



Emissions Inventories for the Unconventional Natural Gas Industry

January 12, 2012

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Emissions Inventory Overview

- There are significant natural gas exploration and extraction activities occurring in the Pennsylvania Marcellus Shale formation and other formations in Pennsylvania.
- On December 6, 2011, the Pennsylvania Department of Environmental Protection (DEP) issued “initial notifications” requiring the reporting of information including emissions data for the unconventional natural gas industry.
- The initial notifications, authorized under section 4(3) of the Pennsylvania Air Pollution Control Act (35 P.S. Section 4004(3)) and 25 Pa. Code Section 135.3 (relating to reporting), will allow the DEP to develop its first emissions inventory for the natural gas production and processing operations in unconventional shale formations.



Emissions Inventory Overview

- Emission inventories allow the DEP to quantify emissions from air contamination sources in order to:
 - compile an accurate inventory of air contaminant emissions for air quality assessments and planning activities;
 - develop State Implementation Plan revisions for the attainment and maintenance of national ambient air quality standards including ozone, fine particulate matter, lead, nitrogen dioxide and sulfur dioxide standards; and
 - identify available or potential emission offsets.
- Emission inventories also provide information to support permit reviews, dispersion modeling and risk assessments.



Emissions Inventory Overview

- The DEP is required to submit comprehensive emissions inventories to the U.S. Environmental Protection Agency (EPA) every three years in accordance 40 CFR Part 51, Subpart A (relating to air emissions reporting requirements).
- The emissions inventories for calendar year 2011 emissions must be submitted to the EPA by December 31, 2012.
- The comprehensive emissions inventories will include point sources (large stationary sources including electric generating units, refineries, manufacturing plants), area sources (small stationary sources including, autobody shops, surface coating, degreasing operations, dry cleaners, gas stations), mobile sources (including on-road and non-road sources), and biogenic source (natural sources including oak, pine, maple).



Emissions Reporting and Recordkeeping Overview

- In accordance with 25 Pa. Code Section 135.3(a), the “initial” source report for calendar year 2011 emissions will be due to DEP no later than March 1, 2012, and each year thereafter.
- An extension of time may be granted beyond the March 1 submittal date for a “reasonable cause.”
- The reports must contain sufficient information to allow the DEP to complete the inventory for the unconventional natural gas industry by December 2012. The reports must be submitted to DEP using a format specified by the department.



Emissions Reporting and Recordkeeping Overview

- Records including records of production, fuel usage, maintenance of production or pollution control equipment must be maintained to demonstrate compliance with the reporting requirements.
- DEP may also request other information needed to identify and quantify actual and potential air contaminant emissions. The records must be provided to DEP upon request.



What Emissions Inventory Data is Required for the Natural Gas Industry?

- Emission estimates for both criteria and hazardous air pollutants should be reported along with production and hours of operation data used to calculate these emissions.
- The owners/operators will submit the data to DEP using a spreadsheet format.
- The Department considered natural gas emissions reporting requirements in several states including Colorado, Texas and Wyoming.



Air Contaminants Subject to Chapter 135 Reporting Requirements

- Criteria pollutant and precursor emissions
 - Carbon Monoxide
 - Lead
 - Nitrogen Dioxide
 - Ozone precursors (Oxides of Nitrogen and volatile organic compounds)
 - Particulate Matter (including PM2.5 and PM-10)
 - Sulfur dioxide

- Hazardous Air Pollutants (HAP) including the following:
 - Benzene
 - Ethylbenzene
 - Formaldehyde
 - N-hexane
 - Toluene
 - 2,2,4-trimethylpentane; xylene



Air Contamination Sources Subject to Chapter 135 Reporting Requirements

Sources and activities subject to the emissions reporting requirements will include the following:

- Dehydration units
- Drill rigs
- Fugitives (connectors, flanges, pump lines, pump seals, valves, etc.)
- Heaters
- Pneumatic devices
- Stationary engines
- Tanks/Pressurized Vessels/Impoundments
- Venting & blow downs
- Wellheads
- Well completions/work overs



Source Data Requirements

- Engines: engine model, fuel type, fuel quantity, fuel % sulfur, horsepower, % average load, hours of operation, emission factor basis, type of control.
- Heaters: size (MMBtu/hr), hours of operation.
- Tanks: number of condensate and water tanks, impoundments, hours of operation, controls and control operation.
- Dehydrators: gas processed, design rating, actual operating hours, lean glycol circulation rate, controls and control operation.



Source Data Requirements

- Pumps: gas processed, condensate processed, number of pumps, hours operated, controls and control operation.
- Venting: number of blowdowns, average blowdown rate, average blowdown length, controls and control operation.
- Drill Rigs: drill dates, total hours, fuel usage, controls and control operation.
- Completions: start and end date, total hours.
- Fugitives: number of connectors, flanges, open ended lines, pump seals, valves, operating data.



How Will The Data Be Submitted?

- The DEP is developing a “Shale Air Emissions Data Management System.” This system will be an “Excel spreadsheet solution” for the submission of the data.
- The DEP Oil and Gas Reporting-Electronic (OGRE) System will be modified to accept the data electronically. Owners/operators with well permits will access and log in to OGRE.
- The system will display well sites for each owner/operator.
- There will be a download button to create the appropriate spreadsheets. These spreadsheets will have location and identification information preloaded.



How Will The Data Be Submitted?

- DEP anticipates that the Shale Air Emissions Data Management System will be available in February 2012.
- Owners/operators will be notified when completed spreadsheets can be uploaded to the system.
- DEP will also provide compliance assistance and training in February 2012.



How Will Mid-Stream Data Be Submitted?

- Owners and operators of mid-stream activities that are not associated with a well will submit a modified Excel spreadsheet to the Department.
- The spreadsheet will not include worksheets for drill rigs, completions and venting.
- The modified spreadsheet will be available in February 2012 for download from the BAQ website.
- The completed spreadsheets will be emailed to DEP, Bureau of Air Quality.



Emission Inventory Contact

- Questions on the inventory may be directed to:

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