South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
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SOURCE TEST REPORT

13-307 and 13-308

CONDUCTED AT

Exide Technologies
2700 S. Indiana Street
Vernon, CA 90058

MULTIPLE METAL AND TOXIC ORGANIC EMISSIONS FROM THE HARD AND SOFT LEAD BAGHOUSE EXHAUST STACKS

TESTED:	August 8 and 23, 2013 and September 20, 2013
LAB DATA RECEIVED:	October 11, 2013
ISSUED:	October 17, 2013
REPORTED BY:	Jason Aspell Air Quality Engineer II

REVIEWED BY:

Michael Garibay
Supervising Air Quality Engineer

SOURCE TEST ENGINEERING BRANCH

MONITORING & ANALYSIS DIVISION

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, California 91765

SUMMARY

a. Firm	Exide Technologies
b. Test Location	2700 S. Indiana St., Vernon, CA 90023
c. Unit Tested	Soft Lead Baghouse (Dev. ID C47) Hard Lead Baghouse (Device ID C46)
d. Test Requested by	Barry Wallerstein, D. Env; Executive Officer (909) 396-3131
e. Reason for Test Request	Simultaneous sampling of multiple metal and toxic organic emission rates
f. Dates of Test	August 8, 2013, August 23, 2013, and September 20, 2013
g. Source Test Performed by	M. Garibay, R. Lem, C. Willoughby E. Padilla, W. Stredwick, J. Aspell
h. Test Arrangements Made Through	Ed Mopas (Environmental Manager) Exide Technologies (323) 262-1101 x 259
i. Source Test Observed by	Michal Haynes, AQ Inspector III (909) 396-2369
j. Company I.D. No.	124838
k. Permit No.	RECLAIM/Title V Facility Permit
l. Application Nos.	501060, 374234

EXECUTIVE SUMMARY

In March 2013, the South Coast Air Quality Management District (SCAQMD) approved the Health Risk Assessment for the Exide Technologies facility in Vernon that was submitted to meet the requirements of Assembly Bill (AB) 2588 and SCAQMD Rule 1402. In response to the high levels of toxic air contaminants (TAC) reported, modifications were made to equipment at the facility in an attempt to mitigate the toxic emissions. Specifically, an isolation door was installed on the feed chute of the Blast Furnace to keep the Blast Furnace closed during times when material is not being charged to the furnace. This was designed to direct emissions to the Afterburner and Neptune Scrubber control system, instead of routing the emissions to the Hard Lead Baghouse, which is not designed to properly control emissions from the Blast Furnace feed chute. Prior to installation of the Isolation Door, arsenic emissions from the Hard Lead Baghouse contributed approximately 90% of the facility's health risk. In addition, 1,3-butadiene emissions, a toxic organic compound, from the same exhaust stack contributed 4% of the facility's risk.

Early screening source tests were performed on the Hard Lead Baghouse. Testing was performed for multiple metals (including lead and arsenic) and toxic organic emissions while the facility's Blast Furnace, Reverbatory (Reverb) Furnace and Refining Kettles were in operation. At the time of early screening testing, the facility was not capable of full-scale production. This current testing was conducted under more representative conditions of the facility's full production capacity. These tests are considered more comprehensive because the Hard and Soft Lead exhaust stacks were sampled simultaneously. In addition, for one of the test runs, the North and South Torit Filter exhaust stacks were included in the simultaneous sampling. The Torit stacks were included because of observations during the earlier test runs of visible emissions released by the furnaces inside of the building. The air within the building is designed to be collected and controlled by the Torit Filter system.

Some improvements continue to be observed with the installation and operation of the Blast Furnace Isolation Door. Overall, the door has reduced the amount of emissions released directly from the feed chute into the Hard Lead Baghouse collection vents. However, the Isolation Door should not be considered as the definitive solution to prevent excessive arsenic and toxic organic emissions from the Blast Furnace. A correlation has been established through this testing that the emissions from the Blast Furnace, both fugitives into the building and at the Hard Lead exhaust stack, are dependent on the pressure inside the Blast Furnace. Greater positive pressures have resulted in higher arsenic emissions and visible fugitive emissions. The pressure has been monitored continuously inside both furnaces since early August 2013, and a relationship between increased fugitive emissions and furnace pressures has been established through this test program, monitoring and limitations for the pressure are recommended for the purposes of minimizing arsenic emissions.

There is no confidence that the emissions presented in this report can be maintained in the future during normal operations at Exide. This is due to the variable nature of the furnace operations and the insufficient capacity of the air pollution control equipment to maintain negative pressure in the Blast Furnace. Records have shown greater pressure spikes and greater average pressures during non-test periods, which most likely resulted in greater emissions than the measured emissions.

RESULTS

Table 1. Summary of Mass Emission Rates for Contaminants of Concern

Lead	Run No. 1 8/8/13	Run No. 2 8/23/13	Run No. 3 9/20/13	Test Average	2010 HRA Test Average	2012 HRA Test Average
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Hard Lead Baghouse	**2.23×10^{-2}**	5.45×10^{-3}	**2.14×10^{-2}**	**1.64×10^{-2}***	1.02×10^{-3}	1.80×10^{-3}
Soft Lead Baghouse	N/A	4.97×10^{-3}	1.54×10^{-2}	1.02×10^{-2}#	8.51×10^{-4}	N/A

***** Exceeds SCAQMD Rule 1420.1 limit of 0.01 lb lead per hour.
# Within allowable 10% margin of error of Rule 1420.1 emission limit.

Arsenic	Run No. 1 8/8/13	Run No. 2 8/23/13	Run No. 3 9/20/13	Test Average	2010 HRA Test Average	2012 HRA Test Average
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Hard Lead Baghouse	7.31×10^{-4}	1.61×10^{-3}	1.02×10^{-3}	1.12×10^{-3}	7.59×10^{-2}	2.12×10^{-2}
Soft Lead Baghouse	N/A	8.36×10^{-6}	8.82×10^{-5}	4.83×10^{-5}	1.00×10^{-4}	N/A

1,3-Butadiene	Run No. 1 8/23/13	Run No. 2 8/23/13	Run No. 3 9/20/13	Test Average	2011 HRA Test Average	2012 HRA Test Average
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Hard Lead Baghouse	2.97×10^{-2}	2.48×10^{-2}	1.85×10^{-2}	$2.43x\ 10^{-2}$	3.45×10^{-1}	1.50×10^{-1}
Soft Lead Baghouse	2.95×10^{-3}	5.37×10^{-4}	1.22×10^{-2}	5.23×10^{-3}	9.77×10^{-2}	N/A

Benzene	Run No. 1 8/23/13	Run No. 2 8/23/13	Run No. 3 9/20/13	Test Average	2010 HRA Test Average	2012 HRA Test Average
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Hard Lead Baghouse	1.46×10^{-1}	1.27×10^{-1}	8.41×10^{-2}	1.19×10^{-1}	1.41	5.30×10^{-1}
Soft Lead Baghouse	4.94×10^{-2}	2.08×10^{-2}	1.64×10^{-1}	7.81×10^{-2}	6.19×10^{-2}	N/A

Table 2. Summary of Test Production Rates

		Run No. 1	Run No. 2	Run No. 3
Date		8/8/13	8/23/13	9/20/13
Time	HH:MM	11:10 – 13:45	09:11 - 13:21	9:03 - 13:15
Sampling time	min	120	240	240
Charge Rate During Sampling*				
Blast Furnace	ton/hr	5.31	7.24	5.79
Reverb Furnace	ton/hr	6.3	13.6	13.0
Percent of Permitted Limit During Sampling#				
Blast Furnace	%	71.4	97.5	77.9
Reverb Furnace	%	34.6	74.3	71.0
Overall Charge (Day and Night Shift)				
Blast Furnace	tons	113.5	154	134.2
Reverb Furnace	tons	263	282	172
Overall Percent of Permitted Limit (Day and Night Shift)				
Blast Furnace	%	66.0	86.4	75.3
Reverb Furnace	%	59.9	64.2	39.2
Kettle Arsenic Additions	lb	0	55	0
Time of Arsenic Addition	HH:MM	N/A	11:45	N/A

* Charge rate based on material charged during test period.

Test period charge rate extrapolated to 24 hours divided by daily permit limit of equipment.

Table 3. Summary of Test Operating Parameters

		Run No. 1	Run No. 2	Run No. 3	Average
Date		8/8/13	8/23/13	9/20/13	
EXHAUST FLOW RATES					
Hard Lead Baghouse	acfm	106,000	105,800	112,200	108,000
	dscfm	93,000	92,700	98,700	94,800
Soft Lead Baghouse	acfm	*	89,000	95,900	92,500
	dscfm	*	78,300	83,400	80,900
Neptune/Venturi Scrubber (from CEMS)	dscfm	22,700	23,000	21,000	22,200
BLAST FURNACE					
Blast Furnace Static Pressure					
Maximum	" H_2O	#	+0.59	+0.24	
Minimum	" H_2O		-0.07	-0.021	
Average	" H_2O		+0.18	+0.06	
Blast Baghouse Temperature	^oF	412	434	440	
Blast Baghouse Dilution Air Damper Position		CLOSED	CLOSED	OPEN	
REVERB FURNACE					
Reverb Furnace Static Pressure					
Maximum	" H_2O	#	+0.46	+0.69	
Minimum	" H_2O		+0.10	+0.41	
Average	" H_2O		+0.32	+0.50	

* Sampling was not conducted on Soft Lead Baghouse on 8/8/13

Pressure gauges not operational on furnaces until 8/14/13

Table 4. Air Pollution Control Device Differential Pressures (inches H_2O)

		Baghouse Cell No.									
Control Device	Run	1	2	3	4	5	6	7	8	9	10
Reverb Baghouse	1	Cells 1-5 not used					-1.0	-0.5	-1.5	-1.25	-1.0
	2						-1.25	-1.0	-2.25	-1.5	-1.0
	3						-2.0	-1.75	-2.0	-1.5	-1.0
Soft Lead Baghouse	1*	-2.0	-2.0	-2.75	-2.75	-4.0	-2.0	-2.0	-3.75	-	-
	2	-2.0	-2.0	-3.5	-3.0	-3.25	-1.75	-1.75	-3.0	-	-
	3	-2.0	-2.0	-3.5	-3.25	2.75	-1.5	-2.0	-3.0	-	-
Blast Baghouse	1	-0.25	-0.75	0	-1.0	-1.0	-	-	-	-	-
	2	-0.5	-0.75	-0.25	-1.0	-1.0	-	-	-	-	-
	3	-0.5	-1.0	0	-1.0	-1.25	-	-	-	-	-
Hard Lead Baghouse	1	*	-1.25	-6.5	-2.5	-3.75	-3.75	-6.25	-2.0	-	-
	2	-4.5	-1.0	-6.5	-6.5	-5.5	-3.0	-3.0	-2.0	-	-
	3	-4.0	-0.5	-5.5	-6.0	-4.5	-2.5	-2.5	-2.0	-	-
Venturi/ Neptune Scrubber#	1	**32**	-	-	-	-	-	-	-	-	-
	2	**34**	-	-	-	-	-	-	-	-	-
	3	**32**	-	-	-	-	-	-	-	-	-

***** Some readings were unreadable due to clouded gauges. Gauges were replaced after first run.

The Venturi/Neptune Scrubber has a permit limit of a minimum of 36 inches of H_2O when both the Reverb and Blast Furnaces are in operation. The other control devices listed in this table do not have differential pressure permit limits (but are required to have triboelectric broken bag sensors). Both furnaces were in operation during these readings.

Table 5. Summary of Test Results for Metal Emissions from Hard Lead Baghouse

HARD LEAD BAGHOUSE

	Run No. 1 8/8/13	Run No. 2 8/23/13	Run No. 3 9/20/13	Average
	lb/hr	lb/hr	lb/hr	lb/hr
Lead	**2.23×10^{-2}**	5.45×10^{-3}	**2.14×10^{-2}**	**1.64×10^{-2}***
Arsenic	7.31×10^{-4}	1.61×10^{-3}	1.02×10^{-3}	1.12×10^{-3}
Cadmium	2.87×10^{-4}	3.51×10^{-5}	8.71×10^{-5}	1.36×10^{-4}
Manganese	3.03×10^{-4}	1.79×10^{-4}	3.19×10^{-5}	1.71×10^{-4}
Nickel	3.98×10^{-4}	4.61×10^{-5}	5.81×10^{-5}	1.67×10^{-4}
Chromium	1.75×10^{-4}	5.70×10^{-5}	7.18×10^{-5}	1.01×10^{-4}
Antimony	1.06×10^{-4}	3.51×10^{-5}	1.04×10^{-4}	8.15×10^{-5}
Selenium	4.68×10^{-5}	1.56×10^{-4}	1.96×10^{-5}	7.40×10^{-5}
Barium	7.99×10^{-4}	1.45×10^{-4}	2.70×10^{-4}	4.04×10^{-4}
Zinc	8.77×10^{-3}	5.08×10^{-4}	6.38×10^{-4}	3.31×10^{-3}
Tin#	1.22×10^{-3}	3.52×10^{-2}	5.72×10^{-2}	3.12×10^{-2}
Titanium	2.34×10^{-4}	1.97×10^{-4}	1.58×10^{-4}	1.96×10^{-4}
Copper	2.19×10^{-3}	1.16×10^{-4}	1.91×10^{-4}	8.33×10^{-4}
Cobalt	3.09×10^{-5}	Non-Detect	2.90×10^{-6}	1.13×10^{-5}
Iron	1.15×10^{-2}	1.07×10^{-3}	2.28×10^{-3}	4.96×10^{-3}

***** Exceeds SCAQMD Rule 1420.1 limit of 0.01 lb lead per hour.
# Tin is present in the hydrogen peroxide impinger solution as a stabilizer.

Table 6. Summary of Test Results for Metal Emissions from Soft Lead Baghouse*

SOFT LEAD BAGHOUSE

	Run No. 1 8/23/13	Run No. 2 9/20/13	Average
	lb/hr	lb/hr	lb/hr
Lead	4.97×10^{-3}	1.54×10^{-2}	$1.02 \times 10^{-2\#}$
Arsenic	8.36×10^{-6}	8.82×10^{-5}	4.83×10^{-5}
Cadmium	4.60×10^{-5}	1.38×10^{-4}	9.20×10^{-5}
Manganese	1.59×10^{-4}	8.24×10^{-5}	1.21×10^{-4}
Nickel	4.72×10^{-5}	8.60×10^{-5}	6.66×10^{-5}
Chromium	7.23×10^{-5}	1.03×10^{-4}	8.76×10^{-5}
Antimony	3.29×10^{-5}	1.05×10^{-4}	6.90×10^{-5}
Selenium	Non-Detect	2.57×10^{-5}	1.29×10^{-5}
Barium	1.26×10^{-4}	2.38×10^{-4}	1.82×10^{-4}
Zinc	8.94×10^{-4}	2.56×10^{-3}	1.73×10^{-3}
Tin^{+}	3.04×10^{-2}	5.67×10^{-2}	4.35×10^{-2}
Titanium	1.85×10^{-4}	3.05×10^{-4}	2.45×10^{-4}
Copper	2.17×10^{-4}	3.01×10^{-4}	2.59×10^{-4}
Cobalt	Non-Detect	7.35×10^{-6}	3.68×10^{-6}
Iron	2.86×10^{-2}	6.06×10^{-3}	1.73×10^{-2}
Beryllium	Non-Detect	2.94×10^{-7}	1.47×10^{-7}

*Only two runs were conducted on the Soft Lead Baghouse Exhaust Stack. SCAQMD Rule 1420.1 requires triplicate runs for compliance.

Average lead emissions are within the allowable 10% margin of error of the Rule 1420.1 compliance limit of 0.01 lb lead per hour.

+ Tin is present in the hydrogen peroxide impinger solution as a stabilizer.

Table 7. Summary of Toxic Organic Emissions from Hard Lead Baghouse

HARD LEAD BAGHOUSE

Compound	Run No. 1	Run No. 2	Run No. 3	Average
	8/23/13	8/23/13	9/20/13	
	lb/hr	lb/hr	lb/hr	lb/hr
1,3-butadiene	2.97×10^{-2}	2.48×10^{-2}	1.85×10^{-2}	2.43×10^{-2}
benzene	1.46×10^{-1}	1.27×10^{-1}	8.41×10^{-2}	1.19×10^{-1}
acrolein	1.64×10^{-3}	1.97×10^{-3}	2.63×10^{-3}	2.08×10^{-3}
methylene chloride	6.23×10^{-4}	7.48×10^{-4}	3.98×10^{-4}	5.89×10^{-4}
MEK	1.80×10^{-3}	1.69×10^{-3}	1.69×10^{-3}	1.73×10^{-3}
chloroform	7.00×10^{-4}	5.25×10^{-4}	3.73×10^{-4}	5.33×10^{-4}
toluene	3.43×10^{-2}	2.97×10^{-2}	2.68×10^{-2}	3.03×10^{-2}
ethylbenzene	8.72×10^{-3}	7.01×10^{-3}	3.81×10^{-3}	6.51×10^{-3}
m+p xylenes	1.56×10^{-2}	9.81×10^{-3}	6.63×10^{-3}	1.07×10^{-2}
styrene	1.59×10^{-1}	1.20×10^{-1}	5.42×10^{-2}	1.11×10^{-1}
o-xylene	4.52×10^{-3}	2.65×10^{-3}	3.32×10^{-3}	3.49×10^{-3}
n-hexane	4.42×10^{-3}	5.18×10^{-3}	2.02×10^{-3}	3.88×10^{-3}
propylene	1.20×10^{-1}	9.57×10^{-2}	9.01×10^{-2}	1.02×10^{-1}
tetrachloroethylene	Non-Detect	Non-Detect	2.59×10^{-4}	8.64×10^{-5}
carbon tetrachloride	Non-Detect	Non-Detect	2.40×10^{-4}	8.01×10^{-5}

NOTE: Table only lists compounds identified as SCAQMD Rule 1401 Toxic Air Contaminants. Other non-toxic compounds detected in analysis are listed in Calculations section of this report.

Table 8. Summary of Toxic Organic Emissions from Soft Lead Baghouse

SOFT LEAD BAGHOUSE

Compound	Run No. 1	Run No. 2	Run No. 3	Average
	8/23/13	8/23/13	9/20/13	
	lb/hr	lb/hr	lb/hr	lb/hr
1,3-butadiene	2.95×10^{-3}	5.37×10^{-4}	1.22×10^{-2}	5.23×10^{-3}
benzene	4.94×10^{-2}	2.08×10^{-2}	1.64×10^{-1}	7.81×10^{-2}
acrolein	7.65×10^{-4}	6.26×10^{-4}	3.03×10^{-3}	1.47×10^{-3}
methylene chloride	4.21×10^{-4}	5.27×10^{-4}	Non-Detect	3.16×10^{-4}
MEK	1.52×10^{-3}	7.16×10^{-4}	9.52×10^{-4}	1.06×10^{-3}
chloroform	5.92×10^{-4}	2.96×10^{-4}	1.58×10^{-4}	3.49×10^{-4}
toluene	8.91×10^{-3}	4.34×10^{-3}	3.27×10^{-2}	1.53×10^{-2}
ethylbenzene	3.82×10^{-3}	2.63×10^{-3}	2.66×10^{-3}	3.04×10^{-3}
m+p xylenes	1.55×10^{-2}	1.05×10^{-2}	1.40×10^{-2}	1.34×10^{-2}
styrene	1.81×10^{-3}	3.87×10^{-4}	3.01×10^{-2}	1.08×10^{-2}
o-xylene	4.35×10^{-3}	2.50×10^{-3}	2.66×10^{-3}	3.17×10^{-3}
n-hexane	5.34×10^{-4}	4.28×10^{-4}	9.10×10^{-4}	6.24×10^{-4}
propylene	1.07×10^{-2}	6.68×10^{-3}	1.06×10^{-1}	4.10×10^{-2}
carbon tetrachloride	Non-Detect	Non-Detect	2.03×10^{-4}	6.77×10^{-5}

NOTE: Table only lists compounds identified as SCAQMD Rule 1401 Toxic Air Contaminants. Other non-toxic compounds detected in analysis are listed in Calculations section of this report.

INTRODUCTION

On August 8 and 23, and September 20, 2013, engineers from the SCAQMD conducted source tests for multiple metal and toxic organic emissions from the Hard Lead Baghouse and Soft Lead Baghouse exhaust stacks at Exide Technologies in Vernon. A series of tests has been performed in response to high levels of toxic air contaminants (arsenic in particular) from the Hard Lead Baghouse that were detected during previous source tests used to determine the facility-wide health risk. These tests were performed in addition to an earlier screening source test program. During the initial runs for this test and previous testing, fugitive emissions from the Reverb and Blast Furnaces were observed to be vented into the building enclosing these processes. Because the North and South Torit exhaust stacks ventilate the building air to cartridge and HEPA filters, a simultaneous one-run test was conducted on these two additional stacks during the testing on September 20. Almega Environmental was contracted to perform the additional testing on the Torit exhaust stacks, and the results will be reported separately by Almega.

EQUIPMENT AND PROCESS DESCRIPTION

Exide Technologies is a Cycle 1 RECLAIM facility for NOx and SOx, and is in the Title V permitting program. The facility operates a secondary lead smelting process to recover lead from recycled automotive batteries.

The facility receives lead-acid batteries from off-site collection facilities and breaks them down in the Raw Material Preparation System (RMPS) using a hammer mill. The components are then drained of acid and separated into metallic lead, polypropylene, rubber and plastic fractions. Emissions from this process are vented to a packed bed scrubber followed by a HEPA filter.

Following the RMPS, the metallic portion is fed to the furnaces for smelting. This consists of two different streams, the Reverb Furnace to process lead acid and battery scrap, and the Blast Furnace to process lead slag and scrap. The emissions from Reverb Feed Hopper are controlled by the MAC Baghouse, and fugitive emissions from the Kiln Dryer are collected by two vents leading to the Hard Lead Baghouse. The Reverb Feed Hopper feeds the 8 MMBTU/hr natural gas-fired Rotary Kiln Dryer. The Kiln Dryer is used to drive off moisture and other contaminants prior to feeding the furnace, which is vented to a baghouse with Teflon-coated bags. The scrap is then fed to the 30 MMBTU/hr natural gas-fired Reverb Furnace. The lead is reduced in the furnace and slag is removed from the bottom to feed the Blast Furnace, while the crude lead is refined further in the soft lead process. The soft lead refined in this process is typically 99.9% pure lead. Emissions from the Reverb Furnace are quenched before entering the Reverb Baghouse, which is followed by the Venturi and Neptune scrubbers. The crude lead removed from the Reverb Furnace is fed into receiving kettles and then refined in four refining kettles. Emissions from this refining process are collected and controlled by the Soft Lead Baghouse. The Soft Lead Baghouse also collects fugitive emissions from the tapping ports on either side of the Reverb Furnace. On the south side of the building, the slag from the Reverb

Furnace is fed into the top of a 4 MMBTU/hr coke and natural gas-fired Blast Furnace. Lead removed from this process is further refined into hard lead in refining kettles which are vented by the Hard Lead Baghouse. Emissions from the inside of the Blast Furnace are vented to a 10 MMBTU/hr natural gas-fired afterburner, the Blast Baghouse, and then manifolded with the exhaust from the Reverb Furnace to the Venturi and Neptune Scrubbers. Emissions from the tapping ports on either side of the Blast Furnace are vented to the Hard Lead Baghouse.

The Blast Furnace feed chute, located on top of the Blast Furnace, was recently equipped with an isolation door in March/April 2013 for the purpose of addressing the high arsenic emissions from the Hard Lead Baghouse stack. When the furnace is not being charged, the door remains closed. The feed cart is loaded in the Blast Feed Room and is hoisted with cables to the top of the furnace. As the cart approaches the top of the furnace, it mechanically opens the isolation door and the contents of the cart are unloaded into the furnace. Dust created during the charging is collected by various ducts surrounding the door that vent the emissions to the Hard Lead Baghouse. As the Feed Cart begins its descent back down to the Feed Room, the door closes again. A schematic diagram of this process is located in Figure 1.

SAMPLING AND ANALYTICAL PROCEDURES

Source testing was conducted on the Hard Lead and Soft Lead Baghouse exhaust stacks at Exide Technologies (Figures 2 and 3). Testing consisted of multi-run sampling performed for multiple metals using California Air Resources Board (CARB) Method 436. Fixed gases testing, to determine the molecular weight of the stack gases pursuant to SCAQMD Method 10.1, and toxic organic emissions testing, following U.S. EPA Method TO-15, were both performed using integrated 6-liter summa canister samples.

Gas Flow Rate

The gas velocity was measured during the sampling runs in accordance with SCAQMD Methods 1.1 and 2.1. This was done using an S type Pitot tube (permanently attached to the probe, with the impact opening of the Pitot tube even with the nozzle entry plane) with a differential pressure manometer, and a type "K" thermocouple (also permanently attached to the probe so that the tip of the sensor extended beyond the leading edge of the probe sheath, and touching no metal) with a digital potentiometer (Figure 4). The apparatus was 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 verified the absence of leaks in the system.

The access ports on both stacks were greater than five diameters downstream and greater than four stack diameters upstream from any flow disturbances along the vertical exhaust stack. Velocity sampling was performed at 24 traverse points positioned across the ports along the

stack diameters. Details regarding traverse point locations and locations of the access ports for the exhaust stacks can be found in Figure 5 of this report.

The volumetric flow rate was calculated from the exhaust stack cross sectional area and average gas velocities. The absence of cyclonic flow conditions was verified during previous source tests. The flow rate was corrected to standard conditions by using the stack temperature and pressure along with the barometric pressure measured with a calibrated aneroid barometer. The flow rates were also corrected to dry conditions using the moisture content as determined by SCAQMD Method 4.1 weight gain from the multiple metals samples described in the following sections.

Multiple Metals Sampling and Analysis

Testing was conducted using CARB Method 436. Each sampling train consisted of a borosilcate probe and nozzle, which was used to draw the stack sample isokinetically from the source. The sample was then drawn through two impingers each filled with an aqueous solution of 5% nitric acid and 10% hydrogen peroxide, an empty impinger, a 2" Teflon-coated glass fiber filter, and an impinger bubbler filled with tared silica gel. Each sampling train was connected to a leak free vacuum pump, a dry gas meter, and a calibrated orifice. The impingers were contained in a dry ice bath to condense water vapor and other condensable matter present in the sample stream (Figures 6 and 7). The method option for two impingers containing an acidic potassium permanganate solution used solely to collect mercury vapor emissions was not used because previous testing did not indicate that mercury emissions were significant. A modification was made by moving the filter prior to the impinger containing the silica gel.

The SCAQMD laboratory analyzed the metals in the samples by EPA Method 200.7. Metals deposited in the filter, probe, nozzle and impingers were acid digested and analyzed by ICP/MS (Inductively Coupled Plasma Mass Spectrometry) by the SCAQMD laboratory. Moisture content was determined gravimetrically and volumetrically.

Toxic Organic Compounds Sampling and Analysis

Testing was conducted using U.S. EPA Method TO-15. The sample was collected continuously from the exhaust stack. The gas sampling apparatus consisted of a stainless steel probe, a Teflon line, and a specially prepared 6-liter summa canister. The equipment is similar to that described in Figure 8 used for Integrated Gas Sampling (SCAQMD Method 10.1) except no rotameter was used. Analysis involves using a high resolution gas chromatograph coupled with a mass spectrometer. Previous testing on similar sources using this method has shown it yields similar results obtained simultaneously with CARB Method 422.

Integrated Gas Sampling and Analysis

An integrated gas sample was collected continuously from the exhaust stack during each day of testing. The gas sampling apparatus consisted of a stainless steel probe, a Teflon line, and a 6-liter summa canister (Figure 8). The sample was collected at a rate of approximately 0.10 liters per minute controlled by a rotameter.

The samples were analyzed by the SCAQMD laboratory for carbon monoxide, carbon dioxide, and oxygen. The gases were separated by gas chromatography. The carbon dioxide was determined by a gas chromatograph with a nickel catalyzed methanizer and flame ionization detector (GC/Ni-FID). Carbon monoxide was combusted to carbon dioxide and analyzed by SCAQMD Method 25.1. Oxygen was analyzed by thermal conductivity.

TEST CRITIQUE

The testing was conducted on a pre-scheduled basis during normal working hours, to gather multiple metal and toxic organics emissions data to monitor emissions from the facility. Sampling commenced on August 8, 2013 on only the Hard Lead Baghouse. The Soft Lead Baghouse was included the testing program on August 23 and September 20 after fugitive emissions from the Reverb Furnace were observed being collected by the Soft Lead Baghouse vents. Similarly, the Torit exhaust stacks were included in the testing after fugitive emissions from both the Reverb and Blast Furnace were observed being collected by those vents. Due to the timing of the observations, multiple metals testing only consisted of two test runs for the Soft Lead Baghouse and one test run for the Torit Filters.

Based upon previous testing for metals on this equipment, it was determined that a 120 minute sampling time would give analytical results above the detection limits for lead, arsenic and other metals. After the first run was completed, the sampling time was increased to 240 minutes due to the variable operation of the furnaces, with respect to charge rates and fugitive emissions.

The average of the triplicate test runs on the Hard Lead Baghouse resulted in an exceedance of the SCAQMD Rule 1420.1 limit of 0.01 lb lead per hour. In addition, the recorded total differential pressure across the Venturi/Neptune Scrubber system did not meet the minimum requirement of 36" H_2O (Permit Condition C8.7) for each test run.

Pressure gauges were installed on both furnaces for the second and third runs of the test. Continuous pressure readings were provided by Exide after the testing. Periods of high positive pressure in the Blast Furnace were typically accompanied by visible emissions when the Isolation Door was open, and from other places on the Blast Furnace, that were collected by either the Hard Lead Baghouse or the Torit Filter system. In addition, it was observed that pressure spikes greater than 1.0" H_2O in the Reverb Furnace resulted in visible fugitive

emissions being released into the building, which were collected by the Torit Filters. During the test run that included the Torit Filters on September 20, a lesser amount of these fugitive emissions occurrences were observed.

Although periods of both negative and positive pressures were recorded during the test for the Blast Furnace, the average pressures (obtained from one-minute readings) were positive for both furnaces. During periods of negative pressure in the Blast Furnace during the tests, no visible emissions were observed from the Blast Furnace. Conversely, during periods of positive pressure in the Blast Furnace, visible emissions were observed from various seams in the Blast Furnace, as well as during opening and charging to the Isolation Door and feed chute. It should be noted that the highest arsenic emissions from the Hard Lead Baghouse occurred during the test run with the highest Blast Furnace feed rate and the highest average Blast Furnace pressure. Testing included an arsenic addition, and a high temperature antimony addition, to the refining kettles during the second run of testing. Although there was an increase in arsenic emissions measured during this run compared to the next highest arsenic measurement, it is thought that the Blast Furnace pressure has a greater effect on arsenic emissions.

Emissions of benzene and 1,3-butadiene from the Hard Lead Baghouse were consistent regardless of feed rate or Blast Furnace pressure. Emissions for lead, arsenic, 1,3-butadiene and benzene from the Soft Lead Baghouse were all higher during the third run, which experienced the highest Reverb Furnace pressure of all three of the test runs. The emission rates of these four compounds from the Soft Lead Baghouse are still much less than the emission rates from the Hard Lead Baghouse from the 2010 and 2012 Health Risk Assessment tests. Charts of the Reverb and Blast Furnaces Pressures from the test days are located in Figures 9 through 12.

1,3-butadiene emissions are typically tested in accordance with CARB Method 422.102. For this testing program, EPA Method TO-15 was used to measure 1,3-butadiene emissions as a screening tool. However, based on previous testing Method TO-15 is expected to yield similar and accurate results as compared to Method 422.102.

The Blast Baghouse is equipped with a dilution air damper to cool the flue gas prior to the baghouse. This damper is automatically controlled and was observed to be open during the test on September 20. The air flow into the duct was not quantified. Future testing for NESHAP Subpart X compliance should include a quantification of the dilution air to verify compliance with the concentration limit.

Exide Blast/Cupola Furnace

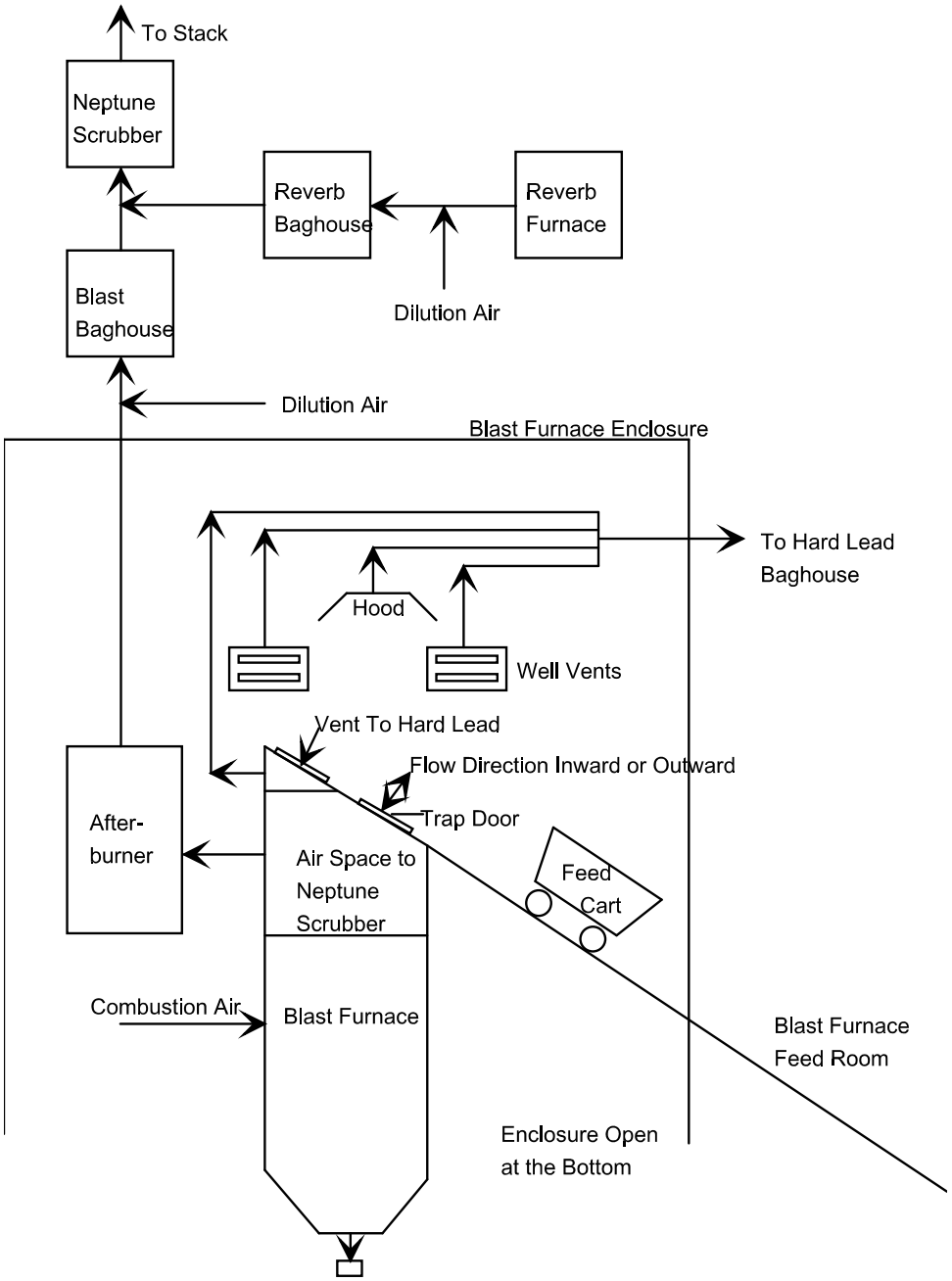


Figure 1: Blast Furnace Feed and Exhaust Schematic Diagram

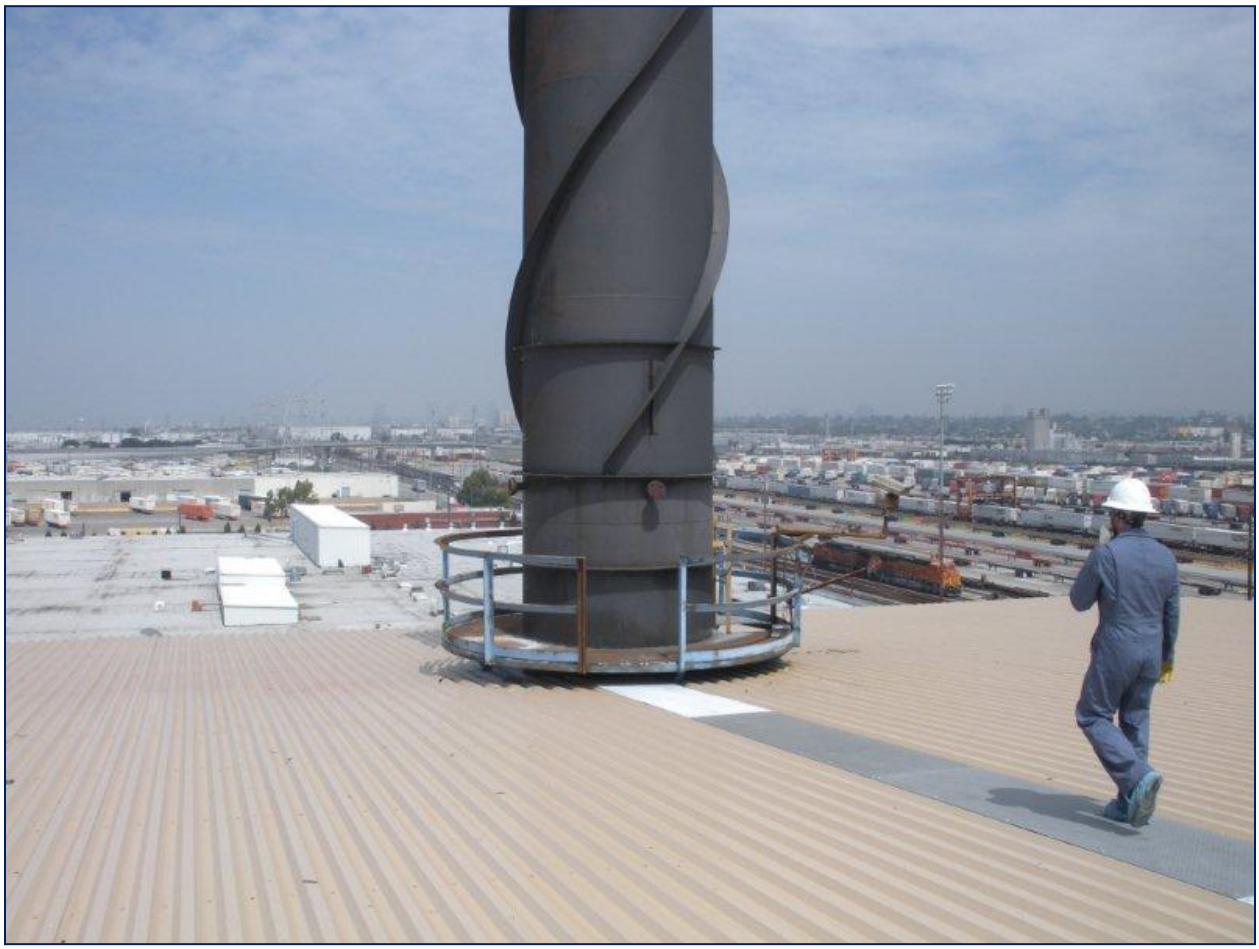


Figure 2: Hard Lead Baghouse Exhaust Stack

Figure 3: Soft Lead Baghouse Exhaust Stack

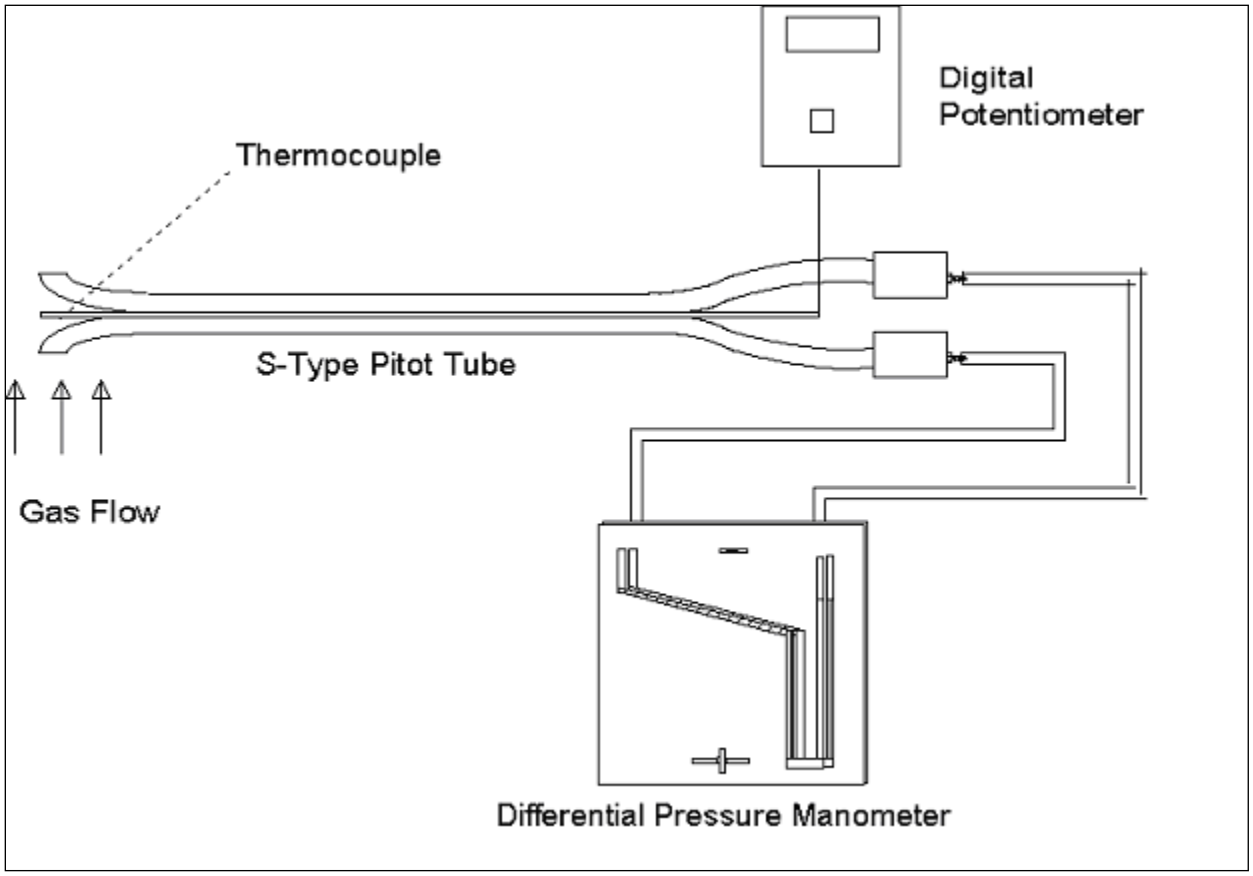
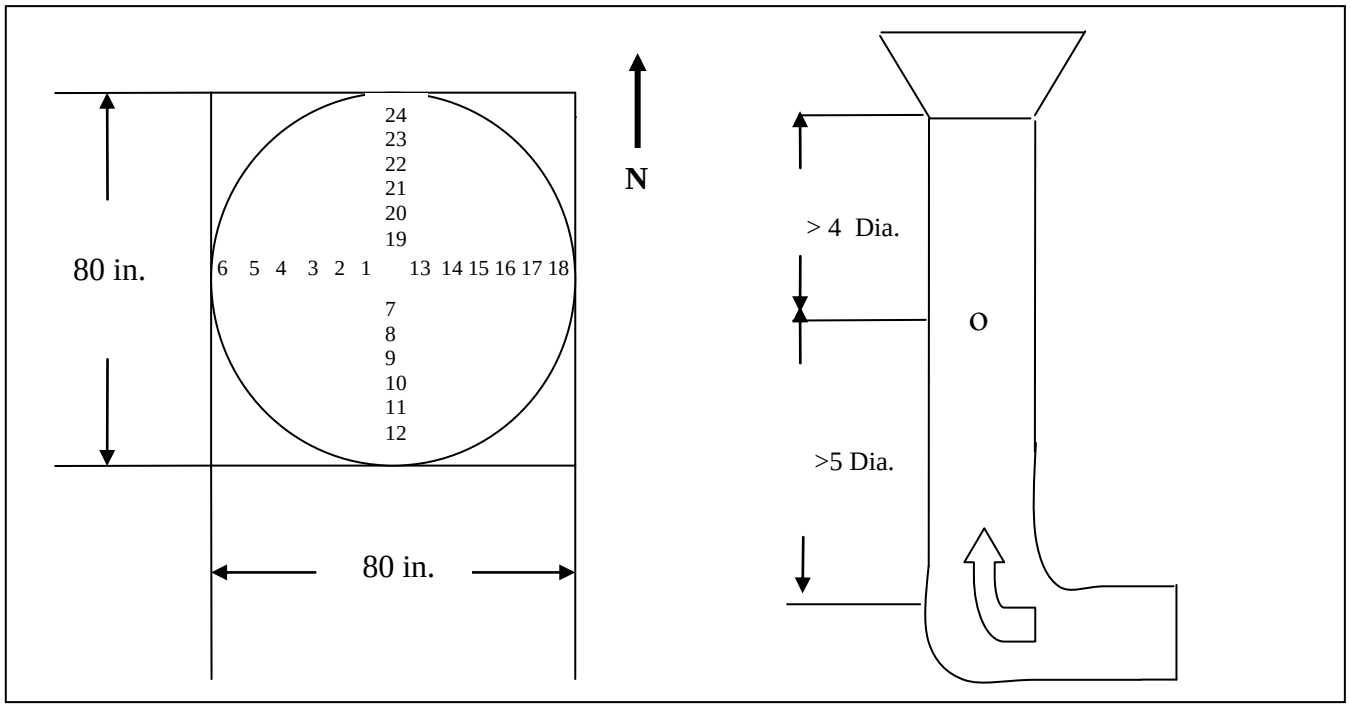


Figure 4: SCAQMD Methods 1.1 and 2.1

Stack Orientation: Vertical, Circular



Traverse Point Number	Distance from inner stack wall (in.)
1, 7, 13, 19	28.45
2, 8, 14, 20	20.00
3, 9, 15, 21	14.18
4, 10, 16, 22	9.45
5, 11, 17, 23	5.36
6, 12, 18, 24	1.70

Figure 5: Hard Lead and Soft Lead Baghouses Stack Diagram and Sampling Locations
(Both exhaust stacks are identical in dimensions)

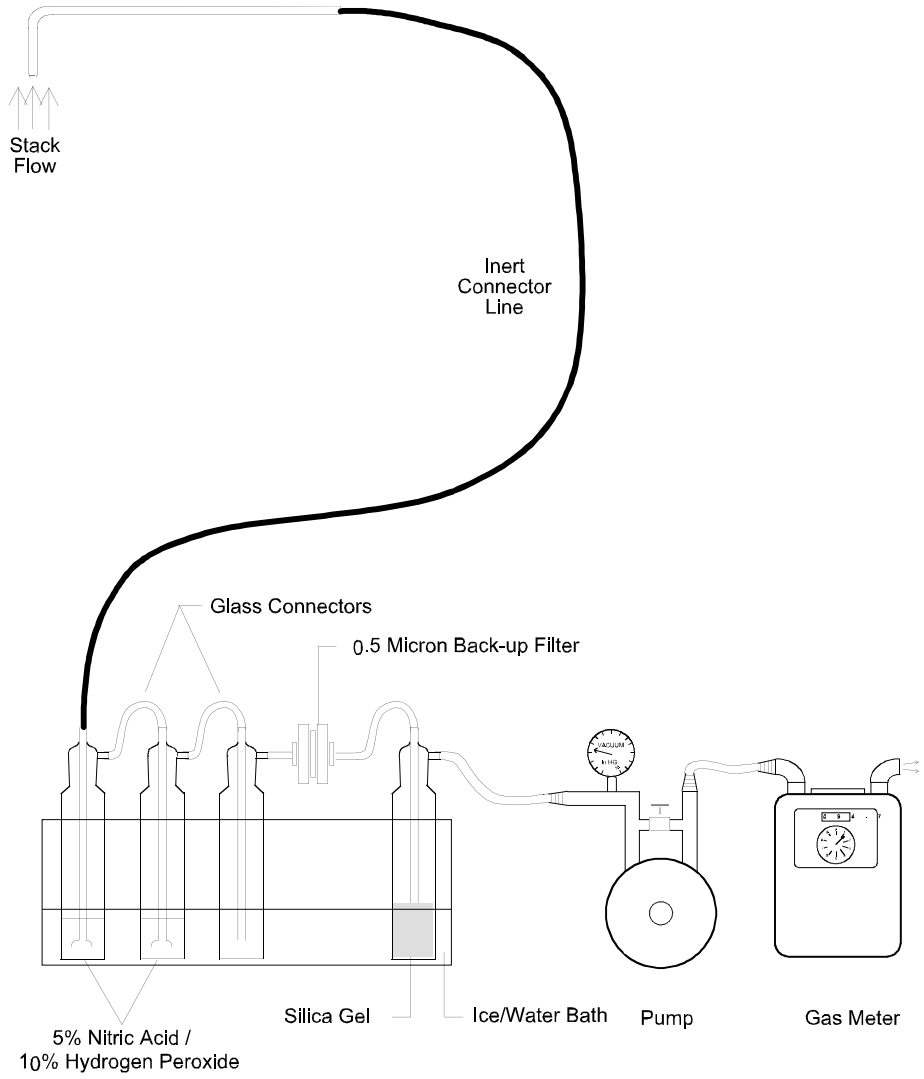


Figure 6: CARB Method 436 Sampling Train Diagram
(Modified by moving filter before the fourth impinger)

Figure 7: CARB Method 436 Field Sampling Train and Probe

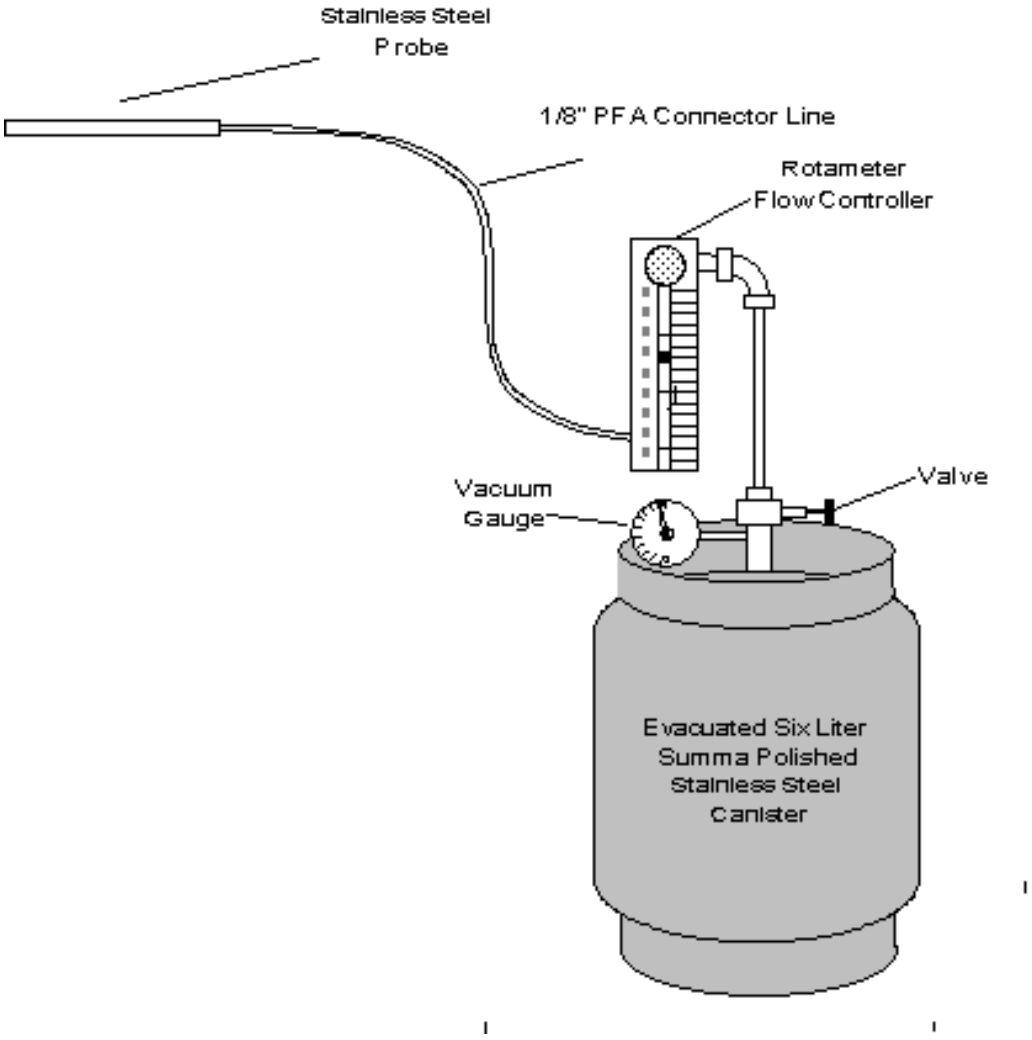


Figure 8: SCAQMD Method 10.1

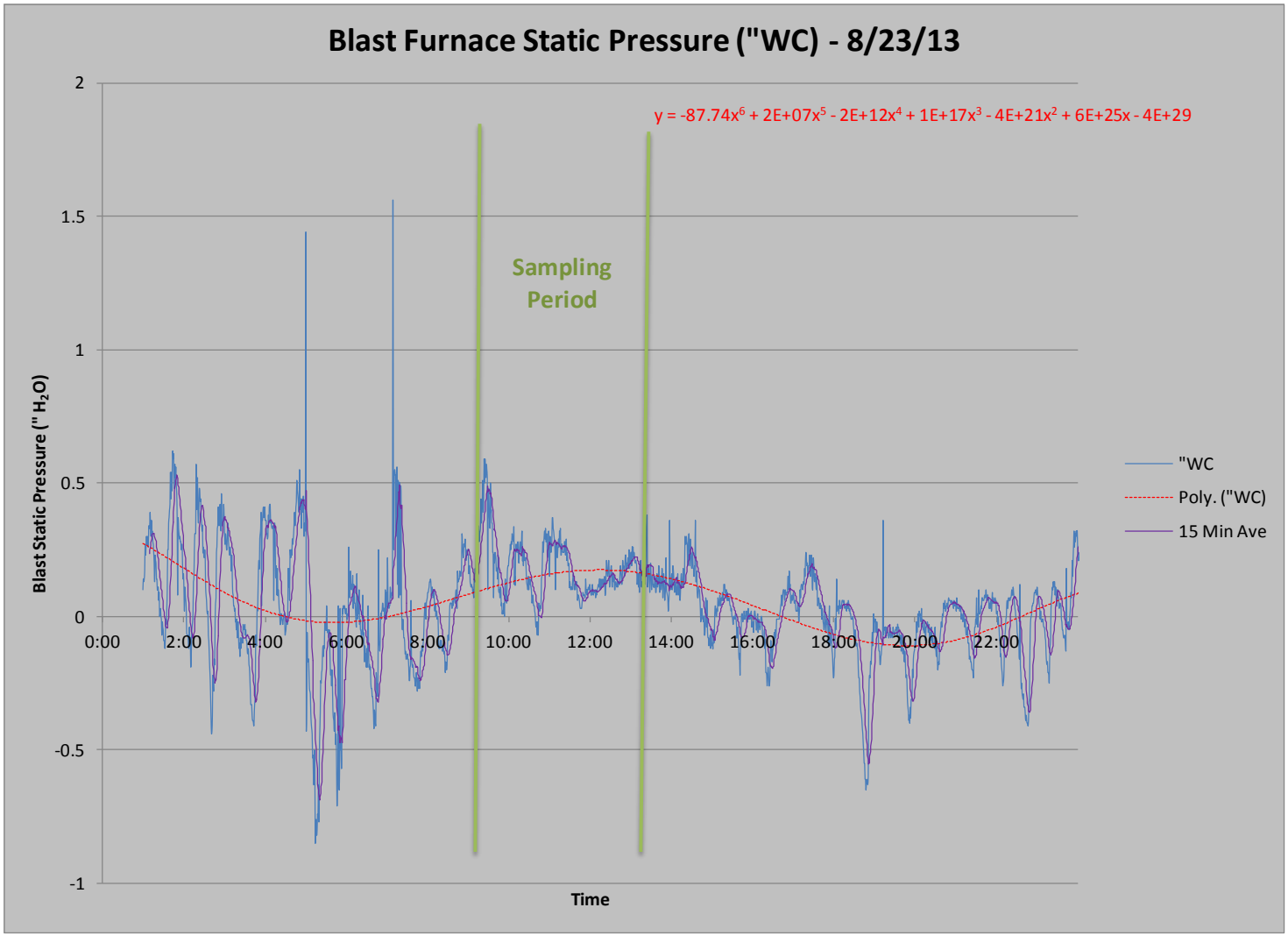


Figure 9: Blast Furnace Static Pressure (8/23/13)

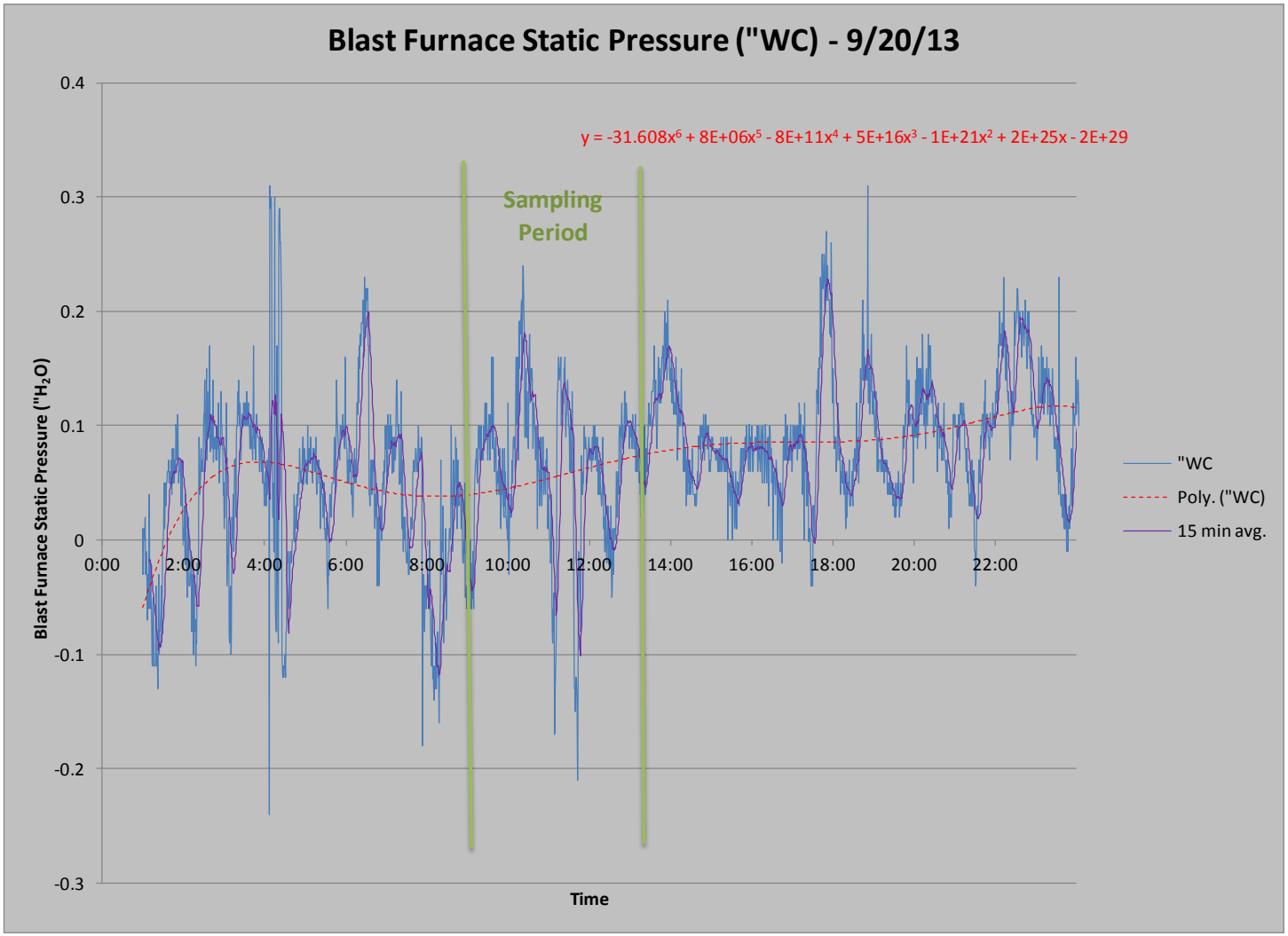


Figure 10: Blast Furnace Static Pressure (9/20/13)

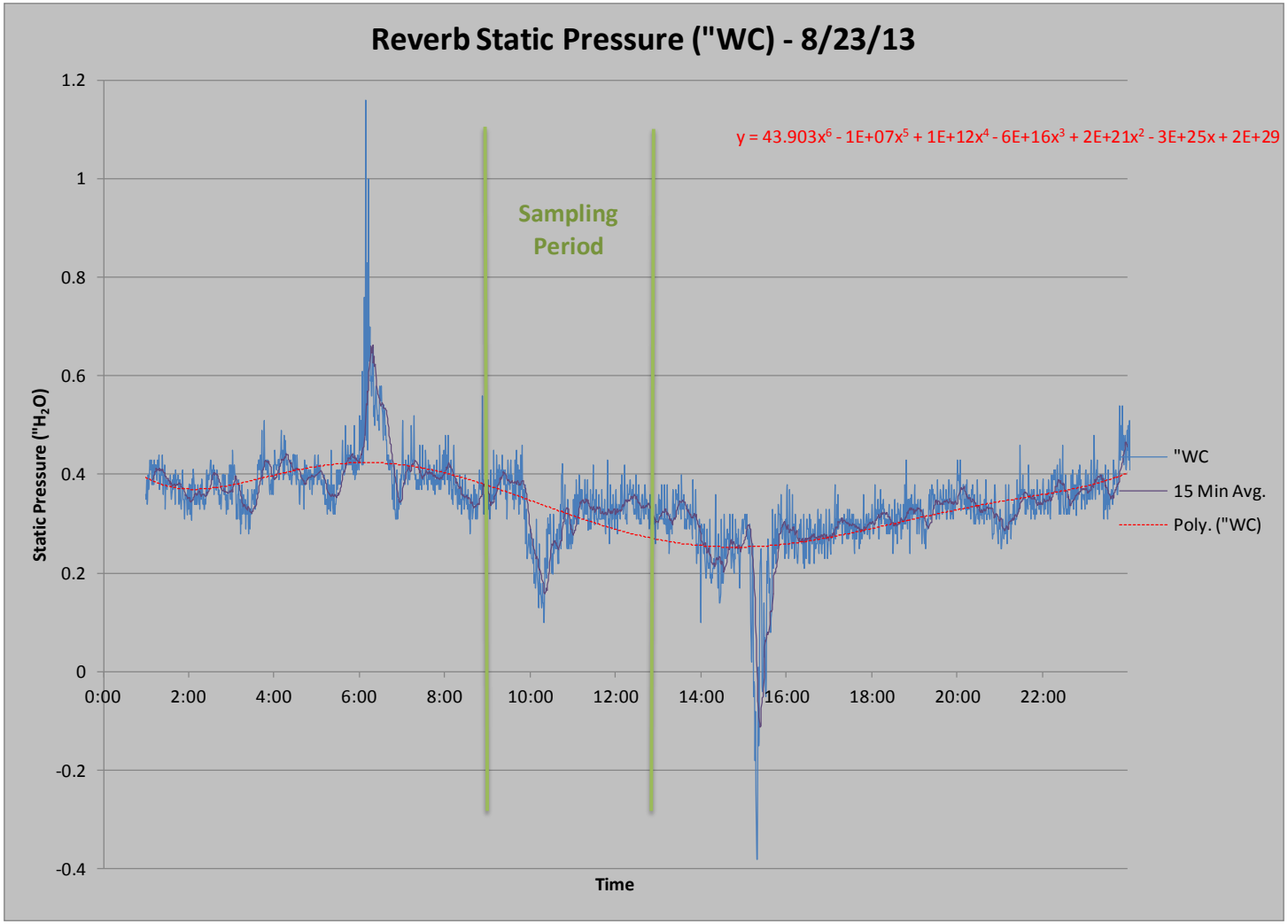


Figure 11: Reverb Furnace Static Pressure (8/23/13)

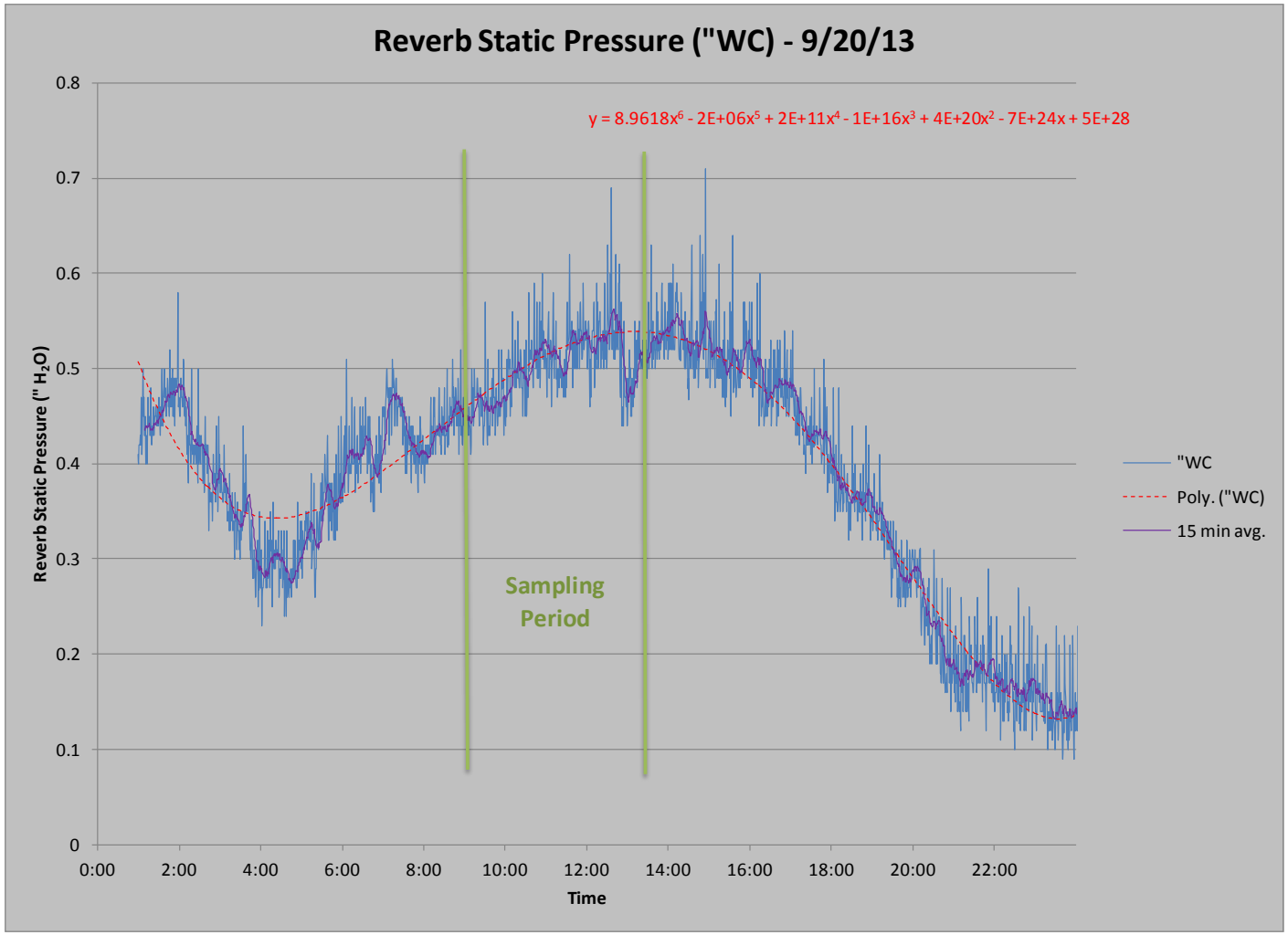


Figure 12: Reverb Furnace Static Pressure (9/20/13)

CALCULATIONS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Dr. Diamond Bar, California 91765-4182

Test No. 1 Test Date: 8/8/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Hard Lead Baghouse Exhaust
Sample Train: 10 Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	32.54	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	83.1875	deg F
C. Gas Meter Correction Factor	1.0085	
D. Average Orifice Pressure	0.65	"H2O
E. Nozzle Diameter	0.1700	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	120	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00016	ft
H. Average Stack Temp	118.8	deg F	P. Net Sample Collection	0	mg
I. Barometric Pressure	30.01	"HgA	Q. Net Solid Collection	0	mg
J. Gas Meter Pressure (I+(D/13.6))	30.06	"HgA	R. Water Vapor Condensed	16	ml
K. Static Pressure	-0.60	"H2O	S. Gas Volume Metered	46.847	dcf
L. Total Stack Pressure (I+(K/13.6))	29.97	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C	45.436	dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T))	1.61	%

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x	Moist. Fract.	x	Molecular Wt.		=	Wt./Mole
Water	0.016			1.000		18.0	,	0.29	
Carbon Dioxide	0.000	Dry Basis		0.984		44.0	,	0.01	
Carbon Monoxide	0.000	Dry Basis		0.984		28.0	,	0.00	
Oxygen	0.208	Dry Basis		0.984		32.0	,	6.55	
Nitrogen & Inerts	0.792	Dry Basis		0.984		28.2	,	21.97	
							,		
							Sum	28.82	

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.00	
Y. Corrected Velocity* (A x M x W x X)	50.61	fps
Z. Flow Rate* (Y x G x 60)	106008	cfm
AA. Flow Rate (Standard)* {Z x (L/29.92) x [520/(460+H)]}	94549	scfm
BB. Dry Flow Rate* (AA x (U/100))	93029	dscfm

* Values taken from velocity traverse conducted immediately after sampling because of blocked pitot tube

SAMPLE CONCENTRATION/EMISSION RATE

	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Antimony
Net Sample (mg)	0.0027	0.00106	0.000646	0.0823	0.00112	0.00147	0.00039
Sample Conc. (gr/dscf)	9.17E-07	3.60E-07	2.19E-07	2.79E-05	3.80E-07	4.99E-07	1.32E-07
Mass Emission (lb/hr)	7.31E-04	2.87E-04	1.75E-04	2.23E-02	3.03E-04	3.98E-04	1.06E-04
Emission Conc. (ug/dscf)	0.059415	0.023326	0.014216	1.811051	0.024646	0.032348	0.008582
Emission Conc.(ug/dscm)	2.097936	0.823634	0.501951	63.94821	0.870255	1.14221	0.303035

	Barium	Zinc	Selenium	Tin	Titanium	Copper	Cobalt	Iron
Net Sample (mg)	0.00295	0.0324	0.000173	0.00451	0.000863	0.008099	0.000114	0.04254
Sample Conc. (gr/dscf)	1.00E-06	1.10E-05	5.88E-08	1.53E-06	2.93E-07	2.75E-06	3.87E-08	1.44E-05
Mass Emission (lb/hr)	7.99E-04	8.77E-03	4.68E-05	1.22E-03	2.34E-04	2.19E-03	3.09E-05	1.15E-02
Emission Conc. (ug/dscf)	0.064916	0.712978	0.003807	0.099245	0.018991	0.178222	0.002509	0.936113
Emission Conc.(ug/dscm)	2.29219	25.17524	0.134423	3.504331	0.670563	6.293032	0.08858	33.05415

CALCULATIONS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Dr. Diamond Bar, California 91765-4182

Test No. 2 Test Date: 8/8/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Hard Lead Baghouse Velocity Traverse
Sample Train: N/A Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	60.28	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	83.1875	deg F
C. Gas Meter Correction Factor	1.0085	
D. Average Orifice Pressure	0.65	"H_20
E. Nozzle Diameter	0.1700	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	120	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00016	ft
H. Average Stack Temp	123.9	deg F	P. Net Sample Collection	0	mg
I. Barometric Pressure	30.01	"HgA	Q. Net Solid Collection	0	mg
J. Gas Meter Pressure (I+(D/13.6))	30.06	"HgA	R. Water Vapor Condensed	16	ml
K. Static Pressure	-0.60	"H_20	S. Gas Volume Metered	46.847	dcf
L. Total Stack Pressure (I+(K/13.6))	29.97	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C	45.436	dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T))	1.61	%

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x	Moist. Fract.	x	Molecular Wt.		=	Wt./Mole
Water	0.016			1.000		18.0	,	0.29	
Carbon Dioxide	0.000	Dry Basis		0.984		44.0	,	0.01	
Carbon Monoxide	0.000	Dry Basis		0.984		28.0	,	0.00	
Oxygen	0.208	Dry Basis		0.984		32.0	,	6.55	
Nitrogen & Inerts	0.792	Dry Basis		0.984		28.2	,	21.97	
							,		
							Sum	28.82	

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.00	
Y. Corrected Velocity (A x M x W x X)	50.71	fps
Z. Flow Rate (Y x G x 60)	106213	cfm
AA. Flow Rate (Standard) {Z x (L/29.92) x [520/(460+H)]}	94732	scfm
BB. Dry Flow Rate (AA x (U/100))	93209	dscfm

SAMPLE CONCENTRATION/EMISSION RATE

CC. Sample Concentration [0.01543 x (P/T)]	0.00000	gr/dscf
DD. Sample Concentration [54,143xC (Molecular Wt.)]	#DIV/0!	ppm
EE. Sample Emission Rate (0.00857 x BB xCC)	0.000	lb/hr
FF. Solid Emission Rate [(.0001322 x Q x BB)/T]	0.000	lb/hr
GG. Isokinetic Sampling Rate [(G x T x 100)/(N x O x BB)]	90.0	%

CALCULATIONS

Run No. 1

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)
1	0.03	114	12.03	1	79	78	78.50	1	0.07
2	0.02	115	9.83	2	78	80	79.00	2	0.04
3	0.02	117	9.85	3	80	79	79.50	3	0.04
4	0.02	115	9.83	4	81	78	79.50	4	0.04
5	0.11	117	23.10	5	81	79	80.00	5	0.24
6	0.10	117	22.03	6	81	79	80.00	6	0.22
7	0.05	116	15.56	7	82	80	81.00	7	0.11
8	0.09	121	20.97	8	82	80	81.00	8	0.2
9	0.12	119	24.17	9	83	81	82.00	9	0.26
10	0.08	119	19.74	10	83	81	82.00	10	0.18
11	0.11	119	23.14	11	84	81	82.50	11	0.24
12	0.07	119	18.46	12	85	82	83.50	12	0.15
13	0.14	118	26.09	13	85	83	84.00	13	0.31
14	0.16	118	27.89	14	85	83	84.00	14	0.35
15	0.14	119	26.11	15	86	83	84.50	15	0.31
16	0.14	122	26.18	16	86	84	85.00	16	0.31
17	0.80	120	62.47	17	86	85	85.50	17	1.78
18	0.70	120	58.43	18	86	84	85.00	18	1.55
19	0.57	121	52.77	19	84	84	84.00	19	1.26
20	0.83	121	63.68	20	86	84	85.00	20	1.84
21	0.80	122	62.58	21	89	85	87.00	21	1.78
22	0.72	121	59.31	22	90	85	87.50	22	1.61
23	0.64	121	55.92	23	90	86	88.00	23	1.43
24	0.53	121	50.89	24	91	86	88.50	24	1.19

Average Temperature (°F) -	118.833	Average Velocity (fps) -	32.54
Avg Gas Meter Temperature (°F	83.1875	Average Orifice Press. ("H_2O) -	0.65

CALCULATIONS

Velocity Traverse

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)		
1	0.78	125	61.95	1				1			
2	0.74	125	60.34	2				2			
3	0.77	125	61.55	3				3			
4	0.76	125	61.15	4				4			
5	0.80	125	62.74	5				5			
6	0.84	125	64.29	6				6			
7	0.83	124	63.85	7				7			
8	0.87	124	65.37	8				8			
9	0.86	123	64.94	9				9			
10	0.82	122	63.35	10				10			
11	0.70	123	58.58	11				11			
12	0.49	122	48.97	12				12			
13	0.82	124	63.46	13				13			
14	0.84	124	64.23	14				14			
15	0.84	124	64.23	15				15			
16	0.90	125	66.54	16				16			
17	0.85	124	64.61	17				17			
18	0.78	125	61.95	18				18			
19	0.78	124	61.89	19				19			
20	0.73	124	59.88	20				20			
21	0.67	124	57.36	21				21			
22	0.65	124	56.50	22				22			
23	0.58	123	53.33	23				23			
24	0.26	121	35.64	24				24			

Average Temperature (°F) -	123.917	Average Velocity (fps) -	60.28
Avg Gas Meter Temperature (°F	#DIV/0!	Average Orifice Press. ("H_2O) -	#DIV/0!

CALCULATIONS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr. Diamond Bar, California 91765-4182

Test No. 1 Test Date: 8/23/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Tech. - Soft Lead Baghouse Exhaust
Sample Train: 18 Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	50.45	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	100.8333	deg F
C. Gas Meter Correction Factor	1.0021	
D. Average Orifice Pressure	1.85	"H2O
E. Nozzle Diameter	0.2320	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	240	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00029	ft
H. Average Stack Temp	122.2	deg F	P. Net Sample Collection		mg
I. Barometric Pressure	29.87	"HgA	Q. Net Solid Collection		mg
J. Gas Meter Pressure (I+(D/13.6))	30.01	"HgA	R. Water Vapor Condensed	45.1	ml
K. Static Pressure	-0.31	"H2O	S. Gas Volume Metered	186.098	dcf
L. Total Stack Pressure (I+(K/13.6))	29.85	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C] 173.406 dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T)) 1.19 %

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x Moist. Fract.	x Molecular Wt.		= Wt./Mole
Water	0.012		1.000	18.0	,	0.21
Carbon Dioxide	0.001	Dry Basis	0.988	44.0	,	0.03
Carbon Monoxide	0.000	Dry Basis	0.988	28.0	,	0.00
Oxygen	0.207	Dry Basis	0.988	32.0	,	6.55
Nitrogen & Inerts	0.792	Dry Basis	0.988	28.2	,	22.07
					,	
				Sum		28.87

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.00	
Y. Corrected Velocity (A x M x W x X)	42.49	fps
Z. Flow Rate (Y x G x 60)	88987	cfm
AA. Flow Rate (Standard) {Z x (L/29.92) x [520/(460+H)]}	79291	scfm
BB. Dry Flow Rate (AA x (U/100))	78346	dscfm

SAMPLE CONCENTRATION/EMISSION RATE

GG. Isokinetic Sampling Rate [(G x T x 100)/(N x O x BB)] 109.7 %

	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Antimony	Beryllium
Net Sample (mg)	0.00014	0.00077	0.00121	0.08311	0.00266	0.00079	0.00055	0
Sample Conc. (gr/dscf)	1.25E-08	6.85E-08	1.08E-07	7.40E-06	2.37E-07	7.03E-08	4.89E-08	0.00E+00
Mass Emission (lb/hr)	8.36E-06	4.60E-05	7.23E-05	4.97E-03	1.59E-04	4.72E-05	3.29E-05	0.00E+00
Emission Conc. (ug/dscf)	0.000807	0.00444	0.006977	0.479206	0.0153374	0.004555	0.003171	0
Emission Conc.(ug/dscm)	0.028503	0.156768	0.24635	16.92076	0.541562	0.16084	0.111977	0

	Barium	Zinc	Selenium	Tin	Titanium	Copper	Iron	Thallium	Vanadium
Net Sample (mg)	0.00211	0.01496	0	0.50801	0.00309	0.00364	0.47889	0	0
Sample Conc. (gr/dscf)	1.88E-07	1.33E-06	0.00E+00	4.52E-05	2.75E-07	3.24E-07	4.26E-05	0.00E+00	0.00E+00
Mass Emission (lb/hr)	1.26E-04	8.94E-04	0.00E+00	3.04E-02	1.85E-04	2.17E-04	2.86E-02	0.00E+00	0.00E+00
Emission Conc. (ug/dscf)	0.012166	0.086258	0	2.929146	0.0178167	0.020988	2.761243	0	0
Emission Conc.(ug/dscm)	0.429585	3.045777	0	103.4282	0.6291077	0.741085	97.49948	0	0

CALCULATIONS

RUN NO. 1 - Soft Lead

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)
1	0.66	116	56.54	1	91	87	89.00	1	2.26
2	0.64	118	55.78	2	97	90	93.50	2	2.21
3	0.60	118	54.01	3	103	91	97.00	3	2.1
4	0.60	118	54.01	4	105	93	99.00	4	2.11
5	0.53	118	50.76	5	109	95	102.00	5	1.89
6	0.35	116	41.18	6	107	96	101.50	6	1.25
7	0.57	118	52.64	7	100	96	98.00	7	2
8	0.58	120	53.19	8	104	96	100.00	8	2.05
9	0.54	121	51.37	9	106	96	101.00	9	1.91
10	0.55	121	51.84	10	108	98	103.00	10	1.96
11	0.48	122	48.47	11	108	97	102.50	11	1.71
12	0.48	122	48.47	12	108	98	103.00	12	1.71
13	0.63	122	55.53	13	101	97	99.00	13	2.21
14	0.63	122	55.53	14	104	97	100.50	14	2.21
15	0.55	123	51.93	15	106	97	101.50	15	1.95
16	0.55	124	51.97	16	106	97	101.50	16	1.94
17	0.45	124	47.01	17	105	97	101.00	17	1.59
18	0.35	125	41.50	18	107	98	102.50	18	1.24
19	0.58	127	53.51	19	105	100	102.50	19	2.04
20	0.50	128	49.72	20	109	101	105.00	20	1.77
21	0.48	128	48.72	21	109	101	105.00	21	1.7
22	0.39	129	43.95	22	109	101	105.00	22	1.38
23	0.45	125	47.05	23	106	100	103.00	23	1.59
24	0.43	127	46.07	24	107	101	104.00	24	1.52

Average Temperature (°F) -	122.167	Average Velocity (fps) -	50.45
Avg Gas Meter Temperature (°F	100.833	Average Orifice Press. ("H_2O) -	1.85

CALCULATIONS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Dr. Diamond Bar, California 91765-4182

Test No. 2 Test Date: 8/23/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Hard Lead Baghuse Exhaust
Sample Train: 10 Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	60.01	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	91.64583	deg F
C. Gas Meter Correction Factor	1.0085	
D. Average Orifice Pressure	1.69	"H20
E. Nozzle Diameter	0.2190	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	240	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00026	ft
H. Average Stack Temp	126.0	deg F	P. Net Sample Collection		mg
I. Barometric Pressure	29.87	"HgA	Q. Net Solid Collection		mg
J. Gas Meter Pressure (I+(D/13.6))	29.99	"HgA	R. Water Vapor Condensed	38.5	ml
K. Static Pressure	-0.36	"H20	S. Gas Volume Metered	175.866	dcf
L. Total Stack Pressure (I+(K/13.6))	29.84	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C] 167.600 dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T)) 1.05 %

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x	Moist. Fract.	x	Molecular Wt.		=	Wt./Mole
Water	0.011			1.000		18.0	,	0.19	
Carbon Dioxide	0.001	Dry Basis		0.989		44.0	,	0.04	
Carbon Monoxide	0.000	Dry Basis		0.989		28.0	,	0.00	
Oxygen	0.209	Dry Basis		0.989		32.0	,	6.62	
Nitrogen & Inerts	0.790	Dry Basis		0.989		28.2	,	22.05	
							,		
							Sum	28.89	

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.00	
Y. Corrected Velocity (A x M x W x X)	50.52	fps
Z. Flow Rate (Y x G x 60)	105810	cfm
AA. Flow Rate (Standard) {Z x (L/29.92) x [520/(460+H)]}	93646	scfm
BB. Dry Flow Rate (AA x (U/100))	92659	dscfm

SAMPLE CONCENTRATION/EMISSION RATE

GG. Isokinetic Sampling Rate [(G x T x 100)/(N x O x BB)] 100.6 %

	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Antimony	Beryllium	Cobalt
Net Sample (mg)	0.02202	0.00048	0.00078	0.07455	0.00245	0.00063	0.00048	0	0
Sample Conc. (gr/dscf)	2.03E-06	4.42E-08	7.18E-08	6.86E-06	2.26E-07	5.80E-08	4.42E-08	0.00E+00	0.00E+00
Mass Emission (lb/hr)	1.61E-03	3.51E-05	5.70E-05	5.45E-03	1.79E-04	4.61E-05	3.51E-05	0.00E+00	0.00E+00
Emission Conc. (ug/dscf)	0.131364	0.002864	0.004653	0.44474	0.0146159	0.003758	0.002864	0	0
Emission Conc.(ug/dscm)	4.638461	0.101111	0.164305	15.70378	0.5160867	0.132708	0.101111	0	0

	Barium	Zinc	Selenium	Tin	Titanium	Copper	Iron	Thallium	Vanadium
Net Sample (mg)	0.00198	0.00695	0.00213	0.48133	0.00269	0.00158	0.01468	0	0
Sample Conc. (gr/dscf)	1.82E-07	6.40E-07	1.96E-07	4.43E-05	2.48E-07	1.45E-07	1.35E-06	0.00E+00	0.00E+00
Mass Emission (lb/hr)	1.45E-04	5.08E-04	1.56E-04	3.52E-02	1.97E-04	1.16E-04	1.07E-03	0.00E+00	0.00E+00
Emission Conc. (ug/dscf)	0.011812	0.041461	0.012707	2.871454	0.0160476	0.009426	0.087576	0	0
Emission Conc.(ug/dscm)	0.417082	1.464001	0.448679	101.391	0.5666421	0.332823	3.092307	0	0

CALCULATIONS

RUN NO. 1 Hard Lead

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (^oF)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (^oF)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)
1	0.73	117	59.52	1	81	80	80.50	1	1.6
2	0.68	118	57.49	2	83	81	82.00	2	1.5
3	0.61	119	54.50	3	86	82	84.00	3	1.4
4	0.59	120	53.65	4	88	82	85.00	4	1.3
5	0.57	120	52.73	5	89	83	86.00	5	1.3
6	0.58	122	53.28	6	90	84	87.00	6	1.3
7	0.79	122	62.18	7	88	85	86.50	7	1.8
8	0.80	122	62.58	8	91	85	88.00	8	1.8
9	0.79	124	62.29	9	92	86	89.00	9	1.8
10	0.75	125	60.74	10	94	87	90.50	10	1.7
11	0.71	127	59.20	11	96	89	92.50	11	1.6
12	0.65	127	56.65	12	96	90	93.00	12	1.5
13	0.79	126	62.40	13	92	90	91.00	13	1.8
14	0.81	127	63.24	14	96	90	93.00	14	1.9
15	0.79	127	62.45	15	96	90	93.00	15	1.8
16	0.81	128	63.29	16	97	91	94.00	16	1.9
17	0.68	132	58.19	17	98	92	95.00	17	1.6
18	0.69	130	58.51	18	98	92	95.00	18	1.6
19	0.85	130	64.94	19	98	94	96.00	19	2
20	0.88	131	66.14	20	102	96	99.00	20	2.1
21	0.82	133	63.95	21	102	97	99.50	21	1.9
22	0.88	133	66.25	22	102	97	99.50	22	2.1
23	0.70	133	59.08	23	103	98	100.50	23	1.7
24	0.65	132	56.89	24	102	98	100.00	24	1.5

Average Temperature (^oF) -	126.042	Average Velocity (fps) -	60.01
Avg Gas Meter Temperature (^oF	91.6458	Average Orifice Press. ("H_2O) -	1.69

CALCULATIONS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr. Diamond Bar, California 91765-4182

Test No. 3 Test Date: 9/20/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Tech. - Soft Lead Baghouse Exhaust
Sample Train: 4 Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	53.89	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	88.47917	deg F
C. Gas Meter Correction Factor	1.0021	
D. Average Orifice Pressure	1.36	"H2O
E. Nozzle Diameter	0.2190	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	240	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00026	ft
H. Average Stack Temp	116.2	deg F	P. Net Sample Collection		mg
I. Barometric Pressure	29.44	"HgA	Q. Net Solid Collection		mg
J. Gas Meter Pressure (I+(D/13.6))	29.54	"HgA	R. Water Vapor Condensed	66.1	ml
K. Static Pressure	-0.35	"H2O	S. Gas Volume Metered	159.878	dcf
L. Total Stack Pressure (I+(K/13.6))	29.41	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C	149.964	dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T))	2.00	%

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x	Moist. Fract.	x	Molecular Wt.		=	Wt./Mole
Water	0.020			1.000		18.0	,		0.36
Carbon Dioxide	0.001	Dry Basis		0.980		44.0	,		0.04
Carbon Monoxide	0.000	Dry Basis		0.980		28.0	,		0.00
Oxygen	0.203	Dry Basis		0.980		32.0	,		6.37
Nitrogen & Inerts	0.796	Dry Basis		0.980		28.2	,		21.99
							,		
							Sum		28.77

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.01	
Y. Corrected Velocity (A x M x W x X)	45.80	fps
Z. Flow Rate (Y x G x 60)	95914	cfm
AA. Flow Rate (Standard) {Z x (L/29.92) x [520/(460+H)]}	85095	scfm
BB. Dry Flow Rate (AA x (U/100))	83389	dscfm

SAMPLE CONCENTRATION/EMISSION RATE

GG. Isokinetic Sampling Rate [(G x T x 100)/(N x O x BB)]	100.0	%

	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Antimony	Beryllium	Cobalt
Net Sample (mg)	0.0012	0.00187	0.0014	0.20995	0.00112	0.00117	0.00143	0.000004	0.0001
Sample Conc. (gr/dscf)	1.23E-07	1.92E-07	1.44E-07	2.16E-05	1.15E-07	1.20E-07	1.47E-07	4.12E-10	1.03E-08
Mass Emission (lb/hr)	8.82E-05	1.38E-04	1.03E-04	1.54E-02	8.24E-05	8.60E-05	1.05E-04	2.94E-07	7.35E-06
Emission Conc. (ug/dscf)	0.008001	0.012468	0.009334	1.399788	0.0074673	0.007801	0.009534	2.67E-05	0.000667
Emission Conc.(ug/dscm)	0.282504	0.440236	0.329588	49.4265	0.2636708	0.275442	0.336651	0.000942	0.023542

	Barium	Zinc	Selenium	Tin	Titanium	Copper	Iron	Thallium	Vanadium
Net Sample (mg)	0.00323	0.03479	0.00035	0.77163	0.00415	0.0041	0.08236	0	0
Sample Conc. (gr/dscf)	3.32E-07	3.58E-06	3.60E-08	7.94E-05	4.27E-07	4.22E-07	8.47E-06	0.00E+00	0.00E+00
Mass Emission (lb/hr)	2.38E-04	2.56E-03	2.57E-05	5.67E-02	3.05E-04	3.01E-04	6.06E-03	0.00E+00	0.00E+00
Emission Conc. (ug/dscf)	0.021535	0.231953	0.002334	5.144644	0.0276691	0.027336	0.549114	0	0
Emission Conc.(ug/dscm)	0.760408	8.190273	0.082397	181.6574	0.9769944	0.965223	19.38922	0	0

CALCULATIONS

Soft Lead | Run No. 3

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)
1	0.66	108	56.15	1	79	79	79.00	1	1.45
2	0.66	109	56.20	2	81	79	80.00	2	1.46
3	0.60	111	53.68	3	85	79	82.00	3	1.33
4	0.65	111	55.87	4	88	79	83.50	4	1.45
5	0.48	111	48.01	5	90	81	85.50	5	1.08
6	0.44	110	45.93	6	90	81	85.50	6	0.99
7	0.62	112	54.61	7	87	82	84.50	7	1.38
8	0.60	114	53.82	8	91	83	87.00	8	1.35
9	0.65	115	56.06	9	92	84	88.00	9	1.46
10	0.57	115	52.50	10	94	85	89.50	10	1.29
11	0.55	115	51.57	11	94	86	90.00	11	1.25
12	0.55	117	51.66	12	95	86	90.50	12	1.25
13	0.79	117	61.92	13	88	85	86.50	13	1.76
14	0.76	117	60.73	14	92	85	88.50	14	1.7
15	0.72	117	59.11	15	96	86	91.00	15	1.63
16	0.65	120	56.31	16	97	87	92.00	16	1.47
17	0.58	120	53.19	17	98	88	93.00	17	1.32
18	0.35	110	40.96	18	96	89	92.50	18	0.81
19	0.70	121	58.48	19	91	87	89.00	19	1.56
20	0.67	124	57.36	20	95	88	91.50	20	1.5
21	0.62	125	55.23	21	96	89	92.50	21	1.4
22	0.57	125	52.96	22	98	90	94.00	22	1.29
23	0.52	123	50.49	23	98	90	94.00	23	1.18
24	0.52	122	50.45	24	98	90	94.00	24	1.18

Average Temperature (°F) -	116.208	Average Velocity (fps) -	53.89
Avg Gas Meter Temperature (°F	88.4792	Average Orifice Press. ("H_2O) -	1.36

CALCULATIONS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Dr. Diamond Bar, California 91765-4182

Test No. 3 Test Date: 9/20/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Hard Lead Baghuse Exhaust
Sample Train: 5 Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	63.08	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	80.16667	deg F
C. Gas Meter Correction Factor	1.0085	
D. Average Orifice Pressure	1.94	"H2O
E. Nozzle Diameter	0.2200	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	240	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00026	ft
H. Average Stack Temp	111.8	deg F	P. Net Sample Collection		mg
I. Barometric Pressure	29.44	"HgA	Q. Net Solid Collection		mg
J. Gas Meter Pressure (I+(D/13.6))	29.58	"HgA	R. Water Vapor Condensed	64.2	ml
K. Static Pressure	-0.34	"H2O	S. Gas Volume Metered	187.326	dcf
L. Total Stack Pressure (I+(K/13.6))	29.42	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C	179.813	dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T))	1.63	%

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x	Moist. Fract.	x	Molecular Wt.		=	Wt./Mole
Water	0.016			1.000		18.0	,	0.29	
Carbon Dioxide	0.001	Dry Basis		0.984		44.0	,	0.03	
Carbon Monoxide	0.000	Dry Basis		0.984		28.0	,	0.00	
Oxygen	0.204	Dry Basis		0.984		32.0	,	6.42	
Nitrogen & Inerts	0.795	Dry Basis		0.984		28.2	,	22.06	
							,		
							Sum	28.81	

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.01	
Y. Corrected Velocity (A x M x W x X)	53.57	fps
Z. Flow Rate (Y x G x 60)	112197	cfm
AA. Flow Rate (Standard) {Z x (L/29.92) x [520/(460+H)]}	100313	scfm
BB. Dry Flow Rate (AA x (U/100))	98678	dscfm

SAMPLE CONCENTRATION/EMISSION RATE

GG. Isokinetic Sampling Rate [(G x T x 100)/(N x O x BB)]	100.4	%

	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Antimony	Beryllium	Cobalt
Net Sample (mg)	0.01408	0.0012	0.00099	0.29437	0.00044	0.0008	0.00143	0	0.00004
Sample Conc. (gr/dscf)	1.21E-06	1.03E-07	8.50E-08	2.53E-05	3.78E-08	6.86E-08	1.23E-07	0.00E+00	3.43E-09
Mass Emission (lb/hr)	1.02E-03	8.71E-05	7.18E-05	2.14E-02	3.19E-05	5.81E-05	1.04E-04	0.00E+00	2.90E-06
Emission Conc. (ug/dscf)	0.078292	0.006673	0.005505	1.63684	0.0024466	0.004448	0.007951	0	0.000222
Emission Conc.(ug/dscm)	2.764478	0.235609	0.194377	57.79682	0.0863899	0.157073	0.280767	0	0.007854

	Barium	Zinc	Selenium	Tin	Titanium	Copper	Iron	Thallium	Vanadium
Net Sample (mg)	0.00372	0.00879	0.00027	0.78782	0.00218	0.00263	0.03139	0	0
Sample Conc. (gr/dscf)	3.19E-07	7.54E-07	2.32E-08	6.76E-05	1.87E-07	2.26E-07	2.69E-06	0.00E+00	0.00E+00
Mass Emission (lb/hr)	2.70E-04	6.38E-04	1.96E-05	5.72E-02	1.58E-04	1.91E-04	2.28E-03	0.00E+00	0.00E+00
Emission Conc. (ug/dscf)	0.020685	0.048877	0.001501	4.380662	0.0121219	0.014624	0.174544	0	0
Emission Conc.(ug/dscm)	0.730388	1.725835	0.053012	154.6812	0.4280228	0.516376	6.163136	0	0

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, California 91765

Test Nos. 13-307 and 13-308 -42- Date(s): 8/8/13, 8/23/13 and 9/20/13

CALCULATIONS

Hard Lead Run No. 3

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)
1	0.83	108	62.97	1	69	68	68.50	1	1.85
2	0.73	110	59.16	2	73	70	71.50	2	1.64
3	0.69	110	57.51	3	76	71	73.50	3	1.56
4	0.65	110	55.82	4	78	72	75.00	4	1.48
5	0.53	110	50.40	5	79	74	76.50	5	1.21
6	0.57	110	52.27	6	80	74	77.00	6	1.31
7	0.97	109	68.13	7	78	75	76.50	7	2.22
8	0.93	111	66.83	8	81	76	78.50	8	2.14
9	0.88	112	65.06	9	83	77	80.00	9	2.03
10	0.86	112	64.32	10	84	78	81.00	10	2
11	0.76	112	60.46	11	84	79	81.50	11	1.77
12	0.54	112	50.97	12	84	79	81.50	12	1.26
13	1.05	110	70.95	13	78	77	77.50	13	2.41
14	1.07	112	71.74	14	82	78	80.00	14	2.47
15	1.08	113	72.14	15	84	79	81.50	15	2.51
16	0.96	113	68.02	16	86	80	83.00	16	2.24
17	0.84	114	63.68	17	87	81	84.00	17	1.96
18	0.67	114	56.87	18	87	82	84.50	18	1.57
19	1.05	111	71.01	19	85	82	83.50	19	2.46
20	1.05	113	71.13	20	86	82	84.00	20	2.46
21	0.96	114	68.08	21	88	83	85.50	21	2.26
22	0.87	115	64.86	22	90	83	86.50	22	2.05
23	0.81	114	62.53	23	89	84	86.50	23	1.91
24	0.72	114	58.95	24	89	84	86.50	24	1.7

Average Temperature (°F) -	111.792	Average Velocity (fps) -	63.08
Avg Gas Meter Temperature (°F	80.1667	Average Orifice Press. ("H_2O) -	1.94

CALCULATIONS

EPA Method TO-15 Calculations			
Location	Exide Hard Lead Baghouse Exhaust		
Run No.	1	Date	8/23/2013
Measured Flowrate	92659	dscfm	
Compound	**Conc. (ppb)**	**MW**	**lb/hr**
1,3 butadiene	37.4	54.09	2.97E-02
benzene	127	78.11	1.46E-01
acrolein	2	56.06	1.64E-03
acetone	57.9	58.08	4.93E-02
methylene chloride	0.5	84.93	6.23E-04
MEK	1.7	72.11	1.80E-03
chloroform	0.4	119.38	7.00E-04
toluene	25.4	92.13	3.43E-02
ethylbenzene	5.6	106.16	8.72E-03
m+p xylenes	10	106.17	1.56E-02
styrene	104	104.14	1.59E-01
o-xylene	2.9	106.17	4.52E-03
isoprene	8.6	68.12	8.59E-03
Acetylene+ethylene	662	27.045	2.63E-01
ethane	4440	30.07	1.96E+00
propylene	194	42.08	1.20E-01
propane	909	44.1	5.88E-01
isobutane	41.9	58.12	3.57E-02
1-butene	9.8	56.11	8.07E-03
n-butane	71.2	58.12	6.07E-02
n-pentane	27.6	72.15	2.92E-02
1-hexene	4.5	84.16	5.56E-03
n-hexane	3.5	86.18	4.42E-03
n-heptane	2.6	100.21	3.82E-03
n-octane	1.4	114.23	2.35E-03
n-nonane	0.4	128.2	7.52E-04
n-decane	0.3	142.29	6.26E-04
n-undecane	0.3	156.31	6.88E-04
n-dodecane	0.3	170.33	7.50E-04
thiophene	0	84.14	0.00E+00
2,4 dimethyl-1-heptene	0	126.24	0.00E+00
acetonitrile	0	41.05	0.00E+00
ethanol	19.8	46.07	1.34E-02
lb/hr = (ppbv/1000)* (Q*60)*MW/379/1000000			

EPA Method TO-15 Calculations			
Location	Exide Hard Lead Baghouse Exhaust		
Run No.	2	Date	8/23/2013
Measured Flowrate	92659	dscfm	
Compound	**Conc. (ppb)**	**MW**	**lb/hr**
1,3 butadiene	31.3	54.09	2.48E-02
benzene	111	78.11	1.27E-01
acrolein	2.4	56.06	1.97E-03
acetone	32.8	58.08	2.79E-02
methylene chloride	0.6	84.93	7.48E-04
MEK	1.6	72.11	1.69E-03
chloroform	0.3	119.38	5.25E-04
toluene	22	92.13	2.97E-02
ethylbenzene	4.5	106.16	7.01E-03
m+p xylenes	6.3	106.17	9.81E-03
styrene	78.4	104.14	1.20E-01
o-xylene	1.7	106.17	2.65E-03
isoprene	7.6	68.12	7.59E-03
Acetylene+ethylene	595	27.045	2.36E-01
ethane	4400	30.07	1.94E+00
propylene	155	42.08	9.57E-02
propane	949	44.1	6.14E-01
isobutane	47.6	58.12	4.06E-02
1-butene	8.5	56.11	7.00E-03
n-butane	64.7	58.12	5.52E-02
n-pentane	25.9	72.15	2.74E-02
1-hexene	4	84.16	4.94E-03
n-hexane	4.1	86.18	5.18E-03
n-heptane	2.7	100.21	3.97E-03
n-octane	1.3	114.23	2.18E-03
n-nonane	0.4	128.2	7.52E-04
n-decane	0.3	142.29	6.26E-04
n-undecane	0.3	156.31	6.88E-04
n-dodecane	0.4	170.33	9.99E-04
thiophene	0	84.14	0.00E+00
2,4 dimethyl-1-heptene	0	126.24	0.00E+00
acetonitrile	0	41.05	0.00E+00
ethanol	6.6	46.07	4.46E-03
lb/hr = (ppbv/1000)* (Q*60)*MW/379/1000000			

CALCULATIONS

EPA Method TO-15 Calculations			
Location	Exide Hard Lead Baghouse Exhaust		
Run No.	3	Date	9/20/2013
Measured Flowrate	98678	dscfm	
Compound	**Conc. (ppb)**	**MW**	**lb/hr**
1,3 butadiene	21.9	54.09	1.85E-02
benzene	68.9	78.11	8.41E-02
acrolein	3	56.06	2.63E-03
acetone	42	58.08	3.81E-02
methylene chloride	0.3	84.93	3.98E-04
MEK	1.5	72.11	1.69E-03
chloroform	0.2	119.38	3.73E-04
toluene	18.6	92.13	2.68E-02
ethylbenzene	2.3	106.16	3.81E-03
m+p xylenes	4	106.17	6.63E-03
styrene	33.3	104.14	5.42E-02
o-xylene	2	106.17	3.32E-03
isoprene	19.4	68.12	2.06E-02
Acetylene+ethylene	551	27.045	2.33E-01
ethane	433	30.07	2.03E-01
propylene	137	42.08	9.01E-02
propane	144	44.1	9.92E-02
isobutane	7.8	58.12	7.08E-03
1-butene	14.4	56.11	1.26E-02
n-butane	17.2	58.12	1.56E-02
n-pentane	11.1	72.15	1.25E-02
1-hexene	6.1	84.16	8.02E-03
n-hexane	1.5	86.18	2.02E-03
n-heptane	1.5	100.21	2.35E-03
n-octane	0.8	114.23	1.43E-03
n-nonane	0.4	128.2	8.01E-04
n-decane	0.3	142.29	6.67E-04
n-undecane	0.4	156.31	9.77E-04
n-dodecane	0.6	170.33	1.60E-03
thiophene	0	84.14	0.00E+00
tetrachloroethylene	0.1	165.83	2.59E-04
carbon tetrachloride	0.1	153.82	2.40E-04
ethanol	13.5	46.07	9.72E-03
lb/hr = (ppbv/1000)* (Q*60)*MW/379/1000000			

EPA Method TO-15 Calculations			
Location	Exide Soft Lead Baghouse Exhaust		
Run No.	1	Date	8/23/2013
Measured Flowrate	78346	dscfm	
Compound	**Conc. (ppb)**	**MW**	**lb/hr**
1,3 butadiene	4.4	54.09	2.95E-03
benzene	51	78.11	4.94E-02
acrolein	1.1	56.06	7.65E-04
acetone	98.4	58.08	7.09E-02
methylene chloride	0.4	84.93	4.21E-04
MEK	1.7	72.11	1.52E-03
chloroform	0.4	119.38	5.92E-04
toluene	7.8	92.13	8.91E-03
ethylbenzene	2.9	106.16	3.82E-03
m+p xylenes	11.8	106.17	1.55E-02
styrene	1.4	104.14	1.81E-03
o-xylene	3.3	106.17	4.35E-03
isoprene	0.3	68.12	2.53E-04
Acetylene+ethylene	467	27.045	1.57E-01
ethane	192	30.07	7.16E-02
propylene	20.5	42.08	1.07E-02
propane	269	44.1	1.47E-01
isobutane	3.8	58.12	2.74E-03
1-butene	1.5	56.11	1.04E-03
n-butane	25.6	58.12	1.85E-02
n-pentane	3.1	72.15	2.77E-03
1-hexene	0.2	84.16	2.09E-04
n-hexane	0.5	86.18	5.34E-04
n-heptane	0.4	100.21	4.97E-04
n-octane	0.2	114.23	2.83E-04
n-nonane	0	128.2	0.00E+00
n-decane	0	142.29	0.00E+00
n-undecane	0	156.31	0.00E+00
n-dodecane	0	170.33	0.00E+00
thiophene	0	84.14	0.00E+00
2,4 dimethyl-1-heptene	0	126.24	0.00E+00
acetonitrile	0	41.05	0.00E+00
ethanol	26.1	46.07	1.49E-02
lb/hr = (ppbv/1000)* (Q*60)*MW/379/1000000			

CALCULATIONS

EPA Method TO-15 Calculations			
Location	Exide Soft Lead Baghouse Exhaust		
Run No.	2	Date	8/23/2013
Measured Flowrate	78346	dscfm	
Compound	**Conc. (ppb)**	**MW**	**lb/hr**
1,3 butadiene	0.8	54.09	5.37E-04
benzene	21.5	78.11	2.08E-02
acrolein	0.9	56.06	6.26E-04
acetone	75.4	58.08	5.43E-02
methylene chloride	0.5	84.93	5.27E-04
MEK	0.8	72.11	7.16E-04
chloroform	0.2	119.38	2.96E-04
toluene	3.8	92.13	4.34E-03
ethylbenzene	2	106.16	2.63E-03
m+p xylenes	8	106.17	1.05E-02
styrene	0.3	104.14	3.87E-04
o-xylene	1.9	106.17	2.50E-03
isoprene	0	68.12	0.00E+00
Acetylene+ethylene	450	27.045	1.51E-01
ethane	208	30.07	7.76E-02
propylene	12.8	42.08	6.68E-03
propane	398	44.1	2.18E-01
isobutane	4.6	58.12	3.32E-03
1-butene	0.8	56.11	5.57E-04
n-butane	21.8	58.12	1.57E-02
n-pentane	2.1	72.15	1.88E-03
1-hexene	0	84.16	0.00E+00
n-hexane	0.4	86.18	4.28E-04
n-heptane	0.4	100.21	4.97E-04
n-octane	0	114.23	0.00E+00
n-nonane	0	128.2	0.00E+00
n-decane	0	142.29	0.00E+00
n-undecane	0	156.31	0.00E+00
n-dodecane	0	170.33	0.00E+00
thiophene	0	84.14	0.00E+00
2,4 dimethyl-1-heptene	0	126.24	0.00E+00
acetonitrile	0	41.05	0.00E+00
ethanol	6.3	46.07	3.60E-03
lb/hr = (ppbv/1000)* (Q*60)*MW/379/1000000			

EPA Method TO-15 Calculations			
Location	Exide Soft Lead Baghouse Exhaust		
Run No.	3	Date	9/20/2013
Measured Flowrate	83389	dscfm	
Compound	**Conc. (ppb)**	**MW**	**lb/hr**
1,3 butadiene	17.1	54.09	1.22E-02
benzene	159	78.11	1.64E-01
acrolein	4.1	56.06	3.03E-03
acetone	40	58.08	3.07E-02
methylene chloride	0	84.93	0.00E+00
MEK	1	72.11	9.52E-04
chloroform	0.1	119.38	1.58E-04
toluene	26.9	92.13	3.27E-02
ethylbenzene	1.9	106.16	2.66E-03
m+p xylenes	10	106.17	1.40E-02
styrene	21.9	104.14	3.01E-02
o-xylene	1.9	106.17	2.66E-03
isoprene	5.6	68.12	5.04E-03
Acetylene+ethylene	888	27.045	3.17E-01
ethane	119	30.07	4.72E-02
propylene	190	42.08	1.06E-01
propane	75	44.1	4.37E-02
isobutane	3.5	58.12	2.69E-03
1-butene	46.3	56.11	3.43E-02
n-butane	11.4	58.12	8.75E-03
n-pentane	20	72.15	1.90E-02
1-hexene	2.5	84.16	2.78E-03
n-hexane	0.8	86.18	9.10E-04
n-heptane	0.9	100.21	1.19E-03
n-octane	0.6	114.23	9.05E-04
n-nonane	0.4	128.2	6.77E-04
n-decane	0.4	142.29	7.51E-04
n-undecane	0	156.31	0.00E+00
n-dodecane	0	170.33	0.00E+00
thiophene	0	84.14	0.00E+00
2,4 dimethyl-1-heptene	0	126.24	0.00E+00
carbon tetrachloride	0.1	153.82	2.03E-04
ethanol	10.8	46.07	6.57E-03
lb/hr = (ppbv/1000)* (Q*60)*MW/379/1000000			

APPENDICES

APPENDIX A

Field Data

South Coast Air Quality Management District

Test No. 13-307 Company: EXIDE Date: 8/8/13
Sampling Location: HARD LEAD B/H - EXH Sample Train: 10

Traverse Source Test Data

Pre-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: 0.00 cfm @ 15 "Hg vac
Pitot Tube Leak Check: Pass / Fail

Post-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: 0 cfm @ 8 "Hg vac
Pitot Tube Leak Check: Pass / Fail

Time	Sample Point #	Gas Meter Reading (dcf)	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum " Hg
11:10		Start: 774.496											
11:45	1	775.35	.03	114	12.03	0.14	.07			50	79	78	<1
	2	775.91	.02	115	9.83	0.11	.04			49	78	80	<1
	3	776.36	.02	117	9.85	.11	.04			53	80	79	<1
	4	777.0	.02	115	9.83	.11	.04			54	81	78	<1
	5	778.25	.11	117	23.1	.27	.24			53	81	79	1
	6	779.66	0.10	117	22.0	.25	.27			57	81	79	1
	1	780.65	.05	116	15.56	.18	.11			51	82	80	<1
	2	781.73	.09	121	20.97	.24	.20			53	82	80	1
	3	783.26	0.12	119	24.17	.28	.26			48	93	91	1
	4	784.50	0.08	119	19.74	.23	.18			47	93	81	1
	5	785.74	0.11	119	23.14	.27	.24			49	84	81	1
	6	786.96	0.07	114	18.46	.21	.15			45	85	82	1
	1	788.53	0.14	118	26.10	.30	.31			48	85	83	1
	2	790.20	0.16	118	27.89	.32	.35			46	85	83	1
	3	791.80	0.14	119	26.11	.30	.31			50	86	83	1
	4	793.42	0.14	122	26.18	0.30	.31			48	86	84	1
12:30 Ref. Flight	5	797.0	0.60	120	60.97	.726	70			46	86	85	4
	6	800.60	0.70	120	58.43	.67	1.55			43	86	84	4
	1	803.60	0.57	121	52.77	.60	1.26			44	84	84	4
	2	807.25	0.83	121	63.68	.73	1.84			44	86	84	6
	3	811.20	0.80	122	62.58	.72	1.78			48	89	85	7
	4	814.90	0.72	121	59.31	.68	1.61			50	90	85	7
	5	818.30	0.64	121	55.92	.64	1.43			47	90	86	5
	6	821.343	0.53	121	50.89	.58	1.19			47	91	86	3
5:05	1:45	PM											
(Net Vol. Uncorr.)			Avg.										

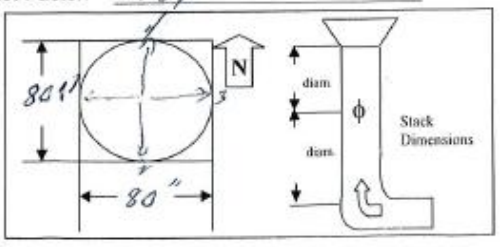
K-Factor: 0.5639 Stack Moisture: ~1% Canister #: _____ Start: _____ "Hg vac

Nozzle Diameter: 0.817" 0.174
Barometric Pressure: 30.01 " HgA
Static Pressure in Stack: + (-) 0.6 " H_2O

Recorded By: RL
Pitot Factor: 0.84

Calibration Data

Inclined Manometer	✓ (Cal: N/A)
Magnehelic No.	30403 (Cal: 8/6/13)
Pitot Tube No.	50415 (Cal: 4/12/13)
Potentiometer No.	NO313 (Cal: 6/21/13)
Thermocouple No.	50115 (Cal: 6/21/13)
Gas Meter No.	NO713 (Cal: 6/21/13)
Meter Corr. Factor:	1.0065



Sampling Probe: Stainless Steel / Borosilicate / Quartz

Stack: Horizontal / Vertical Rectangular / Circular

Revision 01/09

South Coast Air Quality Management District

Test No. 13-307 Company: EXIDE Date: 8/8/13
Sampling Location: HARD LEAD B/H - EXH Sample Train: _____

Traverse Source Test Data

Pre-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: _____ cfm @ _____ "Hg vac
Pitot Tube Leak Check: Pass / Fail

Post-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: _____ cfm @ _____ "Hg vac
Pitot Tube Leak Check: Pass / Fail

VELOCITY P CHECK

Time	Sample Point #	Gas Meter Reading (dcf) Start:	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum " Hg
7:00	1		0.79	125									
	2		0.74	125									
	3		0.77	125									
	4		0.76	125									
	5		0.80	125									
	6		0.84	123									
	7		0.83	124									
	8		0.87	124									
	9		0.86	123									
	10		0.82	122									
	11		0.70	123									
	12		0.49	122									
	13			0.82	124								
	14			0.84	124								
	15			0.84	124								
	16			0.90	125								
	17			0.85	124								
	18			0.78	125								
	19			0.79	124								
	20			0.73	124								
	21			0.67	124								
	22			0.65	124								
	23			0.58	123								
	24			0.26	121								
	(Net Vol. Uncorr.)		Avg.										

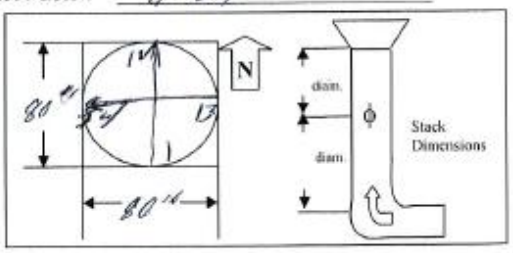
K-Factor: _____ Stack Moisture: _____ Canister #: _____ Start: _____ "Hg vac

Nozzle Diameter: _____ "
Barometric Pressure: _____ " HgA
Static Pressure in Stack: +/- _____ " H_2O

Recorded By: RC
Pitot Factor: 0.84

Calibration Data

Inclined Manometer		(Cal: N/A)
Magnehelic No.		(Cal:)
Pitot Tube No.	30483	(Cal: 8/6/13)
Potentiometer No.	20304	(Cal: 8/6/13)
Thermocouple No.	50112	(Cal: 8/6/13)
Gas Meter No.		(Cal:)
Meter Corr. Factor:		



Sampling Probe: Stainless Steel / Borosilicate / Quartz

Stack: Horizontal / Vertical Rectangular / Circular

Revision 01/09

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET (METHOD 25.1)

Date: 8/8/13 Page No.:

Test No.: Recorded By: CW

Company/Sampling Location Exide

Basic and Control Equipment

Barometric Pressure: "HgA Static Pressure: +/- "H_2O

SAMPLE A

Tank #: 34185 Trap #: Reg. #:

Pre-Test Leak Check: Gauge Reading:

(Pass) / Fail

Post-Test Leak Check: Gauge Reading:

Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
11:18	30		
11:32	29		
12:00	25		
12:06	20		
12:16	16		
12:18	13		

SAMPLE B

Tank #: E3385 Vial #: Reg. #:

Pre-Test Leak Check: Gauge Reading:

TO-15 (Pass) / Fail

Post-Test Leak Check: Gauge Reading:

Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
11:18	30		
11:48	0		

TCA SAMPLING INTERVAL TABLE (ΔP)

Min. \ °F	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.9							
20	2.20	2.45	2.7						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

Revision: April 20, 2011

South Coast Air Quality Management District

Test No. 13-308 Company: EXIDE [illegible] Date: 8/23/13
Sampling Location: HARD LEAD B/H Stack Sample Train: 10

Traverse Source Test Data

Pre-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: 0.015 cfm @ 15 "Hg vac
Pitot Tube Leak Check: Pass / Fail

Post-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: 0.010 cfm @ 7 "Hg vac
Pitot Tube Leak Check: Pass / Fail

Time 9:11 start	Sample Point #	Gas Meter Reading (dcf) Start: 821.909	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum "Hg
W	1	824.03	0.73	117	59.5	0.70	1.6			42	81	80	1.5
	2	836.20	0.68	118	57.5	0.67	1.5			41	83	81	1.5
	3	848.85	0.61	119	54.5	0.64	1.4			50	86	82	1.5
	4	849.24	0.59	120	53.6	0.62	1.3			43	88	82	1.5
	5	855.66	0.57	120	52.7	0.61	1.3			47	89	83	1.5
	6	862.249	0.58	122	53.3	0.62	1.3			42	90	84	1.5
S	1	869.96	0.79	122	67.2	0.72	1.8			43	88	85	3
	2	877.52	0.80	122	62.6	0.73	1.8			53	91	85	3
	3	884.90	0.79	124	62.3	0.72	1.8			44	92	86	3
	4	892.42	0.75	125	60.7	0.70	1.7			43	94	87	3
	5	899.85	0.71	127	59.2	0.68	1.6			45	96	89	3
	6	906.558	0.65	127	56.6	0.65	1.5			40	96	90	2
N	1	914.42	0.79	126	62.4	0.72	1.8			42	92	90	3
	2	921.10	0.81	127	63.2	0.73	1.9			43	96	90	2
	3	929.45	0.79	127	62.4	0.72	1.8			45	96	90	3
	4	937.34	0.81	128	63.3	0.73	1.9			40	97	91	3
	5	944.60	0.68	132	58.7	0.66	1.6			35	98	92	2
	6	951.32	0.69	130	58.5	0.67	1.6			43	98	92	2
E	1	959.49	0.85	130	64.9	0.74	2.0			43	98	94	3
	2	967.67	0.88	131	66.1	0.76	2.1			40	102	96	3
	3	975.46	0.82	133	63.9	0.73	1.9			53	102	97	3
	4	983.44	0.88	133	66.2	0.75	2.1			48	102	97	3
	5	990.85	0.70	133	59.1	0.67	1.7			43	103	98	3
	6	997.775	0.65	132	56.9	0.65	1.5			49	102	98	3
1:21 finish													
(Net Vol. Uncorr.)			Avg.										

K-Factor: 0.5639

Nozzle Diameter: 0.219 "

Barometric Pressure: 29.87 " HgA

Static Pressure in Stack: +/- 0.36 " H_2O

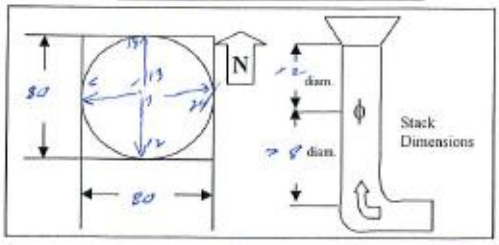
Canister #: _____ Start: _____ "Hg vac

Recorded By: RL

Pitot Factor: 0.84

Calibration Data

Inclined Manometer ✓	(Cal: N/A)
Magnehelic No. N/A	(Cal:)
Pitot Tube No. N041V	(Cal: 7/02/13)
Potentiometer No. N033	(Cal: 6/21/13)
Thermocouple No. N011V	(Cal: 6/14/13)
Gas Meter No. N071Z	(Cal: 6/21/13)
Meter Corr. Factor: 1.0085	



Sampling Probe: Stainless Steel / Borosilicate / Quartz

Stack: Horizontal / Vertical Rectangular / Circular

South Coast Air Quality Management District

Test No. 13-308 Company: Exide Technologies Date: 8-23-13
Sampling Location: Soft Lead Baghouse exhaust stack Sample Train: 18

Traverse Source Test Data

Pre-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: 1001 cfm @ 15 "Hg vac
Pitot Tube Leak Check: (Pass) Fail

Post-Test Leak Check:
Filter: _____ cfm @ _____ "Hg vac
Probe: 0 cfm @ 6 "Hg vac
Pitot Tube Leak Check: (Pass) Fail

Time	Sample Point #	Gas Meter Reading (dcf) Start: 344,972	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum " Hg
0910	1	352,895	0.66	116	56.54	0.816	2.26			45	91	87	6
	2	361,225	0.64	118	55.78	0.802	2.21			48	97	90	6
	3	369,510	0.60	118	54.00	0.776	2.10			49	103	91	6
	4	378.700	0.60	118	54.00	0.776	2.11			48	105	93	6
	5	386,600	0.53	118	50.76	0.730	1.89			53	109	95	5.5
	6	393.035	0.35	116	41.18	0.594	1.25			46	107	96	4.5
1015	7	400.720	0.57	118	52.64	0.757	2.00			52	100	96	6
	8	408.950	0.58	120	53.20	0.762	2.05			45	104	96	6
	9	417,235	0.54	121	51.37	0.735	1.91			42	106	96	5.5
	10	425.330	0.55	121	51.84	0.741	1.96			51	108	98	5.5
	11	432.970	0.48	122	48.47	0.692	1.71			51	108	97	5.5
	12	440.270	0.48	122	48.47	0.692	1.71			47	108	98	5.5
1123	13	447.890	0.63	122	55.53	0.793	2.21			51	101	97	6.0
	14	457.000	0.63	122	55.53	0.793	2.21			54	104	97	6.0
	15	465.445	0.55	123	51.93	0.740	1.95			46	106	97	6.0
	16	473.295	0.55	124	51.97	0.739	1.94			48	106	97	6.0
	17	480.055	0.45	124	47.01	0.669	1.59			53	105	97	5.0
	18	486.927	0.35	125	41.49	0.589	1.24			53	107	98	4.5
	19	494.620	0.58	127	53.51	0.757	2.04			46	105	100	5.5
	20	502,700	0.50	128	49.72	0.703	1.77			50	109	101	5.5
	21	510,365	0.48	128	48,72	0.688	1.70			47	109	101	5.5
	22	516.900	0.39	129	43.95	0.620	1.38			52	109	101	4.5
	23	524.105	0.45	125	47.05	0.668	1.59			53	106	100	5.0
	24	531,070	0.43	127	46.07	0.652	1.52			52	107	101	5.0
(Net Vol. Uncorr.)			Avg.										

54772 - MW
53397 - TO15
E3383 - TO15

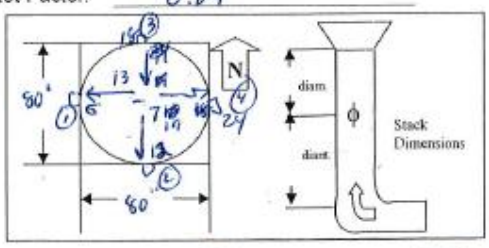
K-Factor: 0.5732
Canister #: _____ Start: _____ "Hg vac

Nozzle Diameter: 0.232 "
Barometric Pressure: 29.54 " HgA
Static Pressure in Stack: +/(-) 0.31 " H_2O

Recorded By: W. Stredwick
Pitot Factor: 0.84

Calibration Data

Inclined Manometer		(Cal: N/A)
Magnehelic No.		(Cal:)
Pitot Tube No.	50415	(Cal: 4-12-13)
Potentiometer No.	N0314	(Cal: 6-21-13)
Thermocouple No.	50115	(Cal: 4-12-13)
Gas Meter No.	N0714	(Cal: 6-21-13)
Meter Corr. Factor:	1.0021	



Sampling Probe: Stainless Steel / (Borosilicate) / Quartz

Stack: Horizontal / (Vertical) Rectangular / (Circular)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET ~~(METHOD 25.1)~~

Date: 8/23/13 Page No.:

Test No.: 13-308 Recorded By:

Company/Sampling Location Exide - Hard Lead

Basic and Control Equipment

Barometric Pressure: 29.87 "HgA Static Pressure: +~~(-)~~ 0.36 "H_2O

SAMPLE A

Tank #: 53484 Trap #: Reg. #:

Pre-Test Leak Check: Gauge Reading: -30

(Pass) / Fail

Post-Test Leak Check: Gauge Reading: -3

(Pass) / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
9:15 Am	30	0.2	
9:20	30	"	
9:25	29	"	
9:30	28	"	
9:35	22	"	
9:40	15	"	
9:45	8	"	
9:50	3	"	

SAMPLE B

Tank #: E4234 Vial #: Reg. #:

Pre-Test Leak Check: Gauge Reading: -30

(Pass) / Fail

Post-Test Leak Check: Gauge Reading: 2

(Pass) / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
9:55	30	0.2	
10:00	29	"	
10:05	28	"	
10:10	26	"	
10:15	23	"	
10:20	16	"	
10:25	10	"	
10:30	2	"	

TCA SAMPLING INTERVAL TABLE (ΔP)

Min. \ °F	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.9							
20	2.20	2.45	2.7						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

Revision: April 20, 2011

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET (~~METHOD 25.1~~)

Date: 8/23/13 Page No.:

Test No.: 13-308 Recorded By: EP

Company/Sampling Location Exide - Hard Lead

Basic and Control Equipment Blast furnace & Baghase

Barometric Pressure: 29.87 "HgA Static Pressure: +(-) 0.36 "H_2O

SAMPLE A

Tank #: 54080 Trap #: _____ Reg. #: _____

Pre-Test Leak Check: Gauge Reading: -30

Pass / Fail

Post-Test Leak Check: Gauge Reading: -2

Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
9:15 AM	30	0.1	
9:22	30	〃	
9:32	28	〃	
9:42	22	〃	
9:52	16	〃	
10:02	8	〃	
10:12	2	〃	

SAMPLE B

Tank #: _____ Vial #: _____ Reg. #: _____

Pre-Test Leak Check: Gauge Reading: _____

Pass / Fail

Post-Test Leak Check: Gauge Reading: _____

Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments

TCA SAMPLING INTERVAL TABLE (ΔP)

Min. \ °F	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.9							
20	2.20	2.45	2.7						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

Revision: April 20, 2011

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET (~~METHOD 25.1~~)

Date: 8/23/13 Page No.: 2 OF 2

Test No.: 13-308 Recorded By: JA

Company/Sampling Location EXIDE - SOFT LEAD B/H EXIT

Basic and Control Equipment

Barometric Pressure: 29.87 "HgA Static Pressure: +(-) .31 "H_2O

SAMPLE A TO 15

Tank #: 53397 Trap #: N/A Reg. #:

Pre-Test Leak Check: Gauge Reading: 30 Pass / Fail

Post-Test Leak Check: Gauge Reading: 2.5 Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
913	30	2.5cfh	
927	24	5cfh	
933	8	3	
942	3	3	
FINISH			

SAMPLE B TCA - FROGSES

Tank #: 54772 Vial #: N/A Reg. #:

Pre-Test Leak Check: Gauge Reading: 30 Pass / Fail

Post-Test Leak Check: Gauge Reading: Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
913	30	~~0.5~~ 0.2 lpm	
927	24	0.2 lpm	
933	22	0.3	
948	14	"	
959	10		
1015	2		FINISHED

TCA SAMPLING INTERVAL TABLE (ΔP)

Min. \ °F	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.9							
20	2.20	2.45	2.7						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

Revision: April 20, 2011

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
METHOD 25.3 TEST DATA SHEET TO-15

Date: 8/23/13 Page No.: 1 OF 2

Test No.: 13-308 Recorded By: JA

Company/Sampling Location: EXIDE - SOFT LEAD B/H EXH

Basic and Control Equipment:

Barometric Pressure: 29.87 "HgA Static Pressure: +/0 0.31 "H_2O

SAMPLE A TO15

Tank #: E3383 Vial #: N/A Reg. #:

Pre-Test Leak Check: Gauge: 30

Pass / Fail

Post-Test Leak Check: Gauge:

Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
948	30	3 scfh	
959	22	3	
1015	2		FINISHED

SAMPLE B

Tank #: Vial #: Reg. #:

Pre-Test Leak Check: Gauge:

Pass / Fail

Post-Test Leak Check: Gauge:

Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments

Approximate Time To Fill Tank (minutes)	20	30	40	50	60	90	120
ΔP Setting	62 (max.)	30	21	14	8	5	2

South Coast Air Quality Management District

Test No. 13-308 Company: EXIDE TECHNOLOGIES Date: 9/20/13
Sampling Location: HACO LEAD 13/H Sample Train: #5

Traverse Source Test Data

Pre-Test Leak Check:
Filter: ____ cfm @ ____ "Hg vac
Probe: 0.013 cfm @ 15 "Hg vac
Pitot Tube Leak Check: (Pass) / Fail

Post-Test Leak Check:
Filter: ____ cfm @ ____ "Hg vac
Probe: 0.012 cfm @ 10 "Hg vac
Pitot Tube Leak Check: (Pass) / Fail

Time start 9:03	Sample Point #	Gas Meter Reading (dcf) Start 10.342	Stack Velocity Head ("H2O)	Stack Temp °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum "Hg
W	1	17.75	0.83	108	63.0	.75	1.85			45	69	68	3
	2	24.80	0.73	110	59.2	.71	1.64			49	73	70	3
	3	32.0	0.69	110	57.5	.69	1.56			48	76	71	3
	4	38.95	0.65	110	55.8	.67	1.48			48	78	72	3
	5	45.40	0.53	110	50.4	.60	1.21			41	79	74	3
	6	51.801	0.57	110	52.3	.62	1.31			42	80	74	3
S	1	60.25	0.97	109	68.1	.82	2.22			44	78	75	4
	2	68.45	0.93	111	66.8	.80	2.14			42	81	76	4
	3	76.51	0.88	112	65.1	.77	2.03			42	83	77	4
	4	84.54	0.86	112	64.3	.77	2.00			43	84	78	4
	5	92.10	0.76	112	60.5	.72	1.77			48	84	79	4
	6	98.296	0.54	112	51.9	.61	1.26			44	84	79	4
E	1	106.95	1.05	110	70.9	.85	2.41			43	78	77	5
	2	115.65	1.07	112	71.7	.85	2.47			43	82	78	5
	3	124.78	1.08	113	72.1	.86	2.51			47	84	79	6
	4	133.35	0.96	113	68.0	.81	2.24			45	86	80	5
	5	141.15	0.84	114	63.7	.76	1.96			47	87	81	3
	6	148.279	0.67	114	56.9	.67	1.57			44	87	82	3
N	1	157.28	1.05	111	71.0	.85	2.46			47	85	82	6
	2	165.93	1.05	113	71.1	.85	2.46			43	86	82	5
	3	174.43	0.96	114	68.1	.81	2.26			48	88	83	5
	4	182.64	0.87	115	64.9	.77	2.05			41	90	83	5
	5	190.33	0.81	114	62.5	.74	1.91			43	89	84	3
	6	197.668	0.72	114	59.0	.70	1.70			44	89	84	3
1115 stop													
(Net Vol. Uncorr.)			Avg.										

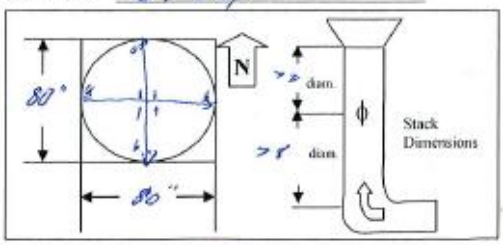
K-Factor: 0.5039 Stack Moisture: 1.5 Canister #: ____ Start: ____ "Hg vac

Nozzle Diameter: 0.720 "
Barometric Pressure: 29.94 " HgA
Static Pressure in Stack: +10 0.34 " H_2O

Recorded By: EC
Pitot Factor: 0.84

Calibration Data

Inclined Manometer	✓	(Cal: N/A)
Magnehelic No.	N/A	(Cal:)
Pitot Tube No.	504/13	(Cal: 6/12/13)
Potentiometer No.	N0313	(Cal: 6/21/13)
Thermocouple No.	N0113	(Cal: 6/21/13)
Gas Meter No.	N0713	(Cal: 6/21/13)
Meter Corr. Factor:	1.0085	



Sampling Probe: Stainless Steel / Borosilicate / Quartz

Stack: Horizontal / (Vertical) Rectangular / (Circular)

Revision 01/09

South Coast Air Quality Management District

Test No. 13308 Company: Exide Technologies Date: 9-20-13
Sampling Location: Soft Lead Exhaust Stack Sample Train: 4

Traverse Source Test Data

Pre-Test Leak Check:
Filter: ____ cfm @ ____ "Hg vac
Probe: 0 cfm @ 15 "Hg vac
Pitot Tube Leak Check: (Pass) / Fail

Post-Test Leak Check:
Filter: ____ cfm @ ____ "Hg vac
Probe: 0 cfm @ 6 "Hg vac
Pitot Tube Leak Check: (Pass) / Fail

Time	Sample Point #	Gas Meter Reading (dcf) Start: 541,882	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum "Hg
9:04	1	548.750	0.66	108	56.15	0.667	1.45	[redacted]		44	79	79	5.0
	2	555.515	0.66	109	56.20	0.666	1.46			42	81	79	5.0
	3	562.405	0.60	111	53.68	0.634	1.33			35	85	79	5.0
	4	569.100	0.65	111	55.87	0.660	1.45			42	88	79	5.0
	5	574.900	0.48	111	48.01	0.567	1.08			45	90	81	4.0
	6	580.958	0.44	110	45.93	0.544	0.99			37	90	81	4.0
10:06	7	587.970	0.62	112	54.61	0.644	1.38			39	87	82	5.0
	8	594.675	0.60	114	53.82	0.633	1.35			45	91	83	5.0
	9	601.250	0.65	115	56.06	0.659	1.46			51	92	84	5.0
	10	607.710	0.57	115	52.50	0.616	1.29			46	94	85	4.5
	11	614.320	0.55	115	51.57	0.605	1.25			51	94	86	4.5
	12	620.646	0.55	117	51.66	0.604	1.25			50	95	86	4.5
11:10	13	628.040	0.79	117	61.92	0.724	1.76			52	88	85	6.0
	14	635.315	0.76	117	60.73	0.710	1.70			48	92	85	6.0
	15	642.825	0.72	117	59.11	0.691	1.63			45	96	86	5.5
	16	649.830	0.65	120	56.31	0.655	1.47			54	97	87	5.0
	17	656.135	0.58	120	53.19	0.619	1.32			41	98	88	4.5
	18	661.265	0.35	110	40.96	0.485	0.81			49	96	89	3.0
12:15	19	668.390	0.70	121	58.48	0.679	1.56			47	91	87	5.0
	20	675.655	0.67	124	57.36	0.663	1.50			51	95	88	5.0
	21	682.680	0.62	125	55.23	0.637	1.40			48	96	89	5.0
	22	689.345	0.57	125	52.96	0.611	1.29			45	98	90	5.0
	23	695.555	0.52	123	50.49	0.584	1.18			50	98	90	4.5
	24	701.760	0.52	122	50.45	0.585	1.18			51	98	90	4.5
(Net Vol. Uncorr.)			Avg.										

K-Factor: 0.5732

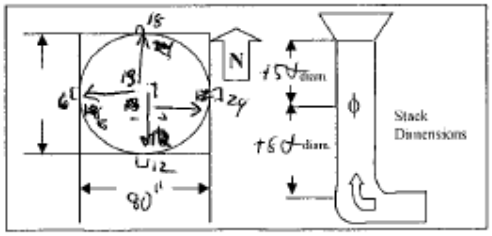
Canister #: 54731 E4224 Start: 30" "Hg vac

Nozzle Diameter: 0.219 "
Barometric Pressure: 29.94 " HgA
Static Pressure in Stack: + (-) 0.35 " H_2O

Recorded By: W.S.
Pitot Factor: 0.84

Calibration Data

Inclined Manometer	(Cal:	N/A)
Magnehelic No. 10102	(Cal:	7/2/13)
Pitot Tube No. N0412	(Cal:	7/23/13)
Potentiometer No. N0314	(Cal:	6/21/13)
Thermocouple No. N0112	(Cal:	6/23/13)
Gas Meter No. N0714	(Cal:	6/21/13)
Meter Corr. Factor: 1.0021		



Sampling Probe: Stainless Steel / (Borosilicate) / Quartz

Stack: Horizontal / (Vertical) Rectangular / (Circular)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET

Date: 9/20/13
Test No.: 13308
Page No.: _____
Recorded by: _____
Company/Sampling Location: Exide Soft lead
Basic and Control Equipment: _____

Fixed Gas **SAMPLE A**
Tank # 54731 Trap # _____ Control # _____

Pre-Test Leak Check: Gauge -30 ΔP _____

Post-Test Leak Check: Gauge -2 ΔP _____

Barometric Pressure 29.44 "HgA

10-15 **SAMPLE B**
Tank # E4224 Trap # _____ Control # _____

Pre-Test Leak Check: Gauge -30 ΔP _____

Post-Test Leak Check: Gauge -1 ΔP _____

Static Pressure _____ "HgA (-0.35 "H2O)

TIME	VACUUM ("Hg)	FLOW (cc/min)	COMMENTS
10:00 AM	30	0.1	
10:15	25	"	
10:30	20	"	
10:45	10	"	
11:00	2	"	

TIME	VACUUM ("Hg)	FLOW (cc/min)	COMMENTS
10:00 AM	30	0.1	
10:15	21	"	
10:30	12	"	
10:45	8	"	
11:00	1	"	

TCA SAMPLING INTERVAL TABLE (Δ P)

Min. °F	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.90							
20	2.20	2.45	2.70						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET (METHOD 25.1)

Date: 9/20/13 Page No.:

Test No.: Recorded By: CW

Company/Sampling Location Exide

Basic and Control Equipment Hard Lead

Barometric Pressure: 29.44 "HgA Static Pressure: +⊖ 0.34 "H_2O

70-15

SAMPLE A

Tank #: 5A775 Trap #: Reg. #:

Pre-Test Leak Check: Gauge Reading: 30"

(Pass) / Fail

Post-Test Leak Check: Gauge Reading: 2"

(Pass) / Fail

Time	Vacuum ("Hg)	Flow (cc/min) 1/min	Comments
9:04am	30	0.1	
9:14	23		
9:24	18		
9:34	13		
9:44	7		
9:54	4		
10:04	2		

SAMPLE B

Tank #: E4281 Vial #: Reg. #:

Pre-Test Leak Check: Gauge Reading: 30"

(Pass) / Fail

Post-Test Leak Check: Gauge Reading: 2"

(Pass) / Fail

Time	Vacuum ("Hg)	Flow (cc/min) 1/min	Comments
10:00am	30	0.1	
10:10	27		
10:20	22		
10:30	19		
10:40	14		
10:50	8		
11:00	3		

TCA SAMPLING INTERVAL TABLE (ΔP)

Min. \ °F	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.9							
20	2.20	2.45	2.7						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

Revision: April 20, 2011

PROPRIETARY PROCESS INFORMATION
REDACTED FOR PUBLIC DISTRIBUTION

PROPRIETARY PROCESS INFORMATION
REDACTED FOR PUBLIC DISTRIBUTION

PROPRIETARY PROCESS INFORMATION
REDACTED FOR PUBLIC DISTRIBUTION

APPENDIX B

Process Data

Appendix B has been removed from this file because it may contain proprietary information.

APPENDIX C

Calibration Records

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
PITOT TUBE CALIBRATION

Date : 8-6-13
Calibrated by : T. Nguyen
At : H&

S-Type STQC# : 30403
OD : 3/8" Length : 8'

Standard S/N : N/R
Cp (STD): 0.99
OD : 3/8" Length : 4 ft

A-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_{S} (in.H2O)	Cp (S)	Dev.	95% CI
	Geometrical Check is OK			
Average : $\overline{Cp}$ (A)		0.84		

B-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_{S} (in.H2O)	Cp (S)	Dev.	95% CI
Average : $\overline{Cp}$ (B)				

$Cp\ (S) = Cp\ (STD)\sqrt{\frac{\Delta P_{STD}}{\Delta P_{S}}}$ Remarks:

Dev. = Cp (S) - $\overline{Cp}$ (must be < 0.01)

$\overline{Cp}$ (A) - $\overline{Cp}$ (B) = _____ (must be < 0.01)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DRY GAS METER CALIBRATION WORKSHEET

Page 1

SOUTH COAS
DRY GAS MET

DATE: 06/21/2013 PERFORMED BY: T.Nguyen

AMBIENT AIR 75 o F

DRY GAS MET

PBAR: 29.34 In.Hg DRY GAS METER ID : N0713

STANDARD DRY GAS METER ID#: 7812470

STANDARD DI
With

TRIAL	CFM	TOTAL cubicF	TEMP	H2O PRESSURE IN	OUT	H20	METER READ1 (in cubic F)	READ2	TOTAL cubicF	HRS	MIN	SEC	TIME Decimal	UC FL RT CFM	TRIAL	CFM
1	1/4	5.9	75	2	2	2.0	166.6	172.5	5.9		23	51.32	23.86	0.2473	1	1/4
2	1/4	5.3	75	2	2	2.0	172.6	177.9	5.3		21	30.57	21.51	0.2464	2	1/4
3	1/4	12.4	75	2	2	2.0	178.0	190.4	12.4		50	22.28	50.37	0.2462	3	1/4
1	1/2	10.0	76	2.2	2.2	2.2	631.7	641.7	10.0		18	8.37	18.14	0.5513	1	1/2
2	1/2	12.0	76	2.2	2.2	2.2	641.8	653.8	12.0		21	47.10	21.79	0.5508	2	1/2
3	1/2	23.0	76	2.2	2.2	2.2	663.9	686.9	23.0		41	34.87	41.58	0.5531	3	1/2
1	3/4	11.7	72	2.6	2.6	2.6	241.4	253.1	11.7		12	15.07	12.25	0.9550	1	3/4
2	3/4	25.2	72	2.6	2.6	2.6	253.2	278.4	25.2		26	23.56	26.39	0.9548	2	3/4
3	3/4	11.3	72	2.6	2.6	2.6	278.6	289.9	11.3		11	50.03	11.83	0.9549	3	3/4
1	1	12.0	75	2.4	2.4	2.4	301.6	313.6	12.0		15	55.09	15.92	0.7539	1	1
2	1	7.9	75	2.4	2.4	2.4	313.7	321.6	7.9		10	28.53	10.48	0.7541	2	1
3	1	10.4	75	2.4	2.4	2.4	321.7	332.1	10.4		13	48.13	13.80	0.7535	3	1

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DRY GAS METER CALIBRATION WORKSHEET

Page 2

DATE: 06/21/2013 PERFORMED BY: T.Nguyen

DRY GAS METER ID : N0713

TRIAL	CFM	TOTAl cubicF	TEMP	H2O PRESSURE IN	OUT	H20	METER READ1 (In cubic F)	READ2	CubicF	HRS	MIN	SEC	TIME Decimal	UC FL RT CFM
1	1/4	5.7	75	1.8	1.5	1.7	219.5	225.2	5.7		23	10.71	23.18	0.2459
2	1/4	5.6	75	1.8	1.5	1.7	225.3	230.9	5.6		22	55.89	22.93	0.2442
3	1/4	12.2	75	1.8	1.5	1.7	231.0	243.2	12.2		49	59.81	50.00	0.2440
1	1/2	10.0	75	2.2	1.0	1.6	584.1	594.1	10.0		18	14.18	18.24	0.5484
2	1/2	12.0	75	2.2	1.0	1.6	594.2	606.2	12.0		21	52.63	21.88	0.5485
3	1/2	10.1	75	2.2	1.0	1.6	606.1	616.2	10.1		18	20.81	18.35	0.5505
1	3/4	11.7	75	1.5	0.0	0.8	87.0	98.7	11.7		12	18.38	12.31	0.9507
2	3/4	24.9	75	1.5	0.0	0.8	99.0	123.9	24.9		26	12.31	26.21	0.9502
3	3/4	11.2	75	1.5	0.0	0.8	124.0	135.2	11.2		11	46.37	11.77	0.9513
1	1	11.9	75	0.9	0.0	0.5	147.0	158.9	11.9		15	47.82	15.80	0.7533
2	1	7.8	75	0.9	0.0	0.5	159.2	167.0	7.8		10	21.99	10.37	0.7524
3	1	10.4	75	0.9	0.0	0.5	167.1	177.5	10.4		13	48.95	13.82	0.7528

DATE: 06/21/2013

T AIR QUALITY MANAGEMENT DISTRICT
'ER CALIBRATION WORKSHEET

Page 3

DATE : 06/21/2013
PERFORMED BY: T.Nguyen

'ER COEFFICIENT CALCULATIONS

ꓤY GAS METER ID#: 7812470
Coefficient of 1.0000

DRY GAS METER ID : N0713

U/C FlowRate	TEMI	H2O	Corrected FlowRate	U/C FlowRate	TEMF	H2O	Corrected FlowRate	COEF	AVE:	OVERALL
0.2473	75	2	0.2369	0.2459	75	1.65	0.2354	1.0066	1.0087	1.0085
0.2464	75	2	0.2360	0.2442	75	1.65	0.2337	1.0099		
0.2462	75	2	0.2358	0.2440	75	1.65	0.2335	1.0097		
0.5513	76	2.2	0.5274	0.5484	75	1.6	0.5247	1.0050	1.0044	
0.5508	76	2.2	0.5269	0.5485	75	1.6	0.5249	1.0039		
0.5531	76	2.2	0.5291	0.5505	75	1.6	0.5268	1.0044		
0.9550	72	2.6	0.9213	0.9507	75	0.75	0.9079	1.0148	1.0147	
0.9548	72	2.6	0.9211	0.9502	75	0.75	0.9074	1.0152		
0.9549	72	2.6	0.9212	0.9513	75	0.75	0.9084	1.0141		
0.7539	75	2.4	0.7228	0.7533	75	0.45	0.7188	1.0056	1.0062	
0.7541	75	2.4	0.7231	0.7524	75	0.45	0.7180	1.0072		
0.7535	75	2.4	0.7225	0.7528	75	0.45	0.7183	1.0059		

DRY GAS METER ID : N0713
DATE: 06/21/2013

CORRECTION FACTOR: **1.0085**

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DRY GAS METER CALIBRATION WORKSHEET

Page 1

DATE: 06-21-2013 PERFORMED BY: T.Nguyen

AMBIENT AIR: 75 o F

PBAR: 29.34 In.Hg DRY GAS METER ID : N0714

STANDARD DRY GAS METER ID#: 7812470

TRIAL	CFM	TOTAL cubicF	TEMP	H2O PRESSURE IN	OUT	H20	METER READ1 (in cubic F)	READ2	TOTAL cubicF	HRS	MIN	SEC	TIME Decimal	UC FL RT CFM
1	1/4	6.9	76	1.1	1.1	1.1	486.6	493.5	6.9		24	10.74	24.18	0.2854
2	1/4	11.1	76	1.1	1.1	1.1	493.6	504.7	11.1		38	58.06	38.97	0.2849
3	1/4	10.3	76	1.1	1.1	1.1	504.8	515.1	10.3		36	2.46	36.04	0.2858
1	1/2	10.0	76	2.2	2.2	2.2	631.7	641.7	10.0		18	8.37	18.14	0.5513
2	1/2	12.0	76	2.2	2.2	2.2	641.8	653.8	12.0		21	47.10	21.79	0.5508
3	1/2	23.0	76	2.2	2.2	2.2	663.9	686.9	23.0		41	34.87	41.58	0.5531
1	3/4	15.9	76	5	5	5.0	782.8	798.7	15.9		20	10.21	20.17	0.7883
2	3/4	19.9	76	5	5	5.0	798.8	818.7	19.9		25	12.80	25.21	0.7893
3	3/4	12.8	76	5	5	5.0	818.8	831.6	12.8		16	13.00	16.22	0.7893
1	1	7.4	76	9.2	9.2	9.2	833.0	840.4	7.4		6	47.24	6.79	1.0903
2	1	9.1	76	9.2	9.2	9.2	840.7	849.8	9.1		8	19.16	8.32	1.0938
3	1	6.2	76	9.2	9.2	9.2	850.0	856.2	6.2		5	41.82	5.70	1.0883

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DRY GAS METER CALIBRATION WORKSHEET

Page 2

DATE: 06-21-2013 PERFORMED BY: T.Nguyen

DRY GAS METER ID : N0714

TRIAL	CFM	TOTAL cubicF	TEMP	H2O PRESSURE IN	OUT	H20	METER READ1 (in cubic F)	READ2	CubicF	HRS	MIN	SEC	TIME Decimal	UC FL RT CFM
1	1/4	7.1	76	1.0	0.2	0.6	538.9	546.0	7.1		24	50.08	24.83	0.2859
2	1/4	11.1	76	1.0	0.2	0.6	546.1	557.2	11.1		38	52.56	38.88	0.2855
3	1/4	10.2	76	1.0	0.2	0.6	557.3	567.5	10.2		35	43.24	35.72	0.2855
1	1/2	10.0	76	2.2	1.0	1.6	584.1	594.1	10.0		18	14.18	18.24	0.5484
2	1/2	12.0	76	2.2	1.0	1.6	594.2	606.2	12.0		21	52.63	21.88	0.5485
3	1/2	10.1	76	2.2	1.0	1.6	606.1	616.2	10.1		18	20.81	18.35	0.5505
1	3/4	16.0	76	5.0	2.0	3.5	334.8	350.8	16.0		20	21.38	20.36	0.7860
2	3/4	19.8	76	5.0	2.0	3.5	350.9	370.7	19.8		25	10.82	25.18	0.7863
3	3/4	12.9	76	5.0	2.0	3.5	370.7	383.6	12.9		16	23.34	16.39	0.7871
1	1	7.8	76	9.0	4.1	6.6	384.9	392.7	7.8		7	4.86	7.08	1.1015
2	1	9.2	76	9.0	4.1	6.6	392.9	402.1	9.2		8	20.17	8.34	1.1036
3	1	6.0	76	9.0	4.1	6.6	402.5	408.5	6.0		5	26.60	5.44	1.1023

DATE: 06-21-2013

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DRY GAS METER CALIBRATION WORKSHEET

Page 3

DATE : 06-21-2013
PERFORMED BY: T.Nguyen

DRY GAS METER COEFFICIENT CALCULATIONS

STANDARD DRY GAS METER ID#: 7812470 DRY GAS METER ID : N0714
With Coefficient of 1.0000

TRIAL	CFM	U/C FlowRate	TEMI	H2O	Corrected FlowRate	U/C FlowRate	TEMF	H2O	Corrected FlowRate	COEF	AVE:	OVERALL
1	1/4	0.2854	76	1.1	0.2722	0.2859	76	0.6	0.2724	0.9994	1.0001	1.0023
2	1/4	0.2849	76	1.1	0.2717	0.2855	76	0.6	0.2720	0.9989		
3	1/4	0.2858	76	1.1	0.2726	0.2855	76	0.6	0.2721	1.0021		
1	1/2	0.5513	76	2.2	0.5274	0.5484	76	1.6	0.5238	1.0068	1.0063	
2	1/2	0.5508	76	2.2	0.5269	0.5485	76	1.6	0.5239	1.0057		
3	1/2	0.5531	76	2.2	0.5291	0.5505	76	1.6	0.5258	1.0063		
1	3/4	0.7883	76	5	0.7593	0.7860	76	3.5	0.7543	1.0067	1.0069	
2	3/4	0.7893	76	5	0.7603	0.7863	76	3.5	0.7546	1.0075		
3	3/4	0.7893	76	5	0.7603	0.7871	76	3.5	0.7554	1.0065		
1	1	1.0903	76	9.2	1.0611	1.1015	76	6.55	1.0651	0.9962	0.9959	
2	1	1.0938	76	9.2	1.0646	1.1036	76	6.55	1.0672	0.9976		
3	1	1.0883	76	9.2	1.0592	1.1023	76	6.55	1.0658	0.9938		

DRY GAS METER ID : N0714 CORRECTION FACTOR: **1.0023**
DATE: 06-21-2013

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
PITOT TUBE CALIBRATION

Date : 7-2-13
Calibrated by : TN
At : HQ

S-Type STQC# : N0412
OD : 7/8 Length : 6'

Standard S/N :
Cp (STD): 0.99
OD : 3/8" Length : 4 ft

A-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_S (in.H2O)	Cp (S)	Dev.	95% CI
	Geometrical check is OK			
Average : $\overline{Cp}$ (A)		0.84		

B-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_S (in.H2O)	Cp (S)	Dev.	95% CI
Average : $\overline{Cp}$ (B)				

$$Cp\ (S) = Cp\ (STD)\sqrt{\frac{\Delta P_{STD}}{\Delta P_S}}$$ Remarks:

Dev. = Cp (S) - $\overline{Cp}$ (must be < 0.01)

$\overline{Cp}$ (A) - $\overline{Cp}$ (B) = _____ (must be < 0.01)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
PITOT TUBE CALIBRATION

Date : 2-22-13
Calibrated by : T Nguyen
At : HQ

S-Type STQC# : 40413
OD : 3/8 Length : 41

Standard S/N :
Cp (STD): 0.99
OD : 3/8" Length : 4 ft

A-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_S (in.H2O)	Cp (S)	Dev.	95% CI
	Geometrical Check is OK			
Average : $\overline{Cp}$ (A)		0.84		

B-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_S (in.H2O)	Cp (S)	Dev.	95% CI
Average : $\overline{Cp}$ (B)				

$Cp\ (S) = Cp\ (STD)\sqrt{\frac{\Delta P_{STD}}{\Delta P_S}}$ Remarks:

$Dev. = Cp\ (S) - \overline{Cp}$ (must be < 0.01)

$\overline{Cp}\ (A) - \overline{Cp}\ (B) =$ _____ (must be < 0.01)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
PITOT TUBE CALIBRATION

Date : 4-12-13
Calibrated by : TN
At : HQ

S-Type STQC# : 50415
OD : 3/8 Length : 6'

Standard S/N :
Cp (STD): 0.99
OD : 3/8" Length : 4 ft

A-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_{S} (in.H2O)	Cp (S)	Dev.	95% CI
	Geometrical Check			
	is	OK		
Average : $\overline{Cp}$ (A)		0.84		

B-Side Calibration				
ΔP_{STD} (in.H2O)	ΔP_{S} (in.H2O)	Cp (S)	Dev.	95% CI
	--			
Average : $\overline{Cp}$ (B)				

$Cp\ (S) = Cp\ (STD)\sqrt{\frac{\Delta P_{STD}}{\Delta P_{S}}}$ Remarks:

Dev. = Cp (S) - $\overline{Cp}$ (must be < 0.01)

$\overline{Cp}$ (A) - $\overline{Cp}$ (B) = _____ (must be < 0.01)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DATA SHEET FOR THERMOCOUPLE/POTENTIOMETER CALIBRATION

Field Meter STQC# : N0311 & N0313
Ref. Thermometer # : ASTM05340
Temperature Source(s): Fafnir

Date: 6-21-2013
Calibration By: T. Nguyen
Calibration Period:
Semiannual X
Bimonthly
Other

		N0311 Lead Wire STQC# ✓				N0313 Lead Wire STQC# ✓				
Temp.*	A	B		(B-A)100 A **		B		(B-A)100 A **		
Sensor STQC#	Ref. Temp.	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	COMMENTS
N0112	210	211				211				
N0113	210	211				210				
N0116	210	211				211				
S0115	210	210				211				
N0112	410	411				411				
N0113	410	411				410				
N0116	410	412				411				
S0115	410	411				412				
N0112	710	711				712				
N0113	710	710				711				
N0116	710	711				710				
S0115	710	712				711				

All temperatures are in degrees F.
*Percent (%) difference should not exceed +/- 1.5%.

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DATA SHEET FOR THERMOCOUPLE/POTENTIOMETER CALIBRATION

Field Meter STQC# : N0314 & N0315
Ref. Thermometer # : ASTM0340
Temperature Source(s): Johnson

Date: 6-21-2013
Calibration By: T. Nguyen
Calibration Period:
Semiannual X
Bimonthly
Other

		N0314				N0315				
		Lead Wire STQC# NA				Lead Wire STQC# NA				
Temp.*	A	B		(B-A)100 A **		B		(B-A)100 A **		
Sensor STQC#	Ref. Temp.	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	COMMENTS
N0112	210	211				212				
N0113	210	211				211				
S0115	210	211				212				
N0116	210	211				211				
N0112	410	411				412				
N0113	410	412				411				
S0115	410	412				412				
N0116	410	411				411				
N0112	710	711				712				
N0113	710	712				711				
S0115	710	712				711				
N0116	710	711				711				

All temperatures are in degrees F.
*Percent (%) difference should not exceed +/- 1.5%.

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DATA SHEET FOR THERMOCOUPLE/POTENTIOMETER CALIBRATION

Field Meter STQC# : Infared Ther.
Ref. Thermometer # : ASTM 0833 40
Temperature Source(s): Tofna

Date: July 2, 13
Calibration By: TN
Calibration Period:
Semiannual X
Bimonthly
Other

		Lead Wire STQC#				Lead Wire STQC#				
Temp.*	A	B		(B-A)100 A **		B		(B-A)100 A **		
Sensor STQC#	Ref. Temp.	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	COMMENTS
~~N010~~	212	212								
~~N0102~~	212	212								
~~N0103~~	212	211								
~~N0101~~	412	411								
~~I0102~~	412	412								
~~I0103~~	412	413								
I0101	710	711								
I0102	710	712								
I0103	710	710								

* All temperatures are in degrees F.
**Percent (%) difference should not exceed +/- 1.5%.

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DATA SHEET FOR THERMOCOUPLE/POTENTIOMETER CALIBRATION

Field Meter STQC# : 20304 & C0301
Ref. Thermometer # : ASTM 68340
Temperature Source(s): Fafco

Date: 8-6-13
Calibration By: T. Nguyen
Calibration Period:
Semiannual ____
Bimonthly X
Other ____

		20304				C0301				
		Lead Wire STQC#				Lead Wire STQC#				
Temp.*	A	B		(B-A)100 A **		B		(B-A)100 A **		
Sensor STQC#	Ref. Temp.	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	COMMENTS
50112	212	213	213			213	214			
C0112	212	214	214			214	214			
50112	410	411	412			412	413			
C0112	410	412	411			413	412			
50112	710	711	712			712	713			
C0112	710	711	712			711	713			

* All temperatures are in degrees F.
**Percent (%) difference should not exceed +/- 1.5%.

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DATA SHEET FOR THERMOCOUPLE/POTENTIOMETER CALIBRATION

Field Meter STQC# : N0311
Ref. Thermometer # : ASTM0234O
Temperature Source(s): Fluke

Date: 9-24-13
Calibration By: T. Nguyen
Calibration Period:
Semiannual X
Bimonthly
Other

		Lead Wire STQC#				Lead Wire STQC#				
Temp.*	A	B		(B-A)100 A **		B		(B-A)100 A **		
Sensor STQC#	Ref. Temp.	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	Ch#1	Ch#2	COMMENTS
N0112	210	210	211							
N0113	210	211	210							
N0112	410	411	411							
N0113	410	411	410							
N0112	710	710	711							
N0113	710	711	711							
N0112										
N0113										

* All temperatures are in degrees F.
**Percent (%) difference should not exceed +/- 1.5%.

APPENDIX D

District Laboratory Data

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING AND ANALYSIS
REPORT OF LABORATORY ANALYSIS

(Page 1 of 2)

TO: Mike Garibay, Supervising A.Q. Engineer
Monitoring/Source Testing
Science & Technology Advancement

LABORATORY NO. 1322105-02 to - 08

REFERENCE NO. ICPMS-YS-5-57

SAMPLES DESCRIBED AS:

Solutions and filters from CARB Method 436 (Excl. mercury) performed at Exide Technologies. Samples consist of solutions and filters from source test trains # 10 & #15. (See details on page 2)

SUBMITTED ON: 7/30/2013

REQUESTED BY: Mike Garibay

SAMPLE SOURCE:

Exide Technologies
2700 Indiana St.
Vernon, CA 90058

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Analysis of Metal by Inductively Coupled Plasma - Mass Spectrometry

Aliquots of solutions from impingers, housing, tubing, probe and blank were treated with nitric acid prior to analysis. Filters samples were digested in a microwave oven using 1:1 Ultrapure Nitric Acid. Analysis for metals was performed in accordance with AQMD Method #0005, (*Standard Operating Procedure for the Analysis of Metals in Filters by Inductively Coupled Plasma - Mass Spectrometer*).

Results:
Results for solutions are given in ppb (ng/ml). Concentrations of metals on filters are given in ng/filter. Where results were found to be below the Method Reporting Limit (MRL), a < MRL value in ppb is reported. For example, if the MRL for a compound is 0.5 ppb and a sample was found to be not detected for that compound, the reported value is <0.5 ppb. Please see next page for full results.

Date Approved: 8/28/13

Approved By:
Rudy Eden, Sr. Manager
Laboratory & Source Test Engineering

(Page 2 of 2)

Lab. ID	1322105-02	1322105-03	1322105-04	1322105-05	1322105-06	1322105-07	1322105-08
	Blank Reagent 5%HNO3 + 10% H2O2	Container #2 Train #10 Probe + Line	Container #3 Train #10 Impinger + Front of filter housing	Container #3 Blank Train #15 Impinger + Front of filter housing	Container #2 Blank Train #15 Tubing + Probe	Train#10 Container#1	Train #15 Filter Blank
Element	ng/mL	ng/mL	ng/mL	ng/mL	ng/mL	ng/filter	ng/filter
Antimony	<0.18	0.59	0.78	<0.18	<0.18	10	8
Arsenic	<0.06	2.63	6.26	0.12	0.19	20	<2
Barium	<0.06	0.82	2.25	1.53	<0.06	2,000	1,320
Beryllium	<0.06	<0.06	<0.06	<0.06	<0.06	<2	<2
Cadmium	0.48	0.91	2.52	0.76	<0.12	<3	<3
Chromium	<0.60	<0.60	1.51	<0.60	<0.60	90	70
Cobalt	<0.06	<0.06	0.31	0.13	<0.06	<2	5
Copper	1.03	23.1	12.5	15.8	2.69	40	70
Iron	<0.06	51.4	93.1	23.9	4.66	560	640
Lead	0.19	52	202	19.2	3.19	120	40
Manganese	<0.120	1.06	2.31	0.91	0.14	110	60
Nickel	0.128	4.19	2.22	1.12	0.80	30	20
Selenium	<0.240	<0.24	0.47	<0.24	<0.24	<6	<6
Thallium	<0.60	<0.60	<0.60	<0.60	<0.60	<20	<20
Tin*	51.5	0.63	11.5	10.6	<0.60	180	<20
Titanium	<0.60	1.09	1.9	1.37	<0.60	<20	<20
Vanadium	<0.60	<0.60	<0.60	<0.60	<0.60	<20	<20
Zinc	4.31	48.5	61.1	24.3	8.57	2,620	2,110

*Tin can be used as a stabilizer in H202 by the manufacturer.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING AND ANALYSIS
REPORT OF LABORATORY ANALYSIS
(Page 1 of 2)

TO: Mike Garibay, Supervising AQ Engineer
Source Test Engineering

LABORATORY NO: 1323517-04 to -12

REFERENCE NO: ICP-MS-YS-5-60

SUBMITTED ON: 8/27/2013

REQUESTED BY: Jason Aspell

SOURCE TEST NO: 13-308

SAMPLE DESCRIBED AS:

Solutions and filters from three CARB Method 436 (Excl. mercury) source test trains; Trains, #7, #10 and #18
(See details on page 2)

SAMPLE SOURCE:
Exide Technologies
2700 Indiana St.
Vernon, CA 90058

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Analytical Method

Analysis of Metals by Inductively Coupled Plasma - Mass Spectrometry

Aliquots of solutions from impingers, housing, tubing, probe and blank were treated with nitric acid prior to analysis. Filter samples were digested in a microwave oven using 1:1 Ultrapure Nitric Acid. Analysis for metals was performed in accordance with AQMD Method #0005, (*Standard Operating Procedure for the Analysis of Metals in Filters by Inductively Coupled Plasma - Mass Spectrometer*).

Results:

See attachment.

Date Approved: 10/4/13

Approved By: _____
Rudy Eden, Sr. Manager
Laboratory & Source Test Engineering

(Page 2 of 2)

Exide Technologies: 2700 Indiana St., Vernon, CA 90058

LN 1323517-04 to -12

Metal analysis results for source test performed at Exide Technologies (Source Test # 13-308)

	1323517-05 Train #10 tubing & probe	1323517-06 Train #10 Impinger & front half filter housing	1323517-04 filter for Train #10	1323517-08 Train #18 tubing & probe	1323517-09 Train #18 Impinger & front half filter housing	1323517-07 filter for Train #18	1323517-11 Train #7 Impinger & front half filter housing	1323517-12 Reagent blank 5% HNO_3/10% H_2O_2	1323517-10 filter for Train #7
Element	ng/mL	ng/mL	ng/filter	ng/mL	ng/mL	ng/filter	ng/mL	ng/mL	ng/filter
Antimony	1.0	0.9	10	2.4	0.50	20	<0.2	<0.2	7
Arsenic	4.6	60	110	0.5	0.2	<1.0	<0.06	<0.06	<1.0
Barium	<0.05	1.4	1480	1.8	1.8	1210	1.4	<0.05	1440
Beryllium	<0.5	<0.5	<2.5	<0.5	<0.5	<2.5	<0.5	<0.5	<2.5
Cadmium	1.4	0.75	4	2.75	1	8	1	<0.05	<1.5
Chromium	<0.6	2	70	0.6	3	70	2.2	3.3	60
Cobalt	<0.5	<0.5	<1.5	<0.5	<0.5	<1.5	<0.5	<0.5	<1.5
Copper	2.3	3.5	<1.50	10	5.8	120	4.8	1.4	30
Iron	35	25	630	715	1060	340	15	7.7	450
Lead	109	164	320	342	91.7	450	18	0.4	30
Manganese	0.4	0.4	2250	8	4	70	0.4	0.2	50
Nickel	0.3	1.5	50	1.0	1.78	20	1.30	1.40	30
Selenium	<0.6	6.0	7	<0.6	<0.6	<2.0	<0.6	<0.6	<2.0
Thallium	<0.6	<0.6	<1.5	<0.6	<0.6	<1.5	<0.6	<0.6	<1.5
Tin	1	1360	150	3.21	1440	510	1140	2580	<0.1
Titanium	<0.6	7.6	<1.2	1.4	8.2	<1.2	7.5	10.9	<1.2
Vanadium	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0
Zinc	5	12	1960	24	26	2270	13	3	1890

WO #: 1323517

Source Test Train Samples received from Compliance Group

Name of Company tested: Exide Technologies

Source Test No.: 13-308
Date of Transfer 8-27-13
Date of receipt to Particulates Group: 8-27-2013

Sample no.	Container	Train	Description
1323517-04	#1	#10	Filter
1323517-05	#2	#10	Tubing & Probe
1323517-06	#3	#10	Impinger & Front Half Filter Housing
1323517-07	#1	#18	Filter
1323517-08	#2	#18	Tubing & Probe
1323517-09	#3	#18	Impinger & Front Half Filter Housing
1323517-10	#1	#7	Filter (Train 7 is the blank)
1323517-11	#3	#7	Impinger & Front Half Filter Housing
1323517-12	N/A	N/A	Reagent blank (5% HNO3/10% H2O2)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING AND ANALYSIS
REPORT OF LABORATORY ANALYSIS
(Page 1 of 2)

TO: Mike Garibay, Supervising A.Q. Engineer
Laboratory & Source Test Engineering

LABORATORY NO. 1326709-03 to -11

REFERENCE NO. ICP-MS-YS-5-78

SUBMITTED ON: 9/24/2013

REQUESTED BY: Jason Aspell

SOURCE TEST NO.: 13-308

SAMPLE DESCRIBED AS:

Solutions and filters from three CARB Method 436 (Excl. mercury) source test trains; Trains #4, #5 and #11
(See details on page 2)

SAMPLE SOURCE:

Exide Technologies
2700 Indiana St.
Vernon, CA 90058

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Analytical Method

Analysis of Metals by Inductively Coupled Plasma - Mass Spectrometry

Aliquots of solutions from impingers, housing, tubing, probe and blank were treated with nitric acid prior to analysis. Filters samples were digested in a microwave oven using 1:1 Ultrapure Nitric Acid. Analysis for metals was performed in accordance with AQMD Method #0005, (*Standard Operating Procedure for the Analysis of Metals in Filters by Inductively Coupled Plasma - Mass Spectrometer*).

Results:

See attachment.

Date Approved: 10/9/13

Approved By

Rudy Eden, Sr. Manager
Laboratory & Source Test Engineering

(Page 2 of 2)

Exide Technologies: 2700 Indiana St., Vernon, CA 90058

LN 1326709-03 to -11

Metal analysis results for source test performed at Exide Technologies (Source Test # 13-308)

Lab ID	1326709-03	1326709-04	1326709-05	1326709-06	1326709-07	1326709-08	1326709-09	1326709-10	1326709-11
Sample Description	Train #4 Filter	Train #4 Probe and Line	Train #4 Impinger & front half filter housing	Train #5 Filter	Train #5 Probe and Line	Train #5 Impinger & front half filter housing	Train #11 (blank) Filter	Train #11 (blank) Impinger & front half filter housing	Reagent Blank 5% HNO_3/10% H_2O_2
	ng/filter	ng/mL	ng/mL	ng/filter	ng/mL	ng/mL	ng/filter	ng/mL	ng/mL
Antimony	40	5.6	1.4	10	1.7	3.0	9	<0.2	<0.2
Arsenic	30	2	2	40	3.2	34.8	<1.0	0.08	<0.06
Barium	1770	4.9	1.9	2840	0.7	2	2670	0.6	<0.5
Beryllium	4	<0.5	<0.5	<2.5	<0.5	<0.5	<2.5	<0.5	<0.5
Cadmium	60	6.74	2.05	20	2.1	2.2	<1.5	0.3	0.2
Chromium	70	1.8	2.65	40	<0.6	2.44	60	2.6	3.4
Cobalt	6	<0.5	<0.5	<1.5	<0.5	<0.5	<1.5	<0.5	<0.5
Copper	40	6	8	50	4.0	5.0	<0.5	3.0	1
Iron	37	220	124	1010	43	61	34	20	13
Lead	3490	645	279	86	170	690	4	13.9	0.2
Manganese	70	4.2	1.1	60	0.5	0.8	60	0.3	0.2
Nickel	20	2.7	1.9	30	0.6	1.7	20	1.4	1.5
Selenium	<2.0	<0.6	0.68	<2.0	<0.6	<0.6	<2.0	<0.6	<0.6
Thallium	<1.5	<0.6	<0.6	<1.5	<0.6	<0.6	<1.5	<0.6	<0.6
Tin	28	5.8	1920	36	3.0	2020	<1.5	2210	3440
Titanium	30	9.2	6.9	50	<0.6	5.47	<1.2	6.8	9
Vanadium	<1.0	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	<0.5	<0.5
Zinc	2640	140	29	1310	7	16	2900	15	1

SOURCE TEST REQUEST FOR EQUIPMENT/ANALYSIS

Company: Exide Technologies
Address: 2700 S. Indiana St
Basic Equipment: Blast Furnace, Reverb Furn., Refining Kettles
Analysis/Equipment Requested By: Jason Aspell
For Compliance, Rule(s): 1402, 1407, 1420, 1420.1
Other (specify):

Source Test No.: 13-308
Request Date: September 17, 2013
Control Device: HL/SL baghouses, Tent Stacks
Date Equipment Needed: September 19, 2013

SAMPLE EQUIPMENT REQUEST

Prep/Reference:
Prep Laboratory No.: 1326101
Dry Ice Needed: ☒

Quantity and Description	I.D. Nos
3 - 6L Canisters (Fixed Gases)	54775, 54164, 54731
4 - EPA Method TO-15 Canisters	E4224, ~~E3747~~, E3373, E4281
5 - CARB Method 436 Trains (excl. mercury)	(#1) → Trains Nos: 4, 5, 11, 27, 31

Reference: Blue Book No. 41
Pages 40, 41

SAMPLE EQUIPMENT ANALYSIS REQUEST

Source Test No.:
Analysis Laboratory No.: 1326709

Sample Description	Analysis Requested
TRAIN 4 & 5 + Sample Line & Probe CAN 54775, 54731	TRAINS Met. Methods Fixed Gases
(1) CAN E4281, E4224	TO-15
Train #11 used as a blank	

SAMPLE EQUIPMENT CHAIN OF CUSTODY

Sample Equipment #	From	To	For I/S/T, Analysis, Cleanup, Not Used	Date	Time
(#1) 11			ST	09/19/13	13:20
			Analyze	9/20/13	1655
				9/23/13	7:15 am

Revision: January 2012

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO: Mike Garibay, Supervising AQ Engineer
Source Testing

SAMPLE DESCRIPTION:

Canister # 53484, E4324, 53397, E3383

SAMPLE LOCATION:

Exide Technologies
2700 S. Indiana St.
Vernon, CA 90057

LABORATORY NO: 1323519-01 to -04
REFERENCE NO: MSF-7-49
DATE SAMPLED: 08/23/13
DATE RECEIVED: 08/23/13
DATE ANALYZED: 09/09/13
ANALYZED BY: Yadira De Haro-Hammock
REQUESTED BY: Jason Aspell

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Note: See attached results.

Date Approved: 10/3/13

Approved By:
Rudy Eden, Sr. Manager
Laboratory Services Branch
(909) 396-2391

C:\Users\sbarbosa\Documents\Exide\LN1323519 Exide.xlsx

LAB NO: 1323519
Location: Exide Technologies

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Sample Date	8/23/2013	8/23/2013	8/23/2013	8/23/2013
Canister	53484	E4324	53397	E3383

Compound	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)
ethanol	19.8	6.6	26.1	6.3
vinyl chloride	N.D.	N.D.	N.D.	N.D.
1,3-butadiene	37.4	31.3	4.4	0.8
2-propenal (Acrolein)	2.0	2.4	1.1	0.9
acetone	57.9	32.8	98.4	75.4
methylene chloride	0.5	0.6	0.4	0.5
methyl tert butyl ether	N.D.	N.D.	N.D.	N.D.
2-butanone (MEK)	1.7	1.6	1.7	0.8
chloroform	0.4	0.3	0.4	0.2
1,2-dichloroethane	N.D.	N.D.	N.D.	N.D.
benzene	127	111	51.0	21.5
carbon tetrachloride	N.D.	N.D.	<0.1	<0.1
1,2-dichloropropane	N.D.	N.D.	N.D.	N.D.
trichloroethylene	<0.1	N.D.	N.D.	<0.1
toluene	25.4	22.0	7.8	3.8
1,2-dibromoethane	N.D.	N.D.	N.D.	N.D.
tetrachloroethylene	N.D.	<0.1	<0.1	<0.1
ethylbenzene	5.6	4.5	2.9	2.0
m+p-xylenes	10.0	6.3	11.8	8.0
Styrene	104	78.4	1.4	0.3
o-xylene	2.9	1.7	3.3	1.9
1,4-dichlorobenzene	N.D.	N.D.	<0.1	N.D.
1,2-dichlorobenzene	N.D.	N.D.	N.D.	N.D.
isoprene	8.6	7.6	0.3	<0.1

LAB NO: 1323519
Location: Exide Technologies

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Sample Date	8/23/2013	8/23/2013	8/23/2013	8/23/2013
Canister	53484	E4324	53397	E3383

Compound	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)
acetylene+ethylene	662 *	595 *	467 *	450 *
ethane	4440 *	4400 *	192	208
propylene	194	155	20.5	12.8
propane	909 *	949 *	269	398
isobutane	41.9	47.6	3.8	4.6
1-butene	9.8	8.5	1.5	0.8
n-butane	71.2	64.7	25.6	21.8
n-pentane	27.6	25.9	3.1	2.1
1-hexene	4.5	4.0	0.2	<0.1
n-hexane	3.5	4.1	0.5	0.4
n-heptane	2.6	2.7	0.4	0.4
n-octane	1.4	1.3	0.2	N.D.
n-nonane	0.4	0.4	<0.1	<0.1
n-decane	0.3	0.3	<0.1	<0.1
n-undecane	0.3	0.3	<0.1	<0.1
n-dodecane	0.3	0.4	<0.1	<0.1

* = Data Flagged, above calibration range
Supplemental report to follow of "Hydrocarbon Speciation by GC/FID"
N.D. = Not Detected

SOURCE TEST REQUEST FOR EQUIPMENT/ANALYSIS

Company: Exide Technologies
Address: 2700 S. Indiana St.
Basic Equipment: Blast Furnace, Reverb Furn., Refining Kettles
Analysis/Equipment Requested By: Jason Aspell
For Compliance, Rule(s): 1402, 1407, 1420, 1420.1
Other (specify):

Source Test No.: 13-308
Request Date: August 14, 2013
Control Device: HL/SL baghouses, Nept Scrubber
Date Equipment Needed: See Below

SAMPLE EQUIPMENT REQUEST

Prep Reference:
Prep Laboratory No.: 1322654
Dry Ice Needed: ☒

Quantity and Description	I.D. Nos.
[redacted]	
Test Run No. 2 – Equip. need by 8/22/13 AM	
5 - 6L Canisters (Fixed Gases)	54317, 54128, 54099, 54772, 54080, NE
5 - EPA Method TO-15 Canisters	E4324, E3383, 53484, 53397, 54107 36 Blk
5 - CARB Method 436 Trains (excl. mercury)	Tedlar Nos: 5-7-10-18-27 SB 9/24
[redacted]	Reference: Blue Book No. 41 Pages Nos: 36, 37

SAMPLE EQUIPMENT ANALYSIS REQUEST

Source Test No.:
Analysis Laboratory No.: 1323519

Sample Description	Analysis Requested
TRAIN 10 & 18 + PROBE & LINES	MIXED METALS
I CANS 54080, 54772	FIXED GASES
CANS 53484, E4324, 53397, E3383	TO-15
Train II 7	Blank

SAMPLE EQUIPMENT CHAIN OF CUSTODY

Sample Equipment #	From	To	For (S/T, Analysis, Cleanup, Not Used)	Date	Time
I	[signature]	[signature]	ST	8/22/13	2:30
II	[signature]	[signature]	ANALYSIS	8/23/13	4:40

Revision: January 2012

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO: Mike Garibay, Supervising AQ Engineer
Source Testing

SAMPLE DESCRIPTION:

Can #E4281, E4224

SAMPLE LOCATION:

Exide Technologies
2700 S. Indiana St.
Vernon, CA 90057

LABORATORY NO:	1326711
REFERENCE NO:	MSF-7-53
DATE SAMPLED:	09/20/13
DATE RECEIVED:	09/20/13
DATE ANALYZED:	10/08/13
ANALYZED BY:	Yadira De Haro-Hammock
REQUESTED BY:	Jason Aspell

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Note: See attached results.

Date Approved: 10/9/13

Approved By:
Rudy Eden, Sr. Manager
Laboratory Services Branch
(909) 396-2391

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LAB NO: 1326711
Location: Exide Technologies

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Sample Date	9/20/2013	9/20/2013
Canister	E4224	E4281

Compound	Conc. (ppb)*	Conc. (ppb)*
ethanol	10.8	13.5
vinyl chloride	N.D.	N.D.
1,3-butadiene	17.1	21.9
2-propenal (Acrolein)	4.1	3.0
acetone	40.0	42.0
methylene chloride	N.D.	0.3
methyl tert butyl ether	N.D.	N.D.
2-butanone (MEK)	1.0	1.5
chloroform	0.1	0.2
1,2-dichloroethane	N.D.	N.D.
benzene	159	68.9
carbon tetrachloride	0.1	0.1
1,2-dichloropropane	N.D.	N.D.
trichloroethylene	N.D.	N.D.
toluene	26.9	18.6
1,2-dibromoethane	N.D.	N.D.
tetrachloroethylene	N.D.	0.1
ethylbenzene	1.9	2.3
m+p-xylenes	10.0	4.0
Styrene	21.9	33.3
o-xylene	1.9	2.0
1,4-dichlorobenzene	N.D.	N.D.
1,2-dichlorobenzene	N.D.	N.D.
isoprene	5.6	19.4

LAB NO: 1326711
Location: Exide Technologies

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Sample Date	9/20/2013	9/20/2013
Canister	E4224	E4281

Compound	Conc. (ppb)*	Conc. (ppb)*
acetylene+ethylene	888	551
ethane	119	433
propylene	190	137
propane	75.0	144
isobutane	3.5	7.8
1-butene	46.3	14.4
n-butane	11.4	17.2
n-pentane	20.0	11.1
1-hexene	2.5	6.1
n-hexane	0.8	1.5
n-heptane	0.9	1.5
n-octane	0.6	0.8
n-nonane	0.4	0.4
n-decane	0.4	0.3
n-undecane	N.D.	0.4
n-dodecane	N.D.	0.6

* = Samples pressurized with argon- dilution factor applied

NMOC = Non-Methane Organic Compounds
N.D. = Not Detected

SOURCE TEST REQUEST FOR EQUIPMENT/ANALYSIS

Company: Exide Technologies
Source Test No.: 13-308
Address: 2700 S. Indiana St.
Request Date: September 17, 2013
Basic Equipment: Blast Furnace, Reverb Furn., Refining Kettles
Control Device: HL/SL baghouses, Torit Stacks
Analysis/Equipment Requested By: Jason Aspell
Date Equipment Needed: September 19, 2013
For Compliance, Rule(s): 1402, 1407, 1420, 1420.1
Other (specify):

SAMPLE EQUIPMENT REQUEST

Prep Reference:
Prep Laboratory No.: 1326101
Dry Ice Needed: ☒

Quantity and Description	I.D. Nos.
3 - 6L Canisters (Fixed Gases)	54775, 54164, ~~54731~~ NR 9/18/2013
4 - EPA Method TO-15 Canisters	E4224, ~~E3747~~, E3373, E4281 ~~SB~~ 9/18/13 (E3718)
5 - CARB Method 436 Trains (excl. mercury) (#1)	Trains Nos: 4, 5, 11, 27, 31
	Reference: Bleed Book No. 41 Pages 40, 41

SAMPLE EQUIPMENT ANALYSIS REQUEST

Source Test No.:
Analysis Laboratory No.: 1326711

Sample Description	Analysis Requested
TRAIN 4 & 5 + SAMP. LINE & PROBE	MULTI METALS
CAN 54775, 54731	FIXED GASES
CAN E4281, E4224	TO-15
Train #11 used as a blank 9.23.13	

SAMPLE EQUIPMENT CHAIN OF CUSTODY

Sample Equipment #	From	To	For (S/T, Analysis, Cleanup, Not Used)	Date	Time
(#1) 11			ST	09/19/13	13:20
			ANALYZE	9/20/13	1655
				9/23/13	7:15 AM

Revision: January 2012

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MW 4:21

8-27-2013 CN132 3518

Parm = 729.0 WET : not available
T = 23.0°C Filled with Ar

Canister	P_i	P_f	V
#54080	709.1	985.2	6000
54772	709.6	990.7	6000

MR 8-27-2013

9-13-2013

Parm = 727.8 WET : not available
T = 22.6°C Filled with Ar

Canister	P_i	P_f	V
E5113	726.4	1001.5	6000 mL
54136	728.2	992.6	6000 mL

MR 9-13 2013

Dilution bulb C	100mL from 54136	981.4	1800 mL
Dilution bulb E	100mL from E5113	993.4	1790 mL

MR 9-3-2013

9-26-2013

Parm = 731.8 WET = 734.6
T = 22.3°C Filled with Ar

Canister	P_i	P_f	V
54775	713.7	946.9	6000mL
54731	744.4	989.4	6000mL
E4214	740.6	984.6	6000mL
E4281	702.6	981.7	6000mL

MR 9-26-2013

To Page No.

SIGNATURE	DATE	WITNESSED & UNDERSTOOD BY	DATE

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO	Mike Garibay, Supervising AQ Engineer Source Test Engineering	**LABORATORY NO.**	1322105
		ST NO	13-307
SAMPLE(S) DESCRIBED AS	Two CARB 436 Trains	**DATE RECEIVED**	8/9/2013
		PROJECT/ RULE	1401, 1407, 1420, 1420.1
SAMPLING LOCATION	Exide Technologies 2700 S Indiana St Vernon CA 90023	**REQUESTED BY**	Jason Aspell
		DATE ANALYZED	8/9/2013

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Moisture and multiple metals by CARB 436. (1)

MOISTURE	**TRAIN 10**	**TRAIN 15**
Moisture gain, g	16	<1
Silica gel%	50-55	<1
Notes	Probe #9, ~ 12' Teflon, no moisture or deposit visible. Clear colorless liquid.	Blank probe submitted. Clear colorless liquid in impingers.
RECOVERY VOLUMES		
Probe, mL	149.6	105.9
Impinger, mL	368.3	277.8
Filter, mL	NA (2)	NA (2)

NOTE (1) Additional significant figures provided for calculation purposes.
(2) Filter recovered without liquid. See ICP MS preparation for volume.

Date Approved: 8/23/13

Approved By:

Rudy Eden, Senior Manager
Laboratory Services
(909) 396-2391

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO Mike Garibay, Supervising AQ Engineer
Source Test Engineering

LABORATORY NO. 1323517-01,2,3

ST NO 13-308

SAMPLE(S) DESCRIBED AS
Three CARB 436 Trains

DATE RECEIVED 8/23/2013

PROJECT/ RULE 1402, 1407, 1420, 1420.1

SAMPLING LOCATION
Exide Technologies
2700 S Indiana St
Vernon CA 90023

REQUESTED BY Mohsen Nazemi

DATE ANALYZED 8/23/2013

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Moisture and multiple metals by CARB 436. (1)

MOISTURE	**TRAIN 7**	**TRAIN 10**	**TRAIN 18**
Moisture gain, g	<1	38.5	45.1
Silica gel%	<1	65-70	85-90
Notes	No probe or tubing. Clear colorless liquid w/ white ppt	~ 6'3" probe, 18'9" Teflon, dry and clean. Slightly cloudy colorless liquid.	~ 6'3" probe, 14' Teflon, dry and clean. Slghtly cloudy colorless liquid, a drk brwn particles
RECOVERY VOLUMES			
Probe, mL	NA (2)	148.8	147.3
Impinger, mL	341.3	353.7	352.1
Filter, mL	NA (3)	NA (3)	NA (3)

NOTE (1) Additional significant figures provided for calculation purposes.
(2) Probe and tubing not supplied
(3) Filter recovered without liquid. See ICP MS preparation for volume.

Date Approved: 10/4/13

Approved By:

Rudy Eden, Senior Manager
Laboratory Services
(909) 396-2391

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Dr., Diamond Bar, CA 91765-4182

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO	Mike Garibay, Supervising AQ Engineer Source Test Engineering	**LABORATORY NO.**	1326709-01,2,3
		ST NO	13-308
SAMPLE(S) DESCRIBED AS	Three CARB 436 Trains	**DATE RECEIVED**	9/23/2013
		PROJECT/ RULE	1402, 1407, 1420, 1420.1
SAMPLING LOCATION	Exide Technologies 2700 S Indiana St Vernon CA 90023	**REQUESTED BY**	Jason Aspell
		DATE ANALYZED	9/23/2013

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Moisture and multiple metals by CARB 436. (1)

MOISTURE	**TRAIN 4**	**TRAIN 5**	**TRAIN 11**
Moisture gain, g	66.1	64.2	0.1
Silica gel%	90-95	95+	<1
Notes	~ 6'4" probe, 14'8" Teflon, dry and clean. Clear colorless liquid with white ppt.	~ 6'4" probe, 17'11" Teflon, dry and clean. Clear colorless liquid with white ppt.	No probe or tubing. Clear colorless liquid w/ white ppt
RECOVERY VOLUMES			
Probe, mL	146.5	153.5	NA (2)
Impinger, mL	401.3	389.6	332.7
Filter, mL	NA (3)	NA (3)	NA (3)

NOTE (1) Additional significant figures provided for calculation purposes.
(2) Probe and tubing not supplied
(3) Filter recovered without liquid. See ICP MS preparation for volume.

Date Approved: 10/4/13

Approved By:

Rudy Eden, Senior Manager
Laboratory Services
(909) 396-2391

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS
Page 1 of 2

TO Mike Garibay, Supervising AQ Engineer
Monitoring/Source Testing

LABORATORY NO 1322107-01

DATE RECEIVED 08/09/2013

SAMPLE DESCRIBED AS
One 6L Canister

FACILITY ID NO NA

REQUESTED BY Mohsen Nazemi

SAMPLING LOCATION
Exide Technologies
2700 S. Indiana St.
Vernon, CA 90058

ST NO / PROJECT 13-307

Percent hydrogen (H_2), nitrogen (N_2), oxygen (O_2) and methane (CH_4) by SCAQMD Method 10.1 (GC TCD).

Type	Canister
Number	**54185**
Pressure (Torr)	406
H_2, percent	< 0.2
O_2, percent	20.9
N_2, percent	78.7
CH_4, percent	< 0.2

Date Approved: 10/2/13

Approved By:
Rudy Eden, Senior Manager
Laboratory Services
909-396-2391

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
QUALITY CONTROL SUMMARY
Page 2 of 2

SAMPLE DESCRIBED AS **LABORATORY NO** 1322107-01

One 6L Canister **REQUESTED BY** Mohsen Nazemi

Percent hydrogen (H_2), nitrogen (N_2), oxygen (O_2) and methane (CH_4) by SCAQMD Method 10.1 (GC TCD).

QUALITY CONTROL -- End of run control recovery

CC12089	MDL	Theoretical	Measured	Absolute Difference	QC Limit 0.7% Abs.
H_2, percent	0.2% abs	1.04	1.05	0.01	PASS
O_2, percent	0.2% abs	1.01	1.07	0.06	PASS
N_2, percent	0.2% abs	0.99	1.10	0.1	PASS
CH_4, percent	0.2% abs	1.05	1.08	0.03	PASS

CC73109	MDL	Theoretical	Measured	Absolute Difference	QC Limit 0.7% Abs.
H_2, percent	0.2% abs	0.00	0.00	NA	NA
O_2, percent	0.2% abs	24.63	24.92	0.29	PASS
N_2, percent	0.2% abs	4.94	5.04	0.1	PASS
CH_4, percent	0.2% abs	0.00	0.00	NA	NA

DATE ANALYZED 8/15/2013
REFERENCE NO: 13TC3ad
TC3-18-74

SOURCE TEST REQUEST FOR EQUIPMENT/ANALYSIS

Company: Exide Technologies
Source Test No: 13-307
Address: 2700 S. Indiana St.
Request Date: August 2, 2013
Basic Equipment: Blast Furnace, Reverb Furn., Refining Kettles
Control Device: HL/SL baghouses, Nept Scrubber
Analysis/Equipment Requested By: Jason Aspell
Date Equipment Needed: August 7, 2013 (AM)
For Compliance, Rule(s): 1402, 1407, 1420, 1420.1
Other (specify):

SAMPLE EQUIPMENT REQUEST

Prep Reference:
Prep Laboratory No.:
Dry Ice Needed: ☒

Quantity and Description	I.D. Nos.
I { 3 CARB Method 436 Trains (excl. mercury)	Trains Nos: 10, 11, 15
2 – 6L Canisters (Fixed Gases)	54185, 54138
2 EPA Method TO-15 Canister	E3385, 53484 SP. 8/6/13
	Reference: Blue Book: No 41
	Pages 34, 35

SAMPLE EQUIPMENT ANALYSIS REQUEST

Source Test No.:
Analysis Laboratory No.: 13241[illegible]-1

Sample Description	Analysis Requested
II { Probe 9, Train 10, Sample Line & Connections	Mult. Metals + Moisture
Can. E3385	TO 15
Can. 54185	Fixed Gases
Train 11, 15 / Can 53484, 54138	Not Used / Blank TBD By Analyst

SAMPLE EQUIPMENT CHAIN OF CUSTODY

Sample Equipment #	From	To	For (S/T, Analysis, Cleanup, Not Used)	Date	Time
I	[signature]	[signature]	ST	8/7/13	10:35
II	[signature]	[signature]	Analysis	8/9/13	9:30

Revision: January 2012

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS
Page 1 of 2

TO Mike Garibay, Supervising AQ Engineer
Monitoring/Source Testing

SAMPLE DESCRIBED AS
One 6L Canister

SAMPLING LOCATION
Exide Technologies
2700 S. Indiana St.
Vernon, CA 90058

LABORATORY NO 1322107-01
DATE RECEIVED 08/09/2013
FACILITY ID NO NA
REQUESTED BY Mohsen Nazemi
ST NO / PROJECT 13-307

Carbon monoxide (CO), methane (CH_4), carbon dioxide (CO_2), ethane (C_2H_6), and non-methane non-ethane organic carbon (NM/NEOC) in ppmvC by SCAQMD Method 25.1 (TCA FID).

Type	Canister
Number	**54185**
Pressure (Torr)	406
CO, ppm	59
CH_4, ppm	173
CO_2, ppm	730
Ethane, ppmC	11
NM/NEOC, ppmC	< 1

Date Approved: 10/2/13

Approved By: Rudy Eden

Rudy Eden, Senior Manager
Laboratory Services
909-396-2391

Pages 158-161 have been removed from this file because it may contain proprietary information.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
QUALITY CONTROL SUMMARY
Page 2 of 2

SAMPLE DESCRIBED AS Two 6L Canisters

LABORATORY NO 1323518

REQUESTED BY Jason Aspell

Carbon monoxide (CO), methane (CH_4), carbon dioxide (CO_2), ethane (C_2H_6), and non-methane non-ethane organic carbon (NM/NEOC) in ppmvC by SCAQMD Method 25.1 (TCA FID).

QUALITY CONTROL -- End of run control recovery

CC91340	MDL	Theoretical	Measured	Percent Difference	QC Limit ±5% or ± 1
CO, ppmvC	0.31976058	10.40	10.17	-2.17	PASS
CH_4, ppmvC	0.08319894	10.17	10.42	2.47	PASS
CO_2, ppmvC	0.47061793	10.38	10.18	-1.90	PASS
C_2H_4, ppmvC	0.47061793	NA	NA	NA	NA
C_2H_6, ppmvC	0.2381613	11.00	10.14	-7.79	PASS
NM/NEOC, ppmvC	0.26158589	10.64	10.25	-3.64	PASS

CC12628	MDL	Theoretical	Measured	Percent Difference	QC Limit ±5% or ± 1
CO, ppmvC	0.31976058	1036	1041	0.51	PASS
CH_4, ppmvC	0.08319894	1068	1088	1.85	PASS
CO_2, ppmvC	0.47061793	1023	1023	0.04	PASS
C_2H_4, ppmvC	0.47061793	NA	NA	NA	NA
C_2H_6, ppmvC	0.2381613	1032	1059	2.59	PASS
NM/NEOC, ppmvC	0.26158589	1036	1028	-0.75	PASS

DATE ANALYZED 08/27/2013
REFERENCE NO: 13QM2AD
QM2-101-18

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS
Page 1 of 2

TO Mike Garibay, Supervising AQ Engineer
Monitoring/Source Testing

SAMPLE DESCRIBED AS
Two 6L Canisters

SAMPLING LOCATION
Exide Technologies
2700 S. Indiana St.
Vernon, CA 90058

LABORATORY NO 1326710-01,2
DATE RECEIVED 09/20/2013
FACILITY ID NO NA
REQUESTED BY Jason Aspell
ST NO / PROJECT 13-308

Percent hydrogen (H_2), nitrogen (N_2), oxygen (O_2) and methane (CH_4) by SCAQMD Method 10.1 (GC TCD).

Type	Canister	Canister
Number	**54775**	**54731**
Pressure (Torr)	714	744
H_2, percent	< 0.2	< 0.2
O_2, percent	20.4	20.3
N_2, percent	77.5	76.9
CH_4, percent	< 0.2	< 0.2

Date Approved: 10/10/13

Approved By:
Rudy Eden, Senior Manager
Laboratory Services
909-396-2391

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
QUALITY CONTROL SUMMARY
Page 2 of 2

SAMPLE DESCRIBED AS		**LABORATORY NO**	1326710-01,2
Two 6L Canisters		**REQUESTED BY**	Jason Aspell

Percent hydrogen (H_2), nitrogen (N_2), oxygen (O_2) and methane (CH_4) by SCAQMD Method 10.1 (GC TCD).

QUALITY CONTROL -- End of run control recovery

CC12089	MDL	Theoretical	Measured	Absolute Difference	QC Limit 0.7% Abs.
H_2, percent	0.2% abs	1.04	1.04	0.00	PASS
O_2, percent	0.2% abs	1.01	1.08	0.07	PASS
N_2, percent	0.2% abs	0.99	1.08	0.1	PASS
CH_4, percent	0.2% abs	1.05	1.04	-0.01	PASS

CC73109	MDL	Theoretical	Measured	Absolute Difference	QC Limit 0.7% Abs.
H_2, percent	0.2% abs	0.00	0.00	NA	NA
O_2, percent	0.2% abs	24.63	24.54	-0.09	PASS
N_2, percent	0.2% abs	4.94	5.02	0.1	PASS
CH_4, percent	0.2% abs	0.00	0.00	NA	NA

DATE ANALYZED 10/3/2013
REFERENCE NO: 13TC3ae
TC3-18-80

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS
Page 1 of 2

TO Mike Garibay, Supervising AQ Engineer
Monitoring/Source Testing

LABORATORY NO 1326710

DATE RECEIVED 09/20/2013

SAMPLE DESCRIBED AS
Two 6L Canisters

FACILITY ID NO NA

REQUESTED BY Jason Aspell

SAMPLING LOCATION
Exide Technologies
2700 S. Indiana St.
Vernon, CA 90058

ST NO / PROJECT 13-308

Carbon monoxide (CO), methane (CH_4), carbon dioxide (CO_2), ethane (C_2H_6), and non-methane non-ethane organic carbon (NM/NEOC) in ppmvC by SCAQMD Method 25.1 (TCA FID).

Type	Canister	Canister
Number	54775	54731
Pressure (Torr)	714	744
CO, ppm	70	45
CH_4, ppm	20	10
CO_2, ppm	718	1040
Ethane, ppmC	< 1	< 1
NM/NEOC, ppmC	4	10

Date Approved: 10/11/13

Approved By:
Rudy Eden, Senior Manager
Laboratory Services
909-396-2391

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar CA 91765-1482

MONITORING & ANALYSIS
QUALITY CONTROL SUMMARY
Page 2 of 2

SAMPLE DESCRIBED AS Two 6L Canisters

LABORATORY NO 1326710

REQUESTED BY Jason Aspell

Carbon monoxide (CO), methane (CH_4), carbon dioxide (CO_2), ethane (C_2H_6), and non-methane non-ethane organic carbon (NM/NEOC) in ppmvC by SCAQMD Method 25.1 (TCA FID).

QUALITY CONTROL -- End of run control recovery

CC91340	MDL	Theoretical	Measured	Percent Difference	QC Limit ±5% or ± 1
CO, ppmvC	0.32	10.40	10.31	-0.91	PASS
CH_4, ppmvC	0.08	10.17	10.56	3.83	PASS
CO_2, ppmvC	0.47	10.38	10.45	0.69	PASS
C_2H_4, ppmvC	0.47	NA	NA	NA	NA
C_2H_6, ppmvC	0.24	11.00	10.39	-5.57	PASS
NM/NEOC, ppmvC	0.26	10.64	10.44	-1.85	PASS

CC12628	MDL	Theoretical	Measured	Percent Difference	QC Limit ±5% or ± 1
CO, ppmvC	0.32	1036	1065	2.75	PASS
CH_4, ppmvC	0.08	1068	1115	4.36	PASS
CO_2, ppmvC	0.47	1023	1048	2.47	PASS
C_2H_4, ppmvC	0.47	NA	NA	NA	NA
C_2H_6, ppmvC	0.24	1032	1083	4.99	PASS
NM/NEOC, ppmvC	0.26	1036	1054	1.77	PASS

DATE ANALYZED 10/07/2013
REFERENCE NO: 13QM2AD
QM2-101-21