to verify that the operations and maintenance program implemented for this building are working properly, testing for the levels of airborne asbestos fibers is conducted periodically.

## 2.0 Methodology

### Asbestos

Ambient air samples for asbestos were collected at the following stations and quantities:

- San Francisco
- Powell Street Station (2)
- Montgomery Street Station (2)
  
- Oakland
- 12th Street Station (1)
- 19th Street Station (1)
- MacArthur Station (1)
- Berkeley Main Station (1)
- Ashby Station (1)
  
- M-Line
- 16<sup>th</sup> Street (1)
- 24<sup>th</sup> Street (1)
  
- C-Line
- Rockridge (1)
- Lafayette (1)

All the asbestos samples were analyzed by Phase Contrast Microscopy (PCM), except for the project blanks, in accordance with the National Institute for Occupational Safety and Health (NIOSH) method 7400. PCM results are calculated in fibers per cubic centimeter (f/cc).

All air samples were collected for an approximately 24 hour period using Buck Libra low flow, AC-operated or similar air pumps to maintain even flow rates. Samples were collected on Zefon International Inc. Model Z008BA 25-millimeter, 0.8-micrometer pore size, mixed cellulose ester membrane filters in open-faced cassettes with conductive cowls. Pump flow rates were calibrated against a primary standard.

The contract laboratories that provided analytical asbestos services for the project are summarized below:

Laboratory	Analysis Type	Accreditation
EMSL Analytical, Inc. San Leandro, CA	Phase Contrast Microscopy (PCM) Asbestos Analyses	<ul style="list-style-type: none"> <li>• National Voluntary Laboratory Accreditation Program (NVLAP # 101048-3).</li> <li>• California Environmental Laboratory Accreditation Program (ELAP #1620).</li> </ul>
Asbestos TEM Laboratories, Inc., Berkeley, CA	Bulk Asbestos Analysis by Polarized Light Microscopy (PLM)	<ul style="list-style-type: none"> <li>• National Voluntary Laboratory Accreditation Program (NVLAP #101891-0).</li> <li>• California Environmental Laboratory Accreditation Program (ELAP #1866).</li> </ul>

### Respirable Dust

Ambient sampling for total respirable dust was conducted at two downtown San Francisco stations, which experience black soot and dust deposits associated with the Muni-Metro system within the same tunnels and ventilation system and wheel grinding activities. Total respirable dust sampling was conducted at:

- Montgomery Street Station, San Francisco, CA
- Embarcadero Station, San Francisco, CA

Particulate readings were made utilizing a TSI Dust-Trak, which measures respirable dust or PM<sub>10</sub> levels. Measurements are reported as mg/m<sup>3</sup>.



Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in size, shape and chemical composition, and can be made up of many different materials, such as metals, soot, soil, dust, mold and fungi. Particles 10 microns or less in diameter are defines as “respirable particulate matter” or PM<sub>10</sub>. Fine particles are 2.5 microns or less in diameter (PM<sub>2.5</sub>) and can contribute significantly to regional haze and reduction in visibility.

#### Spot Particulate Sampling.

In addition to the longer-term respirable dust sampling at the two BART stations noted above, SCA conducted spot sampling at agent booths, ticket machines and trackside to determine typical PM<sub>10</sub> and PM<sub>2.5</sub> concentrations for BART passengers and employees. Stations sampled included 24<sup>th</sup> Street through Embarcadero in San Francisco.

Particulate readings were made utilizing a TSI Dust-Trak, which measures PM<sub>2.5</sub> and PM<sub>10</sub> levels.

#### Settled Dust Sampling

CAM-17 metal analyses were completed for settled dust samples collected in the Montgomery, Powell and Civic Center track beds by EPA Method 6010B/7470A by McCampbell Analytical Inc.’s ELAP-accredited laboratory in Pittsburg, CA. Additionally, CAM-17 TTLC, STLC and TCLP analyses were recently completed for settled dust in the Glen Park BART Station, which have been included herein for informational purposes. PLM analyses for asbestos were also recently conducted at the Glen Park Fan Room.

### 3.0 Applicable Standards

#### Asbestos

A summary of airborne asbestos standards applicable to this project is tabulated in Table 2 as follows:

**Table 2: Summary of Asbestos Standards**

Source	Level	Nature	Comments
Cal/OSHA <sup>1</sup>	0.1 f/cc	Occupational & mandatory	8-hour Time Weighted Average (TWA) Permissible Exposure Level (PEL) (triggers OSHA required training, medical examinations, etc.)
	1.0 f/cc		Excursion Limit (EL) for 30 minutes sampling duration
NIOSH <sup>2</sup>	0.1 f/cc	Recommended	Occupational PEL
ACGIH <sup>3</sup>	0.2 f/cc	Recommended	Occupational Threshold Limit Value (TLV) Notice of Intended Changes
Calif. Prop 65 <sup>4</sup>	vague	Mandatory	Standard and monitoring method are unclear, but generally interpreted as comparable to outside ambient air
Bay Area Rapid Transit	0.01 f/cc (PCM)	Contractual & mandatory	Ambient air action level for occupied areas via PCM. Originating from AHERA <sup>5</sup> regulations and adopted by Bay Area Rapid Transit.
	70 str/mm <sup>2</sup> (TEM)	Contractual & mandatory	Ambient air action level for occupied areas via TEM. Originating from AHERA <sup>5</sup> regulations and adopted by Bay Area Rapid Transit.

1 California Department of Industrial Relations, Division of Occupational Safety and Health, 8 CCR 1529.

2 National Institute of Occupational Safety and Health

3 American Conference of Governmental Industrial Hygienists, 2004

4 California Proposition 65

5 Asbestos Hazard Emergency Response Act (AHERA); 40 CFR Part 763

#### Respirable Dust

Extensive research indicates that exposure to PM<sub>10</sub> and PM<sub>2.5</sub> levels exceeding current air quality standards is associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma. PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses.

Table 3 below summarizes the applicable published Cal/OSHA and ACGIH permissible exposure limits for respirable dust as well as the California Air Resources Board's standards. Note that some of the addressed standards cover office environments and are not occupational exposure standards for BART station employees. In addition, many of these standards are arithmetic mean levels over a 24-hour or annual period; therefore, exposure within the BART system needs to be time-weighted against other daily or annual exposures outside the BART system.

**Table 3: Summary of Respirable Dust Standards**

Contaminant	Source	Level	Nature	Comments
Particulate	N/A	ambient	N/A	Compare against outdoor readings to indicate effectiveness of filter units in air handling system
	Cal/OSHA <sup>1</sup>	5 mg/m <sup>3</sup>	Mandatory/ Occupational	8-hour TWA PEL for respirable dust
		10 mg/m <sup>3</sup>		8-hour TWA PEL for total dust
	ACGIH <sup>2</sup>	10 mg/m <sup>3</sup>	Recommended/ Occupational	8-hour TWA TLV resulting in lung disorders
	EPA <sup>3</sup>	0.05 mg/m <sup>3</sup>	Recommended/ Indoor Occupancy (Offices)	National Ambient Air Quality Standard
Respirable Particles (PM <sub>10</sub> )	ASHRAE <sup>4</sup>	0.05 mg/m <sup>3</sup>	Recommended Indoor Occupancy (Offices)	Based on protecting office environments against respiratory morbidity in the general population and avoiding exacerbation of asthma with no carcinogens. Indoor concentrations are normally lower. Guideline level may lead to unacceptable deposition of "dust."
	0.02 mg/m <sup>3</sup>	Annual arithmetic mean level		
	EPA <sup>3</sup>	0.15 mg/m <sup>3</sup>	Recommended by LEED Program (for Offices)	National Ambient Air Quality Standard
	LEED <sup>6</sup>	0.05 mg/m <sup>3</sup>	Recommended by LEED Program (for Offices) <sup>6</sup>	8-hour TWA PEL for respirable dust for office environments using a TSI Sidepak Aerosol Monitor or PEM Sampler with PM <sub>10</sub> lab analyses
Respirable Particles (PM <sub>2.5</sub> )	CARB <sup>5</sup>	0.02 mg/m <sup>3</sup>	Recommended by CARB	Annual arithmetic mean level
	EPA <sup>3</sup>	0.035 mg/m <sup>3</sup>	Recommended by EPA	24-hr arithmetic mean level

Table 1 Footnotes:

1. California Department of Industrial Relations, Division of Occupational Safety and Health, Title 8 General Safety Orders §5155.
2. American Conference of Governmental Industrial Hygienists, 2016, Threshold Limit Values for Chemical Substances and Physical Agents
3. U.S. Environmental Protection Agency, National Ambient Air Quality Standard.
4. ASHRAE Standards 62-1989R, Appendix C-1, August 1996, and 62.1-2004, Appendix B.
5. California Air Resources Board, June 2005, "Draft for Public Review – Report to the California Legislature Indoor Air Pollution in California," Table 4.1.
6. U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED), Indoor Air Quality testing, credit 3.2, November 2008.

CAM-17 Metals

Total Threshold Limit Concentrations (TTLC), Soluble Threshold Limit Concentrations (STLC), and Toxicity Characteristic Leaching Procedure (TCLP) limits are published under Title 22 of the California Code of Regulations §662261.24 for classifying hazardous waste. Applicable standards for the CAM-17 metals are included in Tables 1, 7 and 8 herein.

## 4.0 Results and Discussion

### Asbestos

Sampling was conducted as part of the BART's Ambient Air Quality Monitoring Program, since the listed stations have asbestos-containing fireproofing. Sampling was conducted for an approximately 24-hour period from February 22 to February 24, 2016 in the San Francisco stations and February 23 to February 24, 2016 in the East Bay Stations.

At the request of Mr. Jonathan Rossen, CIH, CSP within BART's System Safety Department, SCA Environmental, Inc. (SCA) conducted visual inspections and ambient air testing. SCA's Environmental Scientist, Mr. Jerry Cook (Certified Asbestos Consultant #01-2925), conducted work under the direct supervision of Mr. Glenn Cass, PE, CIH of SCA. Mr. Cass is a Cal/OSHA registered Certified Asbestos Consultant (CAC #92-0092) and a Certified Industrial Hygienist (CIH).

The ambient air sampling results for the Stations are summarized in Table 4 below. The laboratory reports and field data sheets are included as Attachment 1. All observed asbestos-containing fireproofing was noted to be in "good" condition. No notable areas of imminent danger were observed within the representative areas viewed by SCA's Surveyor. Asbestos fireproofing on the Concourse Level of the Powell Street Station was significantly abated since the prior ambient air sampling in May 2011.

Background airborne fiber concentrations by PCM were as follows:

**Table 4: Summary of Airborne Asbestos Results – Stations with ACM Fireproofing**

Station	Location	Sample I.D.	Results (fibers/cc)	Comments
Lafayette	Train Control Room w/VAT	LAF-TC103-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
Rockridge	Janitor's Room 203	ROCK-203-1	0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
MacArthur	Break Room 102	MAC-102-1	0.002	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
Berkeley	Break Room 108	BERK-108-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
Ashby	Elevator Room 204	ASH-204-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
19 <sup>th</sup> St. Oakland	Mech. Room 108A	19-108A-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
12 <sup>th</sup> St. Oakland	Electrical Room 107C	12-107C-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
Montgomery	Coffee Shop Storage Rm.	MONT-110-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
Montgomery	Storage Room 111	MONT-111-2	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
Powell	Police Break Room	POW-POL-BK-2	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
Powell	Storage Room 110	POW-110-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
16 <sup>th</sup> St. Mission	Mech. Room 101A	16-101A-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc
24 <sup>th</sup> St. Mission	Mech. Room 101A	24-101A-1	<0.001	Well below the EPA's PCM Clearance Air Standards of 0.01 f/cc

All ambient station air samples were below BART's Perimeter Action Level of 0.01 fibers per cubic centimeter (fibers/cc). The results were generally found to be comparable to the previous sampling rounds completed by SCA and other Consultants.

Respirable Dust ( $PM_{10}$ )

SCA sampled for respirable dust at two San Francisco Stations to determine typical airborne dust concentrations. Sampling occurred during typical daytime and nighttime operations with the fans on as well as overnight. The purpose of this sampling was to determine the concentrations of black carbon soot arising from the Muni-Metro system, which shares a common ventilation system.

Total respirable dust concentrations were found to be as follows:

**Table 5: Respirable Dust Concentrations**

Location	Start Date	Sampling Time	Respirable Dust Concentration			Permissible Exposure Limit ( $mg/m^3$ )	Comments
			Max. Level ( $mg/m^3$ )	Min. Level ( $mg/m^3$ )	Average Level ( $mg/m^3$ )		
Embarcadero Concourse Level Central Station @ Bike Room	2/22/16	19:30 hrs.	0.112	0.01	0.063	5.0	Well Below 8-hr. PEL
Embarcadero Concourse Level South Station Agent's Booth	2/22/16	20:06 hrs.	0.171	0.008	0.077	5.0	Well Below 8-hr. PEL
Montgomery Platform Level Station Fan Room 301	2/23/16	22:20 hrs.	0.103	0.011	0.068	5.0	Well Below 8-hr. PEL
Montgomery Concourse Level South Station Agent's Booth	2/23/16	22:21 hrs.	0.116	0.008	0.06	5.0	Well Below 8-hr. PEL

All sample results were found to be well under Cal/OSHA's occupational exposure standard of  $5.0 mg/m^3$ .

Spot  $PM_{10}$  and  $PM_{2.5}$  Reading

The results of spot  $PM_{10}$  and  $PM_{2.5}$  readings for various San Francisco Line stations are presented in Table 6.

**Table 6: Spot PM<sub>10</sub> and PM<sub>2.5</sub> Readings**

Station	Date	Time	Location	PM <sub>10</sub> Concentrations (mg/m <sup>3</sup> )			PM <sub>2.5</sub> Concentrations (mg/m <sup>3</sup> )		
				Max	Avg.	Min.	Max	Avg.	Min
CAAQS Std. <sup>(1)</sup>					0.05			0.035	
Cal/OSHA 8-hr. PEL Respirable Dust <sup>(2)</sup>					5			---	
19th St.	2/22/2016	8:13 a.m.	Agent Booth	0.055	0.052	0.048	0.035	0.033	0.029
19th St.	2/22/2016	8:19 a.m.	Lower Trackside	0.081	0.071	0.061	0.065	0.048	0.035
12th St.	2/22/2016	8:23 a.m.	Trackside	0.11	0.009	0.077	0.065	0.055	0.044
12th St.	2/22/2016	8:43 a.m.	Ticket Machines	0.065	0.065	0.065	0.034	0.034	0.034
12th St.	2/22/2016	8:47 a.m.	Agent Booth	0.045	0.042	0.039	0.034	0.03	0.026
Montgomery	2/22/2016	9:57 a.m.	North Station Agent Booth	0.081	0.052	0.036	0.043	0.036	0.033
Montgomery	2/22/2016	10:02 a.m.	North Ticket Machines	0.081	0.044	0.018	0.073	0.058	0.052
Montgomery	2/22/2016	10:27 a.m.	Lower Level Trackway	0.136	0.104	0.076	0.08	0.057	0.07
Powell	2/22/2016	10:56 a.m.	Police Squad Room	0.134	0.036	0.022	0.026	0.02	0.017
Powell	2/22/2016	11:00 a.m.	Ticket Machines	0.082	0.079	0.045	0.057	0.05	0.044
Powell	2/22/2016	11:04 a.m.	South Agent Booth	0.094	0.045	0.017	0.045	0.031	0.013
Powell	2/22/2016	11:27 a.m.	Lower Level Trackway	0.084	0.066	0.048	0.054	0.044	0.035
16th St.	2/22/2016	11:49 a.m.	Agent Booth	0.138	0.063	0.033	0.071	0.044	0.025
16th St.	2/22/2016	11:53 a.m.	Ticket Machines	0.05	0.031	0.013	0.08	0.043	0.017
16th St.	2/22/2016	11:58 a.m.	Trackway	0.155	0.085	0.032	0.082	0.061	0.025
24th St.	2/22/2016	12:16 p.m.	Ticket Machines	0.131	0.064	0.031	0.06	0.04	0.017
24th St.	2/22/2016	12:21 p.m.	Agent Booth	0.1	0.052	0.015	0.055	0.036	0.012
24th St.	2/22/2016	12:27 p.m.	Trackway	0.136	0.092	0.04	0.081	0.072	0.05
Civic Center	2/22/2016	1:09 p.m.	North Agent Booth	0.128	0.081	0.056	0.067	0.05	0.039
Civic Center	2/22/2016	1:13 p.m.	North Ticket Machines	0.133	0.094	0.057	0.079	0.06	0.037
Civic Center	2/22/2016	1:18 p.m.	Lower Trackway	0.111	0.087	0.066	0.076	0.053	0.046
Embarcadero	2/22/2016	1:28 p.m.	Trackway	0.159	0.118	0.089	0.08	0.071	0.051
Embarcadero	2/22/2016	1:34 p.m.	South Agent Booth	0.07	0.041	0.023	0.046	0.031	0.019
Embarcadero	2/22/2016	1:36 p.m.	South Ticket Machines	0.077	0.018	0.007	0.013	0.008	0.004
			Maximum	0.159	0.118	0.089	0.082	0.072	0.07
			Minimum	0.045	0.009	0.007	0.013	0.008	0.004

Station	Date	Time	Location	PM <sub>10</sub> Concentrations (mg/m <sup>3</sup> )			PM <sub>2.5</sub> Concentrations (mg/m <sup>3</sup> )		
				Max	Avg.	Min.	Max	Avg.	Min
CAAQS Std. <sup>(1)</sup>					0.05			0.035	
Cal/OSHA 8-hr. PEL Respirable Dust <sup>(2)</sup>					5			---	
			Average	0.102	0.062	0.042	0.058	0.044	0.032

Source: (1) California Environmental Protection Agency Air Resources Board, April 25, 2005  
<http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm>  
 (2) Table AC-1 Permissible Exposure Limits for Chemical Contaminants  
[https://www.dir.ca.gov/title8/5155table\\_ac1.html](https://www.dir.ca.gov/title8/5155table_ac1.html)

None of the spot measurements found PM<sub>10</sub> levels exceeding Cal/OSHA's 8-hr. Permissible Exposure Limit of 5.0 mg/m<sup>3</sup>; Cal/OSHA has no established occupational standard for PM<sub>2.5</sub>. While the short-term PM<sub>2.5</sub> exposures exceed the EPA/CARB level of 0.35 mg/m<sup>3</sup>, the EPA/CARB standard is an annual average concentrations. Passengers and employees need to weigh their exposures outside of the station with the time-weighted exposures indoors. Note that the airborne levels within the BART system largely contain carbon, cellulose, silica and iron as contaminants, based on previous bulk sample analyses.

Cleanup of the stations with HEPA-filtered vacuums would help reduce the airborne dust concentrations. Use of power washing would require proper filtering and disposal of the waste water because of its metal content.

Settled Dust

Settled dust samples were collected within the track bed at three San Francisco Stations to determine their metal content. Analyses were completed by McCampbell Analytical Inc.'s ELAP-accredited laboratory. The results of the CAM-17 analyses are as follows:

**Table 7: Settled Dust CAM-17 TTLC Metal Analyses**

CAM-17 Metal	Sample MONT-SOOT-202-1		Sample POWELL-SOOT-302-1		Sample CIVIC-SOOT-402-1		Title 22 Hazardous Waste
	TTLC (ppm)	STLC/TCLP (mg/l)	TTLC (ppm)	STLC/TCLP (mg/l)	TTLC (ppm)	STLC/TCLP (mg/l)	TTLC/ STLC Standard*
Antimony	21	N/A	40	N/A	<b>17,000</b>	TBD	500 / 15
Arsenic	11	N/A	25	N/A	75	N/A	500 / 5.0
Barium	160	N/A	570	N/A	1,500	N/A	10000 / 100
Beryllium	ND	N/A	ND	N/A	ND	N/A	75 / 0.75
Cadmium	45	TBD	<b>390</b>	TBD	ND	N/A	100 / 1.0
Chromium	98	TBD	<b>670</b>	TBD	310	TBD	500 (CrVI) / 5
Cobalt	14	N/A	21	N/A	19	N/A	8000 / 80
Copper	530	TBD	<b>3,100</b>	TBD	<b>8,100</b>	TBD	2500 / 25
Lead	170	TBD	410	TBD	420	TBD	1,000 / 5.0
Mercury	0.32	N/A	0.58	N/A	0.43	N/A	20 / 0.2
Molybdenum	17	N/A	100	N/A	84	N/A	3500 / 350
Nickel	52	N/A	430	TBD	230	TBD	2000 / 20
Selenium	ND	N/A	ND	N/A	ND	N/A	100 / 1.0
Silver	0.99	N/A	1.9	N/A	8.1	N/A	500 / 5
Thallium	ND	N/A	ND	N/A	ND	N/A	700 / 7.0
Vanadium	12	N/A	22	N/A	16	N/A	2400 / 24
Zinc	<b>8,400</b>	TBD	<b>12,000</b>	TBD	1,800	TBD	5000 / 250

ND = None Detected NR = Not Reported

N/A = TTLC results under 10% of standard, so extraction testing is not required

TBD = To Be Determined

TTLC = Total Threshold Limit Concentration in ppm or mg/kg

STLC = Soluble Threshold Limit Concentrations in mg/liter

TCLP = Toxicity Characteristic Leaching Procedure in mg/liter

The results of the CAM-17 analyses are as follows:

- The Montgomery Street trackside soot sample has an elevated concentration (8,400 mg/kg) of zinc over the TTLC concentration of 5,000 mg/kg, defining this material as a hazardous waste. STLC testing of cadmium, chromium, copper, lead and zinc are needed to determine the leachability of these metals. Previous soot sampling in 2011 showed similar concentrations for chromium, copper, lead and zinc for this station.
- The Powell Street trackside soot sample has an elevated concentration of cadmium (390 mg/kg), chromium (670 mg/kg), copper (3,100 mg/kg) and zinc (12,000 mg/kg) exceeding the Title 22 TTLC for each (see Table 7). STLC testing of cadmium, chromium, copper, lead, nickel and zinc are needed to determine the leachability of these metals. Previous soot sampling in 2011 showed similar concentrations for chromium, copper, lead, nickel and zinc for this station.
- The Civic Center trackside soot sample has an elevated concentration of antimony and copper over the TTLC concentrations of 500 and 2,500 mg/kg, respectively, defining this material as a hazardous waste. STLC testing of cadmium, chromium, copper, lead and zinc are needed to determine the leachability of these metals. Previous soot sampling in 2011 showed similar concentrations for chromium, copper, lead and zinc.

For comparison purposes, recent sampling of soot in the Glen Park Fan Room found the following CAM-17 metal concentrations:



**Table 8: Glen Park Station Soot CAM-17 Metal Analyses Results**

Sample I.D.	Metal	Measured TTLC (ppm)	Measured TCLP/STLC (mg/l)	Title 22 Hazardous Waste TTLC/STLC Standard	Comments
GP-MV-7-Soot	Antimony	50	NR	500 / 1.5	Below Title 22 TTLC Std.
	Arsenic	18	NR	500 / 5.0	Below Title 22 TTLC Std.
	Barium	460	NR	10000 / 100	Below Title 22 TTLC Std.
	Beryllium	ND	NR	75 / 0.75	Below Title 22 TTLC Std.
	<b>Cadmium</b>	<b>58</b>	<b>2.9</b>	<b>100 / 1.0</b>	<b>Above Title 22 STLC Std.</b>
	<b>Chromium</b>	<b>260</b>	<b>9.2</b>	<b>500 (CrVI) / 5</b>	<b>Above Title 22 STLC Std.</b>
	Cobalt	30		8000 / 80	Below Title 22 TTLC Std.
	<b>Copper</b>	<b>3700</b>	<b>6.1</b>	<b>2500 / 25</b>	<b>Above Title 22 TTLC Std.</b>
	Lead	480	1.7 STLC & 0.14 TCLP	1,000 / 5.0	Below Title 22 TTLC & STLC Stds.
GP-MV-7-Soot	Mercury	ND		20 / 0.2	Below Title 22 TTLC Std.
	Molybdenum	57		3500 / 350	Below Title 22 TTLC Std.
	Nickel	190		2000 / 20	Below Title 22 TTLC Std.
	Selenium	ND		100 / 1.0	Below Title 22 TTLC Std.
	Silver	ND		500 / 5	Below Title 22 TTLC Std.
	Thallium	ND		700 / 7.0	Below Title 22 TTLC Std.
	Vanadium	34		5000 / 24	Below Title 22 TTLC Std.
	<b>Zinc</b>	<b>9,800</b>	<b>790</b>	<b>2400 / 250</b>	<b>Above Title 22 TTLC &amp; STLC Stds.</b>

NR = Not Reported  
 ND = None Detected

Polarized Light Microscopy (PLM) analyses for asbestos for the Glen Park Fan Room MV-7 found the following results:

**Table 9: Glen Park Station Soot Bulk Asbestos Analyses**

Sample I.D.	Location	Asbestos content	Comment
GP-MV-7-Soot	Glen Park Fan Room MV-7 Floor Soot	None detected	Non-asbestos

In summary the Glen Park Station Fan Room MV-7 soot analyses found the following:

1. The CAM-17 tests for Sample I.D. GP-MV-7-Soot show metal concentrations well under Title 22 hazardous materials standards, with the exception of cadmium, chromium, copper and zinc. These results are similar to the last round of sampling completed of settled dust in the Electrical Rooms at 24<sup>th</sup> & Mission and Civil Center Stations in 2014. SCA recommends the use of a half face-piece HEPA-filtered respirator within these areas unless a negative exposure assessment is completed. In lieu of the respiratory protection

for tradespersons, the Contractor may wish to HEPA vacuum these areas in advance of their work to reduce contact with the settled dust. HEPA vacuum debris will need to be disposed as hazardous waste.

2. Asbestos: Settled dust is non-asbestos per PLM analyses [SCA Sample I.D. GP-MV-7-Soot]. The majority of the soot consists of fiberglass fragments, carbon, cellulose, silica and iron.
3. Lead: A lead concentration in the sample is 480 ppm or under the Consumer Products Safety Council's limits for paints set in 1978. This concentration is considered minimal; however, any lead concentration can pose a health hazard if good work practices are not utilized in dusty areas. While not considered a hazardous waste at these levels, lead dust controls and personnel protection are still required under 8 CCR Section 1532.1 unless personal air sampling is conducted for a negative exposure assessment. Cal/OSHA does not consider a dust mask as adequate protection for lead hazards so a half face-piece HEPA-filtered respirator should be used for work within the Fan Room if a negative exposure assessment is not completed and the Contractor does not undertake HEPA vacuuming in advance of their work. Workers should always wash their hands before eating, drinking or smoking to protect against ingestion of heavy metals. Dirty coveralls should be handled in a manner to protect against bringing heavy metal home where they can affect the worker's family. Tyvek disposable coveralls or washable coveralls are recommended only if the Cal/OSHA action level of  $30 \text{ mg/m}^3$  is exceeded. Based on SCA's prior sampling, good work practices will keep workers well under this level.

Note that airborne metal analyses were not conducted for the San Francisco stations in 2016 as the prior sampling found airborne metal concentrations to be relatively low. For informational purposes the metal concentrations in May 2011 for the Powell, Montgomery and Embarcadero Stations were as follows:

- Airborne lead concentrations during the sampling periods all fell below  $0.014 \text{ } \mu\text{g/m}^3$ , or less than the analytical detection limit. All perimeter airborne lead concentrations fell well below Cal/OSHA's Action Level or Permissible Exposure Level (PEL) of  $30 \text{ } \mu\text{g/m}^3$  and  $50 \text{ } \mu\text{g/m}^3$ , respectively, as well as the National Ambient Air Quality Standard (NAAQS) of  $1.5 \text{ } \mu\text{g/m}^3$ .
- Airborne iron concentrations during the sampling period ranged from  $<4.6$  to  $80 \text{ } \mu\text{g/m}^3$ . All airborne iron concentrations fell well below Cal/OSHA's Permissible Exposure Level (PEL) of  $5,000 \text{ } \mu\text{g/m}^3$ .
- Airborne copper concentrations during the sampling period ranged from  $<0.11$  to  $1.1 \text{ } \mu\text{g/m}^3$ , or well below Cal/OSHA's Permissible Exposure Level (PEL) of  $100 \text{ } \mu\text{g/m}^3$  for copper fume.
- Airborne zinc concentrations during the sampling period all fell below  $1.4 \text{ } \mu\text{g/m}^3$ , or less than the analytical detection limit, or well below Cal/OSHA's Permissible Exposure Level (PEL) of  $5,000 \text{ } \mu\text{g/m}^3$  for zinc fumes.
- Airborne nickel concentrations during the sampling period ranged from  $<0.11$  to  $0.39 \text{ } \mu\text{g/m}^3$ , or well below Cal/OSHA's Permissible Exposure Level (PEL) of  $1,000 \text{ } \mu\text{g/m}^3$ .
- Airborne chromium concentrations during the sampling period all ranged from  $0.12$  to  $0.21 \text{ } \mu\text{g/m}^3$ , or well below Cal/OSHA's Permissible Exposure Level (PEL) of  $500 \text{ } \mu\text{g/m}^3$ .

Please feel free to contact me directly at (510) 517-1119 or [gcass@sca-enviro.com](mailto:gcass@sca-enviro.com) if you have any questions or require any additional information.

Sincerely,  
**SCA ENVIRONMENTAL, INC.**



Glenn R. Cass, PE, CIH, CAC #92-0092, CDPH #717  
Vice-President

**Attachment 1**

**Laboratory Results – Airborne Asbestos at ACM Fireproofing Areas**



Environmental, Inc.

**PROJECT NAME**  
Zone  
Asbestos-containing Stations

**FIELD DATA SHEET**

650 Delancey St, #222, SF, CA 94107  
1 Lakeside Drive, Suite 215, Oakland, CA 94612

Tel  
415-8821675  
510-6456200

Fax  
415-9620736  
415-9620736

**BART Ambient Air Sampling**    **SCA PRJ #**    **K-11983**  
**Activities**    **DATE**    **2/22/16-2/24/16**  
**Ambient Air Sampling**

**Inspected & Sampled By:** JC    **Reviewed By:** GRC

COMMENTS: Ambient air sampling. The Police Break Room sample started on 2/22/16 was discarded and a new sample collected due to a pump malfunction.

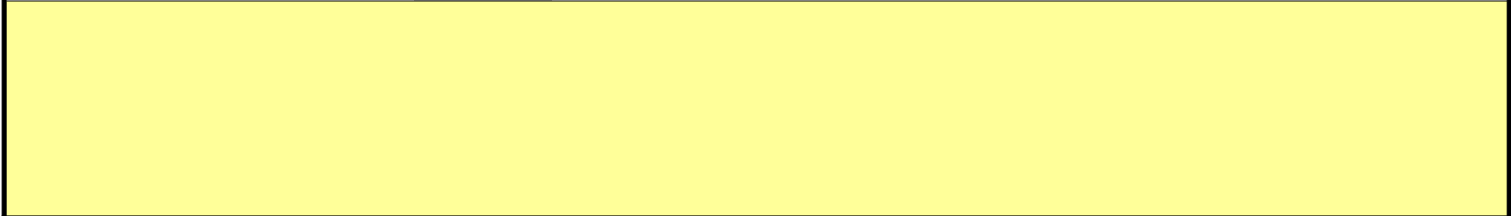
Media: 25mm 0.45micron MCEF

Method Ref: AHERA-TEM

Sampling Type: 0

BLANKS	BLANK			Rotom ID:	2310	Report #:	091602314	091603494
SAMPLE LOC	19 <sup>th</sup> St Rm 108A	12 <sup>th</sup> St Rm 107C	Montgomery Rm 110	Montgomery Rm 111	Powell Rm 110	Powell Police Brk Rm	16 <sup>th</sup> St Rm 101A	24 <sup>th</sup> St Rm 101A
START (LPM)	2	2	2	2	2	2.3	2	1.8
STOP (LPM)	1.8	2	1.8	1.8	1.8	N/A	1.8	1.6
HEIGHT (ft)	5	5	5	5	5	5	5	5
SAMPLE I.D.	19-108A-1	12-107C-1	MONT-110-1	MONT-111-2	POWELL-110-1	POWELL-POL-BRK-2	16-101A-1	24-101A-1
PUMP I.D.	8023	7321	8025	7364	7259	7355	7354	7134
AVG. FLOW RATE (LPM)	1.9	2	1.9	1.9	1.9	2.3	1.9	1.7
TIME ON (hh:mm)	08:04	08:39	09:18	09:52	10:23	10:50	12:38	12:11
TIME OFF	08:03	08:14	08:40	08:46	08:55	N/A	09:19	09:32
SAMPLED TIME (MIN.)	1439	1415	1402	1374	1352	N/A	1241	1281
SAMPLE VOL. (L.)	2734	2830	2664	2611	2569	N/A	2358	2178
microgram / M <sup>3</sup> lead								
p p b lead								
[PCM] Total Fibers / cc	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
[TEM] structures / cc								
SAMPLE LOC	Powell Police Brk Rm	MacArthur Rm 102	Ashby Rm 204	Berkeley Rm 108	Lafayette Rm TC 103	Rockridge Rm 203		
START (LPM)	2	2	2	2	1.8	2		
STOP (LPM)	2	1.8	1.8	1.9	1.6	1.8		
HEIGHT (ft)	5	5	5	5	5	5		
SAMPLE I.D.	POW-POL-BK-2	MAC-102-1	ASH-204-1	BERK-108-1	LAF-TC-103-1	ROCK-203-1		
PUMP I.D.	8025	7259	3023	8028	7134	7364		
AVG. FLOW RATE (LPM)	2.0	1.9	1.9	2.0	1.7	1.9		
TIME ON (hh:mm)	09:04	10:57	11:18	11:38	12:25	13:12		
TIME OFF	08:32	10:00	09:35	09:29	10:42	10:21		
SAMPLED TIME (MIN.)	1408	1383	1337	1311	1337	1269		
SAMPLE VOL. (L.)	2816	2628	2540	2556	2273	2411		
microgram / M <sup>3</sup> lead								
p p b lead								
[PCM] Total Fibers / cc	<0.001	0.002	<0.001	<0.001	<0.001	0.001		
[TEM] structures / cc								

Sampling Location Diagram    work zone    \* sample location



**EMSL Analytical, Inc**

464 McCormick Street, San Leandro, CA 94577

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

<http://www.EMSL.com>[sanleandrolab@emsl.com](mailto:sanleandrolab@emsl.com)

EMSL Order: 091603214

CustomerID: SCAE50

CustomerPO: K11983

ProjectID:

Attn: **Jerry Cook**  
**SCA Environmental**  
**650 Delancy Street**  
**Suite 222**  
**San Francisco, CA 94107**

Phone: (415) 882-1675  
 Fax: (415) 962-0736  
 Received: 02/23/16 2:45 PM  
 Analysis Date: 2/29/2016  
 Collected:

Project: K11983 / BART AMBIENT

### Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method, Revision 3, Issue 2, 8/15/94

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/mm <sup>2</sup>	Fibers/cc	Notes
19-108A-1			2734.00	<5.5	100	0.001	<7.01	<0.001	
091603214-0001									
12-107C-1			2830.00	<5.5	100	0.001	<7.01	<0.001	
091603214-0002									
MONT-110-1			2664.00	<5.5	100	0.001	<7.01	<0.001	
091603214-0003									
MONT-111-2			2611.00	<5.5	100	0.001	<7.01	<0.001	
091603214-0004									
POWELL-110-1			2569.00	<5.5	100	0.001	<7.01	<0.001	
091603214-0005									
PB-101A-1			2358.00	<5.5	100	0.001	<7.01	<0.001	
091603214-0006									
24-101A-1			2178.00	<5.5	100	0.001	<7.01	<0.001	
091603214-0007									
BLANK - HOLD									Field Blank Not Analyzed
091603214-0008									

The results reported have been blank corrected as applicable.

Analyst(s)

Rui Cindy Geng (7)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

\*Following EMSL Analytical SOP Asbestos and Other Fibers by PCM. Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.35, 21-50 fibers = 0.30, 51-100 fibers = 0.20. The laboratory is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. Samples received in good condition unless otherwise noted.  
 Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 02/29/2016 10:20:44



<b>CHAIN OF CUSTODY FORM</b>		<b>Tel</b> 415-8821675 510-6456200 310-2580460		<b>Fax</b> 415-9620736 415-9620736 415-9620736	
		650 Delancey St, #222, SF, CA 94107 1 Lakeside Dr, #215, Oakland, CA 94612			
<b>CALL/TXT with results:</b> (925) 219-5524 @messaging.sprintpcs.com <b>Email rpt / COC &amp; invoice:</b> jcook@sca-enviro.com & pgervasio@scachs.com					
<b>EMAIL HEADING:</b> (Project #) - (Project Manager Initials) - (Site Name/Address) - (Date MMDD)		K11983 GRC BART AMBIENT			
<b>LAB</b> EMSL		<b>Email Prj Mgr Name:</b> Chuck Siu Glenn Cass Christina Codemo			
<b>COURIER</b> LAB REP NOTIFIED: _____ AIRBILL/FLIGHT NO.: _____ EST ARRIVAL DATE: _____		Notification DATE/TIME: _____ Shipper REFERENCE I.D. _____ EST. ARRIVAL TIME: _____			
<b>Method Reference</b> 7400 PCM PLM (asbestos) Sample Media 25 37 mm 0.45		AHERA TEM Flame AA (Lead) 0.8 micron MCEF Bulk Water Wipe			
<b>RESULTS DUE:</b> 5 day AM / PM					
<b>CHAIN OF CUSTODY DATA:</b> Sending Info 8 samples submitted by JC (SCA) on 0223 at 1600 Received by Lab: _____ samples received by ZA on 2/23/10 at 2:45pm Received by Analyst: _____ samples received by _____ on _____ at _____					
<b>SAMPLE ID</b>		<b>LITERS</b>		<b>Results</b>	
19-108A-1		2734			
12-107C-1		2830			
MONT-110-1		2664			
MONT-111-2		2611			
POWEHL-110-1		2569			
16-101A-1		2358			
24-101A-1		2178			
BLANK		0 LITERS		BLANK	
		0 LITERS		BLANK	
		0 LITERS		BLANK	
<b>INSTRUCTIONS TO LAB</b> (delete items not applicable AND circle items applicable): 1. Pickup requested: _____ Contact: _____ Time of Call: _____ 2. Call SCA's contact to acknowledge receipt of samples. 3. Analyze samples by PCM only. 4. Analyze inside samples by PCM first; if any sample >0.01 f/cc, contact SCA. 5. If all samples are <0.01 f/cc, proceed with items 6, 7 or 8, as noted. 6. Analyze inside samples only; stop if Avg >70 str/mm <sup>2</sup> , contact SCA before analyzing outsides or blanks. 7. Analyze all samples, including outside samples and blanks. 8. Do NOT analyze outside or blank samples. 9. Analyze by TEM only the inside air sample with the highest PCM result. 10. Serial analysis; stop at first positive (>1%); first trace (<0.1%); except sheetrock and plaster samples. 11. Analyze all bulk samples, unless otherwise indicated.					
<b>Report Number:</b>		<b>Supplies /Equipment</b>		<b>Qty</b>	
		Hi-Vol (3040)			
		Lo-Vol (3020)		8	
<b>Invoice Number:</b>		TEM / Pb cassettes (3520)			
		PCM cassettes (3500)		9	
		Bulk sampling supply (3710)			

Wipes	Flame AA	Units (each)	ASBESTOS	
			LEAD	
			1 to 9	< 6 hours
			10 to 40	>40
			>40	
			1 to 9	24 hours
			10 to 40	>40
			>40	
			1 to 9	48 hours
			10 to 40	>40
			>40	
			1 to 9	3 to 5 days
			10 to 40	>40
			>40	
			1 to 9	> 6 days
			10 to 40	>40
			>40	



**EMSL Analytical, Inc**

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<http://www.EMSL.com>[sanleandrolab@emsl.com](mailto:sanleandrolab@emsl.com)

EMSL Order: 091603494

CustomerID: SCAE50

CustomerPO:

ProjectID:

Attn: **Jerry Cook**  
**SCA Environmental**  
**650 Delancy Street**  
**Suite 222**  
**San Francisco, CA 94107**

Phone: (415) 882-1675  
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 Received: 02/24/16 1:45 PM  
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 Collected:

Project: K11983 BART AMBIENT

### Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method, Revision 3, Issue 2, 8/15/94

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/mm <sup>2</sup>	Fibers/cc	Notes
LAF-TR103-1 091603494-0001			2273.00	<5.5	100	0.001	<7.01	<0.001	
ROCK-203-1 091603494-0002			2411.00	6	100	0.001	7.64	0.001	
MAC-102-1 091603494-0003			2628.00	11	100	0.001	14.0	0.002	
BERK-108-1 091603494-0004			2556.00	<5.5	100	0.001	<7.01	<0.001	
ASH-204-1 091603494-0005			2540.00	<5.5	100	0.001	<7.01	<0.001	
PAW-POL BRK-2 091603494-0006			2816.00	<5.5	100	0.001	<7.01	<0.001	
BLANK-HOLD 091603494-0007									Field Blank Not Analyzed

The results reported have been blank corrected as applicable.

Analyst(s)

Rui Cindy Geng (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

\*Following EMSL Analytical SOP Asbestos and Other Fibers by PCM. Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.35, 21-50 fibers = 0.30, 51-100 fibers = 0.20. The laboratory is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. Samples received in good condition unless otherwise noted.  
 Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 02/29/2016 10:24:23

**SCA CHAIN OF CUSTODY FORM**

650 Delaney St, #222, SF, CA 94107  
1 Lakeside Dr, #215, Oakland, CA 94612

Tel: 415-4821675  
510-6456200  
310-2580460

Fax: 415-9620736  
415-9620736  
415-9620736

Environmentel, Inc.

EMAIL HEADING: (Project #) - (Project Manager Initials) - (Site Name/Address) - (Date MMDD)

K11983 GRC BART AMBIENT 0224

LAB: EHS

CALL/FAX with results: 925-219-5524

@messaging.sprintpcs.com

Email rpt / COC & invoice: jcook@sca-enviro.com & pgervasio@scaehs.com

Email Prj Mgr Name: Chuck Siu Glenn Cass Christina Codemo

COURIER:

LAB REP NOTIFIED:

AIRBILL/FLIGHT NO: \_\_\_\_\_

EST ARRIVAL DATE: \_\_\_\_\_

Notification DATE/TIME: \_\_\_\_\_

Shipper REFERENCE I.D.: \_\_\_\_\_

EST. ARRIVAL TIME: \_\_\_\_\_

Method Reference: 7400 PCM AHERA TEM CARB-AHERA TEM 0.001 s/cc Detection Limit

Sample Media: PLM (asbestos) 0.7 mm 0.45 0.6 micron MCEE Bulk Water Wipe

RESULTS DUE: 5 day AM / PM

Units (each)	ASBESTOS
Units (each)	< 6 hours
PCM NIOSH 7400	1 to 9 10 to 40 >40
PLM Bulk	1 to 9 10 to 40 >40
CARB AHERA 400 Pt Ch w/ prep	1 to 9 10 to 40 >40
PLM Std Point Count 400	1 to 9 10 to 40 >40
TEM AHERA	1 to 9 10 to 40 >40
CARB AHERA 36-40 grid openings	1 to 9 10 to 40 >40
CARB AHERA 10-15 grid openings	1 to 9 10 to 40 >40
Flame AA	1 to 9 10 to 40 >40
Wipes	1 to 9 10 to 40 >40
Units (each)	24 hours
Flame AA	1 to 9 10 to 40 >40
Wipes	1 to 9 10 to 40 >40
Units (each)	48 hours
Flame AA	1 to 9 10 to 40 >40
Wipes	1 to 9 10 to 40 >40
Units (each)	3 to 5 days
Flame AA	1 to 9 10 to 40 >40
Wipes	1 to 9 10 to 40 >40
Units (each)	> 6 days
Flame AA	1 to 9 10 to 40 >40
Wipes	1 to 9 10 to 40 >40

CHAIN OF CUSTODY DATA:

Sending Info: 7 samples submitted by J (SCA) on 2/24/16 at 13:45

Received by Lab: samples received by ARD on 2/24/16 at 13:45

Received by Analyst: samples received by \_\_\_\_\_ on \_\_\_\_\_ at \_\_\_\_\_

SAMPLE ID	LITERS	Results	Inn/Blanks/Outs
LAF-2103-1	2273		
ROCK-203-1	2411		
MAG-102-1	2628		
BERK-108-1	2556		
ASH-204-1	2540		
Panel POL BULK	2816		
-2			
BLANK	0 LITERS		BLANK
BLANK	0 LITERS		BLANK
BLANK	0 LITERS		BLANK

INSTRUCTIONS TO LAB (delete items not applicable AND circle items applicable):

- Pickup requested. 11. : \_\_\_\_\_  
Contact: \_\_\_\_\_  
Time of Call: \_\_\_\_\_
- Call SCA's contact to acknowledge receipt of samples.
- Analyze samples by PCM only.
- Analyze inside samples by PCM first; if any sample >0.01 f/cc, contact SCA
- If all samples are <0.01 f/cc, proceed with items 6, 7 or 8, as noted.
- Analyze inside samples only; stop if Avg >70 str/mm<sup>2</sup>, contact SCA before analyzing outsides or blanks.
- Analyze all samples, including outside samples and blanks.
- Do NOT analyze outside or blank samples.
- Analyze by TEM only the inside air sample with the highest PCM result.
- Serial analysis; stop at first positive (>1%); first trace (<0.1%); except sheetrock and plaster samples.
- Analyze all bulk samples, unless otherwise indicated.

Report Number:	Supplies / Equipment	Qty
	Hi-Vol (3040)	
	Lo-Vol (3020)	76
Invoice Number:	TEM / Pb cassettes (3520)	
	PCM cassettes (3500)	7
	Bulk sampling supply (3710)	



**Attachment 2**

**Respirable Dust (PM<sub>10</sub>) Sampling Results – Embarcadero & Montgomery Street Stations**

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Sampling	
Location	Embarcadero South Station Agent's Booth	
Model Number		8530
Serial Number		8530100930
Firmware Version		3.4
Calibration Date		10/22/2015
Test Name	TEST1_005	
Test Start Time		1:49:16 PM
Test Start Date		2/22/2016
Test Length [D:H:M]		0:20:06
Test Interval [M:S]		1:00
Mass Average [mg/m <sup>3</sup> ]		0.077
Mass Minimum [mg/m <sup>3</sup> ]		0.008
Mass Maximum [mg/m <sup>3</sup> ]		0.171
Mass TWA [mg/m <sup>3</sup> ]		0.092
Photometric User Cal		1
Flow User Cal		0
Errors		
Number of Samples		1206

PM<sub>10</sub> Results

Elapsed Time [s]	Mass [mg/m <sup>3</sup> ]	
60		0.013
120		0.02
180		0.013
240		0.014
300		0.016
360		0.015
420		0.014
480		0.017
540		0.015
600		0.013
660		0.014
720		0.014
780		0.011
840		0.009
900		0.011
960		0.01
1020		0.008
1080		0.008
1140		0.008
1200		0.008
1260		0.011
1320		0.012
1380		0.015
1440		0.015
1500		0.016

1560	0.019
1620	0.019
1680	0.02
1740	0.02
1800	0.023
1860	0.021
1920	0.021
1980	0.021
2040	0.021
2100	0.02
2160	0.021
2220	0.023
2280	0.025
2340	0.027
2400	0.03
2460	0.031
2520	0.031
2580	0.032
2640	0.032
2700	0.032
2760	0.036
2820	0.036
2880	0.036
2940	0.036
3000	0.036
3060	0.036
3120	0.037
3180	0.037
3240	0.038
3300	0.038
3360	0.039
3420	0.041
3480	0.041
3540	0.041
3600	0.042
3660	0.042
3720	0.04
3780	0.04
3840	0.04
3900	0.041
3960	0.042
4020	0.042
4080	0.042
4140	0.041
4200	0.042
4260	0.044
4320	0.06

4380	0.075
4440	0.085
4500	0.093
4560	0.095
4620	0.089
4680	0.083
4740	0.078
4800	0.074
4860	0.073
4920	0.071
4980	0.073
5040	0.088
5100	0.083
5160	0.077
5220	0.073
5280	0.082
5340	0.092
5400	0.099
5460	0.092
5520	0.086
5580	0.081
5640	0.078
5700	0.083
5760	0.086
5820	0.089
5880	0.094
5940	0.101
6000	0.101
6060	0.101
6120	0.093
6180	0.086
6240	0.081
6300	0.077
6360	0.083
6420	0.089
6480	0.098
6540	0.113
6600	0.111
6660	0.104
6720	0.103
6780	0.101
6840	0.099
6900	0.096
6960	0.1
7020	0.102
7080	0.108
7140	0.114

7200	0.114
7260	0.113
7320	0.11
7380	0.108
7440	0.106
7500	0.108
7560	0.111
7620	0.114
7680	0.117
7740	0.117
7800	0.118
7860	0.116
7920	0.115
7980	0.117
8040	0.12
8100	0.122
8160	0.115
8220	0.111
8280	0.108
8340	0.111
8400	0.109
8460	0.108
8520	0.112
8580	0.121
8640	0.117
8700	0.113
8760	0.109
8820	0.11
8880	0.104
8940	0.105
9000	0.108
9060	0.11
9120	0.11
9180	0.109
9240	0.104
9300	0.1
9360	0.1
9420	0.098
9480	0.098
9540	0.103
9600	0.099
9660	0.095
9720	0.092
9780	0.085
9840	0.083
9900	0.088
9960	0.089

10020	0.091
10080	0.095
10140	0.098
10200	0.103
10260	0.1
10320	0.103
10380	0.107
10440	0.102
10500	0.109
10560	0.108
10620	0.105
10680	0.103
10740	0.101
10800	0.103
10860	0.102
10920	0.099
10980	0.099
11040	0.102
11100	0.108
11160	0.107
11220	0.105
11280	0.103
11340	0.103
11400	0.1
11460	0.103
11520	0.101
11580	0.103
11640	0.105
11700	0.104
11760	0.103
11820	0.107
11880	0.11
11940	0.114
12000	0.118
12060	0.119
12120	0.116
12180	0.108
12240	0.105
12300	0.11
12360	0.107
12420	0.105
12480	0.109
12540	0.111
12600	0.115
12660	0.114
12720	0.116
12780	0.111

12840	0.109
12900	0.107
12960	0.104
13020	0.106
13080	0.108
13140	0.11
13200	0.111
13260	0.111
13320	0.112
13380	0.11
13440	0.107
13500	0.108
13560	0.112
13620	0.108
13680	0.098
13740	0.1
13800	0.103
13860	0.106
13920	0.106
13980	0.108
14040	0.108
14100	0.11
14160	0.114
14220	0.113
14280	0.111
14340	0.112
14400	0.111
14460	0.115
14520	0.117
14580	0.116
14640	0.113
14700	0.111
14760	0.108
14820	0.097
14880	0.101
14940	0.103
15000	0.104
15060	0.105
15120	0.113
15180	0.11
15240	0.116
15300	0.117
15360	0.103
15420	0.104
15480	0.1
15540	0.098
15600	0.101

15660	0.105
15720	0.115
15780	0.113
15840	0.116
15900	0.114
15960	0.114
16020	0.105
16080	0.099
16140	0.095
16200	0.108
16260	0.111
16320	0.111
16380	0.113
16440	0.118
16500	0.116
16560	0.115
16620	0.119
16680	0.11
16740	0.11
16800	0.114
16860	0.123
16920	0.124
16980	0.12
17040	0.122
17100	0.111
17160	0.11
17220	0.109
17280	0.103
17340	0.106
17400	0.112
17460	0.118
17520	0.123
17580	0.124
17640	0.125
17700	0.126
17760	0.13
17820	0.132
17880	0.133
17940	0.131
18000	0.128
18060	0.121
18120	0.111
18180	0.105
18240	0.104
18300	0.106
18360	0.113
18420	0.116



18480	0.117
18540	0.122
18600	0.12
18660	0.12
18720	0.114
18780	0.114
18840	0.111
18900	0.121
18960	0.128
19020	0.13
19080	0.126
19140	0.121
19200	0.124
19260	0.125
19320	0.128
19380	0.127
19440	0.132
19500	0.129
19560	0.121
19620	0.108
19680	0.101
19740	0.103
19800	0.11
19860	0.111
19920	0.109
19980	0.102
20040	0.104
20100	0.111
20160	0.115
20220	0.12
20280	0.126
20340	0.128
20400	0.134
20460	0.126
20520	0.122
20580	0.116
20640	0.115
20700	0.12
20760	0.123
20820	0.124
20880	0.12
20940	0.106
21000	0.099
21060	0.099
21120	0.106
21180	0.109
21240	0.111

21300	0.108
21360	0.103
21420	0.101
21480	0.109
21540	0.119
21600	0.126
21660	0.129
21720	0.123
21780	0.112
21840	0.104
21900	0.105
21960	0.111
22020	0.115
22080	0.114
22140	0.102
22200	0.094
22260	0.096
22320	0.108
22380	0.114
22440	0.114
22500	0.116
22560	0.112
22620	0.104
22680	0.096
22740	0.09
22800	0.086
22860	0.082
22920	0.079
22980	0.077
23040	0.082
23100	0.097
23160	0.102
23220	0.106
23280	0.108
23340	0.11
23400	0.112
23460	0.115
23520	0.112
23580	0.114
23640	0.111
23700	0.109
23760	0.109
23820	0.113
23880	0.113
23940	0.115
24000	0.116
24060	0.11

24120	0.111
24180	0.106
24240	0.108
24300	0.108
24360	0.109
24420	0.108
24480	0.104
24540	0.1
24600	0.096
24660	0.097
24720	0.101
24780	0.1
24840	0.092
24900	0.088
24960	0.086
25020	0.09
25080	0.092
25140	0.099
25200	0.096
25260	0.099
25320	0.096
25380	0.097
25440	0.1
25500	0.101
25560	0.102
25620	0.101
25680	0.1
25740	0.103
25800	0.104
25860	0.099
25920	0.095
25980	0.094
26040	0.095
26100	0.092
26160	0.09
26220	0.089
26280	0.087
26340	0.093
26400	0.093
26460	0.092
26520	0.095
26580	0.093
26640	0.088
26700	0.09
26760	0.091
26820	0.089
26880	0.092

26940	0.092
27000	0.091
27060	0.086
27120	0.082
27180	0.084
27240	0.084
27300	0.082
27360	0.083
27420	0.084
27480	0.085
27540	0.089
27600	0.089
27660	0.085
27720	0.086
27780	0.089
27840	0.094
27900	0.097
27960	0.093
28020	0.087
28080	0.086
28140	0.083
28200	0.079
28260	0.076
28320	0.076
28380	0.083
28440	0.082
28500	0.079
28560	0.072
28620	0.073
28680	0.076
28740	0.078
28800	0.08
28860	0.077
28920	0.076
28980	0.084
29040	0.091
29100	0.09
29160	0.086
29220	0.089
29280	0.086
29340	0.084
29400	0.083
29460	0.081
29520	0.082
29580	0.083
29640	0.082
29700	0.081

29760	0.078
29820	0.075
29880	0.074
29940	0.072
30000	0.073
30060	0.076
30120	0.079
30180	0.083
30240	0.094
30300	0.1
30360	0.101
30420	0.094
30480	0.086
30540	0.082
30600	0.081
30660	0.081
30720	0.081
30780	0.084
30840	0.083
30900	0.08
30960	0.079
31020	0.076
31080	0.075
31140	0.08
31200	0.078
31260	0.068
31320	0.063
31380	0.066
31440	0.078
31500	0.09
31560	0.096
31620	0.097
31680	0.099
31740	0.096
31800	0.091
31860	0.09
31920	0.09
31980	0.092
32040	0.092
32100	0.089
32160	0.085
32220	0.087
32280	0.09
32340	0.088
32400	0.087
32460	0.085
32520	0.087

32580	0.085
32640	0.093
32700	0.096
32760	0.099
32820	0.095
32880	0.095
32940	0.092
33000	0.09
33060	0.084
33120	0.083
33180	0.084
33240	0.083
33300	0.082
33360	0.082
33420	0.079
33480	0.079
33540	0.078
33600	0.079
33660	0.075
33720	0.074
33780	0.077
33840	0.077
33900	0.077
33960	0.072
34020	0.069
34080	0.073
34140	0.065
34200	0.067
34260	0.069
34320	0.073
34380	0.074
34440	0.069
34500	0.067
34560	0.066
34620	0.065
34680	0.06
34740	0.06
34800	0.061
34860	0.06
34920	0.064
34980	0.068
35040	0.071
35100	0.069
35160	0.064
35220	0.059
35280	0.058
35340	0.06

35400	0.06
35460	0.063
35520	0.061
35580	0.062
35640	0.058
35700	0.056
35760	0.054
35820	0.049
35880	0.047
35940	0.047
36000	0.045
36060	0.045
36120	0.045
36180	0.056
36240	0.064
36300	0.067
36360	0.061
36420	0.056
36480	0.056
36540	0.054
36600	0.054
36660	0.053
36720	0.052
36780	0.056
36840	0.056
36900	0.055
36960	0.054
37020	0.052
37080	0.052
37140	0.048
37200	0.048
37260	0.049
37320	0.05
37380	0.052
37440	0.052
37500	0.053
37560	0.048
37620	0.045
37680	0.047
37740	0.049
37800	0.051
37860	0.052
37920	0.048
37980	0.046
38040	0.042
38100	0.04
38160	0.038

38220	0.038
38280	0.038
38340	0.038
38400	0.04
38460	0.044
38520	0.041
38580	0.039
38640	0.038
38700	0.037
38760	0.037
38820	0.035
38880	0.034
38940	0.034
39000	0.034
39060	0.033
39120	0.032
39180	0.032
39240	0.032
39300	0.031
39360	0.03
39420	0.03
39480	0.029
39540	0.029
39600	0.028
39660	0.028
39720	0.028
39780	0.028
39840	0.033
39900	0.042
39960	0.046
40020	0.045
40080	0.043
40140	0.04
40200	0.037
40260	0.04
40320	0.045
40380	0.047
40440	0.049
40500	0.051
40560	0.047
40620	0.046
40680	0.045
40740	0.045
40800	0.048
40860	0.051
40920	0.052
40980	0.049



41040	0.046
41100	0.047
41160	0.046
41220	0.045
41280	0.044
41340	0.043
41400	0.043
41460	0.043
41520	0.042
41580	0.042
41640	0.04
41700	0.039
41760	0.038
41820	0.036
41880	0.036
41940	0.034
42000	0.035
42060	0.032
42120	0.032
42180	0.032
42240	0.031
42300	0.03
42360	0.029
42420	0.028
42480	0.027
42540	0.026
42600	0.026
42660	0.024
42720	0.024
42780	0.023
42840	0.023
42900	0.023
42960	0.023
43020	0.022
43080	0.023
43140	0.022
43200	0.022
43260	0.021
43320	0.021
43380	0.022
43440	0.022
43500	0.02
43560	0.02
43620	0.02
43680	0.02
43740	0.019
43800	0.02

43860	0.02
43920	0.02
43980	0.021
44040	0.019
44100	0.018
44160	0.017
44220	0.017
44280	0.017
44340	0.018
44400	0.018
44460	0.018
44520	0.034
44580	0.036
44640	0.036
44700	0.032
44760	0.026
44820	0.026
44880	0.025
44940	0.025
45000	0.023
45060	0.023
45120	0.023
45180	0.023
45240	0.023
45300	0.022
45360	0.023
45420	0.024
45480	0.023
45540	0.024
45600	0.024
45660	0.022
45720	0.02
45780	0.02
45840	0.02
45900	0.019
45960	0.019
46020	0.017
46080	0.017
46140	0.017
46200	0.016
46260	0.016
46320	0.017
46380	0.016
46440	0.017
46500	0.017
46560	0.017
46620	0.016

46680	0.017
46740	0.016
46800	0.018
46860	0.016
46920	0.016
46980	0.016
47040	0.016
47100	0.016
47160	0.016
47220	0.017
47280	0.018
47340	0.019
47400	0.019
47460	0.018
47520	0.019
47580	0.019
47640	0.019
47700	0.018
47760	0.018
47820	0.018
47880	0.018
47940	0.018
48000	0.018
48060	0.019
48120	0.019
48180	0.019
48240	0.019
48300	0.021
48360	0.021
48420	0.021
48480	0.019
48540	0.019
48600	0.019
48660	0.02
48720	0.019
48780	0.02
48840	0.018
48900	0.017
48960	0.018
49020	0.019
49080	0.018
49140	0.018
49200	0.018
49260	0.017
49320	0.017
49380	0.017
49440	0.017

49500	0.017
49560	0.017
49620	0.017
49680	0.016
49740	0.016
49800	0.015
49860	0.015
49920	0.015
49980	0.016
50040	0.015
50100	0.015
50160	0.015
50220	0.014
50280	0.015
50340	0.015
50400	0.014
50460	0.014
50520	0.014
50580	0.014
50640	0.014
50700	0.017
50760	0.015
50820	0.015
50880	0.015
50940	0.015
51000	0.014
51060	0.015
51120	0.015
51180	0.014
51240	0.014
51300	0.014
51360	0.014
51420	0.014
51480	0.022
51540	0.019
51600	0.018
51660	0.016
51720	0.015
51780	0.014
51840	0.015
51900	0.014
51960	0.014
52020	0.015
52080	0.013
52140	0.012
52200	0.012
52260	0.013

52320	0.014
52380	0.012
52440	0.012
52500	0.012
52560	0.012
52620	0.019
52680	0.03
52740	0.019
52800	0.013
52860	0.013
52920	0.013
52980	0.012
53040	0.013
53100	0.016
53160	0.014
53220	0.021
53280	0.015
53340	0.014
53400	0.013
53460	0.013
53520	0.014
53580	0.013
53640	0.013
53700	0.013
53760	0.012
53820	0.012
53880	0.013
53940	0.013
54000	0.012
54060	0.012
54120	0.012
54180	0.011
54240	0.012
54300	0.011
54360	0.012
54420	0.012
54480	0.012
54540	0.012
54600	0.012
54660	0.013
54720	0.012
54780	0.012
54840	0.012
54900	0.012
54960	0.012
55020	0.013
55080	0.013

55140	0.013
55200	0.013
55260	0.013
55320	0.014
55380	0.014
55440	0.014
55500	0.014
55560	0.014
55620	0.016
55680	0.014
55740	0.015
55800	0.015
55860	0.015
55920	0.016
55980	0.017
56040	0.017
56100	0.016
56160	0.017
56220	0.018
56280	0.02
56340	0.02
56400	0.026
56460	0.049
56520	0.042
56580	0.034
56640	0.035
56700	0.036
56760	0.04
56820	0.045
56880	0.045
56940	0.051
57000	0.064
57060	0.144
57120	0.1
57180	0.084
57240	0.065
57300	0.055
57360	0.045
57420	0.045
57480	0.047
57540	0.065
57600	0.061
57660	0.068
57720	0.062
57780	0.063
57840	0.058
57900	0.064

57960	0.055
58020	0.061
58080	0.083
58140	0.097
58200	0.089
58260	0.107
58320	0.095
58380	0.087
58440	0.072
58500	0.066
58560	0.069
58620	0.069
58680	0.057
58740	0.054
58800	0.056
58860	0.061
58920	0.071
58980	0.069
59040	0.067
59100	0.065
59160	0.075
59220	0.069
59280	0.067
59340	0.067
59400	0.085
59460	0.082
59520	0.079
59580	0.07
59640	0.065
59700	0.067
59760	0.066
59820	0.061
59880	0.06
59940	0.063
60000	0.078
60060	0.091
60120	0.095
60180	0.094
60240	0.105
60300	0.103
60360	0.107
60420	0.078
60480	0.084
60540	0.101
60600	0.103
60660	0.126
60720	0.14

60780	0.143
60840	0.146
60900	0.142
60960	0.139
61020	0.129
61080	0.111
61140	0.108
61200	0.123
61260	0.12
61320	0.118
61380	0.098
61440	0.094
61500	0.096
61560	0.12
61620	0.118
61680	0.123
61740	0.123
61800	0.108
61860	0.11
61920	0.105
61980	0.102
62040	0.099
62100	0.105
62160	0.109
62220	0.113
62280	0.113
62340	0.108
62400	0.108
62460	0.102
62520	0.1
62580	0.107
62640	0.105
62700	0.11
62760	0.107
62820	0.093
62880	0.096
62940	0.095
63000	0.098
63060	0.103
63120	0.124
63180	0.118
63240	0.11
63300	0.112
63360	0.108
63420	0.108
63480	0.118
63540	0.142



63600	0.148
63660	0.139
63720	0.139
63780	0.143
63840	0.142
63900	0.145
63960	0.164
64020	0.153
64080	0.146
64140	0.144
64200	0.14
64260	0.147
64320	0.154
64380	0.146
64440	0.144
64500	0.142
64560	0.128
64620	0.126
64680	0.134
64740	0.144
64800	0.144
64860	0.147
64920	0.148
64980	0.14
65040	0.137
65100	0.127
65160	0.126
65220	0.126
65280	0.126
65340	0.126
65400	0.114
65460	0.115
65520	0.127
65580	0.129
65640	0.127
65700	0.13
65760	0.133
65820	0.145
65880	0.16
65940	0.149
66000	0.148
66060	0.146
66120	0.158
66180	0.147
66240	0.139
66300	0.144
66360	0.147

66420	0.139
66480	0.138
66540	0.143
66600	0.142
66660	0.132
66720	0.118
66780	0.111
66840	0.108
66900	0.108
66960	0.108
67020	0.108
67080	0.101
67140	0.104
67200	0.104
67260	0.105
67320	0.101
67380	0.104
67440	0.098
67500	0.108
67560	0.105
67620	0.102
67680	0.1
67740	0.102
67800	0.115
67860	0.114
67920	0.134
67980	0.134
68040	0.133
68100	0.128
68160	0.133
68220	0.144
68280	0.133
68340	0.144
68400	0.141
68460	0.134
68520	0.135
68580	0.136
68640	0.128
68700	0.123
68760	0.126
68820	0.129
68880	0.126
68940	0.135
69000	0.134
69060	0.131
69120	0.143
69180	0.137

69240	0.142
69300	0.144
69360	0.142
69420	0.147
69480	0.149
69540	0.143
69600	0.148
69660	0.152
69720	0.16
69780	0.148
69840	0.147
69900	0.141
69960	0.141
70020	0.15
70080	0.147
70140	0.149
70200	0.143
70260	0.149
70320	0.146
70380	0.156
70440	0.16
70500	0.157
70560	0.162
70620	0.163
70680	0.16
70740	0.142
70800	0.144
70860	0.143
70920	0.166
70980	0.171
71040	0.167
71100	0.167
71160	0.158
71220	0.155
71280	0.158
71340	0.159
71400	0.157
71460	0.156
71520	0.149
71580	0.152
71640	0.16
71700	0.149
71760	0.145
71820	0.137
71880	0.142
71940	0.138
72000	0.119

72060	0.123
72120	0.139
72180	0.127
72240	0.123
72300	0.137
72360	0.159

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Sampling	
Location	Embarcadero Station Bike Rack Area	
Model Number		8530
Serial Number		8530100913
Firmware Version		3.4
Calibration Date		12/23/2015
Test Name	TEST 3_001	
Test Start Time		2:13:55 PM
Test Start Date		2/22/2016
Test Length [D:H:M]		0:19:30
Test Interval [M:S]		10:00
Mass Average [mg/m <sup>3</sup> ]		0.063
Mass Minimum [mg/m <sup>3</sup> ]		0.01
Mass Maximum [mg/m <sup>3</sup> ]		0.112
Mass TWA [mg/m <sup>3</sup> ]		0.087
Photometric User Cal		1
Flow User Cal		0
Errors		
Number of Samples		117

PM<sup>10</sup> Concentrations

Elapsed Time [s]	Mass [mg/m <sup>3</sup> ]
600	0.025
1200	0.04
1800	0.064
2400	0.076
3000	0.082
3600	0.086
4200	0.088
4800	0.09
5400	0.094
6000	0.095
6600	0.097
7200	0.101
7800	0.106
8400	0.098
9000	0.09
9600	0.091
10200	0.093
10800	0.099
11400	0.105
12000	0.107
12600	0.099
13200	0.098
13800	0.095
14400	0.097
15000	0.1

15600	0.1
16200	0.093
16800	0.093
17400	0.098
18000	0.1
18600	0.105
19200	0.108
19800	0.097
20400	0.092
21000	0.088
21600	0.083
22200	0.086
22800	0.092
23400	0.083
24000	0.078
24600	0.079
25200	0.078
25800	0.08
26400	0.076
27000	0.07
27600	0.066
28200	0.07
28800	0.065
29400	0.064
30000	0.068
30600	0.064
31200	0.072
31800	0.08
32400	0.078
33000	0.063
33600	0.052
34200	0.045
34800	0.034
35400	0.036
36000	0.038
36600	0.038
37200	0.033
37800	0.037
38400	0.042
39000	0.046
39600	0.046
40200	0.037
40800	0.028
41400	0.02
42000	0.015
42600	0.014
43200	0.017

43800	0.016
44400	0.018
45000	0.015
45600	0.015
46200	0.016
46800	0.016
47400	0.016
48000	0.015
48600	0.014
49200	0.013
49800	0.012
50400	0.012
51000	0.01
51600	0.01
52200	0.01
52800	0.01
53400	0.011
54000	0.014
54600	0.019
55200	0.023
55800	0.023
56400	0.028
57000	0.03
57600	0.03
58200	0.034
58800	0.035
59400	0.045
60000	0.06
60600	0.07
61200	0.089
61800	0.082
62400	0.084
63000	0.09
63600	0.089
64200	0.086
64800	0.093
65400	0.095
66000	0.089
66600	0.089
67200	0.094
67800	0.086
68400	0.093
69000	0.103
69600	0.112
70200	0.111

Instrument Name	DustTrak II PM10 Respirable
Location	Montgomery Station Fan Room 301
Model Number	8530
Serial Number	8530100913
Firmware Version	3.4
Calibration Date	12/23/2015
Test Name	TEST 3_002
Test Start Time	10:18:38 AM
Test Start Date	2/23/2016
Test Length [D:H:M]	0:22:20
Test Interval [M:S]	10:00
Mass Average [mg/m3]	0.068
Mass Minimum [mg/m3]	0.011
Mass Maximum [mg/m3]	0.103
Mass TWA [mg/m3]	0.091
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	134

#### PM<sub>10</sub> Results

Elapsed Time [s]	Mass [mg/m3]
600	0.103
1200	0.084
1800	0.081
2400	0.086
3000	0.09
3600	0.087
4200	0.086
4800	0.09
5400	0.086
6000	0.086
6600	0.085
7200	0.092
7800	0.096
8400	0.101
9000	0.097
9600	0.094
10200	0.096
10800	0.094
11400	0.089
12000	0.079
12600	0.076
13200	0.08
13800	0.085
14400	0.093
15000	0.096



Instrument Name	DustTrak II PM10 Respirable
Location	Montgomery Station Fan Room 301
15600	0.094
16200	0.092
16800	0.091
17400	0.092
18000	0.093
18600	0.092
19200	0.095
19800	0.091
20400	0.092
21000	0.093
21600	0.092
22200	0.096
22800	0.093
23400	0.087
24000	0.085
24600	0.091
25200	0.101
25800	0.096
26400	0.091
27000	0.091
27600	0.1
28200	0.097
28800	0.098
29400	0.103
30000	0.1
30600	0.098
31200	0.098
31800	0.094
32400	0.095
33000	0.093
33600	0.09
34200	0.093
34800	0.093
35400	0.092
36000	0.086
36600	0.078
37200	0.075
37800	0.073
38400	0.068
39000	0.067
39600	0.072
40200	0.072
40800	0.069
41400	0.07
42000	0.069

Instrument Name	DustTrak II PM10 Respirable
Location	Montgomery Station Fan Room 301
42600	0.068
43200	0.072
43800	0.067
44400	0.066
45000	0.074
45600	0.059
46200	0.064
46800	0.057
47400	0.045
48000	0.049
48600	0.045
49200	0.048
49800	0.043
50400	0.046
51000	0.033
51600	0.052
52200	0.038
52800	0.035
53400	0.027
54000	0.026
54600	0.022
55200	0.021
55800	0.017
56400	0.015
57000	0.014
57600	0.015
58200	0.013
58800	0.014
59400	0.014
60000	0.013
60600	0.012
61200	0.011
61800	0.017
62400	0.013
63000	0.012
63600	0.011
64200	0.011
64800	0.012
65400	0.016
66000	0.019
66600	0.026
67200	0.029
67800	0.051
68400	0.049
69000	0.051

Instrument Name	DustTrak II PM10 Respirable
Location	Montgomery Station Fan Room 301
69600	0.059
70200	0.057
70800	0.056
71400	0.053
72000	0.058
72600	0.062
73200	0.064
73800	0.073
74400	0.074
75000	0.071
75600	0.072
76200	0.083
76800	0.095
77400	0.091
78000	0.096
78600	0.083
79200	0.075
79800	0.073
80400	0.084

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
Model Number		8530
Serial Number		8530100930
Firmware Version		3.4
Calibration Date		10/22/2015
Test Name	TEST1_007	
Test Start Time		10:25:16 AM
Test Start Date		2/23/2016
Test Length [D:H:M]		0:22:21
Test Interval [M:S]		1:00
Mass Average [mg/m3]		0.06
Mass Minimum [mg/m3]		0.008
Mass Maximum [mg/m3]		0.116
Mass TWA [mg/m3]		0.077
Photometric User Cal		1
Flow User Cal		0
Errors		
Number of Samples		1341

PM<sub>10</sub> Results

Elapsed Time [s]	Mass [mg/m3]
60	0.09
120	0.088
180	0.084
240	0.081
300	0.086
360	0.086
420	0.086
480	0.084
540	0.087
600	0.088
660	0.09
720	0.091
780	0.092
840	0.091
900	0.092
960	0.091
1020	0.089
1080	0.091
1140	0.092
1200	0.092
1260	0.094
1320	0.09
1380	0.09
1440	0.091
1500	0.09

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
1560	0.091
1620	0.09
1680	0.1
1740	0.09
1800	0.092
1860	0.089
1920	0.083
1980	0.076
2040	0.072
2100	0.073
2160	0.079
2220	0.083
2280	0.084
2340	0.087
2400	0.084
2460	0.085
2520	0.087
2580	0.083
2640	0.082
2700	0.083
2760	0.081
2820	0.085
2880	0.086
2940	0.087
3000	0.087
3060	0.085
3120	0.088
3180	0.079
3240	0.072
3300	0.069
3360	0.077
3420	0.081
3480	0.075
3540	0.07
3600	0.073
3660	0.074
3720	0.072
3780	0.079
3840	0.084
3900	0.086
3960	0.083
4020	0.076
4080	0.071
4140	0.065
4200	0.065

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
4260	0.079
4320	0.087
4380	0.092
4440	0.094
4500	0.09
4560	0.089
4620	0.09
4680	0.089
4740	0.087
4800	0.088
4860	0.088
4920	0.089
4980	0.09
5040	0.092
5100	0.091
5160	0.091
5220	0.083
5280	0.078
5340	0.083
5400	0.086
5460	0.087
5520	0.086
5580	0.079
5640	0.072
5700	0.074
5760	0.078
5820	0.072
5880	0.075
5940	0.084
6000	0.086
6060	0.088
6120	0.083
6180	0.085
6240	0.089
6300	0.09
6360	0.091
6420	0.089
6480	0.09
6540	0.093
6600	0.091
6660	0.094
6720	0.095
6780	0.095
6840	0.092
6900	0.083

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
	6960	0.079
	7020	0.073
	7080	0.078
	7140	0.087
	7200	0.091
	7260	0.088
	7320	0.09
	7380	0.081
	7440	0.073
	7500	0.076
	7560	0.084
	7620	0.087
	7680	0.087
	7740	0.089
	7800	0.094
	7860	0.089
	7920	0.081
	7980	0.084
	8040	0.076
	8100	0.074
	8160	0.084
	8220	0.087
	8280	0.088
	8340	0.086
	8400	0.085
	8460	0.086
	8520	0.087
	8580	0.087
	8640	0.086
	8700	0.08
	8760	0.073
	8820	0.071
	8880	0.081
	8940	0.091
	9000	0.089
	9060	0.087
	9120	0.088
	9180	0.089
	9240	0.09
	9300	0.089
	9360	0.091
	9420	0.092
	9480	0.09
	9540	0.09
	9600	0.093

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
9660	0.091
9720	0.096
9780	0.095
9840	0.099
9900	0.094
9960	0.09
10020	0.097
10080	0.097
10140	0.099
10200	0.097
10260	0.093
10320	0.093
10380	0.093
10440	0.092
10500	0.092
10560	0.092
10620	0.085
10680	0.084
10740	0.083
10800	0.089
10860	0.086
10920	0.083
10980	0.078
11040	0.074
11100	0.077
11160	0.078
11220	0.083
11280	0.081
11340	0.077
11400	0.077
11460	0.077
11520	0.08
11580	0.078
11640	0.077
11700	0.076
11760	0.078
11820	0.079
11880	0.078
11940	0.077
12000	0.08
12060	0.079
12120	0.077
12180	0.076
12240	0.075
12300	0.076



Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
12360	0.081
12420	0.085
12480	0.086
12540	0.085
12600	0.086
12660	0.086
12720	0.083
12780	0.084
12840	0.081
12900	0.081
12960	0.079
13020	0.081
13080	0.086
13140	0.085
13200	0.083
13260	0.084
13320	0.084
13380	0.079
13440	0.082
13500	0.081
13560	0.08
13620	0.08
13680	0.08
13740	0.078
13800	0.077
13860	0.078
13920	0.081
13980	0.081
14040	0.085
14100	0.085
14160	0.089
14220	0.091
14280	0.087
14340	0.089
14400	0.088
14460	0.086
14520	0.084
14580	0.078
14640	0.078
14700	0.07
14760	0.077
14820	0.078
14880	0.075
14940	0.084
15000	0.088

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
15060		0.09
15120		0.091
15180		0.087
15240		0.088
15300		0.092
15360		0.088
15420		0.087
15480		0.085
15540		0.085
15600		0.085
15660		0.086
15720		0.087
15780		0.088
15840		0.086
15900		0.079
15960		0.074
16020		0.075
16080		0.075
16140		0.077
16200		0.081
16260		0.079
16320		0.079
16380		0.079
16440		0.08
16500		0.075
16560		0.079
16620		0.078
16680		0.07
16740		0.065
16800		0.064
16860		0.073
16920		0.066
16980		0.063
17040		0.069
17100		0.064
17160		0.06
17220		0.067
17280		0.074
17340		0.074
17400		0.064
17460		0.059
17520		0.057
17580		0.058
17640		0.071
17700		0.071

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
17760	0.074
17820	0.077
17880	0.079
17940	0.08
18000	0.077
18060	0.071
18120	0.071
18180	0.064
18240	0.061
18300	0.057
18360	0.057
18420	0.058
18480	0.055
18540	0.054
18600	0.051
18660	0.051
18720	0.051
18780	0.049
18840	0.048
18900	0.047
18960	0.06
19020	0.066
19080	0.074
19140	0.077
19200	0.082
19260	0.085
19320	0.079
19380	0.079
19440	0.078
19500	0.072
19560	0.069
19620	0.068
19680	0.076
19740	0.08
19800	0.082
19860	0.077
19920	0.076
19980	0.077
20040	0.077
20100	0.078
20160	0.072
20220	0.072
20280	0.081
20340	0.078
20400	0.065

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
20460		0.069
20520		0.07
20580		0.071
20640		0.077
20700		0.072
20760		0.068
20820		0.068
20880		0.07
20940		0.065
21000		0.065
21060		0.068
21120		0.08
21180		0.078
21240		0.072
21300		0.071
21360		0.066
21420		0.065
21480		0.059
21540		0.067
21600		0.074
21660		0.066
21720		0.063
21780		0.064
21840		0.065
21900		0.062
21960		0.069
22020		0.068
22080		0.063
22140		0.058
22200		0.054
22260		0.054
22320		0.052
22380		0.055
22440		0.058
22500		0.056
22560		0.058
22620		0.054
22680		0.055
22740		0.061
22800		0.059
22860		0.057
22920		0.053
22980		0.055
23040		0.056
23100		0.059

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
23160	0.062
23220	0.064
23280	0.061
23340	0.068
23400	0.06
23460	0.066
23520	0.072
23580	0.066
23640	0.063
23700	0.065
23760	0.065
23820	0.065
23880	0.066
23940	0.066
24000	0.067
24060	0.072
24120	0.079
24180	0.077
24240	0.077
24300	0.076
24360	0.074
24420	0.071
24480	0.073
24540	0.071
24600	0.07
24660	0.071
24720	0.066
24780	0.065
24840	0.065
24900	0.065
24960	0.062
25020	0.064
25080	0.063
25140	0.065
25200	0.069
25260	0.065
25320	0.061
25380	0.068
25440	0.065
25500	0.065
25560	0.063
25620	0.054
25680	0.049
25740	0.047
25800	0.053

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
25860	0.059
25920	0.059
25980	0.059
26040	0.062
26100	0.057
26160	0.054
26220	0.057
26280	0.07
26340	0.066
26400	0.07
26460	0.071
26520	0.071
26580	0.074
26640	0.065
26700	0.065
26760	0.067
26820	0.061
26880	0.065
26940	0.069
27000	0.068
27060	0.07
27120	0.074
27180	0.066
27240	0.069
27300	0.073
27360	0.074
27420	0.074
27480	0.068
27540	0.067
27600	0.073
27660	0.076
27720	0.079
27780	0.081
27840	0.079
27900	0.081
27960	0.078
28020	0.079
28080	0.072
28140	0.074
28200	0.07
28260	0.073
28320	0.07
28380	0.072
28440	0.075
28500	0.076

Instrument Name                    DustTrak II PM<sub>10</sub> Respirable Dust Results  
Location                            Montgomery South Station

28560	0.08
28620	0.071
28680	0.069
28740	0.067
28800	0.067
28860	0.073
28920	0.08
28980	0.09
29040	0.088
29100	0.081
29160	0.082
29220	0.082
29280	0.082
29340	0.078
29400	0.073
29460	0.07
29520	0.069
29580	0.066
29640	0.058
29700	0.057
29760	0.06
29820	0.07
29880	0.071
29940	0.069
30000	0.061
30060	0.066
30120	0.06
30180	0.058
30240	0.057
30300	0.059
30360	0.061
30420	0.059
30480	0.057
30540	0.05
30600	0.047
30660	0.046
30720	0.05
30780	0.06
30840	0.065
30900	0.072
30960	0.07
31020	0.075
31080	0.074
31140	0.075
31200	0.077

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
	31260	0.078
	31320	0.072
	31380	0.073
	31440	0.073
	31500	0.07
	31560	0.072
	31620	0.069
	31680	0.069
	31740	0.071
	31800	0.074
	31860	0.078
	31920	0.076
	31980	0.077
	32040	0.083
	32100	0.086
	32160	0.087
	32220	0.088
	32280	0.089
	32340	0.086
	32400	0.085
	32460	0.088
	32520	0.089
	32580	0.092
	32640	0.093
	32700	0.093
	32760	0.09
	32820	0.081
	32880	0.075
	32940	0.071
	33000	0.068
	33060	0.066
	33120	0.063
	33180	0.077
	33240	0.087
	33300	0.091
	33360	0.088
	33420	0.088
	33480	0.089
	33540	0.09
	33600	0.091
	33660	0.091
	33720	0.094
	33780	0.092
	33840	0.09
	33900	0.087



Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
	33960	0.086
	34020	0.086
	34080	0.084
	34140	0.083
	34200	0.084
	34260	0.086
	34320	0.09
	34380	0.084
	34440	0.083
	34500	0.08
	34560	0.077
	34620	0.082
	34680	0.082
	34740	0.083
	34800	0.084
	34860	0.085
	34920	0.091
	34980	0.09
	35040	0.09
	35100	0.091
	35160	0.09
	35220	0.089
	35280	0.084
	35340	0.082
	35400	0.082
	35460	0.079
	35520	0.078
	35580	0.079
	35640	0.082
	35700	0.08
	35760	0.076
	35820	0.069
	35880	0.064
	35940	0.059
	36000	0.061
	36060	0.059
	36120	0.057
	36180	0.066
	36240	0.071
	36300	0.073
	36360	0.075
	36420	0.077
	36480	0.081
	36540	0.081
	36600	0.08

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
36660	0.071
36720	0.069
36780	0.07
36840	0.073
36900	0.073
36960	0.07
37020	0.065
37080	0.062
37140	0.062
37200	0.071
37260	0.073
37320	0.072
37380	0.071
37440	0.069
37500	0.067
37560	0.067
37620	0.068
37680	0.069
37740	0.071
37800	0.067
37860	0.06
37920	0.061
37980	0.066
38040	0.067
38100	0.068
38160	0.069
38220	0.07
38280	0.071
38340	0.072
38400	0.071
38460	0.071
38520	0.07
38580	0.07
38640	0.07
38700	0.071
38760	0.07
38820	0.073
38880	0.074
38940	0.073
39000	0.071
39060	0.07
39120	0.068
39180	0.066
39240	0.067
39300	0.069

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
39360	0.07
39420	0.068
39480	0.068
39540	0.07
39600	0.071
39660	0.071
39720	0.072
39780	0.069
39840	0.067
39900	0.064
39960	0.062
40020	0.062
40080	0.066
40140	0.064
40200	0.064
40260	0.063
40320	0.062
40380	0.065
40440	0.067
40500	0.066
40560	0.064
40620	0.063
40680	0.063
40740	0.065
40800	0.067
40860	0.07
40920	0.071
40980	0.07
41040	0.07
41100	0.068
41160	0.067
41220	0.068
41280	0.069
41340	0.062
41400	0.059
41460	0.063
41520	0.067
41580	0.066
41640	0.067
41700	0.067
41760	0.068
41820	0.071
41880	0.068
41940	0.067
42000	0.065

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
42060	0.065
42120	0.068
42180	0.069
42240	0.067
42300	0.066
42360	0.067
42420	0.065
42480	0.065
42540	0.065
42600	0.068
42660	0.064
42720	0.063
42780	0.065
42840	0.062
42900	0.06
42960	0.06
43020	0.06
43080	0.062
43140	0.064
43200	0.065
43260	0.067
43320	0.067
43380	0.068
43440	0.068
43500	0.07
43560	0.068
43620	0.068
43680	0.067
43740	0.067
43800	0.075
43860	0.074
43920	0.071
43980	0.067
44040	0.066
44100	0.065
44160	0.065
44220	0.064
44280	0.063
44340	0.062
44400	0.064
44460	0.063
44520	0.066
44580	0.065
44640	0.059
44700	0.052

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
44760		0.045
44820		0.046
44880		0.043
44940		0.04
45000		0.036
45060		0.041
45120		0.045
45180		0.046
45240		0.045
45300		0.046
45360		0.036
45420		0.036
45480		0.034
45540		0.034
45600		0.034
45660		0.032
45720		0.034
45780		0.033
45840		0.032
45900		0.032
45960		0.034
46020		0.034
46080		0.046
46140		0.041
46200		0.037
46260		0.039
46320		0.034
46380		0.03
46440		0.029
46500		0.027
46560		0.028
46620		0.034
46680		0.037
46740		0.034
46800		0.032
46860		0.035
46920		0.032
46980		0.03
47040		0.03
47100		0.032
47160		0.033
47220		0.033
47280		0.03
47340		0.029
47400		0.031

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
47460	0.031
47520	0.03
47580	0.03
47640	0.027
47700	0.026
47760	0.025
47820	0.025
47880	0.025
47940	0.027
48000	0.033
48060	0.036
48120	0.036
48180	0.035
48240	0.034
48300	0.036
48360	0.035
48420	0.035
48480	0.03
48540	0.03
48600	0.031
48660	0.032
48720	0.035
48780	0.035
48840	0.032
48900	0.034
48960	0.035
49020	0.036
49080	0.033
49140	0.035
49200	0.034
49260	0.032
49320	0.034
49380	0.035
49440	0.038
49500	0.038
49560	0.038
49620	0.034
49680	0.032
49740	0.032
49800	0.031
49860	0.033
49920	0.033
49980	0.035
50040	0.034
50100	0.033

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
50160		0.033
50220		0.034
50280		0.035
50340		0.035
50400		0.036
50460		0.037
50520		0.035
50580		0.039
50640		0.038
50700		0.036
50760		0.037
50820		0.039
50880		0.037
50940		0.035
51000		0.034
51060		0.035
51120		0.033
51180		0.032
51240		0.034
51300		0.036
51360		0.036
51420		0.035
51480		0.036
51540		0.036
51600		0.034
51660		0.033
51720		0.032
51780		0.029
51840		0.028
51900		0.03
51960		0.034
52020		0.04
52080		0.039
52140		0.042
52200		0.041
52260		0.042
52320		0.055
52380		0.037
52440		0.034
52500		0.035
52560		0.035
52620		0.036
52680		0.037
52740		0.036
52800		0.033

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
	52860	0.033
	52920	0.031
	52980	0.031
	53040	0.032
	53100	0.033
	53160	0.035
	53220	0.034
	53280	0.033
	53340	0.031
	53400	0.035
	53460	0.033
	53520	0.034
	53580	0.034
	53640	0.035
	53700	0.035
	53760	0.036
	53820	0.036
	53880	0.036
	53940	0.036
	54000	0.036
	54060	0.035
	54120	0.036
	54180	0.035
	54240	0.035
	54300	0.037
	54360	0.036
	54420	0.036
	54480	0.035
	54540	0.034
	54600	0.035
	54660	0.034
	54720	0.034
	54780	0.034
	54840	0.032
	54900	0.031
	54960	0.031
	55020	0.029
	55080	0.029
	55140	0.028
	55200	0.027
	55260	0.026
	55320	0.025
	55380	0.025
	55440	0.023
	55500	0.022



Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
55560	0.022
55620	0.021
55680	0.02
55740	0.02
55800	0.019
55860	0.018
55920	0.017
55980	0.017
56040	0.018
56100	0.016
56160	0.017
56220	0.016
56280	0.016
56340	0.015
56400	0.015
56460	0.015
56520	0.015
56580	0.015
56640	0.015
56700	0.014
56760	0.014
56820	0.014
56880	0.013
56940	0.013
57000	0.013
57060	0.013
57120	0.013
57180	0.013
57240	0.013
57300	0.012
57360	0.012
57420	0.012
57480	0.012
57540	0.012
57600	0.012
57660	0.011
57720	0.012
57780	0.011
57840	0.011
57900	0.011
57960	0.011
58020	0.011
58080	0.011
58140	0.011
58200	0.01

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
58260	0.01
58320	0.01
58380	0.01
58440	0.01
58500	0.01
58560	0.01
58620	0.01
58680	0.01
58740	0.01
58800	0.01
58860	0.01
58920	0.01
58980	0.01
59040	0.01
59100	0.01
59160	0.01
59220	0.01
59280	0.01
59340	0.01
59400	0.01
59460	0.01
59520	0.01
59580	0.01
59640	0.01
59700	0.01
59760	0.01
59820	0.01
59880	0.01
59940	0.01
60000	0.01
60060	0.01
60120	0.01
60180	0.01
60240	0.01
60300	0.01
60360	0.01
60420	0.01
60480	0.01
60540	0.01
60600	0.01
60660	0.01
60720	0.01
60780	0.01
60840	0.009
60900	0.009

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
60960	0.009
61020	0.009
61080	0.009
61140	0.009
61200	0.009
61260	0.01
61320	0.009
61380	0.009
61440	0.009
61500	0.009
61560	0.009
61620	0.009
61680	0.009
61740	0.009
61800	0.009
61860	0.009
61920	0.009
61980	0.009
62040	0.008
62100	0.009
62160	0.009
62220	0.009
62280	0.008
62340	0.009
62400	0.008
62460	0.008
62520	0.009
62580	0.012
62640	0.013
62700	0.016
62760	0.011
62820	0.016
62880	0.015
62940	0.016
63000	0.015
63060	0.014
63120	0.013
63180	0.013
63240	0.013
63300	0.013
63360	0.012
63420	0.013
63480	0.013
63540	0.013
63600	0.013

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
63660	0.014
63720	0.013
63780	0.013
63840	0.013
63900	0.013
63960	0.012
64020	0.014
64080	0.012
64140	0.012
64200	0.011
64260	0.013
64320	0.016
64380	0.014
64440	0.014
64500	0.014
64560	0.014
64620	0.015
64680	0.014
64740	0.014
64800	0.015
64860	0.017
64920	0.021
64980	0.023
65040	0.027
65100	0.032
65160	0.03
65220	0.037
65280	0.034
65340	0.032
65400	0.029
65460	0.027
65520	0.024
65580	0.023
65640	0.023
65700	0.022
65760	0.021
65820	0.021
65880	0.021
65940	0.02
66000	0.019
66060	0.02
66120	0.021
66180	0.02
66240	0.02
66300	0.02

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
66360	0.02
66420	0.02
66480	0.02
66540	0.021
66600	0.02
66660	0.022
66720	0.022
66780	0.021
66840	0.023
66900	0.024
66960	0.024
67020	0.024
67080	0.023
67140	0.023
67200	0.023
67260	0.023
67320	0.024
67380	0.025
67440	0.03
67500	0.035
67560	0.038
67620	0.035
67680	0.031
67740	0.03
67800	0.028
67860	0.028
67920	0.027
67980	0.026
68040	0.026
68100	0.025
68160	0.025
68220	0.032
68280	0.031
68340	0.03
68400	0.028
68460	0.027
68520	0.026
68580	0.026
68640	0.026
68700	0.027
68760	0.027
68820	0.026
68880	0.028
68940	0.038
69000	0.04

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
69060	0.045
69120	0.047
69180	0.046
69240	0.05
69300	0.05
69360	0.05
69420	0.043
69480	0.042
69540	0.04
69600	0.037
69660	0.035
69720	0.034
69780	0.034
69840	0.033
69900	0.044
69960	0.051
70020	0.05
70080	0.05
70140	0.054
70200	0.056
70260	0.057
70320	0.057
70380	0.055
70440	0.058
70500	0.054
70560	0.055
70620	0.059
70680	0.063
70740	0.063
70800	0.063
70860	0.061
70920	0.059
70980	0.062
71040	0.064
71100	0.062
71160	0.062
71220	0.063
71280	0.064
71340	0.071
71400	0.073
71460	0.073
71520	0.071
71580	0.071
71640	0.072
71700	0.077

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
71760	0.082
71820	0.08
71880	0.077
71940	0.079
72000	0.074
72060	0.071
72120	0.075
72180	0.076
72240	0.077
72300	0.075
72360	0.077
72420	0.076
72480	0.078
72540	0.081
72600	0.078
72660	0.078
72720	0.079
72780	0.084
72840	0.086
72900	0.087
72960	0.084
73020	0.081
73080	0.08
73140	0.08
73200	0.082
73260	0.081
73320	0.081
73380	0.081
73440	0.082
73500	0.08
73560	0.08
73620	0.08
73680	0.082
73740	0.085
73800	0.084
73860	0.083
73920	0.081
73980	0.079
74040	0.075
74100	0.075
74160	0.077
74220	0.072
74280	0.069
74340	0.071
74400	0.074

Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results	
Location	Montgomery South Station	
	74460	0.077
	74520	0.077
	74580	0.078
	74640	0.082
	74700	0.082
	74760	0.081
	74820	0.081
	74880	0.081
	74940	0.079
	75000	0.078
	75060	0.082
	75120	0.08
	75180	0.086
	75240	0.087
	75300	0.085
	75360	0.083
	75420	0.083
	75480	0.083
	75540	0.087
	75600	0.085
	75660	0.087
	75720	0.087
	75780	0.089
	75840	0.09
	75900	0.09
	75960	0.091
	76020	0.096
	76080	0.096
	76140	0.092
	76200	0.095
	76260	0.095
	76320	0.099
	76380	0.113
	76440	0.111
	76500	0.116
	76560	0.115
	76620	0.114
	76680	0.108
	76740	0.114
	76800	0.114
	76860	0.107
	76920	0.114
	76980	0.11
	77040	0.101
	77100	0.1



Instrument Name	DustTrak II PM <sub>10</sub> Respirable Dust Results
Location	Montgomery South Station
77160	0.099
77220	0.103
77280	0.111
77340	0.109
77400	0.105
77460	0.104
77520	0.105
77580	0.102
77640	0.105
77700	0.107
77760	0.107
77820	0.096
77880	0.095
77940	0.097
78000	0.094
78060	0.096
78120	0.08
78180	0.058
78240	0.046
78300	0.042
78360	0.043
78420	0.041
78480	0.042
78540	0.044
78600	0.048
78660	0.058
78720	0.063
78780	0.062
78840	0.062
78900	0.063
78960	0.064
79020	0.071
79080	0.072
79140	0.079
79200	0.079
79260	0.083
79320	0.089
79380	0.086
79440	0.088
79500	0.088
79560	0.092
79620	0.089
79680	0.09
79740	0.091
79800	0.092

Instrument Name            DustTrak II PM<sub>10</sub> Respirable Dust Results  
Location                    Montgomery South Station

79860	0.097
79920	0.098
79980	0.099
80040	0.102
80100	0.1
80160	0.1
80220	0.099
80280	0.101
80340	0.097
80400	0.099
80460	0.097

**Attachment 3**

**San Francisco Line Spot Sampling Results for PM<sub>10</sub> and PM<sub>2.5</sub>**

Spot Dust Readings  
 SCA Project No. K-119

Station	Date	Time	Location	PM <sub>10</sub> Concentrations	
				Max	Avg.
CAAQS Std. <sup>(1)</sup>					0.05
Cal/OSHA 8-hr. PEL Respirable Dust <sup>(2)</sup>					5
19th St.	2/22/2016	8:13 a.m.	Agent Booth	0.055	0.052
19th St.	2/22/2016	8:19 a.m.	Lower Trackside	0.081	0.071
12th St.	2/22/2016	8:23 a.m.	Trackside	0.11	0.009
12th St.	2/22/2016	8:43 a.m.	Ticket Machines	0.065	0.065
12th St.	2/22/2016	8:47 a.m.	Agent Booth	0.045	0.042
Montgomery	2/22/2016	9:57 a.m.	North Station Agent Booth	0.081	0.052
Montgomery	2/22/2016	10:02 a.m.	North Ticket Machines	0.081	0.044
Montgomery	2/22/2016	10:27 a.m.	Lower Level Trackway	0.136	0.104
Powell	2/22/2016	10:56 a.m.	Police Squad Room	0.134	0.036
Powell	2/22/2016	11:00 a.m.	Ticket Machines	0.082	0.079
Powell	2/22/2016	11:04 a.m.	South Agent Booth	0.094	0.045
Powell	2/22/2016	11:27 a.m.	Lower Level Trackway	0.084	0.066
16th St.	2/22/2016	11:49 a.m.	Agent Booth	0.138	0.063
16th St.	2/22/2016	11:53 a.m.	Ticket Machines	0.05	0.031
16th St.	2/22/2016	11:58 a.m.	Trackway	0.155	0.085
24th St.	2/22/2016	12:16 p.m.	Ticket Machines	0.131	0.064
24th St.	2/22/2016	12:21 p.m.	Agent Booth	0.1	0.052
24th St.	2/22/2016	12:27 p.m.	Trackway	0.136	0.092
Civic Center	2/22/2016	1:09 p.m.	North Agent Booth	0.128	0.081
Civic Center	2/22/2016	1:13 p.m.	North Ticket Machines	0.133	0.094
Civic Center	2/22/2016	1:18 p.m.	Lower Trackway	0.111	0.087
Embarcadero	2/22/2016	1:28 p.m.	Trackway	0.159	0.118
Embarcadero	2/22/2016	1:34 p.m.	South Agent Booth	0.07	0.041
Embarcadero	2/22/2016	1:36 p.m.	South Ticket Machines	0.077	0.018
			Maximum	0.159	0.118
			Minimum	0.045	0.009
			Average	0.102	0.062

Source: (1) California Environmental Protection Agency Air Resources Board, April 25, 200  
<http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm>  
 (2) Table AC-1 Permissible Exposure Limits for Chemical Contaminants  
[https://www.dir.ca.gov/title8/5155table\\_ac1.html](https://www.dir.ca.gov/title8/5155table_ac1.html)

(mg/m <sup>3</sup> )	PM <sub>2.5</sub> Concentrations (mg/m <sup>3</sup> )		
Min.	Max	Avg.	Min
		0.035	
		---	
0.048	0.035	0.033	0.029
0.061	0.065	0.048	0.035
0.077	0.065	0.055	0.044
0.065	0.034	0.034	0.034
0.039	0.034	0.03	0.026
0.036	0.043	0.036	0.033
0.018	0.073	0.058	0.052
0.076	0.08	0.057	0.07
0.022	0.026	0.02	0.017
0.045	0.057	0.05	0.044
0.017	0.045	0.031	0.013
0.048	0.054	0.044	0.035
0.033	0.071	0.044	0.025
0.013	0.08	0.043	0.017
0.032	0.082	0.061	0.025
0.031	0.06	0.04	0.017
0.015	0.055	0.036	0.012
0.04	0.081	0.072	0.05
0.056	0.067	0.05	0.039
0.057	0.079	0.06	0.037
0.066	0.076	0.053	0.046
0.089	0.08	0.071	0.051
0.023	0.046	0.031	0.019
0.007	0.013	0.008	0.004
0.089	0.082	0.072	0.07
0.007	0.013	0.008	0.004
0.042	0.058	0.044	0.032

**Attachment 4**

**CAM-17 Settled Dust Metals Analyses – Montgomery, Powell & Civic Center Stations**



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1602945

**Report Created for:** SCA Enviromental, Inc.

1 Lakeside Drive, Suite 215  
Oakland, CA 94612

**Project Contact:** Glenn Cass

**Project P.O.:** K11983

**Project Name:** K11983

**Project Received:** 02/23/2016

Analytical Report reviewed & approved for release on 03/01/2016 by:

Angela Rydelius,  
Laboratory Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.*





## Glossary of Terms & Qualifier Definitions

**Client:** SCA Enviromental, Inc.  
**Project:** K11983  
**WorkOrder:** 1602945

### Glossary Abbreviation

95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

### Analytical Qualifiers

a16 reporting limit raised due to high metals content





## **Glossary of Terms & Qualifier Definitions**

**Client:** SCA Enviromental, Inc.  
**Project:** K11983  
**WorkOrder:** 1602945

### **Quality Control Qualifiers**

F8 MS/MSD recovery and/or RPD was out of acceptance criteria; PDS validated the prep batch. If PDS recovery was out of acceptance criteria, DLT validated the prep batch.



## Analytical Report

**Client:** SCA Enviromental, Inc.  
**Date Received:** 2/23/16 19:53  
**Date Prepared:** 2/23/16-2/26/16  
**Project:** K11983

**WorkOrder:** 1602945  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Mont-Soot-202-1	1602945-001A	Solid	02/22/2016 10:30	ICP-MS1	117119

Analytes	Result	RL	DF	Date Analyzed
Antimony	21	0.50	1	02/25/2016 23:29
Arsenic	11	0.50	1	02/25/2016 23:29
Barium	160	5.0	1	02/25/2016 23:29
Beryllium	ND	0.50	1	02/25/2016 23:29
Cadmium	45	0.25	1	02/25/2016 23:29
Chromium	98	0.50	1	02/25/2016 23:29
Cobalt	14	0.50	1	02/25/2016 23:29
Copper	530	5.0	10	02/25/2016 19:56
Lead	170	0.50	1	02/25/2016 23:29
Mercury	0.32	0.050	1	02/25/2016 23:29
Molybdenum	17	0.50	1	02/25/2016 23:29
Nickel	52	0.50	1	02/25/2016 23:29
Selenium	ND	0.50	1	02/25/2016 23:29
Silver	0.99	0.50	1	02/25/2016 23:29
Thallium	ND	0.50	1	02/25/2016 23:29
Vanadium	12	0.50	1	02/25/2016 23:29
Zinc	8400	50	10	02/25/2016 19:56

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	99	70-130	02/25/2016 23:29

Analyst(s): DVH



# Analytical Report

**Client:** SCA Enviromental, Inc.  
**Date Received:** 2/23/16 19:53  
**Date Prepared:** 2/23/16-2/26/16  
**Project:** K11983

**WorkOrder:** 1602945  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

## CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Powell-Soot-302-1	1602945-002A	Solid	02/22/2016 11:30	ICP-MS1	117119

Analytes	Result	RL	DF	Date Analyzed
Antimony	40	0.50	1	02/25/2016 23:42
Arsenic	25	0.50	1	02/25/2016 23:42
Barium	570	5.0	1	02/25/2016 23:42
Beryllium	ND	0.50	1	02/25/2016 23:42
Cadmium	390	0.25	1	02/25/2016 23:42
Chromium	670	5.0	10	02/25/2016 20:02
Cobalt	21	0.50	1	02/25/2016 23:42
Copper	3100	5.0	10	02/25/2016 20:02
Lead	410	0.50	1	02/25/2016 23:42
Mercury	0.58	0.050	1	02/25/2016 23:42
Molybdenum	100	0.50	1	02/25/2016 23:42
Nickel	430	0.50	1	02/25/2016 23:42
Selenium	ND	0.50	1	02/25/2016 23:42
Silver	1.9	0.50	1	02/25/2016 23:42
Thallium	ND	0.50	1	02/25/2016 23:42
Vanadium	22	0.50	1	02/25/2016 23:42
Zinc	12,000	50	10	02/25/2016 20:02

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	105	70-130	02/25/2016 23:42

Analyst(s): DVH



## Analytical Report

**Client:** SCA Enviromental, Inc.  
**Date Received:** 2/23/16 19:53  
**Date Prepared:** 2/23/16-2/26/16  
**Project:** K11983

**WorkOrder:** 1602945  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Civic-Soot-402-1	1602945-003A	Solid	02/22/2016 13:00	ICP-MS2	117260

Analytes	Result	RL	DF	Date Analyzed
Antimony	17,000	25	50	02/26/2016 17:52
Arsenic	75	2.5	5	02/26/2016 11:10
Barium	1500	25	5	02/26/2016 11:10
Beryllium	ND	2.5	5	02/26/2016 11:10
Cadmium	ND	1.2	5	02/26/2016 11:10
Chromium	310	2.5	5	02/26/2016 11:10
Cobalt	19	2.5	5	02/26/2016 11:10
Copper	8100	25	50	02/26/2016 17:52
Lead	420	2.5	5	02/26/2016 11:10
Mercury	0.43	0.25	5	02/26/2016 11:10
Molybdenum	84	2.5	5	02/26/2016 11:10
Nickel	230	2.5	5	02/26/2016 11:10
Selenium	ND	2.5	5	02/26/2016 11:10
Silver	8.1	2.5	5	02/26/2016 11:10
Thallium	ND	2.5	5	02/26/2016 11:10
Vanadium	16	2.5	5	02/26/2016 11:10
Zinc	1800	25	5	02/26/2016 11:10

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	116	70-130	02/26/2016 11:10

**Analyst(s):** AC, BBO

**Analytical Comments:** a16



## Quality Control Report

**Client:** SCA Enviromental, Inc.  
**Date Prepared:** 2/23/16  
**Date Analyzed:** 2/24/16  
**Instrument:** ICP-MS2  
**Matrix:** Soil  
**Project:** K11983

**WorkOrder:** 1602945  
**BatchID:** 117119  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS-117119  
 1602930-001AMS/MSD  
 1602930-001APDS

### QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Antimony	ND	49.8	0.50	50	-	100	75-125
Arsenic	ND	51.6	0.50	50	-	103	75-125
Barium	ND	513	5.0	500	-	103	75-125
Beryllium	ND	50.8	0.50	50	-	102	75-125
Cadmium	ND	50.4	0.25	50	-	101	75-125
Chromium	ND	51.3	0.50	50	-	103	75-125
Cobalt	ND	48.4	0.50	50	-	97	75-125
Copper	ND	52.7	0.50	50	-	105	75-125
Lead	ND	49.5	0.50	50	-	99	75-125
Mercury	ND	1.17	0.050	1.25	-	94	75-125
Molybdenum	ND	48.8	0.50	50	-	98	75-125
Nickel	ND	52.7	0.50	50	-	105	75-125
Selenium	ND	51.7	0.50	50	-	103	75-125
Silver	ND	49.6	0.50	50	-	99	75-125
Thallium	ND	51.1	0.50	50	-	102	75-125
Vanadium	ND	51.2	0.50	50	-	102	75-125
Zinc	ND	520	5.0	500	-	104	75-125
<b>Surrogate Recovery</b>							
Terbium	513	498		500	103	100	70-130



## Quality Control Report

**Client:** SCA Enviromental, Inc.  
**Date Prepared:** 2/23/16  
**Date Analyzed:** 2/24/16  
**Instrument:** ICP-MS2  
**Matrix:** Soil  
**Project:** K11983

**WorkOrder:** 1602945  
**BatchID:** 117119  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS-117119  
 1602930-001AMS/MSD  
 1602930-001APDS

### QC Summary Report for Metals

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	49.5	51.0	50	ND	99	102	75-125	3.08	20
Arsenic	55.6	55.2	50	5.709	100	99	75-125	0.704	20
Barium	616	774	500	91.16	105	137,F8	75-125	22.8,F8	20
Beryllium	51.2	51.8	50	ND	102	103	75-125	1.32	20
Cadmium	49.8	49.1	50	ND	99	98	75-125	1.38	20
Chromium	84.1	116	50	40.12	88	153,F8	75-125	32.2,F8	20
Cobalt	58.4	63.0	50	13.74	89	98	75-125	7.55	20
Copper	70.6	85.4	50	21.59	98	128,F8	75-125	19.0	20
Lead	54.8	60.0	50	6.298	97	107	75-125	8.92	20
Mercury	1.33	1.40	1.25	0.2199	89	94	75-125	5.20	20
Molybdenum	48.4	49.7	50	ND	96	99	75-125	2.63	20
Nickel	118	142	50	42.60	151,F8	199,F8	75-125	18.6	20
Selenium	50.8	49.9	50	ND	101	100	75-125	1.81	20
Silver	49.0	49.4	50	ND	98	99	75-125	0.772	20
Thallium	51.6	50.3	50	ND	103	101	75-125	2.45	20
Vanadium	116	127	50	86.84	57,F8	81	75-125	9.80	20
Zinc	556	573	500	52.57	101	104	75-125	3.08	20

#### Surrogate Recovery

Terbium	502	516	500		100	103	70-130	2.67	20
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Analyte	PDS Result	SPK Val	SPKRef Val	PDS %REC	PDS Limits
Barium	675	500	91.16	117	80-120
Chromium	93.0	50	40.12	106	80-120
Copper	78.1	50	21.59	113	80-120
Nickel	102	50	42.60	118	80-120
Vanadium	142	50	86.84	110	80-120

(Cont.)



## Quality Control Report

**Client:** SCA Enviromental, Inc.  
**Date Prepared:** 2/25/16  
**Date Analyzed:** 2/26/16  
**Instrument:** ICP-MS1  
**Matrix:** Soil  
**Project:** K11983

**WorkOrder:** 1602945  
**BatchID:** 117260  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS-117260  
 1602A64-001AMS/MSD  
 1602A64-001APDS

### QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Antimony	ND	50.5	0.50	50	-	101	75-125
Arsenic	ND	52.1	0.50	50	-	104	75-125
Barium	ND	533	5.0	500	-	107	75-125
Beryllium	ND	53.0	0.50	50	-	106	75-125
Cadmium	ND	51.1	0.25	50	-	102	75-125
Chromium	ND	51.2	0.50	50	-	102	75-125
Cobalt	ND	54.0	0.50	50	-	108	75-125
Copper	ND	53.1	0.50	50	-	106	75-125
Lead	ND	53.8	0.50	50	-	108	75-125
Mercury	ND	1.19	0.050	1.25	-	95	75-125
Molybdenum	ND	50.8	0.50	50	-	102	75-125
Nickel	ND	52.9	0.50	50	-	106	75-125
Selenium	ND	53.7	0.50	50	-	107	75-125
Silver	ND	51.4	0.50	50	-	103	75-125
Thallium	ND	51.5	0.50	50	-	103	75-125
Vanadium	ND	50.3	0.50	50	-	101	75-125
Zinc	ND	538	5.0	500	-	108	75-125
<b>Surrogate Recovery</b>							
Terbium	515	500		500	103	100	70-130



## Quality Control Report

**Client:** SCA Enviromental, Inc.  
**Date Prepared:** 2/25/16  
**Date Analyzed:** 2/26/16  
**Instrument:** ICP-MS1  
**Matrix:** Soil  
**Project:** K11983

**WorkOrder:** 1602945  
**BatchID:** 117260  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS-117260  
 1602A64-001AMS/MSD  
 1602A64-001APDS

### QC Summary Report for Metals

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	30.2	49.8	50	ND	60,F8	99	75-125	49.1,F8	20
Arsenic	52.4	55.3	50	3.472	98	104	75-125	5.50	20
Barium	535	554	500	19.96	103	107	75-125	3.53	20
Beryllium	50.0	52.5	50	ND	100	105	75-125	5.03	20
Cadmium	47.7	51.0	50	ND	95	102	75-125	6.63	20
Chromium	84.7	85.1	50	31.25	107	108	75-125	0.401	20
Cobalt	54.4	56.6	50	5.024	99	103	75-125	4.07	20
Copper	52.8	55.2	50	3.789	98	103	75-125	4.50	20
Lead	52.8	55.4	50	2.362	101	106	75-125	4.75	20
Mercury	0.749	1.19	1.25	ND	59,F8	94	75-125	45.2,F8	20
Molybdenum	30.4	50.6	50	ND	61,F8	101	75-125	49.9,F8	20
Nickel	73.8	73.5	50	21.91	104	103	75-125	0.353	20
Selenium	50.4	52.7	50	ND	101	105	75-125	4.56	20
Silver	48.2	50.5	50	ND	96	101	75-125	4.69	20
Thallium	48.7	51.4	50	ND	97	103	75-125	5.30	20
Vanadium	83.8	84.0	50	30.89	106	106	75-125	0	20
Zinc	515	539	500	17.40	99	104	75-125	4.59	20

#### Surrogate Recovery

Terbium	506	489	500		101	98	70-130	3.26	20
---------	-----	-----	-----	--	-----	----	--------	------	----

Analyte	PDS Result	SPK Val	SPKRef Val	PDS %REC	PDS Limits
Antimony	54.4	50	ND	109	80-120
Mercury	1.35	1.25	ND	107	80-120
Molybdenum	54.4	50	ND	109	80-120



1534 Willow Pass Rd  
 Pittsburg, CA 94565-1701  
 (925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 1602945

ClientCode: SCAO

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  EQuIS   
 Email   
 HardCopy   
 ThirdParty   
 J-flag

**Report to:**  
 Glenn Cass  
 SCA Enviromental, Inc.  
 1 Lakeside Drive, Suite 215  
 Oakland, CA 94612  
 (510) 645-6200    FAX: (510) 839- 6200

Email: gcass@sca-enviro.com; pgervasio@scaeh  
 cc/3rd Party:  
 PO: K11983  
 ProjectNo: K11983

**Bill to:**  
 Accounts Payable  
 SCA Enviromental, Inc.  
 1 Lakeside Drive, Suite 215  
 Oakland, CA 94612  
 emuise@sca-ic.com

**Requested TAT: 5 days;**  
  
**Date Received: 02/23/2016**  
**Date Logged: 02/23/2016**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1602945-001	Mont-Soot-202-1	Solid	2/22/2016 10:30	<input type="checkbox"/>	A												
1602945-002	Powell-Soot-302-1	Solid	2/22/2016 11:30	<input type="checkbox"/>	A												
1602945-003	Civic-Soot-402-1	Solid	2/22/2016 13:00	<input type="checkbox"/>	A												

**Test Legend:**

1	CAM17MS_TTLC_S	2		3		4	
5		6		7		8	
9		10		11		12	

**Project Manager:**

**Prepared by: Jena Alfaro**

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days). Hazardous samples will be returned to client or disposed of at client expense.



## WORK ORDER SUMMARY

**Client Name:** SCA ENVIROMENTAL, INC.

**QC Level:** LEVEL 2

**Work Order:** 1602945

**Project:** K11983

**Client Contact:** Glenn Cass

**Date Logged:** 2/23/2016

**Comments:**

**Contact's Email:** gcass@sca-enviro.com; pgervasio@scaehs.com

WaterTrax     WriteOn     EDF     Excel     Fax     Email     HardCopy     ThirdParty     J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1602945-001A	Mont-Soot-202-1	Solid	SW6020 (CAM 17)	1	8OZ GJ	<input type="checkbox"/>	2/22/2016 10:30	5 days		<input type="checkbox"/>	
1602945-002A	Powell-Soot-302-1	Solid	SW6020 (CAM 17)	1	8OZ GJ	<input type="checkbox"/>	2/22/2016 11:30	5 days		<input type="checkbox"/>	
1602945-003A	Civic-Soot-402-1	Solid	SW6020 (CAM 17)	1	8OZ GJ	<input type="checkbox"/>	2/22/2016 13:00	5 days		<input type="checkbox"/>	

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.





### Sample Receipt Checklist

Client Name: **SCA Enviromental, Inc.**  
 Project Name: **K11983**  
 WorkOrder №: **1602945** Matrix: Solid  
 Carrier: Bernie Cummins (MAI Courier)

Date and Time Received: **2/23/2016 16:25**  
 Date Logged: **2/23/2016**  
 Received by: **Jena Alfaro**  
 Logged by: **Jena Alfaro**

**Chain of Custody (COC) Information**

Chain of custody present? Yes  No   
 Chain of custody signed when relinquished and received? Yes  No   
 Chain of custody agrees with sample labels? Yes  No   
 Sample IDs noted by Client on COC? Yes  No   
 Date and Time of collection noted by Client on COC? Yes  No   
 Sampler's name noted on COC? Yes  No

**Sample Receipt Information**

Custody seals intact on shipping container/cooler? Yes  No  NA   
 Shipping container/cooler in good condition? Yes  No   
 Samples in proper containers/bottles? Yes  No   
 Sample containers intact? Yes  No   
 Sufficient sample volume for indicated test? Yes  No

**Sample Preservation and Hold Time (HT) Information**

All samples received within holding time? Yes  No   
 Sample/Temp Blank temperature Temp: NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  NA   
 Sample labels checked for correct preservation? Yes  No   
 pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)? Yes  No  NA   
 Samples Received on Ice? Yes  No

**UCMR3 Samples:**

Total Chlorine tested and acceptable upon receipt for EPA 522? Yes  No  NA   
 Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539? Yes  No  NA

\* NOTE: If the "No" box is checked, see comments below.

-----  
 Comments:

**Attachment 5**

**CAM-17 Settled Dust Metals Analyses – Glen Park Station**



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1602801

**Report Created for:** SCA Enviromental, Inc.

1 Lakeside Drive, Suite 215  
Oakland, CA 94612

**Project Contact:** Glenn Cass

**Project P.O.:** B-11978

**Project Name:** B-11978; Bart Glen Park Soot

**Project Received:** 02/19/2016

Analytical Report reviewed & approved for release on 02/26/2016 by:

Angela Rydelius,  
Laboratory Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.*





## Glossary of Terms & Qualifier Definitions

**Client:** SCA Enviromental, Inc.  
**Project:** B-11978; Bart Glen Park Soot  
**WorkOrder:** 1602801

### Glossary Abbreviation

95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

### Analytical Qualifiers

a1 sample diluted due to matrix interference





## Analytical Report

**Client:** SCA Enviromental, Inc.  
**Date Received:** 2/19/16 17:39  
**Date Prepared:** 2/19/16  
**Project:** B-11978; Bart Glen Park Soot

**WorkOrder:** 1602801  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GP-MV-7-S00T	1602801-001A	Solid	02/19/2016 08:15	ICP-MS3	116956
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Antimony	50		5.0	10	02/24/2016 13:44
Arsenic	18		5.0	10	02/24/2016 13:44
Barium	460		50	10	02/24/2016 13:44
Beryllium	ND		5.0	10	02/24/2016 13:44
Cadmium	58		2.5	10	02/24/2016 13:44
Chromium	260		5.0	10	02/24/2016 13:44
Cobalt	30		5.0	10	02/24/2016 13:44
Copper	3700		5.0	10	02/24/2016 13:44
Lead	480		5.0	10	02/24/2016 13:44
Mercury	ND		0.50	10	02/24/2016 13:44
Molybdenum	57		5.0	10	02/24/2016 13:44
Nickel	190		5.0	10	02/24/2016 13:44
Selenium	ND		5.0	10	02/24/2016 13:44
Silver	ND		5.0	10	02/24/2016 13:44
Thallium	ND		5.0	10	02/24/2016 13:44
Vanadium	34		5.0	10	02/24/2016 13:44
Zinc	9800		50	10	02/24/2016 13:44
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Terbium	102		70-130		02/24/2016 13:44
<u>Analyst(s):</u> AC			<u>Analytical Comments:</u> a1		





## Quality Control Report

**Client:** SCA Enviromental, Inc.  
**Date Prepared:** 2/19/16  
**Date Analyzed:** 2/22/16  
**Instrument:** ICP-MS2  
**Matrix:** Soil  
**Project:** B-11978; Bart Glen Park Soot

**WorkOrder:** 1602801  
**BatchID:** 116956  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS-116956  
 1602813-001AMS/MSD

### QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Antimony	ND	51.0	0.50	50	-	102	75-125
Arsenic	ND	45.4	0.50	50	-	91	75-125
Barium	ND	443	5.0	500	-	89	75-125
Beryllium	ND	44.9	0.50	50	-	90	75-125
Cadmium	ND	46.1	0.25	50	-	92	75-125
Chromium	ND	45.1	0.50	50	-	90	75-125
Cobalt	ND	44.4	0.50	50	-	89	75-125
Copper	ND	48.0	0.50	50	-	96	75-125
Lead	ND	44.0	0.50	50	-	88	75-125
Mercury	ND	1.27	0.050	1.25	-	101	75-125
Molybdenum	ND	49.3	0.50	50	-	99	75-125
Nickel	ND	47.1	0.50	50	-	94	75-125
Selenium	ND	46.0	0.50	50	-	92	75-125
Silver	ND	44.3	0.50	50	-	89	75-125
Thallium	ND	42.1	0.50	50	-	84	75-125
Vanadium	ND	45.6	0.50	50	-	91	75-125
Zinc	ND	475	5.0	500	-	95	75-125
<b>Surrogate Recovery</b>							
Terbium	496	502		500	99	100	70-130



## Quality Control Report

**Client:** SCA Enviromental, Inc.  
**Date Prepared:** 2/19/16  
**Date Analyzed:** 2/22/16  
**Instrument:** ICP-MS2  
**Matrix:** Soil  
**Project:** B-11978; Bart Glen Park Soot

**WorkOrder:** 1602801  
**BatchID:** 116956  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS-116956  
 1602813-001AMS/MSD

### QC Summary Report for Metals

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	49.2	53.3	50	ND	98	106	75-125	7.92	20
Arsenic	56.8	50.3	50	6.485	101	88	75-125	12.1	20
Barium	808	854	500	237.3	114	123	75-125	5.55	20
Beryllium	52.6	52.8	50	0.6708	104	104	75-125	0	20
Cadmium	52.8	49.3	50	ND	105	98	75-125	6.89	20
Chromium	105	99.9	50	55.49	100	89	75-125	5.30	20
Cobalt	62.9	60.9	50	14.52	97	93	75-125	3.29	20
Copper	99.9	85.0	50	42.67	114	85	75-125	16.2	20
Lead	61.8	61.8	50	15.24	93	93	75-125	0	20
Mercury	1.33	1.32	1.25	0.05820	102	101	75-125	1.06	20
Molybdenum	50.2	55.4	50	0.8484	99	109	75-125	9.84	20
Nickel	102	97.4	50	54.30	95	86	75-125	4.37	20
Selenium	49.7	48.3	50	ND	99	96	75-125	3.00	20
Silver	51.4	52.5	50	ND	103	105	75-125	2.10	20
Thallium	48.7	49.0	50	ND	97	98	75-125	0.675	20
Vanadium	139	120	50	81.07	116	78	75-125	14.6	20
Zinc	597	542	500	75.24	104	93	75-125	9.75	20
<b>Surrogate Recovery</b>									
Terbium	522	577	500		104	115	70-130	9.88	20



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 1602801

ClientCode: SCAO

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  EQulS   
  Email   
  HardCopy   
  ThirdParty   
  J-flag

**Report to:**

Glenn Cass  
SCA Enviromental, Inc.  
1 Lakeside Drive, Suite 215  
Oakland, CA 94612  
(510) 645-6200    FAX: (510) 839- 6200

Email: gcass@sca-enviro.com; pgervasio@scaeh  
cc/3rd Party:  
PO: B-11978  
ProjectNo: B-11978; Bart Glen Park Soot

**Bill to:**

Accounts Payable  
SCA Enviromental, Inc.  
1 Lakeside Drive, Suite 215  
Oakland, CA 94612  
emuisse@sca-ic.com

**Requested TAT: 5 days;**

**Date Received: 02/19/2016**

**Date Logged: 02/19/2016**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1602801-001	GP-MV-7-S00T	Solid	2/19/2016 8:15	<input type="checkbox"/>	A												

**Test Legend:**

1	CAM17MS_TTLC_S	2		3		4	
5		6		7		8	
9		10		11		12	

**Project Manager:**

**Prepared by: Jena Alfaro**

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



## WORK ORDER SUMMARY

**Client Name:** SCA ENVIROMENTAL, INC.

**QC Level:** LEVEL 2

**Work Order:** 1602801

**Project:** B-11978; Bart Glen Park Soot

**Client Contact:** Glenn Cass

**Date Logged:** 2/19/2016

**Comments:**

**Contact's Email:** gcass@sca-enviro.com; pgervasio@scaehs.com

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  Fax   
 Email   
 HardCopy   
 ThirdParty   
 J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1602801-001A	GP-MV-7-S00T	Solid	SW6020 (CAM 17)	1	8OZ GJ	<input type="checkbox"/>	2/19/2016 8:15	5 days		<input type="checkbox"/>	

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).  
 - MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.



# McCampbell Analytical, Inc.

1534 Willow Pass Rd. / Pittsburg, Ca. 94565-1701  
 www.mccampbell.com / main@mccampbell.com  
 Telephone: (877) 252-9262 / Fax: (925) 252-9269

1602801

## CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH  1 DAY  2 DAY  3 DAY  5 DAY

GeoTracker EDF  PDF  EDD  Write On (DW)  EQuIS  10 DAY

Effluent Sample Requiring "J" flag  UST Clean Up Fund Project ; Claim # \_\_\_\_\_

Report To: Glenn Cass Bill To: Glenn Cass  
 Company: SEA Environmental Inc.

Tele: (510) 517-1119 E-Mail: gcass@sea-enviro.com  
 Project #: B-11978 Project Name: BART Glen Park Spud  
 Project Location: Glen Park, SF, CA Purchase Order# B-11978  
 Sampler Signature: [Signature]

### Analysis Request

SAMPLE ID	Location/ Field Point Name	SAMPLING		# Containers	MATRIX								METHOD PRESERVED			BTEX & TPH as Gas (8021/ 8015) MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 505/ 608 / 8081 (CI Pesticides)	EPA 608 / 8082 PCB's ; Aroclors only	EPA 507 / 8141 (NP Pesticides)	EPA 515 / 8151 (Acidic Cl Herbicides)	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNA3)	CAM 17 Metals (200.8 / 6020)***	LUFT 5 Metals (200.8 / 6020)***	Metals (200.8 / 6020)***	Lab to Filter sample for Dissolved metals analysis	STC-ITCUP (NOTE 1)						
		Date	Time		Ground Water	Waste Water	Drinking Water	Sea Water	Soil	Air	Sludge	Other	HCL	HNO <sub>3</sub>	Other																						
GP-M/V-7-S005	Fan Rem.	2/19/16	8:15A	1										X																				X			

\*\*MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate \$250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

\*\*\* If metals are requested for water samples and the water type is not specified on the chain of custody, then MAI will default to metals by E200.8.

Relinquished By: <u>[Signature]</u>	Date: <u>2/19/16</u>	Time: <u>9:30 AM</u>	Received By: <u>[Signature]</u>
Relinquished By: <u>[Signature]</u>	Date: <u>2/19/16</u>	Time: <u>11:45</u>	Received By: <u>[Signature]</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____

ICE/P: \_\_\_\_\_  
 GOOD CONDITION \_\_\_\_\_  
 HEAD SPACE ABSENT \_\_\_\_\_  
 DECHLORINATED IN LAB \_\_\_\_\_  
 APPROPRIATE CONTAINERS \_\_\_\_\_  
 PRESERVED IN LAB \_\_\_\_\_

Notes: Reanalyze leachability for any metals over 10% of title 22 TRL std.

COMMENTS: \_\_\_\_\_

VOAS O&G METALS OTHER HAZARDOUS:  
 PRESERVATION \_\_\_\_\_ pH < 2 \_\_\_\_\_



### Sample Receipt Checklist

Client Name: **SCA Enviromental, Inc.**  
 Project Name: **B-11978; Bart Glen Park Soot**  
 WorkOrder №: **1602801** Matrix: Solid  
 Carrier: Bernie Cummins (MAI Courier)

Date and Time Received: **2/19/2016 14:45**  
 Date Logged: **2/19/2016**  
 Received by: **Jena Alfaro**  
 Logged by: **Jena Alfaro**

#### Chain of Custody (COC) Information

Chain of custody present? Yes  No   
 Chain of custody signed when relinquished and received? Yes  No   
 Chain of custody agrees with sample labels? Yes  No   
 Sample IDs noted by Client on COC? Yes  No   
 Date and Time of collection noted by Client on COC? Yes  No   
 Sampler's name noted on COC? Yes  No

#### Sample Receipt Information

Custody seals intact on shipping container/cooler? Yes  No  NA   
 Shipping container/cooler in good condition? Yes  No   
 Samples in proper containers/bottles? Yes  No   
 Sample containers intact? Yes  No   
 Sufficient sample volume for indicated test? Yes  No

#### Sample Preservation and Hold Time (HT) Information

All samples received within holding time? Yes  No   
 Sample/Temp Blank temperature Temp: NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  NA   
 Sample labels checked for correct preservation? Yes  No   
 pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)? Yes  No  NA   
 Samples Received on Ice? Yes  No

#### UCMR3 Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522? Yes  No  NA   
 Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539? Yes  No  NA

\* NOTE: If the "No" box is checked, see comments below.

-----  
 Comments:



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1602801 A

**Report Created for:** SCA Enviromental, Inc.

1 Lakeside Drive, Suite 215  
Oakland, CA 94612

**Project Contact:** Glenn Cass

**Project P.O.:** B-11978

**Project Name:** B-11978; Bart Glen Park Soot

**Project Received:** 02/19/2016

Analytical Report reviewed & approved for release on 03/03/2016 by:

Angela Rydelius,  
Laboratory Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.*







## Glossary of Terms & Qualifier Definitions

**Client:** SCA Enviromental, Inc.  
**Project:** B-11978; Bart Glen Park Soot  
**WorkOrder:** 1602801

### Glossary Abbreviation

95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

### Analytical Qualifiers

a1 sample diluted due to matrix interference





# Analytical Report

**Client:** SCA Enviromental, Inc.

**WorkOrder:** 1602801

**Date Received:** 2/19/16 17:39

**Extraction Method:** CA Title 22

**Date Prepared:** 2/29/16

**Analytical Method:** SW6020

**Project:** B-11978; Bart Glen Park Soot

**Unit:** mg/L

## STLC Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GP-MV-7-S00T	1602801-001A	Solid	02/19/2016 08:15	ICP-MS3	117373

Analytes	Result	RL	DF	Date Analyzed
Cadmium	2.9	0.050	1	03/03/2016 00:02
Chromium	9.2	0.10	1	03/03/2016 00:02
Copper	6.1	0.10	1	03/03/2016 00:02
Lead	1.7	0.10	1	03/03/2016 00:02
Zinc	790	1.0	1	03/03/2016 00:02

**Analyst(s):** BBO



# Analytical Report

**Client:** SCA Enviromental, Inc.

**WorkOrder:** 1602801

**Date Received:** 2/19/16 17:39

**Extraction Method:** SW1311/SW3010

**Date Prepared:** 2/29/16

**Analytical Method:** SW6020

**Project:** B-11978; Bart Glen Park Soot

**Unit:** mg/L

## TCLP Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GP-MV-7-S00T	1602801-001A	Solid	02/19/2016 08:15	ICP-MS2	117374

Analytes	Result	RL	DF	Date Analyzed
Lead	0.14	0.10	1	03/01/2016 21:26

Analyst(s): BBO



## Quality Control Report

**Client:** SCA Enviromental, Inc.

**WorkOrder:** 1602801

**Date Prepared:** 2/29/16

**BatchID:** 117373

**Date Analyzed:** 3/2/16

**Extraction Method:** CA Title 22

**Instrument:** ICP-MS3

**Analytical Method:** SW6020

**Matrix:** Soil

**Unit:** mg/L

**Project:** B-11978; Bart Glen Park Soot

**Sample ID:** MB/LCS-117373

### QC Summary Report for Metals (STLC)

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Cadmium	ND	10.0	0.050	10	-	100	75-125
Chromium	ND	9.85	0.10	10	-	99	75-125
Copper	ND	10.1	0.10	10	-	101	75-125
Lead	ND	9.22	0.10	10	-	92	75-125
Zinc	ND	101	1.0	100	-	101	75-125



## Quality Control Report

**Client:** SCA Enviromental, Inc.

**WorkOrder:** 1602801

**Date Prepared:** 2/29/16

**BatchID:** 117374

**Date Analyzed:** 3/1/16

**Extraction Method:** SW1311/SW3010

**Instrument:** ICP-MS2

**Analytical Method:** SW6020

**Matrix:** Soil

**Unit:** mg/L

**Project:** B-11978; Bart Glen Park Soot

**Sample ID:** MB/LCS-117374

1602B46-002AMS/MSD

### QC Summary Report for Metals (TCLP)

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Lead	ND	10.1	0.10	10	-	101	75-125

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Lead	9.38	9.62	10	ND	94	96	75-125	2.57	20



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 1602801 **A** ClientCode: SCAO

WaterTrax  
  WriteOn  
  EDF  
  Excel  
  Fax  
 Email  
  HardCopy  
  ThirdParty  
  J-flag

**Report to:**  
 Glenn Cass  
 SCA Enviromental, Inc.  
 1 Lakeside Drive, Suite 215  
 Oakland, CA 94612  
 (510) 645-6200    FAX: (510) 839- 6200

**Email:**    gcass@sca-enviro.com; pgervasio@scaeh  
 cc/3rd Party:  
**PO:**        B-11978  
**ProjectNo:** B-11978; Bart Glen Park Soot

**Bill to:**  
 Accounts Payable  
 SCA Enviromental, Inc.  
 1 Lakeside Drive, Suite 215  
 Oakland, CA 94612  
 emuise@sca-ic.com

**Requested TAT:**    **5 days;**  
  
**Date Received:**    **02/19/2016**  
**Date Logged:**        **02/19/2016**  
**Date Add-On:**        **02/26/2016**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1602801-001	GP-MV-7-S00T	Solid	2/19/2016 8:15	<input type="checkbox"/>	A	A											

**Test Legend:**

1	METALSMS_STLC_S	2	PBMS_TCLP_S	3		4	
5		6		7		8	
9		10		11		12	

**Project Manager:**

**Prepared by: Jena Alfaro**

**Add-On Prepared By: Jena Alfaro**

**Comments:**    STLC Cd Cr Cu Pb Zn & TCLP Pb added 2/26/16 5D TAT

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



## WORK ORDER SUMMARY

**Client Name:** SCA ENVIROMENTAL, INC.

**QC Level:** LEVEL 2

**Work Order:** 1602801

**Project:** B-11978; Bart Glen Park Soot

**Client Contact:** Glenn Cass

**Date Logged:** 2/19/2016

**Comments:** STLC Cd Cr Cu Pb Zn & TCLP Pb added 2/26/16 5D TAT

**Contact's Email:** gcass@sca-enviro.com; pgervasio@scaehs.com

**Date Add-On:** 2/26/2016

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1602801-001A	GP-MV-7-S00T	Solid	SW6020 (Lead) (TCLP)	1	8OZ GJ	2/19/2016 8:15	5 days*		<input type="checkbox"/>	
			SW6020 (Metals) (STLC) <Cadmium, Chromium, Copper, Lead, Zinc>				5 days*		<input type="checkbox"/>	

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.



# McC Campbell Analytical, Inc.

1534 Willow Pass Rd. / Pittsburg, Ca. 94565-1701  
 www.mccampbell.com / main@mccampbell.com  
 Telephone: (877) 252-9262 / Fax: (925) 252-9269

1602801

## CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH  1 DAY  2 DAY  3 DAY  5 DAY   
 GeoTracker EDF  PDF  EDD  Write On (DW)  EQUIS  10 DAY   
 Effluent Sample Requiring "J" flag  UST Clean Up Fund Project ; Claim # \_\_\_\_\_

Report To: Glenn Cass Bill To: Glenn Cass  
 Company: SEA Environmental Inc.  
 Tele: (510) 517-1119 E-Mail: gcass@sea-enviro.com  
 Project #: B-11978 Project Name: BART Glen Park Sewer  
 Project Location: Glen Park, SF, CA Purchase Order# B-11978  
 Sampler Signature: [Signature]

### Analysis Request

SAMPLE ID	Location/ Field Point Name	SAMPLING		# Containers	MATRIX							METHOD PRESERVED		BTEX & TPH as Gas (8021/ 8015 ) MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 505/ 608 / 8081 (CI Pesticides)	EPA 608 / 8082 PCB's ; Aroclors only	EPA 507 / 8141 (NP Pesticides)	EPA 515 / 8151 (Acidic CI Herbicides)	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNA's)	CAM 17 Metals (200.8 / 6020)***	LUFT 5 Metals (200.8 / 6020)***	Metals (200.8 / 6020)***	Lab to Filter sample for Dissolved metals analysis	STLC & TCEP (NOTE 1)				
		Date	Time		Ground Water	Waste Water	Drinking Water	Sea Water	Soil	Air	Sludge	Other	HCL																HNO <sub>3</sub>	Other	STLC	TCEP	
GP-M/V-7-5005	Fan Rem.	2/19/16	8:15A	1																												X	X

\*\*MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate \$250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

\*\*\* If metals are requested for water samples and the water type is not specified on the chain of custody, then MAI will default to metals by E200.8.

Relinquished By: <u>[Signature]</u>	Date: <u>2/19/16</u>	Time: <u>9:30AM</u>	Received By: <u>[Signature]</u>
Relinquished By: <u>[Signature]</u>	Date: <u>2/19/16</u>	Time: <u>1:45</u>	Received By: <u>[Signature]</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____

ICE/r \_\_\_\_\_  
 GOOD CONDITION \_\_\_\_\_  
 HEAD SPACE ABSENT \_\_\_\_\_  
 DECHLORINATED IN LAB \_\_\_\_\_  
 APPROPRIATE CONTAINERS \_\_\_\_\_  
 PRESERVED IN LAB \_\_\_\_\_

VOAS O&G METALS OTHER HAZARDOUS:  
 PRESERVATION \_\_\_\_\_ pH < \_\_\_\_\_

Note: Reanalyze leachability for any metals over 10% of title 22 TCE std.

COMMENTS: \_\_\_\_\_

**Attachment 6**

**Glen Park Station Soot Bulk Asbestos Analyses**







CHAIN OF CUSTODY FORM

Environmental, Inc.

650 Delancey St., Ste. 222, San Francisco, CA 94107  
1 Lakeside Drive, Ste. 215, Oakland, CA 94612

Tel  
415-882-1675  
510-645-6200

Fax  
415-962-0736  
415-962-0736

CALL/TXT with results:

@messaging.sprintpcs.com  
Email rpt / COC & invoice:  
pgervasio@scaehs.com  
GCASS@sca-emviro.com

EMAIL HEADING: (Project #) - (Project Manager Initials) - (Site Name/Address) - (Date MM/DD)

B-11978 GRC BAAR GlenPark 2/19/16

LAB

A:TEM

Email Prj Mgr Name:  
Chuck Siu Glenn Cass Christina Codemo

Accounting Data:

COURIER

LAB REP NOTIFIED: Notification DATE/TIME:  
AIRBILL/FLIGHT NO.: Shipper REFERENCE I.D.  
EST ARRIVAL DATE: EST. ARRIVAL TIME:

Method Reference

7400 PCM AHERA TEM (<0.005 f/cc AnaSen) CARB-AHERA TEM 0.001 s/cc Ana Sensitivity

PLM (asbestos) Flame AA (Lead)

Sample Media 25-37 mm 0.45 0.8 micron MCEF Bulk Water Wipe

RESULTS DUE:

5 DAY AM / PM

CHAIN OF CUSTODY DATA:

Sending Info 1 samples submitted by GC (SCA) on 2/19/16 at 10:00 AM  
Received by Lab: 1 samples received by GC on 2/23/16 at 1:220  
Received by Analyst: samples received by on at

SAMPLE ID	LITERS	Results	Inn/Blanks/Outs
GP-WT-A-S00F		PLM / Asbestos	
0 LITERS			BLANK
0 LITERS			BLANK
0 LITERS			BLANK

INSTRUCTIONS TO LAB (delete items not applicable AND circle items applicable):

- Pickup requested:  
Contact: \_\_\_\_\_  
Time of Call: \_\_\_\_\_
- Call SCA's contact to acknowledge receipt of samples.
- Analyze samples by PCM only.
- Analyze inside samples by PCM first; if any sample >0.01 f/cc, contact SCA.
- If all samples are <0.01 f/cc, proceed with items 6, 7 or 8, as noted.
- Analyze inside samples only; stop if Avg >70 str/mm^2, contact SCA before analyzing outsides or blanks.
- Analyze all samples, including outside samples and blanks.
- Do NOT analyze outside or blank samples.
- Analyze by TEM only the inside air sample with the highest PCM result.
- Serial analysis; stop at first positive (>1%); first trace (<0.1%); except sheetrock and plaster samples.
- Analyze all bulk samples, unless otherwise indicated.
- PCB: <25 PPM detection limit required. Authorized to perform cleanup to meet the detection limit.
- 

Report Number:

339382

Supplies /Equipment	Qty
Hi-Vol (3040)	
Lo-Vol (3020)	
TEM / Pb cassettes (3520)	
PCM cassettes (3500)	
Bulk sampling supply (3710)	1

Invoice Number:

Units (each)	ASBESTOS		LEAD		24 hours		48 hours		3 to 5 days		> 6 days	
	1 to 9	>40	1 to 9	>40	1 to 9	>40	1 to 9	>40	1 to 9	>40	1 to 9	>40
PCM NIOSH 7400												
PLM Bulk												
CARB 435 (400 Pt Ct) w/ prep												
PLM Std Point Count 400												
TEM AHERA												
CARB AHERA 35-40 grid openings												
CARB AHERA 10-15 grid openings												
Flame AA												
Wipes												

printArea

**Attachment 7**

**SCA's Personnel Certifications**

DEPARTMENT OF INDUSTRIAL RELATIONS  
Division of Occupational Safety and Health  
Asbestos Unit  
2424 Arden Way, Suite 495  
Sacramento, CA 95825-2417  
(916) 574-2993 Office (916) 483-0572 Fax  
<http://www.dir.ca.gov/dirdatabases.html> [actu@dir.ca.gov](mailto:actu@dir.ca.gov)



206240092C

3

April 23, 2015

SCA Environmental, Inc.  
Glenn Robert Cass  
334 19th Street, 2nd floor  
Oakland CA 94612

Dear Certified Asbestos Consultant or Technician:

Enclosed is your certification card. **To maintain your certification, you must abide by the rules printed on the back of the certification card.**

Your certification is valid for a period of one year. If you wish to renew your certification, you must apply for renewal at least 60 days before the expiration date shown on your card. [8 CCR 341.15(h)(1)].

Please hold and do not send copies of your required AHERA refresher renewal certificates to our office until you apply for renewal of your certification.

Certificates must be kept current if you are actively working as a CAC or CSST. The grace period is only for those who are not actively working as an asbestos consultant or site surveillance technician.

Please contact our office at the above address, fax number or email; of any changes in your contact/ mailing information within 15 days of the change.

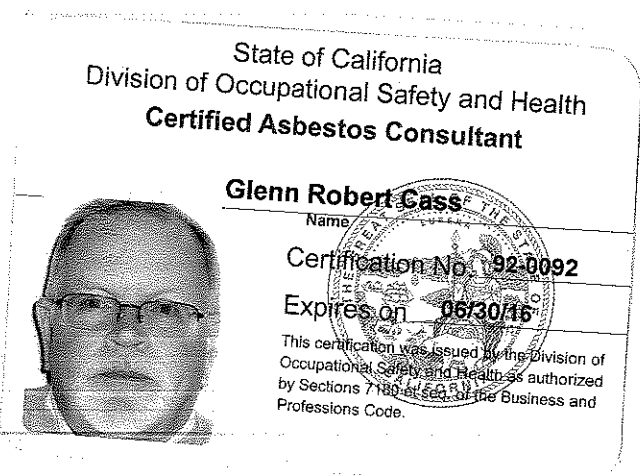
Sincerely,

Jeff Ferrell  
Senior Safety Engineer

Attachment: Certification Card

cc: File

Renewal - Card Attached (Revised 10/24/2012)



State of California Department of Public Health

Lead-Related  
Construction  
Certificate

Certificate  
Type

Expiration  
Date



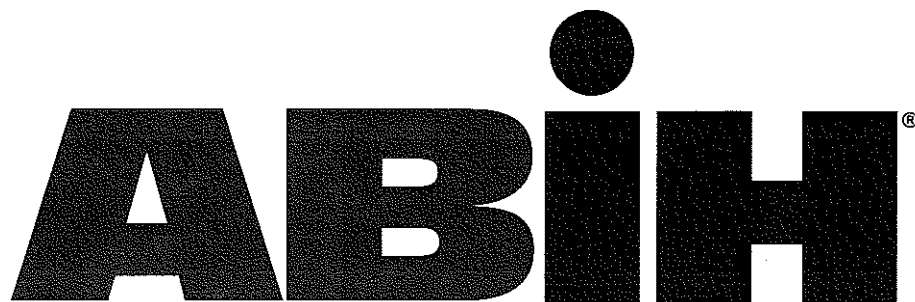
Inspector/Assessor	07/22/2016
Project Designer	07/22/2016
Project Monitor	07/22/2016



16074

Glenn R. Cass

ID #: 717



**american board of industrial hygiene®**

organized to improve the practice of industrial hygiene  
proclaims that

*Glenn Robert Cass*

having met all requirements of  
education, experience and examination, and  
ongoing maintenance,  
is hereby certified in the

**ACOUSTICAL ASPECT  
of  
INDUSTRIAL HYGIENE**

and has the right to use the designations

**CERTIFIED INDUSTRIAL HYGIENIST**

**CIH**

Certificate Number	<b>4847 A</b>
Awarded:	<b>December 14, 1990</b>
Expiration Date:	<b>June 1, 2018</b>



  
Chair ABIH

  
Executive Director ABIH

DEPARTMENT OF INDUSTRIAL RELATIONS  
 Division of Occupational Safety and Health  
 Asbestos Unit  
 2424 Arden Way, Suite 495  
 Sacramento, CA 95825-2417  
 (916) 574-2993 Office (916) 483-0572 Fax  
<http://www.dir.ca.gov/dirdatabases.html> [actu@dir.ca.gov](mailto:actu@dir.ca.gov)



103202923C

220

April 03, 2015

SCA Environmental, Inc.

Jerald S Cook

334 19th Street

Oakland

CA 94612

Dear Certified Asbestos Consultant or Technician:

Enclosed is your certification card. **To maintain your certification, you must abide by the rules printed on the back of the certification card.**

Your certification is valid for a period of one year. If you wish to renew your certification, you must apply for renewal at least 60 days before the expiration date shown on your card. [8 CCR 341.15(h)(1)].

Please hold and do not send copies of your required AHERA refresher renewal certificates to our office until you apply for renewal of your certification.

Certificates must be kept current if you are actively working as a CAC or CSST. The grace period is only for those who are not actively working as an asbestos consultant or site surveillance technician.

Please contact our office at the above address, fax number or email; of any changes in your contact/mailling information within 15 days of the change.

Sincerely,

Jeff Ferrell  
 Senior Safety Engineer

Attachment: Certification Card

cc: File

Renewal – Card Attached (Revised 10/24/2012)

State of California  
 Division of Occupational Safety and Health  
**Certified Asbestos Consultant**

Jerald S Cook

Name

Certification No. 01-2923

Expires on 05/16/16

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.





State of California Department of Public Health

Lead-Related

Certificate

Expiration

Construction

Type

Date

Certificate



Inspector/Assessor

09/07/2015



16493

Jerald S. Cook

ID #: 9083



# Board of Certified Safety Professionals

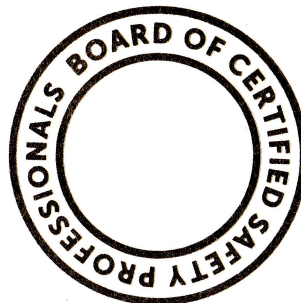
Upon the recommendation of the  
Board of Certified Safety Professionals,  
by virtue of the authority vested in it,  
has conferred on

**Jerald S Cook**

the credential of

**Certified Safety Professional**

and has granted the title as evidence of meeting the qualifications and passing  
the required examination so long as this credential is not suspended or  
revoked and is renewed annually and meets all recertification requirements.



June 23, 2012

DATE ISSUED

23226

CERTIFICATION NUMBER

A handwritten signature in black ink, appearing to read "Carl W. Hill".

BOARD PRESIDENT SIGNATURE

A handwritten signature in black ink, appearing to read "Monica Hill".

BOARD SECRETARY SIGNATURE