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SETBACKS PROPOSAL FROM CONCERNED CITIZENS GROUP

What the Frack?! Arapahoe

The Colorado Petroleum Association asks in its statement to the setbacks group, "what is the rationale, the evidentiary basis" for reconsideration of COGCC regulations regarding setbacks , with the presumption that COGCC current setback regulations should be retained.

At the August 10 2012 Public /Citizen's Perspective on Setbacks meeting, 18 individuals presented on behalf of themselves or the concerned citizens groups that have arisen across Colorado, with representation from Longmont, Battlement Mesa, Boulder, Aurora,, Denver, Erie, and other Colorado cities and counties. **In contrast to CPA's central question, the questions of most of the citizen presenters were : what is the current rationale and evidentiary basis of COGCC setbacks ? Why are our regulations not based on scientific evidence in support of COGCC's mandate for "responsible development" of oil and gas resources, "in a manner consistent with the protection of public safety and welfare"? Where is the data and scientific study providing support to industry's and COGCC's claim that oil and gas extraction from shale, with the relatively new technique of horizontal slickwater hydraulic fracturing, is "safe and clean"?**

Horizontal fracking brought game-changing new operational features to oil and gas extraction in Colorado, requiring logarithmically larger truck/traffic volume and amounts of clean water, as well as amounts of chemicals used, and emitting a larger volume of chemicals, venting, and flaring, and producing more significant overall environmental and health and quality of life impact than traditional drilling techniques. Yet the COGCC rules do not adequately reflect these new risks and challenges, even as the residents of Colorado become keenly aware of them as drilling enters their community.

Colorado citizens provided thoughtful testimony to the Setbacks group on Aug 19th, regarding:

- the 2005 waiver to the oil and gas industry of key federal acts that would normally protect individuals and communities from toxic air emissions, toxic wastes, and toxic fluid and gas migration, and the fact that this waiver precluded normal scientific monitoring, data collection, and study
- uncompensated community quality of life impact,
- uncompensated losses to property values and community assets,
- impacts on mortgage guarantees and title insurance,
- impacts on health
- water contamination risks related to frack fluid and deep earth gas migration,
- fire and explosion and blowout facts that demonstrate that current setbacks do not address public safety,
- review of Colorado's poor record of accident/spill rates that contaminate water in about one third of the cases, and which have not decreased in frequency over the past few years, and have minimal penalties associated with them,
- the extremely low number of well inspectors, the infrequency of well inspections in Colorado
- and other contentious issues related to setbacks, including COGCC's aggressive claim to total preemption/total 'occupation of the field', that appears to fly in the face of case law as well as zoning rights of cities and counties and unduly diminishes citizen rights of local representation .

My presentation focused mainly on empirical evidence and scientific study related to significant risks to human health, water (water contamination risk, water scarcity, and climate change issues related to water), pointing out that all of our systems indicator lights are blinking, indicating high risk for large scale impact if horizontal fracking from shale continues and expands operations per current CO regulations. I explicitly concluded that setbacks must be more variously considered (e.g. separately consider health and safety and quality of life issues regarding setbacks in residential areas versus recreational areas versus areas frequented primarily by vulnerable populations, etc) and must be determined by scientific findings pertaining to public health and safety, not by any arbitrary numbers.

As a representative of my local concerned citizens group, What the Frack?! Arapahoe, I would like to summarize our perspective on the setbacks issue below. We are in agreement with many of the suggestions made in writing by the several environmental groups and citizens, namely, that:

- Toxic emissions and venting and fugitive emissions cannot be tolerated, since they pose a significant risk to health and safety and the environment, with greater risk at closer distances, whereas mitigating operational techniques are available to use now that would prevent such harm and ongoing risks.
- Closed loop systems and green completion and vapor recovery systems and non toxic frack fluid chemicals are currently available and would mitigate many of the significant public health and safety risks currently posed by horizontal fracking in shale and must therefore be required in our state at all wells.
- The " setback loophole" regarding the refracking of old wells and/or new developments constructed around old wells must be definitively closed. In fact, standards for setbacks should be greater for older wells, which were not subject to the same cement bonding standards as current wells.
- New categories of setback considerations should be created for:
 - Surface water- rivers, creeks, reservoirs, lakes

Schools, hospitals, daycares, **(although language should include also: any institutions/facilities/zones (such as playgrounds) that are regularly frequented by the most health -vulnerable populations (elderly, children, pregnant women, the health impaired).**

(However, there are additional categories of special setbacks that need to be considered separately as well: Open spaces, biking and hiking trails and recreation areas and state parks , where people go to commune with nature and to exercise (which increases their deep intake of air emissions during exercise); people go to such places with the expectation that they are going to a healthy, natural environment and that expectation must be met

Geologic hazards and special geologic case sites, to be determined by USGS findings regarding risk of earthquakes and other seismic events, and by hydrogeologic analysis of geologic permeability and other features that can lead to gas and fluid migration

Headwaters)

-Requiring all wells to fully capture fugitive emissions

However, we do not agree with proposals to increase setbacks to 1000 or 1500 or even 2000 feet:

a. There is no science to support even 2000 feet as being "safe" re air emissions or fluid migration to groundwater or longterm public safety or human health. In fact, the CSPH studies conducted to date by Witter and McKenzie et al. suggest that significant health impacts are expected to occur within one half mile (2640 ft) of well sites. Water modelling studies incorporating known hydrogeologic factors in the Marcellus shale suggest that fluid and gas migrations into ground water occurs over miles of distance and can migrate a mile a year in some circumstances, and that such migration patterns are expected to apply in other shale regions as well, with perhaps *faster* timelines of migration in the west.

b. The heavy industrial operations involved in using hydrofracking to extract oil and gas from shale do not appear to be appropriate in residential areas whatsoever, given their known impacts on traffic, roads, quality of life, property values, mortgage and title insurance, and the emerging evidence regarding health impacts. "Residential areas" is meant to include all areas of human habitation, since rural residents have the same biological and health characteristics as city dwellers.

c. Horizontal hydrofracking from shale, as it is currently practiced, cannot be deemed "safe" any more than some rape is conceivable as "legitimate". Current practices have high rates of accidents, spills, leakage, fires, explosions, blowouts, and citizen complaints, per COGCC's public database . Current practices use too much of our precious clean water, destroying all of it (irredeemably contaminating it) , removing about half from our parched hydrologic cycle altogether, and posing a permanent lurking threat to groundwater and land and future safe and productive human habitation. Current practices contribute significantly to escalating the rate of climate change and risk of climate collapse. It is a heavy industry that poses myriad risks, some of which are unprecedented in scale of harm (i.e., risk of aquifer contamination, depletion of Colorado's supply of clean water, health risks, risk of climate collapse escalation, etc.)

Urgently needed reform of setbacks in Colorado must be guided by available facts, relevant to air, water, health and public safety impact and by scientific study, not by arbitrary distances set by industry or policy makers. Only urgently needed scientific study can reveal what setbacks are appropriate to protect public health, public safety, our water supply, and our quality of life.

The moratorium on fracking in New York was most strongly supported by the fact that the medical society of every borough of NY state, as well as the state medical society, demanded that public health and public safety impact must be ascertained first, in advance of operations expansion. Germany instituted a ban for similar reasons, stating that the health and safety impacts must be first scientifically investigated and determined to be within acceptable risk levels, prior to consideration of a lifting of the ban.

Such urgently needed study in Colorado must be initiated this year, since expansion of the scale of fracking is quickly escalating: the number of Colorado wells is expected to triple, to around 100,000 over the next few years. We urgently need to obtain scientific answers to questions surrounding areas of risk, especially high impact and catastrophic, irreversible risk, pertaining to public health, our water supply, our climate and hydrologic cycle, land contamination, and risk of climate collapse. **The scale and scope of some of these risks is unprecedented in Colorado and indeed in human history, as is the fact that some of them appear to be irreversible/ unfixable impacts. In the face of such unparalleled risk, continuing business as usual, with no change to setback regs, and with tremendous increase in the numbers of well applications, would be beyond irresponsible.. Therefore, there must be a moratorium on new well applications, until the results of such studies are made available to the public, for public consideration of the findings. That is the prudent course to follow.**

Urgently needed scientific study should include but not be limited to the areas specified below, and should be designed by a team of appropriate scientific specialists (epidemiologists, toxicologists, endocrine disruption scientists, neuroscientists, physicians, hydrogeologists, air quality and air movement climate specialists, etc, with inclusion of scientists who have already pioneered some study in our state, such as Dr. Witt, Dr. McKenzie, etc.):

In order to determine rational setbacks for horizontal fracking from shale, we need studies such as the ones described below:

- Statewide representative sampling of all current well types for toxic air emissions (from wells with open pits, wells with closed loop systems, wells with vapor recovery systems, etc), with data collection during every phase of operations, to assess for the classes of chemicals known to be used in all phases of operations, as well as for deep earth heavy metals and radioactive materials and deep earth gases (such as hydrogen sulfide, methane), with statement of known health and environmental impacts of any of the known toxins at the levels recorded, (at 150 feet exposure, 350 feet exposure, 1000 ft exposure, 2000 foot exposure, 1 mile exposure, and 5 mile exposure, for 3 hours per day or some other average amount of time residents are likely to be outside daily, say for 300 days a year), with separate estimates for vulnerable populations (children, pregnant women and their unborn children, the elderly, health compromised populations) and with longterm exposure estimates (1 year, 5 years, 10 years, 20 years). Such estimates must include endocrine disruption estimates for future

generations, which would include low dose exposure as well as medium and high dose exposures.

- Statewide epidemiological study of populations exposed to horizontal fracking from shale in Colorado, designed by epidemiologists and toxicologists, examining incidence of respiratory, myocardial, neurological, gastrologic, and dermatologic, illness, as well as cancer rates, reproductive dysfunctions and premature births, and endocrine disruption in populations exposed to varying densities of oil and gas wells within 1 mile of their homes or place of business (zero, 1-5, 6-10 wells, etc), with information sorted also by type of operations (i.e. closed loop versus open pit), in order to determine gross health impact trends for the general population and vulnerable populations, with special attention to the constellation of symptoms most frequently reported to be associated with oil and gas operations (i.e., headaches, bloody noses, bleeding from the eyes, rashes, gastrointestinal problems, neurologic weakness and neuropathies, impairment of memory and cognitive processing). The study should compare incidence rates in comparable populations with varying exposure and should include some blood sample comparisons from each population, testing for common toxins associated with oil and gas operations.

Whatever the health studies reveal regarding oil and gas operations setback requirements for the most vulnerable populations must be applied as the standard for all humans..

-Worldwide data search of fracking groundwater contamination, (from spills and from methane migration and frack fluid migration) with particular focus on Colorado and the rest of the Niobrara shale region, to summarize extent of known contamination, assess special geologic features associated with each contamination, assess operational procedures associated with contamination (i.e. pit liner quality and/or age, cement bonding quality standards, etc), hydrogeologic features associated with contamination and with rate of contamination migration, assess operator characteristics and operations phases most likely to be associated with contamination, in order to have the currently available empirical data at hand regarding known contamination features to date.

-Construct a comprehensive computer simulated model of the hydrogeologic factors related to fracking and groundwater, based on Tom Myer's study of the Marcellus shale. The Colorado study should focus on known hydrogeologic factors in the Colorado Niobrara shale, in order to derive best estimates of likely rates of migration of methane and frack fluid in the Niobrara shale. The first such model should be focussed on the specific hydrogeologic features that characterize the largest headwater area of our state or the headwater that ultimately serves the largest population (e.g. Park County). Such simulation will produce estimates of likely fluid migration distances and timescales, as well as their escalation due to fracking. Such estimates are needed in order to produce a rational, scientifically based estimate of appropriate minimal distance of fracking wells from ground and surface water, our state's most precious, irreplaceable, and limited resource.

The above is input based on the urgent need for scientific determination of SETBACKS. But it must be rationally insisted that SETBACKS is not the only critical issue in urgent need of regulatory reform review, and that rational regulatory reform considerations MUST URGENTLY INCLUDE:

BEST MANAGEMENT PRACTICES should be reformed to require that all operators use closed loop, vapor recovery systems, green completion, non toxic ('green') frack fluids and green options (including aggressive re use of water on site) in every phase of operations where they are technically *possible* (not 'feasible, since "feasible" usually translates to hugely profitable)), in order to immediately prevent preventable harm and risk to health and the environment and water.

LIABILITY POLICIES should be reformed to reflect the actual cost of cleanup / damage resolution of accidents, spills, public impacts of all kinds, and contamination of land and water, especially since CERCLA Superfund Act does not currently apply at the well site. Operators must pay higher up front liability fees and receive much more aggressive fines and penalties that would begin to affect the accident and spill rates in our state. Presumption of liability must be turned around from its current status (where

individuals and communities are in the almost impossible situation of having to prove causation when industry hold critical evidence as proprietary) to presumption of industry causation and requirement of industry to prove that it did not cause the harms being litigated.

WASTE MANAGEMENT must be reformed to reflect the actual toxicity of the materials being disposed of, with scientific analysis and measurement of waste materials re chemical toxicity, deep earth NORM and heavy metals, salinity, gases, and evaluation of endocrine disruption impact, in order to determine what are actual 'safe' practices with regard to waste disposal, both with regard to immediate health and environmental exposures and longterm risk.

SEISMISITY impact must be further evaluated by the USGS, to determine the underlying characteristics of area geologic and hydrogeologic factors that lead to earthquakes associated with deep injection wells and those associated with the fracking process itself. Clearly fracking and/or deep injection practices must be regulated in such a way as to preclude the risk of earthquakes.

STATE PREEMPTION CLAIMS must be modified to both reflect the reality of CO case law and the rights and will of the people to exercise those rights in their communities. Oil and gas cannot continue to exercise a unique privileged position that permits it to operate in a manner that exempts it from federal and state health and safety laws, trumps all other fields of law, and allows them to operate with impunity, as if in a legal, political, social, biological and ecological vacuum.

WATER NEEDS FOR CURRENT HORIZONTAL HYDRAULIC FRACTURING FROM SHALE must be re assessed in light of current state drought and scientifically projected decades of increasing water scarcity. Clean water is the most precious resource of our semi arid and increasingly arid West and is irreplaceable. Current horizontal hydrofracking uses up tremendous quantities of clean water to extinction, irredeemably destroys the water in the process, and sequesters about 40% underground permanently, removing it from our already parched hydrologic cycle. Further, hydrogeologic simulation studies show that the wastewater remaining in wells and placed in deep injection wells remains as a permanent lurking risk for future contamination of nearby water wells, aquifers, springs, etc, as frack fluids and methane pockets migrate- truly a catastrophic risk scenario. The current large volume water usage and permanent water destruction and lurking risks of future groundwater contamination are clearly unsustainable and appear to pose publicly unacceptable catastrophic risk. Just this one area of concern should itself signal the need for immediate moratorium in our state and initiation of relevant scientific study!

CLIMATE CHANGE is clearly worsened by methane release and fugitive emissions that are associated with horizontal hydrofracking. Additionally, public subsidy of oil and gas precludes investment in alternative, sustainable energy sources that could mitigate the rate and scale of climate change, possibly allowing our species to avoid the unpredictable and unprecedented global armageddeddan , the tipping point of complete climate collapse .

These factors must be included in any rational consideration of public policy around oil and gas exploration in Colorado. It is irrational and the height of irresponsibility at this point to ignore these critical risk factors to health, water, air, environment, quality of life, and the ability of our climate and water supply and land to support future generations of Coloradans.

No public official, or even elected official or legislator has the right to make decisions in these matters that would preclude or override the objective, scientific determination of the answers we need. For our common good, we must declare a moratorium on new drilling applications and aggressively initiate data collection and scientific study necessary to determine what the margins of safety and risk are regarding horizontal hydrofracking from shale in Colorado.

Sincerely,

**Sonia Skakich-Scrima,
On behalf of What the Frack?! Arapahoe**