

SECTION 10 | Air Quality

10.1 Background

As a result of the increased development of oil and natural gas from shale formations, concerns about air emissions from the oil and gas sector have become more focused. The criteria of this Guidelines section are focused on air emissions from upstream oil and gas exploration and production (E&P) operations. The term “upstream” is used throughout to describe the full array of operations, activities, facilities, and sources in this sector.

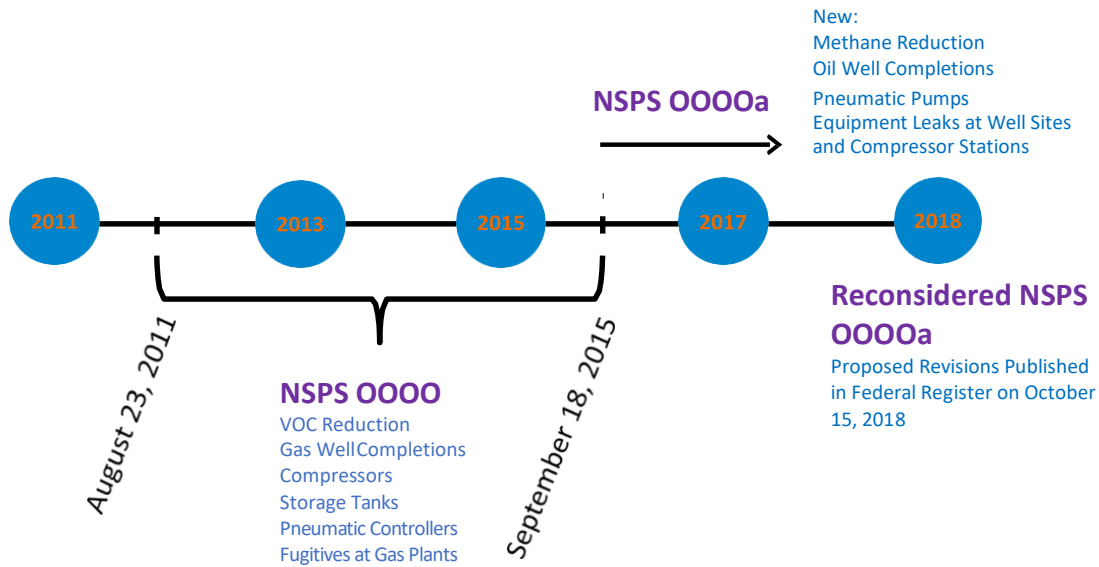
On August 16, 2012, EPA published three final rules for the Oil and Natural Gas Sector: NSPS OOOO for the control of VOC and SO₂ emissions; and NESHAP HH/HHH for the control of hazardous air pollutant emissions. For VOC sources, NSPS OOOO applies to affected sources that are new, modified or reconstructed on or after August 23, 2011, and on or before September 18, 2015. NSPS OOOO 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 NSPS Subpart VVa leak detection and repair (LDAR) programs at natural gas processing plants. NSPS OOOO also revised SO₂ emissions maximum control requirements for sweetening units affected facilities from 99.8 percent to 99.9 percent.

The NESHAP HH/HHH rules amended provisions to previously 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.

EPA published minor amendments to NSPS OOOO on September 23, 2013 and December 31, 2014. In response to petitions for administrative reconsideration of certain provisions in NSPS OOOO and in the amendments, EPA granted reconsideration for certain issues and subsequently proposed revisions to the rule on September 18, 2015. In the proposed rule, EPA revised the regulated pollutant to be both methane and VOC across the oil and natural gas source category (i.e., production, processing, transmission and storage). EPA also added control requirements for completion flowback emissions from hydraulically fractured and refractured oil wells, emissions from pneumatic pumps, and fugitive emissions from well sites and compressor station sites (LDAR). On June 6,

2016, EPA published a final NSPS OOOOa. The initial compliance date was August 2, 2016.

NSPS OOOO/OOOOa Applicability Timeline



New petitions for administrative reconsideration of certain provisions in NSPS OOOOa were filed and, after additional input from public and industry stakeholders, EPA published proposed revisions to NSPS OOOOa on October 15, 2018. EPA has not proposed removing any of the current regulated sources. EPA requested public comments on the proposed revisions and for questions the agency has asked in the preamble. A final revised NSPS OOOOa will likely be published in the second quarter of 2019.

10.2 Administrative

While state oil and gas regulatory agencies have many environmental responsibilities, air quality programs are typically administered by state environmental protection or health agencies and are given statutory and regulatory powers as described below.

Recognizing the local and regional differences discussed in Section 3.3, states should have standards to prevent the contamination of air from pollutants such as nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), methane, hydrogen sulfide (H₂S); and air toxics or hazardous air pollutants (HAP) such as sulfur dioxide (SO₂), benzene, normal hexane (N-Hexane), and formaldehyde.

10.2.1 Scope of Authority

An effective state program for the regulation of air emissions from upstream operations should include, at a minimum:

1. Statutory authority that adequately details the powers and duties of the respective regulatory body or bodies;
2. Statutory authority that grants the regulatory body or bodies the power to oversee air emissions from upstream operations such as 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;
3. 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 (for example, additional requirements on new and/or existing facilities or sources within ozone nonattainment areas);
4. Authority to accept delegation and authority for implementation of federal air quality programs specific to upstream operations;
5. 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;
6. Statutes and implementing regulations which adequately and clearly define necessary terminology;
7. Provisions to ensure adequate funding for the staff and program to carry out its objectives and duties;
8. Mechanisms for coordination among stakeholders (including the public, federal and state agencies, and the regulated industry); and
9. Technical criteria for air emission controls that are flexible and forward-looking to encourage and accommodate advancements in technology.

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 upstream oil and gas exploration and production 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 (NAAQS). 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 (NSPS). Even if a state does not accept delegation to implement and enforce a particular federal requirement, EPA retains responsibility for implementing and enforcing that requirement. Part of EPA's role is to ensure a level playing field across the country, therefore where a state accepts delegation of federal regulations, EPA continues to provide oversight to ensure adequate programmatic and compliance efforts across states.

Within states that accept delegation from EPA, jurisdiction over air quality issues related to upstream operations 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. Because states do not have jurisdiction over air pollution sources on tribal lands, EPA or the tribes hold responsibility for implementation and enforcement of air quality requirements for upstream operations on these lands.

Where multiple state, federal or tribal authorities have jurisdiction over air quality issues in the same landscape, mechanisms should be in place to avoid duplication, regulatory gaps, or inconsistent air quality requirements or enforcement of such requirements. Consistent with EPA and state agency authority, 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 or agencies have jurisdiction over a particular area, or responsibility for enforcing a given set of air quality requirements.

10.2.3 Permits, Authorizations and Exemptions

The Clean Air Act prohibits the construction of a major source without a permit. State permits should clearly establish what performance standards and/or emission control requirements are required for each covered source. State programs should establish 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 consider mechanisms that allow operators to construct and operate certain source types for a limited but sufficient period of time to determine actual facility emissions prior to permitting (similar to federal rules such as the storage vessel provisions of OOOO and OOOOa that allow an established period for emissions determination before requiring control). Such mechanisms should be designed to ensure that permit conditions, including emission control requirements and Federal applicability, are properly informed, but that

regulatory emissions thresholds are not exceeded during the evaluation period. States should have flexibility to re-visit emissions calculations as necessary.

States with approved Clean Air Act permitting authority should adopt a program for upstream emission sources that:

1. Is designed to protect human health and the environment;
2. Is legally and practicably enforceable;
3. Harmonizes with federal requirements to avoid confusing and duplicative requirements for operators; and
4. Allows the state to develop additional requirements beyond federal requirements to address state-specific air quality issues.

The permitting process should be efficient. Therefore, state air quality permitting programs should be:

5. Straightforward for operators to understand and implement;
6. Administratively efficient for the regulatory agency to minimize cost in time and resources; and
7. Transparent for public understanding.

To accomplish this, states are encouraged to simplify the application process by providing:

8. Accepted emission estimation methods and supporting documentation;
9. Guidance on air quality modeling requirements; and
10. Permit application assistance tools.

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 integrate 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, should be used to track compliance.

2. Inspection and monitoring procedures that are independent of information supplied by regulated entities 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 assist with the evaluation of operational compliance;
 - b. The authority to obtain information from regulated entities and investigate information obtained regarding potential violations of applicable program and permit requirements; and
 - c. The capability to conduct regular inspections of regulated facilities and activities at a frequency that is commensurate with state priorities based on the protection of health, safety and the environment.
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 operations 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.

- a. Operators and the state should presume that all records submitted to the state are public. It is the operator's obligation to identify which information is confidential business information, to take adequate steps to safeguard that information, and to demonstrate to the state that the release of such information would cause substantial harm.
- 7. Authority to require regulated persons to conduct stack testing or other measurements to establish or verify compliance with applicable requirements; to provide for state presence at 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;
- 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.

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

10.2.5.2 Penalties

States should develop clear guidance for calculations of penalties that include factors such as the economic benefit resulting from noncompliance, 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 deter noncompliance by other operators. States should evaluate their enforcement options and policies to assure that the full range of actions available to them are applied effectively and consistently.

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 initial and on-going training to stay current with federal and state air regulatory requirements, state airshed goals, and industry production practices and technology, especially new and developing emissions estimation methods, air pollution control and monitoring technology (e.g., gas detection technologies). This training should include an oil and gas industry overview to familiarize state agency staff with the equipment and processes typical to industry operations, the sources of air pollutants, and the pollution control equipment and monitoring equipment they will be regulating and inspecting. Training programs to accomplish these goals could include:

1. Training courses or resource materials available through 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 state and EPA air regulatory programs;
4. Conference attendance; and
5. Coordination and frequent discussions with other state and federal

agencies regulating oil and gas operations, including state oil and gas 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:

6. Maintaining competitive salary levels;
7. Creation of new technical positions (air specialists, oil and gas sector specialists, etc.) in the permitting and enforcement programs; and
8. 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 as efficiently as possible. The air quality program should have electronic access to an inventory that includes the level of detail (locations of oil and gas facilities and a unique identifier for the regulated activity such as API well number) necessary to conduct an effective program. Some of the data gathered may be required to be reported electronically, e.g., EPA Central Data Exchange (CDX).

Emissions data and other information should be made available in user-friendly electronic formats after thorough and appropriate quality assurance.

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.

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. The inventory should be comprehensive; however, it should not capture inconsequential (de minimis) sources that do not impact air quality.

10.3.2 Source-Specific Requirements

A state's air quality program should identify emission source types that must be represented in applications for air quality permits or authorizations. Source types and activities may include stationary engines and turbines, well completions or recompletions, handling of associated gas from oil wells, venting and leaking gas from compressors, gas-powered pneumatic devices, dehydration units, gas processing plants, storage vessels and other hydrocarbon fluids handling, wellbore liquids unloading, produced water management facilities, sweetening units, flares, fugitive emissions from components at well sites, compressor stations and gas processing

plants, and emissions from all other maintenance activities.

The state requirements for these emission source types should be as stringent as the Federal requirements, where such requirements exist, unless the state deems it necessary to establish additional, alternative, or more stringent requirements. When specific air issues demand more stringent requirements, states may consider adopting, as consistently as possible, provisions by other states or the EPA that have been successfully implemented to address similar air quality issues, 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, abnormal process conditions or malfunctions, wellbore liquids unloading, well maintenance, third party equipment downtime, changes in third party product gathering pipeline capacity or business agreements, and equipment failure. The programs should require incident reporting and corrective actions where possible, to ascertain root causes and avoid incident recurrence. However, the state should also consider safety aspects when developing new requirements for unplanned emissions.

The state air quality regulator should coordinate with the state oil and gas conservation regulator to develop a process to quantify and minimize the flaring, and prohibit the venting of, associated gas from oil wells. Such a process should contemplate both the air quality concerns and financial loss to the state, royalty owners, and operators of wasted gas from drilling operations.

In addition to regulatory efforts, there are several voluntary programs that provide best practices and information sharing. 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. In 2016, EPA updated this program to include the [Methane Challenge](#). The oil and gas industry has developed programs as well, including [The Environmental Partnership](#), [ONE Future](#), and the [Oil and Gas Climate Initiative](#). The Environmental Council of the States (ECOS) has also developed an online [Methane and Air Toxics Reduction Information Exchange](#) (E-MATRIX) that provides information on state best practices and cost-effective technologies that reduce emissions at points along oil and gas systems. The state should encourage awareness of the programs.

10.3.3 Air Quality Monitoring Networks

Air quality monitoring is an essential tool both to determine compliance with NAAQS 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 NAAQS. 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 oil and gas development 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 existing, or anticipated increases in, oil and gas activity.

States should have appropriate monitoring equipment necessary to support emergency response activities as discussed in Section 10.3.5. Monitoring data should be made available consistent with the criteria of 10.2.7.

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. 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. Consistent calculations methods, based on the gas and oil/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 demonstrating attainment through air quality modeling.

States should consider using the EPA's oil and gas emissions tool(s) for computing nonpoint emissions sources. 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. States that have developed emissions estimation techniques beyond those currently available from EPA are encouraged to share their methods with EPA and other states and tribes through channels such as the National Oil and Gas Emission Inventory Committee and the ECOS Shale Gas Caucus.

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. Projections which consider emissions under a range of alternative future conditions, such as the effect of changing industry practices, regulations, and crude oil and gas pricing, 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.

10.3.5 Corrective Actions & Emergency Response

State air quality programs should establish clear criteria for the emergency reporting of significant, non-routine releases. 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 operators and

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.

10.3.6 Long-Term Planning, Prioritization & Evaluation

The state should develop procedures for regular evaluation and consideration of the appropriateness and adequacy of its air quality regulatory program.

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 stakeholders (including oil and gas producers, environmental and citizen groups, and local governments) in the planning and evaluation processes. Periodic analyses should be completed to ensure that air quality remain protective of public health and the environment, in accordance with state and federal statutes and regulations, as the oil and gas 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 EPA for implementation. In most states, these federal regulations become the basis of the state air regulatory program. 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 important to ensure that 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 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 the following:

1. The development and implementation of an effective stakeholder outreach and education program;
2. 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;
3. The development and posting of guidelines, policies and report templates that result in efficiencies in the permitting and compliance assurance processes while encouraging good practice;
4. The creation of voluntary programs that recognize operators adopting additional air pollution measures; and
5. 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 metrics that is most applicable to its goal and then determine a schedule for program evaluation.