KINDER MORGAN
CRUDE & CONDENSATE LLC

December 3, 2019

Attention: Steve Thompson (6EN-A)
United States Environmental Protection Agency
1201 Elm St
Dallas, TX 75270

Subject: Request for Alternative Monitoring Plan
Kinder Morgan Crude & Condensate LLC
Galena Park Splitter
407 Clinton Dr.
Galena Park, TX 77547

Dear Mr. Thompson,

Kinder Morgan Crude & Condensate LLC (Kinder Morgan) is seeking an Alternative Monitoring Plan (AMP) for the NOx CEMS span requirements pertaining to process heaters located at refineries, which are driven by New Source Performance Standard (NSPS) Subpart Ja.

The attached AMP application has been prepared and submitted in accordance with guidance from the US Environmental Protection Agency (EPA) Region 6 and the *Applicability Determinations, Alternative Monitoring, and Compliance Assistance Projects* (ADAM-CAP) General Directions. We believe the proposed AMP provides a feasible and acceptable for spanning the NOx CEMS and ensuring the limits in the rules are not exceeded.

Sincerely,

Jenni C. Melder
EHS Manager, Galena Park Splitter
Kinder Morgan Crude & Condensate LLC

Attachments

cc: Anand Rathinasamy, TRC Environmental Corporation
Jack Willey, P.E., TRC Environmental Corporation

Application for an Alternative Monitoring Plan for NO_X CEMS Span

Galena Park Crude Condensate Splitter

Galena Park, Harris County, Texas

December 2019

Prepared For
Kinder Morgan Crude & Condensate LLC

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Section 1
Background

Kinder Morgan Crude & Condensate LLC (Kinder Morgan) owns and operates a Crude Condensate Splitter facility (Splitter) located in Galena Park, Harris County, Texas. The condensate splitter consists of two trains that can each process 50,000 bbl./day of hydrocarbon condensate material using conventional distillation technology to obtain products suitable for commercial use. As part of the production process, Kinder Morgan uses two process heaters which have the capability to combust "recycled fuel gas" (RFG) in addition to the primary fuel which is pipeline quality natural gas. The RFG is considered "fuel gas" under Title 40 of the Code of Federal Regulations (40 CFR) Part 60, pertaining to New Source Performance Standards (NSPS) Subpart Ja. Combustion units, as forced draft process heaters with a maximum heat input greater than 40 MMBtu/hr, are subject to the monitoring requirements of NSPS Ja. Pursuant to 40 CFR §60.107a(c), NSPS Subpart Ja requires the owner or operator of fuel gas combustion devices, including process heaters, to install, calibrate, maintain, and operate a continuous monitoring system to track and record the concentration of oxides of nitrogen (NOx) in the exhaust. NSPS Subpart Ja §60.107a(c)(1) requires a continuous emissions monitoring system (CEMS) span two to three times the emissions limit (inclusive). As the only standard or limit which the CEMS can directly measure is the 60 ppmv (dry basis, corrected to zero percent excess air), the span is required to be between 0-120 ppmv and 0-180 ppmv under this Subpart. At the Kinder Morgan Splitter, under most operating scenarios, the 60 ppmv limit is far higher than the allowable NOx emissions required under Title 30 of the Texas Administrative Code (30 TAC) Ch. 117, current Tier I Best Available Control Technology (BACT) for process heaters, or the facility's permits; resulting in a disproportionately large span. Kinder Morgan is seeking an Alternative Monitoring Plan (AMP) for the NOx CEMS span requirements found in NSPS Subpart Ja §60.107a(c)(1).

Kinder Morgan has prepared this AMP request application for NOx CEMS span in forced draft process heaters used in production at refineries. The AMP presented in this application does not propose to change any monitoring, recordkeeping, or emissions standards in NSPS Subpart Ja. Kinder Morgan is requesting a reduction in the allowable span of the NOx CEMS analyzers, as required in 40 CFR §60.107a(c)(1) from two to three times the emissions limit to 1.7 times the emissions standard, that equates to a span of 100 ppmv. We believe this AMP provides a feasible method to monitor NOx emissions from these heaters demonstrating compliance with the limits described in 40 CFR §60.102a(g)(2)(ii)(A).

Section 2
Basis

EPA Region 6 has the authority to approve this AMP and exemptions from monitoring requirements which are deemed impractical or onerous in the context of certain activities.

The proposed AMP, presented in Section 6 of this application, would provide an alternative NOx CEMS span requirement according to NSPS Subpart Ja. However, this request is not an authorization to construct or operate a source of air emissions. The monitoring techniques proposed in this AMP are sufficient to demonstrate that the NOx concentration will not exceed 60 ppmv, as required by 40 CFR §60.102a(g)(2)(ii)(A).

Section 3
Process Description

Kinder Morgan owns and operates a Crude Condensate Splitter facility located in Galena Park, Harris County, Texas. The condensate splitter consists of two trains that can each process 50,000 bbl./day of hydrocarbon condensate material using conventional distillation technology to obtain products suitable for commercial use. As part of the production process, Kinder Morgan uses two forced draft process heaters which have the capability to combust RFG in addition to the primary fuel which is pipeline quality natural gas. As the RFG is considered "fuel gas" under 40 CFR Part 60, Subpart Ja, the combustion units as process heaters with a maximum heat input greater than 40 MMBtu/hr, are subject to the monitoring requirements of NSPS Subpart Ja.

Section 4
NO_X Span AMP Justification

Kinder Morgan believes the span of 100 ppmv is adequate based on several factors, chief among them is historic CEMS data which demonstrates that the process heaters' emissions of NOx could be measured accurately using the proposed span. The NOx CEMS information used in this analysis is from January 2017 through September 2019 which Kinder Morgan believes is sufficient to show the consistent operation of the heaters.

When hourly data is averaged monthly (comparable to the 30-day rolling average described in the standard), we see that for Heater 1 the actual average monthly NOx is 3.79 ppmv with a monthly average maximum of 12.68 ppmv. For Heater 2 the actual average monthly NOx is 4.06 ppmv with a monthly average maximum of 7.92 ppmv. While these are averages, they demonstrate that the proposed span is typically almost 20 times the average monthly actual concentration, making the span more than adequate. While the span pertains to the actual NOx measurements, these are used to demonstrate compliance with a concentration corrected based on excess air in the exhaust. The corrected values with zero percent excess air are also displayed alongside the actual values on the graphs below. The emissions standard is 60 ppmv on a dry basis corrected to zero percent excess air. As shown in the graphs, for Heater 1, the corrected monthly average NOx is 6.82 ppmv, with a monthly max of 32.25 ppmv. For Heater 2, the corrected monthly average NOx is 6.05 ppmv, with a monthly max of 13.40 ppmv. The actual and corrected monthly averages for Heater 1 and Heater 2 are displayed in Figures 1 and 2 respectively which can be found below. The tables displaying the exact values are included for reference in Appendix A.

Figure 1
Heater 1 Monthly Average NO_X Concentration

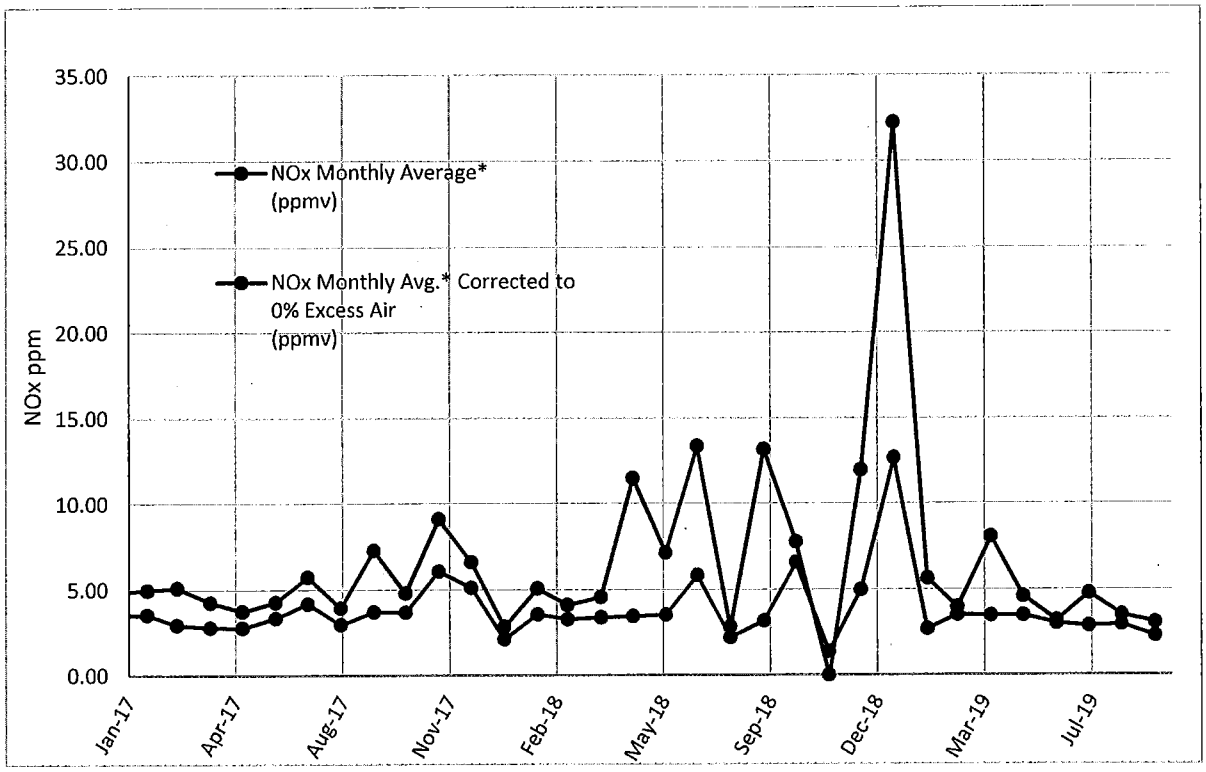
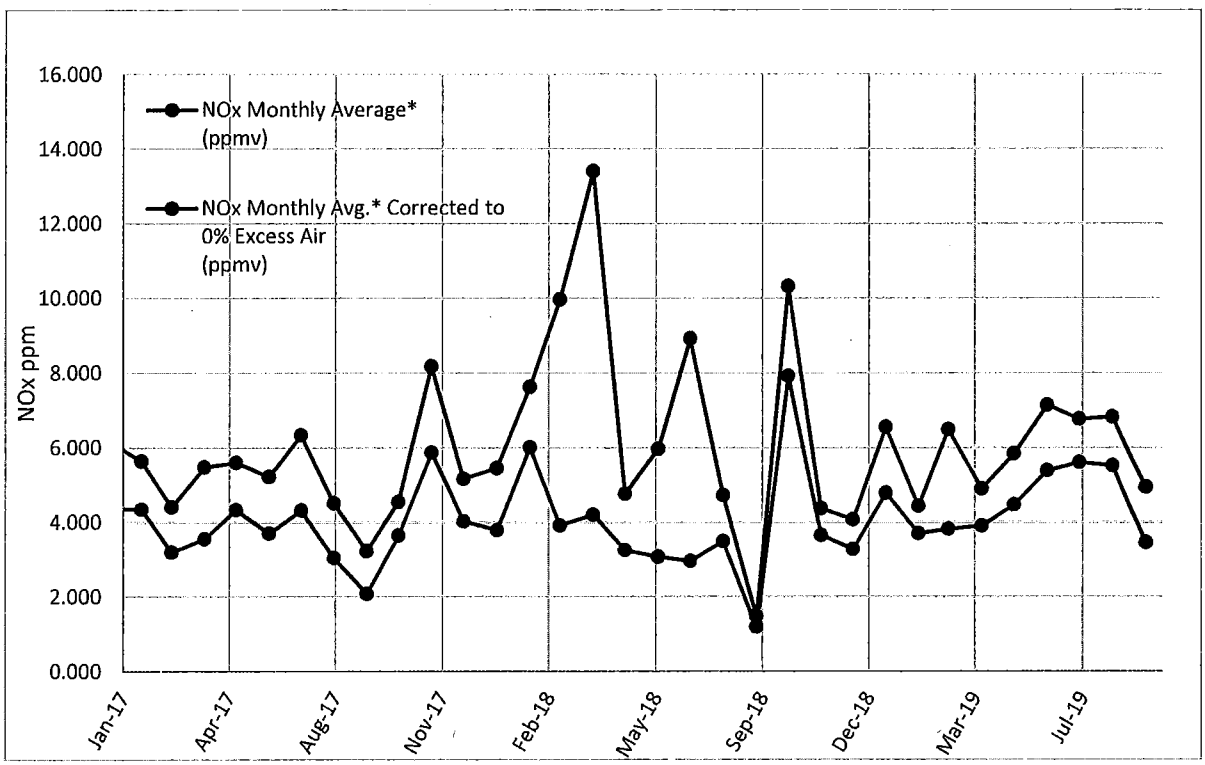


Figure 2
Heater 2 Monthly Average NO_X Concentration



The two heaters, on which the NOx CEMS are installed are also equipped with selective catalytic reduction (SCR) units for the control of NOx emissions. This system uses a catalyst and reagent, in this case ammonia (NH_3), to convert NOx into inert compounds. This system requires that the amount of reagent introduced to the SCR system constantly be metered. If too little NH_3 is added, the NOx would not be sufficiently controlled. If too much is added, this will result in excess NH_3, which would be entrained in the exhaust stream and emitted to the atmosphere in unacceptable levels in what is commonly referred to as "ammonia slip". The SCR NH_3 metering system uses a closed logic loop to adjust the amount of the reagent being added to the system on a continuous basis. The first part of the logic is the "feed-forward scheme", which uses the NOx concentration at the inlet to the SCR along with mass flow and combustion data to predict the amount of NH_3 required to reduce NOx to the level desired. The second part of the logic is the "feed-back control", which uses the NOx outlet concentration to determine the destruction efficiency of the SCR system and fine-tune the NH_3 injection. Thus, the accuracy of the analyzers which measure the NOx outlet concentration, the same units for which the AMP is being requested, is of vital importance to the function of the SCR control system. As the span for this unit is increased, the fidelity of this data will decrease proportionally. Therefore, to maintain the accuracy and fidelity of the analyzer data and by

extension, the functionality of the NOx SCR control system, it is requested that the span for these analyzers be allowed to be set to 0-100 ppmv. The manual for the SCR system which outlines the operation of the NH_3 metering system can be made available at the request of the Region.

In the 2008 proposed rule for NSPS Subpart Ja, the EPA proposed to update the required span for NOx CEMS from a fixed 200 ppmv to the current requirement which is two to three times the NOx limit (inclusive). In the same proposed rule, the EPA proposed a standard of 40 ppm NOx for forced draft process heaters with a maximum heat input greater than 40 MMBtu/hr; which was updated in the final rule to the current 60 ppm of NOx. However, according to the proposed rule, the acceptable span for the NOx CEMS would be 80-120 ppmv inclusive; the span proposed in this AMP application fits into this span which was previously found to be acceptable by the EPA as demonstrated by the EPA's inclusion of it in the proposed rule.

There is no explicit explanation for the span given in the original proposed rule for Subpart Ja, when the span was 200 ppmv; just as there was not an explanation given when the span was updated to the current two to three times the emissions limit, inclusive. However, in the original proposed rule, it is explained that the NOx at the inlet to a control device could be as high as 50-200 ppmv. Therefore, one could conclude that the original span for the NOx at the outlet of the control device was intended to give accurate readings even if the control device was out of service or malfunctioning. The actual measured NOx concentration at the inlet to the SCR is typically around five times the actual measured NOx at the outlet to the SCR, but rarely exceeds 50 ppmv on an instantaneous basis. This would mean that even with the SCR out of service, analyzers spanned to 100 ppmv would be able to accurately measure the NOx concentration.

For all the reasons described above, the NOx CEMS span of 100 ppmv should be acceptable for the process heaters located at the Kinder Morgan Splitter. The analyzers currently installed on the heaters are, in fact, only capable of handling a span of up to 100 ppmv. It would represent a significant expense to the facility to procure and install analyzers capable of achieving the 120 ppmv span required by the Subpart. As shown above, a span of 100 ppmv is more than capable of accurately monitoring the NOx concentration emitted from these heaters and this expenditure would be a superfluous cost to the facility.

Section 5
Authorization

Kinder Morgan understands that an AMP is not an authorization to construct or operate a source of air emissions. Authorization is provided under existing permits, maintained by the facility.

Section 6
Alternative Monitoring Plan

Kinder Morgan has prepared this AMP for NOx CEMS span for forced draft process heaters with a maximum rated heat input greater than 40 MMBtu/hr operating at refineries. We believe this AMP provides a feasible method demonstrating compliance with the limits described in 40 CFR §60.102a(g)(2)(ii)(A).

6.1 Heater NOx CEMS Span AMP

As they combust fuel gas, Kinder Morgan's heaters are subject to NSPS Subpart Ja, specifically forced draft process heaters with a maximum rated heat input of greater than 40 MMBtu/hr. Per §60.102a(g)(2)(ii)(A), the heaters are subject to an emissions standard of 60 ppmv (dry basis, corrected to 0 percent excess air) on a 30-day rolling basis. To demonstrate continued compliance with this standard, Kinder Morgan has installed a CEMS capable of monitoring both NOx and O_2 concentrations in the heater exhaust gases, as required by §60.107a(c). According to §60.107a(c)(1), the NOx CEMS must be spanned to two to three times the emissions standard, inclusive. Kinder Morgan believes the span specified in this Subpart is not necessary to demonstrate compliance with the emissions standard for the reasons described in Section 4.0 of this application. This AMP application proposes a span of 100 ppmv for the NOx CEMS, with all other methods of measurement and recordkeeping remaining unchanged.

6.2 Calibration of NOx Analyzers

The analyzers are validated daily against zero and span gases. If either of these validations are found to be outside of the acceptable range, a full calibration is performed immediately, and the validation is conducted again to verify the success of the calibration and the accuracy of the readings.

In addition to the daily validations and as-needed calibrations, the facility is also required to perform quarterly cylinder gas audits (CGAs) as well as an annual relative accuracy test audit (RATA) to independently verify all instruments are making accurate readings.

6.3 Demonstrating Compliance with Exhaust Gas NOx Concentration Standards

Kinder Morgan will continue to comply with all other portions of NSPS Ja not addressed in this application, including the emissions standard of 60 ppmv (dry basis, corrected to zero percent excess air) for forced draft process heaters with a max heat input greater than 40 MMBtu/hr. As the proposed span (100 ppmv, actual) exceeds the emission standard (60 ppmv, corrected) by 67

percent or more, depending on the correction, it is more than adequate to demonstrate compliance with this standard.

As the emissions standard for NOx in this subpart is calculated on a 30-day rolling average, it is proposed that strictly for the purposes of demonstrating compliance with this Subpart, any valid data points which exceed the span of 100 ppmv be averaged as 120 ppmv, the minimum span for these heaters as indicated in the Subpart. Since the analyzers will not be accurately measuring NOx above the span, this will allow for conservative averages based on the span listed in the Subpart.

By following this methodology, Kinder Morgan can demonstrate compliance with the emission limitations required by 40 CFR §60.102a(g)(2)(ii)(A). Therefore, Kinder Morgan believes that this AMP is enough to exempt these emissions control activities from the NOx CEMS span requirements of 40 CFR §60.107a(c)(1). Kinder Morgan will also maintain records required by this Subpart for a period of five (5) years.

Appendix A
Historic NO_X Outlet CEMS Data (Confidential)

Heater 1 2017-2019 Data		
Month	**NOx Monthly Average* (ppmv)**	**NOx Monthly Avg.* Corrected to 0% Excess Air (ppmv)**
Jan-17	3.50	4.85
Feb-17	3.55	4.98
Mar-17	2.95	5.11
Apr-17	2.80	4.26
May-17	2.78	3.75
Jun-17	3.35	4.27
Jul-17	4.19	5.75
Aug-17	2.96	3.95
Sep-17	3.71	7.30
Oct-17	3.68	4.81
Nov-17	6.08	9.13
Dec-17	5.12	6.62
Jan-18	2.10	2.83
Feb-18	3.56	5.08
Mar-18	3.27	4.11
Apr-18	3.38	4.57
May-18	3.45	11.51
Jun-18	3.53	7.16
Jul-18	5.84	13.38
Aug-18	2.21	2.82
Sep-18	3.17	13.18
Oct-18	6.58	7.79
Nov-18	1.37	no data
Dec-18	4.99	11.98
Jan-19	12.68	32.25
Feb-19	2.69	5.65
Mar-19	3.51	3.98
Apr-19	3.48	8.09
May-19	3.49	4.60
Jun-19	3.01	3.20
Jul-19	2.88	4.78
Aug-19	2.95	3.52
Sep-19	2.29	3.08
Average	3.79	6.82
Max	12.68	32.25

* Average based on the mean of validated CEMS data averaged on an hourly basis.

Heater 2 2017-2019 Data		
Month	**NOx Monthly Average* (ppmv)**	**NOx Monthly Avg.* Corrected to 0% Excess Air (ppmv)**
Jan-17	4.387	6.191
Feb-17	4.351	5.641
Mar-17	3.202	4.412
Apr-17	3.555	5.480
May-17	4.334	5.601
Jun-17	3.704	5.226
Jul-17	4.322	6.333
Aug-17	3.049	4.512
Sep-17	2.086	3.232
Oct-17	3.647	4.547
Nov-17	5.869	8.175
Dec-17	4.027	5.165
Jan-18	3.786	5.447
Feb-18	6.009	7.627
Mar-18	3.917	9.964
Apr-18	4.205	13.405
May-18	3.257	4.765
Jun-18	3.077	5.969
Jul-18	2.962	8.921
Aug-18	3.495	4.725
Sep-18	1.202	1.494
Oct-18	7.922	10.331
Nov-18	3.656	4.377
Dec-18	3.281	4.075
Jan-19	4.787	6.553
Feb-19	3.705	4.439
Mar-19	3.819	6.485
Apr-19	3.904	4.901
May-19	4.473	5.842
Jun-19	5.390	7.138
Jul-19	5.603	6.762
Aug-19	5.514	6.822
Sep-19	3.458	4.943
Average	4.06	6.05
Max	7.92	13.40

* Average based on the mean of validated CEMS data averaged on an hourly basis.