

GENERAL PLAN APPROVAL AND/OR GENERAL OPERATING PERMIT BAQ-GPA/GP-5A

Unconventional Natural Gas Well Site Operations and Remote Pigging Stations

SECTION A. GENERAL REQUIREMENTS

1. Statutory/Regulatory Authority and General Description

In accordance with Section 6.1(f) of the Pennsylvania Air Pollution Control Act (APCA), 35 P.S. §4006.1(f) and 25 Pa. Code Chapter 127, Subchapter H, the Department of Environmental Protection (Department or DEP) hereby issues this General Plan Approval and/or General Operating Permit (General Permit or GP-5A) for new or modified unconventional natural gas well site operations and remote pigging stations (facility or facilities) constructed or operating in this Commonwealth.

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3. Definitions

Words and terms that are not otherwise defined in this General Permit shall have the meanings set forth in Section 3 of the APCA (35 P.S. §4003) and Title 25, Article III including 25 Pa. Code §121.1 unless the context indicates otherwise. The meanings set forth in applicable definitions codified in the Federal Code of Regulations including 40 CFR Part 60, Subparts JJJJ, OOOO, and OOOOa or 40 CFR Part 63, Subparts HH and ZZZZ shall also apply to this General Permit.

Deviation – An instance in which an affected source or the owner or operator of an affected source fails to meet any term or condition of this General Permit, including any emission limit, operating limit, or work practice standard, including during startup, shutdown, or malfunction regardless of whether such a failure is permitted.

Difficult-To-Monitor – A fugitive emissions component that cannot be monitored without elevating the monitoring personnel more than 6.6 feet above the surface may be designated difficult-to-monitor for purposes of Section K.

Fugitive Emissions Component – Any component that has the potential to emit fugitive emissions of methane, VOC, or HAP at an unconventional natural gas well site or remote pigging station including, but not limited to, valves,

connectors, pressure relief devices, open-ended lines, flanges, compressors, instruments, meters, covers, and closed vent systems. Devices that vent as part of normal operations are not considered fugitive sources unless the emission originates from a place other than the vent.

Haul Road – A road owned or operated by the permittee which is used to facilitate the movement of people, equipment, and/or materials to and from a facility.

Leak – A leak is defined as any release of gaseous hydrocarbons that is detected by Auditory, Visual, or Olfactory (AVO) inspection; an optical gas imaging (OGI) camera; a gas leak detector that meets the requirements of 40 CFR Part 60, Appendix A-7, Method 21; or other leak detection methods approved by the Department's Division of Source Testing and Monitoring. However, a release from any equipment or component designed by the manufacturer to protect the equipment, controller, or personnel or to prevent groundwater contamination, gas migration, or an emergency situation is not considered a leak.

Malfunction – Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures caused in part by poor maintenance or careless operation are not malfunctions. Malfunctions include, but are not limited to, triggering of emergency shutdown devices and unscheduled blowdowns.

Pigging Operations – The process of removing and collecting condensed liquids including condensate, intermediate hydrocarbons, or produced water, from a pipeline using a spherical or bullet shaped device, known as a pig, forced through the pipeline by natural gas pressure. The liquids are then collected at their eventual destination in a storage tank, often referred to as a slug tank.

Remote Pigging Station – A facility where pigging operations are conducted that is not located at an unconventional natural gas well site, natural gas compressor station, natural gas processing plant, or natural gas transmission station and which meet or exceed the exemption emissions thresholds of 200 tpy of methane, 2.7 tpy of total VOC, 0.5 tpy of a single HAP, or 1.0 tpy of total HAP.

Sour Gas – Natural gas where the H₂S content is in excess of 4 ppmv at standard temperature and pressure.

Start of Production – The beginning of initial flow following the end of flowback when there is continuous recovery of salable quality gas and separation and recovery of any crude oil, condensate, or produced water. A well whose owner or operator is selling gas through temporary equipment designed for flowback shall not be considered in production until either the sales continue through the temporary equipment for more than 30 days or the gas is routed to a permanent production separator.

Unconventional Natural Gas Well – A well drilled to produce natural gas from shale formations below the Elk Group or its geologic equivalent stratigraphic interval, where recovery of the resource is generally not economic without the bores being stimulated by hydraulic fracturing, multilateral well bores, or other techniques to expose more of the formation to the well bore.

Unconventional Natural Gas Well Site – A location with one or more unconventional natural gas wells at which unconventional natural gas well site operations are conducted.

Unconventional Natural Gas Well Site Operations – Equipment and processes at unconventional natural gas well sites including, but not limited to, drilling, hydraulic fracturing or refracturing, well completion, gas dehydration, tanker truck load-out, wellbore liquid unloading, gas compression, pigging, and storage.

Unsafe-To-Monitor – A fugitive emissions component that cannot be monitored because monitoring personnel would be exposed to immediate danger while conducting a monitoring survey may be designated unsafe-to-monitor for purposes of Section K.

Wellbore Liquids Unloading – The process of removing accumulated liquids from a natural gas well in order to restore well pressure and natural gas production.

Well Completion – The beginning of the flowback period after hydraulic fracturing is completed. If a well is shut-in prior to the beginning of flowback (i.e., no fluids or solids are returned from the well), the well is not considered to be completed.

4. **Applicability/Scope**

- (a) This General Permit authorizes the construction, modification, and/or operation of an unconventional natural gas well site or remote pigging station. The applicability of this General Permit may include one or more of the following operations or emissions sources:
- (i) Fugitive Particulate Matter
 - (ii) Well Drilling and Hydraulic Fracturing Operations
 - (iii) Well Completion Operations
 - (iv) Natural Gas-Fired Combustion Units
 - (v) Glycol Dehydration Units
 - (vi) Stationary Natural Gas-Fired Spark Ignition Internal Combustion Engines
 - (vii) Reciprocating Compressors
 - (viii) Storage Vessels
 - (ix) Tanker Truck Load-Out Operations
 - (x) Fugitive Emissions Components
 - (xi) Controllers
 - (xii) Pumps
 - (xiii) Enclosed Flares and Other Emission Control Devices
 - (xiv) Pigging Operations
 - (xv) Wellbore Liquids Unloading Operations
- (b) An Application for Authorization to Use GP-5A may be submitted for the operation of an eligible source if the source is exempted from plan approval requirements under 25 Pa. Code §127.14.
- (c) If any source located at the facility cannot be regulated under this General Permit, a plan approval and/or an operating permit issued in accordance with 25 Pa. Code, Chapter 127, Subchapter B and/or Subchapter F will be required.

5. **Prohibited Use of GP-5A**

GP-5A may not be used for the construction, modification, or operation of any of the following air contamination sources:

- (a) A proposed source located at a Title V facility including sources determined to be a single source Title V facility.
- (b) A proposed source that is subject to Title V permitting requirements specified in 25 Pa. Code Chapter 127, Subchapters F and G; prevention of significant deterioration requirements specified in 25 Pa. Code Chapter 127 Subchapter D; or nonattainment new source review requirements specified in 25 Pa. Code Chapter 127 Subchapter E.
- (c) A facility that produces or processes sour gas.
- (d) *Circumvention.*
 - (i) The owner or operator of a facility may not circumvent the new source review requirements of 25 Pa. Code Chapter 127, Subchapter E by causing or allowing a pattern of ownership or development, including the phasing, staging, delaying, or engaging in incremental construction over a geographic area of a facility which, except for the pattern of ownership or development would otherwise require a permit or submission of a plan approval application.
 - (ii) No person may permit the use of a device, stack height that exceeds good engineering practice, dispersion technique, or other technique that without resulting in reduction of the total amount of air contaminants emitted, conceals or dilutes an emission of air contaminants that would otherwise be in

violation of this General Permit, the APCA, or the regulations promulgated thereunder, except for those that are used for the control of malodors with the prior written approval of the Department.

6. Authorization to Use GP-5A

- (a) *Application for Authorization to Use GP-5A.* Pursuant to 25 Pa. Code §127.621, any person proposing to construct, operate, or modify a source listed in Section A, Condition 4 of this General Permit at an unconventional natural gas well site or remote pigging station shall submit an Application for Authorization to Use GP-5A to the Air Program Manager of the appropriate DEP Regional Office responsible for authorizing the use of general permits in the county in which the facility will be located.
- (i) This application shall be accompanied by:
- (A) The Compliance Review Form required under 25 Pa. Code §127.12a and §127.412 which details the compliance history of the organization seeking Authorization to Use GP-5A;
- (B) The General Information Form 1300-PM-BIT0001 found at <http://www.elibrary.dep.state.pa.us/>;
- (C) The appropriate application fees as specified in Condition 7;
- (D) Proof of the municipal notification as required in Condition 10(a); **and**
- (E) Any additional forms or information requested by the Department.
- (ii) This application shall be submitted to DEP either by hand delivery, courier, or sent to DEP by certified mail, return receipt requested in accordance with 25 Pa. Code §127.621(b).
- (iii) An electronic copy of this application may be submitted to the appropriate email address in Condition 10(b)(iv).
- (b) *Terms of Authorization to Use GP-5A.* This General Permit authorizes the construction and/or operation of the specific sources and the specific facility as described in the application for a term of five years from the date of authorization. The authorization to construct a source or facility will expire 18 months from the date of the authorization if the owner or operator fails to commence construction or if there is a lapse in construction of 18 months. The Department may extend the 18 month period upon an owner or operator providing satisfactory justification for an extension up to the original date of the five year term. All requests for extension shall be submitted to the Department at least 30 days prior to the end of the 18 month period and are only valid upon receipt of written approval by the Department. The expiration of the authorization to construct will require a new Application for Authorization to Use GP-5A if an extension is not requested and granted.
- (c) *Expiration of and Re-Authorization to Use GP-5A.*
- (i) The authorization granted by the Department to construct and/or operate under this General Permit shall terminate on the date of expiration unless a complete Application for Authorization to Use GP-5A is submitted to the Department at least 30 calendar days prior to the expiration date.
- (ii) Upon receipt by the Department of a timely, administratively and technically complete application for re-authorization to operate under this General Permit, the owner or operator may continue to operate the facility subject to final action by the Department provided that the sources and the facility are operated in compliance with the terms and conditions of this General Permit. The Authorization to Use GP-5A shall cease if the owner or operator fails to submit any additional information requested by the Department to process the application by the specified deadline.
- (d) *Transfer of Ownership.* The Authorization to Use GP-5A may not be transferred from the owner or operator of a facility except when the change of ownership is demonstrated to the satisfaction of the Department and the Department approves the transfer in writing. Within 30 calendar days after a change of ownership of the facility, the new owner or operator shall submit to the Air Program Manager of the appropriate Regional Office an Application for Authorization to Use GP-5A in accordance with Condition (a) above.
- (e) *Administrative Amendment.* In the event of a change in the name, address, or phone number of a person identified in the General Permit or a similar minor administrative change at the facility, in accordance with 25 Pa. Code §127.450, the Department may authorize an administrative amendment. The owner or operator shall submit a brief description of the change and the date on which the change is to occur in a letter signed by the Responsible Official with the fee specified in Condition 7(d) to the Air Program Manager of the appropriate Regional Office.
- (f) *Modification, Suspension, or Revocation of GP-5A or Authorizations to Use GP-5A.*

- (i) The Department may modify, suspend, or revoke and reissue this General Permit if it is determined that GP-5A does not comply with the Clean Air Act, the APCA, or regulations adopted under the acts.
- (ii) This General Permit may be modified, suspended, or revoked if the Department determines that the unconventional natural gas well site or remote pigging station cannot be adequately regulated under this General Permit.
- (iii) An Authorization to Use GP-5A may be suspended or revoked if the Department determines that, at any time, the owner or operator has failed to construct and/or operate the facility in compliance with the terms and conditions of this General Permit, the specifications in the Application for Authorization to Use GP-5A, or the information provided in the supplemental material included with the application used to determine if the proposed sources will comply with the GP-5A.
- (iv) Upon suspension or revocation of an Authorization to Use GP-5A, the owner or operator shall immediately cease construction and/or operation of the facility. The owner or operator of the facility shall not restart construction and/or operation prior to the receipt of written approval from the Department.

7. General Permit Fees

Each applicant seeking Authorization to Use GP-5A shall submit the applicable fees required under this Condition to the appropriate DEP Regional Office. The following fee schedules apply to this General Permit:

- (a) General Plan Approval Application Fee, payable upon submission of the application: \$1,700
- (b) General Operating Permit Application Fee, payable upon submission of the application: \$ 375
- (c) Annual Operating Permit Administration Fee, payable by March 1st for the previous calendar year: \$ 375
- (d) Administrative Amendment Fee, payable upon submission of the letter in Condition 6(e): \$ 300
- (e) The Department may increase the applicable fees for this General Plan Approval/General Operating Permit in accordance with the applicable fee schedules in 25 Pa. Code Chapter 127, Subchapter I following notice in the *Pennsylvania Bulletin*.

8. Applicable Laws

- (a) Where ever possible, the terms and conditions of this General Permit have been streamlined to satisfy both federal and state requirements. It is the duty of the Responsible Official, as defined in 25 Pa. Code §121.1, to ensure that the facility is in compliance with all applicable federal, state, and local laws and regulations, including 25 Pa. Code, Subpart C, Article III. Nothing in this General Permit relieves the Responsible Official from this obligation to comply.
- (b) Applicable federal regulations include, but are not limited to, the following New Source Performance Standards (NSPS), codified at 40 CFR Part 60 and incorporated by reference in 25 Pa. Code §122.3, and National Emission Standards for Hazardous Air Pollutants (NESHAP), codified at 40 CFR Part 63 and incorporated by reference in 25 Pa. Code §127.35:
 - (i) **40 CFR Part 60, Subpart JJJJ** – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.
 - (ii) **40 CFR Part 60, Subpart OOOO** – Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which Construction, Modification, or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015.
 - (iii) **40 CFR Part 60, Subpart OOOOa** – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after September 18, 2015.
 - (iv) **40 CFR Part 63, Subpart HH** – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities.
 - (v) **40 CFR Part 63, Subpart ZZZZ** – National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines.

9. Compliance Requirements and Compliance Certification

- (a) The emissions from all sources and associated air pollution control equipment located at an unconventional natural gas well site or remote pigging station and other sources determined by the Department to be a single source shall not equal or exceed either of the following on a 12-month rolling sum basis:

- (i) Nitrogen Oxides (NO_x) – 100 tons
- (ii) Carbon Monoxide (CO) – 100 tons
- (iii) Sulfur Oxides (SO_x) – 100 tons
- (iv) Particulate Matter with an aerodynamic diameter less than 10 microns (PM₁₀) – 100 tons
- (v) Particulate Matter with an aerodynamic diameter less than 2.5 microns (PM_{2.5}) – 100 tons
- (vi) Volatile Organic Compounds (VOCs) – 50 tons
- (vii) Any individual Hazardous Air Pollutant (HAP) – 10 tons
- (viii) Total Hazardous Air Pollutants (HAPs) – 25 tons.
- (ix) In addition, the emissions from all sources and associated air pollution control equipment located at a facility in Bucks, Chester, Delaware, Montgomery, or Philadelphia counties shall not equal or exceed any of the following on a 12-month rolling sum basis:
 - (A) NO_x – 25 tons
 - (B) VOCs – 25 tons.
- (b) The facility throughput and/or equipment hours of operation shall be constrained as necessary to not exceed any facility-wide emissions cap required in (a) above.
- (c) All sources and associated air pollution control equipment located at a facility shall be:
 - (i) Operated in such a manner as not to cause air pollution, as that term is defined in 25 Pa. Code §121.1;
 - (ii) Operated and maintained in accordance with the manufacturer's specifications, procedures, recommended maintenance schedule, and the specifications in the Application for Authorization to Use GP-5A, or an alternate procedure approved by the Department that achieves equal or greater emissions reductions in accordance with 25 Pa. Code §127.12b; **and**
 - (iii) Operated and maintained in such a manner that malodors are not detectable outside the property of the owner or operator on whose land the facility is being operated in accordance with 25 Pa. Code §123.31.
- (d) This General Permit cannot be used to relax best available technology or other emission limitations or requirements previously established through the air quality permitting process.
- (e) An owner or operator of a facility may apply to the Department for a plan approval for any air contamination source in lieu of seeking authorization to use the General Permit for unconventional natural gas well sites or remote pigging stations.
- (f) The owner or operator authorized to use this General Permit shall comply with the specifications in the application and the terms and conditions of this General Permit.
- (g) The owner or operator of the facility shall submit to the Air Program Manager of the appropriate DEP Regional Office an annual certification of compliance with the terms and conditions in the GP-5A for the previous year, including the emission limitations, standards, or work practices. This Compliance Certification Form must be included in the annual report as outlined in Condition 12(c).

10. Notification Requirements

- (a) *Municipal Notification.* The facility owner or operator proposing to use this General Permit shall notify the local municipality and county where the air pollution source is to be located that they have applied for an Authorization to Use GP-5A. The notification shall clearly describe the proposed sources and/or modifications.
- (b) The owner or operator shall notify the Department, by email, no later than five business days after the following activities:
 - (i) Initial commencement date of construction of a source authorized under this General Permit.
 - (ii) Final completion date of construction of a source authorized under this General Permit.
 - (iii) Any lapse of construction activity of 18 months or more that may occur between the initial and final construction dates in (i) and (ii) above.
 - (iv) The email addresses for the notifications are as follows:
 - (A) For the Northeast Regional Office: ER, GP-5A Submittals NERO
 - (B) For the Southeast Regional Office: ER, GP-5A Submittals SERO
 - (C) For the North Central Regional Office: ER, GP-5A Submittals NCRO
 - (D) For the South Central Regional Office: ER, GP-5A Submittals SCRO
 - (E) For the Northwest Regional Office: ER, GP-5A Submittals NWRO

- (F) For the Southwest Regional Office: ER, GP-5A Submittals SWRO
 - (G) For the Philadelphia Air Management Services: ER, GP-5A Submittals AMS
 - (H) For the Allegheny County Health Department: ER, GP-5A Submittals ACHD
- (c) The owner or operator shall notify the Air Program Manager of the appropriate DEP Regional Office, in writing, at least five business days prior to the commencement of operation of a source of their intent to do so. When multiple sources at the facility are subject to different commencement of operation schedules, written notice shall be submitted to DEP prior to the commencement of operation of each source.
- (d) *Malfunctions.*
- (i) Any malfunction that poses an imminent danger to the public health, safety, or welfare or to the environment including, but not limited to, fire, explosion, or exceedance of 50% of the lower explosive limit, shall be reported by telephone to the County Emergency Management Agency and by telephone or email to the Air Program Manager of the appropriate DEP Regional Office no later than one hour after the discovery of an incident. Following the telephone or email notification, a written notice as specified in (iv) below shall be submitted to the DEP within three business days.
 - (ii) The owner or operator shall notify the Air Program Manager of the appropriate DEP Regional Office by telephone or email within 24 hours of the discovery of any malfunction that does not pose an imminent danger to the public health, safety, or welfare or to the environment as described in the [GP-5 Malfunction Reporting Instructions](#) posted on the Department's website. This also includes any emergency shutdown or unscheduled blowdown or venting. Following the telephone or email notification, a written notice as specified in (iv) below shall be submitted to DEP within five business days.
 - (iii) If the owner or operator is unable to provide notification by telephone to the Air Program Manager of the appropriate DEP Regional Office within 24 hours of the discovery of a malfunction due to a weekend or holiday, the notification shall be made to the Department no later than 4 pm on the first business day following the weekend or holiday.
 - (iv) Written notification shall include:
 - (A) The name, GP-5A authorization number, and location of the facility;
 - (B) The nature and cause of the malfunction or incident;
 - (C) The date and time when the malfunction, incident, or breakdown was first discovered;
 - (D) The expected duration of increased emissions;
 - (E) The estimated rate of emissions for all criteria, hazardous, and greenhouse gas pollutants; **and**
 - (F) Any changes to the equipment or modification of the procedures that will prevent future reoccurrences of the malfunction.
 - (v) The owner or operator shall notify the Air Program Manager of the appropriate DEP Regional Office by telephone or email within 24 hours of when corrective measures have been implemented. Following the telephone or email notification, a written notice shall be submitted to the Department within five business days.
 - (vi) Any emissions due to a malfunction are to be reported in the annual emissions inventory report required in Condition 12(d).
- (e) The owner or operator shall notify the Air Program Manager of the appropriate DEP Regional Office, by telephone or email, at least 24 hours prior to any scheduled blowdown or venting. Any emissions due to the scheduled event are to be reported in the annual emissions inventory report required in accordance with Condition 11(d).

11. Recordkeeping Requirements

- (a) All records required must be maintained onsite or at the nearest local field office for a minimum of 5 years and may be maintained in electronic format.
- (b) The owner or operator of the facility shall generate and maintain records that clearly demonstrate to the Department that the facility is not a Title V facility and that the facility is in compliance with facility-wide emission limitations. At a minimum, the records shall be maintained on a monthly basis, and the emissions shall be calculated on a 12-month rolling sum. The Department reserves the right to request additional information necessary to determine compliance with the General Permit.

(c) *Public Records and Confidential Information.*

- (i) As required under Section 13.2 of the APCA, 35 P.S. §4013.2, the records, reports, or information obtained by the Department under this General Permit shall be available to the public, except as provided in paragraph (ii) below.
- (ii) Upon cause shown by the owner or operator that the records, reports, or information, or a particular portion thereof to which the Department has access under the APCA that if made public would divulge production or sales figures or methods, processes, or production unique to that person or would adversely affect the competitive position of that person by revealing trade secrets, including intellectual property rights, the Department will consider the record, report, or information, or particular portion thereof, confidential in the administration of the APCA. Emission data is not eligible for confidentiality.

12. Reporting Requirements

- (a) The owner or operator of an unconventional natural gas well site or remote pigging station shall submit to the Air Program Manager of the appropriate DEP Regional Office all requests, reports, applications, submittals, and other communications concerning applicable federal NSPS and NESHAP.
- (b) In accordance with 40 CFR §60.4 and 40 CFR §63.10 copies of all requests, reports, applications, submittals, and other communications shall also be submitted to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI) accessible at <https://cdx.epa.gov> unless electronic reporting is not available, in which case a copy shall be sent to the following address:

United States Environmental Protection Agency, Region III
Office of Air Enforcement and Compliance Assistance (3AP20)
1650 Arch St.
Philadelphia, PA 19103-2029

- (c) The annual report is required to be submitted either by hand-delivery, courier, or sent by certified mail, return receipt requested to the Air Program Manager of the appropriate DEP Regional Office and in electronic format to the appropriate email address in Condition 10(b)(iv), no later than March 1st each year for the previous calendar year. The initial compliance period may be less than one full year. General information required on all reports includes:
 - (i) Company Name;
 - (ii) Facility Site Name;
 - (iii) The GP-5A authorization number;
 - (iv) US Well ID(s);
 - (v) Either:
 - (A) The address of the site; **or**
 - (B) A description of the site and the location using latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of 5 decimal degrees using the North American Datum of 1983;
 - (vi) The beginning and ending dates of the reporting period;
 - (vii) The Certification Form described in Condition 9(g), which must include:
 - (A) The statement: "Based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."; **and**
 - (B) The signature of the certifying Responsible Official;
 - (viii) Identification of each source included in the report;
 - (ix) The identification of each term or condition of the GP-5A that is the basis of the certification, the compliance status, and the methods used for determining the compliance status of the source, currently and over the reporting period as identified in Sections B. through P. of this General Permit; **and**
 - (x) The records of the facility's emissions that show it is not a Title V facility as per Condition 11(b).

- (d) In accordance with 25 Pa. Code §135.3, the owner or operator of a facility shall submit to the Department via AES*Online or AES*XML at www.depgreenport.state.pa.us/ by March 1st of each year, a facility inventory report for the preceding calendar year for all sources regulated under this General Permit. The inventory report shall include all emissions information for all sources operated during the preceding calendar year from the annual report required in (c) above. Emissions data including, but not limited, to the following shall be reported:
- (i) NO_x;
 - (ii) CO;
 - (iii) SO_x;
 - (iv) PM₁₀;
 - (v) PM_{2.5};
 - (vi) VOCs;
 - (vii) Speciated HAP including, but not limited to, benzene, ethyl benzene, formaldehyde, n-hexane, toluene, isomers and mixtures of xylenes, and 2,2,4-trimethylpentane;
 - (viii) Total HAPs;
 - (ix) CO₂;
 - (x) CH₄; **and**
 - (xi) N₂O.

13. Source Testing Requirements

- (a) In addition to the specific performance testing requirements included in this General Permit, the Department may require the owner or operator to conduct a source test if it is determined that the air contaminant emissions from a source operating under this General Permit are, or may be, in excess of an applicable air contaminant emission limitation.
- (b) All testing, with the exception of periodic monitoring, shall be performed in accordance with any applicable federal regulations, 25 Pa. Code, Chapter 139, and the current version of the Department's Source Testing Manual, or an alternative test method as approved by the Department.
- (c) All submittals, with the exception of periodic monitoring data, shall meet the applicable requirements specified in the most current version of the Department's Source Testing Manual.
- (d) Two copies of all reports, protocols, and test completion notifications, with the exception of periodic monitoring data, shall be submitted through either by hand-delivery, courier, or sent by certified mail, return receipt requested, to the Air Program Manager of the appropriate DEP Regional Office. An electronic copy shall also be submitted via the appropriate email address in Condition 10(b)(iv).
- (e) At least 60 calendar days prior to commencing an emission testing program to demonstrate compliance required by this General Permit, a Test Protocol shall be submitted to in accordance with (d) above for review and approval. The emissions testing shall not commence prior to receipt of a protocol acceptance letter from the Department.
- (f) At least 15 calendar days prior to commencing an emission testing program to demonstrate compliance required by this General Permit, written notification of the date and time of testing shall be provided to the Department's Division of Source Testing and Monitoring and the appropriate DEP Regional Office so that an observer may be present. The Department is under no obligation to accept the results of any testing performed without adequate advance written notice to the Department of such testing.
- (g) Within 15 calendar days after completion of the on-site testing portion of an emission test program to demonstrate compliance required by this General Permit, if a complete test report has not yet been submitted, an electronic notification shall be submitted in accordance with (d) above indicating the completion date of the on-site testing.
- (h) A complete test report shall be submitted in accordance with (d) above no later than 60 calendar days after completion of the on-site testing portion of an emission test program required by this General Permit. The complete test report shall include a summary at the beginning of the report which includes:
 - (i) A statement that the owner or operator has reviewed the report from the emissions testing company and agrees with the findings;

- (ii) The GP-5A authorization number and conditions that are the basis for the evaluation;
- (iii) A summary of results with respect to each applicable permit condition; **and**
- (iv) A statement of compliance or non-compliance with each applicable permit condition.

SECTION B. FUGITIVE PARTICULATE MATTER

1. Compliance Requirements

The owner or operator of a facility shall take all reasonable actions to prevent particulate matter from becoming airborne. Therefore, in accordance with 25 Pa. Code §§123.1 and 123.2, the owner or operator must implement fugitive dust control measures which at a minimum include:

- (a) Preventing emissions that are visible at the point they move outside the property boundaries and the tracking of dirt or soils onto public roads by implementing measures including, but not limited to, sweeping and/or the use of a tire washing system.
- (b) Promptly removing earth or other material that is deposited by trucking or other means on public roadways.
- (c) Applying water or other chemical dust suppressants as needed to haul roads, the shoulders of access roadways, and the shoulders of public highways for a distance of 500 feet in both directions to reduce fugitive dusts based on daily site conditions.
 - (i) The application of dust suppressants on public highways shall be done in accordance with the appropriate PennDOT Bulletins.
 - (ii) If water is used, it shall not be applied if the result would be a potentially unsafe condition.
 - (iii) Waste oil or wastewater shall not be used as a dust suppressant.
- (d) Posting signage consistent with PennDOT regulations on haul roads before the commencement of facility construction imposing a 15 mph speed limit.
- (e) Posting signage that complies with 67 Pa. Code §212.101(a) and (b) informing drivers of diesel-powered motor vehicles of the Pennsylvania anti-idling law, limiting idling to no more than 5 minutes in any continuous 60-minute period except for the exemptions and exclusions of 35 P.S. §4603(b) and (c).
- (f) To demonstrate compliance, the owner or operator must submit the required notifications and reports and maintain the required records.

2. Notification Requirements

The notifications of Section A Condition 10(b) through (d) do not apply to fugitive particulate matter emissions.

3. Recordkeeping Requirements

The owner or operator must keep a written procedures document that describes the activities utilized at the facility to control fugitive particulate matter on-site and sufficient records to demonstrate that the activities are being implemented. All records must be kept in accordance with Section A Condition 11.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the records of activities implemented in accordance with the procedures document during the reporting period covered must be included.

Emissions of fugitive particulate matter are not required to be reported under Section A Condition 12(d).

SECTION C. WELL DRILLING AND HYDRAULIC FRACTURING OPERATIONS

1. Compliance Requirements

- (a) The owner or operator of a facility shall take all reasonable actions to prevent fugitive emissions and fugitive particulate matter from becoming airborne in accordance with 25 Pa. Code §§123.1 and 123.2 during well drilling and hydraulic fracturing operations. This includes, but is not limited to:
 - (i) The proper handling of drilling mud and drill cuttings; **and**
 - (ii) The proper handling of sand or other proppants used in hydraulic fracturing.

- (b) All compression ignition engines used for well drilling and hydraulic fracturing operations shall meet the applicable Tier requirements of 40 CFR Part 89 or Part 1039 for its make and model year.
- (c) All spark ignition engines used for well drilling and hydraulic fracturing operations shall meet the applicable emissions limitations of 40 CFR Part 1048 for its make and model year.
- (d) The owner or operator of an existing facility where a new well is drilled or hydraulically fractured, an existing well is hydraulically refractured, or new equipment is installed becomes a modified facility with respect to the fugitive emissions components requirements of Section K as per 40 CFR §60.5365a(i) **unless** the facility consists only of wellheads.
- (e) To demonstrate compliance, the owner or operator must submit the required notifications and reports and maintain the required records.

2. Notification Requirements

- (a) The owner or operator shall send a copy of the 24-hour advance notice prior to the commencement of well drilling as required under Act 13 of 2012 to the Air Program Manager in the appropriate DEP Regional Office. The notification must be submitted to DEP in writing or by e-mail. The notification must include:
 - (i) Contact information for the owner or operator;
 - (ii) Name of the well site (if any), county, and township;
 - (iii) The GP-5A authorization number;
 - (iv) The US Well Number for each well;
 - (v) The latitude and longitude coordinates for each well in decimal degrees to an accuracy and precision of 5 decimals of a degree using the North American Datum of 1983; **and**
 - (vi) The planned date of the beginning of drilling.
- (b) The owner or operator shall send a copy of the 24-hour advance notice prior to the commencement of hydraulic fracturing as required under Act 13 of 2012 to the Air Program Manager in the appropriate DEP Regional Office. The notification must be submitted to DEP in writing or by e-mail. The notification must include:
 - (i) Contact information for the owner or operator;
 - (ii) Name of the well site (if any), county, and township;
 - (iii) The GP-5A authorization number;
 - (iv) The US Well Number for each well;
 - (v) The latitude and longitude coordinates for each well in decimal degrees to an accuracy and precision of 5 decimals of a degree using the North American Datum of 1983; **and**
 - (vi) The planned date of the beginning of hydraulic fracturing.

3. Recordkeeping Requirements

For each well the owner or operator shall maintain a daily log book in accordance with Section A Condition 11 containing the following information:

- (a) The location of the well;
- (b) The US Well Number;
- (c) The date and time of the commencement of drilling;
- (d) A list of the make and model of the engines used in the drilling operation;
- (e) The hours each engine operated during the drilling operation;
- (f) The emissions calculation for each drilling operation;
- (g) The date and time of the commencement of hydraulic fracturing;
- (h) A list of the make and model of the engines used in the hydraulic fracturing operation;
- (i) The hours each engine operated during the hydraulic fracturing operation;
- (j) The emissions calculation for each hydraulic fracturing operation; **and**
- (k) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each well drilling or hydraulic fracturing operation conducted during the reporting period shall include:

- (a) The records of each well drilling operation;
- (b) The records of each hydraulic fracturing operation; **and**
- (c) The records of deviations and malfunctions.

The emissions from each well drilling and hydraulic fracturing operation conducted during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION D. WELL COMPLETION OPERATIONS

1. Compliance Requirements

- (a) The owner or operator of any unconventional natural gas well must have a separator onsite during the entirety of the flowback period unless the well:
 - (i) Was not hydraulically fractured or refractured; **or** does not generate condensate, intermediate hydrocarbons, or produced water such that there is no liquid collection system present at the site.
 - (ii) The owner or operator of such a well must immediately stop the well completion operation if conditions change such that they allow for liquid collection and then comply with the standard conditions.
- (b) If it is technically infeasible for a separator to function as required, the flowback must be routed to one or more well completion vessels or storage vessels. There are no requirements to control the gas present in the flowback if the separator cannot function as required.
- (c) When a separator is functioning as required, the owner or operator must:
 - (i) Route all recovered liquids from the separator to one or more well completion vessels or storage vessels; re-inject all recovered liquids into the well or another well; **or** route all recovered liquids to a liquids collection system; **and**
 - (ii) Route all recovered gas to the gas flow line or collection system; re-inject all recovered gas into the well or another well; use the recovered gas onsite as a fuel source; **or** use the recovered gas for another useful purpose that a purchased fuel or raw material would serve; **unless**
 - (iii) It is technically infeasible to use the gas in one of the above ways. In such cases, the owner or operator must capture and direct the recovered gas to a completion combustion device that is equipped with a reliable continuous pilot flame **unless** doing so may result in a fire hazard or explosion; **or** where high heat emissions may negatively impact waterways.
- (d) The owner or operator has a general duty to safely maximize resource recovery and minimize releases to the atmosphere during flowback and subsequent recovery.
- (e) To demonstrate compliance, the owner or operator must submit the required notifications and reports and maintain the required records.

2. Notification Requirements

The owner or operator shall send a copy of the 24-hour advance notice prior to the commencement of each well completion as required under Act 13 of 2012 to the Air Program Manager in the appropriate DEP Regional Office. The notification must be submitted to DEP in writing or by e-mail. The notification must include:

- (a) Contact information for the owner or operator;
- (b) Name of the well site (if any), county, and township;
- (c) The GP-5A authorization number;
- (d) The US Well Number for each well;
- (e) The latitude and longitude coordinates for each well in decimal degrees to an accuracy and precision of 5 decimals of a degree using the North American Datum of 1983; **and**
- (f) The planned date of the beginning of flowback.

3. Recordkeeping Requirements

For each well the owner or operator shall maintain a daily log book in accordance with Section A Condition 11 containing the following information:

- (a) The location of the well;
- (b) The US Well Number;
- (c) The date and time of the onset of flowback following hydraulic fracturing or refracturing;
- (d) The date and time of each attempt to direct flowback to a separator;
 - (i) This requirement is not applicable if the well was not hydraulically fractured or refractured or does not produce condensate, intermediate hydrocarbons, or produced water.
 - (ii) A record of the claim signed by the certifying official that no liquids collection is at the well site.
 - (A) The claim must state that, "based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."
 - (B) The claim must be signed by a certifying official.
 - (iii) If liquids are recovered at a well where a separator was not installed, the following information is required:
 - (A) The date and time the well completion operation was stopped; **and**
 - (B) The date and time that the separator was installed.
- (e) The date and time of each occurrence of the separator being unable to function as required;
 - (i) This requirement is not applicable if the well was not hydraulically fractured or refractured or does not produce condensate, intermediate hydrocarbons, or produced water.
- (f) The date and time of either when the well was shut in and the flowback equipment was permanently disconnected; **or** when the well started production.
- (g) The duration, in hours, of the recovery and disposition of the gas (i.e, whether the gas was:);
 - (i) Routed to a gas flow line or collection system; re-injected into the well or another well; used as an onsite fuel source; **or** used for another useful purpose that a purchased fuel or raw material would serve.
 - (A) Wildcat, delineation, and low-pressure wells do not have to record the duration of recovery to a flow line.
 - (ii) This requirement is not applicable if the well was not hydraulically fractured or refractured or does not produce condensate, intermediate hydrocarbons, or produced water.
 - (iii) If applicable, the reason(s) that it is technically infeasible to route recovered gas as described in (g)(i) above including, but not limited to:
 - (A) The starting date and ending date for the period the well operated under the exception.
 - (B) The name and location of the nearest gathering line and the technical considerations preventing routing to this line;
 - (C) The capture, reinjection, and reuse technologies considered and the aspects of the gas or equipment preventing use of the recovered gas as a fuel onsite; **and**
 - (D) The technical considerations preventing use of recovered gas for other useful purposes that a purchased fuel or raw material would serve.
- (h) The duration, in hours, of combustion;
- (i) The duration, in hours, of venting and specific reasons for venting in lieu of capture or combustion;
- (j) If the well is determined to be a low pressure well, a record of the determination including the supporting inputs and calculations described in 40 CFR §60.5432a;
- (k) The emissions calculation for each well completion operation; **and**
- (l) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each well completion operation conducted during the reporting period shall include:

- (a) The records of each well completion operation;
- (b) The records of deviations and malfunctions; **and**

- (c) The calculations that support a determination that the well is a low pressure well, if applicable.

The emissions from each well completion operation conducted during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION E. NATURAL GAS-FIRED COMBUSTION UNITS

1. Compliance Requirements

- (a) Combustion units, including but not limited to, gas production units (GPU), heated flash separator units, evaporator units, and glycol dehydrator reboilers shall have a rated heat input less than 10 MMBtu/h each and only be fired on natural gas.
- (b) Integrated equipment, such as controllers (Section L), pumps (Section M), and any fugitive emissions components (Section K) are subject to the requirements of their respective Sections.
- (c) To demonstrate compliance, the owner or operator must submit the required notifications and reports and maintain the required records.

2. Notification Requirements

Notifications for each combustion unit must be done in accordance with Section A Condition 10(b) through (d).

3. Recordkeeping Requirements

For each combustion unit, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The location of the combustion unit;
- (b) The US Well Number the combustion unit is associated with;
- (c) The monthly fuel usage of the combustion unit;
- (d) The monthly throughput of the combustion unit;
- (e) The emissions calculations for the combustion unit; and
- (f) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each combustion unit operated during the reporting period shall include:

- (a) The records of the fuel usage of each combustion unit;
- (b) The records of the throughput of each combustion unit; and
- (c) The records of any deviations and malfunctions.

The emissions from each combustion unit operated during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION F. GLYCOL DEHYDRATION UNITS

1. Compliance Requirements

- (a) For each glycol dehydration unit constructed under an Authorization to Use GP-5 approved by the Department prior to February 2, 2013, with:
- (i) A total uncontrolled potential VOC emission rate greater than 10 tpy the owner or operator shall:
- (A) Control VOC emissions from the glycol dehydrator still vent stream by at least 85% with a condenser, enclosed flare, thermal oxidizer, vapor recovery unit, or other air cleaning device approved by the Department that meets the applicable requirements in Section N; and
- (B) Meet the requirements of (d) and (e) below.
- (ii) A total uncontrolled potential VOC emission rate less than or equal to 10 tpy, the owner or operator shall:
- (A) Meet the requirements of (d) and (e) below.

- (B) In the event that (d) is not met, the owner or operator must control VOC emissions in accordance with (a)(i)(A) above.
- (b) For each glycol dehydration unit constructed on or after August 10, 2013, but prior to (effective date of GP-5A), with:
- (i) A total uncontrolled VOC emission rate of 2.7 tpy or greater, an uncontrolled single HAP emission rate of 0.5 tpy or greater, or a total uncontrolled HAP emission rate of 1.0 tpy or greater, the owner or operator shall:
- (A) Control VOC emissions from the glycol dehydrator still vent stream by at least 95% with a condenser, enclosed flare, thermal oxidizer, vapor recovery unit, or other air cleaning device approved by the Department that meets the applicable requirements in Section N.
- (B) Meet the requirements of (d) and (e) below.
- (ii) A total uncontrolled VOC emission rate of less than 2.7 tpy, an uncontrolled single HAP emission rate of less than 0.5 tpy, and a total uncontrolled HAP emission rate of less than 1.0 tpy, the owner or operator shall:
- (A) Meet the requirements of (d) and (e) below.
- (B) In the event that (d) is not met, the owner or operator must control VOC emissions in accordance with (b)(i)(A).
- (c) For each glycol dehydrator constructed on or after (effective date of GP-5A) with:
- (i) An uncontrolled methane emission rate of 200 tpy or greater, a total uncontrolled VOC emission rate of 2.7 tpy or greater, an uncontrolled single HAP emission rate of 0.5 tpy or greater, or a total uncontrolled HAP emission rate of 1.0 tpy or greater, the owner or operator shall:
- (A) Control methane, VOC, and HAP emissions from the glycol dehydrator still vent stream by at least 98% with a condenser, enclosed flare, thermal oxidizer, vapor recovery unit, or other air cleaning device approved by the Department that meets the applicable requirements in Section N; **and**
- (B) Meet the requirements of (d) and (e) below.
- (ii) An uncontrolled methane emission rate of less than 200 tpy, a total uncontrolled VOC emission rate of less than 2.7 tpy, an uncontrolled single HAP emission rate of less than 0.5 tpy, and a total uncontrolled HAP emission rate of less than 1.0 tpy, the owner or operator shall:
- (A) Meet the requirements of (d) and (e) below.
- (B) In the event that (d) is not met, the owner or operator must control methane and VOC emissions in accordance with (c)(i)(A) above.
- (d) The owner or operator shall meet the malodor requirements of Section A Condition 9(c)(iii).
- (e) To demonstrate compliance, the owner or operator shall submit the required notifications and reports and maintain the required records.
- (f) Associated equipment, such as reboilers (Section E), flash tanks (Section I), controllers (Section L), pumps (Section M), and fugitive emissions components (Section K) are subject to the requirements of their respective Sections.
- (g) If any glycol dehydration unit uses triethylene glycol for the dehydration process, has a natural gas throughput greater than 3 MMscf/d, **and** emits more than 1.0 tpy of benzene, the owner or operator must:
- (i) Determine the natural gas throughput by either:
- (A) Installing and operating a monitoring instrument that directly measures natural gas flowrate to the glycol dehydration unit with an accuracy of plus or minus 2% or better and then converting the annual natural gas flowrate to a daily average by dividing the annual flowrate by the number of days per year the glycol dehydration unit processed natural gas; **or**
- (B) Documenting to the Department's satisfaction the actual annual average natural gas flowrate to the glycol dehydration unit.
- (ii) Determine the actual average benzene or BTEX emissions by either:
- (A) Using GRI-GLYCalc Version 3.0 or higher with the inputs to the model representative of actual operating conditions of the glycol dehydration unit; **or**
- (B) Determining an average mass rate of benzene or BTEX emissions using direct measurement using methods in 40 CFR §63.772(a)(1)(i) or an alternative method according to 40 CFR §63.7(f).

- (iii) If the glycol dehydration unit is located at a facility located within an urbanized area plus offset or urban cluster boundary, the owner or operator shall:
 - (A) Connect the process vent to a control device through a closed-vent system designed and operated in accordance with the applicable requirements of Section N such that:
 - (1) Benzene emissions are reduced below 1.0 tpy; **or**
 - (2) Total organic compounds or total HAP are reduced by at least 95%.
- (iv) If the glycol dehydration unit is located at a facility that is not within an urbanized area plus offset or urban cluster boundary, the owner or operator shall:
 - (A) Determine the optimum glycol circulation rate using the equation:

$$L_{OPT} = 1.15 * \frac{3.0 \text{ gal TEG}}{\text{lb H}_2\text{O}} * \left(\frac{F * (I - O)}{24 \frac{\text{h}}{\text{d}}} \right)$$

Where:

L_{OPT} is the Optimal Circulation Rate in gal/h

F is the Gas Flowrate in MMscf/d

I is the Inlet Water Content in lb/MMscf

O is the Outlet Water Content in lb/MMscf

3.0 is the industry accepted rule of thumb for a TEG-to water ratio in gal TEG/lb H₂O

1.15 is an adjustment factor included for a margin of safety.

- (B) Operate the triethylene glycol dehydration unit such that the actual glycol circulation rate does not exceed the calculated optimum glycol circulation rate.
- (C) Determine an alternate circulation rate using GRI-GLYCalc computer software or other method approved by the Department if the optimum glycol circulation rate calculated in (g)(iv)(A) above is not adequate to meet the sales gas specification for moisture content.

2. Notification Requirements

Notifications for each glycol dehydration unit must be done in accordance with Section A Condition 10(b) through (d). If an alternate circulation rate is required as in Condition 1(g)(iv)(C) above, the determination must be submitted to the Air Program Manager of the appropriate DEP Regional Office at least 5 days prior to altering the circulation rate.

3. Recordkeeping Requirements

For each glycol dehydration unit, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The location of the glycol dehydration unit;
- (b) The US Well Number the glycol dehydration unit is associated with;
- (c) The actual daily throughput of natural gas;
- (d) The calculation for the optimum glycol circulation rate or the alternative glycol circulation rate, **if applicable**;
- (e) The determination of the actual average benzene or BTEX emissions, **if applicable**;
- (f) The actual daily glycol circulation rate;
- (g) The emissions calculations for each glycol dehydrator; **and**
- (h) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each glycol dehydration unit operated during the reporting period shall include:

- (a) The records of VOC emissions calculated using GRI-GLYCalc computer software or an alternative method as approved by the Department;
- (b) The records of the actual daily throughput of natural gas;
- (c) The records of the actual daily glycol circulation rate;
- (d) The records of the optimum or alternative glycol circulation rate, **if applicable**;

- (e) The records of the determination of the actual average benzene or BTEX emissions, **if applicable**;
- (f) A statement that the applicable cover, closed vent system, and/or control device requirements have been met; **and**
- (g) The records of any deviations and malfunctions.

The emissions from each glycol dehydration unit operated during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION G. STATIONARY NATURAL GAS-FIRED SPARK IGNITION INTERNAL COMBUSTION ENGINES

1. Compliance Requirements

- (a) For each natural gas-fired spark ignition internal combustion engine constructed under an Authorization to Use GP-5 approved by the Department prior to February 2, 2013, the owner or operator shall:
 - (i) Operate or equip the engine with air cleaning devices to meet the following emission levels:
 - (A) NO_x (as NO₂) of 2.00 g/bhp-h while operating at rated bhp and speed;
 - (B) NMNEHC (as propane), excluding formaldehyde, of 2.00 g/bhp-h while operating at rated bhp and speed; **and**
 - (C) CO of 2.00 g/bhp-h while operating at rated bhp and speed.
 - (ii) Ensure that at operating conditions less than rated capacity, the engine shall on a lb/h basis emit no more than it would emit at rated bhp and speed.
 - (iii) Ensure the engine meets the requirements of (d) below.
- (b) For each natural gas-fired spark ignition internal combustion engine constructed on or after February 2, 2013, but prior to (effective date of GP-5A), the owner or operator shall:

- (i) Ensure the engine does not exceed the emissions standards specified in the following table:

Engine Type	Rated bhp	NO _x	NMNEHC (as propane) excluding HCHO	CO
Non-Emergency SI Natural Gas	≤25 and <225 cc	7.46 g/bhp-h		454.88 g/bhp-h
Non-Emergency SI Natural Gas	≤25 and ≥225 cc	5.97 g/bhp-h		454.88 g/bhp-h
Non-Emergency SI Natural Gas	25 < ER < 100	1.00 g/bhp-h	0.70 g/bhp-h	2.00 g/bhp-h
Non-Emergency SI Natural Gas	100 ≤ ER ≤ 500	1.00 g/bhp-h	0.70 g/bhp-h	2.00 g/bhp-h
Non-Emergency SI Natural Gas	>500	1.00 g/bhp-h	0.70 g/bhp-h	2.00 g/bhp-h

- (ii) Ensure the combined NO_x emissions from all engines do not exceed 100 lb/h, 1,000 lb/day, 2.75 tons per ozone season, and 6.6 tons on a 12-month rolling basis.
- (iii) Ensure the engine meets the requirements of (d) below.
- (c) For each natural gas-fired spark ignition internal combustion engine constructed on or after (effective date of GP-5A), the owner or operator shall:
- (i) Ensure the engine does not exceed the emission standards specified in the following table:

Engine Type	Rated bhp	NO _x	CO	NMNEHC (as propane) excluding HCHO	HCHO
Lean-Burn	<100	1.00 g/bhp-h	2.00 g/bhp-h	0.20 g/bhp-h	-
Lean-Burn	100 ≤ ER ≤ 500	1.00 g/bhp-h	0.70 g/bhp-h	0.30 g/bhp-h	-
Lean-Burn	500 < ER < 1,875	0.50 g/bhp-h	0.35 g/bhp-h	0.25 g/bhp-h	0.05 g/bhp-h
Lean-Burn	1,875 ≤ ER < 3,000	0.35 g/bhp-h Uncontrolled or 0.05 g/bhp-h with Control	0.25 g/bhp-h	0.25 g/bhp-h	0.05 g/bhp-h
Lean-Burn	≥3,000	0.05 g/bhp-h	0.25 g/bhp-h	0.25 g/bhp-h	0.05 g/bhp-h
Rich-Burn	<100	0.60 g/bhp-h	0.60 g/bhp-h	0.10 g/bhp-h	
Rich-Burn	100 ≤ ER ≤ 500	0.25 g/bhp-h	0.30 g/bhp-h	0.20 g/bhp-h	-
Rich-Burn	500 <	0.20 g/bhp-h	0.30 g/bhp-h	0.20 g/bhp-h	2.7 ppmvd @ 15% O ₂ <u>or</u> 76% reduction

- (ii) Ensure that for engines that control NO_x emissions with a control technology that uses ammonia or urea as a reagent, the exhaust ammonia slip is limited to 5 ppmvd or less corrected to 15% O₂.
- (iii) Ensure the engine meets the requirements of (d) below.
- (d) The owner or operator of the engine shall also:
- (i) Comply with the requirements for engines constructed (as defined in 40 CFR Part 63, Subpart ZZZZ) prior to June 12, 2006, in the following table:

Engine Category	Oil and Filter Change	Spark Plug Inspection, Plugs Replaced as Necessary	Hose Inspection, Hoses Replaced as Necessary
Emergency SI RICE; 4SRB and 4SLB >500 hp that operate ≤ 24 hours per year	500 hours or annually	1,000 hours or annually	500 hours or annually
4SRB and 4SLB > 500 hp in remote locations	2,160 hours or annually	2,160 hours or annually	2,160 hours or annually
4SLB > 500 hp	Install an oxidation catalyst to reduce HAP emissions and either a CPMS to monitor the catalyst inlet temperature or equipment to shut down the engine if the catalyst inlet temperature exceeds 1350°F		
4SRB > 500 hp	Install NSCR to reduce HAP emissions and either a CPMS to monitor the catalyst inlet temperature or equipment to shut down the engine if the catalyst inlet temperature exceeds 1250°F		
4SRB and 4SLB ≤ 500 hp	1,440 hours or annually	1,440 hours or annually	1,440 hours or annually
2SLB	4,320 hours or annually	4,320 hours or annually	4,320 hours or annually

- (A) Where remote is defined as in 40 CFR Part 63, Subpart ZZZZ.
- (iii) Ensure the engine meets the visible emissions standards, as determined by the methods described in 25 Pa. Code §123.43, by not exceeding the following limitations:
- (A) Equal to or greater than 10% for a period or periods aggregating more than three minutes in any one hour; **and**
 - (B) Equal to or greater than 30% at any time
- (iv) Install, operate, and maintain a non-resettable hour meter;
- (v) Install, operate, and maintain a fuel flow meter;
- (vi) Limit the engine's time spent at idle during startup or shutdown to a period appropriate for the operation of the engine and air pollution control equipment consistent with good air pollution control practices, not to exceed 30 minutes, during which time the emissions standards in (a) through (c) do not apply.
- (vii) Conduct performance tests and periodic monitoring for the engine as detailed in Condition 5 of this section on the following schedule:

Engine Size	Initial Compliance Performance Test	Continuous Compliance Performance Test	Periodic Monitoring
<100 hp	None Required	None Required	Every 2,500 hours of operation
100 hp ≤ ER ≤ 500 hp	Within 180 days of startup of the engine	Within 180 days of each reauthorization	Every 2,500 hours of operation
>500 hp	Within 180 days of startup of the engine	Every 8,760 hours of operation or every three years and within 180 days of each reauthorization	Every 2,500 hours of operation
> 500 hp and subject to (d)(i)	Not Applicable	Every year	Every 2,500 hours of operation

- (A) For an engine greater than or equal to 100 hp and less than or equal to 500 hp, if the engine is certified by the manufacturer in accordance with 40 CFR Part 60, Subpart JJJJ and the owner or operator operates and maintains the engine in accordance with the manufacturer's instructions, the performance testing requirements are waived.
- (B) For an engine greater than 500 hp, if the engine is certified by the manufacturer in accordance with 40 CFR Part 60, Subpart JJJJ and the owner or operator operates and maintains the engine in

accordance with the manufacturer's instructions, the continuous compliance performance testing requirements every 8,760 hours of operation or every three years are waived.

2. Notification Requirements

Notifications for each natural-gas fired spark ignition engine must be done in accordance with Section A Condition 10(b) through (d). Notifications for performance testing of each natural-gas fired spark ignition engine must be done in accordance with Section A Condition 13(f) and (g).

3. Recordkeeping Requirements

For each engine, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The location of each engine;
- (b) The GP-5A authorization number and the date each engine was authorized for use;
- (c) The US Well Number each engine is associated with;
- (d) The make, model, and serial number of each engine;
- (e) The number of hours per month that each engine operated;
- (f) The amount of fuel that is used per month in each engine;
- (g) Either a copy of the manufacturer's maintenance instructions **or** an alternative maintenance plan;
- (h) Records of maintenance conducted on each engine and any installed air pollution control devices;
- (i) A copy of the manufacturer's engine certification or vendor guarantees;
- (j) Records of all notifications as detailed in Condition 2 above;
- (k) The results of each periodic monitoring;
- (l) The summary for each complete test report described in Section A Condition 13(h);
- (m) The site-specific monitoring plan for a CPMS, **if applicable**;
- (n) The data collected from a CPMS, **if applicable**;
- (o) The emissions calculations for each engine; **and**
- (p) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each engine operated during the reporting period shall include:

- (a) The records of the number of hours each engine operated;
- (b) The records of the actual fuel usage for each engine;
- (c) The records of maintenance conducted on each engine and any installed air pollution control devices;
- (d) The results of each periodic monitoring conducted;
- (e) The summary for each complete test report described in Section A Condition 13(h) conducted;
- (f) The results of the CPMS performance evaluation, if one is installed; **and**
- (g) The records of any deviations and malfunctions.

The emissions from each natural gas-fired spark ignition internal combustion engine operated during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

5. Performance Testing Requirements

- (a) When conducting a performance test for an engine, the owner or operator may follow the procedure detailed in (b) below and forego the need to submit the test protocol described in Section A Condition 13(e). If the owner or operator decides to use other methods, such as those outlined in 40 CFR Part 60 Subpart JJJJ or 40 CFR Part 63 Subpart ZZZZ, they must submit the test protocol described in Section A Condition 13(e) for review and approval.
- (b) *Standardized Performance Test Procedure.*
 - (i) Conduct three test runs of at least one hour duration within 10% of the highest achievable load.

- (ii) Select the sampling port location and the number and location of traverse points at the exhaust using 40 CFR Part 60, Appendix A-1, Method 1 or 1A depending on stack diameter, or the sampling points selected according to 40 CFR Part 60, Appendix A-4, Method 7E Section 8.1.2.
- (iii) Determine the effluent characteristics including by either:
 - (A) Calculating the exhaust flow in accordance with 40 CFR Part 60, Appendix A-7, Method 19 and measuring the O₂ concentration using 40 CFR Part 60, Appendix A-2, Method 3A; **or**
 - (B) By measuring:
 - (1) The flow velocity, stack temperature, static pressure, and barometric pressure using 40 CFR Part 60, Appendix A-1, Method 2 or 2C depending on stack diameter;
 - (2) The gas density using 40 CFR Part 60, Appendix A-2, Method 3A; **and**
 - (3) The moisture content using 40 CFR Part 60, Appendix A-3, Method 4.
- (iv) Simultaneous to the determination of the O₂ concentration in (iii)(B) above, determine:
 - (A) The NO_x concentration of the exhaust gas using 40 CFR Part 60, Appendix A-4, Method 7E;
 - (B) The CO concentration of the exhaust gas using 40 CFR Part 60, Appendix A-4, Method 10;
 - (C) The NMNEHC concentration, as propane, excluding formaldehyde of the exhaust gas using 40 CFR Part 60, Appendix A-7, Method 25A to determine the THC, 40 CFR Part 60, Appendix A-6, Method 18 to determine the methane and ethane concentration and then subtracting the methane and ethane concentrations from the THC; **and**
 - (D) The formaldehyde concentration of the exhaust gas, **if applicable**, using 40 CFR Part 63, Appendix A, Method 323.
- (c) If at any time the owner or operator operates the engine in excess of the highest achievable load plus 10%, the owner or operator must perform a stack test within 180 days from the anomalous operation.

6. Periodic Monitoring Requirements

- (a) When conducting periodic monitoring on an engine, the owner or operator may follow the procedures in (b) below. If the owner or operator decides to deviate from those procedures, they must submit a request to use an alternate procedure, in writing, at least 60 days prior to performing the periodic monitoring. In the alternate procedure request, the owner or operator must demonstrate the alternate procedure's equivalence to the standard procedure to the satisfaction of the Division of Source Testing and Monitoring.
- (b) *Standardized Periodic Monitoring Procedure.*
 - (i) Conduct three test runs of at least 20 minutes duration within 10% of the highest achievable load.
 - (ii) Determine NO_x and CO emissions concentrations in the exhaust with an electro-chemical cell portable gas analyzer used and maintained in accordance with the manufacturer's specifications and following the procedures specified in ASTM D6522.
 - (iii) If the measured NO_x or CO emissions concentrations are within the margin of instrument error **or** in exceedance of the emissions limit, the owner or operator must perform a stack test within 180 days of the periodic monitoring.
- (c) The 2,500 hours of operation count resets after any performance test performed in accordance with Condition 5 above.
- (d) For engines constructed (as defined in that subpart) prior to June 12, 2006, that installed a CPMS to monitor the catalyst inlet temperature, the owner or operator must install, operate, and maintain the CPMS according to 40 CFR §63.6625(b)(1) through (6).

SECTION H. RECIPROCATING COMPRESSORS

1. Compliance Requirements

- (a) The owner or operator of a reciprocating compressor constructed on or after August 23, 2011, shall either:
 - (i) Replace the reciprocating compressor rod packing either:
 - (A) On or before 26,000 hours of operation from the initial startup date or most recent rod packing replacement; **or**
 - (B) Prior to 36 months from the initial startup date of the reciprocating compressor or the date of the most recent rod packing replacement; **or**

- (ii) Collect the methane, VOC, and HAP emissions from the rod packing using a collection system that operates under negative pressure and routes the emissions to a process through a closed vent system that meets the applicable requirements of Section N.
- (b) To demonstrate compliance, the owner or operator must submit the required notifications and reports and maintain the required records.

2. Notification Requirements

Notifications for each reciprocating compressor must be done in accordance with Section A Condition 10(b) through (d). In addition, the owner or operator must submit notification of any scheduled blowdown or venting for each reciprocating compressor in accordance with Section A Condition 9(e).

3. Recordkeeping Requirements

For each reciprocating compressor, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The location of the reciprocating compressor;
- (b) The US Well Number the reciprocating compressor is associated with;
- (c) The date and time of the initial startup of the reciprocating compressor;
- (d) The date and time of the most recent rod packing replacement;
- (e) The cumulative number of hours of operation or number of months since the initial startup of the reciprocating compressor or most recent rod packing replacement;
- (f) The date and time of installation of a rod packing emissions collection system and closed vent system;
- (g) Records of the date, time, and duration of any blowdown or venting of the reciprocating compressor;
- (h) The emissions calculation for each reciprocating compressor; **and**
- (i) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each reciprocating compressor operated during the reporting period shall include:

- (a) Either the records of the cumulative number of hours of operation or number of months since the initial startup of the reciprocating compressor or most recent packing replacement; **or** a statement that emissions from the rod packing are being routed to a process through a closed vent system under negative pressure; **and**
- (b) The records of deviations and malfunctions.

The emissions from each reciprocating compressor operating during the reporting period must be included in the emissions inventory report of Section A Condition 12(d), including the emissions from scheduled and unscheduled blowdowns.

SECTION I. STORAGE VESSELS

1. Compliance Requirements

- (a) For each storage vessel constructed on or after August 23, 2011, but prior to August 10, 2013, that:
 - (i) Routes all vapor through a vapor recovery unit, the owner or operator shall:
 - (A) Meet the applicable cover and closed vent system requirements in Section N Condition 1(e) and (f); **and**
 - (B) Demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
 - (ii) Has a total uncontrolled potential VOC emission rate greater than or equal to 6.0 tpy, the owner or operator shall either:
 - (A) Equip the storage vessel with a cover and route all vapor through a closed vent system to a control device that reduces VOC emissions by 95% or more by meeting the applicable control, cover, and closed vent system requirements of Section N Condition 1(a) or (b), (e), and (f);

- (B) Install a floating roof which meets the applicable requirements in Section N Condition 1(c) or (d); or
 - (C) Maintain the actual uncontrolled VOC emission rate at less than 4.0 tpy as determined monthly, based on the average throughput for the month; and meet the control requirement of (A) above if a well that feeds the storage vessel undergoes hydraulic fracturing or refracturing, or within 30 days of the actual uncontrolled VOC emission rate of (C) above equals or exceeds 4.0 tpy; and
 - (D) Demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (b) For each storage vessel constructed on or after August 10, 2013, but prior to (effective date of GP-5A), with:
- (i) A total uncontrolled VOC emission rate of 2.7 tpy or greater, an uncontrolled single HAP emission rate of 0.5 tpy or greater, or a total uncontrolled HAP emission rate of 1.0 tpy or greater, the owner or operator shall:
 - (A) Equip the storage vessel with a cover and route all vapor through a closed vent system to a control device that reduces VOC emissions by 95% or more by meeting the applicable control, cover, and closed vent system requirements of Section N Condition 1(a) through (f) or any alternative method approved by the Department; and
 - (B) Demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
 - (ii) A total uncontrolled VOC emission rate of less than 2.7 tpy, an uncontrolled single HAP emission rate of less than 0.5 tpy, and a total uncontrolled HAP emission rate of less than 1.0 tpy, the owner or operator shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (c) For each storage vessel constructed on or after (effective date of GP-5A), with:
- (i) An uncontrolled methane emission rate of 200 tpy or greater, a total uncontrolled VOC emission rate of 2.7 tpy or greater, an uncontrolled single HAP emission rate of 0.5 tpy or greater, or a total uncontrolled HAP emission rate of 1.0 tpy or greater, the owner or operator shall:
 - (A) Equip the storage vessel with a cover and route all vapor through a closed vent system to a control device that reduces methane, VOC, and HAP emissions by 98% or more by meeting the applicable control, cover, and closed vent system requirements of Section N Condition 1(a) through (f) or any alternative method approved by the Department; and
 - (B) Demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
 - (ii) An uncontrolled methane emission rate of less than 200 tpy, a total uncontrolled VOC emission rate of less than 2.7 tpy, an uncontrolled single HAP emission rate of less than 0.5 tpy, and a total uncontrolled HAP emission rate of less than 1.0 tpy, the owner or operator shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (d) Any storage vessel removed from service must be completely emptied and degassed such that the vessel no longer contains crude oil, condensate, produced water, or intermediate hydrocarbon liquids. A storage vessel with liquid left on walls, as bottom clingage, or in pools due to floor irregularity is considered to be completely empty.
- (e) Any storage vessel returned to service must meet the applicable requirements above.
- (f) Any storage vessel with a capacity greater than or equal to 2,000 gallons and less than or equal to 40,000 gallons which contain VOCs with vapor pressure greater than 1.5 psia under actual storage conditions shall have pressure relief valves which are maintained in good operating condition and which are set to release at no less than 0.7 psig of pressure or 0.3 psig of vacuum or the highest possible pressure and vacuum in accordance with state or local fire codes, the National Fire Prevention Association guidelines, or other national consensus standards acceptable to the Department. When a VOC's storage temperature is governed by ambient weather conditions, the vapor pressure under actual storage conditions shall be determined using a temperature which is representative of the average storage temperature for the hottest month of the year in which storage takes place.

2. Notification Requirements

Notifications for each storage vessel must be done in accordance with Section A Condition 10(b) through (d).

3. Recordkeeping Requirements

For each storage vessel, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The identification, location, and date of construction of each storage vessel;
- (b) The US Well Number each storage vessel is associated with;
- (c) The VOC potential to emit determination including identification of the model or calculation methodology used;
- (d) The actual uncontrolled VOC emissions determined on a monthly basis, **if applicable**;
- (e) The control device specifications as detailed in Section N Condition 3(a) through (d), **if applicable**;
- (f) The cover inspection required as detailed in Section N Condition 3(e), **if applicable**;
- (g) The closed vent system inspection required as detailed in Section N Condition 3(f), **if applicable**;
- (h) Records of the date each storage vessel was removed from or returned to service;
- (i) The emissions calculation for each storage vessel which may be calculated using Department approved methods such as direct measurement; modeling programs such as the most recent version of EPA TANKS, ProMax, and API E&P Tanks; process simulation software such as HYSIM, HYSIS, WINSIM, and PROSIM; or calculation methodologies such as the Vazquez-Beggs equation; **and**
- (j) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each storage vessel operated during the reporting period shall include:

- (a) The identification, location, and date of construction for each storage vessel constructed;
- (b) The records of the VOC potential to emit determination including identification of the model or calculation methodology used for each storage vessel constructed;
- (c) The records of the date each storage vessel was removed from or returned to service;
- (d) The determination that the control efficiency is met or exceeded, **if applicable**;
- (e) A statement that the applicable cover, closed vent system, and/or control device requirements have been met; **and**
- (f) The records of deviations and malfunctions.

The emissions from each storage vessel operating during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION J. TANKER TRUCK LOAD-OUT OPERATIONS

1. Compliance Requirements

- (a) The owner or operator is required to use a vapor recovery load-out system that meets the closed vent system requirements of Section N Condition 1(f) for all truck load-out operations.
- (b) Each tanker truck that is used to remove liquids from a storage vessel is required to have one of the following annual leak tests:
 - (i) A tanker truck that does not indicate more than 1" H₂O pressure change within 5 minutes after being pressurized to 18" H₂O and after being depressurized to 6" H₂O vacuum has passed a MACT-level test and is assumed to have a collection efficiency of 99.2%.
 - (ii) A tanker truck that does not indicate more than 3" H₂O pressure change within 5 minutes after being pressurized to 18" H₂O and after being depressurized to 6" H₂O vacuum has passed an NSPS-level test and is assumed to have a collection efficiency of 98.7%.
 - (iii) A tanker truck that has passed a leak test performed in accordance with 49 CFR §180.407 is accepted as equivalent to an NSPS-level collection efficiency of 98.7%.

- (iv) A tanker truck that has passed a leak test performed in accordance with 40 CFR Part 60, Appendix A-8, Method 27 is accepted as equivalent to an NSPS-level collection efficiency of 98.7%.
- (c) To demonstrate compliance, the owner or operator must submit the required notifications and reports and maintain the required records.

2. Notification Requirements

Notifications for the construction of the vapor recovery load-out system must be done in accordance with Section A Condition 10(b) through (d).

3. Recordkeeping Requirements

For each tanker truck load-out operation, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The identification, location, and date of construction of each vapor recovery load-out system;
- (b) The US Well Number each vapor recovery load-out system is associated with;
- (c) Records of the entire fleet of tanker trucks that collect liquids from the facility, including the date of and rating of each leak test;
- (d) Records of each tanker truck load-out operation including the identification of the tanker truck, the date and time of the liquids load-out, and the type and volume of liquids loaded;
- (e) The closed vent system inspection records as detailed in Section N Condition 3(f);
- (f) The emissions calculation for each tanker truck load-out operation, taking into account the fugitive emissions which escape due to the capture efficiency being less than 100%; **and**
- (g) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each tanker truck load-out operation during the reporting period shall include:

- (a) The identification, location, and date of construction for each vapor recovery load-out system constructed;
- (b) The records of each tanker truck load-out operation including the identification of the tanker truck, the date and time of the liquids load-out, and the type and volume of liquids loaded;
- (c) A statement that the applicable cover and/or closed vent system requirements have been met; **and**
- (d) The records of deviations and malfunctions.

The emissions from tanker truck load-out operations during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION K. FUGITIVE EMISSIONS COMPONENTS

1. Compliance Requirements

- (a) No later than 30 days after an emission source commences operation, and at least monthly thereafter, the owner or operator of a facility shall conduct an AVO inspection.
- (b) No later than 60 days after the start of production, and quarterly thereafter, the owner or operator shall conduct an LDAR program using either an OGI camera, a gas leak detector that meets the requirements of 40 CFR Part 60, Appendix A-7, Method 21, or other leak detection methods approved by the Division of Source Testing and Monitoring.
 - (i) The owner or operator of a well that is temporarily shut-in is not required to perform LDAR until no later than 60 days after the well is put into production or the next quarterly inspection.
 - (ii) The owner or operator may request, in writing, an extension of the LDAR inspection interval from the Air Program Manager of the appropriate DEP Regional Office.
 - (iii) The owner or operator may track the number of leaking components in the LDAR records and decrease the LDAR inspection interval from quarterly to semi-annually if the percentage of leaking components is less than 2.0% for two consecutive quarterly LDAR inspections. If the percentage of leaking components

is higher than 2.0% in any inspection, a quarterly LDAR inspection interval must be resumed or maintained.

- (iv) Any fugitive emissions components that are difficult to monitor or unsafe to monitor must be identified in the monitoring plan described in Condition 3(a).
- (c) The detection devices must be operated and maintained in accordance with manufacturer-recommended procedures, as required by the test method, or a Department-approved method.
- (d) A leak is defined as:
 - (i) Any positive indication, whether audible, visual, or odorous, determined during an AVO inspection;
 - (ii) Any visible emissions detected by an OGI camera; **or**
 - (iii) A concentration of 500 ppm or greater detected by an instrument reading.
- (e) Any leak detected using an OGI camera, a gas leak detector that meets the requirements of 40 CFR Part 60, Appendix A-7, Method 21, or other leak detection methods approved by the Division of Source Testing and Monitoring must be quantified using a high-flow sampler or another method approved by the Department.
- (f) For quarterly inspections using a gas leak detector in accordance with 40 CFR Part 60, Appendix A-7, Method 21, the owner or operator may choose to adjust the detection instrument readings to account for the background organic concentration level as determined according to the procedures in Section 8.3.2.
- (g) Any leak detected from a fugitive emission component shall be repaired by the owner or operator of the facility as expeditiously as practicable. A first attempt at repair must be attempted within 5 calendar days of detection, and repair must be completed no later than 15 calendar days after the leak is detected **unless**:
 - (i) The owner or operator must purchase parts, in which case the repair must be completed no later than 10 calendar days after the receipt of the purchased parts; **or**
 - (ii) The repair or replacement is technically infeasible without a vent blowdown, well shutdown, or well shut-in or would be unsafe to repair during operation of the unit, in which case the repair or replacement must occur at the earliest of the next scheduled or unscheduled blowdown, or within 2 years.
- (h) Once a fugitive emission component has been repaired or replaced, the owner or operator must resurvey the component as soon as practicable, but no later than 30 calendar days after the leak is repaired.
 - (i) For repairs that cannot be made during the monitoring survey when the leak is initially found, either a digital photograph must be taken of the component or the component must be tagged for identification purposes.
 - (ii) A leak is considered repaired if:
 - (A) There are no detectable emissions consistent with Section 8.3.2 of 40 CFR Part 60, Appendix A-7, Method 21;
 - (B) A leak concentration of less than 500 ppm is detected when the gas leak detector probe inlet is placed at the surface of the component;
 - (C) There is no visible leak image when using an OGI camera; **or**
 - (D) There is no bubbling at the leak interface using a soap solution bubble test specified in Section 8.3.3 of 40 CFR Part 60, Appendix A-7, Method 21.

2. Notification Requirements

The notification requirements of Section A Condition 10(b) through (d) do not apply to fugitive emissions components.

3. Recordkeeping Requirements

For fugitive emissions components, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The fugitive emissions monitoring plan which must include:
 - (i) The technique(s) used for determining fugitive emissions;
 - (ii) A list of fugitive emissions equipment, including the manufacturer, model number, and serial number that may be used at the facility;
 - (iii) A list of personnel that may conduct the monitoring surveys at the facility, including their training and experience;

- (iv) The procedures and timeframes for identifying and repairing fugitive emissions components from which fugitive emissions are detected, including for those components that are unsafe-to-repair;
- (v) The procedures and timeframes for verifying fugitive emissions component repairs;
- (vi) The procedure and schedule for verifying the detection equipment is operating properly:
 - (A) For OGI cameras, the following requirements are a minimum:
 - (1) Must either be capable of imaging gases in the spectral range for the compound of highest concentration in the potential fugitive emissions; **or** capable of imaging a gas that is half methane, half propane at a concentration of 10,000 ppm at a flow rate of ≤ 60 g/h from a $\frac{1}{4}$ inch diameter orifice;
 - (2) A procedure for a daily verification check;
 - (3) A procedure for determining the operator's maximum viewing distance from the equipment and how the operator will ensure that this distance is maintained;
 - (4) A procedure for determining maximum wind speed during which monitoring can be performed and how the operator will ensure monitoring occurs only at wind speeds below this threshold;
 - (5) Procedures for conducting surveys including:
 - (i) How the operator will ensure an adequate thermal background is present in order to view potential fugitive emissions;
 - (ii) How the operator will deal with adverse monitoring conditions, such as wind; **and**
 - (iii) How the operator will deal with interferences; **and**
 - (6) Procedures for calibration and maintenance, which must at a minimum comply with the manufacturer's recommendation.
 - (B) For gas leak detection equipment using 40 CFR Part 60, Appendix A-7, Method 21, the following requirements are minimum:
 - (1) Verification that the monitoring equipment either meets the requirements of Section 6.0 of Method 21 with a fugitive emissions definition of 500 ppm or greater methane using an FID-based instrument; **or** a site-specific fugitive emissions definition that would be equivalent to (1) above for other equipment permitted in Method 21;
 - (2) The instrument response factor of Section 8.1.1 must be performed using the average composition of the fluid and not for each individual organic compound in the stream;
 - (3) For process streams that contain nitrogen, air, or other inert gases that are not organic HAPs or VOCs, the average stream response factor must be calculated on an inert-free basis;
 - (4) The detection instrument must be calibrated in accordance with Section 10.1 on each day of its use using zero air (defined as less than 10 ppmv hydrocarbon in air) and a mixture of methane in air at a concentration less than 10,000 ppmv as the calibration gases; **and**
 - (5) Procedures for conducting surveys, which at a minimum must comply with the relevant sections of Method 21, including Section 8.3.1.
 - (C) For Department-approved methods, a copy of the request for approval that shows the equivalence to (A) or (B) above in accordance with 40 CFR §60.5397a(d).
- (vii) A sitemap;
- (viii) A defined observation path that ensures that all fugitive emissions components are within sight of the path and accounts for interferences;
- (ix) A list of all fugitive emissions components to be monitored and an identification method to locate them in the field; **and**
- (x) A written plan for all fugitive emissions components designated as difficult-to-monitor or unsafe-to-monitor which at a minimum must include:
 - (A) How a difficult-to-monitor or unsafe-to-monitor component can be identified in the field;
 - (B) The reasons each component was identified as difficult-to-monitor or unsafe-to-monitor; **and**
 - (C) The monitoring schedule for components identified as difficult-to-monitor or unsafe-to-monitor, which at a minimum must include one survey per year for difficult-to-monitor components.

- (b) Records of each monitoring survey which must include:
- (i) The facility name and location;
 - (ii) The GP-5A authorization number;
 - (iii) The date, start time, and end time of the survey;
 - (iv) The name of the operator(s) performing the survey;
 - (v) The monitoring instrument used;
 - (vi) The ambient temperature, sky conditions, and maximum wind speed at the time of the survey;
 - (vii) Any deviations from the monitoring plan or a statement that there were none; **and**
 - (viii) Documentation of each fugitive emission including:
 - (A) The identification of each component from which fugitive emissions were detected;
 - (B) The instrument reading of each fugitive emissions component that meets the leak definition in Condition 1(c)(iii) of this section;
 - (C) The status of repair of each component including:
 - (1) The repair methods applied in each attempt to repair the component;
 - (2) The tagging or digital photographing of each component not repaired during the monitoring survey in which the fugitive emissions were discovered;
 - (3) The reasons a component was placed on delay of repair;
 - (4) The date of successful repair of the component; **and**
 - (5) The information on the instrumentation or method used to resurvey the component after repair, if it was not completed during the monitoring survey in which the fugitive emissions were discovered.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the records of each monitoring survey conducted during the reporting period shall be included.

The emissions from fugitive emissions components during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION L. CONTROLLERS

1. Compliance Requirements

- (a) For pneumatic controllers constructed on or after August 23, 2011, but prior to (effective date of GP-5A), the owner or operator is required to use a pneumatic controller with a bleed rate of less than or equal to 6 scfh, unless the owner or operator demonstrates that a bleed rate greater than the applicable standard is required based on functional needs including, but not limited to, response time, safety, and positive actuation.
- (b) For controllers constructed on or after (effective date of GP-5A):
- (i) If access to grid electricity is available, the owner or operator is required to install and operate an electric controller.
 - (ii) If access to grid electricity is not available, the owner or operator is required to meet the conditions of (a) above.
- (c) Each controller must be tagged with the month and year of installation and an identification that allows traceability with the required records.
- (d) To demonstrate compliance, the owner or operator must submit the required notifications and reports and maintain the required records.

2. Notification Requirements

Notifications for each controller must be done in accordance with Section A Condition 10(b) through (d). Integrated controllers can be included in the notifications for the equipment to which they are integrated.

3. Recordkeeping Requirements

For each controller, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The identification, location, manufacturer's specifications, and date of construction of each controller;
- (b) The US Well Number each controller is associated with;
- (c) Records of the demonstration that the use of a pneumatic controller with a natural gas bleed rate greater than 6 scfh is required;
- (d) The emissions calculation for each pneumatic controller; **and**
- (e) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each controller during the reporting period shall include:

- (a) The identification, location, and date of construction for each controller constructed;
- (b) Documentation of the reasons why the use of a pneumatic controller with a natural gas bleed rate greater than 6 scfh is required; **and**
- (c) The records of deviations and malfunctions.

The emissions from each pneumatic controller during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION M. PUMPS

1. Compliance Requirements

- (a) For each natural gas driven pneumatic diaphragm pump constructed on or after September 18, 2015 but prior to (effective date of GP-5A):
 - (i) The owner or operator of each pump operated less than 90 calendar days per year shall demonstrate compliance by submitting the notification requirements of Condition 2, the reporting requirements of Condition 4(a)(iv) and (d), and maintaining the records of Condition 3(a) through (c), (j), and (k).
 - (ii) The owner or operator of each natural gas driven pneumatic diaphragm pump constructed:
 - (A) At a greenfield site that operates 90 calendar days or more per year shall:
 - (1) Control methane and VOC emissions from the pump by at least 95% with a condenser, enclosed flare, thermal oxidizer, vapor recovery unit, or other air cleaning device, or any alternative method approved by the Department that meets the applicable requirements in Section N. unless the pneumatic diaphragm pump is the only source at the facility required to have controls; **and**
 - (2) Demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
 - (B) At a non-greenfield site that operates 90 calendar days or more per year shall:
 - (1) Control methane and VOC emissions from the pump by at least 95% with an existing condenser, enclosed flare, thermal oxidizer, vapor recovery unit, or other air cleaning device, or any alternative method approved by the Department that meets the applicable requirements in Section N **unless**:
 - (i) It is technically infeasible to route the pneumatic diaphragm pump emissions to the controls; **or**
 - (ii) The existing control device is unable to achieve a 95% reduction; **and**
 - (2) Demonstrate compliance by submitting the required notifications and reports and maintaining the required records.

- (b) For each pump constructed on or after (effective date of GP-5A):
- (i) If access to grid electricity is available, the owner or operator is required to install and operate an electric pump.
 - (ii) If access to grid electricity is not available, the owner or operator of each natural gas-driven pneumatic diaphragm pump shall meet the applicable requirements of (a) above, except that the control requirement for (a)(ii)(A)(1) and (B)(1) is 98% for methane, VOC, and HAP.
 - (iii) If access to grid electricity is not available, the owner or operator of each natural gas-driven pneumatic pump that is not a diaphragm pump shall demonstrate compliance by submitting the notification requirements of Condition 2, the reporting requirements of Condition 4(d), and maintaining the records of Condition 3(a), (b), (j), and (k).

2. Notification Requirements

Notifications for each pump must be done in accordance with Section A Condition 10(b) through (d). Integrated pumps can be included in the notifications for the equipment to which they are integrated.

3. Recordkeeping Requirements

For each pump, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The identification, location, manufacturer's specifications, and date of construction of each pump;
- (b) The US Well Number each pump is associated with;
- (c) Records of the days of operation, if the pneumatic diaphragm pump operates less than 90 calendar days;
- (d) The control device specifications as detailed in Section N Condition 3(a) or (b), **if applicable**;
- (e) The cover inspection required as detailed in Section N Condition 3(e), **if applicable**;
- (f) The closed vent system inspection required as detailed in Section N Condition 3(f), **if applicable**;
- (g) A statement that there is no control device present at the facility, **if applicable**;
- (h) The demonstration that the control device on site is unable to achieve 98% reduction, **if applicable**; **or**
- (i) The demonstration that it is technically infeasible to route the pneumatic diaphragm pump emissions to an existing control, **if applicable**:
 - (i) The assessment of technical feasibility to route emissions from the pneumatic pump to an existing control device shall include, but is not limited to, safety considerations, distance from the control device, pressure losses and pressure differentials in the closed vent system, and the ability of the control device to handle the additional emissions; **and**
 - (ii) The assessment must be prepared under the direction or supervision of a qualified professional engineer who must sign and date the assessment with the following certification: "I certify that the assessment of technical infeasibility was prepared under my direction or supervision. I further certify that the assessment was conducted and this report was prepared pursuant to the requirements of §60.5393a(b)(5)(iii). Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."
- (j) The emissions calculation for each pneumatic pump; **and**
- (k) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each pump during the reporting period shall include:

- (a) The identification, location, and date of construction for each pump constructed, including the certification for pneumatic diaphragm pumps for which:
 - (i) There is no control device available on site;
 - (ii) It is technically infeasible to capture and route the emissions to the existing control device or process;

- (iii) The emissions from the pneumatic diaphragm pump are routed to a control or process and the level of emissions reduction achieved; **or**
- (iv) The pneumatic diaphragm pump operated less than 90 calendar days, counting any partial day of operation as one day;
- (b) The records of the date of installation or removal of any control device as detailed in Section N Condition 3(a) or (b), including an update in status in accordance with (a) above;
- (c) A statement that the applicable cover, closed vent system, and/or control device requirements have been met; **and**
- (d) The records of deviations and malfunctions.

The emissions from each pneumatic pump during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION N. ENCLOSED FLARES AND OTHER EMISSION CONTROL DEVICES

1. Compliance Requirements

- (a) *Enclosed Flares and Other Enclosed Combustion Control Devices.*
 - (i) The owner or operator of an enclosed flare or other enclosed combustion control device shall:
 - (A) Ensure that the device is maintained in a leak free condition by conducting a monthly AVO inspection;
 - (B) Install and operate a continuous burning pilot flame and a heat sensing monitoring device to ensure the presence of the pilot flame;
 - (C) Operate the device with no visible emissions except for periods not to exceed a total of 1 minute during any 15 minute period;
 - (1) A visible emissions test using Section 11 of 40 CFR Part 60, Appendix A-7, Method 22 must be performed at least once per month using an observation period of 15 minutes.
 - (2) A device that fails the visible emissions test must follow the manufacturer's repair instructions or best combustion engineering practice to return the unit to compliant operations.
 - (3) A visible emissions test must be performed following the maintenance or repair activity to certify the device's return to service.
 - (D) Ensure the device is designed and operated to either:
 - (1) Meet the most stringent percent reduction requirement for all sources routed to the control device;
 - (2) Reduce the concentration of TOC in the exhaust gases at the outlet of the device to a level less than or equal to 275 ppmv as propane on a wet basis corrected to 3% O₂ as determined in Condition 5 below;
 - (3) Meet a minimum temperature of 1,600°F, provided the device has demonstrated during the performance test that combustion zone temperature is an indicator of destruction efficiency; **or**
 - (4) Introduce the vent stream into the flame zone of a combustion unit or process heater that is used as a control device.
 - (ii) The owner or operator must conduct a performance test in accordance with Condition 5 within 180 days of initial startup of the source and within 180 days of the reauthorization to use this General Permit for each enclosed combustion device unless:
 - (A) The device is a manufacturer tested model which has been operated and maintained in accordance with the manufacturer's instructions;
 - (B) The device is a combustion unit or process heater where the vent stream is introduced with or is used as the primary fuel; **or**
 - (C) The owner or operator opts to show continuing compliance by using a CPMS in accordance with (iv) below, in which case only the initial performance test is required to establish the parameter values.

- (iii) The owner or operator of any combustion control device that is a manufacturer tested model shall ensure a gas flow monitoring device that meets the requirements of Condition 6(e)(i) is installed at the inlet to the control device.
 - (iv) The owner or operator of any combustion control device that opts to show continuing compliance through a CPMS shall:
 - (A) Ensure that the CPMS meets the applicable requirements of Condition 6(a); **and** either:
 - (B) Install temperature monitoring devices that meet the requirements of Condition 6(c) to demonstrate compliance with (a)(i)(D)(3):
 - (1) At a location representative of combustion zone temperature for a combustion control device that establishes a correlation between combustion zone temperature and destruction efficiency; **or**
 - (2) At the nearest feasible point to the inlet and outlet of a catalytic bed for a catalytic vapor incinerator; **or**
 - (C) Install an organic monitoring device at the outlet of the control device to demonstrate compliance with (a)(i)(D)(2) that meets the requirements of Condition 6(d).
 - (v) The owner or operator shall ensure the device operates below the site specific maximum or above the site specific minimum parameter value established in Condition 6(a)(vi) by:
 - (A) Calculating the daily average of the applicable monitored parameter in accordance with Condition 6(a)(vii) except that the inlet gas flow rate to the control device shall not be averaged; **and**
 - (B) Ensuring that the daily average is less than or equal to the site specific maximum or greater than or equal to the site specific minimum; **or**
 - (C) Ensuring that the inlet gas flow rate does not exceed the manufacturer's specified maximum value at any time.
 - (vi) The owner or operator of any combustion control device shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (b) *Vapor Recovery Devices.*
- (i) The owner or operator of a vapor recovery device shall ensure the device is designed and operated to meet the most stringent percent reduction requirement for all sources routed to the control device by either:
 - (A) Conducting a performance test within 180 days of initial startup in accordance with Condition 5; **or**
 - (B) Conducting a control device design analysis including the vent stream composition, constituent concentrations, flowrate, relative humidity, and temperature and establish:
 - (1) For a condenser:
 - (i) The design outlet organic compound concentration level;
 - (ii) The design average temperature of the condenser exhaust vent stream; **and**
 - (iii) The design average temperatures of the coolant fluid at the condenser inlet and outlet;
 - (2) For a regenerative carbon adsorption system:
 - (i) The design exhaust vent stream organic compound concentration level;
 - (ii) The adsorption cycle time;
 - (iii) The number and capacity of carbon beds;
 - (iv) The type and working capacity of activated carbon used for the carbon beds;
 - (v) The design total regeneration stream flow over the period of each regeneration cycle;
 - (vi) The design carbon bed temperature after regeneration;
 - (vii) The design carbon bed regeneration time; **and**
 - (viii) The design service life of the carbon.
 - (3) For a non-regenerative carbon adsorption system:
 - (i) The design exhaust vent stream organic compound concentration level;
 - (ii) The capacity of the carbon bed;
 - (iii) The type and working capacity of activated carbon used for the carbon beds;
 - (iv) The design carbon replacement interval based on the total carbon working capacity of the device and the source operating schedule; **and**

- (v) The incorporation of dual carbon canisters in case of emission breakthrough occurring in one canister.
 - (ii) The owner or operator shall conduct a performance test in accordance with Condition 5 within 180 days of the reauthorization to use this General Permit for each vapor recovery device unless the owner or operator opts to show continuing compliance by using a CPMS in accordance with (iv) below, where the parameter values are established in accordance with (i)(A) or (B) above.
 - (iii) The owner or operator of any vapor recovery device shall conduct a monthly AVO inspection to ensure the physical integrity of the control device according to the manufacturer's instructions.
 - (iv) The owner or operator that opts to show continuing compliance through a CPMS shall:
 - (A) Ensure that the CPMS meets the applicable requirements of Condition 6(a);
 - (B) Install temperature monitoring devices that meet the requirements of Condition 6(c) to demonstrate compliance:
 - (1) At a location in the exhaust vent stream for a condenser; **or**
 - (2) At each carbon bed for a regenerative carbon adsorption unit; **and**
 - (C) Install a gas flow monitoring device that meets the requirements of Condition 6(e)(ii) for a regenerative carbon adsorption unit.
 - (v) If the vapor recovery device is a condenser, the owner or operator shall:
 - (A) Establish a site-specific condenser performance curve showing the relationship between outlet temperature and control efficiency in accordance with Condition 6(a)(vi)(A) or (B);
 - (B) Calculate the daily average condenser outlet temperature as in accordance with Condition 6(a)(vii);
 - (C) Determine the condenser efficiency for the current operating day using the daily average condenser outlet temperature and the condenser performance curve;
 - (D) Calculate the 365-day rolling average TOC emission reduction using the condenser efficiencies in (C) **except**:
 - (1) When there are less than 120 days of data, in which case the owner or operator must calculate the average TOC emission reduction rate for the first 120 days.
 - (2) When there are between 120 days and 364 days of data, in which case the owner or operator must calculate the average TOC emission reduction rate over the number of days between the current day and the startup date; **and**
 - (E) Demonstrate compliance by meeting or exceeding the applicable standard for the source being controlled by the condenser.
 - (vi) If the vapor recovery device is a regenerative carbon adsorption unit, the owner or operator shall:
 - (A) Calculate the average carbon bed temperature for the duration of the steaming cycle in accordance with Condition 6(a)(vii);
 - (B) Measure the actual carbon bed temperature after regeneration and within 15 minutes of completing the cooling cycle;
 - (C) Calculate the average total regeneration stream mass flow or volumetric flow during each carbon bed regeneration cycle in accordance with Condition 6(a)(vii); **and**
 - (D) Replace spent carbon according to the manufacturer's recommended replacement schedule or as determined in (i)(B)(2) above.
 - (vii) If the vapor recovery device is a non-regenerative carbon adsorption unit, the owner or operator shall replace spent carbon according to the manufacturer's recommended replacement schedule or as determined in (i)(B)(3) above.
 - (viii) The owner or operator of any vapor recovery device shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (c) *External Floating Roof.*
- (i) An external floating roof shall be fitted with a primary seal and a continuous secondary seal extending from the floating roof to the storage vessel wall with:
 - (A) Seal closure devices with:
 - (1) No visible holes, tears, or other openings in the seals or seal fabric; **and**

- (2) Seals that are intact and uniformly in place around the circumference of the floating roof between the floating roof and the storage vessel wall;
- (B) Automatic bleeder vents that are closed at all times except when the roof is being floated off or landed on the roof leg supports.
- (C) Rim vents that are set to open when the roof is being floated off the leg supports or at the recommended manufacturer's settings.
- (D) Emergency roof drains are provided with slotted membrane fabric covers or the equivalent which cover at least 90% of the opening.
- (E) All other openings in the external floating roof, except for leg sleeves, must be:
 - (1) Equipped with covers, seals, or lids in the closed position except when in use; **and**
 - (2) Equipped with projections into the storage vessel which remain below the liquid surface at all times.
- (ii) Perform a gap measurement test, as detailed in (iv) below, of the primary seal during hydrostatic testing, within 60 days of initial fill, and at each reauthorization of this General Permit.
 - (A) A mechanical shoe or liquid-mounted primary seal shall not have an accumulated area of gaps that exceeds 10 ¼ square inches per foot of storage vessel diameter or that exceeds 1 ½ inches in width between the primary seal and the storage vessel wall.
 - (B) A vapor-mounted primary seal shall not have an accumulated area of gaps that exceeds 1 square inch per foot of storage vessel diameter or that exceeds ⅛ inch in width between the primary seal and the storage vessel wall.
- (iii) Perform a gap measurement test, as detailed in (iv) below, of the secondary seal within 60 days of initial fill and annually thereafter.
 - (A) A mechanical shoe or liquid-mounted primary seal's secondary seal shall not have an accumulated area of gaps that exceeds 1 square inch per foot of storage vessel diameter or that exceeds ½ inch in width between the secondary seal and the storage vessel wall.
 - (B) A vapor-mounted primary seal's secondary seal shall not have an accumulated area of gaps that exceeds 1 square inch per foot of storage vessel diameter or that exceeds ⅛ inch in width between the secondary seal and the storage vessel wall.
- (iv) To perform the gap measurement test, the inspector shall hold a ⅛ inch diameter probe against the storage vessel wall and attempt to slide the probe between the seal and the wall.
 - (A) The probe must move between the seal and the wall without forcing or binding against the seal in order to constitute a gap.
 - (B) The length of the gap shall be determined by sliding the probe along the vessel wall in each direction as far as it will travel freely.
 - (C) The maximum gap width shall be determined by inserting probes of various diameters (in ⅛ inch increments) between the seal and the vessel wall, with the largest diameter that moves freely between the seal and the wall being the maximum diameter.
 - (D) Determine the area of a gap by multiplying the average width, determined as the simple average of the ⅛ inch probe and the diameter of the largest probe, by the gap length.
 - (E) Sum all gap areas and divide by the vessel's nominal diameter to determine the accumulated area of gaps.
- (v) Visually inspect the external floating roof, primary seal, and secondary seal at least annually to determine if the roof has defects or if the primary or secondary has holes or tears in the seal fabric.
- (vi) Any defect detected during a visual inspection or gap measurement test must be repaired within 45 days, unless a request for extension is sent to the Air Program Manager of the appropriate DEP Regional Office.
- (vii) The owner or operator of an external floating roof shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (d) *Internal Floating Roof.*
 - (i) An internal floating roof shall be fitted with a primary seal with:
 - (A) A closure seal or seals to close the space between the roof edge and tank wall.

- (B) No holes, tears, or other openings in the seal, seal fabric, or seal materials.
 - (C) All openings, except for stub drains, are equipped with covers, lids, or seals such that:
 - (1) The cover, lid, or seal is closed at all times except when in use;
 - (2) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports; **and**
 - (3) Rim vents are set to open when the roof is being floated off the roof leg supports or at the recommended manufacturer's settings.
 - (D) If the internal floating roof is a non-contact roof, each opening except for automatic bleeder vents and rim vents are to provide a projection below the liquid surface.
- (ii) Visually inspect the internal floating roof, primary seal, and secondary seal (if equipped) prior to the initial fill and at each reauthorization of this General Permit for holes, tears, or other openings in the seal, seal fabric, or seal materials.
 - (iii) Visually inspect the internal floating roof, primary seal, and secondary seal (if equipped) through manholes and roof hatches on the fixed roof at least annually to determine if the roof is resting on the surface of the liquid, if there is liquid accumulated on the roof, if the seal is detached, or if there are holes or tears in the seal fabric.
 - (iv) Any defect detected during a visual inspection must be repaired within 45 days, unless a request for extension is sent to the Air Program Manager of the appropriate DEP Regional Office.
 - (v) The owner or operator of an internal floating roof shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (e) *Covers.*
- (i) The cover and all openings on the cover shall form a continuous impermeable barrier over the entire surface area of the liquid.
 - (ii) Each cover opening shall be secured in a closed, sealed position whenever material is in the unit except during those times it is necessary to use an opening as follows:
 - (A) Adding or removing material from the unit, including openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit;
 - (B) Inspecting or sampling the material in the unit;
 - (C) Inspecting, maintaining, repairing, or replacing equipment located inside the unit; **or**
 - (D) Venting liquids, gases, or fumes from the unit through a closed vent system designed and operated in accordance with (f) below.
 - (iii) Each storage vessel thief hatch shall be equipped, maintained, and operated with a weighted mechanism or the equivalent to ensure that the lid remains properly seated and sealed under normal operating conditions including when working, breathing, and flash emissions may be generated. The owner or operator must select gasket material for the hatch based on composition of the fluid in the storage vessel and weather conditions.
 - (iv) The owner or operator shall conduct AVO inspections for defects that could result in air emissions in accordance with Section K Condition 1(a). Defects include, but are not limited to, visible cracks, holes, or gaps in the cover or between the cover and the separator wall; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and broken or missing hatches, access covers, caps, or other closure devices.
 - (v) Any defect or leak detected shall be repaired in accordance with Section K Condition 1(f).
 - (vi) The owner or operator of a cover shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (f) *Closed Vent Systems.*
- (i) The owner or operator shall conduct an assessment that the closed vent system is of sufficient design and capacity to route all gases, vapors, and fumes emitted from the material in the unit to a control device or process of sufficient design and capacity to accommodate all emissions from the source. The owner or operator must have the design certified by a qualified engineer by performing the assessment under the direction or supervision of the qualified professional engineer that signs the following certification:

"I certify that the closed vent system design and capacity assessment was prepared under my direction and supervision. I further certify that the closed vent system design and capacity assessment was conducted and this report was prepared pursuant to the requirements of 40 CFR Part 60, Subpart OOOOa. Based on my professional knowledge and experience, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."

- (ii) The owner or operator shall design and operate the closed vent system with no detectable emissions, as determined in accordance with Section K Condition 1(a) and (b).
- (iii) If the closed vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device or process, **unless** the bypass device is on a low leg drain, high point bleed, analyzer vent, open-ended valve or line, or safety device, the owner or operator shall:
 - (A) Install, calibrate, maintain, and operate a flow indicator at the inlet to the bypass device that sounds an alarm or initiates notice via a remote alarm to the nearest field office when the bypass device is open such that the stream is, or could be, diverted away from the control device or process; **or**
 - (B) Secure the valve installed at the inlet to the bypass device in the non-diverting position using a car-seal or a lock-and-key type configuration.
- (iv) The owner or operator shall conduct AVO inspections for defects that could result in air emissions in accordance with Section K Condition 1(a). Defects include, but are not limited to, visible cracks, holes, or gaps in ductwork; loose connections; liquid leaks; and broken or missing caps or other closure devices.
- (v) The owner or operator shall either:
 - (A) Set the flow indicator at the inlet to a bypass device to take a reading once every 15 minutes; **or**
 - (B) Visually inspect that a bypass device secured by a car-seal or lock-and-key at least once a month to ensure the bypass device is in the non-diverting position and the vent stream is not being diverted through the bypass device.
- (vi) Any defect or leak detected shall be repaired in accordance with Section K Condition 1(f).
- (vii) The owner or operator of a closed vent system shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.

2. Notification Requirements

Notifications for each control device must be done in accordance with Section A Condition 10(b) through (d). Notifications for performance testing of each control device must be done in accordance with Section A Condition 13(f) and (g).

3. Recordkeeping Requirements

For each control device, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) *Enclosed Flares and Other Enclosed Combustion Control Devices.*
 - (i) For non-manufacturer tested models:
 - (A) The results of all inspections;
 - (B) The heat sensing monitoring device data;
 - (C) Records of the visible emissions tests;
 - (D) The manufacturer's written operating instructions, procedures, and maintenance schedule;
 - (E) Records of the maintenance and repair activities;
 - (F) The summary for each complete test report described in Section A Condition 13(h) conducted, **if applicable**;
 - (G) The site-specific monitoring plan, **if applicable**; **and**
 - (H) The temperature monitoring device data, **if applicable**.

- (ii) For manufacturer tested models:
 - (A) In addition to (i)(A) through (H) above, the records of the manufacturer's performance test information including:
 - (1) The make, model, and serial number of the device;
 - (2) The date of purchase and a copy of the purchase order;
 - (3) A full schematic of the control device and dimensions of the device components;
 - (4) The maximum net heating value of the device;
 - (5) The test fuel gas flow range in mass and volume, including the maximum allowable inlet gas flow rate;
 - (6) The air/steam injection/assist ranges, if used;
 - (7) The test conditions as applicable for the tested model:
 - (i) Fuel gas delivery pressure and temperature;
 - (ii) Fuel gas moisture range;
 - (iii) Purge gas usage range;
 - (iv) Condensate separation range;
 - (v) Combustion zone temperature range;
 - (vi) Excess air range;
 - (vii) Flame arrestor(s);
 - (viii) Burner manifold;
 - (ix) Pilot flame indicator;
 - (x) Pilot flame design fuel and calculated or measured fuel usage;
 - (xi) Tip velocity range;
 - (xii) Momentum flux ratio;
 - (xiii) Exit temperature range;
 - (xiv) Exit flow rate; and
 - (xv) Wind velocity and direction.
 - (8) Calibration QA/QC data, calibration gas values, gas cylinder certification, strip charts, or other graphic presentations of the data annotated with test times and calibration values; **and**
 - (B) The gas flow monitoring device data.
- (b) *Vapor Recovery Devices.*
 - (i) *For a Condenser:*
 - (A) The manufacturer's written operating instructions, procedures, and maintenance schedule;
 - (B) Records of the maintenance and repair activities;
 - (C) The design analysis, **if applicable**;
 - (D) The summary for each complete test report described in Section A Condition 13(h) conducted, **if applicable**;
 - (E) The site-specific condenser performance curve;
 - (F) The site-specific monitoring plan;
 - (G) The temperature monitoring device data;
 - (H) The results of all compliance calculations; **and**
 - (I) The results of all inspections.
 - (ii) *For a Carbon Adsorption Unit:*
 - (A) The manufacturer's written operating instructions, procedures, and maintenance schedule;
 - (B) Records of the maintenance and repair activities;
 - (C) The design analysis, **if applicable**;
 - (D) The summary for each complete test report described in Section A Condition 13(h) conducted, **if applicable**;
 - (E) The site-specific monitoring plan, **if applicable**;
 - (F) The temperature monitoring devices data, **if applicable**;
 - (G) The gas flow monitoring device data, **if applicable**;
 - (H) The results of all inspections;

- (I) The carbon replacement schedule; **and**
 - (J) Records of each carbon replacement including the disposition of the spent carbon.
- (c) *External Floating Roof.*
- (i) The determination of the maximum true vapor pressure as determined under actual storage conditions using a temperature representative of the average storage temperature for the hottest month of the year;
 - (ii) Records of each time the roof is floated off or landed on the roof leg supports;
 - (iii) The results of each visual inspection of the roof, primary seal, and secondary seal;
 - (iv) The results of each gap measurement test of the primary seal and secondary seal; **and**
 - (v) Records of the maintenance and repair activities.
- (d) *Internal Floating Roof.*
- (i) The determination of the maximum true vapor pressure as determined under actual storage conditions using a temperature representative of the average storage temperature for the hottest month of the year;
 - (ii) Records of each time the roof is floated off or landed on the roof leg supports;
 - (iii) The results of each visual inspection of the roof, primary seal, and secondary seal (if equipped); **and**
 - (iv) Records of the maintenance and repair activities.
- (e) *Covers.*
- (i) The results of each visual inspection of the cover; **and**
 - (ii) Records of the maintenance and repair activities.
- (f) *Closed Vent Systems.*
- (i) Records of the assessment including the engineer's certification;
 - (ii) The results of each visual inspection of the closed vent system and each bypass device;
 - (iii) Either records of each time the alarm is triggered for each bypass device; **or** records of each time the key is signed out for a secured bypass device;
 - (iv) The results of each monitoring survey to meet the no detectable emissions requirements; **and**
 - (v) Records of the maintenance and repair activities.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each control device during the reporting period shall include:

- (a) *Enclosed Flares and Other Enclosed Combustion Control Devices.*
- (i) For non-manufacturer tested models:
 - (A) The records of the results of all inspections conducted;
 - (B) The records of the heat sensing monitoring device data;
 - (C) The records of the visible emissions tests conducted;
 - (D) The records of the maintenance and repair activities conducted;
 - (E) The summary for each complete test report described in Section A Condition 13(h) conducted, **if applicable; and**
 - (F) The records of the temperature monitoring device data, **if applicable.**
 - (ii) For manufacturer tested models:
 - (A) In addition to (i)(A) through (F) above, the records of the manufacturer's performance test information of 3(a)(ii)(A) above unless the test results for that model of combustion control device are posted at www.epa.gov/airquality/oilandgas/; **and**
 - (B) The records of the gas flow monitoring device data.
- (b) *Vapor Recovery Devices.*
- (i) *For a Condenser:*
 - (A) The records of the maintenance and repair activities conducted;
 - (B) The summary for each complete test report described in Section A Condition 13(h) conducted, **if applicable;**
 - (C) The records of the temperature monitoring device data;
 - (D) The records of the results of all compliance calculations; **and**
 - (E) The records of the results of all inspections conducted.

- (ii) *For a Carbon Adsorption Unit:*
 - (A) The records of the maintenance and repair activities conducted;
 - (B) The summary for each complete test report described in Section A Condition 13(h) conducted, **if applicable**;
 - (C) The records of the results of all inspections conducted;
 - (D) The records of the temperature monitoring device data, **if applicable**;
 - (E) The records of the gas flow monitoring device data, **if applicable**;
 - (F) The records of the carbon replacement schedule; **and**
 - (G) The records of each carbon replacement including the disposition of the spent carbon.
- (c) *External Floating Roof.*
 - (i) The records of each time the roof is floated off or landed on the roof leg supports;
 - (ii) The records of each visual inspection of the roof, primary seal, and secondary seal;
 - (iii) The records of each gap measurement test of the primary seal and secondary seal; **and**
 - (iv) The records of the maintenance and repair activities conducted.
- (d) *Internal Floating Roof.*
 - (i) The records of each time the roof is floated off or landed on the roof leg supports;
 - (ii) The records of each visual inspection of the roof, primary seal, and secondary seal (if equipped); **and**
 - (iii) The records of the maintenance and repair activities conducted.
- (e) *Covers.*
 - (i) The records of each visual inspection of the cover conducted; **and**
 - (ii) The records of the maintenance and repair activities conducted.
- (f) *Closed Vent Systems.*
 - (i) The records of each visual inspection of the closed vent system and each bypass device conducted;
 - (ii) Either the records of each time the alarm is triggered for each bypass device; **or** the records of each time the key is signed out for a secured bypass device;
 - (iii) The records of each monitoring to meet the no detectable emissions requirements; **and**
 - (iv) The records of the maintenance and repair activities conducted.

5. Performance Testing Requirements

The performance test for each control device using the following procedure may forgo the submission of the test protocol in Section 13(e). Any other method for determining compliance must submit the test protocol described in Section A Condition 13(e) for review and approval.

- (a) Conduct three test runs of at least one hour duration.
- (b) Select the sampling port location and the number and location of traverse points at the exhaust using 40 CFR Part 60, Appendix A-1, Method 1 or 1A depending on stack diameter.
 - (i) If demonstrating compliance with a percent reduction requirement, sampling sites must be located at the inlet of the first control device and the outlet of the final control device; **or**
 - (ii) If demonstrating compliance with an outlet concentration requirement, the sampling site must be located at the outlet of the control device.
- (c) Determine the effluent characteristics including:
 - (i) The flow velocity, stack temperature, static pressure, and barometric pressure using 40 CFR Part 60, Appendix A-1, Method 2 or 2C depending on stack diameter;
 - (ii) The gas density using 40 CFR Part 60, Appendix A-2, Method 3A; **and**
 - (iii) The moisture content using 40 CFR Part 60, Appendix A-3, Method 4.
- (d) To demonstrate compliance with (b)(i) use 40 CFR Part 60, Appendix A-7, Method 25A to determine the TOC and then convert to dry basis using the moisture content from (c)(iii) above and calculate the inlet and outlet mass rates as propane and the percent reduction.
- (e) To demonstrate compliance with (b)(ii) use 40 CFR Part 60, Appendix A-7, Method 25A to determine the TOC and 40 CFR Part 60, Appendix A-6, Method 18 to determine the methane and ethane concentration and then correct the TOC concentration, minus methane and ethane, for percent oxygen from (c)(ii) above.

6. Periodic Monitoring Requirements

- (a) If required to install a continuous parameter monitoring system, the owner or operator shall:
- (i) Ensure that the CPMS measures and records data values at least once every hour and records each block average value calculated from all measured data values during each period.
 - (ii) Prepare a site-specific monitoring plan that addresses the monitoring system design, data collection, and the quality assurance and quality control elements below:
 - (A) The performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, and data acquisition and calculations;
 - (B) Sampling interface location such that the monitoring system will provide representative measurements;
 - (C) Equipment performance checks, system accuracy audits, or other audit procedures;
 - (D) Ongoing operation and maintenance procedures in accordance with the provisions in 40 CFR §60.13(b); **and**
 - (E) Ongoing reporting and recordkeeping procedures in accordance with provisions in 40 CFR §60.7(c),(d), and (f).
 - (iii) Install, calibrate, operate, and maintain each CPMS according to the procedures in the approved site-specific monitoring plan.
 - (iv) Conduct the CPMS equipment performance checks, system accuracy audits, or other audit procedures specified in the site-specific monitoring plan at least once every 12 months.
 - (v) Conduct a performance evaluation of each CPMS in accordance with the site-specific monitoring plan.
 - (vi) Establish a minimum or maximum operating parameter value for each CPMS, as appropriate to the control device, to define the conditions at which the control device must be operated to continuously achieve the applicable performance requirements.
 - (A) If the owner or operator conducts a performance test to demonstrate that the control device achieves the applicable performance standards, then the minimum or maximum operating parameter should be established based on values measured during the performance test and supplemented, if necessary, by the design analysis or control device manufacturer's recommendations.
 - (B) If the owner or operator uses a design analysis to demonstrate that the control device achieves the applicable performance standards, then the minimum or maximum operating parameter should be established based on the design analysis and supplemented, if necessary, by the manufacturer's recommendations.
 - (C) If the owner or operator operates a control device where the performance testing was done by the equipment manufacturer, then the control device inlet gas flow rate must not exceed the maximum inlet gas flow rate determined by the manufacturer.
 - (vii) Calculate the daily average value for each monitored operating parameter for each operating day, using the data recorded by the CPMS. If the emissions unit operation is continuous, the operating day is a 24-hour period. If the emissions unit operation is not continuous, the operating day is the total number of hours of control device operation per 24-hour period. Valid data points must be available for 75% of the operating hours in an operating day to compute the daily average.
 - (viii) Ensure that the CPMS is operating at all times the affected source is operating except during periods of CPMS malfunction, repairs related to CPMS malfunctions, and required CPMS quality assurance or quality control (QA/QC) activities including, but not limited to, system accuracy audits, zero adjustments, and span adjustments.
 - (ix) Not use data recorded during CPMS malfunctions, repairs of CPMS malfunctions, or required CPMS QA/QC activities in calculations used to report emissions or operating levels.
 - (x) Report any failure to collect required data as a deviation except during periods of CPMS malfunctions, repairs related to CPMS malfunctions, or required CPMS QA/QC activities.
- (b) Heat sensing monitoring devices to detect the presence of a pilot flame are exempt from the calibration and QA/QC requirements of the site-specific monitoring plan.

- (c) Temperature monitoring devices shall be accurate to $\pm 1\%$ of the temperature being monitored or $\pm 4.5^\circ\text{F}$, whichever is greater.
- (d) The owner or operator of any control device that must, or that chooses to, monitor the outlet organic concentration shall:
 - (i) Ensure that the organic monitoring device meets the requirements of Performance Specification 8 or 9 of 40 CFR Part 60 Appendix B; **and**
 - (ii) Must install, calibrate, and maintain the monitor according to the manufacturer's specifications.
- (e) The owner or operator of any control device that must monitor the gas flow rate shall:
 - (i) For a combustion control device whose model is tested by the manufacturer, ensure that the gas flow meter is accurate to $\pm 2\%$ or better of the maximum flow rate.
 - (ii) For a regenerative carbon adsorption unit:
 - (A) Ensure that the gas flow meter is accurate to $\pm 5\%$ of the flow rate or 10 cfm, whichever is greater; **and**
 - (B) Inspect the gas flow CPMS monthly for leakage in the mechanical connections and quarterly for physical and operational integrity of all components and oxidation and galvanic corrosion of all electrical connections unless equipped with a redundant flow sensor.

SECTION O. PIGGING OPERATIONS

1. Compliance Requirements

- (a) The owner or operator that conducts pigging operations shall:
 - (i) Install a liquids drain into each pig receiver chamber; **and**
 - (ii) Route each high pressure pig launcher and receiver chamber to a low pressure line or vessel, **if available**.
- (b) The owner or operator that conducts pigging operations shall use additional best management practices including, but not limited to, using ball valve type chambers or multiple pig chambers.
- (c) For pigging operations with an uncontrolled methane emission rate of 200 tpy or greater, a total uncontrolled VOC emission rate of 2.7 tpy or greater, an uncontrolled single HAP emission rate of 0.5 tpy or greater, or a total uncontrolled HAP emission rate of 1.0 tpy or greater, the owner or operator shall:
 - (i) Control methane, VOC, and HAP emissions from all pigging operations by at least 98% with a condenser, enclosed flare, thermal oxidizer, vapor recovery unit, or other air cleaning device, or any alternative method approved by the Department that meets the applicable requirements in Section N; **and**
 - (ii) Demonstrate compliance by submitting the required notifications and reports and maintaining the required records.
- (d) For pigging operations with an uncontrolled methane emission rate of less than 200 tpy, a total uncontrolled VOC emission rate of less than 2.7 tpy, an uncontrolled single HAP emission rate of less than 0.5 tpy, and a total uncontrolled HAP emission rate of less than 1.0 tpy, the owner or operator shall demonstrate compliance by submitting the required notifications and reports and maintaining the required records.

2. Notification Requirements

Notifications for the construction of pig launchers and receivers must be done in accordance with Section A Condition 10(b) through (d). Notifications for pigging operations that vent to the atmosphere must be done in accordance with Section A Condition 10(e).

3. Recordkeeping Requirements

For each pigging operation, the owner or operator shall maintain the following records in accordance with Section A Condition 11, including information on:

- (a) The identification, location, and date of construction of each pig launcher or receiver;
- (b) The US Well Number each pig launcher or receiver is associated with;

- (c) Records of each pigging operation including the identification of the pig chamber used, the date and time of the pigging operation, and the type and volume of liquids cleared;
- (d) The control device specifications as detailed in Section N Condition 3(a) and (b), **if applicable**;
- (e) The cover inspection required as detailed in Section N Condition 3(e), **if applicable**;
- (f) The closed vent system inspection required as detailed in Section N Condition 3(f), **if applicable**;
- (g) The emissions calculation for each pig chamber, using the Department's spreadsheet found at <http://files.dep.state.pa.us/> or other equivalent method; **and**
- (h) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each pigging operation conducted during the reporting period shall include:

- (a) The records of the emissions from each pig chamber;
- (b) A statement that the applicable cover, closed vent system, and/or control device requirements have been met; **and**
- (c) The records of deviations and malfunctions.

The emissions from each pigging operation conducted during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

SECTION P. WELLBORE LIQUIDS UNLOADING OPERATIONS

1. Compliance Requirements

The owner or operator that conducts wellbore liquids unloading operations shall use best management practices including, but not limited to, plunger lift systems, soaping, swabbing, or venting to atmospheric pressure. All manual unloading operations must have an operator in attendance at all times. In all cases, where technically feasible, the owner or operator shall direct the gas to a separator, storage vessel, or control device.

2. Notification Requirements

Notifications for wellbore liquids unloading operations in which gas is being vented directly to the atmosphere must be done in accordance with Section A Condition 10(e).

3. Recordkeeping Requirements

For each well the owner or operator shall maintain a daily log book in accordance with Section A Condition 11 containing the following information:

- (a) The location of the well;
- (b) The US Well Number;
- (c) The date and time of each wellbore liquids unloading operation;
- (d) The wellbore liquids unloading technique used during each unloading operation;
- (e) The disposition of the associated gas from each wellbore liquids unloading operation;
- (f) The duration of any blowdown or venting due to the wellbore liquids unloading operation;
- (g) The emissions calculation for each wellbore liquids unloading operation; **and**
- (h) Records of deviations and malfunctions.

4. Reporting Requirements

In the required annual report of Section A Condition 12(c), the information about each wellbore liquids unloading operation conducted during the reporting period shall include:

- (a) The records of each wellbore liquids unloading operation conducted; **and**
- (b) The records of deviations and malfunctions.

The emissions from each well drilling and hydraulic fracturing operation conducted during the reporting period must be included in the emissions inventory report of Section A Condition 12(d).

Issued by: _____

Krishnan Ramamurthy
Acting Director,
Bureau of Air Quality

Date Issued: _____

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