Phillips 66
San Francisco Refinery
1380 San Pablo Avenue
Rodeo, CA 94572
phone 510.799.4411
fax 510.245.4476

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January 18, 2019

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Director of Compliance and Enforcement
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attn: Title V Reports

Subject: Phillips 66 San Francisco Refinery – Plant No. A0016
Six-month Monitoring Report for July 1, 2018 through December 31, 2018

Director:

Phillips 66 is submitting its Monitoring Report covering the period of July 1, 2018 through December 31, 2018 as required by Section I.F in its Title V permit.

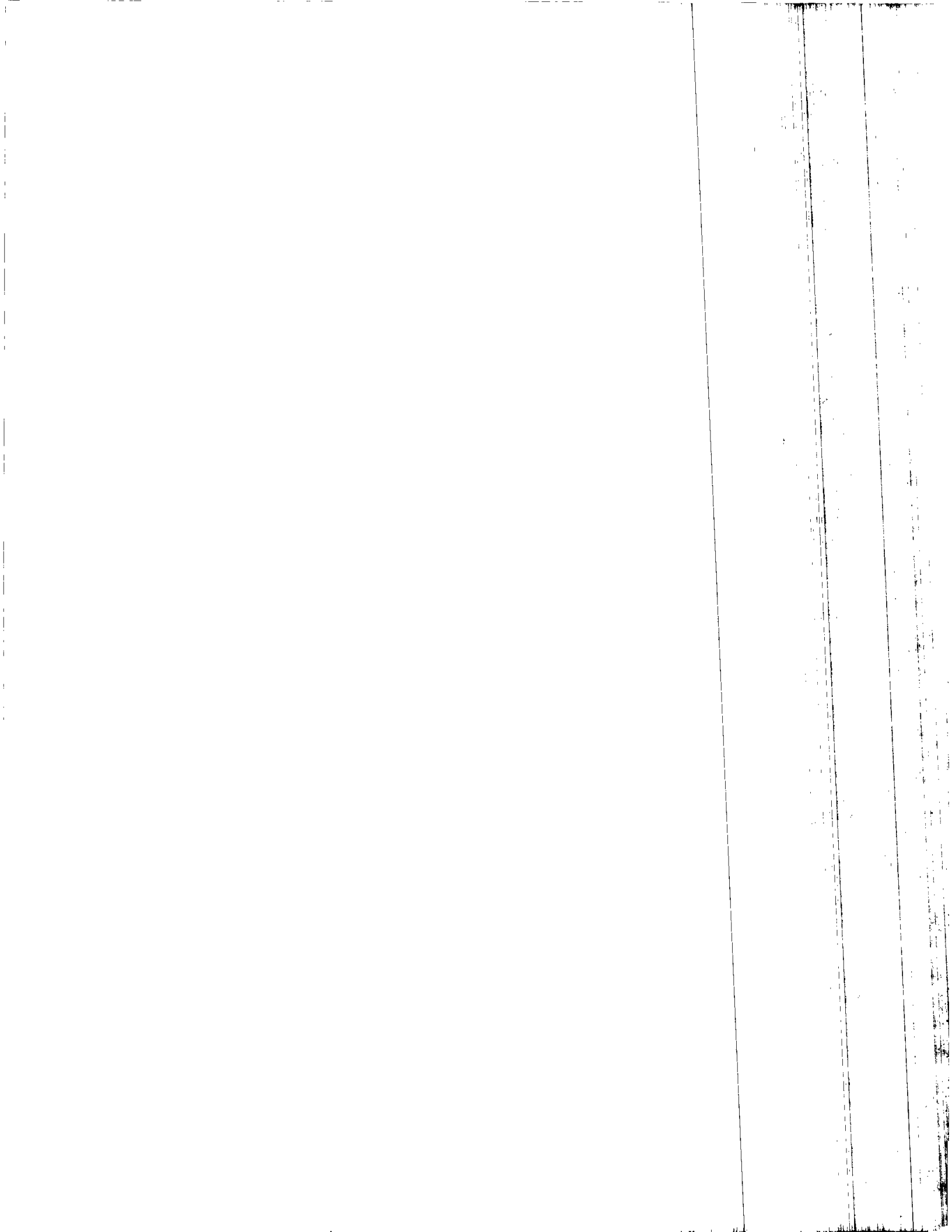
If you have any questions or require additional information on the information contained in this report, please contact Suejung Shin at (510) 245-4655.

Sincerely,

Brent Eastep, Team Lead
Environmental Department

Attachment

cc: Ms. Ying Yu, BAAQMD inspector via e-mail (YYu@baaqmd.gov)



BAAQMD Title V Permit
6 Month Deviation Summary Report
From 7/1/2018 to 12/31/2018
San Francisco Refinery, A0016

Certification Statement

I certify under penalty of law that based on the information and belief formed after reasonable inquiry, the statements and information in this document and in all attachments and other materials are true, accurate, and complete.

x Carl Perkins	Carl Perkins	Refinery Manager	1/18/19
Signature of Responsible Official	Print Name	Title	Date

BAAQMD Title V Permit
6 Month Deviation Summary Report

From 7/1/2018 *to* 12/31/2018

A0016 Phillips 66 Company San Francisco Refinery

Facility Address:
1380 San Pablo Ave

City: Rodeo
State: CA
Zip Code: 94572-

Mailing Address:
1380 San Pablo Ave

City: Rodeo
State: CA
Zip Code: 94572

Contact: Suejung Shin Title: Environmental Engineer Phone: (510) 245-4655

Title V deviations for the reporting period are summarized below:

May have resulted in a deviation from:

Deviation No: 037-18
Event Started: 9/30/2018 12:00 AM
Stopped: 9/30/2018 2:00 AM

Source Number(s): 461
Abatement Device(s) : 461
Emission Point(s):

Permit: 21096.3b
AQMD:
Other:

Event Description: On 9/30/18, NOx concentrations exceeded the 10-ppm 3-hour average limit at S461 (U250 B-701) for two three-hour averaging periods at 1:00 AM and 2:00 AM. The maximum measured concentration was 14.3 ppm during this event. Total excess NOx mass emissions were 0.4 lbs. The excess was reported as Excess ID 07J49.

At approximately 11:22 PM on 9/29/2018, the aqueous ammonia supply to U250 B-701 was isolated from the heater as part of the procedure to prepare Unit 200 for maintenance. The U250 B-701 ammonia supply was required to be isolated as part of the procedure because it uses the same ammonia feed tank as the U200 B-102 heater, which was shutdown. The job was planned to last approximately 20 minutes, which allowed enough time for the U250 B-701 to remain in compliance with the 10 ppm 3-hour average limit while at reduced rates. However, maintenance activities took longer than anticipated. An issue arose with the fresh air supply being used by the workers, which lengthened the repair period approximately 60 minutes longer than planned.

Probable Cause: The job was planned to last approximately 20 minutes, which allowed enough time for the U250 B-701 to remain in compliance with the 10-ppm 3-hour average limit. However, maintenance activities took longer than anticipated. After an issue arose with the fresh air supply being used by the workers, which lengthened the repair period approximately 60 minutes longer than planned.

Corrective actions or preventative steps taken: Once the boundary blind was set, the flow of aqueous ammonia was re-established to U250 B-701, which reduced NOx concentrations below the limit. The isolation and blinding procedures for this system will be reviewed to determine if there is a way to complete this work with shutting off ammonia to the U250 B-701 heater.

May have resulted in a deviation from:

Deviation No:	040-18	Source Number(s):	461	Permit:	21096.3b
Event Started:	10/15/2018 3:00 PM	Abatement Device(s) :	461	AQMD:	
Stopped:	10/15/2018 5:59 PM	Emission Point(s):		Other:	

Event Description: On 10/15/18, NOx concentrations exceeded the 10-ppm 3-hour average limit at S461 (U250 B-701) for three, three-hour averaging periods at 3:00 PM, 4:00 PM, and 5:00 PM. The maximum hourly average concentration was 13.3 ppm during this event. Upon discovery of the excess, the BAAQMD was notified of a potential breakdown (07J58) and excess (07J59). Total excess NOx mass emissions were 0.3 lbs.

At approximately 1:36 PM on 10/15/18, the primary ammonia injection pump for the S461 SCR tripped, leading to excess NOx emission concentrations. Under normal operating conditions, a low-pressure switch signals the secondary ammonia injection pump to startup following a trip of the primary ammonia injection pump. During this event, however, the secondary ammonia injection pump failed to startup after the primary pump tripped. Refinery personnel manually started the secondary ammonia injection pump at approximately 3:35 PM, resupplying aqueous ammonia flow to the SCR, and lowering the NOx concentration.

Probable Cause: The primary ammonia injection pump for S461 tripped during operation. Normally, a low-pressure switch initiates the startup of a backup ammonia injection pump after the primary pump trips. However, the low-pressure switch was broken, and was unable to startup the secondary ammonia injection pump. Without ammonia flow to the SCR, NOx emission concentrations were uncontrolled until the secondary ammonia injection pump was manually restarted. The investigation also determined that the motor overload size could be increased on each ammonia injection pump in order to prevent tripping upsets in the future.

Corrective actions or preventative steps taken: After discovering that the primary ammonia pump had tripped, the secondary pump was manually started, lowering NOx concentrations. The failed low-pressure switch on the secondary pump was replaced with a new switch. The motor overloads were replaced on each pump with a larger size.

May have resulted in a deviation from:

Deviation No:	041-18	Source Number(s):	296	Permit:	
Event Started:	10/16/2018 11:02 PM	Abatement Device(s) :		AQMD:	12-11-502.3.1
Stopped:	10/17/2018 1:45 AM	Emission Point(s):		Other:	40 CFR 60.103a(h); 40 CFR 60.107a(a)

Event Description: NSPS Ja monitoring requirements at 40 CFR 60.107a(a)(2) require an H2S CEMs for any flaring of gas that is not process upset gas, non-routine relief valve leakage, or results from an emergency malfunction. Phillips 66 Company submitted an Alternative Monitoring Plan (AMP) application to EPA on March 1, 2016 requesting that BAAQMD Regulation 12-11 sampling be used in lieu of the Subpart Ja H2S CEMs required by section 60.107a(a)(2). We are currently awaiting EPA's approval of the AMP and do not have any indication that the AMP will not be approved.
Flaring occurred at the Main Flare on October 16, 2018. The gases combusted at the flare did not meet the process upset definition in NSPS Subpart Ja, or result from non-routine relief valve leakage or an emergency malfunction. Therefore, we believe the flaring resulting from this October 16 event did not fit within the NSPS Ja exemptions described above. Because we are still awaiting EPA approval of our AMP, we were in "technical" non-compliance with the section 60.107a(a)(2) requirements to have an H2S CEMs during the October 16 flaring. Said another way, if EPA had timely acted on our AMP request, we would not be reporting this part of the Title V Permit deviation.
The flaring event lasted approximately 105 minutes. Refinery personnel obtained a flare sample 73 minutes into the flaring event. Analysis of the flare sample indicates the presence of 0.18% H2S in the flare gas which is in excess of the NSPS Subpart Ja H2S limit. Phillips 66 believes this sample was representative of the gas flared during the incident. An initial flare sample was not taken.

Probable Cause: The initial flare sample was not taken because the flare sample cylinder valves were inadvertently placed in the closed position and the cylinder did not get filled when the sample was triggered initially. EPA's delay in approving the AMP resulted in the flaring event technically running afoul of the NSPS Ja H2S CEMs requirement.

Corrective actions or preventative steps taken: Flare sampling procedures will be reinforced with Phillips 66 and additional corrective actions will be evaluated.
Phillips 66 continues to press EPA for AMP approval.

May have resulted in a deviation from:

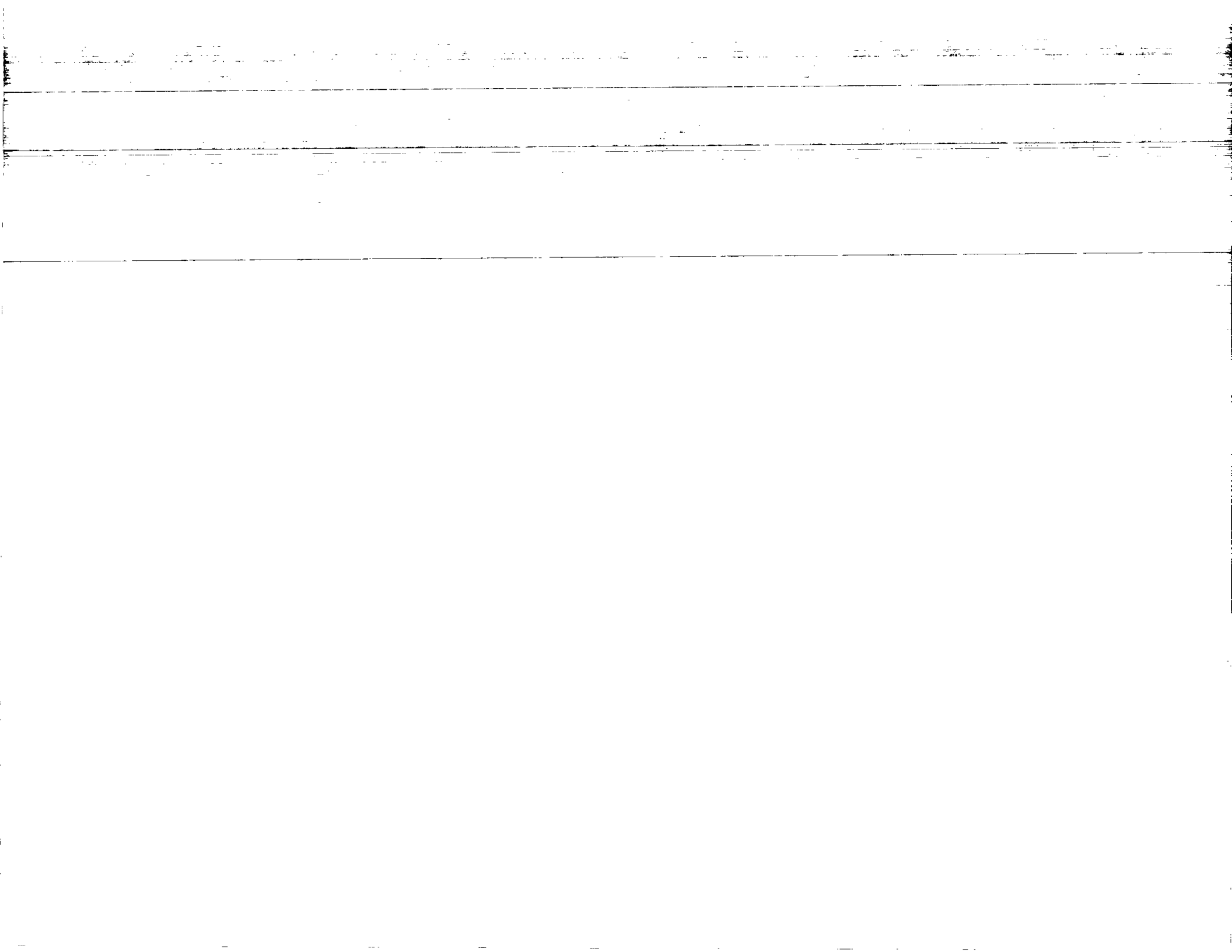
Deviation No: 042-18	Source Number(s): 398	Permit:	
Event Started: 10/30/2018 8:36 AM	Abatement Device(s) :	AQMD:	
Stopped: 10/30/2018 9:30 AM	Emission Point(s):	Other:	40 CFR 60.103a(h); 40 CFR 60.107a(a)

Event Description: Flaring occurred at the MP30 Flare on October 30, 2018 from approximately 8:36 a.m. until 9:30 a.m. (approximately 54 minutes). The flaring occurred during the process of returning the F-2 Flare Blowdown Drum to service following planned maintenance. Gases normally recovered by the Flare Gas Recovery Compressors passed through the F-2 drum and were combusted at the flare after a valve was inadvertently opened. Analysis of the timely flare sample indicates the presence of 0.19% H2S in the flare gas, which is in excess of the NSPS Subpart Ja H2S limit at 40 CFR 60.103a(h).

In addition, NSPS Ja monitoring requirements at 40 CFR 60.107a(a)(2) require an H2S CEMs for any flaring of gas that is not process upset gas, non-routine relief valve leakage, or results from an emergency malfunction. Phillips 66 Company submitted an Alternative Monitoring Plan (AMP) application to EPA on March 1, 2016 requesting that BAAQMD Regulation 12-11 sampling be used in lieu of the Subpart Ja H2S CEMs required by section 60.107a(a)(2). We are currently awaiting EPA's approval of the AMP and do not have any indication that the AMP will not be approved. However, because we are still awaiting EPA approval of our AMP, we were in "technical" non-compliance with the section 60.107a(a)(2) requirements to have an H2S CEMs during the October 30 flaring. Said another way, if EPA had timely acted on our AMP request, we would not be reporting this part of the Title V Permit deviation.

Probable Cause: In the process of returning the F-2 drum to service following maintenance, a valve was inadvertently opened which allowed gas to be flared. EPA's delay in approving the AMP resulted in the flaring event technically running afoul of the NSPS Ja H2S CEMs requirement.

Corrective actions or preventative steps taken: The process used to return the F-2 drum to service will be reviewed and updated as necessary to prevent flaring. Phillips 66 will continue to work with EPA to ensure EPA finalizes review and approval of the AMP application that was submitted.



May have resulted in a deviation from:

Deviation No: 047-18	Source Number(s):	10; 11; 12; 13; 15; 16; 17; 18; 19; 20; 22; 351; 438; 9	Permit:
Event Started: 10/30/2018 9:00 AM	Abatement Device(s) :		AQMD:
Stopped: 10/31/2018 6:00 PM	Emission Point(s):		Other: 40 CFR 60.104(a)(1)

Event Description: During the morning of October 30, 2018, refinery personnel were troubleshooting what appeared to be an inoperative H2S continuous analyzer at the U233 Fuel Gas Center that is utilized to determine compliance with the H2S concentration limit. As part of the trouble-shooting process, one of the refinery workers mistakenly blocked in a transmitter that controls the valve position for the flow through the H2S contactor (D-601) bypass line which opened the valve and allowed gas to bypass D-601. The operator was apparently told to block in and close the valve, but misheard the instructions and, instead, blocked in the transmitter which opened the valve. Blocking in the transmitter resulted in fuel gas with relatively high H2S concentrations to bypass treatment at D-601 and, instead, be combusted at several downstream heaters without first undergoing treatment.

The blocked-in transmitter was discovered relatively quickly (less than an hour had elapsed), upon which the bypass line control valve was immediately closed. Fuel gas treatment at D-601 was bypassed from approximately 8:45 a.m. until 9:42 a.m., likely resulting in exceedances of the NSPS J H2S limit of 162 ppm, 3-hour rolling average. Based on our engineering estimates, we would expect that fuel gas not treated by D-601 would contain approximately 5.7% H2S.

Unfortunately, a second problem occurred upon closure of the bypass line control valve. We suspect that a low slipstream of untreated fuel gas leaked by the bypass line control valve. This suspicion arose the next day upon receiving and reviewing analysis of fuel gas grab samples, which showed elevated levels of H2S in the fuel gas. These fuel gas grab samples were obtained not long after the bypass line control valve was closed.

Upon concluding that the bypass line control valve was leaking, refinery personnel promptly closed the block valves upstream and downstream of the control valve to prevent any further leak-by (the valves were closed at approximately 2:30 p.m. on October 31, 2018). Between the time that the bypass line control valve was closed (at approximately 9:42 a.m. on October 30) and the time that the block valves upstream and downstream of the bypass line control valve were closed (at approximately 2:30 p.m. on October 31), we suspect that the H2S concentration limit in the fuel gas was exceeded. Based on our process knowledge and our review of the downstream SO2 CEMS at the Unit 238 sulfur plant, we calculate that the H2S concentration in the fuel gas could have ranged approximately <0.1% to 1.4% H2S (that calculated H2S concentration is lower than the concentration in the fuel gas grab samples because the fuel gas grab sample location is physically located where the slipstream "leakby" was highest and before downstream dilution with low sulfur natural gas occurred prior to combustion).

The H2S continuous analyzer used to determine compliance with the H2S concentration limit, which we suspected was not working correctly and whose troubleshooting triggered this event, did not indicate H2S concentrations in excess of the 162-ppm limit during the times described above. We reported an inoperative monitor under BAAQMD episode 07J76 for the H2S analyzer during this period.

We suspect that the following heaters received fuel gas with elevated H2S levels as a result of the transmitter that was mistakenly blocked in:
- U267 B601/B602 (S#351)
- U240 B-2 (S#9)
- U240 B-101 (S#4)
- U240 B-201 (S#11)
- U240 B-202 (S#12)
- U240 B-301 (S#13)
- U244 B-501-5 (S#14)
- U244 B-506 (S#20)
- U248 B-606 (S#22)

We suspect that Heater U267 B601/B602 (S#351) and U110 H-1 (S#438) also received fuel gas with elevated H2S levels as a result of the slipstream "leakby" on October 30th and 31st.

Probable Cause: The inadvertent blocking in of the transmitter occurred because a refinery worker mistakenly heard an oral instruction different than what was intended or given. The slipstream "leakby" was due to the control valve not correctly reseating to a closed position.

Corrective actions or preventative steps taken: Upon discovery, Phillips 66 immediately closed the bypass line control valve inadvertently blocked in. With respect to the slipstream "leakby," Phillips 66 promptly closed the block valves upstream and downstream of the control valve to prevent any further leak-by. To minimize, if not prevent, the possibility of future similar incidents, Phillips 66 will evaluate blinding the lines that allow high H2S fuel gas to bypass the D-601 contactor.

May have resulted in a deviation from:

Deviation No: 049-18
Event Started: 10/19/2018 12:40 PM
Stopped: 10/21/2018 11:45 AM

Source Number(s): 1010
Abatement Device(s) :
Emission Point(s):

Permit: 23125-21; 23125-22
AQMD: 1-522.4
Other:

Event Description: At approximately 12:40 PM on 10/19/18, the SO2, CO, and O2 CEMS analyzers at S1010 (U235) were taken offline in preparation for the planned unit shutdown. However, natural gas flow to the tail gas incinerator (TGI) at U235 was not shut down until approximately 11:45 AM on 10/21/18, resulting in a period of inoperation greater than 24 hours. Upon later review of operating data it was determined that the CEMs was inoperative and the inoperative monitor report was submitted on 11/1/18 (ID 07J78), which was not by the next business day, as required.

Although Phillips 66 believes that we are in compliance with Permit Condition 23125-21 and 23125-22, we are amending this deviation per BAAQMD request.

Probable Cause: The CEMs were taken offline while the U235 TGI was still combusting natural gas due to internal miscommunication.

Corrective actions or preventative steps taken: An inoperative monitor report was sent to BAAQMD (ID 07J78). Existing shutdown operating procedures as they relate to CEMs will be reviewed.

May have resulted in a deviation from:

Deviation No: 051-18
Event Started: 9/30/2018 8:00 AM
Stopped: 10/1/2018 12:30 PM

Source Number(s): 353; 356
Abatement Device(s) :
Emission Point(s):

Permit:
AQMD: 1-522.4
Other:

Event Description: At approximately 8:00 AM on 9/30/18, the NOx, CO, and O2 analyzers at S353 (SPP B) failed calibration due to a sample pump failure. The sample pump was rebuilt, and the CEMS analyzers validated at approximately 12:30 PM on 10/1/18. Upon later review, it was determined that the CEMs were inoperative, and the inoperative monitor report was submitted on 11/6/18 (ID 07J79).

Probable Cause: The sample pump failed when a plugged sample line caused loss of pressure, which prevented gases from reaching the analyzer for calibration. Due to internal miscommunication, the inoperative monitor was not noted until 11/6/18.

Corrective actions or preventative steps taken: An inoperative monitor report was sent to BAAQMD (ID 07J79). A reviewof inoperative monitoring will be conducted.

May have resulted in a deviation from:

Deviation No:	052-18	Source Number(s):	465	Permit:	22964-3
Event Started:	11/2/2018 1:06 PM	Abatement Device(s) :		AQMD:	
Stopped:	1/5/2019 1:43 PM	Emission Point(s):		Other:	

Event Description: Unit 235 Sulfur Recovery Unit (SRU) utilizes a degassing system for emissions control from the sulfur header (S465) where liquid sulfur is routed. The vent gases from S465 are normally routed to the front-end portion of Unit 235 for control. These gases can also be routed to the Unit 238 SRU Claus Reaction Furnace. On November 2, 2018 the routing of the vent gases was being switched from Unit 238 to Unit 235. During the re-routing the air to the eductor system failed. The air provides the motive force for routing vent gases from S465 to the front-end of Unit 235 or Unit 238. Troubleshooting continued in order to determine the cause for the loss of air to the eductor and to clear potential vent line blockage. Following troubleshooting re-routing of the gases was attempted to the normal routing. During the attempts that took place on November 2, 8, 26, and December 7, 2018 there were brief periods (3-20 minutes) when gases may have been vented uncontrolled. When re-routing was not being attempted the gases were controlled by routing to Unit 238. On January 5, 2019 an additional attempt was made after more rigourously heating the line with a heat wrap. During this attempt there was an unplanned eductor shutdown which resulted in gases venting uncontrolled.

Probable Cause: There appeared to be blockage in the vent line.

Corrective actions or preventative steps taken: Valves associated with the vent system have been x-rayed to determine potential blockage. Steam tracing was applied to heat the affected line in order to clear any temperature related blockage. Additional temperature via heat tracing was applied to attempt to clear pending blockage. Additional X-rays were taken to identify pending blockage. Additional heat wraps were applied to the line to clear blockage. Following the January 5, 2019 activity a bleeder ring was installed so that the line could be blocked on both ends while additional work takes place to remove the plug in the line.

May have resulted in a deviation from:

Deviation No:	058-18	Source Number(s):	461	Permit:	21096.3b
Event Started:	11/23/2018 1:00 AM	Abatement Device(s) :	461	AQMD:	
Stopped:	11/23/2018 5:00 AM	Emission Point(s):		Other:	

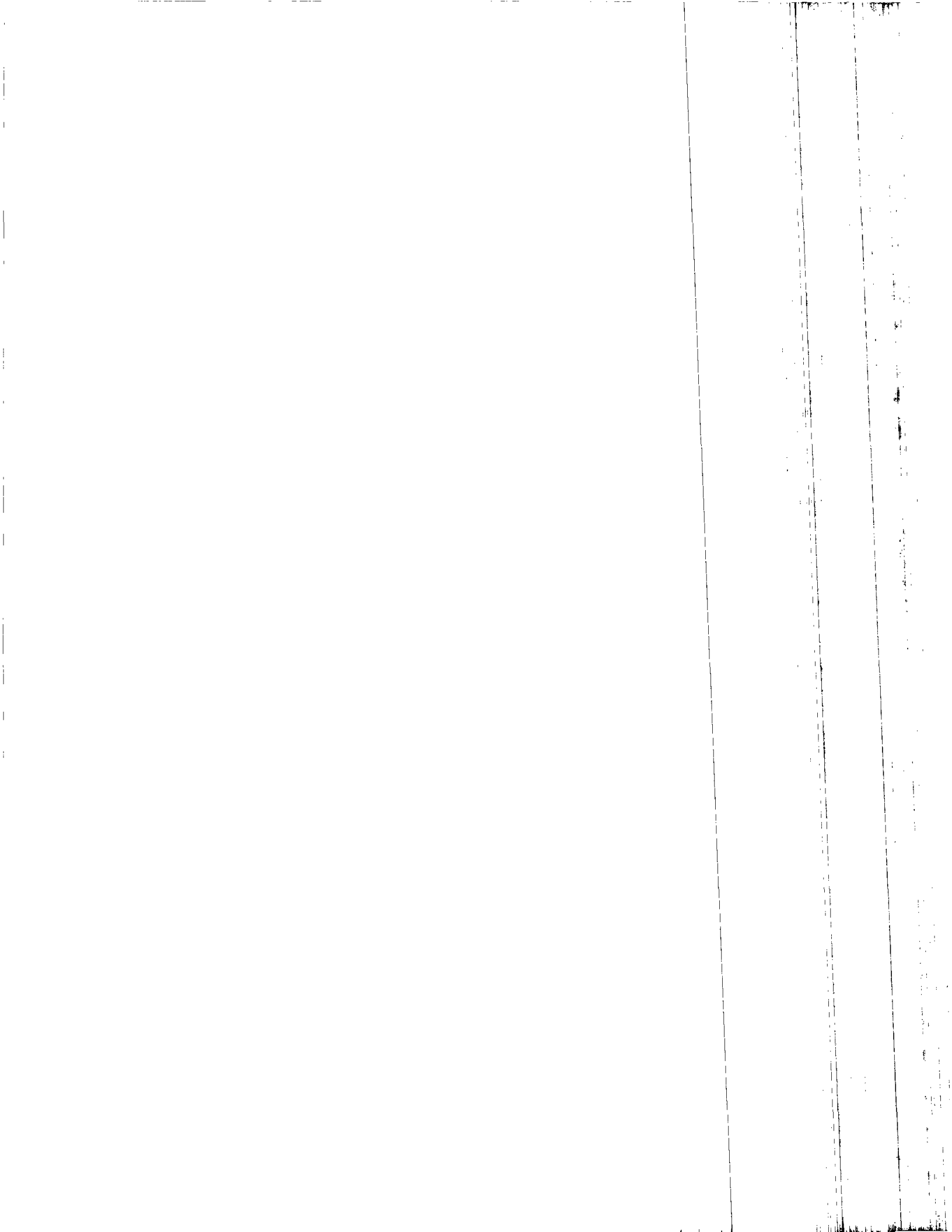
Event Description: On 11/23/18, S461 (U250 B-701) exceeded the 10-ppm 3-hour average NOx concentration limit for four, 3-hour averaging periods at 2:00, 3:00, 4:00, and 5:00 a.m. The maximum measured concentration was 13.6 ppm during this event. Upon discovery of the excess, the BAAQMD was notified of a potential breakdown reported as ID 07K01 and excess ID 07K02. Total excess NOx mass emissions were 0.39 lbs.

At approximately 10:15 p.m. on 11/22/18, the diluent air heater for the ammonia vaporizer tripped, causing the SCR skid to shut down. Without the supply of aqueous ammonia from the SCR skid, NOx concentrations exceeded the permit limit while operations personnel attempted to restart the diluent air heater.

After further investigation, it was discovered that the diluent airflow had dropped to zero at approximately 8:45 p.m. on 11/22/18. Phillips 66 believes that the air filter may have become plugged due to degraded air quality resulting from the California wildfires. Without the flow of air through the diluent air heater, the heating coils overheated and tripped the air heater.

Probable Cause: The diluent airflow heater for S461 tripped during operation due to a plugged airflow filter. Without the flow of heated air to vaporize aqueous ammonia, the SCR skid similarly, shutdown. NOx concentrations from S 461 exceeded the 10-ppm limit without the SCR skid.

Corrective actions or preventative steps taken: The diluent airflow heater was restarted at approximately 2:10 a.m. bringing NOx concentrations within permit limits. After restarting, the diluent airflow heater tripped several more times early on 11/23/18. The airflow heater was restarted after each trip, however, and the NOx concentrations remained within permit limits throughout the restart efforts.



				May have resulted in a deviation from:	
Deviation No:	064-18	Source Number(s):	296	Permit:	
Event Started:	11/11/2018 6:38 AM	Abatement Device(s) :		AQMD:	
Stopped:	11/11/2018 2:42 PM	Emission Point(s):		Other:	40 CFR 60.103a(h); 40 CFR 60.107a(a)

Event Description: On November 11, 2018 flare activity occurred from 6:38 a.m. until 2:42 p.m. when the Unit 200 G-501 Wet Gas Compressor (G-501) unexpectedly shutdown during the Unit 200 startup. The G-501 shutdown resulted in flaring because the amount of gas being generated following the G-501 shutdown could not be completely recovered by the G-503/G540 Flare Gas Recovery Compressors. This flare event triggered root cause analysis reporting in accordance with BAAQMD 12-12-406. This report is required within 60 days following the end of the month in which the reportable flaring event occurred, and was submitted on 12/26/18 (371-ESDR-18). The investigation analysis indicated that the gas flared did not meet the "process upset gas" definition in NSPS Subpart Ja.

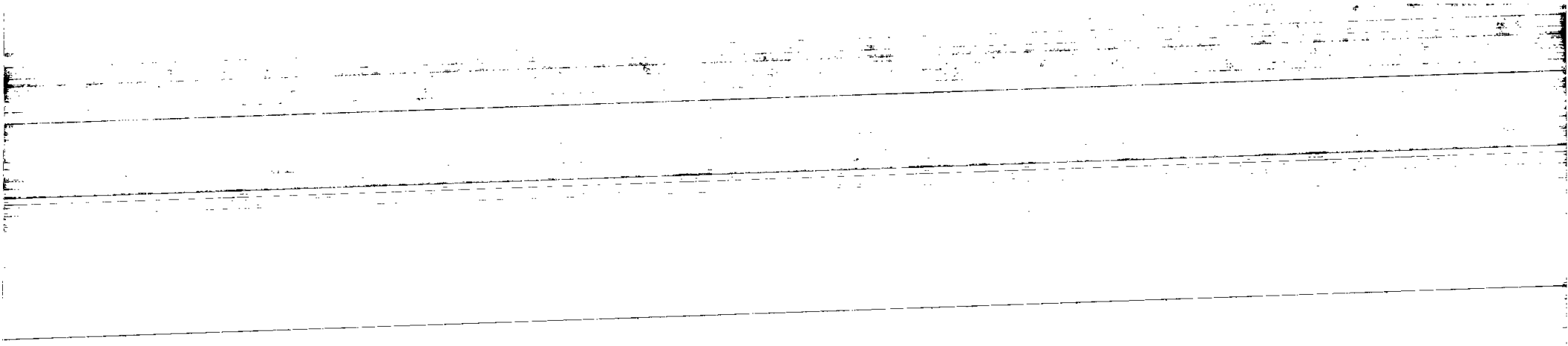
Analysis of the timely flare samples indicates the presence of 2.13% H2S (average) in the flare gas, which is in excess of the NSPS Subpart Ja H2S limit at 40 CFR 60.103a(h). In addition, NSPS Ja monitoring requirements at 40 CFR 60.107a(a)(2) require an H2S CEMs for any flaring of gas that is not process upset gas, non-routine relief valve leakage, or results from an emergency malfunction. Phillips 66 Company submitted an Alternative Monitoring Plan (AMP) application to EPA on March 1, 2016 requesting that BAAQMD Regulation 12-11 sampling be used in lieu of the Subpart Ja H2S CEMs required by section 60.107a(a)(2). We are currently awaiting EPA's approval of the AMP and do not have any indication that the AMP will not be approved. However, because we are still awaiting EPA approval of our AMP, we were in "technical" non-compliance with the section 60.107a(a)(2) requirements to have an H2S CEMs during this flaring activity.

Probable Cause: It was determined that during pre-startup commissioning faults had been detected on the G-501 motor protective relay. It was determined that replacement of the relay was a prudent action to take so that the Unit 200 start-up could continue. A more modern and updated relay was available on-site and was used as a replacement. The relay provided for all of the required motor protection functions. The replacement relay was installed and performance testing showed no faults. Following the relay replacement, the Unit 200 and G-501 started-up with normal associated post maintenance performance testing being conducted.

Although the relay installed provided all required motor protective functions there was one accessory function that the older relay had previously supplied that was not supported. This function was analog transmission of motor power consumption (AMP) data. The new relay was configured to transmit motor AMP data using a digital protocol. At the time of installation, the electrical maintenance team did not realize that the digital data transmission from the new relay was not suitable for communication with the operator control console (DCS).

Because the transmission of motor amps to the Operations console had been inadvertently disabled, Operators were unaware that changing conditions were overloading the G-501 compressor motor. Approximately 12 hours after the G-501 compressor had been placed on-line the AMPs exceeded the protective limit, resulting in the G-501 shutdown.

Corrective actions or preventative steps taken: Following the G-501 shutdown the replacement motor protective relay was re-configured to transmit the necessary analog signal so that amperes levels could be transmitted to the Distributed Control System (DCS) for monitoring and alarms. In addition, an operating guideline will be incorporated in the Unit 200 startup procedure to include a recommended suction pressure limitation for startup operation.



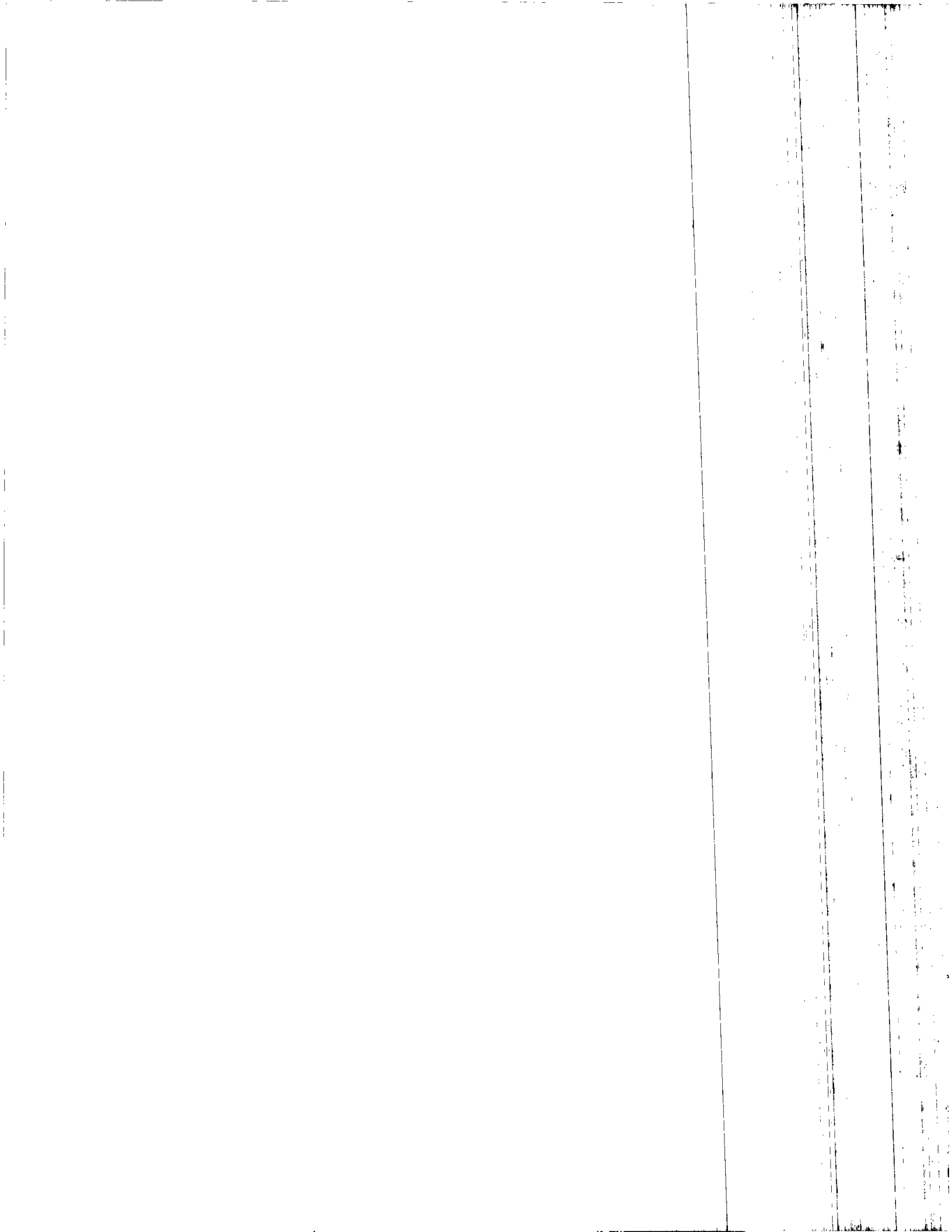
May have resulted in a deviation from:

Deviation No:	065-18	Source Number(s):	36; 461	Permit:	21096-6; 21097-6
Event Started:	12/7/2018	Abatement Device(s) :		AQMD:	
Stopped:	12/8/2018	Emission Point(s):		Other:	

Event Description: Unit 215 Merichem fuel gas combusted at Unit 200 B-102 (S-36) and Unit 250 B-701 (S-461) heaters is subject to a 100-ppmv total reduced sulfur (TRS) limit. Per applicable permit conditions, TRS can be determined directly or conservatively assumed as equivalent to total sulfur (where TRS is a subset of total sulfur). Three samples of U215 fuel gas were taken and analyzed on 12/7/18; two were analyzed for Total Sulfur only and one was analyzed for both Total Sulfur and TRS. The average TRS from the 3 samples using TRS for one sample and Total Sulfur assumed conservatively to be TRS for the other two samples was 176 ppmv, which is above the 100-ppmv TRS permit limit. Typically, Phillips 66 would have further analyzed the two "Total Sulfur" samples for TRS to demonstrate a calendar-day average below the 100-ppmv TRS limit. However, due to a miscommunication regarding the operating status of the Merichem unit, only one of the Total Sulfur samples was analyzed for TRS and the other two samples were not retained for further analysis. Based on the one TRS result (2.6 ppmv) and comparable TRS results from subsequent days, we believe that we were in compliance with the 100-ppmv TRS limit on 12/7/18. However, based on the prescriptive way the permit requires calculating the daily average when only Total Sulfur is analyzed, the calculated TRS of 176 ppmv exceeded the 100-ppmv limit when the two Total Sulfur results are factored into the determination of the daily average (notwithstanding that TRS as measured directly was 2.6 ppmv, which is well below the permit limit of 100 ppmv). The 100-ppmv permit limit affects the Unit 200 B-102 (S-36) and Unit 250 B-701 (S-461) heaters, which were both operating and receiving Merichem fuel gas that day.

Probable Cause: The two samples were not further analyzed for TRS due to miscommunication about the fuel gas unit's operating status.

Corrective actions or preventative steps taken: Phillips 66 does not believe there was an actual exceedance of the daily 100-ppmv TRS limit and, therefore, no corrective actions were necessary with respect to actual sulfur content in the fuel gas. To improve internal communications, however, the operating procedure will be reviewed with Operations and Lab personnel and communication methods improved to ensure lab personnel are adequately notified about unit operating status so that samples are retained and analyzed as needed to ensure the calculated daily average demonstrates TRS below the limit.



BAAQMD Title V Permit
6 Month Monitoring Report

A0016 Phillips 66 Company San Francisco Refinery

Facility Address:
1380 San Pablo Ave

City: Rodeo
State: CA
Zip Code: 94572

Mailing Address:
1380 San Pablo Ave

City: Rodeo
State: CA
Zip Code: 94572

Contact: Suejung Shin Title: Environmental Engineer Phone: (510) 245-4655

Inoperable monitors as defined by BAAQMD Regulations 1-522 and 1-523 for the reporting period are summarized below:

Started		Stopped			Deviation #	Source (S#)	Abatement Device (A#)	Emission Point (P#)
7/6/2018	12:05 PM	7/9/2018	8:37 AM	☑	030-18	371; 372		

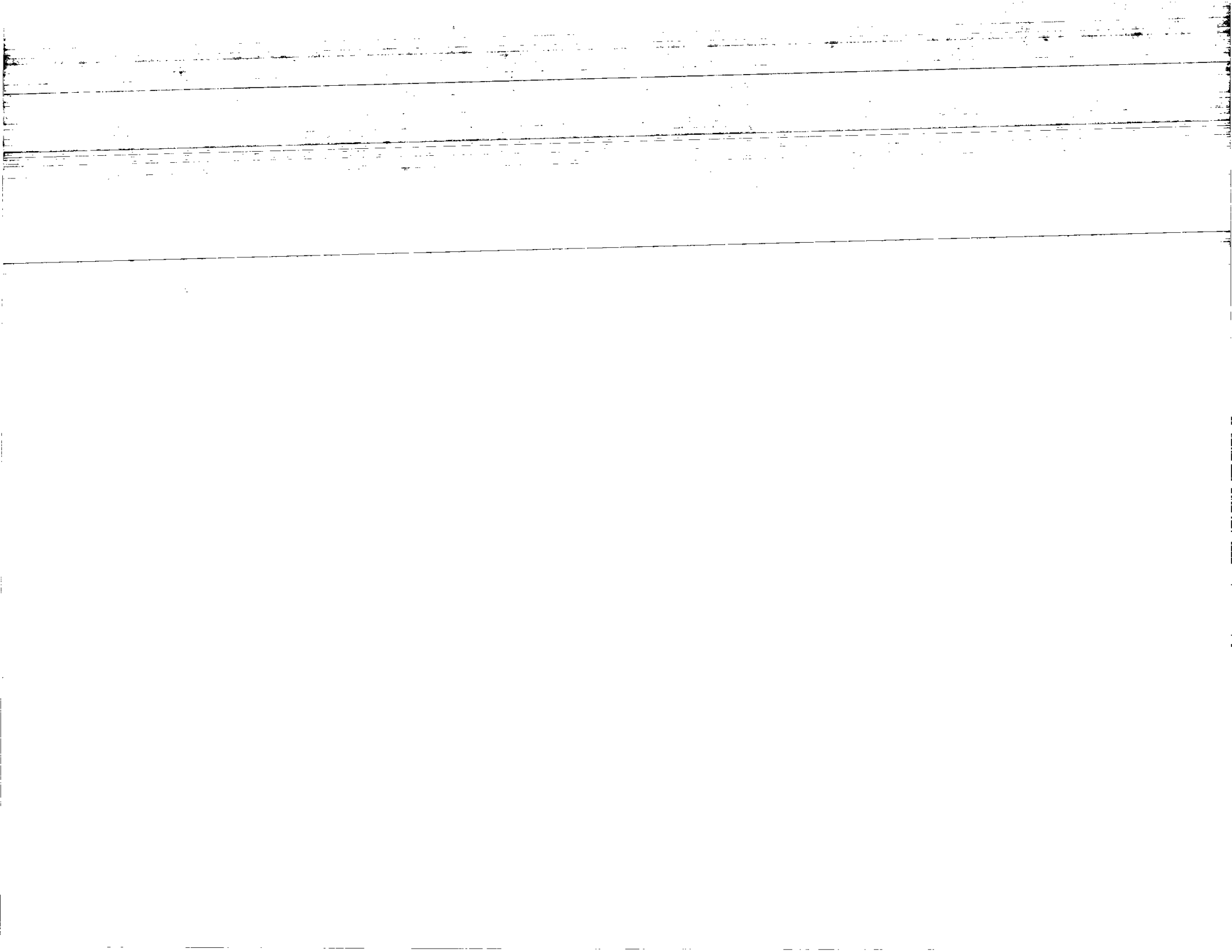
CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 12:05 PM on 7/6/18 the O2 analyzer at U228 B-520/521 became stuck in calibration mode during calibration. The analyzer was repaired and back online at 8:37 AM on 7/9/18.

Started		Stopped			Deviation #	Source (S#)	Abatement Device (A#)	Emission Point (P#)
7/14/2018	10:30 AM	7/16/2018	10:00 AM	☑	031-18	15; 16; 17; 18; 19		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At around 10:30 am on 7/14/2018, both O2 analyzers at U244 B-501 through B-505 heaters (S15-S19) failed to calibrate. They also failed to calibrate on 7/15, resulting in over 24 hours of downtime. The analyzers were repaired, successfully calibrated, and back on line at approximately 10:00 am on Monday, 7/16/2018.



Started	Stopped		Deviation #	Source (S#)	Abatement Device (A#)	Emission Point (P#)
7/17/2018	11:15 AM	7/18/2018 11:20 AM	☑ 032-18	10		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: The CEMs system at U240 B-101 stopped giving readings at around 11:15 am on 7/17. The system was repaired and back online at 11:20 am on 7/18.

8/4/2018	9:30 AM	8/6/2018 9:00 AM	☑ 036-18	10		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At around 9:30 AM on 8/4/2018, the NOx analyzers at U240 B-101 failed calibration. The analyzers again failed calibration on 8/5/2018, resulting in inoperative monitors. Repairs were made and the analyzers were brought back online on 8/6/2018 at approximately 9:00 AM.

8/25/2018	8:00 AM	8/28/2018 9:07 AM	☑ 035-18	53		

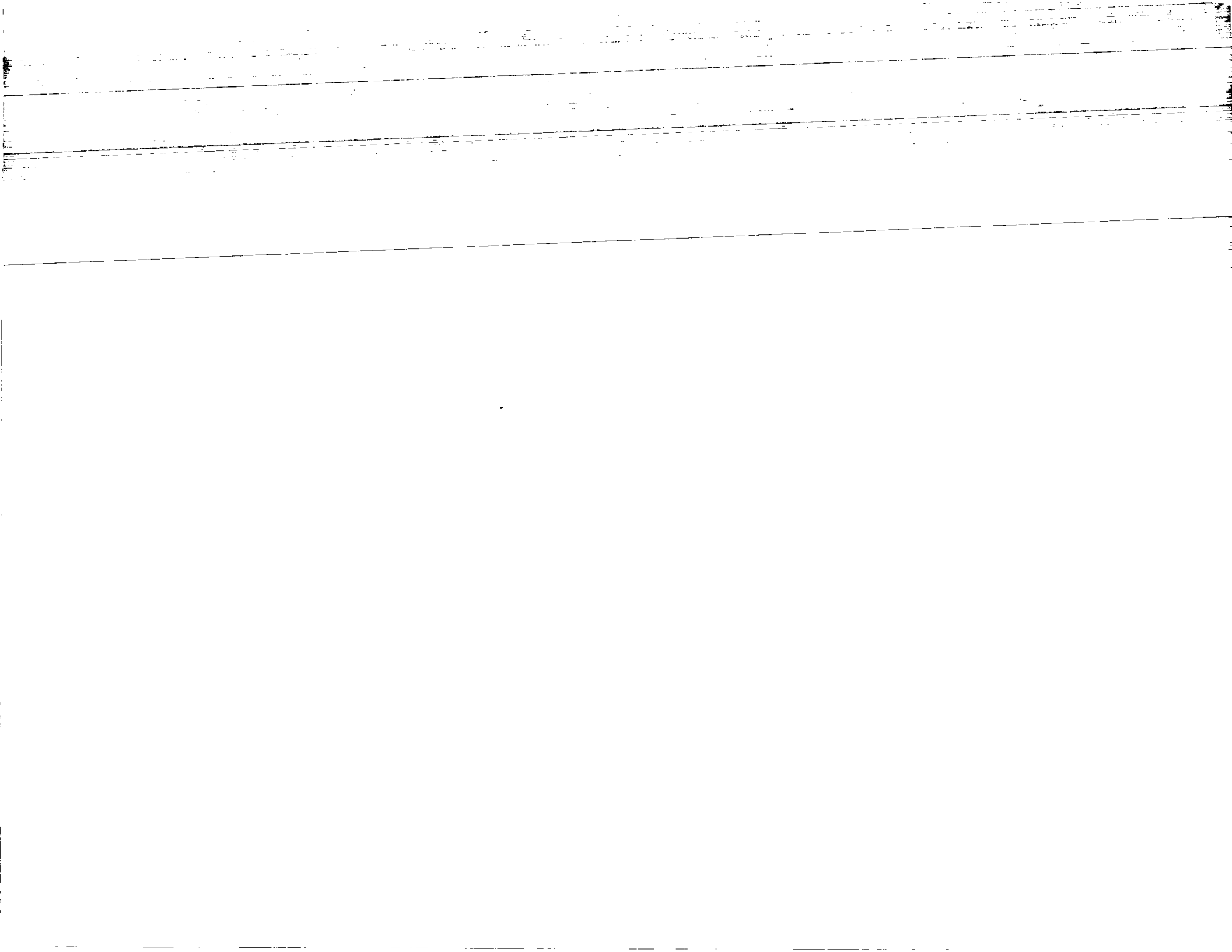
CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 8:00 AM on 8/25/18, the CO analyzer at SPP B failed to successfully clibrate and subsequently failed to calibrate the following day, resulting in an inoperative monitor.

9/8/2018	8:00 AM	9/10/2018 7:30 AM	☑ 034-18	13		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 8:00 AM on 9/8/18, the NOx analyzer at U240 B-301 failed calibration. The analyzers subsequently failed calibration the following day on 9/9/18, resulting in 24 hours of inoperation. The analyzer was repaired and back online at approximately 7:30 AM on 9/10/18.



Started	Stopped		Deviation #	Source (S#)	Abatement Device (A#)	Emission Point (P#)
9/29/2018	7:45 AM	9/30/2018 8:00 AM	☑ 038-18	1002		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
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Event Description: At around 7:45 AM on 9/29/18, the SO2 analyzer at U236 became inoperative. The analyzer was reapiared and back online at approximately 8:00 AM on 9/30/18, resulting in over 24 hours of inoperation.

9/30/2018	8:00 AM	10/1/2018	12:30 PM	☑ 051-18	353; 356	

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 8:00 AM on 9/30/18, the NOx, CO, and O2 analyzers at S353 (SPP B) failed calibration due to a sample pump failure. The sample pump was rebuilt, and the CEMS analyzers validated at approximately 12:30 PM on 10/1/18. Upon later review, it was determined that the CEMs were inoperative, and the inoperative monitor report was submitted on 11/6/18 (ID 07J79).

10/5/2018	10:25 PM	10/8/2018	11:03 AM	☑ 039-18	353; 356	14

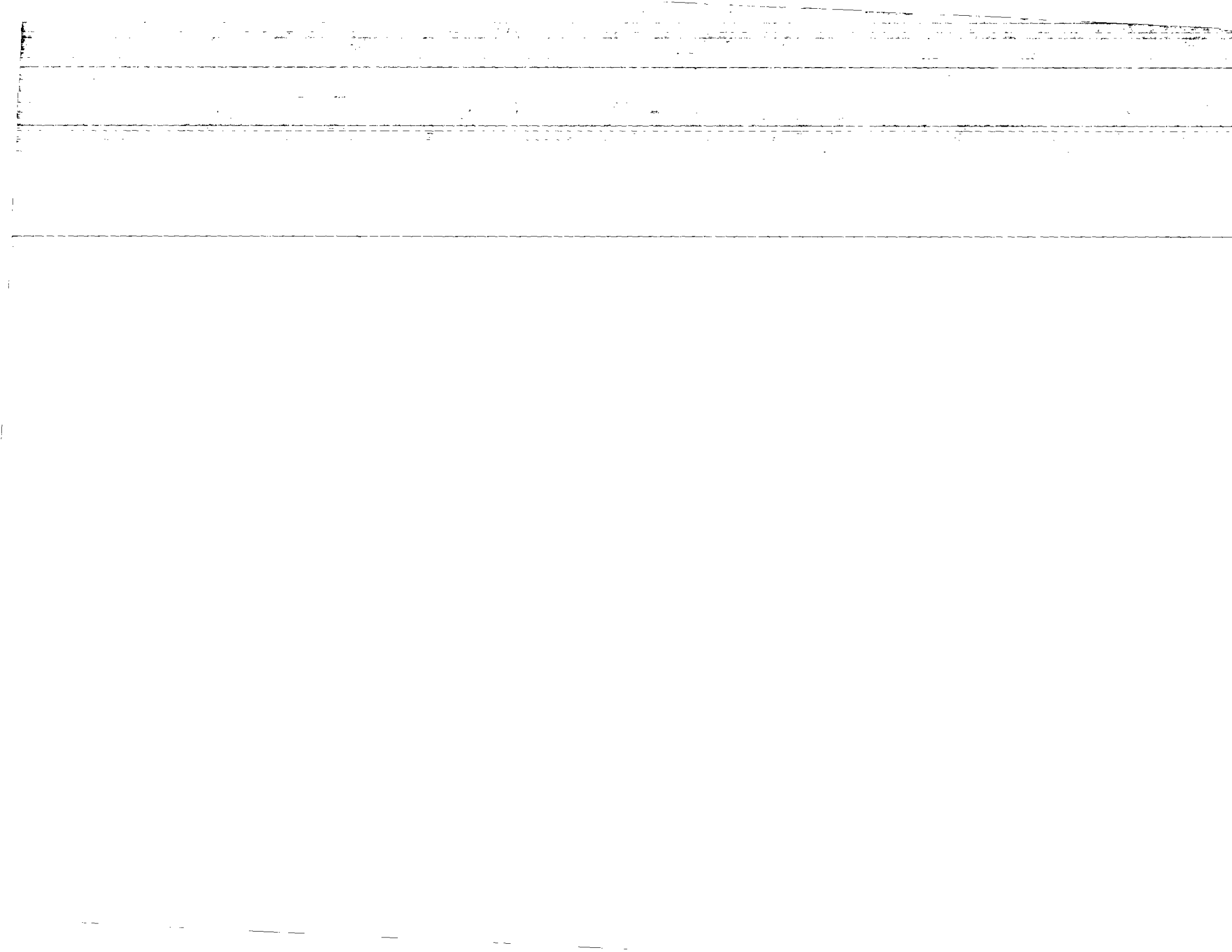
CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 10:25 PM on 10/5/18, the Nox, CO, and O2 analyzers at S353 (SPP B) became inoperative. Repars were made, and the analyzers were brought back online at approximately 11:03 AM on 10/8/18, resulting in over 24 hours of inoperation.

10/17/2018	9:00 PM	10/17/2018	9:00 PM	☑ 046-18	351	

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At around 9:00 PM on 10/17/18, the NOx analyzer at S-351 (U267 B-601/602) began giving inaccurate readings. The monitor continued to give inaccurate readings on 10/18/18, resulting in a period of inoperation over 24 hours. After further investigation, it was determined that the CEMS analyzers were giving accurate readings, but the heaters were not firing.



Started	Stopped		Deviation #	Source (S#)	Abatement Device (A#)	Emission Point (P#)
10/19/2018	12:40 PM	10/21/2018 11:45 AM	☑ 049-18	1010		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 12:40 PM on 10/19/18, the SO2, CO, and O2 CEMS analyzers at S1010 (U235) were taken offline in preparation for the planned unit shutdown. However, natural gas flow to the tail gas incinerator (TGI) at U235 was not shut down until approximately 11:45 AM on 10/21/18, resulting in a period of inoperation greater than 24 hours. Upon later review of operating data it was determined that the CEMs was inoperative and the inoperative monitor report was submitted on 11/1/18 (ID 07J78), which was not by the next business day, as required.

Although Phillips 66 believes that we are in compliance with Permit Condition 23125-21 and 23125-22, we are amending this deviation per BAAQMD request.

10/27/2018	7:00 AM	10/29/2018 7:00 AM	☑ 048-18	351		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At around 7:00 AM on 10/27/18, the NOx analyzer at S-351 (U267 B-601/602) failed calibration. The monitor subsequently failed calibration the following day on 10/28/18, resulting in over 24 hours of inoperation. The analyzer was repaired and back online at approximately 7:00 AM on 10/29/18.

10/30/2018	12:25 AM	10/31/2018 9:20 PM	☑ 004-19	338		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At about 12:25 am on 10/30/18, the H2S monitor at U233 began reading erratic values and is believed to be inoperative. The analyzer was repaired and considered operative at approximately 9:20 pm on 10/31/18.

Started		Stopped			Deviation #	Source (S#)	Abatement Device (A#)	Emission Point (P#)
11/11/2018	1:30 AM	11/13/2018	8:30 AM	☑	053-18	352; 355		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 1:30 AM on 11/11/18, the Nox and CO CEM analyzers at S352/355 (SPP A) failed calibration. The analyzers failed calibration the following day on 11/12/18, resulting in greater than 24 hours of inoperation. The system was repaired, and the analyzer passed calibration at approximately 8:30 AM on 11/13/18.

11/23/2018	9:00 AM	11/26/2018	9:00 AM	☑	059-18	351		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 9:00 AM on 11/23/18, the NOx analyzer at S-351 (U267 B-601/602) failed calibration. The analyzer subsequently failed calibration the following morning, resulting in more than 24 hours of inoperation. The analyzer was repaired and successfully calibrated at approximately 9:00 AM on 11/26/18.

11/24/2018	8:30 AM	11/25/2018	12:30 PM	☑	060-18	303		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: The SO2 analyzer at S303 (U238) failed calibration at approximately 8:30 AM on 11/24/18. The analyzer successfully calibrated at approximately 12:30 PM on 11/25/18, resulting in greater than 24 hours of inoperation.

11/30/2018	8:30 PM	12/3/2018	9:00 AM	☑	062-18	15; 16; 17; 18; 19		

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 8:30 PM on 11/30/18, the NOx analyzers at S15-19 (U244 B-501 through B-505) lost indication. The NOx analyzer failed to calibrate on 12/1/18 and 12/2/18, resulting in greater than 24 hours of inoperation. Repairs were made, and the analyzer successfully calibrated at approximately 9:00 AM on 12/3/18.

Started	Stopped			Deviation #	Source (S#)	Abatement Device (A#)	Emission Point (P#)
12/1/2018	9:20 AM	12/3/2018	8:45 AM	☑	063-18	352; 355	13

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
☑	☐	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Event Description: At approximately 9:20 AM on 12/1/18, the NOx and CO CEM analyzers at S352/355 (SPP A) lost indication due to a pump shutdown. The pump shutdown was caused by excessive moisture in the sampling system. The moisture was cleared from the system, and the CEMS validated calibration at approximately 8:45 AM 12/3/18.

12/23/2018	12:14 AM	12/24/2018	9:00 AM	☑	066-18	371; 372	

CEM	GLM	Fuel Gas	Parametric	NOx	SO2	CO	H2S	TRS	NH3	O2	CO2	H2O	Opacity/ LTA	Lead	Steam	Flow	Wind Dir.	Wind Speed	pH	Temp.	VOC.	Gauge Press.
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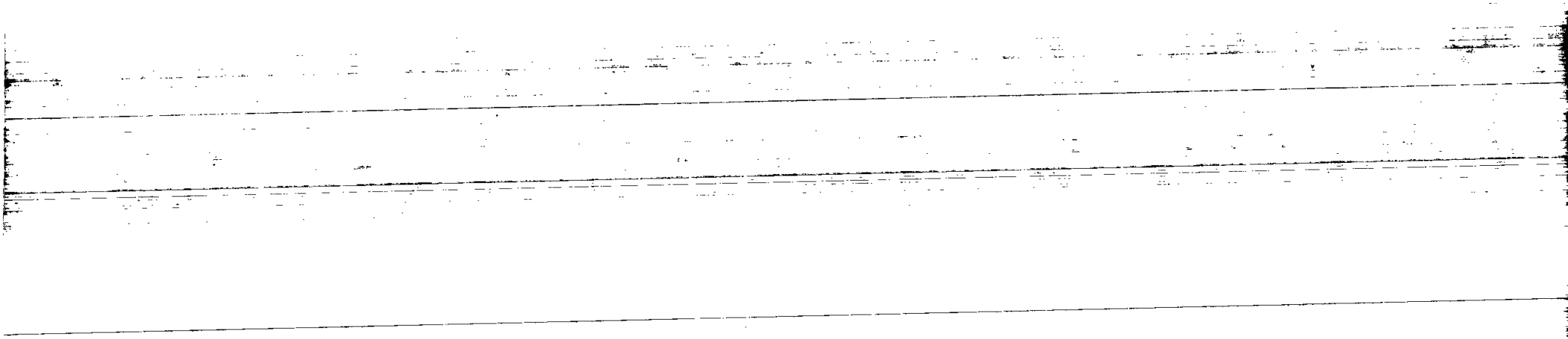
Event Description: The NOx CEMs value for U228 B520/521 was detected as reading low. Repairs were made and the CEMs began to function properly. The cause appears to be a plugged sample filter.