EPA United States Environmental Protection Agency

Region 6 Compliance Assurance and Enforcement Division

INSPECTION REPORT

Inspection Date(s):	08/15-18/2016		
Media:	Air		
Regulatory Program(s)	Consent Decree, Civil Action H-05-0258		
Company Name:	**Phillips 66 Company**		
Facility Name:	**Alliance Refinery**		
Facility Physical Location:	15551 Highway 23 S		
(city, state, zip code)	Belle Chasse, LA 70037		
Mailing address:	P.O. Box 176		
(city, state, zip code)	Belle Chasse, LA 70037		
County/Parish:	Plaquemines Parish		
Facility Contact:	Tom Morgan	Environmental Team Leader	
	Thomas.R.Morgan@p66.com		
FRS Number:	110064365690		
Identification/Permit Number:	2774-V4, 2778-V2, 2180-V4, 2593-V3, 2840-V4, 1810-V8 AA, 1870-V2, 2512-V4, 2313-V5, 2513-V8 AA, 2511-V5, 2775-V5, 2113-V3, 2779-V3		
Media Number:	AFS # 22-075-00003		
NAICS:	324110		
SIC:	2911		

Personnel participating in inspection			
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Daniel Odem	LDEQ	Environmental Scientist	(504)736-7713
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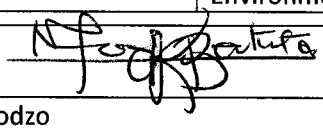
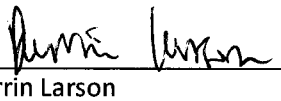
EPA Lead Inspector Signature/Date		10/13/2016
	Prince Nfodzo	Date
Supervisor Signature/Date		10/13/16
	Darrin Larson	Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

Jim Gold and I (Prince Nfodzo), Environmental Protection Agency (EPA) Region 6 inspectors, conducted an inspection of Phillips 66 Company (Phillips 66) Alliance Refinery from August 15, 2016 through August 18, 2016. The Alliance Refinery is located at 15551 Highway 23 S, Belle Chasse, Louisiana. We arrived at the facility August 15, 2016 at 13:58 hours and went through the required facility safety training. Mr. Daniel Odem and Ms. Davina Witte from the Louisiana Department of Environmental Quality (LDEQ) joined the inspection on August 15-16, 2016 and August 17-18, 2016, respectively. On August 15, 2016, the inspection team met with representatives of the Alliance Refinery at 14:40 for an opening conference for introductions and briefing on the purpose and an overview of the inspection. Jim Gold presented his EPA Inspector credentials, and I presented a letter of authorization to participate in Clean Air Act inspections to Mr. Larry Poche, HSE Manager. Jim informed the representatives that this was an EPA inspection to evaluate implementation of the requirements in the federally-issued consent decree (CD), which is a national priority for EPA.

On August 18, 2016, the inspection team met with the refinery representatives at 11:30 hours for the closing conference and presented preliminary findings of the inspection. We informed the representatives of the procedures that will follow the field inspection, and that the inspection report will be made public on EPA's website. The sign-in sheets for the opening and closing conferences are included as **Appendix 2**.

The CD (Civil Action H-01-0258), which was originally entered August 5, 2005, consists of 19 Parts designated by Roman numerals and has been amended four times and filed as follows:

- First Amendment 01/11/2007;
- Second Amendment 08/11/2008;
- Third Amendment 02/28/2012; and
- Fourth Amendment 07/31/2012.

The inspection was a Partial Compliance Evaluation (PCE) that focused on Part V which requires affirmative relief to address nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter (PM), volatile organic compounds (VOCs), and benzene emission reductions through various construction projects, process additives, and process and program enhancements. The inspection included an evaluation of four marquee issues:

- NO_x and SO_2 reductions,
- leak detection and repair (LDAR),
- benzene waste operations NESHAPs (BWON), and
- flaring acid gases and hydrocarbons.

FACILITY OVERVIEW

The Alliance Refinery produces a wide range of petroleum products from crude oil, including liquefied petroleum gas (LPG), motor gasoline, jet fuel, diesel, carbon black feedstock, propane, propylene and coke, as well as petrochemicals, including benzene, toluene, xylene, and elemental sulfur. The permitted processing rate for the facility is 260,000 barrels crude oil input per day. A plant-wide process flow diagram and detailed facility description is included as **APPENDIX 3**.

Section II – OBSERVATIONS

PART V: AFFIRMATIVE RELIEF/ENVIRONMENTAL PROJECT

A. NO_x Emissions Reduction from FCCUs

Status: On Schedule

Program Summary: Phillips 66 will implement a program as set forth in Paragraphs 13-54 to reduce NO_x emissions from the covered FCCUs, will incorporate lower NO_x emission limits at the covered FCCUs into permits, and will demonstrate future compliance with the lower emission limits through the use of continuous emission monitoring systems (CEMS).

Alliance Refinery notified EPA of Phillips 66's agreement to comply with NO_x emission limits of 20 ppmvd on a 365-day rolling average basis and 40 ppmvd on a 7-day rolling average basis, at 0% oxygen, effective 12/31/2014, per letter dated 6/24/2010. Phillips 66 has incorporated the NO_x emission limits in permit number 1810-V8 AA issued August 14, 2015.

Alliance Refinery installed a selective catalytic reduction (SCR) unit with ammonia injection in order to meet NO_x emission limits. We observed that Phillips 66 has installed and is operating NO_x and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. We verified that Phillips 66 conducted cylinder gas audits (CGA) and relative accuracy test audits (RATA) for the period January 2013 through June 2016 in accordance with the applicable requirements. Photographs of the CEMS are included as **Photo No. 1 and No. 2** in **Appendix 1.**

The trends for the FCCU NO_x emission limits of 20 ppmvd on a 365-day rolling average basis, and 40 ppmvd on a 7-day rolling average basis, at 0% oxygen from December 2015 – July 2016 are included as **Appendix 4**. No exceedances of the limits occurred during the period. We verified the Ammonia injection for the period July 2015 through June 2016.

B. SO_2 Emissions Reduction from FCCUs

Status: On Schedule

Program Summary: Phillips 66 will implement a program to reduce SO_2 emissions from the covered FCCUs as set forth in Paragraphs 56-75. Phillips 66 will incorporate the lower SO_2 emission limits at the covered FCCUs into permits, and will demonstrate future compliance with the lower emission limits

through the use of CEMS.

Alliance Refinery is required to comply with SO_2 emission limits of 25 ppmvd on a 365-day rolling average basis, and 50 ppmvd on a 7-day rolling average basis, at 0% oxygen, effective 12/31/2009. Phillips 66 has incorporated the SO_2 emission limits in permit number 1810-V8 AA issued August 14, 2015.

Alliance Refinery installed a wet gas scrubber (WGS), **Photo No. 3** in **Appendix 1**, in order to meet SO_2 emission limits. We observed that Phillips 66 has installed and is operating SO_2 and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. We verified that Phillips 66 conducted CGA and RATA for the period January 2013 through June 2016 in accordance with the applicable requirements. Photographs of the CEMS are included as **Photo No. 1 and No. 2** in **Appendix 1.**

The trends for the FCCU SO_2 emission limits of 25 ppmvd on a 365-day rolling average basis, and 50 ppmvd on a 7-day rolling average basis, at 0% oxygen from July 2015 - June 2016 are included as **Appendix 5**. No exceedances of the limits occurred during the period.

C. PM Emissions Reduction from FCCUs

Status: On Schedule

Program Summary: Phillips 66 will implement a program to reduce PM emissions from the covered FCCUs as set forth in Paragraphs 77-83. Phillips 66 will incorporate the lower PM emission limits at the covered FCCUs into permits, and will demonstrate future compliance with the lower emission limits through annual performance testing.

Alliance Refinery is required to comply with PM emission limits of 0.5 pound PM per 1000 pounds of coke burned on a 3-hour average basis determined by testing following test methods specified in 40 C.F.R. 60.106(b)(2), effective 12/31/2009. Phillips 66 has incorporated the PM emission limits in permit number 1810-V8 AA issued on August 14, 2015. We verified that Phillips 66 conducted annual PM performance testing for the years 2013 through 2015 in accordance with the applicable requirements. No exceedances of the limits occurred during the period.

D. CO Emissions Reduction from FCCUs

Status: On Schedule

Program Summary: Phillips 66 will incorporate the lower CO emission limits at the covered FCCUs into permits, and will demonstrate future compliance with the lower emission limits through the use of CEMS. Alliance Refinery is required to comply with CO emission limits of 100 ppmvd on a 365-day rolling average basis, and 500 ppmvd on a 1-hour average basis, at 0% oxygen, effective 09/30/2005. The CO emission limits have been properly incorporated in permit number 1810-V8 AA issued August 14, 2015.

Prior to the CD agreement, Alliance Refinery had installed a boiler in order to meet CO emission limits. We observed that Phillips 66 has installed and is operating CO and O_2 CEMS in accordance with the applicable

requirements, and certification and concentrations of calibration gases were accurate and current. We verified that Phillips 66 conducted CGA and RATA for the period January 2013 through June 2016 in accordance with the applicable requirements. A photograph of the CEMS is included as **Photo No. 2** in **Appendix 1.**

The trends for the FCCU CO emission limits of 100 ppmvd on a 365-day rolling average basis and 500 ppmvd on a 1-hour average basis, at 0% oxygen from July 2015 – June 2016 are included as **Appendix 6**. No exceedances of the limits occurred during the period.

E. NSPS Applicability of FCCU-Catalyst Regenerators

Status: On Schedule, except that AMP parameter limits have not been incorporated in permit.

Program Summary: The FCCU catalyst regenerators will be subject to and will comply with NSPS Subparts A and J for SO_2, PM and CO. Phillips 66 will demonstrate compliance with NSPS opacity limits through the use of continuous opacity monitoring system (COMS) or with an EPA approved alternative monitoring plan (AMP).

EPA approved Alliance Refinery's AMP for monitoring opacity in lieu of COMS per letter dated June 24, 2014. The approved AMP requires the Alliance Refinery to monitor parameters on the wet gas scrubber (WGS) and comply with minimum liquid-to-gas (L/G) ratio of 29.8 gallons per 1000 actual cubic feet (G/KACF) on a 3-hour rolling average basis, and minimum slurry liquid circulation pump discharge pressure (P_{disch}) of 125.8 pounds per square inch (psig) on a 3-hour rolling average basis. Phillips 66 has not incorporated the WGS scrubber parameter limits, L/G ratio and slurry liquid circulation pump discharge pressure in the refinery's Title V operating permit ***(see AOC #1)***.

The trends for the L/G ratio and P_{disch} limits from July 2015 – June 2016 are included as **Appendix 7**. Exceedances of the limits occurred during the period. According to Alliance Refinery representatives, the exceedances of L/G ratio and P_{disch} in July 2015, and L/G ratio in February 2016 were due to power failure, and planned shutdown, respectively. EPA will review the company's excess emissions report for this period separately, and will determine whether these exceedances will result in stipulated penalties.

F. NO_x Emissions Reduction from Combustion Units

Status: On Schedule

Program Summary: Phillips 66 will implement a program to reduce and monitor NOx emissions from the combustion units, will incorporate lower NO_x emission limits at the covered combustion units into permits, and will demonstrate future compliance with the lower emission limits through the use of CEMS.

Alliance Refinery is required to comply with NO_x emission limits of 0.040 lb/MMBtu and 0.0185 lb/MMBtu on a 365-day rolling average basis for ten (10) and one (1) combustion units, respectively. Phillips 66 has incorporated the NO_x emission limits in permit numbers: 1810-V8 AA issued August 14, 2015 for unit 1291-H2/H3 (common stack); 2180-V4 issued May 13, 2013 for Unit 191-H1; 2512-V4 issued July 7, 2014 for units 491-H1 and 491-H2; 2775-V5 issued August 14, 2015 for units 291-H2, 1391-H1, 1391-H2/H3 (common stack), 1391-H4 and 1792-H1.

Alliance Refinery operates eleven (11) combustion units, out of which ten (10) are equipped with ultra-low NO_x burners (ULNB), and one (1) has selective catalytic reduction (SCR) control devices in order to meet NO_x emission limits. We observed that Phillips 66 has installed and is operating NO_x and O_2 CEMS on all covered combustion units in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. We verified that Phillips 66 conducted CGA and RATA for the period January 2013 through June 2016 in accordance with the applicable requirements. Photographs of the CEMS and NO_x control devices are included as **Photo Nos 4-10, 12-14 and 16-19** in **Appendix 1.**

The trends for the combustion units' NO_x emission limits on a 365-day rolling average basis, at 0% oxygen from July 2015 – June 2016 are included as **Appendix 8.** Alliance Refinery exceeded the 365-day rolling average emission limit of 0.040 lb/MMBtu for Unit 1391-H2/H3 for the period January 24, 2016 through March 14, 2016. According to Alliance Refinery representatives, the exceedance was the result of low firing during shutdown, regeneration, and startup of the unit. EPA will review the company's excess emissions report for this period separately, and will determine whether these exceedances will result in stipulated penalties. No other exceedances of the emission limits occurred during the period.

G. SO_2 Emissions Reduction from and NSPS Applicability to Heaters and Boilers

Status: On Schedule

Program Summary: The covered heaters and boilers will be subject to and comply with the applicable requirements of NSPS Subparts A and J for fuel gas combustion devices. Phillips 66 will not burn fuel oil in any existing combustion device.

Alliance Refinery is required to comply with H_2S emission limits of 162 ppmv on a 3-hour rolling average basis for fuel gas combusted in heaters and boilers. Phillips 66 has incorporated the H_2S emission limits, and the requirement that Phillips 66 will not burn fuel oil in any existing combustion device in the refinery's permits.

Alliance Refinery monitors the fuel gas into the heaters and boilers at units 1391 and 301-B-3 and 491 in order to meet H_2S emission limits. We observed that Phillips 66 has installed and is operating the H_2S CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. We verified that Phillips 66 conducted CGA and RATA for the period January 2013 through June 2016 in accordance with the applicable requirements. Photographs of the CEMS are included as **Photo No. 21 and No. 22** in **Appendix 1.**

The trends for the combustion units' H_2S emission limits on a 3-hour rolling average basis from July 2015 – June 2016 are included as **Appendix 9.** Alliance Refinery exceeded the 3-hour rolling average emission limit of 162 ppmv in July 2015. No other exceedances of the emission limit occurred during the period.

H. NSPS Applicability of Sulfur Recovery Plants

Status: On Schedule

Program Summary: Sulfur recovery plants will be subject to and comply with the applicable requirements

of NSPS Subparts A and J. Phillips 66 will incorporate SO_2 emission limits into permits, and will demonstrate future compliance with the lower emission limits through the use of CEMS.

The CD requires the Alliance Refinery to comply with SO_2 emission limits of 250 ppm on a 12-hour rolling average basis at all tail gas emission points. Phillips 66 has incorporated the SO_2 emission limit in permit number 2774-V4 issued July 17, 2014.

Alliance Refinery operates a sulfur recovery unit (SRU), and monitors SO_2 emissions at the tail gas emission point in order to meet SO_2 emission limits. We observed that Phillips 66 installed and is operating SO_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. We verified that Phillips 66 conducted CGA and RATA for the period January 2013 through June 2016 in accordance with the applicable requirements. A photograph of the CEMS is included as **Photo No. 20** in **Appendix 1.**

The trends for the SRU SO_2 emission limits on a 12-hour rolling average basis from July 2015 - June 2016 are included as **Appendix 10.** No exceedances of the limit occurred during the period.

J. NSPS Applicability of Flaring Devices

Status: On Schedule

Program Summary: Phillips 66 will operate flaring devices in compliance with NSPS applicability.

Alliance Refinery elected to operate and maintain a flare gas recovery system to control continuous or routine combustion in the flaring devices and is required to comply with H_2S emission limits of 162 ppmv on a 3-hour rolling average basis for fuel gas combusted in the flares. Phillips 66 has incorporated the NSPS requirements into permit number 2779-V3 issued July 25, 2012.

Alliance Refinery operates two flares (high and low pressure) and has installed and is operating a flare gas recovery system, routing the recovered flare gas to amine treating for use in the refinery fuel gas system, and monitors H_2S and total reduced sulfur (TRS) concentrations with gas chromatograph (GC) and TRS analyzer, respectively. Photographs of the flare gas recovery system and monitoring equipment are included as **Photo Nos. 23-27** in **Appendix 2.** We observed that Phillips 66 has wrongly labeled the TRS Analyzers in the field for both flares ***(see AOC #2)***.

The trends for the flare gas recovery and H_2S emission limits on a 3-hour rolling average basis from July 2015 – June 2016 are included as **Appendix 11 and 12**, respectively**.** We verified that Alliance Refinery properly documented and reported exceedances of limits during the period.

We did not observe visible emissions from the flares. We observed the flares with the forward looking infra-red (FLIR) camera and did not see any significant trail of unburned hydrocarbons.

N. Benzene Waste Operations NESHAP Program Enhancements

Status: On Schedule

Program Summary: Phillips 66 shall undertake refinery-wide audits to determine its compliance with all Benzene Waste NESHAPS requirements and to take corrective action where any areas of non-compliance are identified. In addition Phillips 66 shall undertake refinery wide measures to minimize or eliminate fugitive benzene waste emissions at the refinery.

The CD requires the Alliance Refinery to implement the 6BQ compliance option of Subpart FF using upstream controls, and replace any single carbon canisters (CCs) or dual canister systems in parallel with primary and secondary CCs, and operate them in series.

A schematic of the BWON process is included as **APPENDIX 13**. Compliance sampling conducted at the outlet of strippers from July 2015 - June 2016 is included as **APPENDIX 14**. We verified that Phillips 66 took appropriate corrective actions regarding exceedances of the 10 ppm limit required by NESAHP Subpart FF that occurred on July 2, 2015, July 27, 2015, and April 21, 2016.

We reviewed the sampling procedure and standard operating procedures (SOPs) that Phillips 66 uses. The procedures were written in a formal SOP and consistent with BWON sampling techniques required by 40 CFR § 61.355. We verified that Phillips 66 conducted annual employee training and lab audits as required.

Alliance Refinery has engaged the services of Evoqua and ERM for monitoring, and scheduling the monitoring of the CCs, respectively. We observed that Phillips 66 monitored CC breakthrough, and conducted waste sampling consistent with regulatory requirements and the SOP.

O. Leak Detection and Repair (LDAR) Program Enhancements

Status: On Schedule

Program Summary: In order to minimize or eliminate fugitive emissions of volatile organic compounds (VOCs), benzene, volatile hazardous air pollutants (VHAPs), and organic hazardous air pollutants (HAPs) from equipment in light liquid and/or in gas/vapor service, Phillips 66 will undertake enhancements to its LDAR program including to develop and maintain a written LDAR program for compliance with all regulations, conduct LDAR training, conduct internal and third party audits, maintain an electronic database for storing and reporting data, and retain a third party contractor to develop and implement procedures for QA/QC reviews of data generated by monitoring.

Alliance Refinery retains the services of a contractor (Guardian Compliance) to conduct LDAR services. We verified that Alliance Refinery conducts beginning and end of day drift checks, as required by the CD. We observed that Phillips 66 carried out the calibration of instrument (Thermo Scientific TVA-1000) accurately. We verified that certification and concentrations of calibration gases were accurate and current, and that Alliance Refinery uses electronic data collection for LDAR monitoring by using data loggers, and leak tracking and reporting software (LEAK DAS V4).

We reviewed records which showed that Phillips 66 consistently maintains equipment calibration records and conducts annual training and audits, as required. We walked through the units and observed that components were properly tagged, and we noticed one open-ended line ***(see AOC #3)***. We

queried the LDAR monitoring and reporting software with randomly selected tag numbers from the units, and we did not find any discrepancy except for the one open-ended line.

P. Incorporation of Consent Decree Requirements into Federally Enforceable Permits

Status: Ongoing

Program Summary: Phillips 66 will submit complete applications to the applicable state/local agency to incorporate the emission limits and standards required by the CD into federally enforceable minor or major new source review permits or other permits that will ensure that the underlying emission limit or standard survives the termination of this CD.

Alliance Refinery has incorporated all the required emission limits and standards into current operating permits, except for the limits of monitoring parameters for an EPA approved AMP in lieu of COMS. The AMP was approved June 24, 2014.

Section III – AREAS OF CONCERN

1. Phillips 66 has not incorporated the Wet Gas Scrubber operating parameter limits approved in the June 24, 2014 AMP in lieu of COMS into their Title V operating permit as required by Paragraph 257 of the CD.
2. The TRS analyzer for the flares have been mislabeled in the field.
3. Alliance Refinery is required to equip each open-ended valve or line with a cap, blind flange, plug, or second valve. We observed one open-ended line in the field.

Section IV – FOLLOW UP

N/A

Section V – LIST OF APPENDICES

Appendix 1 - Photograph Log
Appendix 2 - Opening and closing conference sign-in sheets
Appendix 3 - Plant wide process flow diagram and written description
Appendix 4 - FCCU NO_x emission trends
Appendix 5 - FCCU SO_2 emission trends
Appendix 6 - FCCU CO emission trends
Appendix 7 - FCCU L/G ratio and Discharge pressure trends
Appendix 8 - Combustion units NOx emission trends
Appendix 9 - Fuel gas H_2S emission trends
Appendix 10 - SRU SO_2 emission trends
Appendix 11 - Flare gas recovery trends

Appendix 12 - Flare H_2S emission trends
Appendix 13 - BWON process schematic
Appendix 14 - Benzene stripper outlet concentration trends

Appendix 1
Photograph Log

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

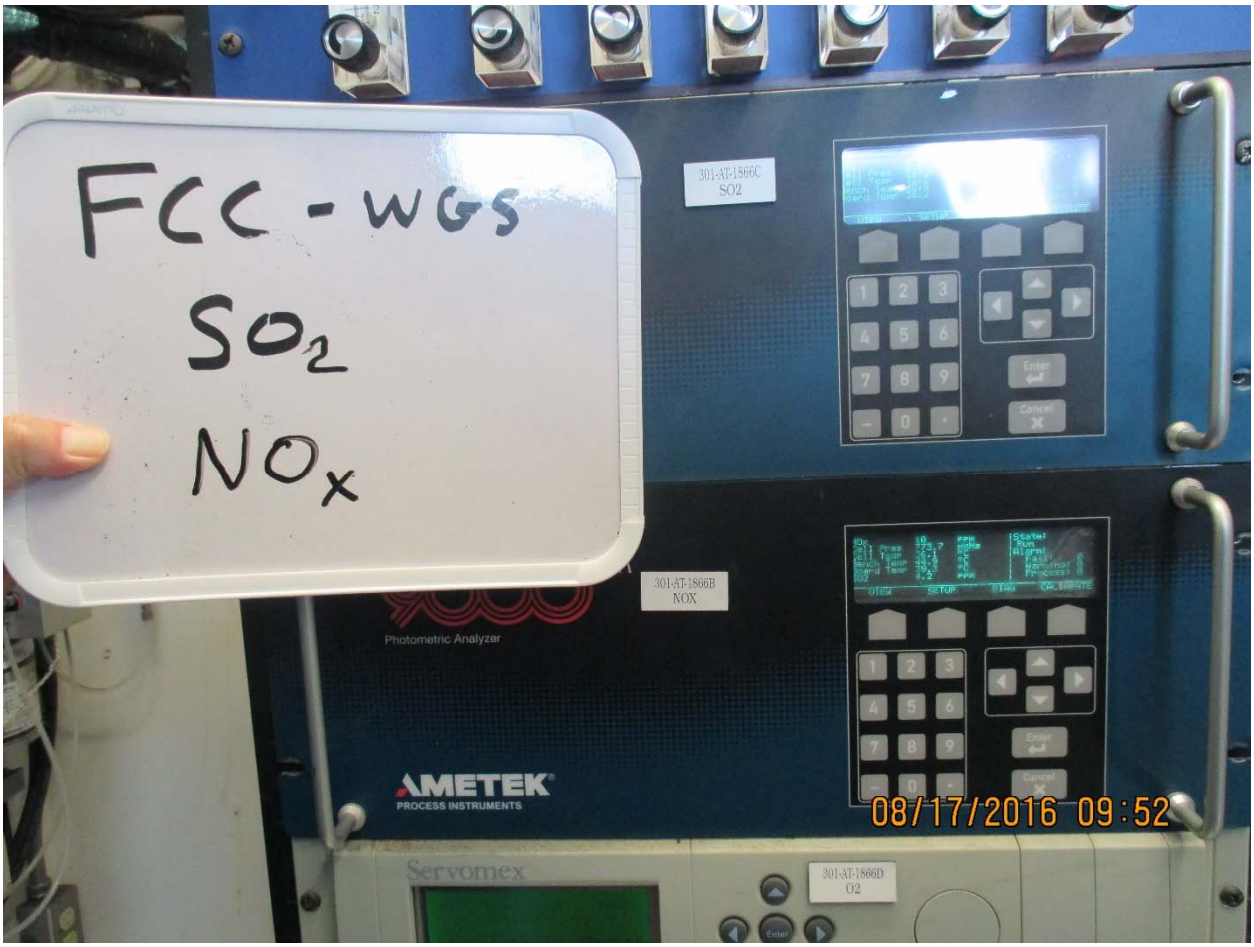


Photo File Name: IMG_0001.JPG
Date of Photo: 08/17/2016
Time of Photo: 9:52 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: FCCU Wet Gas Scrubber (WGS) NO_x and SO_2 CEMS
NO_x = 10 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0002.JPG
Date of Photo: 08/17/2016
Time of Photo: 9:53 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: FCCU WGS O_2 and CO CEMS
O_2 = 3.49%
CO = 6.61 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0003.JPG
Date of Photo: 08/17/2016
Time of Photo: 9:59 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: FCCU WGS

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

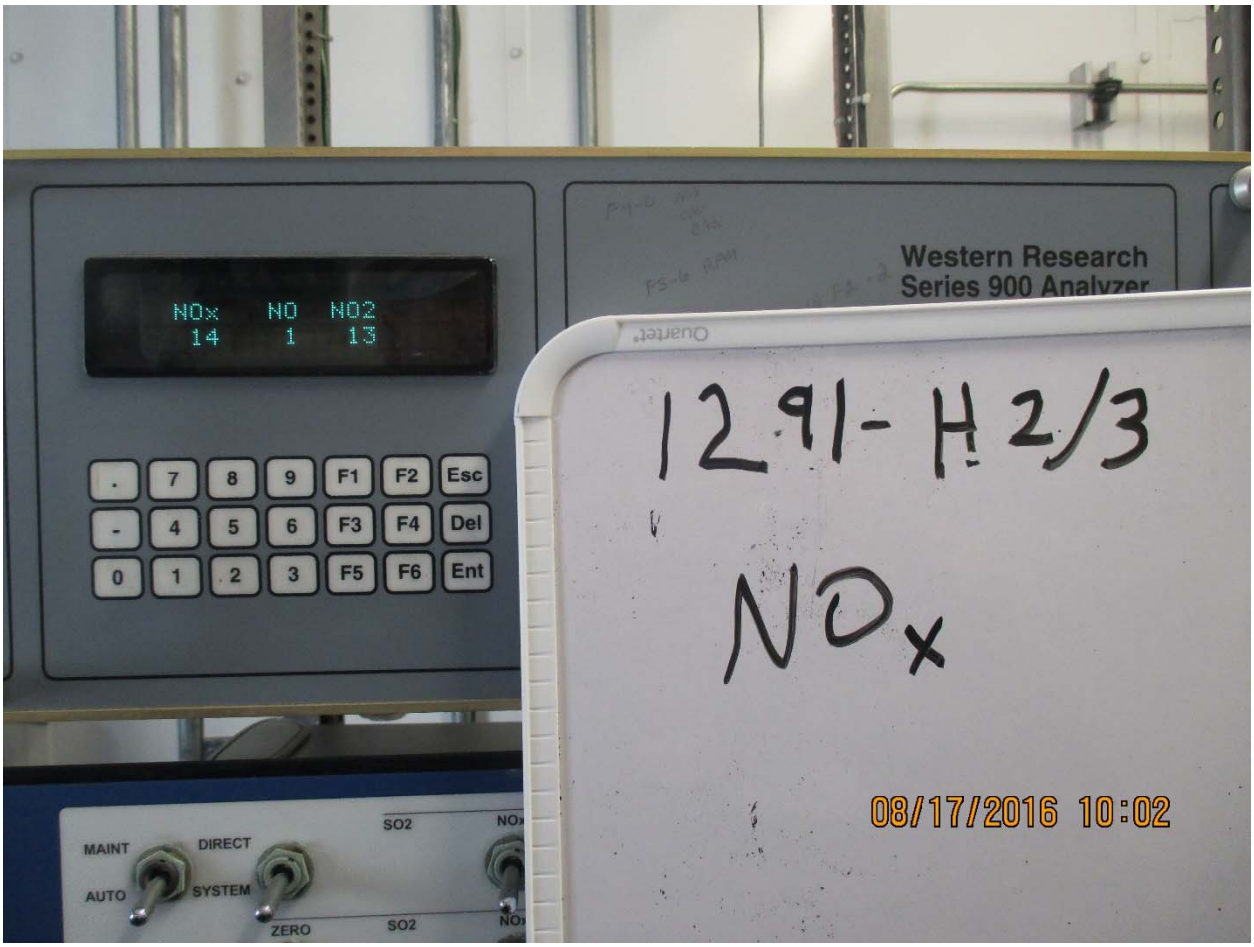


Photo File Name: IMG_0004.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:02 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1291-H2/H3 NO_x CEMS
NO_x = 14 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

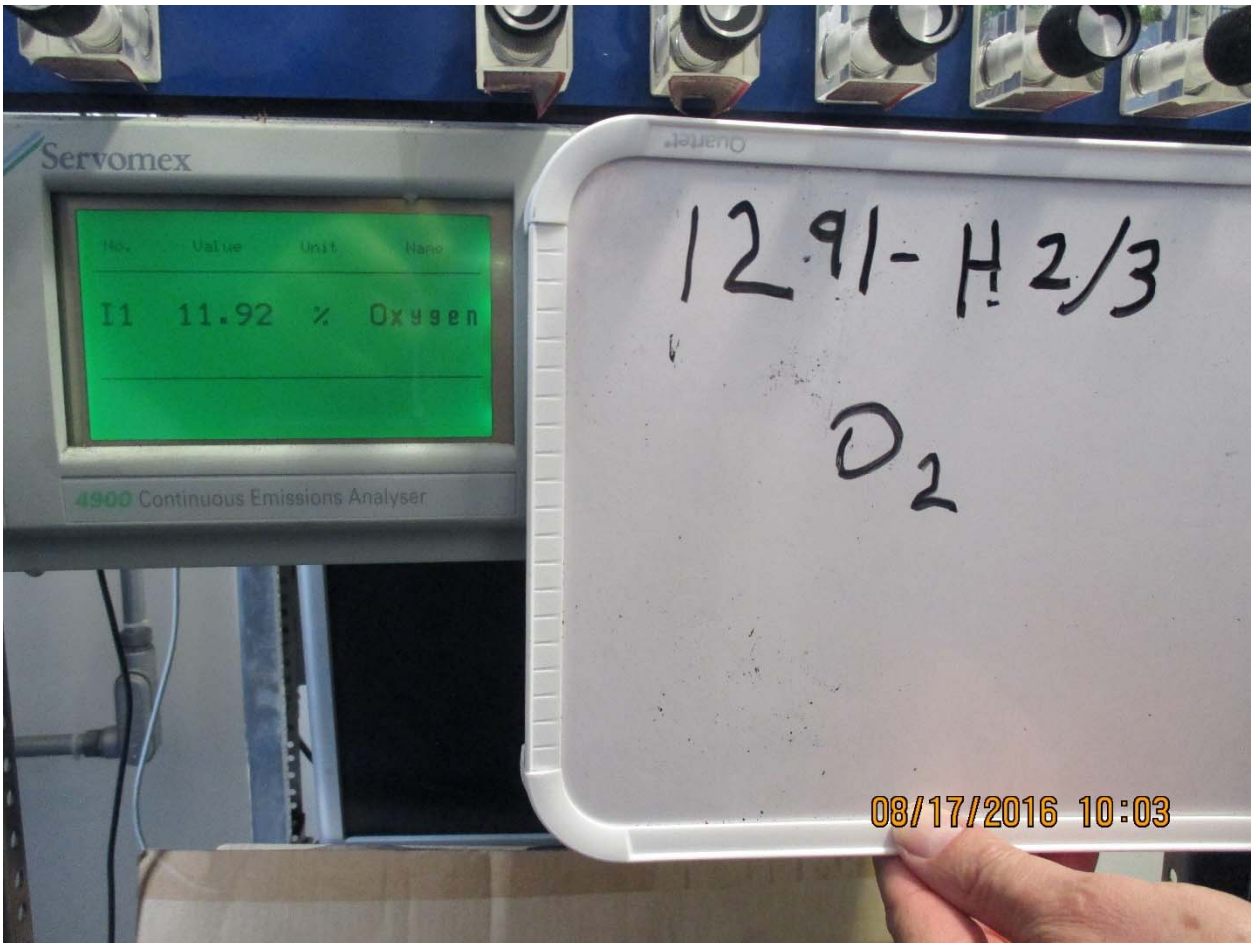


Photo File Name: IMG_0005.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:03 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1291-H2/H3 O_2 CEMS
O_2 = 11.92%

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0006.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:06 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1291-H2 Ultra-low NO_x Burner (ULNB)

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0007.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:08 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1291-H3 ULNB

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

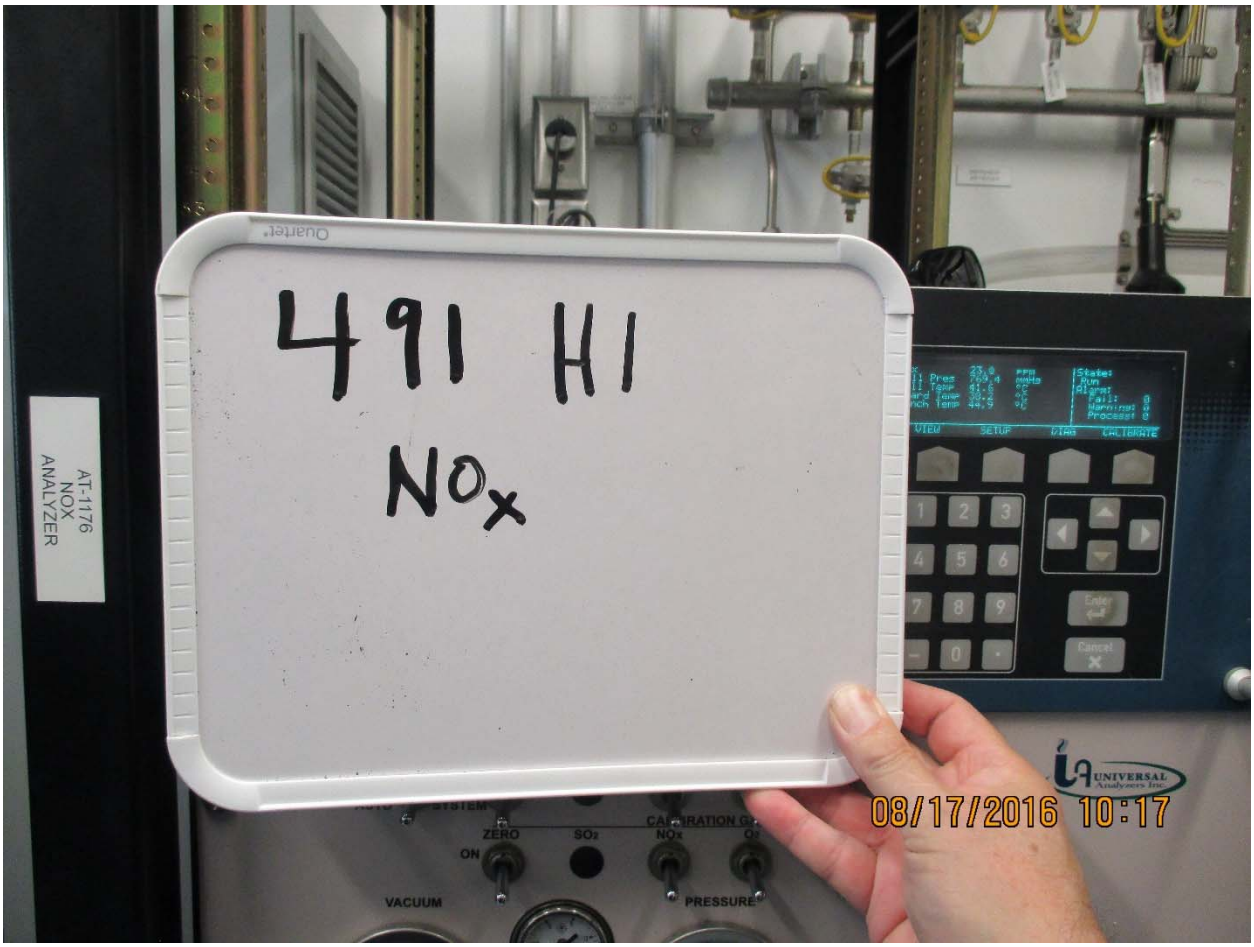


Photo File Name: IMG_0008.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:17 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 491-H1 NO_x CEMS
NO_x = 23 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0009.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:17 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 491-H1 O_2 CEMS
O_2 = 6.44%

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

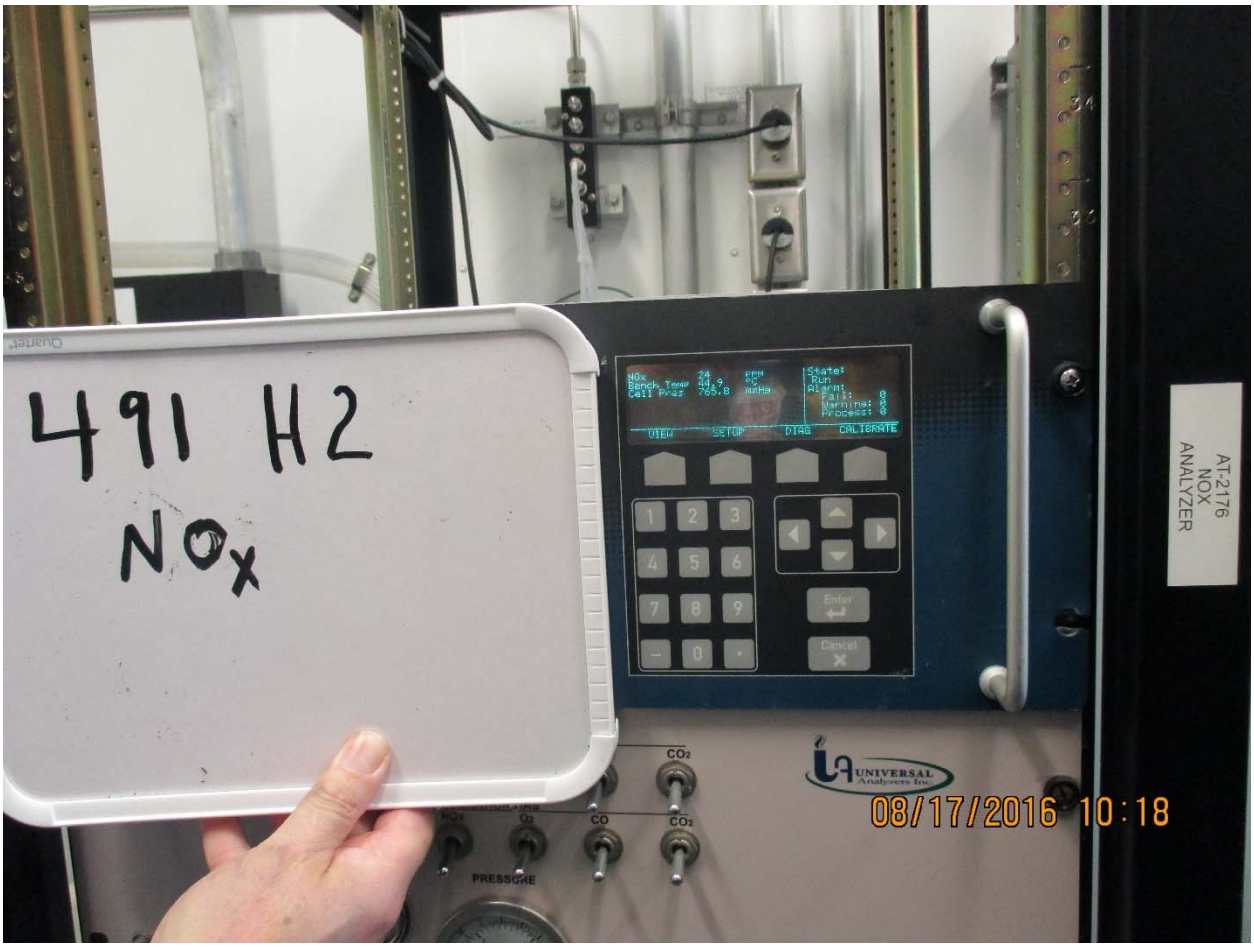


Photo File Name: IMG_0010.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:18 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 491-H2 NO_x CEMS
NO_x = 24 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 11

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

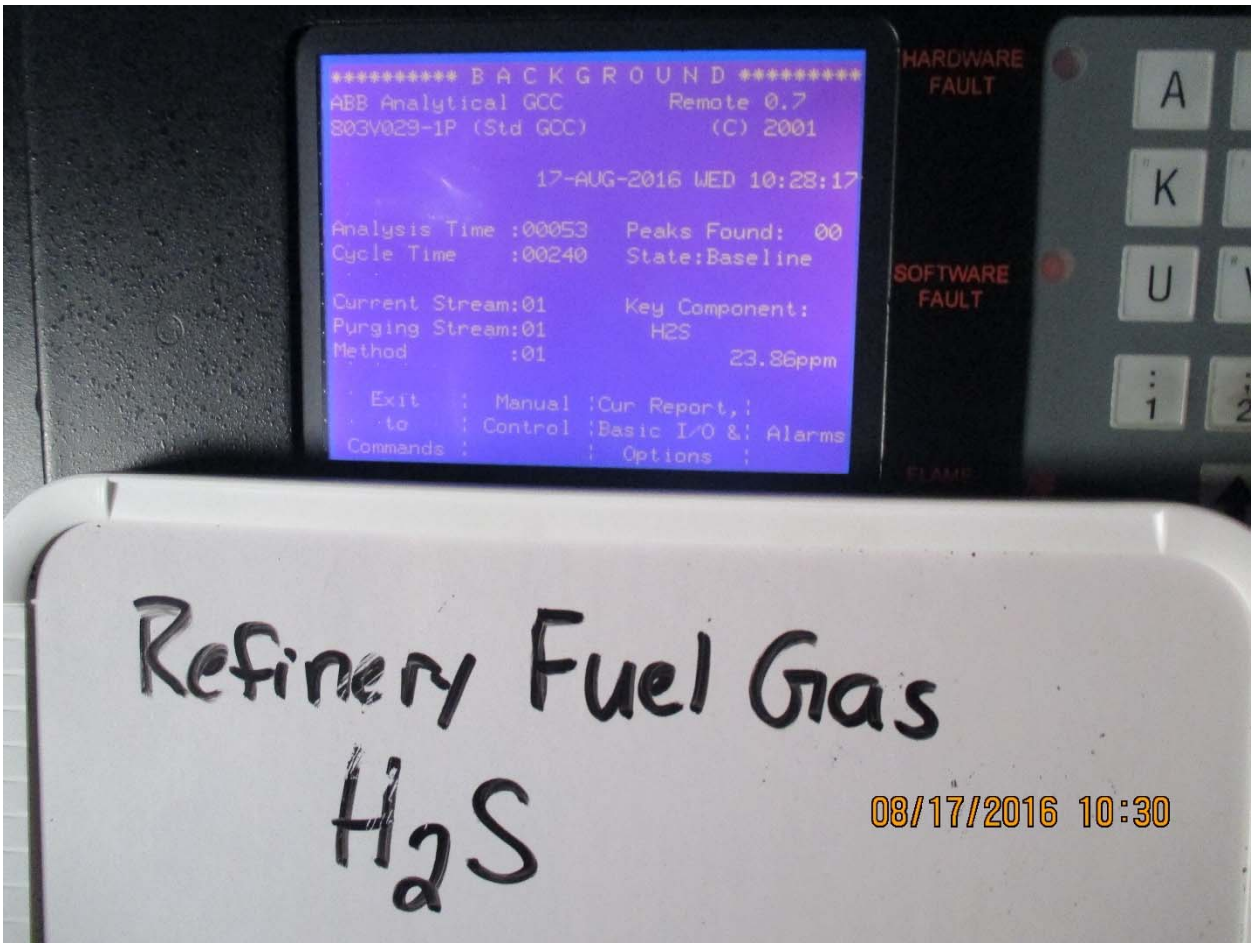


Photo File Name: IMG_0019.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:30 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Refinery Fuel Gas H_2S CEMS
H_2S = 23.86 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

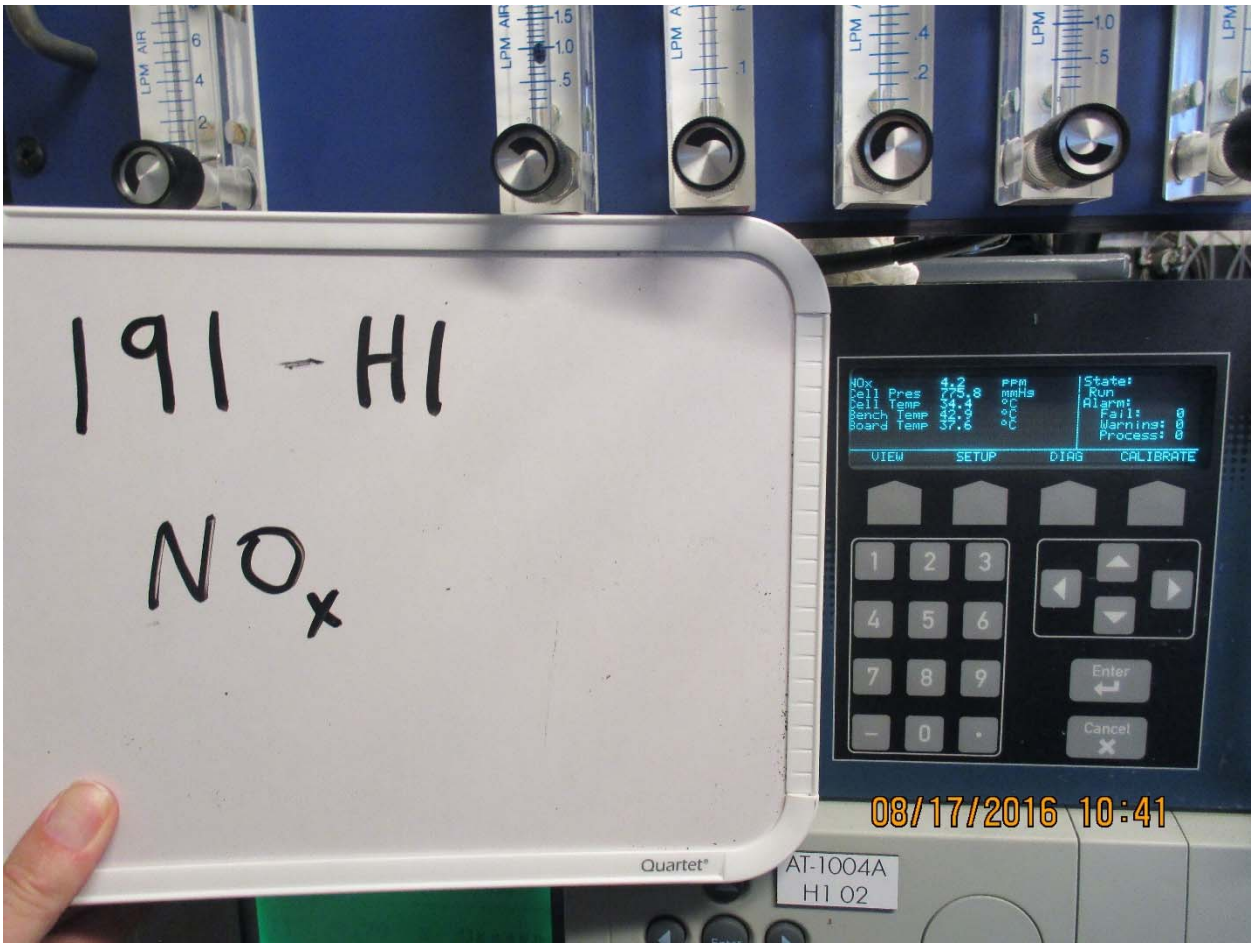


Photo File Name: IMG_0020.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:41 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 191-H1 NO_x CEMS
NO_x = 4.2 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

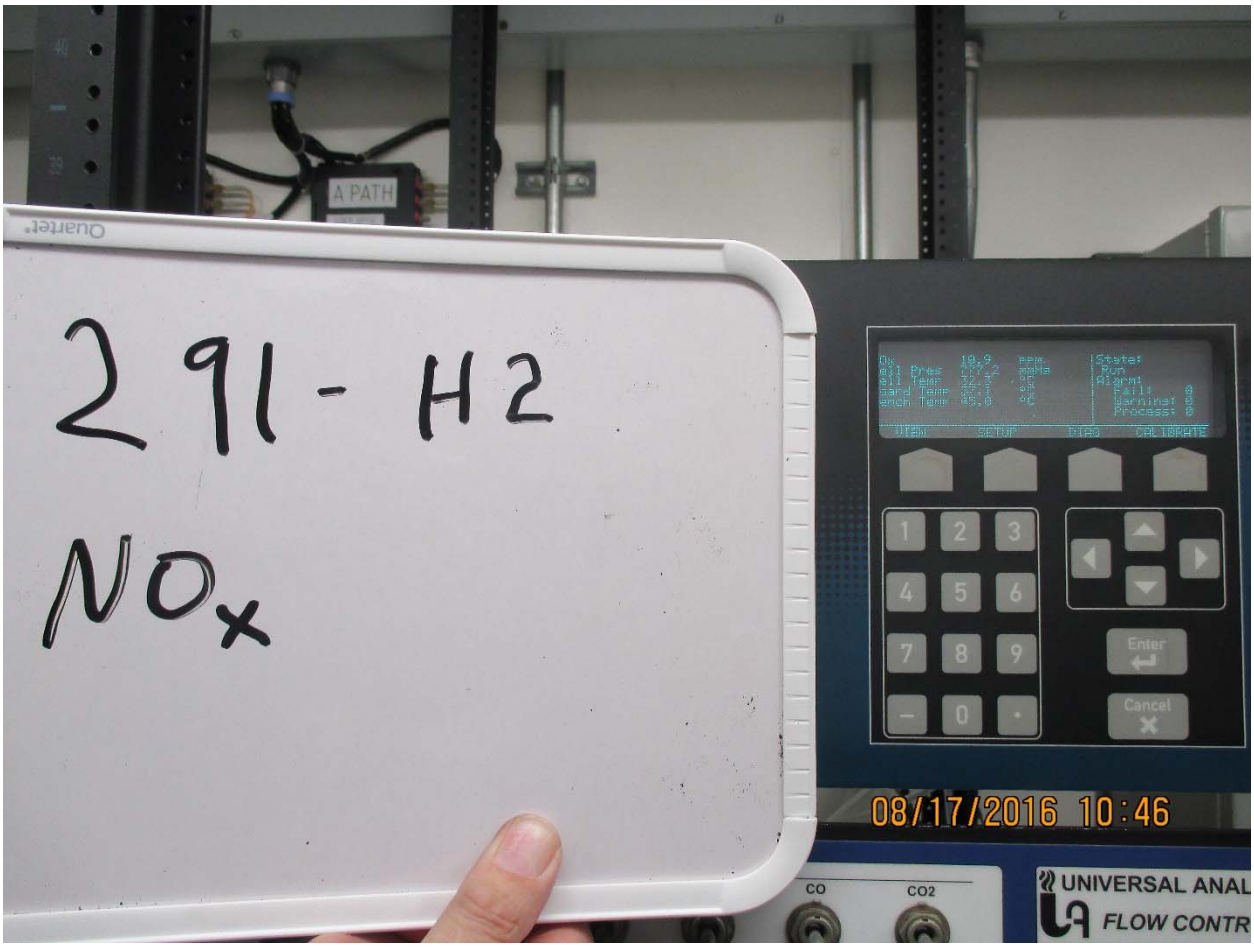


Photo File Name: IMG_0021.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:46 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 291-H2 NO_x CEMS
NO_x = 10.9 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0022.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:50 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 291-H2 ULNB

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name:	IMG_0023.JPG
Date of Photo:	08/17/2016
Time of Photo:	10:52 am
Photographer:	Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description:	Carbon Canister (CC) set-up

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 16

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0024.JPG
Date of Photo: 08/17/2016
Time of Photo: 10:56 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1792-H1 NO_x CEMS
NO_x = 18 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 17

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

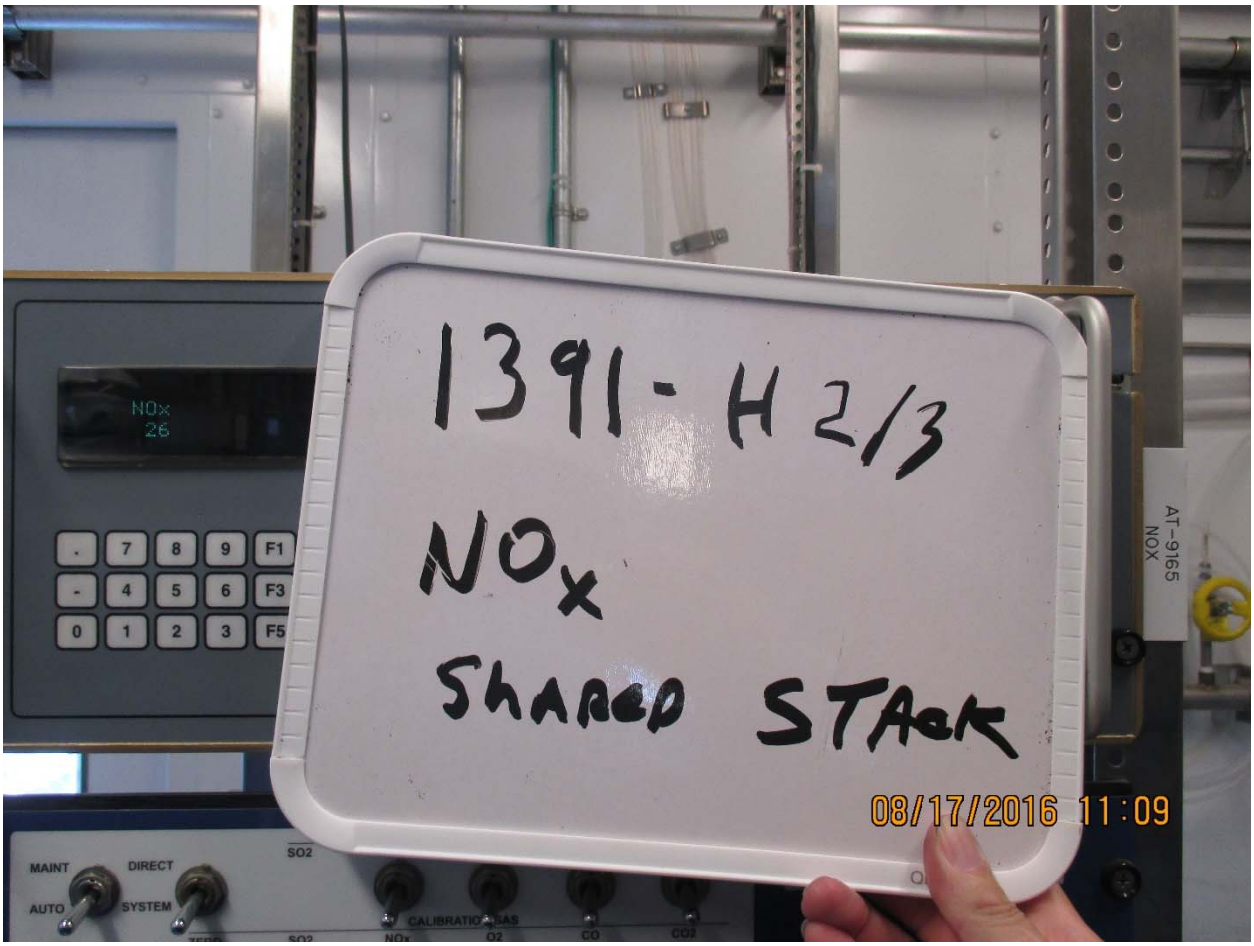


Photo File Name: IMG_0026.JPG
Date of Photo: 08/17/2016
Time of Photo: 11:09 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1391-H2/H3 NO_x CEMS
NO_x = 26 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 18

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

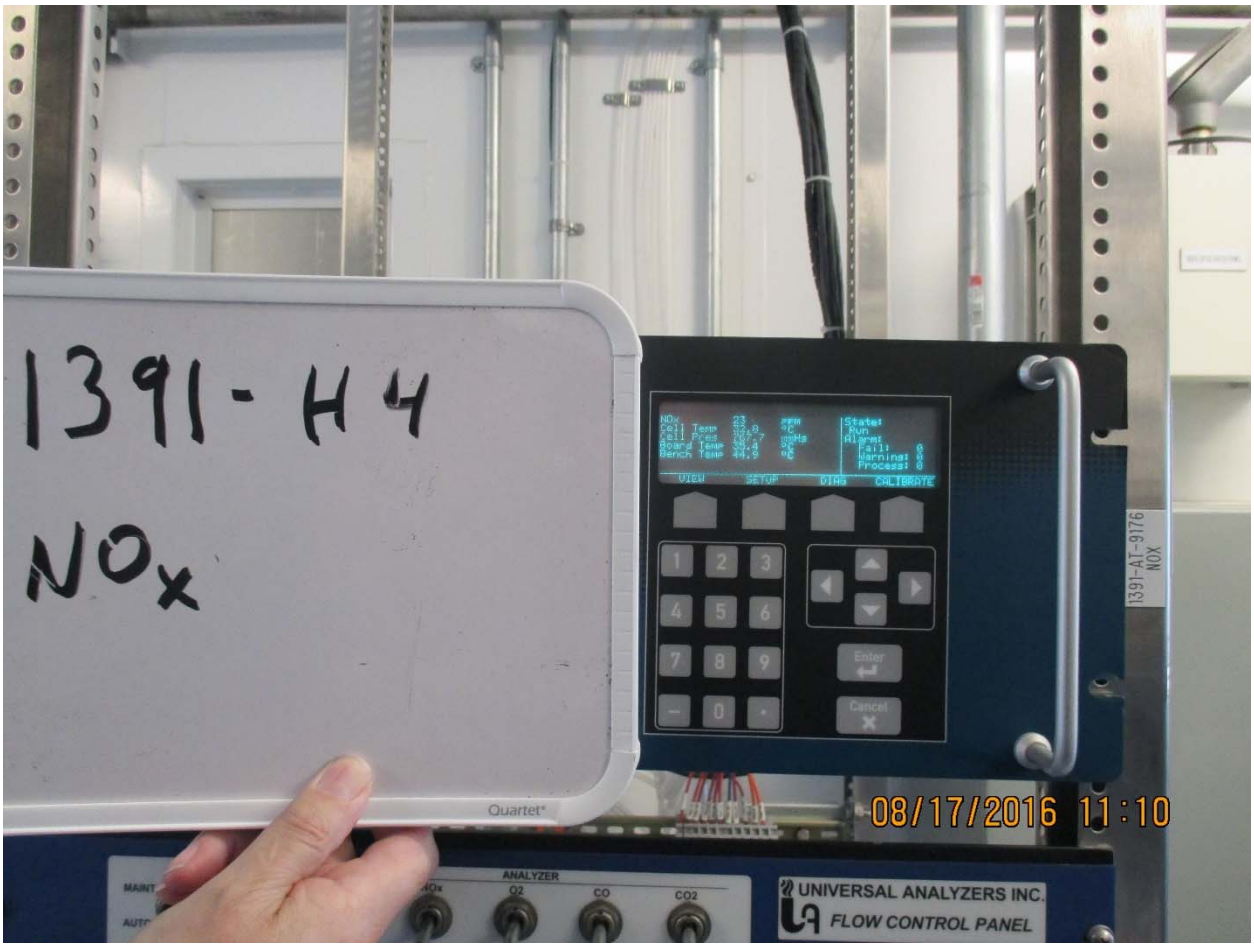


Photo File Name: IMG_0027.JPG
Date of Photo: 08/17/2016
Time of Photo: 11:10 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1391-H4 NO_x CEMS
NO_x = 23 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 19

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

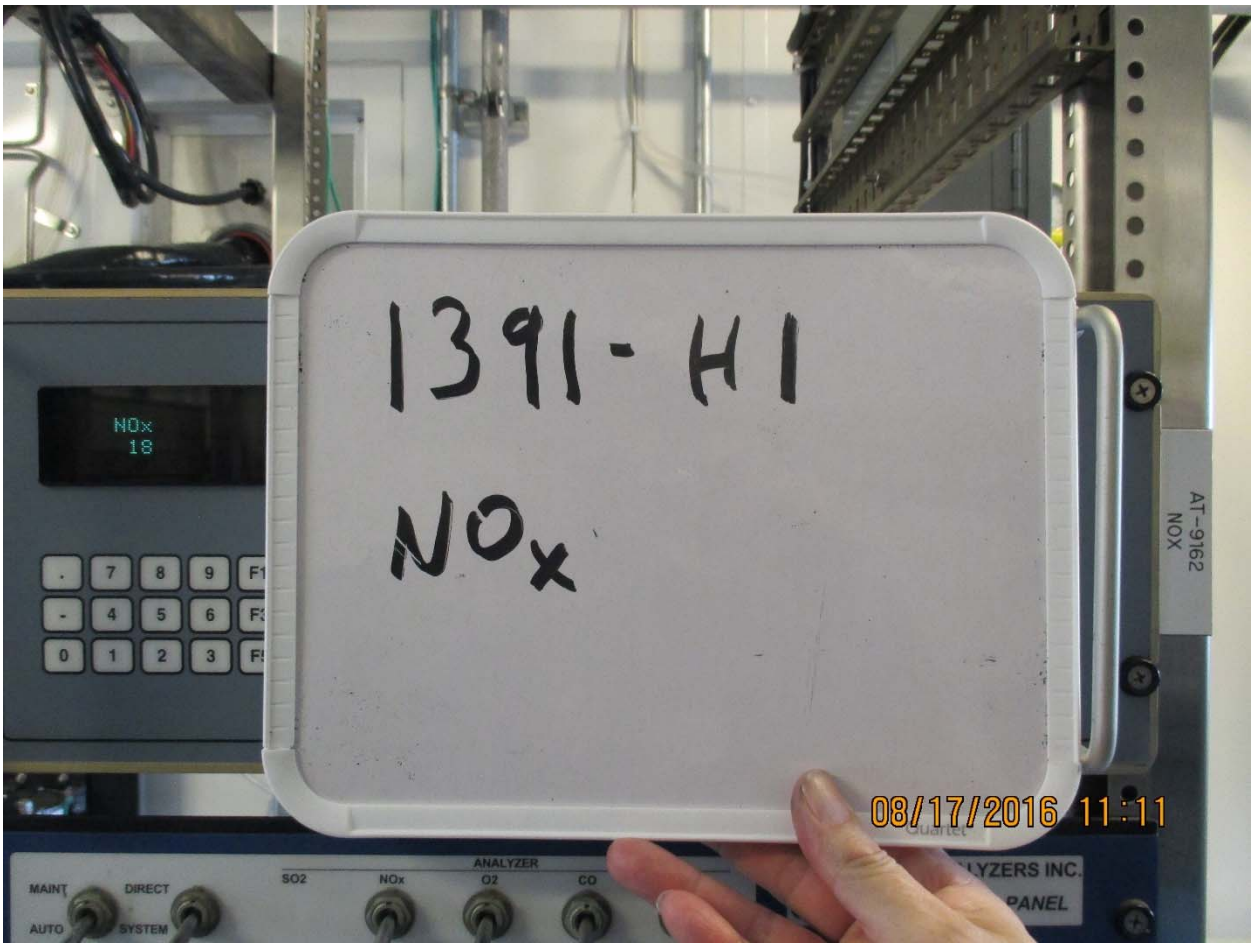


Photo File Name: IMG_0029.JPG
Date of Photo: 08/17/2016
Time of Photo: 11:11 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1391-H1 NO_x CEMS
NO_x = 18 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 20

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

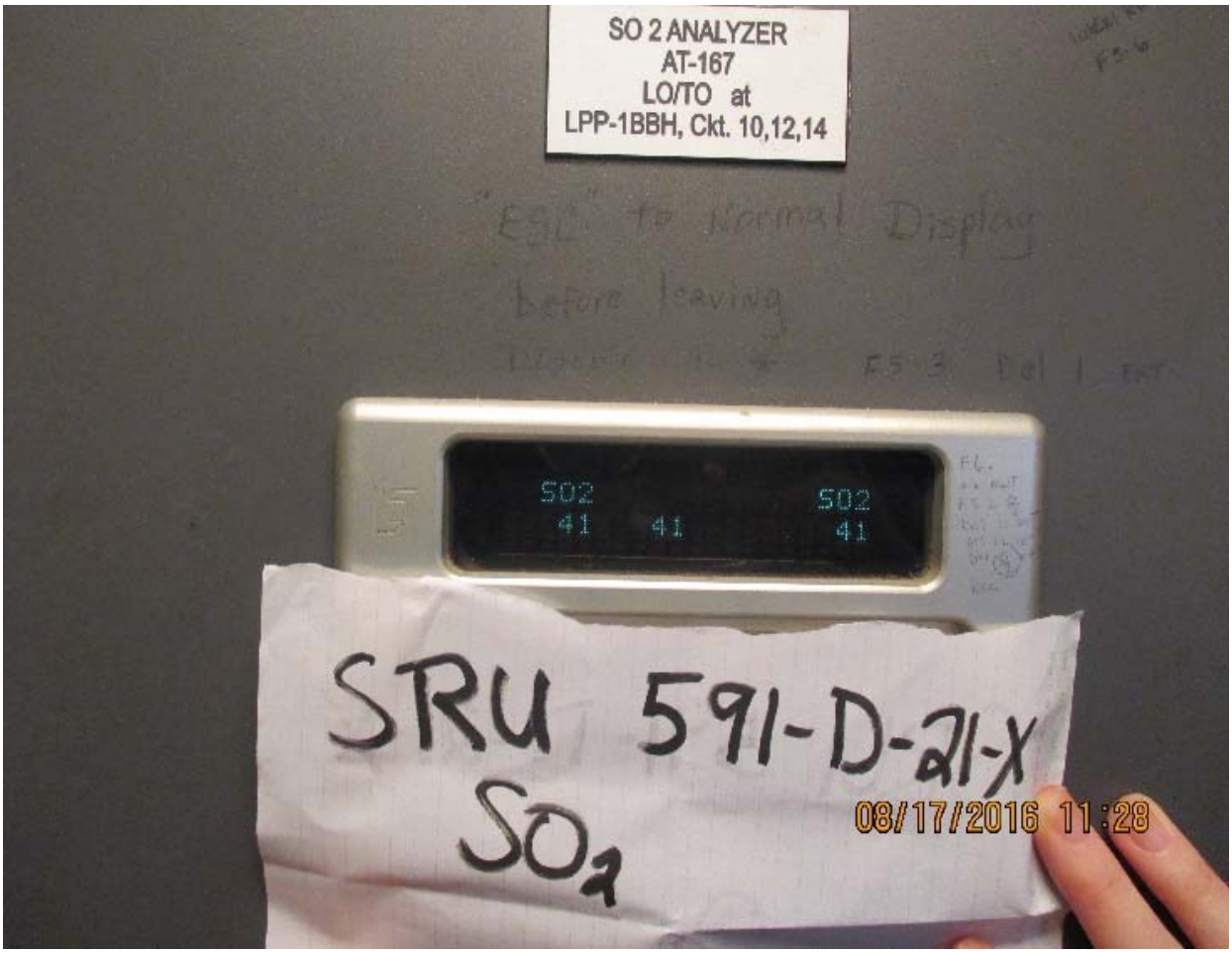


Photo File Name: IMG_0030.JPG
Date of Photo: 08/17/2016
Time of Photo: 11:28 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Sulfur Recovery Unit (SRU) SO_2 CEMS
SO_2 = 41 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 21

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

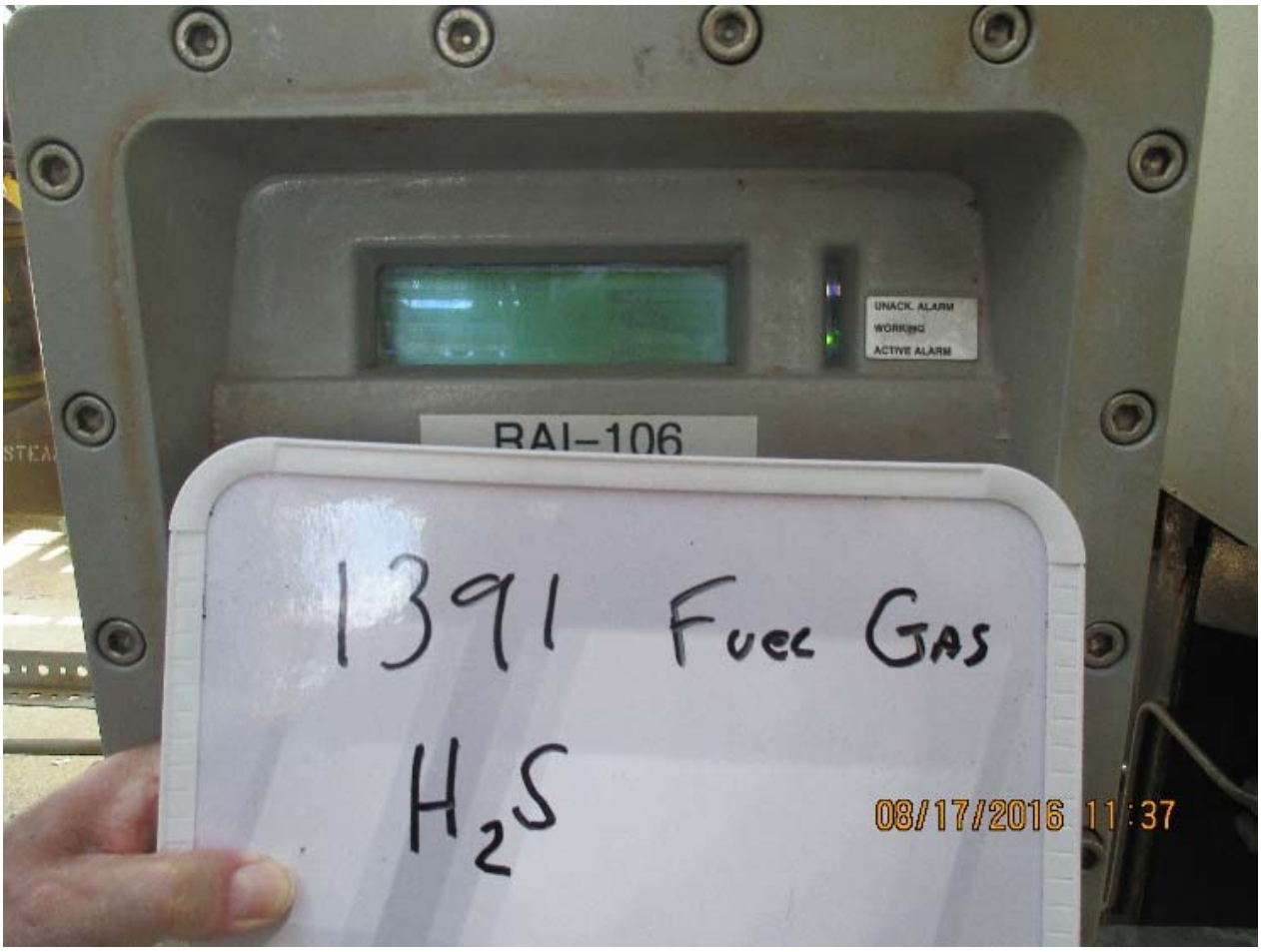


Photo File Name: IMG_0031.JPG
Date of Photo: 08/17/2016
Time of Photo: 11:37 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Heater 1391-H1 Fuel Gas H_2S CEMS

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 22

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

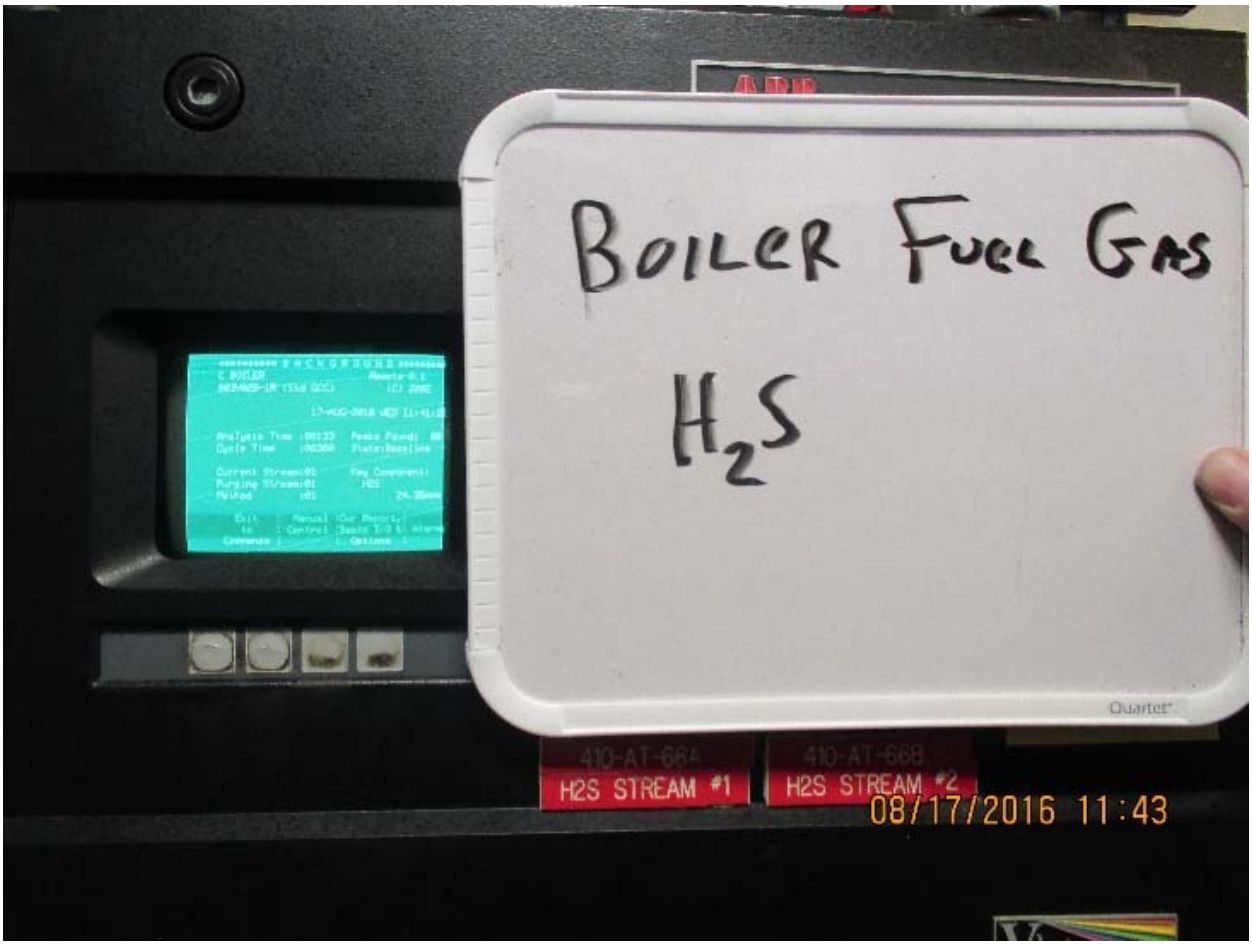


Photo File Name: IMG_0032.JPG
Date of Photo: 08/17/2016
Time of Photo: 11:43 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Boiler 301-B3 Fuel Gas H_2S CEMS
H_2S = 24.35 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 23

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0033.JPG
Date of Photo: 08/17/2016
Time of Photo: 2:06 pm
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: High Pressure Flare Gas Chromatograph (GC) for H_2S monitoring (Labeled wrongly as TRS Analyzer)

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 24

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0034.JPG
Date of Photo: 08/17/2016
Time of Photo: 2:07 pm
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Low Pressure Flare Gas Chromatograph (GC) for H_2S monitoring (Labeled wrongly as TRS Analyzer)

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 25

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name:	IMG_0037.JPG
Date of Photo:	08/17/2016
Time of Photo:	2:24 pm
Photographer:	Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description:	Flare Gas Recovery Compressors

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 26

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0038.JPG
Date of Photo: 08/17/2016
Time of Photo: 2:31 pm
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Low Pressure Flare Total Reduced Sulfur (TRS) Analyzer

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 27

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0039.JPG
Date of Photo: 08/17/2016
Time of Photo: 2:33 pm
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Low Pressure Flare TRS Analyzer

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 28

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name:	IMG_0001.JPG
Date of Photo:	08/18/2016
Time of Photo:	10:12 am
Photographer:	Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description:	Benzene Stripper Outlet Sampling Point

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 29

Location: **Phillips 66 Company - Alliance Refinery**		
City: **Belle Chasse**	**Plaquemines Parish**	State: **LA**

Photo File Name: IMG_0002.JPG
Date of Photo: 08/18/2016
Time of Photo: 10:12 am
Photographer: Tom Morgan, Environmental Team Lead, Phillips 66 Alliance Refinery
Description: Benzene Stripper Outlet Sampling Point

Appendix 2
Opening and closing conference sign-in sheets

PHILLIPS 66 ALLIANCE REFINERY
CD FOLLOW-UP INSPECTION

Date: 08/15/2016

	Name	Title	Representing	e-Mail	Phone
1	Jim Gold	Inspector	US EPA	gold.jim@epa.gov	281-986-2153
2	Prince Nfodzo	Environmental Engineer	US EPA	nfodzo.prince@epa.gov	214-665-7491
3	Neil Faulkner	Refinery Manager	Phillips 66 Company	Neil.Faulkner@p66.com	504-656-3213
4	Jody Moffett	Operations Manager	Phillips 66 Company	Jody.Moffett@p66.com	504-656-3689
5	Patrick O'hara	Maintenance Manager	Phillips 66 Company	Patrick.J.Ohara@p66.com	504-656-3010
6	Jim Piper	Technical Manager	Phillips 66 Company	Jim.M.Piper@p66.com	504-656-3016
7	Mike Haggard	Business Manager	Phillips 66 Company	Terry.M.Haggard@p66.com	504-656-3288
~~8~~	~~Ann Janson~~	~~HRBP Manager~~	~~Phillips 66 Company~~	~~Ann.E.Janson@p66.com~~	~~504-656-3207~~
9	Larry Poche'	HSE Manager-Interim	Phillips 66 Company	Larry.R.Poche@p66.com	504-656-3212
10	Tom Morgan	Environmental Team Leader - Interim	Phillips 66 Company	Thomas.R.Morgan@p66.com	504-656-3352
11	Steve Johnson	Senior Environmental Consultant	Phillips 66 Company	Steven.W.Johnson@p66.com	504-656-3669
12	Katie Mareno	HSE Specialist	Phillips 66 Company	Katherine.Mareno@p66.com	504-656-3612
13	Keith Bourque	HSE Specialist	Phillips 66 Company	Keith.W.Bourque@p66.com	504-656-3339
~~14~~	~~Hilda Sebesta~~	~~Environmental Intern~~	~~Phillips 66 Company~~	~~Hilda.K.Sebesta@p66.com~~	
15	DANIEL ODEM	Environmental Scientist	LADEQ	DANIEL.ODEM@la.gov	504 736 7713
16					
17					
18					
19					
20					

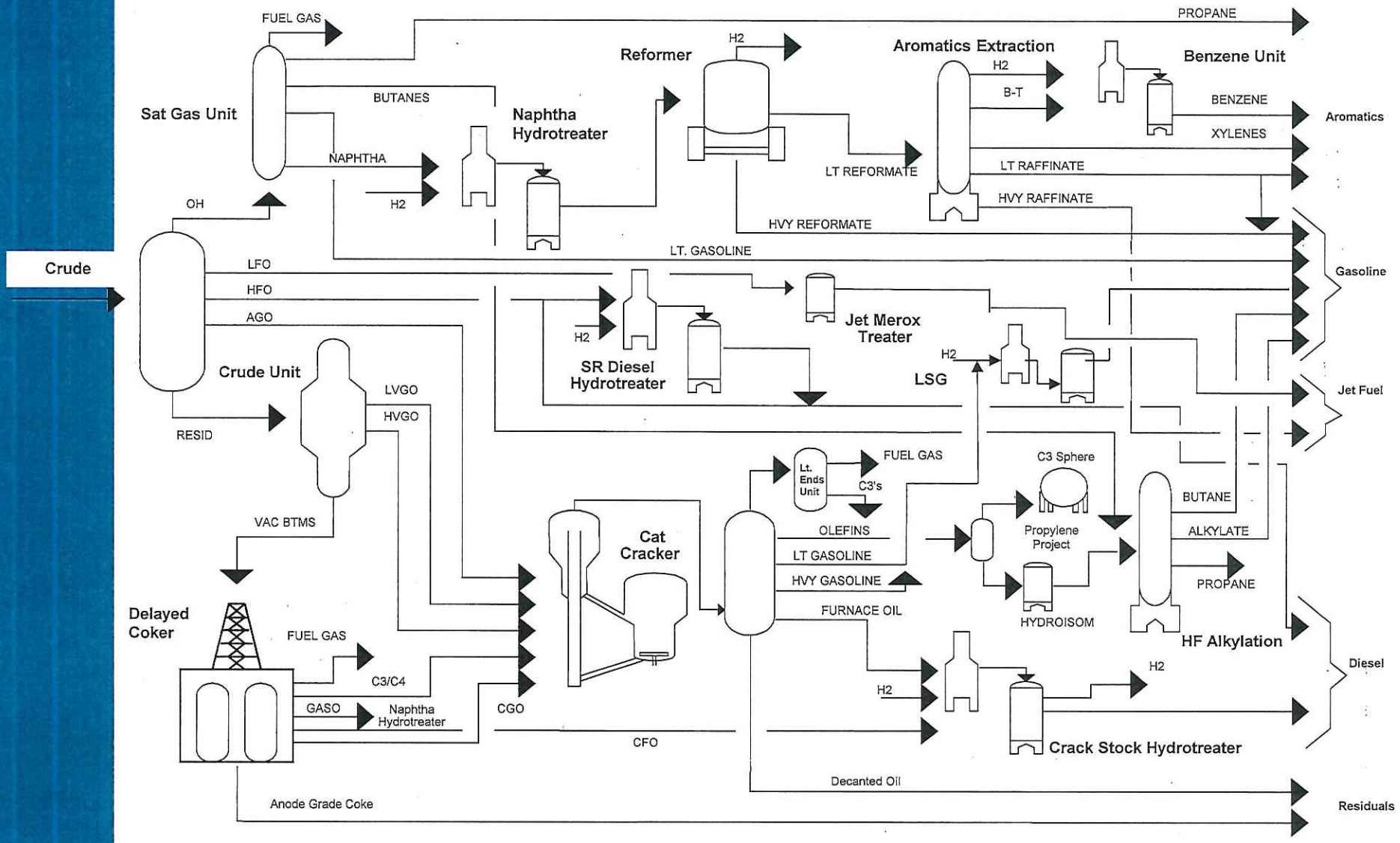
PHILLIPS 66 ALLIANCE REFINERY
CD FOLLOW-UP INSPECTION

Date: 08/18/2016

	Name	Title	Representing	e-Mail	Phone
1	Jim Gold	Inspector	US EPA	gold.jim@epa.gov	281-986-2153
2	Prince Nfodzo	Environmental Engineer	US EPA	nfodzo.prince@epa.gov	214-665-7491
3	Neil Faulkner	Refinery Manager	Phillips 66 Company	Neil.Faulkner@p66.com	504-656-3213
4	~~Jody Moffett~~	~~Operations Manager~~	~~Phillips 66 Company~~	~~Jody.Moffett@p66.com~~	~~504-656-3689~~
5	~~Patrick O'hara~~	~~Maintenance Manager~~	~~Phillips 66 Company~~	~~Patrick.J.Ohara@p66.com~~	~~504-656-3010~~
6	Jim Piper	Technical Manager	Phillips 66 Company	Jim.M.Piper@p66.com	504-656-3016
7	~~Mike Haggard~~	~~Business Manager~~	~~Phillips 66 Company~~	~~Terry.M.Haggard@p66.com~~	~~504-656-3288~~
8	Ann Janson	HRBP Manager	Phillips 66 Company	Ann.E.Janson@p66.com	504-656-3207
9	Larry Poche'	HSE Manager-Interim	Phillips 66 Company	Larry.R.Poche@p66.com	504-656-3212
10	Tom Morgan	Environmental Team Leader - Interim	Phillips 66 Company	Thomas.R.Morgan@p66.com	504-656-3352
11	Steve Johnson	Senior Environmental Consultant	Phillips 66 Company	Steven.W.Johnson@p66.com	504-656-3669
12	Katie Mareno	HSE Specialist	Phillips 66 Company	Katherine.Mareno@p66.com	504-656-3612
13	Keith Bourque	HSE Specialist	Phillips 66 Company	Keith.W.Bourque@p66.com	504-656-3339
14	~~Hilda Sebesta~~	~~Environmental Intern~~	~~Phillips 66 Company~~	~~Hilda.K.Sebesta@p66.com~~	
15	Dawna Witte		LDEQ		
16					
17					
18					
19					
20					

Appendix 3
Plant-wide process flow diagram and written description

Phillips 66 Alliance Refinery Block Flow Diagram



Phillips 66 Alliance Refinery
Facility Overview

Phillips 66 Company owns and operates Alliance Refinery, a petroleum refinery located in Belle Chasse, Louisiana. Figure 1-1 shows the location of the Phillips 66 Company – Alliance Refinery (Alliance Refinery). The Alliance Refinery produces a wide range of petroleum products from crude oil such as LPG, motor gasoline, jet fuel, diesel, carbon black feedstock, propane, propylene, and coke. The Refinery also produces petrochemicals such as benzene, toluene, xylene, and elemental sulfur. Emission sources at the refinery include process heaters, boilers, storage vessels, loading facilities, fugitive emissions from equipment, cooling water towers, process vents, diesel driven air compressors, wastewater collection and treatment operations, and flares.

Unit 191/7991 – Crude/Sat Gas

Unit 191 – Crude Unit is designed to process crude oil into the following unit products, unstabilized naphtha, light vacuum gas oil, light furnace oil, heavy vacuum gas oil, heavy furnace oil, vacuum tower bottoms, atmospheric gas oil, and atmospheric tower bottoms. Preheated crude enters the desalters where salts, water, and sediment are removed. The crude furnace heats the crude before it enters the atmospheric tower for fractionation into the products listed above. The lighter oils are extracted from the tower top sections. The heavier oils feed the crude vacuum tower unit for distillation under a vacuum to recover gas oils. The atmospheric tower bottoms are heated and enter the vacuum tower. The overhead vapors are burned in a furnace. The overhead liquid is recycled to the crude charge. The heaviest material, vacuum tower bottoms, is used as coker feed stock.

Unit 7991 – Saturate Gas Unit recovers propane and heavier products from various refinery liquids and vapors containing primarily saturated hydrocarbons. The unit produces the following products: propane, mixed butanes, light straight run gasoline, and straight run gasoline.
The unit consists of two sections, the debutanizer section and the absorber stripper-fractionation section. In the debutanizer section, the crude unit naphtha is processed and sent on as feedstock to the Naphfining Unit. The absorber-stripper-fractionator section produces the propane/butane feedstock for the alkylation unit.

Unit 293 – Gulfiner

Unit 293 Gulfining Unit hydrogenates and desulfurizes a mixture of cracked furnace oils to produce a product suitable for blending into diesel fuel. The hydrodesulfurization is accomplished by treating the furnace oil mixture with hydrogen in the presence of a catalyst (hydro-treating process) at an elevated temperature.

Cracked furnace oil is combined with separator off-gas from the Naphfining Unit (Unit 291) and then heated before being fed to the reactor. In the reactor, the combined feed stream flows through a series of five catalyst beds within the reactor vessel. The reactor effluent is cooled to 350 degrees Fahrenheit and flashed to produce a vapor. This vapor is cooled and flashed again to produce recycle hydrogen and quench hydrogen gas. The net production of separator (hydrogen-rich) off-gas is sent to the amine contactor for hydrogen sulfide removal and is used as Thermal Hydrodealkylation Unit make-up hydrogen and fuel gas. The liquids produced by the flash separations of the reactor effluent are fractionated in the stabilizer. The Gulfiner light furnace oil and heavy furnace oil from the stabilizer are cooled and sent to storage as a blend stock for diesel.

Unit 292 – Diesel Hydrotreater

The Diesel Hydrotreater Unit hydrogenates and desulfurizes a mixture of furnace oils to produce a product suitable for blending into low sulfur diesel fuel. The hydrodesulfurization is accomplished by treating the distillate feed streams with hydrogen in the presence of a catalyst (hydro-treating process) at an elevated temperature.

The distillate feed stream is combined with hydrogen and heated to an elevated temperature before being fed to the reactor. In the reactor, the combined feed stream flows through a single catalyst bed. The reactor effluent is cooled and flashed to produce a vapor, which constitutes the hydrogen rich recycle gas. The liquid produced by the flash separation of the reactor effluent is fractionated in the stabilizer.

The stabilizer overhead gas and liquid products are routed to the Saturated Gas Unit (Unit 7991) for further processing. The stabilizer bottoms are routed to storage for use as a blending component for the production of low sulfur diesel.

Unit 292 emission sources include the reactor heater and stabilizer reboiler, which are fired with refinery fuel gas. Fugitive VOC is emitted from the hydrotreater piping system. Storage tank emissions and fugitive emissions associated with storage piping systems are permitted unit the Unit 412 – Offsites (Tank Farm) Title V Permit.

Units 1391/1791/1792/291 – Catalytic Reformer, Aromatic Extraction, Thermal Hydrodealkylation, Naphfiner

The Naphfining Unit (NU), Unit 291, reduces the sulfur, nitrogen, and oxygen content of the Catalytic Reforming Unit (CRU), Unit 1391, feed. This is accomplished by treating the naphtha with hydrogen in the presence of a catalyst at an elevated temperature. The naphtha feed is combined with hydrogen-rich gas entering the unit. The combined stream is heated and passed through the reactor. The reactor effluent is partially cooled, combined with excess hydrogen-rich gas, and cooled further. The resulting vapor-liquid mixture is then flashed in a separator. The separator off-gas is utilized as hydrogen feed for other hydrotreating units. The liquid from the separation of the reactor effluent is sent to the Deisohexanizer for fractionation. The deisohexanizer overheads (both gas and liquid) are routed to the Saturated Gas Unit, Unit 7991, for further processing.

The deisohexanizer bottoms product treated naphtha is fed to the CRU. The CRU processes the desulfurized blend of deisohexanized straight run naphtha from the NU and coker naphtha. The CRU produces Depentanized Reformate, Hydrogen, Depentanized Overhead Vapor, and Depentanized Overhead Liquid. The reformate is fed to the Reformate Splitter Column, 1791-V-1 (Unit 1791 – Aromatic Extraction Unit), which is physically located in Unit 1391. The Splitter overhead product is charged via intermediate storage to Unit 1791 for the aromatics extraction process. The heavy reformate produced is sent to storage for use in gasoline blending.

The Aromatic Extraction Unit (AEU), Unit 1791, extracts aromatics from reformate produced in the CRU. The reformate is first split into light and heavy fractions. Light Reformate is introduced into the Extractor Column where a counter-current flow of solvent extracts the aromatic compounds. The Raffinate stream, containing the non-aromatic fraction of the feed, is fed to the Raffinate Splitter Column. The products from this column, Light and Heavy Raffinate, are used for gasoline, diesel, and jet-fuel blending. The solvent-aromatics mixture from the Extractor Column is heated in the Recovery Column where aromatics are fractionated overhead. The overhead (benzene, toluene, and xylenes) is fed to the Benzene Column to be fractionated into xylene and a benzene-toluene mixture. Xylene is shipped via

marine vessels; the benzene-toluene mixture is feedstock to the Thermal Hydrodealkylation Unit (THDU), Unit 1792, where benzene is produced.

A benzene/toluene mixture, either from the Aromatics Extraction Unit (AEU) or purchased off-site, is preheated by the Hydrodealkylation Charge Heater and then combined with unconverted toluene from the THDU reactor, benzene/toluene mixture from the benzene recovery unit, and hydrogen. The combined streams are fed to the hydrogenation reactor to remove impurities. The hydrogenation reactor effluent is cooled and the components are separated. A portion of the separated vapor is used as recycle hydrogen. The other portion of the vapor is processed by the Benzene Recovery Unit (BRU). The remaining gas is sent to the refinery fuel gas system. The separator liquid is sent to the Benzene Tower for fractionation into benzene product, toluene, and heavy aromatics. The toluene and aromatics are routed to the THDU reactor for conversion into benzene.

Unit 294 - LSG

The Alliance Refinery produces a full boiling range fluid catalytic cracking (FCC) gasoline stream, which is treated to reduce the sulfur content through additional hydrotreating facilities, which lower the sulfur content of the motor gasoline pool. The motor gasoline pool consists primarily of naphthas with different boiling points.

Generally, for the hydrotreating process, fresh liquid feed, makeup hydrogen, and gasoline are heated and contacted with one or more fixed bed catalytic reactors. Reactor effluent is cooled and separated. The liquid is stripped to remove light components and hydrogen sulfide. Hydrogen-rich gas is amine treated to remove hydrogen sulfide and is recycled back to the reactors. The liquid is then fractionated into the desired products.

Unit 1291/301 - FCC/Boilers

Unit 1291 – FCCU converts gas oils into gasoline by splitting long-chain hydrocarbons under low-pressure, high temperature conditions using a fluid catalyst process. The unit produces the following components in each section:

- Fractionator Section – Decanted oil, light catalytic gas oil, and lower boiling point hydrocarbons; and
- Recovery Gas Section – C_2 and lighter hydrocarbons, Alkylation Unit feed, and light and heavy catalytic gasolines.

In the cracking section, the gas oil feed comes in contact with the fluid catalyst. After contacting the gas oil, the hot catalyst becomes coated with coke. The catalyst is the circulated in the regenerator with air and the coke is partially burned off. The overheads from the cracking section are sent to the fractionator section, which separates the stream into the components listed above. The recovery section processes liquid and vapor from the fractionator overhead jointly with butane and lighter feeds from the 891-Delayed Coking Unit. In the recovery section C_3-C_5 hydrocarbons are separated and sent to 491-HF Alkylation Unit. The sour fuel gas system in Unit 1291 recovers C_2 and light hydrocarbons for use as refinery fuel gas. The gasoline splitter distills the depentanized gasoline into heavy and light components.

The 301-Boilers Unit generates the steam used throughout the refinery. There are two CO Boilers fired by FCCU regenerator flue gas and supplemental refinery fuel gas. These CO Boilers serve as CO control devices for the FCCU Process Vent, Emission Point No. 1291-D-1. A third supplemental boiler is fired by fuel gas. Boiler feed water pumped through the boiler economizer section is preheated prior to entering the steam drum. The water flows out of the steam drum, keeping the boiler tubes full. The fuel gases are combusted, and the heat generated is used to boil the water into steam. Once back in the steam

drum the steam is separated from the water and flows through the boiler superheated section to be distributed through the refinery.

The CO Boilers may operate under an alternative operating scenario to operate the boilers in power mode. In the event of a FCC shutdown, the CO Boilers will operate in Power Mode, burning refinery fuel gas to produce steam for Alliance's other process units.

The Wet Gas Scrubber (WGS) was installed in accordance with the Consent Decree (Civil Action No. H-05-0285) dated December 5, 2005 and commenced operation on November 18, 2009. A Selective Catalytic Reduction (SCR) control device was additionally installed upstream of the WGS to meet the NOx emission limits Alliance accepted per the Consent Decree. The SCR control device commenced operation on March 15, 2015. With the installation of the WGS and the SCR control device, the CO Boilers are routed through the SCR control device and the WGS during normal operations. There are individual stub vents on the CO Boiler lines to the SCR control device and WGS that can be potentially used in the event of a SCR control device and/or WGS Startup, Shutdown or Maintenance (SSM) Activity of FCC shutdown. In the event that the SCR control device and/or WGS is in SSM, the CO Boilers will operate under the CO Boiler Stub Vent for SSM alternate scenario.

Units 491/6191 – Alkylation, Light Ends Recovery Unit

The Light Ends Recovery Unit (LERU) consists of a series of separators, compressors, dehydrators, chillers, exchangers, and fractionation columns and receives the cracked gas stream from the Fluidized Catalytic Cracking Unit (FCCU). This stream is processed, and the various olefin components are separated into two streams: ethane/ethylene and an olefin stream, which contains propane/propylene and butane/butylenes. The ethylene/ethane stream is combined with the fuel gas stream and sent to the amine contactor. The olefin stream is sent to the HF Alkylation Unit (AU).

Upon reaching the AU, the olefin stream and a stream of iso-butane are introduced to hydrofluoric acid, and the three are mixed. A reaction takes place, and the butylene and propylene in the olefin stream are transformed into alkylate, which is used for gasoline blending. Propane, butane, and acid soluble oil are also produced in small amounts and are used in various refinery processes.

Unit 591/592 – SRU

The SRU at the Alliance Refinery consists of one amine regeneration system, two Claus Units, and one SCOT Tail Gas Treater (TGT). Unit 591 includes the amine system, the original Claus Unit, TGT, and the SRU Incinerator. Unit 592 includes the Claus Unit commissioned in 1995.

The SRU is designed to recover sulfur from sour gas streams in the Refinery. Recycle hydrogen from the hydrotreaters and fuel gas from the Fluidized Catalytic Cracking Unit (FCCU) are treated with an amine solution. The amine solution is utilized in contactors to absorb Hydrogen Sulfide (H_2S) and Carbon Dioxide (CO_2) of Carbonyl Sulfide from the fuel gas and recycled hydrogen. This solution is steam stripped in the amine regenerator.

Lean (stripped) amine is recycled back to the amine contactors. The amine regenerator overhead gas contains the H_2S and CO_2. Additional H_2S is recovered from the refinery's sour water streams. Sour water from several units in the refinery is stripped with steam in the Sour Water Stripper (SWS). The overhead gas from the SWS contains H_2S and ammonia (NH_3). The SWS overhead gas is routed to the Unit 592 Claus Unit.

The H_2S in amine regenerator overhead gas and the sour water stripper overhead gas is converted to liquid sulfur via the Claus process. The liquid sulfur is shipped via tanker trucks to chemical companies.

Tail gas is exhaust gas from the Claus process. This tail gas contains H_2S, SO_2, and sulfur that could not be recovered as liquid sulfur in the Claus process. This tail gas is sent to the SCOT TGT unit for treatment. In the SCOT unit, the SO_2 in the tail gas is converted into H_2S, and all but a trace amount of this H_2S is returned to the Claus Unit. The vent gas (with a minimal amount of H_2S) from the TGT is then sent to the SRU Incinerator for destruction.

Unit 891 – Delayed Coker

The purpose of the Delayed Coking Unit is to thermally crack crude unit vacuum tower bottoms (VTB) into the following products; petroleum coke, coker gas oil (CGO), coker furnace oil (CFO), coker gasoline and $C_3 - C_4$ Liquid Fraction. The unit consists of a charge heater, steam generation equipment, two coke drums, fractionation, light ends recovery, and coke handling facilities. The feed for the unit comes from vacuum tower bottoms and refinery slop oil from outside Unit 891. It is also possible to include Fluid Catalytic Cracking Unit (FCCU) decanted oil in the feed to the coking unit.

Unit 7591 – Merox

Unit 7591 produces jet fuel by removing water and naphthenic acids from Light Furnace Oil (LFO). The LFO is fed from the Crude Unit (Unit 191). A detailed process description is given below.

The LFO enters the Unit 7591 and passes through a water separator to remove any excess water. Caustic is then injected in the LFO charge to react with naphthenic acids. The spent caustic is removed in an electrostatic coalescer and discharged into a spent caustic holding tank. Air is then injected (prior to the Merox reactor) to convert mercaptans into disulfides to eliminate sulfur odor and reduce corrosivity. The LFO is then routed through salt and clay filters for removal of water, organic metals, and other contaminants. Heavy Raffinate is injected into the LFO downstream from those filters for flash point control; the resulting product is jet fuel, which is then routed to Jet Fuel Storage and Distribution.

Unit 308W – Wastewater Treatment Plant

Drains, which are in hydrocarbon service and are located within processing areas throughout the refinery, collect wastewater and route it to the Wastewater Treatment Plant (WWTP). Wastewater Collection System (WCS) emissions are controlled from the point of generation using controls such as drain water seals and caps and carbon canisters for junction box vents. Oil/water/solids separation is accomplished using external floating roof tanks and dissolved gas floatation. Vacuum steam strippers are used to strip Volatile Organic Compounds (VOCs) from the wastewater prior to biological treatment (if needed for compliance with NESHAP Subpart FF). Following biological treatment, the treated water is discharged into the Mississippi River. VOCs in the stripper overhead are combusted in a thermal oxidizer.

Unit 412 - Offsites

Offsites unit includes the tank farm and associated piping, pumping, and tank heating equipment. The tank farm stores various refinery streams in fixed roof, internal floating roof, and external floating roof tanks. Each tank is assumed to be operating throughout the year.

Unit 406 - Docks

Marine Loading Operations Unit 406 consists of docks on the Mississippi River. The refinery has the capability to load and unload organic chemicals from these docks. The organic chemicals loaded from the docks onto marine vessels include: FCC charge stocks, xylene, benzene, naphtha, carbon black feedstock, No. 6 fuel oil, various grades of gasoline, light gasoline blending components, jet fuel "A", diesel fuel, light raffinate, and heavy gasoline blending components. Unloading of organic chemicals from marine vessels occurs at the dock facility with no emissions to the atmosphere from Unit 406, except fugitive VOC from piping components traversing the unit.

The products that are loaded are separated into two categories, Marine Vapor Recovery (MVR) and non-MVR. MVR products have a vapor pressure greater than or equal to 1.5 psia. They include the following: Benzene, Light Gasoline Blending Components, Light Raffinate, Premium Gasoline, Regular Gasoline, and Naphtha. When these products are being loaded, they are controlled by a vapor recovery system and a flare for each of the two docks. Non-MVR products have a vapor pressure less than 1.5 psia. They include following: Heavy Petroleum Distillate Products (Fluidized Catalytic Cracking Charge Stocks (FCCS), Carbon Black Feed Stock (CBFS), No. 2 Fuel Oil, Diesel, Diesel Blendstock, Jet Fuel "A"), Heavy Gasoline Blending Components, and Xylene. The vapors resulting from loading of these products are not routed to the vapor recovery system and flares.

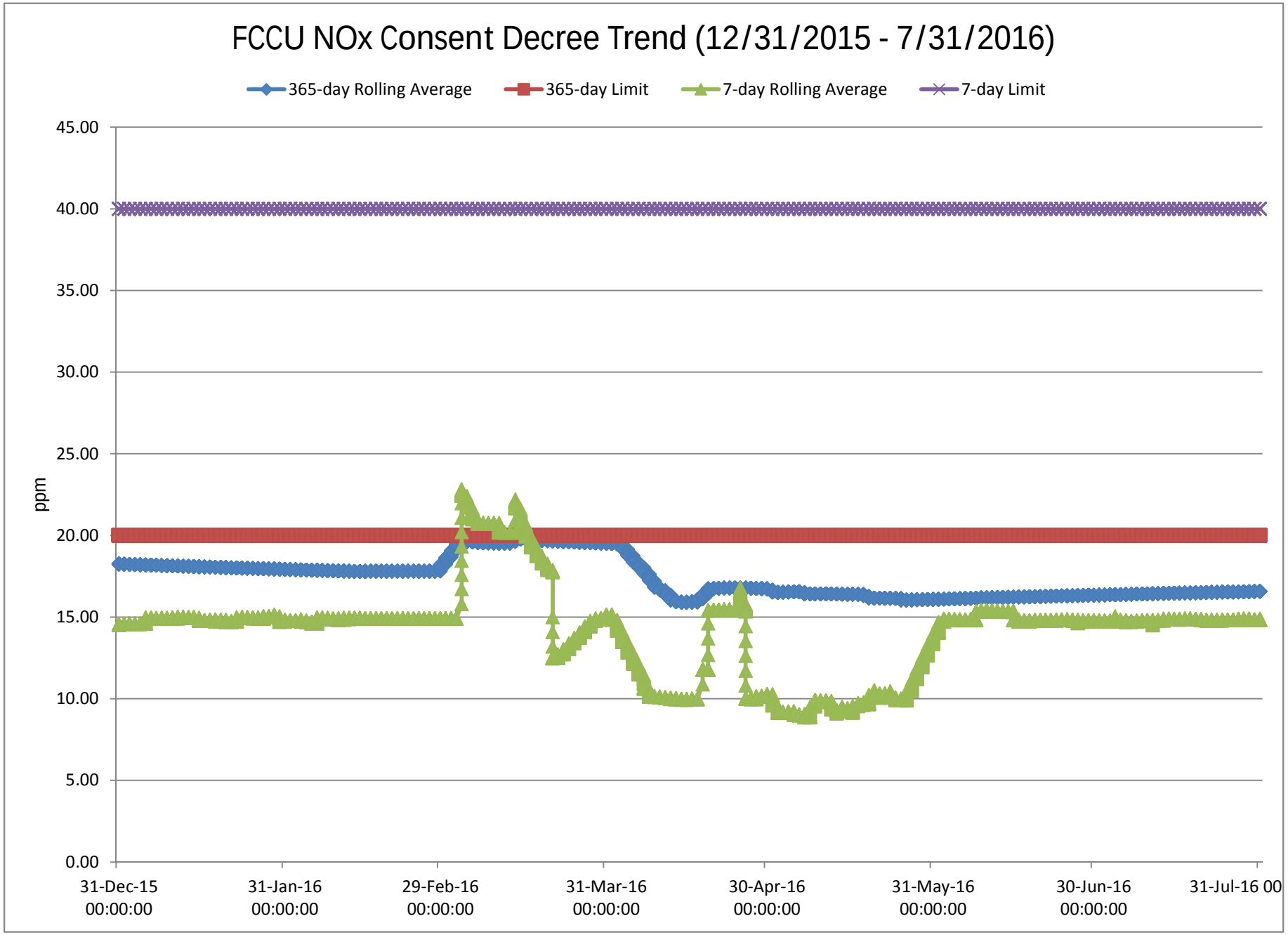
Unit 308F - Flares

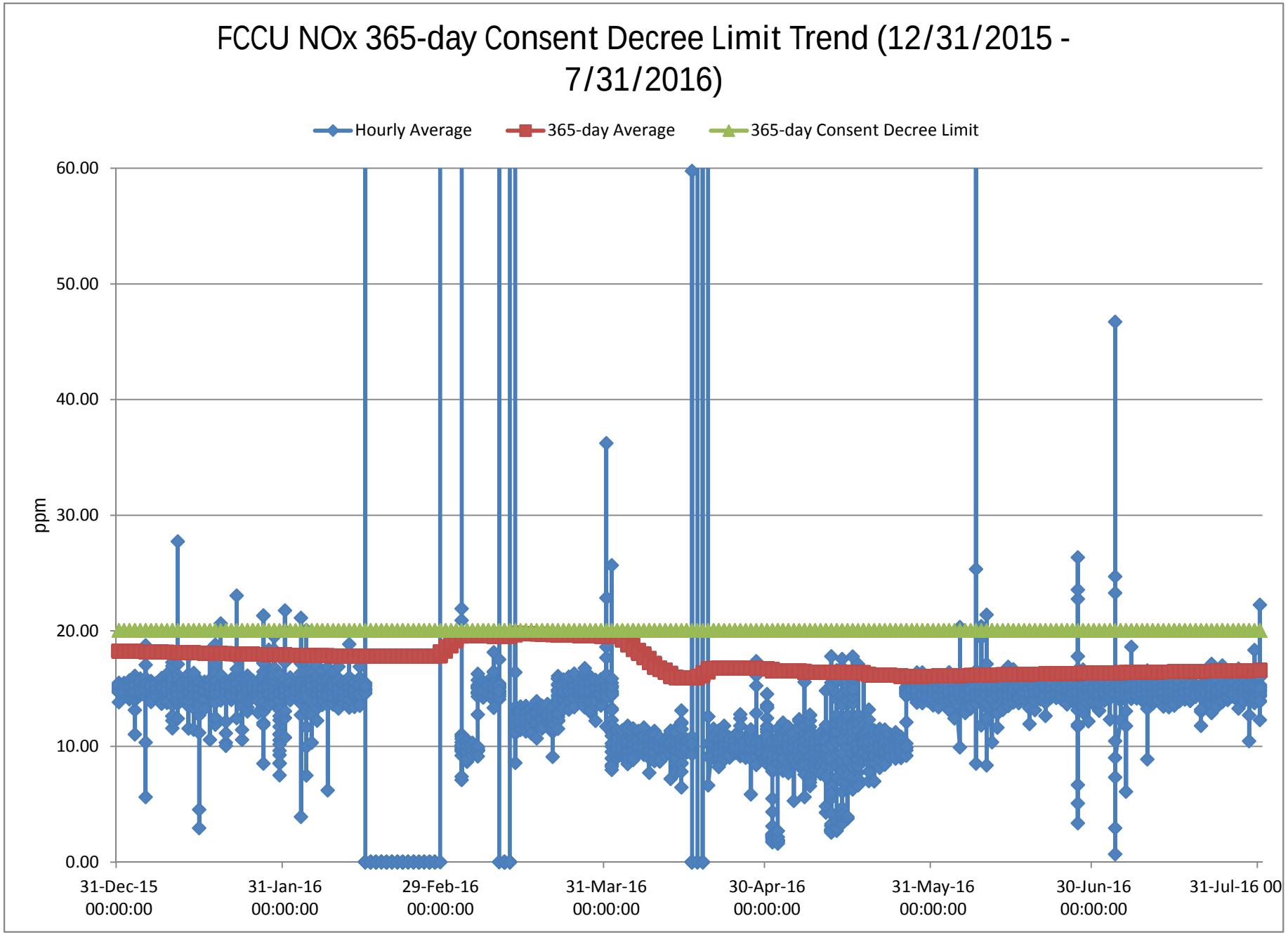
The refinery has two aboveground flares, designated as low and high pressure systems. Various process streams are sent to these flares for destruction. The purpose of the flare system is to provide a means to safely collect gases and/or liquid released from process units. The flares are routinely used for the purging and depressurizing of equipment to prepare them for technical work.

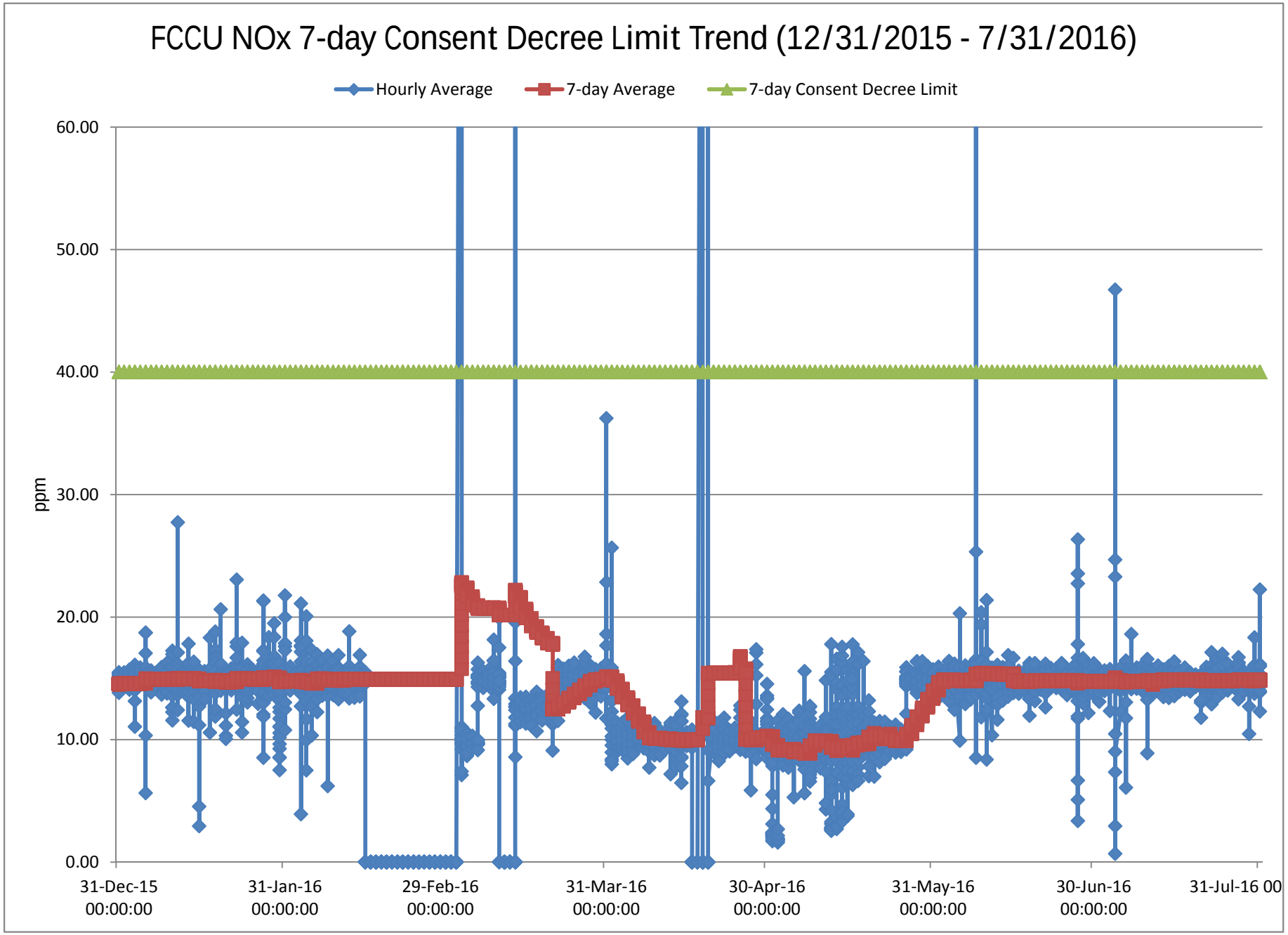
Unit 303 – Utilities

The Utilities Unit, Unit 303, contains plant support and back-up equipment necessary to operate the refinery. There are no commercial products produced by this unit.

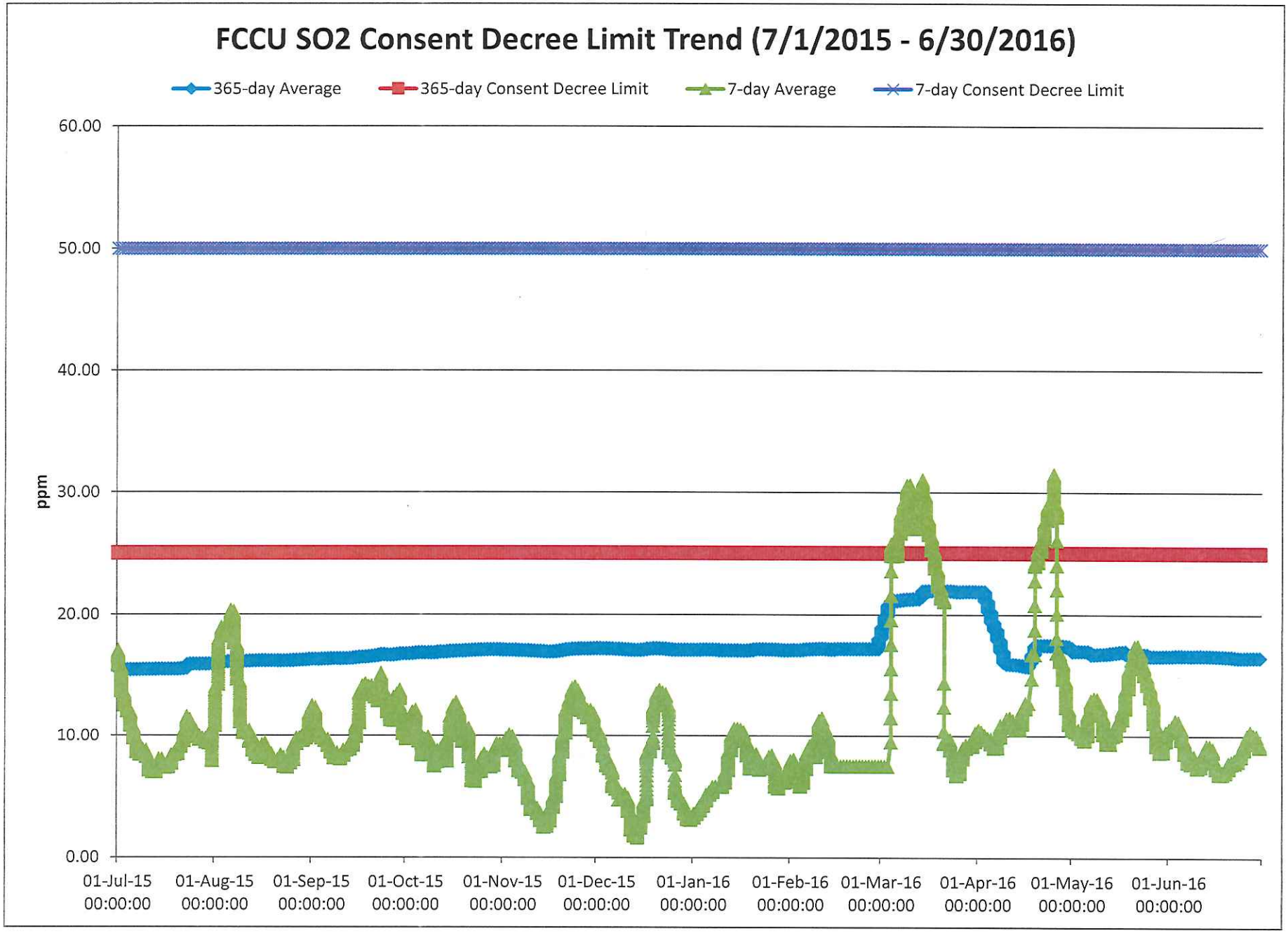
Appendix 4
FCCU NO_x emission trends

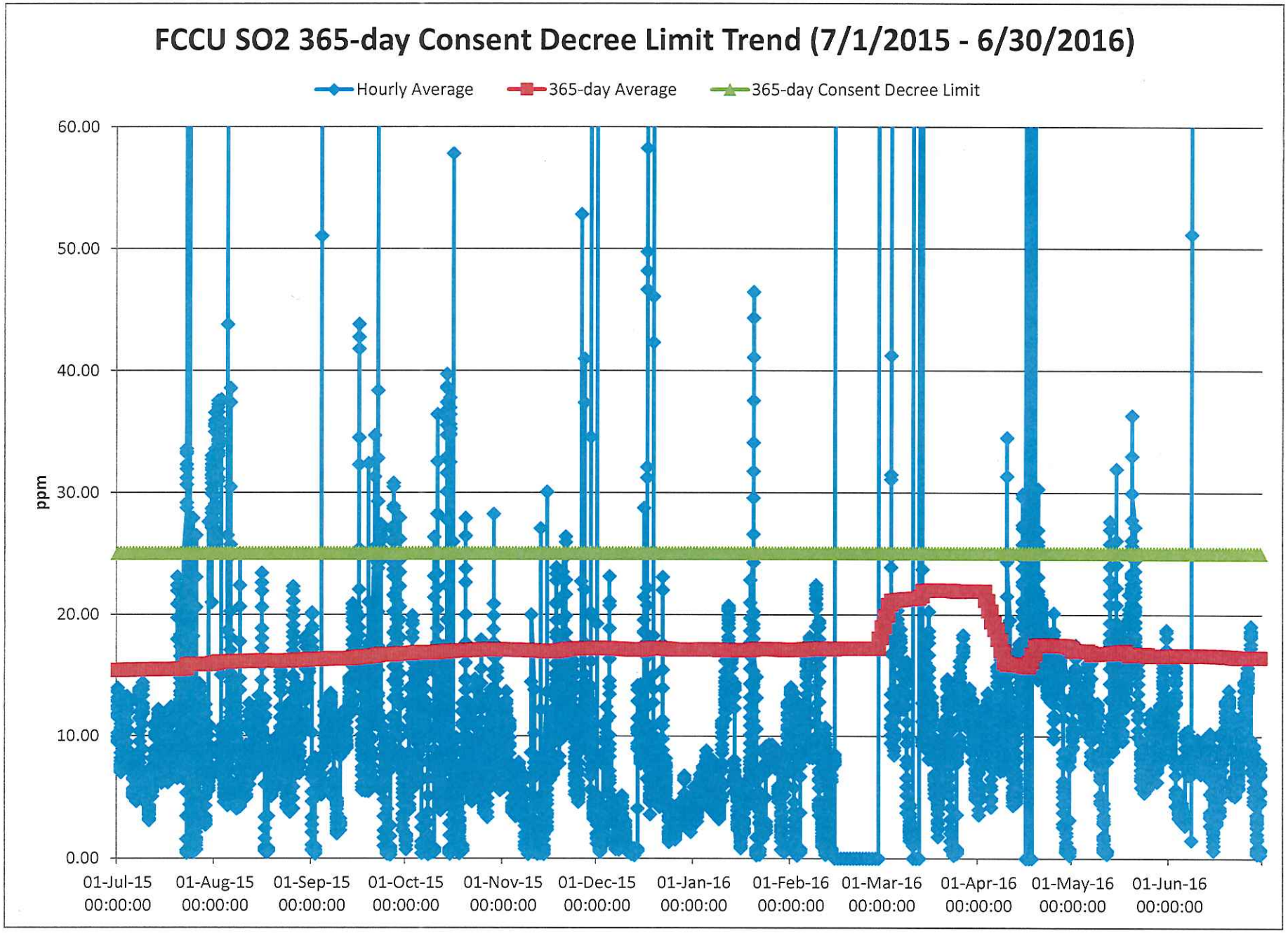

FCCU NOx Consent Decree Trend (12/31/2015 - 7/31/2016)
365-day Rolling Average
365-day Limit
7-day Rolling Average
7-day Limit
ppm
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
31-Dec-15 00:00:00
31-Jan-16 00:00:00
29-Feb-16 00:00:00
31-Mar-16 00:00:00
30-Apr-16 00:00:00
31-May-16 00:00:00
30-Jun-16 00:00:00
31-Jul-16 00

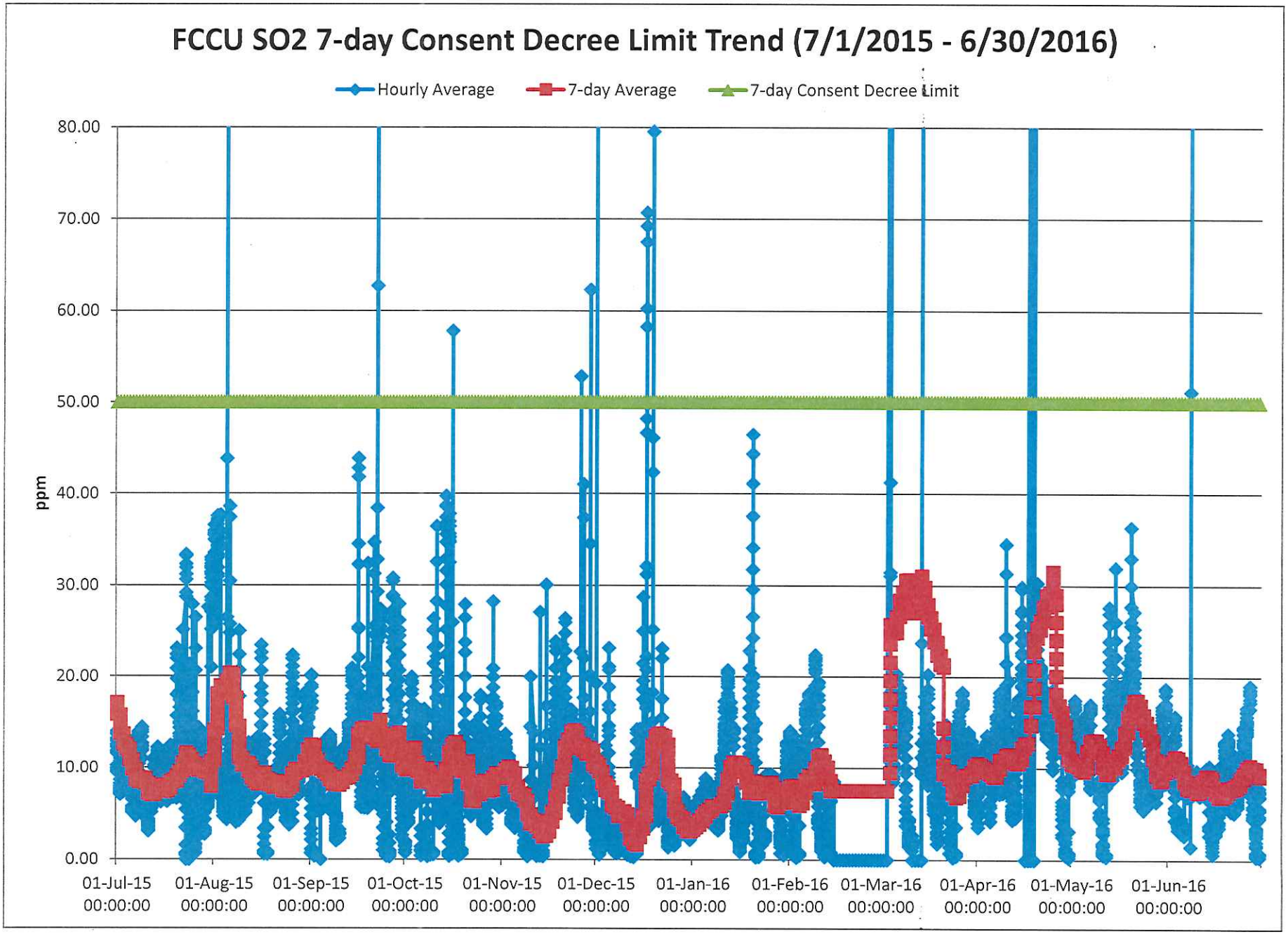

FCCU NOx 365-day Consent Decree Limit Trend (12/31/2015 - 7/31/2016)
Hourly Average
365-day Average
365-day Consent Decree Limit
ppm
60.00
50.00
40.00
30.00
20.00
10.00
0.00
31-Dec-15 00:00:00
31-Jan-16 00:00:00
29-Feb-16 00:00:00
31-Mar-16 00:00:00
30-Apr-16 00:00:00
31-May-16 00:00:00
30-Jun-16 00:00:00
31-Jul-16 00


FCCU NOx 7-day Consent Decree Limit Trend (12/31/2015 - 7/31/2016)
Hourly Average
7-day Average
7-day Consent Decree Limit
60.00
50.00
40.00
30.00
20.00
10.00
0.00
ppm
31-Dec-15 00:00:00
31-Jan-16 00:00:00
29-Feb-16 00:00:00
31-Mar-16 00:00:00
30-Apr-16 00:00:00
31-May-16 00:00:00
30-Jun-16 00:00:00
31-Jul-16 00

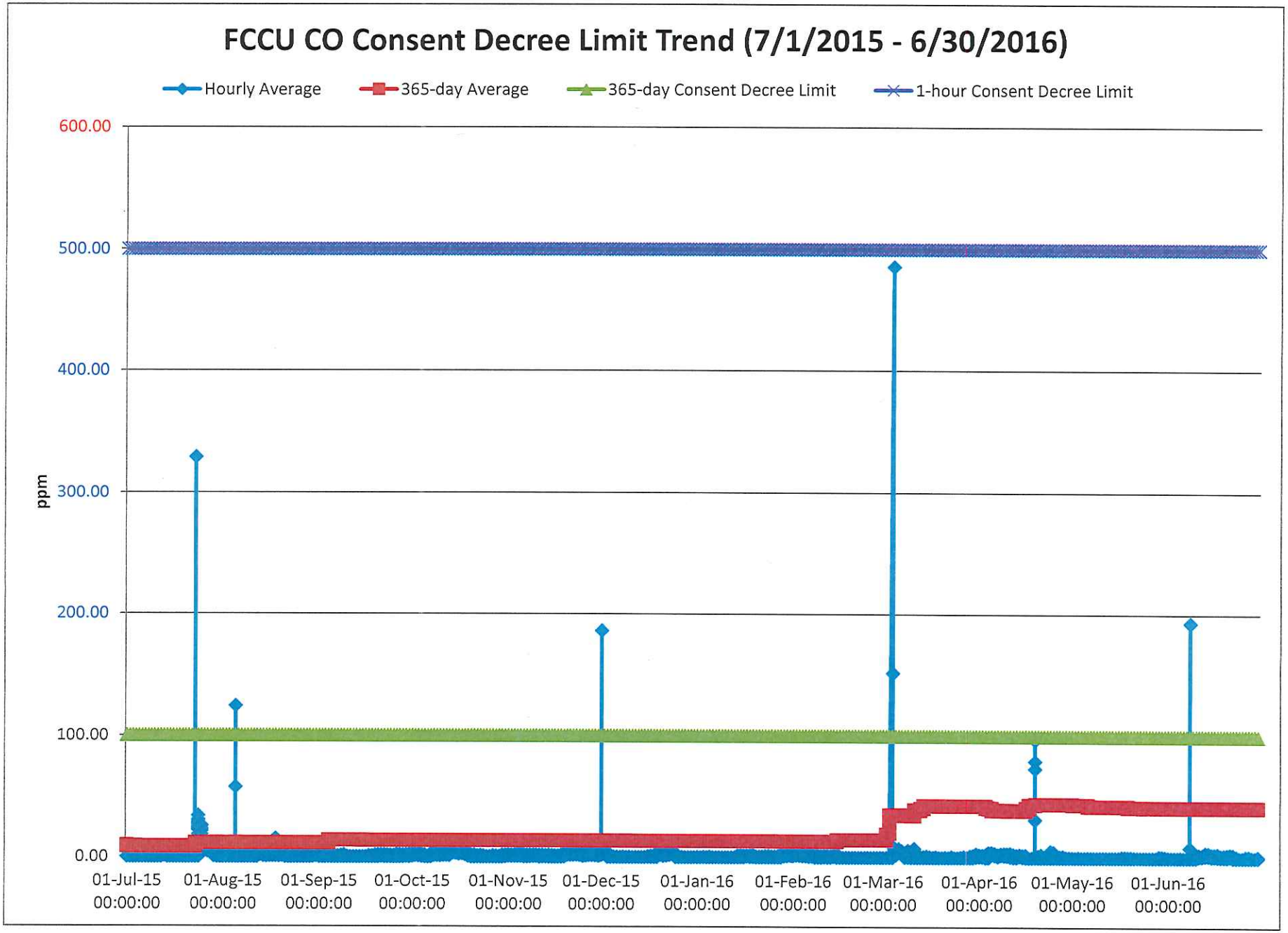
Appendix 5
FCCU SO_2 emission trends


FCCU SO2 Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
365-day Average
365-day Consent Decree Limit
7-day Average
7-day Consent Decree Limit
60.00
50.00
40.00
30.00
20.00
10.00
0.00
ppm
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

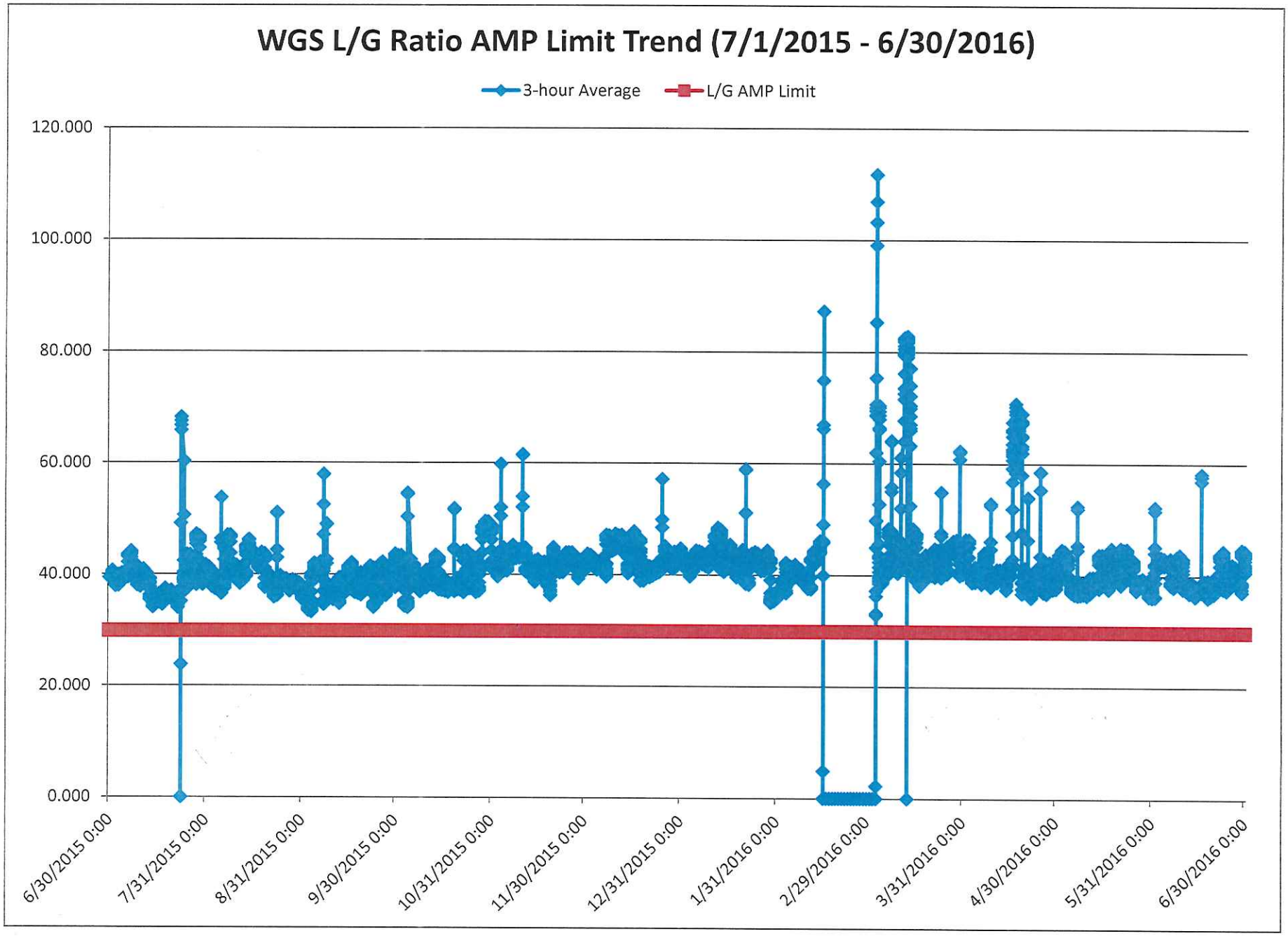

FCCU SO2 365-day Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Hourly Average
365-day Average
365-day Consent Decree Limit
ppm
60.00
50.00
40.00
30.00
20.00
10.00
0.00
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

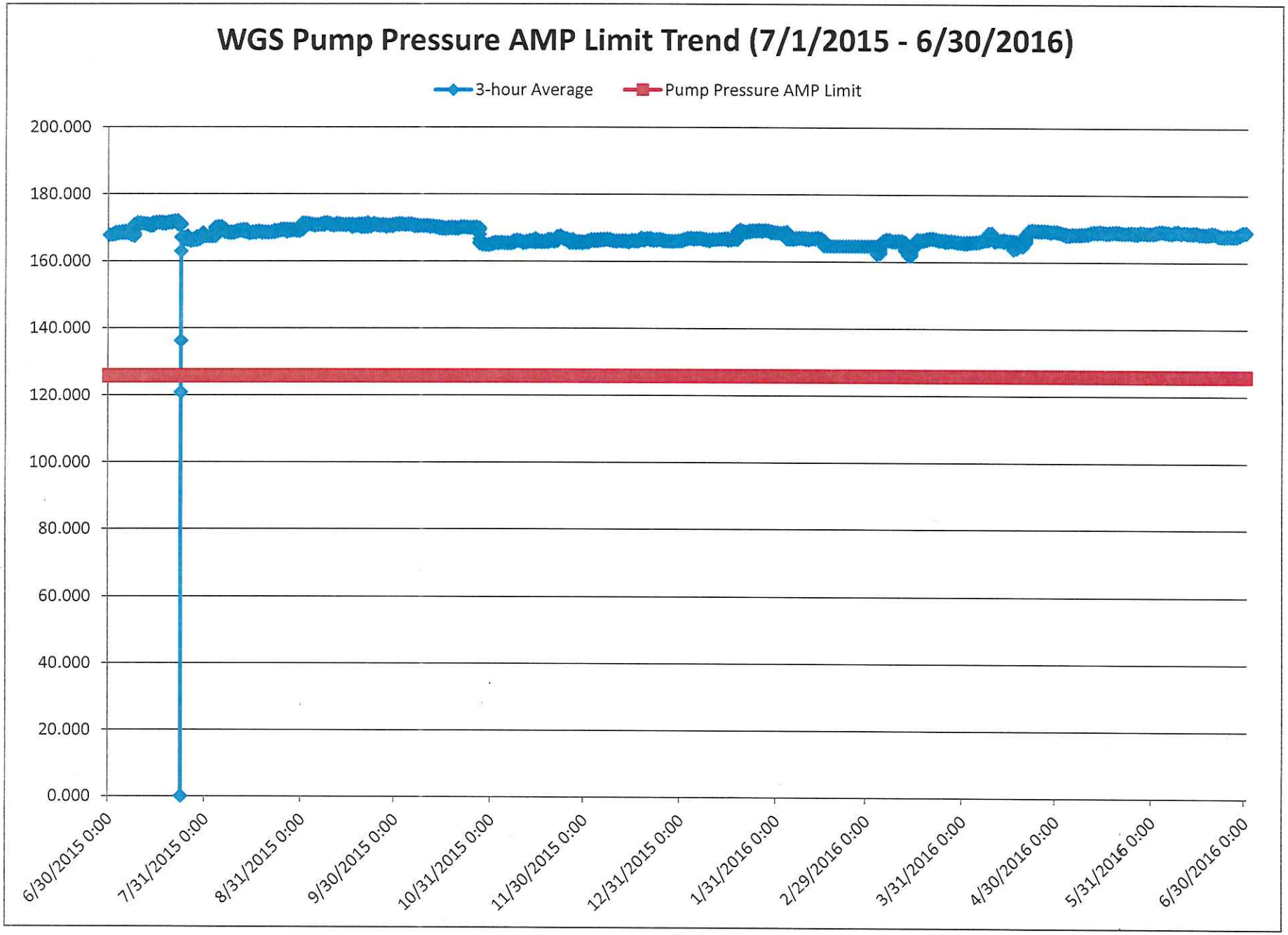

FCCU SO2 7-day Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Hourly Average
7-day Average
7-day Consent Decree Limit
ppm
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

Appendix 6
FCCU CO emission trends

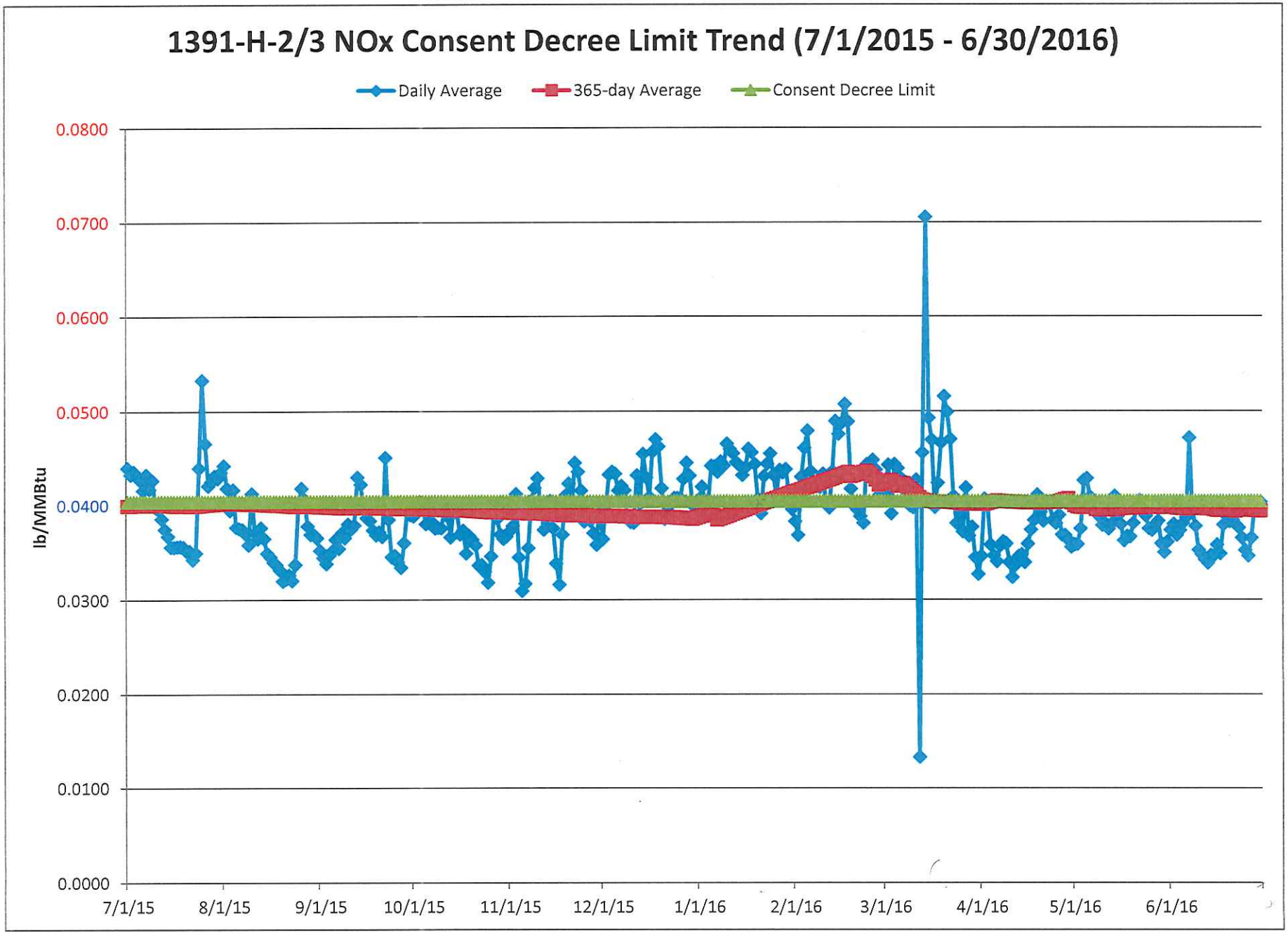

FCCU CO Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Hourly Average
365-day Average
365-day Consent Decree Limit
1-hour Consent Decree Limit
600.00
500.00
400.00
300.00
200.00
100.00
0.00
ppm
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

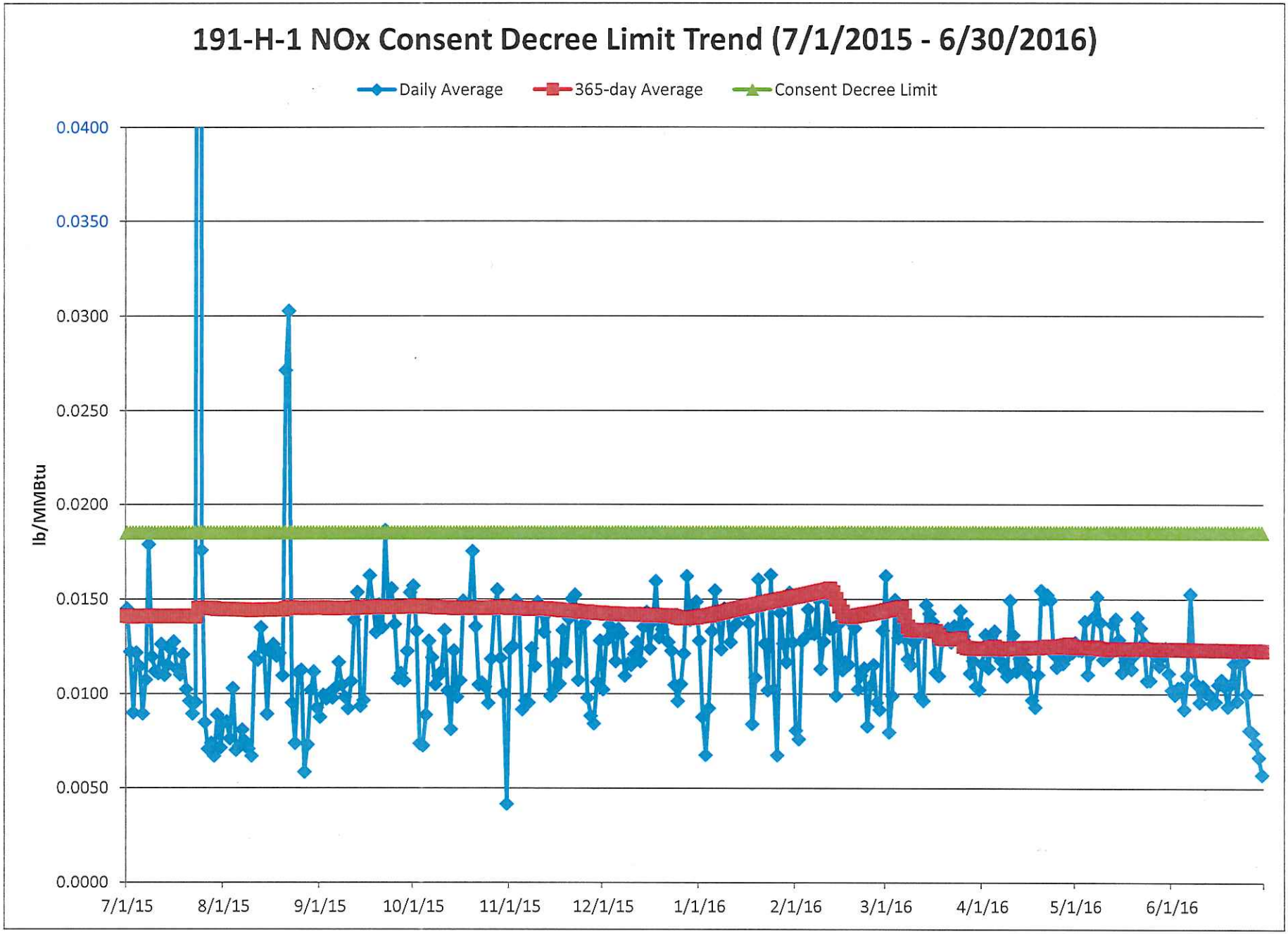
Appendix 7
FCCU L/G ratio and Discharge pressure trends

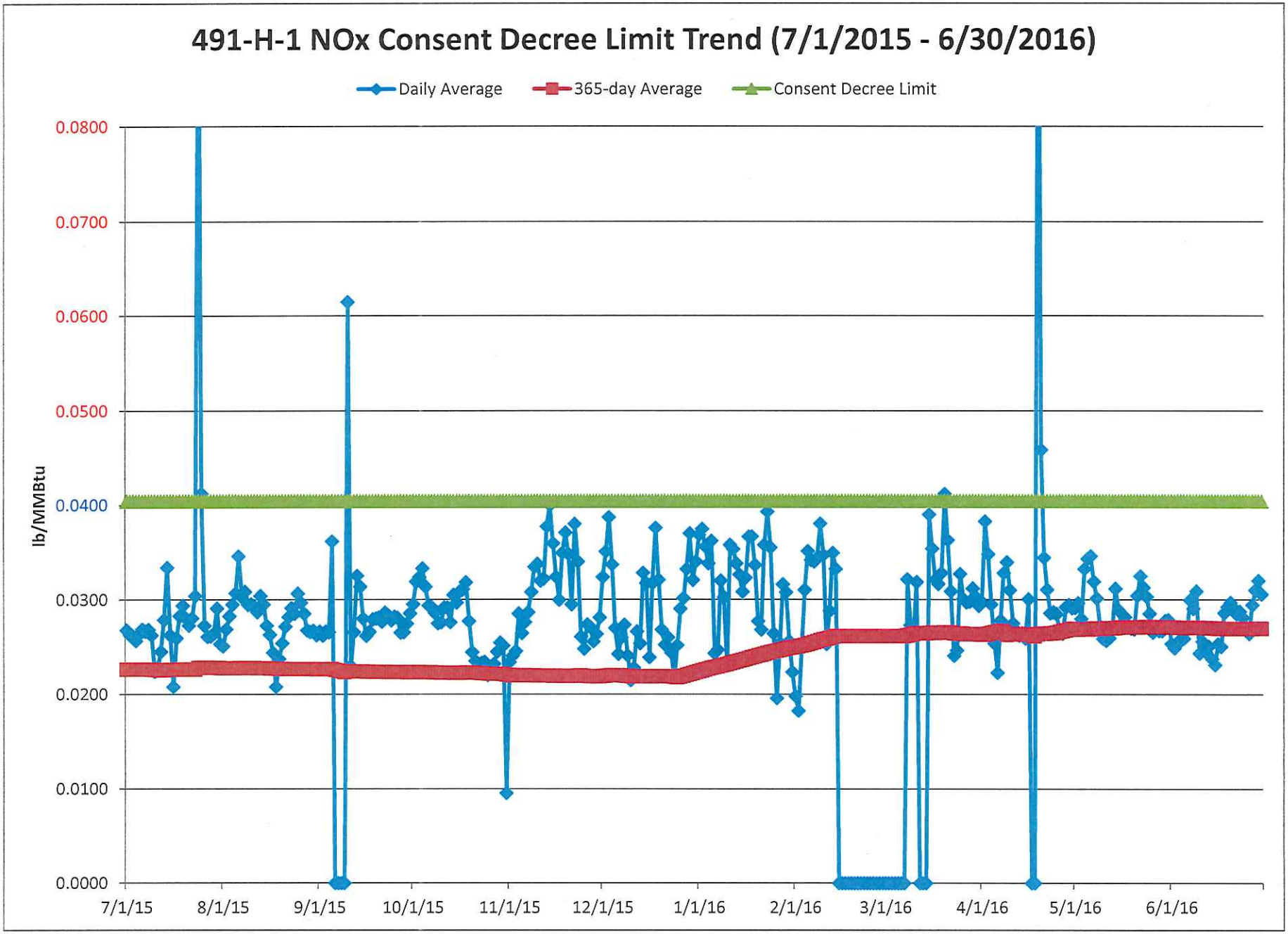

WGS L/G Ratio AMP Limit Trend (7/1/2015 - 6/30/2016)
3-hour Average
L/G AMP Limit
120.000
100.000
80.000
60.000
40.000
20.000
0.000
6/30/2015 0:00
7/31/2015 0:00
8/31/2015 0:00
9/30/2015 0:00
10/31/2015 0:00
11/30/2015 0:00
12/31/2015 0:00
1/31/2016 0:00
2/29/2016 0:00
3/31/2016 0:00
4/30/2016 0:00
5/31/2016 0:00
6/30/2016 0:00

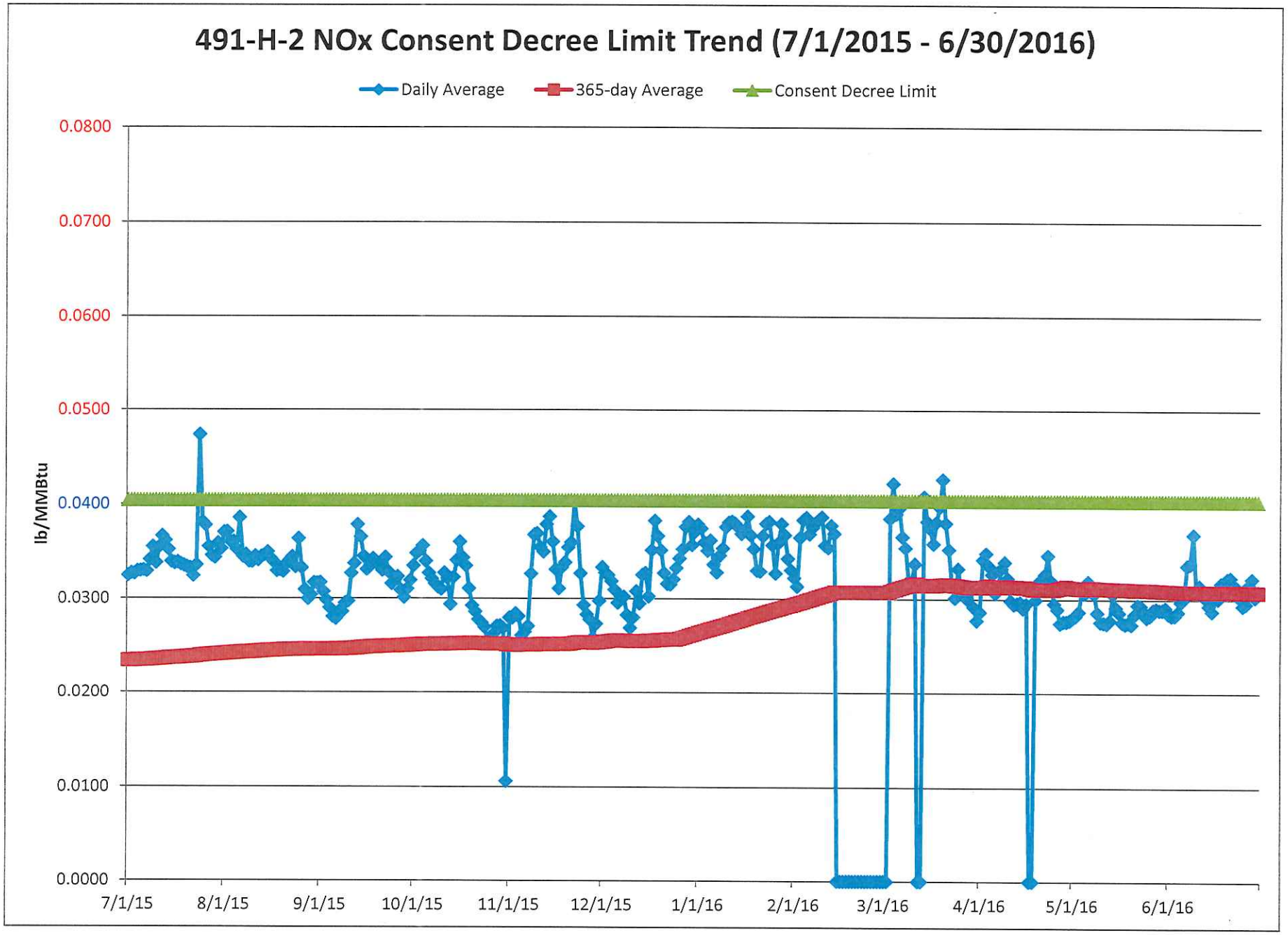

WGS Pump Pressure AMP Limit Trend (7/1/2015 - 6/30/2016)
3-hour Average
Pump Pressure AMP Limit
200.000
180.000
160.000
140.000
120.000
100.000
80.000
60.000
40.000
20.000
0.000
6/30/2015 0:00
7/31/2015 0:00
8/31/2015 0:00
9/30/2015 0:00
10/31/2015 0:00
11/30/2015 0:00
12/31/2015 0:00
1/31/2016 0:00
2/29/2016 0:00
3/31/2016 0:00
4/30/2016 0:00
5/31/2016 0:00
6/30/2016 0:00

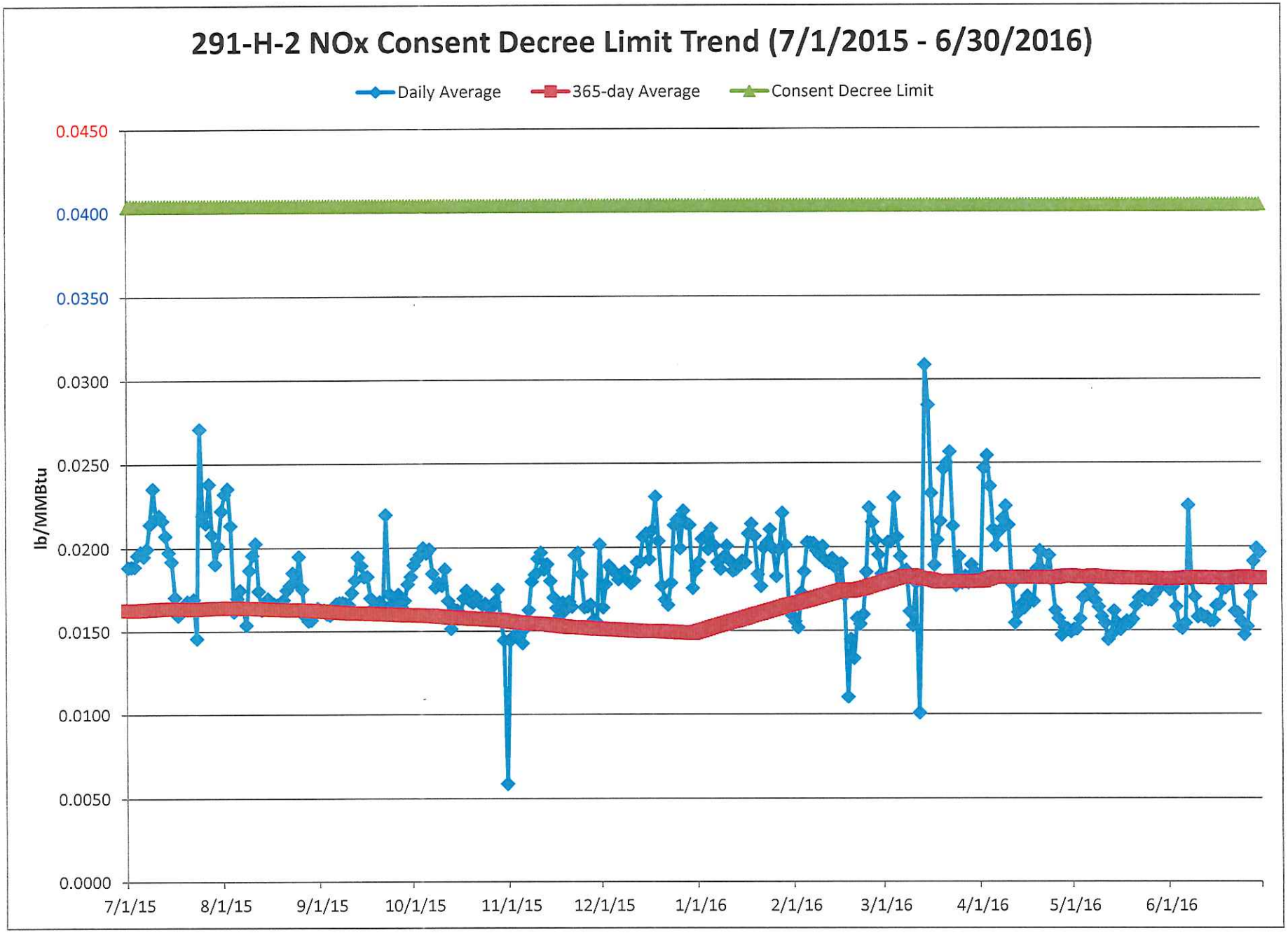
Appendix 8
Combustion units NO_x emission trends

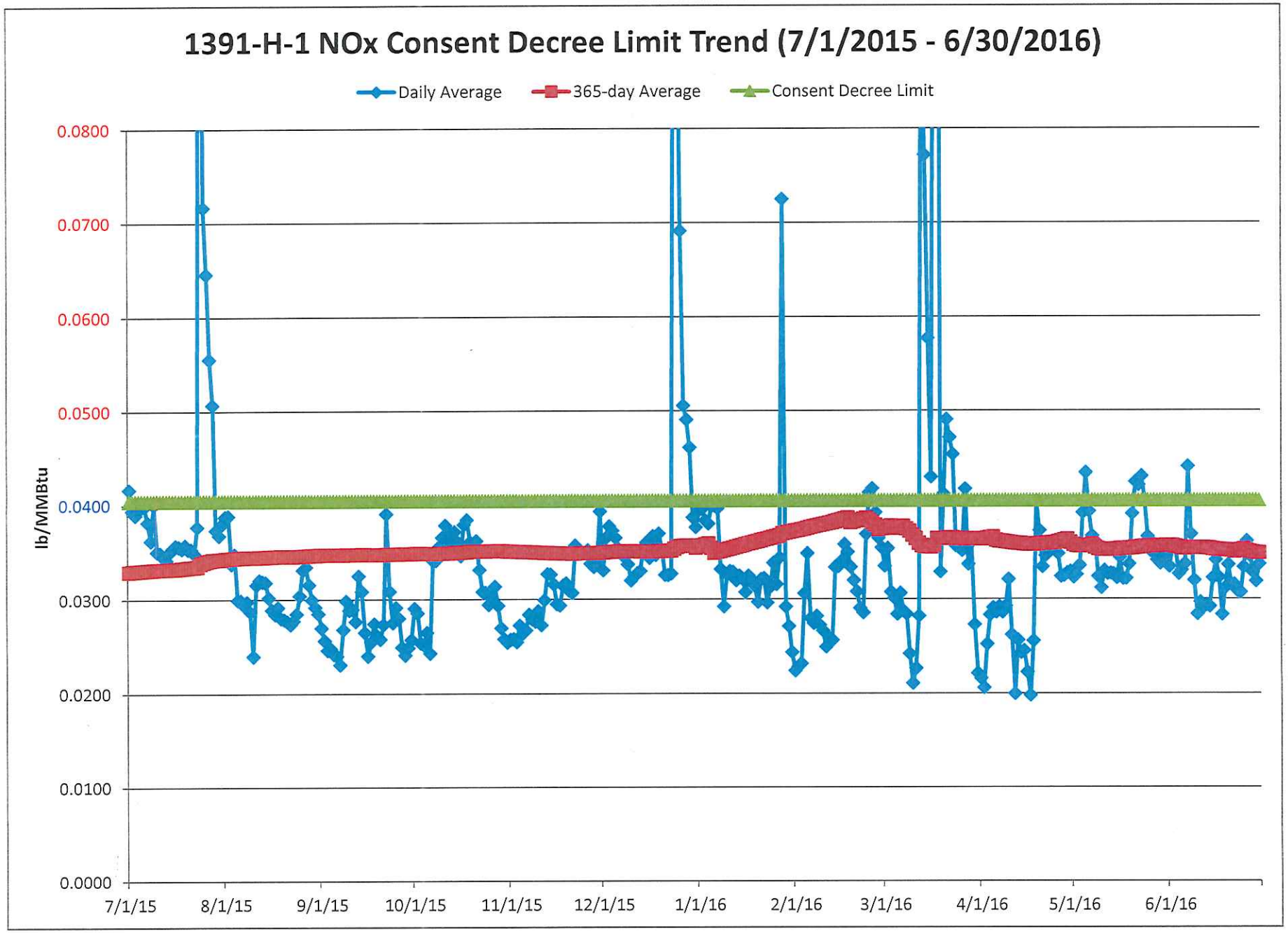

1391-H-2/3 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16

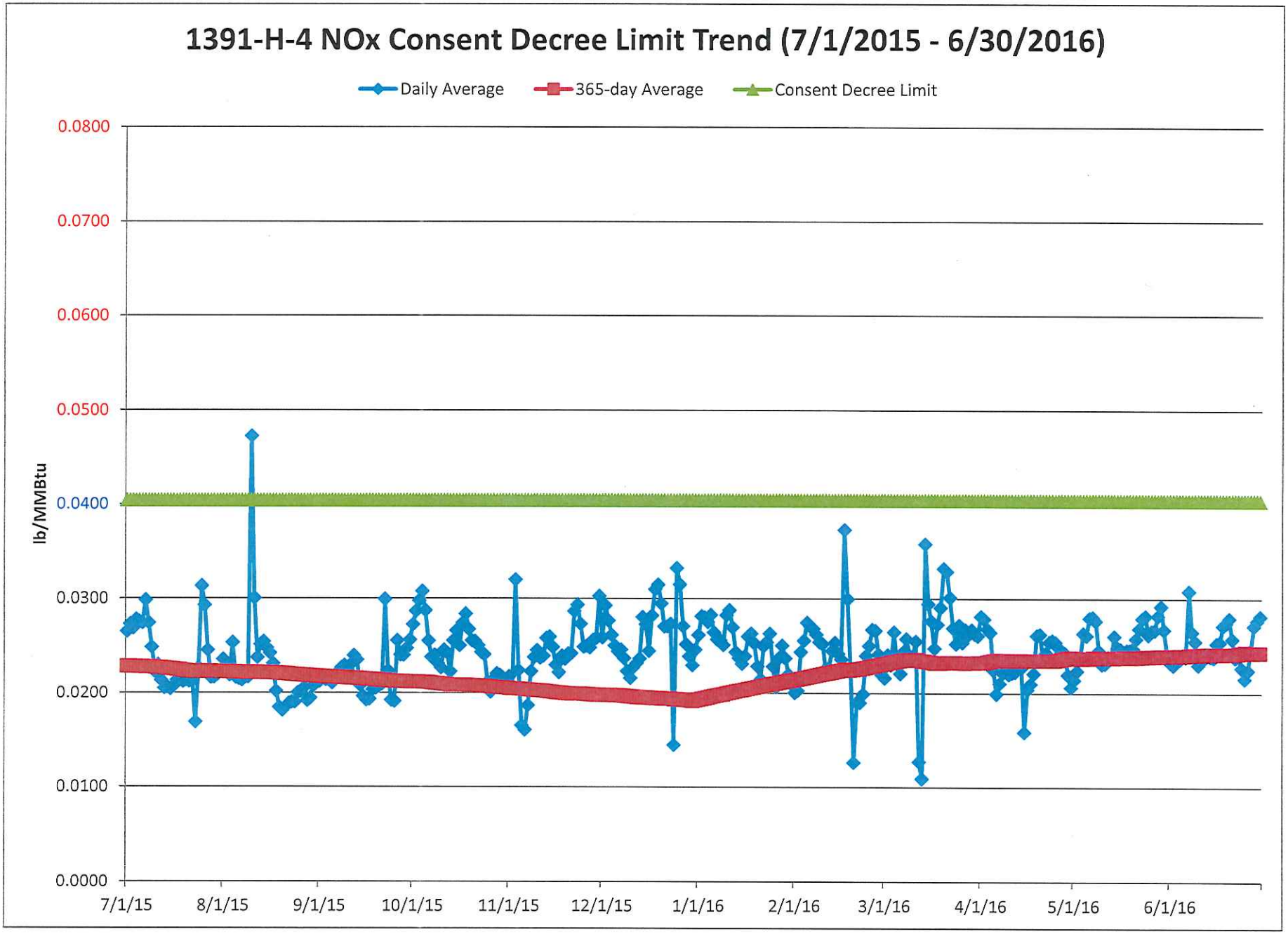

191-H-1 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0400
0.0350
0.0300
0.0250
0.0200
0.0150
0.0100
0.0050
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16

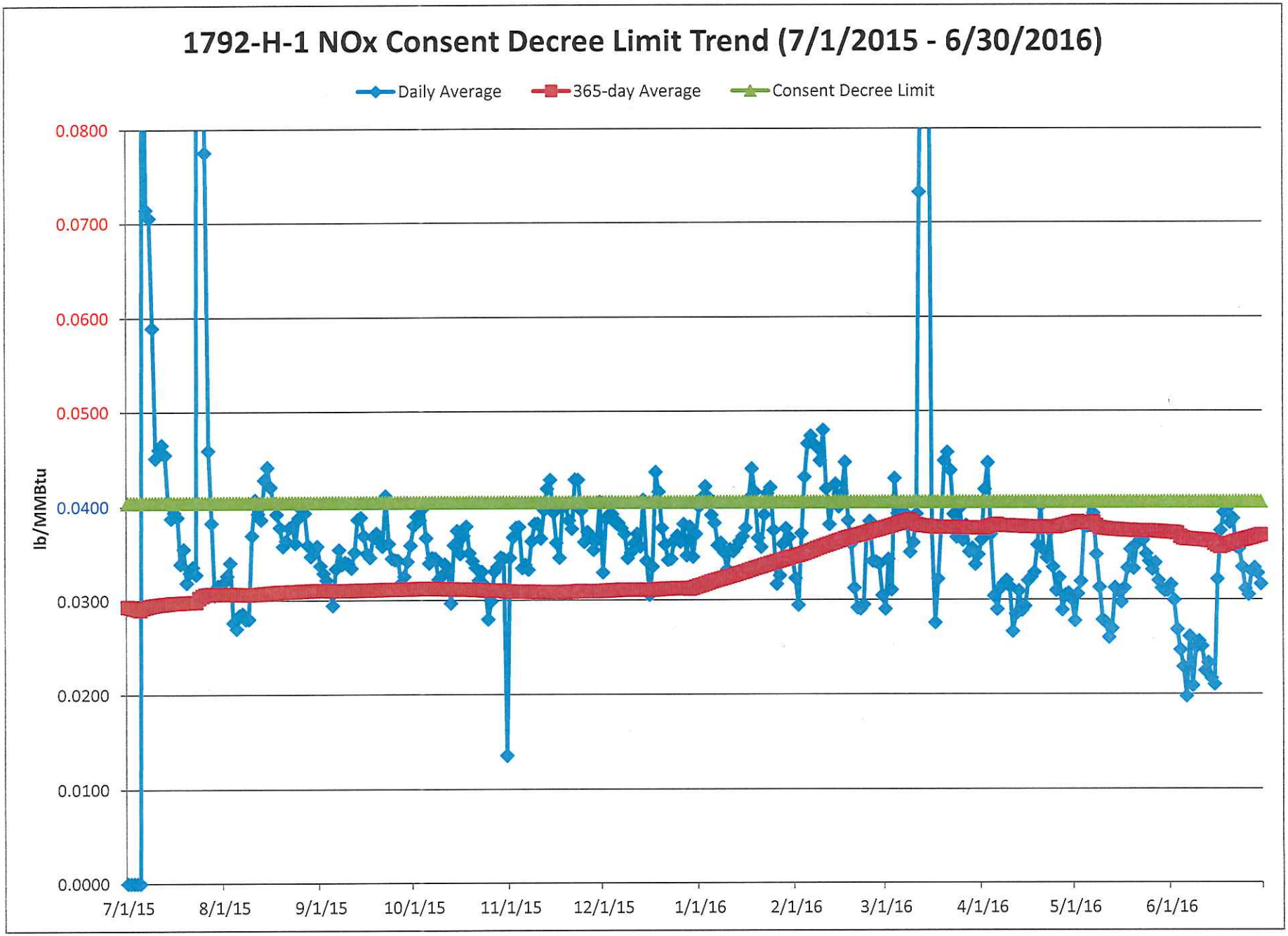

491-H-1 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16

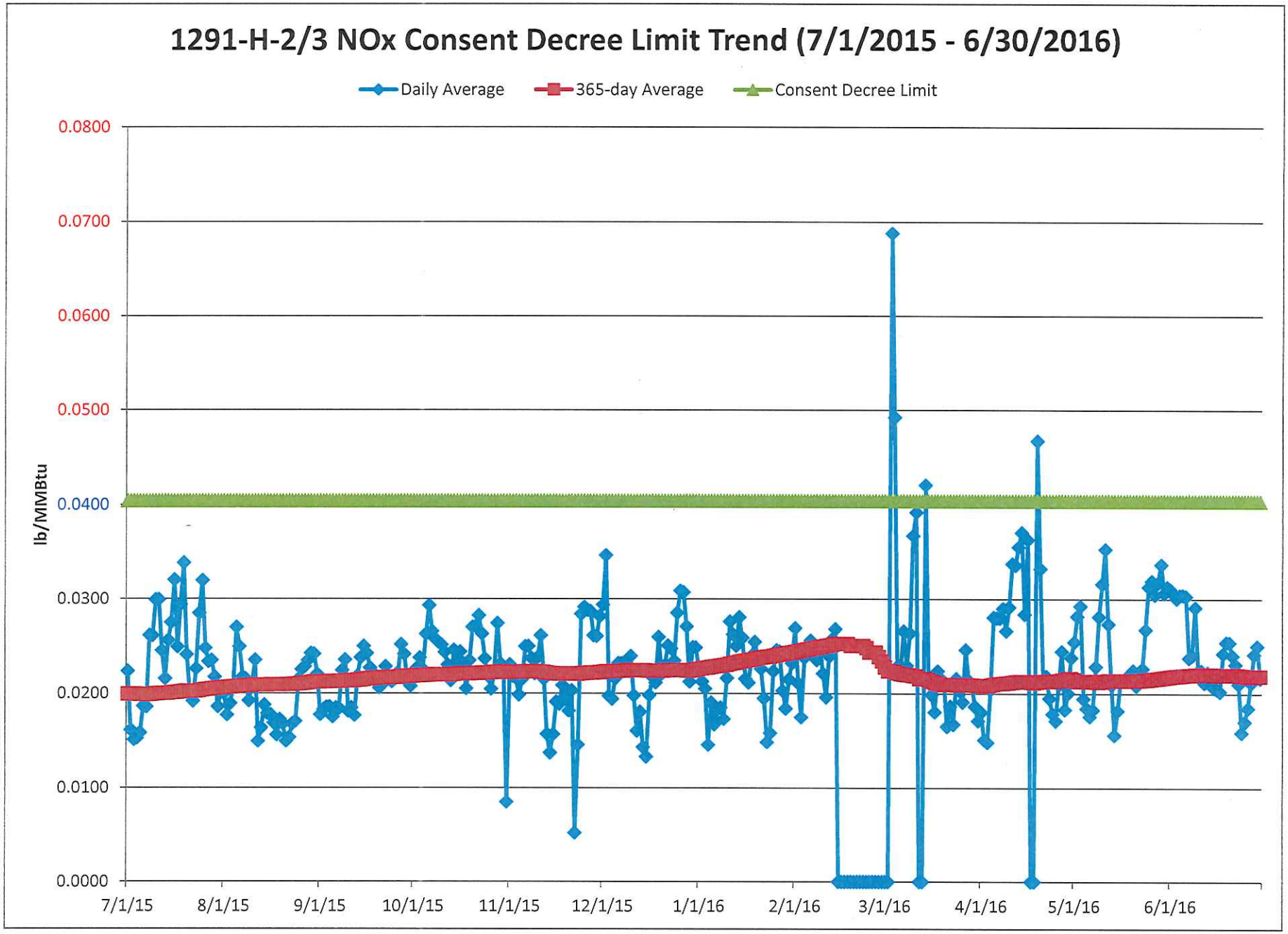

491-H-2 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16


291-H-2 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0450
0.0400
0.0350
0.0300
0.0250
0.0200
0.0150
0.0100
0.0050
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16

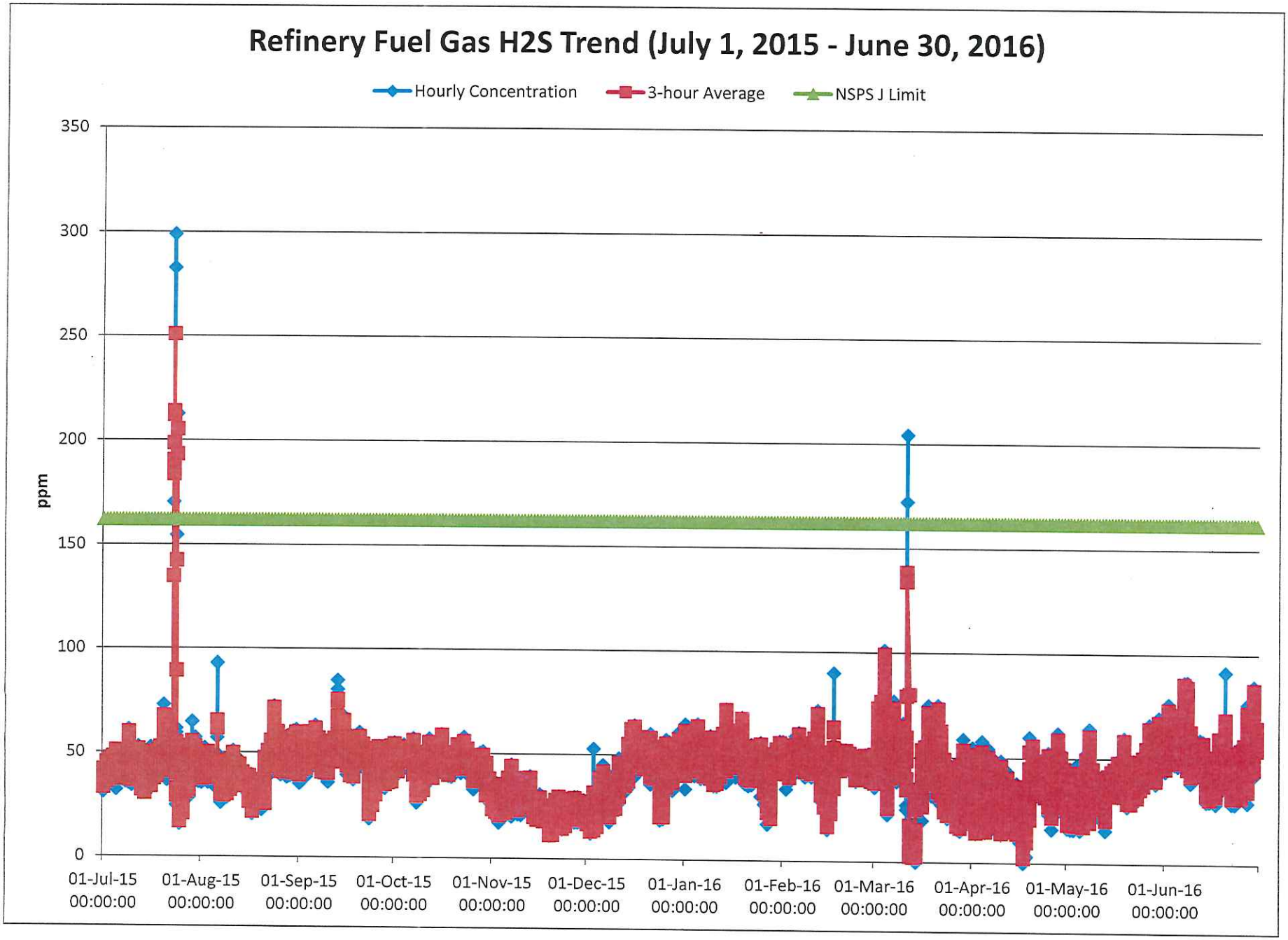

1391-H-1 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16

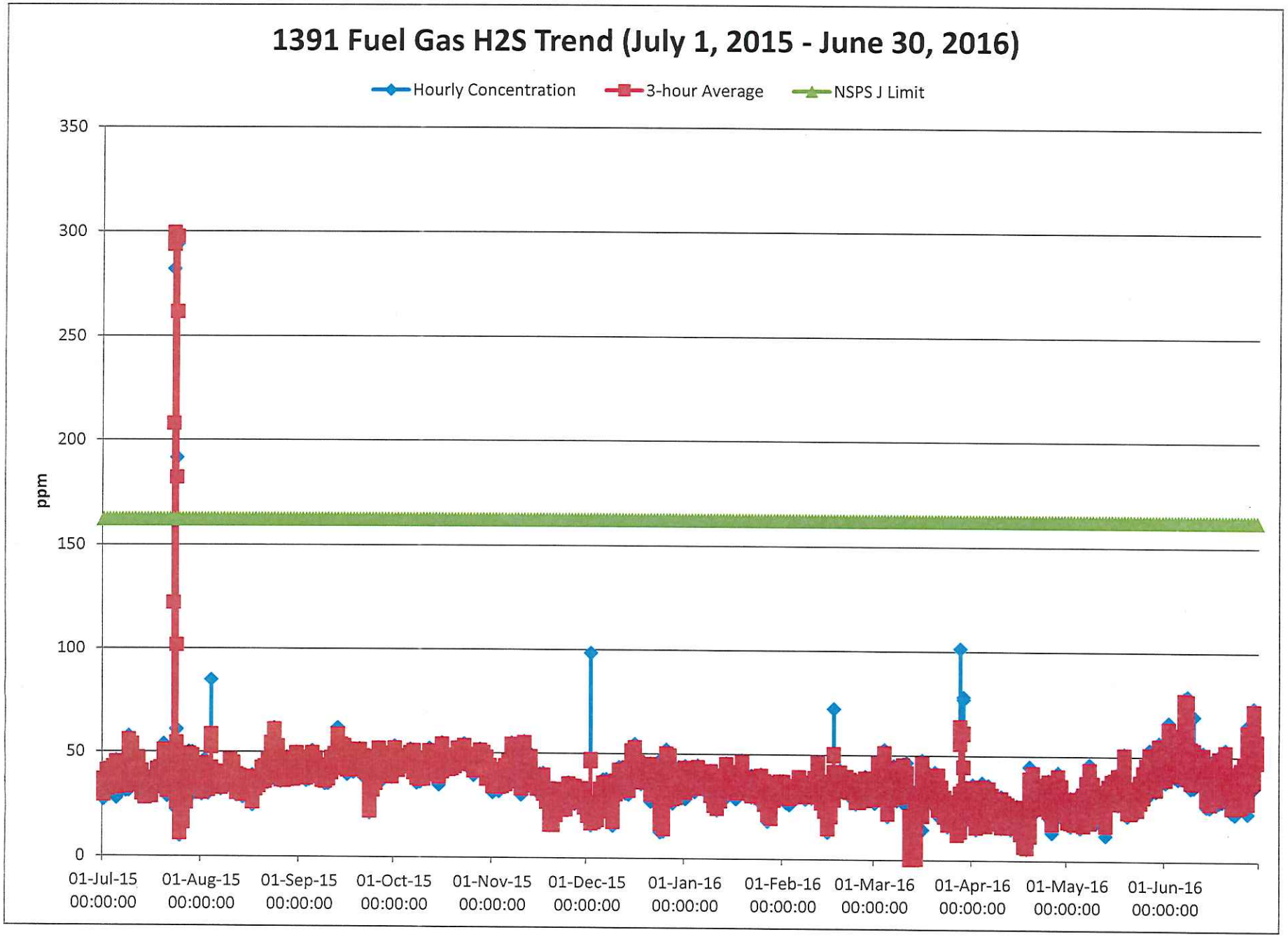

1391-H-4 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16

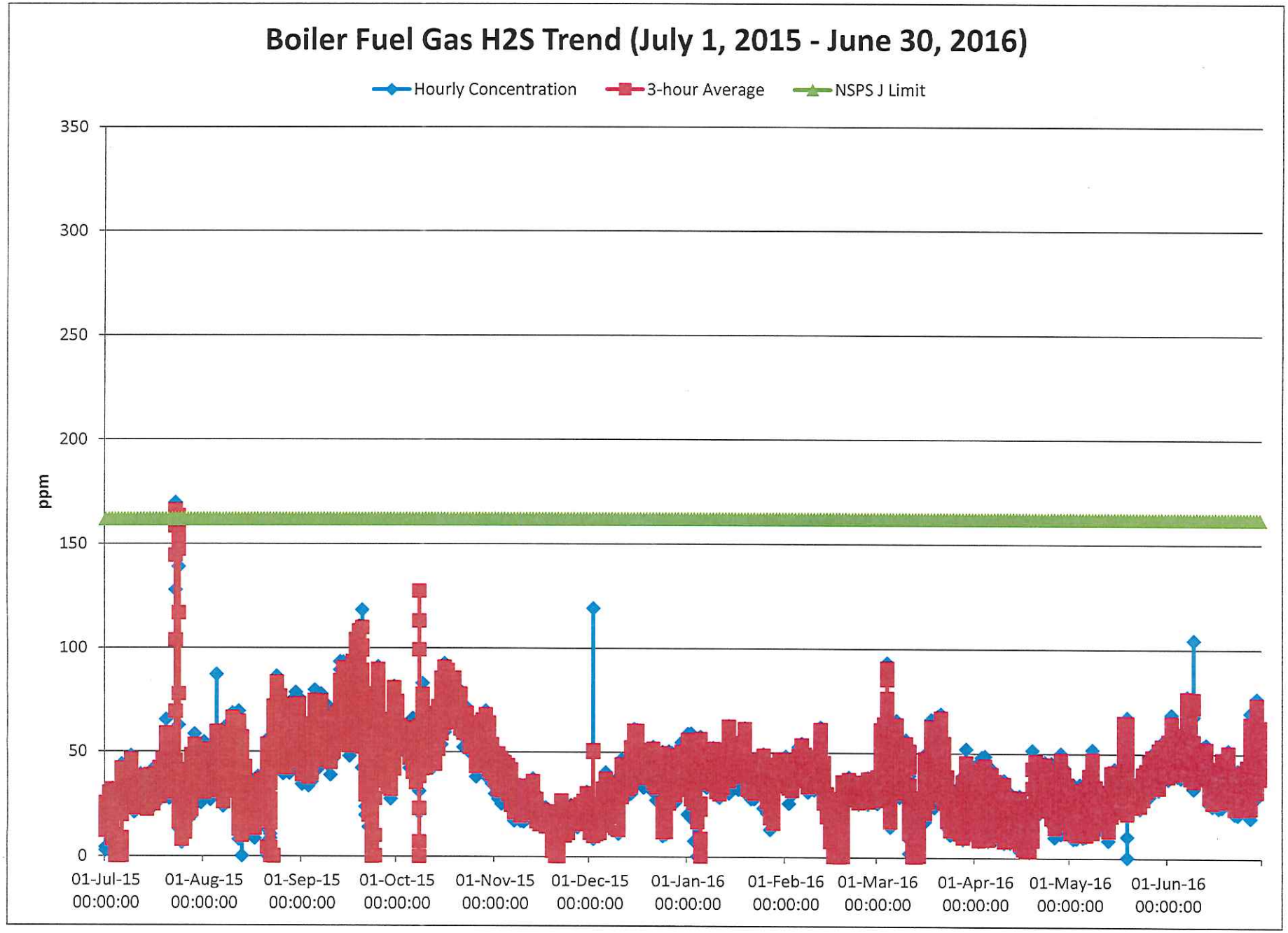

1792-H-1 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16


1291-H-2/3 NOx Consent Decree Limit Trend (7/1/2015 - 6/30/2016)
Daily Average
365-day Average
Consent Decree Limit
lb/MMBtu
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
7/1/15
8/1/15
9/1/15
10/1/15
11/1/15
12/1/15
1/1/16
2/1/16
3/1/16
4/1/16
5/1/16
6/1/16

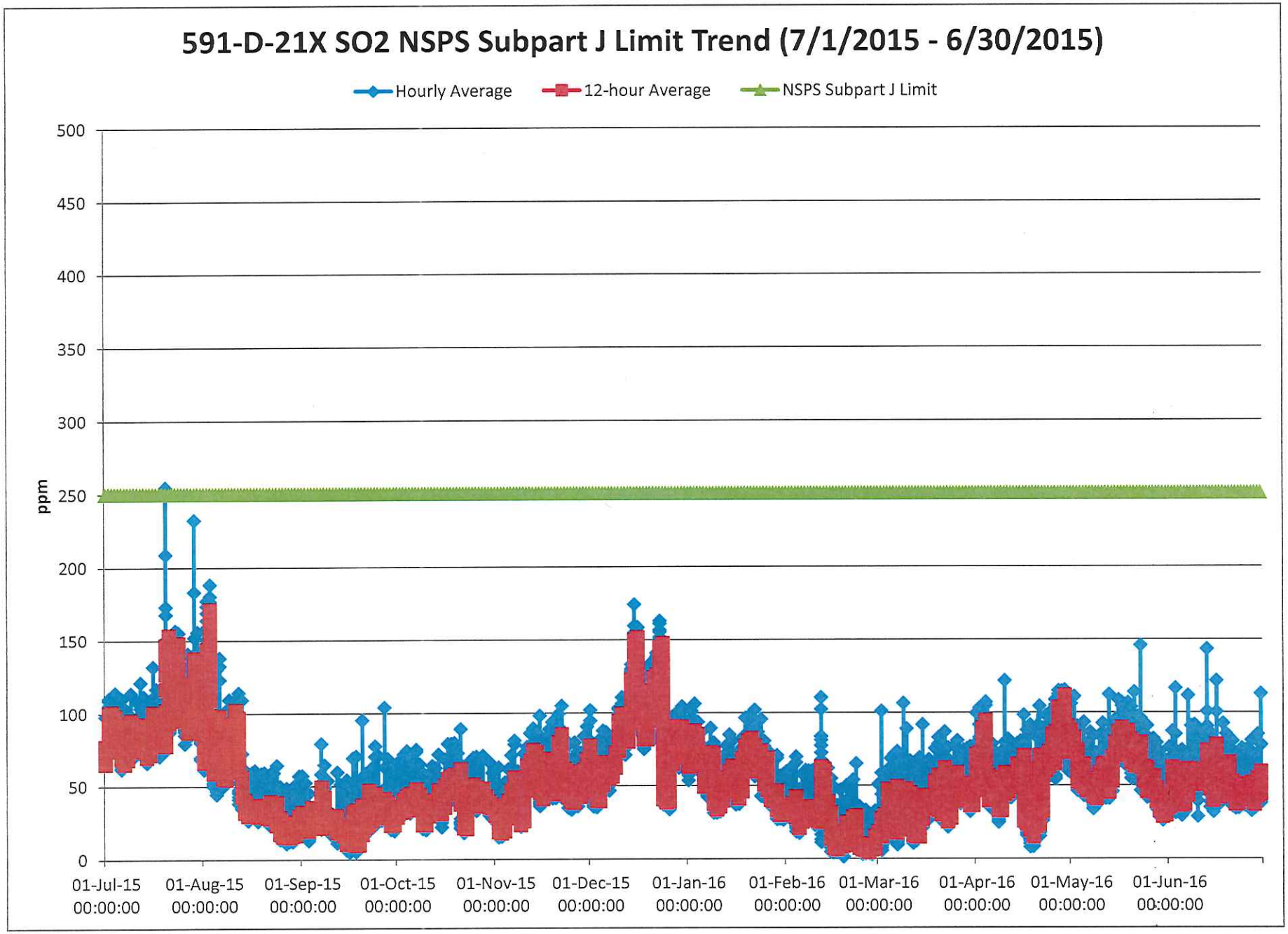
Appendix 9
Fuel gas H_2S emission trends


Refinery Fuel Gas H2S Trend (July 1, 2015 - June 30, 2016)
Hourly Concentration
3-hour Average
NSPS J Limit
ppm
350
300
250
200
150
100
50
0
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

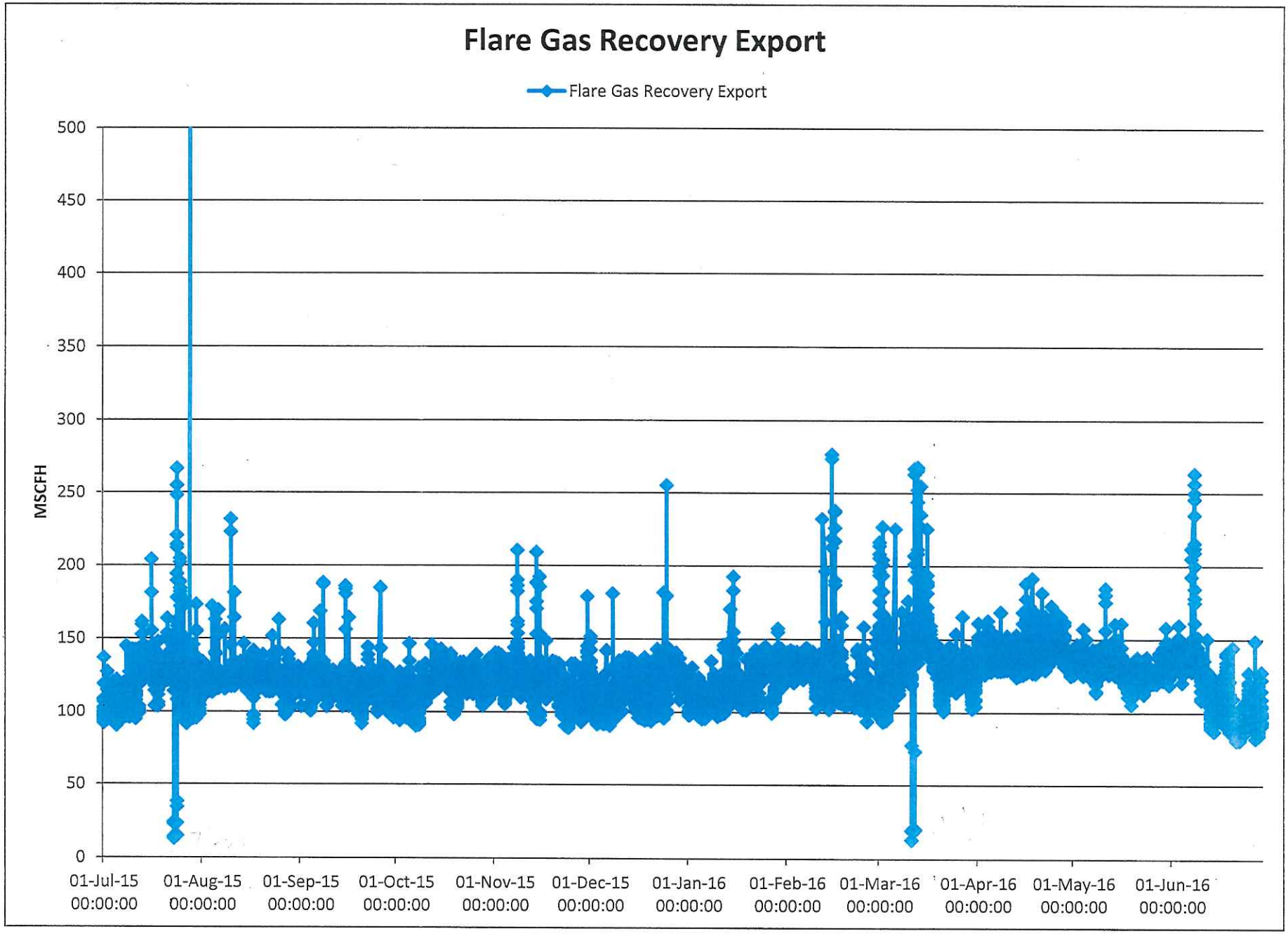

1391 Fuel Gas H2S Trend (July 1, 2015 - June 30, 2016)
Hourly Concentration
3-hour Average
NSPS J Limit
ppm
350
300
250
200
150
100
50
0
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00


Boiler Fuel Gas H2S Trend (July 1, 2015 - June 30, 2016)
Hourly Concentration
3-hour Average
NSPS J Limit
ppm
350
300
250
200
150
100
50
0
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

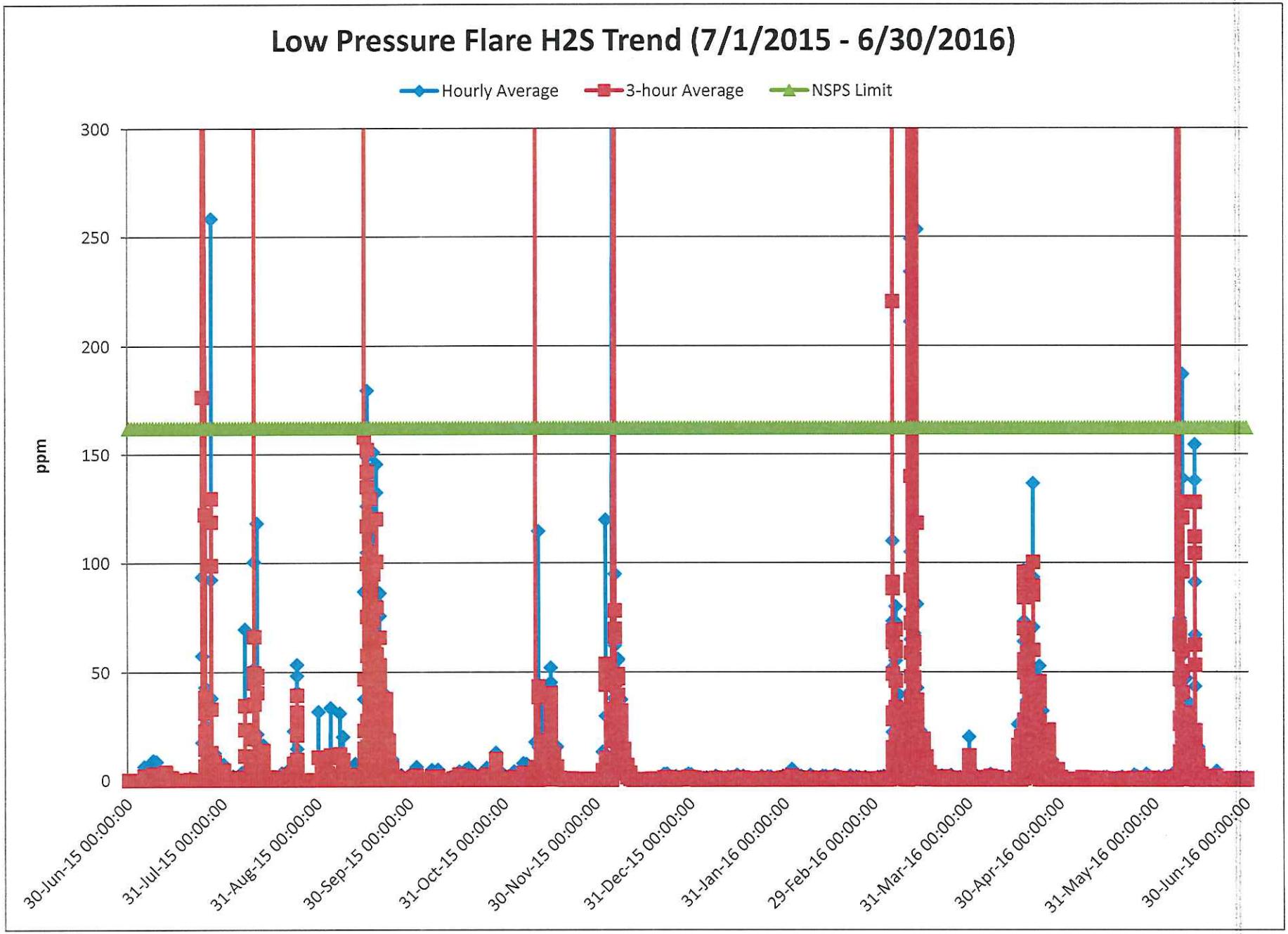
Appendix 10
SRU SO_2 emission trends

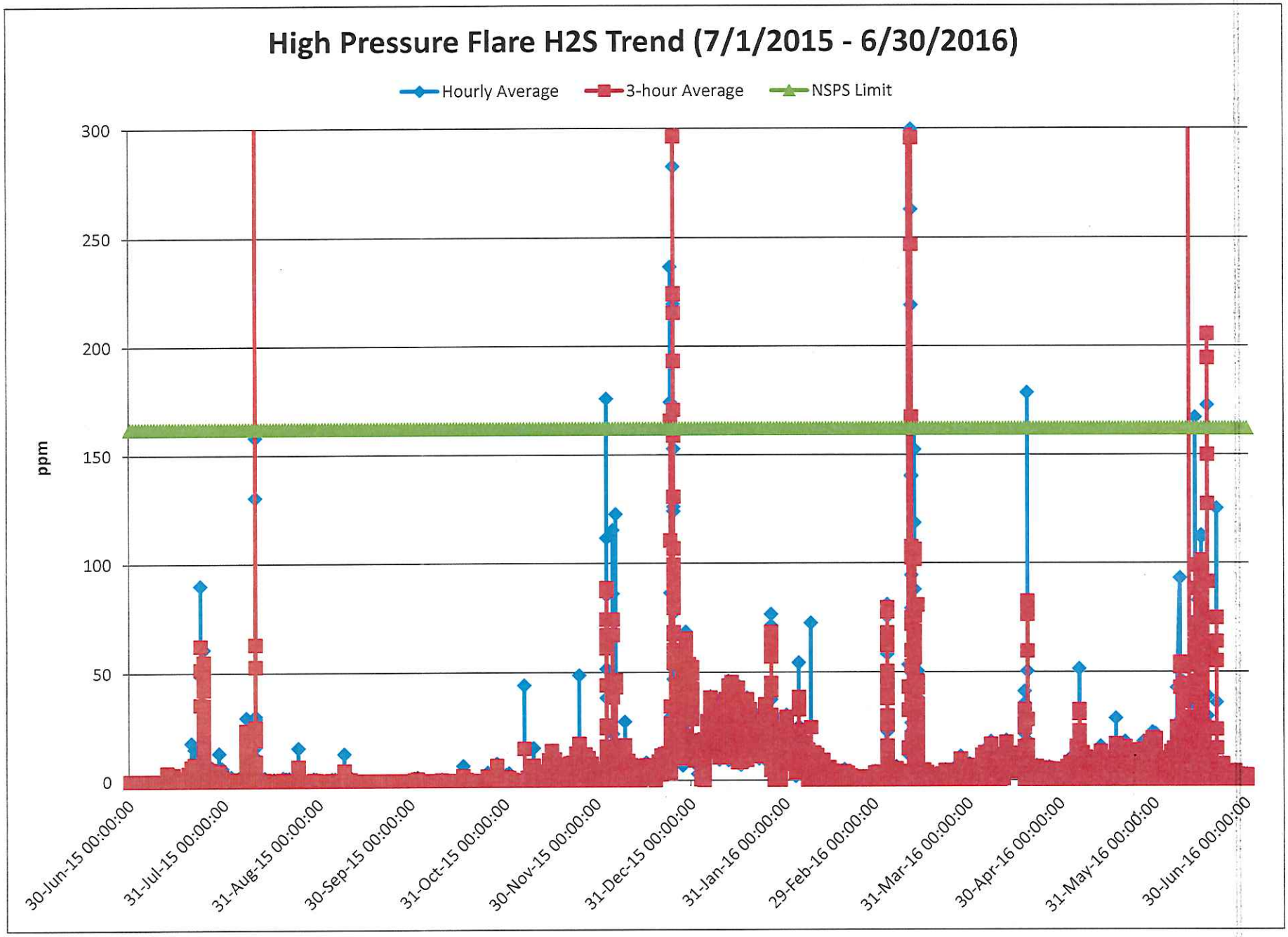

591-D-21X SO2 NSPS Subpart J Limit Trend (7/1/2015 - 6/30/2015)
Hourly Average
12-hour Average
NSPS Subpart J Limit
ppm
500
450
400
350
300
250
200
150
100
50
0
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

Appendix 11
Flare gas recovery trends

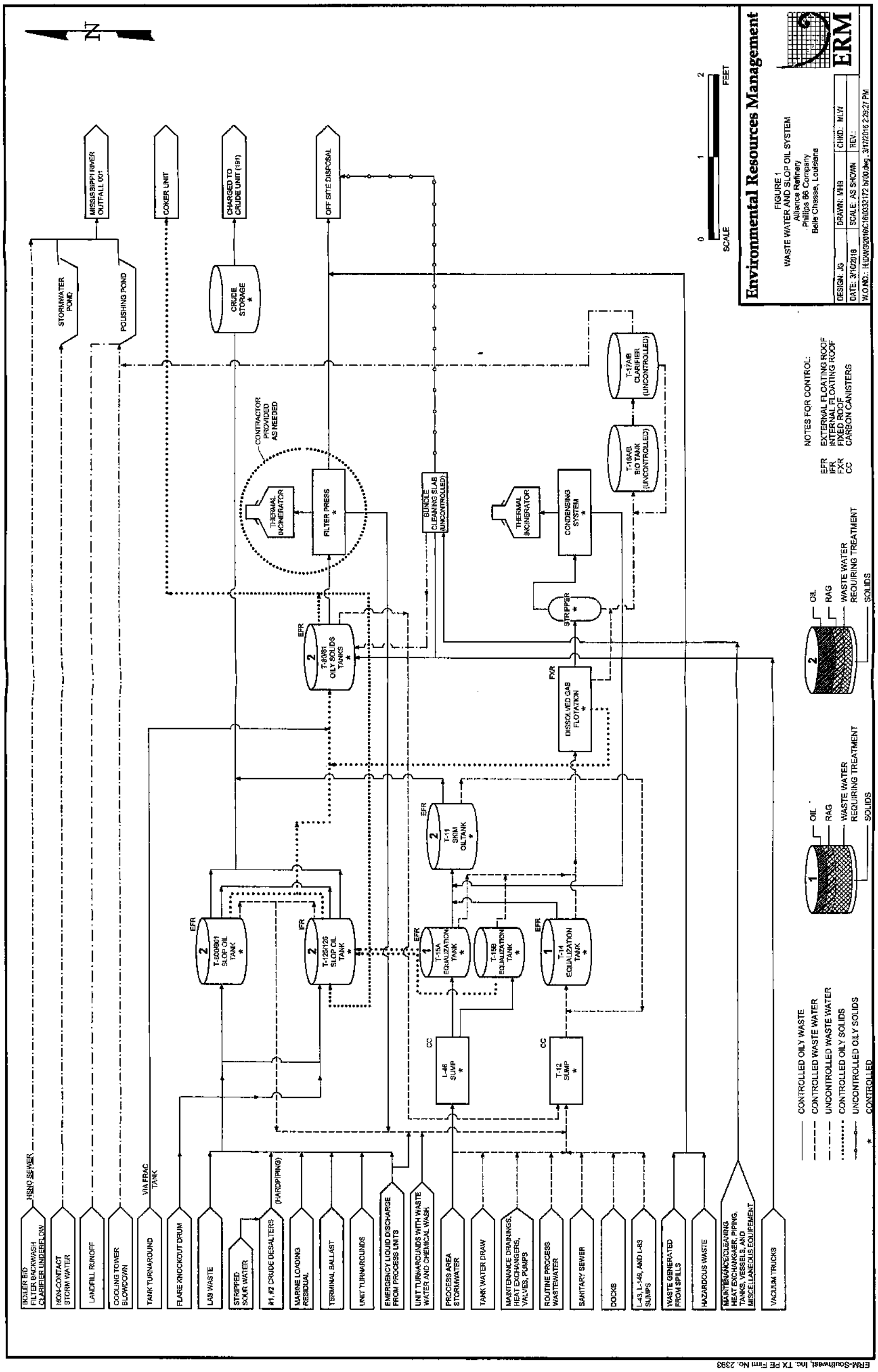

Flare Gas Recovery Export
Flare Gas Recovery Export
MSCFH
500
450
400
350
300
250
200
150
100
50
0
01-Jul-15 00:00:00
01-Aug-15 00:00:00
01-Sep-15 00:00:00
01-Oct-15 00:00:00
01-Nov-15 00:00:00
01-Dec-15 00:00:00
01-Jan-16 00:00:00
01-Feb-16 00:00:00
01-Mar-16 00:00:00
01-Apr-16 00:00:00
01-May-16 00:00:00
01-Jun-16 00:00:00

Appendix 12
Flare H_2S emission trends

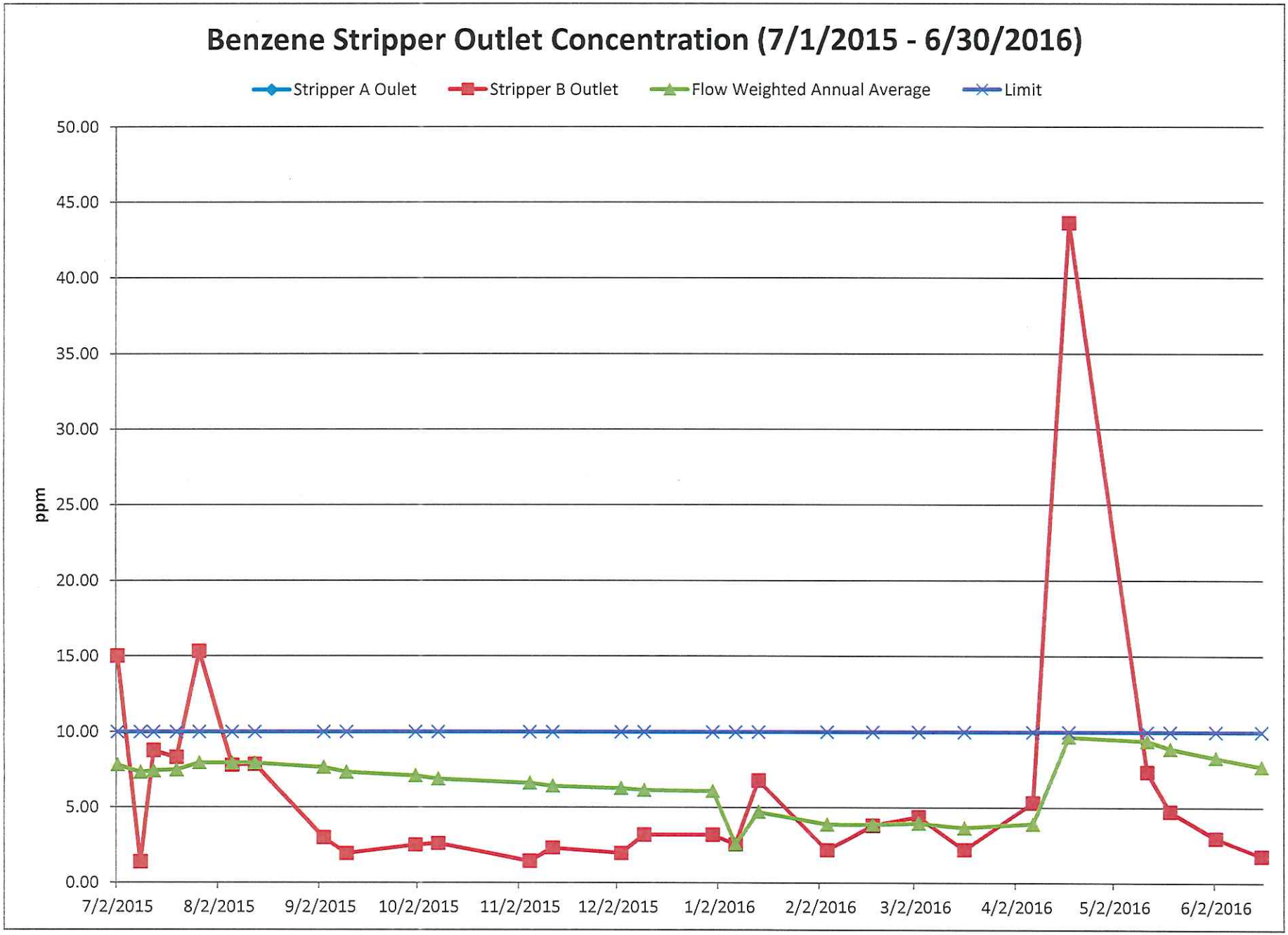

Low Pressure Flare H2S Trend (7/1/2015 - 6/30/2016)
Hourly Average
3-hour Average
NSPS Limit
ppm
300
250
200
150
100
50
0
30-Jun-15 00:00:00
31-Jul-15 00:00:00
31-Aug-15 00:00:00
30-Sep-15 00:00:00
31-Oct-15 00:00:00
30-Nov-15 00:00:00
31-Dec-15 00:00:00
31-Jan-16 00:00:00
29-Feb-16 00:00:00
31-Mar-16 00:00:00
30-Apr-16 00:00:00
31-May-16 00:00:00
30-Jun-16 00:00:00


High Pressure Flare H2S Trend (7/1/2015 - 6/30/2016)
Hourly Average
3-hour Average
NSPS Limit
ppm
300
250
200
150
100
50
0
30-Jun-15 00:00:00
31-Jul-15 00:00:00
31-Aug-15 00:00:00
30-Sep-15 00:00:00
31-Oct-15 00:00:00
30-Nov-15 00:00:00
31-Dec-15 00:00:00
31-Jan-16 00:00:00
29-Feb-16 00:00:00
31-Mar-16 00:00:00
30-Apr-16 00:00:00
31-May-16 00:00:00
30-Jun-16 00:00:00

Appendix 13
BWON process schematic


N
MISSISSIPPI RIVER OUTFALL 001
COKER UNIT
CHARGED TO CRUDE UNIT (191)
OFF SITE DISPOSAL
STORMWATER POND
POLISHING POND
CRUDE STORAGE
0
1
2
SCALE
FEET
Environmental Resources Management
FIGURE 1
WASTE WATER AND SLOP OIL SYSTEM
Alliance Refinery
Phillips 66 Company
Belle Chasse, Louisiana
ERM
DESIGN: JG
DRAWN: MHB
CHKD.: MLW
DATE: 3/10/2016
SCALE: AS SHOWN
REV.:
W.O.NO.: H:\DWG\0196\16\0332172 b\00.dwg, 3/17/2016 2:29:27 PM
CONTRACTOR PROVIDED AS NEEDED
THERMAL INCINERATOR
FILTER PRESS *
BUNDLE CLEANING SLAB (UNCONTROLLED)
THERMAL INCINERATOR
CONDENSING SYSTEM *
T-17A/B CLARIFIER (UNCONTROLLED)
T-18A/B BIO TANK (UNCONTROLLED)
STRIPPER *
EFR 2 T-900/801 OILY SOLIDS TANKS *
FXR DISSOLVED GAS FLOTATION *
EFR 2 T-11 SKIM OILTANK *
EFR 2 T-800/801 SLOP OIL TANK *
IFR 2 T-125/126 SLOP OIL TANK *
EFR 1 T-15A EQUALIZATION TANK *
T-15B EQUALIZATION TANK *
EFR 1 T-14 EQUALIZATION TANK *
CC L-46 SUMP *
CC T-12 SUMP *
NOTES FOR CONTROL:
EFR EXTERNAL FLOATING ROOF
IFR INTERNAL FLOATING ROOF
FXR FIXED ROOF
CC CARBON CANISTERS
2 OIL RAG WASTE WATER REQUIRING TREATMENT SOLIDS
1 OIL RAG WASTE WATER REQUIRING TREATMENT SOLIDS
HSNO SEWER
BOILER B/D FILTER BACKWASH CLARIFIER UNDERFLOW
NON-CONTACT STORM WATER
LANDFILL RUNOFF
COOLING TOWER BLOWDOWN
VIA FRAC TANK
TANK TURNAROUND
FLARE KNOCKOUT DRUM
LAB WASTE
STRIPPED SOUR WATER
#1, #2 CRUDE DESALTERS (HARDPIPING)
MARINE LOADING RESIDUAL
TERMINAL BALLAST
UNIT TURNAROUNDS
EMERGENCY LIQUID DISCHARGE FROM PROCESS UNITS
UNIT TURNAROUNDS WITH WASTE WATER AND CHEMICAL WASH
PROCESS AREA STORMWATER
TANK WATER DRAW
MAINTENANCE DRAININGS: HEAT EXCHANGERS, VALVES, PUMPS
ROUTINE PROCESS WASTEWATER
SANITARY SEWER
DOCKS
L-43, L-148, AND L-83 SUMPS
WASTE GENERATED FROM SPILLS
HAZARDOUS WASTE
MAINTENANCE/CLEANING HEAT EXCHANGAER, PIPING, TANKS, VESSELS, AND MISCELLANEOUS EQUIPEMENT
VACUUM TRUCKS
CONTROLLED OILY WASTE
CONTROLLED WASTE WATER
UNCONTROLLED WASTE WATER
CONTROLLED OILY SOLIDS
UNCONTROLLED OILY SOLIDS
* CONTROLLED
ERM-Southwest, Inc. TX PE Firm No. 2393

Appendix 14
Benzene stripper outlet concentration trends


Benzene Stripper Outlet Concentration (7/1/2015 - 6/30/2016)
Stripper A Oulet
Stripper B Outlet
Flow Weighted Annual Average
Limit
ppm
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
7/2/2015
8/2/2015
9/2/2015
10/2/2015
11/2/2015
12/2/2015
1/2/2016
2/2/2016
3/2/2016
4/2/2016
5/2/2016
6/2/2016