

PUBLIC COMMENT REGARDING HOUSE BILL 14-1297

My comments are submitted in support and in extension of HB 14-1297. I would like to thank Representative Ginal for persevering in her attempt to get needed legislative support for scientific assessment of health impacts and risks of oil and gas operations that our state so urgently needs.. **Residents across Colorado and you, our representatives, must know what the facts are, regarding health impacts and risks. This bill is all the more important given the current context of such operations in Colorado:**

- With the introduction of high volume slickwater horizontal hydraulic fracturing (colloquially known as "fracking") about 10 years ago, fracking operations have boomed in Colorado. This heavy industrial activity is now being practiced across Colorado, including in cities, towns, and residential areas.
- Fracking of shale for oil and gas is known to have much larger environmental and neighborhood impact than conventional fracking techniques, with tremendously higher rates of truck traffic, use and emissions of toxic chemicals (not all of which are identified by industry), emissions of gases and diesel fumes, use of vast amounts of clean water to extinction (permanently contaminated and half removed from the hydrologic cycle altogether by underground sequestering).
- COGCC's website record of spills and accidents related to oil and gas operations in Colorado documents approximately one incident a day, with approximately a third of all incidents impacting ground or surface water
- It is anticipated that Colorado's current well numbers (approximately 50,000 wells) will double in the next several years.
- If the TransPacific Trade Treaty and TransAtlantic Trade treaties are passed, it is anticipated that they will include export quotas for oil and gas that will increase CO oil and gas production even further and more rapidly, and will include preferential treatment of foreign oil and gas companies, that will allow them to bypass federal and state regulations regarding oil and gas operations.

The collection of public health data should have begun in CO in 2004, when 18 public health experts wrote to the EPA and some testified before Congress regarding the public health threats and impacts being seen from unconventional extraction of natural gas from shale, **but certainly by 2006, by which time numerous residents of western CO communities with heavy shale gas development (such as Garfield and Weld County) were complaining to their County, to the COGCC, to the Colorado legislature, and even to Congress regarding a constellation of horrific health problems they had developed.**

These Colorado residents reported an unusual matrix of symptoms, usually beginning with a dermatologic "frack rash", burning eyes and throat, and coughing up dust and blood, and often proceeding to increasing respiratory problems, chemical sensitivity symptoms, and neurologic symptoms (such as muscle weakness, balance problems, mental fogging, memory problems, severe chronic fibromyalgia type pain, etc), as well as other conditions (e.g. reproductive failure, immune disorders, asthma, etc).

Read a sampling of these health complaints in:

"Voices from the Gas Fields", *Orion Magazine* article, Nov-Dec 2006, by R. Clarren and in Tara Meixsell's 2010 book, Collateral Damage.

Watch moving interviews of Coloradans describing their difficult health problems associated with local oil and gas operations fumes, smells, stepping outside their door and breathing, working outside, etc in the following documentary films, that also feature interviews with local physicians and health researchers : Split Estate (Dir. D. Anderson, 2010) Gasland (Dir. J. Fox, 2011), Gasland II (Dir. J. Fox, 2013)

These interviews and films also document that these individuals report limited benefit from medical treatment, whereas moving to a non fracked area provided relief, with some of their symptoms eventually clearing up and some remaining permanently. As oil and gas operations move into every corner of Colorado, these firsthand testimonies regarding health impacts suspected to be oil and gas related should be seen by all CO legislators !

Local health assessments for Garfield County (Coons and Wallace 2008) and Battlement Mesa (Witter et al., 2010) have been informative, but need to be done for multiple counties in order to be more readily generalizable for the state as a whole.

Representative Ginal's bill provides a critically necessary platform for comprehensive objective study of health impacts in Colorado. But given the above cited escalation of unconventional fracking of shale, and clear indications of community harm and threats to health (in Colorado and in other states in which the same techniques are being used), the bill should be amended to include some additional important research efforts, as outlined below. It is critical that this legislatively backed investigation into possible health impacts and risks use the full range of data sets and tools that will yield an appropriate scientific assessment of health impacts and risks related to oil and gas operations in our state.

Stage 1 Review of Medical Literature: Important Additions:

1. The investigative articles,, book and films with Colorado citizen testimony regarding suspected oil and gas activity impact (cited above) comprise an **invaluable archive of health complaints** that deserve inclusion into the Stage 1 review of literature. The unique matrix of symptoms that they described have been reported in other shale fracked areas as well and are included to some extent in the **community health surveys** conducted by Steinzor, Subra and Sumi and reported on in a peer reviewed journal in 2013 .

2. Peer reviewed articles regarding **veterinary findings** should also be included in the Stage 1 review, in order to apply the **useful concept of checking impacts on "Sentinel Species"** (livestock, pets) as an important indicator for human health (; Bamberger & Oswald, 2012, Olsen 2011).

3. **Available state incidence data for reportable diseases (such as birth defects, cancer) and emergency room admissions rates** would be an invaluable addition, especially if presented by county (and population numbers) and for the following timelines: most recent year data and number of wells, 5 year data summaries going back five years before first usage of fracking for oil and gas in shale deposits (with associated number of wells and population numbers), in order to ascertain any data trends, especially in light of the recent report of and the McKenzie et al, 2014, which found increase in heart disease and neural tube defects in Garfield County infants whose mothers reside within 10 miles of oil and gas development.

4. **Review all COGCC complaints (they are posted online on COGCC's website, and categorize according to quality of life nuisances, suspicious smells, changes in water smell/color/flammability, specific health impacts, etc.** since this is a readily available database germane to the research topics of this bill.

5. **State estimates for respiratory disease and cardiovascular disease**, starting in 2004 and through current, with state number of wells listed for each year, to assess for data trends, **especially for children, the most vulnerable group for air exposure impacts from toxic chemicals and gases.** (Landrigan et al, 2002 : Landrigan & Goldman 2011; Trasande & Liu, 2008; Whitworth, Symanski, Coker, 2008; Coons and Walker 2008; Witter et al. 2010). Seniors, another vulnerable group, will likely also have good available data.

6. **Request access to oil and gas industry worker health incident logs** from industry physician /clinic logs, in order to assess common health impacts on oil and gas workers, who are the most exposed population next to that of residents who live and work next to the wells every day.

7. **A review of research regarding the health threats of endocrine disruptor chemicals on human hormonal and reproductive health, and regarding permanent alteration of DNA.** Some endocrine disruptor chemicals, even at low doses, or for some chemicals **especially** in low or medium dose ranges, have

the capacity to permanently degrade the DNA of all future generations (transgenerational impact), since **endocrine disrupting chemicals associated with O&G activities have been detected in numerous air and water samples in Colorado (e.g. Kassotis et al, 2014).**

Permanent trans generational harm to DNA poses an intolerable risk to future generations and civilized society. **Colorado legislators should consider immediate statewide prohibition of endocrine disruptor chemical usage that has the potential for air exposure to humans, livestock, or the wildlife and flora of Colorado, for all chemicals suspected of altering DNA across generations, and to apply to all industries in Colorado, including oil and gas.**

8. Remove one of the many impediments to meaningful health research regarding oil and gas impacts and threats (see Physicians and Scientists for Health Energy website: Resources: "Impediments to Public Health Research on Shale (Tight) Oil and Gas Development), by legislatively mandating that ALL chemicals and materials used in the life cycle process of shale fracking be disclosed to the researchers doing the health study review and designing the health studies outlined in this bill, so that necessary toxicological analysis can inform and guide the review and understanding of the data generated by the studies. Under current CO regulations through the COGCC, oil and gas chemical reporting is voluntary and can include waivers for "trade secret" chemical mixtures and components. Such waivers must be lifted for the researchers involved in this bill's research efforts. Researchers must be able to find out what quantities of each class of chemicals are used, what percentages are likely to become airborne or enter water sources, etc.

Public health scientists must know what is regularly emitted from each O&G life cycle activity, as well as what could be emitted in the event of spills, explosions, fires, or malfunctions, in order to fully assess public health risk, identify likely chemical and gases contributors to health impairment symptoms being seen, and inform you of key chemicals that may deserve special monitoring or regulatory treatment.

(Of course, first responders, emergency room staff, and Colorado physicians also need to be apprised of this same chemical information. Appropriate planning and treatment depends upon advance knowledge of what the oil and gas worker, local resident, or first responder may have been exposed to. **Additionally, residents** near O&G operations who are experiencing similar health impairments across their community have a very difficult time bringing legal suit for damages, in part because CO regulations currently allow O&G to hide chemical usage with "trade secret" exemptions. If citizens mount a successful legal suit proving damages, they are offered settlement and the case is sealed, such that no other affected citizen nor public health researcher can access that impact data. **No industry has the right to withhold such critical public health information, neither at the front end nor in the context of legal settlements and you must ensure that our legislature rectifies that !).**

9. . Include a summary toxicological analysis of chemicals/ chemical types used, in order to provide researchers with a guideline of associated known health impacts that are likely to be related to worker or resident exposure. Colorado researchers (Colborn et al) published a peer reviewed article in 2011, describing 353 chemicals known to be used in unconventional oil and gas operations and the fact that more than 75% were known to have impacts on eyes, skin, respiratory and gastrointestinal systems, more than 40-50 % had known neurologic impact, and more than 25% had known cancer and mutation impacts. With the benefit of full chemical disclosure and industry information regarding volumes of chemicals used and emitted in life cycle operations, this seminal research can be advanced and its implications can be more readily ascertained regarding oil and gas operations in Colorado.

Stage 2: Including, at minimum, Surveys and Case Studies: Important Additions:

1. In order to appropriately assess the health risks and impacts of unconventional oil and gas operations in Colorado, it is critical that the study phase include those counties where unconventional oil and gas operations to extract from shale have been operating most heavily and the longest (such as

Garfield and Weld) , in order to assess for longer and heavier exposure rates and provide comparison that reflects reality in our state. To avoid those counties would be scientifically and morally inappropriate.

2. Survey and case report are relatively weak assessment tools without some additional objective assessments. **Collect average air exposure data by using portable air monitoring backpacks that can collect much needed objective data regarding typical toxic air emissions exposure of Coloradans who live and work within various distances from well sites and compressor stations and who spend varying amount of time outdoors. Such data is critical to an understanding of what Colorado residents are exposed to and to informing other health studies.** Such research in various counties in Colorado ,comparing areas of low versus high oil and gas activity, would be **invaluable** and relatively easy to carry out within a year . Such devices can provide objective data regarding average exposure to toxic VOCs such as benzene (and 6 or 7 key other VOCS) and methane and could include hydrogen sulfide gas or other gases or chemicals of interest.

3.. Survey response rates are notoriously low. **Increase the responding population size of the hard copy community health surveys by also setting up a (strongly encrypted) online survey, so that Coloradans from other counties (and/or who prefer online surveys) can also participate and health care providers can encourage that their patients fill out the surveys while in their office.**

4.A.. **Prepare a notice and guideline for Colorado physicians and other health care providers regarding common symptoms and disorders that may be related to oil and gas activity exposure in adults and children, along with helpful guidelines for eliciting environmental exposure information , so that they can become aware of this health risk and assess for it.** Saberi 2013 provides specific guidelines in this regard. Without specific information on known impacts and increased health risks related to oil and gas activity and how to evaluate them, Colorado physicians are not well prepared to assess the associated health threats and such health impacts will be under reported.

4B. **Set up an online reportable database for Colorado physicians to report suspected oil and gas related health impacts, so that this important public health information can be collected and followed up on, to better inform the legislature, the public and future research.**

Additional Note: Some seminal papers regarding urgent priorities for public health research on fracking: :Finkel & Hays, 2013; Colborn et al 2011; Goldstein, Kriesky, Pavioliakova 2012; Korfmacher et al. 2013; Lustgarten & Kusnetz, 2011 ; Steinzor, Subra,Sumi 2013.

By including the above suggestions, the power, validity, and reliability of any case study and survey data will be expanded considerably, making it more meaningful and readily applicable to public policy making, and thus capable of informing policy that can appropriately prevent public health harm and elevated risk in Colorado.

Thank you for your work on behalf of the public health and safety of Coloradans.

Sincerely,

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