



Marathon Petroleum Company LP  
1300 South Fort Street  
Detroit, MI 48217

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JUL 13 2015  
AIR QUALITY DIV.

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**REPORT ON COMPLIANCE RE-TESTING**

Performed for:  
**MARATHON PETROLEUM COMPANY LP  
DETROIT REFINERY**

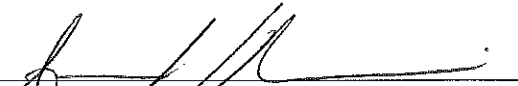
**NHT STRIPPER/REBOILER STACK (SV16-H3)  
NHT CHARGE HEATER STACK (SV16-H4)**

Client Reference No: 4100048779  
CleanAir Project No: 12734-2  
Revision 0: July 2, 2015

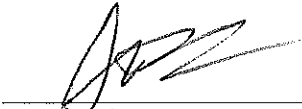
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To the best of our knowledge, the data presented in this report are accurate, complete, error free, legible and representative of the actual emissions during the test program. Clean Air Engineering operates in conformance with the requirements of ASTM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

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## PROJECT OVERVIEW

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### INTRODUCTION

Marathon Petroleum Company LP (MPC) contracted Clean Air Engineering (CleanAir) to perform continuous emissions monitoring system (CEMS) testing at the Detroit Refinery to demonstrate compliance with permit limits.

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 (MDEQ). The permit limits are referenced in Michigan Department of Environmental Quality, Air Quality Division Permit to Install No. 63-08D, issued May 12, 2014.

This test program was performed as a re-test for the testing performed on May 12-13, 2015, presented in the report with CleanAir Project No: 12734-1. The testing in May did not meet all of the necessary QA/QC criteria.

### **Key Project Participants**

Individuals responsible for coordinating and conducting the test program were:

Crystal Davis – MPC  
Joe Reidy – MPC  
Andy Obuchowski – CleanAir

### **Test Program Parameters**

The testing was performed at the NHT Stripper/Reboiler Stack (Emission Unit ID No. EU16-NHTSTRIPREBOIL-S1; Stack ID No. SV16-H3) and at the NHT Charge Heater Stack (Emission Unit ID No. EU16-NHTCHARHTR-S1; Stack ID No. SV16-H4) on June 16, 2015, and included the following emissions measurements:

- nitrogen oxides (NO<sub>x</sub>)
- oxygen (O<sub>2</sub>)

**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	NHT Stripper/Reboiler Stack	USEPA Method 3A/7E	O <sub>2</sub> /NO <sub>x</sub>	06/16/15	10:33	11:35
2	NHT Stripper/Reboiler Stack	USEPA Method 3A/7E	O <sub>2</sub> /NO <sub>x</sub>	06/16/15	11:55	12:56
3	NHT Stripper/Reboiler Stack	USEPA Method 3A/7E	O <sub>2</sub> /NO <sub>x</sub>	06/16/15	14:44	15:45
1	NHT Charge Heater Stack	USEPA Method 3A/7E	O <sub>2</sub> /NO <sub>x</sub>	06/16/15	16:51	17:52
2	NHT Charge Heater Stack	USEPA Method 3A/7E	O <sub>2</sub> /NO <sub>x</sub>	06/16/15	18:01	19:01
3	NHT Charge Heater Stack	USEPA Method 3A/7E	O <sub>2</sub> /NO <sub>x</sub>	06/16/15	19:11	20:11

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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 are shown on page 2-1.

**Table 1-2:  
Summary of RATA Results**

Source	Constituent (Units)	Sampling Method	Average Emission	Permit Limit <sup>1</sup>
<u>NHT Stripper/Reboiler Stack</u>				
	NO <sub>x</sub> (lb/MMBtu)	USEPA 7E	0.13	0.20
<u>NHT Charge Heater Stack</u>				
	NO <sub>x</sub> (lb/MMBtu)	USEPA 7E	0.16	0.20

<sup>1</sup> Permit limits obtained from MDEQ Permit To Install No. 63-08D.

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## PROJECT OVERVIEW

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### *Discussion of Test Program*

#### *O<sub>2</sub> and NO<sub>x</sub> Emissions Testing - USEPA Methods 3A and 7E*

Minute-average data points for O<sub>2</sub> and NO<sub>x</sub> (dry basis) were collected over a period of approximately 60-minutes for each test run.

Emission results in units of dry volume-based concentration (ppmdv) were converted to units of pounds per million Btu (lb/MMBtu) by calculating an oxygen-based fuel factor (F<sub>d</sub>) for refinery gas from percent volume composition analytical data provided by MPC and tabulated heating values for each of the measured constituents per Method 19.

NO<sub>x</sub> results (lb/MMBtu) were used to demonstrate compliance with the permit limit. The final results were expressed as the average of the three (3) runs. The final results for NHT Stripper/Reboiler Stack and NHT Charge Heater Stack were below the permit limit.

Following the post Run 2 bias check on the NHT Stripper/Reboiler Stack, a new calibration error and bias check was performed. The new calibration data was applied to Run 3.

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*End of Section 1 – Project Overview*

**RESULTS****Table 2-1:  
NHT Stripper/Reboiler Stack – NO<sub>x</sub> Emissions**

Run No.		1	2	3	Average
Date (2015)		Jun 16	Jun 16	Jun 16	
Start Time (approx.)		10:33	11:55	14:44	
Stop Time (approx.)		11:35	12:56	15:45	
<b>Process Conditions</b>					
P <sub>1</sub>	Feed rate (bpd)	28,000	28,046	28,013	<b>28,019</b>
P <sub>2</sub>	Fuel gas flow rate (Mscf/day)	588	591	626	<b>602</b>
F <sub>d</sub>	Oxygen-based F-factor (dscf/MMBtu)	8,305	8,305	8,305	<b>8,305</b>
<b>Gas Conditions</b>					
O <sub>2</sub>	Oxygen (dry volume %)	6.9	6.6	5.7	<b>6.4</b>
<b>Nitrogen Oxides Results</b>					
C <sub>sd</sub>	Concentration (ppmdv)	88.9	93.3	100	<b>94.1</b>
C <sub>sd-x</sub>	Concentration @ 0% O <sub>2</sub> (ppmdv)	132	137	137	<b>135</b>
C <sub>sd</sub>	Concentration (lb/dscf)	1.06E-05	1.11E-05	1.19E-05	<b>1.12E-05</b>
E <sub>Fd</sub>	Emission Rate - F <sub>d</sub> -based (lb/MMBtu)	0.131	0.136	0.136	<b>0.134</b>

Average includes 3 runs.

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**Table 2-2:  
NHT Charge Heater Stack – NO<sub>x</sub> emissions**

Run No.		1	2	3	Average
Date (2015)		Jun 16	Jun 16	Jun 16	
Start Time (approx.)		16:51	18:01	19:11	
Stop Time (approx.)		17:52	19:01	20:11	
<b>Process Conditions</b>					
P <sub>1</sub>	Feed rate (bpd)	32,502	32,518	32,499	<b>32,506</b>
P <sub>2</sub>	Fuel gas flow rate (Mscf/day)	1,428	1,426	1,473	<b>1,443</b>
F <sub>d</sub>	Oxygen-based F-factor (dscf/MMBtu)	8,305	8,305	8,305	<b>8,305</b>
<b>Gas Conditions</b>					
O <sub>2</sub>	Oxygen (dry volume %)	5.3	5.3	5.1	<b>5.2</b>
<b>Nitrogen Oxides Results</b>					
C <sub>sd</sub>	Concentration (ppmdv)	127	124	119	<b>123</b>
C <sub>sd-x</sub>	Concentration @ 0% O <sub>2</sub> (ppmdv)	170	166	157	<b>165</b>
C <sub>sd</sub>	Concentration (lb/dscf)	1.52E-05	1.49E-05	1.42E-05	<b>1.47E-05</b>
E <sub>Fd</sub>	Emission Rate - F <sub>d</sub> -based (lb/MMBtu)	0.169	0.165	0.156	<b>0.163</b>

Average includes 3 runs.

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*End of Section 2 – Results*