



EES Coke Battery, LLC
P.O. Box 18309
River Rouge, Michigan 48218

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AIR QUALITY DIV.

REPORT ON TOTAL PARTICULATE TESTING

Performed for:
EES COKE BATTERY, LLC
PUSHING EMISSIONS CONTROL SYSTEM STACK
ZUG ISLAND, RIVER ROUGE, MICHIGAN

Client Reference No: 4700857297
CleanAir Project No: 12750
Revision 0: June 16, 2015

To the best of our knowledge, the data presented in this report are accurate, complete, error free, legible and representative of the actual emissions during the test program. Clean Air Engineering operates in conformance with the requirements of ASTM D7036-04 Standard Practice for Competence of Air Emission Testing Bodies.

Submitted by,

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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

**RENEWABLE OPERATING PERMIT
REPORT CERTIFICATION**

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating (RO) Permit program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as described in General Condition No. 22 in the RO Permit and be made available to the Department of Environmental Quality, Air Quality Division upon request.

Source Name EES Coke Battery LLC County Wayne

Source Address PO Box 18309, Zug Island City River Rouge

AQD Source ID (SRN) A7809 RO Permit No. 199600132, 51-08C RO Permit Section No. 7

Please check the appropriate box(es):

Annual Compliance Certification (General Condition No. 28 and No. 29 of the RO Permit)

Reporting period (provide inclusive dates): From _____ To _____

1. During the entire reporting period, this source was in compliance with ALL terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the RO Permit.

2. During the entire reporting period this source was in compliance with all terms and conditions contained in the RO Permit, each term and condition of which is identified and included by this reference, EXCEPT for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the RO Permit, unless otherwise indicated and described on the enclosed deviation report(s).

Semi-Annual (or More Frequent) Report Certification (General Condition No. 23 of the RO Permit)

Reporting period (provide inclusive dates): From _____ To _____

1. During the entire reporting period, ALL monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred.

2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the RO Permit were met and no deviations from these requirements or any other terms or conditions occurred, EXCEPT for the deviations identified on the enclosed deviation report(s).

Other Report Certification

Reporting period (provide inclusive dates): From N/A To N/A

Additional monitoring reports or other applicable documents required by the RO Permit are attached as described:
Test Report at EUCKE-BATTERY PECS Baghouse Stack for PM10 and PM2.5 performed April 21-
23, 2015

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete.

M Krchmar	Plant Manager	313-216-2535
Name of Responsible Official (print or type)	Title	Phone Number

	<u>6/16/15</u>
Signature of Responsible Official	Date

PROJECT OVERVIEW

INTRODUCTION

EES Coke Battery, LLC contracted Clean Air Engineering (CleanAir) to perform air emissions testing at the Zug Island Coke Battery located in River Rouge, Michigan.

The objective of the test program was to provide testing to verify if DTE Energy's EES Zug Island Coke Battery Pushing Emissions Control System (PECS) Stack is operating in compliance with their applicable air permit limits (Michigan Permit to Install No. MI-PTI-51-08C). During the testing, there were no variations in process conditions as the testing was performed at normal operating conditions throughout the program.

The PECS Pushing Stack has a baghouse to control particulate emissions during each oven push. Process conditions provided by DTE EES include the following:

- oven number
- push time
- amount of coke pushed
- coke volatile matter content
- fan amps
- baghouse pressure drop

All testing was conducted in accordance with the regulations set-forth by the United States Environmental Protection Agency (USEPA) and the Michigan Department of Environmental Quality (DEQ).

Key Project Participants

Individuals responsible for coordinating and conducting the test program were:

- B. Harden – EES Coke Battery, LLC
- J. Childers – CleanAir

Test Program Parameters

The testing was performed at the PECS Pushing Stack on April 21 through 23, 2015 and included the following emissions measurements:

- filterable particulate matter (FPM)
- condensable particulate matter (CPM)
- flue gas composition (e.g., O₂, CO₂, H₂O)
- flue gas temperature
- flue gas flow rate

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Client Reference No: 4700857297
CleanAir Project No: 12750

PROJECT OVERVIEW

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TEST PROGRAM SYNOPSIS

Test Schedule

The on-site schedule followed during the test program is outlined in Table 1-1.

Table 1-1:
Schedule of Activities

Run Number	Location	Method	Analyte	Date	Start Time	End Time
1	PECS Stack	USEPA Method 5/202	FPM/CPM	04/21/15	10:09	14:45
2	PECS Stack	USEPA Method 5/202	FPM/CPM	04/22/15	09:40	14:16
3	PECS Stack	USEPA Method 5/202	FPM/CPM	04/23/15	08:01	12:35

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Results Summary

Table 1-2 summarizes the results of the test program. A more detailed presentation of the test conditions and results of analysis is shown on page 2-1.

Table 1-2:
Summary of Test Results

Source	Constituent	Sampling Method	Average Emission	Permit Limit ¹
<i>PECS Pushing Stack</i>				
	PM (lb/ton Coke)	EPA 5	0.003	0.02
	PM (ton/yr)	EPA 5	1.5	9.7
	PM ₁₀ (lb/hr) ²	EPA 5/202	0.62	0.69
	PM _{2.5} (lb/hr) ²	EPA 5/202	0.62	0.69

¹ Permit limits obtained from Michigan Permit to Install number MI-PTI-51-08C.

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² The source does not emit continuously; lb/hr values are calculated as lb/operating hour of PECS exhaust fan.

PROJECT OVERVIEW

1-3

Discussion of Test Program***Test Program Summary***

Due to the intermittent nature of the process, it took approximately 5.5 hours to complete one test run. A push would occur approximately every 11-15 minutes and during each push, roughly three minutes of sample was collected. Twelve total points were sampled isokinetically. Each point was sampled for six minutes. The test program was completed over the span of three test days with each day completing one test run.

Emission Calculation Explanation

The approach to the emission calculations was adjusted due to the intermittent nature of the facility process operation. Each test run consisted of 72 minutes of sampling time. However, it required between 274-276 minutes to obtain each sample since sampling could only occur while the PECS exhaust fan was operating. A ratio of the metered sample time to elapsed test time was applied to the emission rate values to ensure representative results based on the process operations.

USEPA Method 5/202 Testing

Filterable particulate matter (USEPA Method 5) was withdrawn isokinetically through a temperature-controlled probe and collected on a high-efficiency quartz fiber filter. Both the probe and filter were maintained at a temperature of $248 \pm 25^{\circ}\text{F}$. Test runs were 72 minutes in duration. The mass of particulate collected on the filter and in the sampling probe was determined gravimetrically. The laboratory analysis was performed at CleanAir's analytical laboratory located in Palatine, Illinois. The laboratory report is located in Appendix H.

The condensable particulate matter (USEPA Method 202) was collected in dry impingers. Total CPM was represented by the impinger fractions and the CPM filter. Immediately following a test run, Method 202 sample trains were purged with UHP nitrogen at a rate of 14 liters per minute for 60 minutes to remove any potential dissolved sulfur dioxide gases from the impinger.

End of Section 1 -- Project Overview

RESULTS**Table 2-1:
PECS Pushing Stack – FPM/CPM**

Run No.		1	2	3	Average
Date (2015)		Apr 21	Apr 22	Apr 23	
Start Time (approx.)		10:09	09:40	08:01	
Stop Time (approx.)		14:45	14:16	12:35	
Process Conditions					
R _p	Production rate (ton/hr)	108	113	112	111
P ₁	Oven number	18	84	49	
P ₂	Elapsed push time (minutes)	272	271	268	270
P ₃	Amount of coke pushed (tons)	491	511	499	500
Cap	Capacity factor (hours/year)	8,760	8,760	8,760	8,760
Gas Conditions					
O ₂	Oxygen (dry volume %)	19.3	19.8	19.9	19.7
CO ₂	Carbon dioxide (dry volume %)	1.7	0.8	0.8	1.1
T _s	Sample temperature (°F)	126	130	114	124
B _w	Actual water vapor in gas (% by volume)	0.9	2.0	1.3	1.4
Gas Flow Rate					
Q _a	Volumetric flow rate, actual (acfm)	189,000	194,000	196,000	193,000
Q _s	Volumetric flow rate, standard (scfm)	164,000	165,000	175,000	168,000
Q _{std}	Volumetric flow rate, dry standard (dscfm)	163,000	162,000	173,000	166,000
FPM Results (Method 5) = PM					
C _{sd}	Particulate Concentration (lb/dscf)	1.41E-07	1.07E-07	1.45E-07	1.31E-07
C _{sd}	Particulate Concentration (gr/dscf)	9.85E-04	7.50E-04	1.01E-03	9.17E-04
E _{lb/hr}	Particulate Rate (lb/hr)*	0.358	0.272	0.396	0.342
E _{T/yr}	Particulate Rate (Ton/yr)	1.57	1.19	1.73	1.50
E _{Rp}	Particulate Rate - Production-based (lb/ton)	3.31E-03	2.40E-03	3.54E-03	3.09E-03
CPM Results (Method 202)					
C _{sd}	Particulate Concentration (lb/dscf)	1.09E-07	1.36E-07	7.81E-08	1.08E-07
C _{sd}	Particulate Concentration (gr/dscf)	7.66E-04	9.48E-04	5.47E-04	7.54E-04
E _{lb/hr}	Particulate Rate (lb/hr)*	0.279	0.343	0.213	0.278
E _{T/yr}	Particulate Rate (Ton/yr)	1.22	1.50	0.934	1.22
E _{Rp}	Particulate Rate - Production-based (lb/ton)	2.57E-03	3.04E-03	1.91E-03	2.51E-03
Total Particulate Matter Results (Method 5/202) = PM₁₀ = PM_{2.5}					
C _{sd}	Particulate Concentration (lb/dscf)	2.50E-07	2.43E-07	2.23E-07	2.39E-07
C _{sd}	Particulate Concentration (gr/dscf)	1.75E-03	1.70E-03	1.56E-03	1.67E-03
E _{lb/hr}	Particulate Rate (lb/hr)*	0.637	0.615	0.609	0.620
E _{T/yr}	Particulate Rate (Ton/yr)	2.79	2.69	2.67	2.72
E _{Rp}	Particulate Rate - Production-based (lb/ton)	5.89E-03	5.44E-03	5.45E-03	5.59E-03

Average includes 3 runs.

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* Hourly emission rate represents the average rate prorated over 60 minutes.

End of Section 2 – Results