

**PUBLIC COMMENTS ON OIL
AND GAS DEVELOPMENT,
RECEIVED BY BOULDER
COUNTY IN 2016**

From: [STEWART GUTHRIE](#)
To: [Boulder County Board of Commissioners](#)
Subject: Response to Colorado Supreme Court
Date: Tuesday, May 03, 2016 8:48:55 AM

Dear Commissioners Domenico, Gardner and Jones,

Thank you for your quick response to the Colorado Supreme Court's support of oil and gas over residents and for your clear support of residents instead.

Please continue that support, which is more crucial than ever and which is increasingly justified by evidence of harm from fracking (e.g., [Study: US oil field source of global uptick in air pollution | US News](#)), by all means possible.

Temporary profit for a few does not justify permanent injury to many.

Sincerely,
Stewart Guthrie
Heatherwood

From: [Kimberley Rivero](#)
To: [Boulder County Board of Commissioners](#)
Subject: Thank you for your position on fracking
Date: Tuesday, May 03, 2016 12:25:04 PM

As a resident of Heatherwood, in Gunbarrel, I want to thank all of you for your position against fracking.

Thanks, Kim

~~~~~  
Kimberley Rivero  
Cell: 720.341.2869  
~~~~~

From: frances.tinsley@yahoo.com
To: [Boulder County Board of Commissioners](#)
Subject: Thank you.
Date: Tuesday, May 03, 2016 1:02:03 PM

TO WHOM IT MAY CONCERN,

My husband, family and I wanted to thank you for your position against fracking in Boulder County.

We saved for a long time to purchase our home and we do not want our property value to drop because of oil and gas companies.

Best,

Frances & Ben Tinsley

From: [Barbara Lewis](#)
To: [Boulder County Board of Commissioners](#)
Subject: Fracking
Date: Tuesday, May 03, 2016 1:13:51 PM

Please do all you can to prevent fracking in Boulder County. As a life-long resident of the Heatherwood sub-division I would hate to see the Open Space areas contaminated with fracking operations. Boulder city and county has some of the most beautiful scenery anywhere. Don't let our way of life and surrounding Open Space be compromised.

Thank you for your efforts against fracking.

Sincerely,

Barb Lewis

4781 Heatherwood Ct.

Boulder, CO 80301

From: [Mark Perkins](#)
To: [Boulder County Board of Commissioners](#)
Subject: Fracking and Heatherwood
Date: Tuesday, May 03, 2016 1:48:36 PM

Hello,

I want to first thank you for your position and actions against fracking in Boulder. This destructive and invasion practice is not in line with Boulder values and desires.

Can you please expand on the implications of the recent CO Supreme Court decision around fracking? How will this impact our ability to remove this threat?

Thank you in advance!

--

Regards,
Mark Perkins
maperki@comcast.net
720-635-9599
<https://www.linkedin.com/in/maperki>

From: [Ben Tinsley](#)
To: [Boulder County Board of Commissioners](#)
Subject: fracking stance
Date: Tuesday, May 03, 2016 1:54:01 PM

Hi,

My name is Ben Tinsley and I live in Gunbarrel. I wanted to thank you for your continued stance against the oil industry in favor of community and public health.

I am very concerned about the potential for fracking in my community now that the Colorado Supreme Court has overturned local communities right to banning fracking, so how can I help? I know that the decision was a blow to citizens' rights and my help may be futile, but I have become more impassioned to be involved so I don't risk losing Boulder to a harmful industry.

best,
Ben

From: [Valerie](#)
To: [Boulder County Board of Commissioners](#)
Subject: fracking
Date: Wednesday, May 04, 2016 9:26:59 PM

Hello County Commissioners,

Thank you for voicing concerns against fracking. I live in Heatherwood and am quite alarmed at the possibility of fracking near our homes. What actions can be taken to stop the greed and destructive possibilities of corporations from hurting our homes, health, and well being?

Thank you

Valerie Lorig, Psychotherapist, M.Ed., LPC
Naropa University, Contemplative Psychology
www.auspiciouscoincidencecounseling.com

The basic work of health professionals in general, and of psychotherapists in particular, is to become full human beings and to inspire full human-beingness in other people... When we say full human being here, we mean a person who not only eats, sleeps, walks, and talks, but someone who also experiences a basic state of wakefulness. ~ Chöygam Trungpa

From: [jamie.suits](#)
To: [Boulder County Board of Commissioners](#)
Subject: Fracking near Heatherwood
Date: Thursday, May 05, 2016 9:33:50 AM

Thank you for your previous (and, I hope, current) stance on fracking. I hope, if there's any way, you can do your best to prevent fracking near Heatherwood.
If there's anything I can do/say/write to help keep fracking away from Boulder County, please let me know.
Thanks,
Jamie Suits

From: [STEWART GUTHRIE](#)
To: [Boulder County Board of Commissioners](#)
Cc: [heatherwood_CO@yahoogroups.com](#); [Nextdoor Heatherwood](#)
Subject: Fwd: PSR Monitor: PSR Calls for Ban on Fracking
Date: Tuesday, May 24, 2016 1:54:51 PM

Dear Commissioners Domenico, Gardner and Jones,

As you consider your further responses to the Colorado Supreme Court decision affirming the "right" of oil and gas companies to frack Boulder County cities (and of course, Boulder County as a whole) , please take into account the this position paper ("PSR Calls for Ban on Fracking") released today by Physicians for Social Responsibility.

The paper is strong and--perhaps needless to say--persuasive. It seems correct in every particular, including even its moderation.

Thank you,
Stewart Guthrie and Phyllis Kaplan
Heatherwood

----- Forwarded message -----

From: **Physicians for Social Responsibility** <psrnatl@psr.org>
Date: Tue, May 24, 2016 at 3:28 PM
Subject: PSR Monitor: PSR Calls for Ban on Fracking
To: guthrie@fordham.edu

If you are unable to view the message below, please [click here](#)

**PSR[®]** **PHYSICIANS
FOR SOCIAL
RESPONSIBILITY[®]***monitor*

May 24, 2016

ENVIRONMENT & HEALTH

PSR Calls for Ban on Fracking



PSR's national board of directors

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In This Issue

[PSR Calls for Ban on Fracking](#)

[New Methane Standards: A Good First Step](#)

[Gates Foundation Sells Fossil Fuel Stocks](#)

[President Obama's Historic Visit to](#)

voted on May 14 to call for a ban on hydraulic fracturing (fracking). The newly adopted position cites the extensive leaks of methane, a powerful accelerator of climate change, as a significant cause for concern. It also acknowledges that a transition is needed to end fracking and calls on the gas and oil industries to shoulder responsibility for, among other things, water testing, public disclosure on chemicals used, and the costs of managing health-threatening practices. The position replaces PSR's earlier position calling for a moratorium. [Read the new position here »](#)

New Methane Standards: A Good First Step



The Environmental Protection Agency (EPA) recently released the first nationwide standards curbing dangerous methane pollution from proposed, not yet constructed, sources in the oil and natural gas industry. The rule is an important first step in minimizing leaks of methane, a powerful driver of climate change, and hazardous air pollutants, which are damaging to human health. Thousands of PSR members submitted comments to EPA calling on them to [strengthen the new standards](#). Now we continue to advocate so that similar safeguards are extended to *existing* wells and infrastructure. [Take Action »](#)

Gates Foundation Sells Fossil Fuel Stocks

[Hiroshima](#)

[International Health Federations Form Historic Disarmament Partnership](#)

[Security News & Views](#)

Latest PSR Blog Post

[300,000+ public health professionals call on G7 to speed clean energy shift](#) by Catherine Thomasson, MD

PSR Actions

[President Obama: We need actions, not words – to reduce nuclear risks »](#)

[President Obama: Please restore critical military-to-military communications between the U.S. and Russia »](#)

In the News

[Obama's Hiroshima visit will remind us of the horrors of nuclear war](#)

Bangor Daily News
May 16, 2016
An op-ed by Dr. Paul Averill Liebow, PSR Maine board member.

[Keep our public lands in public hands](#)



The Bill and Melinda Gates Foundation is divesting its fossil fuel stocks – and PSR helped make it happen! Last fall, PSR circulated an open letter calling on the Foundation to divest from fossil fuels. PSR members from across the nation signed on, and in November, PSR/Washington delivered those signatures to the Gates headquarters in Seattle. The Foundation has now sold off its \$187 million holdings in the oil giant BP, and earlier sold off \$824 million in ExxonMobil stock. Now, it just needs to divest the rest! Read about our divestment actions [here](#).

PEACE & SECURITY

President Obama's Historic Visit to Hiroshima



On May 27, President Obama will be the first sitting President to ever visit Hiroshima, Japan. Representatives from PSR and allied organizations met with White House officials on May 18 to thank Obama for his decision – and, since actions speak much louder than words, to urge him to announce concrete actions toward nuclear disarmament.

Tallahassee Democrat
May 12, 2016
Op-ed co-authored by
PSR Florida Executive
Director Marybeth
Dunn.



2015 Annual Report
[Download now »](#)



[Please email President Obama](#) and ask him to announce these actions while he is in Hiroshima.

International Health Federations Form Historic Disarmament Partnership



Nations without nuclear weapons are forging an alliance with civil society groups to stigmatize, ban and eliminate nuclear weapons. At a United Nations working group meeting this month in Geneva, four international health federations representing over 15 million health professionals submitted a joint paper to the UN titled *"The Health and Humanitarian Case for Banning and Eliminating Nuclear Weapons"*. The 4 groups are: International Physicians for the Prevention of Nuclear War, International Nurses Council, World Health Organization, and World Federation of Public Health Associations. [Read more »](#)

Security News & Views ~ May Edition



Here are this month's top ten news articles, media hits and opinion pieces to keep you informed about what's happening in the nuclear disarmament movement. [Read more »](#)

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If you received this email as a forward, [subscribe here](#).

Physicians For Social Responsibility
1111 14th St, NW, Suite 700 Washington, DC, 20005
t 202.667.4260 | f 202.667.4201

From: [Boulder County BOCC](#)
To: [Boulder County Board of Commissioners](#)
Subject: County Commissioners Contact Us/Feedback Form. [#45]
Date: Saturday, May 28, 2016 5:04:44 PM

Name *	Dr. Eugene Wahl
Organization (optional)	Constituent
Email *	generwahl@yahoo.com
Phone Number (optional)	(720) 355-0867
My Question or Feedback most closely relates to the following subject: (fill in the blank) *	Information re: Permit Applications for Gas/Oil Drilling (Fracking)

Comments, Question or Feedback *

Hello Commissioner Domenico:

You and I met at the Plan Boulder County annual dinner in 2013. It was a delightful conversation, and I'm grateful for your time then. We talked about your as Commissioner and mine as a scientist at NOAA Boulder.

We also talked about fracking and oil/gas-related drilling activities. I asked if you could provide information whether there were any permit applications to drill in the Open Space north of Jay Road between Spine and 63rd, near where I live on Wellington Road. You mentioned that the moratorium did not allow you to discuss permit applications one way or the other. I'm wondering if you now can say whether there may be any live application(s), given the Colorado Supreme Court ruling concerning the Longmont and Fort Collins situations.

I understand if you are still not able to discuss this, or would prefer not to, but if you have any information you can share, even if it is "no applications at this time", that would be helpful. As I know you would be aware, we (my wife, the Rev. Dr. Barbara Dumke, and I) are concerned about possible air quality diminishment and devaluation of our property if well development would occur in this Open Space, and so we are trying to gather as much related information as we can.

Thanks very much for the time taken to read this message, and we wish you all the best and add our gratefulness for your work as Commissioner.

Please check box below *

- ☐ I acknowledge receipt of the Open Records Notification

From: mbrownfausset@comcast.net
To: [Boulder County Oil and Gas Comment](#)
Subject: 6-Month Moratorium on Oil & Gas Development
Date: Wednesday, June 15, 2016 11:59:58 AM

The moratorium is completely NIMBY. Nobody who drives a gasoline-powered car or heats their home with gas should be allowed to vote on this--or should be able to support this with a straight face. It is so hypocritical.

-Marilyn Fausset
Boulder

From: [Grant Dupre](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Boulder to lead by example
Date: Wednesday, June 15, 2016 2:27:25 PM

Boulder is a leader in land use. We should continue to be a leader by preventing oil and gas drilling and fracking within Boulder County. We have taken so many steps as a community to protect our lands for recreational use. To allow oil and gas drilling within Boulder County would be a huge mistake. If you disagree I urge you to take a drive on I70 to the western slope or head north towards Wyoming. The land is littered with fracking and drilling structures. Not only are they an eyesore they are devastating to the landscape, ground water, and environment. The oil and gas companies are bleeding our earth dry of a non renewable resource to fill their own pockets with money. They claim job creation and whenever there is a downturn in oil prices they are quick to fire all the people they say they are creating jobs for leaving communities as fast as they came in to take the resources. Oil and gas drilling in Boulder county is a bad idea. Please do not let it happen in our county.

Thanks for your consideration

Kindly

Grant Dupré

From: [Dave Corman](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking Moratorium
Date: Wednesday, June 15, 2016 2:27:49 PM

I strongly advise the Council to resist attempts to resume the moratorium. This is an infringement on landowners and mineral rights owners freedom to recognize income from oil and gas production. I am a geologist (AB Geology, 1969 - Franklin and Marshall College and MS Geology, 1971 - University of Delaware). I worked seven years for Conoco in Denver and 3 for Union Pacific in Wyoming; then formed a Boulder based Engineering and Geological Services Company (BXG, INC ---The Boulder Exploration Group) which served the energy industry for 22 years. I have lived in Boulder for 42 years at 403 and 409 Mountain View Road, 80302.

We have been fracking wells for over 25 years and the technology and safety have improved every year. In addition the wells planned in Boulder County are in the Niobrara Formation at 6,000-8,000 feet below the surface (well below the water table) and would be protected by double wall casing. I have no financial interest in fracking and am retired but I think the County's regulatory intrusion into the process is both wrong and as the courts have shown illegal. Please cease and desist. Fracking offers us the opportunity to become exporters of oil and natural gas and reduce our imports from the volatile Middle East.

I recommend the Boulder County friends I have copied this to, to advise the Council on your views, pro or con. Only written opinions will be accepted as oral presentation is ruled out on the June 28 hearing. Submit to the above e-mail by 4PM on June 27. Thanks.

From: [CenturyLink Customer](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking moratorium must be extended
Date: Wednesday, June 15, 2016 2:42:34 PM

In the event the community rights amendment does not pass this November, a sufficient period of time to reassess Boulder County's strategy moving forward must be afforded to determine community rights position. I believe the moratorium must be extended 1 - 2 years past November 2016.

Thank you.

From: [A.J.](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil and Gas Moratorium
Date: Wednesday, June 15, 2016 8:25:16 PM

Unfortunately, I can't make the meeting on 6/28; but wanted to send on my thoughts. I feel that Boulder should be leading the charge with respect to renewable energy. Due to the effects of climate change, we should be making every effort to avoid fossil fuel use and extraction – and thus, should extend the moratorium. (Not to mention the environment and health impacts of the actual extraction.)

Thank you,

Adam Pastula

From: [lisa.mcdonough](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: fracking
Date: Wednesday, June 15, 2016 8:27:17 PM

hello,
fracking has created all sorts of trouble already: earthquakes where they never happened before & the heinous degradation of clean water sources for human consumption.
i seriously hope you continue to prevent fracking in our county. why would you start?
thanks,
lisa g mcdonough
unincorporated boulder county

Sent from space

From: calpolyche@aol.com
To: [Boulder County Oil and Gas Comment](#)
Subject: End the moratorium on hydraulic fracturing
Date: Thursday, June 16, 2016 7:45:09 AM

Dear Boulder County Commissioners,

I urge you to end the moratorium on hydraulic fracturing "fracking" in unincorporated Boulder County immediately. Fracking has been proven to be a safe way to extract oil and natural gas according to President Obama and many independent and credible studies. It also contributes to the State and Local revenues through leases, jobs, taxes and indirect revenue from those who work in the oil and gas industry. Low cost, clean, reliable and affordable natural gas is the reason why the US has come into compliance with the GHG reductions set by the Kyoto agreement without the U.S. ever even having to sign the agreement or pass any legislation. This should make anyone who cares about global warming happy, because the alternative for producing the large chunk of energy this country needs is coal. Renewable power will continue to grow, but we should not force ordinary citizens to pay high energy prices because of a perception that fracking is not safe. Fracking is safe.

Sincerely,
Stephen Leichty
7215 Empire Drive
Boulder, CO 80303

From: [Jenny Miles](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Moratorium in Boulder County
Date: Thursday, June 16, 2016 8:28:15 AM

To Whom this concerns,

Please do everything in your power to reduce, limit, regulate, or ban all forms of oil and gas exploitation in Boulder County. This destructive, polluting, and antiquated technology is hastening humanity's extinction. There us no more important an issue than "keeping it in the ground".

Thanks.

Jennifer Miles
Longmont, CO

Sent from my iPhone

From: pkyoungson@yahoo.com
To: [Boulder County Oil and Gas Comment](#)
Subject: fracking
Date: Thursday, June 16, 2016 9:50:29 AM

No fracking Boulder County. This is a human rights issue. It is all about profits for the oil gas business.

May I walk through this day in peace and well being.

May I walk through this day in love and joy.

From: smallcircles@yahoo.com
To: [Boulder County Oil and Gas Comment](#)
Subject: please, no fracking in Boulder County
Date: Thursday, June 16, 2016 11:24:17 AM

Dear Commissioners,

Please do what is right for the people of Boulder, for this amazing land we are blessed to live on, for the future generations who deserve clean air and water. Let's invest in more solar, more wind.... Let's lead the nation in showing what a sustainable city looks like... Let's stand out from the pack where making money is more important than living peacefully in reciprocity with the earth. Capitalism does not have to cause harm, let's lead the way.

NO FRACKING, please, please, please. You have the opportunity to do something really good. May you be blessed with deep awareness of the importance of your role. We are all counting on you. May it go well for you.

<http://environment.yale.edu/envy/stories/fracking-outpaces-science-on-its-impact#gsc.tab=0>
http://serc.carleton.edu/NAGTWorkshops/health/case_studies/hydrofracking_w.html
<http://news.stanford.edu/2016/03/29/pavillion-fracking-water-032916/>
<http://www.popularmechanics.com/science/energy/g161/top-10-myths-about-natural-gas-drilling-6386593/>

Thank you,

Jennifer Garone
Citizen of Unincorporated Boulder County

From: [Ward Anthony](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: comment on fracking moratorium
Date: Thursday, June 16, 2016 11:46:19 AM

The moratorium should be suspended indefinitely.

We must get right to the point and develop a program meaningfully by saying we must stop the use of fossil fuels altogether by the year 2025. That is our goal and anything that does not advance that needs to be put aside. That goal brings together all the various people who can get it done and gets them working together. Any thought that fracking has a place in bringing this about really makes no sense. It is cheaper now to move ahead with renewable energy sources than to use fossil fuels. Any effort to find or use new sources of fossil fuels is completely in opposition to the direction our future must take.

Ward R Anthony

1850 Folsom St. #1101

Boulder, CO 80203

303-494-2074

betward@hotmail.com

From: [Mac Kobza](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Thank you for fighting Fracking in Boulder County
Date: Thursday, June 16, 2016 12:52:26 PM
Importance: High

As a resident of Longmont in Boulder County - I support you 100% in your efforts to keep fracking out of our landscape. It is horrific how this industry demands its profits over people and the environment, even the global climate.

Thank you for your hard work, your thoughtful debate, and your tireless fight to protect our community and our wild places.

Sincerely,
Mac Kobza

2758 Falcon Drive
Longmont, CO

From: [david.goodrich](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: fracking
Date: Thursday, June 16, 2016 12:56:51 PM

To Boulder County

It is imperative that you do everything to stop fracking in Boulder County. The evidence is in: fracking does contaminate water in the the ground, and it does create earth quakes. Do the right thing this time. Take a stand for the planet.

David Goodrich,

Boulder, Colo.

From: [Susan Prieto](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking Moratorium
Date: Thursday, June 16, 2016 3:37:33 PM

Dear County Commissioners,

I am writing on behalf of the residents of unincorporated Boulder County in regards to Boulder County's land use and environmental regulations for oil and gas drilling. "Unconventional oil and natural gas extraction enabled by horizontal drilling and hydraulic fracturing (fracking) is driving an economic boom, with consequences described from "revolutionary" to "disastrous." Reality lies somewhere in between" (Jackson, 2014).

When considering this type of exploration in unincorporated Boulder County, it is necessary to look at all of the possible consequences to the people and environment. Since banning and moratoriums are not a simple answer as has been determined the legal protocol, it appears that we must accept applications, but at what cost? Because we live in a semi-arid area, water as you know is an important consideration. "the availability of water for hydraulic fracturing in water scarce areas and this could be partially offset by increased reuse of produced water. Increased reuse would simultaneously reduce the potential for seismic activity due to disposal of produced waters through deep well injection" (Reible, 2016). The consequences of fracking could be dire for the city of Boulder's health, safety, welfare and environment.

It seems that since Boulder cannot just ban fracking, perhaps we look at each application and determine the consequences on individual basis. Perhaps we can limit the average number of wells per pad to one. These pads should be no closer than a one mile radius to other residents, schools and businesses. Six months to a year seems reasonable for the application process, to analyze and evaluate flood plain protection, environmental impact and mitigation, rules from COGCC and AQCC, improvements or building pipelines, necessary improvements for adequate water supply for drilling, completion and all phases of the exploration. All of these processes should be paid by the applicant not the city or county of Boulder.

Finally, let's continue to look at alternate energy to coal. Could we somehow encourage other applicants than fracking?

Thank you for your time and commitment to the health and well-being of our community.

Gratefully,

Susan Prieto

6321 Bruntwood Ct.

Boulder, CO 80303

Resources:

Jackson, R. B., Vengosh, A., Carey, J. W., Davies, R. J., Darrah, T. H., O'Sullivan, F., & Pétron, G. (2014). The environmental costs and benefits of fracking. *Annual Review of Environment and Resources*, 39, 327-362.

Reible, D. D., Honarparvar, S., Chen, C. C., Illangasekare, T. H., & MacDonell, M. (2016). Environmental Impacts of Hydraulic Fracturing. In *Environmental Technology in the Oil Industry* (pp. 199-219). Springer International Publishing.

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From: [Chris Cook](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Moratorium
Date: Thursday, June 16, 2016 3:38:13 PM

With the end of the moratorium coming in the very near future, please do all you can to protect our air quality and beautiful open space. Hopefully Boulder county will be a national leader in enacting strict regulations regarding oil and gas exploration.

Sincerely,
Chris Cook

From: [Angie Cook](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: End of moratorium
Date: Thursday, June 16, 2016 8:51:54 PM

With the end of the moratorium coming in the very near future, please do all you can to protect our air quality and beautiful open space. Hopefully Boulder county will be a national leader in enacting strict regulations regarding oil and gas exploration.

Sincerely,
Angie Cook

From: [Mari](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil/gas comment
Date: Thursday, June 16, 2016 9:20:12 PM

Dear Commissioners,

I'm writing today as a concerned citizen. I want to plead with You to leave the current moratorium in place for now. In light of the recent Colorado State Supreme Court decision against community rights to choose locally around fracking and other oil and gas issues, I understand there are many things to consider. Please consider the following:

1) Fracking is toxic. Fracking leaves behind a radioactive legacy, endangering public health. Researchers have identified 3,900 radioactive spill sites in the Bakken Shale region, one of the most fracked areas in the country. Radioactive spills put surrounding communities at elevated risk of cancer. The only way to stop this health disaster is to ban fracking. Therefore, the Colorado State Supreme Court might be liable for all future health and environmental consequences for its decision. This could prove very costly and leads to point two.

2) It is economically and socially devastating for communities to accept fracking long term. As the ecological degradation, the diminished air quality, and increased health risks are absorbed by fracked communities, property values and productivity decline. Additionally, in many communities in the Bakken Shale region, drug use has risen sharply along with human trafficking. Is this what progressive Boulder County wants?

3) Supporting the fossil fuel industry, an industry that does not pay its fair share of taxes, in fact is subsidized by citizens to the tune of billions of dollars, sells out our children's future, a future that would be better served by local innovations in the development of renewable energy and other green jobs. Communities all over the world that are investing in a green energy future are thriving as communities that reap the toxic consequences of the fossil fuel industry are getting sickly and dying. Check with citizens in Pennsylvania on this.

4) The heritage, creative, and artistic merits of this great county will be devastated if we allow this archaic industry to move forward with plans to frack.

5) There will be potential seismic impacts which add additional risks to buildings, infrastructure, and safety, so high risk, and again, very expensive. Check with the insurance industry to see how they are responding to fracking risks.

6) There is a Community Rights Initiative coming up for a vote this fall. It would be prudent to see what the outcome of that initiative will be before making a decision to rescind the current moratorium.

There is much more that can be added. The long and the short of it is that fracking is risky and a poor investment for our county. It will potentially cost the county billions, if not trillions, in health care for folks who develop chronic diseases. There is a huge potential for increased birth defects, costs for toxic spills are highly likely, and clean up must be included in assessments of community impact. Loss of property values and revenues must be considered. Will bankers want to invest here in the long haul given the risks?

I urge You County Commissioners to take whatever actions may be needed to prevent this calamity from unfolding. Let's protect and enhance the quality of life we currently have. Let's model for the rest of the world. Let's stand for prosperity and a healthy future for all citizens. Do whatever it takes, even if it means appealing to the Supreme Court of the United States. Every day without fracking is a win for humanity, for life, for good air quality, toxic free living, citizen health, high property values, and an investment in health and well being for future citizens, like my grandchildren.

Thank You for considering the impact of your decision on the next generation of human beings and all species.

Sincerely,
Mari Heart
1540 Zamia Av.
Boulder, CO 80304

Sent from my iPad

From: [Kara](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: No to fracking!!!
Date: Thursday, June 16, 2016 9:34:14 PM

Dear Commissioners of Boulder County,

Rather than amending the six month moratorium on fracking, I implore you to consider how we can outright ban it in Boulder County. On a recent trip to New York State, residents I spoke to there were disgusted to hear that Colorado, a state considered to be so health conscious and environmentally friendly, would allow fracking. And Boulder county is considered to be the healthiest part of the state!

Do not be fooled: fracking is merely corporate greed. No amount of money is worth the health risks of the citizens and environmental impact that comes along with fracking. As you read this, we are living in a climate disaster with record setting temperatures and recurring extinctions of crucial species. This is no joke. The citizens of Boulder County deserve to know that their elected officials are doing everything in their power to keep them safe from the dangers of fracking. Please consider reading the myriad of scientific reasons the state of New York provided for banning fracking. Let's follow in their footsteps!

Sincerely An Extremely Concerned Citizen of Boulder County,
Kara Reese

Sent from my iPhone

From: [alexandra niehaus](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Boulder county Oil and Gas comments
Date: Friday, June 17, 2016 8:42:12 AM

We have got to keep oil and gas companies from destroying our public lands with fracking. Do not lift the moratorium! Do not end the ban. We need to fight back.

For decades Boulder county has kept oil and gas companies off of our public lands. Decades when it would have been easy to say yes, easy to drill wells, years when we only suspected that we were affecting climate change and only suspected that fracking was un safe. Now we KNOW it is un safe! We need to learn from other communities mistakes. Once you drill that well there is no going back. How can anyone allow oil and gas to frack our public lands knowing what damage it can cause, and knowing that climate change is real and we are only speeding it up.

Boulder county has kept fracking out when it was easy to let them in, and now it is so much easier to say no. We have major politicians on the side of banning fracking. We have to protect our land from damage and pollution. It is the only earth we have!!!! Please Please do not give up and allow oil and gas companies to rape our land and poison our air and water!!!

Keep fracking off our lands! Public land belongs to all members of the Boulder county community. We deserve to be heard! We deserve to be valued over any company that is only looking for its own profit and gain, with no respect for the environment.

Caring about the environment and protecting open space is what is special about Boulder county. Do not sell us out! Do not give in to pressure to destroy the land for profit!

PLEASE!!! Keep fracking out!

Sincerely,
Alexandra Niehaus
Boulder County citizen

From: [Neshama Abraham](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Pavillion, WY residents exposed to toxins from fracking per biomonitoring report
Date: Friday, June 17, 2016 8:48:40 AM
Attachments: [image_asset_11914.png](#)
[image_asset_11915.png](#)

Dear Boulder County Commissioners,
As you consider whether to extend the 6-month moratorium on processing O&G permits, please take a few minutes to read this article from *Green Wire* (below) summarizing the just released report- [When the Wind Blows: Tracking Toxic Chemicals in Gas Fields and Impacted Communities](#) - See more at: <http://comingcleaninc.org/wind-blows> - about the carcinogens and VOC exposure to residents from natural gas drilling and fracking at an Encana site in the town of Pavillion, Wyoming.

This interactive map showing methane emissions in U.S. states, including Colorado, where there is O&G development, may also be a helpful resource: <http://ecowatch.com/2016/06/15/oil-gas-industry-map/>.

Thank you very much for your service to the people and wildlife of our County. Please let me know how I can be of help.

Sincerely,

Neshama Abraham
1460 Quince Ave., #102
Boulder, CO 80304
(303) 413-8066 office
(303) 596-9905 cell

P.S. Here's a 3-min interview about the levels of the carcinogen Benzene found in "produced water" which exceeded World Health Organization standards that Dart Energy in Scotland did not want to admit.

Interview with Dr. Mariann Lloyd-Smith PhD, Senior Policy Advisor, National Toxins Network:

<http://www.youtube.com/watch?v=AHBqjIEJ7bk>

"Last week's Scottish Parliament vote for an outright ban on fracking was a significant step closer to protecting Scottish communities from unconventional gas extraction in Scotland and is to be applauded. Overwhelming scientific and peer reviewed evidence now supports the real life testimonies of communities living side by side with this industry and was the basis of the New York State ban 2014. The evidence presented by the Broad Alliance of Scottish Communities puts the case very strongly under the Precautionary Principle, that this industry is not safe for communities and there can be no alternative but a complete ban in Scotland. Ineos's minimum 400m buffer is derisory while mitigation measures and the imposition of fines following regulation breaches, if detected, are totally unacceptable given the constraints of: land mass, population density, extensive underground mine workings, significant geological faulting not to mention the scale of the industry and its track record around the world. Scottish Communities now await the final verdict from our Scottish Government which will determine whether or not our government is for and by the people."

OIL AND GAS:

Wyo. town's residents absorbing drilling toxins -- report

[Colby Bermel](#), E&E reporter

Published: Thursday, June 16, 2016

Toxic chemicals have been detected in residents of a Wyoming town where natural gas is produced by hydraulic fracturing, according to a study released today by environmental groups.

The Coming Clean coalition said emissions from an Encana Corp. drilling site in the town of Pavillion spewed volatile organic compounds (VOCs) into the air that were absorbed by residents. VOCs have been linked to cancer, respiratory problems, and reproductive and developmental disorders, among other ailments.

Pavillion's VOC levels exceed federal and state standards, the coalition says.

Levels of 10 VOCs of concern to Coming Clean

VOC levels detected in summa canisters (in ppb)			
Chemical	Lowest detected level	Average level	Highest detected level
acetone	BDL	BDL	BDL
2-butanone	BDL	BDL	BDL
hexane	0.61	3303	11000
ethylacetate	BDL	BDL	BDL
benzene	8.7	360	780
cyclohexane	0.66	3643	12000
toluene	0.3	1179	2400
ethylbenzene	BDL	5300	1300
xylenes	0.4	5388	18300
naphthalene	BDL	147.5	210

Key for Tables 2 & 3

- RED = VOC levels that exceed a short-term ESL.
- YELLOW = VOC levels that exceed a long-term ESL.
- ORANGE = VOC levels that exceed a level exposure which is estimated to increase a person's risk of cancer by more than 1 in 1 million.

BDL = below detection limit

ppb = parts per billion

[\[+\]](#) Graphic courtesy of Coming Clean.

The Coming Clean [report](#) comes days after the release of another analysis by environmentalists on carcinogens in people's bodies ([Greenwire](#), June 14).

"The people who live and work in these areas are so close to the sites [and] are being exposed on an ongoing basis, and it was not of their choosing," Wilma Subra, an author of the Coming Clean report, said in an interview. "They were there first, and the production came in, and it wasn't required to be as clean as it should've been to protect their health."

The American Petroleum Institute, a top advocate for oil and gas, was sent a copy of Coming Clean's report but was unable to comment in time for publication.

Pavillion's environmental health struggles are well-documented. In March, a former U.S. EPA investigator linked fracking to the town's tainted drinking water ([Greenwire](#), March 29).

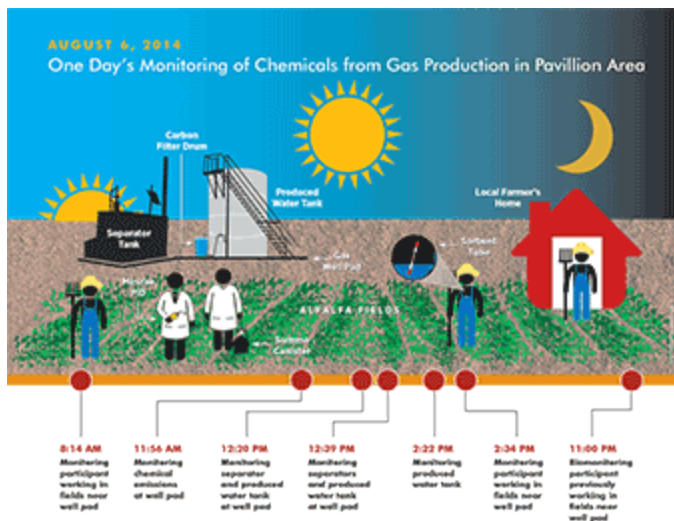
But energy companies scored a victory last year when the Wyoming Department of Environmental Quality [concluded](#) it was "unlikely" that frack fluids reached drinking water wells.

Some see the town as symptomatic of a larger trend. A Coming Clean [report](#) in October 2014 observed that hydrogen sulfide levels in Wyoming overall registered 660 times higher than federal limits. Carcinogens like benzene and formaldehyde were also noted at higher-than-allowed levels.

Using both air monitoring and biomonitoring -- a combination that had not been used in previous studies -- Coming Clean spent a week testing Pavillion residents for a VOC set called BTEX (benzene, toluene, ethylbenzene and xylene). Participants were asked not to fill their vehicles with gasoline or diesel and not to use cleaning agents, in order to remove the possibility of other exposure as the study was taking place.

What was the discovery? The BTEX set was "present in the bodies of the Pavillion area residents who participated in this study," the authors wrote. "The results from both human and air monitoring indicate that study participants during the week of monitoring were intermittently exposed to complex mixtures of chemical substances associated with oil and gas production."

Illustration of Pavillion area air and biomonitoring study method



[+] Graphic courtesy of Coming Clean.

Katie Huffling, director of the Alliance of Nurses for Healthy Environments, is sympathetic to oil and gas companies as economic drivers in their communities, but she wants people to widen their perspective.

"As we're looking at energy sources -- and I totally get right now that natural gas is super cheap, and a lot of communities are looking to that as an energy source -- you have to look at the cost of health impacts," she said in an interview. "Is it worth those trade-offs: increased asthma attacks among your kids, when they're getting those health care costs when they're sick and not able to go to school? Is it worth that trade-off?"

Other health problems in exposed people, in addition to cancer and various disorders, include rashes, nosebleeds, headaches and depression.

Subra, president of an environmental consulting firm, sees a regulatory apparatus unable to keep up with new developments by energy companies.

"When you're dealing with the fracking situation, the technology is growing much faster than the agencies are able to adopt rules and regulations," she said. "The state regulatory agencies don't have the ability to develop the rules and enforce them."

Industry lobbyists have a powerful presence in state capitals, Subra noted, and differing jurisdictions make it difficult to sort which regulator has oversight over what activity. EPA regulates air pollution through the Clean Air Act, but Wyoming's Department of Environmental Quality also plays a role. And a separate state Oil and Gas Conservation Commission deals with drilling operations.

EPA last month adopted rules limiting methane and VOC emissions from new and modified sources -- essentially curbing discharges from sites like wells and rigs that were freshly or recently built ([E&E Daily](#), May 12).

There are currently no rules regarding existing oil and gas sources -- older sites -- but that could change with the implementation of a proposed rule.

Clean energy?

But the rules come too late for Pavillion, Huffling said.

"For the people that are in Pavillion, the new EPA rule doesn't really impact them because it's not going to be looking at what they're exposed to right now," she said of the existing fracking sites.

EPA has put out a request for information for its proposed existing-sources rule, which is the first in a two-part process. The entire review will most likely finish next year after President Obama leaves the White House.

Many predict presumptive Democratic presidential nominee Hillary Clinton would continue Obama's agenda, including on the environment. The unknown at this point is presumptive GOP nominee Donald Trump, whose policy positions are unclear at best, but he has decried federal regulation of the energy industry.

Industry groups tout natural gas as a clean energy source. But Subra disagrees.

"You have to look at the whole life cycle, and the pollution, and the contamination that occurs from the whole life cycle. It is a much larger greenhouse gas producer than carbon monoxide," she said. "Natural gas is not necessarily a better solution."

###

From: [Melanie](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Re: Against Fracking in Heatherwood
Date: Friday, June 17, 2016 2:07:26 PM

On Fri, Jun 17, 2016 at 2:03 PM, Melanie <melanielynns.mail@gmail.com> wrote:

The fight for Gunbarrel is increasing. Between halting fracking in Heatherwood, stopping Twin Lake's wildlife from being paved over, and watching the Gunbarrel Town Center be turned into un-rentable condos, I am beside myself.

I received an email this morning with stated this sentiment and more: "These lands (Heatherwood Open Space) were to remain as open Space in perpetuity; however, they now face several threats. One of them is the oil and fracking industries who could take advantage of the previously unpurchased mineral rights and move fracking operations onto these lands. This is a very real threat, and the meeting below pertains to this."

The dangers of fracking are very, very real. Unless you have your head buried under a rock or down a fracking well you would be aware of the danger to the People, animals, and landscape. C'mon Boulder, you can do better than this.

Whatever happened to Boulder being FOR THE ENVIRONMENT!!!!

Melanie Whitehead

This is an amazing look at fracking:
<http://www.dangersoffracking.com>

But to sum up a few key points:

-

CONTAMINATION

During this process, methane gas and toxic chemicals leach out from the system and contaminate nearby groundwater.

Methane concentrations are 17x higher in drinking-water wells near fracturing sites than in normal wells.

DRINKING WATER

Contaminated well water is used for drinking water for nearby cities and towns.

There have been over 1,000 documented cases of water contamination next to areas of gas drilling as well as cases of sensory, respiratory, and neurological damage due to ingested contaminated water.

LEFT BEHIND

Only 30-50% of the fracturing fluid is recovered, the rest of the toxic fluid is left in the ground and is not biodegradable.

The waste fluid is left in open air pits to evaporate, releasing harmful VOC's (volatile organic compounds) into the atmosphere, creating contaminated air, acid rain, and ground level ozone.

In the end, hydraulic fracking produces approximately 300,000 barrels of natural gas a day, but at the price of numerous environmental, safety, and health hazards.

"Nature does not hurry, yet everything is accomplished." ~Lao Tzu

If you have a moment consider supporting Twin Lakes in protecting our beloved Owls and other abundant wildlife in their natural habitat.

<http://boulderowlpreserve.org>

<http://www.ipetitions.com/petition/no-leap-frog-annexation-and-densification-in>

www.tlag.org

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<http://www.ipetitions.com/petition/no-leap-frog-annexation-and-densification-in>
www.tlag.org

From: [Timothy Mallon](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Ammeding the six-month oil and gas moratorium
Date: Friday, June 17, 2016 3:13:28 PM

I believe that Boulder County should extend the moratorium on accepting and processing new oil and gas development permit applications. Fracking is but one method to extract gas from the earth. We do not have enough evidence to proclaim it safe to the public or environmental sound. There are other extraction options, and while these may be more expensive for the Oil Industry, they might actually prove to be safer for all involved. You, as our governing body, should proceed with caution when it comes to a potential risk to the public health. Until we have true scientific research on the repercussions of fracking then we should extend the moratorium to another 6 months, and if no true scientific proof is made available, this moratorium should occur indefinitely.

Regards,

Tim Mallon
10138 Arapahor Road
Lafayette, CO 80026

From: [William Kellogg](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: oil and gas moratorium
Date: Friday, June 17, 2016 3:13:54 PM

Please support as long a moratorium on oil and gas drilling and fracking. I have three grandchildren in Boulder and would prayer they will live to enjoy the beauty and purity of the area that I have enjoyed at 88!

Bill Kellogg
Boulder Resident

680 Grape Ave.

From: [Michael Sweeney](#)
To: [Boulder County Oil and Gas Comment](#)
Cc: dsc@maximco.com
Subject: shocked
Date: Friday, June 17, 2016 6:52:27 PM

Dear County Commissioners -

I'm disappointed that the moratorium was rescinded.

It was a cowardly act, and I believe many of us would be pleased if all three of you resigned.

I'm seriously shocked by your reverence for Mr. Hickenlooper and your distance from an understanding of Boulder county residents.

From: [Michael Sweeney](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: cowardly
Date: Friday, June 17, 2016 6:58:27 PM

Dear Commissioners -

I'm disappointed that the moratorium was rescinded.

It was a cowardly act, and I believe many of us would be pleased if all three of you resigned.

I'm seriously shocked by your reverence for Mr. Hickenlooper and your distance from an understanding of Boulder county residents.

MS

From: [RandyKathy Hungate](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Changes to Boulder County oil and gas moratorium
Date: Friday, June 17, 2016 7:02:22 PM

Boulder County Commissioners:

Thank you for soliciting Boulder County residents' thoughts on changes to the current moratorium on accepting and processing new oil and gas development permit applications. As a rural resident of Boulder County, I am opposed to any changes to the current moratorium, unless that change is to make the moratorium permanent. The health of our people and our planet is at stake. Part of my attraction to Boulder County is its environmentally conscious priorities and policies. Please don't abandon those principles to the oil and gas lobby. Thank you.

Kathy Hungate
9358 N. 39th Street
Longmont, CO 80503
720-684-8107

From: [Edward Kaufman](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oi and Gas Moratorium comment
Date: Saturday, June 18, 2016 12:56:08 PM

Dear Commissioners,

I want my to express my opposition and disappointment with the Supreme Court's ruling on community rights regarding oil and gas fracking.

I strongly oppose fracking in and around where we live in Boulder County and want you to fight it anyway you can. Please find any possible legal method to allow the moratorium to continue until citizens can find the political power to overturn the Supreme Court's pro-corporate, anti-citizen ruling.

Sincerely,

Edward Kaufman and Diane Woods
Erie, Colorado

From: [tammy](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Just say no to Fracking
Date: Saturday, June 18, 2016 2:56:43 PM

Dear Commissioners of Boulder County,

Rather than amending the six month moratorium on fracking, I implore you to consider how we can outright ban it in Boulder County. On a recent trip to New York State, residents I spoke to there were disgusted to hear that Colorado, a state considered to be so health conscious and environmentally friendly, would allow fracking. And Boulder county is considered to be the healthiest part of the state!

Do not be fooled: fracking is merely corporate greed. No amount of money is worth the health risks of the citizens and environmental impact that comes along with fracking. As you read this, we are living in a climate disaster with record setting temperatures and recurring extinctions of crucial species. This is no joke. The citizens of Boulder County deserve to know that their elected officials are doing everything in their power to keep them safe from the dangers of fracking. Please consider reading the myriad of scientific reasons the state of New York provided for banning fracking. Let's follow in their footsteps!

There is enough fracking in Weld County. Stop poisoning our whole state. Local government should decide.

Tammy Stewart
2017 Grayden Ct
Superior, CO 80027

From: rdbiker48245@aol.com
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking
Date: Saturday, June 18, 2016 10:03:13 PM

No fracking in our county please! Call it a moratorium, a ban or just outlaw it. It's just too dangerous and is not consistent with the protection of the citizens of our county. Thank you. Jack Sasson 2210 Balsam Dr. Boulder 80304

From: [Janet Somerville](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Continue Oil and Gas Moratorium
Date: Sunday, June 19, 2016 8:46:18 PM

Boulder County Commissioners,

As a resident of Boulder County, CO, I urge you to continue the Boulder County Moratorium on Oil and Gas development in our county. This technology has proven health hazards and policy should be to keep fossil fuels in the ground while developing renewable energy sources. If we are to begin to address the effects of massive CO2 emissions and resultant climate change, this is a basic first step. Please continue this moratorium in the spirit of Boulder County and the majority within its borders.

Sincerely,

Janet L. Somerville

490 Lincoln CT

Louisville, CO 80027

From: [roger_barry](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Moratorium on fracking
Date: Sunday, June 19, 2016 8:46:21 PM

I urge the Commissioners to make the moratorium permanent.
Fracking releases large quantities of methane gas as demonstrated by the 'hot spots' in Weld County and the Four Corners areas on NASA imaging of greenhouse gas releases. Excess methane from fracking in North Dakota has recently been detected in Sweden!
Moreover the chemicals injected into the wells are potentially harmful to water supplies from aquifers.

We are rapidly moving to renewable wind and solar power and all oil and gas activities should be reduced not facilitated.

Roger Barry
Distinguished Professor of Geography Emeritus.

From: [Sally Phillips](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking Moratorium
Date: Sunday, June 19, 2016 8:46:24 PM

Boulder County Commissioners:

As resident and property owners in Boulder County, we have serious concerns about the decision of the Commissioners on the fracking moratorium.

We only have to look at Weld County to see a case study of what wide open, unlimited fracking will do...severely damaged roads, increasingly unstable land, water shortage. Now they are trying to mitigate the damage after the fact. What were they thinking? Money talks-in essence they sold their soul and their community. Not only are there the aesthetic issues with degrading of infrastructure, the gradual destruction of the beauty of the landscape and devaluation of our property, but as more and more is revealed about the effects of fracking, health issues become of paramount importance.

With the lack of transparency in the oil and gas industry it is only now becoming apparent with confirmation from the BLM that fracking causes earthquakes. Studies find that the 600 chemicals used in fracking include harmful carcinogens and toxins including lead, benzene, methanol, mercury, salts which leach out and contaminate water used for drinking and pollute the air we breathe. Radon concentration is 39% higher in suburban and rural home sites located near fracking wells. The claim from the oil and gas industry that fracking is cleaner for the environment is false.

The 8 million gallons of water per site is not reusable. As was the agreement of the Paris Accord on Global Warming, we all need to conserve this resource immediately or pay the price of insufficient drinking water in the near future. The amount of money paid to our congressional representatives and candidates by proponents of the industry will not solve this scarcity for our future.

Are there alternatives? Better solutions, better ways? The answer is a resounding YES. "Green" energy is already more economically efficient and the price will decrease as time goes on and investment increases.

You have taken an important and thoughtful first step by stopping the expansion of fracking in our community. As our county leaders, we look to you to hear our voice and continue to say to oil and industry...not here, not now, not in Boulder County. We respectfully ask that you continue the moratorium. Boulder County has been an example for the State and the Nation of focusing on protecting the environment and its' citizens. We must maintain that course for all our futures.

Regards,

Charles DuScha and Sally Phillips

405 Blue Lake Trail

Lafayette, CO 800026

From: [Melanie](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Against Fracking in Leatherwood
Date: Monday, June 20, 2016 9:30:29 AM

The fight for Gunbarrel is increasing. Between halting fracking in Heatherwood, stopping Twin Lake's wildlife from being paved over, and watching the Gunbarrel Town Center be turned into un-rentable condos, I am beside myself.

I received an email this morning with stated this sentiment and more:
"These lands (Heatherwood Open Space) were to remain as open Space in perpetuity; however, they now face several threats. One of them is the oil and fracking industries who could take advantage of the previously unpurchased mineral rights and move fracking operations onto these lands. This is a very real threat, and the meeting below pertains to this."

The dangers of fracking are very, very real. Unless you have your head buried under a rock or down a fracking well you would be aware of the danger to the People, animals, and landscape. C'mon Boulder, you can do better than this. Whatever happened to Boulder being FOR THE ENVIRONMENT!!!!

Melanie Whitehead

This is an amazing look at fracking:
<http://www.dangersoffracking.com>

But to sum up a few key points:

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During this process, methane gas and toxic chemicals leach out from the system and contaminate nearby groundwater.

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Contaminated well water is used for drinking water for nearby cities and towns.

There have been over 1,000 documented cases of water contamination next to areas of gas drilling as well as cases of sensory, respiratory, and neurological damage due to ingested contaminated water.

LEFT BEHIND

Only 30-50% of the fracturing fluid is recovered, the rest of the toxic fluid is left in the ground and is not biodegradable.

The waste fluid is left in open air pits to evaporate, releasing harmful VOC's (volatile organic compounds) into the atmosphere, creating contaminated air, acid rain, and ground level ozone.

In the end, hydraulic fracking produces approximately 300,000 barrels of natural gas a day, but at the price of numerous environmental, safety, and health hazards.

"Nature does not hurry, yet everything is accomplished." ~Lao Tzu

If you have a moment consider supporting Twin Lakes in protecting our beloved Owls and other abundant wildlife in their natural habitat.

<http://boulderowlpreserve.org>

<http://www.ipetitions.com/petition/no-leap-frog-annexation-and-densification-in-tlag.org>

From: [carol coburn](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fwd: Negative economic impacts of energy setback initiative 40 times worse
Date: Monday, June 20, 2016 9:31:05 AM

I would like you to consider all sides to our energy policies in Colorado. Our economy is of great importance as you well know in managing Boulder County finances. Also you have had plenty of time to resolve the moratorium. Sincerely, a lifelong Colorado resident who was well acquainted with wise commissioners who left a legacy for you the present ones...Carol Nelson Coburn

-----Original Message-----

From: Vital for Colorado <info@vitalforcolorado.com>

To: cbcwind11 <cbcwind11@aol.com>

Sent: Thu, Jun 16, 2016 10:03 am

Subject: Negative economic impacts of energy setback initiative 40 times worse



NEWS RELEASE

Negative economic impacts of energy setback initiative 40 times worse

Potential economic boon for West Slope, state jeopardized

The news continues to worsen for the proponents of Initiative #78, which aims to add mandatory 2,500-foot setbacks from new and existing oil and natural gas operations. Earlier this month, the Colorado Oil and Gas Conservation Commission (COGCC) released a [report](#) detailing that the proposed setbacks would ban 90% of Colorado from future energy development. The report drew the ire of business leaders around the state.

"As we've said all along, the extremists behind this ballot issue want to chase our energy sector and the 100,000 jobs it provides out of Colorado," said Vital for Colorado Board Chair and local attorney Peter Moore. "The setback initiative would have a devastating impact on our energy sector and the thousands of other local businesses whose livelihoods rely on partnering with the industry."

The setback initiative received another blow this week following a [report](#) by the United States Geological Survey (USGS). The report finds that Colorado's Piceance Basin, thanks to a new assessment of the Mancos Shale formation within the Piceance, may have 40 times more natural gas reserves than previously thought making it the second largest field of recoverable natural gas in the United States. While many, particularly on the jobs-starved West Slope, celebrated the news, it was quickly overshadowed by the looming setback ballot initiative that would ban access to these vast natural gas reserves.

Colorado's Piceance Basin primarily overlays Garfield and Rio Blanco counties. According

to the COGCC setback study, these counties will be the most affected by Initiative #78 banning future energy development in 98.9% of Garfield County and 99.2% of Rio Blanco County.

"The USGS study was certainly welcome news for our West Slope communities because it offers an optimistic future to many families and individuals," said Rifle Area Chamber of Commerce President and CEO Andrea Maddalone. "Sadly, the initiative proponents aim to stifle that hope."

While the proposed initiative hasn't yet qualified for the ballot, paid petition gatherers are collecting signatures in the Denver Metro area to put the constitutional question on the November ballot.

"I know when Coloradans across the state learn more about the damaging effects to our urban and rural economies, they'll loudly voice their opposition and decline to sign these petitions," Maddalone concluded. For those wanting to register their opposition to the anti-energy ballot measures, please visit NoBackDoorBan.com.

About Vital for Colorado

Vital for Colorado is a broad coalition of business and civic leaders formed to support responsible energy development. More than 56,000 chambers, organizations, business and Coloradans have signed its pro-energy pledge. For more information, go to www.vitalforcolorado.com



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[4950 S. Yosemite St. F2 #236](#)

[Greenwood Village, CO | 80111 US](#)

[This email was sent to cbcwind11@aol.com.](#)

[To continue receiving our emails, add us to your address book.](#)



From: [rubala](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Extend oil and gas moratorium
Date: Monday, June 20, 2016 3:48:42 PM

Dear Commissioners:

Please extend the oil and gas moratorium for another 6 months to May 18, 2017. There may be two state ballot measures citizens may get a chance to vote on in November regarding local control and a 2500 foot setback. I hope the measures get on the ballot and become law; however even if they do pass, the Boulder County commissioners will have to update county oil and gas regulations. By extending the moratorium an additional six months, it will provide more time for county staff to develop strict regulations to protect citizens from fracking operations.

Thank you for this opportunity to comment on this important matter.

Sincerely,

Ruby Bowman

1512 Lefthand Drive

Longmont, CO 8501

From: [Razz Gormley](#)
To: [Boulder County Oil and Gas Comment](#)
Date: Monday, June 20, 2016 4:02:39 PM

To our Boulder County Commissioners,

I strongly urge you to make no changes that would weaken the moratorium or to allow any Permits to be filed were exploratory oiling gas development to take place.

Please, forgive any formatting or grammatical errors, as this was sent through voice text on my phone.

Razz Gormley
Pearl Pkwy
Boulder, CO 80301
484-431-3377

From: [gregg](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking
Date: Monday, June 20, 2016 8:02:23 PM

Hello,

These are my main concerns. I believe injection of the fluids used in this process have the potential, to pollute our soil and underground springs. The process uses water at a unacceptable rate.

Drilling is very energy intensive.

Where is the logic? We, on one hand as a county our goal is to have a smaller carbon footprint, yet we allow a industry that runs 24 hrs a day. Into the land which say we love.

Gregg Thornton
1126 Union Ave.
Boulder, Co.

From: [Judith Blackburn](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Response to 6-month moratorium
Date: Monday, June 20, 2016 8:11:02 PM

Commissioners and staff:

I thought your move was brilliant to discontinue Boulder County's long moratorium once the CO Supreme Court verdict came down against Longmont's ban and Fort Collins's moratorium. Your longer moratorium would have attracted another lawsuit from the COGCC unless CO law can be changed in this election cycle. Putting in a shorter moratorium until just after the November election will allow for that possibility. Issues #75 (Local Control) and #78 (longer setbacks) initiated by Coloradans Resisting Extreme Energy Development (CREED) could have just that effect.

As a person concerned about over-reach by the oil and gas corporations, I was surprised that the CO Supreme Court's verdict said so little about the proven health effects and the climate change implications of our current approach to oil and gas development in Colorado. These and the overarching threat of climate change are the concerns of many Boulder County residents--in addition to concerns about their own personal health and safety in proximity to fracking wells. There was never an evidentiary hearing at any level on Longmont's and Ft. Collins's claims that citizen rights to health and happiness needed to be addressed. The case was settled on the basis of current law regarding state pre-emption in matters of oil development. You as commissioners are powerless in this uneven struggle. The make-up of the Colorado Oil and Gas Conservation Commission, the Blue Ribbon Task Force, appointed by Governor Hickenlooper to cut off earlier anti-fracking initiatives--all are heavily weighted toward oil and gas interests. At this point CREED's citizen initiatives, seem to be our only recourse.

In describing the two initiatives, the industry will be pushing the "talking point" that fracking has been used since the 1940's and is safe. However, the newer, deeper hydraulic fracking begun about ten years ago is quite a bit more dangerous and its long-term effects quite unknown. It's of a different order than the earlier fracking process, with more dangerous chemical additives injected under more pressure,

Another oil and gas talking point is their exaggerated numbers of jobs associated with the industry. Recent studies have shown that these figures are padded and the jobs are fleeting. It is a very small percentage of total Colorado employment. Much more relevant in our county would be jobs attributable to tourism and the renewable energy field that could be lost as our air quality and overuse of water are compromised. You will have your hands full trying to balance these competing interests in the coming months.

More needs to be said, too, about "property rights." In a rush to make sure mineral rights are honored, surface rights are treated as though they don't matter. Given our split estates here in Colorado, most homeowners never think to inquire about who owns the mineral rights under their homes or nearby before they buy their homes.

For all these reasons, I urge you to use your new six-month moratorium to design the most restrictive conditions possible to resist and delay further oil and gas

development in Boulder County. It might even be a good idea to endorse Issues #75 and #78 as measures which could empower you in order to prevent further harm to our landscape and our people.

Judith Blackburn
3724 Oakwood Drive
Longmont, CO 80503

From: [Gretchen Ridgeway](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking Moratorium
Date: Tuesday, June 21, 2016 8:02:27 AM

Commissioners:

My family and I support a permanent ban on fracking in Boulder County. Please read the article, *Drilling for Earthquakes*, in the July 2016 issue of **Scientific American** to understand the devastating effects of fracking on our environment. Please vote to protect Boulder County from fracking.

Respectfully submitted,

Dr. Gretchen F. Ridgeway
Boulder

From: [Amy Aschenbrenner](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Opposition Letter Resolution 2016-665
Date: Tuesday, June 21, 2016 8:19:52 AM
Attachments: [Boulder County Commissioners Letter Resolution 2016-65.pdf](#)
Importance: High

Attached please find a letter of opposition to Resolution 2016-65 from The Longmont Association of REALTORS®. Please do not hesitate to contact me with any questions.

Thank you,

Amy Aschenbrenner, RCE

CEO

Longmont Association of REALTORS®

420 Kimbark Street

Longmont, CO. 80501

303.772.5555

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June 21, 2016

Dear Boulder County Commissioners Dominco, Gardner and Jones,

The Longmont Association of REALTORS® (LAR) opposes Resolution 2016-65, which would establish a new moratorium on processing gas and oil applications until November 18, 2016. Boulder County has implemented moratoria on gas and oil applications since 2012. The result of these “temporary” moratoria has been to deny owners of mineral rights the ability to utilize their property for the past four years. In our opinion, the County should accept the Colorado Supreme Court’s ruling of May 2, 2016 and allow those who own mineral rights to develop their holdings if they choose, as the Colorado Constitution allows.

Sincerely,

Cecilia De Villiers

Cecilia De Villiers, Chair
Longmont Association of REALTORS®

From: [Teresa F.](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: The latest BS on Resolution 2016-65
Date: Tuesday, June 21, 2016 9:18:11 AM
Attachments: [FossilFumes.pdf](#)

No verbal testimony will be taken, but written testimony may be submitted through 4 p.m. on Monday, June 27.??????

No public testimony? Is your time so precious that you can't listen to public testimony?

Will the Commissioners read all the testimony / comments?

"The Board of County Commissioners has scheduled a public hearing to consider written public comment and to determine if any changes should be made to the 6-month moratorium (adopted May 19, 2016) on the processing of new oil and gas permits."

Why not take a stand with those who wish to harm us? Have your attorney's have advised you otherwise? Afraid of a lawsuit? That's right, it's an election year.

So, how do I feel about this? The extended moratorium has been rescinded. This is a cowardly act. Now the citizens of Boulder County will be thrown the oil and gas wolves - to be ruled by regulations that only regulate the amount of hard done to us.

You've received hundreds of hours of testimony and miles of evidence about the dangers of oil and gas fracking but instead, you have rolled over and shown your weak spot to the industry that wishes to *exploit you and your constituents*.

Please read the attached Fossil Fumes report, "A public health analysis of toxic air pollution from the oil and gas industry."

I want to know how you plan to protect your constituents. As elected officials, you are accountable to the citizens of Boulder County because you work for us, not the oil and gas industry.

Be sure to watch the FLIR camera infrared videos of the poison spewing forth from the wells here:

https://www.earthworksaction.org/voices/detail/citizens_empowerment_project#.V2g71_krJ9O

Zoom in and see what VOCs we're all breathing. Read this <http://ecowatch.com/2016/06/21/methane-emissions-fracking/> and see how fracking is destroying our life support system.

Am I cynical and angry! You bet. This is your legacy? Are you proud of what you're doing?

Prove me wrong, please.

Teresa Foster
Longmont, CO

Fossil Fumes

A public health analysis of toxic air pollution
from the oil and gas industry



Fossil Fumes:

A public health analysis of toxic air pollution from
the oil and gas industry

Lead Author

Lesley Fleischman, Clean Air Task Force

Contributing Authors

Jonathan Banks, Clean Air Task Force

John Graham, Clean Air Task Force

Supported by:



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This report is available online at:

<http://www.catf.us/resources/publications/view/221>.

Contents:

Page	
2	Abbreviations
3	Executive Summary
6	Introduction
6	The National Air Toxics Assessment (NATA)
7	Toxic Emissions Sources in the Oil and Gas Industry
8	Pollutants
10	Results
10	National
11	Pennsylvania
12	Texas
13	Colorado
14	Further Considerations for NATA Results
16	Technologies and Practices to Reduce Toxic Pollution
18	Appendix
18	A: Counties with Cancer and/or Respiratory Health Risk above EPA's Level of Concern: In order of population from most populous to least populous
20	B: Counties with Cancer and/or Respiratory Health Risk above EPA's Level of Concern: By State
21	C: Calculating 2017 Cancer and Respiratory Health Risk
24	References

Figures and Tables:

Page	
2	Map ES-1: National Map of Risk Level by County
3	Table ES-1: List of Oil and Gas Hazardous Air Pollutants
4	Table ES-2: List of High Risk Counties
9	Map 1: National Map
10	Map 2: Pennsylvania Map
11	Map 3: Texas Map
12	Map 4: Colorado Map
14	Map 5: Intra-County Variation: Weld County, Colorado
14	Map 6: Intra-County Variation: Bradford County, Pennsylvania

Abbreviations

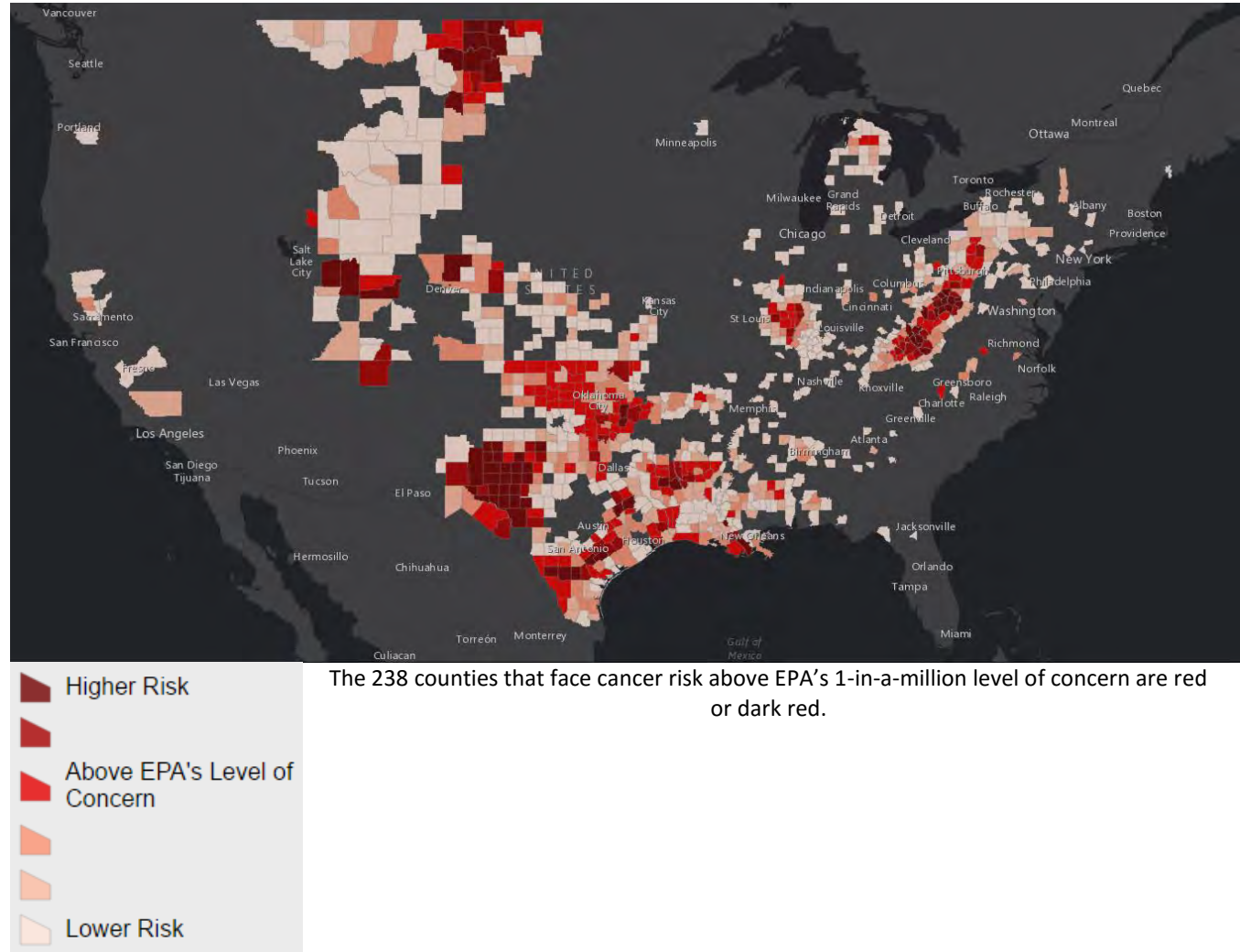
HAP	Hazardous Air Pollutant
LDAR	Leak Detection and Repair
NATA	National Air Toxics Assessment
NEI	National Emissions Inventory
PM	Particulate Matter
RfC	Reference Concentration
URE	Unit Risk Estimate
VOC	Volatile Organic Compound

Executive Summary

As the United States works toward implementing ambitious climate goals, methane pollution from the oil and gas supply chain has received increased attention, and for good reason — methane is a greenhouse gas 87 times more potent than carbon dioxide in the near term, and the oil and gas industry is the largest U.S. source of methane pollution. But methane is just one harmful air pollutant from the oil and gas industry. This report sheds light on the health impacts of hazardous and toxic air pollutants that are often emitted from oil and gas sites alongside methane, including benzene, formaldehyde, and ethylbenzene. These hazardous toxic air pollutants harm the health of people living near oil and gas facilities such as oil and gas wells, compressor stations, and processing plants.

This report presents estimates, based on recent analysis carried out by EPA, of the cancer risk and respiratory health risk to residents of every county in the United States that can be traced back to air toxics from the oil and gas industry. Specifically, the analysis here is based on EPA’s most recent National Air Toxics Assessment (NATA) analysis updated to reflect the latest emissions data from EPA’s National Emissions Inventory (NEI).

Map ES-1: National Map of Risk Level by County



The analysis finds:

- 238 counties in 21 states face cancer risk that exceeds EPA's one-in-a-million threshold level of concern;
- These counties have a population of over 9 million people;
- 43 counties face a risk that exceeds one in 250,000 and 2 counties face a cancer risk that exceeds one in 100,000;
- 32 counties also face a respiratory health risk from toxic air emissions that exceeds EPA's level of concern (hazard index > 1); and
- The areas with the greatest health risk are generally located in states with the greatest amount of oil and gas infrastructure including Texas, Louisiana, Oklahoma, North Dakota, Pennsylvania, and Colorado.

The NATA assessment only takes into account the health impacts related to *toxic air* emissions from the oil and gas industry, i.e. it does not account for the health impacts from particulate matter and ozone-related air emissions, and it does not account for the health impacts of water contamination caused by oil and gas development. As such, NATA is an underestimate of the full health impact of oil and gas operations.

Table ES-1: List of Oil and Gas Hazardous Air Pollutants

Hazardous Air Pollutant	Tons Emitted Per Year from Oil and Gas Industry	Health Impacts
Formaldehyde	22,082	Cancer and respiratory symptoms
Benzene	20,221	Cancer, anemia, brain damage and birth defects, and respiratory tract irritation
Acetaldehyde	3,863	Cancer and respiratory irritant
Ethyl Benzene	2,235	Respiratory and eye irritation, and blood and neurological disorders

Hazardous air pollution is emitted from dozens of types of equipment and processes throughout the oil and gas sector, such as wells, completion operations, storage tanks, compressors, and valves. Many proven, low-cost technologies and practices are available to reduce these emissions, while also reducing emissions of methane, the main constituent of natural gas. Thus, policies that aim to reduce pollution from the oil and gas industry will help protect the health of local communities while addressing global climate change. In their *Waste Not* report, CATF, the Natural Resources Defense Council, and the Sierra Club called for EPA regulations to cut methane emissions from the oil and gas industry by 50 percent. These methane standards would also significantly cut toxic hazardous air pollution. In addition, stringent standards specifically for toxic pollutants emitted throughout the oil and gas supply chain are also needed to ensure compliance with the Clean Air Act and to protect public health.

Table ES-2: List of High Risk Counties

*: Also above EPA level of concern for Respiratory Hazard Risk (county-wide average respiratory hazard index is equal to or greater than 1).

Counties with Cancer Risk Above 1 in 100,000			Risk (county-wide average respiratory hazard index is equal to or greater than 1).		
TX, Gaines*	TX, Yoakum*				
Counties with Cancer Risk Above 1 in 250,000					
CO, Weld	ND, Mountrail	TX, Crane*	TX, La Salle	TX, Ward*	WV, Lewis*
LA, De Soto	ND, Williams	TX, Crockett*	TX, Martin*	UT, Duchesne*	WV, Lincoln
LA, Lafourche	NM, Lea	TX, Dawson*	TX, Midland*	UT, Uintah*	WV, Mingo*
LA, West Baton Rouge	OK, Coal*	TX, Ector*	TX, Mitchell	WV, Calhoun*	WV, Ritchie*
ND, Divide	TX, Andrews*	TX, Glasscock*	TX, Reagan*	WV, Doddridge*	WV, Tyler
ND, Dunn	TX, Borden*	TX, Hockley*	TX, Scurry	WV, Gilmer*	WV, Wetzel
ND, McKenzie	TX, Cochran*	TX, Karnes	TX, Upton*	WV, Harrison	
Counties above EPA Level of Concern for Cancer Risk (County-wide average cancer risk is equal to or greater than 1 in 1 million)					
AR, Van Buren	LA, Cameron	OK, Beaver	OK, Texas	TX, Johnson	TX, Upshur
CO, Garfield	LA, Claiborne	OK, Beckham	OK, Washington	TX, Kent	TX, Webb
CO, La Plata	LA, East Feliciana	OK, Blaine	OK, Washita	TX, King	TX, Wheeler
CO, Phillips	LA, Jackson	OK, Caddo	OK, Woods	TX, Lavaca	TX, Wilson
CO, Rio Blanco	LA, La Salle	OK, Carter	PA, Armstrong	TX, Lee	TX, Winkler*
CO, Yuma	LA, Morehouse	OK, Cotton	PA, Clarion	TX, Leon	TX, Wise*
ID, Bear Lake	LA, Ouachita	OK, Custer	PA, Fayette	TX, Liberty	TX, Zapata
IL, Clay	LA, Red River	OK, Dewey	PA, Forest	TX, Limestone	TX, Zavala
IL, Crawford	LA, St. James	OK, Ellis	PA, Greene	TX, Live Oak	VA, Appomattox
IL, Edwards	LA, Terrebonne	OK, Garvin	PA, Indiana	TX, Loving	VA, Buchanan
IL, Fayette	LA, Union	OK, Grady	PA, Jefferson	TX, Lynn	VA, Dickenson
IL, Gallatin	LA, Webster	OK, Grant	PA, Washington*	TX, Madison	WV, Barbour
IL, Jasper	MI, Montmorency	OK, Harper	TX, Bee	TX, Marion	WV, Boone
IL, Lawrence	MI, Otsego	OK, Haskell	TX, Burleson	TX, Maverick	WV, Braxton
IL, Marion	MS, Jasper	OK, Hughes*	TX, Caldwell	TX, McMullen	WV, Clay
IL, Piatt	MS, Wayne	OK, Jefferson	TX, Chambers	TX, Montague	WV, Jackson
IL, Richland	MT, Fallon	OK, Johnston	TX, Colorado	TX, Newton	WV, Kanawha
IL, Wabash	MT, Richland	OK, Kingfisher	TX, DeWitt	TX, Panola	WV, Logan
IL, Wayne	MT, Roosevelt	OK, Latimer	TX, Dickens	TX, Pecos	WV, Marion
IL, White	MT, Sheridan	OK, Lincoln	TX, Dimmit	TX, Refugio	WV, Marshall
KS, Woodson	NC, Iredell	OK, Love	TX, Fayette	TX, Roberts	WV, McDowell
KY, Floyd	ND, Billings	OK, Major	TX, Fisher	TX, Robertson	WV, Pleasants
KY, Johnson	ND, Bottineau	OK, Marshall	TX, Freestone	TX, Rusk	WV, Putnam
KY, Knott	ND, Burke	OK, McClain	TX, Frio	TX, Schleicher	WV, Roane
KY, Letcher	ND, Golden Valley	OK, McIntosh	TX, Garza	TX, Shelby	WV, Taylor
KY, Magoffin	ND, Renville	OK, Nowata	TX, Gonzales	TX, Stephens	WV, Upshur
KY, Martin	ND, Slope	OK, Okfuskee	TX, Gregg	TX, Sterling	WV, Wayne
KY, Perry	ND, Stark	OK, Osage	TX, Hardin	TX, Stonewall	WV, Wirt
KY, Pike	NM, Eddy	OK, Pittsburg*	TX, Harrison	TX, Sutton*	WV, Wyoming
LA, Assumption	NM, San Juan*	OK, Pontotoc	TX, Hemphill	TX, Tarrant	WY, Weston
LA, Bienville	OH, Carroll	OK, Roger Mills	TX, Howard	TX, Terrell	
LA, Bossier	OK, Alfalfa	OK, Seminole	TX, Irion	TX, Terry	
LA, Caddo	OK, Atoka	OK, Stephens	TX, Jasper	TX, Tyler	

Introduction

The National Air Toxics Assessment (NATA)

In December 2015, the U.S. Environmental Protection Agency (EPA) released the results of its National Air Toxics Assessment (NATA) for 2011, based on air pollution estimates collected through the National Emissions Inventory (NEI).¹ The purpose of NATA is to identify and prioritize air toxics, emission source types, and locations that are of greatest potential concern when looking at overall health risk in populations. NATA calculates risk estimates for two types of health impacts that can result from toxic air emissions: cancer risk and respiratory health risk. The metric for cancer risk is the number of cancer cases per million people exposed; areas with cancer risk above 1-in-a-million are considered to be above EPA's level of concern. For respiratory health risk, the metric is the hazard index; areas with a respiratory hazard index above 1 are above EPA's level of concern for potential harm to the respiratory system, including breathing problems, harm to the lungs, or other respiratory diseases.

Details of the National Air Toxics Assessment

The 2011 NATA represents the fifth installment of the national assessment, building on earlier years of 2005, 2002, 1999 and 1996. Each update included improved modeling protocols and expanded coverage of hazardous air pollutants (HAPs). The 2011 NATA modeled 180 air toxic compounds from dozens of separate emissions sources, including point sources (large, distinct facilities such as power plants), non-point (the large number of dispersed smaller facilities), various classes of vehicles, non-road mobile sources (such as construction equipment), fires, and biogenic sources, including species formed in the atmosphere and transported from distant emissions regions. These emission data were collected as part of the NEI. Then, NATA estimated both the cancer and non-cancer effects of 138 air toxics (for which health data based on chronic exposure exists).

The 2011 NATA relies on two air quality models, AMS/EPA Regulatory Model and Community Model for Air Quality, to determine the ambient distribution of air toxics. The models incorporate emissions information with meteorological data to determine the dispersion of pollution and chemical transformations that result in estimated annual concentrations at the census tract level across the United States. The modeled ambient concentrations are then used in an exposure model to estimate population exposure to the pollutants.

The EPA developed NATA to inform national and local data collection and policy efforts. However, the agency emphasizes that because of data quality issues and uncertainties in the model, the data should be used cautiously—it should be used to screen for geographic areas with high risk, not as a measure of actual risk in specific locations.² In addition, there are other limitations including incomplete assessment of emissions, limited ability to evaluate threats to vulnerable populations, and reliance on potentially outdated health thresholds.³

In this study, we focus on toxic air pollution sources in the oil and gas industry, and we explore the health impacts of these emissions in the latter sections of this report. This assessment characterizes potential public health risk due to inhalation of air toxics including both cancer risk and respiratory health risk. This report focuses on toxic air emissions from the oil and gas industry: oil and natural gas production and natural gas processing, transmission, and storage, including major sources like large compressor stations and gas processing plants, and dispersed sources like wells.* The results presented here are

* Throughout this report, we refer to 2 types of oil and gas sources: major sources and dispersed sources. Major sources are also known as "point" sources; these sources have the potential to emit 10 or more tons per year of one HAP or 25 or more

estimates for the health risk from oil and gas that communities will face in 2017, based on the NATA report for 2011 and EPA's predictions of the changes in the level of HAPs released by oil and gas sources between 2011 and 2017 (see Appendix for a discussion of our methodology).

Toxic Emissions Sources in the Oil and Gas Industry

Raw natural gas (i.e., gas as it is produced from underground formations, before significant processing is done) usually contains significant amounts of volatile organic compounds (VOCs) and toxic hazardous air pollutants (HAPs), though gas varies in composition from source to source.⁴ The HAPs in raw gas include hexane, benzene, and other aromatic chemicals; poisonous gases like hydrogen sulfide can also be present.[†] These pollutants are also emitted from crude oil production operations. Recent work indicates that emissions from oil and gas operations are resulting in concentrations of toxic HAPs that could harm the health of people living and working in and near oil and gas production areas.⁵

While natural gas processing plants separate much of the toxic components from raw natural gas, some of those pollutants remain in the gas even after processing. As such, emissions from facilities further downstream in the natural gas supply chain, like transmission compressor stations and local distribution equipment, still include some toxic pollutants.

There are four segments of the oil and gas industry, and hazardous toxic air pollutants are emitted from each one, though in varying amounts:

Oil and Gas Production: The oil and gas production segment includes many diverse activities, such as production of hydrocarbons from underground geologic formations; separation of natural gas, oil, and water; and collection of gas from multiple wells through natural gas gathering pipeline and compressor systems. These activities in turn involve processes such as well drilling, hydraulic fracturing or other well stimulation, and well workovers; and they require equipment such as tanks, piping, valves, meters, separators, dehydrators, pipelines, and gathering compressors.

Natural Gas Processing: Gas processing plants separate raw natural gas into natural gas liquids and processed natural gas that meets specifications for transport in high-pressure pipelines and consumption in furnaces and power plants. Natural gas liquids are hydrocarbons such as propane, butane, etc., which are valuable products of gas processing. The processing removes most of the toxic components from the gas, but some toxics still remain.

Transmission and Storage: Natural gas transmission pipelines carry gas from production regions to markets. This segment also includes facilities where gas is stored, either underground or in tanks. Compressor stations along pipelines maintain pressure and provide the energy to move the gas.

tons per year of some combination of HAPs. Dispersed sources are also known as "non-point" sources; these sources are expected to emit less HAPs than sources emitting above these thresholds. See

<https://www3.epa.gov/region1/eco/airtox/glossary.html>.

[†] Hydrogen sulfide is not included in EPA's list of Hazardous Air Pollutants due to a directive from Congress. See <https://www3.epa.gov/airtoxics/pollutants/atwsmod.html>. This does not reflect a determination that hydrogen sulfide does not have toxic properties.

Natural Gas Distribution: Finally, natural gas is delivered to customers (residential, commercial, and light industrial) via low-pressure underground distribution pipelines.

Pollutants

Natural gas development and transmission release a host of pollutants—toxics, smog forming pollutants, and greenhouse gases—that take a toll on our environment and our health. In this analysis, we focus specifically on toxic air pollutants, i.e. those pollutants that are known or probable carcinogens or that cause other serious health problems through either short-term or long-term exposure.⁶ More specifically, we focus on the toxic air pollutants that are responsible for elevated cancer risk and increased respiratory hazard. The pollutants of greatest concern are benzene, ethylbenzene, and formaldehyde.

Benzene: Benzene has been linked to cancer, anemia, brain damage, and birth defects, and it is associated with respiratory tract irritation.⁷ Over time, benzene exposure can also lead to reproductive, developmental, blood, and neurological disorders. A 2012 study estimated a 10 in a million cancer risk for residents near a well pad, attributable primarily to benzene.⁸ According to the NEI, over 20,000 tons of benzene was emitted by oil and gas sources, accounting for 32 percent of the elevated cancer risk and 19 percent of the increased respiratory health risk from the oil and gas industry (see Appendix C). Benzene is a constituent of raw natural gas, so leaks and deliberate releases of gas (venting) are the primary source of benzene pollution from the oil and gas industry.

Ethylbenzene: Exposure to ethylbenzene has been associated with respiratory and eye irritation, as well as blood and neurological disorders.⁹ Over 2,000 tons of ethylbenzene was emitted by oil and gas sources, accounting for 71 percent of the increased respiratory health risk from oil and gas. Like benzene, ethylbenzene is a constituent of raw natural gas and leaks and venting sources are the primary sources of ethylbenzene.

Formaldehyde: Formaldehyde has been linked to certain types of cancer, and chronic exposure to it is known to cause respiratory symptoms.¹⁰ Nearly 22,000 tons of formaldehyde was emitted by oil and gas sources, accounting for 59 percent of the elevated cancer risk and 7 percent of the increased respiratory health risk from oil and gas. Formaldehyde is primarily emitted from combustion sources such as flares and compressor engines.[‡]

Other oil and gas industry toxic pollutants were also emitted in lower amounts, including acetaldehyde (a probable carcinogen and respiratory irritant¹¹), 1,3-butadiene (increases risk of cancer and cardiovascular diseases¹²), and polycyclic organic matter (a carcinogen¹³).

[‡] In addition to being directly emitted from oil and gas engines and flares, a much larger amount of formaldehyde is formed when other pollutants from oil and gas (VOCs) are broken down in the atmosphere. However, the NATA process does not attribute this second, larger quantity of formaldehyde to oil and gas. Therefore, NATA underestimates the impacts from oil and gas formaldehyde.

Some of this pollution is emitted from major facilities like gas processing plants and large compressor stations.[§] But the majority of this pollution comes from the large number of dispersed smaller facilities located, such as well sites, tank batteries, and small compressor stations, in communities throughout the country.

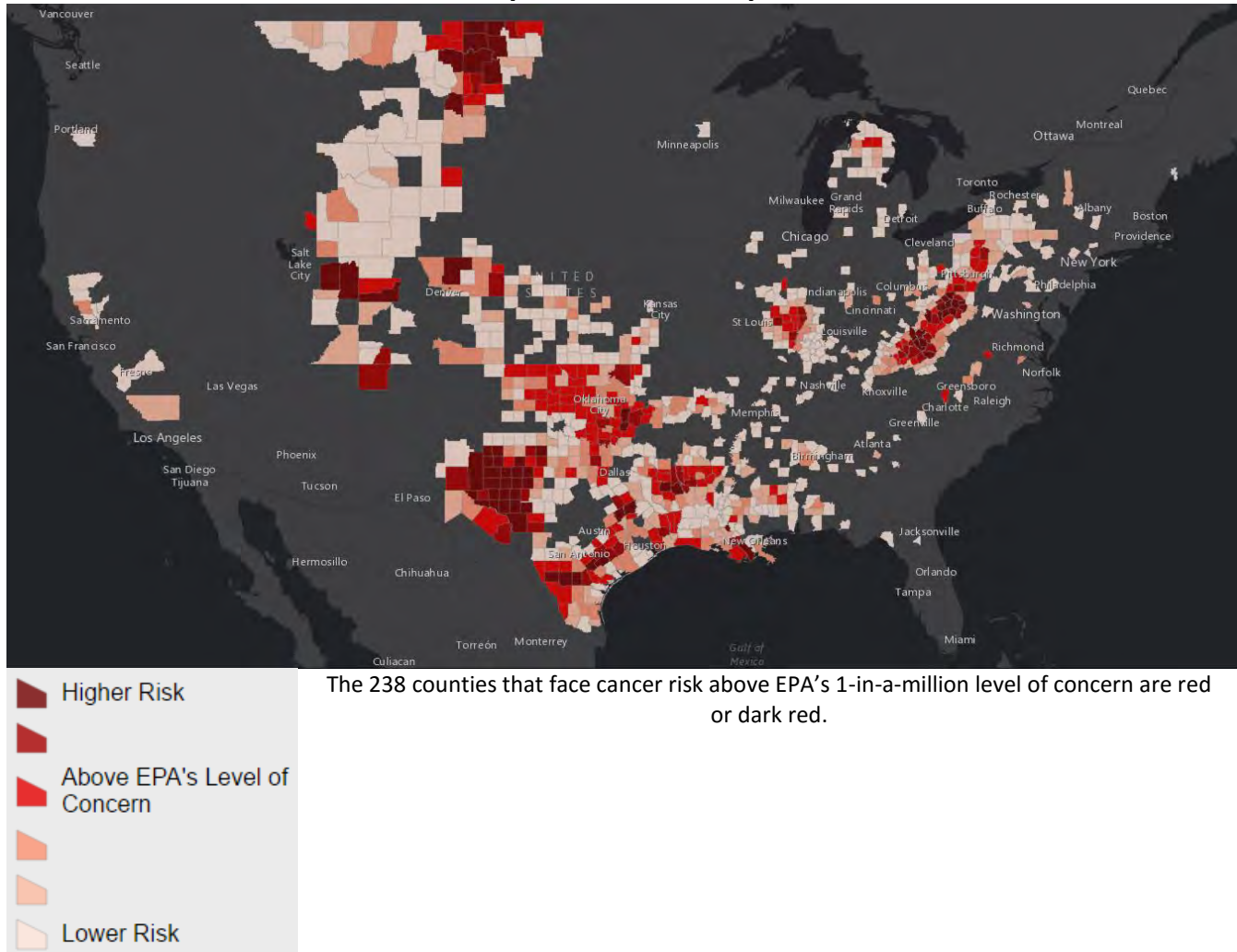
[§] In 2011, on a toxicity weighted basis, cancer risk from oil and gas is 41% from major facilities and 59% dispersed facilities. Respiratory health risk is 13% from major facilities and 87% from dispersed facilities.

Results

National

Using projections of toxic air emissions from EPA's National Emissions Inventory (NEI) for 2017, we estimate that 238 counties in 21 states face cancer risk above EPA's 1-in-a-million level of concern due to toxic emissions from oil and gas operations (National Map). Of these counties, 43 counties face a risk that exceeds one in 250,000 and 2 counties face a cancer risk that exceeds one in 100,000. In addition, 32 of these counties will also face an elevated respiratory health risk from toxic air emissions.** The total population of the counties above EPA's level of concern is over 9 million (see Appendix A). The areas with the greatest health risk are generally located in states with the largest amount of oil and gas infrastructure including Texas, Louisiana, Oklahoma, North Dakota, Pennsylvania, and Colorado, and they include cities such as Fort Worth, Texas; Shreveport, Louisiana; Greeley, Colorado; and Charleston, West Virginia.

Map 1: National Map



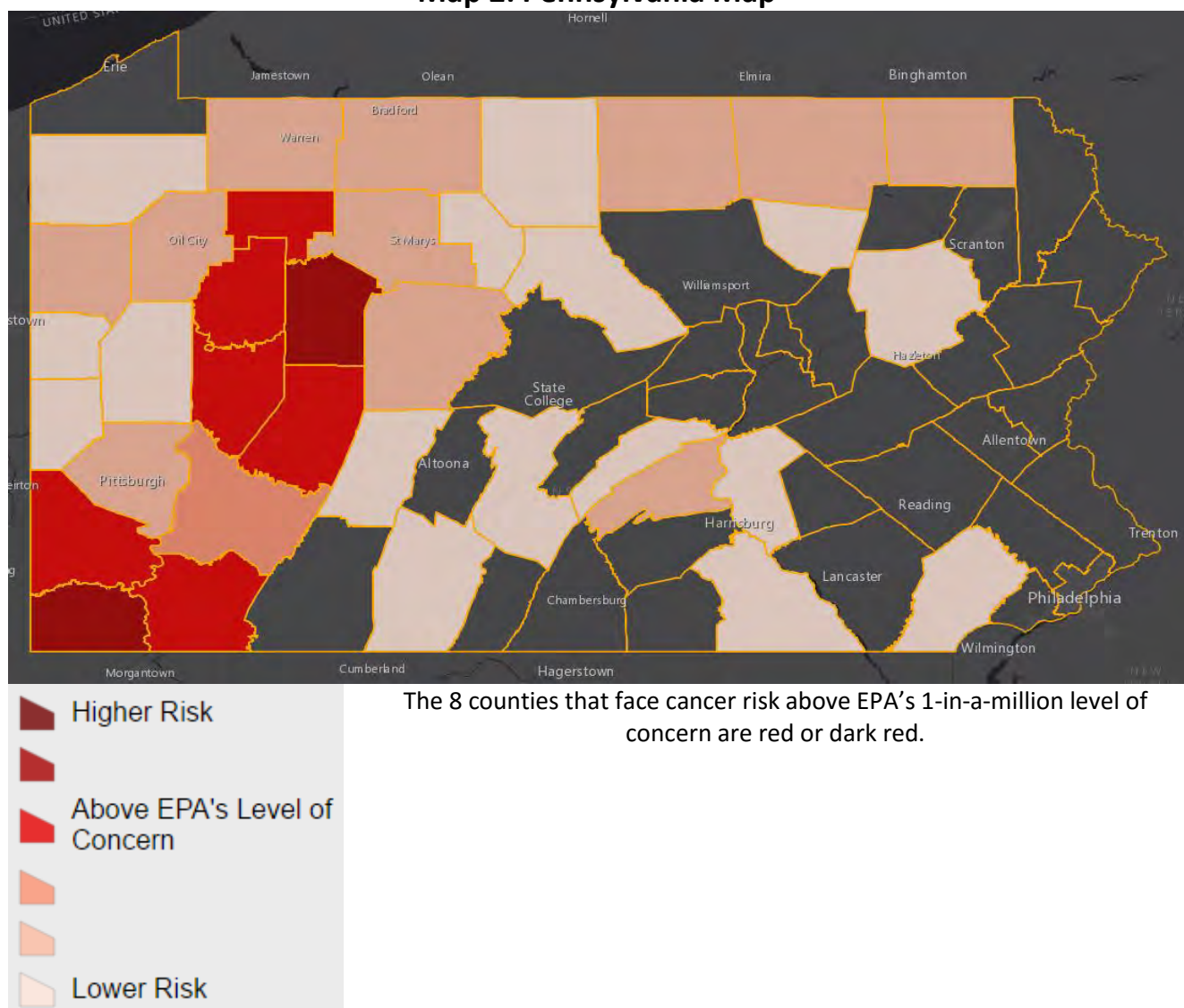
** The U.S. EPA considers cancer risks over one-in-a-million, or a respiratory hazard index greater than 1, to be above its level of concern.

Pennsylvania

According to the NEI, over 1,300 tons of hazardous toxic air pollution—benzene, formaldehyde, and acetaldehyde—were emitted by oil and gas facilities in Pennsylvania. Furthermore, oil and gas production has increased significantly in Pennsylvania since 2011; oil production increased by 112 percent between 2011 and 2015, and natural gas production increased by 264 percent.¹⁴ As a result, toxic air pollution from the oil and gas industry is becoming a greater and greater concern, and it is important to incorporate EPA’s projections of emissions growth between 2011 and 2017 emissions into the analysis.

Based on EPA’s projection of 2017 emissions, eight counties in Pennsylvania will face a high cancer risk due to toxic emissions from oil and gas operations—Armstrong, Clarion, Fayette, Forest, Greene, Indiana, Jefferson, and Washington counties. The counties above EPA’s level of concern have a population of over 625,000. (Pennsylvania Map).

Map 2: Pennsylvania Map

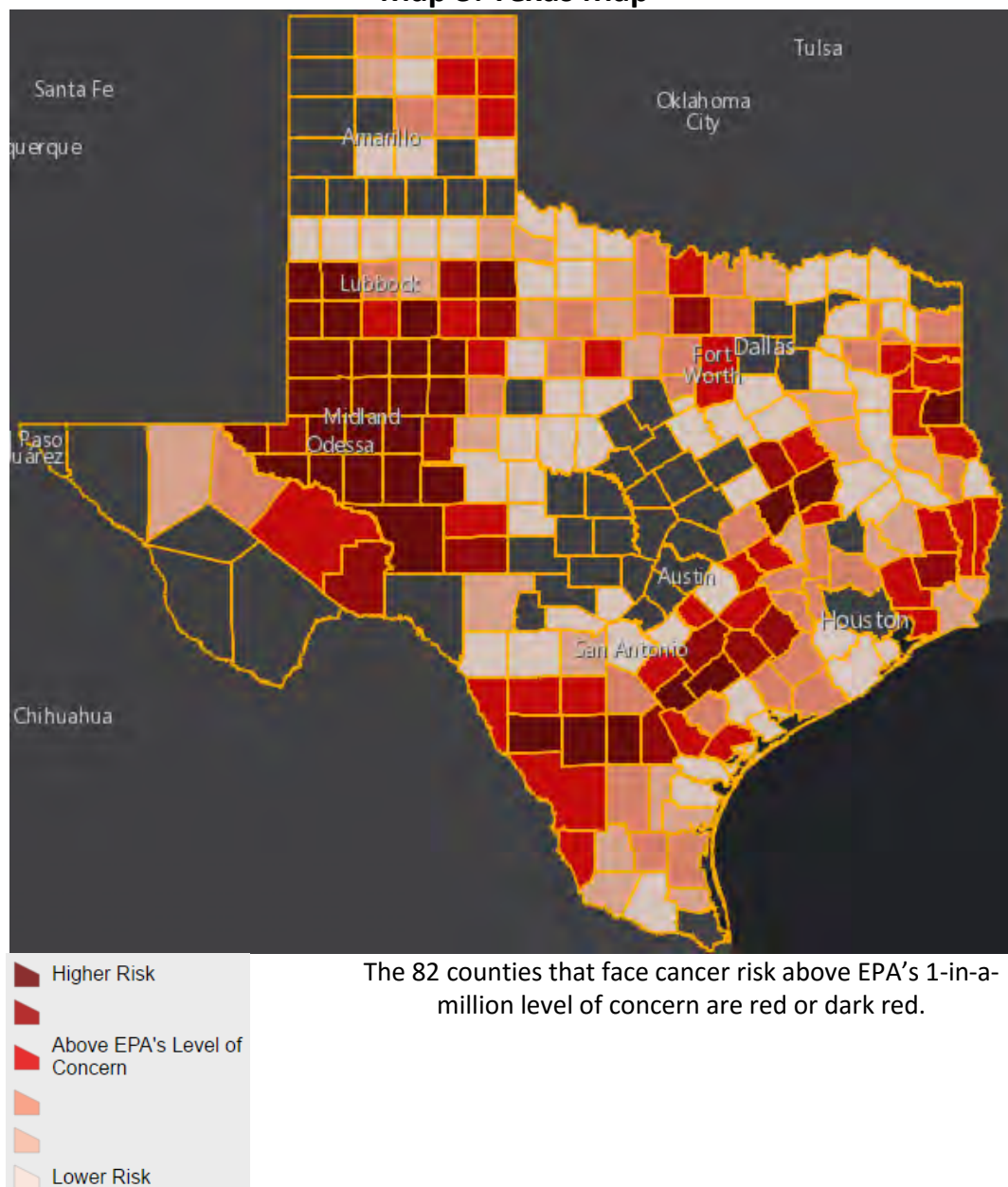


Texas

According to the NEI, over 8,500 tons of hazardous toxic air pollution—benzene, formaldehyde, and acetaldehyde—were emitted by oil and gas facilities in Texas. Oil production has increased significantly in Texas—by 139 percent between 2011 and 2015, and natural gas production has grown moderately—by 11 percent.¹⁵ Accordingly, EPA projects that the volume of benzene, formaldehyde, and acetaldehyde emissions from oil and gas operations in Texas will grow 136% between 2011 and 2017.

Based on that projection, 82 counties in Texas will face elevated cancer risk due to toxic emissions from oil and gas operations (up from 50 counties in 2011). The 82 counties above EPA's level of concern have a population of over 4.1 million (Texas Map).

Map 3: Texas Map



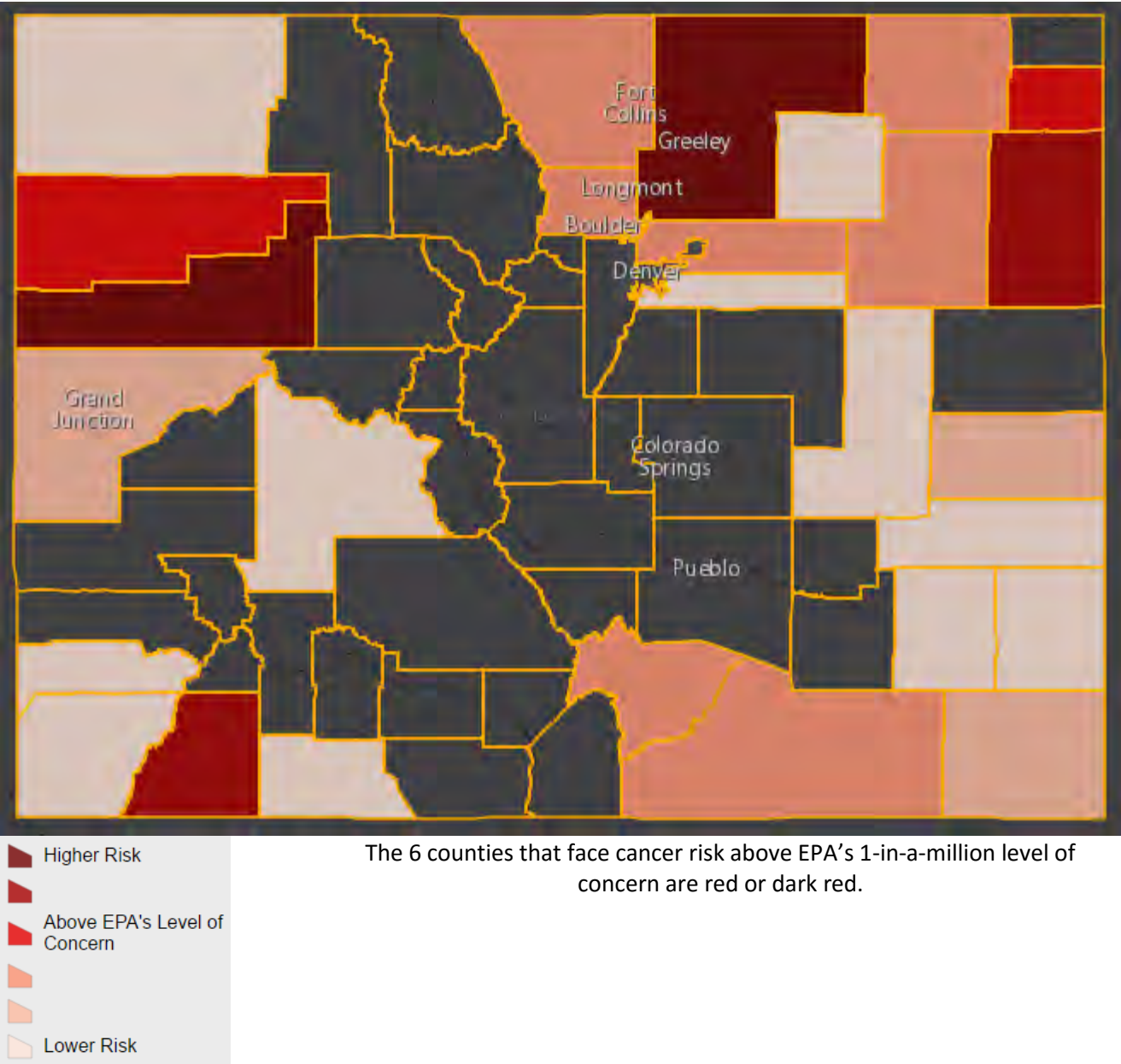
The 82 counties that face cancer risk above EPA's 1-in-a-million level of concern are red or dark red.

Colorado

According to the National Emissions Inventory, over 3,300 tons of hazardous toxic air pollution—benzene, formaldehyde, and acetaldehyde—were emitted by oil and gas facilities in Colorado. Oil production has increased significantly in Colorado—by 202 percent between 2011 and 2015, and natural gas production has stayed approximately level.¹⁶

Based on EPA’s projection of 2017 emissions, six counties in Colorado will face elevated cancer risk due to toxic emissions from oil and gas operations—Garfield, La Plata, Phillips, Rio Blanco, Weld, and Yuma. The counties above EPA’s level of concern have a population of over 410,000 (Colorado Map).

Map 4: Colorado Map



Further Considerations for NATA Results

NATA is an underestimate of overall health impact from oil and gas for a variety of reasons:

- First, the results represent just a portion of the full impact of oil and gas operations on respiratory health: it only accounts for the respiratory health risk from toxic hazardous air emissions. Oil and gas infrastructure is also responsible for particulate matter (PM) emissions and emissions of chemicals that create ozone. Both PM and ozone exacerbate respiratory diseases, including asthma and chronic lung disease, but these risks are not included in the current analysis. Silica dust from hydraulic fracturing and sand mining operations can also cause lung diseases.
- Second, NATA only accounts only for risk associated with inhalation of these pollutants—the exposure risks from water contamination may also be relevant for communities living near oil and gas facilities.
- Third, we only included health impacts directly associated with oil and gas facilities. Oil and gas development may also entail increased truck traffic and changes in land use, neither of these are accounted for in the present analysis.
- Finally, NATA and the inventories it relies on may underestimate the total emissions of toxics from oil and gas.¹⁷

The geographic distribution of health impacts changed between 2011 and 2017, while the total number of counties with elevated cancer risk grew from 206 in 2011 to 238 in 2017. These changes follow the growth or decline of the oil and gas industry in different geographical areas, but the industry grew in many more locations than it shrank, as it grew nationwide. For example, the 2011 data indicates that 50 counties in Texas had elevated cancer risk, while 82 Texas counties will face elevated risk in 2017.

In addition, there are many communities affected by oil and gas toxic air pollution that are missed when we look only at county-level risk results. In many places, the county-level average impact may be moderate, but individuals living in close proximity to oil and gas infrastructure will face elevated risk of both cancer and respiratory hazard.^{††} NATA did present data on health impacts for geographical units smaller than counties (census tracts), but because of data limitations, we were not able to produce estimates of health impacts at the census tract level for 2017 (see Appendix C).

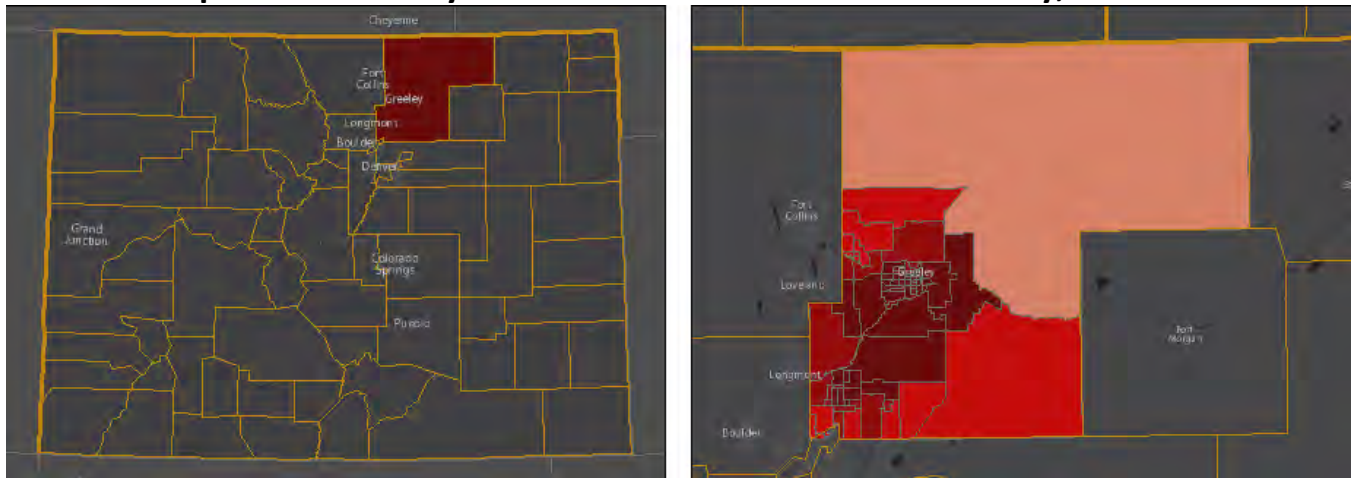
However, census tract level data does demonstrate that some areas within counties experience higher impacts than the county as a whole. Two counties illustrate this:

- In Weld County, Colorado, there is a high overall county-wide cancer risk from oil and gas sources. Within the county, there are 77 individual census tracts, and the cancer risks calculated in those tracts range from 1/5th of the county average to over 3 times the county average—22 census tracts have a risk above the county average and 55 have a risk that is lower than the county

^{††} See Oil and Gas Threat Map for more on population living in close proximity to oil and gas infrastructure. Available at: <http://oilandgasthreatmap.com/>.

average. However, even among the tracts below the county average, all but one still have a cancer risk above EPA's level of concern. (Weld County Map)

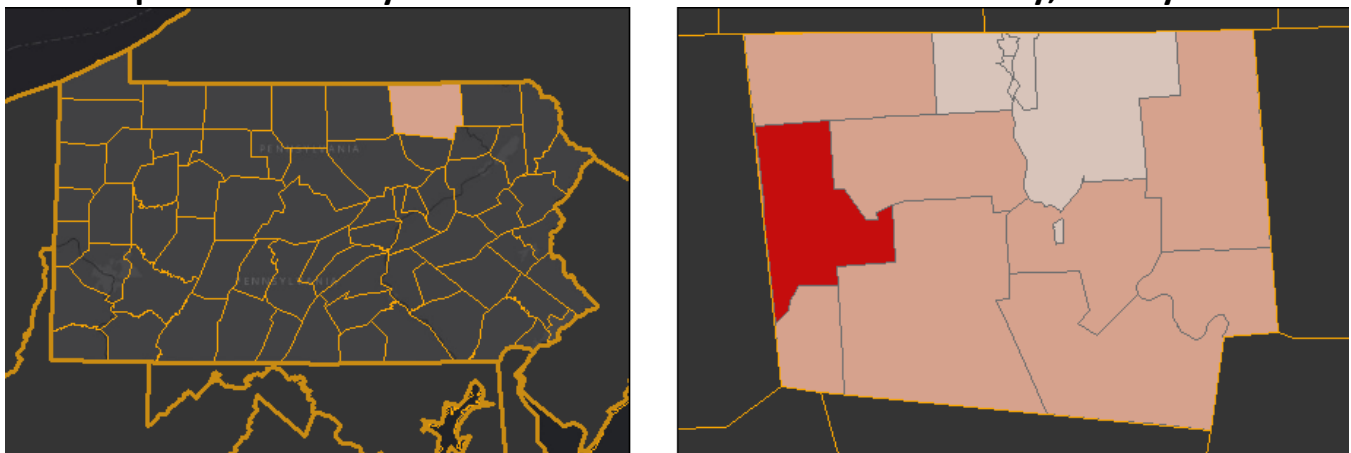
Map 5: Intra-County Variation in Cancer Risk: Weld County, Colorado



Note: Tract level assessments based solely on 2011 data for non-point source emissions, and do not include point sources and growth of emissions from 2011 to 2017.

- In Bradford County, Pennsylvania, the average county-wide cancer risk from oil and gas sources is below EPA's level of concern. However, one census tract in the western part of the county does have a cancer risk above EPA's level of concern, and other tracts may also have a higher risk if major sources and the 2017 emissions projections were taken into account. (Bradford County Map)

Map 6: Intra-County Variation in Cancer Risk: Bradford County, Pennsylvania



Note: tract level assessments based solely on 2011 data for non-point source emissions, and do not include point sources and growth of emissions from 2011 to 2017.

Technologies and Practices to Reduce Toxic Pollution

As outlined in the 2014 report *Waste Not*, readily-available technologies and practices can cut methane emissions dramatically in just a few years.¹⁸ These technologies and practices will reduce the total amount of natural gas that leaks and is released from facilities throughout the oil and gas supply chain. Thus, these policy recommendations will also reduce emissions of hazardous toxic air pollutants from the oil and gas industry. As such, these measures would have important benefits for air quality and public health in and downwind of oil and gas producing areas.

- *Finding and Fixing Leaks*: Unintentional leaks of natural gas from static components such as connectors, valves, regulators, and hatches throughout the oil and natural gas sector are widespread. Leaks will eventually occur at all oil and gas facilities; failing to fix them in a timely manner is a wasteful and harmful practice that leads to clearly avoidable emissions. Leak emissions can be reduced with rigorous leak detection and repair (LDAR) programs. These programs require frequent, regular surveying of facilities for leaks using instruments that detect methane and other hydrocarbons in natural gas.
- *Reducing or eliminating venting from natural gas-driven pneumatic equipment*: Gas-driven pneumatic equipment uses the pressure energy of natural gas in pipelines to do work, such as control, open, and shut valves, or operate pumps. This equipment is ubiquitous at oil and gas facilities, and emits natural gas to the atmosphere by design. Replacing high-emitting pneumatic equipment with low- or zero-emitting equipment will greatly reduce toxic emissions.
- *Controlling Emissions from Oil and Condensate Storage Tanks*: Storage tanks are used to hold oil, condensate, and produced water from oil and gas wells. During normal operations, toxic pollutants such as benzene, methane, and other light hydrocarbons separate from the liquids and, if not controlled, vent into the atmosphere. Tanks are a very large source of toxic air pollutants – we estimate that tanks are emitting over a quarter of the toxic pollutants from the oil and gas industry.^{††} Control measures such as vapor recovery units (small compressors which capture these vapors and inject them into natural gas pipelines) can greatly reduce emissions of these toxic pollutants.
- *Reducing Compressor Seal Emissions*: Seals on the moving parts of natural gas compressors are a significant source of preventable toxic emissions. These emissions can be very large when the seals are not regularly maintained or replaced, and when operators use older designs for certain compressors. Fortunately, these emissions can easily be reduced or eliminated by employing a mix of modern seal design, capture of gas that escapes from seals so it can be utilized, and proper maintenance practices.
- *Reducing Dehydrator Venting*: Dehydrators remove water from the natural gas stream. When their emissions are not controlled, dehydrators vent large amounts of pollution alongside the

^{††} Calculations based on the US GHG Inventory and ratios of VOC to methane and toxic air pollutants to methane from various emission streams from US EPA Regulatory Impact Statement.

water they are intended to remove. They are very large source of toxic air pollutants – dehydrators are the source of about a third of the entire oil and gas industry’s toxic air emissions.^{§§} There are a number of approaches to reducing emissions from dehydrator venting, such as adjusting circulation rates of the glycol fluid; routing the vent gas to a burner used to heat the glycol, so toxics are combusted; and routing emissions to a flare or incinerator.

- *Reducing venting from oil wells:* Venting of gas during completion of oil wells, following hydraulic fracturing, can be a significant source of toxics. In 2012, EPA established standards to address emissions from gas wells during flowback after hydraulic fracturing or re-fracturing requiring operators to flare or capture the gas,^{***} and in 2016, EPA issued standards that will extend this requirement to hydraulically fractured oil wells.¹⁹ Some oil well operators also vent off the “casinghead” natural gas, which they may consider to be an unwanted by-product of oil production; this venting is another significant source of toxics.
- *Reducing venting from gas wells during liquids unloading:* When water from the underground formations that produce gas accumulates in a mature gas well, it can slow or stop gas production from that well. In order to maintain production, operators remove, or “unload”, liquids through a variety of methods, some of which vent natural gas to varying degrees. While a variety of technologies and practices can reduce or eliminate this venting and the resulting pollution, some operators forego these proven, affordable approaches and crudely “blow down” the well by opening it to the atmosphere. This approach is inefficient, as it vents large quantities of gas, including toxics, while only removing a small portion of the liquids in the well.²⁰

^{§§} Calculations based on the US GHG Inventory and the ratio of toxic air pollutants to methane from various emission streams from US EPA Regulatory Impact Statement

^{***} When a well (gas or oil) is hydraulically fractured, large volumes of water and other substances are pumped down the well to break up (fracture) the rock holding the gas / oil. After fracturing is completed, the water is allowed to flow back to the surface during the “flowback” phase of well completion. Natural gas, including toxic species like benzene, from the fractured rock mixes in with this water, and if not controlled, will be vented into the air.

Appendix

A. Counties with Cancer and/or Respiratory Health Risk above EPA's Level of Concern: In order of population from most populous to least populous²¹

State	County	2014 population
TX	Tarrant	1,945,360
CO	Weld	277,670
TX	Webb	266,673
LA	Caddo	252,603
PA	Washington	208,187
WV	Kanawha	190,223
NC	Iredell	166,675
TX	Johnson	157,456
LA	Ouachita	156,325
TX	Midland	155,830
TX	Ector	153,904
PA	Fayette	134,086
LA	Bossier	125,064
NM	San Juan	123,785
TX	Gregg	123,204
LA	Terrebonne	113,328
LA	Lafourche	98,020
PA	Indiana	87,706
TX	Liberty	78,117
NM	Lea	69,999
WV	Harrison	68,761
PA	Armstrong	67,785
TX	Harrison	67,336
KY	Pike	63,034
TX	Wise	61,638
CO	Garfield	57,461
TX	Maverick	57,023
WV	Marion	56,803
WV	Putnam	56,770
NM	Eddy	56,395
TX	Hardin	55,621
CO	La Plata	53,989
TX	Rusk	53,923
OK	Grady	53,854
OK	Washington	51,937
OK	Carter	48,821
OK	Osage	47,981
TX	Wilson	46,402
PA	Jefferson	44,638
OK	Pittsburg	44,626
OK	Stephens	44,493
WV	Wayne	41,122
TX	Upshur	40,354
LA	Webster	40,333
TX	Caldwell	39,810
PA	Clarion	38,821
IL	Marion	38,571
TX	Chambers	38,145
KY	Floyd	38,108
OK	Pontotoc	38,005

State	County	2014 population
PA	Greene	37,843
OK	McClain	37,313
UT	Uintah	36,867
TX	Howard	36,651
TX	Jasper	35,552
WV	Logan	35,348
OK	Lincoln	34,619
TX	Bee	32,863
WV	Marshall	32,416
ND	Williams	32,130
ND	Stark	30,372
OK	Custer	29,500
OK	Caddo	29,317
WV	Jackson	29,126
OH	Carroll	28,187
KY	Perry	27,597
OK	Garvin	27,561
LA	De Soto	27,142
LA	Morehouse	26,760
WV	Mingo	25,716
TX	Shelby	25,515
OK	Seminole	25,421
LA	West Baton Rouge	25,085
TX	Fayette	24,833
WV	Upshur	24,731
MI	Otsego	24,158
TX	Panola	23,769
WV	Boone	23,714
OK	Beckham	23,691
TX	Hockley	23,577
TX	Limestone	23,524
KY	Letcher	23,359
KY	Johnson	23,262
VA	Buchanan	23,106
LA	Assumption	23,034
WV	Wyoming	22,598
LA	Union	22,539
IL	Fayette	21,870
OK	Texas	21,853
LA	St. James	21,638
WV	Lincoln	21,561
TX	Tyler	21,418
TX	Colorado	20,719
TX	DeWitt	20,684
MS	Wayne	20,490
TX	Gonzales	20,462
WV	McDowell	20,448
UT	Duchesne	20,380
OK	McIntosh	20,088

State	County	2014 population
LA	East Feliciana	19,813
TX	Freestone	19,762
TX	Lavaca	19,721
TX	Gaines	19,425
TX	Montague	19,416
IL	Crawford	19,393
TX	Frio	18,531
TX	Andrews	17,477
TX	Scurry	17,328
TX	Burleson	17,253
WV	Taylor	17,069
TX	Leon	16,861
AR	Van Buren	16,851
WV	Barbour	16,766
TX	Lee	16,742
MS	Jasper	16,601
IL	Wayne	16,543
IL	Lawrence	16,519
TX	Robertson	16,500
IL	Piatt	16,431
WV	Lewis	16,414
LA	Claiborne	16,412
OK	Marshall	16,182
IL	Richland	16,061
LA	Jackson	15,994
WV	Wetzel	15,988
TX	Pecos	15,893
KY	Knott	15,892
OK	Kingfisher	15,532
VA	Dickenson	15,308
VA	Appomattox	15,279
TX	Karnes	14,906
LA	La Salle	14,839
WV	Roane	14,664
WV	Braxton	14,463
IL	White	14,374
TX	Zapata	14,319
TX	Newton	14,138
LA	Bienville	13,885
TX	Madison	13,861
OK	Hughes	13,806
OK	Atoka	13,796
IL	Clay	13,520
TX	Dawson	13,372
KY	Magoffin	12,913
OK	Haskell	12,896
TX	Terry	12,739
KY	Martin	12,537
TX	Zavala	12,267
OK	Okfuskee	12,186

State	County	2014 population
TX	Live Oak	12,091
TX	Ward	11,625
MT	Richland	11,576
IL	Wabash	11,549
OK	Washita	11,547
MT	Roosevelt	11,332
OK	Johnston	11,103
TX	Dimmit	11,089
ND	McKenzie	10,996
OK	Latimer	10,693
OK	Nowata	10,524
CO	Yuma	10,202
TX	Marion	10,149
WV	Ritchie	10,011
OK	Blaine	9,917
ND	Mountrail	9,782
OK	Love	9,773
IL	Jasper	9,623
TX	Stephens	9,405
MI	Montmorency	9,300
OK	Woods	9,288
WV	Tyler	9,098
TX	Mitchell	9,076
WV	Clay	8,941
LA	Red River	8,669
WV	Gilmer	8,618
WV	Doddridge	8,391
TX	Yoakum	8,286
TX	Winkler	7,821
OK	Major	7,750

State	County	2014 population
WV	Pleasants	7,634
PA	Forest	7,518
WV	Calhoun	7,513
TX	La Salle	7,474
TX	Refugio	7,302
WY	Weston	7,201
CO	Rio Blanco	6,707
LA	Cameron	6,679
ND	Bottineau	6,650
IL	Edwards	6,617
TX	Garza	6,435
OK	Jefferson	6,292
OK	Cotton	6,150
ID	Bear Lake	5,957
WV	Wirt	5,845
OK	Coal	5,807
OK	Alfalfa	5,790
TX	Lynn	5,771
TX	Wheeler	5,714
OK	Beaver	5,486
TX	Martin	5,460
IL	Gallatin	5,291
TX	Crane	4,950
OK	Dewey	4,914
OK	Grant	4,501
ND	Dunn	4,399
CO	Phillips	4,363
TX	Hemphill	4,180
OK	Ellis	4,150
TX	Sutton	3,972

State	County	2014 population
TX	Fisher	3,831
TX	Crockett	3,812
OK	Harper	3,812
OK	Roger Mills	3,761
TX	Reagan	3,755
MT	Sheridan	3,696
TX	Upton	3,454
TX	Schleicher	3,162
KS	Woodson	3,157
MT	Fallon	3,108
TX	Cochran	2,935
ND	Renville	2,587
ND	Divide	2,432
ND	Burke	2,245
TX	Dickens	2,218
ND	Golden Valley	1,825
TX	Irion	1,574
TX	Stonewall	1,403
TX	Sterling	1,339
TX	Glasscock	1,291
TX	Roberts	928
TX	Terrell	927
ND	Billings	901
TX	McMullen	805
TX	Kent	785
ND	Slope	765
TX	Borden	652
TX	King	262
TX	Loving	86
TOTAL POPULATION		9,013,075

B. Counties with Cancer and/or Respiratory Health Risk above EPA's Level of Concern:
By State

Arkansas	Louisiana (cont.)	Oklahoma (cont.)	Texas (cont.)	Texas (cont.)
Van Buren	Union Parish	Harper	Freestone	Terry
Colorado	Webster Parish	Haskell	Frio	Tyler
Garfield	West Baton Rouge Parish	Hughes	Gaines	Upshur
La Plata	Michigan	Jefferson	Garza	Upton
Phillips	Montmorency	Johnston	Glasscock	Ward
Rio Blanco	Otsego	Kingfisher	Gonzales	Webb
Weld	Mississippi	Latimer	Gregg	Wheeler
Yuma	Jasper	Lincoln	Hardin	Wilson
Idaho	Wayne	Love	Harrison	Winkler
Bear Lake	Montana	Major	Hemphill	Wise
Illinois	Fallon	Marshall	Hockley	Yoakum
Clay	Richland	McClain	Howard	Zapata
Crawford	Roosevelt	McIntosh	Irion	Zavala
Edwards	Sheridan	Nowata	Jasper	Utah
Fayette	North Carolina	Okfuskee	Johnson	Duchesne
Gallatin	Iredell	Osage	Karnes	Uintah
Jasper	North Dakota	Pittsburg	Kent	Virginia
Lawrence	Billings	Pontotoc	King	Appomattox
Marion	Bottineau	Roger Mills	La Salle	Buchanan
Piatt	Burke	Seminole	Lavaca	Dickenson
Richland	Divide	Stephens	Lee	West Virginia
Wabash	Dunn	Texas	Leon	Barbour
Wayne	Golden Valley	Washington	Liberty	Boone
White	McKenzie	Washita	Limestone	Braxton
Kansas	Mountrail	Woods	Live Oak	Calhoun
Woodson	Renville	Pennsylvania	Loving	Clay
Kentucky	Slope	Armstrong	Lynn	Doddridge
Floyd	Stark	Clarion	Madison	Gilmer
Johnson	Williams	Fayette	Marion	Harrison
Knott	New Mexico	Forest	Martin	Jackson
Letcher	Eddy	Greene	Maverick	Kanawha
Magoffin	Lea	Indiana	McMullen	Lewis
Martin	San Juan	Jefferson	Midland	Lincoln
Perry	Ohio	Washington	Mitchell	Logan
Pike	Carroll	Texas	Montague	Marion
Louisiana	Oklahoma	Andrews	Newton	Marshall
Assumption Parish	Alfalfa	Bee	Panola	McDowell
Bienville Parish	Atoka	Borden	Pecos	Mingo
Bossier Parish	Beaver	Burleson	Reagan	Pleasants
Caddo Parish	Beckham	Caldwell	Refugio	Putnam
Cameron Parish	Blaine	Chambers	Roberts	Ritchie
Claiborne Parish	Caddo	Cochran	Robertson	Roane
De Soto Parish	Carter	Colorado	Rusk	Taylor
East Feliciana Parish	Coal	Crane	Schleicher	Tyler
Jackson Parish	Cotton	Crockett	Scurry	Upshur
La Salle Parish	Custer	Dawson	Shelby	Wayne
Lafourche Parish	Dewey	DeWitt	Stephens	Wetzel
Morehouse Parish	Ellis	Dickens	Sterling	Wirt
Ouachita Parish	Garvin	Dimmit	Stonewall	Wyoming
Red River Parish	Grady	Ector	Sutton	Wyoming
St. James Parish	Grant	Fayette	Tarrant	Weston
Terrebonne Parish		Fisher	Terrell	

C. Calculating 2017 Cancer and Respiratory Health Risk

The results of our analysis are based on the modeled cancer and respiratory health risk presented by NATA in its 2011 risk assessment. We made two adjustments to this data to more fully reflect the true impact of the oil and gas industry: we incorporated EPA's data on toxic emissions from Oil and Gas "point" sources, and we updated the results using EPA's 2017 emissions inventory projection to estimate 2017 health impacts.

The NATA results as presented only include non-point emissions sources in the oil and gas industry—these are the large number of relatively small and dispersed facilities and oil and gas activities, such as oil and gas well pads and smaller compressor stations. The cancer and respiratory health risk figures by tract, county, and state can be downloaded directly from the EPA website.²² These results represent the impact from non-point sources, which make up the majority of toxic emissions from the oil and gas industry.

However, emissions from the less numerous but larger point sources are also significant. To determine the full impact of the oil and gas industry, we estimated the impact of emissions from oil and gas point sources and added that to the impacts from non-point sources. Since the NATA calculation of point source cancer and respiratory health risk lumps all industry segments together, we used the following methodology to estimate the cancer and respiratory health risk specifically from oil and gas point sources:

- Download data from the National Emissions Inventory by pollutant for Oil and Gas Point sources and All Point sources by county.²³
 - Point source emissions are not available at the census tract level, so we could not do this analysis at the tract level.
 - As downloaded, the Oil and Gas Point Source data includes a number of facilities that we do not consider to be part of the natural gas supply chain. We removed a total of 11 facilities with the following "facility source descriptions":
 - Coke Battery
 - Electricity Generating via Combustion
 - Hot Mix Asphalt Plant
 - Landfill
 - Coal Gasification Plant
 - Gasoline/Diesel Service Station
 - Petroleum Refinery
 - Petroleum Storage Facility
 - (Note: we made similar adjustments to emissions in our 2017 inventory to keep the inventories consistent.)
- For each point source data set (Oil and Gas, All) we multiply pollutant tonnage by pollutant toxicity to get the weighted sum of toxicity for each pollutant from each county. For cancer, we

used Unit Risk Estimate⁺⁺⁺ (URE) as an estimate of pollutant toxicity, and for respiratory health risk we used Reference Concentration⁺⁺⁺ (RfC) as an estimate of pollutant toxicity. The EPA uses the URE and RfC concepts in its dose-response assessments for chronic exposure to toxic air pollutants, and it periodically re-examines and updates the values for individual substances as knowledge improves.²⁴ The same pollutant has a different impact on cancer and respiratory health, so we calculate two weighted toxicities, one for cancer and one for respiratory health risk.

- For cancer risk, subtract out risk from Coke Ovens from All Point source risk, because EPA modeled emissions and impacts from coke ovens as a distinct source type.²⁵
- We can calculate the percent of point source cancer and respiratory toxicity in each county that are from oil and gas facilities by taking the ratio of weighted oil and gas emissions toxicity to weighted toxicity of emissions from all point sources.
- Multiply this percentage by the total respiratory health risk or the total cancer risk minus risk from coke ovens. This is the estimate of cancer and respiratory health risk from oil and gas point sources.
- Add the estimate of risk from oil and gas point sources to the cancer or respiratory health risk for oil and gas non-point sources that was presented directly by NATA.
- This is the total estimate of 2011 oil and gas cancer or respiratory health risk.

The total estimate of 2011 oil and gas cancer risk, as calculated using this methodology at the countywide level, averaged 24% higher than the risk from non-point sources alone. As a result of adding in oil and gas point sources, the number of counties exceeding the threshold of EPA's level of concern for cancer risk for 2011 increased from 106 to 206.

Next, we know that the oil and gas industry has changed substantially between 2011 and today, both in terms of the volume of oil and gas being produced and the geographic distribution of oil and gas production. For example, oil production has increased 67 percent, from 2,058 million barrels in 2011 to 3,442 million barrels in 2015.²⁶ Gas production has increased 16 percent, from 38.48 trillion cubic feet in 2011 to 32.96 trillion cubic feet in 2015.²⁷ Thus, a risk assessment based on 2011 emissions does not accurately reflect the current realities of emissions from the oil and gas industry. We used NEI's 2017 projection of air toxic emissions to estimate cancer and respiratory health risk in 2017, and NEI's inventory of emissions in 2011, to estimate the change in risk between 2011 and 2017.

- We downloaded EPA's 2017 projection of toxic emissions by county for both oil and gas point and non-point sources.^{§§§}

+++++ "The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 µg/m3 in air." See: <https://www.epa.gov/national-air-toxics-assessment/nata-glossary-terms>.

+++ "The reference concentration is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups that include children, asthmatics, and the elderly) that is likely to be without an appreciable risk of deleterious effects during a lifetime." See: <https://www.epa.gov/national-air-toxics-assessment/nata-glossary-terms>.

§§§ Using the 2011 NEI v2 as a starting point, the U.S. EPA developed a 2017 future case by projecting population and production growth as well as the impact of federal emissions regulations promulgated by December 2014. The emissions model used for this platform is the Sparse Matrix Operator Kernel Emissions (SMOKE) model version 3.7 commonly used by

- 2017 projected toxic emissions are not available at the tract level, so this analysis cannot be done at the tract level.
- We calculated weighted toxicity for oil and gas in each county for both point and non-point sources (using same URE and RfC factors and method as above). To simplify analysis, we focused on only the most consequential pollutant species: benzene, formaldehyde, and acetaldehyde. These three pollutants account for 93% of national cancer risk and 27% of national respiratory hazard risk in the oil and gas sector (Note: ethyl benzene accounts for 71% of national respiratory hazard risk in the oil and gas sector, but it was not reported as a separate pollutant species in NEI's 2017 projections, so we did not include it in our analysis. However, ethyl benzene emissions will closely track benzene emissions, and benzene, which is reported separately in NEI's projection, makes up most of the remainder of the national respiratory hazard risk.)
- For each county we compared total 2011 toxicity for the 3 pollutants (benzene, formaldehyde, acetaldehyde) to total 2017 toxicity for the 3 pollutants, and calculated percent increase or decrease for cancer and respiratory toxicity.
- We multiplied this percent increase (or decrease) by the 2011 oil and gas risk estimate for both cancer and respiratory health risk. This is the 2017 risk estimate.

As a result of the 2017 update, the number of counties exceeding the threshold of EPA's level of concern for cancer risk increased from 206 in 2011 to 238 in 2017. (60 counties shifted from below to above the threshold, while 28 counties fell from above to below the threshold as a result of the 2017 adjustment, for a net increase of 32.)

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¹³ US EPA. Polycyclic organic matter (POM) Hazard Summary. Available at: <http://www3.epa.gov/ttn/atw/hlthef/polycycl.html>.

¹⁴ US Energy Information Administration (EIA). Pennsylvania Field Production of Crude Oil. Available at: <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfppa1&f=a>.

US EIA. Natural Gas Gross Withdrawals and Production. Available at: http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm.

¹⁵ US EIA. Texas Field Production of Crude Oil. Available at: <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfptx1&f=a>.

US EIA. Natural Gas Gross Withdrawals and Production. Available at: http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm.

¹⁶ US EIA. Colorado Field Production of Crude Oil. Available at: <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfpco1&f=a>.

US EIA. Natural Gas Gross Withdrawals and Production. Available at:
http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcfa.htm.

¹⁷ Many peer-reviewed studies based on independent measurements conducted in both oil and gas producing basins and urban areas consuming natural gas have concluded that official emissions inventories such as NEI underestimate actual emissions from oil and gas. See *Waste Not*, pp. 9 – 11. More recent work, including work carried out in cooperation with the industry, has come to similar conclusions. See Harriss, R., et al., (2015) “Using Multi-Scale Measurements to Improve Methane Emission Estimates from Oil and Gas Operations in the Barnett Shale Region, Texas,” *Environ. Sci. Technol.* 49, 7524–7526, and references therein. Recent work to update and improve emissions inventories, particularly for methane, is improving this situation. EPA Office of Inspector General (2013), “Report: EPA Needs to Improve Air Emissions Data for the Oil and Natural Gas Production Sector.” Available at: <https://www.epa.gov/office-inspector-general/report-epa-needs-improve-air-emissions-data-oil-and-natural-gas-production>. Although the methane inventory and the NEI, which NATA and our analysis are based on, are developed separately, it is likely that the NEI underestimates HAP from oil and gas just as the GHG inventory underestimates methane from oil and gas, for similar reasons (underestimated emissions factors and undercounts of equipment).

¹⁸ McCabe, David, et al. (2015) “Waste Not: Common Sense Ways to Reduce Methane Pollution from the Oil and Natural Gas Industry.” Available at: <http://www.catf.us/resources/publications/files/WasteNot.pdf>

¹⁹ US EPA. “Final Rule: Oil and Natural Gas Sector: Emissions Standards for New and Modified Sources.” Available at: <https://www3.epa.gov/airquality/oilandgas/may2016/nsps-finalrule.pdf>.

²⁰ US EPA. “Lessons Learned from Natural Gas STAR Partners, Installing Plunger Lift Systems in Gas Wells.” Available at: http://epa.gov/gasstar/documents/ll_plungerlift.pdf.

²¹ U.S. Census Bureau, Population Division. (2015) Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2014. Available at: <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>

²² US EPA. 2011 NATA: Assessment Result. "2011 NATA natl cancer risk by tract source" & "2011 NATA natl respiratory health risk by tract source". Available at: <https://www.epa.gov/national-air-toxics-assessment/2011-nata-assessment-results>

²³ US EPA. 2011 National Emissions Inventory (NEI) Data. Available at: <https://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data>.

²⁴ US EPA. “NATA Frequent Questions, Q10: How does EPA estimate cancer risk?” Available at: <https://www.epa.gov/national-air-toxics-assessment/nata-frequent-questions>.

²⁵ US EPA. (2015) “Technical Support Document EPA’s 2011 National-scale Air Toxics Assessment.” Available at: <https://www.epa.gov/sites/production/files/2015-12/documents/2011-nata-tsd.pdf>.

²⁶ US EIA. U.S. Field Production of Crude Oil. Available at:
<http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=p&s=mcrfpus1&f=a>.

²⁷ US EIA. Natural Gas Gross Withdrawals and Production. Available at:
http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcfa.htm.

From: [Hattel, Christy](#)
To: [Boulder County Oil and Gas Comment](#)
Date: Tuesday, June 21, 2016 9:48:08 AM

Please continue to allow fracking in Boulder County.

Please note that you only had 5 protesters in your lobby yesterday.

We need comprehensive oil and gas development in a smart, sustainable way.

Fracking is a safe and proven method for supporting that sustainability.

Thank you,

Christy Hattel

This message and any enclosures are intended only for the addressee. Please notify the sender by email if you are not the intended recipient. If you are not the intended recipient, you may not use, copy, disclose, or distribute this message or its contents or enclosures to any other person and any such actions may be unlawful. Ball reserves the right to monitor and review all messages and enclosures sent to or from this email address.

From: [Teresa F](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Methane Pollution Report attached
Date: Tuesday, June 21, 2016 9:49:35 AM
Attachments: [MethanePollution-report.pdf](#)

Another report for the record.

Teresa Foster



AP PHOTO/MATTHEW BROWN

The Who's Who of Methane Pollution in the Onshore Oil and Gas Production Sector

Eleven companies emitted half of all methane pollution in the United States from onshore oil and gas production in 2014.

By Alison Cassady June 20, 2016



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Contents

1	Introduction and summary
3	Controlling methane emissions from the oil and gas sector
4	Methane emissions from onshore oil and gas production
11	Conclusion
12	Methodology
15	Appendix A: Top 100 onshore oil and gas producers with the most methane emissions in 2014, by metric tons of CO₂e
19	Appendix B: Onshore oil and gas producers with at least 100,000 tons of methane emissions in 2014, by basin and metric tons of CO₂e
27	Endnotes

Introduction and summary

Methane is a supercharged global warming pollutant that is 87 times more potent than carbon dioxide over a 20-year time scale.¹ In the United States, the oil and gas industry is the largest industrial source of methane pollution—releasing 33 percent of all methane emissions in 2014.²

As part of its broader climate change mitigation strategy, the Obama administration set a goal of reducing methane emissions from the oil and gas sector by 40 percent to 45 percent from 2012 emissions levels by 2025.³ In May 2016, the U.S. Environmental Protection Agency, or EPA, finalized limits on methane emissions from new sources in the oil and gas sector.⁴ Although the limits on pollution from new and modified sources are important, the EPA will also have to set strong standards for existing wells and equipment—meaning those that are already in operation—in order to achieve the administration’s methane emissions reduction goal. The EPA has initiated an information collection process to help shape a future rule-making on existing sources.⁵ The Bureau of Land Management, or BLM, also is moving forward with rules to reduce methane leaks from oil and gas production on public and Native American lands.⁶

The EPA already collects facility-level greenhouse gas data from the top emitting sectors of the U.S. economy through the Greenhouse Gas Reporting Program, or GHGRP. The Center for American Progress analyzed these data for 2014—the most recent data available—to identify which companies in the onshore oil and gas production sector are responsible for the most methane emissions and which regions of the country experience the most methane pollution.

The key findings for the 2014 data include:

- **The onshore oil and gas production sector’s methane emissions totaled more than 48 million metric tons of carbon dioxide equivalent, or CO₂e, in 2014.** This is the equivalent of 14 coal-fired power plants powered for one year, according to the EPA’s conservative methodology for calculating emissions equivalency.⁷

- **Eleven companies were responsible for almost half—49 percent—of the methane emissions reported from onshore oil and gas production in 2014.** The EPA collected methane emissions data from 211 companies in this sector in 2014.
- **ConocoPhillips, ExxonMobil Corp., Chesapeake Energy, EOG Resources Inc., and BP America ranked first through fifth for the most methane emissions from onshore production.** However, the biggest emitters were not necessarily the biggest natural gas producers. For example, ConocoPhillips—the top methane emitter from onshore oil and gas production—was the sixth largest natural gas producer in 2014. EOG Resources Inc., which ranked fourth for methane emissions, was the 14th largest natural gas producer that same year.
- **Some companies reported emitting more methane on a per-well basis than others.** For companies that reported at least 1,000 wells in 2014, the companies with the highest per-well emissions in the onshore oil and gas production sector included Lewis Energy Group, QEP Resources Inc., EOG Resources Inc., Samson Energy Company, and EP Energy E&P Company.
- **The parts of the country experiencing the most methane pollution from onshore oil and gas production include the following:** the Anadarko Basin of Colorado, Kansas, Oklahoma, and Texas; the Gulf Coast Basin of Louisiana and Texas; the San Juan Basin of Colorado and New Mexico; the Permian Basin of New Mexico and Texas; and the Appalachian Basin in the eastern part of the United States.
- **The San Juan Basin of Colorado and New Mexico experienced the most methane emissions per well in 2014,** followed by the Arkoma Basin of Arkansas and Oklahoma; the Strawn Basin of Texas; the Green River Basin of Colorado and Wyoming; and the Uinta Basin of Utah.

These EPA data show that oil and gas wells already in operation are releasing significant volumes of methane across the United States. The best way to curb these emissions is for the EPA to set strong mandatory standards for existing sources in the oil and gas sector in order to complement the new source standards finalized in May 2016. The BLM also should finalize a strong rule that ensures oil and gas companies find and repair wasteful methane leaks in their operations on public and Native American lands.

Controlling methane emissions from the oil and gas sector

On May 12, 2016, the EPA finalized new source performance standards to directly regulate methane emissions from the oil and gas sector for the first time. These standards will limit methane pollution released from future oil and gas operations; they will not, however, apply to existing sources of pollution in the oil and gas industry. The EPA estimates that these rules will reduce methane emission by 510,000 short tons in 2025 alone.⁸

The EPA proposal for new and modified sources triggers section 111(d) of the Clean Air Act, which requires the EPA to reduce methane from wells, equipment, and facilities that are already in operation—also known as existing sources.⁹ The EPA has taken the first step toward setting standards for existing sources by initiating a formal information collection request that requires oil and gas companies to submit data about their operations to the EPA.¹⁰

In order to cut methane emissions from the oil and gas sector by 40 percent to 45 percent by 2025, the EPA will need to set limits for existing sources. In January 2016, the Clean Air Task Force, or CATF, estimated that emissions from the oil and gas sector will need to fall by an additional 75 million metric tons of CO₂e, after accounting for emissions reductions achieved by the new source performance standards.¹¹ The CATF identifies strong, enforceable limits on methane pollution from existing sources as the only way to close this gap.¹² Similarly, the Rhodium Group concluded that, even with significant voluntary efforts from the oil and gas industry, the United States would need to find 59 million to 70 million metric tons of additional reductions by 2025 in order to hit the 40 percent to 45 percent reduction goal.¹³

Notably, the BLM also has proposed a rule to reduce methane leaks from oil and gas production on public and Native American lands.¹⁴ The proposed rule would avert the waste of up to 56 billion cubic feet of natural gas annually, which is enough to supply up to approximately 760,000 households per year.¹⁵

Methane emissions from onshore oil and gas production

Methane emissions from existing oil and gas operations are a significant problem. ICF International estimates that by 2018, nearly 90 percent of the oil and gas sector's methane emissions will come from sources that were already in operation in 2011.¹⁶ After the EPA's methane limits for new and modified sources go into effect, methane pollution from 75 percent of the wells and oil and gas infrastructure in the United States will remain unregulated at the federal level.¹⁷

To better understand where some of these existing sources are located and who owns them, CAP analyzed 2014 data on methane emissions from the onshore oil and gas production sector as reported to the EPA Greenhouse Gas Reporting Program. Through the GHGRP, the EPA collects facility-level greenhouse gas data from the top emitting sectors of the U.S. economy.¹⁸ The EPA uses these data to inform domestic policy and improve the "U.S. Greenhouse Gas Inventory Report"—a comprehensive annual report submitted to the United Nations in accordance with the U.N. Framework Convention on Climate Change.

The GHGRP includes data on 211 companies from the onshore oil and gas production sector that reported methane emissions in 2014. CAP analyzed these data for onshore oil and gas production by both parent company and hydrocarbon basin, as detailed below. Onshore oil and gas producers must report emissions from natural gas well completions and workovers; well venting; and leaks from equipment such as pneumatic devices and pumps, tanks, dehydrators, and compressors. These reports likely underestimate methane emissions from this sector. (See Text Box below)

CAP's analysis shows that millions of tons of methane pollution will go unchecked from oil and gas production without additional emissions limits for existing sources in the oil and gas sector.

Why the data likely underestimate emissions from the onshore oil and gas production sector

The analysis presented in this report likely underestimates the amount of methane released by the onshore oil and gas production sector in 2014.

- **Only the largest emitters of methane and other greenhouse gases—those emitting more than 25,000 metric tons of CO₂e in the reporting year—report to the GHGRP.**¹⁹

As a result, these data may not include methane emissions from smaller producers.

- **The oil and gas producer data for 2014 do not include greenhouse gas emissions from completions and workovers of oil wells with hydraulic fracturing, although many of these wells coproduce natural gas and, therefore, methane.** For the 2014 reporting year, the EPA only required companies to report emissions from natural gas well completions

and workovers. In 2015, the EPA finalized a rule clarifying that companies must report emissions associated with completions and workovers with hydraulic fracturing for wells regardless of whether their primary product is oil or natural gas.²⁰

- **Some of the oil and gas wells may be so-called superemitters and far leakier than regulators or even the well owners themselves know.** The Environmental Defense Fund, or EDF, hired a leak detection company to fly a helicopter over 8,000 well pads across seven states and use an infrared camera to detect methane leaks. In April 2016, the EDF released its study of this experiment and revealed that experts found superemitter sites in every basin they examined. The EDF also concluded that “super-emitting sources are nearly impossible to predict. They can happen anywhere anytime as a result of malfunctioning equipment that goes unattended and sloppy mistakes in the field.”²¹

Methane emissions by oil and gas producer

In 2014, the U.S. onshore oil and gas production sector reported nearly 103 million metric tons of greenhouse gas emissions measured in CO₂e.²² Onshore oil and gas production is the largest contributor to the total greenhouse gas emissions footprint of the petroleum and natural gas systems sector, which also includes natural gas transmission, processing, underground storage, and other sources.²³

Methane emissions comprised almost half of the total greenhouse gas emissions from the onshore oil and gas production sector—more than 48 million metric tons of CO₂e, or 47 percent.²⁴ Although this marks a small decline from 2013, these methane emissions are the equivalent of 14 coal fired-power plants operating for one year, calculated by using the EPA’s conservative methodology for calculating emissions equivalency.²⁵

Table 1 displays the 11 oil and gas producers that reported the most methane emissions in 2014—led by ConocoPhillips, ExxonMobil Corp., Chesapeake Energy, EOG Resources Inc., and BP America. These 11 companies represent

almost half—49 percent—of the methane emissions reported from onshore oil and gas production in 2014. Their combined methane emissions are the carbon equivalent of burning almost 125,000 rail cars of coal or running almost seven coal-fired power plants for one year.²⁶

See Appendix A for a list of the top 100 oil and gas producers in terms of methane emissions for 2014.

TABLE 1

11 onshore oil and gas producers with at least 1 million metric tons of methane emissions in 2014

Metric tons of carbon dioxide equivalent

Rank	Parent company	2014 methane emissions	2014 emissions equivalent, railcars of coal burned
1	ConocoPhillips Corp.	4,653,752	24,783
2	ExxonMobil Corp.	3,491,197	18,592
3	Chesapeake Energy Corp.	2,767,333	14,737
4	EOG Resources Inc.	2,668,380	14,210
5	BP America	2,309,971	12,302
6	Anadarko Petroleum Corp.	1,743,867	9,287
7	EnerVest Operating Company	1,403,018	7,472
8	Southwestern Energy Company	1,159,863	6,177
9	Lewis Energy Group	1,154,730	6,149
10	Samson Energy Company LLC	1,027,889	5,474
11	Devon Energy Corp.	1,005,238	5,353

Sources: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). Emissions equivalencies were generated with U.S. Environmental Protection Agency, "Greenhouse Gas Equivalencies Calculator," available at <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (last accessed June 2016).

One would assume that the companies with the most natural gas production would be the largest methane polluters. However, the companies in the top five do not neatly align with the list of the top natural gas producers in 2014, as compiled by the Natural Gas Supply Association. For example, ConocoPhillips—the top methane emitter from onshore oil and gas production—was the sixth largest natural gas producer in 2014. EOG Resources Inc.—ranking fourth for methane emissions—was the 14th largest natural gas producer that same year. Devon Energy—the fifth largest natural gas producer in 2014—ranked 11th for methane emissions from onshore production in 2014.²⁷

In order to compare companies, CAP attempted to control for the production volume for each company by calculating the average amount of methane pollution emitted per well. To do this, CAP looked at the emissions data for the 66 companies—out of 211 companies—that reported owning or operating at least 1,000 wells in 2014. Table 2 shows that Lewis Energy Group—a privately held oil and gas producer that operates primarily in Texas—reported per-well methane emissions that were more than double the per-well emissions from the company that ranked second: Colorado-based QEP Resources Inc. ConocoPhillips—the company with the most methane emissions from the onshore oil and gas production sector in 2014—ranked 10th for the highest rate of methane emissions per well. (See Text Box below)

TABLE 2
10 onshore oil and gas producers with the
highest per-well methane emissions in 2014

For companies reporting at least 1,000 wells in 2014:
Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Lewis Energy Group	1,154,730	1,682	687
QEP Resources Inc.	990,500	3,264	303
EOG Resources Inc.	2,668,380	9,221	289
Samson Energy Company LLC	1,027,889	3,645	282
EP Energy E&P Company LP	402,741	1,455	277
Cimarex Energy*	781,466	3,156	248
Southwestern Energy Company	1,159,863	5,539	209
PDC Energy	573,802	2,747	209
BP America	2,309,971	11,125	208
ConocoPhillips Corp.	4,653,752	22,863	204

* Cimarex Energy reported methane emissions for a jointly owned facility in Oklahoma but reported "0" wells. The emissions per-well figure for Cimarex does not include emissions from this facility, which amounted to just 310 metric tons of carbon dioxide equivalent.

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016).

ConocoPhillips' efforts to cut methane emissions in the San Juan Basin of Colorado and New Mexico

ConocoPhillips released more methane emissions from onshore oil and gas production than any other company in 2014—a position it has held since at least 2011²⁸—and ranked 10th for most methane emissions per well. That said, the company's 2014 performance is a significant improvement from 2013. Between 2013 and 2014, ConocoPhillips reduced its methane emissions from the onshore oil and gas production sector by 40 percent.²⁹

ConocoPhillips achieved most of these reductions at its operations in the San Juan Basin of Colorado and New Mexico, where NASA discovered a methane cloud the size of Delaware in October 2014 hovering over the region.³⁰ The company reports that it invested and installed more efficient pneumatic devices—devices used to operate valves and control pressure, flow, and other parameters—and improved its

liquids unloading process, which is used to optimize conditions for gas production but can result in significant methane leaks.³¹

ConocoPhillips has shown that companies can use existing technology to reduce their methane pollution at wells that are already in operation. More remains to be done; however: The company remains the top methane emitter in the San Juan Basin of Colorado and New Mexico. The EPA and BLM will require these same type of technologies as part of their rule-makings on methane emissions from the oil and gas sector. Voluntary measures alone are not sufficient to drive across-the-board methane emissions reductions and ensure that all companies are detecting and repairing methane leaks in a timely manner on both public and private lands.

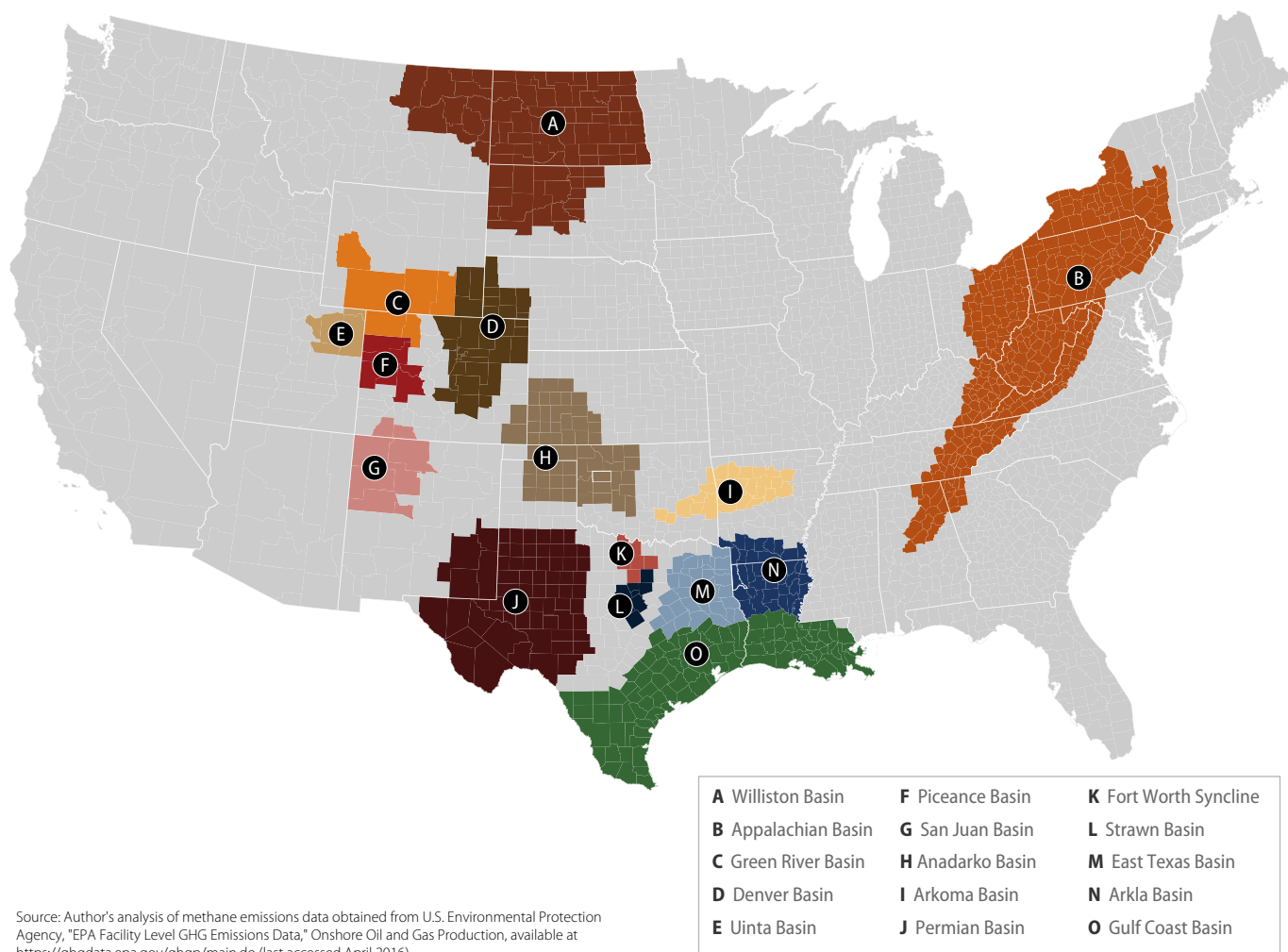
Methane emissions by oil and gas basin

Fifteen basins recorded at least 1 million metric tons CO₂e of methane in 2014. (See Table 3) The Anadarko Basin of Colorado, Kansas, Oklahoma, and Texas; the Gulf Coast Basin of Louisiana and Texas; and the San Juan Basin of Colorado and New Mexico each experienced more than 5 million metric tons CO₂e of methane pollution in 2014. Onshore oil and gas producers released 4.8 million metric tons CO₂e of methane in the Permian Basin of New Mexico and Texas and 3.5 million metric tons CO₂e of methane in the Appalachian Basin in the eastern part of the United States. These five basins accounted for more than half—52 percent—of the nation's methane pollution from onshore oil and gas production in 2014.

Table 3 also shows that certain basins have a higher rate of methane emissions per well than others. The San Juan Basin of Colorado and New Mexico experienced the most methane emissions per well in 2014—a total of 227 metric tons of CO₂e per well. The Arkoma Basin of Arkansas and Oklahoma, the Strawn Basin of Texas, and the Green River Basin of Colorado and Wyoming each had more than 200 metric tons of CO₂e per well.

FIGURE 1

Hydrocarbon basins with the most methane pollution from onshore oil and gas production, 2014



See Appendix B for a list of the companies that emitted the most methane in each of these 15 basins in 2014.

TABLE 3
15 oil- and gas-producing basins with at least
1 million metric tons of methane emissions in 2014

Metric tons of carbon dioxide equivalent

Basin	2014 methane emissions	Number of wells*	Methane emissions per well*
Anadarko Basin	5,855,333	43,536	128
Gulf Coast Basin	5,751,780	32,770	163
San Juan Basin	5,202,528	22,579	227
Permian Basin	4,782,622	112,230	40
Appalachian Basin	3,455,036	76,800	41
East Texas Basin	2,760,620	20,684	133
Arkoma Basin	2,462,511	11,471	212
Green River Basin	2,375,566	11,790	201
Uinta Basin	2,336,781	11,753	199
Denver Basin	1,909,847	22,253	85
Piceance Basin	1,837,649	13,486	136
Williston Basin	1,769,469	13,799	125
Strawn Basin	1,604,892	7,503	209
Fort Worth Syncline	1,557,056	8,619	181
Arkla Basin	1,381,239	8,369	165

* Forty-three of the 522 facility records did not include well count data. The per-well figures do not include emissions from those records.

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016).

Conclusion

As this report shows, the U.S. oil and gas industry released millions of tons of methane pollution in 2014 in regions across the country. These localized emissions have a powerful global impact, especially given methane's potent greenhouse effect. Curbing methane pollution from the oil and gas sector—as well as other sectors—will be key to slowing the rate of climate change. Recognizing this reality, the EPA has taken an important step by finalizing standards to limit methane pollution from oil and gas operations that will come online in the future. In order to address the bulk of the methane emissions from this sector, however, the EPA now must work expeditiously to limit pollution from the thousands of wells and facilities already in operation. The BLM also must finalize a strong rule that minimizes wasteful methane leaks from oil and gas operations on public and Native American lands.

Methodology

Data source

The author accessed GHGRP data on 2014 emissions from the onshore oil and gas production sector through the EPA's Facility Level Information on Greenhouse Gases Tool, available at <https://ghgdata.epa.gov/ghgp/main.do>, on April 22, 2016. The GHGRP includes data on 211 companies that reported methane emissions from 522 facilities in the onshore oil and gas production sector in 2014.

Basin data

Onshore oil and gas producers do not report their data on an individual facility-by-facility basis. Instead, they group their emissions data by hydrocarbon basin. For onshore oil and gas production, the facility report reflects all emissions from wells and associated equipment owned or operated by a single company in a specific hydrocarbon producing basin.³² The EPA relies on the American Association of Petroleum Geologists to define the hydrocarbon basins.³³

The author used the geologic names as presented in the GHGRP database but considered the basins coded in the EPA's GHGRP database as "160-Appalachian Basin" and "160A-Appalachian Basin (Eastern Overthrust Area)" to be one basin.³⁴

Parent companies

For parent companies, the author relied on the information that the facilities themselves provided to the EPA. The author did not modify the data if a company has been acquired; changed its name; or went out of business since reporting its 2014 data to the EPA. For joint ventures, the author attributed methane emissions to the company with the largest share in the operation.³⁵

Well-count data

Forty-three out of the 522 onshore oil and gas facilities that reported to the GHGRP did not include a well count or listed “0” as the well count. After consultation with the EPA, the author assumed these to be data reporting errors and excluded the methane emissions for these facilities from the per-well emissions analysis.

Carbon equivalencies

The methane emissions data in this report are expressed in carbon dioxide equivalent, as this is the format used by the EPA in the GHGRP database. To calculate the carbon dioxide equivalency for methane, the EPA uses the 100-year global warming potential, or GWP, as calculated in the Intergovernmental Panel on Climate Change’s, or IPCC’s, “Fourth Assessment Report.”³⁶

This GWP potential is conservative for two reasons. First, the IPCC “Fifth Assessment Report” revised the 100-year GWP to be higher in order to reflect methane’s potency.³⁷ Second, since methane persists in the atmosphere for a short period of time, it may be more appropriate to assess its potency based on a 20-year time scale rather than a 100-year scale.³⁸

About the author

Alison Cassady is the Director of Domestic Energy Policy at the Center for American Progress. Cassady joined the organization after working as a senior professional staff member for Rep. Henry Waxman (D-CA) and the U.S. House of Representatives Energy and Commerce Committee.

Appendix A

Top 100 onshore oil and gas producers with the most methane emissions in 2014, by metric tons of CO₂e

APPENDIX A

Top 100 onshore oil and gas producers with the most methane emissions in 2014

Metric tons of carbon dioxide equivalent

Rank	Parent company	2014 methane emissions	Number of wells	Methane emissions per well
1	ConocoPhillips Corp.	4,653,752	22,863	204
2	ExxonMobil Corp.	3,491,197	28,143	124
3	Chesapeake Energy Corp.	2,767,333	18,946	146
4	EOG Resources Inc.	2,668,380	9,221	289
5	BP America	2,309,971	11,125	208
6	Anadarko Petroleum Corp.*	1,743,867	16,210	98
7	EnerVest Operating Company	1,403,018	16,914	83
8	Southwestern Energy Company	1,159,863	5,539	209
9	Lewis Energy Group	1,154,730	1,682	687
10	Samson Energy Company LLC	1,027,889	3,645	282
11	Devon Energy Corp.	1,005,238	13,391	75
12	QEP Resources Inc.	990,500	3,264	303
13	Linn Energy LLC*	940,884	19,603	48
14	Encana Corp.	858,833	8,184	105
15	SandRidge Exploration and Production LLC	824,292	4,173	198
16	Cimarex Energy*	781,466	3,156	248
17	Chevron Corp.	736,235	35,677	21
18	WPX Energy Inc.	723,202	6,076	119
19	Atlas Energy Inc.	681,668	7,047	97
20	Apache Corp.	633,740	14,008	45

Rank	Parent company	2014 methane emissions	Number of wells	Methane emissions per well
21	PDC Energy	573,802	2,747	209
22	Occidental Petroleum Corp.	542,142	20,943	26
23	Marathon Oil Corp.	530,956	3,491	152
24	Pioneer Natural Resources Company	487,716	11,251	43
25	Diamondback Energy Inc.	432,156	682	634
26	EP Energy E&P Company LP	402,741	1,455	277
27	BHP Billiton Ltd.	388,082	2,457	158
28	Questar Corp.	385,940	769	502
29	Loews Corp.	385,869	6,069	64
30	Sabine Oil & Gas Company	356,739	870	410
31	CNX Gas Company	327,612	12,460	26
32	Energen Corp.*	323,001	1,471	185
33	Stephens Production Company	314,397	925	340
34	Yates Petroleum Corp.	291,487	2,892	101
35	BreitBurn Energy Partners LP	285,831	4,535	63
36	Noble Energy Company	279,921	7,986	35
37	Alta Mesa Holdings LP*	272,446	N/A	N/A
38	Compass Production Partners LP	268,554	1,421	189
39	Midstates Petroleum Company	267,539	457	585
40	Denbury Resources Inc.	263,967	3,639	73
41	Vanguard Natural Resources LLC	262,829	2,104	125
42	Foundation Energy Company LLC	244,670	1,731	141
43	COG Operating LLC	239,991	4,250	56
44	Newfield Exploration Company	229,770	4,303	53
45	Endeavor Energy Resources LP*	224,696	13,090	17
46	Seneca Resources Corp.*	212,822	N/A	N/A
47	Continental Resources Inc.	207,979	2,270	92
48	Shell Oil Company	205,070	17,893	11
49	Premier Natural Resources LLC	204,913	787	260
50	Unit Petroleum Company*	201,907	N/A	N/A
51	Parsley Energy Inc.	196,632	139	1,415
52	Exco Resources Inc.	186,091	5,318	35
53	Bill Barrett Corp.	185,227	590	314
54	Whiting Petroleum Corp.	180,822	1,829	99

Rank	Parent company	2014 methane emissions	Number of wells	Methane emissions per well
55	Hilcorp Energy Company	178,205	6,846	26
56	Chaparral Energy Inc.	177,426	1,855	96
57	Halcón Resources Corp.	172,299	518	333
58	Pennsylvania General Energy Company LLC	171,382	2,442	70
59	Jonah Energy LLC	159,627	2,139	75
60	Forest Oil Corp.*	152,587	510	290
61	Bonanza Creek Energy Inc.	146,188	812	180
62	Ultra Petroleum Corp.	144,940	1,895	76
63	Statoil	143,850	667	216
64	Comstock Resources Inc.	141,249	920	154
65	Hess Corp.	139,889	1,946	72
66	Sanguine Gas Exploration LLC*	135,132	N/A	N/A
67	Kaiser-Francis Oil Company	134,137	824	163
68	Templar Energy LLC	132,923	937	142
69	Merit Energy Company	131,626	8,671	15
70	Clayton Williams Energy Inc.*	122,392	N/A	N/A
71	Talisman Energy Inc.	121,716	679	179
72	RKI Exploration & Production	118,125	664	178
73	Cabot Corp.*	115,899	3,705	12
74	J-W Energy Company	115,310	1,018	113
75	Sanchez Oil & Gas Corp.	109,666	393	279
76	Nadel & Gussman LLC	109,318	461	237
77	BOPCO LP	105,163	861	122
78	Approach Resources Inc.	98,476	730	135
79	Samuel Gary Jr. & Associates Inc.	96,676	209	463
80	Enerplus Corp.	95,589	311	307
81	American Energy Partners LP	83,214	316	263
82	Penn Virginia Corp.	82,488	994	83
83	Memorial Resource Development Corp.	82,454	1,265	65
84	Valence Operating Company	80,855	592	137
85	MDU Resources Group Inc.	80,422	1,921	42
86	Legend Natural Gas LLC	78,620	814	97

Rank	Parent company	2014 methane emissions	Number of wells	Methane emissions per well
87	Elm Ridge Exploration Company LLC*	75,766	N/A	N/A
88	Discovery Natural Resources LLC	74,049	1,084	68
89	Dugan Production Corp.	73,644	819	90
90	SM Energy Company	71,512	1,587	45
91	Ursa Resources Group II LLC	70,450	330	213
92	Trendwell Energy Corp.*	70,342	N/A	N/A
93	Caerus Oil and Gas LLC	70,098	750	93
94	Antero Resources	69,952	653	107
95	Indigo Minerals LLC	69,483	429	162
96	BlueStone Natural Resources	68,590	630	109
97	Swift Energy Operating LLC	66,758	778	86
98	Laredo Petroleum Inc.	64,967	1,164	56
99	EQT Corp.	62,850	6,380	10
100	Range Resources Corp.	62,626	8,265	8

*These companies did not report well count data for at least one basin in 2014. For these companies, the emissions-per-well analysis does not include emissions from basins for which there are no well count data. If a company did not report any well count data, the column is marked as "not applicable."

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

Appendix B

Onshore oil and gas producers with at least 100,000 tons of methane emissions in 2014, by basin and metric tons of CO₂e

This only includes data for the 15 basins with at least 1 million metric tons of CO₂e of methane emissions in 2014.

APPENDIX B1

Anadarko Basin—Colorado, Kansas, Oklahoma, and Texas

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Chesapeake Energy Corp.	1,390,902	7,039	198
SandRidge Exploration and Production LLC	584,547	1,577	371
Apache Corp.	507,210	2,466	206
Samson Energy Company LLC	452,446	1,118	405
Cimarex Energy Company	321,700	1,192	270
BP America	258,001	1,393	185
Linn Energy LLC	222,395	8,571	26
Devon Energy Corp.	186,389	1,269	147
ConocoPhillips Corp.	182,366	2,121	86
Midstates Petroleum Company Inc.	178,896	393	455
Chaparral Energy Inc.	150,604	769	196
Sanguine Gas Exploration LLC*	135,132	N/A	N/A
Kaiser-Francis Oil Company	134,137	824	163
Templar Energy LLC	132,923	937	142
Unit Petroleum Company*	132,834	N/A	N/A
Marathon Oil Corp.	111,563	353	316
ExxonMobil Corp.	105,226	1,422	74
EOG Resources Inc.	102,282	453	226

* These companies did not report well count data for the basin in 2014; as a result, CAP was unable to calculate per-well emissions for these companies.

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B2

Appalachian Basin—Alabama, Georgia, Kentucky, Maryland, North Carolina, New York, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Atlas Energy Inc.	589,434	6,453	91
EnerVest Operating Company	567,908	10,926	52
CNX Gas Company	327,612	12,460	26
Chesapeake Energy Corp.	312,179	6,108	51
Seneca Resources Corp.*	212,822	N/A	N/A
Pennsylvania General Energy Company LLC	171,382	2,442	70
Southwestern Energy Company	158,206	1,213	130
Chevron Corp.	129,040	285	453
ExxonMobil Corp.	112,917	5,691	20

* These companies did not report well count data for the basin in 2014; as a result, CAP was unable to calculate per-well emissions for these companies.

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B3

Arkla Basin—Arkansas and Louisiana

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
BHP Billiton	149,889	897	167
Compass Production Partners LP	149,866	727	206
Chesapeake Energy Corp.	146,351	910	161
QEP Resources Inc.	138,844	511	272
ConocoPhillips Corp.	117,766	409	288
J-W Energy Company	115,310	1,018	113

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B4

Arkoma Basin—Arkansas and Oklahoma

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Southwestern Energy Company	939,967	4,191	224
ExxonMobil Corp.	498,760	2,236	223
Stephens Production Company	314,397	925	340
BP America	165,748	1,214	137
Samson Energy Company LLC	140,940	241	585
BHP Billiton	125,033	967	129

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B5

Denver Basin—Colorado, Nebraska, and Wyoming

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
PDC Energy	573,802	2,747	209
Anadarko Petroleum Corp.	478,544	6,333	76
Noble Energy Inc.	262,461	7,831	34
Encana Corp.	145,259	1,578	92
Foundation Energy	142,453	1,024	139
Bonanza Creek Energy Inc.	126,777	525	241

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B6

East Texas Basin—Texas

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
ExxonMobil Corp.	762,322	5,439	140
Linn Energy LLC	285,477	1,082	264
Sabine Oil & Gas Company	279,333	763	366
Samson Energy Company LLC	221,402	1,297	171
Anadarko Petroleum Corp.	165,316	2,180	76
Forest Oil Corp.	148,013	510	290
Devon Energy Corp.	121,843	1,243	98
Marathon Oil Corp.	105,102	413	254

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B7

Fort Worth Syncline Basin—Texas

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
EOG Resources Inc.	413,538	910	454
ConocoPhillips Corp.	298,981	722	414
EnerVest Operating Company	280,684	954	294
Devon Energy Corp.	271,034	4,469	61

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B8

Green River Basin—Colorado and Wyoming

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
BP America	801,193	2,031	394
Questar Corp.	252,893	517	489
Linn Energy LLC	178,242	1,060	168
Anadarko Petroleum Corp.	160,553	841	191
QEP Resources Inc.	156,707	1,265	124
Ultra Petroleum Corp.	143,196	1,770	81
EOG Resources Inc.	131,632	727	181
BreitBurn Energy Partners LP	121,306	283	429

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B9

Gulf Coast Basin—Louisiana and Texas

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Lewis Energy Group	1,154,730	1,682	687
ConocoPhillips Corp.	918,017	3,103	296
EOG Resources Inc.	452,364	2,077	218
Alta Mesa Holdings LP*	272,446	N/A	N/A
Chesapeake Energy Corp.	270,447	1,271	213
Occidental Petroleum Corp.	169,841	1,480	115
Marathon Oil Corp.	162,539	998	163
Hilcorp Energy Company	159,197	6,664	24
EP Energy E&P Company LP	130,756	489	267
ExxonMobil Corp.	120,574	581	208
Sanchez Oil & Gas Corp.	109,666	393	279
Halcón Resources Corp.	104,301	285	366

* These companies did not report well count data for the basin in 2014; as a result, CAP was unable to calculate per-well emissions for these companies.

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B10

Permian Basin—New Mexico and Texas

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Diamondback Energy Inc.	432,156	682	634
Cimarex Energy Co.	388,449	1,604	242
Loews Corp.	385,869	6,069	64
COG Operating LLC	239,991	4,250	56
Yates Petroleum Corp.	227,661	1,695	134
Endeavor Energy Resources LP	223,301	13,090	17
Devon Energy Corp.	215,920	2,907	74
Parsley Energy Inc.	196,632	139	1,415
Pioneer Natural Resources Company	184,660	7,608	24
SandRidge Exploration and Production LLC	173,911	2,328	75
EOG Resources Inc.	163,364	914	179
Anadarko Petroleum Corp.*	149,880	N/A	N/A
EP Energy E&P Company LP	124,306	229	543
RKI Exploration & Production	115,045	588	196
ExxonMobil Corp.	108,679	4,343	25
Apache Corp.	102,581	11,237	9

* These companies did not report well count data for the basin in 2014; as a result, CAP was unable to calculate per-well emissions for these companies.

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B11

Piceance Basin—Colorado

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Encana Corp.	610,799	3,896	157
WPX Energy Inc.	536,143	4,689	114
Vanguard Natural Resources LLC	185,532	930	199
Occidental Petroleum Corp.	176,889	805	220

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B12

San Juan Basin—Colorado and New Mexico

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
ConocoPhillips Corp.	2,655,605	9,864	269
BP America	1,045,493	3,425	305
ExxonMobil Corp.	514,969	1,788	288
Energen Corp.	271,772	1,471	185
WPX Energy Inc.	136,238	1,088	125
Chevron Corp.	131,153	1,297	101

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B13

Strawn Basin—Texas

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
Chesapeake Energy Corp.	480,634	2,333	206
EOG Resources Inc.	390,384	941	415
ExxonMobil Corp.	306,030	1,742	176
EnerVest Operating Company	134,698	375	359
Premier Natural Resources LLC	111,302	296	376

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B14

Uinta Basin—Utah

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
EOG Resources Inc.	519,267	1,304	398
Anadarko Petroleum Corp.	408,168	3,048	134
QEP Resources Inc.	392,056	847	463
EnerVest Operating Company	229,354	330	695
ExxonMobil Corp.	206,524	609	339
Bill Barrett Corp.	146,689	276	531
EP Energy E&P Company LP	118,337	545	217

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

APPENDIX B15

Williston Basin—Montana, North Dakota, and South Dakota

Metric tons of carbon dioxide equivalent

Parent company	2014 methane emissions	Number of wells	Methane emissions per well
ExxonMobil Corp.	324,849	812	400
QEP Resources Inc.	210,791	273	772
Hess Corp.	134,906	1,029	131
Whiting Petroleum Corp.	131,034	1,520	86
Statoil	127,540	513	249

Source: Author's analysis of methane emissions data obtained from U.S. Environmental Protection Agency, "EPA Facility Level GHG Emissions Data: Onshore Oil and Gas Production," available at <https://ghgdata.epa.gov/ghgp/main.do> (last accessed April 2016). CAP used the parent company names reported to the EPA and did not modify the parent company data to reflect mergers, acquisitions, or name changes.

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And we believe an effective government can earn the trust of the American people, champion the common good over narrow self-interest, and harness the strength of our diversity.

Our Approach

We develop new policy ideas, challenge the media to cover the issues that truly matter, and shape the national debate. With policy teams in major issue areas, American Progress can think creatively at the cross-section of traditional boundaries to develop ideas for policymakers that lead to real change. By employing an extensive communications and outreach effort that we adapt to a rapidly changing media landscape, we move our ideas aggressively in the national policy debate.



From: [Ryan](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Please Vote to Continue the Moratorium on Fracking in Boulder County
Date: Tuesday, June 21, 2016 11:23:28 AM

Dear Commissioners' Elise Jones, Cindy Domenico and Deb Gardner,

As a Boulder County citizen and environmentalist I greatly encourage you **to vote to extend the moratorium on fracking in Boulder County indefinitely**, at your June 28th public meeting. The future health of all our citizens depend on our local officials taking a stand against the fossil fuel industry. Fracking is extremely damaging to our land, air and water and should not be allowed in Boulder County. Boulder County is a national leader in environmental preservation and sustainability and we need leaders who are willing to continue to push this legacy forward. Please do everything in your power to stop fracking in Boulder County and throughout the state of Colorado.

I also encourage you to do everything in your power to shut down existing fracking wells in Boulder County. I do not believe Boulder County Parks and Open Space should be in the business of profiting off of fracking. Please help put an end to all oil and gas leases that currently exist on Parks and Open Space Owned and Leased land. Doesn't it seem counter to the mission of Boulder County Parks and Open Space to pay for some of our environmental preservation with revenues from fracking wells located on open space properties?

I greatly appreciate all you do as our County Commissioners and have a great deal of respect for you and the job you do. Thanks for promoting sustainability and renewable energy in our county. As a side, I recently purchased an all electric Nissan Leaf through Boulder County's program and will be installing solar panels on my home soon. Please continue to provide incentives for renewable energy and electric cars. With your leadership let's try to move our entire county to 100% renewable energy as quickly as possible.

Thanks,

Ryan

Ryan Ludlow

Boulder, CO

From: [Don Hostetter](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil and Gas testimony
Date: Tuesday, June 21, 2016 2:11:04 PM

I think the 6 month moratorium should be terminated , and per the Colorado Supreme Court determinations land owners and mineral right owners should have the opportunity to develop their resources in conformance with state regulations.

Don Hostetter

From: pkyoungson@yahoo.com
To: [Boulder County Oil and Gas Comment](#)
Subject: moratorium on oil/gas dev.
Date: Tuesday, June 21, 2016 4:57:59 PM

Please maintain the moratorium on oil/gas development

Patricia Kay Youngson

May I walk through this day in peace and well being.

May I walk through this day in love and joy.

From: [Robert Crain](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil & Gas development in Boulder County
Date: Tuesday, June 21, 2016 6:00:34 PM

Please stop the oil and gas development in beautiful Boulder County.

Rob Crain
4231 Prairie Fire Circle
Longmont, CO 80503

Sent from my iPhone

From: [Debra Biasca](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Keep the lid on fracking
Date: Tuesday, June 21, 2016 7:02:05 PM

I'm writing to support continuation of the moratorium on fracking and new o/g development permits.

The dangers outweigh the economic benefits. We need to encourage investment in alternative energy options.

Sincerely,
Debra Biasca
Boulder CO 80305
303.946.3280

Phumbles by iPhone

From: [Csapo.Toth](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: ban fracking
Date: Tuesday, June 21, 2016 8:36:56 PM

Dear Commissioners:

I am deeply troubled by your decision not to hold a public hearing before you intend to make a decision about fracking. I strongly urge you to either extend the moratorium or ban the practice of fracking within county boundaries outright. You should expand all available resources to protect county residents and the environment from the chemical (air, soil, water), sound, light and other damage and destruction this purely profit motivated and destructive activity entails. I trust you will make a wise decision in the interest of the people and environment of Boulder County. Respectfully
Zoltan Toth

csapo.toth@gmail.com

5579 Mesa Top Ct., Boulder

From: [James Kentling Campbell](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: End the moratorium
Date: Wednesday, June 22, 2016 8:08:10 AM

County Commissioners,

I support the oil and gas industry. This industry provides revenue to the County directly via taxes and indirectly through the many oil and gas employees who live, work, and play within the County.

End the moratorium.

The County is using the moratorium on new permit issuance as a proxy to a ban. This is wrong. This denies mineral rights owners access to their property. Mineral rights in CO are owned by farmers, ditch companies, individuals, families, and yes, oil and gas companies.

We all benefit for the vast, reliable and high-density energy oil and gas provides. This is OUR infrastructure. Our first world quality of life requires all energy sources to be leveraged to the fullest. I see no one stepping up to the plate and consuming less in a material way.

The science, academic peer-reviewed and government funded, shows the PUBLIC risks associated with the oil and gas industry to be less than the PUBLIC risks associated with reckless DRIVING, improper DIET, and arguably poor EDUCATION. By risks, I mean statistically-based from hard data using objective and repeatable criteria. True risk management is a topic woefully missing in almost all public discourse of our energy infrastructure.

What value has the moratorium provided the County? What scientists and engineers has the County engaged to objectively evaluate this topic? Have the County experts explained lithostatic pressure and hydrostatic pressure to you, fracture gradient? Have the experts converted the 10^x gallons of water into acre-feet to put fluid volumes into context? If not, then I again ask, what value has the moratorium provided the County other than a political statement.

End the moratorium.

Regards,

James Campbell

MS Geology, 1999

Jay Road

Boulder

From: [Margaret Ludlow](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Please Vote to Continue the Moratorium on Fracking in Boulder County
Date: Wednesday, June 22, 2016 8:51:28 AM

Dear Commissioners' Elise Jones, Cindy Domenico and Deb Gardner,

As a Boulder County citizen and environmentalist, I greatly encourage you **to vote to extend the moratorium on fracking in Boulder County indefinitely**, at your June 28th public meeting. The future health of all our citizens depends on our local officials taking a stand against the fossil fuel industry. Fracking is extremely damaging to our land, air, and water and should not be allowed in Boulder County. Boulder County is a national leader in environmental preservation and sustainability and we need leaders who are willing to continue to push this legacy forward. Please do everything in your power to stop fracking in Boulder County and throughout the state of Colorado.

I also encourage you to do everything in your power to shut down existing fracking wells in Boulder County. I do not believe Boulder County Parks and Open Space should be in the business of profiting off of fracking. Please help put an end to all oil and gas leases that currently exist on Parks and Open Space Owned and Leased land. Doesn't it seem counter to the mission of Boulder County Parks and Open Space to pay for some of our environmental preservation with revenues from fracking wells located on open space properties?

I greatly appreciate all you do as our County Commissioners and have a great deal of respect for you and the job you do. Thanks for promoting sustainability and renewable energy in our county. As an aside, I recently purchased an all electric Nissan Leaf through Boulder County's program and will be installing solar panels on my home soon. I also work for a solar company and am passionate about being environmentally sustainable. Please continue to provide incentives for renewable energy and electric cars. With your leadership let's try to move our entire county to 100% renewable energy as quickly as possible.

Thanks,

Meg

Meg Ludlow

Boulder, CO

From: [angela.mundt](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking moratorium
Date: Wednesday, June 22, 2016 10:48:48 AM

Dear County Commissioners,

Please help us protect this beautiful county with all of the power that you have. Researchers from across scientific fields are showing that fracking negatively affects air quality, water quality and wildlife. There is evidence that it contributes even more greenhouse gas emissions than coal. We can do much, much better. Other counties in the country have fought off this industry. We are counting on our leaders to do everything in their power to help us keep these wells out of our county. Please do all that you can to extend the fracking moratorium beyond six months.

Best regards,
Angela Mundt
Louisville, CO

From: [Kristi Celico](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking moratorium
Date: Wednesday, June 22, 2016 11:10:10 AM

Please continue to extend the fracking moratorium for Boulder County.

Thank you! kpc

--

Kristi Parker Celico
Cell: 970-368-0999
kcelico@gmail.com

From: [andrew.oconnor](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil and Gas Industry Declares War on Colorado
Date: Wednesday, June 22, 2016 4:04:48 PM

Please continue the moratorium on accepting and processing new applications for oil and gas development

in unincorporated Boulder County. Please read my comments below in support of the continuation of said moratorium.

Oil and Gas Industry Declares War on Colorado

Hydraulic fracking companies in Colorado inject into the ground solutions containing known carcinogens endangering the health of the people and the environment.

Fracking wastes massive amounts of water, which is a problem in arid Colorado, as well as producing large amounts of polluted water and mud. Fracking endangers local aquifers, our drinking water and our health.

In March of 2012, Physicians for Social Responsibility called for a moratorium on fracking in order to protect human health and the environment. In June 2015, New York state banned fracking because of threats to the environment and significant public health risks.

On May 2, 2016, the Colorado Supreme Court ruled that profits from fracking trumped the health, safety and welfare of the people of Colorado.

Colorado has become a leading oil and gas producer with over 50,000 active wells. The oil and gas industry has declared war on Coloradans and the Colorado Supreme Court will not protect the people from this significant risk to our health and environment.

Coloradans must confront this threat to our health and environment and fight back in self-defense. Weibo Ludwig of Calgary, Canada fought back by pouring cement down wellhead shafts and blew up other wells. Malcolm X said: "I don't even call it violence when it's in self defense; I call it intelligence."

Andrew J. O'Connor

1220 W. Devonshire Court
Lafayette, CO 80026
Tel: (303) 499-4585

From: tjberto@gmail.com
To: [Boulder County Oil and Gas Comment](#)
Subject: Re: The Upcoming Public Hearing June 28 2016
Date: Wednesday, June 22, 2016 5:41:17 PM

Dear County Commissioners,

Thank you for the opportunity to comment on the new 6-month moratorium on oil and gas activity in unincorporated areas of the county that you enacted on May 19 and extended through November of this year. As a resident of the county, I am grateful to have the opportunity to be heard.

I quite agree with previous statements I have read in the Daily Camera that insist a 6-month time frame is absolutely necessary to allow county leaders adequate opportunity to protect flood plains, assure an appropriate number of wells per pad, and assess adequate fees for the industry's use of county resources. Frankly, I worry that six months may still not be enough, but if you believe it is adequate, then I support your decision.

Furthermore, I vehemently disagree with pressure from COGCC stating you've had plenty of time to prepare. Given the strong opposition Boulder's citizenry has had to this issue, it was quite appropriate for you to wait to enact any plans until after the ruling from the state Supreme Court was delivered. Many of us hoped the Supreme Court would listen to the popular vote of the people. Sadly, that was not the case. Consequently, it is not at all unreasonable that you ask for these six months - and more if necessary - to protect what it is still possible to protect.

Thank You,
Tammy Bertollette

Sent from my iPad

From: [Angela](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking Moratorium must be extended
Date: Wednesday, June 22, 2016 9:11:01 PM

Dear County commissioners,
16 Years ago I purchased a home in Gunbarrel, Boulder City Limits. My decision was based partially on the wonderful clean air and quiet that is frequently graced by wild birds and coyotes. I wish near-by open spaces adjacent to Twin Lakes, Lookout Road, Heatherwood and Gunbarrel North were also within Boulder City Limits so these lands would not be subject to fracking.

Sometimes at night I awaken suddenly, disturbed by the possibility that my neighboring open spaces might soon be fracked. This anticipation and dread of noise, vibration, earthquakes, horrible eye-sores and contaminated air is already bothering me. Please vote to extend the fracking moratorium significantly beyond November 18, 2016.

Thank You,
Angela Green
4895 Twin Lakes Rd #5
Boulder, 80301
303 530 0696

From: [Cedar Barstow](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Please, no more fracking
Date: Thursday, June 23, 2016 9:15:52 AM

Please, no more fracking, whatever it takes to get a lasting moratorium until we can truly assess the negative impacts and find ways to negate them.

Even better....let's shift our attention and support to wind and solar energy!

And it would be helpful to support ballot initiatives 75 and 78.

Sincerely, Cedar Barstow

--

Cedar Barstow, M.Ed., C.H.T.
Boulder, Colorado
303-444-6835
www.rightuseofpower.org
www.cedarbarstow.com

From: [Cheryl Larsen](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil and gas meeting comment
Date: Thursday, June 23, 2016 9:41:36 AM

I'm writing to express my opinion as a mineral rights owner/property owner. Please allow my right to obtain my minerals to proceed. I know it must seem that every citizen is anti-fracking, this is not true. We all use petroleum everyday, unless someone is off grid. I have been next to large oil and gas pads in Weld county, no big deal. I live in the country not next to any subdivision, school or anything that would be a problem. Please just give us a special permit, since we are out away from any town. It is not fair that we are lumped in with the anti-frackers. I no longer want to wait another 5 years. Plus the Supreme Court said BC can not keep doing this. There must be a compromise for us in unincorporated BC.

Thank you
Cheryl Larsen

From: [Heather Starsong](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: fracking ban
Date: Thursday, June 23, 2016 10:58:29 AM

to Boulder County:

I would like to see a long-term ban on fracking in Boulder County. Let us put our focus on solar and wind energy. I am supporting ballot initiatives 75 and 78.

Please keep our county clean and safe.

Heather Starsong
heatherstarsong.com

From: [James Maslanik](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Additional requirements for methane leak detection and air quality monitoring?
Date: Thursday, June 23, 2016 12:23:06 PM

Regarding possible changes to the BoCo fracking moratorium, might it be possible for the County to require that oil/gas installations include additional monitoring for trace gas pollutants? In particular, the technology exists for continuous, 24/7 monitoring to detect large spikes in methane concentration using inexpensive sensors, with the capability for real-time alerts if leaks are detected. This would exceed state and federal rules that require only occasional testing.

If oil/gas operators cannot be required to include additional monitoring in this manner, then perhaps the County could require (or at least recommend) that all operators with facilities within the County be willing to assist and cooperate with outside organizations that would like to carry out atmospheric monitoring at oil/gas installations.

Thank you,
Jim Maslanik
Lafayette, CO
ph. 303-807-4064

James Maslanik
Research Professor Emeritus
Dept. of Aerospace Engineering Sciences

From: [Rob Jackson](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: For future generations - keep the brakes on oil and gas
Date: Thursday, June 23, 2016 1:41:44 PM

Hello commissioners,

Firstly, thank you for your past decisions to enact moratoria on fracking in Boulder County. I believe you did the right thing in those cases and I very much appreciate that.

Now I ask you to continue making the correct decisions on behalf of your community, future generations, and the one planet earth that we all share. Please keep our moratorium on fracking in place or enact a new one effective for as long as possible.

As you are likely aware, the [Denver Post recently reported](#) that Denver is deemed to have the 8th worst air quality in the nation, behind mostly southern California locales as well as one in Arizona. Fort Collins is 10th worst. Oil and gas is largely to blame.

[NOAA recently reported](#) that the earth has experienced record high temperatures for 13 consecutive months. We are careening towards climate tipping points. Oil and gas is mostly to blame.

The largest frack site in the world was proposed within a stone's throw of Silver Creek Elementary School in nearby Thornton. Joel Dyer of Boulder Weekly, one of the very few journalists paying due attention to fracking in this state, [covered the response of concerned citizens](#) this past May. Oil and gas would do the same in Boulder County and threaten our schools, homes, water sources, parks, hospitals, etc. if they are permitted to do so.

Those are just a few items that cause me to really scratch my head regarding how fracking is even considered a viable option moving forward. I don't expect oil and gas production to cease overnight in this country. No way. But I do hope and plead that we stop fracking new sites ASAP. As county commissioners, you have a tremendous opportunity to continue saying no to new fracking in Boulder County.

Look at Chile, where [Bloomberg reports](#) that they have approximately 2,000 MW of solar energy due to be online by the end of the year. They started building industrial solar plants in 2013. That is a massive amount of clean energy going online in a span of only a few years. Their perceived "energy crisis" has been totally averted as a result. Chile is thriving with solar.

To go a bit deeper on that story - I lived in Chile as a volunteer school teacher and fly-fishing guide for a year in 2007/2008. Privately owned companies nearly dammed two of the biggest and most crystalline rivers in the country for hydro-power thanks to the support of their government and at a cost of \$8 billion. In 2011, more than ever, it looked like the dams would be built. However, as a result of a massive [8 or 9 year people's movement](#) to keep Patagonia Without Dams, the five mega dams in Chilean Patagonia and the accompanying longest power line in the world [were rejected in June 2014](#). Over 75% of the energy that those dams were slated to generate (2,750 MW) will instead be generated by solar by the end of 2016 at a tremendously lower cost and several times more quickly.

Chile's rapid pivot from devastating hydro in a pristine region of the world to solar in the nearly-always-sunny desert is one of the major environmental victories of my lifetime. But it seems so common sense. And I beg and pray for Colorado to follow suit. In our case by ditching new oil and gas for solar and wind, two natural resources which we are blessed with in abundance.

It is very clear to me that there will be a right and wrong side of history in regards to oil and gas in Colorado. We could keep on blowing through climate tipping points, putting our neighbors and children in harm's way, worsening our already horrible air quality, and risking our precious fresh water resources here in the arid high desert.

Or, as my friend and local award-winning film director Jeff Orlowski suggests, we could hit the brakes (or, in your case, keep the brakes on via commissioner-enacted moratoria - woohoo!) Just as we would do if in a car or on a bike as we are about to have a rear-end collision. Nobody in their right mind would just plow through an object in front of them if they could act otherwise. Any sane person would hit the brakes to reduce impact.

We need to keep pounding the brakes on oil and gas. For ourselves yes, but more so for our children and grandchildren who will inherit our one shared planet earth.

History will look back on those who stood up for planet earth versus oil and gas with admiration and gratitude. So will our children and children's children.

Please oh please keep the pressure on Boulder County's brakes versus oil and gas. Thank you for your time and attention to this cause, one that I deem to be the most critical story of our time.

Thank you,
Rob Jackson

Rob Jackson
[Producer | Shooter | Editor](#)
Longmont, CO

740.670.3494

From: [Drew Stout](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil & Gas Development - Boulder County
Date: Thursday, June 23, 2016 3:18:17 PM

Dear County Commissioners,

Being born and raised in Boulder, Colorado I have seen the city grow and change over the last 30+ years. I love the city and continue to live there. I care about the environment along with wanting the state to thrive and be successful. The people of Boulder (and Colorado as a whole) need to do their research, get their facts straight about fracking, and not be swayed by media fear mongering. The truth: Fracking is safe and very important to Colorado's Economy.

An economic study by the University of Colorado's Leeds School of Business explains the economic consequence of a statewide ban on hydraulic fracturing would be an average \$8 billion in lower gross domestic product (GDP) and 68,000 fewer jobs in the first five years. The study describes job losses in sectors as disparate as health care and farming.

Geologists at the University of Cincinnati released a three-year investigation of hydraulic fracturing and its impact on local water supplies. The result? There's no evidence that fracking contaminates drinking water. Researchers hoped to keep these findings secret as the study was financed by parties against fracking.

The Colorado Oil and Gas Conservation Commission ("COGCC") released spill data for 2015. The result is for every 1,000,000 barrels of oil produced, 11.77 are spilled. These spills, although small, are strictly reported and cleaned (see COGCC Rule 906 and HB 13-1278).

The county has had years to consider new rules and regulations (last updated in 2013), but has failed to do so. Constantly extending a moratorium is not the way to handle an issue, and is the same thing as a ban. A fracking ban is preempted by state law and, therefore, is invalid and unenforceable. Boulder County's moratorium against fracking simply violates constitutional rights and goes against the recent Supreme Court decision overturning Fort Collins' moratorium and Longmont's ban.

The answer is simple, do not impose a moratorium. It is not good for us and will not hold up in court.

Sincerely,

Concerned Boulder Resident

From: [Elaine C. Erb](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: maintain the moratorium on oil and gas drilling
Date: Thursday, June 23, 2016 5:16:26 PM

Dear Commissioners:

I so appreciate you taking a stand against oil and gas drilling in our area.

People can say that drilling is safe or good for us. But here we are dealing with historically hot conditions and poor air quality. As you know, some of the risks to our air quality are from gas emissions and methane creation. With our hot weather, inversions, and other persistent air issues, the last thing we need to do is add another source of methane emission.

I also have huge concern about the byproducts of fracking. For one, when we live in a semi arid climate, how can we justify the use of clean fresh water being injected into the earth to release carbon fuels and become contaminated? Then to see this reinjected into the earth where it can cause seismic activity? No thank you. All so we can keep up with our resource intensive lifestyle.

Let's work harder at establishing and promoting renewable energy sources in Boulder County. Let's put some windmills on those lands where fracking is under consideration. And let's leave some carbon in the ground for future generations to choose to preserve as well.

Thanks for all you do.

Elaine C. Erb
Niwot CO
1.5 miles from her nearest fracking site

Elaine C. Erb
ecerb@indra.com
lovetoride.net/boulder

June 21, 2016

I am writing this letter as a native of Boulder County and now an employee in Boulder County. I live in Weld County currently. Living in Weld County, I drive by oil wells on almost every acre of farm land available. The farmers care not about the residents they are endangering, but the mighty dollar they're paid for stripping our land of its natural oil. The same oil that makes our plants grow and our trees blossom.

The oil and gas development has stifled growth in Frederick and Firestone because where once planned was a Super Target, now sits an oil well right in the middle of where their parking lot would go. So not only has it harmed the environment, it has prevented economic growth in commercial development. Now we have packed roadways into and out of town because there is nothing there!

The traffic from the gravel trucks have dented and broken apart the roads, unsettling dirt and living creatures that call that farmland home. The unsightly beige tanks litter ever corner. Where once there was a beautiful farm house, is now 15 tanks holding oil.

Boulder County is some of the most beautiful land in all the 50 states. Imagine a leak in one of the pipes that leads to one of these holding tanks, unknown for days or weeks because it's all hidden underground, invisible to those passing by. It would be a shame to sell out to big oil when our land is already so valuable just the way it is.

If you are unable to stop fracking because our politicians are bought and paid for by big oil, then I request you at least make it so they have to get their water from somewhere else! Boulder/Longmont have the BEST tasting water in the country! Let's make them find water from other places to feed their insatiable taste for oil and natural gas. Please don't make our beautiful open space available for large, unsightly tanks and dirt roads. We are capable of fighting this... if anyone can do it... Boulder County CAN!

RECEIVED
County Commissioners Office

JUN 24 2016

REC'D BY _____
TIME _____

cc: Rick Hackett
Kim Sanchez


Dietra Porter

From: [Julia Jones](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fwd: Comments
Date: Saturday, June 25, 2016 9:44:47 AM

Begin forwarded message:

From: Julia Jones <julia.jones3@me.com>
Date: June 24, 2016 at 10:23:40 PM MDT
To: oilgascomment@bouldercounty.com
Subject: Comments

Dear Boulder County Commissioners,

Commission policy decisions affecting Boulder county residents must be based on sound science and facts. Popular public perception of oil and gas development is widely based on miscommunication of facts. For example the idea that hydraulic fracturing contaminates ground water has been dispelled by among others the EPA. The commissioners should invite CERD, Coloradans for Responsible Energy Development, to present to the commission to afford the commissioners credible scientifically-proven and factually based information. The moratorium should be lifted and the commission should follow the lead of the State to establish a task force or advisory panel comprised of industry representatives, academic leaders and community interest leaders. Oil and gas development is a critical economic driver of colorado's economy and Boulder county residents do work within that industry. Our voices have a right to be heard. We support the responsible development of a needed energy resource.

Julia Jones
Boulder resident.

From: mary2ron@gmail.com
To: [Boulder County Oil and Gas Comment](#)
Subject: comments for meeting 6/28
Date: Saturday, June 25, 2016 10:37:02 AM

Dear commissioners:

Disclosure – I do not work in the oil/gas industry or have property that could be developed.

I see no reason to continue the moratorium on permit applications.

New rules have been passed at the state level. Since 2012 when the permit moratorium was initially imposed all the studies have shown fracking to be safe. If fracking is used as the excuse to deny permits, then that is wrong. If the intent is to “keep it in the ground”, then that is hypocritical. I am a proponent of renewals. I installed solar on my roof in 1978. But, we cannot deny oil and gas is necessary. None of us want to go back to unpaved streets. All of us need industries that use fossil fuel, e.g. trucking, mining, agriculture, railroads, manufacturing. All of us need the products, e.g. plastics, lubricating oils, fertilizer, pharmaceuticals, etc., even tires for our electric cars.

What's the alternative? Import more from Venezuela? The same heavy crude that we don't want from our Canadian friends? And from Madura who never misses a chance to tell us how rotten the USA is?

My suggestion would be to require more recycle of the fracking fluid. It can be done. More could be reused.

Mineral rights are property. They should not be subject to “taking”.

Sincerely,
Ron Robl

From: [Jeanne Robinson \(via Google Docs\)](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Boulder County's fracking moratorium
Date: Saturday, June 25, 2016 10:44:20 PM

[Jeanne Robinson](#) has attached the following document:



Oilgascomments



Thank you for your attention to my comments.
Snapshot of the item below:

June 25, 2016

Boulder County Commissioners:

No further oil and gas drilling should be allowed. Period. Not in Boulder County. Not in Weld County. Not in the U.S. Not in the Atlantic Ocean. Not in the Arctic. Not anywhere! See, "Global Warming's Terrifying New Math", Bill McKibben. Scientists have stated that 80% of all fossil fuels should be left in the ground if we are to limit global warming to 1.5 (deg)C above pre-industrial levels. (IPCC - Intergovernmental Panel on Climate Change.)

We are seeing impacts of hydraulic fracturing locally: on our air quality; in increasing contributions to methane levels which, in the short-term, are more dangerous than CO2 levels; and more than likely, groundwater contamination. If it's happening in Pavillion, WY, it is probably happening here. (InsideClimateNews, March 29, 2016)

With extreme climate events happening regularly across the globe, we could very likely see the same drought conditions which contributed to this week's, "Raging California wildfire which burned 80 homes in 1hr." (cbsnews.com) The Longmont Times Call reported today about this same fire, "Scorching heat and dry conditions across West have contributed to massive wildfires in the past week..." Do we really want to allow 2-4 million gallons of our precious water to be used for EACH drilled and hydraulically fractured well? Note: This water cannot be used again because of contamination.

And then there's the economics. "In fact, the majority of shale gas basins in America are already exhibiting declining production." (The Popping of the Shale Gas Bubble, Forbes) and "Natural gas: The fracking fallacy" (nature.com)


It seems pretty obvious to me. Just say no to any new oil and gas development permit applications.

Jeanne Robinson

1114 6th Ave.

Longmont, CO

...

Google Docs: Create and edit documents online. 

From: [Beverly Stokes](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: County Commissioner Comment
Date: Saturday, June 25, 2016 11:29:51 PM

What is it about the rule of law that you do not understand? Did the Colorado Supreme Court Rule on May 2, 2016 or not? Did the Colorado Supreme Court uphold lower-court decisions against Fort Collins' voter-approved fracking moratorium and Longmont's voter-approved fracking ban? Did you (the commissioners) end a moratorium that was to end by July, 2018? Then promptly replace it with the current moratorium saying you need at least six months to study, seek comment from the public and update regulations? Really!!

Do you believe that the voters of Boulder County are stupid? You honestly think that we can't see this stall tactic for what it really is--another back door ploy to stop the oil and gas industry? Stop insulting and disrespecting the citizens of Boulder County, do your job and respect the rule of law. We need the development of resources, employment, state tax income, and benefit of legal and logical resource development. Stop trying to shut down the oil and gas industry in Colorado.

The Colorado Supreme Court has spoken, but that decision does not resolve this issue, and in fact it should have.

Beverly Stokes
Longmont

From: [Glenda](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: NO to fracking!!!
Date: Sunday, June 26, 2016 8:39:45 AM

To whom it may concern,

I've lived in Boulder County for 15 years. I'm am very much against "fracking" in the area due to the prevalent effects that are caused by it. First off we are already surrounded by wells why the need for more? We should be investing in energy alternatives. Fracking is only a short term alternative with great and long term consequences. Although Colorado claims it "safely fracks" accidents and negligence happen all the time. When they do occur they devalue homes, water gets contaminated, pollutes air, disrupts wildlife, and last but not least, it's a health hazard for human beings. Yet no one is held accountable for these issues when they do occur. I say no to hydraulic fracturing in Boulder County and I know most of us agree.

So please hear our voice.

"Where energy needs and short-term economic growth are set against our children's health and future"

-Yale Climate Connections

Sincerely,
Glenda Garcia

Sent from my iPhone

From: [Margaret Pevec](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: No more fracking
Date: Sunday, June 26, 2016 10:05:25 AM

Environmental degradation is a big concern of mine. I am against fracking and for developing renewable energy (solar and wind) for the long term. There is no reason why we can't do this. We have the technology, but not the will, even though climate change is now upon us big time. I'd like Boulder County to be a leader in the movement towards renewables and against fracking.

Thank you.

Margaret Pevec, MA
writer/editor
see my LinkedIn profile
see my website: www.scribesassociated.com

From: [Margaret Pevec](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: In favor of ballot initiative 75 and 78
Date: Sunday, June 26, 2016 10:06:21 AM

Environmental degradation is a big concern of mine. I am against fracking and for developing renewable energy (solar and wind) for the long term. There is no reason why we can't do this. We have the technology, but not the will, even though climate change is now upon us big time. I'd like Boulder County to be a leader in the movement towards renewables and against fracking.

Margaret Pevec, MA
writer/editor
see my LinkedIn profile
see my website: www.scribesassociated.com

From: [Andrew Rose](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: County has power to Declare an Emergency to further study impacts
Date: Sunday, June 26, 2016 1:34:13 PM

Dear Commissioners,

Citizens expect strong leadership, commitment to campaign promises, and promotion of democracy and the public majority opposition to drilling by the County Commissioners. Rather than giving in to Oil and Gas interests, county officials and the Commission have the power to declare an emergency, in order to mitigate the damage of the anticipated disaster.

Officials with this power are: Boulder County Sheriff Joe Pelle, Boulder County Commissioners Cindy Domenico, Deb Gardner, Elise Jones, Boulder Police Chief Greg Testa, Boulder Fire Chief Mike Calderazzo, City of Boulder City Manager Jane Brautigam, or the Boulder Director of the Office of Emergency Management Mike Chard.

Citizens also call on Sheriff Joe Pelle to "to keep and preserve the peace in the county" by physically preventing drilling operations until mitigation is completed. Fracking is a slow-moving disaster that as shown severe impacts on the quality of life of communities where fracking has been allowed. Communities have lost access to water, experienced drops in property values, suffered increases in earthquakes, and experienced health impacts.

The end of the drilling moratorium is the event in this emergency. An "emergency" is: "an event that threatens to or actually does inflict damage to people or property, exceeds the daily routine type of response, and still can be dealt with using local internal and mutual aid resources."

With a Declaration of Emergency, the county can engaged in prevention and mitigation.

Prevention (from Boulder OEM document):

Actions to avoid an incident or to intervene to stop an incident from occurring. Prevention involves actions to protect lives and property. It involves applying intelligence and other information to a range of activities that may include such countermeasures as deterrence operations. heightened inspections. improved surveillance and security operations. investigations to determine the full nature and source of the threat. public health and agricultural surveillance and testing processes. immunizations, isolation, or quarantine. and, as appropriate, specific law enforcement operations aimed at deterring, preempting, interdicting, or disrupting illegal activity and apprehending potential perpetrators and bringing them to justice.

Mitigation (same source):

Mitigation involves actions to interdict, disrupt, pre-empt or avert a potential incident. This includes homeland security intelligence and law enforcement efforts to prevent terrorist attacks. Mitigation includes actions to:

- i. Collect, analyze and apply intelligence and other information.
- ii. Conduct investigations to determine the full nature and source of the threat and to

implement countermeasures such as inspections, surveillance, security and infrastructure protection.

iii. Conduct tactical operations to interdict, preempt or disrupt illegal activity; and to apprehend and prosecute the perpetrators.

iv. Conduct public health surveillance and testing processes, immunizations and isolation or quarantine for biological and agricultural threats.

v. Deter, detect, deny access or entry, defeat and take decisive action to eliminate threats.

vi. Conduct code enforcement, inspections and behavior modification to reduce risk.

vii. Analyze threats created by natural hazards and develop action plans to reduce the threat to citizens and property.

Details of Boulder's Emergency Operations are here:

<http://oemwordpress.azurewebsites.net/wp-content/uploads/2014/12/Emergency-Operations-Plan-EOP-City-of-Boulder-Boulder-County-OpVer-1-2014.pdf>

From: [brownglo55](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: leases
Date: Sunday, June 26, 2016 7:12:55 PM

New oil and gas leases should NOT be allowed on public lands. There is enough information available regarding toxicity.
Citizens of boulder county have expressed their antifracking views repeatedly.
Gloria brown
boulder, co

Sent from my Samsung Galaxy Tab® S

From: [STEWART GUTHRIE](#)
To: [Boulder County Board of Commissioners](#)
Subject: Reinstate the moratorium
Date: Sunday, June 26, 2016 8:14:10 PM

Dear Commissioners Domenico, Gardner and Jones,

As we write, Boulder County is again under an ozone alert, and the Front Range is shrouded in smoke. Before fracking, Front Range air quality, as measured in ozone, was federally designated "good" but now is in "non-attainment." Of that difference, fracking is considered to have contributed half, by emissions from varied points.

The current smoke is largely from forest fires across the Southwest, not directly from fracking. However, the fire season now begins earlier and ends later because of higher temperatures and lower humidity, both reflections of climate change. As you know, methane is a potent greenhouse gas, and volumes of methane, like other fracking pollutants, leak from numerous points in the fracking system.

I need not dwell on fracking's other effects on your constituents, because your own Resolution 2013-55 cited many. These included harm to residents' health from multiple toxins (including the carcinogens benzene and formaldehyde) as well as from noise, light and dust; economic loss to homeowners from devalued homes; economic loss of tourism; damage to, and obstruction of, roads by heavy-truck traffic; and—less tangibly, yet visibly—loss of that clarity of the air that permits us to see the mountains.

The three and one-half year moratorium on fracking applications you intended to end in the summer of 2018 was pegged in part to the projected completion of a major study on health effects of fracking. If you end the moratorium early, as you now plan, that study will not have contributed to the discourse among citizens, their representatives, and oil-and-gas companies before further harm is done.

We therefore urge that you protect your constituents by reinstating the moratorium and preparing to defend it in court. If we lose in court, as is quite possible, we will at least have fought, not rolled over. I further urge that if sued, we counter with suits against COGA, COGCC, and the State of Colorado for endangering the health of residents and for nonfeasance.

If we lose in court, you will still have the gratitude and respect of your constituents, most of whom understand that short-term profit for a few does not justify permanent injury to many.

Thank you,

Stewart Guthrie and Phyllis Kaplan

Heatherwood, Boulder County

From: [Kristin Bjornsen](#)
To: [Boulder County Board of Commissioners](#)
Subject: Outgassing of natural gas operations
Date: Sunday, June 26, 2016 8:30:42 PM

Dear Commissioners,

As someone who has reported on the harmful outgassing of natural gas operations, I urge you to reinstate the moratorium until operations are at least improved enough not to release benzene and other volatile organic compounds that no one should be breathing.

Sincerely,

Kristin Bjornsen

From: [Adam Stenftenagel](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Please Extend the Fracking Moratorium for Boulder County
Date: Sunday, June 26, 2016 9:26:02 PM

Natural Gas extraction is a thing of the past. We don't need it anymore. Renewables are already cheap enough to compete with natural gas across the board. If we are to save our planet from extreme overheating, we need to keep all fossil fuels in the ground. If the Boulder County Commissioners are truly committed to the climate, then they will fight like hell, regardless of any potential lawsuits to use whatever excuse they can possibly find to keep fracking off of our lands.

If you're not convinced about renewables, check out this research from Tony Seba who predicts market forces alone (not governments, not policy, not, carbon taxes) will eliminate the need for oil, gas and coal by 2030. We're on track, so don't let them start any new wells in Boulder County.

https://www.youtube.com/watch?v=E7Jg1IJ68_g

Thank you for fighting the good fight!

Adam Stenftenagel
1830 22nd St.
Boulder, CO 80302
720-363-1192

From: [Cyndi Nusbaum](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Stay The Moratorium
Date: Sunday, June 26, 2016 9:55:41 PM

Rumor has it, you are now think keeping the moratorium leaves you vulnerable to being sued. It is also rumored, a new 6 month moratorium would give you more time to implement the regulations you have revised.

You may think 6 month is enough time for the ballot initiatives to manifest in not our November Ballots. It would be miracle if any of them make it onto the ballot but, I am petitioning and The Creed group has the funds to pay petitions now. Community Rights Initiative is struggling. I am carrying all three initiative.

It's going to take every tool in the tool box and maybe the handy work to build some new ones, to build shelter from the wave of oil & gas coming. We will not stop until our safety from it, is secure.

You have taken the Tour De Frack. You know the climate chaos rest in each of our hands. You have heard the rating of our air quality. You also know if you let one pinky toe (new permits) of Big Oil & Gas into Boulder County, it's game over here. If we can not stop it here, there will be no stopping it anywhere in Colorado.

What else is there to do? Make a law that water used cannot be used if it can not be returned to the water cycle (they already lie about that). Restrict transport of heavy trucks from passing over inferior designed roads?

You must find a way to face your fears of being sued and fight them in the smartest way. We can not give into these bullies and laws are in process of being voted upon. You can not count on that as our protection. You are where the tire meets the road. Colorado does not have the strictest regulations. New York does. Vermont does.

The Supreme Court has forgotten that in The Colorado Constitution is says, we have a Right to feel safe in our homes. Many that live near these Frack Sites feel anything but safe, in their home. The fact that Supreme Court has upheld The Rights of this rouge industry over The Rights of the municipalities and people says it all. The laws need changed, agreed. Working on it.

Until then, please be strong and do not be fearful. Do not commit Boulder County to be next to be turned into a toxic waste dump like Weld County. I moved to Longmont because they tried to Ban Fracking & I take I-25 and CO-52 enough to know, this not way it is suppose to be. We are smarter than this. Even Kansas & Iowa have solar farms. Save Colorado. It needs saving in the worst way. It's all in your hands. Stay the Moratorium. Fight this Madness. Thanks for your consideration.

Sincerely,
Cyndi Nusbaum
1103 Frontier Dr.
Longmont, CO
80501

[Sent from Yahoo Mail on](#) Android

From: Boulder County Contact US/Feedback [<mailto:no-reply@wufoo.com>]
Sent: Sunday, June 26, 2016 9:59 PM
To: Webmaster
Subject: Boulder County Contact Us/Feedback Form [#111]

Name * Jacquelyn Goeldner

Email * jrgoeldner@mac.com

Phone (303) 447-2931

Number
(optional)

Select a General Comment or Feedback

Subject *

Comments *

I am appalled that you have used the excuse that you ned time to study ramifications of the legal decision against our sister towns moratoria on fracked oil wells. Hundreds of citizens worked hard to get you to change your initial decision in favor of the oil and gas industry in something like 2012. It was only the result of protests by hundreds of outraged citizens that you reversed the decision.

Now you have betrayed us again. Since then, studies have shown much more serious public health and environmental damage from fracking. This is in the very week when the news reports the front range of Colorado has the 13th poorest air quality in the nation. You know the story: lethal gases, contaminated water, damage to roads, destruction of quality of life of nearby residents and schools from methane, hexane, and some eight other lethal gases.

You are all well educated, intelligent people or we would never have voted for you in the first place. Please support the will of your constituents and allow the original moratorium to stand until the November expiration date. There is seemingly no reason why the studies you outline you intend to do cannot be done while it still stands.

Thank you.

Jacqui Goeldner, a longtime political activist

Please I acknowledge receipt of the Open Records Notification
check
box
below *

From: [Dave A](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: REINSTATE THE MORATORIUM
Date: Sunday, June 26, 2016 10:01:31 PM

Dear Commissioners Domenico, Gardner and Jones,

As we write, Boulder County is again under an ozone alert, and the Front Range is shrouded in smoke. Before fracking, Front Range air quality, as measured in ozone, was federally designated "good" but now is in "non-attainment." Of that difference, fracking is considered to have contributed half, by emissions from varied points. The current smoke is largely from forest fires across the Southwest, not directly from fracking. However, the fire season now begins earlier and ends later because of higher temperatures and lower humidity, both reflections of climate change. As you know, methane is a potent greenhouse gas, and volumes of methane, like other fracking pollutants, leak from numerous points in the fracking system.

I need not dwell on fracking's other effects on your constituents, because your own Resolution 2013-55 cited many. These included harm to residents' health from multiple toxins (including the carcinogens benzene and formaldehyde) as well as from noise, light and dust; economic loss to homeowners from devalued homes; economic loss of tourism; damage to, and obstruction of, roads by heavy-truck traffic; and—less tangibly, yet visibly—loss of that clarity of the air that permits us to see the mountains.

The three and one-half year moratorium on fracking applications you intended to end in the summer of 2018 was pegged in part to the projected completion of a major study on health effects of fracking. If you end the moratorium early, as you now plan, that study will not have contributed to the discourse among citizens, their representatives, and oil-and-gas companies before further harm is done.

We therefore urge that you protect your constituents by reinstating the moratorium and preparing to defend it in court. If we lose in court, as is quite possible, we will at least have fought, not rolled over. I further urge that if sued, we counter with suits against COGA, COGCC, and the State of Colorado for endangering the health of residents and for nonfeasance.

If we lose in court, you will still have the gratitude and respect of your constituents, most of whom understand that short-term profit for a few does not justify permanent injury to many.

Thank you,
David Auerbach
Berwick Ct
Gunbarrel, CO

From: [Cyndi Nusbaum](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Stay The Moratorium II
Date: Sunday, June 26, 2016 10:04:32 PM

First one had Typos, please forgive me.

Rumor has it, you are now think keeping the moratorium leaves you vulnerable to being sued. It is also rumored, a new 6 month moratorium would give you more time to implement the regulations you have revised.

You may think 6 month is enough time for the ballot initiatives to manifest onto our November Ballots. It would be miracle if any of them make it onto the ballot but, I am petitioning and The Creed group has the funds to pay petitioners now. Community Rights Initiative is struggling. I am carrying all three initiative.

It's going to take every tool in the tool box and maybe the handy work to built some new ones, to build shelter from the wave of oil & gas coming. We will not stop until our safety from it, is secure.

You have taken the Tour De Frack. You know the climate chaos rest in each of our hands. You have heard the rating of our air quality. You also know if you let one pinky toe (new permits) of Big Oil & Gas into Boulder County, it's game over here. If we can not stop it here, there will be no stopping it anywhere in Colorado.

What else is there to do? Make a law that water used for Fracking or other industrial use- cannot be used if : it can not be returned into the water cycle (they already lie about that). Restrict transport of heavy trucks from passing over inferior designed roads?

You must find a way to face your fears of being sued and fight them in the smartest way. We can not give into these bullies and laws are in process of being voted upon. You can not count on that as our protection. You are where the tire meets the road. Colorado does not have the strictest regulations. New York does. Vermont does. A Ban & Moratorium.

The Supreme Court has forgotten that in The Colorado Constitution is says, we have a Right to feel safe in our homes. Many that live near these Frack Sites feel anything but safe, in their home. The fact that Supreme Court has upheld The Rights of this rouge industry over The Rights of the municipalities and people says it all. The laws need changed, agreed. Working on it.

Until then, please be strong and do not be fearful. Do not commit Boulder County to be next to, be turned into a toxic waste dump, like Weld County. I moved to Longmont because they tried to Ban Fracking & I take I-25 and CO-52 enough to know, this is Not the way it is suppose to be. We are smarter than this. Even Kansas & Iowa have solar farms. Save Colorado. It needs saving in the worst way. It's all in your hands. Stay the Moratorium. Fight this Madness. We have fought it tooth & nail and We Will Not Stop. Thanks for your consideration.

Sincerely,
Cyndi Nusbaum
1103 Frontier Dr.
Longmont, CO
80501

[Sent from Yahoo Mail on Android](#)

Juliet Gopinath

June 26, 2016

Comments on 6 month fracking moratorium

I understand that you needed to shorten the 18 month moratorium to 6 months based on the recent Colorado Supreme Court ruling on fracking. However, to make this decision without public input, and then to call the meeting on June 28, a “procedural meeting” is ignoring your constituents once again (we’ve seen several instances of this lately). Do remember that you are elected to represent the wishes of your constituents; not to make decisions without their input.

If you ask your constituents, I am sure you will find great opposition to fracking. Most Boulder County residents live in the area because they enjoy a good quality of life, which includes open space, wildlife and few industrial processes like fracking. Many residents value the low pollution and beautiful scenery. Fracking satisfies none of these constraints and will clearly lower the quality of life. Currently, there are more VOCs emitted from the wells drilled in Colorado, than all the cars and trucks in the state combined. It is unsightly, a health threat, generates significant truck traffic to deal with produced water, and has potential to destroy our open space. I request that the Commissioners conduct a true public hearing to find out the wishes of their constituents, which includes verbal arguments. I also respectfully request that the Commissioners find creative avenues to minimize the amount of fracking in Boulder County and explore ways to continue a moratorium, that is in compliance with the recent Colorado Supreme Court decision. You should lobby hard for the increased setbacks that may be on the ballot in Fall 2016, and explore methods to minimize the harm to your land and satisfy your constituents. Several of you are up for re-election and you would do well to make your constituents feel that they are properly represented.

From: [Richard Summers](#)
To: [Boulder County Board of Commissioners](#)
Cc: [STEWART GUTHRIE](#); [yahoogroups](#)
Subject: Fracking Moratorium
Date: Sunday, June 26, 2016 11:07:34 PM

Dear County Commissioners,

I request that you maintain the current moratorium against fracking in Boulder County. It is self-evident that heavy industrial practices are incompatible with close proximity to local neighborhoods and schools. Such practices may be legal, but they defy common sense and are unjust. I note that energy companies disclose serious hazards and physical risks regarding oil and gas exploration in SEC filings designed for financial investors, and it's inconceivable that residential neighborhoods can be subjected to these risks. Keeping such risks away from residential areas is exactly why zoning laws exist. Rex Tillerson, CEO of Exxon participated in a law suit to keep such practices away from his Texas Ranch.

I think every elected official, judge, regulatory agency appointee, mineral rights owner and energy company official should reveal how far their primary home is away from active oil and gas fields when making or ruling on extraction regulations and applying for permits. Are they willing to subject their homes and families in actively drilled gas fields? How far away is your home?

Sincerely,

Rich Summers
Heatherwood Resident

JUN 27 2016

REC'D BY _____
TIME _____

cc: Rick Hackett

Oliver's
2545 Cowley Drive
Lafayette, CO 80026-9175
June 21, 2016

Boulder County Commissioners' Office
Re: OilGas Comment
PO Box 471
Boulder, CO 80306

RE: 6-Month Moratorium on Oil & Gas Development in Unincorporated Boulder County

Dear Sir/Ms;

We have lived in Colorado since early 1982 and have experienced the many attempts to clean the air in the Boulder/Denver Metro areas as well as to comply with EPA standards. The air had been cleaner during the downturns in the local economy, namely Black Monday when the shale oil tanked in the early 80's and then again during the crash in mid-90's. During both occasions, people left the state and there were fewer cars on the roads. Since that time, fracking has come to Colorado and the air pollution has risen to horrible levels. Just today, I was driving from Buckley AFB and the mountains were invisible. When I've driven to Greeley, it just plain smells there and it's not the usual quote, "that's the smell of money." Not the feedlots, but fracking.

The Front Range is amazingly beautiful. Under normal conditions, when you get within site of the Rockies, it is breathtaking. It is being compromised by pollution. I cannot understand how New York can pass a no fracking ban and Colorado cannot. What makes New York savvier than Colorado in taking care of their state? Do they care about their residents more than us? Care more about clean air and better health than us. It surely cannot be that they care less about money, but maybe they care more about good health than about money. Whatever it is, Colorado has to get serious about the environment, people's health, and about positive tourism factors. We cannot have it both ways—major pollution and people to enjoy our clean air and beautiful vistas. Make a decision for the majority, both residents and tourists—Colorado cannot be bought to pollute.

Thank you.

Regards,

Irene Oliver

Keith Oliver

Keith Oliver

From: [Teresa F.](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Weld County "Brown Cloud" Photo - Increasing inspections will not protect us - a picture tells a thousand words
Date: Monday, June 27, 2016 5:03:42 AM

Hello Commissioners - look at what we are breathing!

Yes this photo is a few years old but a picture tells a thousand words! The brown cloud is not from Denver. This is from the oil and gas fields in Weld County.

There is no barrier keeping this toxic brew from poisoning our air in Boulder County. Taken from the NCAR Mesa Lab.

Is this what you want?

Teresa Foster



Fall 2012

From: [Laura Kriho](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Comments on fracking moratorium
Date: Monday, June 27, 2016 7:22:44 AM

I think that it is a violation of the First Amendment to the US Constitution to disallow verbal public comment at your next meeting on this issue. Verbal public comment should be taken at all your meetings.

I support the fracking moratorium for as long as you can extend it.

I also support a Declaration Of Emergency due to the health and environmental danger of fracking. Please put public safety first.

Sincerely,

Laura Kriho
Boulder, CO

From: [Peter Korba](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Public Comment; Fracking
Date: Monday, June 27, 2016 8:40:39 AM

Boulder County Commissioners;

We wish to address the issue of fracking in Boulder County, CO.

We are adamantly OPPOSED to fracking and urge you to oppose all fracking attempts and to create laws disallowing fracking in the County.

We also encourage you to extend the moratorium on fracking to the greatest extent possible within the law. Much more scientific information and sane judgement is necessary before opening up our citizens and environment to the potential of serious consequences.

Thank you for taking our comments.

Peter and Dale Korba
730 South 46th st, 80305

From: [Rebekah Vicknair](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil & Gas Comment
Date: Monday, June 27, 2016 9:45:07 AM

Honorable Boulder County Commissioners:

Please consider the following with respect to the proposed Oil & Gas Development Moratorium in Boulder County:

Let's outlaw fracking in Boulder County and, while we're at it, since it is such a good thing, let's outlaw fracking in Colorado as well...as long as ***somebody else*** still has some oil. No more oil and gas for Boulder County or for Colorado. The fallout?

First, with the loss of oil and gas comes a profound loss of jobs. Hardworking men and women with families to support would no longer have a livelihood. Tens of thousands of jobs would be lost. In addition, hundreds of millions in tax revenue losses would equate to higher taxes. This would, of course, translate into a less than welcoming business environment.

Secondly, there are 248,000 cars in Boulder County. Colorado ranks seventh in the country for electric vehicle sales per capita, with 0.02 vehicles sold per person. Ranking seventh is impressive, but at 0.02 vehicles sold per person, a giant shortfall is left between what electric vehicles are providing and what our fossil fuel needs are. What plans do You, the Commissioners, have for this shortfall?

So, if we turn our backs on an abundant natural resource and outlaw fracking in Boulder County and Colorado and, by progression, everywhere in the United States, where do we go for oil and gas? Iran? Russia? Saudi Arabia? What an untenable position to put ourselves in, yet that is the future if we allow interest groups outside of Colorado to convince us to institute moratoriums on Oil & Gas in our counties and state.

Please think seriously before instituting this ban. I believe it would be terribly harmful to the people of Boulder County.

Thank you.

Rebekah Vicknair

Longmont, CO

From: [Mike McIntyre](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: 6-month moratorium on the processing of new oil and gas permits
Date: Monday, June 27, 2016 11:17:11 AM

Please for the safety of the children, wildlife and environment of Boulder County, the truly innocent residents. Follow your conscience and do what you can within your abilities to prevent those who wish to act for the primary purpose of profit.

Sincerely,

Michael McIntyre

From: [Carolyn Brinski](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Rocky Mountain Peace and Justice Center Comment on Resolution 2016-65
Date: Monday, June 27, 2016 11:49:20 AM

Dear County Commissioners:

I am writing on behalf of the Rocky Mountain Peace and Justice Center regarding Resolution 2016-65.

Our understanding is that you rescinded the three and a half year moratorium in response to the CO Supreme Court decision that overturns the fracking ban by the people of Longmont and the fracking moratorium by the people of Ft. Collins. The notion that the Supreme Court, whose members are appointed for ten year terms, can override the will of the people is inimical to the Colorado Constitution and must be resisted. The Colorado Constitution states the following:

"Article II, Bill of Rights, Colorado Constitution

Bill of Rights

In order to assert our rights, acknowledge our duties, and proclaim the principles upon which our government is founded, we declare:

Section 1. Vestment of political power. All political power is vested in and derived from the people; all government, of right, originates from the people, is founded upon their will only, and is instituted solely for the good of the whole.

Section 2. People may alter or abolish form of government proviso. The people of this state have the sole and exclusive right of governing themselves, as a free, sovereign and independent state; and to alter and abolish their constitution and form of government whenever they may deem it necessary to their safety and happiness, provided, such change be not repugnant to the constitution of the United States.

Section 3. Inalienable rights. All persons have certain natural, essential and inalienable rights, among which may be reckoned the right of enjoying and

defending their lives and liberties; of acquiring, possessing and protecting property; and of seeking and obtaining their safety and happiness."

It is clear that the Colorado Supreme Court completely ignored these fundamental rights of the people of the state. For that reason, their decision to impose fracking on people of Longmont and Ft. Collins , and in its chilling effect, on all the people of Colorado is immoral, illegitimate, illegal and a clear and blatant violation of the above cited sections of the Colorado Constitution. It couldn't be clearer.

The notion of a "Supreme" Court, or "supreme" anything (other than the people) makes democracy in Colorado an absurdity. It is clear that the purpose of the Supreme Court, in many cases, is to over-ride the will of the people, and to quote Noam Chomsky "to keep the rabble in line". The "rabble" in this case are the citizens and public officials who dare to represent their constituents rather than big business, including the oil and gas industry, in the state.

It is clear that you are very concerned about fracking in Boulder County. It is clear that you don't want Boulder County to become the equivalent of the polluted, dangerous and deadly place that Weld County has become. As it is, it is commonplace for the fracking pollutants of Weld County to blow our way. We breathe their deadly gases on a regular basis. We don't need more created by thousands of fracking wells in our own community.

We realize that you are in a hard position. You are caught between on one hand, your fear of lawsuits and state demands and, on the other hand, the demands of your constituents. It is clear that the vast majority of the people who spoke at public hearings on fracking and wrote letters to you don't want fracking in Boulder County. It is also clear that people are willing to resist fracking with their bodies, should it get to that.

It is very important that you, as our County Commissioners, join that resistance, and not allow the Supreme Court to injure and kill the people of Boulder County (these are results of fracking on health and on our lives) by their blatant disregard of the Colorado Constitution.

Your legitimacy in the eyes of the people will be greatly diminished if you are intimidated by the Supreme Court or state power. The people will be with you if you resist illegitimate usurpation of the people's power by the Supreme Court, the Colorado Legislature and by a completely compromised oil and gas governor.

It is essential that you listen to your constituents in a public hearing this summer (submitting written statements is valuable, but is it not a public hearing as is commonly understood). It is concerning that you shortened the moratorium without any public input or a public hearing, given the amount of time, effort and passion that people expended in the past to secure a moratorium and given the clear and unequivocal statement in the Colorado Constitution that power resides in the people.

We realize you are also aware of the 2016 ballot initiatives (the two fracking initiatives and the Community Rights Amendment) designed to give power to the people over corporate activities in their communities, and that you may be waiting to see the results of these initiatives before you act.

In his first inaugural address, Franklin Delano Roosevelt said: "The only thing we have to fear is fear itself". The power of corporations has multiplied exponentially since FDR's time. If we are to have a democracy and if we are to survive as a species, together we must find within ourselves the courage to resist the continual corporate assaults on our lives. We need to face our fears and resist illegitimate authorities who represent the corporate state rather than the people.

Carolyn Brinski

Rocky Mountain Peace and Justice Center

Boulder CO

720-509-3378



Virus-free. www.avast.com

From: [Boulder County BOCC](#)
To: [Boulder County Board of Commissioners](#)
Subject: County Commissioners Contact Us/Feedback Form. [#78]
Date: Monday, June 27, 2016 12:16:00 PM

Name *	Phillip Doe
Organization (optional)	Be the Change
Email *	ptdoe@comcast.net
Phone Number (optional)	(303) 949-6986
My Question or Feedback most closely relates to the following subject: (fill in the blank) *	Should the Commission support a fracking ban or continued moratorium?

Comments, Question or Feedback *

This question should be central in Tuesday's deliberations, "Did the Court's denial of Longmont's amendment to deny fracking within city boundaries also deny the people's "first right" to legislate by means of the initiative?"

NO is the only reasonable answer to this question.

The court blocked the rights of cities to enact bans or moratoria under the Home Rule provision of the state constitution, and got that wrong too.

The court did not address the "first right" of citizens to write law under Article V, the Right to Initiative and Referendum. Consequently that right stands and can't be challenged by the legislature or the Court.

Knowing the sentiment against fracking within Boulder County, the Commission should support an initiative being placed on the ballot to enforce a continued moratorium or ban. If the citizen initiative passes, the constitutional issue cannot be raised, since it is the people's right to legislate directly, and that right cannot be challenged without changing the constitution. The fracking interests might sue, but they could not sue on constitutional grounds.

I invite your attention to two articles on this subject. First, Boulder attorney Dan Leftwich's detailed and magisterial legal argument supporting the rights of the people to the initiative, and why the Court's decision does not and could not weigh on that right. Second is my recent article in Counterpunch which takes a populist point of view.

<http://minddrivelegal.com/blog/>

<http://www.counterpunch.org/2016/06/08/the-great-unraveling-oil-gas-and-the-future-of-colorado/>

Please check box below *

☐ I acknowledge receipt of the Open Records Notification

From: [Ginger Riversong](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Please protect us
Date: Monday, June 27, 2016 3:07:41 PM

To the Commissioners:

Short and to the point - we MUST find ways to protect our air, (ozone alert this past weekend?! - the MS 150 was taking place) water, property values, recreation and health, in the face of aggressive oil and gas development and the *elected* officials who continue to blatantly betray their constituents.

In light of the recent court ruling, we must find new ways to win this battle. I remain hopeful that as a community, we can prevail.

I oppose fracking in particular, and I support doing everything in our power to bring on board more solar and wind, better batteries/storage, and efforts toward increased conservation/efficiency. I have had PV panels on my roof for seven years, and they continue to put power back into the grid.

Thank you for taking my comments.

--

Ginger Ikeda
3320 15th St
80304

SHARE THE ROAD :)

Riders: Be Bright and Be Seen; Rules of the Road

Drivers: Put down the @%\$ cell phone and Save a Life; 3 Feet Between; Pass <15 mph above bike's speed. THANKS!

"Unless someone like you cares a whole awful lot, nothing is going to get better. It's not!"

-Dr. Seuss

"It takes courage to grow up and become who you really are."

-ee cummings

From: [Alexandra Armitage](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Moratorium
Date: Monday, June 27, 2016 3:11:23 PM

Dear Commissioners,

I fully support banning any further new oil and gas permits. I fly a Cessna 150 out of the Boulder Airport. In the recent years, Weld County has allowed so many oil and gas wells. The difference between Boulder County's and Weld County's is more than remarkable. It is the difference between blue and brown. I would be happy to take Commissioners up to see it. One can also see the difference in the air of these two counties when perched on the top of Sunshine Canyon looking east.

Additionally, when we experienced the floods of 2013, many gas tanks were ripped from their moorings alongside the St Vrain River. Oil & gas ran into the river and it took many days before the situation was in check. Interestingly, little was reported in the press about what had happened. The messes were visible from the air.

Please consider my testimony as you make amendments to the regulations.

You should be proud to lead in the county with the blue sky!

Best,

Lexie Armitage

254 Bergren Rd, Cardinal Townsite

Lexie Armitage

Home on the Range Real Estate

<http://www.nederlandproperty.com/>

c.303-517-9658 o.303-258-7839

From: [Martha McPherson](#)
To: [Halpin, Barbara](#)
Subject: Fracking
Date: Monday, June 27, 2016 3:30:05 PM

Here we are again, trying to protect ourselves from the oil and gas cartel and finding the supposed elected representatives in the pocket of the corporate mafia. It takes one's breathe away, the blatant corruption. Here's to another piss in the wind to say... Do the right thing and protect your constituents and the earth that we call home. Be courageous, we need your better selves, not your sold out selves. In great dismay, I doubt you will stand up to the corruption, your political careers seem to be more important than the future of our earth. How do you sleep at night?
Sincerely,

Martha McPherson

Also interesting that we no longer have the right to voice our opinion, the eroding of what little rights we have left...

Sent from my iPhone

From: [Terry Barr](#)
To: [Boulder County Oil and Gas Comment](#)
Cc: [Laurie Barr](#)
Subject: submission
Date: Monday, June 27, 2016 3:32:18 PM
Attachments: [boulder county commission submission.pdf](#)

Commissioners,

Please find attached our submission

regards

Terry Barr

CEO

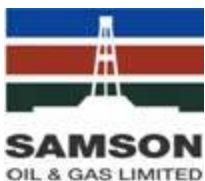
1331 17th Street, Suite 710

Denver, CO 80202

Direct: (303) 296-3994

Cell: (970) 389-5047

Fax: (303) 295-1961



From: [George Newell](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking
Date: Monday, June 27, 2016 3:46:47 PM

Please ban fracking in Boulder County for as long as possible. Fracking's long term damage to Boulder's economy far outweighs any short term gains.

George Newell
P. O. Box 2179
Boulder, Co, 80306

From: [Tom Moore](#)
To: [Boulder County Oil and Gas Comment](#)
Cc: mooretr@centurylink.net
Subject: Regarding the decision to extend the Drilling Moratorium in Boulder County until November 2016
Date: Monday, June 27, 2016 3:51:15 PM

I urge that you maintain it until the last possible moment (Nov. 2016). I think that the Colorado Supreme Court Decision can be challenged based upon Article II Sec 1-3 of the Colorado Constitution. Our health and safety remain of primary concern and we should work hard to assert these rights.

From Article II of the Colorado Constitution

Section 1. ***Vestment of political power.*** All political power is vested in and derived from the people; all government, of right, originates from the people, is founded upon their will only, and is instituted solely for the good of the whole.

Section 2. ***People may alter or abolish form of government*** ♦ ***proviso.*** The people of this state have the sole and exclusive right of governing themselves, as a free, sovereign and independent state; and to alter and abolish their constitution and form of government whenever they may deem it necessary to their safety and happiness, provided, such change be not repugnant to the constitution of the United States.

Section 3. ***Inalienable rights.*** All persons have certain natural, essential and inalienable rights, among which may be reckoned the right of enjoying and defending their lives and liberties; of acquiring, possessing and protecting property; and of seeking and obtaining their safety and happiness.

I think that there is enough scientific investigation to make our assertion of right to postpone any oil and gas activity in our county legitimate.

Thank you

Tom Moore

2830 5th St

Boulder, CO 80304

Submission to Boulder County Commissioners

Date June 27th 2016

Submitted by: Mr. T. M Barr and Mrs. L.J Barr, 3641 Duncan Lane, Boulder.

Commissioners,

We would submit that a moratorium on the exploitation of oil and gas in Boulder County is a denial of property rights and accordingly the moratorium should cease.

In the alternative Boulder County should negotiate in good faith the purchase of landowner's mineral rights so that they can be fairly compensated because of the denial of this right.

Extraction Oil and Gas are the holders of an oil and gas lease dated 23rd March 1977 which includes the property now owned by us which is located in Section 20 T1N, R 69W. We understand this lease is extant and available to be exploited by the lessee and which would return a 12.5% royalty to the mineral owner.

Boulder City entered into a development agreement dated 5th November 1984, which specifically allowed for the Grantor (landowner) to retain the development rights to the oil and gas assets (agreement is attached). The agreement states "Further, Grantor may extract oil and gas and build such structure and maintain such operations necessary for oil and gas extraction from locations determined by the Grantor."

As the mineral owners we would be happy to either:

- 1) Agree a surface use agreement with Extraction such that a series of horizontal wells could be drilled from our owned surface, which would allow the Niobrara Formation that has been proven in the offsetting wells and in the Wattenberg Field generally or,
- 2) Agree to a sale of our minerals rights to Boulder County which fairly compensated us because of the denial of the legal property right to exploit this commodity.

Regards

Terry and Laurie Barr

Attachments

- 1) Grant of Development Right
- 2) Martin Oil Services Lease
- 3) Quit claim

BOOK 795 800
Recorded at 8:00 o'clock A.M. APR 22 1977
Rec. No. 1717142 Mary Ann Feuerstein, Recorder
3-1

FILM 1060

Form 88—(Producers)
Kan., Okla. & Colo., 1957

C Rev 1974 OIL AND GAS LEASE

THIS AGREEMENT, Entered into this the 23rd day of March 1977
between Energy Resources Technology Land Incorporated, P. O. Box 1256,
Boulder, CO 80302

and Martin Oil Service, Inc., P.O. 298, Blue Island, Illinois 60406
hereinafter called lessor.
hereinafter called lessee, does witness:

1. That lessor, for and in consideration of the sum of ten Dollars in hand paid and of the covenants and agreements hereinafter contained to be performed by the lessee, has this day granted, leased, and let and by these presents does hereby grant, lease, and let exclusively unto the lessee the hereinafter described land, and with the right to utilize this lease or any part thereof with other oil and gas leases as to all or any part of the lands covered thereby as hereinafter provided, for the purpose of carrying on geological, geophysical and other exploratory work, including core drilling, and the drilling, mining, and operating for, producing, and saving all of the oil, gas, casinghead gas, casinghead gasoline and all other gases and their respective constituent vapors, and for constructing roads, laying pipe lines, building tank's, storing oil, building power stations, telephone lines and other structures, thereon necessary or convenient for the economical operation of said land alone or conjointly with neighboring lands, to produce, save, take care of, and manufacture all of such substances, and for housing and boarding employees, said tract of land with any reversionary rights therein being situated in the County of _____

Boulder State of Colorado And described as follows:

Township One North, Range Sixty-Nine West of the Sixth P. M.

Section 17: NW, W $\frac{1}{2}$ SW less railroad right of way, West 20 acres of E $\frac{1}{2}$ SW

Section 18: E $\frac{1}{2}$ less railroad right of way, N $\frac{1}{2}$ NW

Section 19: N $\frac{1}{2}$ NE, SW SE, N $\frac{1}{2}$ NW South of railroad right of way, SE NW less South 8 acres

Section 20: NW NW less West 6 Acres, West 10 acres of NE NW

For further conditions of lease see Exhibit "A" attached hereto and made a part hereof.

effective April 21, 1977 and containing 921 acres, more or less

2. It is agreed that this lease shall remain in full force for a term of two years from this date, fourteen years, and twenty-three years, thereafter as gas is produced from said land or from lands which said land is consolidated or the premises are being developed or operated in consideration of the premises and leasehold interest.

To deliver to the credit of lessor, free of cost, in the pipe line to which lessee may connect his wells, the equal one-eighth (1/8) part of all oil produced and saved from the leased premises.

3. The lessee shall monthly pay lessor as royalty on gas marketed from each well where gas only is found, one-eighth (1/8) of the proceeds if sold at well, or if marketed by lessee off the leased premises, then one-eighth (1/8) of its market value at the well. The lessee shall pay the lessor: (a) one-eighth (1/8) of the proceeds received by the lessee from the sale of casinghead gas, produced from any oil well; (b) one-eighth (1/8) of the value, at the mouth of the well, computed at the prevailing market price, of the casinghead gas, produced from any oil well and used by lessee off the leased premises for any purpose or used on the leased premises by the lessee for purposes other than the development and operation thereof. Lessor shall have the privilege at his own risk and expense of using gas from any gas well on said land for storage and inside lights in the principal dwelling located on the leased premises by making his own connections thereto.

Where gas from a well or wells, capable of producing gas only, is not sold or used for a period of one year, lessee shall pay or tender as royalty, an amount equal to the delay rental as provided in paragraph 4 hereof payable annually on the anniversary date of this lease following the end of each such year during which such gas is not sold or used, and while said royalty is so paid or tendered this lease shall be held as a producing property under paragraph numbered two hereof.

4. If operations for the drilling of a well for oil or gas are not commenced on said land on or before the 21st day of April, 1978 this lease shall terminate as to both parties, unless the lessee shall on or before said date pay or tender to the lessor or for the lessor's credit in the Colorado National Bank at Denver, CO or its successors, which Bank and its successors are the lessor's agent and shall continue as the depository of any and all sums payable under this lease regardless of changes of ownership in said land or in the oil and gas or in the rentals to accrue hereunder, the sum of Nine Hundred Twenty-One Dollars, which shall operate as a rental and cover the privilege of deferring the commencement of operations for drilling for a period of one year. In like manner and upon like payments or tenders the commencement of operations for drilling may further be deferred for like periods successively. All payments or tenders may be made by check or draft of lessee or any assignee thereof, mailed or delivered on or before the rental paying date, either direct to lessor or assigns or to said depository bank and it is understood and agreed that the consideration first recited herein, the down payment, covers not only the privilege granted to the date when said first rental is payable as aforesaid, but also the lessor's option of extending that period as aforesaid and any and all other rights conferred. Lessee may at any time execute and deliver to lessor, or place of record, a release or releases covering any portion or portions of the above described premises and thereby surrender this lease as to such portion or portions and be relieved of all obligations as to the acreage surrendered, and thereafter the rentals payable hereunder shall be reduced in the proportion that the acreage covered hereon is reduced by said release or releases.

5. Should the first well drilled on the above described land be a dry hole, then, and in that event, if a second well is not commenced on said land within twelve months from expiration of the last rental period for which rental has been paid, this lease shall terminate as to both parties, unless the lessee on or before the expiration of said twelve months shall resume the payment of rentals in the same amount and in the same manner as hereinbefore provided. And it is agreed that upon the resumption of the payment of rentals, as above provided, that the last preceding paragraph hereof, governing the payment of rentals and the effect thereof shall continue in force just as though there had been no interruption in the rental payments.

6. If said lessor owns a less interest in the above described land than the entire and undivided fee simple estate therein, then the royalties and rentals therein provided shall be paid the lessor only in the proportion which his interest bears in the whole and undivided fee. However, such rental shall be increased at the next succeeding rental anniversary after any reversion occurs to cover the interest so acquired.

7. The lessee shall have the right to use, free of cost, gas, oil and water found on said land for its operations thereon, except water from the wells of the lessor. When required by lessor, the lessee shall bury its pipe lines below plow depth and shall pay for damage caused by its operations to growing crops on said land. No well shall be drilled nearer than 100 feet to the house or barn now on said premises without written consent of the lessor. Lessee shall have the right at any time during, or after the expiration of, this lease to remove all machinery, fixtures, houses, buildings and other structures placed on said premises, including the right to draw and remove all casing, and to remove all installations within a reasonable time.

8. If the estate of either party hereto is assigned and the privilege of assigning in whole or in part is expressly allowed, the covenants hereof shall extend to the heirs, devisees, executors, administrators, successors, and assigns, but no change of ownership in the land or in the rentals or royalties or any sum due under this lease shall be binding on the lessee until it has been furnished with either the original recorded instrument of conveyance or a duly certified copy thereof or a certified copy of the will of any deceased owner and of the probate thereof, or certified copy of the proceedings showing appointment of an administrator for the estate of any deceased owner, whichever is appropriate, together with all original recorded instruments of conveyance or duly certified copies thereof necessary in showing a complete chain of title back to lessor to the full interest claimed, and all advance payments of rentals made hereunder before receipt of said documents shall be binding on any direct or indirect assignee, grantee, devisee, administrator, executor, or heir of lessor.

9. It is hereby agreed that in the event this lease shall be assigned as to a part or as to parts of the above described land and the holder or owner of any such part or parts shall make default in the payment of the proportionate part of the rent due from him or them such default shall not operate to defeat or affect this lease insofar as it covers a part of said land upon which the lessee or any assignee hereof shall make due payment of said rentals.

10. Lessor hereby warrants and agrees to defend the title to the land herein described and agrees that the lessee, at its option, may pay and discharge in whole or in part any taxes, mortgages, or other liens existing, levied, or assessed on or against the above described lands and, in event it exercises such option, it shall be subrogated to the rights of any holder or holders thereof and may reimburse itself by applying to the discharge of any such mortgage, tax or other lien, any royalty or rentals accruing hereunder.

11. Notwithstanding anything in this lease contained to the contrary, it is expressly agreed that if lessee shall commence operations for drilling at any time while this lease is in force, this lease shall remain in force and its terms shall continue so long as such operations are prosecuted and, if production results therefrom, then as long as production continues.

12. If within the primary term of this lease, production on the leased premises shall cease from any cause, this lease shall not terminate provided operations for the drilling of a well shall be commenced before or on the next ensuing rental paying date; or, provided lessee begins or resumes the payment of rentals in the manner and amount hereinbefore provided. If, after the expiration of the primary term of this lease, production on the leased premises shall cease from any cause, this lease shall not terminate provided lessee resumes operations for re-working or drilling a well within sixty (60) days from such cessation and this lease shall remain in force during the prosecution of such operations and, if production results therefrom, then as long as production continues.

13. Lessee is hereby given the right at its option, at any time and from time to time, to pool or utilize all or any part or parts of the above described land with other land, lease, or leases in the immediate vicinity thereof, such pooling to be into units not exceeding the minimum size tract on which a well may be drilled under laws, rules, or regulations in force at the time of such pooling or utilization; provided, however, that such units may exceed such minimum by not more than ten acres if such excess is necessary in order to conform to ownership or lease lines. Lessee shall exercise said option, as to each desired unit, by executing and recording an instrument identifying the unitized area. Any well drilled or operations conducted on any part of each such unit shall be considered a well drilled or operations conducted under this lease, and there shall be allocated to the portion of the above described land included in any such unit such proportion of the actual production from all wells on such unit as lessor's interest, if any, to such portion, computed on an acreage basis, bears to the entire acreage of such unit. And it is understood and agreed that the production so allocated shall be considered for all purposes, including the payment or delivery of royalty, to be the entire production from the portion of the above described land included in such unit in the same manner as though produced from the above described land under the terms of this lease.

14. This lease and all its terms, conditions and stipulations shall extend to, and be binding on each of the parties who signs this lease, regardless of whether such lessor is named above and regardless of whether it is signed by any of the other parties herein named as lessors. This lease may be signed in counterparts, each to have the same effect as the original.

IN WITNESS WHEREOF, we sign the day and year first above written.
Witness:

Thea Ethel

Recorded 2:45 PM On APR 25 1979
334125
Perception No. _____ Charlotte Houston, Boulder County Recorder

PRINTED BY WILKINS PRINTING, INC., 511 16th ST. SUITE 222 DENVER, CO. 80202 (303) 893-1681

1717142

3-2

STATE OF _____ } ss. Oklahoma, Kansas, New Mexico, Wyoming, Montana, Colorado, Utah,
COUNTY OF _____ } Nebraska, North Dakota, South Dakota
ACKNOWLEDGMENT — INDIVIDUAL

BEFORE ME, the undersigned, a Notary Public, in and for said County and State, on this _____
day of _____, 19_____, personally appeared _____

and _____
_____ to me known to be the identical person _____ described in and who executed
the within and foregoing instrument of writing and acknowledged to me that _____ duly executed the same as _____ free
and voluntary act and deed for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal the day and year last above written.
My Commission Expires _____ Notary Public.

STATE OF _____ } ss. Oklahoma, Kansas, New Mexico, Wyoming, Montana, Colorado, Utah,
COUNTY OF _____ } Nebraska, North Dakota, South Dakota
ACKNOWLEDGMENT — INDIVIDUAL

BEFORE ME, the undersigned, a Notary Public, in and for said County and State, on this _____
day of _____, 19_____, personally appeared _____

and _____
_____ to me known to be the identical person _____ described in and who executed
the within and foregoing instrument of writing and acknowledged to me that _____ duly executed the same as _____ free
and voluntary act and deed for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal the day and year last above written.
My Commission Expires _____ Notary Public.

State of Colorado } ss. ACKNOWLEDGMENT (For use by Corporation)
County of Boulder }

On this 23rd day of March, A. D. 19 77, before me personally
appeared Theo Entel President of Energy Resources Development, Inc.
me duly sworn, did say that he is the _____

_____ and that the seal affixed to said instrument is the corporate seal of said corporation
and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said

_____ acknowledged said instrument to be the free act and deed of said corporation

Witness my hand and seal this 23rd day of March, A. D. 19 77
Gunda L. Rippe
Notary Public.

(SEAL)

My Commission expires June 1979

No. _____	FROM	TO	Dated _____, 19____	No. Acres _____	County _____	Term _____	This instrument was filed for record on the _____ day of _____, 19____, at _____ o'clock _____ M., and duly recorded in Volume _____ Page _____ of the records of this office.	County Clerk _____ Deputy _____	When recorded return to MARTIN OIL SERVICE P. O. Box 298 Blue Island, Ill. 60406
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BOOK 795

FILM 1060

1717142

3-3

EXHIBIT "A" *TM*

If lessee's drilling operations prevent lessor from planting a crop or destroys a growing crop in any year, lessee will pay lessor for the crop as though the crop had been grown and destroyed.

Lessee agrees to replace any irrigation structures or fences that may be destroyed during its operations.

Lessee will not conduct any operations without written permission of lessor.

It is understood and agreed that in the event that the above described land shall be subdivided, platted or otherwise divided into smaller or separate parcels, lessee, its successors and assigns agree to release so much of the surface of the land as shall be (at that time) not used for drilling or production.

Lessee agrees that any access road will be by a reasonable route as mutually agreed upon with lessor. Lessee agrees that upon termination of this lease, lessee will place a release of records in the Boulder County Clerk and Recorder's Office.

At end of term of this lease, lessee shall have the right and obligation to remove all production and operating equipment from site.

It is agreed that if during the primary term of the lease that lessor should acquire any additional acreage within the described area of said lease that lessee shall pay to lessor an additional amount in bonus equal to that rate per acre paid in bonus March 23, 1977.

**QUIT CLAIM DEED AND ASSIGNMENT
(Mineral Rights and Water Rights)**

THIS QUIT CLAIM DEED AND ASSIGNMENT ("Quit Claim Deed and Assignment"), is made as of May 4, 2015, from ENERGY RESOURCES TECHNOLOGY LAND, INC., a Colorado corporation ("Grantor") to LAUREL J. BARR and TERENCE M. BARR, as joint tenants ("Grantees"), whose legal address is 3641 Duncan Lane, Boulder, CO 80301.

WITNESS, that the Grantor, for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has sold, quit claimed and assigned, and by these presents does sell, quit claim and assign unto the Grantees, their heirs, successors and assigns forever, (1) all of Grantor's right, title and interest, if any, in and to any and all mineral rights owned by Grantor associated only with the real property described as Lot 2, Replat A Ertl Farm N.U.P.U.D., County of Boulder, State of Colorado; (2) an undivided one-fourth (1/4) interest in the Lewis H. Davidson Ditch decreed for 1.23 cfs by the Boulder District Court on August 1, 1914 in Case No. 6559, with an appropriation date of May 1, 1863; and (3) the rights associated with Well Permit No. 267947 issued March 8, 2006 by the Division of Water Resources.

TO HAVE AND TO HOLD the same, together with all the appurtenances and privileges thereunto belonging, or in anyway thereunto appertaining, and all the estate, right, title, interest and claim whatsoever, of the Grantor, either in law or equity, to the only proper use and benefit of the Grantees, their heirs, successors and assigns forever.

IN WITNESS WHEREOF, the Grantor has executed this Quit Claim Deed and Assignment on the date set forth above.

ENERGY RESOURCES TECHNOLOGY
LAND, INC., a Colorado corporation

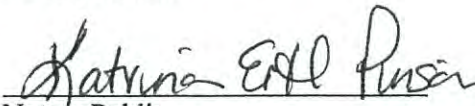
By: 

Anne Smith, Executive Vice-President

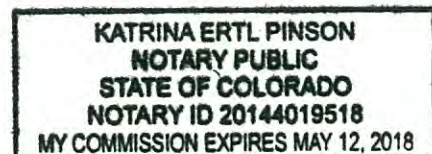
STATE OF COLORADO }
 } ss.
COUNTY OF Boulder }

The foregoing Quit Claim Deed and Assignment was acknowledged before me this 13 day of July, 2015 by Anne Smith, as executive Vice-President of Energy Resources Technology Land, Inc., a Colorado corporation, on behalf of the corporation.

Witness my hand and official seal.


Notary Public

My commission expires: May 12, 2018



GRANT OF DEVELOPMENT RIGHT

For and in consideration of Seven Hundred Eighty-nine Thousand Nine Hundred Sixteen Dollars and Sixty-seven Cents (\$789,916.67) and the covenants and agreements herein contained, ENERGY RESOURCES TECHNOLOGY LAND, INC. (ERTL, Inc.), Grantor, hereby grants and conveys a Development Right to the CITY OF BOULDER, COLORADO, a Colorado Home Rule City, Grantee.

This Development Right is granted in perpetuity for the purpose of preserving and protecting for scenic, open space, and environmental uses the natural condition and aesthetic and ecological features and the development of those lands, hereinafter referred to as the "Protected Area III," and more particularly described in Exhibit "A," attached hereto and incorporated herein by reference.

1. Grant

1.1 Grantee shall have the right to preserve and protect the view of and over the Protected Area III in its present natural, scenic and open space condition.

1.2 Grantee shall have the right to enter upon the Protected Area III in a reasonable manner and at reasonable times for the purposes of inspection and enforcement of any and all rights granted hereby and maintenance, patrol and emergency access.

1.3 Grantee shall have the right, in a reasonable manner and at reasonable times, to enforce by proceedings at law or in equity the rights granted hereby, including but not limited to the right to require the restoration of the Protected Area III to its August 21, 1984, condition if any damage is caused by acts or omissions of Grantor or Grantor's

DOU PEE EXEMPT PER C.R.S. 39-13-105 (1)(b)

14-2

agents. Grantee shall not be deemed to waive or forfeit the right to take any action to insure compliance herewith by any prior failure to act.

1.4 Except as expressly granted herein, Grantor reserves all rights as owner of the Protected Area III, including the right to use the Protected Area III for all purposes not inconsistent herewith.

1.5 Grantor hereby grants and conveys to Grantee any and all minerals and mineral rights on or appurtenant to the Protected Area III, except as specifically excluded by the title insurance commitment for the Protected Area III, including without limitation sand and gravel, but specifically excepting and reserving oil and gas, and further specifically excepting and reserving that sand and gravel subject to an existing gravel mining lease with Flatiron Paving Co. dated September 17, 1984. Further, Grantor may extract oil and gas and build such structures and maintain such operations necessary for oil and gas extraction from locations determined by Grantor. Grantee covenants not to remove any minerals from the Protected Area III.

2. Covenants

2.1 Grantor shall not use the Protected Area III or allow the Protected Area III to be used in a manner inconsistent with the spirit and purposes stated herein.

2.2 Except as provided in Paragraphs 1.5, 2.5, 2.6 and 2.10 herein, there shall be no construction or placing or maintenance of any commercial or industrial structure or use in the Protected Area III, including but not limited to a building containing accommodations, a mobile or manufactured home, a feedlot, a commercial chicken farm, a junk yard, a vehicle or vehicle replacement parts storage area, or a horse, dog, motorcycle, bicycle, automobile race track, or a sign, billboard, or other advertising material except one

sign of not more than 12 square feet in area, to advertise the sale, hire, or lease of the Protected Area III.

2.3 Except as provided in Paragraph 3.2 below, there shall be no dumping or storage of ash, trash, junk, rubbish, sawdust, garbage, chemicals, or other unsightly or offensive material, or changing of the topography through dredging or filling, or the placing of soil or other substances, material, or landfill in the Protected Area III.

2.4 Grantor shall not allow, dedicate, or convey any easement or right of way for any municipal, county, or state road without prior approval of Grantee. There shall not be any construction of any additional road except necessary oil and gas roads and those roads provided on the final plat of the ERTL Farm PUD.

2.5 After platting of the Protected Area III under Boulder County subdivision regulations, Grantor may construct or reconstruct no more than four single family residential housing units, including existing units, not to exceed 35 feet in height, on the Protected Area III. Each single family residential housing unit must be located on a 2.5 acre lot within the areas shown on Exhibit "B," attached hereto and incorporated herein by reference. Location of four units on the Protected Area III is based upon the assumption and contingent upon the condition that additional land will be acquired by Grantor which will allow the addition of one more unit to the approved ERTL Farm PUD. If such additional land is not acquired by Grantor, then Grantor shall be limited to the construction or reconstruction of three single family dwelling units, including existing units, on the Protected Area III. Grantor may convey such lots.

2.6 Grantor shall have the right to construct or reconstruct farm and ranch buildings located on each 2.5

14-4.
acre residential lot. Said buildings may not be used for any commercial or industrial purpose, but may be used for an agricultural purpose consistent with the spirit and purposes stated herein.

2.7 Grantor covenants not to place or allow more than 150 animal unit months, as shown in Exhibit "C," on the Protected Area III in any year, plus up to 100 chickens or other fowl.

2.8 Grantor agrees to pay any taxes levied on the Protected Area III.

2.9 Except as required in order to gain approval of the ERTL Farm PUD dated June 27, 1984, and except for the addition of one unit, as stated in Paragraph 2.5 above, Grantor shall not have the right to use or to convey further or to assign any density or development right relating to the Protected Area III, ~~except that Grantor may convey the entire fee, subject to this Development Right.~~

2.10 Grantor shall be responsible for the construction and maintenance of all fences and gates shown on Exhibit "B" and for all fences and gates associated with the four single family residential lots. Grantor shall construct and maintain a minimum of a two strand electric fence on posts of sufficient construction to assure that all animals grazing on the Protected Area III are prevented from passage onto the land conveyed to Grantee north and east of the Protected Area III; provided, however, that so long as Grantor maintains a lease on the land conveyed to Grantee north and east of Protected Area III, no such electric fence need be constructed.

2.11 Grantor grants the trail easement shown on Exhibit "B" to Grantee for the use of the public and permits the use of the existing Union Pacific Railroad crossing for said trail. Grantee shall apply to the Union Pacific Railroad

for a railroad crossing on land deeded to Grantee to the east of the Protected Area III. If such a railroad crossing is granted by the Union Pacific Railroad Company to Grantee, then Grantee shall construct in a timely manner a new railroad crossing on the eastern parcel to be used for the trail and shall abandon the use of the crossing on the Protected Area III.

2.12 Grantor may quiet title to the fee interest in the land under the Union Pacific Railroad Easement between the Conservation Easement of even date and this Development Right, and west of the land to become part of Outlot P pursuant to the contract of sale of August 20, 1984 between the parties. Upon acquisition of such interest, Grantor shall add such area to the Protected Area III.

2.13 Grantor shall maintain general liability insurance on the Protected Area III in an amount not less than that specified in the Colorado Governmental Immunity Act, Section 24-10-114, C.R.S., as amended, naming Grantee as an additional insured, and shall indemnify and save harmless Grantee from any liability covered thereby, provided that Grantee shall remain liable as provided by law for the acts of its employees and agents.

3. Reciprocal Covenants

3.1 Grantee shall exercise its right of entry under Paragraph 1.2 in a reasonable manner and at reasonable times.

3.2 Grantee recognizes the right of Grantor to utilize the Protected Area III for grazing of animals and raising of crops and for other agricultural purposes not inconsistent with the rights granted hereby.

3.3 Grantee shall not have the right to convey or assign any rights granted hereby to any person or entity, except Grantor, a governmental agency, and its successors.

4. Enforcement

4.1 Each of the parties shall be entitled to specific performance by the other party of all rights granted hereby. In the event one of the parties fails to abide by the terms hereof, the other party shall be entitled to all applicable remedies at law or in equity, including but not limited to restraining orders, temporary and permanent injunctions, and damages for destruction or injury to the Protected Area III and the injured party's interest therein.

5. Notice

All notices under this agreement shall be given by registered or certified mail, postage prepaid, directed as follows, and shall be deemed given on the date of mailing:

A. If intended for ERTL, Inc.

Energy Resources Technology Land, Inc.
P.O. Box 1256
Boulder, Colorado 80306

B. If intended for City

City Manager
City of Boulder
Municipal Building
P.O. Box 791
Boulder, Colorado 80306

6. Miscellaneous

6.1 The terms of this Development Right shall be binding upon Grantor and its agents, personal representatives, heirs, lessees and assigns, and all other successors to it in interest, and shall continue as a servitude running in perpetuity with the Protected Area III.

6.2 Grantor and Grantee covenant that they will defend and maintain the validity of the Development Right granted hereby.

6.3 This instrument and the attached exhibits contain the entire agreement between the parties relating to the Grant of Development Right of the Protected Area III, and

may be modified only by an instrument in writing executed by all parties.

6.4 The parties hereto agree that, except for such of the terms, conditions, covenants and agreements hereof which are, by their very nature, fully and completely performed upon the closing of the transaction herein provided for, all of the terms, conditions, covenants and agreements herein set forth and contained shall survive the closing, and shall continue after said closing to run with the Protected Area III and to be binding upon and inure to the benefit of the parties hereto, their agents, personal representatives, heirs, lessees, successors and assigns.

IN WITNESS WHEREOF, the parties have caused this instrument to be duly executed as of the day and year first above written.

ENERGY RESOURCES TECHNOLOGY
LAND, INC.

Attest:

Buff Ertl White
Secretary

By: Theo Ertl
President

CITY OF BOULDER, COLORADO

Attest:

Cassie I. Irie
Director of Finance and Record
Ex-officio City Clerk

By: James W. Spi
City Manager

ERTL FARM HOMEOWNERS' ASSOCIATION

By: Buff Ertl White, president



14-8

STATE OF COLORADO)
COUNTY OF BOULDER) ss.

The foregoing document was acknowledged before me this
5th day of November, 1984, by THEO ERTL,
as President, and BUFF ERTL WHITE, as Secretary of
Energy Resources Technology Land, Inc., & COLORADO CORPORATION



I witness my hand and official seal.

My commission expires: 10-21-87

My address is: 1317 Spruce St., Boulder, CO 80303

Jacklyn R. Hall
Notary Public

14-9.

EXHIBIT "A" TO GRANT OF DEVELOPMENT RIGHT

All of the ERTL Farm NUPUD lying south of the Railroad right-of-way excepting therefrom Outlot S.

EXHIBIT "C"

Animal Unit Conversion Factors

Determination of total feed requirements of livestock on a farm or ranch is approximated by converting feed requirements of various kinds of grazing animals to standard animal units. A standard animal unit is one mature beef cow (weight 1,000 pounds on the average) with or without nursing calf at side.

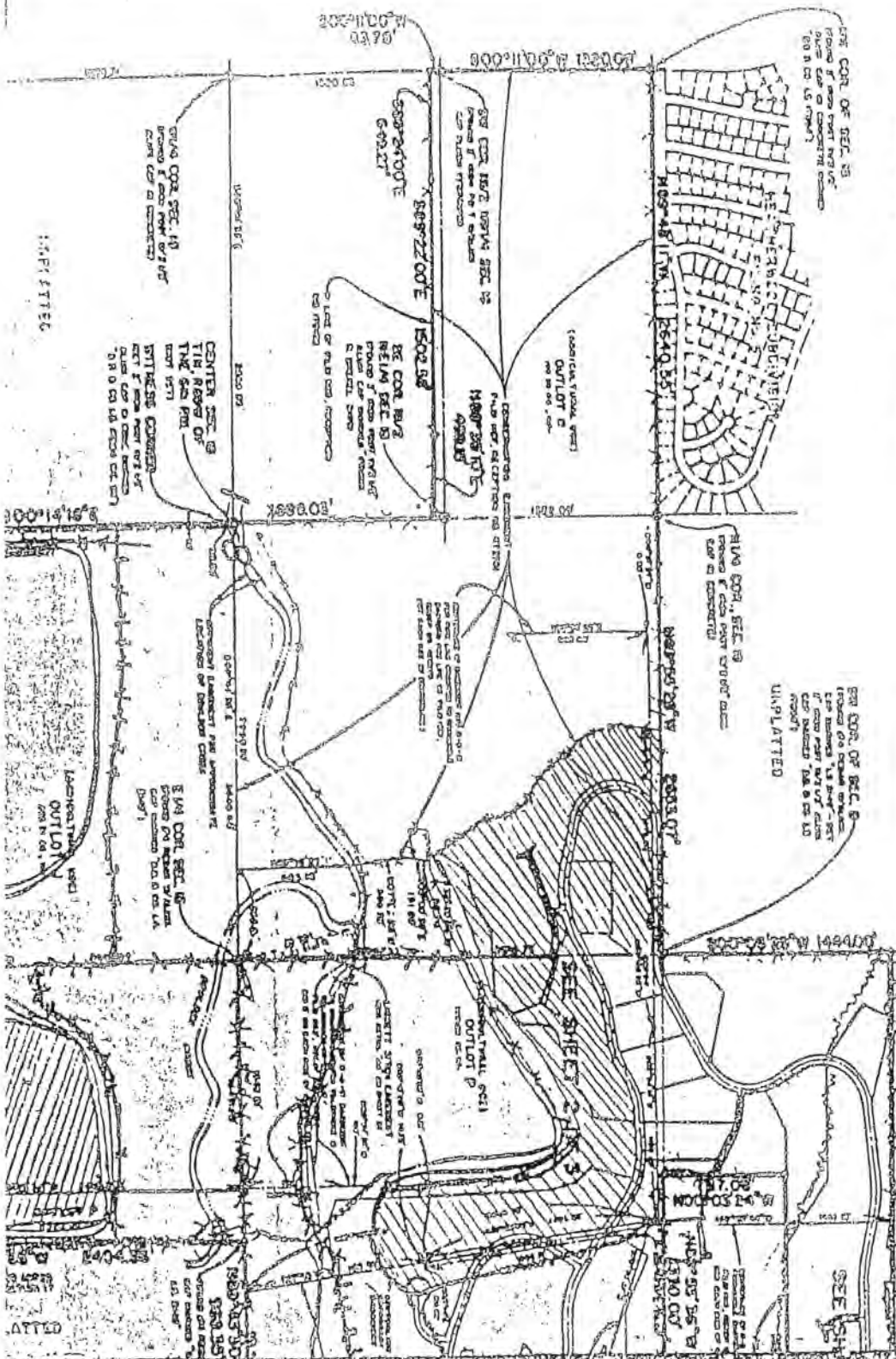
<u>Animal Classes</u>	<u>Animal Units</u>
Beef cow (with or without nursing calf at side) -----	1.00
Dairy cow, dry -----	1.00
Dairy cow, producing milk -----	1.50
Bull - mature -----	1.50
Calf - weaned -----	.60
Steer - 1 yr. old -----	.70
Steer - 2 yr. old -----	.90
Horse, grown -----	1.50-2.00 Depending on soil and slope condition
Ewe (with or without nursing lamb at side) -----	.20
Ram -----	.30
Bison -----	1.50-2.00 depending on soil and slope condition
Goat, with kid -----	.20

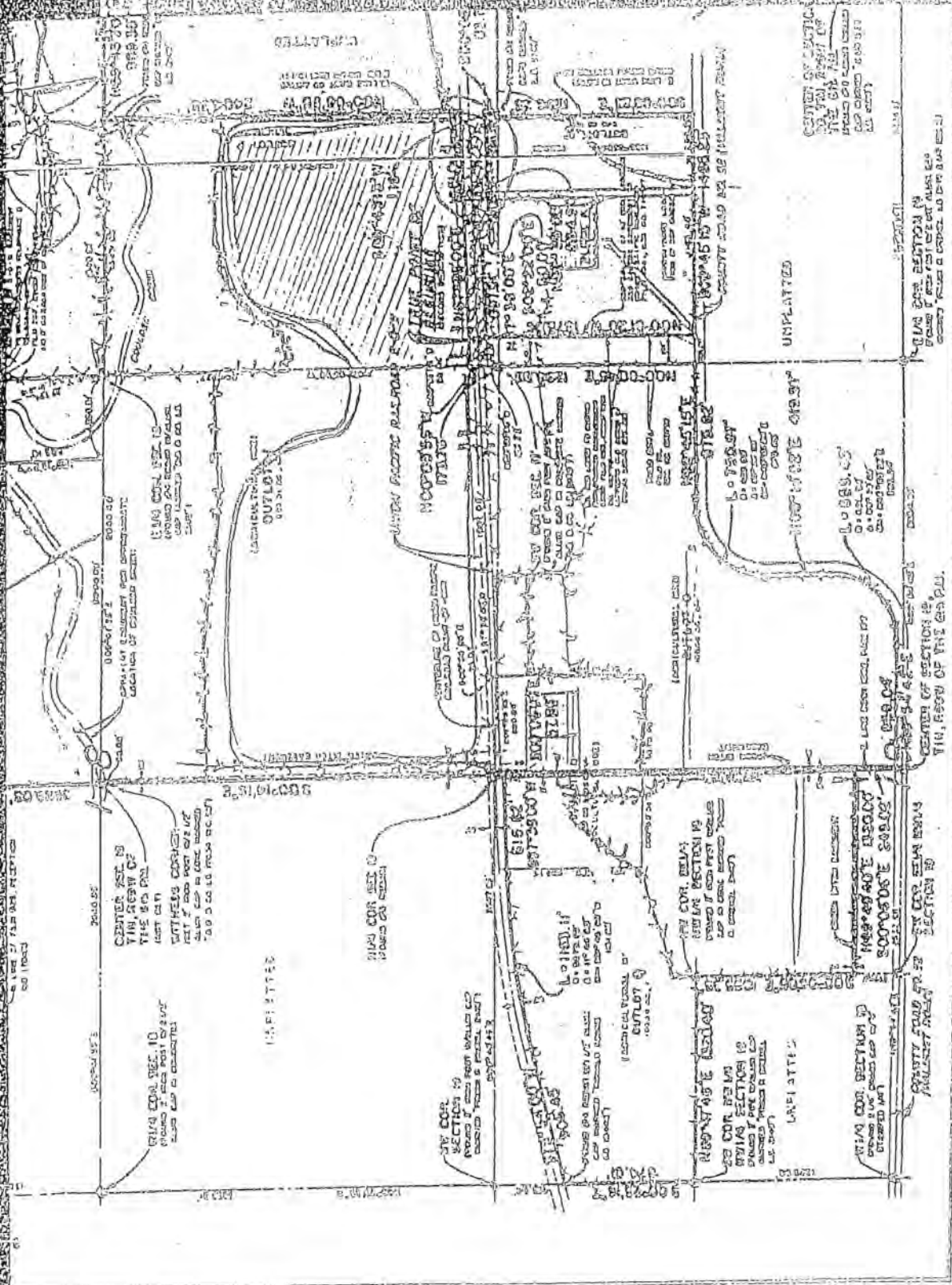
24
with 12
for 12

ERTM
OF A PART OF THE SIZE OF SECTION 8; THE W1/2 OF
2 OF SECTION 19 AND THE NW1/4 OF SECTION 20.

W 444 COR. 212, B—
11/19/49
Rural Gas Company "W" 9

STATE
SUMMAREL PRIDE
AREA = 1025910





14-11
4050

From: [Lynn Segal](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking BAN.
Date: Monday, June 27, 2016 3:58:20 PM

Hi CC's

Increasing reliance on Natural Gas displaces the market for clean energy and trivializes and negates the function of the City Of Boulder-supported attempt of municipalizing the local electric supply from Xcel, the investor owned utility. It harms human health and the environment in places where production occurs.

Institute a permanent BAN on fracking in Boulder County and take the heat.

SOMEBODY has to. Be like Lipkin County first Community Rights Ordinance. Athens County Renewable Energy (the acronym ACRE) Athens Community Bill Of Rights Ohio banning fracking, 200 communities in 10 states Community Rights Ordinances, Pennsylvania Fulton Co. 50 corporate hogfarms- "do it anyway and others will follow" and they won-- NO different than fracking. I have the states and communities documentation from Thomas Linzey's talk promoting the State Community Rights Ordinance on Friday 24 June at CU Humanities 250 where he discussed the communities that have successfully fought. I can get this documentation from Tom Groover, who knows the details and specifics. I have a call in to him, but the talk was Fri. and your deadline is 4 PM. I am going to google and try to find this after the deadline and can get it to you.

I can do the work to get you this documentation to support your decision if need be!

Lynn Segal
538 Dewey
Boulder

303-447-3216 24/7

From: [Pete Morton](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Comments of the Moratorium on Oil and Gas Development
Date: Monday, June 27, 2016 3:59:57 PM

June 27, 2016

Dear Boulder County Board of Commissioners

Below are my comments on the 6-month moratorium on oil and gas development. By reference, please consider all of my comments previously submitted to the county. My comments today will focus on three of my concerns as the county moves forward with implementing its moratorium. I recommend the county: 1) Gain a better understanding on the fiscal risk associated with inadequate bonding for closing and reclaiming wells; 2) review the quality and legal adequacy of current baseline information on environmental, human health, and socio-economic conditions; and 3) Develop a carbon-methane tax proposal to purchase local mineral rights.

I view the current moratorium as an information-based moratorium. Quite simple, this is a moratorium which allows the county time to collect and assess information from which to move forward with responsible oil and gas development in Boulder County. In general, I recommend being proactive. I would engage industry and state officials in a public dialogue on the fiscal and environmental risks faced by Boulder County as well as the very high expectations from Boulder County residents. Below are some more details.

Fiscal Risk from Inadequate Assurance Bonding

One of the fiscal and environmental risks with oil and gas development is insufficient bonding amounts – money necessary to cover well closure and reclamation costs. Inadequate bonding is an issue at county, state and federal level.

Last time I checked, Colorado State Bonding for Soil Protection, Plugging and Abandonment consists of a \$60,000 state-wide bond – for up to 99 wells, and \$100,000 state-wide bond – when a company has more than 100 wells. On a per well basis, these amounts are clearly inadequate for covering the cost of plugging, reclaiming and restoring old well pads. For example, a company with 99 wells has a bonding amount equal to \$606 per well. A company with 200 or 1000 wells has bonding amounts equal to \$500 and \$100 per well – amounts that are clearly inadequate from a fiscal perspective. Closure and reclamation costs can easily run into the \$10s to \$100s of thousands of dollars per well.

I recommend the County assess the closure and reclamation costs for all wells currently existing in Boulder County – as well as their status (i.e. abandoned, orphaned, shut in, closed, active). The reclamation costs for the associated oil and gas infrastructure (i.e. pipelines, roads) must also be considered. One scientist I can recommend for technical assistance in the task of generating information on closure and reclamation costs is Henry Sauer, Senior Scientist at Tetra Tech in Golden, Colorado

Once the cost data are collected, compare the estimated closure and reclamation

costs for all wells with current performance-assurance bonding amounts available to clean up those wells. If the costs are greater than the bonding amounts – as I suspect -- then the bonding amounts must be increased to comply with the Polluter Pays Principle commonly touted by economists.

With closure cost estimates and bonding amounts in hand, I recommend engaging industry and state officials in a proactive discussion on the need to change state rules to allow counties the legal right to increase bonding amounts in order to reduce the fiscal and environmental risks for local taxpayers.

Allowing new wells without closing old wells means more wells. More wells increase the fiscal risks for communities from the inadequate funding (i.e. bonding amounts too low) for closing and restoring oil and gas wells and the associated infrastructure. If industry and the state do not agree to allow counties the legal right to increase bonding amounts in order to cover the fiscal costs to local taxpayers of closure and reclamation of oil and gas wells, what incentive do counties have to allow industry to drill new and more oil and gas wells? Either industry and the state agree on the need to increase bonding amounts in order to cover the County's costs of closure and reclamation -- or Boulder County may have no choice but to extend the moratorium in November.

Uncertainty and the Legal Risk from Inadequate Baseline Data

What is the status and quality of Boulder County's baseline data? Are the baseline data of sufficient statistical quality to withstand legal attacks if harm occurs? Baseline data should be collected in order to understand the current level of harm and to detect future change in environmental, socio-economic and fiscal conditions from new oil and gas wells. If, for example, drilling results in toxic-levels of pollution being discharged in local streams and drinking water, having good baseline data will help prove and quantify the damages due in court.

In Colorado, COGCC data reveals that between 2008 and 2012, 17.5% of spills statewide resulted in groundwater contamination. In Weld County, where the pace of drilling was the fastest, 40% of spills impacted groundwater (Lepore 2014).^[1] Having high quality baseline data is necessary to protect taxpayer interests in case of future damage or harm occurs from oil and gas development activities. Two scientists I can recommend to help with baseline data at Dr. Joe Ryan and University of Colorado, and Dr. Gaby Petron at NOAA here in Boulder.

Once again, I would engage the industry and state in a proactive dialogue about the quality and legal status of Boulder County's base line data. Does industry and the state formally agree that Boulder County's baseline data are of high quality and legally defensible in court? If they agree, then there is less need for a moratorium. If industry and the state do not agree that our baseline data are legally defensible in court, then Boulder County may have no choice but to extend the moratorium – allowing us more time (i.e. due diligence) to collect more and improve the statistical quality of our baseline data.

Develop a Carbon-Methane Tax Proposal to Purchase Mineral Rights

One of the current intractable problems in Colorado concerns lands that have split estates – where the underground mineral owner is not the same as the surface owner of the property. In order to address this problem head on, the county should consider developing a carbon-methane tax proposal for voters to consider – where

the revenue generated is used to negotiate with leased holder to buy the oil and gas rights from willing sellers. Funding from the carbon-methane tax could be used to target and buy mineral rights of drillable acres near schools, homes and other areas where drilling is inappropriate.

Such an approach would help internalize the hidden costs from oil and gas development, it would help sew up the split estates problem in and near communities, and it would allow local communities to decide when and where to drill – or not. In the case of Boulder County, citizens may well choose to buy mineral rights and sequester the oil and natural gas in the ground by choosing not to drill

To facilitate solving the split estate problem at a larger statewide scale, we have proposed implementing an equitable cost share approach where communities, oil and natural gas industry, mineral rights owners, and the state and federal government – all contribute to the fund. By having all 4 parties contribute to buying mineral rights we think it would be easier to find a common value for the mineral rights in question – since they would all be contributing 25% for the purchase. The oil and natural gas industry could provide expertise on valuation to assist mineral owners in providing an estimate of the amount of oil and natural gas that is economically recoverable. Similarly, the federal and state government could provide expert assistance to communities wanting to know the economically recoverable amounts of oil and natural gas within town limits. This approach has a built in regulatory mechanism for finding a common valuation for compensating mineral rights owners while helping insure that taxpayers do not overpay.

The advantages of this approach are many. The state and industry would benefit by not having to sue communities. Local communities benefit by gaining control of local oil-natural gas rights. Industry would benefit in such an effort by helping repair brand damage. And mineral rights owners would get compensation for their mineral rights. Mineral rights owners would have an incentive to contribute as they would be getting 75% of the estimate value (having contributed 25%) with certainty – rather than suing in court and hoping for 100% of the value (minus legal costs) with lots of uncertainty along the way. The transaction would only involve willing sellers – so no one is forced to do anything.

This cooperative approach seems much more productive than the current approach of spending millions on advertising and lawsuits.

Additional material on responsible oil and gas development can be found at the website of the Conservation Economics Institute (www.conservationecon.org).

If you have any questions, please feel free to contact me.

Best regards,

Pete Morton, Ph.D.

Consulting Economist

618 Alpine Avenue

[1] The water pollution from oil and gas operations was in part due to failures of flowlines breaking in winter, and the fact that 60% of berms failed to prevent secondary fluid migration. As a result of poorly constructed and rarely inspected berms, Davis (2015) estimates that millions of gallons of toxic fluids migrated into our groundwater, rivers and soil. Collecting data on the baseline conditions of berms is a sound precautionary indicator for understanding current level of harm from BTEX and other drilling wastes causing water pollution.

From: [Micah Parkin](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Continue the moratorium indefinitely
Date: Monday, June 27, 2016 5:55:37 PM

Dear Commissioners,
350 Colorado and 350 Boulder County encourage you to continue a local moratorium on fracking for at least the next 5 years. Despite the State Supreme Court's decision to overturn Longmont's ban and Ft. Collins' moratorium on fracking, these decisions were not based on science, only on their opinion that state preemption trumps local rules on oil and gas development. The science is more clear than ever that fracking is unsafe for public health, water, land, air, and our global climate. Therefore in good conscience local leaders must protect public health and our most valuable resources and represent the will of their people. Even if this results in a lawsuit against Boulder County, it would buy us additional months or perhaps years of protection. We must do all we can to keep this toxic industry at bay. It's worth it.
Thank you,
Micah Parkin

--

Micah Parkin
350 Colorado, Executive Director
504-258-1247
[350 Colorado on Facebook](#)
www.350Colorado.org

From: ollimaleya@aol.com
To: [Boulder County Oil and Gas Comment](#)
Subject: Extend The Moratorium on Fracking
Date: Monday, June 27, 2016 9:02:08 PM

Would appear we are the last bastion of hope to those that understand the dangers of fracking. Do not let us down. I can think of no better use of funds than to protect our health and that of our plant.

[Oil bust leaves states with massive well cleanup | The Big Story](#)

From: [Laura Fronckiewicz](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Oil & Gas in Boulder
Date: Monday, June 27, 2016 10:11:06 PM

Dear Commissioners,

Fracking is dangerous for our children. Please keep or extend the moratorium. We moved to Boulder County to run from fracking. Please heed the studies that show this is dangerous. If we can't stand up to this in Boulder County, where can we?

Laura Fronckiewicz,
Niwot, CO

From: [Martin Walter](#)
To: [Boulder County Oil and Gas Comment](#)
Cc: [Martin Walter](#)
Subject: fracking `` regulations""
Date: Monday, June 27, 2016 10:16:06 PM

Dear County Commissioners,

At the moment I am in the PRC (China) and cannot comment in person. However, on April 23 of this year I organized an all day ``Teach In" at the University of Colorado, Boulder (where I happen to be a professor). The main topic of discussion was fracking, in the context of ``global warming: it might turn out to be worse than you think." A main presenter was Professor Anthony Ingraffea, one of the world's leading experts on the engineering involved in fracking. He was also one of the experts who advised the governor of New York (who was also dealing with possible political consequences that Dr. Ingraffea was independent from) to ban fracking due to its negative environmental consequences. (Ground water contamination was one of the main issues locally.)

Another main presenter was Antonia Juhasz, author of books on the oil industry, like ``Black Tide"--and expert on said oil industry, with extensive background, including deep investigations of such disasters as the BP Gulf disaster. (She actually was invited to directly observe the site on a scientific expedition/submersible. A third presenter was Andrew Nikiforuk, Canadian author and expert on Alberta Tar Sands and fracking. These presenters, along with local scientists such as Daniel Ziskin from NCAR were quite clear about many things.

First, New York, not Colorado (as it is claimed) has the toughest regulations on fracking -- the practice is banned.

Second, methane emissions due to fracking activity have canceled its benefits vis a vis global warming. Why? Methane (aka ``natural" gas) is many times more effective in trapping heat than carbon dioxide -- in the ``short" term, e.g. during our life times :)) Methane leaks from ``the system" exceed Ingraffea's conservative initial estimates (that at first were disparaged by the Obama administration -- then later garnered an apology from Obama). We (the U.S.) have a serious ``methane leak problem."

Third, even before sea level rises that could occur far sooner and more dramatically than we are led to believe by the ``main stream", seemingly random disasters precipitated by extreme weather ``events" put all individuals at risk -- as well as the very infrastructure required to maintain a complex civilization. (For example, too many Katrina's, Sandys and huge fires, floods and droughts in a row and we wont be able to keep up.)

Finally, due to the decades long campaign of lies, precisely in the ``tobacco model," we as a society do not feel sufficient sense of urgency relative to the actual dangers involved.

On top of the above global concerns, which approach mathematical abstraction, many people locally face the

front line of this war on our environment with polluted water and air -- for themselves and their children (in addition to destroyed roads, water impacts and the host of issues that you are all too familiar with).

Thus all actions in support of making as rapid a transition from carbon fuels to renewable (solar and wind) energy as is physically possible are called for. The politics and laws involved are not easy to deal with, but we must.

Best regards,
Marty Walter
3333 Nebo Road
Boulder, Colorado 80302

303 447 2059 (land line)

From: [Lynn Segal](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: FW: Fracking BAN.
Date: Monday, June 27, 2016 11:36:05 PM

Tom got back! Here you go. The ammo you need!
L

Subject: Re: Fracking BAN.
From: drgroover@comcast.net
Date: Mon, 27 Jun 2016 21:38:39 -0600
To: lynnsegal7@hotmail.com

Hi Lynn,

Thanks for sharing your letter with me. Should the commissioners request documentation, I am sure a CELDF representative would be willing to speak with them.

Here's the link to my interview conducted last Thursday with Thomas Linzey:

<https://youtu.be/BawGoQJ0Se8>

Dr. Tom Groover

On Jun 27, 2016, at 5:18 PM, Lynn Segal <lynnsegal7@hotmail.com> wrote:

From: lynnsegal7@hotmail.com
To: oilgascomment@bouldercounty.org
Subject: Fracking BAN.
Date: Mon, 27 Jun 2016 15:58:16 -0600

Hi CC's

Increasing reliance on Natural Gas displaces the market for clean energy and trivializes and negates the function of the City Of Boulder-supported attempt of municipalizing the local electric supply from Xcel, the investor owned utility. It harms human health and the environment in places where production occurs.

Institute a permanent BAN on fracking in Boulder County and take the heat.

SOMEBODY has to. Be like Lipkin County first Community Rights Ordinance. Athens County Renewable Energy (the acronym ACRE) Athens Community Bill Of Rights Ohio banning fracking, 200 communities in 10 states Community Rights Ordinances, Pennsylvania Fulton Co. 50 corporate hogfarms- "do it anyway and others will follow" and they won-

- NO different than fracking. I have the states and communities documentation from Thomas Linzey's talk promoting the State Community Rights Ordinance on Friday 24 June at CU Humanities 250 where he discussed the communities that have successfully fought. I can get this documentation from Tom Groover, who knows the details and specifics. I have a call in to him, but the talk was Fri. and your deadline is 4 PM. I am going to google and try to find this after the deadline and can get it to you.

I can do the work to get you this documentation to support your decision if need be!

Lynn Segal
538 Dewey
Boulder

303-447-3216 24/7

From: [Laura Hale](#)
To: [Boulder County Board of Commissioners](#)
Subject: Regarding Fracking Concerns
Date: Tuesday, June 28, 2016 9:59:44 AM

Dear County Commissioners,

As a prior member of a community's Board of Adjustment, I am familiar with the challenges you face in determining a healthy land use balance for our broad collective within this county. I believe in compromises, and expect that in due time we will find a reasonable approach for Boulder County regarding the fracking pressures before us today.

As I drive through Weld County, there is a gnawing feeling in my intuition that the close proximities permitted for fracking operations near residences and frequented human pathways is inherently hasty and misguided by powerful interests not associated with a simple resident who is busy raising a family and working for a living outside of the oil and gas industry... and that un-doing the mess will be far worse than avoiding it.

I advocate for wise and spacious regulations, distances, and boundaries between our residents and oil/gas operations that are unlikely to cause Boulder County to ever have to say "oops" regarding the wellbeing of its members... whether because we have destroyed property values, or forebodingly, the health of its occupants.

Therefore, I submit this request that we maintain the current moratorium against fracking in Boulder County. I have seen no wise option otherwise to date.

Verily,
Laura Hale
4725 Greylock St. 80301

From: [Cyndi Nusbaum](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Just Say No!!
Date: Tuesday, June 28, 2016 10:57:43 AM

<https://ecowatch.com/2016/06/26/states-radioactive-fracking-waste/>

Sincerely,
Cyndi Nusbaum
1103 Frontier Dr.
Longmont, CO
80501

.

[Sent from Yahoo Mail on Android](#)

From: [Lon Goldstein](#)
To: [Boulder County Board of Commissioners](#)
Subject: Please maintain fracking moratorium
Date: Tuesday, June 28, 2016 6:34:46 PM

Dear County Commissioners,

As a concerned citizen of Boulder County, I am writing to strongly support a continued ban on fracking. I would like to echo the concerns of Stewart Guthrie and others who are able to more completely and eloquently state the risks. I live in the Heatherwood neighborhood, an area which has been spoken of as being vulnerable to fracking operations nearby in our open space. I understand that you are under pressure from the gas and oil industry as well as state government beholden to oil and gas interests. I hope you will find a way to stand up for the safety and well-being of the residents of this county and extend the moratorium. There are many known and unknown risks to placing such heavy industrial operations near homes and schools, especially with the secrecy surrounding the chemicals used by the fracking industry. The record so far is not good for their ability to conduct such operations in near proximity to residential areas. There are health as well as economic risks that outweigh any potential benefit of these operations. I'm concerned about these as well as concerns about contamination of groundwater, and heavy demands on local water supplies. There is just no reason anyone would want fracking operations in this area other than outside oil and gas corporations who are just looking for a short term profit.

Sincerely,
Lon Goldstein
4602 Chatham Pl.

=====
Lon Goldstein
Boulder, CO
lon.a.goldstein@gmail.com
=====

From: [K Nunemaker](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: Fracking
Date: Tuesday, June 28, 2016 10:16:18 PM

To Whom it may Concern;

I wanted to voice my opinion on the fracking consideration that is coming up for vote. I am in favor of extending the ban on fracking indefinitely. I am interested in converting our energy output to solar, wind and geothermal energy. I also am interested in the types of alternative energy source collectors/ converters that will allow for battery storage.

I am in favor of the ballot initiatives #75 and #78.

Thank you for listening.

Kathy Nunemaker
4105 Gilpin Drive
Boulder, CO 80303

From: [Carol Coburn](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: both sides of fracking
Date: Thursday, June 30, 2016 8:23:54 AM

Jeanie Starr: Fracking ballot issues would cost jobs

POSTED: 06/29/2016 07:20:20 PM MDT

Let's outlaw fracking in Colorado...as long as somebody else still has some oil. Let's get enough signatures and get the anti-oil and gas initiatives (Nos. 40, 63, 75 and 78) on the November ballot. (But, let's call them what they really are: proposed amendments to the Colorado Constitution.)

No more oil and gas for Colorado. The fallout?

First, with the loss of oil and gas comes a profound loss of jobs. Hard-working men and women with families to support would no longer have a livelihood. Tens of thousands of jobs would be lost. In addition, hundreds of millions in tax revenue losses would equate to higher taxes. This would, of course, translate into a less than welcoming business environment in the state.

Secondly, there are 248,000 cars in Boulder County. Additionally, Colorado ranks seventh in the country for electric vehicle sales per capita, with 0.02 vehicles sold per person. Ranking seventh is impressive, but at 0.02 vehicles sold per person, a giant shortfall is left between what electric vehicles are providing and what our fossil-fuel needs are. What plan do the initiative supporters have for this shortfall?

So, if we turn our backs on an abundant natural resource and outlaw fracking everywhere in the United States — which is the intent of the initiative supporters — where do we go for oil and gas? Iran? Russia? Saudi Arabia? What an untenable position to put ourselves in, yet that is the future if we allow interest groups outside of Colorado to convince us to sign their petitions.

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Think seriously if asked to sign a petition. Know what you're signing and what it may lead to. These initiatives are presented as beneficial. In fact, their passage would be terribly harmful to the people of Colorado.

Jeanie Starr

Longmont

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Jeanie Starr

Longmont

From: [Carol Coburn](#)
To: [Boulder County Oil and Gas Comment](#)
Subject: another great letter
Date: Saturday, July 09, 2016 2:48:46 PM

Pat Patton: Just say no to Initiative 78

Posted: Fri Jul 08 18:19:47 MDT 2016

If asked to sign a petition to put Initiative 78 on the statewide ballot, I would encourage you to say "no".

The initiative calls for amending the state constitution so that "All new oil and gas development must be located at least 2,500 feet from an occupied structure or area of special concern." The COGCC assessed the impact of Initiative 78, concluding that 95 percent of surface acreage in the top five oil and gas producing counties in Colorado would be unavailable for future oil and gas development. The mandatory 2,500-foot setback would become an essential ban on oil and gas development in Colorado.

I am a resident of Boulder, a CU alumni and a lifelong native. The overwhelming public perception of hydraulic fracturing is terrifyingly misleading. After 45 years of oil and gas development in northern Colorado, CDPHE Health Indicators demonstrate that the occurrence of asthma, cancer, birth defects, low birth weight and infant mortality in Larimer County (having fewer than 300 active oil and gas wells) is indistinguishable from that in nearby Weld County (having more than 22,000 active oil and gas wells). Do we really want to amend our state constitution over such unsubstantiated claims?

I encourage anyone reading this to study hydraulic fracturing for themselves and come to their own conclusions objectively, scientifically and without bias. Everyone must make up their own mind on the issue and that takes thought. Ralph Waldo Emerson wrote "What is the hardest task in the world? To think." I would encourage everyone who reads this to think about Initiative 78. Ballot initiatives and constitutional amendments should not be used capriciously to settle scores between opponents of emotionally-charged issues. Initiative 78 is a ban on oil and gas development in Colorado. Just say no.

Pat Patton

Boulder

From: [Boulder County Contact US/Feedback](#)
To: [#LandUsePlanner](#)
Subject: Boulder County Contact Us/Feedback Form [#141]
Date: Thursday, July 28, 2016 3:06:57 PM

Name *	Carol Coburn
Organization (optional)	Lansons Farm
Email *	cbcwind11@aol.com
Select a Subject *	Land Use Planning

Comments *

Coloradans have always been pioneers. From starting new businesses to exploring the outdoors, we do things our way. So when it comes to driving our economy forward and securing our long-term energy future, it's no surprise we're passionate about taking the lead on developing safe, responsible sources of energy.

Job Creation: Colorado's oil and natural gas industry supports tens of thousands of good-paying jobs in Colorado. In fact, if the proposed 2,500-foot setback measure succeeds, it would eliminate 140,000 high-paying jobs in the oil and natural gas industry across the state.

Economic Growth: Colorado's energy economy contributes billions in economic activity to our local communities, but there's even better news on the horizon. Recently, the U.S. Geological Survey announced that Colorado's Piceance Basin holds 66.3 trillion cubic feet of natural gas — about 40 times more than previously thought. This discovery is one of the largest natural gas deposits ever measured and means more good jobs in Colorado (PERIOD). This means greater savings through decreased energy costs in the future, both of which are linked to economic growth. On the other hand, ending responsible oil and natural gas development in Colorado would cost \$217 billion in economic activity.

Supporting Colorado Schools: In today's economy, investing in high-quality education that prepares students to succeed is a prerequisite for long-term growth. Here in Colorado, we understand how important it is to ensure the success of our children by providing every opportunity for our communities to grow and thrive. .

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