Sunoco Inc.
100 Green Street
PO Box 426
Marcus Hook PA 19061

January 31, 2013

Director, Air Enforcement Division
Office of Civil Enforcement
U. S. Environmental Protection Agency
Mail Code 2242-A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460-0001

RE: USA v. Sunoco, Inc. et. al. - Civil Action No. 05 CV-02866

Dear Sirs:

Pursuant to Paragraph #114 of the Consent Decree entered in the above noted Civil Action, enclosed is Sunoco's fourteenth semi-annual progress report.

On September 8, 2012, Philadelphia Energy Solutions (PES) acquired the Philadelphia Refinery Property from Sunoco. On August 17, 2012, a Fourth Amendment to the CD was lodged in the US District Court For The Eastern District Of Pennsylvania requiring the transfer of all provisions of the CD as they apply to the Philadelphia Refinery to PES as of the Date of Entry. Upon and following entry of the Fourth Amendment, Sunoco will not report on the status or progress under the Consent Decree as it relates to requirements at the Philadelphia refinery.

Should you have any questions concerning the enclosed report, please contact me at 610-859-1695.

I certify under penalty of law that this information was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my directions and my inquiry of the person(s) who manage the system, or the person(s) directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Terry A Soule

Signed:
Terry A. Soule
Sunoco, Inc. R&S
Environmental Manager

Date: 1/28/13

Sincerely,

Terry A. Soule
Sunoco, Inc. R&S
Environmental Manager

CC:

- Environmental Enforcement Section
  Environmental and Natural Resources Division
  U.S. Department of Justice
  P.O. Box 7611
  Ben Franklin Station
  Washington, DC 20044-7611
  Reference Case No. 90-5-2-1-1744/1

- Director, Air Enforcement Division
  Office of Civil Enforcement
  U.S. Environmental Protection Agency
  Mail Code 22452-A
  1200 Pennsylvania Avenue, NW
  Washington, DC 20460-0001

- Director, Air Enforcement Division
  Office of Civil Enforcement
  c/o Matrix New World Engineering, Inc.
  120 Eagle Rock Avenue, Suite 207
  East Hanover, NJ 07936

- U.S. EPA Region III
  1650 Arch Street
  Philadelphia, PA 19103

- U.S. EPA Region V
  77 W Jackson Blvd.
  Chicago, IL 60604

- U.S. EPA Region VI
  1445 Ross Avenue
  Dallas, TX 75020

- Director, Air Enforcement Division
  Office of Civil Enforcement
  c/o Matrix Environmental & Geotechnical Svcs.
  215 Ridgedale Avenue
  Florham Park, NJ 07932

Sunoco Facility: Marcus Hook
Report Title: Semi-Annual Consent Decree Compliance Report # 14
Reporting Period: 07/01/12 – 12/31/12

Paragraph 114 Reporting and Recordkeeping of Affirmative Relief / Environmental Projects and Emission Data in Section V with Certification

I. Progress Report for Implementation of (section V) Affirmative Relief/Environmental Projects

A. NOx Emissions Reductions from the FCCU

The amended consent decree required the installation of a SNCR at the FCC unit by 1/1/12. The SNCR was installed as required. The FCC unit was shut down in early December of 2011 and remains idled at this time. There are no plans to restart the FCC unit.

B. SO2 Emissions Reductions from the FCCU

The amended consent decree had provisions for SO_2 emissions that were applicable in 2011. The total annual SO_2 emission was limited to 2200 tons. Sunoco was compliant with that provision in 2011. The FCC unit was shut down in December of 2011 and is idled at this time. There are no plans to restart the FCC unit.

C. Control of PM Emissions from FCCU

Paragraph 16 –The FCC unit was shut down in December of 2011 and is idled at this time. There are no plans to restart the FCC unit.

D. Control of CO Emissions from FCCU

Paragraph 19 – The FCC unit was shut down in December of 2011 and is idled at this time. There are no plans to restart the FCC unit.

E. NSPS Subparts A and J Applicability at FCCU Regenerators

Paragraph 25 – FCC unit was shut down in December of 2011 and is idled at this time. There are no plans to restart the FCC unit.

F. NO_x Emission Reductions from Heaters and Boilers

Paragraph 31 – The final detailed NOx Control Plan was submitted to EPA and the Appropriate Plaintiffs/Intervenors on 06/14/10. Per the June 2009 CD Amendment, the plan has been modified to delete any reduction from the Tulsa refinery. As per the July

2011 CD Amendment, all obligations and liabilities related to the Toledo refinery were transferred to TRC.

On September 8, 2012, Philadelphia Energy Solutions (PES) acquired the Philadelphia Refinery Property from Sunoco. On August 17, 2012, a Fourth Amendment to the CD was lodged in the US District Court For The Eastern District Of Pennsylvania requiring the transfer of all provisions of the CD as they apply to the Philadelphia Refinery to PES as of the Date of Entry. Sunoco's Marcus Hook Refinery is compliant with the provisions of Paragraph 31 and the Fourth Amendment does not affect its compliance status.

G. SO_2 Emissions Reductions from and NSPS Applicability for Heaters and Boilers

Paragraph 37 – No changes have been made since the last progress report. The Refinery was idled in December of 2011.

I. Sulfur Recovery Plants - NSPS Applicability

The sulfur Recovery Units were shutdown in December of 2011 and are idled at this time. There are no plans to restart the SRUs.

J. Hydrocarbon Flaring Devices

Paragraph 48 – Alternative Monitoring Protocols ("AMPs") for the 10 Plant and 12 Plant Flares were submitted to EPA on November 12, 2008 and implemented beginning January 1, 2009. The AMPs were approved by the EPA on May 19, 2009.

The 10 Plant Flare serviced the Fluid Catalytic Cracking Unit (FCC). The FCC unit was idled in December of 2011. By late December generation of high-sulfur flare gas from the FCC had ceased, the 10 Plant Flare was purged, and the pilots were extinguished. There are no intentions of restarting this flare at this time.

The 12 Plant Flare serviced a crude unit and two desulfurizing units. Those units were idled in December of 2011. During early 2012 the flare was used to purge some units of VOCs (non sulfur containing streams). The 12 plant flare was purged and pilots were extinguished in February of 2012. There are no intentions of restarting this flare at this time.

The Alternative Monitoring Protocol for the Main (EC) Flare was submitted on December 10, 2010 and reflected an operating refinery scenario. The AMP for the Main (EC) flare was implemented on January 1st, 2011. EPA approved the Main Flare AMP on 09/21/11. The AMP deals with separating out high sulfur streams to insure that the normal combustion of the flare is compliant with subpart J requirements. The Refinery was idled in December of 2011, there is no longer the possibility of any sulfur in the flare; the AMP requirements are for a refinery that has sulfur streams that could go to the flare, that scenario is no longer valid.

As stated above, there have been no high sulfur flare gas streams generated in the refinery since the main process units were shutdown. Therefore, the Main Flare no longer has the potential to receive high sulfur streams. Sunoco expects the Main Flare to remain in service for the Propane – Propylene Splitter Area, gaseous storage areas, and some fuel gas. The streams generated in these areas are inherently low-sulfur.

K. Control of Acid Gas Flaring and Tail Gas Incidents

Paragraphs 52 & 53 –There were no Tail Gas or Acid gas incidents during the period. Since December of 2011 no acid gas is being generated in the facility.

L. Control of Hydrocarbon Flaring Incidents

There were no hydrocarbon flaring incidents during the reporting period. Since December of 2011 no high sulfur streams are present in the facility.

M. Benzene Waste NESHAP Program Enhancements

Paragraphs 65-77

1. **The BWON exempted quantity was calculated to be 3.72 E-02 MG for the first quarter and 8.06 E-02 MG for the second quarter of 2012. The 2012 projected annual BWON exempted quantity, based on EOL sampling, is calculated to be 2.87 E-01 MG based on samples listed in Appendix I.**

N. Leak Detection and Repair Program Enhancements

Paragraphs 78-92

1. **LDAR Monitoring Technician Refresher Training is conducted by Team Inc on a monthly basis.**

2. **A Third party Audits of the program was done in July of 2012. The summary of the third party audit is attached. The refinery was idled in December of 2011. While operating as a refinery the total LDAR program covered around 66,000 components. After the refinery operation ceased and units were purged of gas there still remained around 33,000 LDAR components (this includes around 7000 components that were in assets since sold to Braskem). The third party audit was conducted on the 33,000 components that were still in active service in July of 2012.**

O. Incorporation of Consent Decree Requirements into Federally Enforceable Permit(s)

Paragraphs 93-96: No change in this from previous reports.

II. Summary of (section V) Emissions Data

Included herein.

III. Description of Any Problems Anticipated with Meeting (section V) Requirements

N/A

IV. Additional Matters to be Brought to the Attention of EPA and the Appropriate Plaintiff/Intervenor

N/A

Paragraph 112 SUPPLEMENTAL AND COMMUNITY ENVIRONMENTAL PROJECTS (SCEP) AND STATE AND LOCAL ENVIRONMENTALLY BENEFICIAL PROJECTS (SLEBP) in Section VIII with Certification

I. Progress Report for Each SCEP or SLEBP (section VIII)

Paragraph 104: Completed

Paragraph 105: Completed

Paragraph 106: Completed

Paragraph 107: Completed

Paragraph 107A: Completed

Paragraph 107B: Completed

Paragraph 108: Completed

Paragraph 109: Completed

II. Completed SCEP or SLEBP (section VIII)

A. Detailed Description of Each SCEP or SLEBP Project as Implemented

N/A

B. Brief Description of Any Significant Operating Problems Encountered

N/A

C. Certification That Each Project Has Been Fully Implemented Pursuant to the Provisions of this Consent Decree

N/A

D. Description of the Environmental and Public Health Benefits Resulting From Implementation of Each Project (including quantification of the benefits and pollutant reductions, where practicable)

N/A

Appendix I

Sunoco Marcus Hook Refinery

2012Total Benzene Summary

Unit	2012 1Q Exempt Benzene Total	2012 2Q Exempt Benzene Total	2012 3Q Exempt Benzene Total	2012 4Q Exempt Benzene Total	2012 Annual Total, MG
	Mg	Mg	Mg	Mg	
Spills	0.00E+00	2.80E-06	0.00E+00	0.00E+00	2.80E-06
Hazardous Waste	6.68E-04	1.40E-02	1.61E-02	1.52E-02	4.59E-02
Dock Pans	8.64E-03	1.52E-02	1.67E-03	3.86E-03	2.94E-02
Exchanger Cleaning	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Frac Tanks	0.00E+00	0.00E+00	0.00E+00	8.27E-01	8.27E-01
Total Quarterly Benzene	9.31E-03	2.92E-02	1.78E-02	8.46E-01	9.02E-01

Sunoco Facility: Philadelphia
Report Title: Semi-annual Consent Decree Compliance Report # 14
Reporting Period: 07/01/12 – 12/31/12

Paragraph 114 Reporting and Recordkeeping of Affirmative Relief / Environmental Projects and Emission Data in Section V with Certification

I. Progress Report for Implementation of (section V) Affirmative Relief/Environmental Projects

A. NOx Emissions Reductions from the FCCU

Paragraphs 12 – 13: There were no NOx exceedances of the CD limits during the period. As discussed in previous updates submitted in accordance with the amended CD (via email), Sunoco used Low NOx Combustion Promoter at the 868 FCCU for the first time on April 28, 2011 and the first time the Low NOx Combustion Promoter was added after the Date of Lodging of the Second Amendment was July 15, 2011. Quarterly email updates on the impact of the Low NOx Combustion Promoter were provided to the agencies.

B. SO2 Emissions Reductions from the FCCU

Paragraphs 14 – 15: The Philadelphia Refinery is compliant with the requirements of these paragraphs. There were no SO_2 exceedances of the CD limits during the period.

C. Control of PM Emissions from FCCU

Paragraph 16 – The Philadelphia Refinery is compliant with the requirements of this paragraph.

D. Control of CO Emissions from FCCU

Paragraph 19 – There were no consent decree CO exceptions noted during the reporting period pursuant to paragraph 19. However, the 54 lbs/hour limit was exceeded for one hour on October 9, 2012 when the addition of cold feed caused a sudden drop in the oxygen concentration and an associated increase in CO.

Paragraph 20 – Philadelphia Refinery is compliant with the requirements of this paragraph.

E. NSPS Subparts A and J Applicability at FCCU Regenerators

Paragraphs 24 – 25: There were no Subpart A or J exceptions during the reporting period. However, three separate emergency shutdowns of the 868 FCCU occurred during the reporting period that led to elevated opacity. On July 23, 2012 during the emergency

shutdown, elevated opacity in excess of 30% occurred for 2 minutes during the 8 AM hour (over the one minute allowed) and 16 minutes during the 9 AM hour. On September 4, the unit also had to have an emergency shutdown that led to 19 minutes above 30% during the 2 PM hour and 4 minutes during the 3 PM hour. On December 21, an emergency shutdown and startup led to 8 hours of elevated opacity for 18 minutes during the 9 AM hour, 12 minutes during the 9 PM hour and 19 minutes during the 10 PM hour. Also, on September 4, heavy rains led to rapid cooling in the stack and uncombined rainwater that gave false high opacity readings with 12 minutes above 30%. (In all cases, one minute allowable is being subtracted from the minute information provided.)

F. NO_x Emission Reductions from Heaters and Boilers

Paragraph 31– On September 8, 2012, Philadelphia Energy Solutions (PES) acquired the Philadelphia Refinery Property from Sunoco. On August 17, 2012, a Fourth Amendment to the CD was lodged in the US District Court For The Eastern District Of Pennsylvania requiring the transfer of all provisions of the CD as they apply to the Philadelphia Refinery to PES as of the Date of Entry. This amendment will allow temporary backup operation of Boiler # 38 until August 31, 2014. All other works relative to the heater/boiler NOx requirements has been completed.

G. SO_2 Emissions Reductions from and NSPS Applicability for Heaters and Boilers

On December, 31, 2010, all refinery heaters and boilers became subject to NSPS J. Sunoco submitted a plan approval application to Philadelphia Air Management Services to incorporate these limits into a permit. A draft of this permit was received in July, 2011 and a final permit was received September 23, 2011.

Paragraphs 36 – 38: In accordance with the Consent Decree Appendix D, all remaining refinery heaters and boilers became subject to NSPS Subpart J. There were no exceedances at the NSPS Subpart J regulated heaters or boilers.

All RICE equipments listed in paragraph 38A of the amended Consent Decree were either permanently removed or replaced with equivalent electrical engine by December 31, 2011.

I. Sulfur Recovery Plants - NSPS Applicability

Paragraphs 40 – 47: The Philadelphia Refinery is compliant with the requirements of these paragraphs.

J. Hydrocarbon Flaring Devices

Paragraphs 48 – 50: The following is a summary of options the Philadelphia Refinery has elected to comply with regarding the CD NSPS requirements for flares.

Philadelphia Flares	Compliance Status
PB North Yard LPG Flare	NSPS. Have an approved AMP. Please note that a request to revise this approved AMP was submitted to USEPA and approved by them in April, 2010.
PB South Yard North Flare	NSPS. Operating and maintain a flare gas recovery system.
PB 867 Acid Gas Flare	NSPS. This is not currently a fuel gas combustion device. The purge and pilot gas is normally comprised of purchased natural gas. The purge and pilot gas can occasionally be refinery fuel gas, and during that time, that gas will be monitored to be compliant with Subpart J. The flare only receives non-routinely generated gases; process upset gases, fuel gas released as a result of relief valve leakage or gases released due to other emergency malfunctions.
PB 867 SWS Gas Flare	NSPS. This is not currently a fuel gas combustion device. The purge and pilot gas is normally comprised of purchased natural gas. The purge and pilot gas can occasionally be refinery fuel gas, and during that time, that gas will be monitored to be compliant with Subpart J. The flare only receives non-routinely generated gases, process upset gases, fuel gas released as a result of relief valve leakage or gases released due to other emergency malfunctions.
GP 1231/1232 Flares	NSPS status began12/31/2010. AMP submitted in July, 2010 and approved by EPA in June, 2011.
GP 433 Flare	NSPS status began 12/31/2010. AMP submitted in July, 2010 and approved by EPA in June, 2011.

K. Control of Acid Gas Flaring and Tail Gas Incidents

Paragraphs 51 – 63: Acid gas flaring computational methods have been in place since the DOE. There were no AG flaring events to note for this reporting period.

L. Control of Hydrocarbon Flaring Incidents

Paragraph 64: One Hydrocarbon Flaring Incident occurred during this reporting period from October 31-November 2, 2012 from the South Yard North Flare. A copy of the Root

Cause Failure Analysis is included in Attachment II. As noted in the Attachment, all work planned has been completed.

M. Benzene Waste NESHAP Program Enhancements

Paragraphs 65-77

1. **Relative to BWON training conducted over this semi-annual period, one employee was trained on how to properly collect benzene waste NESHAP samples. Also, two individuals were trained on how to perform Method 21 monitor separator covers, two individuals were trained on how to perform Method 21 monitoring on vacuum trucks and four individuals were trained on how to collect carbon installation effluent air samples.**

2. **The BWON exempted quantity was calculated to be, based on EOL sampling data, 0.015 MG for the third quarter and 0.59 MG for the fourth quarter of 2012. The 2012 annual BWON exempted quantity, based on EOL sampling is 1.15 MG. See Appendix II for EOL sampling results.**

3. **A revised BWON EOL Sampling Plan for the Philadelphia Refinery was submitted on December 30, 2008. This revised sampling plan was approved by the EPA on 01/22/09, which resulted in relocating end-of-line sampling point GP EOL-001 and adding sample point GP EOL-006.**

N. Leak Detection and Repair Program Enhancements

Paragraphs 78 – 92: The Philadelphia Refinery is compliant with the requirements of these paragraphs.

The Philadelphia Refinery did not meet the requirements for paragraph 90(c). One valve did not receive the first drill and tap within 15 days of the leak being identified.

All of the eleven (11) corrective actions for audit findings identified in the 2010 LDAR Third Party Compliance Audit have been completed.

The fourth LDAR third party compliance audit was conducted October 14-17, 2012 pursuant to Paragraph 80 during the reporting period.

Information required under Paragraph 92(c) will be submitted in the first semiannual report of 2013 under 40 CFR 63.655.

O. Incorporation of Consent Decree Requirements into Federally Enforceable Permit(s)

Paragraphs 93 – 96: The Philadelphia Refinery is compliant with the requirements of these paragraphs. Please note that in March, 2011, the Refinery submitted a plan approval

application to incorporate NSPS J requirements on all remaining refinery heaters, boilers and flares. A final permit was received from AMS on September 23, 2011. New permit limits for the 1232 FCCU required by the second CD amendment were incorporated into a draft plan approval that was issued as final by Philadelphia AMS on July 30, 2012.

II. Summary of (section V) Emissions Data

Included herein.

III. Description of Any Problems Anticipated with Meeting (section V) Requirements

None

IV. Additional Matters to be Brought to the Attention of EPA and the Appropriate Plaintiff/Intervenor

None

Paragraph 112 SUPPLEMENTAL AND COMMUNITY ENVIRONMENTAL PROJECTS (SCEP) AND STATE AND LOCAL ENVIRONMENTALLY BENEFICIAL PROJECTS (SLEBP) in Section VIII with Certification

I. Progress Report for Each SCEP or SLEBP (section VIII)

Paragraph 104: All required work was completed during the second half of 2011 and the SCR unit for the H-400 and H-401 heaters was in service on December 30, 2010. Some minor work post construction punch list work was completed in the first half of 2011 and some minor touch up painting was completed in the third quarter of 2011.

Paragraph 105: Completed

Paragraph 106: Completed

Paragraph 107: Completed

Paragraph 108: Completed

Paragraph 109: Completed

Paragraph 110: A cost report for the SCR unit for the H-400 and H-401 heaters was submitted in January 2012.

II. Completed SCEP or SLEBP (section VIII)

A. Detailed Description of Each SCEP or SLEBP Project as Implemented

None

B. Brief Description of Any Significant Operating Problems Encountered

None

C. Certification That Each Project Has Been Fully Implemented Pursuant to the Provisions of this Consent Decree

If applicable, see the certification behind the cover letter.

D. Description of the Environmental and Public Health Benefits Resulting From Implementation of Each Project (including quantification of the benefits and pollutant reductions, where practicable)

N/A

APPENDIX I

Philadelphia Refinery

1. CD Paragraph 77(B)(i)(3) Sampling Results Philadelphia Refinery

Sample Point ID	Sample Date	Benzene Conc (ppmw)	Avg 3rd Qtr 2012 Benzene Conc. (ppmw)	Avg 4th Qtr 2012 Benzene Conc. (ppmw)	3rd Qtr 2012 Flow (gal)	4th Qtr 2012 Flow (gal)	3rd Qtr 2012 Benzene Quantity (Megagrams)	4th Qtr 2012 Benzene Quantity (Megagrams)
210 Box Cooler (PB EOL 001)	7/09/12	0.00099	0.00099		74235000		0.0003	0.0003
	8/7/12	0.00099						
	9/12/12	0.00099						
	10/8/12	0.00099		0.00099		74235000		
	11/6/12	0.00099						
	12/04/12	0.00099						
Klondike Effluent (PB EOL 002)	7/09/12	0.00099	0.002		10000000		0.00008	0.00004
	8/7/12	0.00099						
	9/10/12	0.004						
	10/8/12	0.00099		0.00099		10000000		
	11/6/12	0.00099						
	12/4/12	0.00099						
867 Effluent (PB EOL 003)	7/10/12	0.005	0.002		22625000		0.0002	0.00009
	8/8/12	0.00099						
	9/11/12	0.00099						
	10/09/12	0.00099		0.001		22625000		
	11/7/12	0.00099						
	12/5/12	0.001						
***PB Grit Chamber Effluent (PB EOL 004)**								

*No samples taken this period - not required. Grit chamber samples were only required to be sampled for one quarter and this had already

occurred in early 2008.

Sample Point ID	Sample Date	Benzene Conc (ppmw)	Avg 3rd Qtr 2012 Benzene Conc. (ppmw)	Avg 4th Qtr 2012 Benzene Conc. (ppmw)	3rd Qtr 2012 Flow (gal)	4th Qtr 2012 Flow (gal)	3rd Qtr 2012 Benzene Quantity (Megagrams)	4th Qtr 2012 Benzene Quantity (Megagrams)
1232 4th and M (GP EOL 001)	7/9/12	0.025	0.02		71500000		0.005	0.08
	8/7/12	0.015						
	9/10/12	0.012						
	10/08/12	0.006		0.3		71500000		
	11/7/12	0.017						
	12/5/12	0.95						
231 F Box Discharge (GP EOL 002)	7/10/12	0.78	0.7		3450000		0.009	0.01
	8/8/12	0.07						
	9/11/12	1.2						
	10/9/12	0.58		0.9		3450000		
	11/7/12	1.1						
	12/5/12	1.1						
231 Groundwater (GP EOL 003)	7/12	*No sample	*0		*0		*0	*0
	8/12	*No sample						
	9/12	*No sample						
	10/12	*No sample		*0		*0		
	11/12	*No sample						
	12/12	*No sample						
* Groundwater system not operational the entire six month period.								
#3 Separator Effluent (GP EOL 004)	7/10/12	0.00099	0.00099		3150000		0.00001	0.00001
	8/7/12	0.00099						
	9/10/12	0.00099						
	10/08/12	0.00099		0.00099		3150000		
	11/6/12	0.00099						

	12/4/12	0.00099						

Sample Point ID	Sample Date	Benzene Conc (ppmw)	Avg 3rd Qtr 2012 Benzene Conc. (ppmw)	Avg 4th Qtr 2012 Benzene Conc. (ppmw)	3rd Qtr 2012 Flow (gal)	4th Qtr 2012 Flow (gal)	3rd Qtr 2012 Benzene Quantity (Megagrams)	4th Qtr 2012 Benzene Quantity (Megagrams)
8 Separator Effluent (GP EOL 005)	7/9/12	0.00099	0.00099		8300000		0.00003	0.00006
	8/7/12	0.00099						
	9/10/12	0.00099						
	10/8/12	0.00099		0.002		8300000		
	11/6/12	0.003						
	12/4/12	0.00099						
15 Pumphouse (PB Non-EOL 001)	7/10/12	0.00099	0.00099		15000		0.00000006	0.0000003
	8/7/12	0.00099						
	9/10/12	0.00099						
	10/8/12	0.00099		0.005		15000		
	11/6/12	0.013						
	12/4/12	0.00099						
1232 Sewer M Street (GP EOL 006)	7/10/12	0.005	0.005		4700000		0.00009	0.5
	8/8/12	0.005						
	9/11/12	0.005						
	10/9/12	*2.5 (P) 0.005 (W)		28.3		4700000		
	11/7/12	*25.0 (P) 0.039 (W)						
	12/5/12	*120 (P) 0.1 (W)						

* For the October 2012 sampling event, 20% product (P) and 80% water (W) was observed. For the November 2012 sampling event, 50% product and 50% water was observed. For the December 2012 sampling event, 60% product and 40% water was observed. For all other months during this semi-annual period, 100% water (no product) was observed.

V-4 Hydrobon Separator Condensate Wash (GP Non-EOL 001)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No waste was generated from this Non-EOL point during the semi-annual period.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
V-603 Debutanizer Receiver Condensate Wash (GP Non-EOL 002)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No waste was generated from this Non-EOL point during the semi-annual period.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3rd Qtr 2012 EOL Sampling TAB = 0.015 Megagrams
4th Qtr 2012 EOL Sampling TAB = 0.59 Megagrams

Annual 2012 EOL sampling TAB = 1.15 Megagrams

Notes:

1. *Benzene concentrations listed as 0.00099 ppm were reported by the laboratory as < 0.001 ppm which is the detection limit.*

2. *Average quarterly benzene concentrations are simply the arithmetic mean of the individual laboratory results for the quarter.*

3. Sample calculation of 3rd Qtr Benzene Quantity for GP EOL 002:

3rd Qtr avg benzene conc. = 0.7 ppm
3rd Qtr flow = 3,450,000 gallons

So: $\frac{\text{0.7 ppm benzene x 3,450,000 gallons x 8.34 lbs/gallon}}{\text{2204.6 lbs/megagram x 1,000,000 parts per million}}$ = 0.009 Megagrams

APPENDIX II

Philadelphia Refinery

Investigation Report for Acid Gas, Sour Water Gas, Tail Gas, or Hydrocarbon Flaring Resulting in ≥ 500 lbs. of SO_2 Released

Date of Report:	December 10, 2012	**Incident Type:** (Check one)	☐ Acid Gas Flaring: ☐ Tail Gas Flaring: ☒ Hydrocarbon Flaring:
Date(s) of Incident:	(Beginning) 10/31/2012 (End) 11/2/2012	**1st Flaring start/end time:**	(start) 2:27 AM (end) 4:28 PM
		2st Flaring start/end time:	(start) (end)
		3st Flaring start/end time:	(start) (end)
Amount of SO_2 Released:	1.4 Pounds ☐ Tons ☒	**Location at the Philadelphia Refinery:** 868 Fluid Catalytic Cracking Unit	SWS Flare ☐ 1231/2 Flare ☐ AG Flare ☐ SY N Flare ☒ North Flare ☐ 433 Flare ☐

Incident Description:

At 20:00 on 10/30/2012, the 862 Light Ends outside operator brought to the Shift Supervisor's (SS) attention a noise he heard from 1C-105 flare gas recovery compressor's turbine. Upon further visual inspection, the shaft on the turbine side of the coupling could be seen with about ½ inch of axial movement. The shaft on the compressor side remained stable. The SS consulted the Facility Shift Superintendent (FSS) and the Maintenance Shift Superintendent (MSS) regarding the axial movement of the turbine shaft and arranged to have the MSS and a machinist check and monitor. Upon initial inspection by the MSS, he diagnosed that the turbine thrust bearing had probably failed or was failing. The compressor remained in service to allow the MSS to monitor through the night. At 02:27 on 10/31/12, 1C-105 shut down.

Following the compressor shut down, the SS investigated the alarm/shutdown panel and found no alarms. Operators began blocking in and isolating the compressor and turbine for repair work in the morning. The steam isolation valve for the exhaust did not hold so the valve had to be closed by high reach south west of 868 cooling tower which delayed the isolation effort.

Machinists and Rotating Equipment Engineering found that the turbine thrust bearing had failed. The turbine rotor was pulled to have the bearing journal areas metal sprayed in order to clean them and bring them back to the correct size. Sending the rotor out to have the metal spray increased the length of the outage compared to original estimates.

In addition, 1C-105 SIS shutdown testing was performed prior to turning the machine back over to Operations.

As a result of the shutdown of 1C-105, flare gases were no longer recovered and flaring occurred until all repairs and testing were completed (total of approximately 62 hours).

Steps taken to limit duration of flaring or quantity of SO2/Hydrocarbon released (Corrective Actions):

Operations made moves throughout the outage period to reduce flaring.

Root Cause of Incident:

Failed turbine thrust bearing on 1C-105 flare gas recovery compressor

Contributing Causes of Incident:

Lube oil contamination from water. There was also a poor bearing to shaft fit.

Preventative Actions (Actions to reduce likelihood of Recurrence):

Conduct Safety Instrumented System (SIS) shutdown testing to confirm that all are in working order prior to restart (completed).

Purchase spare turbine rotor to minimize flaring duration if rotor fails again (on order with expected delivery of 1/31/13.)

Confirm preventative maintenance program in place is appropriate to prevent recurrence (completed). This includes daily visual inspections, monthly lube oil sampling and monthly vibration checks.

Do Stipulated Penalties Apply? (Acid Gas Flaring Only) YES ☐ NO ☒

If YES explain:

- ☐ Yes ☐ No **Error resulting from careless operation.**
- ☐ Yes ☐ No **Failure to follow written procedures.**
- ☐ Yes ☐ No **Failure of equipment due to failure by Sunoco to operate and maintain equipment in a manner consistent with good engineering practices**
- ☐ Yes ☐ No **SO_2 rate greater than 20 lbs/hour continuously for 3 hours or more where SUNOCO did not follow PMO plan and took no action to limit duration and/or quantity of SO_2 emissions.**
- ☐ Yes ☐ No **More than five acid gas flaring incidents in rolling 12 months period.**

If NO explain:
Hydrocarbon Flaring Event

If corrective actions are not completed within 45 days from the end date of the incident, list the projected date for the follow-up report which will show corrective actions and preventive actions:

N/A: ☐ **Completed:** ☒ **Not Completed:** ☐ **Explain:** All planned preventative actions were completed by 11/30/12.

Approval Section

Title	Print Name	Date
Operations Superintendent:	Beth Anne Tarum	December 10, 2012
Environmental Manager:	Charles D. Barksdale Jr.	December 10, 2012
Operations Manager:	Wayne Darrow	December 10, 2012

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ERM

December 10, 2012

Mr. Paul Braun
Environmental Manager
Sunoco Marcus Hook Refinery
100 Green Street
Marcus Hook, PA 19061

Re: Consent Decree Third-Party LDAR Audit Report
Sunoco Marcus Hook Refinery, Marcus Hook, Pennsylvania

Dear Mr. Braun:

This report documents the biennial third-party audit of the Leak Detection and Repair (LDAR) program at the Sunoco, Inc. (R&M) (Sunoco) Marcus Hook Refinery in Marcus Hook, Pennsylvania. Environmental Resources Management, Inc. (ERM) performed the assessment during the weeks of July 9 and 16 as part of a Consent Decree (CD) between Sunoco and the United States Department of Justice (USDOJ), entered on March 21, 2006. The audit team consisted of a two-person team from ERM, who worked under the direction of ERM's Partner-in-Charge for the project.

ERM was retained to perform an audit of the refinery's LDAR program, focusing on compliance with the following LDAR regulations:

- 40 CFR 60, Subparts VV and GGG;
- 40 CFR 63, Subpart H;
- 25 Pa. Code Chapter §125.58; and
- Sunoco LDAR Consent Decree provisions under Paragraph N.

The objective of the audit was to assess the refinery's program in comparison to the LDAR elements contained in these regulations and identify areas of noncompliance with applicable LDAR regulations. Specific required elements under Paragraph N.80 of the CD included:

- Performing comparative monitoring;
- Reviewing records to ensure that monitoring and repairs were completed in the required periods;
- Reviewing component identification procedures, tagging procedures, and data management procedures; and
- Observing the LDAR technicians' calibration and monitoring techniques.

Each of these elements is described below:

Comparative Monitoring

ERM personnel conducted Method 21 monitoring of a representative selection of normal to monitor light liquid and gas vapor service valves and light liquid pumps in three process units at the refinery, selected by ERM based on their relative leak rate and valve count, which corresponded to 24% to 35% of the VOC service valves in each of these units. The overall number of valves monitored was approximately 3.9 percent of the refinery's total valve count.

The audit team monitored components identified in the database as being in light liquid or gas/vapor service at random with assistance of refinery personnel to delineate unit boundaries. Comparative monitoring results for a random sample of valves measured a leak rate that ranged from 0.4 to 1.0 times the refinery's valve leak rate at a 500-ppmv leak definition during the previous four calendar quarters in the C3 Rack, Ethylene, and #5 Caverns units based on a 95% confidence interval. The comparative monitoring leak rate for these units was within accepted statistical tolerances used by the EPA's National Enforcement Investigation Center (NEIC). The comparative monitoring results are summarized below:

Process Unit	*Audit Leak Rate*	*Refinery Leak Rate [a]*	*Leak Rate Multiple[b]*
C3 Rack	0.8%	2.1%	0.4
Ethylene	0.4%	0.9%	0.5
#5 Caverns	3.1%	3.1%	1.0

Notes:
[a] Refinery Leak Rate was based on the previous four quarters of monitoring data.
[b] Leak rate multiple was calculated as the Audit Leak Rate divided by the Refinery Leak Rate.

Records Review

For this task, ERM reviewed monitoring records primarily from the refinery's LDAR database, along with supporting documentation. ERM interviewed LDAR personnel and reviewed facility's documentation and information related to LDAR standards, monitoring and repair frequencies, records of calibration, inspection, and repairs, and periodic reporting elements. ERM also utilizes previous periodic reports in conjunction with the refinery's LDAR database to evaluate whether the contractor is monitoring at the prescribed frequencies under the applicable requirements.

ERM also evaluated the refinery's current methods for electronic monitoring, storing, and reporting of LDAR data. For the required systems review, ERM reviewed the refinery's methods for populating component information, monitoring data, repair information, and other

necessary LDAR data into the database to facilitate semiannual reporting and satisfy the various state and federal LDAR recordkeeping requirements.

Tagging Review

As part of this task, the audit team assessed whether a representative sample LDAR-affected equipment has been properly "identified" (e.g., by tagging or marking) and included in the refinery's periodic monitoring program. The audit team also reviewed a representative sample of LDAR-related management of change (MOC) projects to evaluate whether fugitive component changes had been integrated into the LDAR program in a timely manner. The audit team also made a specific effort to identify open-ended lines that were not properly plugged or double-blocked, AVOs (Auditory, Visual, or Olfactory indications of leaks) that had not been accounted for, and sample collection systems that were not configured to meet LDAR equipment standards.

Observation of Technicians' Calibration and Monitoring Techniques

ERM observed instrument calibration instrument certification (i.e., response time and calibration precision tests) and equipment leak monitoring performed by the refinery's internal or contracted fugitive monitoring technicians to evaluate whether these elements are being conducted in the manner prescribed in 40 CFR Part 60, Appendix A, Method 21, "Determination of Volatile Organic Compound Leaks." The audit team relied upon guidance from the EPA Technical Assistance Document: Training and Certification of EPA Method 21 Operators, the EPA Inspection Manual: Federal Equipment Leak Regulations for the Chemical Manufacturing Industry, and ERM auditors' knowledge and experience.

Findings

The audit findings are listed in Table 1 attached to this report, and include the applicable citation(s) and regulatory requirements. The findings provided herein are technical and should not be construed as legal advice. These findings are intended to provide information to Sunoco regarding the Marcus Hook Refinery's compliance with applicable LDAR regulations.

Limitations

This assessment represents ERM's professional interpretation and judgment of existing conditions based on review of available records, field inspections and verbal interviews with site personnel. It is ERM's specific intent that the findings presented herein be used as guidance. Unless explicitly stated as such, ERM makes no warranties, expressed or implied. Regulatory interpretation given hereunder is provided by a technical person rather than by an attorney-at-law.

ERM appreciates the opportunity to assist Sunoco on this important project. Please contact John at (610) 524-3453 or Deever at (281) 600-1223 if you have any questions.

Sincerely,

Environmental Resources Management, Inc.

John J. Butow, P.E.
Project Manager

Donald D. Bradley III, P.E.
Partner

Attachment: Table 1 – 2012 Leak Detection and Repair Compliance Audit Findings

TABLE 1

2012 Leak Detection and Repair Compliance Audit Findings
Sunoco, Inc. (R&M)
Marcus Hook, Pennsylvania

Finding No.	Type	Regulatory Citation	Finding
1	Regulatory	40 CFR §60.482(a)(1): Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in §60.485(b), except as provided in 40 CFR §60.482–1(c) and paragraphs (d), (e), and (f) of this section. (2) Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal. §60.482-7(c)(1) Any valve for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. (2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months.	Records identified two (2) light liquid pumps that were not monitored in accordance with the required schedule.
2	Regulatory	40 CFR §60.482-6 Standards: Open-ended valves or lines. (a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in §60.482–1(c) and paragraphs (d) and (e) of this section. (2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line.	Six (6) open-ended lines were observed during field walkthroughs of the refinery's process units.
3	Regulatory	40 CFR §60.482-7(c)(1): Any valve for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. (2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months.	Records indicated that follow-up monitoring of seven (7) repaired valves was not consistently conducted for the two successive months after repair.
4	Regulatory	40 CFR §60.482-7(d)(1): When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in §60.482–9.	Records indicated that one (1) valve was not effectively repaired or placed upon delay of repair within 15 days after identification of the leaking valve.
5	Regulatory	40 CFR §60.482-7(d)(2): A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.	Records indicated that one (1) valve did not have a first attempt at repair conducted on the valve within 5-days after identification of the leaking valve.
6	Regulatory	40 CFR §60.482-8(c)(1): When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482–9.	Records indicated that one (1) pump was not effectively repaired or placed upon delay of repair within 15 days after identification of the leaking pump.
7	Regulatory	40 CFR §60.485(b), 40 CFR 60 Appendix A - Method 21, Section 8.1.2: Calibration Precision. The calibration precision test must be completed prior to placing the analyzer into service and at subsequent 3-month intervals or at the next use, whichever is later. Section 8.1.2.1: Make a total of three measurements by alternately using zero gas and the specified calibration gas.	Refinery records indicated that calibration precision tests were not conducted for two (2) instruments during the three-month period in which the instruments were used for monitoring.
8	Regulatory	40 CFR §60.485(b), 40 CFR 60 Appendix A - Method 21, Section 8.3.1.3: Valves. The most common source of leaks from valves is the seal between the stem and housing. Place the probe at the interface where the stem exits the packing gland and sample the stem circumference. Also, place the probe at the interface of the packing gland take-up flange seat and sample the periphery. In addition, survey valve housings of multipart assembly at the surface of all interfaces where a leak could occur.	During observations of technician monitoring techniques, the audit team observed two technicians that did not consistently monitor at all of the potential leak interfaces on a twin seal valve.
9	Regulatory	40 CFR §60.485(b), 40 CFR 60 Appendix A - Method 21, Section 8.3.1: Use Method 21 to identify leaking sources. Place the probe inlet at the surface of the component interface where leakage could occur. Move the probe along the interface periphery while observing the instrument readout. If an increased meter reading is observed, slowly sample the interface where leakage is indicated until the maximum meter reading is obtained. Leave the probe inlet at this maximum reading location for approximately two times the instrument response time.	During observations of technician monitoring techniques, the audit team observed that an LDAR monitoring technician did not sample for an interval of at least two times the response time of his monitoring device after he had identified the location of the maximum reading.
10	Regulatory	40 CFR §60.487(a), (c): All semiannual reports to the Administrator shall include the following information, summarized from the information in §60.486: (3) Dates of process unit shutdowns which occurred within the semiannual reporting period.	The semiannual reports did not identify the dates of process unit shutdowns that occurred within the semiannual reporting period.
11	Regulatory	40 CFR §63.163(b)(1): The owner or operator of a process unit subject to this subpart shall monitor each pump monthly to detect leaks by the method specified in § 63.180(b) of this subpart and shall comply with the requirements of paragraphs (a) through (d) of this section, except as provided in § 63.162(b) of this subpart and paragraphs (e) through (j) of this section.	LDAR database records identified one (1) light liquid pump that was not monitored in accordance with the required schedule.
12	Regulatory	40 CFR §63.168(f)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in §63.171 of this subpart.	Records indicated that one (1) valve was not effectively repaired or placed upon delay of repair within 15 days after identification of the leaking valve.

TABLE 1

2012 Leak Detection and Repair Compliance Audit Findings
Sunoco, Inc. (R&M)
Marcus Hook, Pennsylvania

Finding No.	Type	Regulatory Citation	Finding
13	Regulatory	40 CFR §63.168(f)(2): A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.	Records indicated that one (1) valve did not have a first attempt at repair conducted on the valve within 5-days after identification of the leaking valve.
14	Regulatory	40 CFR §63.168(f)(3): When a leak has been repaired, the valve shall be monitored at least once within the first 3 months after its repair.	Records reviewed indicated that the refinery did not consistently conduct follow-up monitoring of four (4) repaired valves within three months after repair.
15	Regulatory	40 CFR §63.174(d): When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in paragraph (g) of this section and in §63.171 of this subpart. A first attempt at repair shall be made no later than 5 calendar days after the leak is detected.	Records indicated that one (1) connector did not have a first attempt at repair conducted on the valve within five days after identification of the leaking connector.
16	Consent Decree	Section N, Paragraph 83(b) of the Consent Decree: Sunoco shall record, track, repair, and remonitor all leaks above the internal leak definitions specified by Paragraph 82 (at such time as those definitions become applicable). For any component leaking above the internal leak definitions specified by Paragraph 82 but below the applicable regulatory leak rate, Sunoco shall make an initial attempt at repair and remonitor the component within five (5) calendar days, and shall complete repairs and remonitor the component or place the component on a "delay of repair" list according to Paragraph 90 within 30 calendar days.	Records indicated that three (3) components leaking above the internal leak definition did not have a first attempt at repair and remonitoring conducted within five days following identification of the leaking component.
17	Consent Decree	Section N, Paragraph 83(b) of the Consent Decree: Sunoco shall record, track, repair, and remonitor all leaks above the internal leak definitions specified by Paragraph 82 (at such time as those definitions become applicable). For any component leaking above the internal leak definitions specified by Paragraph 82 but below the applicable regulatory leak rate, Sunoco shall make an initial attempt at repair and remonitor the component within five (5) calendar days, and shall complete repairs and remonitor the component or place the component on a "delay of repair" list according to Paragraph 90 within 30 calendar days.	Records indicated that two (2) components were leaking above the internal leak definition were not repaired and remonitored or placed upon delay of repair within 30 days following identification of the leaking component.
18	Consent Decree	Section N, Paragraph 85 of the Consent Decree: First Attempt at Repairs on Valves. Commencing no later than 90 days after Date of Entry of the Consent Decree, Sunoco shall make a "first attempt at repair" within one (1) calendar day on any valve that has a reading greater than 200 ppm of VOCs and that LDAR personnel are authorized to repair. Sunoco or its designated contractor shall re-monitor all valves no later than the next calendar day at that Refinery where LDAR personnel made a "first attempt at repair."	According to historical database records, the refinery did not conduct an initial repair attempt on two (2) valves within five days of identifying a leak above the 200-ppm action level.
19	Consent Decree	Section N, Paragraph 89(b) of the Consent Decree: Calibration Drift Assessment. Commencing on Date of Entry of the Consent Decree, at each Refinery, Sunoco shall conduct calibration drift assessments of LDAR monitoring equipment at the end of each monitoring shift, at a minimum. Sunoco shall conduct the calibration drift assessment using, at a minimum, a calibration gas corresponding to the applicable leak threshold. If any calibration drift assessment after the initial calibration shows a negative drift of more than 10% from the previous calibration, Sunoco shall re-monitor all valves that were monitored since the last calibration that had a reading greater than 100 ppm and shall re-monitor all pumps that were monitored since the last calibration that had a reading greater than 500 ppm.	There was one (1) day when an end-of-shift calibration drift assessment for an instrument was documented as failing in the calibration records and one (1) valve measured at greater than 100 ppm was not re-monitored during the scheduled monitoring month.