

Special Conditions

Permit Numbers 2933, PSDTX1270, and N140M1

1. This permit covers only those sources of emissions listed in the attached table entitled "Emission Sources – Maximum Allowable Emission Rates" (MAERT), and those sources are limited to the emission limits and other conditions specified in that table.
2. Non-fugitive emissions from relief valves, safety valves, or rupture discs of gases containing Volatile Organic Compounds (VOC) at a concentration of greater than 1 percent are not authorized by this permit unless authorized on the maximum allowable emission rates table. Any releases directly to atmosphere from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration greater than 1 weight percent are not consistent with good practice for minimizing emissions with the exception of safety valves listed below and those that discharge directly to the atmosphere as a result of fire or failure of utilities.

PSV Number	Service	Set	Operating Pressure (psig)
49021	TK-4901 Suction Line	180	25
48036	TK-4901 Feed Line	180	50
49001	P-4901A/B Discharge	180	30
49022	TK-4904 Suction Line	180	25
49017	P-4903A/B Discharge	275	138
49016	TK-4902 Suction Line	50	25
48037	TK-4092 Feed Line	180	50
48012	TK-4903 Feed Line	180	50
49017	TK-4903 Suction Line	50	25
49003	P-4902A/B/C Discharge	180	47
49051	P-4902A Discharge to 16" PL	150	47
39568	P-4902B Suction (Dock)	225	150
49036	P-4902C Suction Line	180	25
49018	TK-4907 Suction Line	180	25
49519	P-4928A/B Discharge (Minimum Flow)	180	140
49514	P-4928A/B Discharge	180	140
49515	P-4928A/B Discharge	180	140
49516	P-4928A/B Discharge	180	140
49517	P-4928A/B Discharge	180	140
48016	1st Feed System	275	160
48035	3rd Feed System	720	275
49023	2nd Feed System	275	150
49513	PGO	180	20

Federal Applicability

3. These facilities shall comply with all requirements of the U.S. Environmental Protection Agency (EPA) regulations on Standards of Performance for New Stationary Sources promulgated in Title 40 Code of Federal Regulations Part 60 (40 CFR Part 60):
 - A. Subpart A, General Provisions.
 - B. Subpart D, Standards of Performance for Fossil-Fuel-Fired Steam Generators

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- C. Subpart K, Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978.
 - D. Subpart Ka, Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978.
 - E. Subpart Kb, Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.
 - F. Subpart VV, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006.
 - G. Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
4. These facilities shall comply with all requirements of the U.S. EPA regulations on National Emission Standards for Hazardous Air Pollutants promulgated in 40 CFR Part 61, as applicable, for:
- A. Subpart A, General Provisions.
 - B. Subpart J, Equipment Leaks (Fugitive Emission Sources) of Benzene
 - C. Subpart V, Equipment Leaks (Fugitive Emission Sources)
 - D. Subpart Y, Benzene Emission From Benzene Storage Vessels
 - E. Subpart FF, Benzene Waste Operations
5. These facilities shall comply with all applicable requirements of the U.S. EPA regulations on National Emission Standards for Hazardous Air Pollutants for Source Categories in 40 CFR Part 63:
- A. Subpart A, General Provisions.
 - B. Subpart G, National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater
 - C. Subpart YY, Generic Maximum Achievable Control Technology Standards.
 - D. Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.
 - E. Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.

Emission Standards and Operating Specifications

6. Tanks are approved to store the liquids on the Approved Product List represented in Attachment A.
7. Storage tanks are subject to the following requirements: The control requirements specified in parts A-C of this condition shall not apply (1) where the VOC has an aggregate partial pressure of less than 0.50 psia at the maximum feed temperature or 95°F, whichever is greater, or (2) to storage tanks smaller than 25,000 gallons.

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- A. The tank emissions must be controlled as specified in one of the paragraphs below:
- (1) An internal floating deck or "roof" shall be installed. A domed external floating roof tank is equivalent to an internal floating roof tank. The floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the floating roof: (1) a liquid-mounted seal, (2) two continuous seals mounted one above the other, or (3) a mechanical shoe seal.
 - (2) An open-top tank shall contain a floating roof (external floating roof tank) which uses double seal or secondary seal technology provided the primary seal consists of either a mechanical shoe seal or a liquid-mounted seal and the secondary seal is rim-mounted. A weathershield is not approvable as a secondary seal unless specifically reviewed and determined to be vapor-tight.
- B. For any tank equipped with a floating roof, the permit holder shall perform the visual inspections and any seal gap measurements specified in Title 40 Code of Federal Regulations § 60.113b (40 CFR § 60.113b) Testing and Procedures (as amended at 54 FR 32973, Aug. 11, 1989) to verify fitting and seal integrity. Records shall be maintained of the dates inspection was performed, any measurements made, results of inspections and measurements made (including raw data), and actions taken to correct any deficiencies noted.
- C. The floating roof design shall incorporate sufficient flotation to conform to the requirements of API Code 650 dated November 1, 1998 except that an internal floating cover need not be designed to meet rainfall support requirements and the materials of construction may be steel or other materials.
- D. Except for labels, logos, etc. not to exceed 15 percent of the tank total surface area, uninsulated tank exterior surfaces exposed to the sun shall be white or unpainted aluminum. Storage tanks must be equipped with permanent submerged fill pipes.
- E. The permit holder shall maintain an emissions record which includes calculated emissions of VOC from all storage tanks during the previous calendar month and the past consecutive 12-month period. The record shall include tank identification number, control method used, tank capacity in gallons, name of the material stored, VOC molecular weight, VOC monthly average temperature in degrees Fahrenheit, VOC vapor pressure at the monthly average material temperature in psia, VOC throughput for the previous month and year-to-date. Records of VOC monthly average temperature are not required to be kept for unheated tanks which receive liquids that are at or below ambient temperatures.
- Emissions from tanks shall be calculated using the methods that were used to determine the MAERT limits in the permit application dated December 5, 2016. Sample calculations from the application shall be attached to a copy of this permit at the plant site.
8. Tanks less than 1,000 gallons or containing a mixture of VOCs having a partial vapor pressures less than 0.5 psia or containing only non-VOCs are exempt from the requirements in Special Condition No. 7.D.
9. Atmospheric relief valves in VOC service that are not equipped with rupture disks shall be checked for leaks on a quarterly basis with an approved gas analyzer. A leak shall be defined as 500 parts per million by volume (ppmv). There shall be no variance for inaccessible valves. All leaking valves shall be repaired or replaced at the earliest opportunity but not later than the next scheduled process shutdown.
10. Analyzer sample system vents or speed loops shall be equipped with vapor recovery or liquid recovery systems (vapor samples routed to flare system or liquids samples route back to process).

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Analyzer (gas chromatographs) vapor sample loops shall depressure to atmospheric pressure during sample injection only and shall be routed to the flare during periods when sample is not being injected.

11. Cracking heaters, and heaters associated with the Olefin II and Flex/Isom Units shall not exceed the following firing rates:

EPN 44HTHTR, EPN EF4419 Pyrolysis/Steam Production Service	5,275 MMBtu/hr (combined total)*
EPN 44HTHTR *Cracking Heaters: (F-4401, F-4402, F-4403, F-4404, F-4405, F-4406, F-4407, F-4408, F-4409, F-4410, F-4411, F-4412, F-4413, F-4414, F-4415) *Ethane Heater (F4418): *Superheaters (F48001A/B)	
Regeneration Heater (F4601):	25 MMBtu/hr
Flex Regeneration Heater I (F4351):	13 MMBtu/hr
Flex Regeneration Heater II (F4361):	4.1 MMBtu/hr
Flexibility DP Heater I (F4360):	16 MMBtu/hr
Flexibility DP Heater II (F4360C):	16 MMBtu/hr
EPN EF4419 *Cracking Heater: (F-4419)	640 MMBtu/hr

The heating value of the fuel (Btu/scf) and the fuel flow rate shall be continuously monitored for the cracking heaters, ethane heater, and steam superheaters. Compliance with air contaminant emission limits shall be based upon the above firing rate. Quality-assured (or valid) data must be generated when the fired unit is operating. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that the fired unit operated over the previous rolling 12-month period. The measurements missed shall be estimated using engineering judgment and the methods used recorded. Compliance with air contaminant emission limits shall be based upon the above firing rate.

12. Concentrations of NH₃ from the Cracking Heater Stack (Emission Point Nos. EPN 44HTHTRS, EPN EF 4419) shall not exceed 10 ppmvd on an hourly basis when corrected to three percent oxygen (O₂). The NH₃ concentration shall be tested or calculated according to one of the three methods listed below:

- A. The holder of this permit may install, calibrate, maintain, and operate a CEMS to measure and record the concentrations of NH₃. The NH₃ concentrations shall be corrected and reported in accordance with Special Condition No. 23.
- B. If a sorbent tube device specific for NH₃ is used, the frequency of the sorbent tube testing shall be daily for the first 60 days of SCR operation, after which, the frequency of the sorbent tube testing may be reduced from daily to weekly after operating procedures have been developed to prevent excess amounts of NH₃ from being introduced, and when operation of the SCR system has been proven successful with regard to controlling NH₃ slippage.
- C. As an approved alternative to sorbent or stain tube testing or an NH₃ CEMS, the permit holder may install and operate a second oxides of nitrogen (NO_x) CEMS probe located upstream of the SCR and the stack NO_x CEMS, which may be used in association with the SCR efficiency and NH₃ injection rate to estimate NH₃ slip.

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- D. Any other method used for measuring NH_3 slippage shall require prior approval from the TCEQ.

13. Purchased gas combusted at this facility shall be sweet natural gas containing no more than 5 grains of total sulfur per 100 dry standard cubic feet.

14. Flares shall be designed and operated in accordance with the following requirements:
(08/2020)

- A. The flare systems shall be designed such that the combined assist natural gas and waste stream to each flare meets the 40 CFR § 60.18 specifications of minimum heating value and maximum tip velocity under normal, upset, and maintenance flow conditions.

The heating value and velocity requirements shall be satisfied during operations authorized by this permit. Flare testing per 40 CFR § 60.18(f) may be requested by the appropriate regional office to demonstrate compliance with these requirements.

- B. The flare shall be operated with a flame present at all times and/or have a constant pilot flame. The pilot flame shall be continuously monitored by a thermocouple or an infrared monitor. The time, date, and duration of any loss of pilot flame shall be recorded. Each monitoring device shall be accurate to, and shall be calibrated at, a frequency in accordance with the manufacturer's specifications.

- C. The flare shall be operated with no visible emissions except periods not to exceed a total of five minutes during any two consecutive hours. This shall be ensured by the use of steam assist to the flare.

- D. The permit holder shall install a continuous flow monitor and composition analyzer that provide a record of the vent stream flow and composition to the flare. The flow monitor sensor and analyzer sample points shall be installed in the vent stream as near as possible to the flare inlet such that the total vent stream to the flare is measured and analyzed. Readings shall be taken at least once every 15 minutes and the average hourly values of the flow and composition shall be recorded each hour.

The monitors shall be calibrated on an annual basis to meet the following accuracy specifications: the flow monitor shall be ± 5.0 percent, temperature monitor shall be ± 2.0 percent at absolute temperature, and pressure monitor shall be ± 5.0 mm Hg;

The analyzer shall be calibrated, installed, operated, and maintained, in accordance with manufacturer recommendations, to calculate and record the net heating value of the gas sent to the flare, in British thermal units/standard cubic foot of the gas.

The monitors and analyzers shall operate as required by this section at least 95 percent of the time when the flare is operational, averaged over a calendar 12-month period. Flared gas net heating value and actual exit velocity determined in accordance with 40 CFR § 60.18(f)(4) shall be recorded at least once every 15 minutes.

- E. The flare (EPN EFL60731) shall operate in accordance with the 40 CFR 63 Subpart YY "National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology Standards Residual Risk and Technology Review for Ethylene Production", and Alternate Method of Control (AMOC) No. 157 issued May 12, 2020. Compliance with the requirements of this paragraph shall begin December 31, 2020 and occur as otherwise specified in the AMOC. Prior to the compliance requirements and schedule of this paragraph, Special Condition Nos. 14.A through 14.D shall apply.**(08/2020)**

Compliance Assurance Monitoring (CAM)

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15. The following requirements apply to capture systems for the OP2 Flare, identified as EPN 48E01.

A. The holder of this permit shall perform one of the following:

- (1) Conduct a once a month visual, audible, and/or olfactory inspection of the capture system to verify that there are no leaking components in the capture system; or
- (2) Once a year, verify the capture systems are leak-free by inspecting in accordance with 40 CFR Part 60, Appendix A, Test Method 21. Leaks shall be indicated by an instrument reading greater than or equal to 500 ppmv above background.

B. If there is a bypass for the control device, the permit holder shall either:

- (1) Install a flow indicator that records and verifies zero flow at least once every 15 minutes immediately downstream of each valve that if opened would allow a vent stream to bypass the control device and be emitted, either directly or indirectly, to the atmosphere; or
- (2) Once a month, inspect the valves, verifying that the position of the valves and the condition of the car seals that prevent flow out the bypass.

A bypass does not include authorized analyzer vents, highpoint bleeder vents, low point drains, or rupture discs upstream of pressure relief valve if the pressure between disc and relief valve is monitored and recorded at least weekly. A deviation shall be reported if the monitoring or inspections indicate bypass of the control device when it is required to be in service.

C. Records of the inspections required shall be maintained and if the results of any of the above inspections are not satisfactory, the permit holder shall promptly take necessary corrective action.

Fugitive Leak Detection and Repair

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16. The following requirements apply to piping, valves, connectors, pumps, agitators, and compressors containing or in contact with fluids that could reasonably be expected to contain greater than or equal to 10 weight percent volatile organic compounds (VOC) at any time:

A. The requirements of paragraphs F and G shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 pounds per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request.

The exempted components may be identified by one or more of the following methods:

- piping and instrumentation diagram (PID);
- a written or electronic database or electronic file;
- color coding;
- a form of weatherproof identification; or
- designation of exempted process unit boundaries.

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- B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), API, American Society of Mechanical Engineers (ASME), or equivalent codes.
- C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.
- D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in Paragraph A above. If an unsafe to monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe to monitor times. A difficult to monitor component for which quarterly monitoring is specified may instead be monitored annually.
- E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. No later than the next scheduled quarterly monitoring after initial installation or replacement, all new or reworked connections shall be gas-tested or hydraulically-tested at no less than normal operating pressure and adjustments made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve. Except during sampling, the second valve shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period;

- (1) a cap, blind flange, plug, or second valve must be installed on the line or valve;
or
 - (2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once within the 72 hour period following the creation of the open ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.
- F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. If a relief valve is equipped with rupture disc, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity.

A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping

requirements specified in this paragraph. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.

The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR part 60, appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.

Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service and full unit reaches operating pressure.

- G. Except as may be provided for in the special conditions of this permit, all pump and compressor seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored.

These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

- H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump and compressor seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days and a record of the attempt shall be maintained.
- I. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shut down as calculated in accordance with 30 TAC 115.782 (c)(1)(B)(i)(I) or 500 pounds, whichever is greater, the TCEQ Regional Manager and any local programs shall be notified and the TCEQ Executive Director may require early unit shut down or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

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- J. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95% of the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.
- K. Alternative monitoring frequency schedules of 30 TAC §§ 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F and G of this condition.
- L. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.

17. Pumps and compressors equipped with single seals in HRVOC (as defined in 30 TAC § 115.10 unless exempted by § 115.787) or greater than 10 weight percent benzene service shall be monitored with a leak definition of 500 ppmv rather than the 2,000 ppmv identified in Special Condition No. 16.H.

18. In addition to the weekly physical inspection required by Item E of Special Condition No. 16, all connectors in non-HRVOC gas/vapor and light liquid service shall be monitored annually with an approved gas analyzer in accordance with Items F through J of Special Condition No. 16. Alternative monitoring frequency schedules ("skip options") of 40 CFR Part 63, Subpart H, National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks, may be used in lieu of the monitoring frequency required by this permit condition. Compliance with this condition does not assure compliance with requirements of applicable state or federal regulation and does not constitute approval of alternative standards for these regulations.

19. In addition to the weekly physical inspection required by Item E of Special Condition No. 16, all accessible connectors in HRVOC gas/vapor and light liquid service shall be monitored quarterly with an approved gas analyzer in accordance with Items F through J of Special Condition No. 16.

- A. Connectors may be monitored on a semiannual basis if the percent of connectors leaking for two consecutive quarterly monitoring periods is less than 0.5 percent.

Connectors may be monitored on an annual basis if the percent of connectors leaking for two consecutive semiannual monitoring periods is less than 0.5 percent.

If the percent of connectors leaking for any semiannual or annual monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this paragraph.

- B. The percent of connectors leaking used in paragraph A shall be determined using the following formula:

$$(CI + Cs) \times 100/Ct = Cp$$

Where:

CI = the number of connectors found leaking by the end of the monitoring period, either by Method 21 or sight, sound, and smell.

Cs = the number of connectors for which repair has been delayed and are listed on the facility shutdown log.

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Ct = the total number of connectors in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including nonaccessible and unsafe-to-monitor connectors.

Cp = the percentage of leaking connectors for the monitoring period.

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20. This special condition applies to components associated with the construction of F-4419 as submitted in the application dated September 23, 2011.

Except as may be provided for in the special conditions of this permit, the following requirements apply to the above-referenced equipment:

- A. The requirements of paragraphs F and G shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 pounds per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request.

The exempted components may be identified by one or more of the following methods:

- piping and instrumentation diagram (PID);
 - a written or electronic database or electronic file;
 - color coding;
 - a form of weatherproof identification; or
 - designation of exempted process unit boundaries.
- B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.
- C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.
- D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe-to-monitor times. A difficult to monitor component for which quarterly monitoring is specified may instead be monitored annually.
- E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service and the full unit reaches operating pressure. Adjustments shall be made as necessary to obtain leak-free performance.

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Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer with a directed maintenance program in accordance with items F thru J of this special condition.

In lieu of the monitoring frequency specified above, connectors may be monitored on a semiannual basis if the percent of connectors leaking for two consecutive quarterly monitoring periods is less than 0.5 percent. Connectors may be monitored on an annual basis if the percent of connectors leaking for two consecutive semiannual monitoring periods is less than 0.5 percent.

If the percent of connectors leaking for any semiannual or annual monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this paragraph.

The percent of connectors leaking used in paragraph B shall be determined using the following formula:

$$(Cl + Cs) \times 100/Ct = Cp$$

Where:

Cl = the number of connectors found leaking by the end of the monitoring period, either by Method 21 or sight, sound, and smell.

Cs = the number of connectors for which repair has been delayed and are listed on the facility shutdown log.

Ct = the total number of connectors in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including non-accessible and unsafe-to-monitor connectors.

Cp = the percentage of leaking connectors for the monitoring period.

Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period;

- (1) a cap, blind flange, plug, or second valve must be installed on the line or valve; or
- (2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once by the end of the 72 hours period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

- F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer with a directed maintenance program. Non-accessible valves shall be monitored by leak-checking for fugitive emissions at least annually using an approved gas analyzer with a directed maintenance program. Sealless/leakless

valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph.

The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR part 60, appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs are being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.

A directed maintenance program shall consist of the repair and maintenance of components assisted simultaneously by the use of an approved gas analyzer such that a minimum concentration of leaking VOC is obtained for each component being maintained. Replaced components shall be re-monitored within 15 days of being placed back into VOC service and the full unit reaches operating pressure.

- G. All new and replacement pumps, compressors, and agitators shall be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. These seal systems need not be monitored and may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

All other pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly.

- H. Damaged or leaking valves, connectors, compressor seals, pump seals, and agitator seals found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days. Records of the first attempt to repair shall be maintained. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components

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on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC 115.782 (c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

- I. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95% of the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.
- J. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.
- K. In lieu of the monitoring frequency specified in paragraph F, valves in gas and light liquid service may be monitored on a semiannual basis if the percent of valves leaking for two consecutive quarterly monitoring periods is less than 0.5 percent.

Valves in gas and light liquid service may be monitored on an annual basis if the percent of valves leaking for two consecutive semiannual monitoring periods is less than 0.5 percent.

If the percent of valves leaking for any semiannual or annual monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this paragraph.

- L. The percent of valves leaking used in paragraph K shall be determined using the following formula:

$$(VI + Vs) \times 100/Vt = Vp$$

Where:

VI = the number of valves found leaking by the end of the monitoring period, either by Method 21 or sight, sound, and smell.

Vs = the number of valves for which repair has been delayed and are listed on the facility shutdown log.

Vt = the total number of valves in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including non-accessible and unsafe to monitor valves.

Vp = the percentage of leaking valves for the monitoring period.

- M. Any component found to be leaking by physical inspection (i.e., sight, sound, or smell) shall be repaired or monitored with an approved gas analyzer within 15 days to determine whether the component is leaking in excess of 500 ppmv of VOC. If the component is found to be leaking in excess of 500 ppmv of VOC, it shall be subject to the repair and replacement requirements contained in this special condition.

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21. Except as may be provided for in the Special Conditions of this permit, the following requirements apply to the above-referenced equipment:
- A. Audio, olfactory, and visual checks for leaks within the operating area shall be made every shift.
 - B. Immediately, but no later than 24 hours upon detection of a leak, plant personnel shall take at least one of 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.

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. These records shall be made available to representatives of the TCEQ upon request.

Initial Determination of Compliance

22. The holder of this permit 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 cracking heaters (EPN 44HTHTRS F-4401, F-4402, F-4403, F-4404, F-4405, F-4406, F-4407, F-4408, F-4409, F-4410, F-4411, F-4412, F-4413, F-4414, F-4418 and EPN EF4419). Three cracking heater stacks, to be determined by the permit holder with agreement of the TCEQ Houston Regional Office, may be tested as representative of the eight cracking heater stacks. Ethane Heater (EPN 44E18); Regeneration Heaters (EPNs F4601 and F4361); Flex Regeneration Heaters (EPNs F4351 and F4361); Flexibility DP Heaters (EPNs F4360 and F4360C); and Steam Superheaters (EPNs 48E001A/B). The holder of this permit is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at his expense.

- A. The appropriate TCEQ Regional Office in the region where the source is located shall be contacted as soon as testing is scheduled, but not less than 45 days prior to sampling to schedule a pretest meeting.

The notice shall include:

- (1) 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.

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 submitting the test reports.

A written proposed description of any deviation from sampling procedures specified in permit conditions, TCEQ, or EPA sampling procedures shall be made available to the TCEQ prior to the pretest meeting. The TCEQ Regional Director shall approve or disapprove of any deviation from specified sampling procedures.

Requests to waive testing for any pollutant specified in B of this condition shall be submitted to the TCEQ Office of Permitting and Registration, Austin.

Test waivers and alternate/equivalent procedure proposals for NSPS testing which must have the EPA approval shall be submitted to the TCEQ Regional Director.

- B. Air contaminants emitted from the cracking heaters, ethane heater, and steam superheaters to be tested for include (but are not limited to) nitrogen oxide (NO_x) and carbon monoxide.
- C. Sampling may be required by the Executive Director of the TCEQ. Requests for additional time to perform sampling shall be submitted to the TCEQ Regional Office.
- D. The source being tested shall operate at maximum represented operating rates during stack emission testing. Primary operating parameters that enable determination of firing rates shall be monitored and recorded during the stack test. These parameters are to be determined at the pretest meeting.

If the source is unable to operate at maximum represented operating rates during testing, then additional stack testing may be required when higher represented operating rates are achieved.

- E. Copies of the final sampling report shall be forwarded to the TCEQ within 60 days after all sampling is completed. Sampling reports shall comply with the attached provisions of Chapter 14 of the TCEQ Sampling Procedures Manual. The reports shall be distributed as follows:

One copy to the TCEQ Houston Regional Office, Houston.

One copy to the Harris County Air Pollution Control Program, Pasadena.

Continuous Demonstration of Compliance

23. The permit holder shall install, calibrate, and maintain a predictive emission monitoring system (PEMS) to measure and record the in-stack concentration of NO_x from the Cracking Heaters (EPN 44HTHTRS F-4401, F-4402, F-4403, F-4404, F-4405, F-4406, F-4407, F-4408, F-4410, F-4411, F-4412, F-4413, F-4414, F-4415, F-4418 and EPN EF4419) when in operation.

- A. A PEMS may be used for demonstrating continuous compliance if it can be proven to have the same or better accuracy, precision, reliability, accessibility, and timeliness as that provided by a hardware CEMS. All PEMS shall be subject to the approval of the TCEQ Executive Director. Owners or operators must petition the TCEQ Executive Director for approval to use PEMS. The petition must include results of tests conducted beforehand to demonstrate equivalent accuracy and precision of PEMS to that of hardware CEMS. Demonstrating equivalency of PEMS to CEMS shall be met by instantaneously comparing data collected by PEMS with that collected by a certified hardware CEMS or an EPA reference method. For a PEMS replacing a CEMS, both systems shall remain in place for at least an operating quarter collecting valid information before the CEMS is removed.
- B. For any unit at which the PEMS is installed, PEMS initial certification by the TCEQ shall occur while the unit is firing its primary fuel. The owner or operator shall:
 - (1) Conduct relative accuracy testing for NO_x and O₂, or carbon dioxide (CO₂) per 40 CFR Part 60, Appendix B, Performance Specifications 2, 3, and 4, respectively, at low, medium, and high levels of the most significant operating parameter affecting NO_x emissions.
 - (2) Conduct statistical test analysis at low, medium, and high levels of the most significant operating parameter affecting NO_x emissions. A minimum of 30 successive paired data points which are either 15-minute averages, 20-minute averages, or hourly averages must be collected at each tested level before a reliable statistical test can be performed.

Data collection must be continuous at all times except when calibration of the reference method must be conducted for the purpose of collecting data for RATA.

The following three tests must be conducted to demonstrate precision:

- (a) A T-test for bias per Appendix A, 40 CFR Part 75, § 7.6. The test shall be conducted using all paired data points collected at all three tested levels.
 - (b) An F-test per 40 CFR § 75.41(c)(1). The F-test must be conducted separately at the three tested levels.
 - (c) A correlation analysis per 40 CFR § 75.41(c)(2). Calculation of the correlation coefficient (Equation 27) shall be performed using all paired data points collected at all three tested levels.
- (3) For NO_x for the purpose of conducting an F-test, if the standard deviation (SD) of the reference method is less than either 3 percent of the span or 5 parts per million (ppm), use a reference method SD of the greater of 5 ppm or 3 percent of span.
 - (4) For diluent CO₂ or O₂ and for the purpose of conducting an F-test, if the SD of the reference method is less than 3 percent of span, use a reference method SD of 3 percent of span.
 - (5) For NO_x at any one tested level, if the mean value of the reference method is less than either 10 ppm or 5 percent of the standard, all statistical tests are waived for that emission parameter at that specific tested level.
 - (6) For either O₂ or CO₂ and at any one tested level, if the mean value of the reference method is less than 3 percent of span, all the statistical tests are waived for that diluent parameter at that specific tested level.
- C. The monitoring data shall be reduced to hourly average concentrations at least once every day, using a minimum of four equally spaced data points from each one-hour period. The individual average concentrations shall be reduced to units of pound per million Btu at least once every week.
 - D. All monitoring data and quality-assurance data shall be maintained by the permit holder.
 - E. Any PEMS downtime shall be reported to the appropriate TCEQ Regional Director per § 117.345(d)(3) and necessary corrective action shall be taken. Quality-assured (or valid) data must be generated when the Cracking Heaters (EPN 44HTHTRS and EF4419) are 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 (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that the Cracking Heaters (EPN 44HTHTRS and EF4419) operated over the previous rolling 12-month period. Owners or operators shall demonstrate that all missing data can be accounted for in accordance with the applicable missing data procedures of 30 TAC 117.340. Supplemental stack concentration measurements may be required at the discretion of the appropriate TCEQ Regional Director.
 - F. The appropriate TCEQ Regional Office shall be notified for each annual RATA in order to provide them the opportunity to observe the testing.
 - G. The owner or operator shall perform daily sensor validation. The owner or operator shall develop and implement plans that will ensure proper functioning of the monitoring systems, ensure proper accuracy and calibration of all operational parameters that affect emissions

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- and serve as input to the predictive monitoring system, and ensure continuous operation within the certified operating range.
- H. In accordance with the procedure of § 2.3.1, Appendix B of 40 CFR Part 60, a RATA must be performed every six months for each unit while firing its primary fuel. A RATA may be performed annually if the relative accuracy of the previous audit is 7.5 percent or less.
 - I. For each of the three successive quarters following the quarter in which initial certification was conducted, RATA and statistical testing must be conducted for at least one unit in a category of units in accordance with the procedures outlined for initial certification under Section B.
 - J. Any RATA exceeding 20 percent or statistical test exceeding the applicable standard shall be reported to the appropriate TCEQ Regional Director, and necessary corrective action shall be taken.
 - K. When an alternative fuel is fired in a unit, PEMS must be re-certified in accordance with the certification procedures outlined for initial certification under § B. Owners or operators may justify to the satisfaction of the TCEQ Executive Director that slight changes in fuel composition do not constitute an alternative fuel. No additional recertification procedures are required if the unit meets the current monitoring requirements when switching back to the normal fuel from an alternate fuel.
 - L. The system is required to provide valid emission predictions for at least 95 percent of the time that the unit being monitored is operated. The following rules for tuning without recertification shall be followed:
 - (1) The model did not change fundamentally.
 - (2) The model continues to operate within the initially certified operating ranges.Otherwise, the system must be recertified. Any tuning must be documented, and the records must be made available during any future inspection.
 - M. All owners or operators shall develop a quality-assurance plan or manual that insures continuous and reliable performance of the PEMS. As part of the plan, owners or operators shall recommend a frequency for calibrating each sensor whose readout serves as an input to the model. All sensors, at a minimum, shall be calibrated as often as recommended by the manufacturer.
 - N. As an alternative to Special Condition 22 A.-E. the permit holder may install a continuous emission monitoring system (CEMS) to measure and record the in-stack concentration of NO_x from the Cracking Heaters (EPN 44HTHTRS: F-4401, F-4402, F-4403, F-4404, F-4405, F-4406, F-4407, F-4408, F-4409, F-4410, F-4411, F-4412, F-4413, F-4414, F-4415, F-4418 and EPN EF4419 F-4419) when in operation.
24. Opacity of emissions from cracking heaters, heaters, and decoking cyclones shall not exceed 15 percent average over a six-minute period except for those periods described in 30 TAC § 111.111.

Production Limits and Recordkeeping

25. Production rates shall not exceed 11.3 billion pounds per year of all products. The holder of this permit shall maintain records on the operation of the facility that shall include (but are not limited to) hours of operation, production rates, hours of operation of each heater unit, time period pre-regeneration gases are purged to each flare unit, and time period regeneration cycle emits to the atmosphere.

Cooling Towers

26. The VOC associated with cooling tower water shall be monitored monthly with an air stripping system meeting the requirements of the TCEQ Sampling Procedures Manual, Appendix P (dated January 2003 or a later edition) or an approved equivalent sampling method. The results of the monitoring, cooling water flow rate, and maintenance activities on the cooling water system shall be recorded. The monitoring results and cooling water hourly mass flow rate shall be used to determine cooling tower hourly VOC emissions. The rolling 12-month cooling water emission rate shall be recorded on a monthly basis and be determined by summing the VOC emissions between VOC monitoring periods over the rolling 12-month period. The emissions between VOC monitoring periods shall be obtained by multiplying the total cooling water mass flow between cooling water monitoring periods by the higher of the 2 VOC monitored results. Cooling water sampling as required by 30 TAC Chapter 115 Subchapter H may be used in lieu of this special condition.

27. Cooling water shall be sampled once a week for total dissolved solids (TDS) and once a day for conductivity. Dissolved solids in the cooling water drift are considered to be emitted as PM₁₀. 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, and SM 2540 C [SM - 19th edition of Standard Methods for Examination of Water]. The analysis method for Conductivity shall be ASTM D1125-95A and SM2510 B. Use of an alternative method shall be approved by the TCEQ Regional Director prior to its implementation.

Engine

28. The following requirements shall apply to the Diesel Engine-Driven Air Compressor (EPN OP2EN1): **(08/2020)**

- A. Fuel for the engine shall be limited to ultra-low sulfur diesel (ULSD) containing no more than 15 ppmw total sulfur.
- B. The engine shall be limited to 4,500 hours per year.
- C. The engine shall be equipped with a non-resettable hour meter.
- D. Compliance with the emission factors represented in the permit amendment application (PI-1 dated November 19, 2019) shall be demonstrated by retaining a copy of the manufacturers' certificate of conformity, or through other methods receiving prior written approval of the TCEQ Executive Director

Wastewater

29. Process wastewater drains shall be equipped with water seals or equivalent; lift stations, manholes, junction boxes, any process wastewater collection system components, and conveyance, shall be equipped with a closed vent system that routes all organic vapor to a control device.

Water seals shall be checked by visual, physical inspection or Method 21 monitoring quarterly for indications of low water levels or other conditions that would reduce the effectiveness of water seal controls. Water seals shall be restored as necessary within 24 hours. Records shall be maintained of these inspections and corrective actions taken.

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Planned Maintenance, Startup and Shutdown (MSS)

30. This permit authorizes the emissions from facilities for the planned maintenance, startup, and shutdown (MSS) activities summarized in the MSS Activity Summary (Attachment C) attached to this permit.

Routine maintenance activities, as identified in Attachment B of this permit, may be tracked through work orders or their equivalent. Emissions from activities identified in Attachment B 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 each planned MSS activity not identified in Attachment B and the emissions associated with it 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.

31. Process units and facilities, shall be depressurized, emptied, degassed, and placed in service in accordance with the following requirements:

- A. The process equipment shall be depressurized to a control device, transferred within the process unit, transferred to another process unit, transferred to a pressurized storage tank, or depressurized to a controlled recovery system prior to venting to atmosphere, degassing, or draining liquid. Equipment that only contains material that is liquid with volatile organic compounds (VOC) partial pressure less than 0.50 pound per square inch, absolute (psia) at the highest of the actual temperature or 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, transferred within the process unit, transferred to another process unit, or transferred to a pressurized storage tank. If the VOC partial pressure is greater than 0.50 psi at either the actual temperature or 95°F, any vents in the system must be routed to a control device or a controlled recovery system. 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. Control must remain in place until degassing has been completed or the system is no longer vented to atmosphere.
- C. All liquids from process equipment or storage vessels must be removed to the maximum extent practical prior to opening equipment to commence degassing and/or maintenance.

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Liquids must be drained into a closed vessel or closed liquid recovery system unless prevented by the physical configuration of the equipment, transferred within the process unit, transferred to another process unit, or transferred to a pressurized or an atmospheric storage tank. 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.

- D. If the VOC partial pressure is greater than 0.50 psi at the normal process temperature or 95°F, facilities shall be degassed using good engineering practice to ensure air contaminants are removed from the system through the control device or controlled recovery system to the extent allowed by process equipment or storage vessel design. 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. The facilities to be degassed shall not be vented directly to atmosphere, except as necessary to establish isolation of the work area or to monitor VOC concentration following controlled depressurization. The venting shall be minimized to the maximum extent practicable and actions taken recorded. The control device or recovery system utilized shall be recorded with the estimated emissions from controlled and uncontrolled degassing calculated using the methods that were used to determine allowable emissions for the permit application.
- (1) For MSS activities identified in Attachment B, the following option may be used in lieu of item (2) below. The facilities being prepared for maintenance shall not be vented directly to atmosphere until the VOC concentration has been verified to be less than 10,000 ppmv or less than 10 percent of the lower explosive limit (LEL) per the site safety procedures.
 - (2) The locations and/or identifiers where the purge gas or steam enters the process equipment or storage vessel and the exit points for the exhaust gases shall be recorded (process flow diagrams [PFDs] or piping and instrumentation diagrams [P&IDs] may be used to demonstrate compliance with the requirement). If the process equipment is purged with a gas, two system volumes of purge gas must have passed through the control device or controlled recovery system before the vent stream may be sampled to verify acceptable VOC concentration prior to uncontrolled venting. The VOC sampling and analysis shall be performed using an instrument meeting the requirements of SC No. 29. The sampling point shall be upstream of the inlet to the control device or controlled recovery system. The sample ports and the collection system must be designed and operated such that there is no air leakage into the sample probe or the collection system downstream of the process equipment or vessel being purged. The facilities shall be degassed to a control device or controlled recovery system until the VOC concentration is less than 10,000 ppmv or 10 percent of the LEL. Documented site procedures used to de-inventory equipment to a control device for safety purposes (e.g., hot work or vessel entry procedures) that achieve at least the same level of purging may be used in lieu of the above.
- E. Gases and vapors with VOC partial pressure greater than 0.50 psi may be vented directly to atmosphere if all the following criteria are met:
- (1) It is not technically practicable to depressurize or degas, as applicable, into the process;
 - (2) There is not an available connection to a plant control system (flare); and
 - (3) There is no more than 50 lbs of air contaminant to be vented to atmosphere during shutdown or start-up, as applicable.

All instances of venting directly to atmosphere per sub-paragraph E. of this condition must be documented when occurring as part of any MSS activity. The emissions

associated with venting without control must be included in the work order or equivalent for those planned MSS activities identified in Attachment B.

32. Air contaminant concentration shall be measured using an instrument/detector meeting one set of requirements specified below.

A. VOC concentration shall be measured using an instrument meeting all the requirements specified in EPA Method 21 (40 CFR Part 60, Appendix A) with the following exceptions:

- (1) The instrument shall be calibrated within 24 hours of use with a calibration gas such that the response factor (RF) of the VOC (or mixture of VOCs) to be monitored shall be less than 2.0. The calibration gas and the gas to be measured, and its approximate RF shall be recorded. If the RF of the VOC (or mixture of VOCs) to be monitored is greater than 2.0, the VOC concentration shall be determined as follows:

VOC Concentration = Concentration as read from the instrument*RF

In no case should a calibration gas be used such that the RF of the VOC (or mixture of VOCs) to be monitored is greater than 5.0.

- (2) Sampling shall be performed as directed by this permit in lieu of section 8.3 of Method 21. During sampling, data recording shall not begin until after two times the instrument response time. The date and time shall be recorded, and VOC concentration shall be monitored for at least five minutes, recording VOC concentration each minute. As an alternative the VOC concentration may be monitored over a five-minute period with an instrument designed to continuously measure concentration and record the highest concentration read. The highest measured VOC concentration shall be recorded and shall not exceed the specified VOC concentration limit prior to uncontrolled venting.

B. Colorimetric gas detector tubes may be used to determine air contaminant concentrations if they are used in accordance with the following requirements.

- (1) The air contaminant concentration measured as defined in (3) is less than 80 percent of the range of the tube and is at least 20 percent of the maximum range of the tube.
- (2) The tube is used in accordance with the manufacturer's guidelines.
- (3) At least two samples taken at least five minutes apart must satisfy the following prior to uncontrolled venting:

measured contaminant concentration (ppmv) < release concentration.

Where the release concentration is:

10,000* mole fraction of the total air contaminants present that can be detected by the tube.

The mole fraction may be estimated based on process knowledge. The release concentration and basis for its determination shall be recorded.

Records shall be maintained of the tube type, range, measured concentrations, and time the samples were taken.

C. Lower explosive limit measured with a lower explosive limit detector.

- (1) The detector shall be calibrated within 30 days prior to use with a certified pentane gas standard at 58 percent of the LEL for pentane. Records of the calibration date/time and calibration result (pass/fail) shall be maintained.

- (2) A functionality test shall be performed within 24 hours prior to use on each detector using the same certified gas standard used for calibration. The LEL monitor shall read no lower than 90 percent of the calibration gas certified value. Records, including the date/time and test results, shall be maintained.
 - (3) A certified methane gas standard equivalent to 58 percent of the LEL for pentane may be used for calibration and functionality tests provided that the LEL response is within 95 percent of that for pentane.
- D. Gas Chromatograph. As an alternative to an instrument/detector, the analysis may be conducted in a laboratory. Bag samples of the gas discharged may be drawn and taken to an onsite laboratory to be analyzed by gas chromatography (GC). A minimum of two bag samples shall be drawn approximately ten minutes apart. A Tedlar bag, or a bag or glass container appropriate for the material to be sampled, shall be used and shall have a valve to seal gas in the bag or container. The samples shall be drawn as follows:
 - (1) The sample point on the equipment being cleared shall be purged sufficiently to ensure a representative sample at the sample valve.
 - (2) The sample bag shall be connected directly to the sample valve or to a pump that is connected directly to the sample valve.
 - (3) The sample valve and sample bag shall be opened to allow the bag to fill to approximately 80% of capacity. The sample connections shall be fitted such that no air is drawn into the sample bag.
 - (4) The two valves shall then be closed to seal the sample in the bag.
 - (5) The sample bag shall then be disconnected and placed in a dark container out of direct sunlight for transport to the analyzer.
 - (6) This process is repeated to collect additional samples.
 - (7) The sample shall be analyzed within 12 hours of collection.
 - (8) If condensation is observed in a bag sample, the sampling must be repeated using one of the modified bag sampling procedures in 40 CFR 60, Appendix A, Method 18 Section 8.
 - (9) At least two samples taken at least five minutes apart must satisfy the following prior to uncontrolled venting.

The laboratory GC shall meet or exceed the requirements of 40 CFR 60, Appendix A, Method 18 Sections 6 (Equipment and Supplies), 7 (Reagents and Standards), 9 (Quality Control), and 10 (Calibration and Standards). The sample shall be analyzed per Section 8.2.1.5 of Method 18, except the analysis of each bag may be performed in duplicate and use gas tight syringe through septums. The highest measured VOC concentration shall not exceed the specified VOC concentration limit prior to uncontrolled venting. The recovery study for bag sampling and post analysis calibration is only required the first time a vessel is degassed and analyzed if the procedure meets the accuracy specifications of Method 18 and the analytical equipment is not modified. If the material content, temperature and pressure are the same among multiple vessels when sampling occurs, the post analysis calibration need only be conducted on sample(s) from one representative vessel.

33. This condition applies only to piping and components subject to leak detection and repair monitoring requirements. Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the removal of a component for repair or replacement results in an open-

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ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period:

- A. cap, blind flange, plug, or second valve must be installed on the line or valve; or
- B. The open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once within the 72-hour period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings 500 ppmv above background and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

34. Additional occurrences of MSS activities authorized by this permit may be authorized under permit by rule only if conducted in compliance with this permit's procedures, emission controls, monitoring, and recordkeeping requirements applicable to the activity.

35. Planned maintenance activities must be conducted in a manner consistent with good practice for minimizing emissions, including the use of air pollution control equipment, practices and processes. All reasonable and practical efforts to comply with Special Condition Nos. 29 through 34 must be used when conducting the planned maintenance activity, until the Commission determines that the efforts are unreasonable or impractical, or that the activity is an unplanned maintenance activity.

Netting & Offsets

36. This Prevention of Significant Deterioration (PSD) permit (PSDTX1270, 25.71 tpy NO_x project increase) is conditioned on the completion of the emission reduction project represented in the permit application (PI-1 dated September 23, 2011) as follows:

Methanol Unit Shutdown	November 2008
Total NO _x Reduction:	780.4 tpy

These reductions shall occur prior to the start of operation of the facilities and activities authorized by the indicated PSD permit. The permit holder shall maintain records of these emission reductions.

Construction of the authorized facilities must begin as defined in 40 CFR § 52.21(b)(9), no later than five years after the all emission reductions identified in the NO_x netting analysis are actually accomplished. If construction does not begin as specified, the netting reductions will no longer be creditable.

This Nonattainment New Source Review (NNSR) permit (N140) is issued based on the permanent retirement of a TCEQ Emission Reduction Credit (ERC) for 25.6 tpy of VOC emissions reduction at Equistar's Chocolate Bayou Polymer Facility. This ERC provides offsets at the rate of 1.3:1 for the 19.7 tpy of VOC emissions authorized as a project increase by the indicated NNSR permit.

- A. The permit holder shall use 25.6 tpy ECs of VOC from TCEQ credit certificate number 3518 to offset the 19.7 tpy VOC project emission increase for the facilities authorized by this permit at a ratio of 1.3 to 1.0. **(08/2020)**

Special Conditions

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37. This Nonattainment New Source Review (NNSR) permit is issued/approved based on the requirement that the permit holder offset the project emission increase for facilities authorized by this permit prior to the commencement of operation, through participation in the TCEQ Emission Banking and Trading (EBT) Program in accordance with the rules in 30 TAC Chapter 101, Subchapter H. **(08/2020)**
- A. The permit holder shall use 6.9 tpy of NOx credits to offset the 5.8 tpy NOx project emission increase for the facilities authorized by this permit at a ratio of 1.20 to 1.0.
- B. Prior to the commencement of operation, the permit holder shall obtain approval from the TCEQ EBT Program for the credits being used and then submit a permit alteration or amendment request to the TCEQ Air Permits Division (and copy the TCEQ Regional Office) to identify approved credits by TCEQ credit certificate number.

Standard Permit Reference

38. The following sources and/or activities are authorized under a Permit by Rule (PBR) by a Title 30 Texas Administrative Code Chapter 106 (30 TAC Chapter 106). These lists are not intended to be all inclusive and can be altered without modifications to this permit.

Authorization	Source or Activity
Pollution Control Project (PCP) Standard Permit No. 150877	Replacement burner for heater F-4402 (EPN 44HTHTRS)

Date: August 10, 2020

Attachment A

Permit Numbers 2933, PSDTX1270, and N140

Multiple Products Approved for Storage

Tank	EPN	Service
TK-4455	44E12	Water Caustic
TK-48007	48E22	PFO
TK-48008	48E008	Slop Oil
TK-48009	48E009	Wastewater
TK-48010	48E010	Wastewater
TK-48011	48E011	Wastewater
TK-48302	48E07	PGO
TK-48303	48E08	Slop Oil
TK-48304	48E20	PFO & PGO
TK-48305	48E21	LCO & PGO
TK-4901	49E01	Olefins Feedstock, Pygas, Light Pygas
TK-4902	49E02	Olefins Feedstock, Pygas, Light Pygas
TK-4903	49E03	Olefins Feedstock, Pygas, Light Pygas, DRIPS
TK-4904	49E04	Olefins Feedstock, Pygas, Light Pygas
TK-4905	49E05	Olefins Feedstock, Pygas, Light Pygas
TK-4906	49E06	Olefins Feedstock, Pygas, Light Pygas
TK-4907	49E07	Olefins Feedstock, Pygas, Light Pygas
TK-4915	49E08	PGO
TK-4916	49E09	Benzene, DRIPs, Raw Pygas, Heartcut Pygas, Light Pygas, Heavy Pygas, Toluene
TK-4917	49E10	Light Pygas, Toluene, Heavy Pygas & Toluene
TK-4919	49E11	Light Pygas, Toluene
TK-4921	49E12	Heavy Pygas
TK-4922	49E13	Light Pygas, Toluene, Heavy Pygas, DRIPs, Raw Pygas, Heartcut Pygas
D-4311	43E01	Catalyst Mixture
D-4310	43E03	Catalyst Mixture
OP2SMLTK50	OP2SMLTK50	Additive Mixture
OP2SMLTK33	OP2SMLTK33	Antifoulant

Date: January 29, 2020

Attachment B

Permit Numbers 2933, PSDTX1270, and N140

Routine Maintenance Activities

Pump repair/replacement

Fugitive component (valve, pipe, flange) repair/replacement

Compressor repair/replacement

Heat exchanger repair/replacement

Process & Storage Vessel cleaning/repair/replacement

Date: January 29, 2020

Attachment C

Permit Numbers 2933, PSDTX1270, and N140

MSS Activities Summary

Facilities	Description	Emissions Activity	EPN
F-4419 and ancillary piping	Process unit purge/degas/drain	Vent to atmosphere	ENMSSROUT
Flare MSS	OP2 Flare	Vent to atmosphere	48E01

Date: January 29, 2020