

## SPECIAL CONDITIONS

Permit Number 87549

1. This permit authorizes emissions only from those points listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," (MAERT) and the facilities covered by this permit are authorized to emit subject to the emission rate limits on that table and other operating conditions specified in this permit.

Planned startup and shutdown emissions due to the activities identified in Special Condition 13 are authorized from these facilities at the emission points identified in that condition or from the routine emission points provided the emissions are compliant with the special conditions.

2. The following records shall be kept at the plant for the life of the permit.
  - A. Permit and permit amendment applications, and subsequent representations for each submitted to the TCEQ, and a current copy of the permit.
  - B. Air emissions testing reports conducted on facilities authorized under this permit.
3. The holder of this permit shall mark, or physically identify with weatherproof tags, the point sources identified in the MAERT of this permit (Emission Point Numbers [EPNs] HP-1, 2, 4, and 5).

### Process Fugitive Monitoring

4. Piping, Valves, Pumps, and Compressors in Ammonia Service
  - A. Audio, olfactory, and visual checks for ammonia leaks within the SCR operating area shall be made twice a day, each check shall be completed at least 8 hours after the previous check. If the site is manned for more than one shift, a check shall be completed on each shift.
  - B. Immediately, but no later than one hour upon detection of a leak, plant personnel shall take the following actions:
    - (1) Isolate the leak.
    - (2) Commence repair or replacement of the leaking component.
    - (3) Use a leak collection/containment system to prevent the leak until repair or replacement can be made if immediate repair is not possible.
  - C. The total quantity of anhydrous ammonia contained in and stored for the SCR process shall not exceed 10,000 pounds.

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The date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be maintained at the plant site of all repairs and replacements made due to leaks. The permit holder may propose an alternative AVO program, equivalent to the above requirements to the TCEQ Air Permits Division. If approved, it may be utilized in lieu of the above requirements.

### Reformer Conditions

5. The reformer (EPN HP-1) shall be fired with natural gas contain no more than 5 grains of total sulfur per 100 dry standard cubic feet (dscf) or fuel gas containing no more than 0.1 grain of hydrogen sulfide ( $H_2S$ ) per dry standard cubic foot. The natural gas shall be sampled every 6 months to determine total sulfur and net heating value. Test results from the fuel supplier may be used to satisfy this requirement.

6.  $NO_x$ , CO, and ammonia emissions from the Reformer (EPN HP-1) shall not exceed the following:

5 ppmvd  $NO_x$  corrected to 3 percent oxygen on a rolling 12 month average  
9 ppmvd  $NO_x$  corrected to 3 percent oxygen on an hourly average  
50 ppmvd CO corrected to 3 percent oxygen on an hourly average  
10 ppmvd ammonia corrected to 3 percent oxygen on an hourly average

$NO_x$  and CO hourly average exhaust concentrations shall not exceed 9 and 50 ppmvd corrected to 3 percent oxygen, respectively, unless operating during planned maintenance, startup, or shutdown (MSS) activities as provided in Special Conditions 13 and 15.

7. The permit holder shall install, calibrate, and maintain a continuous emission monitoring system (CEMS) to measure and record the in-stack concentration of  $NO_x$  and CO from Reformer (EPN HP-1) within 6 months after initial start-up of the reformer.
  - A. The CEMS shall meet the design and performance specifications, pass the field tests, and meet the installation requirements and the data analysis and reporting requirements specified in the applicable Performance Specification Nos. 1 through 9, 40 CFR Part 60, Appendix B. If there are no applicable performance specifications in 40 CFR Part 60, Appendix B, contact the TCEQ Office of Air, Air Permits Division for requirements to be met.

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- B. The system shall be zeroed and spanned daily, and corrective action taken when the 24-hour span drift exceeds two times the amounts specified in the applicable Performance Specification Nos. 1 through 9, 40 CFR Part 60, Appendix B, or as specified by the TCEQ if not specified in Appendix B. Zero, span, and corrective action is only required when the instrument-operations technician is normally scheduled to be on duty, at least three days per week.

Each monitor shall be quality-assured at least quarterly using Cylinder Gas Audits (CGA) in accordance with 40 CFR Part 60, Appendix F, Procedure 1, Section 5.1.2, with the following exception: a relative accuracy test audit (RATA) is **not** required once every four quarters (i.e., four successive quarterly CGA may be conducted). An equivalent quality-assurance method approved by the TCEQ may also be used. Successive quarterly audits shall occur no closer than two months.

All CGA exceedances of  $\pm 15$  percent accuracy indicate that the CEMS is out of control.

- C. The permit holder shall install and operate a fuel flow meter to measure the gas fuel usage for Reformer EPN: HP-1. The monitored data shall be reduced to an hourly average flow rate at least once every day, using a minimum of four equally-spaced data points from each one-hour period. Each monitoring device shall be calibrated at a frequency in accordance with the manufacturer's specifications or at least annually, whichever is more frequent, and shall be accurate to within 5 percent. In lieu of monitoring fuel flow, the permit holder may monitor stack exhaust flow using the flow monitoring specifications of 40 CFR Part 60, Appendix B, Performance Specification 6 or 40 CFR Part 75, Appendix A.
- D. All monitoring data and quality-assurance data shall be maintained by the source. The data from the CEMS may, at the discretion of the TCEQ, be used to determine compliance with the conditions of this permit.
- E. The appropriate TCEQ Regional Office shall be notified at least 30 days prior to any required RATA in order to provide them the opportunity to observe the testing.
- F. Quality-assured (or valid) data must be generated when the Reformer EPN: HP-1 is operating except during the performance of a daily zero and span check. Loss of valid data due to periods of monitor break down, out-of-control operation (as defined in 40 CFR Appendix F, Procedure 1 or as specified in part

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B of this condition), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that the Reformer EPN: HP-1 operated over the previous rolling 12-month period. The measurements missed shall be estimated using engineering judgment and the methods used recorded. Options to increase system reliability to an acceptable value, including a redundant CEMS, may be required by the TCEQ Regional Manager.

8. The permit holder shall monitor ammonia emissions the SCR system (EPN HP-1) using one of the following methods:

- A. Install and operate two NO<sub>x</sub> CEMS, one located upstream of the SCR system and the other located downstream of the SCR system, which are used in association with ammonia injection rate and the following calculation procedure to estimate ammonia slip.

$$\text{ammonia slip, ppmvd} = (a - (b \times c / 1,000,000)) \times 1,000,000 / b \times d$$

where:

- a = ammonia injection rate (lb/hr)/17 (lb/lb-mole);
- b = dry exhaust gas flow rate (lb/hr)/29 (lb/lb-mole);
- c = change in measured NO<sub>x</sub> concentration, ppmvd, across catalyst; and
- d = correction factor.

The correction factor shall be derived during compliance testing by comparing the measured and calculated ammonia slip. The ammonia injection rate and exhaust gas flow rate shall be recorded at least every 15 minutes and be recorded as hourly averages. Each flow monitoring device shall be calibrated at a frequency in accordance with the manufacturer's specifications, or at least annually, whichever is more frequent, and shall be accurate to within 2 percent of span or 5 percent of the design value.

- B. Install and operate a dual stream system of NO<sub>x</sub> CEMS at the exit of the SCR system. One of the exhaust streams would be routed, in an unconverted state, to one NO<sub>x</sub> CEMS and the other exhaust stream would be routed through a NH<sub>3</sub> converter to convert ammonia to NO<sub>x</sub> and then to a second NO<sub>x</sub> CEMS. The ammonia slip concentration shall be calculated from the delta between the two NO<sub>x</sub> CEMS readings (converted and unconverted).

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- C. Install an ammonia CEMS approved by TCEQ and meeting the following requirements:
- (1) Initial Performance Test Sampling shall be conducted in accordance with EPA Conditional Test Method 27 (CTM-027), modified as follows: the  $\text{NH}_3$  RATA samples shall be collected from three sample points located from one sample port. The points shall be those identified in Performance Specification 2 (16.7, 50.0, and 83.3% of the inside diameter). The samples shall be collected isokinetically for seven minutes at each of the three points for a total individual test time of twenty-one minutes. The  $\text{NH}_3$  data from the three, one-hour compliance runs shall also be used for the first three RATA runs. Subsequent tests will be twenty-one minutes in duration. The relative accuracy must be equal to or less than 20 percent of the mean value of the reference method test data.
  - (2) As part of the Initial Performance Test the ammonia CEMS shall be calibrated with the TÜV and MCERTS add-on provided by Siemens according to the operating instructions.
  - (3) Zero drift in the calibration of the LDS6 shall be continuously assured by absence of an alarm condition. The alarm condition is defined by  $\pm 10\%$  error in the automatic correlation verification.
  - (4) Quality-assured (or valid) data must be generated when the Reformer EPN: HP-1 is operating. Loss of valid data due to periods of monitor break down, out-of-control operation, repair, maintenance, or calibration may be exempted provided it does not exceed 10 percent of the time that the Reformer EPN: HP-1 operated over the previous rolling 12-month period. The measurements missed shall be estimated using engineering judgment and the methods used recorded. Options to increase system reliability to an acceptable value, including a redundant CEMS, may be required by the TCEQ Regional Director.
- D. The ammonia slip may be measured using a sorbent or stain tube device specific for ammonia measurement with a range such that 10 parts per million by volume (ppmv) is between 50 and 80 percent of its range. The frequency of sorbent or stain tube testing shall be daily for the first 60 days of operation, after which, the frequency may be reduced to weekly testing if operating procedures have been developed to prevent excess amount of ammonia from being introduced in the SCR unit and when operation of the SCR unit has been proven successful with regard to controlling ammonia slip.

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The ammonia injection rate shall be monitored and recorded hourly. If the hourly ammonia injection rate is more than 50 percent greater than that maintained during the last test for ammonia concentration, corrected to the equivalent firing rate, daily sorbent or stain tube testing shall resume for the next 7 days. These results shall be recorded and used to determine compliance with Special Condition No. 6.

9. The permit holder shall perform stack sampling and other testing as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere from the Reformer (EPN HP-1) to demonstrate compliance with the MAERT and Special Condition 6. The permit holder is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at his expense. Sampling shall be conducted in accordance with the appropriate procedures of the Texas Commission on Environmental Quality (TCEQ) Sampling Procedures Manual and the U.S. Environmental Protection Agency (EPA) Reference Methods.

Requests to waive testing for any pollutant specified in this condition shall be submitted to the TCEQ Office of Air, Air Permits Division. Test waivers and alternate/equivalent procedure proposals for 40 CFR Part 60 testing which must have EPA approval shall be submitted to the TCEQ Regional Office.

- A. The appropriate TCEQ Regional Office shall be notified not less than 45 days prior to sampling. The notice shall include:
  - (1) Proposed date for pretest meeting.
  - (2) Date sampling will occur.
  - (3) Name of firm conducting sampling.
  - (4) Type of sampling equipment to be used.
  - (5) Method or procedure to be used in sampling.
  - (6) Description of any proposed deviation from the sampling procedures specified in this permit or TCEQ/EPA sampling procedures.
  - (7) Procedure/parameters to be used to determine worst case emissions during the sampling period.

The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for the test reports. The TCEQ Regional Director must approve any deviation from specified sampling procedures.

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B. Air contaminants emitted from the Reformer to be tested for include (but are not limited to) CO, NO<sub>x</sub>, ammonia, and VOC.

C. Stack sampling shall occur as specified below.

(1) within 60 days after achieving the maximum operating rate, but no later than 180 days after initial start-up of the facilities;

(2) at such other times as may be required by the TCEQ Executive Director.

Requests for additional time to perform sampling shall be submitted to the appropriate regional office.

D. The facility being sampled shall operate at maximum hydrogen plant production feed rate during stack emission testing. These conditions /parameters and any other primary operating parameters that affect the emission rate shall be monitored and recorded during the stack test. Any additional parameters shall be determined at the pretest meeting and shall be stated in the sampling report. Permit conditions and parameter limits may be waived during stack testing performed under this condition if the proposed condition/parameter range is identified in the test notice specified in paragraph A and accepted by the TCEQ Regional Office. Permit allowable emissions and emission control requirements are not waived and still apply during stack testing periods.

During subsequent operations, if the hourly hydrogen plant production rate exceeds that recorded during the test period, stack sampling shall be performed at the new operating conditions within 120 days. This sampling may be waived by the TCEQ Air Section Manager for the region.

E. The CO emissions determined by the stack test shall not exceed 0.0089 lb/MMBtu for the test to be satisfactory.

F. Copies of the final sampling report shall be forwarded to the offices below within 60 days after sampling is completed. Sampling reports shall comply with the attached provisions entitled "Chapter 14, Contents of Sampling Reports" of the TCEQ Sampling Procedures Manual. The reports shall be distributed as follows:

One copy to the appropriate TCEQ Regional Office

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10. Steam may be vented from EPN HP-5 if the customer is temporarily unavailable. These periods shall be recorded and the emissions from this point calculated and the rolling 12 month emissions from this point be updated monthly. Emissions must comply with the MAERT limits for EPN HP-5.

### Cooling Tower Monitoring

11. Cooling water shall be sampled once a week for total dissolved solids (TDS). Dissolved solids in the cooling water drift are considered to be emitted as PM. The data shall result from collection of water samples from the cooling tower feed water and represent the water being cooled in the tower. Water samples should be capped upon collection, and transferred to a laboratory area for analysis. The analysis method for TDS shall be EPA Method 160.1, ASTM D5907, or SM 2540 C [SM - 19th edition of Standard Methods for Examination of Water]. Use of an alternative method shall be approved by the TCEQ Regional Director prior to its implementation.

The permit holder may reduce the frequency of sampling for TDS by establishing a correlation between TDS and conductivity for the cooling tower as follows.

- A. For a minimum period of four weeks the cooling water shall be sampled once a week for analysis total dissolved solids (TDS) and conductivity. The analysis method for conductivity shall be ASTM D1125-95A or SM2510 B. The data from the initial side-by-side measurements of TDS and conductivity shall be graphed and a slope calculated. A safety factor of two standard deviations will be applied to the slope for data quality expectation. A report including the weekly results, a data assessment and correlation of TDS to conductivity will be maintained on site.
- B. Following the completion of the report, the cooling water shall be sampled daily for conductivity and the result converted to TDS from the established correlation.
- C. The correlation will be rechecked annually with a single cooling water sample analysis for TDS and conductivity. The measured TDS value shall be compared to that estimated using the measured conductivity and the established correlation. If the calculated TDS value falls either above or below two standard deviations of the calculated slope, a new correlation effort shall be conducted in accordance with paragraph A of this condition.

Cooling tower PM emissions shall be determined using the cooling tower water circulation rate, cooling tower design drift, and the measured or estimated TDS.



MARKWEST FLARE

12. The following activities have been authorized in Markwest NSR Permit 19296:

Natural gas purge of flare header  
PSA feed syngas to flare due to quality excursion  
PSA purge gas to flare during quality excursion  
Product hydrogen vent to flare during quality excursion  
MSS activities vented to flare as identified in Special Condition 13

The date and duration of venting to the flare due to quality excursions shall be recorded. There shall be no more than 6 of these per rolling 12 month period and each shall not exceed 30 minutes in duration.

MSS Conditions

13. This permit authorizes emissions from the planned MSS activities summarized in the tables below.

Facility or FIN	Activities	EPN
Reformer Furnace	Initial commissioning Cold startup Warm startup	HP-1
SCR	Bypass SCR during maintenance	HP-1
Hydrodesulfurization Reactor	Catalyst change out	HP-3-MSS
All	process turnaround equipment degassing	PDEGASTAU

Facility or FIN	Activities	EPN
Absorber Vessels Separator Volume Bottle Filters Tanks and Drums Reactors Heaters and Boilers Coolers Reformer	unit equipment degassing	UDEGASTAU
INS1 INS8 INS9 INS10 INS11 INS12 INS13	fuel gas purge meter proving meter calibrations filter replacement screen replacement water wash small equipment empty and purge pump	INS

The following planned MSS activities are authorized and the waste gases must be routed to the flare located at the adjacent plant site authorized in Permit 19296: PSA feed startup, PSA purge startup, Hydrogen vent startup, SMR feed natural gas vent, shutdown PSA feed, desulfurizer natural gas vent for maintenance, hydrogen compressor vent for maintenance, hydrogen recycle compressor vent during maintenance, reduced bed mode, initial startup, process turnaround to flare, unit turnaround to flare, and performance tests. The performance of these activities shall be recorded with the information specified in this condition. This information shall be provided to the holder of Permit 19296 on a monthly basis.

Activities included in EPN INS are the inherently low emitting MSS activities that may be performed at the plant. Emissions from these activities shall be considered to be equal to the potential to emit represented in the permit amendment application, PI-1 dated December 1, 2009. The estimated emissions from these activities must be revalidated annually. This revalidation shall consist of the estimated emissions for each type of activity and the basis for that emission estimate.

Routine maintenance activities are included in EPNs UDEGASTAU and PDESASTAU and may be tracked through the work orders or equivalent. Emissions from these activities shall be calculated using the number of work orders or equivalent that month and the emissions associated with that activity identified in the permit application.

The performance of all other planned MSS activities and the emissions associated with each shall be recorded and include at least the following information:

- A. the process unit at which emissions from the MSS activity occurred, including the emission point number and common name of the process unit;
- B. the type of planned MSS activity and the reason for the planned activity;
- C. the common name and the facility identification number, if applicable, of the facilities at which the MSS activity and emissions occurred;
- D. the date and time of the MSS activity and its duration;
- E. the estimated quantity of each air contaminant, or mixture of air contaminants, emitted with the data and methods used to determine it. The emissions shall be estimated using the methods identified in the permit application, consistent with good engineering practice.

All MSS emissions shall be summed monthly and the rolling 12-month emissions shall be updated on a monthly basis.

- 14. Process units and facilities, with the exception of EPN INS shall be depressurized, emptied, degassed, and placed in service in accordance with the following requirements.
  - A. The process equipment containing process materials shall be depressurized to a control device or a controlled recovery system prior to venting to atmosphere, degassing, or draining liquid. Equipment that only contains material that is liquid with VOC partial pressure less than 0.50 psi at the normal process temperature and 95°F may be opened to atmosphere and drained in accordance with paragraph C of this special condition. The vapor pressure at 95°F may be used if the actual temperature of the liquid is verified to be less than 95°F and the temperature is recorded.
  - B. If mixed phase materials must be removed from process equipment, the cleared material shall be routed to a knockout drum or equivalent to allow for managed initial phase separation.
  - C. All liquids from process equipment or storage vessels must be removed to the maximum extent practical prior to opening equipment to commence

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degassing and/or maintenance. Liquids must be drained into a closed vessel unless prevented by the physical configuration of the equipment. If it is necessary to drain liquid into an open pan or sump, the liquid must be covered or transferred to a covered vessel within one hour of being drained.

15. The SCR system shall be placed in operation as soon as practicable during the reformer furnace startup. Startup is defined as the period following initial introduction of natural gas to the furnace not to exceed 12 hours for a warm startup and 24 hours for a cold startup with a firing rate less than 60 percent of design.
16. When the Hydrodesulfurization Reactor (EPN HP-3-MSS) catalyst bed is opened and the spent catalyst is vacuumed out, the particulate matter emissions from the vacuum process must be controlled using a filter system limiting PM to no more than 0.01 grain per standard cubic feet.
17. MSS activities represented in the permit application may be authorized under permit by rule only if the procedures, emission controls, monitoring, and recordkeeping are the same as those required by this permit.

Dated: September 10, 2014