

**Before the United States Senate
Subcommittee on Clean Air and Nuclear Safety**

**‘Review of Recent Environmental Protection Agency’s Air Standards for Hydraulically
Fractured Gas Wells and Oil and Natural Gas Storage’**

**Testimony of Fred Krupp
President
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Chairman Carper, Ranking Member Barrasso, and members of the Subcommittee, thank you for the opportunity to testify about the U.S. Environmental Protection Agency’s Air Standards for Hydraulically Fractured Gas Wells and Oil and Natural Gas Storage.

My name is Fred Krupp. I serve as the President of Environmental Defense Fund, a national non-partisan, non-profit environmental organization.

OVERVIEW

In the fall of 2011, Secretary of Energy, Steven Chu, asked that I serve on the Secretary of Energy Advisory Board (“SEAB”) Natural Gas Subcommittee. The Subcommittee was tasked with recommending measures to address the safety and environmental performance of natural gas hydraulic fracturing from shale formations.¹ During this service, I was fortunate to meet with state policymakers, federal government officials, industry representatives, public health and environmental advocates, and hundreds of concerned citizens through an intensive process of fact gathering, technical presentations and public meetings.

The Subcommittee’s work was animated by two central considerations, the brisk expansion of shale gas in America transforming our nation’s energy landscape and the imperative for our nation to work together addressing the public health and environmental impacts to ensure the safe development of this resource.

Shale gas accounted for only two percent of total U.S. natural gas production in 2001.² With the development of horizontal drilling and hydraulic fracturing, that number has grown extensively

¹ Steven Chu, CHARGE TO SECRETARY OF ENERGY ADVISORY BOARD NATURAL GAS SUBCOMMITTEE TO EXAMINE FRACKING ISSUES (May 5, 2011), *available at* http://www.shalegas.energy.gov/resources/Natural_Gas_Subcommittee_Charge_Memo_5_5_11.pdf.

² SEC’Y OF ENERGY ADVISORY BD, SHALE GAS PRODUCTION SUBCOMMITTEE 90-DAY REPORT 6 (Aug. 18, 2011), *available at* http://www.shalegas.energy.gov/resources/081811_90_day_report_final.pdf [hereinafter 90-DAY REPORT].

to 30 percent in 2011.³ The U.S. Energy Information Administration projects shale gas will account for 47 percent of domestic natural gas production by 2035, spanning the nation from New York and Pennsylvania to Ohio, Texas, Colorado, and California.⁴

Much has been written both about the economic significance of shale gas production and the deep public concern that this development not harm human health and the environment. For natural gas to have a future, our nation must act decisively and wisely to implement measures that will address the public health and environmental impacts of shale gas development. This requires smart, well-designed policy solutions in a number of areas, including actions to protect air and water quality, to ensure disclosure of the chemicals used in fracturing fluid, and to mitigate impacts on communities, land use, wildlife and ecosystems.⁵

And our nation must work together. The policy makers responsible for protecting human health and the environment must provide leadership. The private companies engaged in these extraction activities must pioneer and carry out solutions to protect our environment and our communities. Our nation's leading scientists must devote their expertise in providing answers to critical questions. And the voices of concerned citizens across our nation must be heard in forging lasting solutions.

While this testimony focuses on the discharge of airborne contaminants, other public health and environmental impacts also warrant policy action. In addressing the urgent challenge of air emissions, the Subcommittee found that “[s]hale gas production . . . results in the emission of ozone precursors (Volatile Organic Compounds (VOCs), and nitrogen oxides), particulates from diesel exhaust, toxic air pollutants and greenhouse gases, such as methane” and that “[s]ignificant air quality impacts from oil and gas operations in Wyoming, Colorado, Utah and Texas are well documented. . . .”⁶ As a result, we supported robust protections to address the suite of deleterious air pollutants from both new and existing sources, encouraging “adoption of rigorous standards for new and existing sources of methane, air toxics, ozone precursors and other air pollutants from shale gas operations.”⁷

EPA's New Source Performance Standards (NSPS) for the oil and natural gas sector are an important first step toward reducing harmful air pollution. The standards limit harmful ozone precursors and air toxics, and as a co-benefit limit methane emissions, a potent climate forcer. They build on leadership from states like Colorado and Wyoming, utilizing cost-effective,

³ *Id.*

⁴ U.S. Energy Information Administration, Annual Energy Outlook 2011 79 (2011), available at [http://205.254.135.7/forecasts/aeo/pdf/0383\(2011\).pdf](http://205.254.135.7/forecasts/aeo/pdf/0383(2011).pdf)

⁵ See 90-DAY REPORT, *supra* note 2 at 15-26.

⁶ *Id.* at 15 (citations omitted).

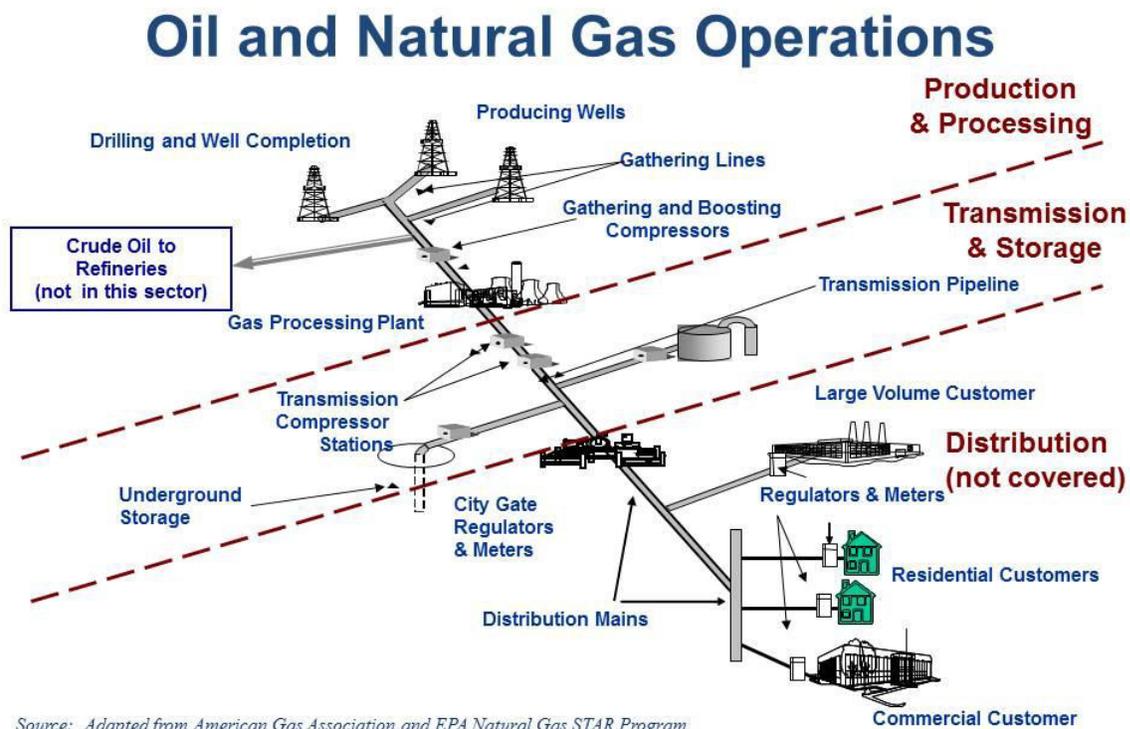
⁷ *Id.* at 2.

proven technologies that, in many cases, plug leaks throughout the system. These common sense measures are a win-win-win: they reduce pollution, conserve valuable domestic energy resources, and in some cases, actually save producers money. As a result, representatives of the public health community and business community commended EPA's action.

It is critical that we build on these clean air measures if our nation is to fulfill the President's promise in his State of the Union to develop natural gas without putting the health and safety of our citizens at risk.⁸

OIL AND NATURAL GAS SECTOR OVERVIEW

Oil and natural gas operations fall into four broad categories that encompass a range of oil and natural gas activities: 1) oil and natural gas production, 2) natural gas processing, 3) natural gas transmission and 4) natural gas distribution.



The New Source Performance Standards partially addresses elements of the production, processing and transmission segments but do not address the natural gas distribution segment.

⁸ U.S. President Barack Obama, Remarks in State of the Union Address (January 24, 2012), available at <http://www.whitehouse.gov/the-press-office/2012/01/24/remarks-president-state-union-address> (emphasis added).

OIL AND NATURAL GAS SYSTEMS EMIT AIR POLLUTION THAT IS ASSOCIATED WITH SERIOUS PUBLIC HEALTH AND ENVIRONMENTAL IMPACTS

Oil and natural gas operations emit a variety of air pollutants, including pollutants that contribute to ground-level ozone or “smog;” toxic air pollutants like benzene, a known human carcinogen; and methane, a potent climate-disrupting pollutant. We can measure these emissions in tons and characterize their damaging human health impacts. In a discussion that often focuses on numbers, however, we must not overlook the deeply personal impacts associated with air pollution from oil and natural gas development. Last summer, along with others on the SEAB Subcommittee, I spent time in Washington County, Pennsylvania. There, a mother told me and the other panel members that she has been forced to leave her family farm because of the severe air pollution from shale gas wells. The problem had become so bad that the woman and her young son were now living out of their car.

Natural Gas and Oil Operations Emit Toxic Air Pollution

Oil and natural gas operations emit hazardous air pollutants, including benzene, formaldehyde and hydrogen sulfide. Benzene is a known human carcinogen. The International Agency for Research on Cancer and the National Toxicology Program, an interagency program of the Department of Health and Human Services, have likewise classified formaldehyde as a human carcinogen.⁹ Hydrogen sulfide, a pollutant that is found in certain types of natural gas (“sour” gas), causes nausea, headaches, delirium, disturbed equilibrium, poor memory, loss of consciousness, tremors, and convulsions.¹⁰

Scientists have detected elevated concentrations of benzene near gas production sites in Texas and Colorado.¹¹ In 2010 the Texas Commission on Environmental Quality measured acute concentrations of benzene that exceeded the state’s health-based risk guidelines at two

⁹ See, e.g., NATIONAL TOXICOLOGY PROGRAM, REPORT ON CARCINOGENS, 12TH ED. 195 (2011), available at <http://ntp.niehs.nih.gov/ntp/roc/twelfth/profiles/Formaldehyde.pdf>.

¹⁰ AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, TOXICOLOGICAL PROFILE FOR HYDROGEN SULFIDE 104 (July 2006), available at <http://www.atsdr.cdc.gov/toxprofiles/tp114.pdf>.

¹¹ See, e.g., Raj Goyal, *Air Toxic Inhalation: Overview of Screening-Level Health Risk Assessment for Garfield County*, (June 2008), <http://www.garfield-county.com/public-health/documents/Air%20Toxics%20Screening%20Level%20Risk%20Assesment%20Presentation%206%2017%208%20-%20Dr%20Raj%20Goyal.pdf> (last visited June 14, 2012); Teresa Coons & Russell Walker, *Community Health Risk Analysis of Oil and Gas Industry Impacts in Garfield County* (June 2008), [http://www.garfield-county.com/public-health/documents/1._COMMUNITY_HEALTH_RISK_ANALYSIS-\(Complete_Report_16MB\).pdf](http://www.garfield-county.com/public-health/documents/1._COMMUNITY_HEALTH_RISK_ANALYSIS-(Complete_Report_16MB).pdf) (last visited June 14, 2012); Teri Whiteley, T & Tim Doty, *Barnett Shale Formation Area Monitoring Projects* (2009), <http://www.bseec.org/sites/all/pdf/airquality/01.pdf> (last visited June 14, 2012).

exploration and production sites in the Barnett Shale.¹² In 2008, air samples obtained from oil and gas sites in Colorado's Piceance Basin led researchers to determine that emissions from well completions, dehydration units, and condensate tanks may pose an elevated cancer risk to nearby residents.¹³ Similarly, a recent study released by the National Oceanic and Atmospheric Administration based on atmospheric measurements in Colorado's D.J. Basin concluded that "oil and gas operations in the [Denver-Julesburg Basin] could be the largest source of C6H6 (benzene) in Weld County."¹⁴

Natural Gas and Oil Operations Contribution to Ground-Level Ozone

Ozone pollution, or "smog," is linked to serious health problems, including premature mortality, heart failure, increased hospital admissions and emergency room visits for respiratory causes among children and adults with pre-existing respiratory disease, and possible long-term damage to the lungs.¹⁵ Children, the elderly, and people with existing respiratory conditions are the most at risk from ozone pollution.¹⁶

Oil and natural gas drilling, production, processing and transport can release significant amounts of volatile organic compounds (VOCs) and oxides of nitrogen (NOx) which combine in the presence of sunlight to form smog. According to the state of Colorado, natural gas and oil operations were the largest source of smog-forming pollutants in the state in 2008.¹⁷

There are strong links between ozone precursor emissions from oil and gas development and serious ozone air quality impacts. Rural parts of Wyoming and Utah, where little other industrial activity occurs, have suffered ozone concentrations comparable to those recorded in some of the

¹² Railroad Commission of Texas, Notice to Oil, Gas & Pipeline Operators Regarding Air Emissions (March 2010), <http://www.rrc.state.tx.us/forms/reports/notices/airemission21010.pdf>.

¹³ Teresa Coons & Russell Walker, *supra* note 11.

¹⁴ GABRIELLE PÉTRON ET AL., HYDROCARBON EMISSIONS CHARACTERIZATION IN THE COLORADO FRONT RANGE: A COLORADO FRONT RANGE PILOT STUDY (2012). While Colorado has tightened its controls on natural gas and oil sources in the D.J. Basin since 2008, at that time, equipment in the D.J. Basin represented some of the best controlled natural gas and oil sources in the country. In fact, controls in most parts of the country remain less rigorous and comprehensive than those in place in the D.J. Basin in 2008, suggesting that benzene and other pollutant levels in many other parts of the country may also be higher than believed.

¹⁵ EPA, AIR QUALITY CRITERIA FOR OZONE AND RELATED PHOTOCHEMICAL OXIDANTS (2006); Michelle L. Bell, Roger D. Peng & Francesca Dominici, *The Exposure-Response Curve for Ozone and Risk of Mortality and the Adequacy of Current Ozone Regulations*, 114 ENVTL. HEALTH PERSPS. 532 (2006); Jonathan I. Levy et al., *Ozone Exposure and Mortality: An Empiric Bayes Metaregression Analysis*, 16 EPIDEMIOLOGY 458 (2005).

¹⁶ See EPA, Ground-Level Ozone Health Effects, <http://www.epa.gov/glo/health.html>; EPA, Nitrogen Dioxide, Health, <http://www.epa.gov/air/nitrogenoxides/health.html>.

¹⁷ COLO. CODE REGS. § 1001-9:XIX.K (2008), available at <http://www.cdphe.state.co.us/regulations/airregs/5CCR1001-9.pdf>.

most heavily polluted U.S. cities. The Bureau of Land Management (BLM) identified concentrated oil and gas development as the likely dominant source of the ozone pollution in the Utah's Uinta Basin,¹⁸ where, in the first three months of 2010, air quality exceeded national health standards for ozone nearly seventy times.¹⁹ Similarly, in addressing the designation of the Upper Green River Basin as an ozone non-attainment area, then-Wyoming Governor Dave Freudenthal noted the "need to reduce emissions from the natural gas industry."²⁰ In its submission recommending a non-attainment designation for the area, the Wyoming Department of Environmental Quality concluded "that elevated ozone [in the area] is primarily due to local emissions from oil and gas (O&G) development activities: drilling, production, storage, transport and treating."²¹

As natural gas and oil development expands into new regions, adverse air impacts are likely to follow absent protective pollution controls. Air modeling for the Haynesville Shale projects an increase in ozone concentrations near natural gas drilling and production and in adjacent regions due to ozone transport.²²

Natural Gas and Oil Operations Emit Methane

Natural gas extraction activity also discharges methane, which is the primary constituent of natural gas as well as a potent greenhouse gas. Methane has a warming potential seventy-two times that of carbon dioxide over the short term (twenty years) and twenty-five times that of

¹⁸ BLM, GASCO ENERGY INC. UINTA BASIN NATURAL GAS DEVELOPMENT DRAFT ENVIRONMENTAL IMPACT STATEMENT 3-13 (2010), available at http://www.blm.gov/ut/st/en/fo/vernal/planning/nepa/_gasco_energy_eis.html.

¹⁹ Streater, Scott, *Air Quality Concerns May Dictate Uintah Basin's Natural Gas Drilling Future*, N.Y. TIMES, Oct. 1, 2010, available at <http://www.nytimes.com/gwire/2010/10/01/01greenwire-air-quality-concernsmay-dictate-uintah-basins-30342.html?pagewanted=1>.

²⁰ Letter from Wyoming Governor Dave Freudenthal to Carol Rushin, Acting Regional Administrator, USEPA Region 8, "Wyoming 8-Hour Ozone Designation Recommendations" (Mar. 12, 2009), available at <http://deq.state.wy.us/out/downloads/Rushin%20Ozone.pdf>.

²¹ WY DEPARTMENT OF ENVIRONMENTAL QUALITY, TECHNICAL SUPPORT DOCUMENT I FOR RECOMMENDED 8-HOUR OZONE DESIGNATION FOR THE UPPER GREEN RIVER BASIN, WY at vii (Mar. 26, 2009), available at http://deq.state.wy.us/out/downloads/Ozone%20TSD_final_rev%203-30-09_jl.pdf.

²² See Susan Kembell-Cook et al., *Ozone Impacts of Natural Gas Development in the Haynesville Shale*, 44 ENVTL. SCI. TECH. 9357, 9362 (2010).

carbon dioxide over a longer time-frame (one-hundred years).²³ In addition to its climate impacts, methane contributes to higher global background concentrations of ozone pollution.²⁴

According to EPA's most recent greenhouse gas inventory, natural gas and petroleum systems represent 37% of U.S. methane emissions, making them the largest domestic source of methane.²⁵ In 2011, the EPA doubled its previous estimate of methane released due to leaks and venting in the natural gas network between production wells and the local distribution network. In effect, EPA's data suggests that about 2.4% of gross U.S. natural gas production was being lost to the atmosphere before it reached the consumer. A recent paper from the National Oceanic and Atmospheric Administration, however, measured methane concentrations in the Denver-Julesburg Basin in Colorado and concluded that "the methane source from natural gas systems in Colorado [estimated using EPA's State Inventory Tool] is most likely underestimated by at least a factor of two."²⁶ These discrepancies highlight the uncertainty in our understanding of how much natural gas is lost between wells and consumers.

To reduce this uncertainty, EDF is participating with industry and academic partners on a series of scientific field studies to better quantify methane leakage rate across the natural gas supply chain. The five studies – focusing on the production of natural gas, natural gas processing, long-distance pipelines and storage, local distribution systems and natural gas vehicles – will utilize scientifically rigorous field measurements to quantify methane leakage. In addition to many leading companies in the industry, we are working with the University of Texas, Duke University, Harvard University and Boston University.

Characterizing the overall leakage rate from the natural gas and oil sector is critical to understanding the climatic implications of natural gas use relative to other fuels. A recent paper co-authored by EDF scientists underscores this point, proposing an analytical approach that reveals the inherent climatic trade-offs of different policy and investment choices involving natural gas for electricity and transportation. While this important scientific research continues, our nation too must move forward in addressing the emissions, leaks, venting and discharges associated with natural gas extraction.

²³ The values of 25 and 72 are methane's global warming potential (GWP); GWP is a commonly used concept to compare the radiative forcing of GHGs relative to that of CO₂. The Intergovernmental Panel on Climate Change (IPCC) typically uses a 100-year time horizon for the calculation of GWP; but a 20-year horizon is sometimes used.

²⁴ J. Jason West et al., *Global Health Benefits of Mitigating Ozone Pollution with Methane Emission Controls*, 103 PROC. NAT'L ACAD. SCI. 3988, 3989 (2006).

²⁵ EPA, METHANE EMISSIONS, [HTTP://WWW.EPA.GOV/CLIMATECHANGE/GHGEMISSIONS/GASES/CH4.HTML](http://www.epa.gov/climatechange/ghgemissions/gases/ch4.html).

²⁶ PÉTRON, *supra* note 14 at 18.

THE EPA NEW SOURCE PERFORMANCE STANDARDS DEPLOY COMMON SENSE, COST-EFFECTIVE CONTROL TECHNOLOGIES TO REDUCE POLLUTION

EPA's emission standards reduce harmful air toxics, ozone precursors, and methane as a co-benefit using proven, cost-effective control technologies. When fully implemented, EPA estimates that these national emissions standards will achieve significant air pollution reductions each year: 190,000 to 290,000 tons of VOCs; 12,000 to 20,000 tons of air toxics, and 1.0 to 1.7 million short tons of methane (about 19 to 33 million tons of CO₂ equivalent).

The requirement to perform a reduced emission completion or green completion at hydraulically fractured gas wells forms the centerpiece of these EPA clean air measures. After a well is hydraulically fractured, a mixture that includes water, fracturing fluid, proppant (usually sand), and some natural gas returns to the surface. During this well completion event, natural gas that is part of the flowback mixture is emitted directly into the atmosphere or burned in a combustion device. In a reduced emission completion or "green completion," operators utilize separators and traps to capture natural gas that would otherwise be lost. This allows operators to direct the gas to a sales line and ultimately to customers, which provides an offset to the costs associated with compliance. A number of companies are already using this proven, cost-effective technology, and states like Colorado and Wyoming have similar requirements. As of 2015, EPA's clean air measures will ensure that this proven, cost-effective technology is being deployed broadly, ensuring uniform requirements and a level playing field at the approximately 11,400 new and 1,400 re-fractured gas wells across the country.

The national emission standards also include important protections for pneumatic controllers, compressors, storage vessels and equipment leaks, which, in many cases, involve plugging leaks throughout the oil and natural gas system. Capturing this valuable resource is a win-win-win: it reduces pollution, while conserving valuable domestic energy, and, in many cases, saving producers money. Collectively, producers will capture an estimated 43 billion cubic feet of natural gas and 160,000 barrels of condensate in 2015 as a result of EPA's standards,²⁷ which is enough energy to power 645,000 American homes for a year. Fixing these leaks can also pay financial dividends: the standards as a whole will save the industry \$11 million in 2015.²⁸

EPA has also included important provisions to help secure compliance with these national standards. For example, the standards require producers, in their annual compliance report, to "include a signed certification by a senior company official that attests to the truth, accuracy and

²⁷ Pre-publication Final Rule, "Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews" (April 17, 2012) at 239.

²⁸ See *Id.* at 252.

completeness of the report.”²⁹ These protections advance important accountability, helping to provide Americans with confidence that sources are complying with EPA’s clean air protections.

EPA’S EMISSION STANDARDS BUILD FROM A FOUNDATION OF STRONG STATE STANDARDS TO LIMIT POLLUTION FROM OIL AND GAS ACTIVITIES

States with historic natural gas and oil development such as Wyoming and Colorado have long recognized the deleterious effect uncontrolled natural gas and oil emissions can have on air quality and human health. Indeed, many of EPA’s standards build from time-tested clean air requirements that have been in place in Wyoming for over a decade and in Colorado since 2004.

For example, Wyoming first introduced controls for storage vessels with flash emissions in 1998 and has repeatedly strengthened these requirements until their last revision in 2010. In concentrated development areas, Wyoming currently requires 98% control of VOCs from certain storage tanks.³⁰ Similarly, in 2004, Wyoming first required “green completions” in the Upper Green River Basin,³¹ and as of 2010, Wyoming expanded this requirement to all areas of concentrated development.³² Simultaneously the state required the use of low or no-bleed pneumatic devices in all areas of concentrated development.

Similarly, Colorado first introduced requirements to control emissions from condensate tanks in the D.J. Basin in 2004,³³ tightening these controls in 2006 and expanding coverage to include condensate tanks statewide.³⁴ In 2008 the state adopted its own statewide green completion requirement, as well as a requirement that pneumatic devices be low or no-bleed.³⁵ For storage vessels located near public places in the heavily developed Piceance Basin, the state required even greater control.³⁶ These measures, like Wyoming’s, help to form the basis for EPA’s reduced emission completion, pneumatic controller and storage vessel standards.

²⁹ *Id.* at 104.

³⁰ WYOMING DEQ, AIR QUALITY DIVISION, OIL AND GAS PRODUCTION FACILITIES CHAPTER 6, SECTION 2 PERMITTING GUIDANCE at 5 (March 2010 Revision), *available at* <http://deq.state.wy.us/aqd/Oil%20and%20Gas/March%202010%20FINAL%20O&G%20GUIDANCE.pdf>

³¹ WYOMING DEQ, AIR QUALITY DIVISION, JONAH AND PINEDALE ANTICLINE GAS FIELDS, ADDITION TO OIL AND GAS PRODUCTION FACILITY EMISSION CONTROLS AND PERMITTING REQUIREMENTS (July 28, 2004) <http://deq.state.wy.us/aqd/Oil%20and%20Gas/JONAH%20INFILL%20GUIDANCE%20FINAL%207-28-04.pdf>.

³² *See* WYOMING DEQ, *supra* note 30 at 15 (describing green completion requirement in all Concentrated Development Areas).

³³ *See* 5 COLO. CODE REGS., § 1001-9(XIX.G) (2011) (describing 2004 revisions).

³⁴ *Id.* at XIX.I (describing 2006 expansion)

³⁵ COLO. CODE REGS. § 404-1:805(b)(2)(E), (b)(3)(A) (2012).

³⁶ *Id.* § 404-1:805(b)(2)(A)-(D).

Clean Air Measures and Industry Growth

EDF undertook an economic analysis of the natural gas and oil industry in Wyoming and Colorado following the adoption of both states' clean air requirements discussed above.³⁷ The results demonstrate that clean air measures, such as those finalized by EPA, and industry growth can go hand-in-hand. Between 2000 and 2009 Wyoming and Colorado had the highest annual growth rates for gross withdrawals and the highest average annual growth in producing gas wells as compared to other major gas-producing states with less protective measures.³⁸

A recent Baird analysis underscores this point: According to Baird, since the beginning of Colorado's green completion requirement in April 2009, horizontal well permit approvals have increased 126% from 2009 to 2010, and 147% in 2011.³⁹ Wyoming's green completion requirement applicable to all concentrated development areas has been in place since March of 2010, and, according to the same analysis, during that time, Wyoming's has experienced an increase in horizontal drilling approved permits from 81 in 2009, to 290 in 2010, and 746 in 2011.⁴⁰ This represents a 2-year increase of more than 900%.⁴¹

The natural gas industry in both states has continued to experience brisk growth while rigorous clean air standards similar to those finalized by EPA have been in place.

REPRESENTATIVES OF THE PUBLIC HEALTH COMMUNITY AND BUSINESS COMMUNITY COMMENDED EPA'S ACTION

On April 18, 2012, the day EPA released the final oil and natural gas standards, the *National Journal* ran a story with a headline that read, "EPA Finds Rare Sweet Spot on Fracking Rules," stating that EPA's rule "drew praise from both sides of the issue."⁴² Indeed, EPA's cost-effective, common sense national emission standards for oil and natural gas activities were well received by public health associations, environmental organizations, industry groups, and individual companies.

³⁷ Comment, *Sierra Club et al.*, Docket ID EPA-HQ-OAR-2010-0505-4240, at 161-67 (Dec. 1, 2011).

³⁸ *Id.* at 166.

³⁹ BAIRD, *Energy Policy: Upstream, Environmental Unconventional Drilling Quarterly Update* 11 (Mar. 16, 2012) available at <https://baird.bluematrix.com/docs/pdf/70b8e0c5-7762-49ca-be28-3d8b3bcc12ba.pdf?co=Baird&id=jpolson@bloomberg.net&source=mail>.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² Amy Harder, *EPA Finds Rare Sweet Spot on Fracking Rules*, NATIONAL JOURNAL (Apr. 18, 2012), <http://www.nationaljournal.com/member/energy/epa-finds-rare-sweet-spot-on-fracking-rules-20120418>.

Prominent health organizations such as the American Lung Association and the American Thoracic Society commended EPA for promulgating a rule that will have important public health benefits.

- The **American Lung Association** said, “The adoption of these safeguards against air pollution from oil and natural gas production, as required under the Clean Air Act, will help protect the public from life-threatening pollution. Limiting emissions from oil and natural gas production will yield tremendous benefits and significantly reduce adverse health effects.”⁴³
- The **American Thoracic Society**, in commenting on the final rule, stated “[w]e believe these final rules will help improve America’s air quality.”⁴⁴

Some companies have indicated they are already implementing key provisions of the standards precisely because the practices are so cost-effective. In public statements, **Southwestern Energy** emphasized the common sense nature of reduced emission completions: “What we do today with reduced emissions completions in our wells doesn’t cost us any more than just venting the gas into the atmosphere.”⁴⁵

Similarly, **Devon Energy**, which has utilized green completions as its “standard practice” in the Barnett Shale since 2004,⁴⁶ commented that, by utilizing reduced emission completions, “We are capturing value that would otherwise be lost...It does make good economic sense for us.”⁴⁷

Chesapeake Energy, too, already uses reduced emissions completions on “a high percentage of [its] wells.”⁴⁸

Even industry trade groups that had been critical of EPA’s proposed rule have issued constructive statements in response to the final standards.

⁴³ AM. LUNG ASS’N, *Natural Gas and Oil Production Standards Will Protect Health and Reduce Toxic Air Pollution* (Apr. 18, 2012), <http://www.lung.org/press-room/press-releases/natural-gas-and-oil-standards.html>.

⁴⁴ AM. THORACIC SOC’Y, *EPA Issues Final Rules on Oil and Natural Gas Extraction Emissions*, THE WASHINGTON LETTER (Apr. 27, 2012), <http://www.thoracic.org/advocacy/washington-letter/archive/2012/april-27-2012.php>.

⁴⁵ Jim Efstathiou Jr., *Drillers Say Costs Manageable From Pending Gas Emissions Rule*, BLOOMBERG (Apr. 17, 2012), <http://www.bloomberg.com/news/print/2012-04-17/drillers-say-costs-manageable-from-pending-gas-emissions-rule.html>.

⁴⁶ DEVON ENERGY, *Green Completions Now the Standard in Barnett Shale*, <http://www.dvn.com/CorpResp/initiatives/Pages/GreenCompletions.aspx>.

⁴⁷ *Id.*

⁴⁸ *Drillers Say Costs Manageable From Pending Gas Emissions Rule*, *supra* note 45.

- The **American Petroleum Institute's** (API) press release headline read, "EPA made constructive changes in hydraulic fracturing rules," and continued, "EPA has made some improvements in the rules that allow our companies to continue reducing emissions while producing the oil and natural gas our country needs."⁴⁹
- **America's Natural Gas Alliance** (ANGA) noted that "it appears as if EPA accepted some of our comments in response to the proposal."⁵⁰

The cross-cutting support reflects EPA's constructive engagement across the spectrum of interested stakeholders, resulting in a common sense rule that will reduce harmful air pollution, prevent the waste of a valuable domestic resource, and, in many cases, actually save industry money through sales of recovered natural gas.⁵¹

PREVENTING AIR EMISSIONS AND ENSURING CLEAN, HEALTHY AIR QUALITY

EPA's New Source Performance Standards provide for significant pollution reductions that will have substantial public health and environmental benefits. We must build from this important first step to minimize the pollution burdens associated with oil and gas development and in doing so, bolster these public health and environmental protections and ensure we are not wasting valuable domestic energy. This requires a collaborative effort at the federal, state, and local levels, including strengthening EPA's national emission standards, encouraging strong state leadership in providing communities with protections addressing ozone pollution, and industry leadership in ensuring American's have transparent information about the pollution to which they are exposed.

Strengthening Current Standards

In its recommendations, the SEAB Subcommittee supported "adoption of rigorous standards for new and existing sources of methane, air toxics, ozone precursors and other air pollutants from shale gas operations."⁵² As I discussed earlier, EPA's standards make important reductions with respect to air toxics and ozone-forming pollutants from new and modified sources in certain segments of the oil and gas sector. Consistent with the Subcommittee's recommendation, however, more must be done to protect public health and the environment.

⁴⁹ AM. PETROLEUM INST., *EPA Made Constructive Changes in Hydraulic Fracturing Rules, API Says* (Apr. 18, 2012), <http://www.api.org/news-and-media/news/newsitems/2012/apr-2012/epa-made-constructive-changes-in-hydraulic-fracturing-rules.aspx>.

⁵⁰ AM. NAT. GAS ALLIANCE, *ANGA Comments on EPA Air Standards for Oil and Gas Operations* (Apr. 18, 2012), <http://www.anga.us/media-room/press-releases/2012/04/anga-comments-on-epa-air-standards-for-oil-and-gas-operations>.

⁵¹ Technical Support Document, U.S. ENVTL. PROT. AGENCY, Docket ID EPA-HQ-OAR-2010-0505-0045, at 4-16 – 4-18 (Aug. 23, 2011).

⁵² 90-DAY REPORT, *supra* note 2 at 16.

The SEAB Subcommittee recommendations emphasized that emission standards should cover both new and existing sources. While the agency set new-source standards, EPA declined to issue emission guidelines covering existing sources. There are a large number of existing sources, however, and emissions from these sources can be significant. Emissions inventories, like the one compiled by the Western Regional Air Partnership, indicate that five basins in the Intermountain West would account for 259,051 tons of VOC in 2012.⁵³ Many of the standards EPA has proposed for new sources can cost-effectively be applied to reduce these emissions from existing sources. Existing storage tanks, for instance, can be retrofitted with the same technologies that new sources deploy to meet EPA's New Source Performance Standards. EPA has authority to issue emission guidelines for existing sources, and it is critical to do so to address this significant source of harmful pollution.

EPA's standards cover air toxics and ozone-forming pollutants, but the agency explicitly elected not to cover methane. Methane, however, is a potent greenhouse gas, and one of six well-mixed greenhouse gases that EPA found "may reasonably be anticipated both to endanger public health and to endanger public welfare" of current and future generations.⁵⁴ EPA has authority to strengthen its emission standards in this way, and, while the VOC controls in the rule often result in methane reductions as a co-benefit, there are important opportunities for reducing methane leakage that the current rule does not address. Consistent with EPA's science-based Endangerment Finding and SEAB Subcommittee's recommendations, the agency should strengthen the NSPS by ensuring the standards explicitly cover methane emissions.

Finally, the SEAB Subcommittee recommended that emission standards be "rigorous" and cover emission sources across the exploration, production, transportation and distribution sectors.⁵⁵ As such, it is imperative that EPA clarify that well completion protections apply to wells that co-produce oil and natural gas. Shifting market fundamentals are driving rapid development of co-producing wells in liquids-rich plays, and, contemporaneously, a de-emphasis on well development in dry-gas plays, or plays which exclusively or almost exclusively produce natural gas. Companies are pouring extensive capital resources into developing liquids-rich plays. For instance, Chesapeake Energy plans to allocate 85% of its drilling capital expenditures to liquids-rich fields and operate only 24 dry-gas rigs in 2012, a decline of 50 dry-gas rigs from its 2011

⁵³ Western Regional Air Partnership Phase III 2006 and 2012 Activity Emission Estimates for the Denver-Julesburg, Piceance, Uinta, South San Juan, North San Juan, and Wind River Basins, available at http://www.wrapair.org/forums/ogwg/PhaseIII_Inventory.html.

⁵⁴ Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66496-01 (2009) (to be codified at 40 C.F.R. ch. 1).

⁵⁵ 90-DAY REPORT, *supra* note 2 at 16.

average.⁵⁶ Long-term projections indicate that development in these liquids-rich areas will continue to expand rapidly: over the next 20 years, Bakken wells will increase from 5,000, currently, to a projected 48,000,⁵⁷ and in the Eagle Ford, wells are projected to increase from 293 in 2010 to a 4,890 new wells by 2020.⁵⁸ These wells can produce significant amounts of natural gas and associated VOC pollution, and EPA should ensure that the well completion requirements apply to these wells.

Supporting State Action on Air Quality Issues

In its recommendations, the SEAB Subcommittee noted that “[t]he challenges of protecting human health and the environment in light of the anticipated rapid expansion of shale gas production require the joint efforts of federal and state regulators.”⁵⁹ States have led the way in controlling harmful emissions of ozone precursors from the oil and gas sectors and have an opportunity to continue to collaborate with the federal government to ensure timely, impactful reductions of ozone precursors from these sources.

We must ensure that we are adequately monitoring ozone pollution in areas of oil and gas development, and, in ozone non-attainment areas, EPA should provide guidance for states containing an expansive menu of effective controls for reducing precursor emissions from the oil and gas sector. Such guidance can help states addressing ozone non-attainment problems to ensure they are deploying the suite of available emission reduction opportunities. Similarly, in attainment areas, EPA’s Ozone Advance Program provides a framework for collaboration among EPA, states, tribes, and local governments. This program promotes local actions to reduce ozone precursors, ensuring these areas continue to meet the nation’s health-based standards for ground-level ozone. Reductions from the oil and gas sector should be among the key solutions highlighted for states in the Ozone Advance Program.

Ensuring Emissions Transparency

Finally, the SEAB Subcommittee recommended that “companies should be required, as soon as practicable, to measure and disclose air pollution emissions, including greenhouse gases, air toxics, ozone precursors and other pollutants. Such disclosure should ... be reported on a

⁵⁶ CHESAPEAKE ENERGY, *Chesapeake Energy Corporation Updates Its 2012 Operating Plan in Response to Low Natural Gas Prices* (Jan. 23, 2012), <http://www.chk.com/news/articles/pages/1651252.aspx>.

⁵⁷ Clifford Krauss, *In North Dakota, Flames of Wasted Natural Gas Light the Prairie*, THE NEW YORK TIMES (Sept. 26, 2011), <http://www.nytimes.com/2011/09/27/business/energy-environment/in-north-dakota-wasted-natural-gas-flickers-against-the-sky.html?pagewanted=all>.

⁵⁸ AM. NAT. GAS ALLIANCE, *Economic Impact of the Eagle Ford Shale* 8, 21 (Feb. 2011), <http://www.anga.us/media/195472/utsa%20eagle%20ford.pdf>.

⁵⁹ 90-DAY REPORT, *supra* note 2 at 11.

publically accessible website that allows for searching and aggregating by pollutant, company, production activity and geography.”⁶⁰

As part of its greenhouse gas reporting program, EPA is collecting methane emissions data from sources in the oil and natural gas sector. Many measurement methodologies for the sector, however, rely on equations and emission factors, and, for other pollutants like ozone precursors and hazardous air pollutants, no such comprehensive reporting program exists. Measurement and public disclosure of these data is essential to provide policy makers and all Americans with the emissions data that is the foundation for lasting solutions.

CONCLUSION

EPA’s new source performance standards for the oil and gas sector are an important step forward, one that has been commended by a broad variety of interests and is an example of smart, cost-effective regulation. This modernization provides a strong foundation for the additional protections that will be necessary to ameliorate air pollution from the oil and gas sector. The standards also form an important part of what the SEAB Subcommittee considered central to rigorous policy design – a “regulatory system that sets the policy and technical foundation to provide for continuous improvement in protection of human health and the environment.”⁶¹ Thank you for the opportunity to share our views.

⁶⁰ *Id.* at 16.

⁶¹ *Id.* at 11.