SOURCE TEST REPORT

Emissions Testing of
Metal Melting "Facility C"
for
Selected Metals and Particulate Matter

Facility ID: [redacted]

Prepared for:
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Equipment Location:
Metal Melting Facility C
[redacted] CA [redacted]

Test Date(s): August 13-16, 2019

Report Date: November 8, 2019

Revised February 4, 2020

Project No.: 10566a

Prepared by:

Almega Environmental & Technical Services
10602 Walker Street
Cypress, CA 90630

Prepared by & Title: Tulasi Gyawali, QA Engineer

Reviewed by & Title: Charles Figueroa, Sr. Project Manager

TABLE OF CONTENTS

FIGURES

TABLES

TABLE OF CONTENTS - Continued

APPENDICES

1.0 EXECUTIVE SUMMARY

Key project information is provided in the summary below. Test results are summarized in Table 1-1 and Table 1-2.

Customer:	South Coast Air Quality Management District (SCAQMD) 21865 East Copley Drive Diamond Bar, CA 91765-4182 Contact: Mr. Michael Garibay, (909) 396-2249
Facility & Location:	Metal Melting Facility C [redacted] CA
Facility ID:	[redacted]
Equipment:	Inlets (Furnace and Upstream to Baghouse) / HEPA Baghouse Outlet
Test Objective:	To determine the Particulate Matter (PM), Arsenic, Cadmium, Nickel, Chromium, and Hexavalent Chromium (Cr^{6+}) emissions from the chromium alloy melting operations
Test Requested by:	South Coast Air Quality Management District (SCAQMD)
Test Date(s):	August 13-16, 2019
Test Personal	Neal Conroy, Morgan Nguyen, Dorian Johnson, William Bryant, Luke Barrow, and Mark Rowlett of Almega Environmental & Technical Services
Testing Firm:	Almega Environmental & Technical Services 10602 Walker Street Cypress, CA 90630 Contact: Mr. Charles Figueroa, tel (714) 889-4000
Regulatory Agency:	South Coast Air Quality Management District (SCAQMD) 21865 East Copley Drive Diamond Bar, CA 91765-4182 Contact: Mr. Brian Speaks, (909) 396-3212
Measurements: Volumetric flow rates Selected Metals (As, Cd, Cr, & Ni) Chromium (Hex/Total) Particulate Matter (PM)	 SCAQMD Methods 1.1 - 4.1 CARB Method 436 CARB Method 425 SCAQMD Method 5.1

TABLE 1-1. SUMMARY OF TEST RESULTS

Facility: Metal Melting Facility C
City, State: [redacted] CA
Test Location: Baghouse Outlet & Inlets
Test Date(s): August 13-16, 2019

Test Data	Units	Baghouse Outlet	Inlet 1 Furnace (Inside)	Inlet 2 (Upstream to Baghouse)
CARB Method 436		3-Run Avg.	3-Run Avg.	3-Run Avg.
Sampling Data		08/13-14/19	08/13-14/19	08/13-14/19
Stack Temperature	°F	100	114	95
Sample Volume	dscf	79	89	96
Stack Flow Rate	acfm	8,115	1,151	6,507
Stack Flow Rate	dscfm	7,499	1,033	5,989
Concentration (CARB 436)		Total	Total	Total
Arsenic	ug/dscm	< 0.451	3.45	< 0.850
Cadmium	ug/dscm	< 0.451	< 0.399	< 0.367
Chromium	ug/dscm	1.43	2060	503
Nickel	ug/dscm	0.55	61.0	16.7
Mass Emissions (CARB 436)		Total	Total	Total
Arsenic	lb/hr	< 1.27E-05	1.33E-05	< 1.92E-05
Cadmium	lb/hr	< 1.27E-05	< 1.66E-06	< 8.84E-06
Chromium	lb/hr	4.09E-05	7.97E-03	1.12E-02
Nickel	lb/hr	1.56E-05	2.36E-04	3.74E-04
CARB Method 425		3-Run Avg.	3-Run Avg.	3-Run Avg.
Sampling Data		08/14-15/19	08/14-15/19	08/14-15/19
Stack Temperature	°F	103	129	98.4
Sample Volume	dscf	76.4	88.1	93.1
Stack Flow Rate	acfm	7,893	1,172	6,296
Stack Flow Rate	dscfm	7,245	1,030	5,771
Concentration (CARB 425)				
Chromium VI	ug/dscm	< 0.062	5.79	1.52
Total Chromium	ug/dscm	< 0.270	530	106
Mass Emissions (CARB 425)				
Chromium VI	lb/hr	< 1.62E-06	2.26E-05	3.30E-05
Total Chromium	lb/hr	< 7.27E-06	2.00E-03	2.25E-03
SCAQMD Method 5.1		Single Run	Single Run	Single Run
Sampling Data		08/16/19	08/16/19	08/16/19
Stack Temperature	°F	88	101	93
Sample Volume	dscf	40	53	56
Stack Flow Rate	acfm	6,705	1,147	6,412
Stack Flow Rate	dscfm	6,240	1,040	5,825
Particulate Catch	mg	6.57	105.6	45.2
Particulate Concentration	gr/dscf	0.0026	0.0305	0.0126
Particulate Emission Rates	lb/hr	0.136	0.271	0.628
	lb/day	3.28	6.52	15.06

Flags
ND or "<" - Not detected, reporting limit reported.

TABLE 1-2. SUMMARY OF TEST RESULTS
(INLET 1 INSIDE)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1 Furnace (Inside)

Test Data	Units	Source Test Results						Average	
Run Number	--	Run 1		Run 2		Run 3			
CARB Method 436 Sampling Data		08/13/19		08/13/19		08/14/19		**3-Run Avg.**	
Stack Temperature	°F	116		126		101		**114**	
Sample Volume	dscf	86.7		88.8		90.1		**88.6**	
Stack Flow Rate	acfm	1,132		1,177		1,144		**1,151**	
Stack Flow Rate	dscfm	1,012		1,035		1,052		**1,033**	
Material Charged (25CH)	lbs/hr	3000		3000		3000		**3000**	
CARB Method 436 MASS EMISSION RATE		Total		Total		Total			
Arsenic	lb/hr	2.32E-05		1.19E-05		4.63E-06		**1.32E-05**	
Cadmium	lb/hr	ND	1.54E-06	ND	1.54E-06	ND	1.88E-06	<	**1.66E-06**
Chromium	lb/hr	6.79E-03		1.09E-02		6.17E-03		**7.97E-03**	
Nickel	lb/hr	1.43E-04		3.68E-04		1.99E-04		**2.37E-04**	
Emissions Factor (lb/lbs)									
Arsenic	lb-As/lb-25CH	7.72E-09		3.96E-09		1.54E-09		**1.55E-05**	
Cadmium	lb-Cd/lb-25CH	ND	5.15E-10	ND	5.14E-10	ND	6.28E-10	ND	**1.29E-06**
Chromium	lb-Cr/lb-25CH	2.26E-06		3.65E-06		2.06E-06		**1.60E-06**	
Nickel	lb-Ni/lb-25CH	4.77E-08		1.23E-07		6.62E-08		**4.91E-07**	
CARB Method 425 Sampling Data		08/14/19		08/15/19		08/15/19		**3-Run Avg.**	
Stack Temperature	°F	131		114		142		**129**	
Sample Volume	dscf	85.3		92.6		86.3		**88.1**	
Stack Flow Rate	acfm	1,142		1,201		1,174		**1,172**	
Stack Flow Rate	dscfm	998		1,083		1,008		**1,030**	
Material Charged (25CH)	lbs/hr	3000		3000		3000		**3000**	
Mass Emissions (CARB 425)									
Chromium VI	lb/hr	1.27E-06		3.39E-05		3.28E-05		**2.26E-05**	
Total Chromium	lb/hr	3.93E-03		5.11E-04		1.56E-03		**2.00E-03**	
Emissions Factor (lb/lbs)									
Chromium VI	lb-Cr+6/lb-25CH	4.22E-10		1.13E-08		1.09E-08		**7.55E-09**	
Total Chromium	lb-Cr/lb-25CH	1.31E-06		1.70E-07		5.18E-07		**6.67E-07**	
SCAQMD Method 5.1 Sampling Data		08/16/19						**Single Run**	
Stack Temperature	°F	101						**101**	
Sample Volume	dscf	53.5						**53.5**	
Stack Flow Rate	acfm	1,147						**1,147**	
Stack Flow Rate	dscfm	1,040						**1,040**	
Material Charged (25CH)	lbs/hr	3000						**3000**	
PM Emissions									
Emission Rate	lb/hr	0.271						**2.71E-01**	
Emissions Factor (lb/lbs)									
PM Emissions	lb-PM/lb-25CH	9.05E-05						**9.05E-05**	

2.0 INTRODUCTION

Almega Environmental & Technical Services (Almega) was contracted by South Coast Air Quality Management District (SCAQMD) to conduct stationary source emissions testing of the baghouse serving the chromium alloy melting operations at facility designated as "Facility C" located in [redacted] California. The purpose of the test program is to determine the Particulate Matter (PM), Arsenic, Cadmium, Nickel, Chromium, and Hexavalent Chromium (Cr^{6+}) emissions from the chromium alloy melting operations.

Due to the rising level of hexavalent chromium in the ambient air in the city of Paramount and its vicinity, SCAQMD staff initiated the rule development process to amend Rule 1407 to address toxic air contaminant emissions from ferrous metal melting operations and update existing requirements for non-ferrous metal melting operations currently regulated under the rule. Through working group meetings with industry stakeholders, it was requested that the rule be separated in to two rules for (1) ferrous and (2) non-ferrous metal melting. After additional input and working group meetings, the SCAQMD staff decided to bifurcate the rule and reclassify characterization into (1) non-chromium alloy (Rule 1407) and (2) chromium alloy (Rule 1407.1) metal melting. In regards to the chromium alloy melting, additional data from melting operations of metals with a chromium content greater than 0.5% is needed to quantify the conversion rate of chromium to hexavalent chromium and quantify toxic air contaminant emissions from these facilities to aid in the rulemaking process. Three facilities have agreed to allow source testing for the purposes of collecting this data [Ref. SCAQMD Source Test Plan to be conducted at Metal Melting facilities].

Almega was selected as a third-party source test contractor to perform a portion of this testing. The test matrix employed during the testing is presented in Table 2-1.

TABLE 2-1. TEST MATRIX

PARAMETER	TEST METHOD	# OF TEST RUNS	TEST TIME	LOCATION
Traverse Points	SCAQMD Methods 1.1 & 2.1	3 Per Location	120 min.	Simultaneous testing at the outlet and two inlets of the HEPA/ Baghouse
Molecular Weight and Excess Air	SCAQMD Method 10.1	1 each Location	60 min.	
Moisture Content	Method 4.1 (Inclusive in the CARB M436, M425, & SCAQMD M5.1)	3 Per Location	120 min.	
Hexavalent and Total Chromium	CARB Method 425	3 Per Location	120 min.	
Selected Metals (As, Cd, Cr, & Ni)	CARB Method 436	3 Per Location	120 min.	
Particulate Matter (PM)	SCAQMD Method 5.1	3 Per Location	72 min.	
Fugitive Emissions	Determination of overall capture efficiency	--	n/a	HEPA/ Baghouse Inlets

Almega performed source testing at the outlet and the two designated inlets of the baghouse simultaneously over a three-day period August 13 - 16, 2019. The sampling was conducted in triplicate at each of the three (3) sampling locations for metals and chromium with just a single test conducted for the particulate matter. Testing was conducted as specified in the reference methods and Source Test Plan prepared by SCAQMD. The source test plan is included in the Appendix I for reference. Capture/Collection efficiency test was conducted by the SCAQMD personal and provided to Almega for the inclusion in the source test report. All pertinent process data was collected and provided by the facility and included in the Appendix H.

2.1 Document Outline

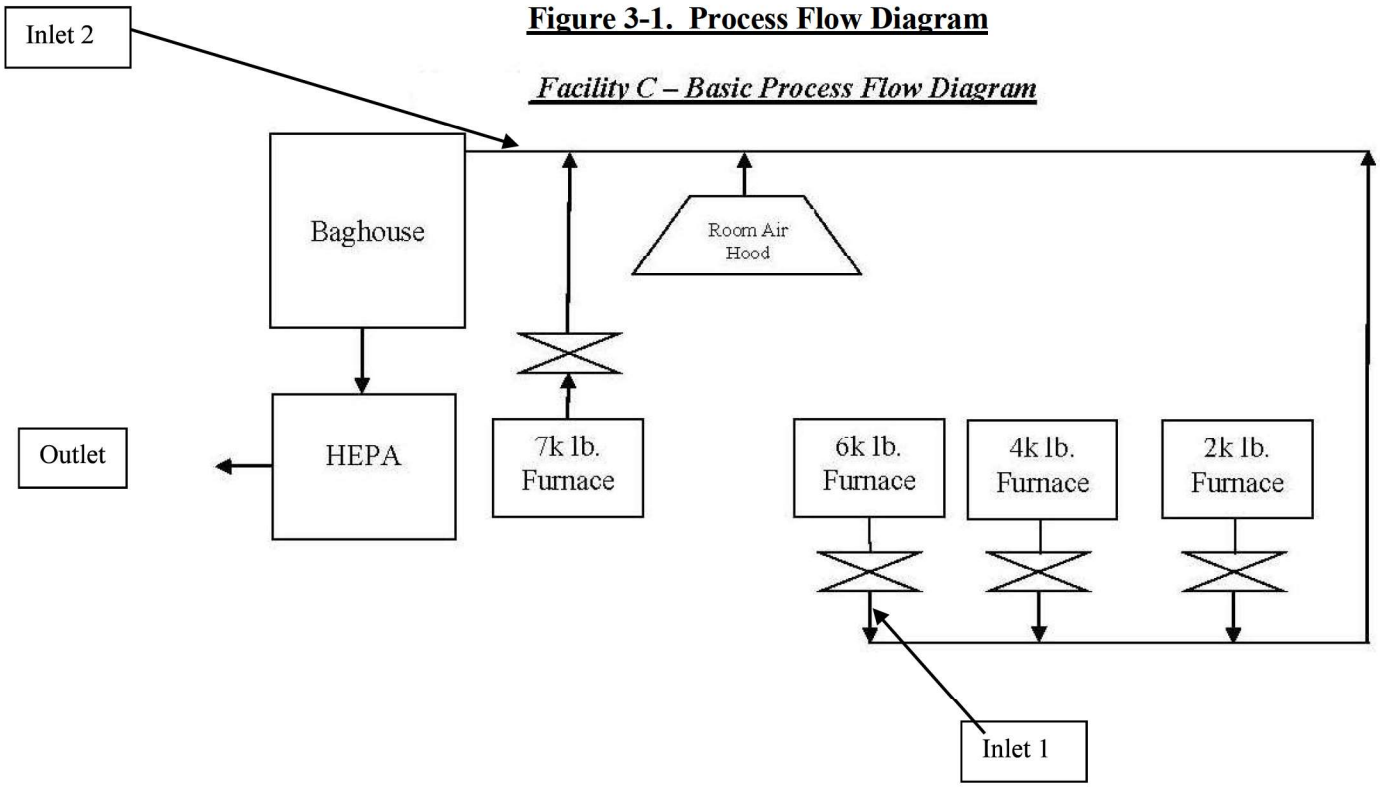
This report is organized as follows. Section 1.0 is a summary of the project and test results. Section 2.0 describes the project, its objectives and approach. Section 3.0 describes the equipment tested and applicable sampling locations. Section 4.0 describes the sampling and analysis procedures used to conduct the testing. Section 5.0 describes Quality Assurance and Quality Control activities performed, and section 6.0 discusses test results. The Appendices contain test results, calculated data, raw field data, analytical data, calibration records, and certification documents.

3.0 EQUIPMENT AND PROCESS DESCRIPTION

The metal melting facility C uses electric induction furnaces for the processing of white iron, cast iron, ductile iron, and stainless steel. A general schematic of the test locations follows:

Figure 3-1. Process Flow Diagram

Facility C – Basic Process Flow Diagram



Note: Courtesy of SCAQMD Source Test Plan

3.1 Process and Equipment Description

The facility C has four electric induction furnaces in sizes as follows:

- 7,000 lbs material capacity with a power rating of 1,500 KW
- 6,000 lbs material capacity with a power rating of 1,500 kW
- 4,000 lbs material capacity with a power rating of 1,000 kW
- 2,000 lbs material capacity with a power rating of 400 kW

90% of facility operations involve melting of various irons and approximately 10% percent of operations are stainless steel melts. Raw materials for iron melts are frequently re-runs while the stainless melts tend to be new certified material. The facility normally runs 2 furnaces at a time, most frequently the 7,000 lbs and 6,000 lbs furnaces. Stainless steels are only processed in either the 4,000 lbs or 2,000 lbs furnace. The furnaces are loaded with the applicable material and the heat begins. Electrical current is applied and the material becomes molten. Typical temperatures are in the 2400-2700°F range during iron melting operations and in the 3000°F range during stainless steel melting operations. Material from the furnace is poured in to pre-heated ladles for transport by forklift to the casting area. All casting at the facility is green sand casting. The casting area is in a separate location within the building.

During the melting process emissions are captured by an exhaust system which mounts to the furnace and utilizes a slot design. Suction is provided by the blower which is part of the baghouse and HEPA system. Each furnace has a closable damper installed which allows for isolation from the system when a furnace is not in use. In the exhaust header there is one non closable exhaust hood which pulls room air into the system. The HEPA filters are installed between the baghouse and the exhaust stack. The facility has modified the outlet such that a straight run of duct is now provided downstream of the exhaust muffler to meet the requirements of at least two duct diameters downstream and one half of a diameter upstream of any flow disturbances.

The facility does approximately 4-5 heats a day. The iron heats performed in the 7,000 lbs and 6,000 lbs furnaces take 1.5 – 2 hours. The stainless heats performed in the smaller 4,000 lbs and 2,000 lbs furnaces take up to 3 hours [Ref. SCAQMD Source Test Plan to be conducted at Metal Melting facilities].

3.2 Operating Conditions during Test

Testing was performed during the processing of chrome iron (25CH) in 6K furnace (Furnace 3). The individual exhaust duct that vents Furnace 3 was designated as “Inlet 1”. The control device is a slot exhaust system mounted on the base of the furnace’s lid. Furnaces No. 3 and 4 were operated during the test program. The Inlet 2 (Upstream to Baghouse) location is the general inlet that vents all four furnaces to the control device.

The process data including process material, baghouse differential pressure, HEPA filter

differential pressure, ambient conditions, etc are included in the Appendix H.

3.3 Sampling Locations

Inlet 1 (Inside) Furnace #3:

The reference method sampling locations meet the following specifications:

Sampling Location Configuration – Inlet Furnace (Inlet Inside)	
Distance from Upstream Disturbance	120 in. (> 8 duct diameter)-B
Distance from Downstream Disturbance	48 in. (> 2 duct diameter)-A
Port Length	0.0 in. (measured from outside wall)-L
Port Inside Diameter	3 in. - d
Number of sampling ports	2 (located at 90° intervals)
Stack Diameter	13 in. (internal diameter)-D

Sampling locations comply with the requirements of SCAQMD Method 1.1.

Inlet 2 (Upstream to Baghouse):

Sampling Location Configuration – Inlet 2 Outside (Upstream of Baghouse)	
Distance from Upstream Disturbance	42.0 in. (2.63 duct diameter)-B
Distance from Downstream Disturbance	196 in. (12.3 duct diameter)-A
Port Length	6 in. (measured from outside wall)-L
Port Inside Diameter	3.0 in.-d
Number of sampling ports	2 (located at 90° intervals)
Stack Diameter	16 in. (internal diameter)-D

Sampling locations comply with the requirements of SCAQMD Method 1.1.

Outlet:

Sampling Location Configuration – Outlet	
Distance from Upstream Disturbance	126 in. (2.63 duct diameter)-B
Distance from Downstream Disturbance	50 in. (1.04 duct diameter)-A
Port Length	6 in. (measured from outside wall)-L
Port Inside Diameter	3.0 in.-d
Number of sampling ports	2 (located at 90° intervals)
Stack Diameter	48 in. (internal diameter)-D

Sampling locations comply with the requirements of SCAQMD Method 1.1.

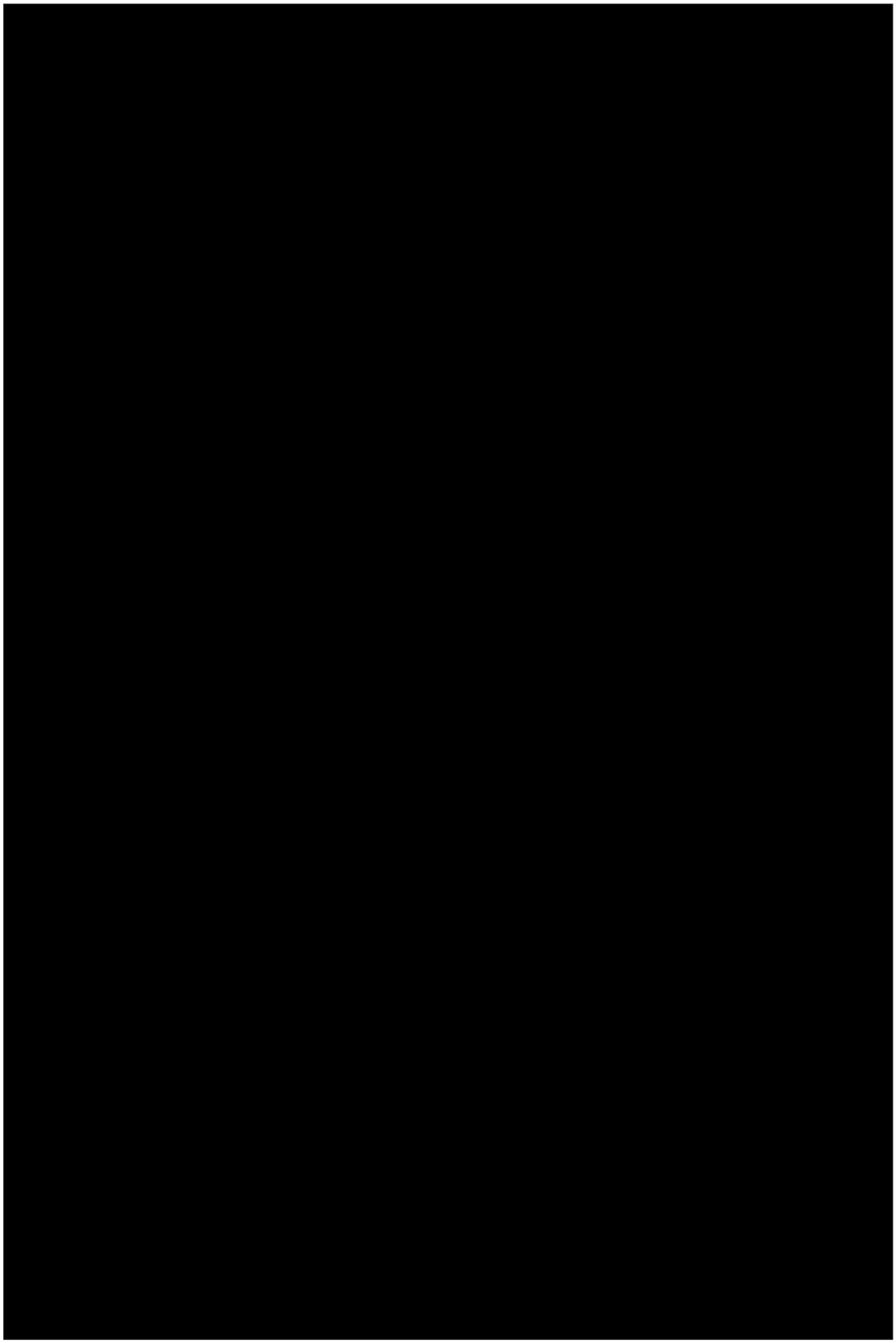
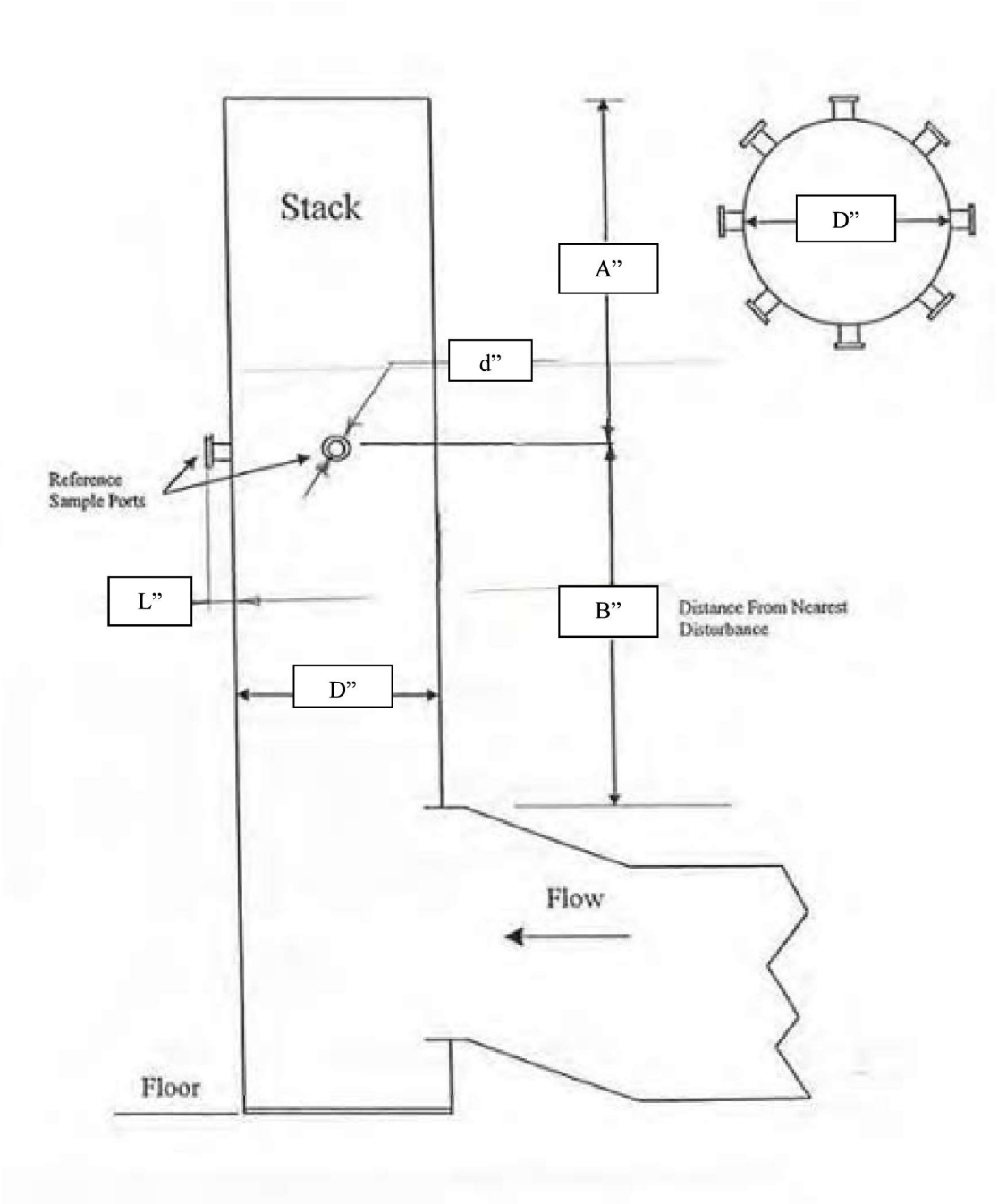


Figure 3-3. General Stack Schematic



4.0 SAMPLING AND ANALYTICAL PROCEDURES

Test measurements were performed according to sampling and analysis procedures promulgated by the South Coast Air Quality Management District (SCAQMD), California Air Resources Board (CARB), or US Environmental Protection Agency (EPA). The sampling and analysis procedures used for this test program are summarized below. Any modifications or deviations not addressed herein are discussed in Section 3 of this report.

4.1 SCAQMD Methods 1.1-4.1 – Determination of Stack Gas Volumetric Flow Rate, Molecular Weight, and Moisture Content
4.1.1 SCAQMD Method 1.1 – Sampling Traverse Points
4.1.2 SCAQMD Method 2.1 – Stack Gas Flow Rate
4.1.3 SCAQMD Method 3.1 – Stack Gas Molecular Weight
4.1.4 SCAQMD Method 4.1 – Stack Gas Moisture Content
4.2 SCAQMD Method 5.1 – Particulate Matter (PM)
4.3 SCAQMD Method 10.1 – Integrated Gas Sampling (O_2/CO_2)
4.4 CARB Method 425 – Total and Hexavalent Chromium
4.5 CARB Method 436 – Multiple Metal Emissions
4.6 Capture/Collection Efficiency

4.1 SCAQMD Methods 1.1-4.1 – Determination of Stack Gas Volumetric Flow Rate, Molecular Weight, and Moisture Content

The flue gas flow characteristics (i.e. flow rate, molecular weight, and moisture content) were determined according to SCAQMD Methods 1.1 through 4.1. The testing was conducted as follows:

4.1.1 SCAQMD Method 1.1/1.2 – Sampling and Velocity Traverse Points

The number and location of traverse points are determined according to SCAQMD Method 1.1/1.2 based on the physical dimensions of the sampling location and process parameters. In principle, the stack cross-section is divided into equal areas, each of which is represented by a "traverse point". Generally, the number of traverse points diminishes as the flow profile at the sampling location becomes uniform. In most cases, the maximum number of sampling points is 24 for particulate/metals testing and 16 for velocity traverses. Fewer traverse points are permitted as described in the method.

4.1.2 SCAQMD Method 2.1 – Gas Velocity and Traverse Points

The velocity and volumetric flow rate of the laser exhaust was determined according to SCAQMD Method 2.1. In this method, the velocity head (differential pressure) and temperature is measured at the required traverse points. The stack gas differential pressure head was determined using an "S" type Pitot tube and inclined liquid manometer. The temperature was measured using a type "K" thermocouple and digital temperature readout.

Prior to testing, the measurement system was set-up and leak-checked. Then the velocity head and temperature was recorded at predetermined traverse points. After the last traverse is completed, the system was again leak-checked. After completion of the traverse, the static pressure in the stack was determined near the centroid of the stack. The stack gas velocity was calculated using the velocity head, and stack gas temperature, pressure and molecular weight.

QA/QC for the method included field performance checks, and periodic calibrations of test equipment including the Pitot tube, differential pressure gauge, TC and TC-readout. A swirl check was also performed to assess cyclonic flow.

4.1.3 SCAQMD Method 3.1 - Gas Molecular Weight

The stack gas molecular weight (MW) was calculated based on the fraction of its major constituents including: oxygen (O_2), carbon dioxide, (CO_2), nitrogen (N_2), carbon monoxide (CO), and water (H_2O). The dry MW was calculated based on the partial fractions of O_2, CO_2, N_2, and CO. Specifically, the O_2 and CO_2 fractions were determined by CEMS, integrated sampling, or grab sampling, and the balance was assumed to be N_2 and CO. The wet MW was calculated based on the fractions of dry gas and water vapor. The dry and wet MW were calculated according to the following equations:

$$MW_{DRY} = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (\%N_2 + \%CO)$$

$$MW_{WET} = 0.18 \times \%H_2O + MW_{DRY} \times (1 - \%H_2O/100)$$

where:
MW_{DRY} = stack gas molecular weight, dry-basis
MW_{WET} = stack gas molecular weight, wet-basis
0.32 = molecular weight fraction for O_2
0.44 = molecular weight fraction for CO_2
0.28 = molecular weight fraction for N_2 and CO
0.18 = molecular weight fraction for H_2O (water vapor)
%X = fraction of X in stack gas, dry basis, where X = O_2, CO_2, N_2, CO
$\%H_2O$ = fraction of water vapor in stack gas, wet-basis

For this test, single bag sample was collected at each test location over a period of 60 minutes. These samples were analyzed for oxygen and carbon dioxide via SCAQMD Method 10.1. The analysis of those bag samples shows that the O_2/CO_2 concentration for all sampling locations is in ambient level.

4.1.4 SCAQMD Method 4.1- Gas Moisture Content

The stack gas moisture content was determined according to SCAQMD Method 4.1. In this method, water vapor is collected in a condenser while the dry stack gas volume is measured using a dry gas meter. The volume of water vapor was calculated from the amount of water condensed and the total gas volume is the sum of water vapor plus dry stack gas. The moisture content was determined as a fraction of the total wet stack gas volume. The following calculations were used.

$$B_{WS} = \frac{V_{W,Std}}{V_{M,Std} + V_{W,Std}}$$

$$V_{W,Std} = K_1 \times V_{H2O}$$

$$V_{M,Std} = T_{Std}/P_{Std} \times Y_M \times V_M \times P_M/T_M$$

where:
- B_{WS} = Fraction of water vapor in stack gas
- $V_{W,Std}$ = Volume of water vapor (scf)
- $V_{M,Std}$ = Volume of stack gas sampled (dscf)
- K_1 = Unit volume of water vapor (0.04707 scf @68°F or 0.0464 scf @60°F)
- T_{Std} = Standard Temperature (528°R or 520°R)
- P_{Std} = Standard Pressure, 29.92 in. Hg
- Y_M = Dry gas meter calibration factor
- V_M = Measured volume of stack gas sampled
- P_M = Dry gas meter pressure (in. Hg)
- T_M = Dry gas meter temperature (°R)

The moisture content was simultaneously determined if sampling was performed isokinetically otherwise performed as follows:

Moisture was collected in a sampling train consisting of a probe, TFE line, four impingers in an ice bath, a leak-free pump, a vacuum gauge and a dry gas meter. Figure 4-1 is a schematic of a typical moisture train. Initially, impingers #1 and #2 contained 100 ml of water, impinger #3 was empty, and impinger #4 contained a known amount (approximately 300 g) of desiccant (e.g. Silica Gel). Prior to sampling, a leak check of the sampling train was performed. Then, the sampling probe was inserted into the centroid of the stack, the initial meter readings (volume, temperatures, etc.) were recorded, the sample pump is started and the sampling rate is adjusted to the desired sampling rate (typically 0.75 dry cfm). Sampling was conducted until at least 22 dry cubic feet were collected. After sampling, the final meter readings were recorded and the impinger train was recovered. The change in volume and/or weight of the impinger train components was used to determine the amount of moisture condensed. The volume of water vapor and the corrected volume of dry gas sampled were used to calculate the moisture fraction as described above.

4.2 SCAQMD Method 5.1 - Total Particulate Matter

Measurements to determine total particulate matter were performed according to SCAQMD Method 5.1. In this method, a stack gas sample is isokinetically extracted from the stack through a stainless-steel nozzle and probe and transported to an impinger train in an ice bath. Entrained particulates were collected in the impingers and on a back-up filter placed between the 3rd and 4th impingers. Figure 4-3 is a schematic of the sampling apparatus.

Prior to testing, a series of measurements were made to determine location and number of traverse points, gas velocity, MW, and moisture content. The results of these measurements were used to determine the appropriate nozzle size for isokinetic sampling. The sampling rate was adjusted to maintain isokinetic conditions based on pitot and TC measurements.

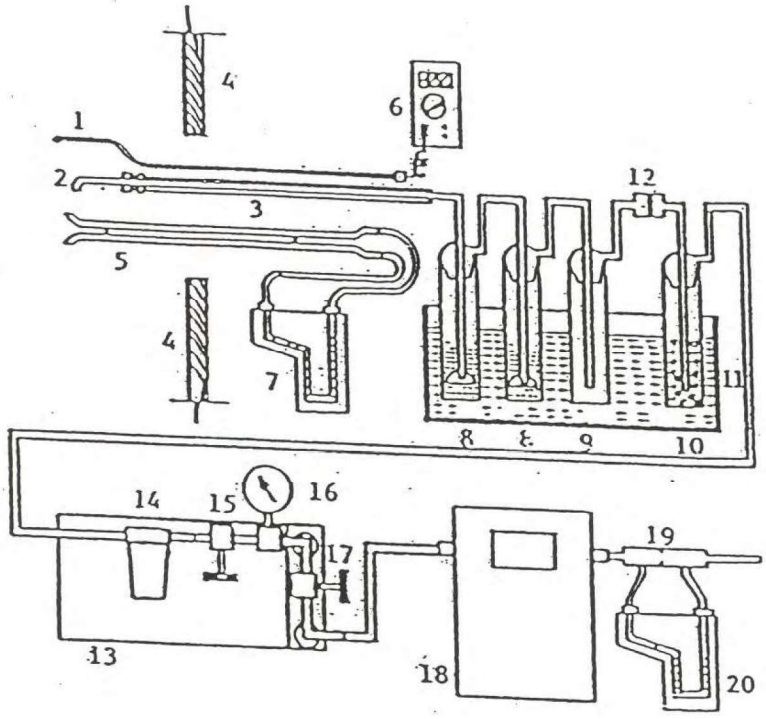
The sampling train was prepared by charging impingers # 1 and # 2 with 100 ml of D.I. water and impinger # 4 with approximately 200 g of silica gel. Impinger # 3 was left empty. Finally, the sampling train was the sealed, transported to the sampling location, and leak-checked. Sampling was performed at each traverse point. After completing the test, the Method 5.1 sample was taken to a secured area (i.e.. Mobile test van or Almega's laboratory) and recovered.

The recovered samples were entered into Almega's Sample Custody Program and delivered to the laboratory for analysis. At the laboratory, samples were analyzed as follows:

The filter was removed and placed in a desiccator until completely dry. Following drying, the filter was weighed to determine the fraction of sample acquired on the filter. The probe, nozzle, sampling lines, and impingers were washed with deionized water and methylene chloride, and the washing solutions were combined with the impinger solutions. The combined solution was extracted with methylene chloride. The aqueous fraction was heated to boil off water, and the organic fraction was allowed to evaporate at room temperature. Residues from both fractions were weighed and combined with the sample weight from the filter to determine the total particulate sample weight. Samples were stored at 4 ºC until analyzed at the Almega in-house laboratory.

Field and laboratory data were used to calculate sample volume corrected to standard conditions, stack gas flow rate, and particulate emissions. Emissions were reported in gr/dscf and lb/hr.

Figure 4-1. Sampling Apparatus for Particulate Matter



1. Temperature Sensor
2. Nozzle
3. Glass Lined Stainless Steel Probe
4. S-type Pitot Tube
5. Stack Wall
6. Temperature Sensor Meter
7. Pitot Tube Inclined Manometer
8. Impinger with 100 ml H_2O
9. Empty Bubbler
10. Bubbler with Silica Gel
11. Ice Bath
12. Filter
13. Sealed Pump (Leak Free)
14. Filter for Pump
15. Metering Valve
16. Vacuum Gauge
17. By-pass Valve
18. Temperature Compensated Dry Gas Meter
19. Orifice
20. Orifice Inclined Manometer

4.3 SCAQMD METHOD 10.1 – INTEGRATED GAS SAMPLING (O2 & CO2)

In this method, gaseous components of the stack gas (e.g. O_2, & CO_2) are measured using integrated sampling in accordance with the procedures specified in SCAQMD Method 10.1. Sample was collected in a Tedlar bag for each test event and analyzed by Almega's in-house laboratory via GC.

4.4 Total and Hexavalent Chromium (CARB Method 425)

Hexavalent chromium and total chromium were measured according to CARB Method 425. The sampling was conducted isokinetically for 2-hours in order to achieve target detection limits. After sampling, the sampling train was recovered and analyzed for both total chromium and hexavalent chromium.

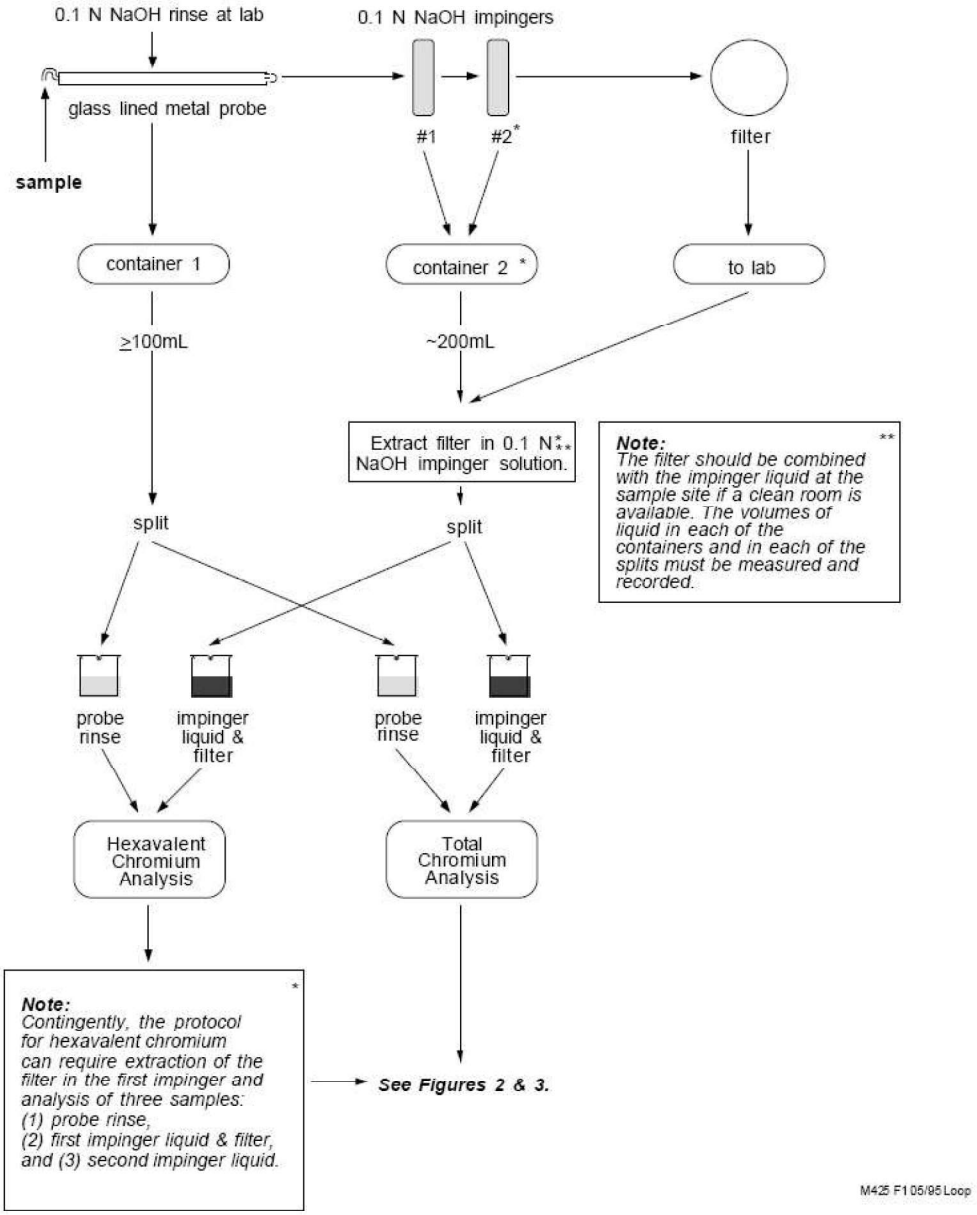
The sampling apparatus included a glass probe, a Teflon union, a flexible Teflon sample line from the probe to the first impinger, two Greenburg-Smith impingers each containing 100 ml of 0.1N NaHCO3 solution, an empty modified impinger, and a modified impinger containing silica gel. The glass probe is fitted with a glass nozzle for isokinetic sampling. The remaining components of the sampling apparatus included an umbilical line, a vacuum pump, a dry gas meter, and a calibrated orifice connected to an inclined manometer. The sampling train is shown in Figure 4-3.

The volume of the impinger solution and the weight of the silica gel were recorded before and after the tests to determine the moisture content of the stack gas. All sample weights were recorded on the sampling data sheet during charging and sample recovery. Leak checks were performed before and after each test.

Volumetric flow rates at the sampling locations were calculated from the measured velocity head and the cross-sectional area of the duct. As each traverse point was sampled, the velocity head of the flue gas was measured with an S-type pitot tube connected to an inclined manometer, and the temperature of the flue gas was measured with a type "K" thermocouple and a digital readout (SCAQMD Method 2.1). This information was used to adjust the sampling rate to isokinetic conditions.

After the test, the contents of the impingers were recovered as described in the method and stored in pre-cleaned sample bottles. The final pH of the sample was verified using multiple-field pH paper. The samples were then stored at 4°C or less until delivered to the Laboratory for analysis. Samples were analyzed for hexavalent chromium as described in the method. Hexavalent chromium was determined by ion chromatography (IC) by Weck Laboratories, Inc. located in City of Industry, California. No sodium bicarbonate reagent blank was submitted since the values from the same sodium bicarbonate batch were on file from a previous test event. All samples are accompanied by a chain of custody until disposed.

Figure 4-2 CARB Method 425 Sampling



Note: 0.1NaHCO3 was used instead 0.1NaOH.

4.5 CARB METHOD 436 - DETERMINATION OF MULTIPLE METALS EMISSIONS

Multiple metals samples were collected isokinetically in accordance with CARB Method 436, "Determination of Multiple Metals Emissions from Stationary Sources." Stack sample was withdrawn from the source, with particulate emissions collected in the probe and on a heated filter and gaseous emissions collected in a series of chilled impingers containing an aqueous solution of dilute nitric acid combined with dilute hydrogen peroxide in two impingers.

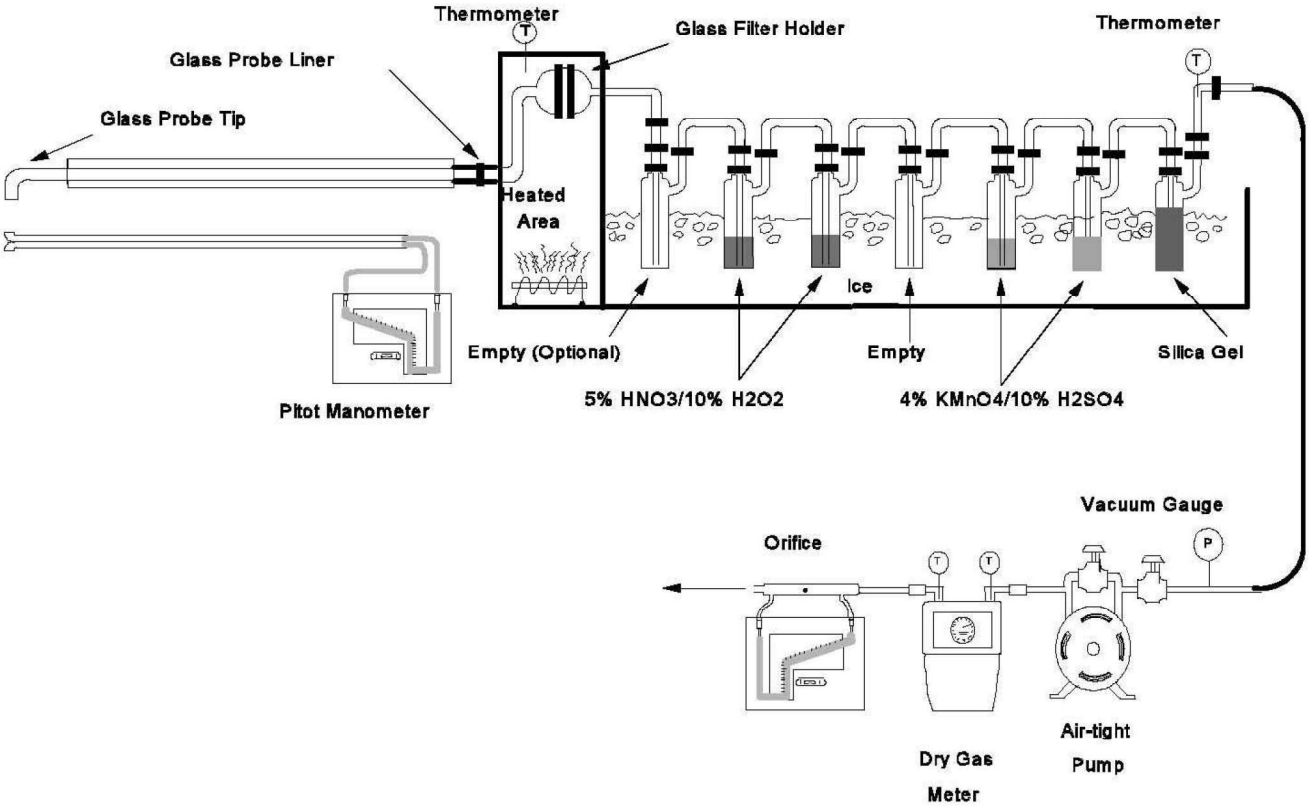
A schematic of the sampling apparatus is shown in Figure 4-2. The sampling train consists of a nozzle, heated probe, heated filter, and a series of three impingers immersed in an ice bath and a silica gel impinger. The probe is made of borosilicate glass with a heating system of maintaining an exit gas temperature during sampling of 248±25°F.

The Teflon line was used to transfer the sample from the filter to the impingers. The impinger train was setup as follows: the first and second impingers each contained 100 mL of a nitric acid/hydrogen peroxide solution (5% HNO_3/10% H_2O_2), the third was empty, the last impinger contained silica gel (for moisture collection), and an umbilical line connected to an isokinetic sampling console. The sampling console includes a vacuum pump, a dry gas meter, and additional monitors and controls for collecting a sample. A thermometer capable of measuring to within 1°C (2°F) was placed at the outlet of the last impinger.

Sampling train components were recovered into separate front and back half fractions and acid digested using conventional digestion techniques to dissolve inorganic and to remove organic constituents that created analytical interferences. After digestion, portions of the probe catch, filter catch, and nitric acid/hydrogen peroxide catch were combined into a single composite sample and analyzed for all target metals according to ICP/MS as prescribed by the Method. Sample analyses were performed by Weck Laboratory in City of Industry, California.

Quality assurance samples include field blanks and reagent blanks. Quality control samples include laboratory method blanks and duplicates. Field sampling and laboratory data were used to calculate emissions concentrations and mass emission rates as described in the Method. Although no nitric reagent blank was submitted for this set of tests, the test results were corrected for background levels found in reagent blank results on-file from a previous test (same nitric batch). Results are reported for concentration in milligram per dry standard cubic meter (mg/dscm). Analysis results that are below the limit of detection (i.e. not detected or ND) were substituted for the one-half of detection limit in calculating three-run averages.

Figure 4-3. CARB Method 436 Sampling Apparatus



Note: Impingers 5 and 6 containing 4% KMnO4/10% H2SO4 were not used in actual sampling since Mercury was not measured.

4.6 Verification of Capture/Collection Efficiency

SCAQMD conducted the verification of the capture and collection. The collection was deemed adequate for us to continue with the testing program. Detailed summary of the collection is available upon request.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

Almega applies stringent quality assurance and quality control (QA/QC) procedures to ensure the validity of measurements for all test methods. The following section discusses general and project-specific QA/QC measures.

5.1 General QA/QC

Almega's QA/QC procedures follow guidelines from the "Quality Assurance Handbook for Air Pollution Measurement Systems," Volume I through III. And, procedures for pretest preparation and calibration of sampling equipment are followed. Standardized written procedures, calculator programs, and computer spreadsheets are used for test planning, pre-survey, equipment checklist, preliminary calculations, testing, data analysis, and reporting. Pretest equipment preparation and maintenance include organization of the following equipment prior to testing:

- Mobile RM CEM test van: Check fluids, fuel, mechanical conditions, verify operation of CEM instruments, sample lines and sample conditioner prior to the date of the source test.

- Sampling Equipment: Check meter boxes, pitot tubes, manometers and thermocouples to ensure in good working conditions and in proper calibrations. Preclean sampling trains and seal all openings prior to use.

Calibrations are performed in accordance with Chapter III of the SCAQMD Source Test Manual (March 1989). Table 5-1 shows the test equipment calibration schedules. Table 5-2 shows the test equipment maintenance schedules.

5.2 Project-Specific QA/QC

This project included specific QA/QC activities required to validate the test results. These QA/QC activities are based on the test methods discussed in Section 5 and generally acceptable test procedures. Reference Methods used for source testing are promulgated by the South Coast Air Quality Management District (SCAQMD), the California Air Resource Board (CARB), or the US Environmental Protection Agency (EPA). Any deviations from published Methods are approved in advance by the regulatory agency (i.e. SCAQMD), prior to implementation if possible. Project-specific QA/QC activities and results that may impact test results are discussed in Section 3.

TABLE 5-1. TEST EQUIPMENT CALIBRATION SCHEDULE

Equipment	Calibration Period	Standard or Method of Calibration
Thermocouples	6 Months and 2 Months	Mercury Thermometer, three point (ice, boiling water, hot oil)
Dry Gas Meters	6 Months and 2 Months	Critical orifice
Field Barometers	6 Months, Check prior to usage	Mercury Barometer
S-Type Pitot	6 Months Check prior to usage	EPA Method 2, Measure physical configuration. Reshape pitot tips or calibrate if configuration does not meet the limits.
Pressure gauges	6 Months 2 Months	Five-point calibration against manometer Three-point check
Temp. Meters	6 Months	Precision Potentiometer
CEM Systems	Bimonthly, or as needed	Specified by Manufacturer

TABLE 5-2. TEST EQUIPMENT MAINTENANCE

Equipment	Check For	Correction	Frequency
CEM Systems	Absence of malfunction, noise, drift, conversion efficiency for NOx anlzr.	As required by the manufacture, or depending on performance	Bimonthly
Pumps	Absence of leakage, flow, proper vacuum	Replace parts, inspect, clean	300 hours of usage
Flow Devices	Levelling, zeroing, obstruction, deformation	Clean, replace, or re-calibrate	300 hours of usage
Calibration Gases	Expiration date, tank pressure	Re-certify, order new gases	2 months and prior to field testing
Regulators	Malfunction, Gauge precision	Repair or replace	3 months and prior to field testing
Gas Divider	Malfunction, precision	Repair or replace	Monthly and before field testing
Condensers	Leakage, temperature	Repair or replace	Monthly and before field testing
Heated lines	Leakage, temperature, cleanliness	Repair, replace, clean	Monthly and before field testing

6.0 TEST RESULTS AND DISCUSSION

The testing was conducted on August 13 through 16, 2019. The sampling locations and equipment were prepared prior to initiating the sampling activities. Testing was conducted after the arrival of Almega's test personnel and set-up of test equipment.

6.1 DISCUSSION

The scope of work included the testing to determine the emissions of Particulate Matter (PM) and selected metals (As, Cd, Ni, Cr, and Cr^{+6}) at the two designated inlets and the outlet of the baghouse/HEPA system. The metals testing were conducted in triplicate with just a single run conducted for PM.

Test calculations are corrected to 68°F for CARB methods and 60°F for SCAQMD methods. The sampling system was setup on August 12, 2019. Sampling was conducted for all three locations on August 13 through 16, 2019.

The metals and PM emissions in the stack gas effluent were reported in micrograms per dry standard cubic meter (µg/dscm), microgram per dry standard cubic feet (ug/dscf), and pounds per hours (lbs/hr). The results are summarized in Table 1-1. Test-specific results for all three sampling locations are presented in Tables 6-1 through 6-9. Supporting data including calculations, field test data, laboratory analysis reports, and QA/QC data are found in the Appendices.

6.1.1 TEST RESULTS – CARB METHOD 436 MULTIPLE METALS

Sampling and analysis for Multiple Metals was conducted for the selected metals in triplicate according to CARB Method 436. The mercury testing option was not used. The CARB Method 436 sampling was conducted simultaneously for all three locations. The sampling duration for each run was two hours. The first and second runs were conducted on August 13 and the third run was conducted on August 14, 2019. The field blank was prepared and collected on August 13 before Run 1. Only Arsenic, Cadmium, Chromium, and Nickel were analyzed as purpose in this testing program. One set of reagent blank was analyzed for those selected metals and the reported results are corrected with the detectable results.

The detailed test results are presented in Table 6-1 for the outlet and Tables 6-4 and 6-7 for the inlets.

6.1.2 TEST RESULTS – CARB M425 HEXAVALENT CHROMIUM AND TOTAL CHROMIUM

Sampling and analysis for hexavalent chromium and total chromium was conducted in triplicate according to CARB Method 425 simultaneously at all three locations. The sampling duration for each run was two hours. The first run was conducted on August 14 with the remaining two runs conducted on August 15, 2019. The field blank was prepared and collected on August 14 before

Run 1. The CARB Method 425 test method used was modified to include the absorbing solution of 0.1N sodium bicarbonate. One set of reagent blank was analyzed for hexavalent chromium and total chromium, the reagent blank results were not detected, and no correction was necessary.

These samples were analyzed within the holding time recommended by the method. However, the samples were re-analyzed to achieve a lower reporting limit without dilution and that second analysis exceeded the recommended holding time (see detail in CARB Method 425 lab report).

The detailed test results are presented in Table 6-2 for the outlet and Tables 6-5 and 6-8 for the inlets.

6.1.3 TEST RESULTS – PARTICULATE MATTER

The single run sampling and analysis for particulate matter was conducted according to SCAQMD Method 5.1. The sampling duration for the test run was 72-minutes. The sampling for PM was conducted simultaneously for all three locations on August 16, 2019. The field blank was prepared and collected prior to sampling.

The detailed test results are presented in Table 6-3 for the outlet and Tables 6-6 and 6-9 for the inlets.

6.2 OTHERS

- Filter and probe temperatures were maintained at 248± 25°F for CARB Method 436 isokinetic sampling.
- Each impinger solution was maintained at a pH greater than eight (8) for CARB Method 425.
- Impinger trains and XAD temperatures, where applicable, were maintained below 68°F for all sampling event.
- Percent (%) Isokinetics was within the allowable range of 90-110% for all isokinetic sampling events.
- Cyclonic flow check was performed prior to sampling. No cyclonic flow was found.
- The single bag sample was collected at each test location over a period of 60 minutes. These samples were analyzed for oxygen and carbon dioxide via SCAQMD Method 10.1. The analysis of those bag samples shows that the O_2/CO_2 concentration for all sampling locations is in ambient level.
- No unusual operating conditions or field-testing observations were reported. Field data and calculations for all the emissions are presented in respective appendices.

- Although no nozzle diameters were recorded on the Method 436 data sheets for Runs 2 and 3, the nozzles were the same as used for Run 1 and hence the same diameter.

- The measured flow rates (dP) at the exhaust test location were approaching the reporting limits of the inclined manometer system used for the measurements. Upon request by the District, a direct comparison of the flows across the stack was collected between the "as-used" inclined manometer and a low-flow ADM electronic meter (Appendix G). The results of the comparison show the readings from the inclined manometer were within 10% (7.8%) of the ADM average values and could be considered as "biased low".

Testing was performed as specified in the reference methods and the SCAQMD Source Test Plan. No modifications to proposed sampling and analysis procedures other than those noted above were required.

6.3 TEST CHRONOLOGY

All testing was conducted during the periods listed below:

Parameter Measurement	Test Date	Time	Run No.
CARB Method 436 Baghouse Outlet, Inlet 1 (inside), and Inlet 2 (upstream to Baghouse)	08/13/19	08:50 – 10:55	Run 1
	08/13/19	11:55 – 14:00	Run 2
	08/14/19	08:25 – 10:30	Run 3
CARB Method 425 Baghouse Outlet, Inlet 1 (inside), and Inlet 2 (upstream to Baghouse)	08/14/19	11:25 – 13:30	Run 1
	08/15/19	08:10 – 10:15	Run 2
	08/15/19	10:55 – 13:10	Run 3
SCAQMD Method 5.1 Baghouse Outlet, Inlet 1 (inside), and Inlet 2 (upstream to Baghouse)	08/16/19	07:40 – 08:56	Run 1

TABLE 6-1. TEST RESULTS
CARB 436 (Multiple Metals)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Test Data	Units	Source Test Results						Average	
Run Number	--	Run 1		Run 2		Run 3			
Test Date	mm/dd/yy	08/13/19		08/13/19		08/14/19			--
Test Time	hh:mm	08:50 - 10:55		11:55 - 14:00		08:25 - 10:30			--
Sampling Data*									
Stack Temperature	°F		93.9		109		96.5		**99.8**
Moisture	%		1.9		2.1		2.1		**2.0**
Sample Volume	dscf		82.4		73.1		80.1		**78.5**
Oxygen**	% v/v		20.9		20.9		20.9		**20.9**
Carbon Dioxide**	% v/v		< 0.3		< 0.3		< 0.3		**< 0.3**
Gas Velocity	ft/min		671		608		658		**646**
Stack Flow Rate	acfm		8,436		7,642		8,268		**8,115**
Stack Flow Rate	dscfm		7,883		6,940		7,674		**7,499**
CARB Method 436 CONCENTRATION			Total		Total		Total		
Arsenic	ug/dscm	ND	0.43	ND	0.48	ND	0.44	<	**0.45**
	ug/dscf	ND	0.012	ND	0.014	ND	0.012	<	**0.013**
Cadmium	ug/dscm	ND	0.43	ND	0.48	ND	0.44	<	**0.45**
	ug/dscf	ND	0.024	ND	0.027	ND	0.025	<	**0.026**
Chromium	ug/dscm		1.63		0.68		1.98		**1.43**
	ug/dscf		0.05		0.02		0.06		**0.04**
Nickel	ug/dscm		0.69		0.34		0.62		**0.55**
	ug/dscf		0.019		0.010		0.017		**0.015**
CARB Method 436 MASS EMISSION RATE			Total		Total		Total		
Arsenic	lb/hr	ND	1.27E-05	ND	1.26E-05	ND	1.27E-05	<	**1.26E-05**
Cadmium	lb/hr	ND	1.27E-05	ND	1.26E-05	ND	1.27E-05	<	**1.26E-05**
Chromium	lb/hr		4.81E-05		1.76E-05		5.70E-05		**4.09E-05**
Nickel	lb/hr		2.02E-05		8.79E-06		1.77E-05		**1.56E-05**

Notes:
* Performed during isokinetic sampling (e.g. CARB Method 436).
** Measured via SCAQMD Method 10.1.
ND or "<" - Not detected, reporting limit reported.

TABLE 6-2. TEST RESULTS
CARB 425 (Hexavalent & Total Chromium)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

TEST DATA	UNITS	TEST RESULTS			AVERAGE
Run Number	-	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	8/14/19	8/14/19	8/15/19	--
Test Time	hh:mm	11:25 - 13:30	08:10 - 10:15	10:55 - 13:10	--
Sampling Data*					
Stack Temperature	°F	117.1	87.1	104.6	**102.9**
Moisture	%	2.3	1.9	2.4	**2.2**
Sample Volume	dscf	73.1	85.3	70.8	**76.4**
Oxygen**	% v/v	20.9	20.9	20.9	**20.9**
Carbon Dioxide**	% v/v	<0.3	<0.3	<0.3	**<0.3**
Gas Velocity	ft/min	613.6	685.1	585.5	**628**
Stack Flow Rate	acfm	7,711	8,609	7,358	**7,893**
Stack Flow Rate	dscfm	6,885	8,143	6,708	**7,245**
Total Catch (CARB 425)					
Chromium VI	ug	< 0.312	< 0.032	< 0.046	< **0.13**
Total Chromium	ug	< 0.550	< 0.590	< 0.600	< **0.58**
Concentration (CARB 425)					
Chromium VI	ug/dscm	< 0.151	< 0.013	< 0.023	< **0.062**
	ug/dscf	< 0.004	< 0.0004	< 0.001	< **0.0018**
Total Chromium	ug/dscm	< 0.266	< 0.244	< 0.299	< **0.270**
	ug/dscf	< 0.0075	< 0.0069	< 0.0085	< **0.0076**
Mass Emissions (CARB 425)					
Chromium VI	ug/hr	< 1763	< 180	< 261	< **735**
Chromium VI	mg/hr	< 1.76	< 0.18	< 0.26	< **0.73**
Chromium VI	lb/hr	< 3.89E-06	< 3.98E-07	< 5.76E-07	< **1.62E-06**
Total Chromium	ug/hr	< 3107	< 3380	< 3410	< **3299**
Total Chromium	mg/hr	< 3.11	< 3.38	< 3.41	< **3.30**
Total Chromium	lb/hr	< 6.85E-06	< 7.45E-06	< 7.52E-06	< **7.27E-06**

Notes:
* Performed during isokinetic sampling by CARB 425.
** O2/CO2 was measured via SCAQMD Method 10.1 by GC.
"<" Indicates an analytical result of non-detect (ND) and the use of laboratory MRL for emission calculations.

TABLE 6-3. TEST RESULTS
SCAQMD Method 5.1 (Particulate Matter)

Facility: AQMD Facility C

City: [redacted] CA

Source: Baghouse

Location: Outlet

Run Number		1		
Run Date		08/16/19		
Run Start Time		7:40		
Run Stop Time		8:56		
Test Train Parameters				**AVERAGE**
Volume of Dry Gas Sample, SCF*		39.73		39.73
Flue Gas Parameters				
CO2, Percent By Volume, Dry**	<	0.30	<	0.30
O2, Percent By Volume, Dry**		20.90		20.90
Temperature, Degrees F		87.6		87.6
Moisture, %		1.93		1.93
Air Flow Rate, Wet ACFM		6,705		6,705
Air Flow Rate, Dry SCFM*		6,240		6,240
Total Particulate				
Catch, mg		6.57		6.57
Concentration, Gr/DSCF		0.002552		0.002552
Emission Rate, lb/hr		0.136		0.136

Notes:

* 60 Degrees F and 29.92 Inches of Mercury

** O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

TABLE 6-4. TEST RESULTS
CARB 436 (Multiple Metals)

Facility: AQMD Facility C
City: [redacted]CA
Source: Baghouse
Location: Inlet 1

Test Data	Units	Source Test Results			Average
Run Number	--	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	08/13/19	08/13/19	08/14/19	--
Test Time	hh:mm	08:50 - 10:55	11:55 - 14:00	08:25 - 10:30	--
Sampling Data*					
Stack Temperature	°F	116	126	101	**114**
Moisture	%	2.0	2.1	1.9	**2.0**
Sample Volume	dscf	86.7	88.8	90.1	**88.6**
Oxygen**	% v/v	20.8	20.8	20.8	**20.8**
Carbon Dioxide**	% v/v	< 0.3	< 0.3	< 0.3	**< 0.3**
Gas Velocity	ft/min	1,228	1,277	1,241	**1,249**
Stack Flow Rate	acfm	1,132	1,177	1,144	**1,151**
Stack Flow Rate	dscfm	1,012	1,035	1,052	**1,033**
CARB Method 436 CONCENTRATION		Total	Total	Total	
Arsenic	ug/dscm	6.11	3.06	1.18	**3.45**
	ug/dscf	0.173	0.087	0.033	**0.098**
Cadmium	ug/dscm	ND 0.407	ND 0.398	ND 0.392	< **0.399**
	ug/dscf	ND 0.023	ND 0.023	ND 0.022	< **0.023**
Chromium	ug/dscm	1790.9	2822.2	1567	**2060**
	ug/dscf	50.71	79.92	44.38	**58.33**
Nickel	ug/dscm	37.7	94.90	50.4	**61.0**
	ug/dscf	1.069	2.687	1.428	**1.728**
CARB Method 436 MASS EMISSION RATE		Total	Total	Total	
Arsenic	lb/hr	2.32E-05	1.19E-05	4.63E-06	**1.32E-05**
Cadmium	lb/hr	ND 1.54E-06	ND 1.54E-06	ND 1.88E-06	< **1.66E-06**
Chromium	lb/hr	6.79E-03	1.09E-02	6.17E-03	**7.97E-03**
Nickel	lb/hr	1.43E-04	3.68E-04	1.99E-04	**2.37E-04**

Notes:
* Performed during isokinetic sampling (e.g. CARB Method 436).
** Measured via SCAQMD Method 10.1.
ND or "<" - Not detected, reporting limit reported.

TABLE 6-5. TEST RESULTS
CARB 425 (Hexavalent & Total Chromium)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

TEST DATA	UNITS	TEST RESULTS			AVERAGE
Run Number	-	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	8/14/19	8/14/19	8/15/19	--
Test Time	hh:mm	11:25 - 13:30	08:10 - 10:15	10:55 - 13:10	--
Sampling Data*					
Stack Temperature	°F	131	114	142	**129**
Moisture	%	1.6	1.6	1.7	**1.7**
Sample Volume	dscf	85.3	92.6	86.3	**88.1**
Oxygen**	% v/v	20.8	20.8	20.8	**20.8**
Carbon Dioxide**	% v/v	0.30	0.30	0.30	**0.30**
Gas Velocity	ft/min	1,238.5	1,303.0	1,273.8	**1,272**
Stack Flow Rate	acfm	1,142	1,201	1,174	**1,172**
Stack Flow Rate	dscfm	998	1,083	1,008	**1,030**
Total Catch (CARB 425)					
Chromium VI	ug	0.82	21.9	21.2	**14.6**
Total Chromium	ug	2540	330	1007	**1292**
Concentration (CARB 425)					
Chromium VI	ug/dscm	0.34	8.35	8.68	**5.79**
	ug/dscf	0.010	0.237	0.246	**0.164**
Total Chromium	ug/dscm	1052	125.9	412.1	**529.9**
	ug/dscf	29.78	3.56	11.67	**15.00**
Mass Emissions (CARB 425)					
Chromium VI	ug/hr	575	15369	14859	**10268**
Chromium VI	mg/hr	0.57	15.37	14.9	**10.3**
Chromium VI	lb/hr	1.27E-06	3.39E-05	3.28E-05	**2.26E-05**
Total Chromium	ug/hr	1784014	231584	705479	**907026**
Total Chromium	mg/hr	1784	232	705	**907**
Total Chromium	lb/hr	3.93E-03	5.11E-04	1.56E-03	**2.00E-03**

Notes:
* Performed during isokinetic sampling by CARB 425.
** O2/CO2 was measured via SCAQMD Method 10.1 by GC.

TABLE 6-6. TEST RESULTS
SCAQMD Method 5.1 (Particulate Matter)

Facility: AQMD Facility C

City: [redacted] CA

Source: Baghouse

Location: Inlet 1

Run Number		1		
Run Date		08/16/19		
Run Start Time		7:40		
Run Stop Time		8:56		
Test Train Parameters				**AVERAGE**
Volume of Dry Gas Sample, SCF*		53.50		53.50
Flue Gas Parameters				
CO2, Percent By Volume, Dry**	<	0.30	<	0.30
O2, Percent By Volume, Dry**		20.80		20.80
Temperature, Degrees F		100.8		100.8
Moisture, %		1.80		1.80
Air Flow Rate, Wet ACFM		1,147		1,147
Air Flow Rate, Dry SCFM*		1,040		1,040
Total Particulate				
Catch, mg		105.57		105.57
Concentration, Gr/DSCF		0.0305		0.0305
Emission Rate, lb/hr		0.271		0.271

Notes:

* 60 Degrees F and 29.92 Inches of Mercury

** O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

TABLE 6-7. TEST RESULTS
CARB 436 (Multiple Metals)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2

Test Data	Units	Source Test Results						Average	
Run Number	--	Run 1		Run 2		Run 3			
Test Date	mm/dd/yy	08/13/19		08/13/19		08/14/19			--
Test Time	hh:mm	08:50 - 10:55		11:55 - 14:00		08:25 - 10:30			--
Sampling Data*									
Stack Temperature	°F	91.9		99.0		95.5			**95.5**
Moisture	%	2.1		2.0		2.3			**2.1**
Sample Volume	dscf	98.9		95.5		94.1			**96.2**
Oxygen**	% v/v	20.8		20.8		20.8			**20.8**
Carbon Dioxide**	% v/v	< 0.3		< 0.3		< 0.3			**< 0.3**
Gas Velocity	ft/min	4,765		4,649		4,568			**4,661**
Stack Flow Rate	acfm	6,653		6,491		6,379			**6,507**
Stack Flow Rate	dscfm	6,164		5,942		5,861			**5,989**
CARB Method 436 CONCENTRATION		Total		Total		Total			
Arsenic	ug/dscm	1.32		0.67		0.56			**0.85**
	ug/dscf	0.037		0.019		0.016			**0.024**
Cadmium	ug/dscm	ND	0.357	ND	0.370	ND	0.375	<	**0.367**
	ug/dscf	ND	0.020	ND	0.021	ND	0.021	<	**0.021**
Chromium	ug/dscm	356.4		553.9		600			**503**
	ug/dscf	10.09		15.68		16.99			**14.25**
Nickel	ug/dscm	11.0		19.11		20.2			**16.7**
	ug/dscf	0.310		0.541		0.571			**0.474**
CARB Method 436 MASS EMISSION RATE		Total		Total		Total			
Arsenic	lb/hr	3.05E-05		1.48E-05		1.24E-05			**1.92E-05**
Cadmium	lb/hr	ND	8.24E-06	ND	8.23E-06	ND	1.01E-05	<	**8.84E-06**
Chromium	lb/hr	8.23E-03		1.23E-02		1.32E-02			**1.12E-02**
Nickel	lb/hr	2.53E-04		4.25E-04		4.42E-04			**3.74E-04**

Notes:
* Performed during isokinetic sampling (e.g. CARB Method 436).
** Measured via SCAQMD Method 10.1.
ND or "<" - Not detected, reporting limit reported.

TABLE 6-8. TEST RESULTS
CARB 425 (Hexavalent & Total Chromium)

Facility: AQMD Facility C
City: [redacted]CA
Source: Baghouse
Location: Inlet 2

TEST DATA	UNITS	TEST RESULTS			AVERAGE
Run Number	-	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	8/14/19	8/14/19	8/15/19	--
Test Time	hh:mm	11:25 - 13:30	08:10 - 10:15	10:55 - 13:10	--
Sampling Data*					
Stack Temperature	°F	112.3	86.1	96.9	**98.4**
Moisture	%	2.0	2.1	1.9	**2.0**
Sample Volume	dscf	89.8	97.3	92.2	**93.1**
Oxygen**	% v/v	20.8	20.8	20.8	**20.8**
Carbon Dioxide**	% v/v	0.30	0.30	0.30	**0.30**
Gas Velocity	ft/min	4,481.7	4,560.9	4,485.3	**4,509**
Stack Flow Rate	acfm	6,258	6,368	6,263	**6,296**
Stack Flow Rate	dscfm	5,597	5,958	5,757	**5,771**
Total Catch (CARB 425)					
Chromium VI	ug	2.89	5.30	3.90	**4.03**
Total Chromium	ug	469	70.0	280	**273**
Concentration (CARB 425)					
Chromium VI	ug/dscm	1.14	1.92	1.49	**1.52**
	ug/dscf	0.032	0.054	0.042	**0.043**
Total Chromium	ug/dscm	184.50	25.42	107.29	**105.7**
	ug/dscf	5.22	0.72	3.04	**2.99**
Mass Emissions (CARB 425)					
Chromium VI	ug/hr	10812	19479	14618	**14969**
Chromium VI	mg/hr	10.8	19.48	14.6	**15.0**
Chromium VI	lb/hr	2.38E-05	4.29E-05	3.22E-05	**3.30E-05**
Total Chromium	ug/hr	1754573	257267	1049466	**1020435**
Total Chromium	mg/hr	1755	257	1049	**1020**
Total Chromium	lb/hr	3.87E-03	5.67E-04	2.31E-03	**2.25E-03**

Notes:
* Performed during isokinetic sampling by CARB 425.
** O2/CO2 was measured via SCAQMD Method 10.1 by GC.

TABLE 6-9. TEST RESULTS
SCAQMD Method 5.1 (Particulate Matter)

Facility: AQMD Facility C

City: [redacted] CA

Source: Baghouse

Location: Inlet 2

Run Number		1		
Run Date		08/16/19		
Run Start Time		7:40		
Run Stop Time		8:56		
Test Train Parameters				**AVERAGE**
Volume of Dry Gas Sample, SCF*		55.51		55.51
Flue Gas Parameters				
CO2, Percent By Volume, Dry**	<	0.30	<	0.30
O2, Percent By Volume, Dry**		20.80		20.80
Temperature, Degrees F		93.2		93.2
Moisture, %		2.26		2.26
Air Flow Rate, Wet ACFM		6,412		6,412
Air Flow Rate, Dry SCFM*		5,825		5,825
Total Particulate				
Catch, mg		45.22		45.22
Concentration, Gr/DSCF		0.0126		0.0126
Emission Rate, lb/hr		0.628		0.628

Notes:

* 60 Degrees F and 29.92 Inches of Mercury

** O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

APPENDICES

APPENDIX A

GENERAL CALCULATIONS AND FORMULAE

GENERAL CALCULATIONS

Standard conditions: 29.92 in.Hg, 68 °F for CARB, 60°F for SCAQMD

Gas Moisture at standard conditions (scf): $V_{WTR} = K2*V_{COND}$
K2 = 0.04707 @ 68 °F, 0.0464 @ 60 °F

Sample volume at standard conditions (scf):
Vmstd =K1*Vmacf*Ym*(Pbar+dH/13.6)/(Tm+460)
K1 = 17.64 @ 68 °F, 17.38 @ 60 °F

Percent of water: $\%H_2O = 100*Vmstd/(Vmstd+Vwtr)$

Dry molecular weight: $M_d = (44*\%CO_2+32*\%O_2+28*(\%N_2+\%CO))/100$

Wet molecular weight: $M_w = M_d*(1-\%H_2O/100)+18*(\%H_2O/100)$

Stack gas pressure (In. Hg): $P_{stk} = P_{bar}+P_{sta}/13.6$

Average velocity head: Ave. dP = $\{SQRT\ (dP)\}^2$

Stack gas velocity (fps): $V = 85.49*C_p*SQRT(dP)*SQRT((T_S+460)/(P_{STK}*M_w))$

Percent of excess air: $\%EXCA = 100*(\%O_2-0.5\%CO)/(0.264(\%N_2-(\%O_2-0.5\%CO)))$

Stack gas flow (scfm): $Q_{STK} = 60(1-\%H_2O/100)*V*A*(528/(T_s+460))*P_{stk}/29.92$

Concentration at 3% O_2: $PPM\ @\ 3\%\ O_2 = PPM_{measured}*17.9/(20.9-\%O_2)$

Emissions lb/MMBtu:
$lb/MMBtu=PPM*10^{-6}*(MW\ lb/lb\text{-}mole)/SV\ Mole*F_d*20.9/(20.9-\%O_2)$

Emissions lb/hr:
$lb/hr = PPM*10^{-6}*((MW\ lb/lb\text{-}mole)/SV)*F_d*FF*(1050\ Btu/scf)*20.9/(20.9-\%O_2)$

Concentration (ug/dscm), Ci = Mi/VmStd*35.315

Metals Mass Emission Rate (ug/hr), Ei,m = Ci*Qsdm*60,

Metals Mass Emission Rate (lbs/hr) = Ei/453.6/1000000

DEFINITIONS

A:	Stack cross area, Square feet
Cp:	Pitot coefficient
@h:	Orifice Pressure, In. H2O
MW:	Molecular weight
Md:	Dry molecular weight of flue gas
Mw:	Wet molecular weight of flue gas
Pbar:	Barometric pressure, In. Hg
Psta:	Static Pressure, In. H2O
Pstk:	Stack pressure, In, Hg
P:	Stack differential pressure, In. H2O
Qstk:	Stack gas flow, scfm
Tm:	Meter temperature, F
Ts:	Stack gas temperature, F
Vcond:	Volume of water condensation, ml
Vm:	Meter volume, acf
Vmstd:	Sample gas at standard conditions, scf
Vwtr:	Water vapor volume, scf
Ym:	Meter correction factor
SV:	Specific molar volume, 379.5 dscf/Lb.mole at 60F, or 385.3 dscf/Lb.mole at 68F
FF:	Fuel Flow Rate (SCF/HR)
Fd:	Dry Fuel Factor, for natural gas Fd=8710 Dscf/MMBTU at 68F.

APPENDIX B

APPROVALS AND CERTIFICATIONS

APPENDIX B1

SCAQMD AND CARB TESTING APPROVALS

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

Almega
ENVIRONMENTAL

May 29, 2019

Mr. John W. Phillips
Almega Environmental
10602 Walker Street
Cypress, CA 90630

Subject: LAP Approval Notice
Reference # 93LA0827

Dear Mr. Phillips:

We completed our review of the renewal application you submitted for approval under the South Coast Air Quality Management District's Laboratory Approval Program (LAP). We are pleased to inform you that your firm is approved for the period beginning June 30, 2019, and ending June 30, 2020 for the following methods, subject to the requirements in the LAP Conditions For Approval Agreement and conditions listed in the attachment to this letter:

SCAQMD Methods 1-4	SCAQMD Method 7.1
SCAQMD Method 10.1	SCAQMD Rule 1121/ 1146.2 Protocols
SCAQMD Method 100.1	SCAQMD Rule 1420/1420.1/ 1420.2 – (Lead) Source Sampling
SCAQMD Method 25.1 (Sampling)	SCAQMD Rule 1420/1420.1/ 1420.2 – (Lead) Ambient Sampling
SCAQMD Method 25.1 (Analysis)	SCAQMD Rule 462 Testing
SCAQMD Method 25.3 (Analysis)	ASTM D6522-00/ USEPA CTM-030
SCAQMD Methods 5.1 and 6.1	

Thank you for participating in the LAP. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions. You may direct any questions or information to LAP Coordinator, Glenn Kasai. He may be reached by telephone at (909) 396-2271, or via e-mail at gkasai@aqmd.gov.

Sincerely,

D. Sarkar

Dipankar Sarkar
Program Supervisor
Source Test Engineering

GK/gk

190529 LapRenewal.doc

ATTACHMENT

Conditions For Almega Environmental's LAP Approval

1) Almega shall adhere to the following requirements when conducting portable analyzer tests using CTM-030 or ASTM D6522:

   a) Deviations to CTM-030 or ASTM D6522 shall be documented in the Test Critique section of the test report;

   b) The test report shall be formatted and organized in a manner consistent with the example portable analyzer test report, dated September 24, 2011, and the Source Test Manual, Chapter II; and,

   c) NO_2 measurements may be quantified to 10% of the NO_2 span under the following conditions:

      - Calibrations shall be conducted per Sections 7.3 and 7.6 of CTM-030 at the span, mid-span (40-60% of span), low-span (10% of span), and zero level. The low-span calibration shall satisfy the requirements in Section 4.2 of CTM-030;
      - A linearity check shall be conducted once every five days using the low-span calibration gas; and,
      - If the measured NO_2 emission is less than 10% of the NO_2 span, it shall be reported as less than 10% of the span, and added to the NO emission to determine the total NOx concentration.

State of California

Air Resources Board

Approved Independent Contractor

Almega Environmental & Technical Services, Incorporated

This is to certify that the company listed above has been approved by the California Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, through June 30, 2020, for the test methods listed below:

ARB Source Test Methods:

1, 2, 3, 4, 5, 8

100 (CO, CO_2, NO_x, O_2, SO_2)

Catherine Dunwoody, Chief
Monitoring and Laboratory Division

State of California

Air Resources Board

Approved Independent Contractor

Almega Environmental & Technical Services, Incorporated

This is to certify that the company listed above has been approved by the California Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, through June 30, 2020, for the test method listed below:

Visible Emissions Evaluation

Catherine Dunwoody, Chief
Monitoring and Laboratory Division

APPENDIX B2

CERTIFICATION OF NO CONFLICT-OF-INTEREST

Certification of No Conflict-of-Interest

Almega Environmental & Technical Services
10602 Walker Street
Cypress, CA 90630

I certify that I am responsible for the testing operations of Almega and am authorized to sign this certificate on the Company's behalf.

Almega may conduct tests as an independent tester pursuant to SCAQMD Rule 304(k). I further certify that Almega has no conflict-of-interests and is not related or owned in any way to the company being tested.

Company being tested: Metal Melting Facility C .

Facility Location: [redacted]

Facility ID: [redacted]

Signature:

Name (printed or typed): Charles M. Figueroa

Title: Senior Project Manager

Date: November 8, 2019

APPENDIX C

CARB METHOD 436 – MULTIPLE METAL EMISSIONS

APPENDIX C1

MULTIPLE METAL EMISSIONS – RESULTS AND CALCULATIONS

Location: Baghouse Outlet

TEST RESULTS
CARB 436 (Multiple Metals)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Test Data	Units	Source Test Results			Average
Run Number	--	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	08/13/19	08/13/19	08/14/19	--
Test Time	hh:mm	08:50 - 10:55	11:55 - 14:00	08:25 - 10:30	--
Sampling Data*					
Stack Temperature	°F	93.9	109	96.5	**99.8**
Moisture	%	1.9	2.1	2.1	**2.0**
Sample Volume	dscf	82.4	73.1	80.1	**78.5**
Oxygen**	% v/v	20.9	20.9	20.9	**20.9**
Carbon Dioxide**	% v/v	< 0.3	< 0.3	< 0.3	**< 0.3**
Gas Velocity	ft/min	671	608	658	**646**
Stack Flow Rate	acfm	8,436	7,642	8,268	**8,115**
Stack Flow Rate	dscfm	7,883	6,940	7,674	**7,499**
CARB Method 436 CONCENTRATION		Total	Total	Total	
Arsenic	ug/dscm	ND 0.43	ND 0.48	ND 0.44	< **0.45**
	ug/dscf	ND 0.012	ND 0.014	ND 0.012	< **0.013**
Cadmium	ug/dscm	ND 0.43	ND 0.48	ND 0.44	< **0.45**
	ug/dscf	ND 0.024	ND 0.027	ND 0.025	< **0.026**
Chromium	ug/dscm	1.63	0.68	1.98	**1.43**
	ug/dscf	0.05	0.02	0.06	**0.04**
Nickel	ug/dscm	0.69	0.34	0.62	**0.55**
	ug/dscf	0.019	0.010	0.017	**0.015**
CARB Method 436 MASS EMISSION RATE		Total	Total	Total	
Arsenic	lb/hr	ND 1.27E-05	ND 1.26E-05	ND 1.27E-05	< **1.26E-05**
Cadmium	lb/hr	ND 1.27E-05	ND 1.26E-05	ND 1.27E-05	< **1.26E-05**
Chromium	lb/hr	4.81E-05	1.76E-05	5.70E-05	**4.09E-05**
Nickel	lb/hr	2.02E-05	8.79E-06	1.77E-05	**1.56E-05**

Notes:
* Performed during isokinetic sampling (e.g. CARB Method 436).
** Measured via SCAQMD Method 10.1.
ND or "<" - Not detected, reporting limit reported.

CARB METHOD 436 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/13-14/19
City:	[redacted] CA	Operator:	NC
Source:	Baghouse	Entered by:	TG
Location:	Outlet	Checked by:	CF

Metals Catch, Mi		**Run 1**		**Run 2**		**Run 3**		Field Blank		Reagent Blank
Fraction			Results		Results		Results		Results	Results
Arsenic	ug	ND	1.0	ND	1.0	ND	1.0	ND	1.0	ND 1.00
Cadmium	ug	ND	1.0	ND	1.0	ND	1.0	ND	1.0	ND 1.00
Chromium	ug		5.3		2.9		6.0		1.6	1.50
Nickel	ug		2.9		2.0		2.7		1.4	1.30

Reagent Blank		**Run 1**		**Run 2**		**Run 3**		Field Blank		
Fraction			Results		Results		Results		Results	
Arsenic	ug	ND	1.0	ND	1.0	ND	1.0	ND	1.0	
Cadmium	ug	ND	1.0	ND	1.0	ND	1.0	ND	1.0	
Chromium	ug		1.5		1.5		1.50		1.5	
Nickel	ug		1.3		1.3		1.30		1.3	

Reagent Blank Corrected Values		**Run 1**		**Run 2**		**Run 3**		Field Blank		Reporting Limit*
Fraction			Results		Results		Results		Results	
Arsenic	ug	ND	1.0	ND	1.0	ND	1.0	ND	1.0	
Cadmium	ug	ND	1.0	ND	1.0	ND	1.0	ND	1.0	
Chromium	ug		3.8		1.4		4.5		0.10	0.30
Nickel	ug		1.6		0.7		1.4		0.10	0.30

*Reporting limit is based on three times the FB values.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/13-14/19
City:	[redacted] CA	Operator:	NC
Source:	Baghouse	Entered by:	TG
Location:	Outlet	Checked by:	CF

Metals Catch, Mi		**Run 1**		**Run 2**		**Run 3**		Field Blank	Reagent Blank
Fraction		Total		Total		Total		Total	Total
Arsenic	ug	ND	1.0	ND	1.0	ND	1.0	ND 1.00	ND 1.00
Cadmium	ug	ND	1.0	ND	1.0	ND	1.0	ND 1.00	ND 1.00
Chromium	ug	B	3.8	B	1.4	B	4.5	1.5	1.50
Nickel	ug	B	1.6	B	0.7	B	1.4	1.3	1.30

Metals Molecular Weight, MW		**Run 1**	**Run 2**	**Run 3**
Fraction		Total	Total	Total
Arsenic	g/g-mole	74.92	74.92	74.92
Cadmium	g/g-mole	112.41	112.41	112.41
Chromium	g/g-mole	51.995	51.995	51.995
Nickel	g/g-mole	58.69	58.69	58.69
Concentration (ug/dscm), Ci = Mi/VmStd *35.315e-3cf/dscm				
Fraction		Total	Total	Total
Arsenic	ug/dscm	ND 0.43	ND 0.48	ND 0.44
Cadmium	ug/dscm	ND 0.4285	ND 0.4829	ND 0.4410
Chromium	ug/dscm	1.628	0.676	1.985
Nickel	ug/dscm	0.6857	0.3381	0.617
Metals Mass Emission Rate (ug/hr), Ei,m Ei,m = Ci*Qsdm*60				
Fraction		Total	Total	Total
Arsenic	ug/hr	ND 5.74E+03	ND 5.69E+03	ND 5.75E+03
Cadmium	ug/hr	ND 5.74E+03	ND 5.69E+03	ND 5.75E+03
Chromium	ug/hr	2.18E+04	7.97E+03	2.59E+04
Nickel	ug/hr	9.18E+03	3.99E+03	8.05E+03
Metals Mass Emission Rate (lb/hr), Ei Ei = Ci*Qsdm*60/453600/1000				
Fraction		Total	Total	Total
Arsenic	lb/hr	ND 1.27E-05	ND 1.26E-05	ND 1.27E-05
Cadmium	lb/hr	ND 1.27E-05	ND 1.26E-05	ND 1.27E-05
Chromium	lb/hr	4.81E-05	1.76E-05	5.70E-05
Nickel	lb/hr	2.02E-05	8.79E-06	1.77E-05

Flags

ND or "<" - Not detected, reporting limit reported.

B - Reagent blank corrected value.

NDb - Reagent blank corrected result is less than RL. RL is substituted.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Test Date(s): 08/13-14/19
Operator: NC
Entered by: TG
Checked by: CF

DATA ENTRY	Symbol	units	08/13/19 DATA	08/13/19 DATA	08/14/19 DATA
Run Number			Run 1	Run 2	Run 3
Stack Dimensions: Round Stack Diameter	Ds	in.	48.0	48.0	48.0
Rectangular Stack, Length	L	in.			
Width	W	in.			
Nozzle Diameter	Dn	in.	0.450	0.450	0.450
Standard Temperature	Tstd	°F	68	68	68
Universal (molar) Gas Constant	Renglish	in. Hg-cu.ft/ °R-lbmole	21.85	21.85	21.85
Average Stack Temperature (measured)	Fs	°F	93.9	109.0	96.5
Average Meter Temperature (measured)	Fm	°F	92.0	109.5	79.0
Standard Pressure	Pstd	in.Hg	29.92	29.92	29.92
Barometric Pressure	Pbar	in.Hg	29.90	29.90	29.90
Stack Static Pressure	Pg	in.WC	-0.020	-0.020	-0.020
Average Meter Orifice Head (Delta-H)	dH	in.WC	1.45	1.13	1.36
Average RMS Velocity Head (Delta-P)	dP	in.WC	0.038	0.030	0.036
Pitot Coefficient	Cp	—	0.84	0.84	0.84
Net Volume of Gas Metered	Vm	cu.ft.	82.774	75.832	78.550
Dry Gas Meter Calibration Factor (gamma, Y)	Y	—	1.0379	1.0379	1.0379
NET Sampling Time	min	min.	120	120	120
Stack Gas: Oxygen Content *	O2,m	%	20.9	20.9	20.9
Carbon Dioxide Content *	CO2,m	%	< 0.3	< 0.3	< 0.3
Total Impinger Gain	Ww	g	33.7	32.6	36.3
CALCULATED DATA					
Nozzle Area: An = pi/4*dn^2	An	sq.in.	0.1590	0.1590	0.1590
Stack Area (round): As = pi/576*ds^2 (rectangular): As = L*W/144	As	sq.ft.	12.57	12.57	12.57
Absolute Stack Temperature: Ts = Fs+460	Ts	°R	553.9	569.0	556.5
Absolute Meter Temperature: Tm = Fm+460	Tm	°R	552.0	569.5	539.0
Standard Temperature: Tstdr = Tstd+460	Tstdr	°R	528.0	528.0	528.0
Gas Sample Volume at Standard Conditions: Vm(std) = Y * (Vm/Tm) * (Pbar + dH/13.6 in H2O/in Hg) * (Tstdr/Pstd)	VmStd	cu.ft.	82.408	73.125	80.071
Vol. of Water Vapor, Vw(std) = Ww/453.59 * Renglish/18 * Tstdr / Pstd	VwStd	cu.ft.	1.592	1.540	1.714
Moisture Fraction: Bws = VwStd/(VmStd+VwStd)	Bws	—	0.019	0.021	0.021
Stack Gas MW, Dry Basis: Md = 0.32*O2,m + 0.44*CO2,m + 0.28*(100-O2,m-CO2,m)	Md	g/mole	28.88	28.88	28.88
Stack Gas MW, Wet Basis: Mw = Md*(1-Bws) + 18*Bws	Mw	g/mole	28.68	28.66	28.66
Stack Pressure: Ps = Pbar + Pg/13.6	Ps	in.Hg	29.90	29.90	29.90
Stack Gas Velocity, measured					
vs = 85.49*Cp*√(dP*Ts/Ps/Mw)	vs	ft/s	11.19	10.14	10.97
vm = 0.3048 m/ft*vs	vsm	m/s	3.41	3.09	3.34
Stack Gas Volumetric Flow Rate: Q = 60*vs*As	Q	acfm	8,436	7,642	8,268
Stack Gas Volumetric Flow Rate, corrected:					
Qsd = Q*(1-Bws)*(Ps/Ts)*(Tstdr/Pstd)	Qsd	dscfm	7,883	6,940	7,674
Qsdm = Qsd/35.315	Qsdm	dscmm	223.2	196.5	217.3
Isokinetic Sampling Rate: I = 144*100*Ts*Vmstd *Pstd/[60*Tstdr*vs*min*An*Ps*(1-Bws)]	I	%	99.1	99.9	98.9

* O2/CO2 is based on SCAQMD Method 10.1 analysis.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Run No.: 1
Test Date: 08/13/19
Times: 08:50 - 10:55

point	Stack Temp (°F) Fs	sqrt (Fs)	Velocity Head (in.WC) dP	sqrt (dP)	dH (in.WC)	DGM Temperature (°F) Fm,in	Fm,out
A-1	87	9.3	0.080	0.283	2.93	71	72
2	90	9.5	0.080	0.283	2.96	82	75
3	91	9.5	0.070	0.265	2.55	85	77
4	91	9.5	0.050	0.224	1.86	88	79
5	92	9.6	0.040	0.200	1.49	90	81
6	92	9.6	0.040	0.200	1.49	90	82
7	92	9.6	0.040	0.200	1.50	91	84
8	92	9.6	0.040	0.200	1.50	93	85
9	93	9.6	0.040	0.200	1.50	94	87
10	93	9.6	0.030	0.173	1.13	95	88
11	94	9.7	0.030	0.173	1.13	96	89
12	94	9.7	0.030	0.173	1.13	97	90
B-1	93	9.6	0.030	0.173	1.13	92	92
2	95	9.7	0.030	0.173	1.13	99	92
3	95	9.7	0.030	0.173	1.13	100	93
4	96	9.8	0.030	0.173	1.13	100	94
5	96	9.8	0.030	0.173	1.14	101	95
6	96	9.8	0.030	0.173	1.14	102	96
7	96	9.8	0.030	0.173	1.14	102	96
8	96	9.8	0.030	0.173	1.14	103	96
9	97	9.8	0.030	0.173	1.14	103	97
10	97	9.8	0.030	0.173	1.14	104	97
11	98	9.9	0.030	0.173	1.14	104	98
12	99	9.9	0.030	0.173	1.13	104	97
Average:	**93.9**		**0.0376**		**1.45**		**92.0**

DGM Reading (cu.ft.):	
Final-1:	443.624
Initial-1:	360.850
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**82.774**

Impinger Weight (g):	
#1 Final:	746.4
#1 Initial:	742.6
#2 Final:	767.6
#2 Initial:	757.2
#3 Final:	636.0
#3 Initial:	632.7
#4 Final:	876.7
#4 Initial:	860.5
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**33.7**

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Run No.: 2
Test Date: 08/13/19
Times: 11:55 - 14:00

point	Stack Temp (°F) Fs	sqrt (Fs)	Velocity Head (in.WC) dP	sqrt (dP)	dH (in.WC)	DGM Temperature (°F) Fm,in	Fm,out
A-1	99	9.9	0.030	0.173	1.13	99	99
2	108	10.4	0.030	0.173	1.12	106	99
3	108	10.4	0.030	0.173	1.13	109	101
4	108	10.4	0.030	0.173	1.13	110	102
5	110	10.5	0.030	0.173	1.13	111	103
6	110	10.5	0.030	0.173	1.13	112	104
7	110	10.5	0.030	0.173	1.13	113	105
8	110	10.5	0.030	0.173	1.13	113	106
9	109	10.4	0.030	0.173	1.13	114	106
10	109	10.4	0.030	0.173	1.13	114	107
11	109	10.4	0.030	0.173	1.13	114	107
12	110	10.5	0.030	0.173	1.13	114	108
B-1	110	10.5	0.030	0.173	1.13	108	108
2	112	10.6	0.030	0.173	1.13	114	107
3	112	10.6	0.030	0.173	1.13	115	107
4	111	10.5	0.030	0.173	1.13	115	108
5	111	10.5	0.030	0.173	1.13	116	108
6	110	10.5	0.030	0.173	1.14	115	109
7	110	10.5	0.030	0.173	1.14	116	109
8	109	10.4	0.030	0.173	1.14	116	109
9	109	10.4	0.030	0.173	1.14	116	109
10	109	10.4	0.030	0.173	1.14	116	109
11	108	10.4	0.030	0.173	1.14	116	109
12	106	10.3	0.030	0.173	1.14	116	109
Average:	**109.0**		**0.030**		**1.13**		**109.5**

DGM Reading (cu.ft.):	
Final-1:	524.682
Initial-1:	448.850
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**75.832**

Impinger Weight (g):	
#1 Final:	727.3
#1 Initial:	739.7
#2 Final:	781.6
#2 Initial:	761.5
#3 Final:	657.8
#3 Initial:	650.9
#4 Final:	768.3
#4 Initial:	750.3
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**32.6**

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Run No.: 3
Test Date: 08/14/19
Times: 08:25 - 10:30

point	Stack Temp (°F) Fs	sqrt (Fs)	Velocity Head (in.WC) dP	sqrt (dP)	dH (in.WC)	DGM Temperature (°F) Fm,in	Fm,out
A-1	93	9.6	0.060	0.245	2.15	66	66
2	98	9.9	0.060	0.245	2.14	69	66
3	98	9.9	0.060	0.245	2.15	74	67
4	100	10.0	0.060	0.245	2.15	77	68
5	93	9.6	0.030	0.173	1.09	79	69
6	94	9.7	0.030	0.173	1.09	79	71
7	93	9.6	0.030	0.173	1.10	80	72
8	92	9.6	0.030	0.173	1.02	81	73
9	92	9.6	0.030	0.173	1.10	82	73
10	93	9.6	0.030	0.173	1.10	83	75
11	93	9.6	0.030	0.173	1.10	84	75
12	95	9.7	0.030	0.173	1.10	84	76
B-1	99	9.9	0.030	0.173	1.09	78	77
2	96	9.8	0.030	0.173	1.10	85	77
3	99	9.9	0.030	0.173	1.10	86	78
4	97	9.8	0.030	0.173	1.10	87	79
5	97	9.8	0.030	0.173	1.10	87	79
6	98	9.9	0.030	0.173	1.10	87	80
7	98	9.9	0.030	0.173	1.11	88	82
8	98	9.9	0.020	0.141	0.74	89	81
9	99	9.9	0.020	0.141	0.73	88	81
10	100	10.0	0.020	0.141	0.73	88	82
11	101	10.0	0.060	0.245	2.20	89	82
12	101	10.0	0.090	0.300	3.31	92	83
Average:	**96.5**		**0.0359**		**1.36**		**79.0**

DGM Reading (cu.ft.):	
Final-1:	607.525
Initial-1:	528.975
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**78.550**

Impinger Weight (g):	
#1 Final:	745.9
#1 Initial:	743.0
#2 Final:	769.3
#2 Initial:	755.6
#3 Final:	635.2
#3 Initial:	632.4
#4 Final:	894.0
#4 Initial:	877.1
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**36.3**

Location: Inlet 1 (Inside)

TEST RESULTS
CARB 436 (Multiple Metals)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Test Data	Units	Source Test Results			Average
Run Number	--	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	08/13/19	08/13/19	08/14/19	--
Test Time	hh:mm	08:50 - 10:55	11:55 - 14:00	08:25 - 10:30	--
Sampling Data*					
Stack Temperature	°F	116	126	101	**114**
Moisture	%	2.0	2.1	1.9	**2.0**
Sample Volume	dscf	86.7	88.8	90.1	**88.6**
Oxygen**	% v/v	20.8	20.8	20.8	**20.8**
Carbon Dioxide**	% v/v	< 0.3	< 0.3	< 0.3	**< 0.3**
Gas Velocity	ft/min	1,228	1,277	1,241	**1,249**
Stack Flow Rate	acfm	1,132	1,177	1,144	**1,151**
Stack Flow Rate	dscfm	1,012	1,035	1,052	**1,033**
CARB Method 436 CONCENTRATION		Total	Total	Total	
Arsenic	ug/dscm	6.11	3.06	1.18	**3.45**
	ug/dscf	0.173	0.087	0.033	**0.098**
Cadmium	ug/dscm	ND 0.407	ND 0.398	ND 0.392	< **0.399**
	ug/dscf	ND 0.023	ND 0.023	ND 0.022	< **0.023**
Chromium	ug/dscm	1790.9	2822.2	1567	**2060**
	ug/dscf	50.71	79.92	44.38	**58.33**
Nickel	ug/dscm	37.7	94.90	50.4	**61.0**
	ug/dscf	1.069	2.687	1.428	**1.728**
CARB Method 436 MASS EMISSION RATE		Total	Total	Total	
Arsenic	lb/hr	2.32E-05	1.19E-05	4.63E-06	**1.32E-05**
Cadmium	lb/hr	ND 1.54E-06	ND 1.54E-06	ND 1.88E-06	< **1.66E-06**
Chromium	lb/hr	6.79E-03	1.09E-02	6.17E-03	**7.97E-03**
Nickel	lb/hr	1.43E-04	3.68E-04	1.99E-04	**2.37E-04**

Notes:
* Performed during isokinetic sampling (e.g. CARB Method 436).
** Measured via SCAQMD Method 10.1.
ND or "<" - Not detected, reporting limit reported.

CARB METHOD 436 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/13-14/19
City:	[redacted] CA	Operator:	DJ
Source:	Baghouse	Entered by:	TG
Location:	Inlet 1	Checked by:	CF

Metals Catch, Mi		**Run 1**	**Run 2**	**Run 3**	Field Blank	Reagent Blank
Fraction		Results	Results	Results	Results	Results
Arsenic	ug	15.0	7.7	3.0	ND 1.0	ND 1.00
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	ND 1.00
Chromium	ug	4,400	7,100	4,000	1.6	1.50
Nickel	ug	94	240	130	1.4	1.30

Reagent Blank		**Run 1**	**Run 2**	**Run 3**	Field Blank	
Fraction		Results	Results	Results	Results	
Arsenic	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	
Chromium	ug	1.5	1.5	1.50	1.5	
Nickel	ug	1.3	1.3	1.30	1.3	

Reagent Blank Corrected Values		**Run 1**	**Run 2**	**Run 3**	Field Blank	Reporting Limit*
Fraction		Results	Results	Results	Results	
Arsenic	ug	15.0	7.7	3.0	ND 1.0	
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	
Chromium	ug	4,398.5	7,098.5	3,998.5	0.10	0.30
Nickel	ug	92.7	238.7	128.7	0.10	0.30

*Reporting limit is based on three times the FB values.

CARB METHOD 436 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/13-14/19
City:	[redacted] CA	Operator:	DJ
Source:	Baghouse	Entered by:	TG
Location:	Inlet 1	Checked by:	CF

Metals Catch, Mi		**Run 1**	**Run 2**	**Run 3**	Field Blank	Reagent Blank
Fraction		Total	Total	Total	Total	Total
Arsenic	ug	15.0	7.7	3.0	ND 1.00	ND 1.00
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.00	ND 1.00
Chromium	ug	B 4,398.5	B 7,098.5	B 3,998.5	1.6	1.50
Nickel	ug	B 92.7	B 238.7	B 128.7	1.4	1.30

Metals Molecular Weight, MW		**Run 1**	**Run 2**	**Run 3**
Fraction		Total	Total	Total
Arsenic	g/g-mole	74.92	74.92	74.92
Cadmium	g/g-mole	112.41	112.41	112.41
Chromium	g/g-mole	51.995	51.995	51.995
Nickel	g/g-mole	58.69	58.69	58.69
Concentration (ug/dscm), Ci = Mi/VmStd *35.315e-3cf/dscm				
Fraction		Total	Total	Total
Arsenic	ug/dscm	6.11	3.06	1.18
Cadmium	ug/dscm	ND 0.4072	ND 0.3976	ND 0.3919
Chromium	ug/dscm	1,790.927	2,822.222	1,567.145
Nickel	ug/dscm	37.7444	94.9024	50.442
Metals Mass Emission Rate (ug/hr), Ei,m Ei,m = Ci*Qsdm*60				
Fraction		Total	Total	Total
Arsenic	ug/hr	1.05E+04	5.38E+03	2.10E+03
Cadmium	ug/hr	ND 7.00E+02	ND 6.99E+02	ND 7.00E+02
Chromium	ug/hr	3.08E+06	4.96E+06	2.80E+06
Nickel	ug/hr	6.49E+04	1.67E+05	9.01E+04
Metals Mass Emission Rate (lb/hr), Ei Ei = Ci*Qsdm*60/453600/1000				
Fraction		Total	Total	Total
Arsenic	lb/hr	2.32E-05	1.19E-05	4.63E-06
Cadmium	lb/hr	ND 1.54E-06	ND 1.54E-06	ND 1.54E-06
Chromium	lb/hr	6.79E-03	1.09E-02	6.17E-03
Nickel	lb/hr	1.43E-04	3.68E-04	1.99E-04

Flags

ND or "<" - Not detected, reporting limit reported.

B - Reagent blank corrected value.

NDb - Reagent blank corrected result is less than RL. RL is substituted.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Test Date(s): 08/13-14/19
Operator: DJ
Entered by: TG
Checked by: CF

DATA ENTRY	Symbol	Units	08/13/19 DATA Run 1	08/13/19 DATA Run 2	08/14/19 DATA Run 3
Run Number			Run 1	Run 2	Run 3
Stack Dimensions: Round Stack Diameter	Ds	in.	13.0	13.0	13.0
Rectangular Stack, Length	L	in.			
Width	W	in.			
Nozzle Diameter	Dn	in.	0.348	0.348	0.348
Standard Temperature	Tstd	°F	68	68	68
Universal (molar) Gas Constant	Renglish	in. Hg-cu.ft/ °R-lbmole	21.85	21.85	21.85
Average Stack Temperature (measured)	Fs	°F	116.2	125.7	101.2
Average Meter Temperature (measured)	Fm	°F	99.6	103.8	96.5
Standard Pressure	Pstd	in.Hg	29.92	29.92	29.92
Barometric Pressure	Pbar	in.Hg	29.90	29.90	29.90
Stack Static Pressure	Pg	in.WC	-1.50	-1.50	-1.50
Average Meter Orifice Head (Delta-H)	dH	in.WC	1.85	1.93	1.97
Average RMS Velocity Head (Delta-P)	dP	in.WC	0.12	0.13	0.13
Pitot Coefficient	Cp	—	0.84	0.84	0.84
Net Volume of Gas Metered	Vm	cu.ft.	88.093	90.864	90.987
Dry Gas Meter Calibration Factor (gamma, Y)	Y	—	1.0395	1.0395	1.0395
NET Sampling Time	min	min.	120	120	120
Stack Gas: Oxygen Content *	O2,m	%	20.8	20.8	20.8
Carbon Dioxide Content *	CO2,m	%	< 0.3	< 0.3	< 0.3
Total Impinger Gain	Ww	g	36.7	39.4	36.2
CALCULATED DATA					
Nozzle Area: An = pi/4*dn^2	An	sq.in.	0.0951	0.0951	0.0951
Stack Area (round): As = pi/576*ds^2 (rectangular): As = L*W/144	As	sq.ft.	0.92	0.92	0.92
Absolute Stack Temperature: Ts = Fs+460	Ts	°R	576.2	585.7	561.2
Absolute Meter Temperature: Tm = Fm+460	Tm	°R	559.6	563.8	556.5
Standard Temperature: Tstdr = Tstd+460	Tstdr	°R	528.0	528.0	528.0
Gas Sample Volume at Standard Conditions: Vm(std) = Y * (Vm/Tm) * (Pbar + dH/13.6 in H2O/in Hg) * (Tstdr/Pstd)	VmStd	cu.ft.	86.733	88.825	90.105
Vol. of Water Vapor, Vw(std) = Ww/453.59 * Renglish/18 * Tstdr / Pstd	VwStd	cu.ft.	1.733	1.861	1.710
Moisture Fraction: Bws = VwStd/(VmStd+VwStd)	Bws	—	0.020	0.021	0.019
Stack Gas MW, Dry Basis: Md = 0.32*O2,m + 0.44*CO2,m + 0.28*(100-O2,m-CO2,m)	Md	g/mole	28.88	28.88	28.88
Stack Gas MW, Wet Basis: Mw = Md*(1-Bws) + 18*Bws	Mw	g/mole	28.67	28.66	28.68
Stack Pressure: Ps = Pbar + Pg/13.6	Ps	in.Hg	29.79	29.79	29.79
Stack Gas Velocity, measured					
vs = 85.49*Cp*√(dP*Ts/Ps/Mw)	vs	ft/s	20.46	21.28	20.69
vm = 0.3048 m/ft*vs	vsm	m/s	6.24	6.49	6.31
Stack Gas Volumetric Flow Rate: Q = 60*vs*As	Q	acfm	1,132	1,177	1,144
Stack Gas Volumetric Flow Rate, corrected:					
Qsd = Q*(1-Bws)*(Ps/Ts)*(Tstdr/Pstd)	Qsd	dscfm	1,012	1,035	1,052
Qsdm = Qsd/35.315	Qsdm	dscmm	28.7	29.3	29.8
Isokinetic Sampling Rate: I = 144*100*Ts*Vmstd *Pstd/[60*Tstdr*vs*min*An*Ps*(1-Bws)]	I	%	99.7	99.8	99.6

* O2/CO2 is based on SCAQMD Method 10.1 analysis.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Run No.: 1
Test Date: 08/13/19
Times: 08:50 - 10:55

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	121	11.0	0.160	0.400	2.35	89	89
2	124	11.1	0.150	0.387	2.20	90	90
3	124	11.1	0.180	0.424	2.65	92	92
4	123	11.1	0.100	0.316	1.48	94	94
5	123	11.1	0.100	0.316	1.48	95	95
6	123	11.1	0.080	0.283	1.19	95	95
7	120	11.0	0.100	0.316	1.49	96	96
8	120	11.0	0.110	0.332	1.65	97	97
9	119	10.9	0.080	0.283	1.20	98	98
10	93	9.6	0.160	0.400	2.52	99	99
11	88	9.4	0.100	0.316	1.59	100	100
12	90	9.5	0.090	0.300	1.43	101	101
B-1	130	11.4	0.190	0.436	2.80	99	99
2	134	11.6	0.170	0.412	2.49	99	99
3	130	11.4	0.180	0.424	2.67	101	101
4	130	11.4	0.180	0.424	2.68	103	103
5	139	11.8	0.130	0.361	1.91	104	104
6	128	11.3	0.110	0.332	1.64	104	104
7	126	11.2	0.100	0.316	1.50	105	105
8	118	10.9	0.091	0.302	1.37	105	105
9	92	9.6	0.120	0.346	1.92	106	106
10	101	10.0	0.110	0.332	1.73	106	106
11	103	10.1	0.080	0.283	1.25	106	106
12	102	10.1	0.080	0.283	1.26	107	107
Average:	**116.2**		**0.1203**		**1.85**		**99.6**

DGM Reading (cu.ft.):	
Final-1:	332.124
Initial-1:	244.031
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**88.093**

Impinger Weight (g):	
#1 Final:	765.6
#1 Initial:	766.1
#2 Final:	746.6
#2 Initial:	729.5
#3 Final:	658.6
#3 Initial:	655.9
#4 Final:	880.0
#4 Initial:	862.6
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**36.7**

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Run No.: 2
Test Date: 08/13/19
Times: 11:55 - 14:00

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	125	11.2	0.150	0.387	2.20	92	92
2	125	11.2	0.140	0.374	2.07	95	95
3	125	11.2	0.160	0.400	2.39	96	96
4	127	11.3	0.150	0.387	2.22	98	98
5	125	11.2	0.140	0.374	2.08	99	99
6	125	11.2	0.110	0.332	1.64	100	100
7	125	11.2	0.100	0.316	1.49	101	101
8	126	11.2	0.090	0.300	1.34	102	102
9	126	11.2	0.140	0.374	2.10	104	104
10	130	11.4	0.140	0.374	2.08	104	104
11	120	11.0	0.100	0.316	1.52	105	105
12	110	10.5	0.120	0.346	1.85	105	105
B-1	128	11.3	0.180	0.424	2.69	104	104
2	128	11.3	0.160	0.400	2.39	105	105
3	130	11.4	0.150	0.387	2.24	106	106
4	136	11.7	0.140	0.374	2.07	107	107
5	128	11.3	0.110	0.332	1.65	108	108
6	130	11.4	0.100	0.316	1.50	108	108
7	129	11.4	0.140	0.374	2.11	109	109
8	126	11.2	0.120	0.346	1.81	108	108
9	125	11.2	0.100	0.316	1.51	108	108
10	124	11.1	0.110	0.332	1.67	108	108
11	124	11.1	0.100	0.316	1.52	109	109
12	120	11.0	0.150	0.387	2.29	109	109
Average:	**125.7**		**0.128**		**1.93**		**103.8**

DGM Reading (cu.ft.):	
Final-1:	423.546
Initial-1:	332.682
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**90.864**

Impinger Weight (g):	
#1 Final:	625.7
#1 Initial:	616.0
#2 Final:	744.0
#2 Initial:	735.0
#3 Final:	657.5
#3 Initial:	651.0
#4 Final:	889.3
#4 Initial:	875.1
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**39.4**

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Run No.: 3
Test Date: 08/14/19
Times: 08:25 - 10:30

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	126	11.2	0.18	0.424	2.59	82	82
2	116	10.8	0.15	0.387	2.20	83	83
3	112	10.6	0.16	0.400	2.37	84	84
4	104	10.2	0.14	0.374	2.11	87	87
5	99	9.9	0.14	0.374	2.14	90	90
6	98	9.9	0.13	0.361	2.00	91	91
7	104	10.2	0.12	0.346	1.83	93	93
8	94	9.7	0.11	0.332	1.71	94	94
9	90	9.5	0.10	0.316	1.57	94	94
10	86	9.3	0.08	0.283	1.27	95	95
11	90	9.5	0.10	0.316	1.57	96	96
12	87	9.3	0.09	0.300	1.42	96	96
B-1	103	10.1	0.17	0.412	2.60	94	94
2	108	10.4	0.18	0.424	2.79	105	105
3	106	10.3	0.15	0.387	2.32	103	103
4	103	10.1	0.16	0.400	2.49	102	102
5	104	10.2	0.12	0.346	1.87	103	103
6	103	10.1	0.10	0.316	1.56	103	103
7	96	9.8	0.12	0.346	1.89	103	103
8	100	10.0	0.11	0.332	1.72	103	103
9	96	9.8	0.10	0.316	1.58	103	103
10	99	9.9	0.10	0.316	1.57	104	104
11	100	10.0	0.12	0.346	1.88	104	104
12	110	10.5	0.14	0.374	2.20	105	105
Average:	**101.2**		**0.1264**		**1.97**		**96.5**

DGM Reading (cu.ft.):	
Final-1:	515.006
Initial-1:	424.019
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**90.987**

Impinger Weight (g):	
#1 Final:	760.3
#1 Initial:	765.0
#2 Final:	747.4
#2 Initial:	731.5
#3 Final:	659.8
#3 Initial:	655.8
#4 Final:	893.6
#4 Initial:	872.6
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**36.2**

Location: Inlet 2 (Upstream to Baghouse)

TEST RESULTS
CARB 436 (Multiple Metals)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Test Data	Units	Source Test Results			Average
Run Number	--	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	08/13/19	08/13/19	08/14/19	--
Test Time	hh:mm	08:50 - 10:55	11:55 - 14:00	08:25 - 10:30	--
Sampling Data*					
Stack Temperature	°F	91.9	99.0	95.5	**95.5**
Moisture	%	2.1	2.0	2.3	**2.1**
Sample Volume	dscf	98.9	95.5	94.1	**96.2**
Oxygen**	% v/v	20.8	20.8	20.8	**20.8**
Carbon Dioxide**	% v/v	< 0.3	< 0.3	< 0.3	**< 0.3**
Gas Velocity	ft/min	4,765	4,649	4,568	**4,661**
Stack Flow Rate	acfm	6,653	6,491	6,379	**6,507**
Stack Flow Rate	dscfm	6,164	5,942	5,861	**5,989**
CARB Method 436 CONCENTRATION		Total	Total	Total	
Arsenic	ug/dscm	1.32	0.67	0.56	**0.85**
	ug/dscf	0.037	0.019	0.016	**0.024**
Cadmium	ug/dscm	ND 0.357	ND 0.370	ND 0.375	< **0.367**
	ug/dscf	ND 0.020	ND 0.021	ND 0.021	< **0.021**
Chromium	ug/dscm	356.4	553.9	600	**503**
	ug/dscf	10.09	15.68	16.99	**14.25**
Nickel	ug/dscm	11.0	19.11	20.2	**16.7**
	ug/dscf	0.310	0.541	0.571	**0.474**
CARB Method 436 MASS EMISSION RATE		Total	Total	Total	
Arsenic	lb/hr	3.05E-05	1.48E-05	1.24E-05	**1.92E-05**
Cadmium	lb/hr	ND 8.24E-06	ND 8.23E-06	ND 1.01E-05	< **8.84E-06**
Chromium	lb/hr	8.23E-03	1.23E-02	1.32E-02	**1.12E-02**
Nickel	lb/hr	2.53E-04	4.25E-04	4.42E-04	**3.74E-04**

Notes:
* Performed during isokinetic sampling (e.g. CARB Method 436).
** Measured via SCAQMD Method 10.1.
ND or "<" - Not detected, reporting limit reported.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/13-14/19
City:	[redacted] CA	Operator:	WB
Source:	Baghouse	Entered by:	TG
Location:	Inlet 2 (Upstream tc	Checked by:	CF

Metals Catch, Mi		**Run 1**	**Run 2**	**Run 3**	Field Blank	Reagent Blank
Fraction		Results	Results	Results	Results	Results
Arsenic	ug	3.7	1.8	1.5	ND 1.0	ND 1.00
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	ND 1.00
Chromium	ug	1,000	1,500	1,600	1.6	1.50
Nickel	ug	32.0	53.0	55.0	1.4	1.30

Reagent Blank		**Run 1**	**Run 2**	**Run 3**	Field Blank	
Fraction		Results	Results	Results	Results	
Arsenic	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	
Chromium	ug	1.5	1.5	1.50	1.5	
Nickel	ug	1.3	1.3	1.30	1.3	

Reagent Blank Corrected Values		**Run 1**	**Run 2**	**Run 3**	Field Blank	Reporting Limit*
Fraction		Results	Results	Results	Results	
Arsenic	ug	3.7	1.8	1.5	ND 1.0	
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.0	
Chromium	ug	998.5	1,498.5	1,598.5	0.1	0.30
Nickel	ug	30.7	51.7	53.7	0.1	0.30

*Reporting limit is based on three times the FB values.

CARB METHOD 436 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/13-14/19
City:	[redacted] CA	Operator:	WB
Source:	Baghouse	Entered by:	TG
Location:	Inlet 2 (Upstream to Ba	Checked by:	CF

Metals Catch, Mi		**Run 1**	**Run 2**	**Run 3**	Field Blank	Reagent Blank
Fraction		Total	Total	Total	Total	Total
Arsenic	ug	3.7	1.8	1.5	ND 1.00	ND 1.00
Cadmium	ug	ND 1.0	ND 1.0	ND 1.0	ND 1.00	ND 1.00
Chromium	ug	B 998.5	B 1,498.5	B 1,598.5	1.6	1.50
Nickel	ug	B 30.7	B 51.7	B 53.7	1.4	1.30

Metals Molecular Weight, MW		**Run 1**	**Run 2**	**Run 3**
Fraction		Total	Total	Total
Arsenic	g/g-mole	74.92	74.92	74.92
Cadmium	g/g-mole	112.41	112.41	112.41
Chromium	g/g-mole	51.995	51.995	51.995
Nickel	g/g-mole	58.69	58.69	58.69
Concentration (ug/dscm), Ci = Mi/VmStd *35.315e-3cf/dscm				
Fraction		Total	Total	Total
Arsenic	ug/dscm	1.32	0.67	0.56
Cadmium	ug/dscm	ND 0.3569	ND 0.3696	ND 0.3753
Chromium	ug/dscm	356.380	553.886	599.977
Nickel	ug/dscm	10.9573	19.1097	20.156
Metals Mass Emission Rate (ug/hr), Ei,m Ei,m = Ci*Qsdm*60				
Fraction		Total	Total	Total
Arsenic	ug/hr	1.38E+04	6.72E+03	5.61E+03
Cadmium	ug/hr	ND 3.74E+03	ND 3.73E+03	ND 3.74E+03
Chromium	ug/hr	3.73E+06	5.59E+06	5.97E+06
Nickel	ug/hr	1.15E+05	1.93E+05	2.01E+05
Metals Mass Emission Rate (lb/hr), Ei Ei = Ci*Qsdm*60/453600/1000				
Fraction		Total	Total	Total
Arsenic	lb/hr	3.05E-05	1.48E-05	1.24E-05
Cadmium	lb/hr	ND 8.24E-06	ND 8.23E-06	ND 8.24E-06
Chromium	lb/hr	8.23E-03	1.23E-02	1.32E-02
Nickel	lb/hr	2.53E-04	4.25E-04	4.42E-04

Flags

ND or "<" - Not detected, reporting limit reported.

B - Reagent blank corrected value.

NDb - Reagent blank corrected result is less than RL. RL is substituted.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Test Date(s): 08/13-14/19
Operator: WB
Entered by: TG
Checked by: CF

DATA ENTRY	Symbol	Units	08/13/19 DATA Run 1	08/13/19 DATA Run 2	08/14/19 DATA Run 3
Run Number					
Stack Dimensions: Round Stack Diameter	Ds	in.	16.0	16.0	16.0
Rectangular Stack, Length	L	in.			
Width	W	in.			
Nozzle Diameter	Dn	in.	0.184	0.184	0.184
Standard Temperature	Tstd	°F	68	68	68
Universal (molar) Gas Constant	Renglish	in. Hg-cu.ft/ °R-lbmole	21.85	21.85	21.85
Average Stack Temperature (measured)	Fs	°F	91.9	99.0	95.5
Average Meter Temperature (measured)	Fm	°F	89.3	106.0	86.7
Standard Pressure	Pstd	in.Hg	29.92	29.92	29.92
Barometric Pressure	Pbar	in.Hg	29.90	29.90	29.90
Stack Static Pressure	Pg	in.WC	-4.200	-4.200	-4.200
Average Meter Orifice Head (Delta-H)	dH	in.WC	2.30	2.18	2.05
Average RMS Velocity Head (Delta-P)	dP	in.WC	1.88	1.77	1.71
Pitot Coefficient	Cp	—	0.84	0.84	0.84
Net Volume of Gas Metered	Vm	cu.ft.	98.720	98.246	93.476
Dry Gas Meter Calibration Factor (gamma, Y)	Y	—	1.0376	1.0376	1.0376
NET Sampling Time	min	min.	120	120	120
Stack Gas: Oxygen Content *	O2,m	%	20.8	20.8	20.8
Carbon Dioxide Content *	CO2,m	%	< 0.3	< 0.3	< 0.3
Total Impinger Gain	Ww	g	44.4	41.2	46.0
CALCULATED DATA					
Nozzle Area: An = pi/4*dn^2	An	sq.in.	0.0266	0.0266	0.0266
Stack Area (round): As = pi/576*ds^2 (rectangular): As = L*W/144	As	sq.ft.	1.40	1.40	1.40
Absolute Stack Temperature: Ts = Fs+460	Ts	°R	551.9	559.0	555.5
Absolute Meter Temperature: Tm = Fm+460	Tm	°R	549.3	566.0	546.7
Standard Temperature: Tstdr = Tstd+460	Tstdr	°R	528.0	528.0	528.0
Gas Sample Volume at Standard Conditions: Vm(std) = Y * (Vm/Tm) * (Pbar + dH/13.6 in H2O/in Hg) * (Tstdr/Pstd)	VmStd	cu.ft.	98.945	95.542	94.089
Vol. of Water Vapor, Vw(std) = Ww/453.59 * Renglish/18 * Tstdr / Pstd	VwStd	cu.ft.	2.097	1.946	2.172
Moisture Fraction: Bws = VwStd/(VmStd+VwStd)	Bws	—	0.021	0.020	0.023
Stack Gas MW, Dry Basis: Md = 0.32*O2,m + 0.44*CO2,m + 0.28*(100-O2,m-CO2,m)	Md	g/mole	28.88	28.88	28.88
Stack Gas MW, Wet Basis: Mw = Md*(1-Bws) + 18*Bws	Mw	g/mole	28.65	28.66	28.63
Stack Pressure: Ps = Pbar + Pg/13.6	Ps	in.Hg	29.59	29.59	29.59
Stack Gas Velocity, measured					
vs = 85.49*Cp*√(dP*Ts/Ps/Mw)	vs	ft/s	79.41	77.48	76.14
vm = 0.3048 m/ft*vs	vsm	m/s	24.21	23.61	23.21
Stack Gas Volumetric Flow Rate: Q = 60*vs*As	Q	acfm	6,653	6,491	6,379
Stack Gas Volumetric Flow Rate, corrected:					
Qsd = Q*(1-Bws)*(Ps/Ts)*(Tstdr/Pstd)	Qsd	dscfm	6,164	5,942	5,861
Qsdm = Qsd/35.315	Qsdm	dscmm	174.6	168.3	166.0
Isokinetic Sampling Rate: I = 144*100*Ts*Vmstd *Pstd/[60*Tstdr*vs*min*An*Ps*(1-Bws)]	I	%	101.1	101.3	101.2

* O2/CO2 is based on SCAQMD Method 10.1 analysis.

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Run No.: 1
Test Date: 08/13/19
Times: 08:50 - 10:55

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	93	9.6	2.60	1.612	3.10	74	74
2	94	9.7	2.55	1.597	3.05	75	75
3	93	9.6	2.75	1.658	3.25	77	77
4	93	9.6	2.90	1.703	3.45	79	79
5	93	9.6	2.45	1.565	2.90	81	81
6	93	9.6	2.65	1.628	3.15	84	84
7	93	9.6	1.90	1.378	2.25	86	86
8	91	9.5	1.50	1.225	1.80	87	87
9	89	9.4	1.25	1.118	1.50	88	88
10	86	9.3	1.20	1.095	1.45	89	89
11	84	9.2	1.19	1.091	1.30	90	90
12	77	8.8	1.20	1.095	1.45	90	90
B-1	94	9.7	2.15	1.466	2.55	90	90
2	95	9.7	2.25	1.500	2.65	90	90
3	95	9.7	2.35	1.533	2.80	91	91
4	94	9.7	2.40	1.549	2.85	93	93
5	96	9.8	2.30	1.517	2.75	94	94
6	96	9.8	2.35	1.533	2.98	96	96
7	98	9.9	2.10	1.449	2.50	97	97
8	98	9.9	1.50	1.225	1.80	98	98
9	96	9.8	1.20	1.095	1.45	98	98
10	95	9.7	1.15	1.072	1.35	99	99
11	87	9.3	1.20	1.095	1.45	99	99
12	84	9.2	1.20	1.095	1.45	99	99
Average:	**91.9**		**1.8789**		**2.30**		**89.3**

DGM Reading (cu.ft.):	
Final-1:	98.912
Initial-1:	0.192
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**98.720**

Impinger Weight (g):	
#1 Final:	752.5
#1 Initial:	758.7
#2 Final:	754.2
#2 Initial:	732.9
#3 Final:	656.9
#3 Initial:	650.4
#4 Final:	791.6
#4 Initial:	768.8
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**44.4**

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Run No.: 2
Test Date: 08/13/19
Times: 11:55 - 14:00

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	102	10.1	2.20	1.483	3.20	93	93
2	101	10.0	2.45	1.565	2.90	93	93
3	103	10.1	2.65	1.628	3.15	95	95
4	104	10.2	2.60	1.612	3.10	97	97
5	103	10.1	2.50	1.581	2.95	99	99
6	105	10.2	2.50	1.581	2.95	102	102
7	102	10.1	1.80	1.342	2.15	103	103
8	99	9.9	1.50	1.225	1.80	105	105
9	100	10.0	1.20	1.095	1.45	106	106
10	96	9.8	1.10	1.049	1.30	107	107
11	95	9.7	1.10	1.049	1.30	108	108
12	98	9.9	1.05	1.025	1.25	108	108
B-1	101	10.0	2.20	1.483	2.60	107	107
2	100	10.0	2.30	1.517	2.75	108	108
3	100	10.0	2.30	1.517	2.75	109	109
4	98	9.9	2.45	1.565	2.90	110	110
5	98	9.9	1.90	1.378	2.25	111	111
6	99	9.9	1.85	1.360	2.20	112	112
7	99	9.9	1.80	1.342	2.15	112	112
8	100	10.0	1.35	1.162	1.60	113	113
9	97	9.8	1.10	1.049	1.30	112	112
10	95	9.7	1.20	1.095	1.45	112	112
11	90	9.5	1.20	1.095	1.45	111	111
12	92	9.6	1.20	1.095	1.45	111	111
Average:	**99.0**		**1.766**		**2.18**		**106.0**

DGM Reading (cu.ft.):	
Final-1:	197.206
Initial-1:	98.960
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**98.246**

Impinger Weight (g):	
#1 Final:	656.2
#1 Initial:	646.2
#2 Final:	774.8
#2 Initial:	763.2
#3 Final:	631.0
#3 Initial:	628.4
#4 Final:	844.8
#4 Initial:	827.8
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**41.2**

Almega ENVIRONMENTAL

CARB METHOD 436 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Run No.: 3
Test Date: 08/14/19
Times: 08:25 - 10:30

point	Stack Temp (°F) Fs	sqrt (Fs)	Velocity Head (in.WC) dP	sqrt (dP)	dH (in.WC)	DGM Temperature (°F) Fm,in	Fm,out
A-1	99	9.9	1.95	1.396	2.30	71	71
2	100	10.0	2.35	1.533	2.75	72	72
3	97	9.8	2.60	1.612	3.05	74	74
4	99	9.9	2.40	1.549	2.80	76	76
5	96	9.8	2.20	1.483	2.60	78	78
6	96	9.8	2.40	1.549	2.80	80	80
7	97	9.8	2.25	1.500	2.65	82	82
8	95	9.7	1.40	1.183	1.65	84	84
9	92	9.6	1.20	1.095	1.40	85	85
10	87	9.3	1.20	1.095	1.40	86	86
11	89	9.4	1.20	1.095	1.40	87	87
12	90	9.5	1.15	1.072	1.35	87	87
B-1	93	9.6	1.70	1.304	2.00	87	87
2	94	9.7	1.85	1.360	2.15	88	88
3	95	9.7	2.10	1.449	2.45	89	89
4	95	9.7	2.20	1.483	2.60	90	90
5	96	9.8	1.80	1.342	2.10	93	93
6	97	9.8	2.10	1.449	2.45	93	93
7	100	10.0	1.80	1.342	2.10	94	94
8	102	10.1	1.50	1.225	1.75	96	96
9	98	9.9	1.30	1.140	1.55	96	96
10	97	9.8	1.10	1.049	1.30	97	97
11	94	9.7	1.05	1.025	1.25	97	97
12	94	9.7	1.20	1.095	1.40	98	98
Average:	**95.5**		**1.7148**		**2.05**		**86.7**

DGM Reading (cu.ft.):	
Final-1:	291.049
Initial-1:	197.573
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
Volume:	**93.476**

Impinger Weight (g):	
#1 Final:	746.2
#1 Initial:	759.0
#2 Final:	760.9
#2 Initial:	735.9
#3 Final:	660.1
#3 Initial:	651.5
#4 Final:	822.4
#4 Initial:	797.2
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**46.0**

APPENDIX C2

MULTIPLE METAL EMISSIONS – FIELD DATA

Location: Baghouse Outlet

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Outlet
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 54.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 6.00 inches
DEPTH OF STACK OR DUCT, D: 48.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 48.00 inches

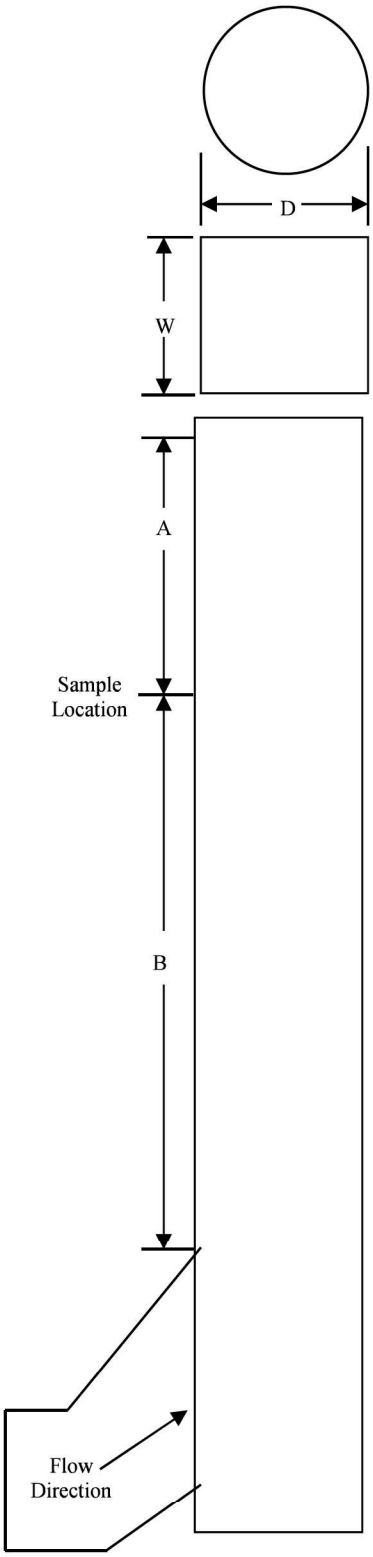
STACK/DUCT AREA = 12.57 sq.feet 1809.6 sq.inches

DISTANCE OF TEST PORT LOCATION:

	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	126.00	50.00
# OF DIAMETERS	2.63	1.04

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	1.01	7
2	6.7	3.22	9 1/4
3	11.8	5.66	11 5/8
4	17.7	8.50	14 1/2
5	25.0	12.00	18
6	35.6	17.09	23 1/8
7	64.4	30.91	36 7/8
8	75.0	36.00	42
9	82.3	39.50	45 1/2
10	88.2	42.34	48 3/8
11	93.3	44.78	50 3/4
12	97.9	46.99	53



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW METH

Almega ENVIRONMENTAL

Run # :	2	Pitot ID:	73	Impinger #	Initial	Final	Net	Pitot Leak Check
Date :	8-13-19	Pitot Coeff. :	0.84	1	742.6	746.4		Initial : ✓ ✓
Client :	SCAQMD C	Meter Box # :	A-3	2	757.2	767.6		Final : ✓ ✓
Unit :	Outlet	Meter @ Dh :	1.583	3	632.7	636.0		
Operator :	NC	Meter Y :	1.0379	860.5 4	~~727.1~~	876.7		Meter Box Leak Check
Stack Dia :	48"	TC # :	73	5				Rate / "HG
Amb. Press :	29.9	Start Time :	8:50	H2O Gain =				Initial : 0.00 12
Static Press :	0.02	Stop Time :	10:55	Filter :				Final : 0.00 12

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
A West													
12	0	0.08	87	2.93	360.850	71	72	252	251	55	3	N/A	N/A
11	5	0.08	90	2.96	365.7	82	75	252	251	56	4		
10	10	0.07	91	2.55	370.7	85	77	248	252	56			
9	15	0.05	91	1.86	375.3	88	79	249	253	56			
8	20	0.04	92	1.49	379.2	90	81	250	251	56	3		
7	25	0.04	92	1.49	382.7	90	82	251	253	56			
6	30	0.04	92	1.50	386.2	91	84	251	250	56			
5	35	0.04	92	1.50	389.7	93	85	249	253	56			
4	40	0.04	93	1.50	393.3	94	87	251	249	56			
3	46	0.03	93	1.13	396.9	95	88	248	252	56			
2	50	0.03	94	1.13	400.0	96	89	249	250	56			
1	55	0.03	94	1.13	403.1	97	90	248	251	56			
450	60				406.214								
Bg 455 South													
12	0	0.03	93	1.13	406.214	92	92	249	250	56	3	N/A	N/A
11	5	0.03	95	1.13	409.3	99	92	248	249	57			
10	10	0.03	95	1.13	412.4	100	93	250	252	57			
9	15	0.03	96	1.13	415.5	100	94	249	250	57			
8	20	0.03	96	1.14	418.6	101	95	248	249	57			
7	25	0.03	96	1.14	421.7	102	96	248	251	57			
6	30	0.03	96	1.14	424.8	102	96	249	252	57			
5	35	0.03	96	1.14	427.9	103	96	247	250	57			
4	40	0.03	97	1.14	431.05	103	97	248	252	57			
3	45	0.03	97	1.14	434.2	104	97	250	250	58			
2	50	0.03	98	1.14	437.35	104	98	251	249	58			
1	55	0.03	99	1.13	440.49	104	97	249	250	58			
	60				443.624								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	88
Estimated Stack Temp:	90
Estimated Delta P:	0.04
Estimated Moisture Content:	2
Estimated O2:	20.8
Estimated CO2:	0.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	0.450

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Almega ENVIRONMENTAL METI

Run # :	2
Date :	8-13-19
Client :	SCAQMD C
Unit :	Baghouse - outlet
Operator :	NC
Stack Dia :	48"
Amb. Press :	29.9
Static Press :	-0.02

Pitot ID:	73
Pitot Coeff. :	0.84
Meter Box # :	A-3
Meter @ Dh :	1.583
Meter Y :	1.0379
TC # :	73
Start Time :	1155
Stop Time :	1400

Impinger #	Initial	Final	Net
1	739.7	727.3	
2	761.5	781.6	
3	650.9	667.8	
4	750.3	768.3	
5			
H2O Gain =			
Filter :			

Pilot Leak Check

Initial :	✓	✓
Final :	✓	✓

Meter Box Leak Check

	Rate	"HG
Initial :	0.00	12
Final :	0.00	12

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0	0.03	99	1.13	448.850	99	99	248	250	55	2	N/A	N/A
11	5	0.03	108	1.12	452.0	106	99	249	251	55	↓	↓	↓
10	10	0.03	108	1.13	455.1	109	101	250	252	55			
9	15	0.03	108	1.13	458.2	110	102	248	250	55			
8	20	0.03	110	1.13	461.3	111	103	248	249	55			
7	25	0.03	110	1.13	464.4	112	104	249	251	55			
6	30	0.03	110	1.13	467.5	113	105	251	252	56			
5	35	0.03	110	1.13	470.65	113	106	249	250	56			
4	40	0.03	109	1.13	473.8	114	106	252	253	56			
3	45	0.03	109	1.13	477.0	114	107	251	250	56			
2	50	0.03	109	1.13	480.2	114	107	248	249	57			
1	55	0.03	110	1.13	483.3	114	108	249	251	57	↓	↓	↓
	60				486.460								
12	0	0.03	110	1.13	486.460	108	108	249	250	57	2	N/A	N/A
11	5	0.03	112	1.13	489.6	114	107	250	252	57	↓	↓	↓
10	10	0.03	112	1.13	492.8	115	107	251	251	57			
9	15	0.03	111	1.13	496.0	115	108	249	252	57			
8	20	0.03	111	1.13	499.2	116	108	248	250	57			
7	25	0.03	110	1.14	502.3	115	109	249	251	57			
6	30	0.03	110	1.14	505.5	116	109	248	252	57			
5	35	0.03	109	1.14	508.7	116	109	249	250	57			
4	40	0.03	109	1.14	511.9	116	109	251	249	57			
3	45	0.03	109	1.14	515.1	116	109	249	249	57			
2	50	0.03	108	1.14	518.3	116	109	248	251	57			
1	55	0.03	106	1.14	521.5	116	109	249	252	56	↓	↓	↓
	60				524.682								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	110
Estimated Stack Temp:	110
Estimated Delta P:	0.03
Estimated Moisture Content:	2
Estimated O2:	20.8
Estimated CO2:	0.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	0.450

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Almega ENVIRONMENTAL

Run # :	3	Pilot ID:	73	Impinger #	Initial / Final / Net
Date :	8-16-19	Pilot Coeff. :	0.84	1	743.0 / 745.9 /
Client :	SCAQMD C	Meter Box # :	A-3	2	755.6 / 769.3 /
Unit :	Outlet	Meter @ Dh :	1.583	3	632.4 / 635.2 /
Operator :	NC	Meter Y :	1.0379	4	877.1 / 894.0 /
Stack Dia :	48"	TC # :	73	5	
Amb. Press :	29.9	Start Time :	0825	H2O Gain =	
Static Press :	-0.02	Stop Time :	1030	Filter :	

Pilot Leak Check

Initial :	✓	✓
Final :	✓	✓

Meter Box Leak Check

	Rate	"HG
Initial :	0.00	12
Final :	0.00	15

	Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
A	12	0	0.06	93	2.15	528.725	66	66	248	251	55	3	N/A	N/A
	11	5	0.06	98	2.14	533.15	69	66	249	248	49	↓	↓	↓
	10	10	0.06	98	2.15	537.3	74	67	250	250	50			
	9	15	0.06	100	2.15	541.5	77	68	299	252	52			
	8	20	0.03	93	1.09	545.7	79	69	248	250	52			
	7	25	0.03	94	1.09	548.7	79	71	247	249	54	2		
	6	30	0.03	93	1.10	551.7	80	72	251	248	54			
	5	35	0.03	92	1.02	554.7	81	73	250	251	55			
	4	40	0.03	92	1.10	557.5	82	73	252	250	56			
	3	45	0.03	93	1.10	560.5	83	75	248	249	55			
	2	50	0.03	93	1.10	563.5	84	75	249	249	55			
	1	55	0.03	96	1.10	566.5	84	76	249	251	55	↓	↓	↓
925		60				569.520								
B 930	12	0	0.07	99	1.09	569.520	78	77	248	252	55	2	N/A	N/A
	11	5	0.03	96	1.10	572.5	85	77	252	251	55			
	10	10	0.03	99	1.10	575.5	86	78	252	250	56			
	9	15	0.03	97	1.10	578.5	87	79	250	249	56			
	8	20	0.03	97	1.10	581.5	87	79	252	250	57			
	7	25	0.03	98	1.10	584.5	87	80	248	252	57			
	6	30	0.03	98	1.11	587.54	88	82	249	250	57			
	5	35	0.02	98	0.74	590.55	89	81	252	251	57			
	4	40	0.02	99	0.73	593.0	88	81	249	251	57			
	3	45	0.02	100	0.73	595.5	88	82	251	249	57			
	2	50	0.06	101	2.20	598.0	89	82	248	251	58			
	1	55	0.09	101	3.31	602.25	92	83	249	252	58	↓	↓	↓
		60				607.525								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	80
Estimated Stack Temp:	90
Estimated Delta P:	0.04
Estimated Moisture Content:	2
Estimated O2:	20.8
Estimated CO2:	0.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	0.450

Location: Inlet 1 (Inside)

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Inlet 1
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 13.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 0.0 inches
DEPTH OF STACK OR DUCT, D: 13.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 13.00 inches

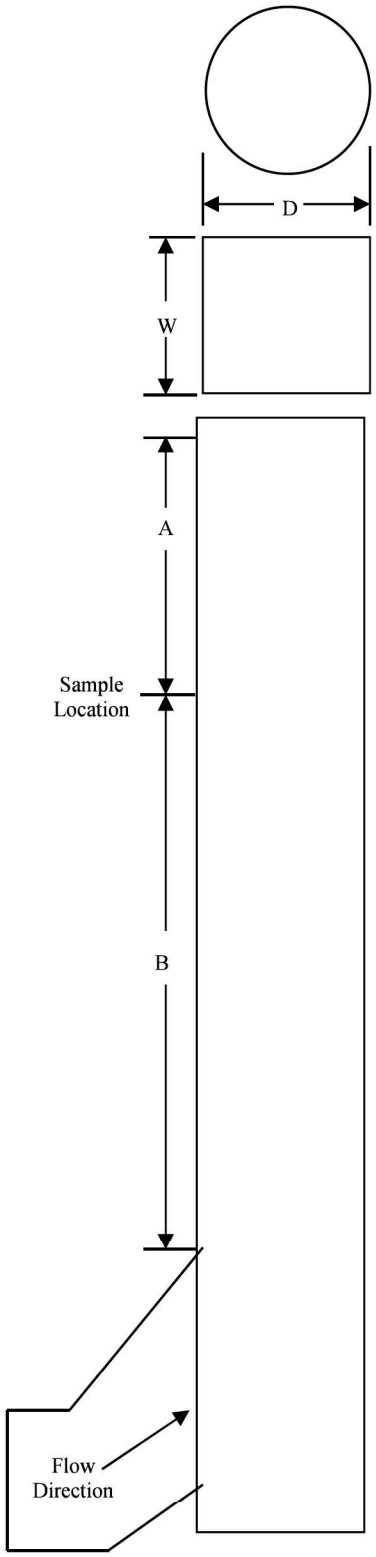
STACK/DUCT AREA = 0.92 sq.feet 132.7 sq.inches

DISTANCE OF TEST PORT LOCATION:

	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	>26.0	>6.5
# OF DIAMETERS	>2.00	>0.50

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	0.50	0 1/2
2	6.7	0.87	0 7/8
3	11.8	1.53	1 1/2
4	17.7	2.30	2 1/4
5	25.0	3.25	3 1/4
6	35.6	4.63	4 5/8
7	64.4	8.37	8 3/8
8	75.0	9.75	9 3/4
9	82.3	10.70	10 3/4
10	88.2	11.47	11 1/2
11	93.3	12.13	12 1/8
12	97.9	12.50	12 1/2



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METI Almega ENVIRONMENTAL

Run # :	1	Pitot ID:	85	Impinger #	Initial	Final	Net	Pitot Leak Check				
Date :	9-12-19	Pitot Coeff. :	0.84	1	766.1	765.6		Initial :	✓	✓		
Client :	SCAQMD C	Meter Box # :	A-8	2	729.5	746.6		Final :	✓	✓		
Unit :	Unit 1	Meter @ Dh :	1.834	3	655.9	658.6						
Operator :	DS	Meter Y :	1.0395	4	862.6	880.0		Meter Box Leak Check				
Stack Dia :	7"-8" 13"	TC # :	85	5					DI Rate	"HG		
Amb. Press :	29.90	Start Time :	8:30	H2O Gain =				Initial :	.008	18"		
Static Press :	-1.5	Stop Time :	16:55	Filter :				Final :	.002	18"		

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)	
0	0				274.031							Jumped		
1	5	.16	121	2.35	278.164	89	89	256	253	54	3	250		
2	10	.15	124	2.26	282.168	92	96	249	250	54	3	251		
3	15	.18	124	2.65	286.564	92	92	254	252	54	3	253		
4	20	.10	123	1.48	289.866	94	94	252	256	54	2.5	250		
5	25	.10	123	1.48	293.172	95	95	251	254	54	2.5	253		
6	30	.08	123	1.19	296.138	95	95	249	251	54	2	250		
7	35	.10	120	1.49	299.462	96	96	253	256	54	2.5	249		
8	40	.11	126	1.65	303.954	97	97	248	251	55	2.5	250		
9	45	.08	119	1.20	306.946	98	98	253	258	54	2	250		
10	50	.16	93	2.62	310.267	99	99	254	253	54	3	253		
11	55	.10	88	1.59	313.784	100	100	254	252	54	2.5	249		
12	60	.09	90	1.43	316.975	101	101	255	257	54	2.5	251		
0	0				316.975									
1	5	.19	130	2.80	321.528	99	99	252	258	54	3.5	250		
2	10	.17	134	2.49	325.815	99	99	253	256	54	3.5	249		
3	15	.18	130	2.67	330.258	101	101	254	253	54	3.5	248		
4	20	.18	130	2.68	334.715	103	103	253	256	54	3.5	250		
5	25	.13	139	1.91	338.498	104	104	253	252	54	3	250		
6	30	.11	128	1.64	342.003	104	104	254	254	55	3	251		
7	35	.10	126	1.50	345.368	105	105	254	256	55	3	250		
8	40	.091	118	1.37	348.571	105	105	253	258	55	3	249		
9	45	.12	92	1.92	352.364	106	106	255	252	55	3	249		
10	50	.11	101	1.73	355.968	106	106	254	254	55	3	253		
11	55	.08	103	1.25	359.044	106	106	252	259	55	2.5	254		
12	60	.18	102	1:26	362.124	107	107	252	254	55	2.5	253		

End @ 9:50

St 9:55

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	110
Estimated Stack Temp:	106
Estimated Delta P:	
Estimated Moisture Content:	2.0%
Estimated O2:	20.9
Estimated CO2:	0.05

Equipment Evaluation , OK? Y or N

Ambient Temp.:	
TC Check:	✓
Pitot Check:	✓
Tedlar Bag:	N/A
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	#85
Nozzle Dia:	.348

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Almega ENVIRONMENTAL

Run # :	2	Pitot ID:	85	Impinger #	Initial	Final	Net
Date :	8-13-19	Pitot Coeff. :	0.84	1	646.0	625.7	
Client :	SCAQMD	Meter Box # :	1-8	2	735.0	744.0	
Unit :	Inlet 1	Meter @ Dh :	1.854	3	651.0	652.5	
Operator :	DS	Meter Y :	1.0395	4	875.1	889.3	
Stack Dia :	13"	TC # :	85	5			
Amb. Press :	29.90	Start Time :	11:55	H2O Gain =			
Static Press :	-1.5	Stop Time :	14:00	Filter :			

Pitot Leak Check		
Initial :	✓	✓
Final :	✓	✓

Meter Box Leak Check	Rate	"HG
Initial :	.002	19"
Final :	.002	19"

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
0	0				332.682							Jumper	
1	5	.15	125	2.20	336.697	92	92	254	256	54	6	250	
2	10	.14	125	2.09	340.593	95	95	256	253	54	6	251	
3	15	.16	125	2.39	344.761	96	96	260	251	54	6	250	
4	20	.15	127	2.22	348.816	98	98	252	251	54	6	253	
5	25	.14	125	2.08	352.717	99	99	254	253	54	6	251	
6	30	.11	125	1.64	356.238	100	100	252	251	54	5	250	
7	35	.10	125	1.49	359.571	101	101	254	250	54	5	251	
8	40	.09	126	1.34	362.745	102	102	256	252	54	5	250	
9	45	.14	126	2.10	366.703	104	104	256	250	54	6	251	
10	50	.14	130	2.08	370.648	104	104	251	251	54	6	252	
11	55	.10	130	1.57	374.025	105	105	252	253	54	5	253	
12	60	.12	110	1.85	377.754	105	105	253	256	54	5.5	251	
END @ 12:55													
0	0				377.954								
1	5	.18	128	2.69	382.226	104	104	251	250	54	6.5	250	
2	10	.16	128	2.39	386.452	105	105	254	251	54	6	250	
3	15	.15	130	2.24	390.558	106	106	255	253	54	6	248	
4	20	.14	136	2.07	394.501	107	107	256	254	55	6	251	
5	25	.11	128	1.65	398.034	108	108	254	258	55	5	250	
6	30	.10	130	1.50	401.390	108	108	258	253	55	5	250	
7	35	.11	129	2.11	405.378	109	109	251	255	55	6	254	
8	40	.12	126	1.81	409.078	108	108	254	251	55	5	251	
9	45	.10	125	1.51	412.459	108	108	250	253	55	5	250	
10	50	.11	124	1.67	416.602	108	108	254	251	54	5	251	
11	55	.10	124	1.52	419.388	109	109	255	250	54	5	251	
12	60	.13	120	2.29	423.646	109	109	250	251	54	6	253	
END @ 13:00													

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	110
Estimated Stack Temp:	130
Estimated Delta P:	
Estimated Moisture Content:	2.0%
Estimated O2:	20.8
Estimated CO2:	.05

Equipment Evaluation , OK? Y or N

Ambient Temp.:	83
TC Check:	✓
Pitot Check:	✓
Tedlar Bag:	N/A
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	.425
Nozzle Dia:	.342

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Almega ENVIRONMENTAL

Run #:	3	Pitot ID:	85	Impinger #	Initial	Final	Net	Pitot Leak Check					
Date:	8-14-19	Pitot Coeff.:	0.84	1	765.0	760.3		Initial:	✓	✓			
Client:	SCAQMD C	Meter Box #:	A-8	2	731.5	747.4		Final:	✓	✓			
Unit:	Inlet 7	Meter @ Dh:	1.834	3	665.8	659.9							
Operator:	DJ	Meter Y:	1.0395	4	872.6	893.6		Meter Box Leak Check					
Stack Dia:	13.0"	TC #:	85	5					Rate	"HG			
Amb. Press:	29.90	Start Time:	8:25	H2O Gain =				Initial:	.002	85"			
Static Press:	-1.6	Stop Time:	10:30	Filter:				Final:	.000	16"			

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	~~Pb Outlet~~ Temp. (F)	Cyclonic Flow ("H2O)
0	0				424.019							Jumped	
1	5	.18	126	2.59	428.324	82	82	262	251	54	3	250	
2	10	.15	116	2.26	432.308	83	83	251	253	54	3	251	
3	15	.16	112	2.37	436.431	84	84	250	251	54	3	250	
4	20	.14	104	2.11	440.348	87	87	248	250	54	3	249	
5	25	.14	99	2.14	444.305	90	90	253	256	54	3	250	
6	30	.13	98	2.00	448.128	91	91	253	250	54	3	250	
7	35	.12	104	1.83	451.993	93	93	250	256	54	2.5	251	
8	40	.11	94	1.71	455.346	94	94	249	251	54	2.5	252	
9	45	.10	90	1.59	458.743	94	94	250	249	54	2.5	251	
10	50	.08	86	1.27	461.807	95	95	248	249	54	2	253	
11	55	.10	90	1.57	465.214	96	96	255	252	54	2.5	253	
12	60	.09	87	1.42	468.453	96	96	253	250	64	2	251	
D	0				468.453								
1	5	.17	103	2.60	472.815	94	94	250	249	54	4	250	
2	10	.18	108	2.79	477.319	105	105	256	257	54	4	249	
3	15	.15	106	2.32	481.532	103	103	256	250	54	4	251	
4	20	.16	103	2.49	485.838	102	102	254	253	54	4	252	
5	25	.12	104	1.89	489.571	103	103	251	256	54	2.5	251	
6	30	.10	103	1.56	492.986	103	103	253	258	54	2.5	253	
7	35	.12	96	1.89	496.942	103	103	254	250	55	2.5	251	
8	40	.11	100	1.72	500.328	103	103	251	254	55	2.5	250	
9	45	.10	96	1.58	503.965	103	103	255	250	53	2.5	250	
10	50	.10	99	1.57	507.198	104	104	255	252	55	2.5	254	
11	55	.12	100	1.88	510.953	104	104	256	254	55	2.5	253	
12	60	.14	100	2.20	515.086	105	105	256	253	55	4	251	

12 MP @ 7:25

5f @ 7:30

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	110
Estimated Stack Temp:	130
Estimated Delta P:	
Estimated Moisture Content:	2.0
Estimated O2:	20.8
Estimated CO2:	.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	63
TC Check:	✓
Pitot Check:	✓
Tedlar Bag:	N/A
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	85
Nozzle Dia:	.348

Location: Inlet 2 (Upstream to Baghouse)

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Inlet 2
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 22.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 6.00 inches
DEPTH OF STACK OR DUCT, D: 16.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 16.00 inches

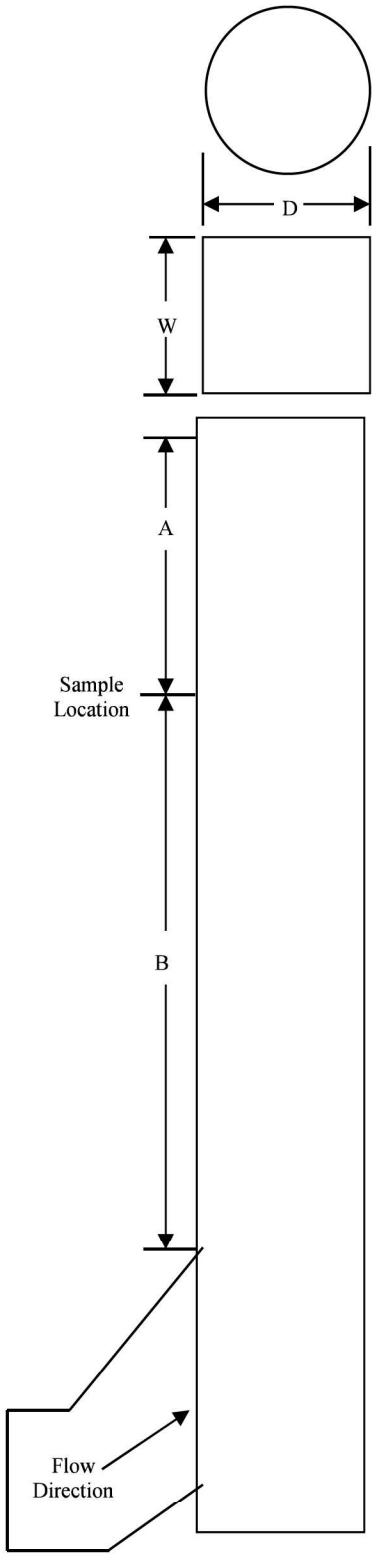
STACK/DUCT AREA = 1.40 sq.feet 201.1 sq.inches

DISTANCE OF TEST PORT LOCATION:

	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	42.00	196.00
# OF DIAMETERS	2.63	12.25

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	0.50	6 1/2
2	6.7	1.07	7 1/8
3	11.8	1.89	7 7/8
4	17.7	2.83	8 7/8
5	25.0	4.00	10
6	35.6	5.70	11 3/4
7	64.4	10.30	16 1/4
8	75.0	12.00	18
9	82.3	13.17	19 1/8
10	88.2	14.11	20 1/8
11	93.3	14.93	20 7/8
12	97.9	15.50	21 1/2



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH Almega ENVIRONMENTAL

Run # :	1	Pitot ID:	28	Impinger #	Initial	Final	Net	Pitot Leak Check			
Date :	8-13-19	Pitot Coeff. :	0.84	1	758.7	752.5		Initial :	✓	✓	
Client :	SCAQMD C	Meter Box # :	A1	2	732.9	754.2		Final :	✓	✓	
Unit :	INLET 2	Meter @ Dh :	1.789	3	650.4	656.9					
Operator :	WB	Meter Y :	1.0376	768.84	768.8	791.6			Meter Box Leak Check		
Stack Dia :	16	TC # :	28	5					Rate	"HG	
Amb. Press :	29.9	Start Time :	0850		H2O Gain =			Initial :	15	0.003	
Static Press :	-4.2	Stop Time :	1055		Filter :			Final :	10	0.002	

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0.0	2.60	93	3.10	0.192	74	74	252	247	46	8		
11	5	2.55	94	3.05	4.97	75	75	254	249	48	8		
10	10	2.75	93	3.25	9.74	77	77	256	251	51	8		
9	15	2.90	93	3.45	14.58	79	79	254	249	52	8		
8	20	2.45	93	2.90	19.57	81	81	254	251	54	8		
7	25	2.65	93	3.15	24.51	84	84	249	249	51	8		
6	30	1.90	93	2.25	29.16	86	86	255	251	55	6		
5	35	1.50	91	1.80	33.35	87	87	254	250	57	5		
4	40	1.25	89	1.50	37.00	88	88	249	251	58	5		
3	45	1.20	86	1.45	40.42	89	89	251	251	59	5		
2	50	1.10	84	1.30	43.70	90	90	249	252	60	4		
1	55	1.20	77	1.45	46.88	90	90	253	250	60	4		
12	60	2.15	94	2.55	50.16	90	90	251	253	48	7		
11	65	2.25	95	2.65	54.54	90	90	252	251	49	7		
10	70	2.35	95	2.80	59.06	91	91	250	249	51	7		
9	75	2.40	94	2.85	63.69	93	93	256	254	53	7		
8	80	2.30	96	2.75	68.36	94	94	249	251	53	7		
7	85	2.35	96	2.80	72.96	96	96	250	253	55	7		
6	90	2.10	98	2.50	77.57	97	97	253	250	56	6		
5	95	1.50	98	1.80	81.98	98	98	250	248	57	5		
4	100	1.20	96	1.45	85.68	98	98	252	251	58	5		
3	105	1.15	95	1.35	88.97	99	99	249	252	59	5		
2	110	1.20	82	1.45	92.22	99	99	256	249	60	5		
1	115	1.20	84	1.45	95.52	99	99	256	251	60	5		
END	120				98.912								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	G372
Nozzle Dia:	0.184

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH Almega ENVIRONMENTAL

				Impinger #	Initial	Final	Net	Pitot Leak Check	
Run # :	2	Pitot ID:	-28						
Date :	8-13-19	Pitot Coeff. :	0.84	1	646.2	656.2		Initial :	✓
Client :	SCAQMD C	Meter Box # :	A-6	2	763.2	774.8		Final :	✓
Unit :	INLET 2	Meter @ Dh :	1.789	3	628.4	631.0			
Operator :	WB	Meter Y :	1.0376	4	827.8	844.8		Meter Box Leak Check	
Stack Dia :	16"	TC # :	28	5				Rate	"HG
Amb. Press :	29.90	Start Time :	1155	H2O Gain =				Initial :	15 0.002
Static Press :	-4.2	Stop Time :	1400	Filter :				Final :	10 0.000

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0	2.70	102	3.20	98.960	95	93	250	251	49	8 7		
11	5	2.45	101	2.90	103.91	93	93	254	253	50	8 7		
10	10	2.65	103	3.05	108.67	95	95	256	250	50	7		
9	15	2.60	104	3.10	113.57	97	97	249	252	51	7		
8	20	2.50	105	2.95	118.49	99	99	254	250	52	7		
7	25	2.50	105	2.95	123.26	102	102	253	248	53	7		
6	30	1.80	102	2.15	128.05	103	103	252	250	54	6		
5	35	1.50	99	1.80	132.20	105	105	252	251	55	5		
4	40	1.20	100	1.45	135.82	106	106	254	250	52	5		
3	45	1.10	96	1.30	139.27	107	107	252	253	57	5		
2	50	1.10	95	1.30	142.44	108	108	253	253	58	5		
1	55	1.05	98	1.25	145.76	108	108	251	249	57	5		
12	60	2.20	101	2.60	148.89	107	107	251	252	52	7		
11	65	2.30	100	2.75	153.42	108	108	252	253	52	7		
10	70	2.30	100	2.75	158.10	109	109	257	250	54	7		
9	75	2.45	98	2.90	162.75	110	110	253	250	55	7		
8	80	1.90	98	2.25	167.05	111	111	253	248	52	6		
7	85	1.85	99	2.20	171.88	112	112	252	250	52	6		
6	90	1.80	99	2.15	176.04	112	112	257	252	52	6		
5	95	1.35	100	1.60	180.11	113	113	255	251	52	6		
4	100	1.10	97	1.30	183.79	112	112	252	249	57	5		
3	105	1.20	95	1.45	187.02	112	112	255	252	58	5		
2	110	1.20	90	1.45	190.41	111	111	254	250	58	5		
1	115	1.20	92	1.45	193.75	111	111	251	249	59			
END	120				197.206								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation , OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Almega MET ENVIRONMENTAL

Run # :	3	Pitot ID:	# 28	Impinger #	Initial	Final	Net	Pitot Leak Check	
Date :	8-14-19	Pitot Coeff. :	0.84	1	759.0	746.2		Initial :	✓ ✓
Client :	SCAQMD C	Meter Box # :	A-6	2	735.9	760.9		Final :	✓ ✓
Unit :	Inlet 2	Meter @ Dh :	1.789	3	651.5	669.1			
Operator :	WB	Meter Y :	1.0376	4	797.2	822.4		Meter Box Leak Check	
Stack Dia :	16	TC # :	28	5				Rate	"HG
Amb. Press :	29.9	Start Time :	0825	H2O Gain =				Initial :	15 0.007
Static Press :	-4.2	Stop Time :	1030	Filter :				Final :	10 0.010

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0	1.95	99	2.30	197.573	71	71	251	248	47	6		
11	5	2.35	100	2.75	201.59	72	72	255	251	46	7		
10	10	2.60	97	3.05	206.10	74	74	255	253	48	7		
9	15	2.40	99	2.80	210.78	76	76	249	252	50	7		
8	20	2.20	96	2.60	215.33	78	78	248	250	51	6		
7	25	2.40	96	2.80	219.73	80	80	252	251	53	6		
6	30	2.25	97	2.65	224.32	82	82	255	249	55	6		
5	35	1.40	95	1.65	228.74	84	84	256	254	55	5		
4	40	1.20	92	1.40	232.26	85	85	249	251	56	4		
3	45	1.20	87	1.40	235.52	86	86	254	254	58	4		
2	50	1.20	89	1.40	238.77	87	87	255	249	60	4		
1	55	1.15	90	1.35	242.09	87	87	251	253	61	4		
12	60	1.70	93	2.00	245.26	87	87	255	250	53	5		
11	65	1.85	94	2.15	249.11	88	88	252	248	53	5		
10	70	2.10	95	2.45	253.10	89	89	255	251	54	6		
9	75	2.20	95	2.60	257.37	90	90	251	250	56	6		
8	80	1.80	96	2.10	261.88	93	93	248	250	58	6		
7	85	2.10	97	2.45	265.88	93	93	249	252	59	6		
6	90	1.80	100	2.10	270.19	94	94	256	250	59	6		
5	95	1.50	102	1.75	274.34	96	96	257	254	59	5		
4	100	1.30	98	1.55	277.90	96	96	252	251	59	5		
3	105	1.10	97	1.30	281.45	97	97	249	253	58	5		
2	110	1.05	94	1.25	284.64	97	97	252	251	55	5		
1	115	1.20	94	1.40	287.77	98	98	255	256	55	5		
End	120				291.049								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	

APPENDIX C3

MULTIPLE METAL EMISSIONS – LABORATORY DATA

				Mehod 436 Lab Data Summary				
				I1 Inlet 1 (Inside) 1	I2 Inlet 2 (Outside) Upstream of Baghouse	Outlet Outlet	RB	FB
Run 1	Arsenic	As	ug	15	3.7	<1	<1	<1
	Cadmium	Cd	ug	<1	<1	<1	<1	<1
	Chromium	Cr	ug	4400	1000	5.3	1.5	**1.6**
	RB Corrected	**Cr**	**ug**	**4398.5**	**998.5**	**3.8**		
	Nickel	Ni	ug	94	32	2.9	1.3	1.4
	RB Corrected	**Ni**	**ug**	**92.7**	**30.7**	**1.6**		
Run 2	Arsenic	As	ug	7.7	1.8	<1		
	Cadmium	Cd	ug	<1	<1	<1		
	Chromium	Cr	ug	7100	1500	2.9		
	RB Corrected	**Cr**	**ug**	**7098.5**	**1498.5**	**1.4**		
	Nickel	Ni	ug	240	53	2		
	RB Corrected	**Ni**	**ug**	**238.7**	**51.7**	**0.70**		
Run 3	Arsenic	As	ug	3.0	1.5	<1		
	Cadmium	Cd	ug	<1	<1	<1		
	Chromium	Cr	ug	4000	1600	6		
	RB Corrected	**Cr**	**ug**	**3998.5**	**1598.5**	**4.5**		
	Nickel	Ni	ug	130	55	2.7		
	RB Corrected	**Ni**	**ug**	**128.7**	**53.7**	**1.4**		
AVG	**Arsenic**	**As**	**ug**	**8.6**	**2.33**	**<1**		
	Cadmium	**Cd**	**ug**	**<1.0**	**<1.0**	**<1.0**		
	Chromium RB Corr.	**Cr**	**ug**	**5165.2**	**1365.2**	**3.23**		
	Nickel RB Corr.	**Ni**	**ug**	**153.4**	**45.4**	**1.23**		

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10562/IN(I)/In(O)/Out

Project Manager: Almega Environmental & Technical Services

Reported:
06/20/2019 07:57

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
105462 - M436 - C1 - In(O) - FB	Client	9E30032-01	Filter	05/21/19 09:00	
105462 - M436 - C1 - In(I) - R1	Client	9E30032-04	Filter	05/21/19 12:10	
105462 - M436 - C1 - In(O) - R1	Client	9E30032-07	Filter	05/21/19 12:10	
105462 - M436 - C1 - Out - R1	Client	9E30032-10	Filter	05/21/19 12:10	
105462 - M436 - C1 - In(I) - R2	Client	9E30032-13	Filter	05/21/19 15:10	
105462 - M436 - C1 - In(O) - R2	Client	9E30032-16	Filter	05/21/19 15:10	
105462 - M436 - C1 - Out - R2	Client	9E30032-19	Filter	05/21/19 15:10	
105462 - M436 - C1 - In(I) - R3	Client	9E30032-22	Filter	05/22/19 08:30	
105462 - M436 - C1 - In(O) - R3	Client	9E30032-25	Filter	05/22/19 08:30	
105462 - M436 - C1 - Out - R3	Client	9E30032-28	Filter	05/22/19 08:30	
105462-M436-RB-Filter	Client	9E30032-31	Filter	05/22/19 09:30	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10562/IN(I)/In(O)/Out

Project Manager: Almega Environmental & Technical Services

Reported:
06/20/2019 07:57

Sample Results

(Continued)

Sample: 105462 - M436 - C1 - In(O) - R3
9E30032-25 (Filter)

Sampled: 05/22/19 8:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9F0681	**Instr:** ICPMS03	**Prepared:** 06/12/19 16:26			**Analyst:** ALN	
Arsenic, Total	ND	1.0	ug/filter	5	06/17/19 15:03	
Cadmium, Total	ND	1.0	ug/filter	5	06/17/19 15:03	
Chromium, Total	60	0.20	ug/filter	1	06/17/19 13:48	
Nickel, Total	44	0.20	ug/filter	1	06/17/19 13:48	

Sample: 105462 - M436 - C1 - Out - R3
9E30032-28 (Filter)

Sampled: 05/22/19 8:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9F0681	**Instr:** ICPMS03	**Prepared:** 06/12/19 16:26			**Analyst:** ALN	
Arsenic, Total	ND	1.0	ug/filter	5	06/17/19 15:05	
Cadmium, Total	ND	1.0	ug/filter	5	06/17/19 15:05	
Chromium, Total	2.1	0.20	ug/filter	1	06/17/19 14:02	
Nickel, Total	1.9	0.20	ug/filter	1	06/17/19 14:02	

Sample: 105462-M436-RB-Filter
9E30032-31 (Filter)

Sampled: 05/22/19 9:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9F0681	**Instr:** ICPMS03	**Prepared:** 06/12/19 16:26			**Analyst:** ALN	
Arsenic, Total	ND	1.0	ug/filter	5	06/17/19 14:18	
Cadmium, Total	ND	1.0	ug/filter	5	06/17/19 14:18	
Chromium, Total	1.5	0.20	ug/filter	1	06/17/19 13:31	
Nickel, Total	1.3	0.20	ug/filter	1	06/17/19 13:31	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

Almega ENVIRONMENTAL _ REPORT

Work Orders:	9H26086	**Report Date:**	10/14/2019
		Received Date:	8/19/2019
Project:	10566 Baghouse SCAQMD-C	**Turnaround Time:**	Normal
		Phones:	(714) 889-4000
		Fax:	(714) 889-7030
Attn:	Almega Environmental & Technical Services	**P.O. #:**	
Client:	Almega Environmental & Technical Services 10602 Walker St Cypress, CA 90630	**Billing Code:**	

ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO 17025 #L2457.01 • LACSD #10143 • NELAP-CA #04229CA • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Almega Environmental & Technical Services,

Enclosed are the results of analyses for samples received 8/19/19 with the Chain-of-Custody document. The samples were received in good condition, at 5.1 °C. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Brandon Gee
Operations Manager/Senior PM

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/14/2019 13:56

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
10566-M436-FB-C1	Client	9H26086-01	Filter	08/13/19 07:30	
10566-M436-I1-R1-C1	Client	9H26086-04	Filter	08/13/19 10:55	
10566-M436-I2-R1-C1	Client	9H26086-07	Filter	08/13/19 10:55	
10566-M436-O-R1-C1	Client	9H26086-10	Filter	08/13/19 10:55	
10566-M436-I1-R2-C1	Client	9H26086-13	Filter	08/13/19 14:00	
10566-M436-I2-R2-C1	Client	9H26086-16	Filter	08/13/19 14:00	
10566-M436-O-R2-C1	Client	9H26086-19	Filter	08/13/19 14:00	
10566-M436-I1-R3-C1	Client	9H26086-22	Filter	08/14/19 10:30	
10566-M436-I2-R3-C1	Client	9H26086-25	Filter	08/14/19 10:30	
10566-M436-O-R3-C1	Client	9H26086-28	Filter	08/14/19 10:30	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported: 10/14/2019 13:56

Sample Results

Sample: 10566-M436-FB-C1
9H26086-01 (Filter)
Sampled: 08/13/19 7:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03		**Prepared:** 09/12/19 12:49			**Analyst:** aln	
Arsenic, Total	ND	1.0	ug/filter	5	10/04/19 16:06	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:06	
Chromium, Total	**1.6**	0.20	ug/filter	1	10/04/19 18:58	
Nickel, Total	**1.4**	0.20	ug/filter	1	10/04/19 18:58	

Sample: 10566-M436-I1-R1-C1
9H26086-04 (Filter)
Sampled: 08/13/19 10:55 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03		**Prepared:** 09/12/19 12:49			**Analyst:** aln	
Arsenic, Total	**15**	1.0	ug/filter	5	10/04/19 16:10	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:10	
Chromium, Total	**4400**	100	ug/filter	500	10/04/19 17:56	
Nickel, Total	**94**	0.20	ug/filter	1	10/04/19 19:02	

Sample: 10566-M436-I2-R1-C1
9H26086-07 (Filter)
Sampled: 08/13/19 10:55 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03		**Prepared:** 09/12/19 12:49			**Analyst:** aln	
Arsenic, Total	**3.7**	1.0	ug/filter	5	10/04/19 16:15	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:15	
Chromium, Total	**1000**	100	ug/filter	500	10/04/19 18:01	
Nickel, Total	**32**	0.20	ug/filter	1	10/04/19 19:11	

Sample: 10566-M436-O-R1-C1
9H26086-10 (Filter)
Sampled: 08/13/19 10:55 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03		**Prepared:** 09/12/19 12:49			**Analyst:** aln	
Arsenic, Total	ND	1.0	ug/filter	5	10/04/19 16:19	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:19	
Chromium, Total	**5.3**	0.20	ug/filter	1	10/04/19 19:16	
Nickel, Total	**2.9**	0.20	ug/filter	1	10/04/19 19:16	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported: 10/14/2019 13:56

Sample Results

(Continued)

Sample: 10566-M436-I1-R2-C1 — Sampled: 08/13/19 14:00 by Client

9H26086-13 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03 **Prepared:** 09/12/19 12:49 **Analyst:** aln						
Arsenic, Total	**7.7**	1.0	ug/filter	5	10/04/19 16:24	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:24	
Chromium, Total	**7100**	500	ug/filter	2500	10/04/19 18:05	
Nickel, Total	**240**	1.0	ug/filter	5	10/04/19 16:24	

Sample: 10566-M436-I2-R2-C1 — Sampled: 08/13/19 14:00 by Client

9H26086-16 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03 **Prepared:** 09/12/19 12:49 **Analyst:** aln						
Arsenic, Total	**1.8**	1.0	ug/filter	5	10/04/19 16:29	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:29	
Chromium, Total	**1500**	100	ug/filter	500	10/04/19 18:10	
Nickel, Total	**53**	0.20	ug/filter	1	10/04/19 19:29	

Sample: 10566-M436-O-R2-C1 — Sampled: 08/13/19 14:00 by Client

9H26086-19 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03 **Prepared:** 09/12/19 12:49 **Analyst:** aln						
Arsenic, Total	ND	1.0	ug/filter	5	10/04/19 16:33	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:33	
Chromium, Total	**2.9**	0.20	ug/filter	1	10/04/19 19:34	
Nickel, Total	**2.0**	0.20	ug/filter	1	10/04/19 19:34	

Sample: 10566-M436-I1-R3-C1 — Sampled: 08/14/19 10:30 by Client

9H26086-22 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03 **Prepared:** 09/12/19 12:49 **Analyst:** aln						
Arsenic, Total	**3.0**	1.0	ug/filter	5	10/04/19 16:38	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:38	
Chromium, Total	**4000**	100	ug/filter	500	10/04/19 18:15	
Nickel, Total	**130**	1.0	ug/filter	5	10/04/19 16:38	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/14/2019 13:56

Sample Results

(Continued)

Sample: 10566-M436-I2-R3-C1
9H26086-25 (Filter)

Sampled: 08/14/19 10:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03		**Prepared:** 09/12/19 12:49			**Analyst:** aln	
Arsenic, Total	**1.5**	1.0	ug/filter	5	10/04/19 16:42	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:42	
Chromium, Total	**1600**	100	ug/filter	500	10/04/19 18:35	
Nickel, Total	**55**	0.20	ug/filter	1	10/04/19 19:47	

Sample: 10566-M436-O-R3-C1
9H26086-28 (Filter)

Sampled: 08/14/19 10:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9I0712 **Instr:** ICPMS03		**Prepared:** 09/12/19 12:49			**Analyst:** aln	
Arsenic, Total	ND	1.0	ug/filter	5	10/04/19 16:47	
Cadmium, Total	ND	1.0	ug/filter	5	10/04/19 16:47	
Chromium, Total	**6.0**	0.20	ug/filter	1	10/04/19 19:52	
Nickel, Total	**2.7**	0.20	ug/filter	1	10/04/19 19:52	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/14/2019 13:56

Quality Control Results

Metals (Non-Aqueous) by EPA 6000/7000 Series Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W9I0712 - EPA 6020										
Blank (W9I0712-BLK1)				**Prepared: 09/12/19 Analyzed: 10/04/19**						
Arsenic, Total	ND	0.20	ug/filter							
Cadmium, Total	ND	0.40	ug/filter							
Chromium, Total	ND	0.20	ug/filter							
Nickel, Total	ND	0.20	ug/filter							
LCS (W9I0712-BS1)				**Prepared: 09/12/19 Analyzed: 10/04/19**						
Arsenic, Total	4.86	1.0	ug/filter	5.00		97	80-120			
Cadmium, Total	4.88	1.0	ug/filter	5.00		98	80-120			
Chromium, Total	5.63	0.20	ug/filter	5.00		113	80-120			
Nickel, Total	5.56	0.20	ug/filter	5.00		111	80-120			
LCS Dup (W9I0712-BSD1)				**Prepared: 09/12/19 Analyzed: 10/04/19**						
Arsenic, Total	4.83	1.0	ug/filter	5.00		97	80-120	0.7	20	
Cadmium, Total	5.02	1.0	ug/filter	5.00		100	80-120	3	20	
Chromium, Total	5.56	0.20	ug/filter	5.00		111	80-120	1	20	
Nickel, Total	5.47	0.20	ug/filter	5.00		109	80-120	2	20	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/14/2019 13:56

Notes and Definitions

Item	Definition
% Rec	Percent Recovery
Dil	Dilution
dry	Sample results reported on a dry weight basis
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
NR	Not Reportable
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.
TIC	Tentatively Identified Compound (TIC) using mass spectrometry. The reported concentration is relative concentration based on the nearest internal standard. If the library search produces no matches at, or above 85%, the compound is reported as unknown.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California State Water Resources Control Board (SWRCB)

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN: Charles

REPORT TO: PO # 10566

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com
Contact:

Turnaround Time
Standard: X Other: ____
Rush:
Depends on # of Samples
5 - 10 days ____
3 - 7 days ____

Job # 10566 | Unit # Baghouse | Client: SCAQMD - C | Location: Inlet & Outlet

Samplers: (Signature)

Project Manager: Morgan Nguyen

Unit Information:

ANALYSIS REQUESTED: CARB M436, Cr, Ni, Cd, As

Return or Dispose

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	CARB M436	Cr	Ni	Cd	As	REMARKS
8/13/2019	7:30	10566-M436-FB-C1				x	1	x					
		10566-M436-FB-C2		x			1	x	✓				combine
		10566-M436-FB-C3		x			1	x					
8/13/2019	8:50 - 10:55	10566-M436-I1-R1-C1				x	1	x					
		10566-M436-I1-R1-C2		x			1	x	✓				combine
		10566-M436-I1-R1-C3		x			1	x					
8/13/2019	8:50 - 10:55	10566-M436-I2-R1-C1				x	1	x					
		10566-M436-I2-R1-C2		x			1	x	✓				combine
		10566-M436-I2-R1-C3		x			1	x					
8/13/2019	8:50 - 10:55	10566-M436-O-R1-C1				x	1	x					
		10566-M436-O-R1-C2		x			1	x	✓				combine
		10566-M436-O-R1-C3		x			1	x					

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 8/16/19 Time: 11:40	Date: 8/19/19 Time: 13:45	Date: 8/19/19 Time 1345
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/19/19 Time 1625	Date: 8/19/19 Time: 14:25	Date: Time:	Date: Time

5 °C T-0222

Almega ENVIRONMENTAL

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN: Charles

REPORT TO:

PO # 10565

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com
Contact:

Turnaround Time
Standard: X Other:
Rush:
Depends on # of Samples
5 - 10 days
3 - 7 days

Job # 10566 | Unit # Baghouse | Client: SCAQMD - C | Location: Inlet & Outlet

Samplers: (Signature)

Project Manager: Morgan Nguyen

Unit Information:

ANALYSIS REQUESTED

Return or Dispose

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample LIQUID	GAS	SOLID	No of Containers	CARB MLOE Cr Ni Cd As	REMARKS
8/13/2019	11:55 - 14:00	10566-M436-I1-R2-C1				x	1	x	
		10566-M436-I1-R2-C2		x			1	x	✓ combine
		10566-M436-I1-R2-C3		x			1	x	
8/13/2019	11:55 - 14:00	10566-M436-I2-R2-C1				x	1	x	
		10566-M436-I2-R2-C2		x			1	x	✓ combine
		10566-M436-I2-R2-C3		x			1	x	
8/13/2019	11:55 - 14:00	10566-M436-O-R2-C1				x	1	x	
		10566-M436-O-R2-C2		x			1	x	✓ combine
		10566-M436-O-R2-C3		x			1	x	

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 8/16/19 Time 11:40	Date: 8/19/19 Time 13:45	Date: 8/19/19 Time 13:45
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/19/19 Time 1425	Date: 8/19/19 Time 14:25	Date: Time:	Date: Time

5.1" T-022c

9H26086

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN: Charles

REPORT TO:

PO # 10566

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com
Contact:

Turnaround Time
Standard: X Other: ____
Rush:
Depends on # of Samples
5 - 10 days ____
3 - 7 days ____

Job # 10566	Unit # Baghouse	Client: SCAQMD - C	Location: Inlet & Outlet

Samplers: (Signature)
Project Manager: Morgan Nguyen
Unit Information:

ANALYSIS REQUESTED

Return or Dispose

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample LIQUID	GAS	SOLID	No of Containers	CARB M436 Cr Ni Cd As					REMARKS
8/14/2019	8:25 - 10:30	10566-M436-I1-R3-C1				x	1	x					
		10566-M436-I1-R3-C2		x			1	x	✓				combine
		10566-M436-I1-R3-C3		x			1	x					
8/14/2019	8:25 - 10:30	10566-M436-I2-R3-C1				x	1	x					
		10566-M436-I2-R3-C2		x			1	x	✓				combine
		10566-M436-I2-R3-C3		x			1	x					
8/14/2019	8:25 - 10:30	10566-M436-O-R3-C1				x	1	x					
		10566-M436-O-R3-C2		x			1	x	✓				combine
		10566-M436-O-R3-C3		x			1	x					

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 8/16/19 Time: 11:40	Date: 8/19/19 Time: 13:45	Date: 8/19/19 Time 1345
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/19/19 Time 1425	Date: 8/20/19 Time: 14:25	Date: Time:	Date: Time

5:11 T-0222

Almega ENVIRONMENTAL

APPENDIX C4

O_2/CO_2 RESULTS – FIELD & LABORATORY DATA

Almega
ENVIRONMENTAL

LABORATORY REPORT

Carbon Dioxide & Oxygen by TCD
by Modified SCAQMD Method 25.3 (TCA/FID)

Client:	AQMD
Project No.:	c10566
Unit Tested:	Facility C
Sampling Date:	13-Aug-19
Analyzed Date:	20-Aug-19
Lab No.:	A 085

Client Sample ID	Lab ID	Almega Sample ID / Tank	CO_2 % v/v by TCD	O_2 % v/v by TCD
Facility C				
10566-M10.1-I2-O2/CO2	A 085 - 01	29	ND	20.8
10566-M10.1-I1-O2/CO2	A 085 - 02	14	ND	20.8
10566-M10.1-O-O2/CO2	A 085 - 03	37	ND	20.9
Detection Limit			0.3	0.3

* NOTE - the BIAS FACTOR (of 1.086) is NOT applied in these results.
ND=Not Detected

TGNMNEO concentration values are reported in ppm (v/v) as Methane (carbon#=1).

The sample cylinder is analyzed for NMNEO, CO, CH_4, CO_2 and C_2H_6. It is then directed to a separation column where all heavy organics (C_3+) separate from the light organics (CO, CO_2, CH_4 and C_2H_6). The light organics are then passed through a reduction catalyst to convert CO and CO_2 to CH_4, and are then directed to a FID for detection and quantification. The heavy organics are backflushed off the holding column, passed through an oxidation catalyst, which convert all organics to CO_2, then through a reduction catalyst to convert CO_2 to CH_4 and then to a FID for detection and quantification.

Reviewed by:

CALCULATIONS

Almega ENVIRONMENTAL

Client:	AQMD	Lab No.: A 085	
Project No.:	c10566		
Unit Tested:	Facility C		
Sampling Date:	13-Aug-19		
Date tested:	20-Aug-19		

Parameter	Symbol	Units	Run #1	Run #2
Sample ID			10566-M10.1-I2-O2/CO2	10566-M10.1-I1-O2.CO2
Lab ID			A 085 - 01	A 085 - 02
Sample Tank				
Tank No			29	14
Sample Tank Volume	V_T	L	12.085	12.035
Barometric Pressure	P_b	mm Hg	763	763
Pre-test Pressure	P_{TI}	mm Hg (abs)	2.00	2.00
Pre-test Temperature	t_{TI}	°C	21	21
Abs. Pre-test Temperature	T_{TI}	°K	294	294
Post-test Pressure	P_{TS}	mm Hg (abs)	372	330
Post-test Temperature	t_{TS}	°C	21	21
Abs. Post-test Temperature	c	°K	294	294
Final Pressure	P_{TF}	mm Hg (abs)	926	930
Abs.Final Temperature	T_{TF}	°K	293	293
Dilution Factor	DF_T		2.51	2.85
Sample Volume	Vs	L	5.778	5.101

Calculations

$V_S = k_1 * V_T * (P_{TS}/T_{TS} - P_{TI}/T_{TI})$ $\quad DF = (P_{TF}/T_{TF})/(P_{TS}/T_{TS} - P_{TI}/T_{TI})$

$k_1 = (273+15.56)/760 = 0.3799$

$C_{SAT} = DF * C_{SA}$

$C_{COT} = DF * C_{CO}$

CALCULATIONS

Client:	AQMD		Lab No.:
Project No.:	c10566		A 085
Unit Tested:	Facility C		
Sampling Date:	13-Aug-19		
Date tested:	20-Aug-19		

Parameter	Symbol	Units	Run #3
Sample ID			10566-M10.1-O-O2/CO2
Lab ID			A 085 - 03
Sample Tank			
Tank No			37
Sample Tank Volume	V_T	L	12.085
Barometric Pressure	P_b	mm Hg	763
Pre-test Pressure	P_{TI}	mm Hg (abs)	2.00
Pre-test Temperature	t_{TI}	°C	21
Abs. Pre-test Temperature	T_{TI}	°K	294
Post-test Pressure	P_{TS}	mm Hg (abs)	416
Post-test Temperature	t_{TS}	°C	21
Abs. Post-test Temperature	T_{TS}	°K	294
Final Pressure	P_{TF}	mm Hg (abs)	932
Abs.Final Temperature	T_{TF}	°K	293
Dilution Factor	DF_T		2.26
Sample Volume	Vs	L	6.465

Calculations

$V_S = k_1 * V_T * (P_{TS}/T_{TS} - P_{TI}/T_{TI})$

$DF = (P_{TF}/T_{TF})/(P_{TS}/T_{TS} - P_{TI}/T_{TI})$

$k_1 = (273+15.56)/760 = 0.3799$

$C_{SAT} = DF * C_{SA}$

$C_{COT} = DF * C_{CO}$

QA/QC SUMMARY
(Repeat Analysis)

Almega ENVIRONMENTAL

Client Project No.:	c10566	Lab No.:	A 085
Sampling Date:	13-Aug-19	Analyzed Date:	20-Aug-19

Run #1

Analyte	Sample ID	Area Count #1	Area Count #2	Area % diff (±20%)	Conc # 1	Conc # 2	Mean Conc ppm	% diff from Mean
Tank Analysis								
CO2*	A 085 - 01	ND	ND	ND	ND	ND	**ND**	ND
O2*	A 085 - 01	1598972	1573856	1.57	8.3	8.2	**8.3**	1.58

Run #2

Analyte	Sample ID	Area Count #1	Area Count #2	Area Count #3	Conc # 1	Conc # 2	Mean Conc ppm	% diff from Mean
Tank Analysis								
CO2*	A 085 - 02	ND	ND	ND	ND	ND	**ND**	ND
O2 *	A 085 - 02	1398715	1399520	-0.06	7.3	7.3	**7.3**	-0.06

* - by GC/TCD

$Conc_{CO}$ in tank = $MeanConc_{CO}$ * DF

$Conc_{CO2}$ in tank = $MeanConc_{CO2}$ * DF

$Conc_{O2}$ in tank = $MeanConc_{O2}$ * DF

QA/QC SUMMARY
(Repeat Analysis)

Almega ENVIRONMENTAL

Client Project No.:	c10566	Lab No.:	A 085
Sampling Date:	13-Aug-19	Analyzed Date:	20-Aug-19
Run #3			

Analyte	Sample ID	Area Count #1	Area Count #2	Area Count #3	Conc # 1	Conc # 2	Mean Conc ppm	% diff from Mean
Tank Analysis								
CO2*	A 085 - 03	ND	ND	ND	ND	ND	**ND**	ND
O2*	A 085 - 03	1750794	1792895	-2.40	9.1	9.4	**9.2**	-2.38

* - by GC/TCD

$Conc_{CO}$ in tank = $MeanConc_{CO}$ * DF

$Conc_{CO2}$ in tank = $MeanConc_{CO2}$ * DF

$Conc_{O2}$ in tank = $MeanConc_{O2}$ * DF

Lot# A085

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

REPORT TO:

PO #

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com
Contact:

ATTN:

Turnaround Time
Standard: X Other:
Rush:
Depends on # of Samples
5 - 10 days
3 - 7 days

Job # 10566 | Unit # Baghouse | Client: SCAQMD - C | Location: Inlet & Outlet

Samplers: (Signature)

Project Manager: Morgan Nguyen

Unit Information:

ANALYSIS REQUESTED

Return or Dispose

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	M10.1	O2/CO2				REMARKS
8/13/2019	13:00 - 14:00	10566-M10.1-I2-O2/CO2	A085 -01		x		1	✓	✓				TK# 29
8/13/2019	11:55 - 12:55	10566-M10.1-I1-O2/CO2	-02		x		1	✓	✓				TK# 14
8/13/2019	11:55 - 12:55	10566-M10.1-O-O2/CO2	-03		x		1	✓	✓				TK# 37

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 08/16/19 Time: 11:40	Date: Time:	Date: Time
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: Time	Date: Time:	Date: Time:	Date: Time

Almega ENVIRONMENTAL

Almega
ENVIRONMENTAL

Almega
ENVIRONMENTAL

Standard Receipt
Sample LOG in Checklist

Project No: 10566

Method: N.C.1, as 1

Lab ID: AQ85

Sampling Date: 8/12 - 8/16

Location: AQMD - C Int:

Date & Time Rc'd: 8/16/19 11:40

Location: LAB Int: DN

Arrived By: (circle) FedEx UPS Drop Off (Int) ok Other

Condition of Package(s): (comment): ok

Package Type: (Box) Cooler Other:

Number of Sample Container(s): 8, 3

Correct Containers (per Method): (Y) N

Preservation: (circle) ICE DryICE ICEPacks (None)

Sample Conditions:

Sample Temp (C): 21

Ambient Temp (C): 21

Sample Temp (C):

Filter Condition: ok - Dirty

PH :

Components Sealed: (Y) N

Sample Recovery Completed On: (date & time)

Recovered In: (circle) (Field) Lab Other

Silica Gel Condition:

Tedlar Bags -
Condensation: Y N

Comments:

Container(s) Requested: Glass Plastic

Additional Comments:

AQ85 - R2 - C2 : hard to extract, Black residue stuck to bottle
need vial to collect it. ~~Specimen~~

Almega
ENVIRONMENTAL

SAMPLE INVENTORY REPORT

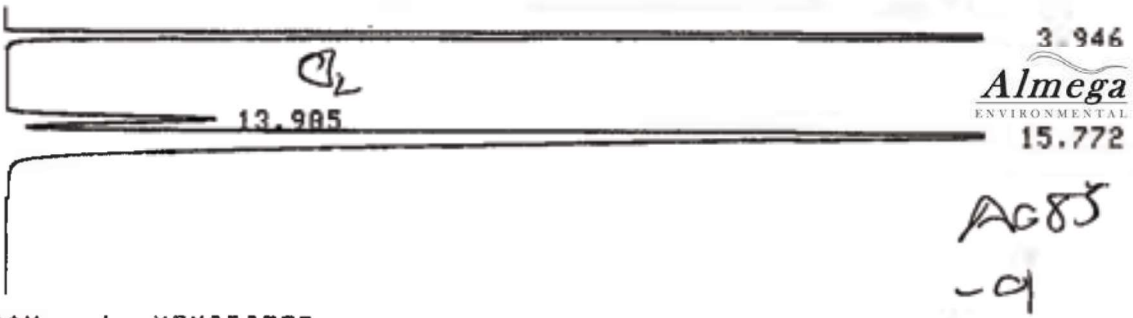
Method 25.3 Sampling Train

Project No.:	c10566	Lab No.:	A 085
Client:	AQMD	Sampling Date:	13-Aug-19

Laboratory ID	Client ID	Component ID	
Run #1			
A 085 - 01	10566-M10.1-I2-O2/CO2	Tank #	29
Run #2			
A 085 - 02	10566-M10.1-I1-O2/CO2	Tank #	14
Run #3			
A 085 - 03	10566-M10.1-O-O2/CO2	Tank #	37

CHROMATOGRAM

TEST SAMPLES



Almega ENVIRONMENTAL

SHIMADZU

A085
-01

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 84

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.946	8115064			34.9591	
2	13.985	1598972			6.8883	
3	15.772	13498974	V		58.1526	
	TOTAL	23213008			100	

A085
-01
dup

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 85

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.935	8095080			35.2841	
2	13.807	1573856			6.86	
3	15.649	13273628	V		57.8559	
	TOTAL	22942562			100	

210 012

A085
D2

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 86

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.923	8147198			35.4486	
2	13.887	1398715			6.0858	
3	15.642	13437182	V		58.4655	
	TOTAL	22983096			100	

A085
D2
dup

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 87

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.928	8145182			35.3557	
2	13.792	1399520			6.0749	
3	15.665	13493086	V		58.5694	
	TOTAL	23037786			100	

A085
03

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 88

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.928	8175739			35.4135	
2	13.825	1750794			7.5836	
3	15.688	13159960	V		57.0029	
	TOTAL	23086492			100	

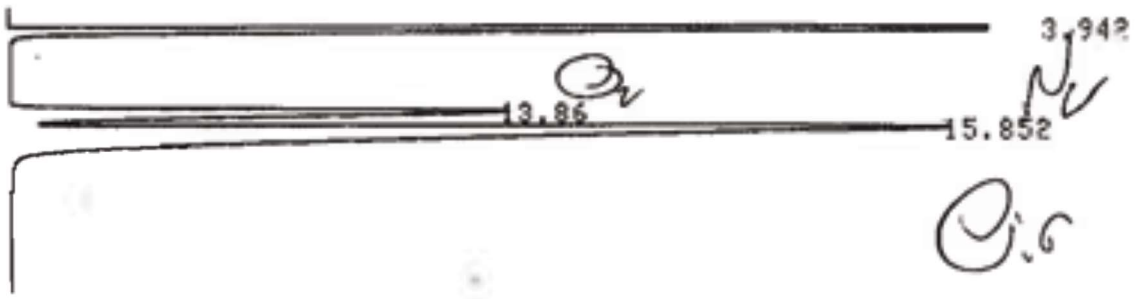
A085
03

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 89

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.947	8114429			35.1026	
2	13.882	1792895			7.756	
3	15.752	13208964	V		57.1414	
	TOTAL	23116288			100	

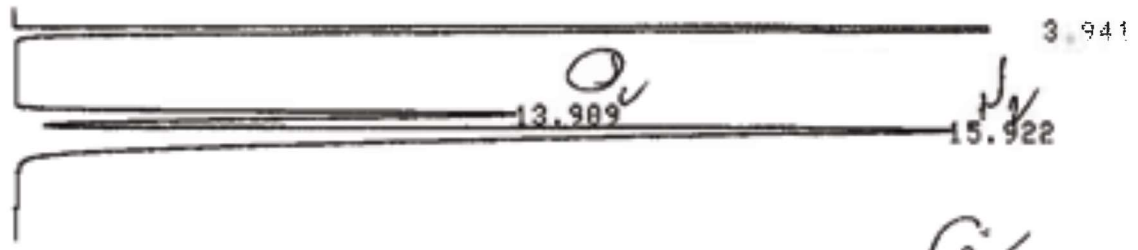
QAQC



CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 80

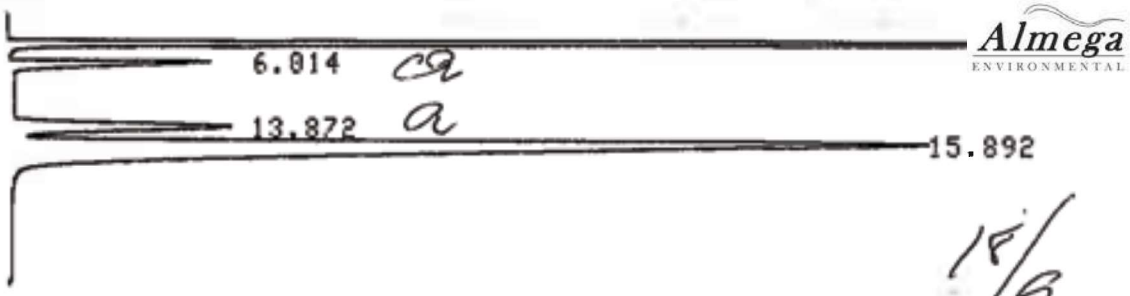
PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.942	8343058			35.5278	
2	13.86	3861772			16.4448	
3	15.852	11278380	V		48.0274	
	TOTAL	23483210			100	



CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 81

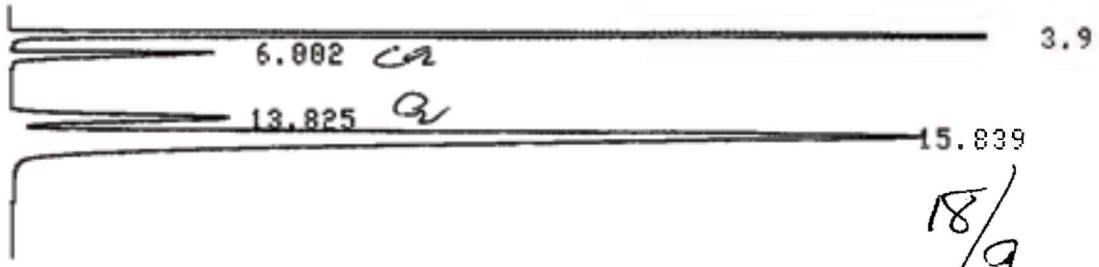
PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.941	8320981			35.1658	
2	13.909	3909554			16.5224	
3	15.922	11431600	V		48.3118	
	TOTAL	23662134			100	



CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 82

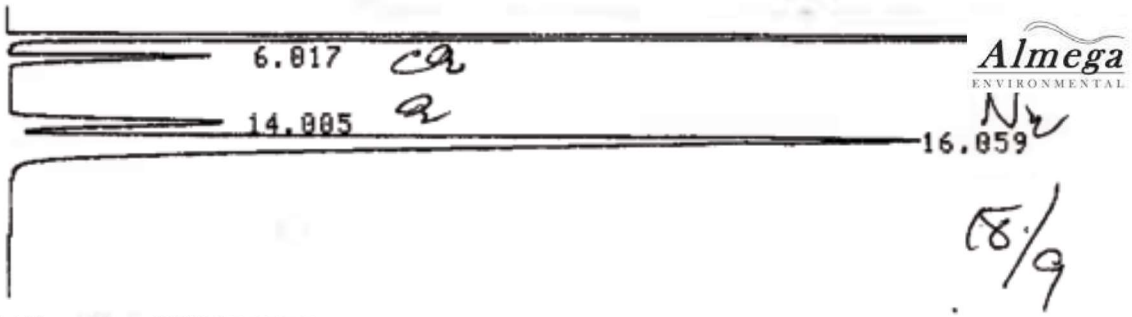
PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.905	6823786			33.4419	
2	6.014	989505			4.8494	
3	13.872	1680226			8.2344	
4	15.892	10911366	V		53.4743	
	TOTAL	20404880			100	



CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC
CHANNEL NO 1 FILE 0
SAMPLE NO 0 METHOD 41
REPORT NO 83

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.9	6801570			33.5435	
2	6.002	993231			4.8983	
3	13.825	1662400			8.1985	
4	15.839	10819684	V		53.3597	
	TOTAL	20276884			100	



Almega ENVIRONMENTAL

CHROMATOGRAM 1 MEMORIZED

C-R5A CHROMATOPAC

CHANNEL NO	1	FILE	0
SAMPLE NO	0	METHOD	41
REPORT NO	90		

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.91	6831713			33.3318	
2	6.017	1000349			4.8807	
3	14.005	1691962			8.2551	
4	16.059	10972030	V		53.5324	
	TOTAL	20496652			100	

TANK PREPARATION

TANK PREPARATIONS

Client:	AQMD	Lab No.:	A 085
Project No.:	c10566		
Unit Tested:	Facility C		
Sampling Date:	13-Aug-19		
Date pressurized:	16-Aug-19		

Tank ID	Sample ID	Pre-test pressure mm Hg		Post-test pressure mm Hg	Final Pressure	Comments
		1	2			
29	A 085 - 01	-758	-758	-388	166	Run #1
14	A 085 - 02	-758	-758	-430	170	Run #2
37	A 085 - 03	-758	-758	-344	172	Run #3

* - Post -test Pressure is less then 200 mm Hg.

Almega ENVIRONMENTAL

VOC FIELD DATA SHEET - SCAQMD METHOD 10.1 (Modified)

Date: 8-13-19 Test No.: 1
Client: SCAQMD C Barometric Pressure (in. Hg): 29.9
Unit: Inlet 1 Baghouse Pretest Leak Check:
Operator Name: DJ A: X B:
Fuel: Stack gas Post-test Leak check:
Location: Inlet 1 A: X B:

RUN # 1 RUN #

Time 24 Hours	Start Time	Tank # 29 Control ID: 12|3 Flow ml/min.	Vacuum inch Hg	Tank # Control ID: Flow ml/min.	Vacuum inch Hg
0	11:55		28		
10			24		
20			20		
30			20		
40			18		
50			16		
60	12:55		14		

Almega ENVIRONMENTAL

VOC FIELD DATA SHEET - SCAQMD METHOD 10.1 (Modified)

Date: 8-13-19 Test No.: 1
Client: SCAQMD Barometric Pressure (in. Hg): 29.9
Unit: Inlet 2 Baghouse Pretest Leak Check:
Operator Name: MR A: K B:
Fuel: Stack gas Post-test Leak check:
Location: Inlet A: B:

RUN # 1 RUN #

Time 24 Hours	Start Time 13:00	Tank # 14 Control ID: 1804 Flow ml/min.	Vacuum inch Hg	Tank # Control ID: Flow ml/min.	Vacuum inch Hg
0		28			
10		26			
20		24			
30		22			
40		20			
50		18			
60		16			

Almega ENVIRONMENTAL

VOC FIELD DATA SHEET - SCAQMD METHOD 10.1 (Modified)

Date: 8-13-19 Test No.: 1
Client: SCAQMD Barometric Pressure (in. Hg): 29.9
Unit: Outlet Baghouse Pretest Leak Check:
Operator Name: LB A: ∞ B:
Fuel: stack gas Post-test Leak check:
Location: outlet A: B:

RUN # 1 RUN #

Time 24 Hours	Start Time	Tank # 37 Control ID: 1820 Flow ml/min.	Vacuum inch Hg	Tank # Control ID: Flow ml/min.	Vacuum inch Hg
0		n/a	28"		
10			25"		
20			22.5"		
30			19.5"		
40			16"		
50			14"		
60			11.5"		

APPENDIX D

CARB METHOD 425 – CHROMIUM EMISSIONS (HEX/TOTAL)

APPENDIX D1

CHROMIUM EMISSIONS (HEX/TOTAL) – RESULTS AND CALCULATIONS

Location: Baghouse Outlet

TEST RESULTS
CARB 425 (Hexavalent & Total Chromium)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

TEST DATA	UNITS	TEST RESULTS			AVERAGE
Run Number	-	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	8/14/19	8/15/19	8/15/19	--
Test Time	hh:mm	11:25 - 13:30	08:10 - 10:15	10:55 - 13:10	--
Sampling Data*					
Stack Temperature	°F	117.1	87.1	104.6	**102.9**
Moisture	%	2.3	1.9	2.4	**2.2**
Sample Volume	dscf	73.1	85.3	70.8	**76.4**
Oxygen**	% v/v	20.9	20.9	20.9	**20.9**
Carbon Dioxide**	% v/v	<0.3	<0.3	<0.3	**<0.3**
Gas Velocity	ft/min	613.6	685.1	585.5	**628**
Stack Flow Rate	acfm	7,711	8,609	7,358	**7,893**
Stack Flow Rate	dscfm	6,885	8,143	6,708	**7,245**
Total Catch (CARB 425)					
Chromium VI	ug	< 0.312	< 0.032	< 0.046	< **0.13**
Total Chromium	ug	< 0.550	< 0.590	< 0.600	< **0.58**
Concentration (CARB 425)					
Chromium VI	ug/dscm	< 0.151	< 0.013	< 0.023	< **0.062**
	ug/dscf	< 0.004	< 0.0004	< 0.001	< **0.0018**
Total Chromium	ug/dscm	< 0.266	< 0.244	< 0.299	< **0.270**
	ug/dscf	< 0.0075	< 0.0069	< 0.0085	< **0.0076**
Mass Emissions (CARB 425)					
Chromium VI	ug/hr	< 1763	< 180	< 261	< **735**
Chromium VI	mg/hr	< 1.76	< 0.18	< 0.26	< **0.73**
Chromium VI	lb/hr	< 3.89E-06	< 3.98E-07	< 5.76E-07	< **1.62E-06**
Total Chromium	ug/hr	< 3107	< 3380	< 3410	< **3299**
Total Chromium	mg/hr	< 3.11	< 3.38	< 3.41	< **3.30**
Total Chromium	lb/hr	< 6.85E-06	< 7.45E-06	< 7.52E-06	< **7.27E-06**

Notes:
* Performed during isokinetic sampling by CARB 425.
** O2/CO2 was measured via SCAQMD Method 10.1 by GC.
"<" Indicates an analytical result of non-detect (ND) and the use of laboratory MRL for emission calculations.

CARB METHOD 425 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/14 to 08/15/19
City:	[redacted]CA	Operator:	NC
Source:	Baghouse	Entered by:	TG
Location:	Outlet	Checked by:	CF

Lab Results	Units	Run 1	Run 2	Run 3	Average
Chromium VI	ug	< 0.31	< 0.032	< 0.046	< 0.130
Total Chromium	µg	< 0.55	< 0.59	< 0.60	< 0.580
Chromium VI, Molecular Weight	g/g-mole	51.995	51.995	51.995	- -
Total Chromium, Molecular Weight	g/g-mole	51.995	51.995	51.995	- -
Concentration (ug/dscm), Ci = Mi/VmStd *35.315 cf/dscm					
Chromium VI	ug/dscm	< 0.151	< 0.013	< 0.023	< 0.062
Total Chromium	ug/dscm	< 0.266	< 0.244	< 0.299	< 0.270
Metals Mass Emissino Rate (lb/hr), Ei Ei = Ci*Qsdm*60/453600/1000					
Chromium VI	lb/hr	< 3.89E-06	< 3.98E-07	< 5.76E-07	< 1.62E-06
Total Chromium	lb/hr	< 6.85E-06	< 7.45E-06	< 7.52E-06	< 7.27E-06

MV_1 = 24.05 L/g-mole @68°F, 23.68 L/g-mole @60°F

"<" Indicates an analytical result of non-detect (ND) and the use of laboratory MRL for emission calculations.

B - Reagent blank corrected value.

Lab Data - CARB 425

Facility: AQMD Facility C
Source: Baghouse Outlet

Analytical Results - Cr+6									
Run Number:		Run 1		Run 2		Run 3		RB	Cr+6
Rinse C1, ug	ND, MRL	0.220	ND, MRL	0.0095	ND, MRL	0.009	ND, MRL	0.010	C1
Impingers C2, ug		0.092	ND, MRL	0.022		0.037	ND, MRL	0.020	C2
Total catch, ug		**<0.312**		**<0.0315**		**<0.046**			

Analytical Results - Total Chromium									
Run Number:		Run 1		Run 2		Run 3		RB	Cr
Rinse C1, ug	ND, MRL	0.31	ND, MRL	0.35	ND, MRL	0.36	ND, MRL	1.00	C1
Impingers C2, ug	ND, MRL	0.24	ND, MRL	0.24	ND, MRL	0.24	ND, MRL	1.00	C2
Total catch, ug		**<0.55**		**<0.59**		**<0.60**			

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Test Date(s): 08/14 to 08/15/19
Operator: NC
Entered by: TG
Checked by: CF

			08/14/19	08/15/19	08/15/19
DATA ENTRY	**symbol**	**units**	**DATA**	**DATA**	**DATA**
Run Number			1	2	3
Stack Dimensions: Round Stack Diameter	Ds	in.	48.00	48.00	48.00
Rectangular Stack, Length	L	in.			
Width	W	in.			
Nozzle Diameter	Dn	in.	0.450	0.450	0.450
Standard Temperature	Tstd	°F	68	68	68
Universal (molar) Gas Constant	Renglish	in. Hg-cu.ft/ °R-lbmole	21.85	21.85	21.85
Average Stack Temperature (measured)	Fs	°F	117.1	87.1	104.6
Average Meter Temperature (measured)	Fm	°F	93.9	76.0	89.9
Standard Pressure	Pstd	in.Hg	29.92	29.92	29.92
Barometric Pressure	Pbar	in.Hg	29.90	29.90	29.90
Stack Static Pressure	Pg	in.WC	-0.02	-0.02	-0.02
Average Meter Orifice Head (Delta-H)	dH	in.WC	1.16	1.49	1.09
Average RMS Velocity Head (Delta-P)	dP	in.WC	0.030	0.040	0.028
Pitot Coefficient	Cp	—	0.84	0.84	0.84
Net Volume of Gas Metered	Vm	cu.ft.	73.752	83.153	70.924
Dry Gas Meter Calibration Factor (gamma, Y)	Y	—	1.0379	1.0379	1.0379
NET Sampling Time	min	min.	120	120	120
Stack Gas: Oxygen Content*	O2,m	%	20.90	20.90	20.90
Carbon Dioxide Content*	CO2,m	%	<0.30	<0.30	<0.30
Total Impingcr Gain	Ww	g	37.2	35.3	37.5
CALCULATED DATA					
Nozzle Area: An = pi/4*dn^2	An	sq.in.	0.1590	0.1590	0.1590
Stack Area (round): As = pi/576*ds^2 (rectangular): As = L*W/144	As	sq.ft.	12.57	12.57	12.57
Absolute Stack Temperature: Ts = Fs+460	Ts	°R	577.1	547.1	564.6
Absolute Meter Temperature: Tm = Fm+460	Tm	°R	553.9	536.0	549.9
Standard Temperature: Tstdr = Tstd+460	Tstdr	°R	528.0	528.0	528.0
Gas Sample Volume at Standard Conditions: Vm(std) = Y * (Vm/Tm) * (Pbar + dH/13.6 in H2O/in Hg) * (Tstdr/Pstd)	VmStd	cu.ft.	73.1	85.3	70.8
Vol. of Water Vapor, Vw(std) = Ww/453.59 * Renglish/18 * Tstdr / Pstd	VwStd	cu.ft.	1.757	1.667	1.771
Moisture Fraction: Bws = VwStd/(VmStd+VwStd)	Bws	—	0.0235	0.019	0.0244
Stack Gas MW, Dry Basis: Md = 0.32*O2,m + 0.44*CO2,m + 0.28*(100-O2,m-CO2,m)	Md	g/mole	28.88	28.88	28.88
Stack Gas MW, Wet Basis: Mw = Md*(1-Bws) + 18*Bws	Mw	g/mole	28.63	28.68	28.62
Stack Pressure: Ps = Pbar + Pg/13.6	Ps	in.Hg	29.90	29.90	29.90
Stack Gas Velocity, measured					
vs = 85.49*Cp*√(dP*Ts/Ps/Mw)	vs	ft/s	10.23	11.42	9.76
vm = 0.3048 m/ft*vs	vsm	m/s	3.12	3.48	2.97
Stack Gas Volumetric Flow Rate: Q = 60*vs*As	Q	acfm	7,711	8,609	7,358
Stack Gas Volumetric Flow Rate, corrected:					
Qsd = Q*(1-Bws)*(Ps/Ts)*(Tstdr/Pstd)	Qsd	dscfm	6,885	8,143	6,708
Qsdm = Qsd/35.315	Qsdm	dscmm	195.0	230.6	190.0
Isokinetic Sampling Rate: I = 144*100*Ts*Vmstd *Pstd/[60*Tstdr*vs*min*An*Ps*(1-Bws)]	I	%	100.7	99.3	100.1

* O2/CO2 was measured via SCAQMD Method 10.1 by GC.

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Run No.: 1
Test Date: 08/14/19
Times: 11:25 - 13:30

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	108	10.4	0.060	0.24	2.17	84	84
2	111	10.5	0.050	0.22	1.81	93	85
3	111	10.5	0.050	0.22	1.82	95	86
4	117	10.8	0.050	0.22	1.80	96	87
5	116	10.8	0.050	0.22	1.81	97	88
6	114	10.7	0.030	0.17	1.09	97	89
7	119	10.9	0.030	0.17	1.09	97	89
8	119	10.9	0.030	0.17	1.08	97	90
9	118	10.9	0.030	0.17	1.08	97	90
10	119	10.9	0.030	0.17	1.08	98	91
11	119	10.9	0.020	0.14	0.72	98	91
12	119	10.9	0.020	0.14	0.72	98	91
B-1	118	10.9	0.020	0.14	0.72	92	93
2	121	11.0	0.020	0.14	0.72	97	91
3	121	11.0	0.020	0.14	0.72	98	92
4	121	11.0	0.020	0.14	0.72	99	92
5	122	11.0	0.020	0.14	0.72	99	92
6	122	11.0	0.020	0.14	0.72	100	92
7	123	11.1	0.020	0.14	0.72	99	93
8	121	11.0	0.020	0.14	0.72	100	93
9	113	10.6	0.030	0.17	1.10	100	93
10	115	10.7	0.030	0.17	1.10	101	94
11	112	10.6	0.050	0.22	1.84	101	94
12	112	10.6	0.030	0.17	1.84	101	94
Average:		**117.1**		**0.0301**	**1.16**		**93.9**

DGM Reading (cu.ft.):		Impinger Weight (g):	
Final-1:	681.850	#1 Final:	774.6
Initial-1:	608.098	#1 Initial:	760.0
Final-2:		#2 Final:	770.4
Initial-2:		#2 Initial:	767.8
Final-3:		#3 Final:	620.8
Initial-3:		#3 Initial:	620.3
Final-4:		#4 Final:	790.0
Initial-4:		#4 Initial:	770.5
Final-5:		#5 Final:	
Initial-5:		#5 Initial:	
NET Volume:	**73.752**	#6 Final:	
		#6 Initial:	
		#7 Final:	
		#7 Initial:	
		#8 Final:	
		#8 Initial:	
		Total wt of impingers:	**37.2**

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Run No.: 2
Test Date: 08/15/19
Times: 08:10 - 10:15

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	78	8.8	0.05	0.224	1.84	66	66
2	82	9.1	0.05	0.224	1.84	75	64
3	82	9.1	0.06	0.245	2.22	76	66
4	82	9.1	0.05	0.224	1.85	78	67
5	83	9.1	0.05	0.224	1.85	79	68
6	82	9.1	0.04	0.200	1.49	80	69
7	82	9.1	0.05	0.224	1.86	80	70
8	83	9.1	0.04	0.200	1.49	80	70
9	85	9.2	0.05	0.224	1.85	80	71
10	86	9.3	0.04	0.200	1.48	81	71
11	86	9.3	0.04	0.200	1.48	81	72
12	86	9.3	0.04	0.200	1.48	82	72
B-1	85	9.2	0.03	0.173	1.11	75	73
2	87	9.3	0.03	0.173	1.11	80	72
3	90	9.5	0.03	0.173	1.10	80	73
4	91	9.5	0.03	0.173	1.10	81	73
5	91	9.5	0.03	0.173	1.10	82	73
6	93	9.6	0.03	0.173	1.10	82	74
7	92	9.6	0.02	0.141	0.74	83	75
8	93	9.6	0.03	0.173	1.10	82	75
9	93	9.6	0.03	0.173	1.11	84	76
10	94	9.7	0.03	0.173	1.10	85	76
11	93	9.6	0.06	0.245	2.22	86	77
12	94	9.7	0.06	0.245	2.22	88	78
Average:		**87.1**		**0.0396**	**1.49**		**76.0**

DGM Reading (cu.ft.):	
Final-1:	767.625
Initial-1:	684.472
Final-2:	
Initial-2:	
Final-3:	
Initial-3:	
Final-4:	
Initial-4:	
Final-5:	
Initial-5:	
NET Volume:	**83.153**

Impinger Weight (g):	
#1 Final:	773.3
#1 Initial:	760.1
#2 Final:	770.9
#2 Initial:	766.8
#3 Final:	621.1
#3 Initial:	619.4
#4 Final:	805.2
#4 Initial:	788.9
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**35.3**

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Outlet

Run No.: 3
Test Date: 08/15/19
Times: 10:55 - 13:10

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	98	9.9	0.04	0.200	1.46	79	79
2	98	9.9	0.04	0.200	1.46	84	79
3	98	9.9	0.04	0.200	1.47	87	80
4	97	9.8	0.03	0.173	1.10	89	81
5	97	9.8	0.03	0.173	1.11	90	82
6	97	9.8	0.02	0.141	0.74	90	83
7	99	9.9	0.02	0.141	0.74	91	84
8	99	9.9	0.03	0.173	1.11	91	84
9	100	10.0	0.02	0.141	0.74	93	86
10	101	10.0	0.02	0.141	0.74	93	86
11	106	10.3	0.02	0.141	0.73	93	86
12	107	10.3	0.02	0.141	0.73	94	86
B-1	109	10.4	0.02	0.141	0.73	88	87
2	109	10.4	0.02	0.141	0.73	94	88
3	110	10.5	0.02	0.141	0.73	96	88
4	110	10.5	0.02	0.141	0.73	96	89
5	111	10.5	0.02	0.141	0.73	96	89
6	111	10.5	0.02	0.141	0.73	97	90
7	111	10.5	0.02	0.141	0.73	97	91
8	111	10.5	0.02	0.141	0.73	98	91
9	111	10.5	0.02	0.141	0.73	98	91
10	108	10.4	0.06	0.245	2.21	99	92
11	107	10.3	0.07	0.265	2.59	101	93
12	107	10.3	0.07	0.265	2.60	102	94
Average:		**104.6**		**0.0280**	**1.09**		**89.9**

DGM Reading (cu.ft.):		Impinger Weight (g):	
Final-1:	838.859	#1 Final:	776.3
Initial-1:	767.935	#1 Initial:	753.3
Final-2:		#2 Final:	756.0
Initial-2:		#2 Initial:	754.6
Final-3:		#3 Final:	542.0
Initial-3:		#3 Initial:	541.2
Final-4:		#4 Final:	871.9
Initial-4:		#4 Initial:	859.6
Final-5:		#5 Final:	
Initial-5:		#5 Initial:	
NET Volume:	**70.924**	#6 Final:	
		#6 Initial:	
		#7 Final:	
		#7 Initial:	
		#8 Final:	
		#8 Initial:	
		Total wt of impingers:	**37.5**

Location: Inlet 1 (Inside)

TEST RESULTS

CARB 425 (Hexavalent & Total Chromium)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

TEST DATA	UNITS	TEST RESULTS			AVERAGE
Run Number	-	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	8/14/19	8/15/19	8/15/19	--
Test Time	hh:mm	11:25 - 13:30	08:10 - 10:15	10:55 - 13:10	--
Sampling Data*					
Stack Temperature	°F	131	114	142	**129**
Moisture	%	1.6	1.6	1.7	**1.7**
Sample Volume	dscf	85.3	92.6	86.3	**88.1**
Oxygen**	% v/v	20.8	20.8	20.8	**20.8**
Carbon Dioxide**	% v/v	0.30	0.30	0.30	**0.30**
Gas Velocity	ft/min	1,238.5	1,303.0	1,273.8	**1,272**
Stack Flow Rate	acfm	1,142	1,201	1,174	**1,172**
Stack Flow Rate	dscfm	998	1,083	1,008	**1,030**
Total Catch (CARB 425)					
Chromium VI	ug	0.82	21.9	21.2	**14.6**
Total Chromium	ug	2540	330	1007	**1292**
Concentration (CARB 425)					
Chromium VI	ug/dscm	0.34	8.35	8.68	**5.79**
	ug/dscf	0.010	0.237	0.246	**0.164**
Total Chromium	ug/dscm	1052	125.9	412.1	**529.9**
	ug/dscf	29.78	3.56	11.67	**15.00**
Mass Emissions (CARB 425)					
Chromium VI	ug/hr	575	15369	14859	**10268**
Chromium VI	mg/hr	0.57	15.37	14.9	**10.3**
Chromium VI	lb/hr	1.27E-06	3.39E-05	3.28E-05	**2.26E-05**
Total Chromium	ug/hr	1784014	231584	705479	**907026**
Total Chromium	mg/hr	1784	232	705	**907**
Total Chromium	lb/hr	3.93E-03	5.11E-04	1.56E-03	**2.00E-03**

Notes:
* Performed during isokinetic sampling by CARB 425.
** O2/CO2 was measured via SCAQMD Method 10.1 by GC.

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/14 to 08/15/19
City:	[redacted] CA	Operator:	DJ
Source:	Baghouse	Entered by:	TG
Location:	Inlet 1	Checked by:	CF

Lab Results	Units	Run 1	Run 2	Run 3	Average
Chromium VI	ug	0.818	21.9	21.2	14.64
Total Chromium	µg	2540	330.0	1007	1292.3
Chromium VI, Molecular Weight	g/g-mole	51.995	51.995	51.995	- -
Total Chromium, Molecular Weight	g/g-mole	51.995	51.995	51.995	- -
Concentration (ug/dscm), Ci = Mi/VmStd *35.315 cf/dscm					
Chromium VI	ug/dscm	0.34	8.35	8.68	5.8
Total Chromium	ug/dscm	1,051.65	125.86	412.06	530
Metals Mass Emissino Rate (lb/hr), Ei Ei = Ci*Qsdm*60/453600/1000					
Chromium VI	lb/hr	1.27E-06	3.39E-05	3.28E-05	2.26E-05
Total Chromium	lb/hr	3.93E-03	5.11E-04	1.56E-03	2.00E-03

MV_1 = 24.05 L/g-mole @68°F, 23.68 L/g-mole @60°F

Lab Data - CARB 425

Facility: AQMD Facility C
Source: Baghouse Inlet 1

Analytical Results - Cr+6						
Run Number:	Run 1	Run 2	Run 3		RB	Cr+6
Rinse C1, ug	0.068	0.90	0.21	ND, MRL	0.010	C1
Impingers C2, ug	0.75	21.0	21.0	ND, MRL	0.020	C2
Total catch, ug	**0.818**	**21.9**	**21.21**			

Analytical Results - Total Chromium						
Run Number:	Run 1	Run 2	Run 3		RB	Cr
Rinse C1, ug	240	50	27.0	ND, MRL	1.00	C1
Impingers C2, ug	2300	280	980	ND, MRL	1.00	C2
Total catch, ug	**2540**	**330**	**1007**			

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Test Date(s): 08/14 to 08/15/19
Operator: DJ
Entered by: TG
Checked by: CF

			08/14/19	08/15/19	08/15/19
DATA ENTRY	**symbol**	**units**	**DATA**	**DATA**	**DATA**
Run Number			1	2	3
Stack Dimensions: Round Stack Diameter	Ds	in.	13.00	13.00	13.00
Rectangular Stack, Length	L	in.			
Width	W	in.			
Nozzle Diameter	Dn	in.	0.348	0.348	0.348
Standard Temperature	Tstd	°F	68	68	68
Universal (molar) Gas Constant	Renglish	in. Hg-cu.ft/ °R-lbmole	21.85	21.85	21.85
Average Stack Temperature (measured)	Fs	°F	131.4	113.5	142.0
Average Meter Temperature (measured)	Fm	°F	114.0	94.4	107.9
Standard Pressure	Pstd	in.Hg	29.92	29.92	29.92
Barometric Pressure	Pbar	in.Hg	29.90	29.90	29.90
Stack Static Pressure	Pg	in.WC	-1.60	-1.50	-1.40
Average Meter Orifice Head (Delta-H)	dH	in.WC	1.82	2.07	1.84
Average RMS Velocity Head (Delta-P)	dP	in.WC	0.119	0.136	0.124
Pitot Coefficient	Cp	—	0.84	0.84	0.84
Net Volume of Gas Metered	Vm	cu.ft.	88.858	93.119	88.950
Dry Gas Meter Calibration Factor (gamma, Y)	Y	—	1.0395	1.0395	1.0395
NET Sampling Time	min	min.	120	120	120
Stack Gas: Oxygen Content*	O2,m	%	20.80	20.80	20.80
Carbon Dioxide Content*	CO2,m	%	<0.30	<0.30	<0.30
Total Impinger Gain	Ww	g	29.0	32.4	32.5
CALCULATED DATA					
Nozzle Area: An = pi/4*dn^2	An	sq.in.	0.0951	0.0951	0.0951
Stack Area (round): As = pi/576*ds^2 (rectangular): As = L*W/144	As	sq.ft.	0.92	0.92	0.92
Absolute Stack Temperature: Ts = Fs+460	Ts	°R	591.4	573.5	602.0
Absolute Meter Temperature: Tm = Fm+460	Tm	°R	574.0	554.4	567.9
Standard Temperature: Tstdr = Tstd+460	Tstdr	°R	528.0	528.0	528.0
Gas Sample Volume at Standard Conditions: Vm(std) = Y * (Vm/Tm) * (Pbar + dH/13.6 in H2O/in Hg) * (Tstdr/Pstd)	VmStd	cu.ft.	85.3	92.6	86.3
Vol. of Water Vapor, Vw(std) = Ww/453.59 * Renglish/18 * Tstdr / Pstd	VwStd	cu.ft.	1.370	1.530	1.535
Moisture Fraction: Bws = VwStd/(VmStd+VwStd)	Bws	—	0.0158	0.016	0.0175
Stack Gas MW, Dry Basis: Md = 0.32*O2,m + 0.44*CO2,m + 0.28*(100-O2,m-CO2,m)	Md	g/mole	28.88	28.88	28.88
Stack Gas MW, Wet Basis: Mw = Md*(1-Bws) + 18*Bws	Mw	g/mole	28.71	28.70	28.69
Stack Pressure: Ps = Pbar + Pg/13.6	Ps	in.Hg	29.78	29.79	29.80
Stack Gas Velocity, measured					
vs = 85.49*Cp*√(dP*Ts/Ps/Mw)	vs	ft/s	20.64	21.72	21.23
vm = 0.3048 m/ft*vs	vsm	m/s	6.29	6.62	6.47
Stack Gas Volumetric Flow Rate: Q = 60*vs*As	Q	acfm	1,142	1,201	1,174
Stack Gas Volumetric Flow Rate, corrected:					
Qsd = Q*(1-Bws)*(Ps/Ts)*(Tstdr/Pstd)	Qsd	dscfm	998	1,083	1,008
Qsdm = Qsd/35.315	Qsdm	dscmm	28.3	30.7	28.5
Isokinetic Sampling Rate: I = 144*100*Ts*Vmstd *Pstd/[60*Tstdr*vs*min*An*Ps*(1-Bws)]	I	%	99.3	99.4	99.6

* O2/CO2 was measured via SCAQMD Method 10.1 by GC.

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Run No.: 1
Test Date: 08/14/19
Times: 11:25 - 13:30

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	128	11.3	0.170	0.41	2.53	101	101
2	146	12.1	0.150	0.39	2.17	102	102
3	149	12.2	0.160	0.40	2.31	104	104
4	150	12.2	0.130	0.36	1.87	105	105
5	139	11.8	0.110	0.33	1.63	107	107
6	135	11.6	0.100	0.32	1.49	108	108
7	126	11.2	0.090	0.30	1.36	109	109
8	127	11.3	0.100	0.32	1.51	110	110
9	126	11.2	0.120	0.35	1.82	111	111
10	126	11.2	0.140	0.37	2.12	111	111
11	122	11.0	0.130	0.36	1.99	111	111
12	120	11.0	0.110	0.33	1.69	112	112
B-1	139	11.8	0.150	0.39	2.23	111	111
2	138	11.7	0.160	0.40	2.38	112	112
3	153	12.4	0.140	0.37	2.06	119	119
4	144	12.0	0.140	0.37	2.09	119	119
5	144	12.0	0.130	0.36	1.95	121	121
6	130	11.4	0.110	0.33	1.69	122	122
7	131	11.4	0.080	0.28	1.23	123	123
8	119	10.9	0.090	0.30	1.41	124	124
9	116	10.8	0.110	0.33	1.73	123	123
10	116	10.8	0.100	0.32	1.58	124	124
11	123	11.1	0.080	0.28	1.25	123	123
12	113	10.6	0.100	0.32	1.58	123	123
Average:		**131.4**		**0.1194**	**1.82**		**114.0**

DGM Reading (cu.ft.):		Impinger Weight (g):	
Final-1:	604.228	#1 Final:	734.4
Initial-1:	515.370	#1 Initial:	721.9
Final-2:		#2 Final:	537.1
Initial-2:		#2 Initial:	535.4
Final-3:		#3 Final:	648.5
Initial-3:		#3 Initial:	646.7
Final-4:		#4 Final:	887.5
Initial-4:		#4 Initial:	874.5
Final-5:		#5 Final:	
Initial-5:		#5 Initial:	
NET Volume:	**88.858**	#6 Final:	
		#6 Initial:	
		#7 Final:	
		#7 Initial:	
		#8 Final:	
		#8 Initial:	
		Total wt of impingers:	**29.0**

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Run No.: 2
Test Date: 08/15/19
Times: 08:10 - 10:15

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	122	11.0	0.19	0.436	2.81	93	93
2	132	11.5	0.18	0.424	2.62	93	93
3	128	11.3	0.18	0.424	2.64	94	94
4	104	10.2	0.16	0.400	2.45	95	95
5	101	10.0	0.14	0.374	2.16	97	97
6	97	9.8	0.13	0.361	2.02	97	97
7	94	9.7	0.11	0.332	1.73	98	98
8	96	9.8	0.12	0.346	1.88	98	98
9	89	9.4	0.10	0.316	1.58	98	98
10	88	9.4	0.13	0.361	2.07	99	99
11	85	9.2	0.15	0.387	2.40	100	100
12	89	9.4	0.14	0.374	2.22	100	100
B-1	114	10.7	0.17	0.412	2.53	89	89
2	118	10.9	0.18	0.424	2.67	90	90
3	121	11.0	0.16	0.400	2.36	90	90
4	119	10.9	0.16	0.400	2.37	91	91
5	126	11.2	0.11	0.332	1.61	92	92
6	131	11.4	0.12	0.346	1.75	93	93
7	127	11.3	0.10	0.316	1.47	93	93
8	129	11.4	0.10	0.316	1.46	93	93
9	132	11.5	0.09	0.300	1.31	93	93
10	131	11.4	0.11	0.332	1.60	93	93
11	131	11.4	0.13	0.361	1.89	93	93
12	137	11.7	0.15	0.387	2.17	94	94
Average:		**113.5**		**0.1363**	**2.07**		**94.4**

DGM Reading (cu.ft.):		Impinger Weight (g):	
Final-1:	697.568	#1 Final:	736.5
Initial-1:	604.449	#1 Initial:	724.1
Final-2:		#2 Final:	631.3
Initial-2:		#2 Initial:	630.0
Final-3:		#3 Final:	649.9
Initial-3:		#3 Initial:	647.4
Final-4:		#4 Final:	902.1
Initial-4:		#4 Initial:	885.9
Final-5:		#5 Final:	
Initial-5:		#5 Initial:	
NET Volume:	**93.119**	#6 Final:	
		#6 Initial:	
		#7 Final:	
		#7 Initial:	
		#8 Final:	
		#8 Initial:	
		Total wt of impingers:	**32.4**

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 1

Run No.: 3
Test Date: 08/15/19
Times: 10:55 - 13:10

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	127	11.3	0.18	0.424	2.70	105	105
2	128	11.3	0.17	0.412	2.55	107	107
3	125	11.2	0.16	0.400	2.43	111	111
4	133	11.5	0.14	0.374	2.11	113	113
5	137	11.7	0.13	0.361	1.94	112	112
6	138	11.7	0.11	0.332	1.64	112	112
7	140	11.8	0.10	0.316	1.49	113	113
8	127	11.3	0.11	0.332	1.64	112	112
9	126	11.2	0.13	0.361	1.98	112	112
10	127	11.3	0.12	0.346	1.82	112	112
11	131	11.4	0.11	0.332	1.65	110	110
12	134	11.6	0.10	0.316	1.49	108	108
B-1	149	12.2	0.17	0.412	2.44	101	101
2	149	12.2	0.16	0.400	2.30	101	101
3	154	12.4	0.15	0.387	2.15	104	104
4	154	12.4	0.13	0.361	1.86	104	104
5	155	12.4	0.12	0.346	1.72	105	105
6	156	12.5	0.10	0.316	1.43	106	106
7	155	12.4	0.10	0.316	1.43	106	106
8	156	12.5	0.09	0.300	1.29	107	107
9	152	12.3	0.10	0.316	1.44	107	107
10	152	12.3	0.11	0.332	1.59	107	107
11	154	12.4	0.10	0.316	1.44	107	107
12	154	12.4	0.12	0.346	1.73	107	107
Average:		**142.0**		**0.1241**	**1.84**		**107.9**

DGM Reading (cu.ft.):		Impinger Weight (g):	
Final-1:	790.926	#1 Final:	740.0
Initial-1:	701.976	#1 Initial:	728.9
Final-2:		#2 Final:	752.5
Initial-2:		#2 Initial:	749.7
Final-3:		#3 Final:	619.1
Initial-3:		#3 Initial:	618.1
Final-4:		#4 Final:	877.1
Initial-4:		#4 Initial:	859.5
Final-5:		#5 Final:	
Initial-5:		#5 Initial:	
NET Volume:	**88.950**	#6 Final:	
		#6 Initial:	
		#7 Final:	
		#7 Initial:	
		#8 Final:	
		#8 Initial:	
		Total wt of impingers:	**32.5**

Location: Inlet 2 (Upstream to Baghouse)

TEST RESULTS

CARB 425 (Hexavalent & Total Chromium)

Facility: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

TEST DATA	UNITS	TEST RESULTS			AVERAGE
Run Number	-	Run 1	Run 2	Run 3	
Test Date	mm/dd/yy	8/14/19	8/15/19	8/15/19	--
Test Time	hh:mm	11:25 - 13:30	08:10 - 10:15	10:55 - 13:10	--
Sampling Data*					
Stack Temperature	°F	112.3	86.1	96.9	**98.4**
Moisture	%	2.0	2.1	1.9	**2.0**
Sample Volume	dscf	89.8	97.3	92.2	**93.1**
Oxygen**	% v/v	20.8	20.8	20.8	**20.8**
Carbon Dioxide**	% v/v	0.30	0.30	0.30	**0.30**
Gas Velocity	ft/min	4,481.7	4,560.9	4,485.3	**4,509**
Stack Flow Rate	acfm	6,258	6,368	6,263	**6,296**
Stack Flow Rate	dscfm	5,597	5,958	5,757	**5,771**
Total Catch (CARB 425)					
Chromium VI	ug	2.89	5.30	3.90	**4.03**
Total Chromium	ug	469	70.0	280	**273**
Concentration (CARB 425)					
Chromium VI	ug/dscm	1.14	1.92	1.49	**1.52**
	ug/dscf	0.032	0.054	0.042	**0.043**
Total Chromium	ug/dscm	184.50	25.42	107.29	**105.7**
	ug/dscf	5.22	0.72	3.04	**2.99**
Mass Emissions (CARB 425)					
Chromium VI	ug/hr	10812	19479	14618	**14969**
Chromium VI	mg/hr	10.8	19.48	14.6	**15.0**
Chromium VI	lb/hr	2.38E-05	4.29E-05	3.22E-05	**3.30E-05**
Total Chromium	ug/hr	1754573	257267	1049466	**1020435**
Total Chromium	mg/hr	1755	257	1049	**1020**
Total Chromium	lb/hr	3.87E-03	5.67E-04	2.31E-03	**2.25E-03**

Notes:
* Performed during isokinetic sampling by CARB 425.
** O2/CO2 was measured via SCAQMD Method 10.1 by GC.

CARB METHOD 425 DATA AND CALCULATIONS

Plant:	AQMD Facility C	Test Date(s):	08/14 to 08/15/19
City:	[redacted] CA	Operator:	WB
Source:	Baghouse	Entered by:	TG
Location:	Inlet 2 (Upstream to Baghouse)	Checked by:	CF

Lab Results	**Units**	**Run 1**	**Run 2**	**Run 3**	Average
Chromium VI	ug	2.89	5.30	3.90	4.03
Total Chromium	µg	469	70.0	280	273
Chromium VI, Molecular Weight	g/g-mole	51.995	51.995	51.995	- -
Total Chromium, Molecular Weight	g/g-mole	51.995	51.995	51.995	- -
Concentration (ug/dscm), Ci = Mi/VmStd *35.315 cf/dscm					
Chromium VI	ug/dscm	1.14	1.92	1.49	1.5
Total Chromium	ug/dscm	184.50	25.42	107.29	106
Metals Mass Emissino Rate (lb/hr), Ei Ei = Ci*Qsdm*60/453600/1000					
Chromium VI	lb/hr	2.38E-05	4.29E-05	3.22E-05	3.30E-05
Total Chromium	lb/hr	3.87E-03	5.67E-04	2.31E-03	2.25E-03

MV_1 = 24.05 L/g-mole @68°F, 23.68 L/g-mole @60°F

Lab Data - CARB 425

Facility: AQMD Facility C
Source: Baghouse Inlet 2 (Upstream to Baghouse)

Analytical Results - Cr+6						
Run Number:	Run 1	Run 2	Run 3		RB	**Cr+6**
Rinse C1, ug	0.29	0.20	1.9	ND, MRL	0.010	C1
Impingers C2, ug	2.60	5.10	2.0	ND, MRL	0.020	C2
Total catch, ug	**2.89**	**5.3**	**3.9**			

Analytical Results - Total Chromium						
Run Number:	Run 1	Run 2	Run 3		RB	**Cr**
Rinse C1, ug	59	14.0	110	ND, MRL	1.00	C1
Impingers C2, ug	410	56.0	170	ND, MRL	1.00	C2
Total catch, ug	**469**	**70.0**	**280**			

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Test Date(s): 08/14 to 08/15/19
Operator: WB
Entered by: TG
Checked by: CF

DATA ENTRY	symbol	units	08/14/19 DATA	08/15/19 DATA	08/15/19 DATA
Run Number			1	2	3
Stack Dimensions: Round Stack Diameter	Ds	in.	16.00	16.00	16.00
Rectangular Stack, Length	L	in.			
Width	W	in.			
Nozzle Diameter	Dn	in.	0.181	0.181	0.181
Standard Temperature	Tstd	°F	68	68	68
Universal (molar) Gas Constant	Renglish	in. Hg-cu.ft/ °R-lbmole	21.85	21.85	21.85
Average Stack Temperature (measured)	Fs	°F	112.3	86.1	96.9
Average Meter Temperature (measured)	Fm	°F	103.2	80.9	96.9
Standard Pressure	Pstd	in.Hg	29.92	29.92	29.92
Barometric Pressure	Pbar	in.Hg	29.90	29.90	29.90
Stack Static Pressure	Pg	in.WC	-4.20	-4.30	-4.30
Average Meter Orifice Head (Delta-H)	dH	in.WC	1.93	2.28	2.16
Average RMS Velocity Head (Delta-P)	dP	in.WC	1.604	1.739	1.650
Pitot Coefficient	Cp	—	0.84	0.84	0.84
Net Volume of Gas Metered	Vm	cu.ft.	91.912	95.555	93.259
Dry Gas Meter Calibration Factor (gamma, Y)	Y	—	1.0376	1.0376	1.0376
NET Sampling Time	min	min.	120	120	120
Stack Gas: Oxygen Content*	O2,m	%	20.80	20.80	20.80
Carbon Dioxide Content*	CO2,m	%	<0.30	<0.30	<0.30
Total Impinger Gain	Ww	g	38.3	45.0	38.3
CALCULATED DATA					
Nozzle Area: An = pi/4*dn^2	An	sq.in.	0.0257	0.0257	0.0257
Stack Area (round): As = pi/576*ds^2 (rectangular): As = L*W/144	As	sq.ft.	1.40	1.40	1.40
Absolute Stack Temperature: Ts = Fs+460	Ts	°R	572.3	546.1	556.9
Absolute Meter Temperature: Tm = Fm+460	Tm	°R	563.2	540.9	556.9
Standard Temperature: Tstdr = Tstd+460	Tstdr	°R	528.0	528.0	528.0
Gas Sample Volume at Standard Conditions: Vm(std) = Y * (Vm/Tm) * (Pbar + dH/13.6 in H2O/in Hg) * (Tstdr/Pstd)	VmStd	cu.ft.	89.8	97.3	92.2
Vol. of Water Vapor, Vw(std) = Ww/453.59 * Renglish/18 * Tstdr / Pstd	VwStd	cu.ft.	1.809	2.125	1.809
Moisture Fraction: Bws = VwStd/(VmStd+VwStd)	Bws	—	0.0198	0.021	0.0192
Stack Gas MW, Dry Basis: Md = 0.32*O2,m + 0.44*CO2,m + 0.28*(100-O2,m-CO2,m)	Md	g/mole	28.88	28.88	28.88
Stack Gas MW, Wet Basis: Mw = Md*(1-Bws) + 18*Bws	Mw	g/mole	28.67	28.65	28.67
Stack Pressure: Ps = Pbar + Pg/13.6	Ps	in.Hg	29.59	29.58	29.58
Stack Gas Velocity, measured					
vs = 85.49*Cp*√(dP*Ts/Ps/Mw)	vs	ft/s	74.70	76.02	74.75
vm = 0.3048 m/ft*vs	vsm	m/s	22.77	23.17	22.79
Stack Gas Volumetric Flow Rate: Q = 60*vs*As	Q	acfm	6,258	6,368	6,263
Stack Gas Volumetric Flow Rate, corrected:					
Qsd = Q*(1-Bws)*(Ps/Ts)*(Tstdr/Pstd)	Qsd	dscfm	5,597	5,958	5,757
Qsdm = Qsd/35.315	Qsdm	dscmm	158.5	168.7	163.0
Isokinetic Sampling Rate: I = 144*100*Ts*Vmstd *Pstd/[60*Tstdr*vs*min*An*Ps*(1-Bws)]	I	%	104.4	106.3	104.2

* O2/CO2 was measured via SCAQMD Method 10.1 by GC.

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Run No.: 1
Test Date: 08/14/19
Times: 11:25 - 13:30

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	108	10.4	1.90	1.38	2.25	91	91
2	110	10.5	1.80	1.34	2.10	92	92
3	111	10.5	1.90	1.38	2.25	93	93
4	113	10.6	1.90	1.38	2.25	94	94
5	114	10.7	1.75	1.32	2.05	96	96
6	113	10.6	2.50	1.58	2.95	98	98
7	111	10.5	1.70	1.30	2.00	100	100
8	109	10.4	1.20	1.10	1.40	101	101
9	106	10.3	1.00	1.00	1.15	103	103
10	104	10.2	1.00	1.00	1.15	103	103
11	107	10.3	1.05	1.02	1.25	104	104
12	107	10.3	1.00	1.00	1.15	104	104
B-1	110	10.5	1.95	1.40	2.30	104	104
2	110	10.5	2.00	1.41	2.35	104	104
3	115	10.7	2.25	1.50	2.65	105	105
4	118	10.9	2.15	1.47	2.50	106	106
5	114	10.7	1.90	1.38	2.25	108	108
6	123	11.1	2.30	1.52	2.70	109	109
7	119	10.9	1.80	1.34	2.10	110	110
8	122	11.0	1.60	1.26	1.90	110	110
9	116	10.8	1.30	1.14	1.55	111	111
10	113	10.6	1.20	1.10	1.40	111	111
11	115	10.7	1.05	1.02	1.25	110	110
12	108	10.4	1.10	1.05	1.30	110	110
Average:		**112.3**		**1.6036**	**1.93**		**103.2**

DGM Reading (cu.ft.):		Impinger Weight (g):	
Final-1:	382.967	#1 Final:	757.7
Initial-1:	291.055	#1 Initial:	743.0
Final-2:		#2 Final:	773.7
Initial-2:		#2 Initial:	769.0
Final-3:		#3 Final:	630.9
Initial-3:		#3 Initial:	628.0
Final-4:		#4 Final:	841.3
Initial-4:		#4 Initial:	825.3
Final-5:		#5 Final:	
Initial-5:		#5 Initial:	
NET Volume:	**91.912**	#6 Final:	
		#6 Initial:	
		#7 Final:	
		#7 Initial:	
		#8 Final:	
		#8 Initial:	
		Total wt of impingers:	**38.3**

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Run No.: 2
Test Date: 08/15/19
Times: 08:10 - 10:15

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	88	9.4	1.90	1.378	2.45	67	67
2	89	9.4	2.50	1.581	3.20	68	68
3	88	9.4	2.60	1.612	3.30	69	69
4	87	9.3	2.45	1.565	3.15	71	71
5	86	9.3	1.90	1.378	2.45	74	74
6	85	9.2	2.80	1.673	3.60	75	75
7	86	9.3	1.90	1.378	2.45	77	77
8	86	9.3	1.50	1.225	1.95	79	79
9	84	9.2	1.40	1.183	1.80	80	80
10	77	8.8	1.10	1.049	1.40	81	81
11	74	8.6	1.20	1.095	1.55	81	81
12	75	8.7	1.20	1.095	1.55	82	82
B-1	87	9.3	1.80	1.342	2.30	81	81
2	88	9.4	2.15	1.466	2.75	81	81
3	88	9.4	2.20	1.483	2.80	83	83
4	89	9.4	2.35	1.533	3.00	84	84
5	90	9.5	1.70	1.304	2.15	85	85
6	91	9.5	1.90	1.378	2.45	86	86
7	92	9.6	2.00	1.414	2.55	87	87
8	92	9.6	1.50	1.225	1.90	89	89
9	89	9.4	1.25	1.118	1.60	89	89
10	87	9.3	1.15	1.072	1.45	90	90
11	85	9.2	1.10	1.049	1.40	91	91
12	85	9.2	1.10	1.049	1.40	91	91
Average:		**86.1**		**1.7389**	**2.28**		**80.9**

DGM Reading (cu.ft.):		Impinger Weight (g):	
Final-1:	478.870	#1 Final:	763.9
Initial-1:	383.315	#1 Initial:	745.1
Final-2:		#2 Final:	650.7
Initial-2:		#2 Initial:	645.1
Final-3:		#3 Final:	630.8
Initial-3:		#3 Initial:	628.7
Final-4:		#4 Final:	816.2
Initial-4:		#4 Initial:	797.7
Final-5:		#5 Final:	
Initial-5:		#5 Initial:	
NET Volume:	**95.555**	#6 Final:	
		#6 Initial:	
		#7 Final:	
		#7 Initial:	
		#8 Final:	
		#8 Initial:	
		Total wt of impingers:	**45.0**

Almega ENVIRONMENTAL

CARB METHOD 425 DATA AND CALCULATIONS

Plant: AQMD Facility C
City: [redacted] CA
Source: Baghouse
Location: Inlet 2 (Upstream to Baghouse)

Run No.: 3
Test Date: 08/15/19
Times: 10:55 - 13:10

	Stack Temp (°F)		Velocity Head (in.WC)		dH	DGM Temperature (°F)	
point	Fs	sqrt (Fs)	dP	sqrt (dP)	(in.WC)	Fm,in	Fm,out
A-1	98	9.9	2.10	1.449	2.70	84	84
2	98	9.9	2.45	1.565	3.15	85	85
3	97	9.8	2.50	1.581	3.20	86	86
4	97	9.8	2.60	1.612	3.30	88	88
5	99	9.9	1.85	1.360	2.35	91	91
6	97	9.8	2.60	1.612	3.30	92	92
7	97	9.8	1.80	1.342	2.30	94	94
8	97	9.8	1.40	1.183	1.80	95	95
9	96	9.8	1.20	1.095	1.55	96	96
10	93	9.6	1.10	1.049	1.40	97	97
11	94	9.7	1.10	1.049	1.40	98	98
12	84	9.2	1.10	1.049	1.40	99	99
B-1	101	10.0	1.70	1.304	2.15	98	98
2	102	10.1	2.05	1.432	2.60	97	97
3	103	10.1	2.25	1.500	2.90	98	98
4	104	10.2	1.90	1.378	2.45	100	100
5	103	10.1	1.65	1.285	2.10	101	101
6	105	10.2	2.00	1.414	2.55	102	102
7	105	10.2	1.70	1.304	2.15	103	103
8	106	10.3	1.15	1.072	1.45	104	104
9	88	9.4	1.10	1.049	1.40	104	104
10	85	9.2	1.10	1.049	1.40	104	104
11	92	9.6	1.10	1.049	1.40	105	105
12	88	9.4	1.10	1.049	1.40	105	105
Average:		**96.9**		**1.6503**	**2.16**		**96.9**

DGM Reading (cu.ft.):		
Final-1:	572.316	
Initial-1:	479.057	
Final-2:		
Initial-2:		
Final-3:		
Initial-3:		
Final-4:		
Initial-4:		
Final-5:		
Initial-5:		
NET Volume:	**93.259**	

Impinger Weight (g):	
#1 Final:	762.4
#1 Initial:	748.6
#2 Final:	694.1
#2 Initial:	689.3
#3 Final:	666.4
#3 Initial:	665.7
#4 Final:	808.3
#4 Initial:	789.3
#5 Final:	
#5 Initial:	
#6 Final:	
#6 Initial:	
#7 Final:	
#7 Initial:	
#8 Final:	
#8 Initial:	
Total wt of impingers:	**38.3**

APPENDIX D2

CHROMIUM EMISSIONS (HEX/TOTAL) – FIELD DATA

Location: Baghouse Outlet

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Outlet
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 54.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 6.00 inches
DEPTH OF STACK OR DUCT, D: 48.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 48.00 inches

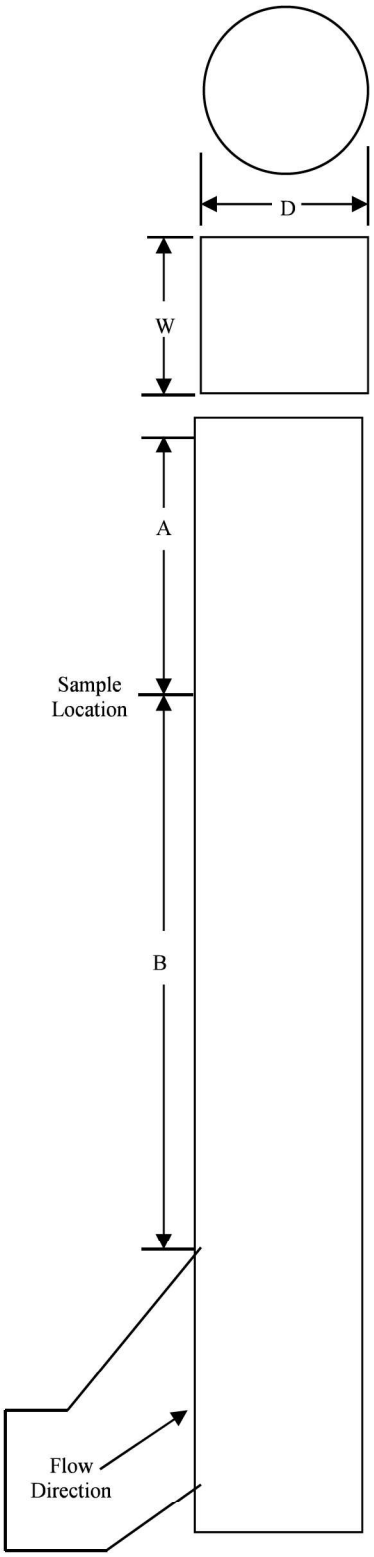
STACK/DUCT AREA = 12.57 sq.feet 1809.6 sq.inches

DISTANCE OF TEST PORT LOCATION:

	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	126.00	50.00
# OF DIAMETERS	2.63	1.04

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	1.01	7
2	6.7	3.22	9 1/4
3	11.8	5.66	11 5/8
4	17.7	8.50	14 1/2
5	25.0	12.00	18
6	35.6	17.09	23 1/8
7	64.4	30.91	36 7/8
8	75.0	36.00	42
9	82.3	39.50	45 1/2
10	88.2	42.34	48 3/8
11	93.3	44.78	50 3/4
12	97.9	46.99	53



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH Almega ENVIRONMENTAL

Run # :	1	Pitot ID:	73	Impinger #	Initial	Final	Net
Date :	8-14-19	Pitot Coeff. :	0.84	1	760.0	774.6	
Client :	SCAQMD C	Meter Box # :	A-3	2	767.8	770.4	
Unit :	Outlet	Meter @ Dh :	1.583	3	620.3	620.8	
Operator :	NC	Meter Y :	1.0379	4	~~780.5~~	790.0	
Stack Dia :	48.0	TC # :	73	5	770.5		
Amb. Press :	29.9	Start Time :	1125	H2O Gain =			
Static Press :	~~29.9~~ -0.02	Stop Time :	1330	Filter :			

Pitot Leak Check		
Initial :	✓	✓
Final :	√	√

Meter Box Leak Check	Rate	"HG
Initial :	.800	9"
Final :	0.00	12

	Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
A	12	0	0.06	108	2.17	608.058	84	84	N/A	N/A	50	7	N/A	N/A
	11	5	0.05	14	1.81	612.3	93	85			46			
	10	10	0.06	111	1.82	616.2	95	86			47			
	9	15	0.05	117	1.80	620.1	96	87			47			
	8	20	0.05	116	1.81	624.2	97	88			48			
	7	25	0.03	114	1.09	627.9	97	89			47			
	6	30	0.03	119	1.09	631.0	97	89			47			
	5	35	0.03	119	1.08	634.0	97	90			48	4		
	4	40	0.03	118	1.08	637.0	97	90			48			
	3	45	0.03	119	1.08	640.0	98	91			48			
	2	50	0.02	119	0.72	643.0	98	91			49			
	1	55	0.02	119	0.72	645.5	98	91			50			
1225		60				647.981								
1230 B	12	0	0.02	118	0.72	647.981	92	93	N/A	N/A	52	3	N/A	N/A
	11	5	0.02	121	0.72	650.4	97	91			52			
	10	10	0.02	121	0.72	652.9	98	92			52			
	9	15	0.02	121	0.72	655.4	99	92			52			
	8	20	0.02	122	0.72	658	99	92			52			
	7	25	0.02	122	0.72	660.4	100	92			52			
	6	30	0.02	123	0.72	662.9	99	93			53			
	5	35	0.02	121	0.72	665.35	100	93			54			
	4	40	0.03	113	1.10	667.8	100	93			54	4		
	3	45	0.03	115	1.10	670.85	101	94			54			
	2	50	0.05	112	1.84	673.9	101	94			53	7		
	1	55	0.05	112	1.84	677.83	101	94			55	7		
		60				681.85								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	92
Estimated Stack Temp:	110
Estimated Delta P:	0.04
Estimated Moisture Content:	2
Estimated O2:	20.8
Estimated CO2:	0.0

Equipment Evaluation , OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	0.450

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH

Almega ENVIRONMENTAL

Run # :	2	Pitot ID:	73	Impinger #	Initial	Final	Net	Pitot Leak Check	
Date :	8-14-19	Pitot Coeff. :	0.84	1	760.1	773.3		Initial :	✓ ✓
Client :	SCAQMD C	Meter Box # :	A-3	2	766.8	770.9		Final :	✓ ✓
Unit :	Outlet	Meter @ Dh :	1.583	3	619.4	621.1			
Operator :	NC	Meter Y :	1.0379	4	~~790.0~~ 788.9	9105.2		Meter Box Leak Check	
Stack Dia :	480	TC # :	73	5				Rate	"HG
Amb. Press :	29.9	Start Time :	0810	H2O Gain =				Initial :	0.00 12
Static Press :	-0.02	Stop Time :	1015	Filter :				Final :	0.00 12

	Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)	
810 A	12	0	0.05	78	1.84	684.472	66	66	N/A	N/A	49	3	N/A	N/A	
	11	5	0.05	82	1.84	688.3	75	64			~~49~~ 51				
	10	10	0.06	82	2.22	692.2	76	66			51				
	9	15	0.05	82	1.85	696.45	78	67			52				
	8	20	0.05	83	1.85	700.3	79	68			53				
	7	25	0.04	82	1.49	704.2	80	69			54				
	6	30	0.05	82	1.86	707.7	80	70			54				
	5	35	0.04	83	1.49	711.6	80	70			54				
	4	40	0.05	85	1.85	715.1	80	71			54				
	3	45	0.04	86	1.48	719.0	81	71			53				
	2	50	0.04	86	1.48	727.5	81	72			53				
	1	55	0.04	86	1.48	726.0	82	72	↓	↓	53	↓	↓	↓	
910		60				729.494									
915 B	12	0	0.03	85	1.11	729.494	75	73	N/A	N/A	53	2	N/A	N/A	
	11	5	0.03	87	1.11	732.5	80	72			53				732.52
	10	10	0.03	90	1.10	735.5	80	73			53				735.5
	9	15	0.03	91	1.10	738.5	81	73			53				738.52
	8	20	0.03	91	1.10	741.5	82	73			53				741.52
	7	25	0.03	93	1.10	744.5	82	74			53				744.53
	6	30	0.02	92	0.74	747.52	83	75			53				747.52
	5	35	0.03	93	1.10	750.0	82	75			52				750.00
	4	40	0.03	93	1.11	753.0	84	76			52				753.03
	3	45	0.03	94	1.10	756.0	85	76			53				756.03
	2	50	0.06	93	2.22	759.0	86	77			54				759.03
	1	55	0.06	94	2.27	763.3	88	78	↓	↓	54		↓	↓	763.28
		60				767.625									767.60

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	80
Estimated Stack Temp:	80
Estimated Delta P:	0.04
Estimated Moisture Content:	2
Estimated O2:	20.8
Estimated CO2:	0.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	0.450

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH

Almega ENVIRONMENTAL

Run # :	3	Pitot ID:	73	Impinger #	Initial	Final	Net	Pitot Leak Check					
Date :	8-15-19	Pitot Coeff. :	0.84	1	763.3	776.3		Initial :	✓	✓			
Client :	SCAQMD C	Meter Box # :	A-3	2	754.6	756.0		Final :	✓	✓			
Unit :	~~Inlet~~ Outlet	Meter @ Dh :	1.583	3	541.2	542.0							
Operator :	NC	Meter Y :	1.0379	4	859.6	871.9							
Stack Dia :	48.0"	TC # :	73	5				Meter Box Leak Check					
Amb. Press :	29.9	Start Time :	1055	H2O Gain =					Rate	"HG			
Static Press :	-0.02	Stop Time :	1310	Filter :				Initial :	0.00	12			
								Final :	0.00	12			

	Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
1055	12	0	0.04	98	1.46	767.935	79	79	N/A	N/A	51	4	N/A	N/A
	11	5	0.04	98	1.46	771.4	84	79			50			
	10	10	0.04	98	1.47	774.9	87	80			51			
	9	15	0.03	97	1.10	778.4	89	81			52	3		
	8	20	0.03	97	1.11	781.45	90	82			52			
	7	25	0.02	97	0.74	784.5	90	83			53			
	6	30	0.02	99	0.74	787.0	91	84			53			
	5	35	0.03	99	1.11	789.5	91	84			53			
	4	40	0.02	100	0.74	792.6	93	86			53			
	3	45	0.02	101	0.74	796.1	93	86			54			
	2	50	0.02	106	0.73	797.6	93	86			54			
	1	55	0.02	107	0.73	800.1	94	86			54			
1155		60				802.590								
1210	12	0	0.02	108	0.73	802.590	98	87	N/A	N/A	54	3	N/A	N/A
	11	5	0.02	109	0.73	805.1	94	88			54	2		
	10	10	0.02	110	0.73	807.6	96	88			54			
	9	15	0.02	110	0.73	810.1	94	89			55			
	8	20	0.02	111	0.73	812.6	96	89			55			
	7	25	0.02	111	0.73	815.1	97	90			55			
	6	30	0.02	111	0.73	817.6	97	91			55			
	5	35	0.02	111	0.73	820.1	98	91			55			
	4	40	0.02	111	0.73	822.6	98	91			56			
	3	45	0.06	108	2.21	825.1	99	92			56			
	2	50	0.07	107	2.59	829.44	101	93			56			
	1	55	0.07	107	2.60	834.15	102	94			56			
		60				838.959								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	90
Estimated Stack Temp:	100
Estimated Delta P:	0.04
Estimated Moisture Content:	2
Estimated O2:	20.9
Estimated CO2:	0.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	0.450

Location: Inlet 1 (inside)

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Inlet 1
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 13.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 0.0 inches
DEPTH OF STACK OR DUCT, D: 13.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 13.00 inches

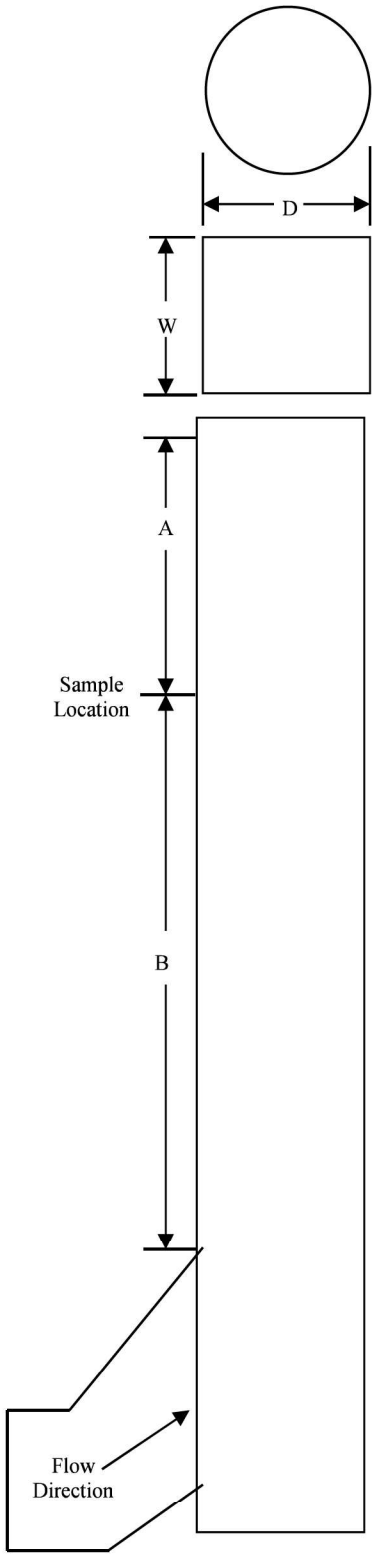
STACK/DUCT AREA = 0.92 sq.feet 132.7 sq.inches

DISTANCE OF TEST PORT LOCATION:

	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	>26.0	>6.5
# OF DIAMETERS	>2.00	>0.50

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	0.50	0 1/2
2	6.7	0.87	0 7/8
3	11.8	1.53	1 1/2
4	17.7	2.30	2 1/4
5	25.0	3.25	3 1/4
6	35.6	4.63	4 5/8
7	64.4	8.37	8 3/8
8	75.0	9.75	9 3/4
9	82.3	10.70	10 3/4
10	88.2	11.47	11 1/2
11	93.3	12.13	12 1/8
12	97.9	12.50	12 1/2



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH

Almega ENVIRONMENTAL

Run # :	1	Pitot ID:	85	Impinger #	Initial	Final	Net	Pitot Leak Check
Date :	8-14-19	Pitot Coeff. :	0.84	1	721.9	734.4		Initial : ✓ ✓
Client :	SCAQMD C	Meter Box # :	A-8	2	535.4	537.1		Final : ✓ ✓
Unit :	Inlet 1	Meter @ Dh :	1.834	3	646.7	648.5		
Operator :	DS	Meter Y :	1.0395	4	879.5	887.5		Meter Box Leak Check
Stack Dia :	13.0"	TC # :	85	5				Rate / "HG
Amb. Press :	29.90	Start Time :	11:25	H2O Gain =				Initial : .000 / 15"
Static Press :	-1.6	Stop Time :	13:30	Filter :				Final : .000 / 16"

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
0	0				515.370								
1	5	.17	128	2.53	519.693	101	101	N/A	N/A	54	5	N/A	
2	10	.15	146	2.17	523.708	102	102			54	5		
3	15	.16	149	2.31	527.856	104	104			54	5		
4	20	.13	150	1.87	531.605	105	105			54	4.5		
5	25	.11	139	1.63	535.103	107	107			54	4.5		
6	30	.10	135	1.49	538.458	108	108			54	4		
7	35	.09	126	1.36	541.669	109	109			54	4		
8	40	.10	129	1.51	545.048	110	110			54	4		
9	45	.12	136	1.82	548.763	111	111			54	4.5		
10	50	.14	126	2.12	552.776	111	111			54	5		
11	55	.13	122	1.99	556.654	111	111			54	4.5		
12	60	.11	120	1.69	560.231	112	112			54	4.5		
0	0				560.231								
1	5	.15	139	2.23	564.336	111	111	N/A	N/A	54	5	N/A	
2	10	.16	138	2.38	568.583	112	112			54	5		
3	15	.14	153	2.06	572.557	119	119			54	5		
4	20	.14	144	2.09	576.564	119	119			54	5		
5	26	.13	194	1.95	580.436	121	121			55	4.5		
6	30	.11	130	1.69	584.093	122	122			65	4		
7	35	.08	131	1.23	587.135	123	123			55	3.5		
8	40	.09	119	1.41	590.448	124	124			55	3.5		
9	45	.11	116	1.73	594.113	123	123			55	4		
10	50	.10	116	1.58	597.614	124	124			55	3.5		
11	65	.08	123	1.25	600.724	123	123			55	3.5		
12	60	.10	113	1.58	604.228	123	123			65	4		

:40 @ 12:25

12:30 st

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	100
Estimated Stack Temp:	130
Estimated Delta P:	
Estimated Moisture Content:	2.0
Estimated O2:	20.8
Estimated CO2:	.05

Equipment Evaluation , OK? Y or N

Ambient Temp.:	84
TC Check:	✓
Pitot Check:	✓
Tedlar Bag:	N/A
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	#85
Nozzle Dia:	.348

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW METH

Almega ENVIRONMENTAL

				Impinger #	Initial	Final	Net
Run # :	2	Pitot ID:	85	1	724.1	736.5	
Date :	8-15-19	Pitot Coeff. :	0.84	2	630.0	631.3	
Client :	SCAQMD C	Meter Box # :	4-8	3	647.4	649.9	
Unit :	Inlet 1	Meter @ Dh :	1.834	4	885.9	902.1	
Operator :	DT	Meter Y :	1.0395	5			
Stack Dia :	13.0 "	TC # :	85	H2O Gain =			
Amb. Press :	29.90	Start Time :	8:10	Filter :			
Static Press :	-1.5	Stop Time :	10:15				

Pitot Leak Check		
Initial :	✓	✓
Final :	✓	✓

Meter Box Leak Check	Rate	"HG
Initial :	.006	15 "
Final :	.001	16 "

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Sqt delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
0	0				604.449								
1	5	.19	122	2.81	608.923	93	93	N/A	N/A	54	4	N/A	
2	10	.18	132	2.62	613.348	93	93	/	/	54	4	/	
3	15	.18	128	2.64	617.745	94	94	/	/	54	4	/	
4	20	.16	104	2.45	621.982	95	95	/	/	54	4	/	
5	25	.14	101	2.16	625.975	97	97	/	/	54	4	/	
6	30	.13	97	2.02	629.842	97	99	/	/	54	4	/	
7	35	.11	94	1.83	633.416	98	98	/	/	54	3.5	/	
8	40	.12	96	1.88	637.148	98	98	/	/	54	3.5	/	
9	45	.10	89	1.58	640.572	98	98	/	/	54	3.5	/	
10	50	.13	88	2.07	644.486	99	99	/	/	54	4	/	
11	55	.15	85	2.40	648.702	100	100	/	/	54	4	/	
12	60	.14	89	2.22	652.768	100	100	/	/	54	4	/	
End @ 9:10													
0	0				652.768								
St @ 9:15													
1	5	.17	114	2.53	657.056	89	89	N/A	N/A	54	4	N/A	
2	10	.18	118	2.67	661.453	90	90	/	/	54	4	/	
3	15	.16	121	2.36	665.591	90	90	/	/	54	4	/	
4	20	.16	119	2.37	669.948	91	91	/	/	54	4	/	
5	25	.11	126	1.61	673.185	92	92	/	/	54	3.5	/	
6	30	.12	131	1.75	676.761	93	93	/	/	54	3.5	/	
7	35	.10	127	1.47	680.048	93	93	/	/	54	3.5	/	
8	40	.10	129	1.46	683.325	93	93	/	/	54	3.5	/	
9	45	.09	132	1.31	686.428	93	93	/	/	54	3.5	/	
10	50	.11	131	1.60	689.852	93	93	/	/	54	3.5	/	
11	55	.13	131	1.89	693.576	93	93	/	/	54	3.5	/	
12	60	.15	137	2.17	697.568	94	94	/	/	54	4	/	

Isokinetic Factor Setup	
Estimated Dry Gas Meter Temp:	100
Estimated Stack Temp:	130
Estimated Delta P:	
Estimated Moisture Content:	2.0
Estimated O2:	20.8
Estimated CO2:	0

Equipment Evaluation , OK? Y or N	
Ambient Temp.:	64 ✓
TC Check:	
Pitot Check:	✓
Tedlar Bag:	N/A
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information	
Nozzle ID:	#85
Nozzle Dia:	0.348

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH Almega ENVIRONMENTAL M425

Run #	3	Pitot ID	85	Impinger #	Initial	Final	Net	Pitot Leak Check			
Date	8-15-19	Pitot Coeff.	0.84	1	728.9	740.0		Initial	✓	✓	
Client	SCAQMD C	Meter Box #	A-8	2	749.7	762.5		Final	✓	✓	
Unit	Baghouse - IN1	Meter @ Dh	1.834	3	~~640.3~~ 639.1	648.1	6.19.1				
Operator	DJ	Meter Y	1.0395	4	859.5	877.1		Meter Box Leak Check			
Stack Dia	13.0"	TC #	85	5					Rate	"HG	
Amb. Press	29.9	Start Time	10:55	H2O Gain =				Initial	.000	13.1"	
Static Press	-1.4	Stop Time	13:10	Filter				Final	.000	13.1"	

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Sqt delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)	
0	0				701.926									They had the leak opening for 15 min
1	5	.18	127	2.70	706.468	105	106	N/A	N/A	54	4	N/A		
2	10	.17	128	2.55	710.845	107	107	/	/	54	4	/		
3	15	.16	125	2.43	715.139	111	111	/	/	54	4	/		
4	20	.14	133	2.11	719.135	113	113	/	/	54	4	/		
5	25	.13	137	1.94	722.978	112	112	/	/	54	4	/		
6	30	.11	138	1.64	726.505	112	112	/	/	54	3.5	/		
7	35	.10	140	1.49	729.873	113	113	/	/	54	3.5	/		
8	40	.11	138	1.64	733.406	112	112	/	/	54	3.5	/		
9	45	.13	126	1.98	737.271	112	112	/	/	54	4	/		
10	50	.12	127	1.82	740.984	112	112	/	/	54	3.5	/		
11	55	.11	131	1.65	744.528	110	110	/	/	54	3.5	/		
12	60	.10	134	1.49	747.883	108	108	/	/	54	3.5	/		
Out @ 11:55														
0	0				747.883									
1	5	.17	149	2.44	752.136	101	101	N/A	N/A	54	4	N/A		
2	10	.16	149	2.30	756.258	101	101	/	/	54	4	/		
3	15	.15	154	2.15	760.274	104	104	/	/	54	4	/		
4	20	.13	154	1.86	764.006	104	104	/	/	54	3.5	/		
5	25	.12	155	1.72	767.592	105	105	/	/	54	3.5	/		
6	30	.10	156	1.43	770.894	106	106	/	/	54	3.5	/		
7	35	.10	155	1.43	774.152	106	106	/	/	54	3.5	/		
8	40	.09	156	1.29	777.275	107	107	/	/	54	3	/		
9	45	.10	152	1.44	780.579	107	107	/	/	54	3.5	/		
10	50	.11	152	1.59	784.035	107	107	/	/	54	3.5	/		
11	55	.10	154	1.44	787.321	107	107	/	/	55	3.5	/		
12	60	.12	154	1.73	790.926	107	107	/	/	55	3.5	/		

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	100
Estimated Stack Temp:	130
Estimated Delta P:	
Estimated Moisture Content:	2.0
Estimated O2:	20.9
Estimated CO2:	.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	76
TC Check:	✓
Pitot Check:	✓
Tedlar Bag:	N/A
Pitot Exp Date:	
TC Exp Date:	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	Gr185
Nozzle Dia:	0.348"

Location: Inlet 2 (Upstream to Baghouse)

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Inlet 2
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 22.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 6.00 inches
DEPTH OF STACK OR DUCT, D: 16.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 16.00 inches

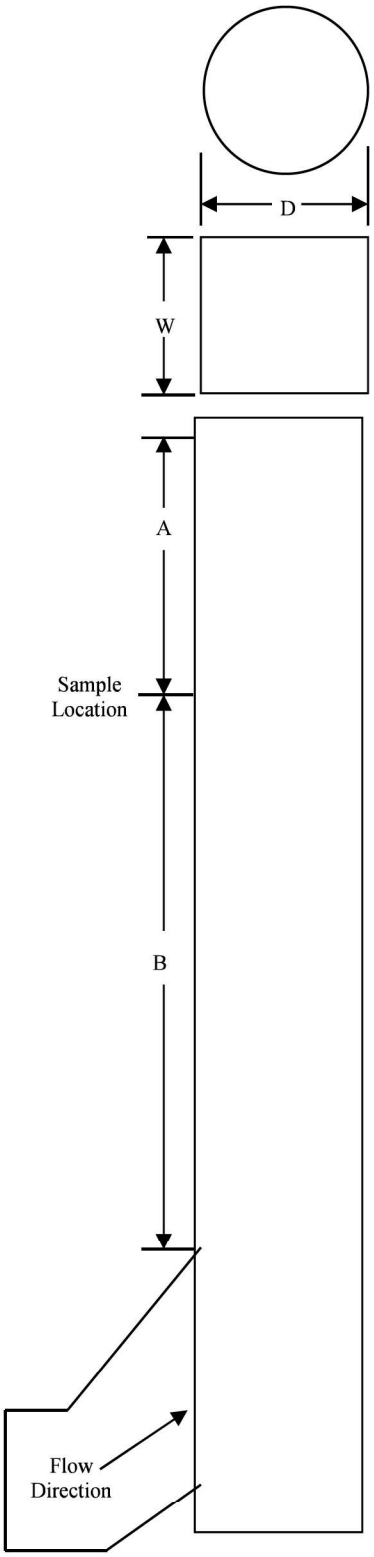
STACK/DUCT AREA = 1.40 sq.feet 201.1 sq.inches

DISTANCE OF TEST PORT LOCATION:

	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	42.00	196.00
# OF DIAMETERS	2.63	12.25

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	0.50	6 1/2
2	6.7	1.07	7 1/8
3	11.8	1.89	7 7/8
4	17.7	2.83	8 7/8
5	25.0	4.00	10
6	35.6	5.70	11 3/4
7	64.4	10.30	16 1/4
8	75.0	12.00	18
9	82.3	13.17	19 1/8
10	88.2	14.11	20 1/8
11	93.3	14.93	20 7/8
12	97.9	15.50	21 1/2



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW METH

Almega ENVIRONMENTAL

Run # :	1	Pitot ID:	28	Impinger #	Initial	Final	Net	Pitot Leak Check			
Date :	8-14-19	Pitot Coeff. :	0.84	1	743.0	757.7		Initial :	✓	✓	
Client :	SCAQMD C	Meter Box # :	A-6	769.02 2	668.5	773.7		Final :	✓	✓	
Unit :	Inlet 7	Meter @ Dh :	1.789	3	628.0	630.9					
Operator :	WB	Meter Y :	1.0376	4	825.3	841.3			Meter Box Leak Check		
Stack Dia :	16.0"	TC # :	28	5					Rate	"HG	
Amb. Press :	29.9	Start Time :	1125	H2O Gain =				Initial :	15	0.001	
Static Press :	-4.2	Stop Time :	1530	Filter :				Final :	15	0.000	

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0	1.90	108	2.25	291.055	91	91	NA	NA	54	11		
11	5	1.80	110	2.10	295.11	92	92			54	11		
10	10	1.90	111	2.25	299.10	93	93			56	11		
9	15	1.90	113	2.25	303.20	94	94			56	11		
8	20	1.75	114	2.05	307.35	96	96			57	10		
7	25	2.50	113	2.95	311.29	98	98			56	14		
6	30	1.70	111	2.00	316.11	100	100			57	10		
5	35	1.20	109	1.40	320.00	101	101			58	9		
4	40	1.00	106	1.15	323.33	103	103			59	8		
3	45	1.00	104	1.15	326.32	103	103			57	8		
2	50	1.05	107	1.25	329.33	104	104			57	8		
1	55	1.00	107	1.15	332.53	104	104			56	8		
12	60	1.95	110	2.30	335.57	104	104			50	12		
11	65	2.00	110	2.35	339.76	104	104			51	12		
10	70	2.25	115	2.65	344.09	105	105			53	13		
9	75	2.15	112	2.50	348.52	106	106			52	13		
8	80	1.90	114	2.25	353.07	108	108			54	12		
7	85	2.30	123	2.70	357.16	109	109			54	14		
6	90	1.80	119	2.10	361.83	110	110			56	11		
5	95	1.60	122	1.90	365.82	110	110			58	11		
4	100	1.30	116	1.55	369.75	111	111			60	9		
3	105	1.20	113	1.40	373.12	111	111			60	9		
2	110	1.05	115	1.25	376.58	110	110			60	9		
1	115	1.10	108	1.30	379.76	110	110			61	9		
END	120				382.967								

Isokinetic Factor Setup		Equipment Evaluation , OK? Y or N		Dry Gas Meter Leak Checks	1	2	3	4			Nozzle Information	
Estimated Dry Gas Meter Temp:		Ambient Temp.:		DGM Initial:							Nozzle ID:	GL 20
Estimated Stack Temp:		TC Check:		Vacuum:							Nozzle Dia:	0.181
Estimated Delta P:		Pitot Check:		Leak Rate:								
Estimated Moisture Content:		Tedlar Bag:		DGM Final:								
Estimated O2:		Pitot Exp Date:										
Estimated CO2:		TC Exp Date										

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH

Almega ENVIRONMENTAL

Run # :	2	Pitot ID:	28	Impinger #	Initial	Final	Net	Pitot Leak Check	
Date :	8-15-19	Pitot Coeff. :	0.28	1	745.1	763.9		Initial :	✓ ✓
Client :	SCAQMDC	Meter Box # :	A-6	2	645.1	650.7		Final :	✓ ✓
Unit :	Inlet 2	Meter @ Dh :	1.789	3	628.7	630.8			
Operator :	WB	Meter Y :	1.0376	4	797.7	816.2			
Stack Dia :	16.0"	TC # :	28	5				Meter Box Leak Check	
Amb. Press :	29.9	Start Time :	0810	H2O Gain =					Rate / "HG
Static Press :	-4.3	Stop Time :	1015	Filter :				Initial :	20 / 0.021
								Final :	10 / 0.090

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0	1.90	88	2.45	388.315	67	67	N/A	N/A	52	5		
11	5	2.50	89	3.20	387.18	68	68			60	5		
10	10	2.60	88	3.30	391.91	69	69			53	5		
9	15	2.45	87	3.15	396.71	71	71			54	5		
8	20	1.90	86	2.45	401.34	74	74			56	4		
7	25	2.80	85	3.60	405.47	75	75			57	5		
6	30	1.90	86	2.45	410.53	77	77			57	4		
5	35	1.50	86	1.95	414.60	79	79			57	4		
4	40	1.40	84	1.80	418.35	80	80			56	3		
3	45	1.10	77	1.40	422.91	81	81			56	3		
2	50	1.20	74	1.55	425.12	81	81			55	3		
1	55	1.20	75	1.55	428.43	82	82			55	3		
12	60	1.80	87	2.30	431.84	81	81			56	4		
11	65	2.15	88	2.75	435.86	81	81			51	5		
10	70	2.20	88	2.80	440.29	83	83			54	5		
9	75	2.35	89	3.00	444.87	84	84			55	5		
8	80	1.70	90	2.15	449.53	85	85			55	4		
7	85	1.98	91	2.45	453.48	86	86			55	4		
6	90	2.00	92	2.55	457.66	87	87			55	5		
5	95	1.50	92	1.90	462.04	89	89			55	4		
4	100	1.25	89	1.60	465.75	89	89			55	4		
3	105	1.15	87	1.45	469.14	90	90			54	4		
2	110	1.10	85	1.40	472.48	91	91			55	4		
1	115	1.10	85	1.40	475.67	91	91			55	4		
END	120				478.870								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation , OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	21.70
Nozzle Dia:	0.181

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH Almega ENVIRONMENTAL M425

Run # :	3	Pitot ID:	28	Impinger #	Initial	Final	Net	Pitot Leak Check			
Date :	8-14 15-19	Pitot Coeff. :	0.84	1	748.6	762.4		Initial :	✓	✓	
Client :	SCAQMD C	Meter Box # :	A-6	2	689.3	694.1		Final :	✓	✓	
Unit :	Inlet 2	Meter @ Dh :	1.789	3	665.7	666.4					
Operator :	WB	Meter Y :	1.0376	4	789.3	805.3		Meter Box Leak Check			
Stack Dia :	16.0"	TC # :	28	5					Rate	"HG	
Amb. Press :	29.9	Start Time :	1055	H2O Gain =				Initial :	20	0.001	
Static Press :	-4.3	Stop Time :	1310	Filter :				Final :	19	0.000	

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0	2.10	98	2.70	479.057	84	84	NA	NA	56	6		
11	5	2.45	98	3.15	483.48	85	85			51	7		
10	10	2.50	97	3.20	488.26	86	86			53	7		
9	15	2.60	97	3.30	493.10	88	88			55	7		
8	20	1.85	99	2.35	497.94	91	91			57	5		
7	25	2.60	97	3.30	501.93	92	92			58	7		
6	30	1.80	97	2.30	506.89	94	94			56	5		
5	35	1.40	97	1.80	510.88	95	95			60	5		
4	40	1.20	96	1.55	514.48	96	96			59	5		
3	45	1.10	93	1.40	517.81	97	97			60	5		
2	50	1.10	94	1.40	520.94	98	98			58	5		
1	55	1.10	84	1.40	524.12	99	99			59	5		
12	60	1.70	101	2.15	527.29	98	98			54	6		
11	65	2.05	102	2.60	531.75	97	97			55	6		
10	70	2.25	103	2.90	535.53	98	98			56	7		
9	75	1.90	104	2.45	540.17	100	100			58	6		
8	80	1.65	103	2.10	544.35	101	101			60	6		
7	85	2.00	105	2.55	548.18	102	102			58	6		
6	90	1.70	105	2.15	552.40	103	103			60	6		
5	95	1.15	106	1.45	556.35	104	104			60	5		
4	100	1.10	88	1.40	559.56	104	104			59	5		
3	105	1.10	85	1.40	562.73	104	104			58	5		
2	110	1.10	92	1.40	565.93	105	105			59	5		
1	115	1.10	88	1.40	569.12	105	105			60	5		
END	120				572.316								

Isokinetic Factor Setup	
Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation , OK? Y or N	
Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	GL 20
Nozzle Dia:	0.181

APPENDIX D3

CHROMIUM EMISSIONS (HEX/TOTAL) – LABORATORY DATA

M425 Lab Data Summary

				Hex Chrome			Total Chrome		
				Inlet 1 Inside	Inlet 2 Outside	Outlet	Inlet 1	Inlet 2	Outlet
Run 1	Rinse	C1	ug	0.068	0.29	<0.22	240	59	<0.31
	Impingers	C2	ug	0.75	2.60	0.092	2300	410	<0.24
	Total		ug	**0.818**	**2.89**	**<0.31**	**2540**	**469**	**<0.55**
Run 2	Rinse	C1	ug	0.90	0.20	<0.0095	50	14	<0.35
	Impingers	C2	ug	21	5.10	<0.022	280	56	<0.24
	Total		ug	**21.90**	**5.30**	**<0.0315**	**330**	**70**	**<0.59**
Run 3	Rinse	C1	ug	0.21	1.9	<0.009	27	110	<0.36
	Impingers	C2	ug	21	2.00	0.037	980	170	<0.24
	Total		ug	**21.21**	**3.9**	**<0.0460**	**1007**	**280**	**<0.60**
Run FB	Rinse	C1	ug		<0.009			**<0.36**	
	Impingers	C2	ug		<0.021			**<0.25**	
	Total		ug		**<0.030**			**<0.61**	
Run RB	Rinse	C1	ug		< 0.010			**< 1**	
	Impingers	C2	ug		0.020			**< 1**	
	Total		ug		**< 0.030**			**< 2**	
AVG	**Total**		**ug**	**14.64**	**4.03**	**<0.13**	**1292.333**	**273**	**<0.58**

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: In (I)/In (O)/Out

Project Manager: Almega Environmental & Technical Services

Reported:
06/24/2019 14:29

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
10562 - M425 - C1 - In(O) - FB	Client	9E30014-01	Filter	05/22/19 10:30	
10562 - M425 - C2 - In(O) - FB	Client	9E30014-02	Filter	05/22/19 10:30	
10562 - M425 - C1 - In(I) - R1	Client	9E30014-03	Filter	05/22/19 11:50	
10562 - M425 - C2 - In(I) - R1	Client	9E30014-04	Filter	05/22/19 11:50	
10562 - M425 - C1 - In(O) - R1	Client	9E30014-05	Filter	05/22/19 11:50	
10562 - M425 - C2 - In(O) - R1	Client	9E30014-06	Filter	05/22/19 11:50	
10562 - M425 - C1 - Out - R1	Client	9E30014-07	Filter	05/22/19 11:50	
10562 - M425 - C2 - Out - R1	Client	9E30014-08	Filter	05/22/19 11:50	
10562 - M425 - C1 - In(I) - R2	Client	9E30014-09	Filter	05/22/19 14:38	
10562 - M425 - C2 - In(I) - R2	Client	9E30014-10	Filter	05/22/19 14:38	
10562 - M425 - C1 - In(O) - R2	Client	9E30014-11	Filter	05/22/19 14:38	
10562 - M425 - C2 - In(O) - R2	Client	9E30014-12	Filter	05/22/19 14:38	
10562 - M425 - C1 - Out - R2	Client	9E30014-13	Filter	05/22/19 14:38	
10562 - M425 - C2 - Out - R2	Client	9E30014-14	Filter	05/22/19 14:38	
10562 - M425 - C1 - In(I) - R3	Client	9E30014-15	Filter	05/23/19 08:25	
10562 - M425 - C2 - In(I) - R3	Client	9E30014-16	Filter	05/23/19 08:25	
10562 - M425 - C1 - In(O) - R3	Client	9E30014-17	Filter	05/23/19 08:25	
10562 - M425 - C2 - In(O) - R3	Client	9E30014-18	Filter	05/23/19 08:25	
10562 - M425 - C1 - Out - R3	Client	9E30014-19	Filter	05/23/19 08:25	
10562 - M425 - C2 - Out - R3	Client	9E30014-20	Filter	05/23/19 08:25	
AQMD Facility A - M425 - RB	Client	9E30014-21	Filter	05/23/19 11:30	
AQMD Facility A - M425 - RB - Filter	Client	9E30014-22	Filter	05/23/19 11:30	

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	By ANAB
CARB 425 in Filter			
Chromium 6+	18540-29-9	✓	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: In (I)/In (O)/Out

Project Manager: Almega Environmental & Technical Services

Reported: 06/24/2019 14:29

Sample Results (Continued)

Sample: 10562 - M425 - C1 - Out - R3 — Sampled: 05/23/19 8:25 by Client

9E30014-19 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9F0120 **Instr:** LC13 **Prepared:** 06/04/19 11:45 **Analyst:** jna						
Chromium 6+	ND	0.050	ug/filter	5	06/04/19 23:22	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9F0440 **Instr:** ICPMS03 **Prepared:** 06/10/19 09:31 **Analyst:** ALN						
Chromium, Total	ND	1.0	ug/filter	5	06/12/19 15:25	M-04

Sample: 10562 - M425 - C2 - Out - R3 — Sampled: 05/23/19 8:25 by Client

9E30014-20 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9F0440 **Instr:** ICPMS03 **Prepared:** 06/10/19 09:31 **Analyst:** ALN						
Chromium, Total	ND	1.0	ug/filter	5	06/12/19 15:27	M-04

Sample: 10562 - M425 - C2 - Out - R3 — Sampled: 05/23/19 8:25 by Client

9E30014-20RE1 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9F0369 **Instr:** LC13 **Prepared:** 06/06/19 11:40 **Analyst:** jna						
Chromium 6+	ND	0.022	ug/filter	1	06/06/19 15:00	

Sample: AQMD Facility A - M425 - RB — Sampled: 05/23/19 11:30 by Client

9E30014-21 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9F0444 **Instr:** ICPMS03 **Prepared:** 06/10/19 09:39 **Analyst:** ALN						
Chromium, Total	ND	1.0	ug/filter	5	06/12/19 15:55	M-04

Sample: AQMD Facility A - M425 - RB — Sampled: 05/23/19 11:30 by Client

9E30014-21RE1 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9F0369 **Instr:** LC13 **Prepared:** 06/06/19 11:40 **Analyst:** jna						
Chromium 6+	ND	0.010	ug/filter	1	06/06/19 15:12	

Sample: AQMD Facility A - M425 - RB - Filter — Sampled: 05/23/19 11:30 by Client

9E30014-22 (Filter)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9F0444 **Instr:** ICPMS03 **Prepared:** 06/10/19 09:39 **Analyst:** ALN						
Chromium, Total	ND	1.0	ug/filter	5	06/12/19 15:56	M-04

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: In (I)/In (O)/Out

Project Manager: Almega Environmental & Technical Services

Reported:
06/24/2019 14:29

Sample Results

(Continued)

Sample: AQMD Facility A - M425 - RB - Filter
9E30014-22RE1 (Filter)

Sampled: 05/23/19 11:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9F0369 **Instr:** LC13 **Prepared:** 06/06/19 11:40 **Analyst:** jna						
Chromium 6+	ND	0.020	ug/filter	1	06/06/19 15:24	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

Almega ENVIRONMENTAL _ REPORT

Work Orders:	9H20010	**Report Date:**	10/09/2019
		Received Date:	8/20/2019
Project:	10566 Baghouse SCAQMD-C	**Turnaround Time:**	Normal
		Phones:	(714) 889-4000
		Fax:	(714) 889-7030
Attn:	Almega Environmental & Technical Services	**P.O. #:**	10566
Client:	Almega Environmental & Technical Services 10602 Walker St Cypress, CA 90630	**Billing Code:**	

ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO 17025 #L2457.01 • LACSD #10143 • NELAP-CA #04229CA • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Almega Environmental & Technical Services,

Enclosed are the results of analyses for samples received 8/20/19 with the Chain-of-Custody document. The samples were received in good condition, at 5.1 °C. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Brandon Gee
Operations Manager/Senior PM

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/09/2019 12:54

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
10566-M425-FB-C1	Client	9H20010-01	Filter	08/14/19 07:30	
10566-M425-FB-C2	Client	9H20010-02	Filter	08/14/19 07:30	
10566-M425-I1-R1-C1	Client	9H20010-03	Filter	08/14/19 13:30	
10566-M425-I1-R1-C2	Client	9H20010-04	Filter	08/14/19 13:30	
10566-M425-I2-R1-C1	Client	9H20010-06	Filter	08/14/19 13:30	
10566-M425-I2-R1-C2	Client	9H20010-07	Filter	08/14/19 13:30	
10566-M425-O-R1-C1	Client	9H20010-09	Filter	08/14/19 13:30	
10566-M425-O-R1-C2	Client	9H20010-10	Filter	08/14/19 13:30	
10566-M425-I1-R2-C1	Client	9H20010-11	Filter	08/15/19 10:15	
10566-M425-I1-R2-C2	Client	9H20010-12	Filter	08/15/19 10:15	
10566-M425-I2-R2-C1	Client	9H20010-14	Filter	08/15/19 10:15	
10566-M425-I2-R2-C2	Client	9H20010-15	Filter	08/15/19 10:15	
10566-M425-O-R2-C1	Client	9H20010-17	Filter	08/15/19 10:15	
10566-M425-O-R2-C2	Client	9H20010-18	Filter	08/15/19 10:15	
10566-M425-I1-R3-C1	Client	9H20010-19	Filter	08/15/19 13:10	
10566-M425-I1-R3-C2	Client	9H20010-20	Filter	08/15/19 13:10	
10566-M425-I2-R3-C1	Client	9H20010-22	Filter	08/15/19 13:10	
10566-M425-I2-R3-C2	Client	9H20010-23	Filter	08/15/19 13:10	
10566-M425-O-R3-C1	Client	9H20010-25	Filter	08/15/19 13:10	
10566-M425-O-R3-C2	Client	9H20010-26	Filter	08/15/19 13:10	

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	By ANAB
CARB 425 in Filter			
Chromium 6+	18540-29-9	✓	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported: 10/09/2019 12:54

Sample Results

Sample: 10566-M425-FB-C1
9H20010-01 (Filter)
Sampled: 08/14/19 7:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	ND	0.0090	ug/filter	1	08/26/19 13:06	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.36	ug/filter	1	10/06/19 14:59	

Sample: 10566-M425-FB-C2
9H20010-02 (Filter)
Sampled: 08/14/19 7:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	ND	0.021	ug/filter	1	08/26/19 13:18	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.25	ug/filter	1	10/06/19 15:00	

Sample: 10566-M425-I1-R1-C1
9H20010-03 (Filter)
Sampled: 08/14/19 13:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**0.068**	0.0085	ug/filter	1	08/26/19 13:30	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**240**	38	ug/filter	100	10/06/19 15:02	

Sample: 10566-M425-I1-R1-C2
9H20010-04 (Filter)
Sampled: 08/14/19 13:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**0.75**	0.043	ug/filter	1	08/26/19 13:41	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**2300**	100	ug/filter	500	10/06/19 15:04	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/09/2019 12:54

Sample Results

(Continued)

Sample: 10566-M425-I2-R1-C1
9H20010-06 (Filter)
Sampled: 08/14/19 13:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**0.29**	0.0089	ug/filter	1	08/26/19 13:53	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**59**	3.6	ug/filter	10	10/06/19 15:06	

Sample: 10566-M425-I2-R1-C2
9H20010-07 (Filter)
Sampled: 08/14/19 13:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**2.6**	0.041	ug/filter	1	08/26/19 14:05	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**410**	20	ug/filter	100	10/06/19 15:07	

Sample: 10566-M425-O-R1-C1
9H20010-09 (Filter)
Sampled: 08/14/19 13:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	ND	0.22	ug/filter	20	08/26/19 15:04	M-05
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.31	ug/filter	1	10/06/19 15:09	

Sample: 10566-M425-O-R1-C2
9H20010-10 (Filter)
Sampled: 08/14/19 13:30 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**0.092**	0.022	ug/filter	1	08/26/19 14:29	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.24	ug/filter	1	10/06/19 15:11	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported: 10/09/2019 12:54

Sample Results

(Continued)

Sample: 10566-M425-I1-R2-C1
9H20010-11 (Filter)
Sampled: 08/15/19 10:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13 **Prepared:** 08/26/19 09:40 **Analyst:** jna						
Chromium 6+	**0.90**	0.011	ug/filter	1	08/26/19 14:40	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03 **Prepared:** 08/29/19 15:58 **Analyst:** aln						
Chromium, Total	**50**	3.1	ug/filter	10	10/06/19 15:13	

Sample: 10566-M425-I1-R2-C2
9H20010-12 (Filter)
Sampled: 08/15/19 10:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13 **Prepared:** 08/26/19 09:40 **Analyst:** jna						
Chromium 6+	**21**	0.043	ug/filter	1	08/26/19 14:52	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03 **Prepared:** 08/29/19 15:58 **Analyst:** aln						
Chromium, Total	**280**	20	ug/filter	100	10/06/19 15:15	

Sample: 10566-M425-I2-R2-C1
9H20010-14 (Filter)
Sampled: 08/15/19 10:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13 **Prepared:** 08/26/19 09:40 **Analyst:** jna						
Chromium 6+	**0.20**	0.0095	ug/filter	1	08/26/19 16:11	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03 **Prepared:** 08/29/19 15:58 **Analyst:** aln						
Chromium, Total	**14**	1.7	ug/filter	5	10/06/19 17:08	

Sample: 10566-M425-I2-R2-C2
9H20010-15 (Filter)
Sampled: 08/15/19 10:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13 **Prepared:** 08/26/19 09:40 **Analyst:** jna						
Chromium 6+	**5.1**	0.053	ug/filter	1	08/26/19 16:23	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03 **Prepared:** 08/29/19 15:58 **Analyst:** aln						
Chromium, Total	**56**	2.0	ug/filter	10	10/06/19 16:45	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/09/2019 12:54

Sample Results

(Continued)

Sample: 10566-M425-O-R2-C1
9H20010-17 (Filter)
Sampled: 08/15/19 10:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	ND	0.0095	ug/filter	1	08/26/19 16:35	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.35	ug/filter	1	10/06/19 16:47	

Sample: 10566-M425-O-R2-C2
9H20010-18 (Filter)
Sampled: 08/15/19 10:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	ND	0.022	ug/filter	1	08/26/19 16:47	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.24	ug/filter	1	10/06/19 16:49	

Sample: 10566-M425-I1-R3-C1
9H20010-19 (Filter)
Sampled: 08/15/19 13:10 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**0.21**	0.0090	ug/filter	1	08/26/19 16:58	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**27**	3.6	ug/filter	10	10/06/19 16:51	

Sample: 10566-M425-I1-R3-C2
9H20010-20 (Filter)
Sampled: 08/15/19 13:10 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**21**	0.044	ug/filter	1	08/26/19 17:10	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**980**	20	ug/filter	100	10/06/19 16:53	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported: 10/09/2019 12:54

Sample Results

(Continued)

Sample: 10566-M425-I2-R3-C1
9H20010-22 (Filter)
Sampled: 08/15/19 13:10 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**1.9**	0.0095	ug/filter	1	08/26/19 17:22	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**110**	3.5	ug/filter	10	10/06/19 16:54	

Sample: 10566-M425-I2-R3-C2
9H20010-23 (Filter)
Sampled: 08/15/19 13:10 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**2.0**	0.042	ug/filter	1	08/26/19 17:34	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	**170**	20	ug/filter	100	10/06/19 16:56	

Sample: 10566-M425-O-R3-C1
9H20010-25 (Filter)
Sampled: 08/15/19 13:10 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	ND	0.0090	ug/filter	1	08/26/19 17:46	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.36	ug/filter	1	10/06/19 16:58	

Sample: 10566-M425-O-R3-C2
9H20010-26 (Filter)
Sampled: 08/15/19 13:10 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Hexavalent Chromium by IC						
Method: CARB 425 **Batch ID:** W9H1418 **Instr:** LC13		**Prepared:** 08/26/19 09:40			**Analyst:** jna	
Chromium 6+	**0.037**	0.022	ug/filter	1	08/26/19 17:57	
Metals (Non-Aqueous) by EPA 6000/7000 Series Methods						
Method: EPA 6020 **Batch ID:** W9H1709 **Instr:** ICPMS03		**Prepared:** 08/29/19 15:58			**Analyst:** aln	
Chromium, Total	ND	0.24	ug/filter	1	10/06/19 17:00	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported: 10/09/2019 12:54

Quality Control Results

Hexavalent Chromium by IC

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W9H1418 - CARB 425										
Blank (W9H1418-BLK1)				**Prepared & Analyzed: 08/26/19**						
Chromium 6+	ND	0.00010	ug/filter							
LCS (W9H1418-BS1)				**Prepared & Analyzed: 08/26/19**						
Chromium 6+	0.00508	0.00010	ug/filter	0.00500		102	90-110			
Matrix Spike (W9H1418-MS1)	**Source: 9H20010-01**			**Prepared & Analyzed: 08/26/19**						
Chromium 6+	0.493	0.0090	ug/filter	0.450	ND	109	85-117			
Matrix Spike (W9H1418-MS2)	**Source: 9H20010-23**			**Prepared & Analyzed: 08/26/19**						
Chromium 6+	4.52	0.042	ug/filter	2.12	2.02	118	85-117			MS-05
Matrix Spike Dup (W9H1418-MSD1)	**Source: 9H20010-01**			**Prepared & Analyzed: 08/26/19**						
Chromium 6+	0.443	0.0090	ug/filter	0.450	ND	98	85-117	11	20	
Matrix Spike Dup (W9H1418-MSD2)	**Source: 9H20010-23**			**Prepared & Analyzed: 08/26/19**						
Chromium 6+	6.14	0.042	ug/filter	2.12	2.02	194	85-117	31	20	MS-05

Quality Control Results

Metals (Non-Aqueous) by EPA 6000/7000 Series Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W9H1709 - EPA 6020										
Blank (W9H1709-BLK1)				**Prepared: 08/29/19 Analyzed: 10/06/19**						
Chromium, Total	ND	0.20	ug/filter							
LCS (W9H1709-BS1)				**Prepared: 08/29/19 Analyzed: 10/06/19**						
Chromium, Total	4.83	0.20	ug/filter	5.00		97	80-120			
LCS Dup (W9H1709-BSD1)				**Prepared: 08/29/19 Analyzed: 10/06/19**						
Chromium, Total	5.04	0.20	ug/filter	5.00		101	80-120	4	20	

Almega Environmental & Technical Services
10602 Walker St
Cypress, CA 90630

Project Number: 10566 Baghouse SCAQMD-C

Project Manager: Almega Environmental & Technical Services

Reported:
10/09/2019 12:54

Notes and Definitions

Item	Definition
M-05	Due to the nature of matrix interferences, sample was diluted prior to analysis. The MDL and MRL were raised due to the dilution.
MS-05	The spike recovery and/or RPD were outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
% Rec	Percent Recovery
Dil	Dilution
dry	Sample results reported on a dry weight basis
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
NR	Not Reportable
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.
TIC	Tentatively Identified Compound (TIC) using mass spectrometry. The reported concentration is relative concentration based on the nearest internal standard. If the library search produces no matches at, or above 85%, the compound is reported as unknown.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California State Water Resources Control Board (SWRCB)

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

9H20010

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN: Charles

REPORT TO: PO # 10566

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com
Contact:

0.1N NaBicarb

Turnaround Time
Standard: ____ Other: X
Rush:
Depends on # of Samples
5 - 10 days
3 - 7 days 8/26/19

Job # 10566 | Unit # Baghouse | Client: SCAQMD - C | Location: Inlet & Outlet

Samplers: (Signature)

Project Manager: Morgan Nguyen

Unit Information:

ANALYSIS REQUESTED

Return or Dispose

	Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	CARB MLS	Wet chrome	Total chrome	Volume (mL)		REMARKS	
-01	8/14/2019	7:30	10566-M425-FB-C1		x			1	x	✓	✓	✓			90mL
-02			10566-M425-FB-C2		x			1	x	✓	✓	✓			210mL
-03	8/14/2019	11:25 - 13:30	10566-M425-I1-R1-C1		x			1	x	✓	✓	✓			85mL
-04			10566-M425-I1-R1-C2		x			1	x	✓	✓	✓		combine	225mL
-05			10566-M425-I1-R1-C3		x			1	x			✓			210mL
-06	8/14/2019	11:25 - 13:30	10566-M425-I2-R1-C1		x			1	x	✓	✓	✓			89mL
-07			10566-M425-I2-R1-C2		x			1	x	✓	✓	✓		combine	220mL
-08			10566-M425-I2-R1-C3		x			1	x			✓			190mL
-09	8/14/2019	11:25 - 13:30	10566-M425-O-R1-C1		x			1	x	✓	✓	✓			110mL
-10			10566-M425-O-R1-C2		x			1	x	✓	✓	✓			225mL

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 8/16/19 Time: 11:40	Date: 8/19/19 Time: 13:45	Date: 8/19/19 Time 1345
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/19/19 Time 1425	Date: 8/19/19 Time: 14:25	Date: Time:	Date: Time

5.1 T-0002

Almega ENVIRONMENTAL

9H20010

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN: Cherry

REPORT TO:

PO # 10566

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com

Contact:

0.1N Bicarb

Turnaround Time
Standard: ____ Other: X
Rush:
Depends on # of Samples
5 - 10 days
3 - 7 days 8/26/19

Job # 10566	Unit # Baghouse	Client: SCAQMD - C	Location: Inlet & Outlet
Samplers: (Signature)		Unit Information:	
Project Manager: Morgan Nguyen			

ANALYSIS REQUESTED

Return or Dispose

	Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	CARB MM25	4A	TOTAL	Volume (mL)		REMARKS	
-11	8/15/2019	8:10 - 10:15	10566-M425-I1-R2-C1		x			1	x	✓	✓	✓			110 mL
-12			10566-M425-I1-R2-C2		x			1	x	✓	✓	✓		combine	215mL
-13			10566-M425-I1-R2-C3		x			1	x			✓			213mL
-14	8/15/2019	8:10 - 10:15	10566-M425-I2-R2-C1		x			1	x	✓	✓	✓			95mL
-15			10566-M425-I2-R2-C2		x			1	x	✓	✓	✓		combine	259mL
-16			10566-M425-I2-R2-C3		x			1	x			✓			270mL
-17	8/15/2019	8:10 - 10:15	10566-M425-O-R2-C1		x			1	x	✓	✓	✓			95mL
-18			10566-M425-O-R2-C2		x			1	x	✓	✓	✓			220mL

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 8/16/19 Time: 11:40	Date: 8/19/19 Time: 13:45	Date: 8/19/19 Time 1345
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/19/19 Time 1425	Date: 8/19/19 Time: 14:25	Date: Time:	Date: Time

5.1° T-0226

9H20010

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

REPORT TO:

PO # 10566

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com

0.1 N. BiCarb

ATTN: Charles

Contact:

Turnaround Time
Standard: ____ Other: X
Rush:
Depends on # of Samples
5 - 10 days
3 - 7 days 8/26/19

Job #	10566	Unit # Baghouse	Client:	SCAQMD - C	Location: Inlet & Outlet

Samplers: (Signature)

Project Manager: Morgan Nguyen

Unit Information:

ANALYSIS REQUESTED

	Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	CARB M425	Hex	TOTAL	Volume mL		Return or Dispose / REMARKS	
-19	8/15/2019	10:55 - 13:10	10566-M425-I1-R3-C1		x			1	x	✓	✓	✓			90mL
-20			10566-M425-I1-R3-C2		x			1	x	✓	✓	✓		combine	215mL
-21			10566-M425-I1-R3-C3		x			1	x			✓			230mL
-22	8/15/2019	10:55 - 13:10	10566-M425-I2-R3-C1		x			1	x	✓	✓	✓			95mL
-23			10566-M425-I2-R3-C2		x			1	x	✓	✓	✓		combine	225mL
-24			10566-M425-I2-R3-C3		x			1	x			✓			200mL
-25	8/15/2019	10:55 - 13:10	10566-M425-O-R3-C1		x			1	x	✓	✓	✓			90mL
-24			10566-M425-O-R3-C2		x			1	x	✓	✓	✓			220mL

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 8/16/19 Time: 1114	Date: 8/19/19 Time: 13:45	Date: 8/19/19 Time 1345
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/19/19 Time: 14:25	Date: 8/19/19 Time: 14:25	Date: Time:	Date: Time

5-1 T-022

Almega ENVIRONMENTAL

APPENDIX E

SCAQMD METHOD 5.1 – PARTICULATE MATTER (PM)

APPENDIX E1

PARTICULATE MATTER (PM) – RESULTS AND CALCULATIONS

Location: Baghouse Outlet

TEST RESULTS
SCAQMD Method 5.1 (Particulate Matter)

Facility: AQMD Facility C

City: [redacted] CA

Source: Baghouse

Location: Outlet

Run Number		1		
Run Date		08/16/19		
Run Start Time		7:40		
Run Stop Time		8:56		
Test Train Parameters				**AVERAGE**
Volume of Dry Gas Sample, SCF*		39.73		39.73
Flue Gas Parameters				
CO2, Percent By Volume, Dry**	<	0.30	<	0.30
O2, Percent By Volume, Dry**		20.90		20.90
Temperature, Degrees F		87.6		87.6
Moisture, %		1.93		1.93
Air Flow Rate, Wet ACFM		6,705		6,705
Air Flow Rate, Dry SCFM*		6,240		6,240
Total Particulate				
Catch, mg		6.57		6.57
Concentration, Gr/DSCF		0.002552		0.002552
Emission Rate, lb/hr		0.136		0.136

Notes:

* 60 Degrees F and 29.92 Inches of Mercury

** O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: METHOD 5.1

Client Name	Facility C		**Operator**		NC
Plant Name	Metal Melting facility		**Project #**		10566
Sampling Location	Outlet		**Standard Temperature, °F**		60

USE IN AVERAGE OF RUN SET? 1 or 0 =>		**1**			**SET AVERAGE**
Run Number		1			
Run Date		08/16/19			
Run Start Time	hh:mm	7:40			
Run Stop Time	hh:mm	8:56			
Meter Calibration Factor	Y	1.0379			
Pitot Tube Coefficient	C_p	0.84			
Actual Nozzle Diameter	in	0.450			
Sample Volume	ft^3	39.14			39.14
Total Sampling Time	min	72			72
Average Meter Temperature	°F	72.3			72.3
Average Stack Temperature	°F	87.6			87.6
Barometric Pressure	in Hg	29.90			29.9
Stack/Duct Static Pressure	in H_2O	-0.02			-0.02
Absolute Stack/Duct Pressure	in Hg	29.9			29.9
Average Delta H	in H_2O	0.90			0.90
Absolute Meter Pressure	in Hg	30.0			30.0
Avg Differential Pressure (Delta P)	in H_2O	0.024			0.024
Total Water Volume Collected	mL	16.9			16.9
Volume of Water vapor @ STP	SCF	0.783			0.783
Volume Metered @ STP	DSCF	39.735			39.735
Calculated Stack Moisture	% H_20	1.93			1.9
Saturated Stack Moisture	% H_20	4.4			4.4
Reported Stack Moisture Content	% H_20	1.93			1.93
Carbon Dioxide Percentage	% CO_2	0.30			0.30
Oxygen Percentage	% O_2	20.90			20.90
Carbon Monoxide Percentage	% CO	0.000			0.000
Nitrogen Percentage	% N_2	78.8			78.8
Dry Mole Fraction	decimal	0.981			0.981
Dry Gas Molecular Weight	lb/lb-mole	28.88			28.88
Wet Stack Gas Molecular Weight	lb/lb-mole	28.67			28.67
Flue Gas Density	lb/ft^3	0.0744			0.0744
Stack Cross-Sectional Area	in^2	1809.6			1809.6
Stack Cross-Sectional Area	ft^2	12.57			12.57
Percent of Isokinetic Rate	% ISO	100.7			100.7
Air Flow Rate Results					
Average Stack Gas Velocity	ft/sec	8.89			8.89
Actual Stack Flow/Minute	ACFM	6,705			6,705
Dry Standard Stack Flow/Minute	DSCFM	6,240			6,240

Almega ENVIRONMENTAL

ISOKINETIC SAMPLING TRAIN DATASHEET - METHOD **METHOD 5.1**

Client Name	Facility C	**Run #**	1		
Plant Name	Metal Melting facility	**Project #**	10566	Run Start	7:40
Plant City, State	[redacted] CA	**Personnel**	NC	Run End	8:56
Test Location	Outlet	**Tester Signature**	Onfile		
Date of Test	08/16/19	**Checked By**	CF		

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tares		Actuals
ΔH @ 0.75 SCFM	1.583	**Pbar**	29.90	**Meter Console #**	A-3			**CO_2**
Meter Calibration Factor	1.0379	**Pstatic**	-0.02	**Ideal Nozzle Diameter**	0.464			**0.30**
Pitot Tube Coefficient	0.840	**Abs P**	29.90	**Nozzle #**	0.450			**O_2**
Estimated Dry Gas Meter Temp	80	**Tstd, °F**	60	**Actual Nozzle Diameter**	0.450			**20.90**
Estimated Stack Temp or M2 Avg.	90	**Pstd**	29.92	**Probe Lgth/ID #**	73			**CO**
Estimated Delta P or M2 Avg.	0.040	**Estimates**		**Liner Material**	Glass	**XAD ID & Tares**		**0.00**
Estimated Moisture Content	2.00	**CO_2**	0.05	**Filter Box #**	NA			**N_2**
Estimated Dry Molecular Weight	28.84	**O_2**	20.80	**Cold Box ID #**	NA			**78.8**
Estimated Velocity, ft/sec	11.5	**CO**	0.00	**Umbilical ID #**	NA			**H_20**
K Factor (delta H/delta P)	37.41	**N_2**	**79.2**	**TC ID #s**	73			**16.9**

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	Filter Temp	Imp. Exit Temp	Cond. Exit Temp
	24 hr	min	ft^3	in H_2O	in H_2O	in H_2O	in Hg	°F	°F	°F	°F	°F	°F
A - 0	7:40	0.0	839.136	0.03	1.12	1.09	3.0	65	65	85		51	NA
A - 1		3.00	840.900	0.04	1.50	1.46	2.0	71	65	86		50	
A - 2		6.0	843.000	0.04	1.50	1.46	2.0	75	65	86		50	
A - 3		9.0	845.100	0.04	1.50	1.47	2.0	76	66	86		51	
A - 4		12.0	847.200	0.04	1.50	1.47	2.0	77	67	87		52	
A - 5		15.0	849.300	0.04	1.50	1.47	2.0	77	67	86		53	
A - 6		18.0	851.400	0.02	0.75	0.74	2.0	78	68	86		53	
A - 7		21.0	852.900	0.02	0.75	0.73	2.0	76	68	87		53	
A - 8		24.0	854.400	0.02	0.75	0.73	2.0	77	68	87		53	
A - 9		27.0	855.900	0.02	0.75	0.73	2.0	77	68	88		53	
A - 10		30.0	857.400	0.02	0.75	0.73	2.0	77	68	88		53	
A - 11		33.0	858.900	0.02	0.75	0.73	2.0	77	69	89		53	
A - 12	8:16	36.0	860.375	0.02	0.75	0.73	2.0	70	69	88		53	
B - 1	8:20	39.0	861.840	0.02	0.75	0.73	2.0	75	69	88		54	
B - 2		42.0	863.300	0.02	0.75	0.73	2.0	77	69	88		54	
B - 3		45.0	864.800	0.02	0.75	0.74	2.0	78	70	88		55	
B - 4		48.0	866.300	0.02	0.75	0.74	2.0	78	70	88		54	
B - 5		51.0	867.800	0.02	0.75	0.74	2.0	77	70	88		54	
B - 6		54.0	869.300	0.02	0.75	0.73	2.0	77	70	88		54	
B - 7		57.0	870.800	0.02	0.75	0.74	2.0	77	71	88		54	
B - 8		60.0	872.300	0.02	0.75	0.73	2.0	77	71	89		54	
B - 9		63.0	873.800	0.02	0.75	0.73	2.0	78	71	89		54	
B 10		66.0	875.300	0.02	0.75	0.73	2.0	78	71	89		55	
B 11		69.0	876.800	0.02	0.75	0.73	2.0	79	71	90		55	
B 12	8:56	72.0	878.280										
						MAX =>	3.00						
Average Values		72.0	39.144	0.024	0.920	0.900		72.3		87.6			

Note: O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

	Water 1	Water 2	Empty	SG
Initial	617.0	732.1	650.9	866.4
Final	621.6	734.9	652.2	874.6
H2O gain	4.60	2.80	1.30	8.20
Total H2O	16.9			

Cumul. Percent ISO	Point Percent ISO	Square Root DP	Local Stack Velocity	Cumulative Meter Volume	Point Meter Volume
%	%	$(in\ H_2O)^{1/2}$	ft/sec	scf	scf
98.6	98.6	0.173	9.9	1.844	1.844
100.0	101.2	0.200	11.5	4.030	2.185
100.3	100.8	0.200	11.5	6.208	2.177
100.4	100.7	0.200	11.5	8.381	2.173
100.4	100.6	0.200	11.5	10.550	2.169
100.4	100.5	0.200	11.5	12.719	2.169
100.5	101.1	0.141	8.1	14.258	1.543
100.6	101.4	0.141	8.1	15.803	1.546
100.6	101.3	0.141	8.1	17.345	1.545
100.7	101.4	0.141	8.1	18.889	1.545
100.7	101.4	0.141	8.1	20.432	1.545
100.7	99.7	0.141	8.1	21.948	1.518
100.6	99.6	0.141	8.1	23.466	1.517
100.5	98.8	0.141	8.1	24.971	1.505
100.5	101.3	0.141	8.1	26.513	1.543
100.6	101.1	0.141	8.1	28.052	1.541
100.6	101.1	0.141	8.1	29.592	1.541
100.6	101.2	0.141	8.1	31.133	1.542
100.6	101.2	0.141	8.1	32.674	1.542
100.7	101.1	0.141	8.1	34.214	1.541
100.7	101.2	0.141	8.1	35.753	1.540
100.7	101.1	0.141	8.1	37.292	1.539
100.7	101.1	0.141	8.1	38.830	1.539
100.7	99.8	0.141	8.1	40.346	1.517
100.7	99.8	Final Values		40.346	1.517
		0.155	8.9		

EXAMPLE CALCULATIONS, RUN 1

ABSOLUTE PRESSURE, INCHES OF MERCURY

Ps = Pbar + Pg/13.6
= 29.90 + -0.02/13.6
= 29.90

VOLUME OF WATER VAPOR, STANDARD CUBIC FEET

Vwstd = 0.002667 * [(Tstd + 460) / Pstd] * Vlc
= 0.002667 * [(60 + 460) / 29.92 * 16.9
= 0.783

SAMPLED VOLUME OF SOURCE GAS, DRY STANDARD CUBIC FEET

Vmstd = [(Tstd + 460)/Pstd] * Y * Vm * (Pbar + Delta-H/13.6) / (460 + tm)
= [(60 + 460)/ 29.92] * 1.0379 * 39.144 * (29.90 + 0.900/13.6) / (460 + 72)
= 39.735

MOISTURE CONTENT, PERCENT BY VOLUME

%H2O = Vwstd / (Vwstd + Vmstd)
= 0.783 / (0.783 + 39.735)
= 1.93

DRY MOLE FRACTION, LB-MOLE/LB-MOLE

Mfd = 1 - %H2O/100
= 1 - 1.93/100
= 0.981

DRY MOLECULAR WEIGHT, LB/LB-MOLE

Md = 44*(%CO2/100) + 32*(%O2/100) + 28*{[100-(%CO2+%O2)]/100}
= 44*(0.3/100) + 32*(20.9/100) + 28*{[100-(0.3+20.9)]/100}
= 28.88

WET MOLECULAR WEIGHT, LB/LB-MOLE

Ms = Md*Mfd + 18.0*%H2O/100
= 28.88*0.981 + 18.0*1.93/100
= 28.67

FUEL FACTOR

Fo = (20.9 - %O2) / %CO2
= (20.9 - 20.9) / 0.3
= 0.000

ISOKINETIC SAMPLING RATE, PERCENT

%I = Pstd/(Tstd + 460) * (100/60) * Vmstd*(ts + 460)/[Ps*vs*Mfd*Theta*(PI*Dia*Dia/576)]
= 29.92/(60 + 460) * (100/60) * 39.735*(88 + 460)/[29.90*8.89*0.981*72.00*(PI*0.450*0.450/576)]
= 100.7

VELOCITY, FEET PER SECOND

vs = 85.49 * Cp * SQRT[Delta-p*(460+ts)/Ps/Ms]
= 85.49 * 0.84 * SQRT[0.0240*(460+88)/29.90/28.67]
= 8.89

VOLUMETRIC FLOW RATE, ACTUAL CUBIC FEET PER MINUTE

Qaw = (60/144) * vs * A
= (60/144) * 8.89 * 1810
= 6705

VOLUMETRIC FLOW RATE, DRY STANDARD CUBIC FEET PER MINUTE

Qsd = (60/144) * Mfd * vs * A * (Tstd + 460)/(ts + 460) * (Ps/Pstd)
= (60/144) * 0.981 * 8.89 * 1810 * (60 + 460)/(88 + 460) * (29.90/29.92)
= 6240

EXAMPLE CALCULATIONS, RUN 1

TOTAL PARTICULATE CONCENTRATION, GRAINS PER DRY STANDARD CUBIC FOOT

gr/DSCF = (Catch/Conversion) * 7,000 / 453.592 / Vmstd
= (6.57/1000) * 7,000 / 453.592 / 39.735
= 0.00255

TOTAL PARTICULATE EMISSION RATE, POUNDS PER HOUR

lb/hr = 60 * (Catch/Conversion) * Qsd / 453.592 / Vmstd
= 60 * (6.57/1000) * 6240 / 453.592 / 39.735
= 0.136

Location: Inlet 1 (inside)

TEST RESULTS
SCAQMD Method 5.1 (Particulate Matter)

Facility: AQMD Facility C

City: [redacted] CA

Source: Baghouse

Location: Inlet 1

Run Number		1		
Run Date		08/16/19		
Run Start Time		7:40		
Run Stop Time		8:56		
Test Train Parameters				**AVERAGE**
Volume of Dry Gas Sample, SCF*		53.50		53.50
Flue Gas Parameters				
CO2, Percent By Volume, Dry**	<	0.30	<	0.30
O2, Percent By Volume, Dry**		20.80		20.80
Temperature, Degrees F		100.8		100.8
Moisture, %		1.80		1.80
Air Flow Rate, Wet ACFM		1,147		1,147
Air Flow Rate, Dry SCFM*		1,040		1,040
Total Particulate				
Catch, mg		105.57		105.57
Concentration, Gr/DSCF		0.0305		0.0305
Emission Rate, lb/hr		0.271		0.271

Notes:

* 60 Degrees F and 29.92 Inches of Mercury

** O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: METHOD 5.1

Client Name	Facility C	**Operator**		DJ
Plant Name	Metal Melting facility	**Project #**		10566
Sampling Location	Inlet 1	**Standard Temperature, °F**		60

USE IN AVERAGE OF RUN SET? 1 or 0 =>		1			SET AVERAGE
Run Number		1			
Run Date		08/16/19			
Run Start Time	hh:mm	7:40			
Run Stop Time	hh:mm	8:56			
Meter Calibration Factor	Y	1.0395			
Pitot Tube Coefficient	C_p	0.84			
Actual Nozzle Diameter	in	0.348			
Sample Volume	ft^3	54.02			54.02
Total Sampling Time	min	72			72
Average Meter Temperature	°F	87.9			87.9
Average Stack Temperature	°F	100.8			100.8
Barometric Pressure	in Hg	29.90			29.9
Stack/Duct Static Pressure	in H_2O	-1.50			-1.50
Absolute Stack/Duct Pressure	in Hg	29.8			29.8
Average Delta H	in H_2O	1.94			1.94
Absolute Meter Pressure	in Hg	30.0			30.0
Avg Differential Pressure (Delta P)	in H_2O	0.127			0.127
Total Water Volume Collected	mL	21.1			21.1
Volume of Water vapor @ STP	SCF	0.978			0.978
Volume Metered @ STP	DSCF	53.495			53.495
Calculated Stack Moisture	% H_20	1.80			1.8
Saturated Stack Moisture	% H_20	6.6			6.6
Reported Stack Moisture Content	% H_20	1.80			1.80
Carbon Dioxide Percentage	% CO_2	0.30			0.30
Oxygen Percentage	% O_2	20.80			20.80
Carbon Monoxide Percentage	% CO	0.000			0.000
Nitrogen Percentage	% N_2	78.9			78.9
Dry Mole Fraction	decimal	0.982			0.982
Dry Gas Molecular Weight	lb/lb-mole	28.88			28.88
Wet Stack Gas Molecular Weight	lb/lb-mole	28.68			28.68
Flue Gas Density	lb/ft^3	0.0744			0.0744
Stack Cross-Sectional Area	in^2	132.7			132.7
Stack Cross-Sectional Area	ft^2	0.92			0.92
Percent of Isokinetic Rate	% ISO	99.7			99.7
Air Flow Rate Results					
Average Stack Gas Velocity	ft/sec	20.74			20.74
Actual Stack Flow/Minute	ACFM	1,147			1,147
Dry Standard Stack Flow/Minute	DSCFM	1,040			1,040

Almega ENVIRONMENTAL

ISOKINETIC SAMPLING TRAIN DATASHEET - METHOD **METHOD 5.1**

Client Name	Facility C	**Run #**	1		
Plant Name	Metal Melting facility	**Project #**	10566	Run Start	7:40
Plant City, State	[redacted] CA	**Personnel**	DJ	Run End	8:56
Test Location	Inlet 1	**Tester Signature**	Onfile		
Date of Test	08/16/19	**Checked By**	CF		

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tares		Actuals
ΔH @ 0.75 SCFM	1.834	Pbar	29.90	Meter Console #	A-8			CO_2
Meter Calibration Factor	1.0395	Pstatic	-1.50	Ideal Nozzle Diameter	0.352			0.30
Pitot Tube Coefficient	0.840	Abs P	29.79	Nozzle #	0.348			O_2
Estimated Dry Gas Meter Temp	100	Tstd, °F	60	Actual Nozzle Diameter	0.348			20.80
Estimated Stack Temp or M2 Avg.	130	Pstd	29.92	Probe Lgth/ID #	85			CO
Estimated Delta P or M2 Avg.	0.130	Estimates		Liner Material	Glass	XAD ID & Tares		0.00
Estimated Moisture Content	2.00	CO_2	0.05	Filter Box #	NA			N_2
Estimated Dry Molecular Weight	28.84	O_2	20.80	Cold Box ID #	NA			78.9
Estimated Velocity, ft/sec	21.5	CO	0.00	Umbilical ID #	NA			H_20
K Factor (delta H/delta P)	14.93	N_2	79.2	TC ID #s	85			21.1

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	Filter Temp	Imp. Exit Temp	Cond. Exit Temp
	24 hr	min	ft^3	in H_2O	in H_2O	in H_2O	in Hg	°F	°F	°F	°F	°F	°F
A - 0	7:40	0.0	791.707	0.16	2.39	2.35	3.5	82	82	115		54	NA
A - 1		3.00	794.173	0.15	2.24	2.21	3.5	83	83	114		54	
A - 2		6.0	796.568	0.15	2.24	2.21	3.5	83	83	114		54	
A - 3		9.0	798.964	0.13	1.94	1.92	3.0	84	84	113		54	
A - 4		12.0	801.203	0.12	1.79	1.79	3.0	85	85	109		54	
A - 5		15.0	803.368	0.10	1.49	1.50	3.0	86	86	108		54	
A - 6		18.0	805.343	0.11	1.64	1.66	3.0	86	86	105		54	
A - 7		21.0	807.429	0.13	1.94	1.96	3.0	87	87	104		54	
A - 8		24.0	809.692	0.14	2.09	2.11	3.5	88	88	107		54	
A - 9		27.0	812.044	0.15	2.24	2.27	3.5	88	88	103		54	
A - 10		30.0	814.486	0.14	2.09	2.13	3.5	89	89	101		54	
A - 11		33.0	816.851	0.11	1.64	1.70	3.0	89	89	94		54	
A - 12	8:16	36.0	818.964	0.15	2.24	2.27	3.5	88	88	103		54	
B - 1	8:20	39.0	821.403	0.16	2.39	2.42	3.5	89	89	105		54	
B - 2		42.0	823.928	0.14	2.09	2.12	3.5	89	89	105		54	
B - 3		45.0	826.283	0.15	2.24	2.30	3.5	89	89	98		54	
B - 4		48.0	828.738	0.13	1.94	2.00	3.5	89	89	96		54	
B - 5		51.0	831.026	0.11	1.64	1.70	3.0	90	90	95		54	
B - 6		54.0	833.142	0.10	1.49	1.54	3.0	90	90	95		54	
B - 7		57.0	835.156	0.12	1.79	1.87	3.0	90	90	90		54	
B - 8		60.0	837.379	0.11	1.64	1.72	3.0	91	91	89		54	
B 9		63.0	839.503	0.10	1.49	1.58	3.0	91	91	84		54	
B 10		66.0	841.548	0.11	1.64	1.73	3.0	91	91	85		54	
B 11		69.0	843.684	0.10	1.49	1.57	3.0	92	92	88		55	
B 12	8:56	72.0	845.728										
						MAX =>	3.50						
Average Values		72.0	54.021	0.127	1.910	1.943		87.9		100.8			

Note: O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

	Water 1	Water 2	Empty	SG
Initial	650.7	754.4	639.2	828.7
Final	657.2	756.8	640.6	839.5
H2O gain	6.5	2.40	1.40	10.80
Total H2O	21.1			

Cumul. Percent ISO	Point Percent ISO	Square Root DP	Local Stack Velocity	Cumulative Meter Volume	Point Meter Volume
%	%	$(in\ H_2O)^{1/2}$	ft/sec	scf	scf
99.9	99.9	0.400	23.6	2.509	2.509
99.9	99.9	0.387	22.8	4.940	2.431
99.9	99.9	0.387	22.8	7.373	2.432
99.9	100.0	0.361	21.2	9.639	2.267
99.9	100.1	0.346	20.3	11.826	2.188
99.9	99.6	0.316	18.5	13.815	1.991
99.9	100.1	0.332	19.4	15.917	2.103
99.9	99.7	0.361	21.1	18.196	2.279
99.9	100.0	0.374	21.9	20.562	2.365
99.9	100.0	0.387	22.6	23.020	2.457
99.9	99.8	0.374	21.8	25.394	2.374
99.9	99.9	0.332	19.2	27.512	2.119
99.9	99.9	0.387	22.6	29.967	2.454
99.9	100.1	0.400	23.4	32.504	2.537
99.9	99.8	0.374	21.9	34.868	2.364
99.9	99.9	0.387	22.5	37.335	2.466
99.9	99.7	0.361	20.9	39.631	2.296
99.9	99.9	0.332	19.2	41.747	2.118
99.9	99.7	0.316	18.3	43.761	2.015
99.9	100.1	0.346	20.0	45.987	2.226
99.8	99.6	0.332	19.1	48.108	2.122
99.8	100.1	0.316	18.1	50.149	2.043
99.8	99.8	0.332	19.0	52.282	2.134
99.8	100.2	0.316	18.2	54.318	2.038
99.8	100.2	Final Values		54.318	2.038
		0.357	20.8		

EXAMPLE CALCULATIONS, RUN 1

ABSOLUTE PRESSURE, INCHES OF MERCURY

Ps = Pbar + Pg/13.6
= 29.90 + -1.50/13.6
= 29.79

VOLUME OF WATER VAPOR, STANDARD CUBIC FEET

Vwstd = 0.002667 * [(Tstd + 460) / Pstd] * Vlc
= 0.002667 * [(60 + 460) / 29.92 * 21.1
= 0.978

SAMPLED VOLUME OF SOURCE GAS, DRY STANDARD CUBIC FEET

Vmstd = [(Tstd + 460)/Pstd] * Y * Vm * (Pbar + Delta-H/13.6) / (460 + tm)
= [(60 + 460)/ 29.92] * 1.0395 * 54.021 * (29.90 + 1.943/13.6) / (460 + 88)
= 53.495

MOISTURE CONTENT, PERCENT BY VOLUME

%H2O = Vwstd / (Vwstd + Vmstd)
= 0.978 / (0.978 + 53.495)
= 1.80

DRY MOLE FRACTION, LB-MOLE/LB-MOLE

Mfd = 1 - %H2O/100
= 1 - 1.80/100
= 0.982

DRY MOLECULAR WEIGHT, LB/LB-MOLE

Md = 44*(%CO2/100) + 32*(%O2/100) + 28*{[100-(%CO2+%O2)]/100}
= 44*(0.3/100) + 32*(20.8/100) + 28*{[100-(0.3+20.8)]/100}
= 28.88

WET MOLECULAR WEIGHT, LB/LB-MOLE

Ms = Md*Mfd + 18.0*%H2O/100
= 28.88*0.982 + 18.0*1.80/100
= 28.68

FUEL FACTOR

Fo = (20.9 - %O2) / %CO2
= (20.9 - 20.8) / 0.3
= 0.333

ISOKINETIC SAMPLING RATE, PERCENT

%I = Pstd/(Tstd + 460) * (100/60) * Vmstd*(ts + 460)/[Ps*vs*Mfd*Theta*(PI*Dia*Dia/576)]
= 29.92/(60 + 460) * (100/60) * 53.495*(101 + 460)/[29.79*20.74*0.982*72.00*(PI*0.348*0.348/576)]
= 99.7

VELOCITY, FEET PER SECOND

vs = 85.49 * Cp * SQRT[Delta-p*(460+ts)/Ps/Ms]
= 85.49 * 0.84 * SQRT[0.1271*(460+101)/29.79/28.68]
= 20.74

VOLUMETRIC FLOW RATE, ACTUAL CUBIC FEET PER MINUTE

Qaw = (60/144) * vs * A
= (60/144) * 20.74 * 133
= 1147

VOLUMETRIC FLOW RATE, DRY STANDARD CUBIC FEET PER MINUTE

Qsd = (60/144) * Mfd * vs * A * (Tstd + 460)/(ts + 460) * (Ps/Pstd)
= (60/144) * 0.982 * 20.74 * 133 * (60 + 460)/(101 + 460) * (29.79/29.92)
= 1040

EXAMPLE CALCULATIONS, RUN 1

TOTAL PARTICULATE CONCENTRATION, GRAINS PER DRY STANDARD CUBIC FOOT

gr/DSCF = (Catch/Conversion) * 7,000 / 453.592 / Vmstd
= (105.57/1000) * 7,000 / 453.592 / 53.495
= 0.03045

TOTAL PARTICULATE EMISSION RATE, POUNDS PER HOUR

lb/hr = 60 * (Catch/Conversion) * Qsd / 453.592 / Vmstd
= 60 * (105.57/1000) * 1040 / 453.592 / 53.495
= 0.271

Location: Inlet 2 (Upstream to Baghouse)

TEST RESULTS
SCAQMD Method 5.1 (Particulate Matter)

Facility: AQMD Facility C

City: [redacted] CA

Source: Baghouse

Location: Inlet 2

Run Number		1		
Run Date		08/16/19		
Run Start Time		7:40		
Run Stop Time		8:56		
Test Train Parameters				**AVERAGE**
Volume of Dry Gas Sample, SCF*		55.51		55.51
Flue Gas Parameters				
CO2, Percent By Volume, Dry**	<	0.30	<	0.30
O2, Percent By Volume, Dry**		20.80		20.80
Temperature, Degrees F		93.2		93.2
Moisture, %		2.26		2.26
Air Flow Rate, Wet ACFM		6,412		6,412
Air Flow Rate, Dry SCFM*		5,825		5,825
Total Particulate				
Catch, mg		45.22		45.22
Concentration, Gr/DSCF		0.0126		0.0126
Emission Rate, lb/hr		0.628		0.628

Notes:

* 60 Degrees F and 29.92 Inches of Mercury

** O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

ISOKINETIC SAMPLING TRAIN RESULTS - METHOD: METHOD 5.1

Client Name	Facility C	**Operator**		WB
Plant Name	Metal Melting facility	**Project #**		10566
Sampling Location	Inlet 2	**Standard Temperature, °F**		60

USE IN AVERAGE OF RUN SET? 1 or 0 =>		**1**			**SET AVERAGE**
Run Number		1			
Run Date		08/16/19			
Run Start Time	hh:mm	7:40			
Run Stop Time	hh:mm	8:56			
Meter Calibration Factor	Y	1.0376			
Pitot Tube Coefficient	C_p	0.84			
Actual Nozzle Diameter	in	0.181			
Sample Volume	ft^3	54.82			54.82
Total Sampling Time	min	72			72
Average Meter Temperature	°F	75.3			75.3
Average Stack Temperature	°F	93.2			93.2
Barometric Pressure	in Hg	29.90			29.9
Stack/Duct Static Pressure	in H_2O	-4.30			-4.30
Absolute Stack/Duct Pressure	in Hg	29.6			29.6
Average Delta H	in H_2O	2.26			2.26
Absolute Meter Pressure	in Hg	30.1			30.1
Avg Differential Pressure (Delta P)	in H_2O	1.740			1.740
Total Water Volume Collected	mL	27.7			27.7
Volume of Water vapor @ STP	SCF	1.284			1.284
Volume Metered @ STP	DSCF	55.513			55.513
Calculated Stack Moisture	% H_20	2.26			2.3
Saturated Stack Moisture	% H_20	5.3			5.3
Reported Stack Moisture Content	% H_20	2.26			2.26
Carbon Dioxide Percentage	% CO_2	0.30			0.30
Oxygen Percentage	% O_2	20.80			20.80
Carbon Monoxide Percentage	% CO	0.000			0.000
Nitrogen Percentage	% N_2	78.9			78.9
Dry Mole Fraction	decimal	0.977			0.977
Dry Gas Molecular Weight	lb/lb-mole	28.88			28.88
Wet Stack Gas Molecular Weight	lb/lb-mole	28.63			28.63
Flue Gas Density	lb/ft^3	0.0743			0.0743
Stack Cross-Sectional Area	in^2	201.1			201.1
Stack Cross-Sectional Area	ft^2	1.40			1.40
Percent of Isokinetic Rate	% ISO	103.5			103.5
Air Flow Rate Results					
Average Stack Gas Velocity	ft/sec	76.54			76.54
Actual Stack Flow/Minute	ACFM	6,412			6,412
Dry Standard Stack Flow/Minute	DSCFM	5,825			5,825

Almega ENVIRONMENTAL

ISOKINETIC SAMPLING TRAIN DATASHEET - METHOD **METHOD 5.1**

Client Name	Facility C	**Run #**	1		
Plant Name	Metal Melting facility	**Project #**	10566	Run Start	7:40
Plant City, State	[redacted] CA	**Personnel**	WB	Run End	8:56
Test Location	Inlet 2	**Tester Signature**	Onfile		
Date of Test	08/16/19	**Checked By**	CF		

Isokinetic Factor Setup		Pressures		Sampling Equipment		Filter ID & Tares		Actuals
ΔH @ 0.75 SCFM	1.789	**Pbar**	29.90	**Meter Console #**	A-8			**CO_2**
Meter Calibration Factor	1.0376	**Pstatic**	-4.30	**Ideal Nozzle Diameter**	0.182			**0.30**
Pitot Tube Coefficient	0.840	**Abs P**	29.58	**Nozzle #**	0.181			**O_2**
Estimated Dry Gas Meter Temp	75	**Tstd, °F**	60	**Actual Nozzle Diameter**	0.181			**20.80**
Estimated Stack Temp or M2 Avg.	90	**Pstd**	29.92	**Probe Lgth/ID #**	28			**CO**
Estimated Delta P or M2 Avg.	1.700	**Estimates**		**Liner Material**	Glass	**XAD ID & Tares**		**0.00**
Estimated Moisture Content	2.50	**CO_2**	0.05	**Filter Box #**	NA			**N_2**
Estimated Dry Molecular Weight	28.84	**O_2**	20.90	**Cold Box ID #**	NA			**78.9**
Estimated Velocity, ft/sec	75.5	**CO**	0.00	**Umbilical ID #**	NA			**H_20**
K Factor (delta H/delta P)	1.08	**N_2**	**79.1**	**TC ID #s**	28			**27.7**

Point #	Clock Time	Test Time	Dry Gas Meter Reading	Velocity Head	Desired Orifice ΔH	Actual Orifice ΔH	Pump Vac.	DGM Inlet Temp	DGM Outlet Temp	Stack Temp	Filter Temp	Imp. Exit Temp	Cond. Exit Temp
	24 hr	min	ft^3	in H_2O	in H_2O	in H_2O	in Hg	°F	°F	°F	°F	°F	°F
A - 0	7:40	0.0	572.522	2.70	2.90	3.40	4.0	64	64	96		52	NA
A - 12		3.00	575.340	2.80	3.01	3.55	4.0	65	65	95		52	
A - 11		6.0	578.220	2.70	2.90	3.40	4.0	66	66	94		53	
A - 10		9.0	581.090	2.65	2.85	3.35	4.0	69	69	95		55	
A - 9		12.0	583.870	1.90	2.04	2.40	3.0	70	70	100		54	
A - 8		15.0	586.250	1.95	2.10	2.45	3.0	72	72	94		55	
A - 7		18.0	588.760	1.70	1.83	2.15	3.0	73	73	94		57	
A - 6		21.0	590.960	1.30	1.40	1.65	3.0	74	74	97		59	
A - 5		24.0	592.970	1.10	1.18	1.40	3.0	75	75	100		58	
A - 4		27.0	594.730	1.10	1.18	1.40	3.0	75	75	85		86	
A - 3		30.0	596.540	1.00	1.08	1.25	2.0	76	76	83		86	
A - 2		33.0	598.330	0.98	1.05	1.25	2.0	76	76	82		54	
A - 1	8:16	36.0	600.060	1.90	2.04	2.40	3.0	75	75	93		56	
B - 12	8:20	39.0	602.380	2.00	2.15	2.55	3.0	76	76	95		52	
B - 11		42.0	604.820	2.30	2.47	2.90	3.0	77	77	98		51	
B - 10		45.0	607.500	2.30	2.47	2.90	3.0	78	78	97		52	
B - 9		48.0	610.120	2.10	2.26	2.65	3.0	79	79	96		54	
B - 8		51.0	612.620	2.49	2.68	3.05	3.0	80	80	99		55	
B - 7		54.0	615.330	1.90	2.04	2.40	3.0	80	80	97		56	
B - 6		57.0	617.690	1.20	1.29	1.50	3.0	81	81	95		56	
B - 5		60.0	619.580	1.60	1.72	2.05	3.0	81	81	92		57	
B 4		63.0	621.740	1.15	1.24	1.45	3.0	81	81	87		56	
B 3		66.0	623.660	1.10	1.18	1.40	3.0	81	81	87		56	
B 2		69.0	625.500	1.10	1.18	1.40	3.0	82	82	85		57	
B 1	8:56	72.0	627.346										
						MAX =>	4.00						
Average Values		72.0	54.824	1.740	1.928	2.263		75.3		93.2			

Note: O2/CO2 was sampled in Tedlar bag and analyzed via SCAQMD Method 10.1 by GC.

	Water 1	Water 2	Empty	SG
Initial	757.4	727.8	670.2	741.9
Final	776.3	732.2	671.9	744.6
H2O gain	18.9	4.40	1.70	2.70
Total H2O	27.7			

Cumul. Percent ISO	Point Percent ISO	Square Root DP	Local Stack Velocity	Cumulative Meter Volume	Point Meter Volume
%	%	$(\text{in } H_2O)^{1/2}$	ft/sec	scf	scf
105.4	105.4	1.643	95.7	2.968	2.968
105.4	105.5	1.673	97.4	5.996	3.028
105.9	106.7	1.643	95.5	9.007	3.011
105.4	103.8	1.628	94.7	11.906	2.900
105.3	105.0	1.378	80.6	14.374	2.472
105.7	108.3	1.396	81.2	16.969	2.598
105.2	101.4	1.304	75.8	19.234	2.271
105.2	105.9	1.140	66.5	21.294	2.068
104.8	100.9	1.049	61.3	23.090	1.807
104.6	102.3	1.049	60.5	24.940	1.858
104.5	105.7	1.000	57.6	26.765	1.833
104.4	103.1	0.990	56.9	28.529	1.772
104.1	100.8	1.378	80.1	30.916	2.387
104.0	103.3	1.414	82.3	33.424	2.507
104.2	106.0	1.517	88.5	36.178	2.751
104.1	103.4	1.517	88.4	38.864	2.684
104.1	102.9	1.449	84.4	41.420	2.555
104.0	102.6	1.578	92.2	44.191	2.767
103.9	101.9	1.378	80.4	46.596	2.406
103.8	102.1	1.095	63.7	48.507	1.919
103.6	100.9	1.265	73.4	50.700	2.196
103.7	105.2	1.072	61.9	52.643	1.949
103.6	103.1	1.049	60.6	54.504	1.868
103.6	103.0	1.049	60.5	56.367	1.870
103.6	103.0	Final Values		56.367	1.870
		1.319	76.7		

EXAMPLE CALCULATIONS, RUN 1

ABSOLUTE PRESSURE, INCHES OF MERCURY

Ps = Pbar + Pg/13.6
= 29.90 + -4.30/13.6
= 29.58

VOLUME OF WATER VAPOR, STANDARD CUBIC FEET

Vwstd = 0.002667 * [(Tstd + 460) / Pstd] * Vlc
= 0.002667 * [(60 + 460) / 29.92 * 27.7
= 1.284

SAMPLED VOLUME OF SOURCE GAS, DRY STANDARD CUBIC FEET

Vmstd = [(Tstd + 460)/Pstd] * Y * Vm * (Pbar + Delta-H/13.6) / (460 + tm)
= [(60 + 460)/ 29.92] * 1.0376 * 54.824 * (29.90 + 2.263/13.6) / (460 + 75)
= 55.513

MOISTURE CONTENT, PERCENT BY VOLUME

%H2O = Vwstd / (Vwstd + Vmstd)
= 1.284 / (1.284 + 55.513)
= 2.26

DRY MOLE FRACTION, LB-MOLE/LB-MOLE

Mfd = 1 - %H2O/100
= 1 - 2.26/100
= 0.977

DRY MOLECULAR WEIGHT, LB/LB-MOLE

Md = 44*(%CO2/100) + 32*(%O2/100) + 28*{[100-(%CO2+%O2)]/100}
= 44*(0.3/100) + 32*(20.8/100) + 28*{[100-(0.3+20.8)]/100}
= 28.88

WET MOLECULAR WEIGHT, LB/LB-MOLE

Ms = Md*Mfd + 18.0*%H2O/100
= 28.88*0.977 + 18.0*2.26/100
= 28.63

FUEL FACTOR

Fo = (20.9 - %O2) / %CO2
= (20.9 - 20.8) / 0.3
= 0.333

ISOKINETIC SAMPLING RATE, PERCENT

%I = Pstd/(Tstd + 460) * (100/60) * Vmstd*(ts + 460)/[Ps*vs*Mfd*Theta*(PI*Dia*Dia/576)]
= 29.92/(60 + 460) * (100/60) * 55.513*(93 + 460)/[29.58*76.54*0.977*72.00*(PI*0.181*0.181/576)]
= 103.5

VELOCITY, FEET PER SECOND

vs = 85.49 * Cp * SQRT[Delta-p*(460+ts)/Ps/Ms]
= 85.49 * 0.84 * SQRT[1.7397*(460+93)/29.58/28.63]
= 76.54

VOLUMETRIC FLOW RATE, ACTUAL CUBIC FEET PER MINUTE

Qaw = (60/144) * vs * A
= (60/144) * 76.54 * 201
= 6412

VOLUMETRIC FLOW RATE, DRY STANDARD CUBIC FEET PER MINUTE

Qsd = (60/144) * Mfd * vs * A * (Tstd + 460)/(ts + 460) * (Ps/Pstd)
= (60/144) * 0.977 * 76.54 * 201 * (60 + 460)/(93 + 460) * (29.58/29.92)
= 5825

EXAMPLE CALCULATIONS, RUN 1

TOTAL PARTICULATE CONCENTRATION, GRAINS PER DRY STANDARD CUBIC FOOT

gr/DSCF = (Catch/Conversion) * 7,000 / 453.592 / Vmstd
= (45.22/1000) * 7,000 / 453.592 / 55.513
= 0.01257

TOTAL PARTICULATE EMISSION RATE, POUNDS PER HOUR

lb/hr = 60 * (Catch/Conversion) * Qsd / 453.592 / Vmstd
= 60 * (45.22/1000) * 5825 / 453.592 / 55.513
= 0.628

APPENDIX E2

PARTICULATE MATTER (PM) – FIELD DATA

Location: Baghouse Outlet

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Outlet
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 54.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 6.00 inches
DEPTH OF STACK OR DUCT, D: 48.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 48.00 inches

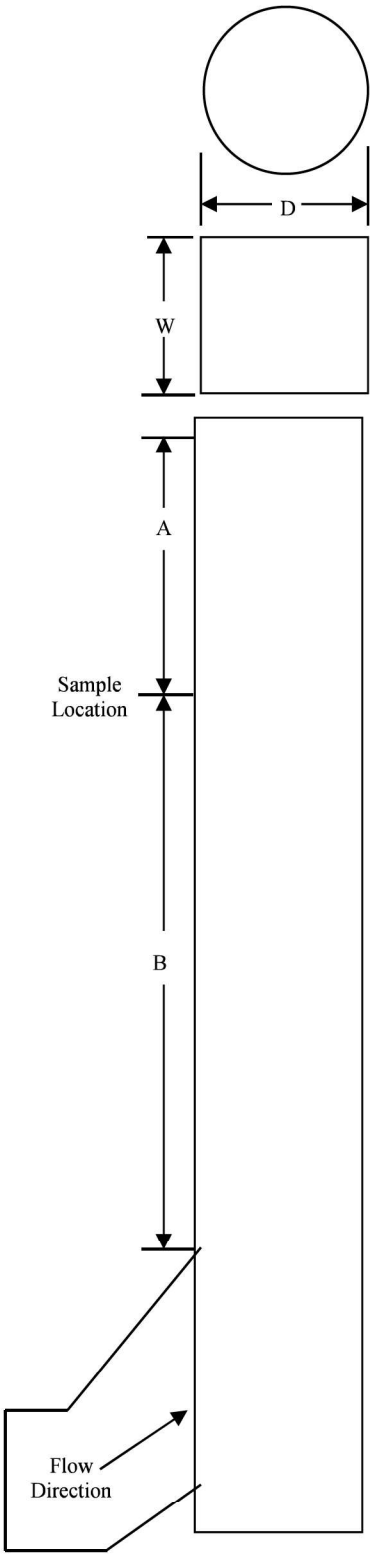
STACK/DUCT AREA = 12.57 sq.feet 1809.6 sq.inches

DISTANCE OF TEST PORT LOCATION:

	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	126.00	50.00
# OF DIAMETERS	2.63	1.04

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	1.01	7
2	6.7	3.22	9 1/4
3	11.8	5.66	11 5/8
4	17.7	8.50	14 1/2
5	25.0	12.00	18
6	35.6	17.09	23 1/8
7	64.4	30.91	36 7/8
8	75.0	36.00	42
9	82.3	39.50	45 1/2
10	88.2	42.34	48 3/8
11	93.3	44.78	50 3/4
12	97.9	46.99	53



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

Almega ENVIRONMENTAL METI

Run # :	1	Pitot ID:	#3	Impinger #	Initial	Final	Net	Pitot Leak Check	
Date :	8-11-19	Pitot Coeff. :	0.84	1	617.0	621.6		Initial :	✓ ✓
Client :	SCAQMD (	Meter Box # :	A-3	2	732.1	734.9		Final :	✓ ✓
Unit :	Outlet	Meter @ Dh :	1.583	3	630.9	652.2			
Operator :	NG	Meter Y :	1.0279	4	966.4	974.6		Meter Box Leak Check	
Stack Dia :	48.0 "	TC # :	#3	5				Rate	"HG
Amb. Press :	29.9	Start Time :	0740	H2O Gain =				Initial :	0.00 12
Static Press :	-0.02	Stop Time :	0856	Filter :	00491			Final :	0.00 12

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	Tff Cooler Temp. (F)	Cyclonic Flow ("H2O)
A 740 12	0	0.03	85	1.09	839.136	65	65	N/A	N/A	51	3	N/A	N/A
11	3	0.04	86	1.46	840.9	71	65			50	2		
10	6	0.04	86	1.46	843.0	75	65			50			
9	9	0.04	86	1.47	845.1	76	66			51			
8	12	0.04	87	1.47	847.2	77	67			52			
7	15	0.04	86	1.47	849.3	77	67			53			
6	18	0.02	86	0.74	851.4	78	68			53			
5	21	0.02	87	0.73	862.9	76	68			53			
4	24	0.02	87	0.73	854.4	77	68			53			
3	27	0.02	88	0.73	855.9	77	68			53			
2	30	0.02	88	0.73	857.4	77	68			53			
1	33	0.02	89	0.73	858.9	77	69			53			
816	36				860.375								
.													
B 820 12	0	0.02	88	0.73	860.375	70	69	N/A	N/A	53	2	N/A	N/A
11	3	0.02	88	0.73	861.84	75	69			54			
10	6	0.02	88	0.73	863.3	77	69			54			
9	9	0.02	88	0.74	864.8	78	70			55			
8	12	0.02	88	0.74	866.3	78	70			54			
7	15	0.02	88	0.74	867.8	77	70			54			
6	18	0.02	88	0.73	869.3	77	70			54			
5	21	0.02	88	0.74	870.8	77	71			54			
4	24	0.02	89	0.73	872.3	77	71			54			
3	27	0.02	89	0.73	873.8	78	71			54			
2	30	0.02	89	0.73	875.3	78	71			55			
1	33	0.02	90	0.73	876.8	79	71						
	36				878.280								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	80
Estimated Stack Temp:	90
Estimated Delta P:	0.04
Estimated Moisture Content:	2
Estimated O2:	20.8
Estimated CO2:	0.05

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	0.450

Location: Inlet 1 (inside)

Almega ENVIRONMENTAL

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted], CA
SAMPLING LOCATION Inlet 1
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 13.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 0.0 inches
DEPTH OF STACK OR DUCT, D: 13.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

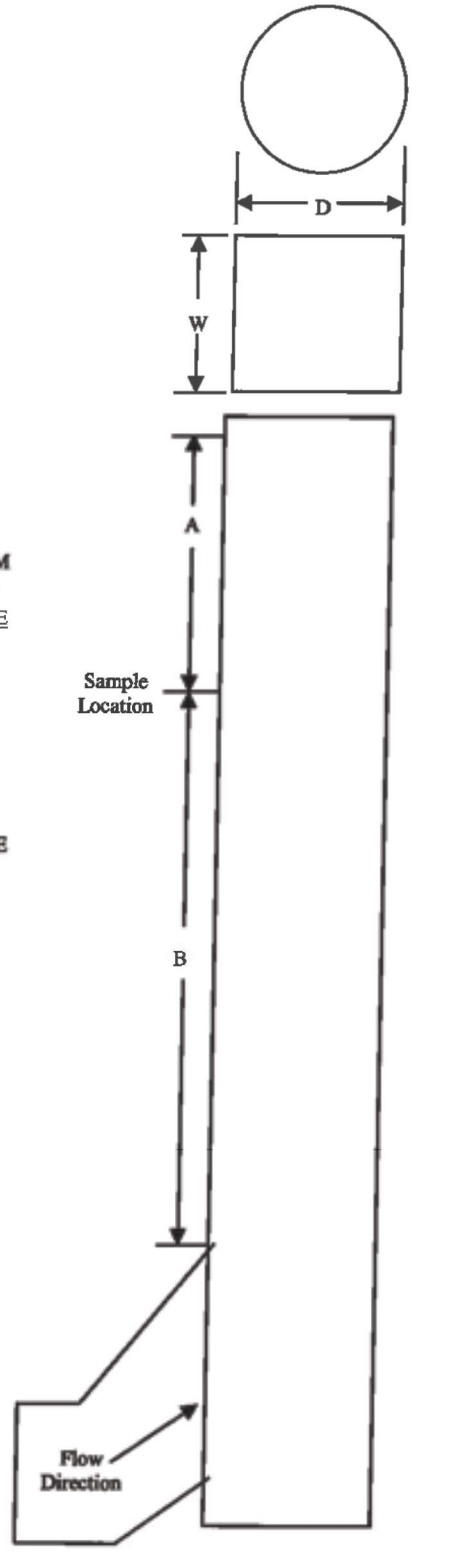
EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 13.00 inches

STACK/DUCT AREA = 0.92 sq.feet 132.7 sq.inches

DISTANCE OF TEST PORT LOCATION:	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	>26.0	>6.5
# OF DIAMETERS	>2.00	>0.50

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	0.50	0 1/2
2	6.7	0.87	0 7/8
3	11.8	1.53	1 1/2
4	17.7	2.30	2 1/4
5	25.0	3.25	3 1/4
6	35.6	4.63	4 5/8
7	64.4	8.37	8 3/8
8	75.0	9.75	9 3/4
9	82.3	10.70	10 3/4
10	88.2	11.47	11 1/2
11	93.3	12.13	12 1/8
12	97.9	12.50	12 1/2



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW METH

Almega ENVIRONMENTAL

Run # :	1	Pitot ID:	85	Impinger #	Initial	Final	Net	Pitot Leak Check			
Date :	8-16-19	Pitot Coeff. :	0.84	1	650.7	657.7		Initial :	✓	✓	
Client :	SCAQMD C	Meter Box # :	A-8	2	754.4	756.8		Final :	✓	✓	
Unit :	Baghouse - IN1	Meter @ Dh :	1.834	3	633.2	640.6					
Operator :	DJ	Meter Y :	1.0395	4	828.3	839.5		Meter Box Leak Check			
Stack Dia :	19.0"	TC # :	85	5					Rate	"HG	
Amb. Press :	29.9	Start Time :	7:48	H2O Gain =			00992	Initial :	.000	18"	
Static Press :	-1.5	Stop Time :	8:56	Filter :				Final :	.000	18"	

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Sqt delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
0	0				791.707								
1	3	.16	115	2.35	794.173	82	82	N/A	N/A	54	3.5	N/A	
2	6	.15	114	2.21	796.568	83	83	/	/	54	3.5	/	
3	9	.15	114	2.21	798.964	83	83	/	/	54	3.5	/	
4	12	.13	113	1.92	801.203	84	84	/	/	54	3.0	/	
5	15	.12	109	1.79	803.368	85	85	/	/	54	3.0	/	
6	18	.10	108	1.50	805.343	86	86	/	/	54	3	/	
7	21	.11	105	1.66	807.429	86	86	/	/	54	3	/	
8	24	.13	104	1.96	809.692	87	87	/	/	54	3	/	
9	27	.14	107	2.11	812.044	88	88	/	/	54	3.5	/	
10	30	.15	103	2.27	814.486	88	88	/	/	54	3.5	/	
11	33	.14	101	2.13	816.851	89	89	/	/	54	3.5	/	
12	36	.11	94	1.70	818.964	89	89	/	/	54	3	/	
END @ 8:16													
6	0				818.964								
1	3	.15	103	2.27	821.403	88	88	N/A	N/A	54	3.5	N/A	
2	6	.16	105	2.42	823.928	89	89	/	/	54	3.5	/	
3	9	.14	105	2.12	826.283	89	89	/	/	54	3.5	/	
4	12	.15	98	2.30	828.938	89	89	/	/	54	3.5	/	
5	15	.13	96	2.00	831.026	89	89	/	/	54	3.5	/	
6	18	.11	95	1.70	833.142	90	90	/	/	54	3	/	
7	21	.10	95	1.54	835.156	90	90	/	/	54	3	/	
8	24	.12	90	1.87	837.379	90	90	/	/	54	3	/	
9	27	.11	89	1.72	839.503	91	91	/	/	54	3	/	
10	30	.10	84	1.58	841.548	91	91	/	/	54	3	/	
11	33	.11	85	1.73	843.684	91	91	/	/	54	3	/	
12	36	.10	88	1.59	845.788	92	92	/	/	54	3	/	

START @ 9:20

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	100
Estimated Stack Temp:	130
Estimated Delta P:	
Estimated Moisture Content:	24%
Estimated O2:	20.8
Estimated CO2:	.05

Equipment Evaluation , OK? Y or N

Ambient Temp.:	64
TC Check:	✓
Pitot Check:	✓
Tedlar Bag:	N/A
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	#85
Nozzle Dia:	.348

Location: Inlet 2 (Upstream to Baghouse)

Almega ENVIRONMENTAL

SAMPLING AND VELOCITY TRAVERSE POINT DETERMINATION
SCAQMD METHOD 1.1

CLIENT: AQMD Facility C
PLANT NAME: Metal Melting Facility
CITY, STATE: [redacted] CA
SAMPLING LOCATION Inlet 2
TYPE OF TESTING: Metals/Particulate

NO. OF PORTS AVAILABLE: 2
NO. OF PORTS TO BE USED: 2
PORT INSIDE DIAMETER: 3 inches

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT: 22.00 inches
NIPPLE LENGTH AND/OR WALL THICKNESS: 6.00 inches
DEPTH OF STACK OR DUCT, D: 16.00 inches
STACK OR DUCT WIDTH (IF RECTANGULAR), W: #N/A inches

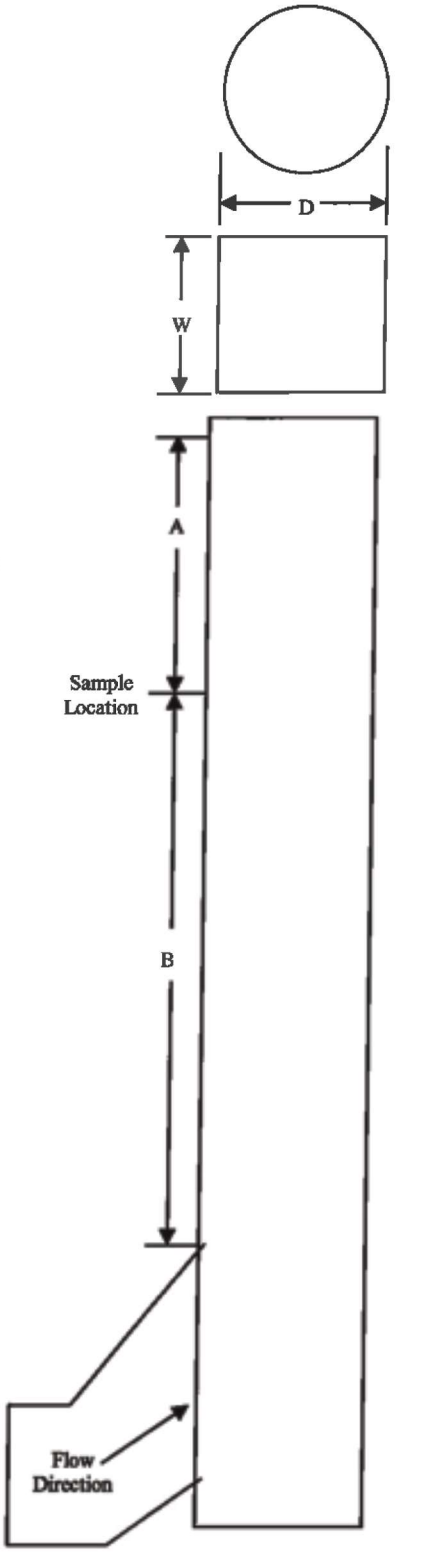
EQUIVALENT DIAMETER
De = 2*(DEPTH)*(WIDTH)/(DEPTH+WIDTH) = 16.00 inches

STACK/DUCT AREA = 1.40 sq.feet 201.1 sq.inches

DISTANCE OF TEST PORT LOCATION:	UPSTREAM FROM FLOW DISTURBANCE B	DOWNSTREAM FROM FLOW DISTURBANCE A
# OF INCHES	42.00	196.00
# OF DIAMETERS	2.63	12.25

MINIMUM NUMBER OF TRAVERSE POINTS: 24

POINT NO.	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL (in.)	DISTANCE FROM OUTSIDE OF PORT (in.)
1	2.1	0.50	6 1/2
2	6.7	1.07	7 1/8
3	11.8	1.89	7 7/8
4	17.7	2.83	8 7/8
5	25.0	4.00	10
6	35.6	5.70	11 3/4
7	64.4	10.30	16 1/4
8	75.0	12.00	18
9	82.3	13.17	19 1/8
10	88.2	14.11	20 1/8
11	93.3	14.93	20 7/8
12	97.9	15.50	21 1/2



DRAWING NOT TO SCALE

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW

METH

Almega ENVIRONMENTAL

Run # :	1	Pitot ID:	28	Impinger #	Initial	Final	Net	Pitot Leak Check	
Date :	8-14-19	Pitot Coeff. :	0.84	1	757.4	776.3		Initial :	✓ ✓
Client :	SCAQMDC	Meter Box # :	A-6	2	727.8	732.7		Final :	✓ ✓
Unit :	Inlet	Meter @ Dh :	1.759	3	670.2	671.9			
Operator :	WB	Meter Y :	1.0574	4	741.9	744.6		Meter Box Leak Check	
Stack Dia :	14.0"	TC # :	28	5				Rate	"HG
Amb. Press :	29.9	Start Time :	0740	H2O Gain =	0094/99			Initial :	19 0.001
Static Press :	-4.5	Stop Time :	0858	Filter :				Final :	10 0.000

Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Set delta H ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
12	0	2.70	96	3.40	572.522	64	64	NA	NA	52	4		
11	3	2.80	95	3.55	575.34	65	65			52	4		
10	6	2.70	94	3.40	578.22	66	66			53	4		
9	9	2.65	95	3.35	581.09	69	69			55	4		
8	12	1.90	100	2.40	583.87	70	70			54	3		
7	15	1.95	94	2.45	586.25	72	72			55	3		
6	18	1.70	94	2.15	588.76	73	73			57	3		
5	21	1.30	97	1.65	590.96	74	74			59	3		
4	24	1.10	100	1.40	592.97	75	75			58	3		
3	27	1.10	85	1.40	594.73	75	75			56	3		
2	30	1.00	83	1.25	596.54	76	76			56	2		
1	33	0.98	82	1.25	598.33	76	76			54	2		
12	36	1.90	93	2.40	600.06	75	75			56	3		
11	39	2.00	95	2.55	602.38	76	76			52	3		
10	42	2.30	98	2.90	604.82	77	77			51	3		
9	45	2.30	97	2.90	607.50	78	78			52	3		
8	48	2.10	96	2.65	610.12	79	79			54	3		
7	51	2.40	99	3.05	612.62	80	80			55	3		
6	54	1.90	97	2.40	615.33	80	80			56	3		
5	57	1.20	95	1.50	617.69	81	81			56	3		
4	60	1.60	92	2.05	619.58	81	81			57	3		
3	63	1.15	87	1.45	621.74	81	81			56	3		
2	66	1.10	87	1.40	623.66	81	81			56	3		
1	69	1.10	85	1.40	625.50	82	82			57	3		
END	72				627.346								

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation, OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	GI 20
Nozzle Dia:	0.181

APPENDIX E3

PARTICULATE MATTER (PM) – LABORATORY DATA

Almega ENVIRONMENTAL

LABORATORY REPORT

SCAQMD M5.1

Lab Report No. A 085
Client Name: AQMD
Unit Tested: Facility C

Project No.: c10566
Date Sampled: 16-Aug-19
Analyst: DW

Client ID	Run #1	Run #2	Run #3	Field Blank
Container No 1 (Filter)	1	1	1	1
Client ID No.:	10566-M5.1-11-R1-C1	10566-M5.1-12-R1-C1	10566-M5.1-O-R1-C1	10566-M5.1-FB-C1
Lab ID No.:	A 085 - R1 - C1	A 085 - R2 - C1	A 085 - R3 - C1	A 085 - FB - C1
Filter ID #	9492	9494	9491	9493
Filter wt., total, mg (m_{fw})	35.20	7.20	0.90	0.20
Filter Acid, mg	ND	NA	NA	NA
Filter SO4, mg	0.00	NA	NA	NA
Filter wt. net ,mg (m_{fn})	**35.20**	**7.20**	**0.90**	**0.20**
Container No 2 (Impinger) -Water org	2	2	2	2
Client ID No.:	10566-M5.1-11-R1-C2	10566-M5.1-12-R1-C2	10566-M5.1-O-R1-C2	10566-M5.1-FB-C2
Lab ID No.:	A 085 - R1 - C2 org	A 085 - R2 - C2 org	A 085 - R3 - C2 org	A 085 - FB - C2 org
Volume, ml (V_{mw})	100	100	100	100
Impinger Catch, total, mg (m_{acc})	46.70	20.65	0.15	0.10
Methylen Chloride Blank, mg (W_{bl})	0.03	0.03	0.03	0.03
Impinger Catch, net, mg (m_{acn}) (m_{acw}-m_{acr}-W_{bl})	**46.67**	**20.62**	**0.12**	**0.07**
Container No 2 (Impinger) -Water sr	2	2	2	2
Client ID No.:	10566-M5.1-11-R1-C2	10566-M5.1-12-R1-C2	10566-M5.1-O-R1-C2	10566-M5.1-FB-C2
Lab ID No.:	A 085 - R1 - C2 sr	A 085 - R2 - C2 sr	A 085 - R3 - C2 sr	A 085 - FB - C2 sr
Volume, L ($V_{t,w}$)	650	715	625	450
Impinger Catch, total, mg (m_{acw})	23.70	17.40	5.55	0.15
DI Water Blank, mg (W_{bl})	0.00	0.00	0.00	0.00
Impinger Acid, mg ($m_{H,Cl}$)	ND	ND	ND	ND
Impinger SO4, mg ($m_{H,SO}$)	0.00	0.00	3.29	0.00
Impinger Catch, net, mg (mB_{wn}) (m_{acw}-m_{acr}-W_{bl})	**23.70**	**17.40**	**5.55**	**0.15**
Total Particulate mass, net, mg (m_t)	**105.60**	**45.25**	**6.60**	**0.45**
Blank correction weight of PM, mg (m_{tb})	**105.57**	**45.22**	**6.57**	**0.42**

$m_t = m_{fn} + m_{acn} - m_{bln}$

Checked by: DW

SUMMARY
SCAQMD M5.1

Almega ENVIRONMENTAL

Laboratory:	Almega	Project No.:	c10566
Project:	AQMD	Filter, Beaker Wt. Log Page(s):	#40 ##31-32
Unit Tested:	Facility C		
Lab. ID No.:	A 085		

Sample Number	Lab ID	Tare Wt. (avg. g)	Final Wt. (avg. g)	Net Change (mg)	Volume ml	Blank mg	Comments
10566-M5.1-I1-R1-C1	A 085 - R1 - C1	0.3947	0.4299	35.20	-		Inlet - 1
10566-M5.1-I1-R1-C2	A 085 - R1 - C2 org	29.4022	29.4489	46.70	100	0.03	Inlet - 1
10566-M5.1-I1-R1-C2	A 085 - R1 - C2 sr	28.8027	28.8264	23.70	650	0.00	Inlet - 1
10566-M5.1-I2-R1-C1	A 085 - R2 - C1	0.3934	0.4006	7.20	-		Inlet - 2
10566-M5.1-I2-R1-C2	A 085 - R2 - C2 org	29.1778	29.1985	20.65	100	0.03	Inlet - 2
10566-M5.1-I2-R1-C2	A 085 - R2 - C2 sr	42.1259	42.1433	17.40	715	0.00	Inlet - 2
10566-M5.1-O-R1-C1	A 085 - R3 - C1	0.3917	0.3926	0.90	-		Outlet
10566-M5.1-O-R1-C2	A 085 - R3 - C2 org	29.2838	29.2840	0.15	100	0.03	Outlet
10566-M5.1-O-R1-C2	A 085 - R3 - C2 sr	29.1118	29.1174	5.55	625	0.00	Outlet
10566-M5.1-FB-C1	A 085 - FB - C1	0.3939	0.3941	0.20	-		Field Blank
10566-M5.1-FB-C2	A 085 - FB - C2 org	29.1975	29.1976	0.10	100	0.03	Field Blank
10566-M5.1-FB-C2	A 085 - FB - C2 sr	29.1218	29.1220	0.15	450	0.00	Field Blank
Reagent Blank		28.6642	28.6641	-0.05	500		DI Water
Reagent Blank		28.7205	28.7207	0.15	500		Methylene Chloride

CALCULATIONS

$C_A = m_A/(V_A * \rho_A)$

Where:

C_A - Blank Concentration

m_A - Mass of residue of after evaporation, mg

V_A - Volume of blank, ml

ρ_A - Density , g/ml

$W_A = C_A * V_{WA} * \rho_A$

Where:

W_A - Weight of residue , mg

V_{WA} - Volume of liquid use, ml

Reagent Blank

Methylene Chloride

Density of methylene chloride ρM, g/ml =	1.3550
Methylene Chloride blank volume V_M, ml =	500
Methylene Chloride blank concentration C_M, mg/g =	0.0002

MeCl Lot No. 186645 Fisher Scientific Optima

DI Water

Density of Water ρW, g/ml	0.998
Water blank volume VW, ml =	500
Water blank concentration C_W, mg/g =	0.0000

DI Water System - Pure Water Tech - WaterLogic Co.

DNJ

SULFURIC ACID & SULFUR OXIDES - LABORATORY DATA SHEET

Client:	AQMD	Project #:	c10566	Checked by: DW
Site Location:	NA	Unit Tested:	Facility C	
Analyst:	DW	Date Analyzed:	12-Sep-19	

Sample No.	Sample			Sample Titration			Acid, as $H_2SO_4*2H_2O$ mg	Sulfate, as $H_2SO_4*2H_2O$ mg
	Total, V (mL)	Aliquot, A (mL)	Factor. F = V/A	T1 (mL)	T2 (mL)	Avg, V (mL)		
ANALYSIS FOR ACID								
A 085 - R1 - C1	50	10	5	0.00	0.00	0.00	ND	
A 085 - R1 - C2 sr	50	10	5	0.00	0.00	0.00	ND	
A 085 - R2 - C2 sr	50	10	5	0.00	0.00	0.00	ND	
A 085 - R3 - C2 sr	50	10	5	0.00	0.00	0.00	ND	
A 085 - FB - C2 sr	50	10	5	0.00	0.00	0.00	ND	
ANALYSIS FOR SULFATE								
A 085 - R1 - C1	50	10	5	0.02	0.02	0.02		0.00
A 085 - R1 - C2 sr	50	10	5	0.02	0.02	0.02		0.00
A 085 - R2 - C2 sr	50	10	5	0.02	0.02	0.02		0.00
A 085 - R3 - C2 sr	50	10	5	1.00	1.00	1.00		3.29
A 085 - FB - C2 sr	50	10	5	0.02	0.02	0.02		0.00

No.	Sodium Hydroxide Titration			Barium Chloride Titration		
	KHP (mg)	Volume, Vs (mL)	Normality, Ns	Aliquot, VI (10 mL)	Volume, VT (mL)	Normality, NB
Blank	-	0.00	-	-	0.02	
1			0.00000	4	4.02	0.01003
2			0.00000	4	4.02	0.01003
Avg.			0.10000			0.01003

Detection Limit	
Sulfate,as $H_2SO_4*2H_2O$, mg	0.01
Acid,as $H_2SO_4*2H_2O$, mg	0.13

Sulfuric Acid Concentraton 0.01000N
Ricca Lot 4610D98 Exp Sept 2019
Sodium Hydroxide Solution 0.100 N
BDH Lot 18J1156571 Exp Sept 2021

CALCULATIONS: $N_S = (\text{mg KHP}/203.44)/(Vs-V_{SB})$
$N_B = (V_1 \times N_{H2SO4})/(V_T-V_{TB})$

Sulfate
as SO_4, mg=$(V_S-V_B) \times N_B \times 134.11/2 \times F$

Acid
as SO_4, mg=$(V_S-V_B) \times N_S \times 134.11/2 \times F$

Lot # A085

Almega ENVIRONMENTAL

CHAIN OF CUSTODY RECORDS

INVOICE TO:

ATTN:

REPORT TO:

PO # _____

ALMEGA Environmental & Technical Services
10602 Walker St.
Cypress, CA 90630
(714) 889-4000 Fax (714) 889-7030
lab@almegaenv.com
Contact:

Turnaround Time
Standard: X Other: _____
Rush:
Depends on # of Samples
5 - 10 days _____
3 - 7 days _____

Job # 10566 | Unit # Baghouse | Client: SCAQMD - C | Location: Inlet & Outlet

Samplers: (Signature)

Project Manager: Morgan Nguyen

Unit Information:

ANALYSIS REQUESTED

Return or Dispose

Sample Date	Sample Time	Sample Identification	Lab Sample #	Type Of Sample: LIQUID	GAS	SOLID	No of Containers	SCAQMD M5.1	Organic Analysis	Metal	Sulfates, pH, etc	Dried filter	REMARKS
8/16/2019	700	10566-M5.1-FB-C1	A085 FB-C1			x	1	✓		✓	✓		
		10566-M5.1-FB-C2	-C2	x			1	✓	✓	✓			
8/16/2019	7:40 - 8:56	10566-M5.1-I1-R1-C1	R1-C1			x	1	✓		✓	✓		
		10566-M5.1-I1-R1-C2	-C2	x			1	✓	✓	✓			
8/16/2019	7:40 - 8:56	10566-M5.1-I2-R1-C1	R2-C1			x	1	✓		✓	✓		
		10566-M5.1-I2-R1-C2	-C2	x			1	✓	✓	✓			
8/16/2019	7:40 - 8:56	10566-M5.1-O-R1-C1	R3-C1			x	1	✓		✓	✓		
		10566-M5.1-O-R1-C2	-C3	x			1	✓	✓	✓			

Relinquished by:	Received by:	Relinquished by:	Received by:
Date: 8/16/2019 Time 11:30	Date: 8/16/19 Time: 11:40	Date: Time:	Date: Time
Relinquished by:	Received by:	Relinquished by:	Received by:
Date: Time	Date: Time:	Date: Time:	Date: Time

10566a_SCAQMD_Facility_Report

Almega ENVIRONMENTAL

Almega ENVIRONMENTAL

Almega ENVIRONMENTAL

Standard Receipt
Sample LOG in Checklist

Project No: e10566

Lab ID: A085

Method: 25.1, 25.1

Sampling Date: 8/13 - 8/16

Location: AQMD - C Int:

Date & Time Rc'd: 8/16/19 11:40

Location: LAB Int: DN

Arrived By: (circle) FedEx UPS Drop Off (Int) ok Other

Condition of Package(s): (comment): ok

Package Type: (Box) Cooler Other:

Number of Sample Container(s): 8, 3

Correct Containers (per Method): (Y) N

Preservation: (circle) ICE DryICE ICEPacks (None)

Sample Conditions:

Sample Temp (C): 21

Ambient Temp (C): 21

Sample Temp (C):

Filter Condition: ok - Dirty

PH :

Components Sealed: (Y) N

Sample Recovery Completed On: (date & time)

Recovered In: (circle) (Field) Lab Other

Silica Gel Condition:

Tedlar Bags - Condensation: Y N

Comments:

Container(s) Requested: Glass Plastic

Additional Comments:

A085-R2-C2 = hard to extract, Black residue stuck to bottle media used to collect it. ~~Separation~~

Beakers Weight Record

Laboratory: Almega
Project: AQMD
Project No.: c10566
Unit Tested: Facility C
Lab. ID No.: A 085

x Pretest

(page _ of _)
Balanced ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 12-Jun-19
Beaker Weight Log Page(s): ##31 - 32

Sample Number	Lab ID	Beaker ID	Beaker Weights (g)							D Wt. (mg)	Volume ml	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average			
10566-MS.1-I1-R1-C2	A 085 - R1 - C2 org	6699	8/19/19 11:00	DW	29.4021	8/26/19 11:00	DW	29.4023	**29.4022**	0.20	100	Inlet - 1
10566-MS.1-I1-R1-C2	A 085 - R1 - C2 sr	7795	8/28/19 11:00	DW	28.8027	8/29/19 11:00	DW	28.8026	**28.8027**	0.10	650	Inlet - 1
10566-MS.1-I2-R1-C2	A 085 - R2 - C2 org	8305	8/19/19 11:00	DW	29.1777	8/26/19 11:00	DW	29.1779	**29.1778**	0.20	100	Inlet - 2
10566-MS.1-I2-R1-C2	A 085 - R2 - C2 sr	3023	8/28/19 11:00	DW	42.1258	8/29/19 11:00	DW	42.1259	**42.1259**	0.10	715	Inlet - 2
10566-MS.1-O-R1-C2	A 085 - R3 - C2 org	8302	8/19/19 11:00	DW	29.2838	8/26/19 11:00	DW	29.2838	**29.2838**	0.00	100	Outlet
10566-MS.1-O-R1-C2	A 085 - R3 - C2 sr	8027	8/28/19 11:00	DW	29.1118	8/29/19 11:00	DW	29.1118	**29.1118**	0.00	625	Outlet
10566-MS.1-FB-C2	A 085 - FB - C2 org	7928	8/19/19 11:00	DW	29.1974	8/26/19 11:00	DW	29.1975	**29.1975**	0.10	100	Field Blank
10566-MS.1-FB-C2	A 085 - FB - C2 sr	e013	8/28/19 11:00	DW	29.1218	8/29/19 11:00	DW	29.1218	**29.1218**	0.00	450	Field Blank
Reagent Blank		4321	5/24/19 17:00	DW	28.6641	5/31/19 17:00	DW	28.6642	**28.6642**	0.10	500	DI Water
Reagent Blank		7965	11/1/18 11:00	DW	28.7206	11/2/18 11:00	DW	28.7204	**28.7205**	0.20	500	Methylene Chloride

Beakers Weight Record

x Post-test (page__of__)

Laboratory: Almega
Project: AQMD
Project No.: c10566
Unit Tested: Facility C
Lab. ID No.: A 085

Balanced ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 12-Jun-19
Beaker Weight Log Page(s): #831 - 32

Sample Number	Lab ID	Beaker ID	Beaker Weights (g)							D Wt. (mg)	Volume ml	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average			
10566-M5.1-I1-R1-C2	A 085 - R1 - C2 org	6699	9/5/19 11:00	DW	29.4488	9/6/19 14:00	DW	29.4490	**29.4489**	-0.20	100	Inlet - 1
10566-M5.1-I1-R1-C2	A 085 - R1 - C2 sr	7795	9/5/19 11:00	DW	28.8262	9/6/19 14:00	DW	28.8265	**28.8264**	-0.30	650	Inlet - 1
10566-M5.1-I2-R1-C2	A 085 - R2 - C2 org	8305	9/5/19 11:00	DW	29.1983	9/6/19 14:00	DW	29.1986	**29.1985**	-0.30	100	Inlet - 2
10566-M5.1-I2-R1-C2	A 085 - R2 - C2 sr	3023	9/5/19 11:00	DW	42.1434	9/6/19 14:00	DW	42.1431	**42.1433**	0.30	715	Inlet - 2
10566-M5.1-O-R1-C2	A 085 - R3 - C2 org	8302	9/5/19 11:00	DW	29.2839	9/6/19 14:00	DW	29.2840	**29.2840**	-0.10	100	Outlet
10566-M5.1-O-R1-C2	A 085 - R3 - C2 sr	8027	9/5/19 11:00	DW	29.1173	9/6/19 14:00	DW	29.1174	**29.1174**	-0.10	625	Outlet
10566-M5.1-FB-C2	A 085 - FB - C2 org	7928	9/5/19 11:00	DW	29.1976	9/6/19 14:00	DW	29.1975	**29.1976**	0.10	100	Field Blank
10566-M5.1-FB-C2	A 085 - FB - C2 sr	4013	9/5/19 11:00	DW	29.1219	9/6/19 14:00	DW	29.1220	**29.1220**	-0.10	450	Field Blank
Reagent Blank		4321	6/10/19 11:00	DW	28.6641	6/11/19 14:00	DW	28.6641	**28.6641**	0.00	500	DI Water
Reagent Blank		7965	11/15/18 11:00	DW	28.7207	11/16/18 12:00	DW	28.7206	**28.7207**	0.10	500	Methylene Chloride

Filter Weight Record

x Pretest (page__of__)

Laboratory: Almega
Project: AQMD
Project No.: c10566
Unit Tested: Facility C
Lab. ID No.: A 085

Balanced ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 12-Jun-19
Filter Weight Log Page(s): #40

Client Sample No.	Lab ID	Filter ID	Filter Weights (g)							D Wt. (mg)	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average		
10566-M5.1-I1-R1-C1	A 085 - R1 - C1	9492	7/29/19 11:00	DW	0.3947	8/12/19 11:00	DW	0.3947	0.3947	0.00	Inlet - 1
10566-M5.1-I2-R1-C1	A 085 - R2 - C1	9494	7/29/19 11:00	DW	0.3933	8/12/19 11:00	DW	0.3934	0.3934	-0.10	Inlet - 2
10566-M5.1-O-R1-C1	A 085 - R3 - C1	9491	7/29/19 11:00	DW	0.3916	8/12/19 11:00	DW	0.3917	0.3917	-0.10	Outlet
10566-M5.1-FB-C1	A 085 - FB - C1	9493	7/29/19 11:00	DW	0.3938	8/12/19 11:00	DW	0.3939	0.3939	-0.10	Field Blank

DW

Filter Weight Record

x Post-test (page__of__)

Laboratory: Almega
Project: AQMD
Project No.: c10566
Unit Tested: Facility C
Lab. ID No.: A 085

Balanced ID: A&D ER-182A
Serial No.: 4702866
Last Calibration: 12-Jun-19
Filter Weight Log Page(s): #40

Client Sample No.	Lab ID	Filter ID	Filter Weights (g)							D Wt. (mg)	Comments
			Date/Time	By	Wt. 1	Date/Time	By	Wt. 2	Average		
10566-M5.1-I1-R1-C1	A 085 - R1 - C1	9492	9/5/19 10:00	DW	0.4299	9/6/19 11:00	DW	0.4299	**0.4299**	0.00	Inlet - 1
10566-M5.1-I2-R1-C1	A 085 - R2 - C1	9494	9/5/19 10:00	DW	0.4006	9/6/19 11:00	DW	0.4005	**0.4006**	0.10	Inlet - 2
10566-M5.1-O-R1-C1	A 085 - R3 - C1	9491	9/5/19 10:00	DW	0.3925	9/6/19 11:00	DW	0.3926	**0.3926**	-0.10	Outlet
10566-M5.1-FB-C1	A 085 - FB - C1	9493	9/5/19 10:00	DW	0.3941	9/6/19 11:00	DW	0.3940	**0.3941**	0.10	Field Blank

Almega ENVIRONMENTAL

TITRATION

closed MS.1

Acids

Page: # 21

No	Sample ID	Date	Sample Volume		DF	mL	Note
			ml (S)	aliquot (A)	(S/A)	used	
1	ADES R1-C1	9/12	50	10	5	0.00	0.1N NaOH
2	Dup		"	"	"	0.00	
3	R1-C2-S5		"	"	"	0.00	
4	Dup		"	"	"	0.00	
5	R2-C2-S5		"	"	"	0.00	
6	Dup		"	"	"	0.00	
7	R3-C2-S5		"	"	"	0.00	
8	Dup		"	"	"	0.00	
9	FB-C2-S5		"	"	"	0.00	
10	Dup		"	"	"	0.00	
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							

DF = Dilution Factor

Comments: 0.1N NaOH Lot# 18J1156571 Exp. Oct 2021 VWR-BDH

c10566

TITRATION

Almega ENVIRONMENTAL

Sulfites mS.1

Page: # 20

No	Sample ID	Date	Sample Volume		DF (S/A)	mL used	Note
			ml (S)	aliquot (A)			
1	0.01N H_2SO_4	9/12	4	4	1	4.02	0.01N BaCl2
2	Dup		"	"	"	4.02	
3	DI Blk		100	100	1	.02	
4	Dup		"	"	"	.02	
5	AOBS R1-C1		50	10	5	.02	
6	Dup		"	"	"	.02	
7	R1-C2-ST		"	"	"	.02	
8	Dup		"	"	"	.02	
9	R2-C2-ST		"	"	"	.02	
10	Dup		"	"	"	.02	
11	R3-C2-ST		"	"	"	1.00	
12	Dup		"	"	"	1.00	
13	FB-C2ST		"	"	"	0.02	
14	Dup		"	"	"	0.02	
15							
16							
17							
18							
19							
20							
21							

DF = Dilution Factor

Comments * 0.01N Sulfuric Acid Lot# 461D98 Exp Sept 2019 Recd

APPENDIX F

COLLECTION/CAPTURE EFFICIENCY TEST

APPENDIX G

QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

TEST EQUIPMENT CALIBRATION DATA

Almega ENVIRONMENTAL

ISOKINETIC DATA FORM, TE COOLER & CYCLONIC FLOW METH

Almega ENVIRONMENTAL

Run # :	Prelim	Pitot ID:		Impinger #	Initial	Final	Net
Date :	8/15/19	Pitot Coeff. :		1			
Client :	[redacted]	Meter Box # :		2			
Unit :	Outlet 1	Meter @ Dh :		3			
Operator :		Meter Y :		4			
Stack Dia :		TC # :		5			
Amb. Press :		Start Time :	740	H2O Gain =			
Static Press :		Stop Time :	755	Filter :			

ΔP ADM

Pitot Leak Check

Initial :		
Final :		

Meter Box Leak Check

	Rate	"HG
Initial :		
Final :		

	Traverse Points	Time (Minute)	Delta P ("H2O)	Stack Temp. (F)	Sq Root Dp ("H2O)	Meter Volume (acf)	Mtr. Inlet Temp. (F)	Mtr. Outlet Temp. (F)	Oven Temp. (F)	Probe Temp. (F)	Impinger Temp. (F)	Pump Vac. ("HG)	TE Cooler Temp. (F)	Cyclonic Flow ("H2O)
A	12		0.06	96	0.0781									
	11		0.07	96	0.0754									
	10		0.07	96	0.0794									
	9		0.06	95	0.0643									
	8		0.05	94	0.0545									
	7		0.04	94	0.0365									
	6		0.04	94	0.0406									
	5		0.03	94	0.0422									
	4		0.03	93	0.0346									
	3		0.03	93	0.0525									
	2		0.04	88	0.0514									
	1		0.05	88	0.0541									
B	12		002	93	0.0254									
	11		0.03	90	0.0292									
	10		0.03	90	0.0303									
	9		0.02	85	0.0250									
	8		0.03	90	0.0340									
	7		0.04	93	0.0463									
	6		0.03	90	0.0432									
	5		0.05	88	0.0623									
	4		0.05	88	0.0732									
	3		0.04	87	0.0783									
	2		0.07	87	0.0814									
	1		0.07	89	0.0593									

Isokinetic Factor Setup

Estimated Dry Gas Meter Temp:	
Estimated Stack Temp:	
Estimated Delta P:	
Estimated Moisture Content:	
Estimated O2:	
Estimated CO2:	

Equipment Evaluation , OK? Y or N

Ambient Temp.:	
TC Check:	
Pitot Check:	
Tedlar Bag:	
Pitot Exp Date:	
TC Exp Date	

Dry Gas Meter Leak Checks

	1	2	3	4
DGM Initial:				
Vacuum:				
Leak Rate:				
DGM Final:				

Nozzle Information

Nozzle ID:	
Nozzle Dia:	

	Reported Inclined H2O	Electronic ADM
	0.06	0.0781
	0.07	0.0759
	0.07	0.0755
	0.06	0.0643
	0.05	0.0545
	0.04	0.0365
	0.04	0.0406
	0.03	0.0422
	0.03	0.0446
	0.03	0.0525
	0.04	0.0514
	0.05	0.0541
	0.02	0.0254
	0.03	0.0292
	0.03	0.0303
	0.02	0.0250
	0.03	0.0340
	0.04	0.0463
	0.03	0.0432
	0.05	0.0623
	0.05	0.0732
	0.06	0.0783
	0.07	0.0814
	0.07	0.0593
Average	**0.0446**	**0.0524**
Sqrt of the average	**0.211**	**0.229**
% difference from RM (ADM)	**7.8%**	
Biased	**Low**	

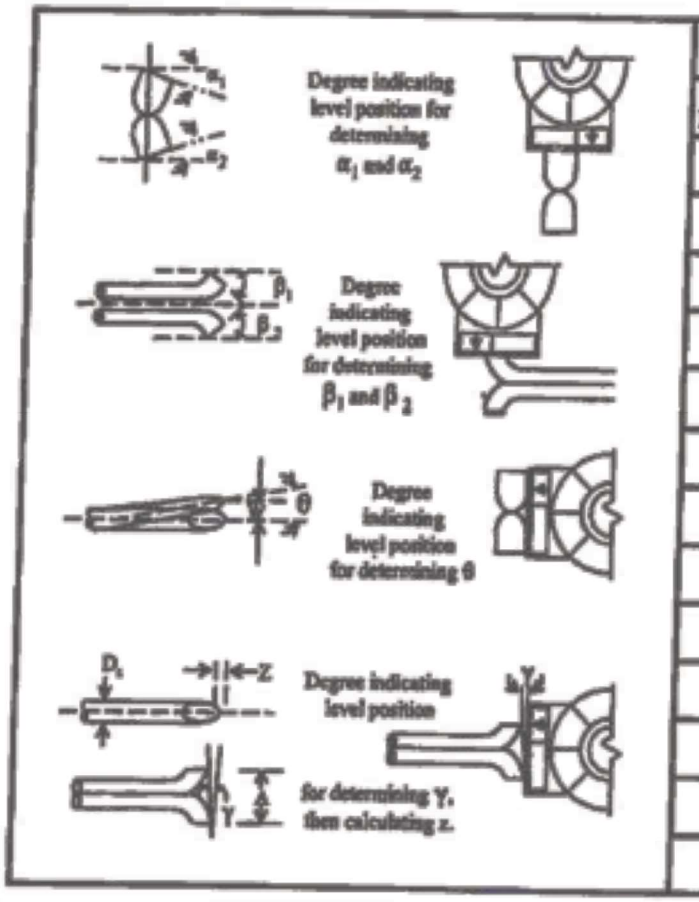
Almega ENVIRONMENTAL

TYPE S PITOT TUBE SEMIANNUAL INSPECTION SHEET

CAL DATE: 6/14/2019

NEXT DUE DATE: 12/13/2019

PITOT ID: 28



Parameter	Values	Allowable Range
Level and Perpendicular?	Yes OR No	Yes
Obstruction?	Yes OR No	No
Damaged?	Yes OR No	No
α1	0	$-10° \leq \alpha 1 \leq +10°$
α2	0	$-10° \leq \alpha 2 \leq +10°$
β1	0	$-5° \leq \beta 1 \leq +5°$
β2	0	$-5° \leq \beta 2 \leq +5°$
γ	0	NA
θ	0	NA
Z = A (tan γ)	0.000	≤ 0.125 in.
W = A (tan θ)	0.000	≤ 0.031 in.
Dt	0.372	0.188 ≤ Dt ≤ 0.375
A	0.937	NA
A/2/(Dt)	1.26	1.05 ≤ PA/Dt ≤ 1.5

Certification:

I certify that this pitot tube meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor Cp of 0.84.

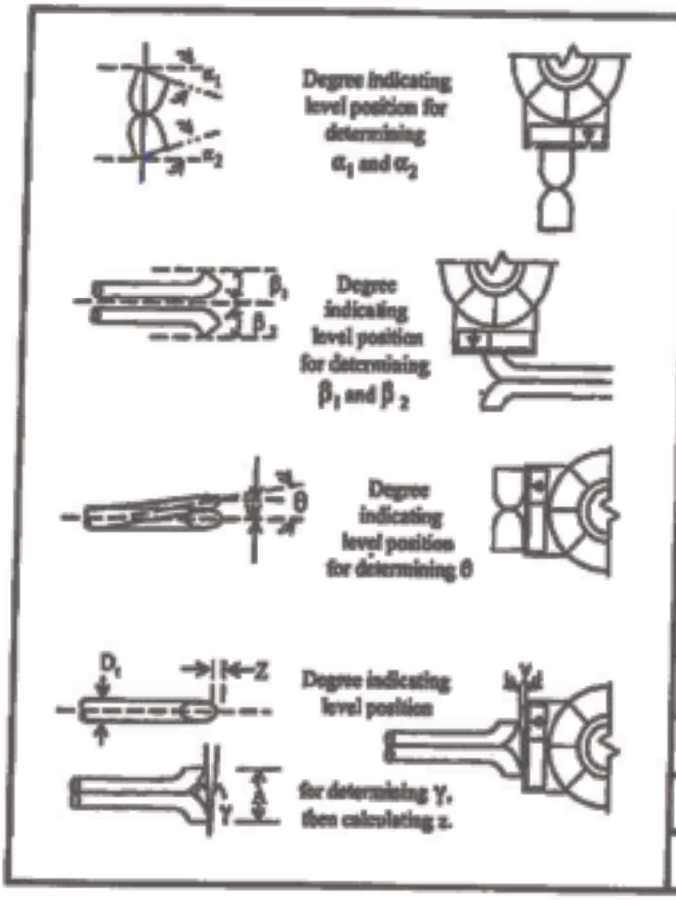
Certified By: William Bryant **Date:** 6/14/2019

TYPE S PITOT TUBE SEMIANNUAL INSPECTION SHEET

CAL DATE: 6/14/2019

NEXT DUE DATE: 12/13/2019

PITOT ID: 73



Parameter	Values	Allowable Range
Level and Perpendicular?	Yes OR No	Yes
Obstruction?	Yes OR No	No
Damaged?	Yes OR No	No
α1	0	$-10° \leq \alpha1 \leq +10°$
α2	0	$-10° \leq \alpha2 \leq +10°$
β1	0	$-5° \leq \beta1 \leq +5°$
β2	0	$-5° \leq \beta2 \leq +5°$
γ	0	NA
θ	0	NA
Z = A (tan γ)	0.000	≤ 0.125 in.
W = A (tan θ)	0.000	≤ 0.031 in.
Dt	0.374	$0.188 \leq Dt \leq 0.375$
A	0.875	NA
A/2/(Dt)	1.17	$1.05 \leq PA/Dt \leq 1.5$

Certification:

I certify that this pitot tube meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor Cp of 0.84.

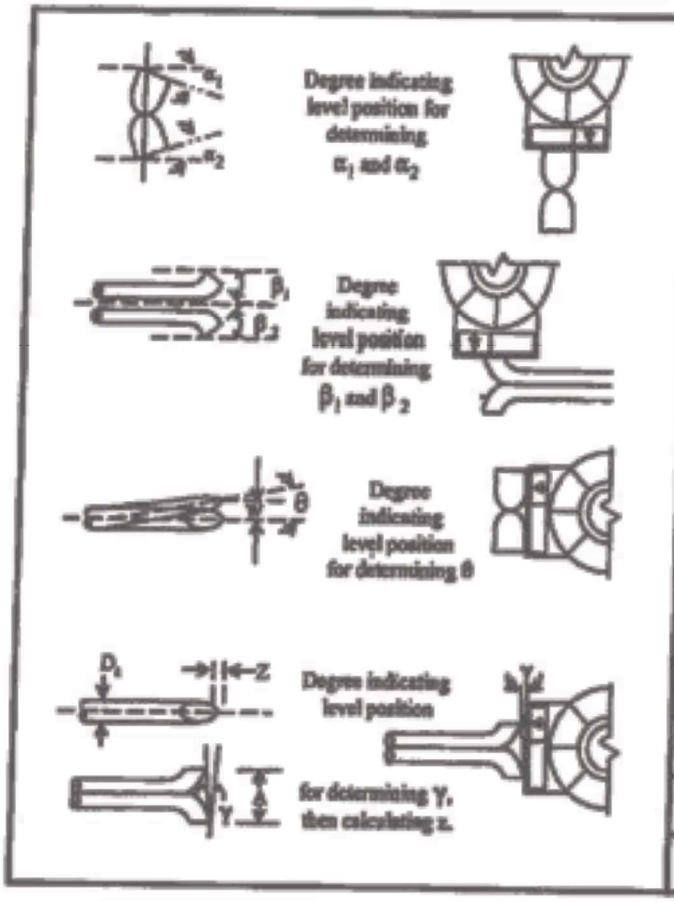
Certified By: William Bryant **Date:** 6/14/2019

TYPE S PITOT TUBE SEMIANNUAL INSPECTION SHEET

CAL DATE: 6/14/2019

NEXT DUE DATE: 12/13/2019

PITOT ID: 85



Parameter	Values	Allowable Range
Level and Perpendicular?	Yes OR No	Yes
Obstruction?	Yes OR No	No
Damaged?	Yes OR No	No
α1	0	$-10° \le \alpha1 \le +10°$
α2	0	$-10° \le \alpha2 \le +10°$
β1	0	$-5° \le \beta1 \le +5°$
β2	0	$-5° \le \beta2 \le +5°$
γ	0	NA
θ	1	NA
Z = A (tan γ)	0.000	≤ 0.125 in.
W = A (tan θ)	0.016	≤ 0.031 in.
Dt	0.375	$0.188 \le Dt \le 0.375$
A	0.917	NA
A/2/(Dt)	1.22	$1.05 \le PA/Dt \le 1.5$

Certification:

I certify that this pitot tube meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor Cp of 0.84.

Certified By: William Bryant **Date:** 6/14/2019

ALMEGA ENVIRONMENTAL AND TECHNICAL SERVICES
10602 WALKER STREET
CYPRESS, CA 90630

STACK TEMPERATURE SENSOR SEMI-ANNUAL CALIBRATION

TEMPERATURE SENSOR I.D:	28	REF. DIGITAL NIST TRACEABLE THERMOMETER ID:: 1, 2 & 3
READ OUT I.D:	VA710	ICE BATH: YES
PITOT TUBE I.D:	28	BOILING WATER: YES
PITOT TUBE LENGTH:	37"	HOT OIL: YES
DATE:	6/14/2019	CALIBRATED BY: CH/JO

S/N: 160764570 Due Date 11/13/2019	ICE BATH			
	REF.DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (°F)	FIELD METER TEMPERATURE (°F)	ABSOLUTE DIFFERENCE TEMPERATURE (°F)	% DIFFERENCE (%)
	31.4	31.5	0.1	0.3
	31.4	31.4	0.0	0.0
	31.4	31.4	0.0	0.0

S/N: 160764579 Due Date 11/13/2019	BOILING WATER			
	REF. DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (°F)	FIELD METER TEMPERATURE (°F)	ABSOLUTE DIFFERENCE TEMPERATURE (°F)	% DIFFERENCE (%)
	212.5	211.9	0.6	0.3
	212.8	212.1	0.7	0.3
	213.9	212.3	1.6	0.7

S/N: 160764557 Due Date 11/13/2019	HOT OIL			
	REF.DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (°F)	FIELD METER TEMPERATURE (°F)	ABSOLUTE DIFFERENCE TEMPERATURE (°F)	% DIFFERENCE (%)
	485.0	483.0	2.0	0.4
	486.0	484.0	2.0	0.4
	488.0	485.0	3.0	0.6

NOTE:
MAXIMUM TOLERANCE BETWEEN ANY TWO MEASUREMENT IS 1.5%.
TAKE READING EVERY ONE MINUTE.

REF. T1 ICE BATH THERMOMETER: -58 - 572 (F)
REF. T2 BOILING WATER THERMOMETER: -58 - 572 (F)
REF. T3 HOT OIL THERMOMETER: -58 - 572 (F)

Almega ENVIRONMENTAL

ALMEGA ENVIRONMENTAL AND TECHNICAL SERVICES
10602 WALKER STREET
CYPRESS, CA 90630

STACK TEMPERATURE SENSOR SEMI-ANNUAL CALIBRATION

TEMPERATURE SENSOR I.D:	73	REF. DIGITAL NIST TRACEABLE THERMOMETER ID: : 1, 2 & 3
READ OUT I.D:	VA710	ICE BATH: YES
PITOT TUBE I.D:	73	BOILING WATER: YES
PITOT TUBE LENGTH:	75"	HOT OIL: YES
DATE:	6/14/2019	CALIBRATED BY: CH/JO

	ICE BATH			
S/N: 160764570 Due Date 11/13/2019	REF.DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (°F)	FIELD METER TEMPERATURE (°F)	ABSOLUTE DIFFERENCE TEMPERATURE (°F)	% DIFFERENCE (%)
	31.4	31.4	0.0	0.0
	31.4	31.4	0.0	0.0
	31.5	31.5	0.0	0.0

	BOILING WATER			
S/N: 160764579 Due Date 11/13/2019	REF. DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (°F)	FIELD METER TEMPERATURE (°F)	ABSOLUTE DIFFERENCE TEMPERATURE (°F)	% DIFFERENCE (%)
	210.1	209.9	0.2	0.1
	210.3	210.0	0.3	0.1
	210.5	210.2	0.3	0.1

	ICE BATH			
S/N: 160764557 Due Date 11/13/2019	REF.DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (°F)	FIELD METER TEMPERATURE (°F)	ABSOLUTE DIFFERENCE TEMPERATURE (°F)	% DIFFERENCE (%)
	441.0	438.0	3.0	0.7
	442.0	439.0	3.0	0.7
	443.0	440.0	3.0	0.7

NOTE:
MAXIMUM TOLERANCE BETWEEN ANY TWO MEASUREMENT IS 1.5%.
TAKE READING EVERY ONE MINUTE.

REF. T1 ICE BATH THERMOMETER: -58 - 572 (F)
REF. T2 BOILING WATER THERMOMETER: -58 - 572 (F)
REF. T3 HOT OIL THERMOMETER: -58 - 572 (F)

Almega ENVIRONMENTAL

ALMEGA ENVIRONMENTAL AND TECHNICAL SERVICES
10602 WALKER STREET
CYPRESS, CA 90630

STACK TEMPERATURE SENSOR SEMI-ANNUAL CALIBRATION

TEMPERATURE SENSOR I.D:	85	REF. DIGITAL NIST TRACEABLE THERMOMETER ID:: 1, 2 & 3
READ OUT I.D:	VA710	ICE BATH: YES
PITOT TUBE I.D:	85	BOILING WATER: YES
PITOT TUBE LENGTH:	37"	HOT OIL: YES
DATE:	6/14/2019	CALIBRATED BY: CH/JO

ICE BATH				
S/N: 160764570 Due Date 11/13/2019	REF.DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (^{o}F)	FIELD METER TEMPERATURE (^{o}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{o}F)	% DIFFERENCE (%)
	31.5	31.3	0.2	0.6
	31.5	31.4	0.1	0.3
	31.5	31.5	0.0	0.1

BOILING WATER				
S/N: 160764579 Due Date 11/13/2019	REF. DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (^{o}F)	FIELD METER TEMPERATURE (^{o}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{o}F)	% DIFFERENCE (%)
	212.3	212.1	0.2	0.1
	212.4	212.1	0.3	0.1
	212.5	212.2	0.3	0.1

ICE BATH				
S/N: 160764557 Due Date 11/13/2019	REF.DIGITAL NIST TRACEABLE THERMOMETER TEMPERATURE (^{o}F)	FIELD METER TEMPERATURE (^{o}F)	ABSOLUTE DIFFERENCE TEMPERATURE (^{o}F)	% DIFFERENCE (%)
	504.0	500.0	4.0	0.8
	505.0	501.0	4.0	0.8
	507.0	503.0	4.0	0.8

NOTE:
MAXIMUM TOLERANCE BETWEEN ANY TWO MEASUREMENT IS 1.5%.
TAKE READING EVERY ONE MINUTE.

REF. T1 ICE BATH THERMOMETER: -58 - 572 (F)
REF. T2 BOILING WATER THERMOMETER: -58 - 572 (F)
REF. T3 HOT OIL THERMOMETER: -58 - 572 (F)

Almega ENVIRONMENTAL

NOZZLE CALIBRATION FORM

NOZZLE ID #: GL 20

CALIPER ID: 491 568

CALIBRATOR: WB

SIGNATURE: Will Mkt

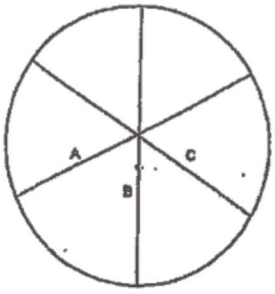
DATE: 6-6-19

Measured Diameter A: 0.181 inch

Measured Diameter B: 0.182 inch

Measured Diameter C: 0 181 inch

Average: 0.181 inch



Inside Diameter

Is the Nozzle Free from Nicks, Dents, or Corrosion?

Yes X

No

If "No", please describe deviations below:

Nozzle Deviations (if any):

Almega ENVIRONMENTAL

NOZZLE CALIBRATION FORM

NOZZLE ID #: GL 40

CALIPER ID: 491568

CALIBRATOR: WB

SIGNATURE: [signature]

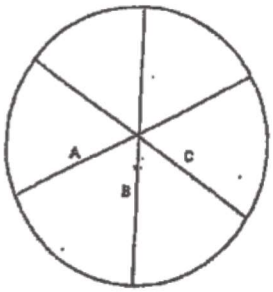
DATE: 6-7-19

Measured Diameter A: 0.346 inch

Measured Diameter B: 0.349 inch

Measured Diameter C: 0.350 inch

Average: 0.348 inch



Inside Diameter

Is the Nozzle Free from Nicks, Dents, or Corrosion?

Yes X

No

If "No", please describe deviations below:

Nozzle Deviations (if any):

Almega ENVIRONMENTAL

NOZZLE CALIBRATION FORM

NOZZLE ID #: D-13

CALIPER ID: 491568

CALIBRATOR: WB

SIGNATURE: WB

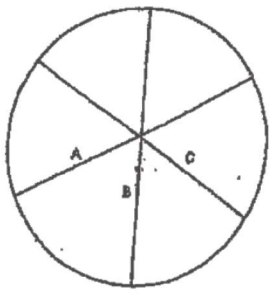
DATE: 6-13-19

Measured Diameter A: 0.439 inch

Measured Diameter B: 0.436 inch

Measured Diameter C: 0.436 inch

Average: 0.437 inch



Inside Diameter

Is the Nozzle Free from Nicks, Dents, or Corrosion?

Yes ✓

No

If "No", please describe deviations below:

Nozzle Deviations (if any):

Almega ENVIRONMENTAL

Semi-Annual Field Dry Gas Meter Calibration* Calibration Date: 5/3/2019

Orifice Series: 33-73
Serial Number: AE_1/AE_2
Cal Type: Semi-Annual
Calibrated by: Luke Barrow
(signature):
Reviewed by:

DRY GAS METER CALIBRATION FACTOR Y	ORIFICE CALIBRATION FACTOR dH@
Yds = 1.0379	dH@ = 1.583

DRY GAS METER READINGS

DGM INLET Initial (°F)	DGM INLET Final (°F)	DGM OUTLET Initial (°F)	DGM OUTLET Final (°F)	Meter Reading Initial (cu.ft.)	Meter Reading Final (cu.ft.)	Orifice Reading Initial (in.H2O)	Orifice Reading Final (in.H2O)
65.0	65.0	64.0	64.0	448.808	454.320	0.110	0.110
65.0	66.0	64.0	65.0	454.320	459.847	0.110	0.110
66.0	67.0	65.0	66.0	459.847	465.388	0.110	0.110
67.0	68.0	66.0	67.0	465.388	471.115	0.680	0.680
68.0	69.0	67.0	68.0	471.115	476.860	0.680	0.680
69.0	70.0	68.0	69.0	476.860	482.658	0.680	0.680
70.0	71.0	69.0	70.0	482.658	487.800	1.700	1.700
71.0	72.0	70.0	71.0	487.800	493.039	1.700	1.700
72.0	72.0	71.0	71.0	493.039	498.302	1.700	1.700
73.0	74.0	72.0	72.0	498.302	504.519	3.300	3.300
74.0	75.0	72.0	73.0	504.519	510.765	3.300	3.300
75.0	75.0	73.0	74.0	510.765	517.007	3.300	3.300

QUALITY CONTROL CHECKS

$(Y_{ds,max} - Y_{ds,min}) <$ 0.010 **	$0.98 < (Y_{ds}/Y_{ds}) <$ 1.02	Average Coeff (Y) (0.95<Y<1.05)	$dH@_{avg} < (dH@ \pm 0.15)$
0.0035	0.997	1.035	1.500
PASS	PASS	PASS	PASS
0.0064	1.006	1.044	1.568
PASS	PASS	PASS	PASS
0.0038	1.002	1.040	1.608
PASS	PASS	PASS	PASS
0.0034	0.995	1.032	1.657
PASS	PASS	PASS	PASS

DGM ID: A-3
Serial #: 26133

Calibration Interval:
Semi-Annual: X
Bi-monthly:
Other:

Standard Temperature (deg.F)
Tstd = 60

Barometric Pressure (in.Hg)
Initial: 29.89
Final: 29.89
$Pbar_{avg}$: 29.89

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE: Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Corrected: Flowrate Q1m (SCFM)	Corrected: Volume (cu.ft.)	DRY GAS METER: Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Corrected: Flowrate Q1m (SCFM)	Corrected: Volume (SCF)	CALCULATIONS: Coefficient $Y_{ds,i}$ $(0.95 < Y_{ds,i} < 1.05)$	CALCULATIONS: Orifice dH@ (in.H2O)
33	28	0.1549	25.00	64.0	0.2023	5.665	0.110	64.50	5.512	0.196	5.464	1.0368	1.500
33	28	0.1549	25.00	65.0	0.202	5.660	0.110	65.00	5.527	0.196	5.474	1.0340	1.502
33	28	0.1549	25.00	66.0	0.202	5.660	0.110	66.00	5.541	0.196	5.477	1.0333	1.499
52	12	0.3769	23.50	66.0	0.491	5.896	0.680	67.00	5.727	0.472	5.658	1.0421	1.570
52	12	0.3769	23.50	66.0	0.491	5.896	0.680	68.00	5.735	0.471	5.655	1.0426	1.567
52	12	0.3769	23.50	67.0	0.491	5.891	0.680	69.00	5.708	0.468	5.618	1.0465	1.557
63	7	0.5890	20.50	67.0	0.767	5.370	1.700	70.00	5.242	0.738	5.163	1.0402	1.609
63	7	0.5890	20.50	68.0	0.766	5.365	1.700	71.00	5.239	0.736	5.150	1.0417	1.609
63	7	0.5890	20.50	68.0	0.766	5.365	1.700	71.60	5.263	0.739	5.169	1.0360	1.607
73	6	0.8109	18.00	69.0	1.054	6.326	3.300	72.75	6.217	1.019	6.115	1.0343	1.656
73	6	0.8109	18.00	69.0	1.054	6.325	3.300	73.50	6.246	1.022	6.135	1.0309	1.656
73	6	0.8109	18.00	70.0	1.053	6.319	3.300	74.25	6.242	1.020	6.122	1.0321	1.657

* Critical Orifice used.

Almega ENVIRONMENTAL

Semi-Annual Field Dry Gas Meter Calibration* Calibration Date: 3/19/2019

Orifice Series: 33-73
Serial Number: AE_1/AE_2
Cal Type: Semi-Annual
Calibrated by: L. Barrow
(signature):
Reviewed by:

DRY GAS METER CALIBRATION FACTOR Y	ORIFICE CALIBRATION FACTOR dH@
Yds = 1.0376	dH@ = 1.789

DRY GAS METER READINGS								QUALITY CONTROL CHECKS			
DGM INLET		DGM OUTLET		Meter Reading		Orifice Reading					
Initial (°F)	Final (°F)	Initial (°F)	Final (°F)	Initial (cu.ft.)	Final (cu.ft.)	Initial (in.H2O)	Final (in.H2O)	$(Y_{Incr.} - Y_{Incr.Ave}) < 0.010$ **	$0.98 < (Y_{Inc}/Y_{Ave}) < 1.02$	Average Coeff (Y) (0.95<Y<1.05)	$dH@_{avg} < (dH@ \pm 0.15)$
N/A	N/A	62.0	63.0	323.972	329.639	0.130	0.130				
		63.0	64.0	329.639	335.123	0.130	0.130	0.0033	0.966	1.022	1.776
		64.0	65.0	335.123	340.724	0.130	0.130	PASS	PASS	PASS	PASS
N/A	N/A	67.0	68.0	341.902	347.625	0.730	0.730				
		68.0	69.0	347.625	353.359	0.730	0.730	0.0004	1.006	1.044	1.682
		69.0	70.0	353.359	359.096	0.730	0.730	PASS	PASS	PASS	PASS
N/A	N/A	71.0	72.0	361.057	366.286	1.900	1.900				
		72.0	73.0	366.286	371.518	1.900	1.900	0.0019	1.008	1.048	1.794
		73.0	74.0	371.518	376.762	1.900	1.900	PASS	PASS	PASS	PASS
N/A	N/A	74.0	75.0	377.762	383.958	3.800	3.800				
		75.0	76.0	383.958	390.181	3.800	3.800	0.0036	1.001	1.039	1.908
		76.0	77.0	390.181	396.388	3.800	3.800	PASS	PASS	PASS	PASS

DGM ID: A-8
Serial #: 20182566
Model#: XC-622-D
Calibration Interval:
Semi-Annual: X
Bi-monthly:
Other:

Standard Temperature (deg.F)
Tstd = 60

Barometric Pressure (in.Hg)
Initial: 29.89
Final: 29.89
$Pbar_{avg}$: 29.89

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE					DRY GAS METER					CALCULATIONS	
		Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Corrected Flowrate Qfm (SCFM)	Corrected Volume (cu.ft.)	Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Corrected Flowrate Qfm (SCFM)	Corrected Volume (SCF)	Coefficient Y_{Incr} ($0.95 < Y_{Incr} < 1.05$)	Orifice dH@ (in.H2O)
33	28	0.1549	27.50	63.0	0.2025	5.670	0.130	62.50	5.667	0.198	5.540	1.0235	1.777
33	28	0.1549	27.50	64.0	0.202	5.665	0.130	63.50	5.664	0.198	5.546	1.0214	1.777
33	28	0.1549	27.50	64.0	0.202	5.665	0.130	64.50	5.661	0.198	5.553	1.0203	1.773
52	12	0.3769	24.50	66.0	0.491	5.896	0.730	67.50	5.723	0.471	5.650	1.0437	1.684
52	12	0.3769	24.50	66.0	0.491	5.896	0.730	68.50	5.734	0.471	5.650	1.0436	1.681
52	12	0.3769	24.50	67.0	0.491	5.891	0.730	69.50	5.737	0.470	5.642	1.0441	1.681
63	7	0.5690	21.00	67.0	0.767	5.370	1.900	71.50	5.229	0.734	5.136	1.0462	1.795
63	7	0.5690	21.00	68.0	0.766	5.365	1.900	72.50	5.232	0.733	5.131	1.0456	1.796
63	7	0.5690	21.00	68.0	0.766	5.365	1.900	73.50	5.234	0.732	5.123	1.0471	1.791
73	6	0.8109	16.00	69.0	1.054	6.325	3.800	74.50	6.208	1.015	6.092	1.0383	1.908
73	6	0.8109	16.00	69.0	1.054	6.325	3.800	75.50	6.223	1.016	6.097	1.0374	1.904
73	6	0.8109	16.00	70.0	1.053	6.319	3.800	76.50	6.207	1.012	6.070	1.0410	1.904

* Critical Orifice used.

Note: This Apex Meter Box, Console Model # XC-622-D does not have a temperature sensor at the inlet. Hence, DGM inlet columns are intentially left blank.

Almega ENVIRONMENTAL

Semi-Annual Field Dry Gas Meter Calibration* Calibration Date: 4/26/2019

Orifice Series: 33-73
Serial Number: AE_1/AE_2
Cal Type: Semi-Annual
Calibrated by: L. Barrow
(signature):
Reviewed by:

DRY GAS METER CALIBRATION FACTOR Y	ORIFICE CALIBRATION FACTOR dH@
Yds = 1.0395	dH@ = 1.819

DRY GAS METER READINGS								QUALITY CONTROL CHECKS				DGM ID: A-8
DGM INLET		DGM OUTLET		Meter Reading		Orifice Reading						Serial #: 1612035
Initial (°F)	Final (°F)	Initial (°F)	Final (°F)	Initial (cu.ft.)	Final (cu.ft.)	Initial (in.H2O)	Final (in.H2O)	$(Y_{fm,max} - Y_{fm,min}) <$ 0.010 **	$0.98 < (Y_{fm}/Y_{fm})$ < 1.02	Average Coeff (Y) (0.95<Y<1.05)	$dH@_{avg}$ < (dH@ ± 0.15)	Model# XC-522
N/A	N/A	67.0	67.0	359.554	365.083	0.140	0.140					Calibration Interval:
		67.0	67.0	365.083	370.604	0.140	0.140	0.0007	0.998	1.038	1.906	Semi-Annual: X
		67.0	68.0	370.604	376.129	0.140	0.140	PASS	PASS	PASS	PASS	Bi-monthly:
N/A	N/A	68.0	68.0	376.149	381.662	0.760	0.760					Other:
		68.0	68.0	381.662	387.575	0.760	0.760	0.0018	1.007	1.047	1.752	
		68.0	69.0	387.575	393.278	0.760	0.760	PASS	PASS	PASS	PASS	Standard Temperature (deg.F)
N/A	N/A	69.0	69.0	393.278	398.498	1.900	1.900					Tstd = 60
		69.0	69.0	398.498	403.739	1.900	1.900	0.0042	1.001	1.041	1.803	
		69.0	70.0	403.739	408.966	1.900	1.900	PASS	PASS	PASS	PASS	Barometric Pressure (in.Hg)
N/A	N/A	70.0	70.0	410.470	416.679	3.600	3.600					Initial: 29.89
		70.0	71.0	416.679	422.871	3.600	3.600	0.0038	0.993	1.033	1.816	Final: 29.89
		71.0	71.0	422.871	429.077	3.600	3.600	PASS	PASS	PASS	PASS	$Pbar_{avg}$: 29.89

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE					DRY GAS METER					CALCULATIONS	
		Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Corrected Flowrate Qfm (SCFM)	Corrected Volume (cu.ft.)	Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Corrected Flowrate Qfm (SCFM)	Corrected Volume (SCF)	Coefficient $Y_{fm,i}$ (0.95 < $Y_{fm,i}$ < 1.05)	Orifice $dH@_i$ (in.H2O)
33	28	0.1549	26.50	65.0	0.2021	5.680	0.140	67.00	5.529	0.196	5.455	1.0375	1.905
33	28	0.1549	26.50	66.0	0.202	5.654	0.140	67.00	5.521	0.196	5.447	1.0389	1.908
33	28	0.1549	26.50	66.0	0.202	5.654	0.140	67.50	5.526	0.195	5.446	1.0382	1.906
52	12	0.3769	23.00	66.0	0.491	5.696	0.760	68.00	5.713	0.470	5.635	1.0464	1.752
52	12	0.3769	23.00	66.0	0.491	5.696	0.760	68.00	5.713	0.470	5.635	1.0464	1.752
52	12	0.3769	23.00	67.0	0.421	5.691	0.760	68.50	5.703	0.468	5.620	1.0482	1.753
63	7	0.5890	20.50	67.0	0.767	5.370	1.900	69.00	5.220	0.736	5.153	1.0421	1.803
63	7	0.5890	20.50	67.0	0.767	5.370	1.900	69.00	5.241	0.739	5.174	1.0379	1.803
63	7	0.5890	20.50	67.0	0.767	5.370	1.900	69.50	5.227	0.736	5.155	1.0416	1.802
73	6	0.8109	18.00	68.0	1.055	6.331	3.600	70.00	6.209	1.024	6.143	1.0305	1.818
73	6	0.8109	18.00	68.0	1.055	6.331	3.600	70.50	6.192	1.020	6.121	1.0343	1.816
73	6	0.8109	18.00	68.0	1.055	6.331	3.600	71.00	6.206	1.021	6.129	1.0329	1.814

* Critical Orifice used.

Note: This Apex Meter Box, Console Model # XC-522 does not have a temperature sensor at the inlet. Hence, DGM inlet columns are intentially left blank.

Almega ENVIRONMENTAL

Bi-Monthly Field Dry Gas Meter Calibration*

Calibration Date: 7/10/2019

Orifice Series: 52,63

Serial Number: AE_1/AE_2

Cal Type: Bi-Monthly

Calibrated by: L. Barrow (signature):

Reviewed by:

SEMI TO BI CHECK		DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR
(+2% of Y)	(-2% of Y)	Y	dH@
1.0587	1.0171	Yds = 1.0483	dH@ = 1.508
PASS			

DRY GAS METER READINGS								QUALITY CONTROL CHECKS				DGM ID: A-3
DGM INLET		DGM OUTLET		Meter Reading		Orifice Reading						Serial #: 26133
Initial (°F)	Final (°F)	Initial (°F)	Final (°F)	Initial (cu.ft.)	Final (cu.ft.)	Initial (in.H2O)	Final (in.H2O)	$(Y_{fm,max} - Y_{fm,min}) < 0.010$ **	$0.98 < (Y_{fm,i}/Y_{fm}) < 1.02$	Average Coeff. $Y_{fm,i}$	$dH@_{i,avg} < (dH@ \pm 0.15)$	Semi A Yfm: 1.0379
75.0	77.0	74.0	76.0	63.915	69.650	0.620	0.620					Calibration Interval:
77.0	78.0	76.0	77.0	69.650	75.411	0.620	0.620	0.0018	1.000	1.048	1.419	Bi-monthly: x
78.0	79.0	77.0	78.0	75.411	81.177	0.620	0.620	PASS	PASS	PASS	PASS	Standard Temperature (deg.F)
79.0	81.0	78.0	79.0	81.177	86.439	1.700	1.700					Tstd = 60
81.0	82.0	79.0	80.0	86.439	91.696	1.700	1.700	0.0051	1.000	1.048	1.597	Barometric Pressure (in.Hg)
82.0	83.0	80.0	80.0	91.696	96.947	1.700	1.700	PASS	PASS	PASS	PASS	Pbar: 30.06

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE					DRY GAS METER					CALCULATIONS	
		Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Corrected Flowrate Q'fm (SCFM)	Corrected Volume (cu.ft.)	Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Corrected Flowrate Q'fm (SCFM)	Corrected Volume (SCF)	Coefficient $Y_{fm,i}$ $(0.95 < Y_{fm,i} < 1.05)$	Orifice $dH@_i$ (in.H2O)
52	12	0.3769	24.0	74.0	0.490	5.886	0.620	75.50	5.735	0.467	5.607	1.0496	1.421
52	12	0.3769	24.0	74.0	0.490	5.885	0.620	77.00	5.761	0.468	5.617	1.0478	1.417
52	12	0.3769	24.0	75.0	0.490	5.880	0.620	78.00	5.766	0.468	5.611	1.0479	1.417
63	7	0.5890	21.5	76.0	0.765	5.355	1.700	79.25	5.262	0.732	5.122	1.0454	1.599
63	7	0.5890	21.5	76.0	0.765	5.355	1.700	80.50	5.257	0.729	5.105	1.0488	1.595
63	7	0.5890	21.5	77.0	0.764	5.350	1.700	81.25	5.251	0.728	5.093	1.0505	1.596

* Critical Orifice used.

Almega ENVIRONMENTAL

Bi-Monthly Field Dry Gas Meter Calibration*

Calibration Date: 8/2/2019

Orifice Series: 52.63

Serial Number: AE_1/AE_2

Cal Type: Bi-Monthly

Calibrated by: JO

(signature):

Reviewed by:

SEMI TO BI CHECK		DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR
(+2% of Y)	(-2% of Y)	Y	dH@
1.0584	1.0168	Yds = 1.0344	dH@ = 1.589
PASS			

DRY GAS METER READINGS								QUALITY CONTROL CHECKS				DGM ID: A-6
DGM INLET		DGM OUTLET		Meter Reading		Orifice Reading						Serial #: 20162566
Initial (°F)	Final (°F)	Initial (°F)	Final (°F)	Initial (cu.ft.)	Final (cu.ft.)	Initial (in.H2O)	Final (in.H2O)	$(Y_{fm,max} - Y_{fm,min}) <$ 0.010 **	$0.98 < (Y_{fm,i}/Y_{fm}) <$ 1.02	Average Coeff. $Y_{fm,i}$	$dH@_{i,avg} <$ (dH@ ± 0.15)	Semi A Yfm: 1.0376
N/A	N/A	81.0	82.0	149.279	155.103	0.680	0.680					Calibration Interval:
		82.0	83.0	155.103	160.956	0.680	0.680	0.0042	1.001	1.035	1.571	Bi-monthly: X
		83.0	84.0	160.956	166.820	0.680	0.680	PASS	PASS	PASS	PASS	Standard Temperature (deg.F)
N/A	N/A	84.0	85.0	166.820	172.180	1.700	1.700					Tstd = 60
		85.0	86.0	172.180	177.529	1.700	1.700	0.0046	0.999	1.033	1.608	Barometric Pressure (in.Hg)
		86.0	87.0	177.529	182.885	1.700	1.700	PASS	PASS	PASS	PASS	Pbar: 29.88

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE					DRY GAS METER					CALCULATIONS	
		Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Corrected Flowrate Q'rm (SCFM)	Corrected Volume (cu.ft.)	Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Corrected Flowrate Q'fm (SCFM)	Corrected Volume (SCF)	Coefficient $Y_{fm,i}$ $(0.95 < Y_{fm,i} < 1.05)$	Orifice $dH@_i$ (in.H2O)
52	12	0.3769	26.0	81.0	0.484	5.812	0.680	81.50	5.824	0.466	5.598	1.0382	1.572
52	12	0.3769	26.0	82.0	0.484	5.806	0.680	82.50	5.853	0.468	5.615	1.0340	1.572
52	12	0.3769	26.0	82.0	0.484	5.806	0.680	83.50	5.864	0.468	5.618	1.0340	1.569
63	7	0.5890	23.5	82.0	0.758	5.293	1.700	84.50	5.360	0.734	5.136	1.0305	1.611
63	7	0.5890	23.5	82.0	0.756	5.293	1.700	85.50	5.349	0.731	5.116	1.0345	1.608
63	7	0.5890	23.5	82.0	0.756	5.293	1.700	86.50	5.356	0.731	5.114	1.0351	1.605

* Critical Orifice used.

Almega

Bi-Monthly Field Dry Gas Meter Calibration*

Calibration Date: 7/9/2019

Orifice Series: 52,63

Serial Number: AE_1/AE_2

Cal Type: Bi-Monthly

Calibrated by: Will Bryant

(signature):

Reviewed by:

SEMI TO BI CHECK		DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR
(+2% of Y)	(-2% of Y)	Y	dH@
1.0603	1.0187	Yds = 1.0410	dH@ = 1.791
PASS			

DRY GAS METER READINGS

DGM INLET		DGM OUTLET		Meter Reading		Orifice Reading	
Initial (°F)	Final (°F)	Initial (°F)	Final (°F)	Initial (cu.ft.)	Final (cu.ft.)	Initial (in.H2O)	Final (in.H2O)
N/A	N/A	73.0	74.0	876.200	881.935	0.770	0.770
N/A	N/A	74.0	75.0	881.935	887.669	0.770	0.770
N/A	N/A	75.0	76.0	887.669	893.411	0.770	0.770
N/A	N/A	76.0	77.0	893.300	899.565	1.900	1.900
N/A	N/A	77.0	78.0	899.565	904.835	1.900	1.900
N/A	N/A	78.0	79.0	904.835	910.120	1.900	1.900

QUALITY CONTROL CHECKS

$(Y_{fm,max} - Y_{fm,min}) < 0.010$ **	$0.98 < (Y_{fm,i}/Y_{fm}) < 1.02$	Average Coeff. $Y_{fm,i}$	$dH@_{i,avg} < (dH@ \pm 0.15)$
0.0021	1.003	1.045	1.779
PASS	PASS	PASS	PASS
0.0010	0.997	1.037	1.803
PASS	PASS	PASS	PASS

DGM ID: A-8

Serial #: 1612035

Semi A Yfm: 1.0395

Calibration Interval:

Bi-monthly: x

Standard Temperature (deg.F)

Tstd = 60

Barometric Pressure (in.Hg)

Pbar: 30.04

Orifice Series No.	Run Time (min)	CRITICAL ORIFICE					DRY GAS METER					CALCULATIONS	
		Orifice K-factor	Tested Vacuum (in.Hg)	Ambient Temp. (°F)	Corrected Flowrate Q'rm (SCFM)	Corrected Volume (cu.ft.)	Orifice dH (in.H2O)	AVG Temp. (°F)	NET Volume (cu.ft.)	Corrected Flowrate Q'fm (SCFM)	Corrected Volume (SCF)	Coefficient $Y_{fm,i}$ $(0.95 < Y_{fm,i} < 1.05)$	Orifice $dH@_i$ (in.H2O)
52	12	0.3769	24.0	76.0	0.469	5.870	0.770	73.50	5.735	0.469	5.626	1.0434	1.781
52	12	0.3769	24.0	76.0	0.469	5.870	0.770	74.50	5.734	0.468	5.615	1.0455	1.778
52	12	0.3769	24.0	77.0	0.469	5.865	0.770	75.50	5.742	0.468	5.612	1.0450	1.778
63	7	0.5890	22.0	76.0	0.763	5.341	1.900	76.50	5.265	0.736	5.150	1.0371	1.806
63	7	0.5890	22.0	78.0	0.763	5.341	1.900	77.50	5.270	0.735	5.146	1.0380	1.803
63	7	0.5890	22.0	78.0	0.763	5.341	1.900	78.50	5.285	0.736	5.151	1.0370	1.799

* Critical Orifice used.

Note: This Apex Meter Box, Console Model # XC-522-D does not have a temperature sensor at the Inlet. Hence, DGM Inlet columns are left intentionally blank.

Almega ENVIRONMENTAL

APPENDIX H

FACILITY PROCESS DATA

Facility Process Data

Charge During CARB Method 436 Metals Testing

Date	Test	Furnace #	Materials	Weight (lbs)
8/13/2019	Metals Run 1	#3 Furnace	25CH	6000
8/13/2019	Metals Run 2	#3 Furnace	25CH	6000
8/14/2019	Metals Run 3	#3 Furnace	25CH	6000
		#4 Furnace	25CH	7000

Charge During CARB Method 425 Chromium Testing

Date	Test	Furnace #	Materials	Weight (lbs)
8/14/2019	Chromium R1	#3 Furnace	25CH	6000
		#4 Furnace	25CH	7000
8/14/2019	Chromium R2	#3 Furnace	25CH	6000
		#4 Furnace	25CH	7000
8/15/2019	Chromium R3	#3 Furnace	25CH	6000

Charge During SCAQMD Method 5.1 PM Testing

Date	Test	Furnace #	Materials	Weight (lbs)
8/16/2019	PM Testing	#3 Furnace	25CH	6000
		#4 Furnace	25CH	7000

From: [redacted]
Sent: Monday, December 02, 2019 11:59 AM
To: Charles Figueroa
Cc: [redacted], Tulasi Gyawali
Subject: Re: AQMD C Source Testing

In #3 furnace only, the following was melted during the test periods.

8/13 three 6000# heats of chrome iron. total 18,000# melted.
8/14 three 6000# heats of chrome iron. total 18,000# melted.
8/15. four 6000# heats of chrome iron. total 24,000# melted.

Hope this helps.

[redacted]

On Mon, Dec 2, 2019 at 9:08 AM Charles Figueroa <Charles@almegaenv.com> wrote:

[redacted]

Do you have information as to the loading in Furnace 3 during those test periods ?

8/13	08:50 – 10:55	11:55 – 14:00
8/14	08:25 – 10:30	11:25 – 13:30
8/15	08:10 – 10:15	10:55 – 13:10
8/16	07:40 – 08:56	

How many batches and lbs/batch ?

Thanks

[redacted]

Spectrographic Analysis

Date 8/13/19

Temp: 74
Humid: 70 %
Time: 3:20PM

OPERATOR
signed [redacted]
signed

ARL Argon 50 psi (M) 1000 psi (B)

SPECTRO Argon 50 psi (M) 2000 psi (B)

Furnace #	Alloy	Sample #	C	Cr	Si	Mn	Ni	Mo	Cu	S	P	Released by
3	25CH	1	3.078	28.468	.315	.557	.281	.102	.077	.024	.026	[redacted]
3	25CH	2	2.927	25.780	.355	.478	.274	.125	.086	.025	.035	[redacted]
3	25CH	3	2.868	25.883	.410	.441	.289	.120	.0101	.023	.045	10 LBS CHARGE [redacted]

END OF SHIFT REMARKS AND SIGNATURE:

Spectrographic Analysis

Date 8/14/19

Temp: 74
Humid: 70 %
Time: 3:06AM

ARL Argon 50 psi (M) 500 psi (B)

SPECTRO Argon 50 psi (M) ____ psi (B)

OPERATOR
signed MAC
signed ____

Furnace #	Alloy	Sample #	C	Cr	Si	Mn	Ni	Mo	Cu	S	P	Released by
3	25CH	1	3.123	25.826	.357	.596	.243	.071	.058	.025	.021	MAC
4	25CH	2	2.574	25.658	.722	.503	.291	.091	.073	.026	.019	MAC
4	25CH	3	2.920	25.548	.324	.557	.278	.098	.067	.018	.019	MAC
3	25CH	4	3.148	26.00	.365	.672	.251	.115	.070	.027	.019	MAC
4	25CH	5	3.178	25.960	.330	.596	.257	.071	.108	.028	.020	MAC
4	25CH	6	3.069	26.177	.313	.493	.284	.065	.120	.025	.020	MAC
3	25H	7	3.603	24.967	.561	.617	.288	1.547	.181	.016	.025	MAC *
4	25CH	8	2.158	26.063	.872	.517	.295	.068	.187	.025	.020	MAC

END OF SHIFT REMARKS AND SIGNATURE: 6140168 2619°F.

[redacted]

Spectrographic Analysis

Date 8/15/19

Temp: 74
Humid: 70 %
Time: 300 PM

ARL Argon 50 psi (M) 2600 psi (B)

SPECTRO Argon 50 psi (M) 1500 psi (B)

OPERATOR
signed [redacted]
signed

Furnace #	Alloy	Sample #	C	Cr	Si	Mn	Ni	Mo	Cu	S	P	Released by
3	25CH	1	3.09	25.969	.500	.501	.264	.188	.097	.024	.055	MAC
3	25CH	2	3.087	26.767	.468	.570	.277	.101	.099	.027	.087	MAC
3	25CH	3	3.00	26.138	.382	.548	.266	.121	.090	.026	.044	MAC
3	25CH	4	2.934	26.000	.364	.477	.279	.106	.084	.026	.035	MAC

END OF SHIFT REMARKS AND SIGNATURE:

[redacted]

Spectrographic Analysis

Date 5/16/19

Temp: 74
Humid: 70 %
Time: 3:00 PM

OPERATOR.
signed [illegible]
signed

ARL Argon 500 psi (M) 2600 psi (B)

SPECTRO Argon 500 psi (M) 2100 psi (B)

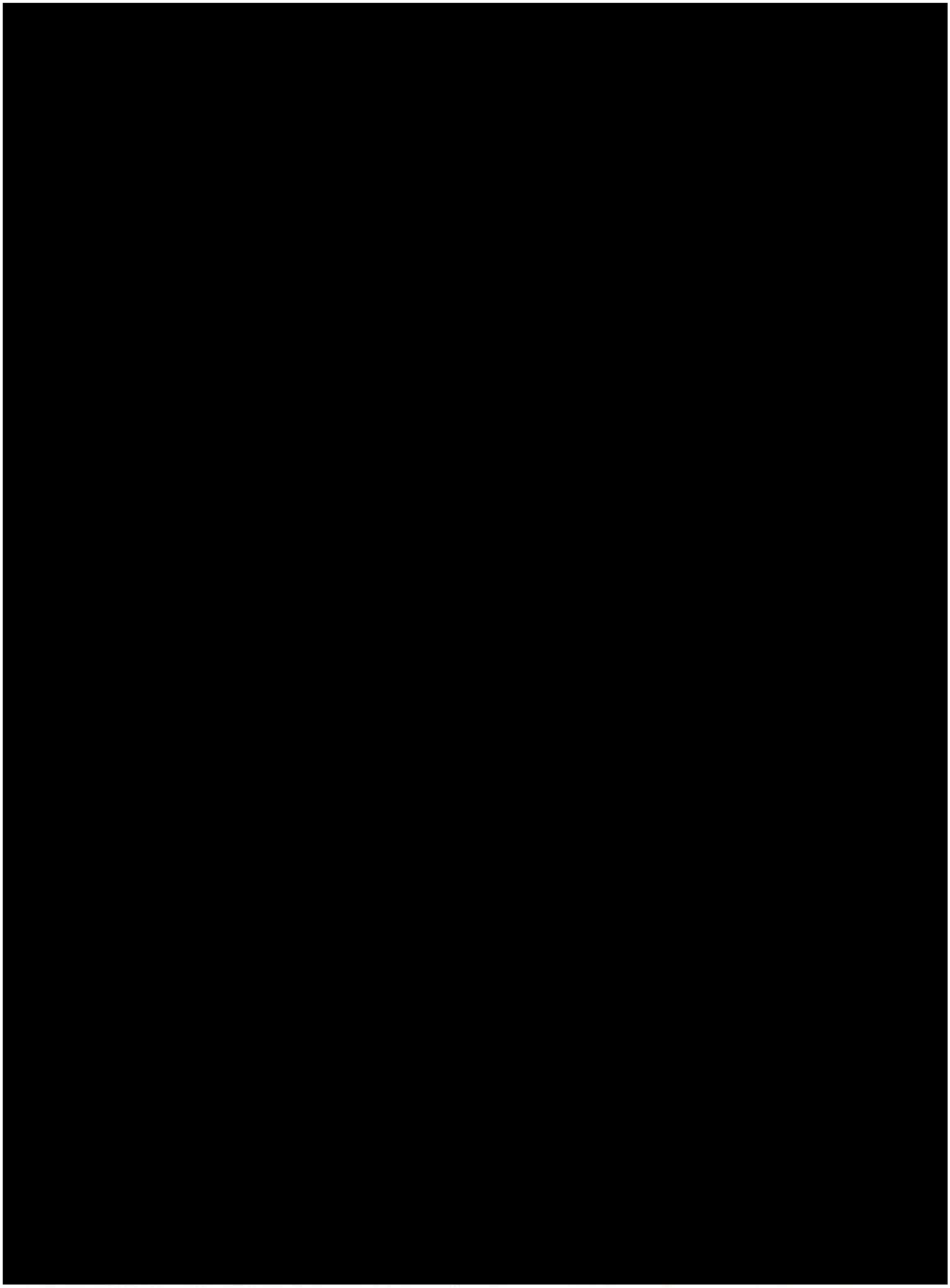
Furnace #	Alloy	Sample #	C	Cr	Si	Mn	Ni	Mo	Cu	S	P	Released by
4	K26	1	2.656	26.00	.445	.777	.254	.285	.135	.025	.018	[illegible]
4	K26	2	2.729	26.178	.451	.767	.285	.402	.124	028	.018	[illegible]
3	25CM	3	2.527	25.477	.399	.494	.248	.066	0.124	.025	.021	[illegible]
3	25CH	4	3.018	25.770	.401	.584	.254	.079	.110	.026	.021	[illegible]
4	26K	5	2.800	26.232	.267	.775	.290	.134	.111	.028	.019	MAC
3	25CH	6	2.932	25.642	.362	.464	.266	.098	.105	.027	.036	MAC
4	25CM	7	2.484	26.640	.316	.647	.270	.217	.101	.026	.018	MAC
3	25CH	8	3.082	26.100	367	.504	262	.067	.114	.029	.031	[illegible]

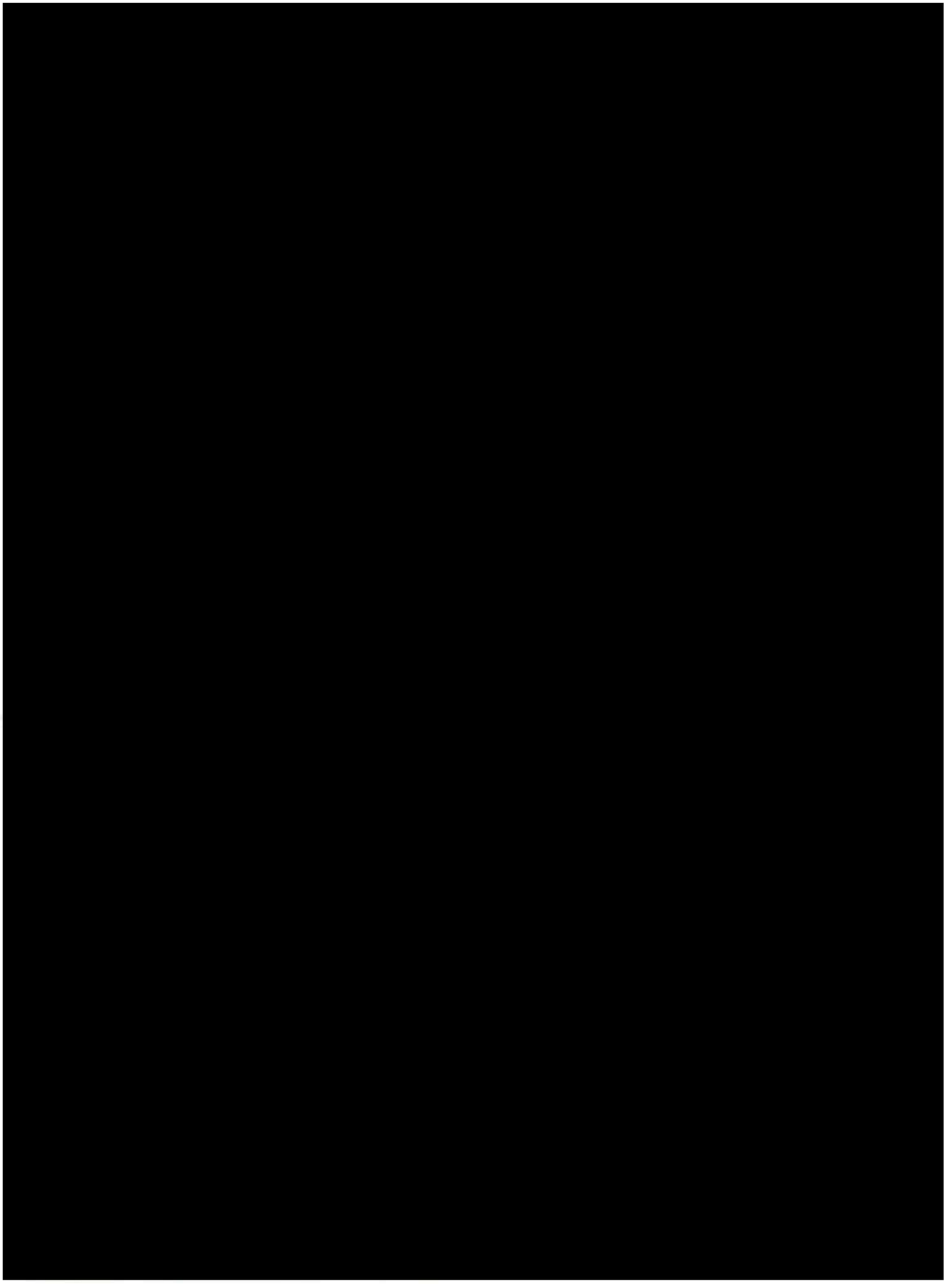
END OF SHIFT REMARKS AND SIGNATURE:

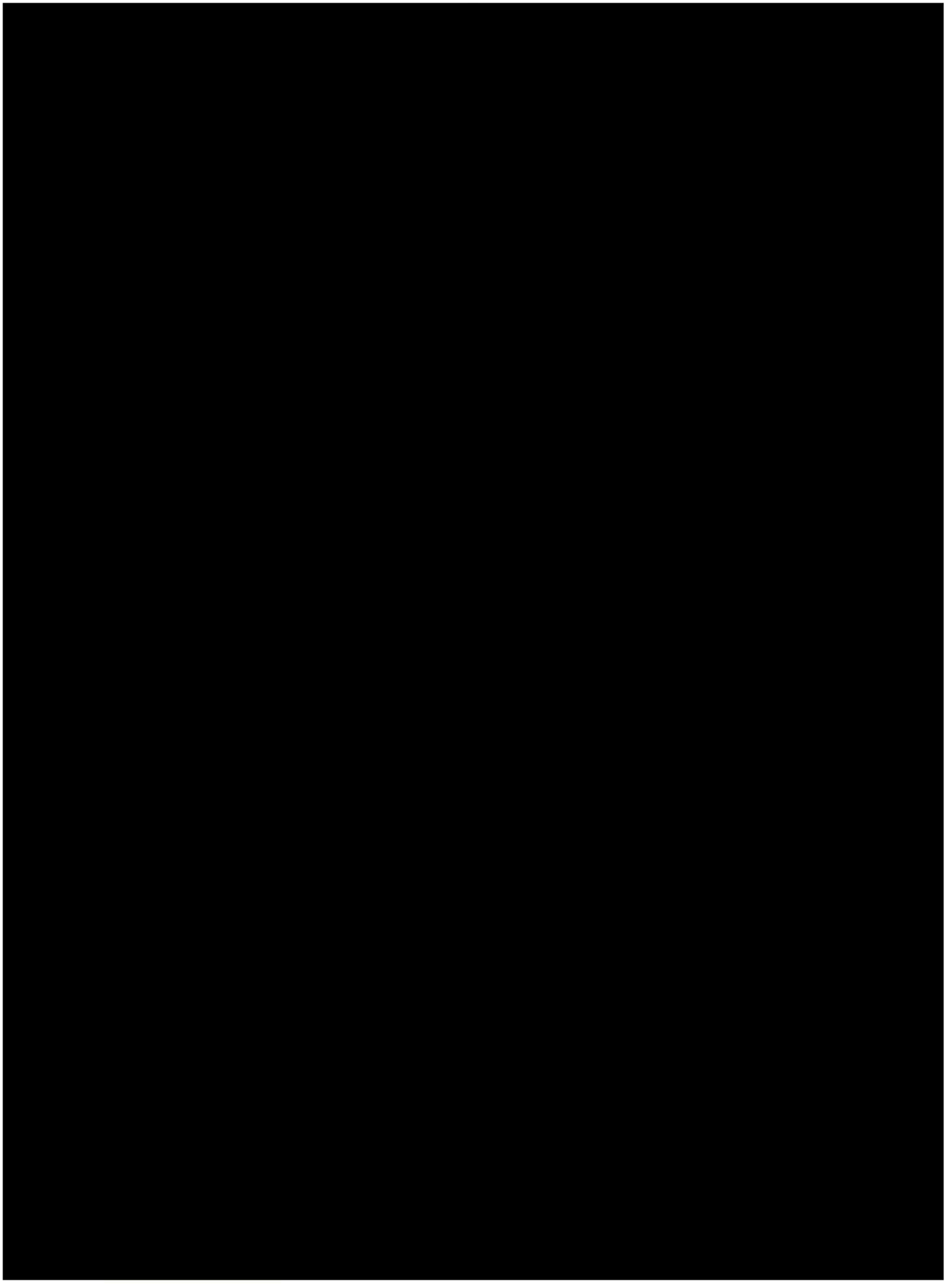
STATIC = 4.2

V 12	2.80	88
11	2.50	89
10	2.90	89
9	2.90	88
8	2.70	87
7	2.50	88
6	1.40	87
5	0.95	87
4	1.20	82
3	1.60	75
2	1.90	70
1	2.00	69

H 11	1.90	87
11	2.35	87
10	2.40	87
9	2.50	87
8	2.20	87
7	2.10	87
6	1.60	87
5	1.20	87
4	1.30	85
3	1.45	78
2	1.60	71
1	1.60	70







APPENDIX I

SCAQMD SOURCE TEST PLAN

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

SOURCE TEST PLAN
TO BE CONDUCTED AT

METAL MELTING FACILITY A

METAL MELTING FACILITY B

METAL MELTING FACILITY C

TO DETERMINE PARTICULATE MATTER (PM), ARSENIC, CADMIUM, NICKEL, CHROMIUM, AND HEXAVALENT CHROMIUM (Cr^{+6}) EMISSIONS FROM CHROMIUM ALLOY MELTING OPERATIONS

ISSUED: November 21, 2018

REVISED: March 27, 2019

REVIEWED BY:

Michael Garibay
Acting Source Testing Manager

SOURCE TEST ENGINEERING BRANCH

SCIENCE & TECHNOLOGY ADVANCEMENT

TABLE OF CONTENTS

INTRODUCTION

Ambient monitoring in the city of Paramount in 2016 and 2017 indicated the presence of elevated levels of hexavalent chromium. During an investigation of the emission sources, the SCAQMD identified hexavalent chromium emissions were being generated by sources including heat treating and forging facilities. Screening source tests were performed on heat treating and forging furnaces processing metals or using materials that contained chromium at several facilities. Results showed elevated hexavalent chromium levels in the outlet of the furnaces which were operated between 1,725 to 2100°F. These temperatures are lower than those experienced during metal melting operations.

An internal review was initiated for previously conducted source tests at metal melting facilities. Most of the source tests on file only tested for elemental chromium and did not perform the separate test required to determine hexavalent chromium emissions as they were not suspected from this process. SCAQMD staff was able to identify one metal melting facility which was tested for both total chromium and hexavalent chromium using CARB Method 425. Review of this test indicated that conversion of chromium to hexavalent chromium did occur and result in emissions of hexavalent chromium during the melting operation.

SCAQMD staff initiated the rule development process to amend Rule 1407 to address toxic air contaminant emissions from ferrous metal melting operations and update existing requirements for non-ferrous metal melting operations currently regulated under the rule. Through working group meetings with industry stakeholders it was requested that the rule be separated in to two rules for ferrous and non-ferrous metal melting. After additional input and working group meetings SCAQMD staff decided to bifurcate the rule and reclassify characterization in to non-chromium alloy (Rule 1407) and chromium alloy (Rule 1407.1) metal melting.

Additional data from melting operations of metals with a chromium content greater than 0.5% is needed to quantify the conversion rate of chromium to hexavalent chromium and quantify toxic air contaminant emissions from these facilities to aid in the rulemaking process.

Three facilities have agreed to allow source testing for the purposes of collecting this data. Testing will be performed by a third party source test contractor. The purpose of this test plan is to allow for the source test contractors to provide bids as part of the RFP process, while eliminating the need for multiple contractors to visit the facilities who have volunteered as host sites for the source testing. Testing contractors must be SCAQMD Laboratory Approval Program certified for SCAQMD Methods 1-5 to be able to participate in the RFP process and testing upon award of contract.

During the source testing at each facility, control system inlet and outlet emissions and associated emission rates will be determined for the following:

- Particulate Matter (PM)
- Total Chromium (Cr)
- Hexavalent Chromium (Cr^{+6})
- Arsenic (As)
- Cadmium (Cd)
- Nickel (Ni)

Testing will be performed according to SCAQMD Method 5.1, CARB Method 425, and CARB Method 436. Flow rates will be determined according to SCAQMD Methods 1-4, with the use of EPA Method 5D for the outlet of the HEPA filters at one of the three facilities.

EQUIPMENT AND PROCESS DESCRIPTION

Pursuant to the agreement with the participants to keep the names of the host facilities anonymous, they will be identified as Facilities A, B, and C. [redacted]

Metal Melting Facility A

Metal melting Facility A uses electric induction furnaces for the processing of materials including Brass, Zinc, Steel, Stainless Steel, Iron, Aluminum, Cobalt, and Nickel. The facility has eight electric induction furnaces in three sizes as follows:

800 lb material capacity with a power rating of 250 kW
3,000 lb material capacity with a power rating of 350 kW
4,500 lb material capacity with a power rating of 1,000 kW (shared power supply)

[redacted] A heat cycle (or "heat") begins when the metal is placed in the electric induction furnace. Electrical current is applied and the material becomes molten. Testing will be performed during heats of 316 stainless steel. The stainless steel materials are typically melted in one of the 4,500 lb furnaces. Typical temperatures are in the 3000°F range. During the melting process emissions are captured by an exhaust system which mounts to the furnace lid and utilizes a slot design. Suction is provided by the blower which is part of the baghouse and HEPA system. The HEPA filters are mounted in an enclosure above the baghouse and exhaust through two rectangular openings on either side of the enclosure. Because the exhaust does not exit through an exhaust stack special consideration must be given for the outlet testing.

[redacted] A typical heat lasts for approximately 2 hours. Each furnace has individual exhaust ducting allowing for testing during a specific heat before being combined in to a common exhaust header. The baghouse and HEPA filter system controls emissions from the eight electric induction furnaces, five casting machines, one Hawley system, four mold spray and coating stations.[redacted]

A complete list of process operating parameters to be obtained for the period during testing as well as results reporting requirements is located in **Appendix A**. A basic process flow diagram has been included in **Appendix B**.

Metal Melting Facility B

Metal melting facility B uses electric induction furnaces for the processing of primarily stainless steel. The facility has two 300 lb capacity electric induction furnaces but typically only uses one at a time. The facility makes small precision parts primarily through an investment casting process.

The furnace is loaded with 17-4 PH stainless steel and the heat begins. Electrical current is applied and the material becomes molten. Typical temperatures are in the 3000°F range during the melting process. Castings are placed in an oven which serves the purpose of removing the wax core from the casting while simultaneously preheating the casting to 1600-1800°F to prevent thermal shock during the pouring process. The molten metal from the furnace is poured in to a ladle before being poured in to the casting mold.

Emissions from the furnace are collected by a hood placed directly above each furnace. The hoods have blast gates installed which can be closed during emissions testing to prevent room air dilution from the adjacent non-operational unit. The facility has agreed to install a hood extension on the furnace in use to ensure that all furnace emissions will be captured during the source test operation. Hood emissions are currently routed through a baghouse. The facility is currently in the process of a control system upgrade to install a HEPA filtration downstream of the baghouse for improved emission control. It is anticipated that the HEPA system will be completed around January of 2019.

The facility does approximately 6 heats a day. Each heat follows a repeating cycle of roughly one hour on during the melt followed by a period of roughly one hour with the furnace off.

A complete list of process operating parameters to be obtained for the period during testing as well as results reporting requirements is located in **Appendix A**. A basic process flow diagram has been included in **Appendix B**.

Metal Melting Facility C

Metal melting facility C uses electric induction furnaces for the processing of white iron, cast iron, ductile iron, and stainless steel. The facility has four electric induction furnaces in sizes as follows:

7,000 lb material capacity with a power rating of 1,500 kW
6,000 lb material capacity with a power rating of 1,500 kW
4,000 lb material capacity with a power rating of 1,000 kW
2,000 lb material capacity with a power rating of 400 kW

90% of facility operations involve melting of the various irons and approximately 10% percent of operations are stainless steel melts. Raw materials for iron melts are frequently re-runs while the stainless melts tend to be new certified material. The stainless steel processed at the facility is CF8M, CF3M, CF8, and CF3. The facility normally runs 2 furnaces at a time, most frequently the 7,000 lb and 6,000 lb furnaces. Stainless steels are only processed in either the 4,000 lb or 2,000 lb furnace. The furnaces are loaded with the applicable material and the heat begins. Electrical current is applied and the material becomes molten. Typical temperatures are in the 2400-2700°F range during iron melting operations and in the 3000°F range during stainless steel melting operations. Material from the furnace is poured in to pre-heated ladles for transport by forklift to the casting area. All casting at the facility is green sand casting. The casting area is in a separate location within the building.

During the melting process emissions are captured by an exhaust system which mounts to the furnace and utilizes a slot design. Suction is provided by the blower which is part of the baghouse and HEPA system. Each furnace has a closable damper installed which allows for isolation from the system when a furnace is not in use. In the exhaust header there is one non closable exhaust hood which pulls room air in to the system. The HEPA filters are installed between the baghouse and the exhaust stack. The exhaust stack outlet in its current configuration undergoes multiple small angular changes prior to exit to the atmosphere. The facility has agreed to modify the outlet such that a straight run of duct will be provided downstream of the exhaust muffler to meet the requirements of at least two duct diameters downstream and one half of a diameter upstream of any flow disturbances.

The facility does approximately 4-5 heats a day. The iron heats performed in the 7,000 lb and 6,000 lb furnaces take 1.5 – 2 hours. The stainless heats performed in the smaller 4,000 lb and 2,000 lb furnaces take up to 3 hours.

A complete list of process operating parameters to be obtained for the period during testing as well as results reporting requirements is located in **Appendix A**. A basic process flow diagram has been included in **Appendix B**.

SAMPLING AND ANALYTICAL PROCEDURES

Two hour test runs at each location within the system will be performed based on the reference methods described below at the locations specified in Table 1. Refer to **Appendix B** for Facility photos depicting equipment, sample locations, and testing logistical notes.

Sampling times may need to be adjusted on the test days to match the facility's batch time for melting and pouring. It is anticipated these times will end up being close to the proposed two hours per run. Material samples will be collected by the facility and/or ~~source test contractor~~SCAQMD at each facility corresponding to each heat which occurs during emissions testing. Samples should include all raw materials, molten material, final product, slag, dross, and baghouse catch. If any such samples are un-available at the time of testing, it should be noted in the final test report. The materials shall be properly identified and delivered to the SCAQMD for materials composition testing. Additionally, if the facility has performed in-house analysis for each or any sample(s) it should be provided to the SCAQMD. Results of material analysis conducted by SCAQMD will be provided to the contractor conducting testing (where applicable). Analysis of Weck Laboratory detection limits are satisfactory for meeting the objectives of the contract and the proposed rulemaking efforts. SCAQMD method reporting limits (MRL) will be adjusted to match Weck Laboratory for consistency.

Table 1: Sampling Details

Facility	Sample Location	Test Method	Number of Runs	Sample Ports	Sample Port Access
A	Inlet Header, For 4.5k lb. Furnace for Stainless Melting	SCAQMD Method 5.1	1	To Be Installed by Facility	Accessed by a removable floor grate from ground level.
		CARB Method 425	3		
		CARB Method 436	3		
A	Inlet Header, Upstream of Baghouse	SCAQMD Method 5.1	1	In Place	Can be reached with a ladder.
		CARB Method 425	3		
		CARB Method 436	3		
A	Exhaust Outlet, Downstream of Baghouse/HEPA Filters	SCAQMD Method 5.1	1	No Ports, Use EPA Method 5D	Accessible by facility owned man lift.
		CARB Method 425	3		
		CARB Method 436	3		

Facility	Sample Location		Number of Runs	Sample Ports	Sample Port Access
B	Inlet Header, Upstream of Baghouse	SCAQMD Method 5.1	1	To Be Installed by Facility	Accessible from ground level.
		CARB Method 425	3		
		CARB Method 436	3		
B	Exhaust Outlet, Downstream of Baghouse/HEPA Filters	SCAQMD Method 5.1	1	To Be Installed by Facility	Will be accessible by a facility provided man lift.
		CARB Method 425	3		
		CARB Method 436	3		

Facility	Sample Location		Number of Runs	Sample Ports	Sample Port Access
C	Inlet Header, Common to 6k, 4k and 2k lb. Furnaces for Stainless Melting	SCAQMD Method 5.1	1	To Be Installed by Facility	Accessible from raised floor.
		CARB Method 425	3		
		CARB Method 436	3		
C	Inlet Header, Common to all Furnaces, Upstream of Baghouse	SCAQMD Method 5.1	1	To Be Installed by Facility	Accessible from facility provided man lift or scaffolding.
		CARB Method 425	3		
		CARB Method 436	3		
C	Exhaust Outlet, Downstream of Baghouse/HEPA Filters	SCAQMD Method 5.1	1	To Be Installed by Facility	Accessible from facility provided man lift.
		CARB Method 425	3		
		CARB Method 436	3		

Gas Flow Rate

The gas velocity will be measured at the inlet duct and outlet duct* in accordance with SCAQMD Methods 1.1 and 2.1. This will be done using an S type Pitot tube, a differential pressure manometer, and a type "K" thermocouple with a digital potentiometer a diagram of this arrangement is presented in Figure 1 below as well as in the appropriate test method. The apparatus will be leak checked both before and after use by introducing a pressure head of at least 80 percent of full scale and blocking the flow at the Pitot tip. An observation of the resulting non diminishing pressure for at least 15 seconds at the manometer should be verified to confirm the absence of leaks in the system.

The velocity measurement location is at least two diameters downstream and one half diameter upstream of any flow disturbances. The sample traverse at each facility will be in accordance with SCAQMD Method 1.1. Traverse sampling is necessary for the determination of stack gas velocity. The number of traverse points must be determined in accordance with SCAQMD Method 1.1 for stacks with diameters greater than 12 inches.

The inlet and outlet* volumetric flow rate is calculated from the duct cross sectional area and average gas velocity. The absence of cyclonic flow conditions must be verified. The flow rate must be corrected to standard conditions using the measured duct temperatures and velocity pressures along with the barometric pressure measured with a calibrated aneroid barometer. The exhaust flow rate must also corrected to dry conditions using the moisture content as determined by SCAQMD Method 4.1 weight gain from the SCAQMD Method 5.1, CARB Method 425, and CARB Method 436 sample trains described in the following sections.

*Facility A does not have an exhaust stack, the HEPA filters are mounted in an enclosure directly on top of the baghouse. Exhaust exits from two rectangular openings in a horizontal direction on either side of the HEPA enclosure (see Figure 2 below for details). Due to the anticipated low velocity pressure exiting the baghouse/HEPA system EPA Method 5D must be used which allows for the velocity and exhaust flow to be determined at the inlet to the baghouse and then applied over the entire area of the exhaust. Isokinetic sampling rates and sampling probe nozzle size will need to be based on these calculations. If it turns out that the velocities can be measured at this location by pitot tube, then isokinetic rate can be set by the measured velocity heads.

Figure 1: Gas Velocity Measurement Apparatus

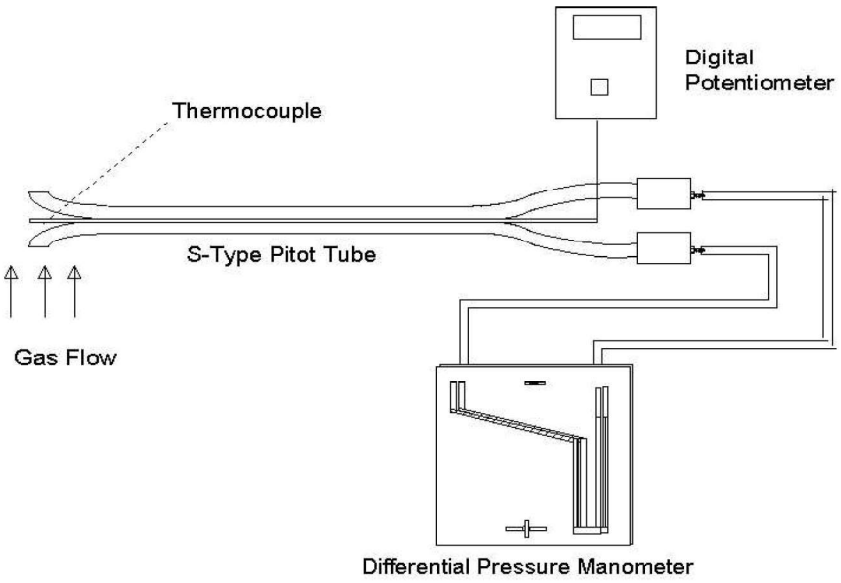
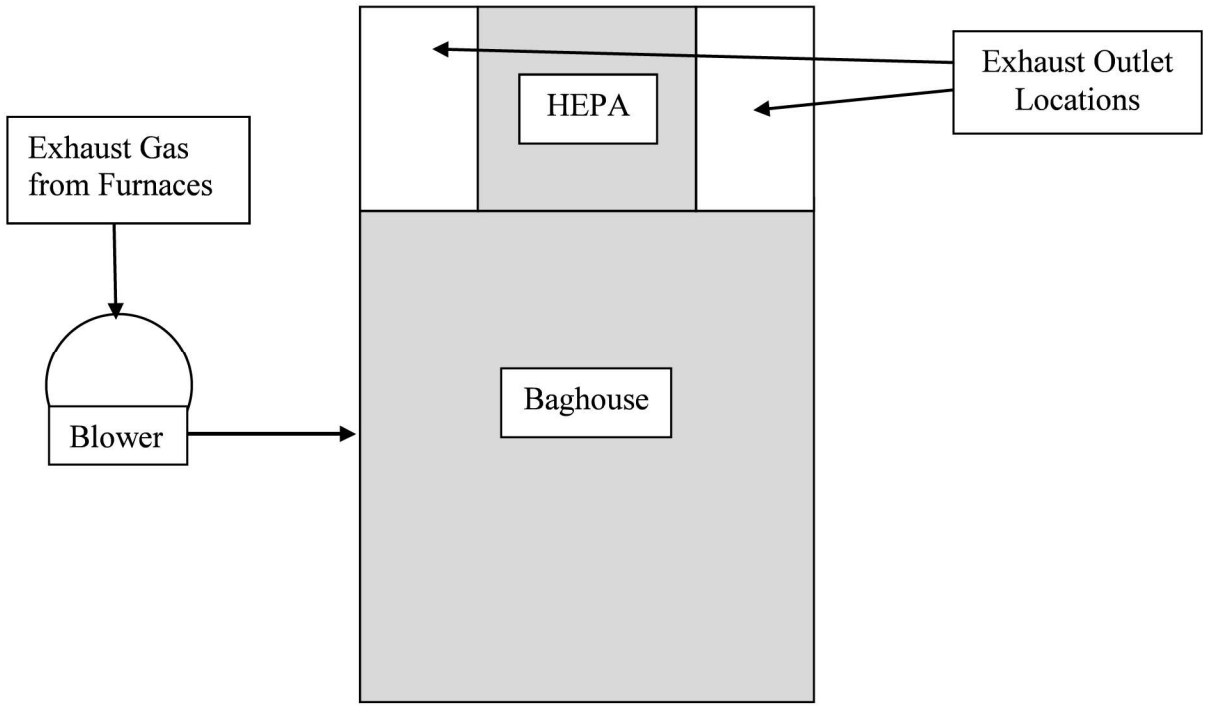


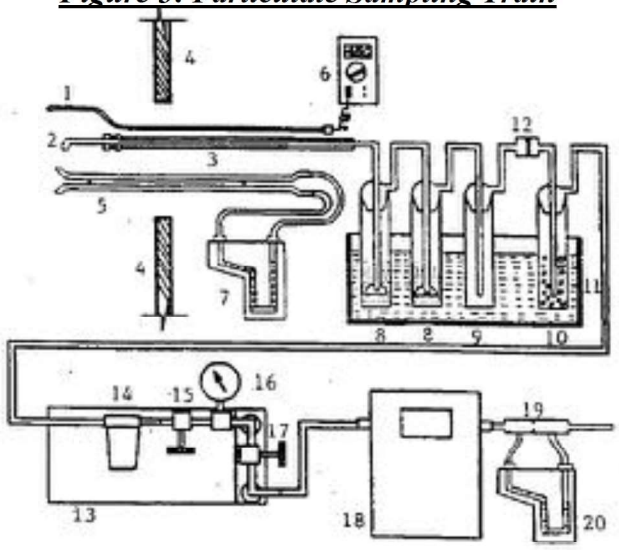
Figure 2: Facility A Exhaust Diagram (EPA Method 5D Required)



Particulate Matter Sampling

Samples are collected using SCAQMD Method 5.1. Particulate matter is withdrawn isokinetically from the source through a sample train by a metering system. Particulate matter is collected in impingers containing deionized water and on a backup filter. The impingers are contained in an ice bath to maintain a sampled gas Temperature of approximately 60°F. The filter is not heated. A diagram of the test apparatus is pictured in Figure 3 below. Total particulate matter mass is defined as the sum of the mass collected in the impingers and the probe, and on the filter after removal of combined water, plus extractable organic matter and sulfuric acid. Samples are analyzed for water gain, PM, acids, sulfates, and organics. For the purposes of this testing, the analysis should include the organic and acid/sulfate traditional analysis. ~~Following analysis, samples shall be retained and made available for 3rd party inspection.~~This is requested with the understanding that portions of the analytical method are destructive and do not allow for samples to be split. A photograph of residue "inspection" of each sample should be taken prior to analysis. The SCAQMD will reserve the right to physically inspect the samples as necessary, while giving the Contractor ample notice. Although not required by ~~the~~ SCAQMD Method 5.1, optional field blank runs may be performed and analyzed.

Figure 3: Particulate Sampling Train



1. Temperature Sensor
2. Nozzle
3. Glass Lined Stainless Steel Probe
4. S-type Pitot Tube
5. Stack Wall
6. Temperature Sensor Meter
7. Pitot Tube Inclined Manometer
8. Impinger with 100 ml H_2O
9. Empty Bubbler
10. Bubbler with Silica Gel
11. Ice Bath
12. Filter
13. Sealed Pump (Leak Free)
14. Filter for Pump
15. Metering Valve
16. Vacuum Gauge
17. By-pass Valve
18. Temperature Compensated Dry Gas Meter
19. Orifice
20. Orifice Inclined Manometer

Hexavalent Chrome Sampling

CARB Method 425 applies to the determination of hexavalent chromium (Cr^{+6}) and total chromium (Cr) emissions from stationary sources. Emissions are collected from the source in an a sampling train consisting of a glass probe and nozzle connected by non-reactive tubing to the first of two Greenburg-Smith impingers each containing 100 ml of 0.1N sodium bicarbonate ($NaHCO_3$), an empty bubbler, a Teflon filter, and a bubbler containing tared silica gel desiccant (see Figure 4).

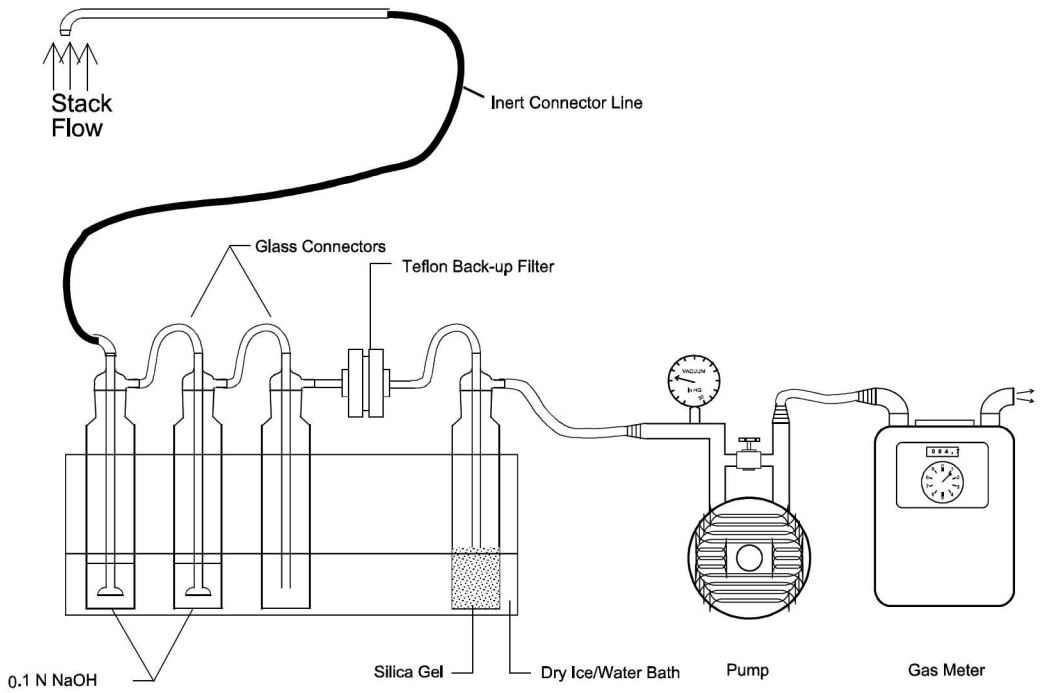
The same batch of 0.1N $NaHCO_3$ solution shall be used for field blanks, impinger sampling, sample recovery, preparation, extraction, and analysis. One batch of solution should be prepared for each facility. Substituting $NaHCO_3$ for NaOH is an approved Alternative Test Method as outlined in Sections 10 and 21 of CARB Method 425.

The impinger assembly must be connected to a vacuum pump and a calibrated dry gas meter. The sampling apparatus shall be checked for leaks both before and after sampling by blocking the flow at the probe tip. An observation of the resulting decrease in flow at the meter should be less than 0.02 cfm or four percent of the sampling rate indicated an acceptable leak rate. The impinger train must be contained within an ice bath to condense water and other condensable matter present in the sample stream.

The impinger train will be returned to the laboratory for recovery. The pH of the recovered solution must be verified as being greater than 8.0 as specified in CARB Method 425. Hexavalent chromium collected in the nozzle, probe, and impingers will be determined using ion chromatography with post column reactor (IC/PCR). The probe and line rinse shall be separated and itemized by weight separately from the rest of the analysis. For each facility a minimum of one field blank run shall be analyzed. Each blank sample train shall be brought onto the test site, assembled, leak checked, and analyzed as above for quality control purposes. No sampling should occur on the blank train.

Following testing, CARB Method 425 samples must be recovered within 24 hours. Samples should be split with remaining aliquots after primary analysis to be held for possible 3rd party analysis. Holding time for Method 425 following recovery is 14 days if stored at < 4° C.

Figure 4: CARB Method 425 Sample Train



Multiple Metals Sampling

CARB Method 436 applies to the determination of aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), phosphorus (P), selenium (Se), silver (Ag), thallium (Tl), vanadium (Vn), and zinc (Zn) stack emissions from stationary sources. For this source test the metals of specific interest are Cr, As, Cd, and Ni. Sampling is conducted using a modified CARB Method 5 sample train. The stack sample is withdrawn isokinetically from the source, with particulate emissions collected in the heated probe and on a heated filter maintained in the temperature range of 248 ± 25°F and gaseous emissions collected in a series of chilled impingers containing an aqueous solution of dilute nitric acid combined with dilute hydrogen peroxide in two impingers (analyzed for metals). If necessary for sampling the vertical port on horizontal ducts, the addition of flexible Teflon tubing between the heated probe and heated filter, or sampling train sections may be allowed; depending on sampling location.

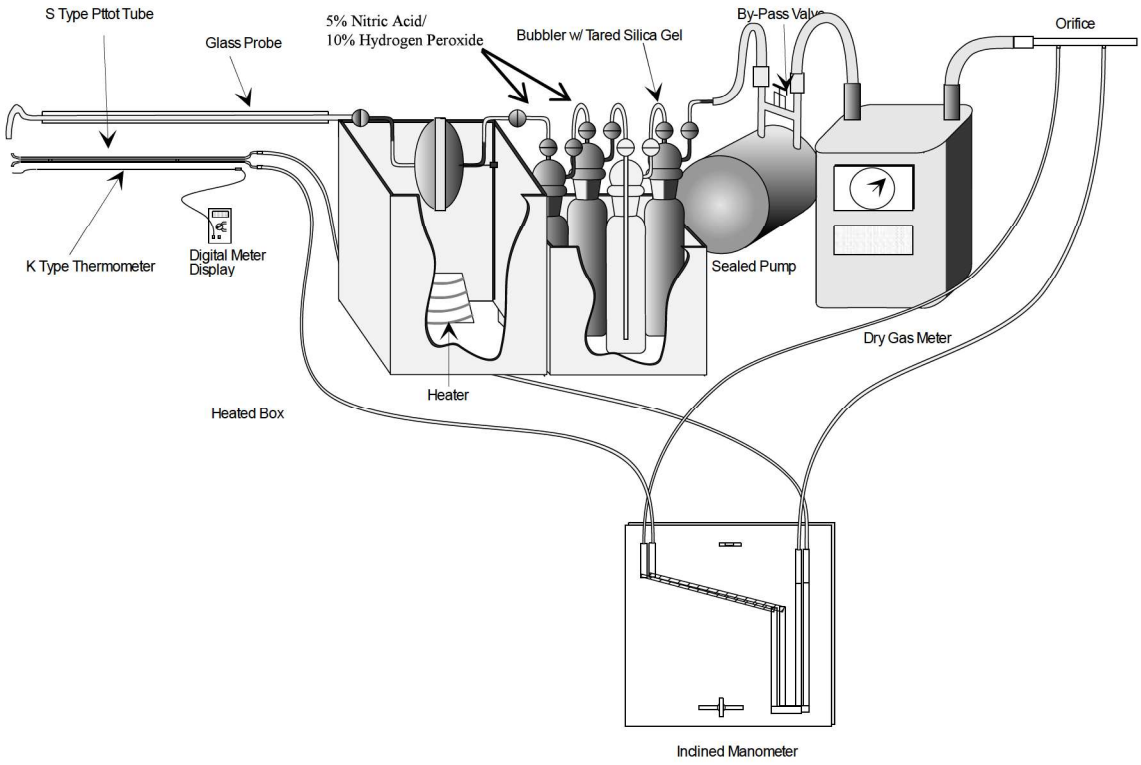
The same batch of 5% HNO_3/10% H_2O_2 solution shall be used for field blanks, impinger sampling, sample recovery, preparation, extraction, and analysis. One batch of solution should be prepared for each facility.

For each facility a minimum of one field blank run shall be analyzed. Each blank sample train shall be brought onto the test site, assembled, leak checked, and analyzed for quality control purposes. No sampling should occur on the blank train.

Sampling train (see Figure 5) components are recovered into separate front and back half fractions and acid digested using conventional Parr^R Bomb or microwave digestion techniques to dissolve inorganics and to remove organic constituents that may create analytical interferences.

Following testing Method 436 samples must be recovered as soon as practical. Samples should be split with remaining aliquots after primary analysis to be held for possible 3rd party analysis. Holding time for Method 436 following recovery is 60 days.

Figure 5: CARB Method 436 Sample Train



After digestion, portions of the probe, filter and nitric acid/hydrogen peroxide digestion solutions are combined into a single front half composite and analyzed for Cr, As, Cd, and Ni. Refer to the test method document for additional details.

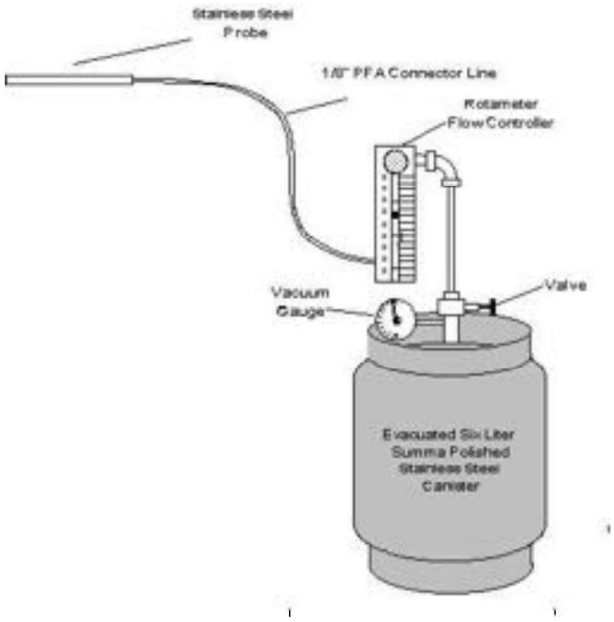
Capture Efficiency

During source testing capture efficiency testing will be performed by SCAQMD personnel (not required for contractor to perform this testing) to determine the efficiency of the collection system. A hot-wire anemometer, vane anemometer, or other device capable of directly measuring air velocity, will quantitatively measure the air velocity at the slots or hood, as applicable, of the furnace emissions collection system. Additionally, a qualitative test shall be performed and photo or video recorded using smoke tubes or smoke sticks. Documentation of these measurements will be provided to the test contractor following measurement.

Integrated Gas Sampling

An integrated gas sample will be taken at each sample location and analyzed for CO, CO_2, and O_2. The sampling procedure shall be according to SCAQMD Method 10.1. The sampling apparatus should consist of a stainless steel probe, a Teflon line, and a 6-liter summa canister (see Figure 6 below for details).

Figure 5: Integrated Gas Sample



Samples will be analyzed for carbon monoxide, carbon dioxide, and oxygen. The gasses should be separated by gas chromatography. Determination shall be by a gas chromatograph with a nickel catalyzed methanizer and flame ionization detector (GC/Ni-FID) for carbon dioxide. Carbon monoxide must be combusted to carbon dioxide and analyzed by SCAQMD Method 25.1. Oxygen will be analyzed by thermal conductivity.

QUALITY ASSURANCE

All applicable pieces of source test and process equipment used directly or indirectly for measurement of source test emission data must be calibrated, and the calibrations included in the final report (this includes gas meters, Pitot tubes, pressure gages, nozzles, temperature devices, calibration gases, fuel usage meters, totalizers, etc.).

All raw data field data sheets, as well as recorder strip charts, must accompany the test report. Additionally, all gas cylinders used to calibrate the analyzers must be certified, and a copy of the gas certificates shall be submitted with the report.

Where laboratory instrument analysis is required, instrument raw stripcharts, calibrations and standards, and limit of detection must be included in the source test report. This also includes equipment transfer and "chain-of-custody" form clearly describing all equipment and laboratory ID

numbers, dates and times, required analysis, and the signature/initials of persons involved in transfers.

The terms "non-detect" or "non-detectable" are no longer used for emission reporting purposes. Instead, non-detectable results are reported with respect to the limit of detection of the analytical instrument or method (e.g. report "<10 ppm", if detection limit is 10 parts per million). Non-detectable emission results must have supporting documentation to show that acceptable sample volume was collected pursuant to rule or permit limits and analytical method limit of detection.

Equipment used by the source testing contractors must adhere to the Chapter III calibration and maintenance requirements of the District Source Test Manual.

All source testing firms used in monitoring emissions or analyzing samples shall be District LAP contractors in good standing, and must perform testing in accordance with District procedures, as clarified in this evaluation.

FINAL TEST REPORT

The final Source Test Report must include the following information:

1) Signed "Statement of Non-Conflict as an Independent Laboratory" (District Rule 304(k)) and CARB Lab Approval or District Lab Approval Program (LAP) document (if applicable).

2) A brief opening statement identifying the Facility I.D., the equipment A/N, P/O, or Device I.D. and the reason(s) for testing (applicable rules permit conditions, etc.). Include a copy of the Permit-to-Construct, Permit-to-Operate, or Facility Permit. Also identify the test dates, the personnel on hand for the test, names, titles and phone numbers of responsible test firm and facility personnel.

3) A summary of the Source Test results, and properly formatted source test data. Results shall be reported

4) A brief process description. Indicate equipment operation during testing; as well as any other information which may influence the final report.

5) A "self-critique" of anything that transpired during the test which you feel is useful in the interpretation of the test results.

6) A simple schematic diagram of the process, showing the sampling location, with respect to the upstream and downstream flow disturbances. Also include a cross- sectional

diagram of the stack or duct at the sampling location, depicting the sampling points with respect to compass direction.

7) The sampling and analytical procedures. Be specific about all aspects of sampling and analysis. Include diagrams of test equipment and methods.

8) Complete raw field data, including production data indicative of the testing interval, lab analyses, and the test results (show all calculations).

9) Current calibration data regarding all sampling and measuring equipment utilized during testing. This also includes all laboratory calibrations. (see District Source Testing Manual, Chapter III or "Quality Assurance Handbook For Air Pollution Measurement Systems", Vol. III, U.S. EPA-600/4-77-0276).

10) All calculations concerning intermediate process, emission, and/or flow information must be shown and included in the final report. This also applies to calculations concerning laboratory analyses.

APPENDICIES

APPENDIX A

Process Operating Parameters and
Results Reporting Requirements

The following process operating parameters shall be recorded during testing at each location in addition to those specifically required by the applicable source test method:

1) Start and End time of each sample run. Note if the sample run must be stopped and restarted due to insufficient sample volume during a single heat.
2) Ambient Temperature shall be monitored and recorded before and after each test (°F).
3) Ambient Relative Humidity shall be monitored and recorded before and after each test (%).
4) Ambient Barometric Pressure shall be monitored and recorded before and after each test (in. Hg).
5) Total sampling time for each run (min.).
6) Specific material processed during each test run, this should be supported by positive material identification or certification documents.
7) Material condition (new/re-run/recycled/etc.).
8) Number of heats performed during sampling.
9) Total material charged during sampling (lbs.).
10) Average baghouse pressure differential during sampling (in. H_2O).
11) Average HEPA filter pressure differential during sampling (in. H_2O).
12) Stack temperature at sample location shall be monitored and recorded every 15 minutes during sampling (°F).
13) Description of all sources venting to the APCS during testing.
14) Velocity measurements at capture hood or furnace control system slots (fpm).

Test results summary shall at a minimum document the following:

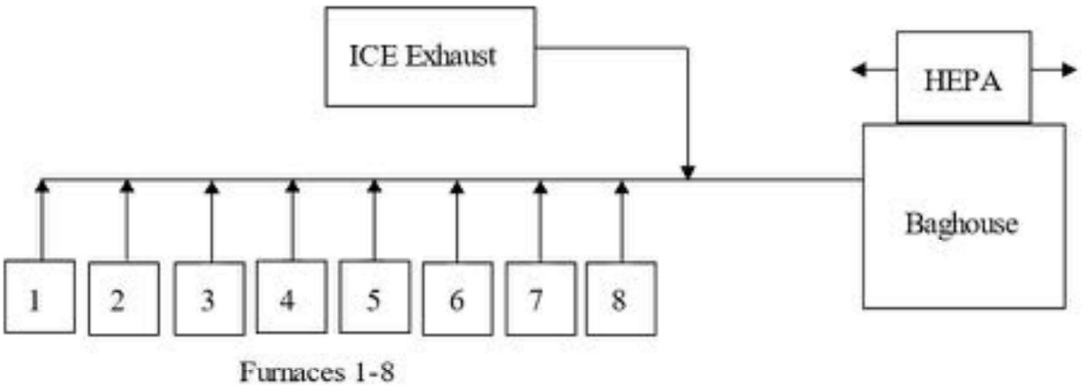
1. Summary of Process and Test Conditions
2. Summary of Results for Particulate Emissions
    a) Sample Time
    b) Exhaust Flow Rate (acfm)
    c) Exhaust Flow Rate (dscfm)
    d) Emissions (grains/dscf)
    e) Mass Emissions (lbs/hr)
3. Summary of Results for Chromium and Hexavalent Chromium
    a) Sample Time
    b) Exhaust Flow Rate (acfm)
    c) Exhaust Flow Rate (dscfm)
    d) Emissions (µg/dscm)
    e) Emissions (µg/dscf)
    f) Mass Emissions (lbs/hr)
4. Summary of Results for Multiple Metals Testing
    a) Sample Time
    b) Exhaust Flow Rate (acfm)

c) Exhaust Flow Rate (dscfm)
d) Emissions (µg/dscm)
e) Emissions (µg/dscf)
f) Mass Emissions (lbs/hr)

APPENDIX B

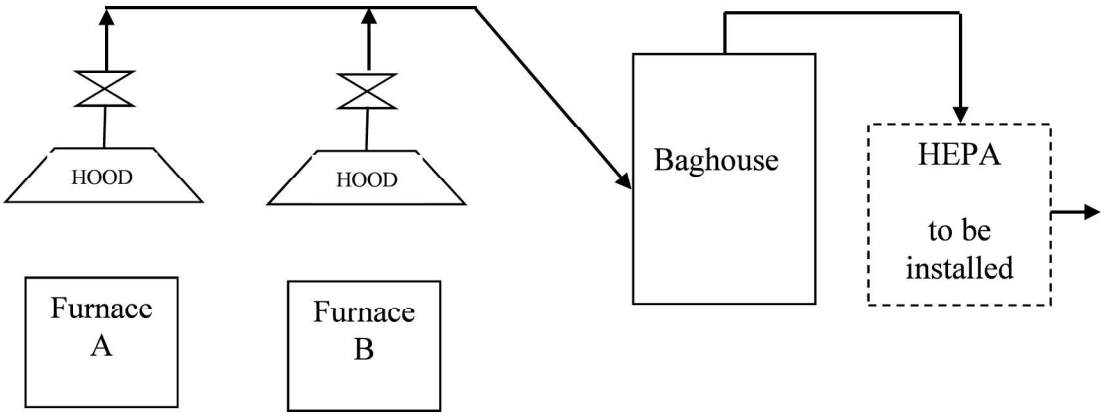
Facility Process Flow Diagrams & Photos
(Confidential Do Not Distribute)

Figure 6: Facility A - Basic Process Flow Diagram



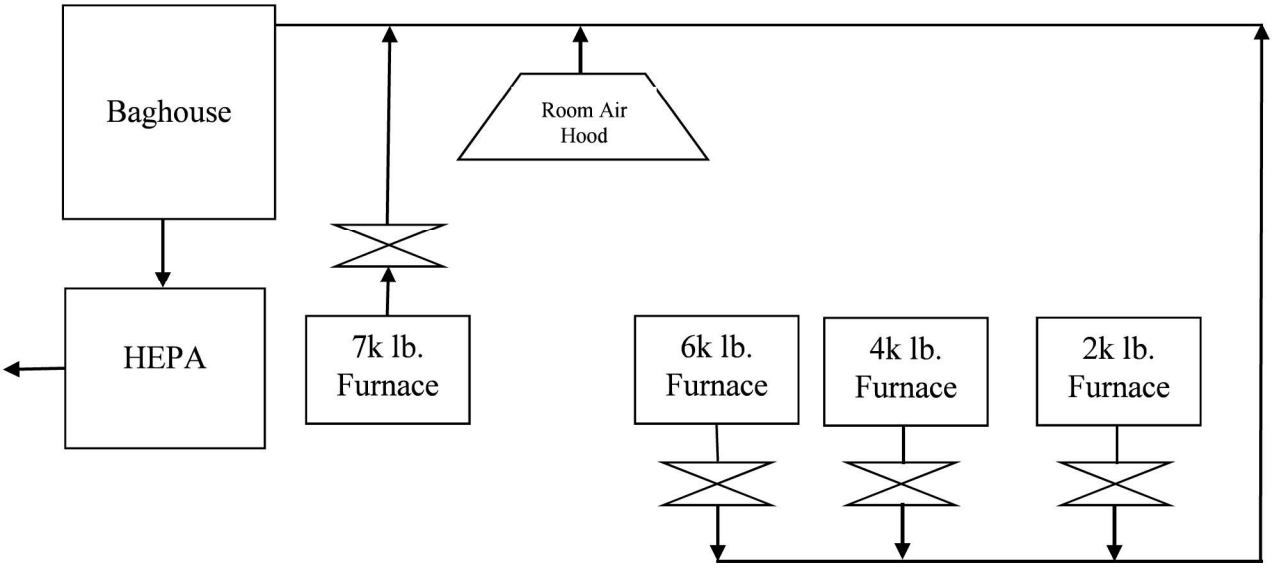
[redacted]

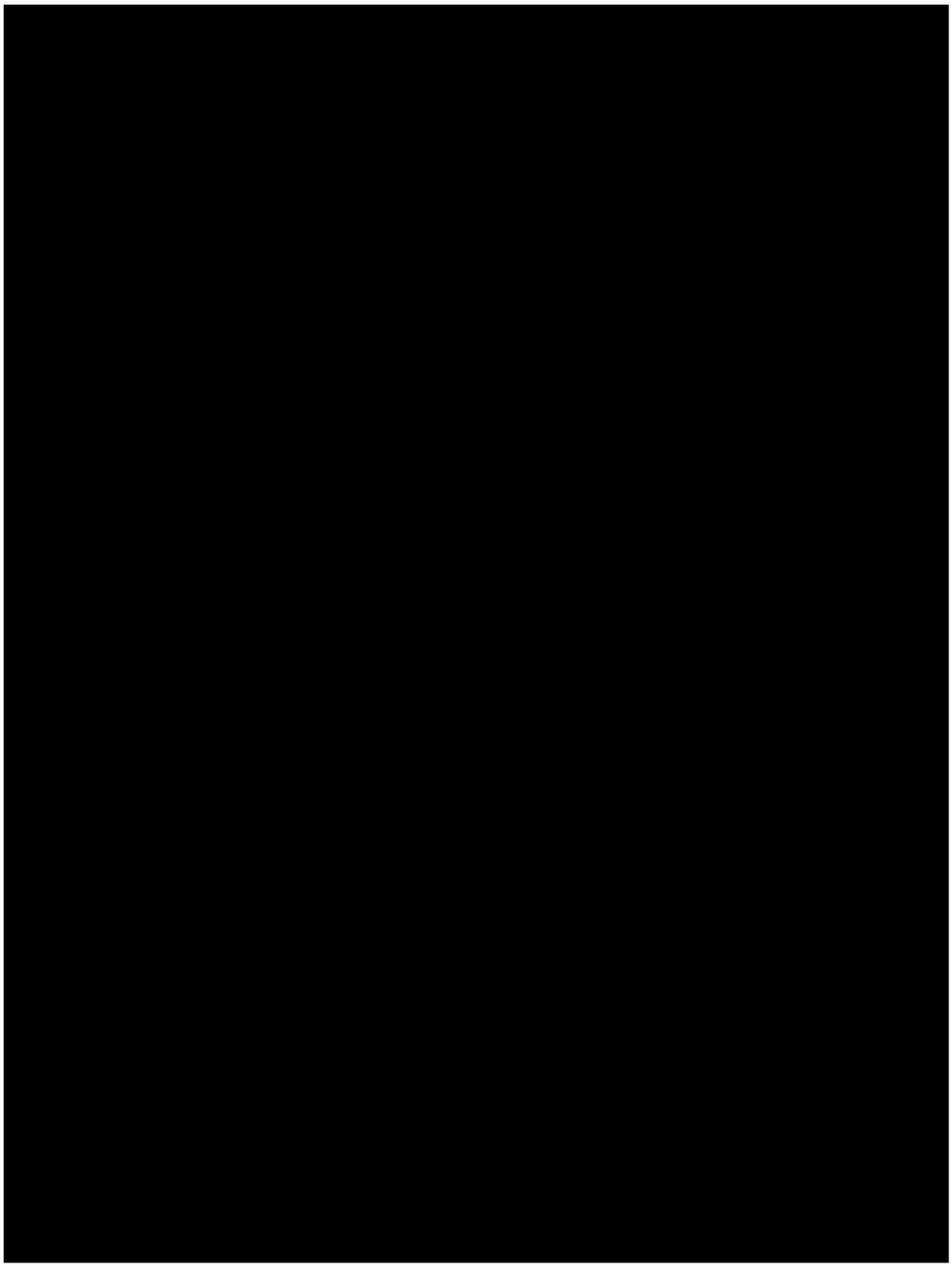
Figure 8: Facility B – Basic Process Flow Diagram



[redacted]

Figure 8: Facility C – Basic Process Flow Diagram





APPENDIX J

SCAQMD CHECKLIST FOR SOURCE TEST REPORTS, FORM STR.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING FORM STR
CHECK LIST FOR SOURCE TEST REPORTS

Please check off all the following items to verify that the information is provided in the source test report, and then send the checklist along with the source test report.

[X] Brief description of the equipment tested.

[X] Brief process description, including maximum and normal operating temperatures, pressures, through-put, etc.

[X] Operating conditions under which test was performed.

[X] Process schematic diagram showing the ports and sampling locations, including the dimensions of the ducts/stacks at the sampling locations, along with upstream and downstream locations, and distances of flow disturbances, (e.g. elbows, tees, fans, dampers) from the sampling locations (upstream and downstream).

[X] Field and laboratory data forms, strip charts and analyses.

[X] Brief description of sampling and analytical methods for each gaseous and particulate constituent measured.

[X] Calculations for volumetric flow rates and emission rates.

[X] Description of calibration and quality assurance procedures.

[X] Determination that the testing laboratory qualifies as an “independent testing laboratory” under Rule 304 (no conflict of interest).