

An Elbert County Resident's Analysis of Colorado Oil and Gas Regulations

I took an interest in oil and gas development in the State of Colorado mainly as a result of witnessing the ongoing struggle here in Elbert County. While creating zoning regulations for oil and gas development within the county, local governing entities are attempting to balance the county's regulatory needs with those of the state. In an effort to understand that struggle, I began attending meetings of the Board of County Commissioners (BOCC) and the Planning Commission. During those meetings, it became apparent that I needed to develop an understanding of the state's rules. This article is the result of that research.

The Colorado Oil and Gas Conservation Commission (COGCC) is the agency tasked with regulating oil and gas development within the State of Colorado. The COGCC mandate is "to conserve oil and gas in the State of Colorado while protecting public health, safety, and welfare, including the environment and wildlife resources". To that end, the COGCC has crafted a set of rules and regulations. After an extensive analysis of that rule-set, I am left questioning whether the COGCC is "protecting public health, safety, and welfare" or simply promoting minimally-regulated oil and gas development.

We've all heard that the State of Colorado is the most heavily regulated state in the nation. We've all been told not to worry, that state regulations are protecting us. We've been told that local counties have little or no authority, protective or otherwise, concerning oil and gas development; the state's economic interest takes precedence. The key findings listed below are examples of ways in which the COGCC rule-set *does not* adequately regulate the oil and gas industry and *is not* protecting us. Following that list is an outline of ways in which a county might mitigate some of the risks found in the COGCC rule-set. Bear in mind that, while real change needs to occur at the state level, counties *are not* powerless; they do not have to sit idly by while waiting for change to occur.

Key findings of my COGCC Rule-set research:

Operators Are Allowed to Contaminate Soil and Groundwater: Operators are allowed to contaminate soil and groundwater up to the chemical concentration levels listed in Table 910-1. Some examples of those chemicals are: benzene, toluene, xylene, arsenic, chromium, lead, and mercury. If an operator determines that background contamination levels exceed the values listed in Table 910-1, the operator is only required to remediate to the higher background level. The same consideration is not given in the opposite direction; if an operator tests an area and finds no contamination whatsoever, he *is still allowed* to pollute the area up to the contamination levels listed in Table 910-1.

Additional problems exist with respect to Table 910-1. The COGCC does not require groundwater testing for heavy metals, but does require heavy metal testing in soil. Heavy metals can leach out of soil into groundwater. Also, the COGCC requires testing for at least eighteen organic pollutants in soil, yet requires that groundwater be tested for only four of those organic pollutants.

Baseline Sampling Helps Facilitate Contamination Not Clean-up: It is in an operator's best interest to determine to what extent his oil and gas sites are contaminated before developing those sites. Establishing baseline levels of contamination enables an operator to determine how much contamination can legally accumulate at any given site. Baseline sampling of soil and groundwater for contaminants listed in Table 910-1 enables an operator to calculate the site's contaminant holding capacity; the holding capacity details to what extent an operator could contaminate soil and groundwater before exceeding maximum concentration levels allowed by Table 910-1. It would appear then that baseline sampling is facilitating an operator's contribution to consensual contamination of soil and groundwater. Because impacted areas could still be contaminated to at least the maximum levels allowed in Table 910-1 even after "clean-up" has occurred, it *does not* appear that baseline sampling is a mechanism by which contamination is remediated.

Groundwater Sampling and Monitoring Does Not Apply to 50,000 Potential Sources of Pollution:

COGCC Rule 609 applies to oil, gas, dedicated injection, and multi-well sites permitted *on or after* May 1st, 2013. Rule 609 does not apply to any of the approximately fifty thousand wells in existence before May 1st, 2013.

Groundwater Sampling and Monitoring Requirements Do Not Provide Adequate Monitoring: Where sampling and monitoring is required, a baseline sample is to be collected within twelve months prior to drilling. One subsequent sample is to be collected between six and twelve months and another collected between sixty and seventy-two months following well completion. There are no additional monitoring requirements for years one, two, three, four, or any year after year six. During the life of the well, three samples are required; two of the three samples are completed early in the life of the well, conceivably before pollution develops or migrates to the sampling point. There is no sampling or remediation requirement prior to plugging and abandoning a well. Consequently, potential contamination levels and the extent of pollution will never be determined.

Groundwater sampling requirements are even less significant in the Greater Wattenberg Area, the most heavily impacted oil and gas development area in the state. One baseline sample and one subsequent sample taken between six and twelve months after well completion is all that is required.

Groundwater Sampling and Monitoring Does Not Apply to Injection Wells Used for Waste Disposal:

COGCC Rule 609 does not apply to any of the existing fifty thousand production wells that are re-permitted for use as dedicated injection wells. By re-injecting wastes back underground, dedicated injection wells are used to dispose of produced water, drilling fluids, work-over (fracking) fluids, tank bottom wastes, pigging wastes, and wastes generated from natural gas gathering, processing, and storage. There are no groundwater sampling requirements in place for these re-permitted wells. As mentioned above, there are no sampling or remediation requirements prior to plugging and abandoning dedicated injection wells; contamination levels and the extent of pollution will never be determined.

Groundwater Sampling and Monitoring Exemptions: Samples are to be collected from up to four available water-sources within a one-half mile radius of the well site. An operator can be exempted if no water sources are located within one-half mile, if the available water sources are determined to be “unsuitable”, or if the water-source owners refuse to grant access.

In the Greater Wattenberg Area, sampling is required from only one available water-source.

Sample Collections and Analysis Concerns: Operators are allowed to collect their own samples, test the samples in their own laboratories, and submit their own results to the COGCC; no requirement for independent, disinterested third-party testing and reporting exists. Also, should any changes in the constituents or concentrations of the constituents be noted during subsequent sampling, the operator is presumed not liable and not at fault.

COGCC Does Not Require Testing of Potentially Radioactive E&P Wastes: Oil and gas exploration and production (E&P) wastes contain chemical compounds that are known carcinogens, mutagens, teratogens, and endocrine disruptors. The oil and gas industry has been granted exemptions from classifying these wastes as “hazardous waste” even though many of the constituents are chemically identical to hazardous wastes listed and regulated by the EPA. E&P wastes include oily waste, crude oil, soil, fracking sand, drilling fluids, pit sludge, and produced water, among others. According to the EPA, much of this waste, particularly pit sludge and produced water, can also contain high concentrations of radioactive material.

Injection Well Activities May Contaminate Drinking Water Aquifers With Radioactive Material and Heavy Metals: As mentioned above, E&P waste is disposed of by re-injection into underground aquifers. According to COGCC Rule 324A.d, an operator is required to demonstrate that injection well activities

“will not result in the presence in an underground source of drinking water of any physical, chemical, biological or radiological substance or matter which may cause a violation of any primary drinking water regulation”. Primary drinking water standards enforced by the EPA contain maximum contaminant levels for radioactive material including Alpha and Beta-emitters, Radium-226, Radium-228, and Uranium as well as heavy metals such as arsenic, chromium, lead, and mercury. The COGCC has *not* defined testing or remediation requirements for wastes containing radioactive material. Neither does the COGCC require testing for heavy metals in groundwater. Therefore, an operator has no defined mechanism by which he can demonstrate that he is not introducing radiological or heavy metal contaminants into underground sources of drinking water and would be violating Rule 324A.d every time injection well activities were undertaken.

Spraying and Spreading E&P Waste: Another method of E&P waste disposal is land application and/or land treatment. This method entails spraying E&P wastes directly onto roadways or spreading E&P wastes directly onto fields and then mechanically incorporating the waste into the soil. In theory, all E&P waste can be land-applied or land-treated locally on-site. Even in the case of drilling fluids, which would normally be treated at a centralized E&P management facility, a loophole exists (Rule 907d and 907e) by which oily wastes (which may contain drilling fluids) are allowed to be “land treated” on-site.

Complicated Pit Regulations Disguise Risks Associated With Pit Use: COGCC regulations pertaining to pits are so complicated that this analysis will be limited solely to drilling pits and multi-well pits, as defined by the COGCC. Drilling pits (ancillary, completion, flow-back, and reserve) are utilized during drilling operations and initial completion of a well, prior to the well being placed into production. These pits contain drilling fluids, completion (fracking) fluids, and E&P wastes.

Multi-well pits are used to treat, store, recycle, reuse, or dispose of E&P wastes generated from more than one well. In essence, they are just like pits at centralized E&P waste management facilities; an operator can use a multi-well pit like a pit at a centralized E&P facility as long as he does so for less than three years. By using a multi-well pit, an operator avoids the additional requirements that a centralized E&P facility permit entails. He will avoid the increased paperwork and fees and the requirements for pit liners, increased soil base, increased engineering requirements, submittal of an operating plan (including treatment practices, dust control, sampling, inspections, and emergency response), prevention of unauthorized access by vehicles and animals, prevention of illegal dumping, baseline sampling and subsequent monitoring for ground and surface water, annual reporting, and closure plans.

COGCC rules allow an operator to construct a drilling pit or multi-well pit without a permit or pit liner. The only time a permit or liner is required is if the pit is designed for use with fluids containing total petroleum hydrocarbon concentrations exceeding 10,000 ppm or chloride concentrations exceeding 15,000 ppm. The COGCC does not stipulate how or when these concentrations are to be determined. Consequently, there is no impetus for an operator to build these pits with permits or liners. If these pits are unpermitted, i.e. no “paper-trail”, they will be unmonitored, unregulated, and closure rules will not apply. Furthermore, nothing in the COGCC rules require continual ongoing analysis or testing of operational pits or their contents.

Exceptions to Setback Classifications and Designated Setback Zones: There are a number of setback classifications and Designated Setback Zones which may prohibit specific activities related to oil and gas development. Theoretically, no wells or production facilities may be located or constructed within these designated setback zones. Per COGCC Rule 603.a, the theoretical minimum setback for oil, gas, or injection wells is two hundred (200) feet from any building, public road, major above ground utility line, or railroad, and one hundred fifty (150) feet from any surface property line.

These setback rules can be excepted and/or exempted by some or all of the following: COGCC Rules 604.a(1)A and B, 604.a(5), 604.b(3), or 604.b(4), or by COGCC Director-granted variances. The end result

is a well or production facility with a minimum setback less than those values listed here, an undefined, unenforceable minimum setback, or no setback at all.

Closed-Loop Drilling Falsely Implies Protection of Public Health and Safety: The COGCC requires operators to adopt certain “mitigation measures” if operating within designated setback zones. There are numerous concerns with the mitigation measures outlined in COGCC Rule 604.c, particularly the Closed Loop Drilling Systems – Pit Restrictions, Rule 604.c(2)B:

- 1) The COGCC does not define Closed-Loop Drilling Systems.
- 2) The COGCC states that pits are not allowed on Oil and Gas Locations within the Buffer Zone, *except for fresh water storage pits, reserve pits to drill surface casing, and emergency pits.*
- 3) The COGCC does not require a Pit Permit for fresh water pits within the Buffer Zone.

Closed-loop drilling systems are being “sold” to the general public as a safer alternative to traditional drilling systems. However, the public has the misconception that closed-loop drilling means “pit-less” drilling, i.e. a system that does not utilize pits, and is a process in which no drilling fluids actually touch the ground. By not strictly defining Closed-Loop-Drilling-Systems as “pit-less”, the COGCC perpetuates this misconception. The COGCC creates additional confusion by prohibiting pits within the Buffer Zone and then immediately creating three exceptions to the rule. One exception, which allows the use of reserve pits, creates a situation where an operator can use the pit “to store drilling fluids” or “to contain E&P waste”. Protection from these fluids is the primary reason the general public desires the ill-defined “closed-loop drilling system” in the first place.

Fresh water (there is no COGCC definition for “fresh water”) storage pits do not need a pit permit or pit liner within the Buffer Zone. Reserve pits do not need a permit or pit liner. If there is no permit, these pits will be unmonitored, unregulated, and closure rules will not apply. The requirement that fresh water storage pits be conspicuously labeled will also be unenforceable. Because of these lapses, it is conceivable that an operator would agree to use the presumably safer “closed-loop drilling system”, while still utilizing unlined reserve pits to store drilling fluids (including hydraulic fracturing fluids) and E&P wastes. These pits are direct sources of soil and groundwater contamination, with no apparent remediation requirement. This contamination will occur within designated setback zones.

Air Quality and Odor-Control Mitigation Measures Are Unenforceable: The COGCC requires that oil and gas facilities be operated in a manner such that odors and dust “do not constitute a nuisance or hazard to public welfare”. There is no clear definition of what constitutes a “nuisance” or a “hazard to public welfare”. Rule 805.b(2) stipulates specific mitigation practices for equipment where volatile organic compound (VOC) emissions are greater than five tons-per-year (TPY). There is no baseline sampling of emissions, air quality, or odors. In fact, no established air sampling requirements exist in the COGCC rules, nor are there any requirements for ongoing, continual monitoring of air emissions, VOC or otherwise. If there are no emissions, air quality, or odor testing, how would an operator know that he is supposed to install an emission control device and obtain an Air Pollution Control Permit from the Colorado Department of Public Health and Environment (CDPHE)?

COGCC Rule 805.b2(C) stipulates that pits with uncontrolled VOC emissions of five TPY or greater shall not be located within 1,320 feet of a Building Unit or Designated Outside Activity Area. When does an operator determine that his pits are emitting VOCs at a rate greater than five TPY? Is that determination made before or after a pit is built within 1,320 feet of a Building Unit or Designated Outside Activity Area? I would assume the determination could occur only after a pit is actively emitting VOC at a rate greater than five tons per year.

Contrasting COGCC odor regulations to those of the CDPHE, the COGCC devotes one paragraph to odor control for the entire oil and gas industry within the state. The CDPHE devotes forty-six pages of regulations solely to one facet (pig farming) of one industry (agriculture).

Non-Disclosure of Hydraulic Fracturing Chemicals and Additives: Despite the assurances that hydraulic fracturing chemicals and additives are disclosed on FracFocus, if a vendor, service provider, or operator considers a hydraulic fracturing chemical or additive to be a “trade secret”, the COGCC allows them a “trade secret” exemption. The exemption eliminates requirements for public disclosure so there is no way for the general public to determine the identity of those chemicals or additives. Vendors, service companies, and operators are further exempted from registering these chemicals and additives with the chemical disclosure registry (FracFocus). Additionally, operators are not required to disclose particulars such as the type and total volume of hydraulic fracturing base fluid, the trade name, vendor, or description of hydraulic fracturing additives, the identities of chemicals intentionally added to the base fluid, the maximum concentrations of chemical additives, or the chemical abstract service numbers of any chemical additives. Operators are not required to maintain Material Safety Datasheets for chemicals or additives used in conjunction with hydraulic fracturing treatments, nor are they required to maintain an inventory of these chemicals and additives.

COGCC Can Grant Exemptions and Variances to Any and All Rules: The COGCC Director or the Commission can grant an operator a variance to any rule, regulation, or order, provided the requested variance will not violate “the basic intent of the Oil and Gas Conservation Act”. Theoretically, the COGCC Rules have been enacted to promote the basic intent of the Oil and Gas Conservation Act, which is “to prevent waste and to conserve oil and gas in the State of Colorado while protecting public health, safety, and welfare, including the environment and wildlife resources”. Any variance given to these rules then, by definition, *would not* prevent waste or *would not* conserve oil and gas, or *would not* protect public health, safety, and welfare. This *would* constitute a violation of the basic intent of the Oil and Gas Conservation Act. Consequently, all variances should be prohibited by Rule 502.b(1).

The COGCC Director may issue a permit to drill, deepen, re-enter, or recomplete and operate a production well at any time, without notice or consultation, if the drilling contractor or operator “swears” they will suffer “significant economic hardship” if not allowed access. In the event the Director issues a permit under this rule, the operator is not required to meet obligations to Surface Owners, Local Governmental Designees, the Colorado Department of Public Health and Environment, or Colorado Parks and Wildlife.

Even in a situation where the COGCC Director has withheld approval for or suspended an approved drilling permit, an operator can appeal to the Commission for an “emergency order” rescinding the Director’s decision.

Conflicting Regulations Regarding Berm and Secondary Containment: Numerous rules stipulate the construction of berms or other secondary containment devices around crude oil, condensate, and produced water storage tanks. Problems arise because the rules conflict with one another. For example, Rule 605.a(4) requires that a synthetic or engineered liner be placed directly beneath each above-ground tank and that the containment devices be inspected at regular intervals and maintained in good condition. Rule 906.e(1) apparently removes the requirement for liners as well as inspections, and stipulates that secondary containment is only required around produced water storage tanks if the produced water has a total dissolved solids (TDS) concentration of 3,500 milligrams per liter.

In some cases, Designated Setback Zone berm requirements are even less stringent. For example, Rule 604.c(2)G removes the requirement for liners and also removes the requirement for sufficient freeboard to contain “precipitation events”. These zones should be *more* stringently regulated because they are closer to population centers.

Ambiguous Fencing Requirements: Fencing requirements are mentioned in at least two COGCC rules. Rule 902.d requires an operator to install “appropriate netting or fencing” around pits. Rule 604.c(2)M requires all sites constructed within Designated Setback Areas “be adequately fenced to restrict access by unauthorized persons”. The wording of these rules is ambiguous and open for operator interpretation.

Industrial Zone Noise Allowances in Non-Industrial Zones: The COGCC allows operators to create noise nuisances at the arbitrarily-defined levels of 70-75 decibels (Light Industrial) and 80-85 decibels (Industrial) regardless of the county's zoning regulations or noise ordinances. It makes no difference whether county land is zoned residential, rural residential, or agricultural.

Some COGCC Regulations Just Make No Sense: Rule 1001.c goes so far as to say that operators are not required to comply with reclamation regulations if the operator can demonstrate to the COGCC that "compliance with such rules is not necessary to protect the public health, safety and welfare, including prevention of significant adverse environmental impacts".

To reiterate, the COGCC mandate is "to conserve oil and gas in the State of Colorado while protecting public health, safety, and welfare, including the environment and wildlife resources". I believe this list of findings is illustrative of the fact that the COGCC is not protecting us to the best of its ability. This list is, by no means, exhaustive; there are many additional concerns that have not been discussed here for the sake of brevity.

Counties can institute measures to mitigate many of the concerns outlined in this article. For example, Elbert County has created a process by which an operator can expedite approval of his drilling permit, saving him valuable time and money. The county can leverage this expedited process in exchange for a comprehensive Memorandum of Understanding (MOU) that contains additional protective measures for its residents. The MOU becomes a contractual agreement between the County and an Oil and Gas Operator. It cannot be *less* stringent than COGCC regulations and should be written in a manner that enhances those regulations by holding an operator to a higher standard. Based on my research, a comprehensive list of additional protective measures in an MOU should include, at a minimum:

- 1) Baseline and subsequent testing of air, soil, and groundwater at all oil and gas production and waste disposal facilities, regardless of date of construction. If no available groundwater sources exist, an operator shall install groundwater monitoring wells.
- 2) Increased frequency of subsequent monitoring at all oil and gas production and waste disposal facilities for the life of the facility as well as monitoring post-closure.
- 3) Baseline sampling and monitoring for Naturally Occurring Radioactive Materials.
- 4) A more comprehensive list of baseline and subsequent testing requirements of groundwater to include the same heavy metals and organic compounds that are tested for in soil.
- 5) Remediation to "non-detect" contamination levels in air, soil, and groundwater.
- 6) Baseline sampling and monitoring to be conducted by properly trained, licensed, and disinterested third-party organizations.
- 7) Treatment and recycling of all E&P waste. Exclude injection, road-spraying, and land-application practices.
- 8) No pits. No exceptions.
- 9) If pits *are* allowed then permits and liners for all pits, regardless of intended use or location. Closure rules shall apply to all pits.
- 10) Closed-loop, pit-less drilling and completion regardless of well location.
- 11) An established absolute minimum setback with no exceptions.
- 12) Full disclosure of all hydraulic fracturing chemicals and additives.
- 13) Impervious liners covering the total surface area of all berms and secondary containment areas.
- 14) A defined fencing requirement that applies to all oil and gas production and waste disposal facilities.

All counties in the State of Colorado have an opportunity and a responsibility to adequately protect their residents during oil and gas exploration, production, and waste disposal activities.

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