

SECTION 10 | Air Quality

10.1 Background

As a result of the increased development of oil and natural gas from shale formations in recent years, concerns about air emissions have become more focused. On August 16, 2012, EPA published 3 final rules for the Oil and Natural Gas Sector (NSPS OOOO, for the control of VOC and SO₂ emissions; and NESHAP HH/HHH, for the control of hazardous air pollutant emissions). The NSPS applies to sources that are new, modified or reconstructed since August 2011. It requires that companies reduce completion flowback emissions from hydraulically fractured and refractured gas wells by employing reduced emissions completions (aka “green completions”), control emissions from storage vessels by 95%, use low or no bleed pneumatic controllers in the production segment, use no bleed controllers at gas plants, replace reciprocating compressor seals every 26,000 hours of operation or three years, reduce wet seal centrifugal compressor emissions by 95%, and implement more stringent leak detection and repair programs at gas plants.

The NESHAP HH/HHH rules amended provisions to currently codified rules. In particular, the amendments set new standards for small glycol dehydrators, lowered the leak detection threshold at gas plants and amended the definition of “associated equipment” used in making major source determinations at well sites.

In response to petitions for administrative reconsideration of the 2012 rules, EPA is working on changes over the next several years to improve the effectiveness and practicability of programs.

10.2 Administrative

Where necessary, and recognizing the local and regional differences discussed in Section 3.3, states should have standards to prevent the contamination of air. While oil and gas regulatory agencies have many environmental responsibilities for oil and gas operations, the air programs are typically regulated by sister state environmental protection or health agencies and are given statutory and regulatory powers as described below. The state should develop procedures for regular evaluation and consideration of the appropriateness and adequacy of the regulatory program.

10.2.1 Scope of Authority



1. An effective state program for the regulation of air emissions from oil and gas exploration and production activities should include, at a minimum:
2. Statutory authority that adequately details the powers and duties of the respective regulatory body or bodies;
3. Statutory authority that grants the regulatory body (or bodies) the power to oversee air emissions from upstream oil and gas activities, including production, gathering, compression and processing. This authority should include the ability to promulgate appropriate rules and regulations and meet the state's obligations under federal law;
4. Statutory authority to promulgate specific requirements that are more stringent than required under the federal Clean Air Act or regulations where necessary and appropriate to protect public health and the environment;
5. Authority to accept delegation of federal air quality programs specific to oil and gas;
6. Authority to consider cost effectiveness in setting air emission standards when appropriate, as well as to exempt facilities or sources based on criteria such as de minimis emissions or by type of source or facility;
7. Statutes and implementing regulations which adequately and clearly define necessary terminology;
8. Provisions to ensure adequate funding for the staff and program to carry out its objectives and duties;
9. Mechanisms for coordination among stakeholders (including the public, federal and state agencies, and the regulated industry); and
10. Technical criteria for air emission controls.

10.2.2 Jurisdiction and Cooperation Between Agencies

The Clean Air Act establishes a dual federal/state system for establishing requirements to protect public health and the environment, and to oversee air pollution sources, including oil and gas exploration and production (E&P) operations. Under this framework, states are required to establish State Implementation Plans (SIPs) that contain sufficient requirements to attain and maintain compliance with National Ambient Air Quality Standards. Separate from the SIP process, states may, but are not required to, accept delegation of certain federal air quality requirements such as the preconstruction Prevention of Significant Deterioration (PSD) permitting program, the Title V permit program or



New Source Performance Standards. If a state does not accept delegation of a particular federal requirement, EPA retains responsibility for implementing and enforcing that requirement.

Within states that do accept delegation, jurisdiction over air quality issues related to E&P facilities may be split between the state air quality agency, local air quality agencies and/or the agency with jurisdiction over oil and gas drilling and production. Finally, because states have no jurisdiction over air pollution sources on tribal lands, responsibility for implementation and enforcement of air quality requirements for E&P sources on these lands is held by EPA or the tribes.

Where multiple state, federal or tribal authorities have jurisdiction over air quality issues, mechanisms should be in place to avoid duplication, regulatory gaps or inconsistent air quality requirements or enforcement of such requirements. Such mechanisms could include formal Memoranda of Understanding, established interagency task forces, regular periodic meetings between agency staff, and joint inspections of facilities. In addition to ensuring proper coordination, agencies should communicate with the regulated community and the public to make it clear which agency has jurisdiction over a particular area or is responsible for enforcing a given set of air quality requirements.

10.2.3 Permits, Authorizations and Exemptions

States with approved Clean Air Act permitting authority should adopt an air quality permitting program for emission sources in the oil and gas industry that is legally and practically enforceable and harmonizes with federal requirements to avoid confusing and duplicative requirements for operators. The program should allow the state to adopt additional air quality requirements beyond federal requirements to address state-specific air quality issues. State permits should clearly establish what performance standards and/or emission control requirements are required for each covered source.

State air quality permitting programs should be designed to protect human health and the environment while allowing oil and gas development to proceed promptly and efficiently to provide continued, responsible growth in US oil and natural gas production. Therefore, state air quality permitting programs should be straightforward for operators to understand and implement, and administratively efficient for the regulatory agency to minimize cost in time and resources. To accomplish this, states are encouraged to simplify the application process, make available accepted emission estimation methods, make permit application assistance tools available to the operator, establish and make clear permit exemption criteria, and employ construction general permits or permits by rule that also serve as final permits to operate.

When emissions are difficult to estimate due to uncertainty of source throughput and composition, states should also consider mechanisms, similar to some federal



rules (e.g., the storage vessel provisions of the Oil and Gas NSPS OOOO that allow an established period for emissions determination before requiring control), that allows operators to construct and operate certain source types for a limited but sufficient period of time to determine actual facility emissions prior to permitting to ensure that permit conditions, including emission control requirements and Federal applicability, are properly informed. States should consider requiring appropriate levels of control during this evaluation period to avoid exceeding regulatory emission thresholds. It is important to note that the construction of a major source without a permit is prohibited by the Clean Air Act.

10.2.4 Compliance Monitoring, Demonstration & Assurance

State programs should contain the following compliance monitoring, demonstration and assurance capabilities:

1. Procedures for the receipt, evaluation, retention, and investigation of all notices and reports required of permittees and other regulated persons. These procedures should ensure that the notices and reports submitted are adequate in both content and frequency to assess compliance with applicable requirements. States should consider integrating electronic reporting systems to improve efficiency and timeliness of data received. Duplicative or unnecessary reporting should be minimized. Investigation for possible enforcement action should include determination of failure to submit complete notices and reports in a timely manner. Effective data management systems, as described in Section 4.2.7, can be used to track compliance.
2. Inspection and monitoring procedures that are independent of information supplied by regulated persons and which allow the state to determine compliance with program requirements, including:
 - a. The capability to conduct comprehensive investigations, that may include advanced monitoring techniques as appropriate, of facilities and activities subject to regulation in order to identify a failure to comply with program requirements by responsible persons;
 - b. The capability to conduct regular inspections of regulated facilities and activities at a frequency that is commensurate with state priorities based on the risk to health, safety and the environment; and
 - c. The authority to investigate information obtained regarding potential violations of applicable program and permit requirements.
3. Procedures to receive and evaluate information submitted by the public about alleged violations and to encourage the public to report perceived



violations. Such procedures should not only involve transparent communications with the public (to apprise it of the process to be followed in filing reports or complaints), but should also communicate how the state agency will assure an appropriate and timely response.

4. Authority to conduct unannounced inspections at a reasonable time of any regulated site or premises where oil and gas activities are being conducted, including the authority to inspect, sample, monitor, or otherwise investigate compliance with permit conditions and other program requirements, such as proper operation of control devices, process operating conditions and control device operating parameters.
5. Authority to enter locations where records are kept during reasonable hours for purposes of copying or obtaining electronic copies and inspecting such records.
6. Procedures to ensure that documents and other evidence are maintained and/or managed such that they can be admitted in any enforcement proceeding brought against an alleged violator, noting that some information may be entitled to confidential treatment (however, it is the source's obligation to identify which information is confidential business information).
7. Authority to require regulated persons to conduct stack testing or other measurements to establish or verify compliance with applicable emission standards, to allow the state to be present for such tests, be given adequate notice of the tests, and to conduct its own tests when deemed appropriate.
8. Authority to require, under statute, regulation or permit, regulated persons to:
 - a. Establish and maintain records;
 - b. Make reports;
 - c. Install, use, and properly maintain monitoring equipment, and use audit procedures, or methods;
 - d. Sample emissions in accordance with prescribed methods;
 - e. Provide stack test protocols and test reports;
 - f. Perform parametric monitoring where direct emissions measurement is impracticable;
 - g. Submit compliance certifications; and
 - h. Provide other information needed to determine compliance on a one-time, periodic or continuous basis.



10.2.5 Enforcement

10.2.5.1 Enforcement Tools

The state agency should have effective enforcement tools to address any violations of the state air program, which may include the following actions:

1. Issue a notice of violation with a compliance schedule;
2. Restrain, immediately and effectively, any person by order or by suit in state court from engaging in any impending or continuing unauthorized activity which is causing or may cause damage to public health or the environment;
3. Establish the identity of emergency conditions which pose an imminent and substantial human health or environmental hazard that would warrant entry and immediate corrective action by the state agency after reasonable efforts to notify the operator have failed;
4. Sue or cause suit to be brought in courts of competent jurisdiction to enjoin any impending or continuing violation of any program requirement, including any permit condition, without the necessity of a prior revocation of the permit;
5. Require, by administrative order or suit in state court, that appropriate action be undertaken to correct any harm to public health and the environment that may have resulted from a violation of any program requirement, including, but not limited to, establishment of compliance schedules or requiring the source to apply for and obtain permits for previously unpermitted emissions;
6. Encourage Beneficial Environmental Projects or Supplemental Environmental Projects to secure additional environmental benefits through enforcement settlements;
7. After administrative review, revoke, modify, or suspend any permit, or take other enforcement action deemed appropriate by the state, when the state agency determines that the permittee has violated the terms and conditions of the permit, failed to pay an assessed penalty, or used false or misleading information or fraud to obtain the permit;
8. Assess administrative penalties or seek, in court, civil penalties or criminal sanctions including fines and/or imprisonment; or
9. Resolve compliance issues informally, through mechanisms such as settlement agreements or warning letters, in lieu of a formal notice of violation, administrative order, or court order.



As an alternative to the enforcement tools identified above, state programs should have incentives (such as penalty mitigation and auditing/self disclosure policies) to encourage sources to voluntarily disclose and correct violations.

10.2.5.2 Penalties

States should develop guidance for calculations of penalties that include factors such as the economic benefit resulting from the violation, willfulness, harm to the environment and the public, duration of the violation, the operator's compliance history, and the operator's good faith efforts to comply. Some of the benefits of having guidance for calculation of penalties include: 1) an opportunity to encourage voluntary disclosure of violations; 2) providing consistency and transparency in the assessment of penalties; and 3) providing for the development of readily defensible assessments. Penalties should be such that an operator does not benefit financially from unlawful conduct, and should provide compliance incentive to other operators. States should evaluate their enforcement options and policies to assure that the full range of actions available are effectively used.

10.2.5.3 Right of Appeal

The right to appeal or seek administrative and/or judicial review of agency action should be available to any person having an interest which is or may be adversely affected, or who is aggrieved by any such action.

10.2.6 Staffing and Training

In addition to the general personnel and funding recommendations found in Section 4.3, state staffing levels should be sufficient to receive, record and respond to complaints of human health impacts and environmental damage resulting from air emissions. Staff should receive adequate training to stay current with federal and state air regulatory requirements, state airshed goals, and industry production practices and technology, especially new and developing air pollution control and monitoring technology. This training should include an oil and gas industry overview to familiarize state agency staff with the sources and monitoring equipment they will be regulating. Training programs to accomplish these goals could include:

1. Training courses or resource materials available through US EPA, multi-state air planning organizations, private sector, industry associations, consortiums and universities;
2. Field visits and tours to oil and gas facilities in the state;



3. Engagement with other states' air regulatory programs;
4. Conference attendance; and
5. Coordination and frequent discussions with other state agencies regulating oil and gas operations, including state oil conservation commissions and divisions.

Additionally, agencies should have a mechanism to assess and implement strategies designed to recruit and retain key agency staff such as:

1. Maintaining competitive salary levels;
2. Creation of new technical positions (air specialists, oil and gas sector specialists, etc.) in the permitting and enforcement programs; and
3. Increasing staff responsibilities via promotion of staff to higher positions (project leaders, team leaders, etc.).

10.2.7 Data Management

In addition to the data management recommendations found in Section 4.2.7, states should ensure that appropriate data is shared between agencies so that the air quality program has access to the inventory, which includes the level of detail needed to conduct an effective program (locations of oil and gas facilities and a unique identifier for the regulated activity (e.g., API well number)). as necessary to conduct an effective program. After appropriate quality assurance, public information, such as emissions data, should be made available to the public, air quality researchers and managers, in appropriate user-friendly electronic formats (e.g., data downloads, web services).

10.2.8 Public Involvement

State agencies should provide for the electronic dissemination of educational and other appropriate information regarding air emissions from oil and gas activities to bridge the knowledge gap between experts and the public. This should occur as part of an ongoing process through which information is exchanged in an open forum as provided in Section 4.2.2.2. This is especially important in areas where development has not occurred historically. The public should also have the ability to ask questions and receive responses through the agency website. States should also use advisory groups of industry, government, and public representatives, or other similar mechanisms, to obtain input and feedback on the effectiveness of state programs as provided in Section 4.2.2.3.



10.2.9 Outreach

In addition to the public participation provisions found in Section 4.2.2, states should take measures, such as web postings, FAQs, and distribution of fact sheets, to ensure that the industry, other state agencies and the public are aware of the delineation of responsibilities between the air quality program and the oil and gas program. Provisions should also be made for the availability of speakers to make presentations to interested groups.

10.2.10 Strategic Program and Resource Planning

State air programs for oil and gas will require adequate resources to fulfill state and federal mandates to ensure healthy air quality while providing adequate response time to permit applications and other needs from industry. As with other growing sectors, the oil and gas industry's potential for rapid growth in production basins can challenge the planning process for air programs, since large numbers of facilities can be deployed in production basins and cumulative emissions from new and existing facilities can potentially have significant impacts on air quality.

To address these challenges, and as set forth in these guidelines, states should have adequate resources to conduct necessary regulatory development, permitting, enforcement, monitoring, modeling, inventory development and public outreach activities. Additionally, states should have strategic planning capabilities to ensure that these resources remain adequate in light of dynamic growth in the oil and gas sector and rapid evolution in production technologies.

10.3 Air Program-Specific Elements

10.3.1 Delineation of Sources

States should consider developing an inventory of sources and activities not previously registered or permitted, for example grandfathered facilities and equipment, and non-permitted sources and activities, if information about emissions from those sources is critical for planning and analysis for agency priorities such as efficiently ensuring compliance with air quality standards.

This inventory should be comprehensive but straightforward and relatively simple to administer. However, the state or tribe should make efforts to avoid capture of inconsequential (de minimis) sources that do not impact air quality.



10.3.2 Source-Specific Requirements

These guidelines are developed with particular emphasis on VOC and HAP emissions, and control of these pollutants often reduces methane emissions as a co-benefit. However, there may be some sources that emit dry gas with little or no VOC or HAP content, but that emit methane emissions.. Since 1993, industry partners in the EPA voluntary Natural Gas STAR Program have developed and employed a variety of innovative techniques for mitigating methane emissions in the oil and gas sector. The state should be aware of which operators participate in EPA's Natural Gas STAR program and make others aware of the program. States should be aware of regulatory initiatives of other states to address methane/dry gas emissions.

A state's air quality program should identify oil and gas industry emission source types that must be represented in applications for air quality permits or authorizations. Oil and gas emissions source types and activities may include stationary engines and turbines, well completions or recompletions, venting and leaking gas from compressors, gas-powered pneumatic devices, dehydration units, gas processing plants, transmission and storage facilities, storage vessels and condensate handling, wellbore liquids unloading, produced water management facilities, sweetening units and flares.

The state requirements for these source types and activities should align with Federal requirements unless the state needs to establish additional or more stringent requirements. When specific air issues demand more stringent requirements, states may consider adopting, as consistently as possible, provisions by other states that have been implemented to address similar air quality issue, to minimize the impact on state resources.

State air quality programs may want to address unplanned and episodic emissions due to such things as fugitive air emissions upstream of gas processing plants, process upsets, wellbore liquids unloading, third party equipment downtime, and equipment failure. The programs should require incident reporting and corrective actions where possible, to avoid incident recurrence. However, the state should also consider safety aspects when developing new requirements for unplanned emissions.

Finally, because there is a growing concern over wasted gas from drilling operations, the state air quality regulator should consider coordination with the state oil and gas conservation regulator on a process to quantify and minimize the flaring or venting of associated gas from oil wells.

10.3.3 Air Quality Monitoring Networks

Air quality monitoring is an essential tool both to determine compliance with



National Ambient Air Quality Standards and to assess the impact of air pollution sources on air quality. State programs should have an air quality monitoring network in place that meets these needs. In developing an air quality monitoring network, states should consider several parameters, including but not limited to: the number of monitors, the types of pollutants to be monitored, the location of monitors, specific monitoring instrumentation to be used, frequency of monitoring, and appropriate QA/QC procedures. In placing air quality monitors, states should consider factors such as emission source location, population density, topography and meteorology.

Many of the air quality monitoring requirements for states are set forth in implementing regulations for the various National Ambient Air Quality Standards. Additionally, federal permitting requirements for major stationary sources include certain source specific monitoring requirements. States should have appropriate mechanisms in place to ensure that this source specific monitoring is conducted in accordance with established standards and methods.

States may also consider whether to conduct ambient air quality monitoring that goes beyond the standards established under federal law. While states should have considerable latitude in determining whether and how to conduct such additional monitoring, appropriate procedures should be established to ensure that such monitoring, if undertaken, accurately assesses ambient air quality levels. As part of this additional monitoring, states should consider, where possible, establishing baseline air quality levels in order to assess the impact of emission source changes.

Areas with significant oil and gas production activity may have few or no regulatory air quality monitors, because these areas may not meet typical criteria for siting of monitors, such as population density. States should consider whether to add monitors in these areas to assess emissions from present or anticipated increases in oil and gas activity.

Once it has gone through appropriate QA/QC procedures, air quality data should be publicly available. Options for making data available could include putting it on-line or publishing regular air quality reports. US EPA makes limited criteria air pollutant data from state air monitors available through federal websites, such as AIRNow.gov. Agencies should consider whether to make data additionally available through their own websites to allow greater context and address local issues and concerns.

10.3.4 Reporting, Emission Inventories & Recordkeeping

States should develop and periodically update accurate and robust emission inventories as necessary to conduct good air quality planning and program assessment. States should establish emission reporting requirements for air



pollution sources that adequately support their efforts to develop high quality emission inventories. For individually small sources of air pollution that don't report (commonly called nonpoint sources), states should use the best available methodologies to quantify emissions. As states review and update their inventories they should work with industry and other stakeholders to identify the types of oil and gas sources which can produce significant emissions, and determine when updates to inventories are needed due to new information, changes to emission inventory compilation methodologies, or changes in production or operational practices.

States should consider using the EPA's oil and gas emissions tool(s) for computing nonpoint sources of oil and gas emissions. EPA provides the tool, instructions, and other guidance for computing these emissions as part of its National Emissions Inventory (NEI) program available on the Clearinghouse for Inventories & Emissions Factors (CHIEF). The tool allows for local inputs to be added by states to improve their emissions estimates. EPA also develops projection methods available on the CHIEF Emissions Modeling Clearinghouse for use by states.

Every three years, states are required to submit to EPA all sources of emissions of criteria pollutants and their precursors (Air Emissions Reporting Requirements, 40 CFR Part 51, Subpart A). This includes both point and nonpoint sources for the oil and gas sector.

States should also develop well-founded emission projections, to ensure that air quality standards will continue to be met in the future. Best available data and methods should be used for these projections. As with other growing emission sectors, development of oil and gas can result in rapid increases in emissions in a given area, so states should develop programs that can keep pace. Projections which consider emissions under a range of alternative future conditions, such as the effect of changing industry practices and regulations, will yield better results than those that are based on single factors.

After administrative review, emission inventories and projections and reported emission data should be readily available to the public, including documentation of methodology, data sources, and assumptions made in producing the inventory. The inventory development process should include stakeholder review so that the general public and the regulated community can provide input. Furthermore, consistent calculations methods, based on the gas and condensate compositions for specific formations and basins, should be applied. If included in SIPs, the public review process is a requirement for those current and projected inventories used for both nonattainment area inventories as well as modeling inventories.

10.3.5 Corrective Actions & Emergency Response

The states should establish clear criteria for the emergency reporting of significant,



non-routine releases to air. These criteria should consider factors such as the mass and type of constituents released and the proximity of the release to sensitive receptors.

Agencies responsible for receiving emergency notifications of reportable releases to air should be identified and be responsible for the coordination, as appropriate, of any necessary response action with the operator, state and local emergency responders, environmental and/or public health agency and any other agency responsible for public protection.

States should ensure that community residents are notified when potentially hazardous air releases occur and should ensure that companies, in addition to emergency responders, take necessary actions to minimize public exposure.

States should require operators to submit reports that contain information on the cause of the release, the type(s) and amount(s) of pollutants released and the corrective actions the company implemented, to aid in the prevention of incident recurrence.

State air regulators should have appropriate air monitoring equipment necessary to support emergency response activities.

10.3.6 Long-Term Planning, Prioritization & Evaluation

In addition to the program planning and evaluation provisions found in Section 4.2.3, states should have a good understanding of oil and gas operations, including exploration and production; gathering, boosting, processing, and transmission; and accurate inventories and projections of air emissions. Because emissions characteristics, operational requirements, and operational approaches can vary widely by basin, it is critical for regulators to involve interested stakeholders (including oil and gas producers and environmental and citizen groups) in the planning and evaluation processes. Periodic analyses should be completed to ensure that air quality will remain protective of public health and the environment, in accordance with state and federal statutes and regulations, as industry evolves and grows.

There are and will be a number of federal regulations applicable to oil and gas operations that must be assessed for state adoption, incorporated by reference into state regulations, or left to US EPA for implementation. In most states, these federal regulations become the base of the state air regulatory program. State air regulatory program planning must consider the air quality impacts of federal regulations. Airsheds with oil and gas basins that have measured or modeled concentrations of air pollutants near or above the NAAQS, considerable existing or planned development, and/or geographic conditions (topography and meteorology) that can create stagnant air, may require specific, specialized analyses to assess



the short-term and long-term status of compliance with the NAAQS. Collaboration with industry and other stakeholders is very important to ensure that the analyses are comprehensive, scientifically sound and adequately address the relevant questions and issues. Technical collaborations may be more successful when accomplished within a structured process that clearly defines the roles and responsibilities of participants, procedures for widely disseminating analysis design, solicitation of comments, processes for responding to comments, and other opportunities for feedback.

Analyses of criteria pollutant trends, comprehensive emissions trends, and projections of pollutant concentrations, visibility, and deposition are important indicators for evaluation of state air programs. In the process of developing a strategic plan, states may develop specific airshed goals to reduce the impacts of pollutants. The development of these goals should be based upon careful analysis of state needs, priorities, available resources, and applicable state and federal regulations.

Additional program goals could include (i) the development and implementation of an effective stakeholder outreach and education program; (ii) the development of incentives for additional pollution control, such as streamlined permitting programs, permits by rule, and other permitting options that simplify the application and review process while promoting air pollution control; (iii) the development and posting of guidelines, policies and templates that result in efficiencies in the permitting and enforcement processes while encouraging good practice; (iv) the creation of voluntary programs that recognize operators adopting additional air pollution measures; and (v) the development or improvement of an air monitoring network in areas with oil and gas activity, emissions inventories and calculation methods, and air modeling tools.

Regarding evaluation, performance metrics could include an evaluation of ambient pollutant concentrations, emissions trends, permit response time, appropriateness of permitting options, and clarity of conditions required for compliance. States should give consideration to the frequency of the evaluation of these types of metrics as well. Evaluation of emissions trends and modeling data may be more suited to an annual or periodic basis, whereas other metrics, such as stakeholder outreach and monitoring, may be done more frequently. The state agency should identify the set of measures that is most applicable to the goal and then determine the schedule for program evaluation.

