

**BEFORE THE ADMINISTRATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

In the Matter of:)
)
Nonattainment Designation for Sublette County,)
Wyoming, for the 8-hour Ozone National Ambient)
Air Quality Standard, 40 CFR § 81.351)
)
_____)

**CITIZEN PETITION TO DESIGNATE THE SUBLETTE COUNTY AREA OF
WYOMING AS NONATTAINMENT FOR THE 8-HOUR OZONE NATIONAL
AMBIENT AIR QUALITY STANDARD**

Ozone air pollution in Sublette County, Wyoming has soared to exceptionally unhealthy levels. Up high, ozone protects us from ultraviolet radiation, but down low, ozone poses myriad adverse health impacts and is the key ingredient of smog.¹ To safeguard public health and welfare, the U.S. Environmental Protection Agency adopted a National Ambient Air Quality Standard in March of 2008 limiting ozone concentrations to no more than 0.075 parts per million over an eight hour period.² Fueled by rising pollution from unprecedented levels of oil and gas drilling, ozone concentrations in Sublette County peaked at 0.122 parts per million in February 2008, with high concentrations of 0.104, 0.102, and 0.101 parts per million also reported earlier this year. These high ozone levels prompted the first-ever health advisories to be issued by the Wyoming Department of Environmental Quality (“DEQ”) over ozone pollution in Sublette County.³

¹ See, Exhibit 1 to this petition, U.S. Environmental Protection Agency, “Health Effects of Ozone in the General Population.” Available online at <http://www.epa.gov/03healthtraining/population.html>.

² See, 73 Fed. Reg. 16436-16514.

³ See, Exhibit 2 to this petition, DEQ ozone advisories issued on February 26, 2008, March 9, 2008, March 10, 2008, March 22, 2008, and March 23, 2008.

These ozone concentrations are significant. The Denver metropolitan region of Colorado, which has long struggled with unhealthy ozone pollution, has not experienced an ozone concentration of 0.122 parts per million for more than ten years.⁴ In 2007, neither Los Angeles, California nor Houston, Texas, two of the most polluted metropolitan areas in the United States, experienced ozone concentrations as high as 0.122 parts per million.⁵ Worse, the latest readings from Sublette County follow a trend of increasingly unhealthy ozone pollution. In 2005 and 2006, ozone concentrations in Sublette County peaked at 0.098 parts per million and 0.093 parts per million, respectively.⁶ Wyoming Governor Dave Freudenthal has stated, “From the data that has been collected, there is little doubt that ozone is a significant concern [in Sublette County].”⁷

To clean up this exceptionally unhealthy air pollution and safeguard public health and welfare, the undersigned residents of Sublette County and organizations, hereby petition the Administrator of the Environmental Protection Agency (“Administrator” or “EPA”)—pursuant to the U.S. Administrative Procedure Act, the Clean Air Act, and the EPA’s Clean Air Act regulations—to designate Sublette County, Wyoming, as well as any nearby area that contributes

⁴ See, Denver monitoring data online at <http://iaspub.epa.gov/airsdata/adaqs.monvals?geotype=st&geocode=CO&geoinfo=st%7ECO%7EColorado&pol=O3&year=2007+2006+2005+2004+2003+2002+2001+2000+1999+1998+1997&fld=monid&fld=siteid&fld=address&fld=city&fld=county&fld=stabbr&fld=regn&rpp=25>.

⁵ See, Los Angeles monitoring data online at <http://iaspub.epa.gov/airsdata/adaqs.monvals?geotype=co&geocode=06037&geoinfo=co%7E06037%7ELos+Angel+es+Co%2C+California&pol=O3&year=2007&fld=monid&fld=siteid&fld=address&fld=city&fld=county&fld=stabbr&fld=regn&rpp=25> and Houston monitoring data online at <http://iaspub.epa.gov/airsdata/adaqs.monvals?geotype=co&geocode=48201&geoinfo=co%7E48201%7EHarris+Co%2C+Texas&pol=O3&year=2007&fld=monid&fld=siteid&fld=address&fld=city&fld=county&fld=stabbr&fld=regn&rpp=25>.

⁶ See, Exhibit 3 to this petition, DEQ, “Pinedale DEQ/DOH Public Meeting,” presentation given April 21, 2008, at unnumbered slide 6.

⁷ See, Exhibit 4 to this petition, Casper Star Tribune, “Ozone: ‘A significant concern,’” (April 12, 2008).

to ozone air pollution in Sublette County, as nonattainment for the eight-hour ozone National Ambient Air Quality Standard.

A nonattainment designation will lead to the development of stronger clean air standards for oil and gas drilling operations—the primary source of ozone forming emissions in Sublette County. **This petition is not about shutting down the oil and gas industry.** A number of cost-effective strategies exist to significantly cut emissions from oil and gas drilling operations, and a nonattainment designation will help spur the adoption of such strategies sooner, rather than later. Most importantly, a nonattainment designation will help spur the clean up of Sublette County's ozone pollution and help keep citizens throughout the region safe and healthy. This petition aims to ensure that oil and gas development is done right. Doing it right means protecting clean air and public health and welfare.

I. PROCEDURAL AUTHORITY TO PETITION THE EPA

We petition the EPA pursuant to the U.S. Administrative Procedures Act.⁸ The Administrative Procedure Act provides citizens the opportunity to bring matters before federal agencies for resolution, and requires that “[e]ach agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule.”⁹

The Administrator of the EPA may notify the Governor of any State that available information indicates that the designation of any area should be revised from attainment to nonattainment—a notification that ultimately requires the EPA to promulgate a revised

⁸ See, 5 USC § 553(e) (rulemaking) and 5 USC § 555(b) (interested persons may present a matter to agencies, agencies required to conclude matter).

⁹ 5 USC § 553(e).

designation within eight months.¹⁰ Based on validated data showing that Sublette County is in violation of the eight-hour ozone National Ambient Air Quality Standard, we request the EPA immediately notify the Governor of Wyoming that the Sublette County area, and any area contributing to ozone air pollution in Sublette County, should be designated as nonattainment.¹¹ We further request that the EPA promulgate a designation of nonattainment under 40 CFR § 81.351 for the Sublette County area, and any area contributing to ozone air pollution in Sublette County, within eight months after notifying the Governor of Wyoming.

The Administrative Procedure Act requires the EPA to resolve the matters raised in this petition within a reasonable timeframe.¹² We request the EPA expedite resolution of this matter by immediately notifying the Governor of Wyoming and within eight months promulgating a nonattainment designation for Sublette County and any area contributing to ozone air pollution in Sublette County. In light of the region's exceptionally high ozone levels and the need to safeguard public health and welfare, this request is more than reasonable.

Given the extraordinarily high ozone levels reported in Sublette County over the past year, together with the health risks associated with elevated ozone, delaying action on this petition will clearly endanger the health and welfare of citizens living in the area. Therefore, should the EPA fail to promulgate a designation of nonattainment for Sublette County, and any area contributing to ozone air pollution in Sublette County, within nine months, we will consider such delay unreasonable. This timeline will provide the EPA with one month to notify the Governor of Wyoming and eight months to promulgate a nonattainment designation.

¹⁰ See, 42 USC § 7407(d)(3).

¹¹ Areas that may contribute to air quality in Sublette County include, but are not limited to, Lincoln County and Sweetwater County, both counties that are adjacent to Sublette County and where sources of air pollution are located.

¹² See, 5 USC § 555(b).

II. THE HEALTH EFFECTS OF OZONE

The Clean Air Act aims to “protect and enhance the quality of the Nation’s air resources.”¹³ To help meet this goal, the Clean Air Act requires the EPA to identify pollutants that “may reasonably be anticipated to endanger public health and welfare” and to establish National Ambient Air Quality Standard for those pollutants.¹⁴ The National Ambient Air Quality Standards are based solely on what is necessary to protect public health and welfare.¹⁵

Ozone has been identified as a pollutant that may reasonably be anticipated to endanger public health and welfare.¹⁶ Ozone forms when sunlight reacts with two key pollutants, nitrogen oxides (“NO_x”), which are released by engines and smokestacks, and volatile organic compounds (“VOCs”), a group of pollutants that evaporate from gas stations, paints, solvents, oil and gas production facilities, and other sources. NO_x and VOCs are referred to as ozone precursors. The main ingredient of smog, ozone can irritate the respiratory system, reduce lung function, aggravate asthma and other respiratory conditions, increase susceptibility to respiratory infections, inflame and damage the lining of lungs, and destroy vegetation. Ozone is particularly harmful to children, those with asthma and other respiratory conditions, seniors, and active

¹³ 42 USC § 7401(b)(1).

¹⁴ *See*, 42 USC § 7408.

¹⁵ *See*, *American Trucking Association v. Whitman*, 531 U.S. 457 (2001).

¹⁶ *See*, 73 Fed. Reg. 16436-16514.

adults.¹⁷ Most recently, the National Academies of Science confirmed the link between ozone pollution and premature death.¹⁸

Recently, the American Lung Association identified the ten most important health studies supporting the need to limit ozone concentrations to protect public health.¹⁹ Those studies and a summary of their findings are as follows:

1. **Koken (2003):** This study tracked summertime cardiovascular hospital admissions of seniors at 11 Denver County hospitals over a four year period. Researchers found that ozone increased the risk of hospitalization even at levels that meet federal air quality standards. Daily average ozone concentrations were 0.025 parts per million, and maximum concentrations were 0.040 parts per million.²⁰
2. **Brunekreef (1994):** The study examined effects of ozone in amateur bicyclists in the Netherlands. Researchers collected lung function measurements before and after summer training sessions or competitive races. Ozone concentrations were low on most occasions, with an average of 0.043 parts per million. These low ozone concentrations were significantly associated with a decline in lung function and an increase in respiratory symptoms, especially shortness of breath. The effect persisted even after removing all observations with hourly ozone concentrations greater than 0.060 parts per million.²¹
3. **Medina-Ramon (2006):** A very large study of Medicare recipients in 36 U.S. cities evaluated the effect of ozone and particulate matter on respiratory hospital admissions in the elderly over a 13-year period. The analysis found that the risk of daily hospital admissions for chronic obstructive pulmonary disease ("COPD") and pneumonia increased with short-term increases in ozone concentrations during the warm season.

¹⁷ See, Exhibit 1.

¹⁸ See, Committee on Estimating Mortality Risk Reduction Benefits from Decreasing Tropospheric Ozone Exposure, National Research Council, "Estimating Mortality Risk Reduction and Economic Benefits from Controlling Ozone Air Pollution," (April 22, 2008). Available online at http://www.nap.edu/catalog.php?record_id=12198.

¹⁹ See, <http://www.cleanairstandards.org/article/2007/08/743>.

²⁰ Koken PJ, Piver WT, Ye F, Elixhauser A, Olsen LM, Portier CJ. 2003. Temperature, air pollution, and hospitalization for cardiovascular diseases among elderly people in Denver. *Environ Health Perspec*; 111: 1312-1317.

²¹ Brunekreef B, Hoek G, Breugelmans O, Leentvaar M. 1994. Respiratory Effects of Low-level Photochemical Air Pollution in Amateur Cyclists. *Am J Respir Crit Care Med*; 150: 962-966.

Eight-hour mean ozone concentrations in the warm season ranged from 0.015 ppm in Honolulu to 0.063 ppm in Los Angeles, with most cities in the 0.040-0.055 ppm range.²²

4. **Dales (2006):** This research study examined 15 years of data on newborns in 11 large Canadian cities to determine the influence of gaseous air pollutants on daily hospitalizations for respiratory causes. Ozone concentrations were extremely low, ranging from a 24-hour mean of 0.013 parts per million in Vancouver to 0.023 parts per million in Saint John. Although hospital admissions for respiratory disease are relatively uncommon in newborns compared with adults, this study found a strong association with ozone. In fact, the study suggests that air pollution at ambient levels seen in Canada could account for 15 percent of hospital admissions in newborns.²³

5. **Naeher (1999):** Scientists examined the relationship between air pollution and daily changes in lung function in about 500 nonsmoking women in Roanoke, Virginia over the summers of 1995-1996. A 0.030 parts per million increment in 24-hour average ozone was associated with a decrease in evening peak expiratory flow. Ozone concentrations in this study were well below the current eight-hour ozone standard. The mean daily maximum 8-hour ozone concentration was 0.054 parts per million, and concentrations never exceeded 0.088 parts per million.²⁴

6. **Brauer (1996):** A study of the effect ozone exposure on lung function of outdoor farm workers was undertaken in British Columbia. The mean work shift concentrations were low, just 0.026 parts per million, with a maximum of 0.054 parts per million. The study found that exposures were associated with decreased lung function over the day, which persisted to the following day. Even after excluding all days when the ozone was greater than 0.040 parts per million, investigators still observed reduced lung function.²⁵

7. **Chan (2005):** This study in Taiwan reported acute lung function decline in mail carriers exposed to ozone concentrations below the current air quality standard. The average eight-hour concentration of ozone in this study was 0.036 parts per million, and the

²² Medina-Ramón M, Zanobetti A, Schwartz J. 2006. The Effect of Ozone and PM₁₀ on Hospital Admissions for Pneumonia and Chronic Obstructive Pulmonary Disease: A National Multicity Study. *American Journal of Epidemiology*; 163: 579-588.

²³ Dales RE, Cakmak S, Doiron MS. 2006. Gaseous Air Pollutants and Hospitalization for Respiratory Disease in the Neonatal Period. *Environ Health Perspect*; 114: 1751-1754.

²⁴ Naeher LP, Holford TR, Beckett WS, Belanger K, Triche EW, Bracken MB, Leaderer BP. 1999. Healthy Women's PEF Variations with Ambient Summer Concentrations of PM₁₀, PM_{2.5}, SO₄²⁻, H⁺, and O₃. *Am J Respir Crit Care Med*; 160: 117-125.

²⁵ Brauer M, Blair J, Vedal S. 1996. Effect of Ambient Ozone Exposure on Lung Function in Farm Workers. *Am J Respir Crit Care Med*; 154: 981-987.

maximum concentration was 0.065 parts per million. Each 0.010 parts per million increase in the eight-hour ozone concentration, decreased the night-time peak expiratory flow rate.²⁶

8. **Mortimer (2002):** The effect of daily ambient air pollution was examined in a cohort of 864 asthmatic children in eight urban areas of the U.S. in a long-term study. Eight-hour average daytime ozone concentrations were 0.048 parts per million, with a range across cities of 0.034 to 0.058 parts per million. Adverse effects were observed in all cities. Summertime ozone at levels below the current air quality standards was significantly related to respiratory symptoms and decreased pulmonary function in children with asthma.²⁷
9. **Bell (2004):** This is a large 14-year study of residents of 95 U.S. cities, in which short-term increases in ozone were found to increase deaths from heart and lung disease. Even when days exceeding 0.060 parts per million were excluded from the analysis, the mortality effect was evident.²⁸
10. **Adams (2002, 2006):** Controlled human exposure studies offer the most compelling evidence of the effects of ozone on lung health. EPA has undertaken a careful reanalysis of the underlying data in the Adams studies to assess the change in lung function following exposure to ozone while exercising. The pre- to post-exposure analysis shows that 6.6 hour exposures to 0.060 parts per million ozone causes a statistically significant decrease in group mean lung function compared to filtered air, in healthy young adults.²⁹

The EPA promulgated an eight-hour ozone National Ambient Air Quality Standard on March 27, 2008, limiting concentrations to no more than 0.075 parts per million over an eight hour period (called the eight-hour ozone National Ambient Air Quality Standard), and this standard became effective on May 28, 2008.³⁰ According to the EPA, the benefits of meeting the

²⁶ Chan C-C, Wu T-H. 2005. Effects of Ambient Ozone Exposure on Mail Carriers' Peak Expiratory Flow Rates. *Environ Health Perspect*; 113: 735-738.

²⁷ Mortimer, KM, Neas LM, Dockery DW, Redline S, Tager IB. 2002. The effect of air pollution on inner-city children with asthma. *Eur Respir J*; 19: 699-705.

²⁸ Bell ML, McDermott A, Zeger SL, Samet JM, Dominici F. 2004. Ozone and short-term mortality in 95 US urban communities, 1987-2000. *JAMA*; 292: 2372-2378.

²⁹ U.S. EPA Memorandum from James S. Brown, EPA, NCEA-RTP Environmental Media Assessment Group, Thru Mary Ross, EPA, NCEA-RTP, EMAG Branch Chief and Ila Cote, EPA, NCEA-RTP, Director, To Ozone NAAQS Review Docket (OAR-2005-0172), The Effects of Ozone on Lung Function at 0.06 ppm in Healthy Adults, June 14, 2007.

³⁰ See, 73 Fed. Reg. 16436-16514.

new standard are enormous. Nationally, the agency estimates that meeting an eight-hour ozone National Ambient Air Quality Standard of 0.075 parts per million will annually prevent:

- 890 heart attacks;
- 1,900 hospital and emergency room visits;
- 11,600 cases of upper and lower respiratory symptoms;
- 6,100 asthma attacks;
- 243,000 days when people miss work and school; and
- 750,000 days when people are required to restrict their activities.

The overall benefit to cost ratio of meeting the eight-hour ozone National Ambient Air Quality Standard may be as high as 2.23:1, in other words for every dollar spent reducing ozone, society will reap as much as \$2.23 in health-related benefits.³¹

While the current eight-hour ozone National Ambient Air Quality Standard limits concentrations to no more than 0.075 parts per million, overwhelming scientific evidence indicates that ozone concentrations as low as 0.060 parts per million are detrimental to human health.

In 2006, the EPA's Clean Air Scientific Advisory Committee completed a comprehensive review of latest scientific information to assess the health effects of ozone and the ability of the previous National Ambient Air Quality Standard to effectively protect public health and

³¹ See, U.S. EPA, "Fact Sheet: Final Revisions to the National Ambient Air Quality Standards for Ozone," (March 18, 2008). Available online at <http://www.epa.gov/groundlevelozone/actions.html>. It is important to note that the EPA's benefit and cost analysis of the eight-hour ozone NAAQS has come under criticism for significantly underestimating benefits. See e.g., OMBWatch report, "Polluted Logic," <http://www.ombwatch.org/regis/PDFs/PollutedLogic.pdf>.

welfare.³² Called the “Air Quality Criteria for Ozone and Related Photochemical Oxidants,” the three volume, 2,118 page document showed that the eight-hour ozone National Ambient Air Quality Standard established in 1997, which limited concentrations to no more than 0.08 parts per million, failed to provide adequate protection. In an October 24, 2006 letter to the EPA Administrator, the Clean Air Scientific Advisory Committee urged the EPA to adopt an eight-hour ozone National Ambient Air Quality Standard of between 0.060 and 0.070 parts per million, stating:

There is no scientific justification for retaining the current primary 8-hr NAAQS [National Ambient Air Quality Standard] of 0.08 parts per million (ppm). The Primary 8-hr NAAQS needs to be substantially reduced to protect human health, particularly in sensitive subpopulations. Therefore, the CASAC [Clean Air Scientific Advisory Committee] unanimously recommends a range of 0.060 to 0.070 ppm for the primary ozone NAAQS.³³

The Clean Air Scientific Advisory Committee reaffirmed their conclusions in a March 26, 2007 letter to the EPA Administrator.³⁴

Since then, many others have urged the EPA to follow the advice and conclusions of the Clean Air Scientific Advisory Committee. In an April 4, 2007 letter to the EPA, over 100 scientists, doctors, and public health professionals urged the adoption of an eight-hour ozone National Ambient Air Quality Standard between 0.060 and 0.070 parts per million.³⁵ In an April

³² See, U.S. EPA. Air Quality Criteria for Ozone and Related Photochemical Oxidants (Final). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-05/004 (March 21, 2006). Available online at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=149923>.

³³ See, Letter to Stephen Johnson, EPA Administrator, from Dr. Rogene Henderson, Chair, Clean Air Scientific Advisory Committee (October 24, 2006). Available online at <http://www.epa.gov/sab/pdf/casac-07-001.pdf>.

³⁴ See, Letter to Stephen Johnson, EPA Administrator, from Dr. Rogene Henderson, Chair, Clean Air Scientific Advisory Committee (March 26, 2007). Available online at <http://www.epa.gov/sab/pdf/casac-07-002.pdf>.

³⁵ See, Letter to Stephen Johnson, EPA Administrator, from Jonathan I. Levy, ScD., et al. (April 4, 2007). Available online at <http://www.cleanairstandards.org/wp-content/uploads/2007/04/final-ozone-scientists-sign-on-letter-4-5-07.doc>.

11, 2007 letter to the EPA Administrator, the EPA's Children's Health Protection Advisory Committee stated:

[I]n order to afford greater protection to children, we strongly recommend setting the proposed [ozone] standard at 0.060 ppm, the lowest value of the range offered by the [EPA] staff paper, and a level which is supported by the scientific literature.³⁶

On April 16, 2007, over 20 public health and environmental groups, including the American Lung Association, American Academy of Pediatrics, American Public Health Association, Asthma and Allergy Foundation of America, and Physicians for Social Responsibility urged the EPA to adopt an ozone National Ambient Air Quality Standard of 0.060 parts per million over an eight-hour period.³⁷ More recently, the American Thoracic Society endorsed a 0.060 parts per million eight-hour ozone National Ambient Air Quality Standard in an editorial printed in the *American Journal of Respiratory and Critical Care Medicine*.³⁸ The Society stated:

Based on the strength of the scientific knowledge base regarding the adverse health effects of ozone air pollution, and the magnitude of public health impact such pollution has on the United States' population, especially on children, the American Thoracic Society has recommended that the EPA take action now to issue a stricter ozone standard of 0.060 ppm [parts per million]/8 hours.

³⁶ See, Letter to Stephen Johnson, EPA Administrator, from Melanie A. Marty, Ph.D., Chair, Children's Health Protection Advisory Committee (April 11, 2007). Available online at [http://yosemite.epa.gov/oehp/ochpweb.nsf/content/3232007.htm/\\$file/3232007.pdf](http://yosemite.epa.gov/oehp/ochpweb.nsf/content/3232007.htm/$file/3232007.pdf).

³⁷ See, Letter to Stephen Johnson, EPA Administrator, from American Lung Association, et al. (April 16, 2007). Available online at <http://www.cleanairstandards.org/wp-content/uploads/2007/04/ltr-from-public-health-environmental-groups-on-ozone-naaqs-04-16-07.pdf>.

³⁸ See, Pinkerton K.E., J.R. Balmes, M.V. Fanucchi, and W.N. Rorn, "Ozone, a malady for all ages," *American Journal of Respiratory and Critical Care Medicine*, Volume 176, 107-108 (July 2007). Available online at http://www.med.nyu.edu/medicine/research/0706_rom.htm.

III. UNHEALTHY OZONE POLLUTION IN SUBLETTE COUNTY

Available information shows that the Sublette County is in violation of the current eight-hour ozone National Ambient Air Quality Standard, raising serious and troubling health concerns. A violation of the eight-hour ozone occurs whenever the three year average of the fourth highest ozone concentration exceeds 0.075 parts per million at a particular monitor.³⁹ Based on validated data from the DEQ, the three year average of the fourth highest ozone concentration is now 0.080 parts per million at the Boulder monitor in Sublette County.⁴⁰ *See*, Table 1 below. **Thus, Sublette County, Wyoming is officially in violation of the eight-hour ozone NAAQS.** Any area that does not meet the National Ambient Air Quality Standard, or that contributes to air quality in an area that does not meet the National Ambient Air Quality Standard, should be designated nonattainment.⁴¹

Table 1. Fourth highest ozone concentrations measured at Boulder, Wyoming ozone monitor, 2006-2008 (data from DEQ).

Monitor	2006	2007	2008	Average
Boulder	0.072	0.067	0.101	0.080

Recently gathered information shows that people in Sublette County are indeed being exposed to unhealthy levels of ozone. A group of concerned Sublette County citizens recently initiated a badge-based measurement project to estimate potential ozone exposure. Individuals wore ozone sensitive badges on several days in April and May of 2008. The badges roughly

³⁹ *See*, 73 Fed. Reg. 16512.

⁴⁰ *See*, Exhibit 5 to this petition, ozone monitoring data spreadsheet from DEQ.

⁴¹ *See*, 42 USC § 7407(d)(1)(A)(i).

indicated peak hourly ozone concentrations. The data show that individuals in Sublette County have likely been exposed to hourly ozone concentrations above 0.075 parts per million.⁴² In fact, the badge data indicates that people may have been exposed to hourly ozone concentrations as high as 105 parts per billion. The badge data underscores concerns that high ozone levels in Sublette County are endangering public health.

IV. THE CAUSE OF SUBLETTE COUNTY'S OZONE POLLUTION

Ozone basically requires two ingredients to form: sunlight, or ultraviolet radiation, and air pollutants, primarily the ozone precursors NO_x and VOCs. In general, increasing emissions of NO_x and VOCs are reacting with ultraviolet radiation, which is often intensified by wintertime snow cover, to make ozone pollution in Sublette County. As the DEQ has concluded, "Temperature inversion, still air, snow cover, sunshine, and ozone precursors" combine together to "produce elevated ozone."⁴³

While meteorology cannot be controlled, emissions of ozone precursors can be controlled. In Sublette County, the most significant source of the ozone precursors NO_x and VOCs is oil and gas development, which is releasing more air pollution than ever before. Indeed, the level of oil and gas development in Sublette County is unprecedented. According to data with the Wyoming Oil and Gas Conservation Commission, the number of producing oil and gas wells in Sublette County has increased by nearly 200% since 2000.⁴⁴ See, Table 2 below. As of the end of 2007, there were 3,436 producing oil and gas wells in Sublette County.

⁴² See, Exhibit 6 to this petition. The data shows the maximum hourly ozone concentration, in parts per billion, that individuals may have been exposed to.

⁴³ See, Exhibit 3 at unnumbered slide 17.

⁴⁴ According to Wyoming Oil and Gas Conservation Commission statistics for the years 2000-2007. Available online at http://wogcc.state.wy.us/cfdocs/2007_stats.htm.

Furthermore, just since January 1, 2008, more than 500 drilling permits in Sublette County have been issued by the Wyoming Oil and Gas Conservation Commission.⁴⁵

Table 2. Number of producing oil and gas wells in Sublette County, 2000-2007
(data from Wyoming Oil and Gas Conservation Commission).

2000	2001	2002	2003	2004	2005	2006	2007	Increase
1,733	1,930	2,114	2,306	2,339	2,625	3,035	3,436	1,703 (~200%)

A number of sources of NO_x and VOCs are associated with oil and gas development. NO_x is a byproduct of combustion; key sources include drill rig engines, natural gas compressor engines, truck traffic, flaring, and heaters/boilers. *See*, Figure 1 below. Emission estimates prepared by the Bureau of Land Management for the Pinedale Resource Area, which encompasses Sublette County and parts of nearby Lincoln County, show that oil and gas operations annually release more than 7,718 tons of NO_x annually, which is 97% of all the NO_x released by all sources of air pollution.⁴⁶ Ten years ago in 1998, total NO_x emissions from all sources in Sublette County totaled only 2,516 tons annually.⁴⁷

⁴⁵ According to Wyoming Oil and Gas Conservation Commission statistics on drilling permits. Available online at <http://wogcc.state.wy.us/RepByCountyApdY.cfm?&RequestTimeOut=500>.

⁴⁶ *See*, Exhibit 7 to this petition, Bureau of Land Management, "Appendix 19: Air Quality Technical Support Document," prepared for the Pinedale Resource Management Plan Draft Environmental Impact Statement, at A19-23. Available online at http://www.blm.gov/rmp/wy/pinedale/documents/DEISFiles/Appendices/Appendix19_Air_Quality_TSD.pdf.

⁴⁷ According to EPA emission inventory data. *See*, <http://iaspub.epa.gov/airsdata/adnet.tier?geotype=co&geocode=56035&geoinfo=co%7E56035%7ESublette+Co%2C+Wvoming&pol=NOX&year=1998&fld=state&fld=county&fld=tier1&rpp=25>.

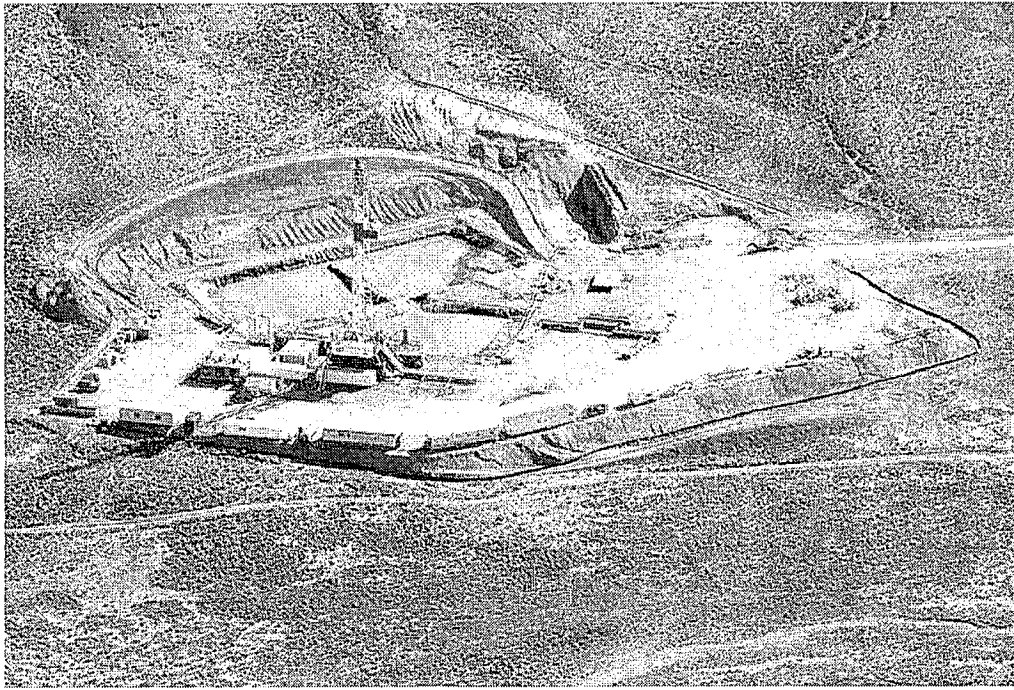


Figure 1. Drilling pad in Sublette County (photo by Ecoflight courtesy of SkyTruth). Sources of NO_x include the diesel-fired drill rig engine, which operates the drill itself, as well as pumps and generators associated with hydraulic fracturing operations, and heavy truck traffic to and from the drilling pad.

As NO_x emissions have increased, ambient concentrations of NO_x also appear to have increased in Sublette County. Monitoring of ambient concentrations of NO_x measured as nitrogen dioxide, or NO₂, shows that since 2004, peak hourly concentrations of NO₂ have climbed at monitors in Jonah (40 miles northwest of Farson), near Boulder, and near Daniel over a three-year period.⁴⁸ See, Figure 2 below. At the Jonah monitor, peak NO₂ concentrations have increased from 0.051 to as high as 0.148 parts per million over the four year monitoring period. Current National Ambient Air Quality Standards for NO₂ limit concentrations to no more than

⁴⁸ See, EPA monitoring data. Available online at <http://iaspub.epa.gov/airsdata/adags.monvals?geotype=co&geocode=56035&geoinfo=co%7E56035%7ESublette+Co%2C+Wyoming&pol=NO2&year=2007+2006+2005+2004+2003+2002+2001+2000+1999+1998+1997&fld=monid&fld=siteid&fld=address&fld=city&fld=county&fld=stabbr&fld=regn&rpp=25>.

0.053 parts per million on an annual basis.⁴⁹ Although Sublette County has not violated the National Ambient Air Quality Standards for NO₂, there is a concern that rising ambient concentrations, fueled by increases in NO_x emissions from oil and gas development, are contributing to the region's ozone pollution.

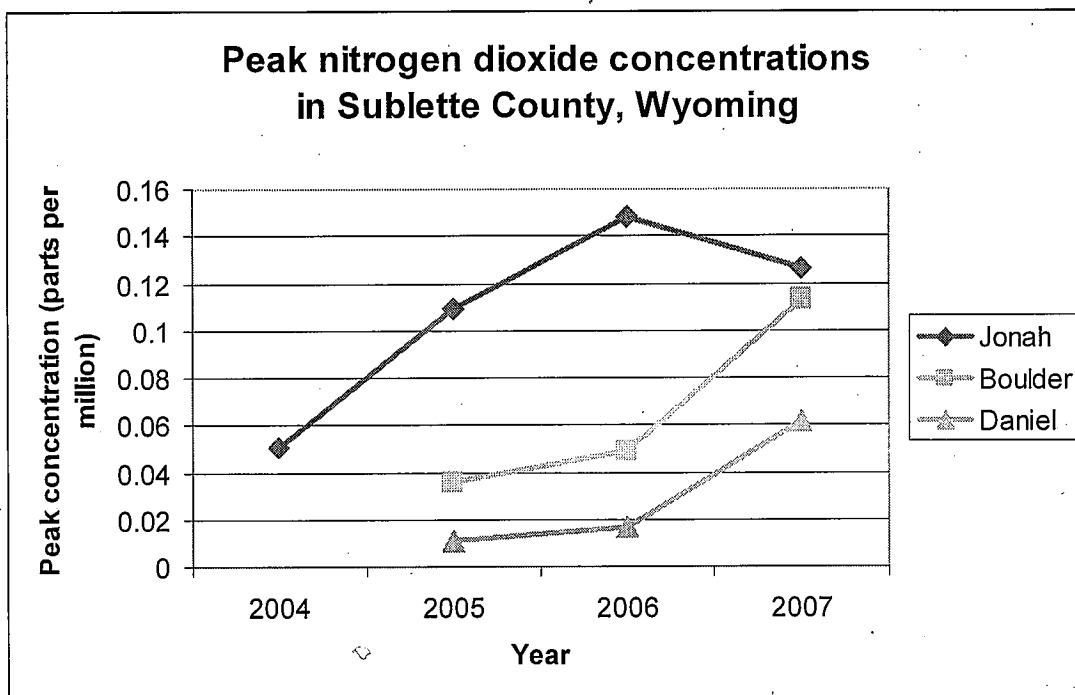


Figure 2. Peak NO₂ concentrations measured at monitors in Sublette County, Wyoming (data from EPA).

VOCs are a component of the oil and natural gas produced in Sublette County and either vented into the air or flared. Key sources of VOCs include condensate storage tanks, evaporation pits, disposal pits, reserve pits, pigging (i.e., pipeline cleaning), leaking equipment, well completion venting, well blowdown venting, gas-actuated pneumatic controllers, and glycol dehydrators. *See e.g.*, Figure 3 below. In major oil and gas producing regions, such as Sublette County, oil and gas sources can be the primary source of VOC emissions. In the Denver

⁴⁹ *See*, 40 CFR § 50.11. The standard is measured based on the average hourly concentration over a year.

metropolitan region of Colorado for example, oil and gas sources release nearly 40% of all VOCs, while mobile sources—including cars and trucks—release nearly 24%.⁵⁰ The region north of the City of Denver is experiencing a similar increase in oil and gas production and associated emissions. Emission estimates prepared by the Bureau of Land Management for the Pinedale Resource Area show that oil and gas operations release more than 13,418 tons of VOCs annually, which is 99% of all the VOCs released by all sources of air pollution.⁵¹ Ten years ago in 1998, total VOC emissions from all sources in Sublette County totaled only 2,309 tons annually.⁵²

⁵⁰ See, Colorado Department of Public Health and Environment, “2006 Base Case Inventory Update and 2010 Base Case Inventory,” presentation given April 10, 2008. Available online at <http://www.ozoneaware.org/documents/2006BaseCaseInventoryUpdateand2010Base.pdf>.

⁵¹ See, Exhibit 7 at A19-23.

⁵² According to EPA emission inventory data. See, <http://iaspub.epa.gov/airdata/adnet.tier?geotype=co&geocode=56035&geoinfo=co%7E56035%7ESublette+Co%2C+Wyoming&pol=VOC&year=1998&fld=state&fld=county&fld=tier1&rpp=25>.

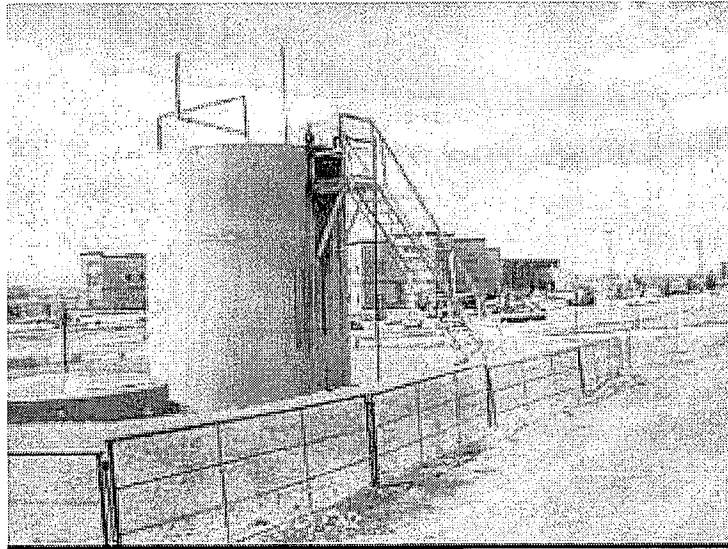


Figure 3. Condensate tanks, which store volatile liquid petroleum produced with natural gas, can be a significant source of VOCs. Emissions are invisible to the naked eye, but can be observed with the use of infrared technology. The picture above is a condensate tank in Weld County, Colorado. Below is the same tank with VOC emissions visible through an infrared camera (images from video prepared by the U.S. Environmental Protection Agency).



The DEQ has undertaken some monitoring of ambient VOC concentrations in Sublette County and the results are striking. Sampling of air quality at monitors near Jonah (40 miles northwest of Farson), near Boulder, and near Daniel in 2007 and 2008 identified a number of

VOCs, including many that are known to be hazardous to human health, such as formaldehyde and toluene.⁵³ Significantly though, the most abundant VOCs detected included propane, n-butane, ethane, and i-butane, described as “Typical gas field VOCs” by the Bureau of Land Management.⁵⁴ These results indicate that increasing VOC emissions from oil and gas development in Sublette County are leading to increased concentrations of VOCs in the ambient air, in turn contributing to the region’s ozone pollution.

While oil and gas development is currently the largest source of NO_x and VOCs in Sublette County, the impact will continue to grow. According to Bureau of Land Management emission estimates, by 2021 oil and gas development will release 23,164 tons of NO_x and 50,365 tons of VOCs annually in the Pinedale Resource Area under the agency’s preferred management of the Pinedale Resource Area.⁵⁵ See, Table 3 below. The amount of NO_x projected to be released by oil and gas development in 2021 would equal the amount released by more than 1.2 million cars.⁵⁶ The amount of VOCs projected to be released by oil and gas development in 2021 would be more than 16 times the amount released by the Sinclair oil refinery near Rawlins, Wyoming, which is the largest single source of VOCs in the state.⁵⁷

⁵³ See, Exhibit 3 at unnumbered slide 14. Both formaldehyde and toluene are classified as “hazardous air pollutants” because of their severe effects to human health.

⁵⁴ See, http://www.wy.blm.gov/jonah_office/monitoring/AirQuality2008.pdf.

⁵⁵ See, Exhibit 7 at A19-22—A19-26.

⁵⁶ According to the EPA, a standard car releases 38.2 pounds of NO_x annually. See, <http://www.epa.gov/otaq/consumer/f00013.htm>.

⁵⁷ According to EPA emission inventory data. See, http://iaspub.epa.gov/airsdata/adnet.ranking?geotype=st&geocode=WY&geoinfo=st%7EWY%7E Wyoming&pol=VOC&year=1999&fld=percent&fld=pl_name&fld=addr&fld=county&fld=state&fld=sic&rpp=25.

Table 3. Current and projected NOx and VOC emissions from oil and gas development in the Pinedale Resource Area under the Bureau of Land Management's Preferred Alternative.⁵⁸

Year	NOx (tons/year)	VOC (tons/year)
2001	7,718	13,418
2011	15,076	31,421
2021	23,164	50,365
% Increase between 2001 and 2021	>300%	>375%

Although the DEQ requires certain sources of air pollution related to oil and gas development to control emissions using the best available control technology, this requirement has not been sufficient to actually reduce emissions of VOCs and NO_x. For instance, while new and modified condensate tanks must reduce VOC emissions by 98%, this requirement continues to allow VOC emissions to increase overall from condensate tanks in Sublette County. Furthermore, a number of sources of air pollution related to oil and gas development have not been required to reduce emissions using the best available control technology, such as leaking equipment and drill rig engines. Increasing air pollution from oil and gas development, coupled with inadequate air quality safeguards, is truly the root of Sublette County's unhealthy ozone pollution.

V. THE NEED FOR A NONATTAINMENT DESIGNATION

As explained earlier, if available information shows that the designation of any area should be revised from attainment to nonattainment, the Administrator of the EPA may publicly notify the Governor of any State that such revision should be made. Based on the fact that

⁵⁸ See, Exhibit 7.

available information shows that Sublette County is in violation of the eight-hour ozone National Ambient Air Quality Standard, the Administrator of the EPA has the authority to immediately notify the Governor of Wyoming that the Sublette County area, and any area contributing to ozone air pollution in Sublette County, should be designated as nonattainment.⁵⁹ Furthermore, upon making such notification, the Administrator of the EPA will have the authority to promulgate a designation of nonattainment under 40 CFR § 81.351 for the Sublette County area, and any area contributing to ozone air pollution in Sublette County, within eight months.

We therefore request that the Administrator of the EPA act on the available data and ultimately designate Sublette County, and any area that contributes to ozone air pollution in Sublette County, as nonattainment for the eight-hour ozone National Ambient Air Quality Standard.

When the Sublette County area is designated as nonattainment for the eight-hour ozone National Ambient Air Quality Standard, the Clean Air Act requires that a clean up plan be developed and implemented by the DEQ, with approval from the Wyoming Environmental Quality Council. Among other things, a clean up plan would be required to:

- Provide for the implementation of all reasonably available ozone control measures as expeditiously as practicable;
- Require reasonable further progress toward attainment of the eight-hour ozone National Ambient Air Quality Standards;
- Include a comprehensive, accurate, current inventory of actual ozone precursor emissions from all sources in the nonattainment areas;
- Identify and quantify the emissions of ozone that will be allowed from the construction and operation of major new or modified stationary sources of pollution;

⁵⁹ Areas that may contribute to air quality in Sublette County include, but are not limited to, Lincoln County and Sweetwater County, both counties that are adjacent to Sublette County and where sources of air pollution are located.

- Require lowest achievable emission rates for NO_x and VOCs from new and modified major stationary sources;
- Require that new and modified major stationary sources offset emissions to achieve overall reductions;
- Include enforceable ozone emission limits and other measures that may be necessary to provide for attainment; and
- Ensure that the Sublette County area is cleaned up by a date certain.⁶⁰

As a practical matter, any ozone clean up plan for the Sublette County area should primarily, if not entirely, focus on reducing emissions of VOCs and NO_x from existing and future oil and gas development. Fortunately, a number of cost-effective strategies exist to achieve this very goal.

For example, the DEQ could adopt air quality safeguards that ensure oil and gas operators in Sublette County reduce VOC emissions from leaking equipment. Often referred to as a Directed Inspection and Maintenance program, leak detection and repair is already being used by certain operators in Sublette County, including EnCana Oil and Gas.⁶¹ Such a program would utilize infrared cameras to detect leaks and wellheads and other facilities and repair them to prevent VOC emissions. Because reducing leaks means more valuable gases—such as methane, propane, and butane—remain in the gathering system to be sold, oil and gas operators can actually make money through a Directed Inspection and Maintenance Program. EnCana Oil and Gas estimates the company will make \$5.30 million by implementing a Directed Inspection and Maintenance Program.

⁶⁰ See, 42 USC §§ 7502 and 7503.

⁶¹ See, Exhibit 8 to this petition, EnCana Oil and Gas, “Directed Inspection and Maintenance Program Overview,” presented May 1, 2008. Available online at <http://www.epa.gov/gasstar/workshops/rockspringsmay2008/rocksprings4.pdf>.

Similarly, existing condensate tanks that are not required to utilize the best available control technology could be retrofitted with vapor recovery units. As their name suggests, vapor recover units can recover emissions from condensate tanks. In doing so, vapor recovery units recover valuable gases in the system to be sold, while at the same time preventing harmful VOC emissions out of the air. Because vapor recovery units recover gases of value, they can also be profitable means of reducing VOC emissions. EnCana Oil and Gas reports a 170% return on investment from the use of vapor recovery units in Wyoming.⁶²

With regards to NO_x emissions, cost-effective strategies include retrofitting drill rig engines with selective catalytic controls. Selective catalytic reduction is similar to a catalytic converter that comes standard on automobiles and can reduce NO_x emissions by 90% or more. Reports indicate that selective catalytic reduction on a diesel-fired drill rig engine can cost between \$3,109-\$7,709 per ton of NO_x reduced.⁶³ While this may appear costly, states and the EPA have indicated that diesel engine retrofit programs are considered cost-effective at thresholds of up to \$13,000 per ton of NO_x reduced.⁶⁴ Thus, retrofitting diesel-fired drill rig engines with selective catalytic reduction controls appears to be a very cost-effective strategy to reduce NO_x emissions in Sublette County.

Finally, oil and gas operators could construct more centralized gathering systems and processing facilities, including produced water processing plants. Some operators, including

⁶² See, Exhibit 9 to this petition, EnCana Oil and Gas, "Vapor Recovery," presented May 1, 2008. Available online at <http://www.epa.gov/gasstar/workshops/rockspringsmay2008/rocksprings6.pdf>.

⁶³ See, Bar-Ilan, A., R. Friesen, A. Pollack, and A. Hoats, "WRAP Area Source Emissions Inventory Projections and Control Strategy Evaluation, Phase II," Final Report Prepared for Western Governor's Association (September 2007) at 4-27—4-28. Available online at [http://www.wrapair.org/forums/ssjf/documents/eiccts/OilGas/2007-10_Phase_II_O&G_Final\)Report\(v10-07%20rev.s\).pdf](http://www.wrapair.org/forums/ssjf/documents/eiccts/OilGas/2007-10_Phase_II_O&G_Final)Report(v10-07%20rev.s).pdf).

⁶⁴ See, Texas Commission on Environmental Quality, "Texas Emission Reduction Plan," at unnumbered slide 10. Available online at <http://www.epa.gov/oar/caaac/pdfs/TERP-06-04.pdf>.

Questar, are already piping condensate directly to refineries, in turn eliminating the need for condensate tanks and the need for trucks to unload condensate tanks. Questar reports that its liquids gathering system has eliminated over 35,600 truck trips, eliminated all liquid storage tanks, significantly lowered NO_x emissions, and significantly lowered VOC emissions.⁶⁵

These are a just a few of the many available solutions to clean up unhealthy ozone pollution in the Sublette County area. As the EPA moves to designate the Sublette County area as nonattainment and the DEQ moves to develop and implement a clean up plan, cost-effective emission reduction strategies must be a keystone. For companies like EnCana Oil and Gas and Questar, which are already utilizing many cost-effective emission reduction practices, the impact will be minimal. However, for companies that have yet to adopt cost-effective practices to reduce emissions, such a plan will ensure that such practices become standard, rather than the exception. With the health and welfare of today's and future generations at stake, this is more than reasonable for citizens to expect and to request.

VI. THE PINEDALE ANTICLINE: CASE IN POINT

The need for a nonattainment designation for Sublette County is underscored by the Bureau of Land Management's recent proposal to allow up to 4,399 additional oil and gas wells to be drilled in the Pinedale Anticline Project Area of Sublette County. This project alone would represent a more than 100% increase in the number of oil and gas wells in Sublette County.

In comment on the Bureau of Land Management's Revised Draft Supplemental Environmental Impact Statement for the proposed drilling, EPA Region 8 roundly criticized the failure of the Bureau of Land Management to protect air quality and keep ozone concentrations in check. In a February 14, 2008 letter, the Regional Administrator commented:

⁶⁵ See, <http://www.pinedaleonline.com/#questar>.

With predicted ozone concentrations approaching the current standard and an underestimation bias in the model, EPA is concerned about the potential environmental and health impacts associated with the projected 0.0782 and 0.0765 ppm [parts per million] ozone concentrations. This concern is further substantiated by the elevated ozone concentrations above the current 0.08 ppm standard recorded at ambient air monitoring stations near the PAPA [Pinedale Anticline Project Area] in 2005 and 2006. In addition, natural gas development and production under the Preferred Alternative is anticipated to continue until 2065.

In view of the ozone levels monitored, modeled and predicted, EPA recommends that an air quality mitigation strategy be developed to address these potentially significant air quality and health impacts.⁶⁶

At the time, the EPA was concerned about future development jeopardizing the older, weaker ozone standard of 0.08 parts per million. With the eight-hour ozone National Ambient Air Quality Standard now set at 0.075 parts per million, the agency's concerns ring with an even greater urgency. As the EPA itself has noted, there is a need to adopt a more thorough and effective "air quality mitigation strategy" for Sublette County. A nonattainment designation will help to make such a strategy become a reality sooner, rather than later.

CONCLUSION

This petition simply asks that the Administrator act to safeguard public health and welfare in the Sublette County area of Wyoming. On the basis of available data showing that Sublette County is in violation of the eight-hour ozone National Ambient Air Quality Standard, we request the Administrator immediately notify the Governor of Wyoming that Sublette County, and any area contributing to ozone air pollution in Sublette County, be designated as nonattainment, and to ultimately promulgate a designation of nonattainment within eight months

⁶⁶ See, Exhibit 10 attached to this petition, Letter to Robert A. Bennett, State Director, Wyoming Bureau of Land Management from Robbie Roberts, Regional Administrator, EPA Region VIII (February 14, 2008). Available online at <http://www.epa.gov/region8/compliance/nepa/nepadocs/FinalEPACommentsOnPinedaleAnticline14Feb08.pdf>.

of notifying the Governor. With the health of Sublette County residents and visitors on the line, it is imperative that we move quickly to provide the tools needed to clean up the region's unhealthy ozone pollution. A nonattainment designation will help to provide the very tools needed to safeguard public health and welfare, and to keep Sublette County free of harmful ozone.

Dated this 14th day of June, 2008

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TABLE OF EXHIBITS

1. U.S. Environmental Protection Agency, "Health Effects of Ozone in the General Population."
2. DEQ, "Air Pollution Advisory in Sublette County," (February 26, 2008); DEQ, "Ozone Advisory in Sublette County," (March 9, 2008); DEQ, "Ozone Advisory in Sublette County," (March 10, 2008); DEQ, "Ozone Advisory in Sublette County," (March 22, 2008); and DEQ, "Ozone Advisory in Sublette County," (March 23, 2008).
3. DEQ, "Pinedale DEQ/DOH Public Meeting," presentation given April 21, 2008.
4. Casper Star Tribune, "Ozone: 'A significant concern'," (April 12, 2008).
5. Ozone monitoring data spreadsheet from DEQ.
6. Spreadsheet showing potential daily maximum eight-hour ozone exposure for several Sublette County residents.
7. Bureau of Land Management, "Appendix 19: Air Quality Technical Support Document," prepared for the Pinedale Resource Management Plan Draft Environmental Impact Statement.
8. EnCana Oil and Gas, "Directed Inspection and Maintenance Program Overview," presented May 1, 2008.
9. EnCana Oil and Gas, "Vapor Recovery," presented May 1, 2008.
10. Letter to Robert A. Bennett, State Director, Wyoming Bureau of Land Management from Robbie Roberts, Regional Administrator, EPA Region VIII (February 14, 2008).