

ANALYSIS OF OIL & GAS IMPACT HB 14-1297

This bill is important to help us wade through the many competing claims about whether or not oil and gas operations have an impact on the health and quality of life of local communities.

The bill will:

- **Require an analysis** to be conducted to examine whether or not there is an impact on local communities by oil & gas operations.
- **Establish a Scientific Oversight Committee**, comprised of scientists and advised by representatives from the industry and environmental community, to ensure the analysis is conducted in an un-biased scientific manner.
- Require a **review of existing literature** on the issue.
- **Require annual interim reports** to be presented to the General Assembly and a **final written report** presented upon the conclusion. The final written report will be submitted for peer review and publishing.

STRUCTURE OF THE ANALYSIS - *to be done in two phases*

Phase 1 will:

- Include a review of existing medical literature from peer-reviewed scientific publications on the effects of oil and gas operations on human health and quality of life;
- Identify conditions of interest that existing medical literature indicates might be related to oil and gas operations; and
- Culminate in a written report due December 1, 2014, and presented orally to committees of the general assembly by January 30, 2015.

Phase 2 will include institutional review board (IRB) approval, surveys, and case studies as follows conducted in two tiers:

- Tier 1:
 - IRB approval by December 31, 2014;
 - mailed and on-line surveys with individuals in the identified communities; and,
 - an interim report due January 1, 2016, and orally presented to committees of the general assembly by January 30, 2016; and
- Tier 2:
 - IRB approval by February 1, 2016;
 - case-control studies on at least 2 relevant conditions of interest identified in Tier 1; and,
 - a final report due January 2017, and presented orally to committees of the general assembly by January 30, 2017.

SCIENTIFIC OVERSIGHT COMMITTEE – 9 voting members, 4 non-voting members

Nine voting members appointed as follows:

- Four members appointed by the governor, no more than three of whom may be registered with the same political party;
- One member appointed by the speaker of the house of representatives;
- One member appointed by the minority leader of the house of representatives;
- One member appointed by the president of the senate;
- One member appointed by the minority leader of the senate; and
- The chief medical officer of the department, or his or her designee, who must also be a physician, who is the chair of the committee; and

Four nonvoting members appointed as follows:

- A representative of the Colorado oil and gas;
- Industry, appointed jointly by the Colorado statewide oil and gas associations;
- A representative of the Colorado environmental community, appointed jointly by the Colorado statewide environmental organizations; and
- A statistician and an economist, both appointed by the executive director of the department of higher education.

Aside from the chair of the committee, at least two appointees to the committee must be physicians, and the remaining appointees must have demonstrated expertise and at least a master's or doctoral degree in no fewer than one of the following scientific or health-related fields:

- Public Health;
- Environmental Health;
- Epidemiology;
- Toxicology; or
- Behavioral or Social Science.

The voting members of the committee shall not have any direct involvement or pecuniary interest in, or affiliation with, the oil and gas industry.

**STUDIES ON HEALTH EFFECTS OF
HYDRAULIC FRACTURING
COLORADO**

TITLE	SOURCE	LOCATION	Pub. Date	EFFECTS
Human Health Risk Assessment of Air Emissions from Development of UNG Resources, McKenzie, et. al. <i>Science of the Total Environment, 2012.</i>	Garfield County Board of County Commissioners and Colo. School of Public Health	Garfield, County,	2012	Risk assessment showed chemicals from O&G operations cause Respiratory, Neurologic, and likely potential to increase Cancer risk.
Air Emissions Case Study Related to Oil and Gas Development in Erie, Co, <i>CDPHE 2012</i>	CDPHE for Erie Board of Trustees	Erie, CO	2012	Air Monitoring showed VOC's in ambient air in Erie are slightly higher than Denver air but not as high as Platteville, CO
Report to Erie Trustees, 2012, Air Quality Monitoring Study Results, Erie, Co <i>NOAA, presented in 2012</i>	NOAA	Erie, CO	Not published	Propane and Butane levels were found ten times higher than levels in Los Angeles in 2011
Garfield County Air Toxic Inhalation: Screening Level Human Health Risk Assessment. Inhalation of VOCs Measured in 2008 Air Quality Monitoring Study <i>CDPHE</i>	Requested by Garfield Public Health Department	Garfield County	2010	Increased VOC emissions were found during well completion phase and less emissions during drilling phase
Garfield County 2008 Air Quality Monitory Study <i>CDPHE/GCPHD</i>	CDHPE	Garfield County	2009	Volatile organic chemicals associated with O&NG emissions were higher in rural Garfield County than other areas in Colo.
Screening Level Human Health Risk Assessment. Inhalation of VOCs Measured in Rural, Urban, and Oil & Gas Areas in Air Monitoring Study (2005-2007) <i>CDPHE</i>	CDPHE	Garfield County,	2007	Data suggested potential cancer and non-cancer (short-term) health effects of benzene in the oil and gas development area, based on the estimated exposures at one monitoring site

**STUDIES ON HEALTH EFFECTS OF
HYDRAULIC FRACTURING
U.S.**

STUDY	LOCATION	DATE	EFFECTS
Southwest Pennsylvania Environmental Health Project, <i>Preliminary Report, not yet published</i>	S.W. Penna.	2013	Skin Rashes Eye Irritation Breathing Difficulties Headaches Dizziness
Childhood Cancer Incidence in Pennsylvania Counties in Relation to Living in Counties with Hydraulic Fracturing Sites	Penna.	2013	No Significant increase in childhood cancers after well completion
Impacts of Gas Drilling on Human and Animal Health, <i>Scientific Solutions, 2012</i>	Colorado Louisiana New York Ohio, Penna,	2012	11 Documented cases of Respiratory, Dermatological, Neurological, and gastro-intestinal effects
Investigating Links Between Shale Gas Development and Health Impacts, <i>New Solutions, 2013</i>	Penna.	2011/2012	Neurological Respiratory Gastrointestinal Dermatological
City of Fort Worth Natural Gas Air Quality Study	Fort Worth	2011	No significant health threats beyond set-backs
EPA Community Health Survey	Pavilion, WY	2010	Respiratory Ailments in 80% of Respondents
Lung Health in Relation to Hydrogen Sulfide Exposure in Oil and Gas Workers in Alberta, CN,	Alberta, Canada	1997	Respiratory Loss of Consciousness

**PUBLISHED, PEER-REVIEWED STUDIES INDICATING THE
POTENTIAL FOR HEALTH RISKS FROM HYDRAULIC
FRACTURING**

STUDY	LOCATION	SUMMARY
<p><i>Source Emissions of VOC's from Oil & Natural Gas Operations in NE Colorado</i>, Gilman, et. al. <u>Environ. Sci. & Techol.</u>, 2013 NOAA</p>	<p>NE Colo.</p>	<p>Estimated average 55+/- 18% the VOC-OH reactivity attributable to emissions from O&NG operations indicating that these emissions are a significant source of ozone precursors. "At our test site in Weld County, we found that oil and natural gas operations are the dominant wintertime source of certain gases, called volatile organic compounds (VOCs), that act as precursors — starting ingredients — for ozone pollution," said lead author Jessica Gilman, Ph.D., NOAA</p>
<p><i>An Exploratory Study of Air Quality near Natural Gas Operations, Human and Ecological Risk Assessment: An International Journal</i>, Colburn, Schultz, Herrick, and Kwiatkowski, 26 Nov. 2012</p>	<p>Garfield Co. Colorado</p>	<p>A list of 944 products containing 632 chemicals used during natural gas operations was compiled. Literature searches were conducted to determine potential health effects of the 353 chemicals identified by Chemical Abstract Service (CAS) numbers. More than 75% of the chemicals could affect the skin, eyes, and other sensory organs, and the respiratory and gastrointestinal systems. Approximately 40-50% could affect the brain/nervous system, immune and cardiovascular systems, and the kidneys; 37% could affect the endocrine system; and 25% could cause cancer and mutations</p>
<p><i>Hydrocarbon Emissions Characterization in the Colorado Front Range: A Pilot Study</i>, NOAA</p>	<p>Denver- Julesberg Basin, CO</p>	<p>Examined air emissions from DJ Basin via aircraft and mobile station. Concluded that O&NG emissions are likely underestimated in current inventories and uncertainties can be as high as a factor of 2.</p>

<p>Fracking in BC: A public health concern., Benusic, Michael A. <u>British Columbia Medical Journal</u>. Jun 2013, Vol. 55 Issue 5, p238-239.</p>	<p>BC, Canada</p>	<p>It relates the number of oil wells fracked in British Columbia since 2005. It discusses the potential contamination of drinking water with chemicals used in the fracking process. Information is presented on methane contamination of drinking water reservoirs in fracking-rich areas of the U.S.</p>
<p>Shale Gas Extraction in North Carolina: Research Recommendations and Public Health Implications. By: Down, Adrian; Armes, Martin; Jackson, Robert B. <u>Environmental Health Perspectives</u>. Oct 2013, Vol. 121 Issue 10, pA292-A293. 2p.</p>	<p>North Carolina</p>	<p>The authors suggest forming a legislative framework that guides state-of-the-art technologies and best practices and protects the health of citizens and ecosystems</p>
<p>Public health and high volume hydraulic fracturing. (English) By: Korfmacher KS; et. al. <u>New Solutions: A Journal Of Environmental And Occupational Health Policy</u>: NS [New Solut], ISSN: 1541-3772, 2013; Vol. 23 (1), pp. 13-31; PMID: 23552646</p>	<p>U.S.</p>	<p>Activities related to expanded HVHF pose potential risks including ground- and surface water contamination, climate change, air pollution, and effects on worker health. HVHF has been largely approached as an issue of energy economics and environmental regulation, but it also has significant implications for public health.</p>
<p>Is Shale Gas Drilling an Energy Solution or Public Health Crisis? By: Rafferty, Margaret A.; Limonik, Elena. <u>Public Health Nursing</u>. Sep/Oct 2013, Vol. 30 Issue 5, p454-462. 9p. 1 Chart</p>	<p>U.S.</p>	<p>Nurses voice grave concern about shale gas drilling safety. Full disclosure of the chemicals used in the process is necessary in order for nurses and other health professionals to effectively care for patients. Any initiation or further expansion of unconventional gas drilling must be preceded by a comprehensive Health Impact Assessment (HIA).</p>
<p>The Use of Health Impact Assessment for a Community Undergoing Natural Gas Development. (includes abstract) Witter, Roxana Z.; McKenzie, Lisa M.; Stinson, Kaylan E.; Scott, Kenneth; Newman, Lee S.; Adgate, John; <u>American Journal of Public Health</u>, 2013 Jun; 103 (6): 1002-10. (journal article - tables/charts) ISSN: 0090-0036 PMID: 23597363 CINAHL AN: 2012086583</p>	<p>Garfield Co. Colo.</p>	<p>Natural gas development may expose local residents to air and water contamination, industrial noise and traffic, and community changes. More than 90 recommendations for preventing or decreasing health impacts associated with these exposures are made. Demonstration that despite the challenges, HIA can successfully enhance public health policymaking</p>

Supporters of HB 14-1297

Academy of Family Physicians

American Lung Association

Audubon Society

Boulder City Council

Boulder County Public Health

Conservation Colorado

Citizens for Healthy Fort Collins

Colorado Medical Society

Fort Collins City Council

Our Broomfield

Salud Clinics

Sierra Club

Testimony
March 20, 2014

Jennie Markarian
3654 Vestal Loop
Broomfield, CO 80023

Hello, my name is Jennie Markarian. I am a mother of two and a small business owner in Broomfield. I am writing this letter in support of Representative Ginal's Bill concerning an analysis to determine whether oil and gas operations have an impact on human health along the front range.

I support this bill because I am one of these humans living along the front range, and so are my family. We moved to Colorado in 2007 from a small town in California called Simi Valley. My husband and I were born and raised there. In 2006 we discovered that for years Rocketdyne had been careless with degreasing chemicals in our hills and these chemicals could now be found in the groundwater. We also learned that in the 1950's there was an uncontained sodium reactor meltdown that was covered up for 20 years and nobody knew about it. Considered to be the 3rd worst nuclear disaster in the U.S. there is now a movie being made about the Santa Susana Field Laboratory. We were raised in this place and never knew until we were 30. When we found out, and looked over at our two babies who were 5 and 3 at the time, we knew we had to leave for their sake, because this was not fixable, the environmental damage was far too great.

So we came to beautiful Colorado, fresh air, beautiful mountains, great lifestyle. We love it here. We were devastated to learn about all the fracking in this state and near our home, feeling that once again we may have to leave a home we love, to escape big industry's pollution. But studies like the one that Representative Ginal's bill is proposing can give us the answers we need to protect the people, clean up our air, and our land. This is a chance to do act with intelligence rather than move forward blindly.

The people matter more. The health of the people needs to come first, or you will be left with a place where no people should be living, like my home town.

Please support Ginal's Bill 14-1297.

Thank you, Jennie Markarian

April Beach of Erie, CO
January 2013 COGCC Testimony

Before I share, it's important to note that I am a Conservative Republican and NOT an environmentalist. I come from a family who owns oil and mineral rights and receives royalty checks. I also have family and friends who work in the industry.

I have three boys. I have lived surrounded by wells for 10 years and within a few hundred yards of what appear to have been open pits for 6.

We were never informed of the pits, or of the chemicals in use, dangers of operations, and ongoing possible health implications of the surrounding operations. In our first home, we felt tremors and small earthquakes, in our current home we have many more issues.

We currently live near 5 wellheads, a BTEX burner, 2 separators and 2 Condensate tanks. Beyond this we are surrounded by 34 wells within a ½ mile radius.

We have been told to evacuate our home by CDPHE from a possible H2S release. Only to have an investigation team on site days later, when obviously no issues would be found.

We have called the fire department multiples times from toxic gasses seeping into our home. Only to have them not equipped with adequate detection monitors for the chemicals of concern. I don't bother calling them anymore because they can't help me.

At night, I can look out my son's window and see the flames inside the closest BTEX burner. Loud sounds and burning noises are a common occurrence. Vapors rise from the numerous burners surrounding our home, day and night.

We have been sick.

I have an unexplained lesion in my spinal cord. I had to deal with a spinal tap, regular MRIs and ongoing testing. After we found the lesion, I do not remember 6 months of my life. A precious time when my second baby was less than a year old.

In addition, our family deals with many more health issues,
Not limited to the following:

Headaches

Severe Migraines

Children with gushing bloody noses

Confusion

Memory loss

Hyper tension

Hair loss

Concentration problems

Severely unexplainable autoimmune disorders and allergies for multiple family members.

Pains and weakness in our bodies

Serious GI issues to the extent of a child needing a colonoscopy, and multiple family members needing endoscopies. All with no findings.

Chronic, painful reflux for everyone

Complete body itching night and day for months with no explanation and no treatment available

Periods of dizziness to the point of not being able to walk or climb stairs in both children and adults

My son also developed severe asthma shortly after the BTEX burner was put online next to our house

My husband redeveloped his childhood asthma at the same time and

I developed new asthma symptoms

Chronic sinusitis for one child, which has led to antibiotic resistance and CT scans

Sickness, lethargy and abdominal pain that lasted for months after the most recent well was completed by our home, with clear CT scans, blood work and stool samplings

Only narcotics could help until the pain went away

And many other health concerns...

Just when we thought we had seen the worst. My son recently developed a rare neurological disorder.

His body began to lose control with ticks and twitches. He has torn all the muscles in his neck and cut his hands from repeatedly gripping so hard. With his hands wrapped, writing at school has become a challenge and playing guitar, his favorite way to self-calm is not always an option. It is unbearable to watch as a parent, let alone live with as a child.

He is the bravest person I know. He submitted a testimony to the EPA in 2011, about his concerns regarding the wells. About how he could no longer play in his tree-fort next to the nearby condensate tanks. In addition, a BTEX burner now stands where there used to be a huge beautiful Cottonwood tree and the owls are gone.

Though this is right next to our home, I am warned to not walk too close without fire retardant clothing on. But every time I ask, I am told we are safe!

Recently, I requested the Town of Erie and Encana place a VRU on the site by my home. This request was declined because:

1. It was too expensive
2. And because the time of highest production had supposedly ended and the VRU would not help

However, according the Production Logs on the COGCC website, for "Vessels Minerals", production has certainly not subsided. In fact, in some instances it appears to have remained steady or increased.

Everything I know, I have been forced to learn on my own. The lack of information and transparency the Industry is entitled to is unacceptable.

With all due respect, I also believe the contradicting authority given to the COGCC is unethical and reveals the lack of protection the State of Colorado is providing for my family. You cannot promote the development of OG and also be commissioned to protect my children.

I believe you need to act immediately. I also believe the following needs to be done:

- Comprehensive, health impact studies are conducted
- Physicians are educated on chemicals in use and how to recognize and treat residents in need
- First responders are trained and equipped
- The COGCC has an adequate number of investigators
- All setback loopholes are closed
- Full disclosure is required and health investigation requests are mandatory

Right now we should also be asking these questions:

- Why are so many people complaining of health concerns?
- Why are our first responders not equipped?
- Why are our procedures for investigating concerns so inadequate?
- What is not the safe distance for drilling to avoid noise and light, but what is the safe distance to avoid the utilization of the death benefit?

There are a lot of experts in this room. Experts in geology, environmental issues and law. I am an Expert at living next to a well. I would venture to say that there are few people in this room who have logged as many hours as I have, near an active well site. Roughly 96, 360 hours.

I want to state some language that it rarely used in this setting but I felt it was important:

Jeremiah 9 says:

"Let not a wise man speak with pride about his wisdom.

Let not the strong man speak with pride about his strength.

And let not a rich man speak with pride about his riches.

*But let him who speaks with pride speak about this, that he understands and knows Me, that I am the Lord who shows loving-kindness and does what is **fair and right and good on earth.**"*

History is our greatest teacher and history does not lie. What will history say about and the decision you're making? Will you do what is Fair and Right and Good? Will you rise to this occasion? Will you remember me and my kids and what I told you?

Tonight when you lay down to sleep and put your kids to bed. I want you to remember me. And what I'll be doing. I'll be holding a 10 year old boy, whose muscles are exhausted from twitching all day, who is likely crying again asking "why me, how did this happen?" I will hold him all night, because even after he falls asleep, his body will still twitch.

I believe we have been exposed for too long, unaware. But you can make a difference and assure other families are protected.

I understand that no one in this room can say for sure that our health issues are related to OG operations. But I also know, that no one can say for sure, that they are not.

Thank you very much for allowing me to speak.

Stats:

From 2002-2005 we lived 759ft from a newly fracked well site, 735ft from an existing well site, 388ft from yet another shut in well, and only 383ft from multiple open evaporation pits.

From 2005 to today, we live in the same neighborhood but in a new home. In addition to the sites mentioned above, our current home is 531ft from 5 wells heads, 437 ft from condensate tanks and 333ft from 2 separators and a BTEX burner. The most recent well was fractured and completed in early 2011 and the BTEX Burner and Separators arrived at this time.