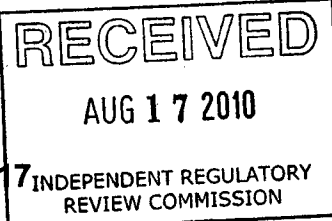




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Additional GASP Comments Concerning Proposed Amendments to the Oil and GAS Well Regulations, Annex A, Title 25, Part 1, subpart C, Article 1, Chapter 78

RegComments@state.pa.us

Dear Members of the Environmental Quality Board (EQB):

Developing the new state regulations, *Proposed Amendments to the Oil and GAS Well Regulations, Chapter 78* are made especially important due to the extensive natural gas drilling underway in Pennsylvania. "The industry has exploded here with 2,500 drilling permits issued by the state from 2007 to 2009 and another 5,000 expected this year."¹

There have been 1435 violations associated with natural gas drilling in the Marcellus Shale in Pennsylvania², a well blowout in Clearfield County and numerous reports of household and property lost or contaminated water relating to nearby natural gas drilling and associated processes.

The EQB notes that as a result of the *Advanced Notice of Proposed Rulemaking* for these proposed Oil and Gas regulations in ch.78, many individuals made comments, "concerning issues beyond the scope of this proposed rulemaking or beyond the scope of the Department's statutory authority"³. In response to these comments, the EQB notes that "while other potential impacts to the environment from oil and gas well development warrant consideration, an evaluation will unduly delay the promulgation of these important regulations."⁴

GASP does not disagree that these updated regulations are needed but we also agree that other impacts to the environment and public health, especially additional science based studies are needed. For example effects of total expected drilling on the Ohio River Watershed and the effect on air quality are needed before, not after expanded drilling in PA, to guide regulations. However, even within the Chapter 78 regulations before you today there is a lack of information needed to make an informed decision and this is within your general statutory authority to evaluate. For example, at §78.122 (b)(6) concerning stimulation fluids, there is no requirement to make clear the impact of these listed chemicals on health and environment during the hydraulic fracturing processes, just to identify them. How can the EQB be satisfied without at least the results of the EPA study on hydraulic fracturing due out in 2012 that this section is as descriptive as it needs to be to provide the DEP with information that is informative to health and safety? The EQB is charged with preventing public nuisance.

We urge you to evaluate whether you can promulgate these rules at this time and urge you to suggest a moratorium on Marcellus hydraulic fracturing new drilling until you can at least evaluate the EPA study on this process and chemicals. We note Pittsburgh City Council called for the state of Pennsylvania to impose a one-year moratorium on drilling in the Marcellus Shale. The New York Senate approved a drilling Moratorium on wells needing hydro fracturing permits.

GASP takes this position regarding Marcellus Shale well development:

"We support a moratorium on Marcellus Shale Drilling in Pennsylvania until it is clear that all regulations needed to ensure environmental and personal safety have been enacted and will be enforced."

While we hope you will agree to a moratorium in accordance with the GASP position, to give science a chance to catch up to regulation and regulation to be in place before additional drilling, we understand that you may not agree and in that case these updated regulations are urgently needed. With that in mind, we send additional GASP comments to those submitted at the Public Hearing in Pittsburgh on July 26 concerning these Oil and Gas chapter 78 regulations.

1. *Wells of wealth -- or woe? Questions waft from Marcellus Shale drilling sites*, Pittsburgh Post Gazette, July 29, 2010, <http://www.news.tradingcharts.com/futures/5/1/143113115.html>

2. Pennsylvania Land Trust Association, *Marcellus Shale Drillers in Pennsylvania Amass 1435 Violations in 2.5 years-952 Identified as Most Likely to Harm the Environment*, 8/2/2010, <http://conserveland.org/violationsrpt/>, The Pennsylvania Land Trust Association after reviewing DEP records, released a report that indicated 1435 violations of state Oil and Gas Laws due to gas drilling or other earth disturbance activities related to natural gas extraction from the Marcellus Shale from January 2008 through June 25, 2010."

3. 40 Pennsylvania Bulletin 3845, 7/10/2010, page 3, <http://www.pabulletin.com/secure/data/vol40/40-28/1248.html>

4. Ibid

Additional Comments

While commenting on these Chapter 78 proposed regulations, GASP urges as an overall principal of regulation, adoption of present and upcoming technology and methods that are the most protective for the environment and the public given the expected large scope of drilling in Pennsylvania.

78.1 Definitions: DEP has revised this definition to:

Casing seat

1. Comment: Noting the last sentence, *In wells without surface casing, the surface casing seat shall be considered to be equal to 50 feet below the deepest fresh groundwater.*

This seems erroneous as all gas wells should have surface casing. The definition of surface casing in these regulations is- (*this is the casing used to isolate the wellbore from fresh groundwater and to prevent escape or migration of gas, oil and other fluids from the well bore into fresh water*). However, the casing mentioned above suggests that since it is going 50 feet below the groundwater, it is the casing or part of the string of casing also protecting the groundwater and therefore is a surface casing by definition so this is confusing.

Whatever string of casing is going 50 feet below the deepest groundwater to form a casing seat should be 100 feet as is recommended in The NY Supplemental Draft Generic Environmental Impact Statement for the state of NY with reference to Marcellus Wells, "surface casing must extend at least 100 feet below the deepest fresh water zone and at least 100 feet into bedrock"¹

****Surface casing***

Comment:

1. This is the sentence in the definition, "**Casing used to isolate the wellbore from fresh groundwater and to prevent the escape or migration of gas, oil and other fluids from the well bore into fresh groundwater.**"

1. This might be more accurate to say "migration of gas, oil or other fluids"

Cement job log—

2. Comment:

This sentence is in the definition, "**The record must include the type of cement with additives, the volume, yield and density in pounds per gallon of the cement and the amount of cement returned to the surface, if any.**"

It would provide better information as to the appropriate quality of the cement for the job at hand if the above definition included in the second sentence "**The record must include the type of cement and the names and percentages of other added materials or chemicals.**"

*The Board is specifically requesting comments on the definition of "deepest fresh groundwater" which is defined as "the deepest fresh groundwater bearing formation penetrated by the wellbore as determined from drillers logs from the well or from other wells in the area surrounding the well or from historical records of the normal surface casing seat depths in the area surrounding the well, whichever is deeper." Ascertaining the deepest fresh groundwater zone is important because this is the depth to which surface casing must be set.
GASP Comment:

If research guidance is not reliable or available, a traditionally safe distance with a margin for error should be chosen. In any case surface casing should be at least 100 feet below the deepest fresh water zone and at least 100 feet into bedrock.

§78.51 Protection of Water Supplies:

DEP leaves (c) in place and adds (h)

GASP Comment:

1. If an affected person loses their water or finds it unusable, given sections (c) and (h) it appears just to move through the well operator notification and the DEP receipt of notification, it could add 20 days to the affected land owner's lack of adequate water. In the meantime if the water is affected, the situation could be made worse by additional drilling. An investigation should start within 24 hours.

¹ Draft GCEIS 8/20/2000 Page 7.45

Evidence of problems at the site is more likely to be discerned if an investigation team arrives on the scene sooner rather than later.

2. GASP Comment:

Is 78.51 B (ii) an accurate outline number? It seems out of place.

3. Comment:

1. From talking to individuals who have lost their water, it appears that in order to receive new water through the company responsible for the loss of their water, the individuals are asked by the drilling company to agree to certain conditions in order to receive water. This should not be permitted. Language specifying that water provisions that come from the responsible drilling entity should come without further requirements from the landowner.

2. Will these regulations affect individuals who have already lost their water?

78.56 Pits and Tanks for Temporary Containment (as well as related sections following)

No comments are requested here but this is an area of regulation that should also be evaluated and better practices developed. Best practices would include a closed loop system, for flowback and produced water to the greatest degree possible. Open pits with hazardous volatile chemicals and possible low level radioactive shale just should not be allowed. Proper disposal of unhealthy material should be required.

§78.71 Use of safety devices-well casing.

GASP Comment:

It is not clear that the recommended added text at (a) or any item in 78.71 needs to have an approval or certification of acceptability from DEP. All directives while important, at least in this section appear to be left to the operator's determination. Because cementing, casing design and blow out preventers are the heart of the well design, DEP should be required to certify that the plan is actually in agreement with (b) 1-7 given the site conditions.

§78.72 Use of Safety Devices-blow out prevention equipment

GASP Comment:

This section (a) requires a Blow Out Preventor (BOP) in four circumstances including on a Marcellus well which is good. However there are wells that might not be covered at least by regulation. In addition, what type or combination of BOPs (pipe rams, blind rams and or shear rams) for what type of well is not indicated. On the positive side there is much emphasis on making sure BOPs are working as they should in requirements at all subsections.

Consider a few quotes from a recent *CNNMoney* article.², "Hard data about the reliability of blowout preventers is hard to come by. But back in 2002, West Engineering conducted a test of seven BOPs at the most demanding conditions to be expected. Five were successful in sealing the pipes, but two failed." Another quote in the article, "The BOP in Pennsylvania]was supposedly tested the morning before the accident, said Pennsylvania Dept. of Environmental Protection spokesman Tom Rathbun, referring to the Clearfield PA well explosion. Rep. Henry Waxman is quoted in the article, "We know that blowout preventers are not foolproof, not even close."

It appears that BOPs are essential but far from perfect. That being the case, gas wells without a BOP should be rare and only with DEP analysis and approval. There should be a required combination of blowout prevention equipment on each BOP and each BOP should be required to be appropriate to the expected pressure of the well with a margin of safety. Even if all of the above is accomplished there should be a rigorous written back up plan in case there is a failure of the BOP. Emergency Management in the local area should be aware of BOP functions and the back up plan.

2. **Comment:** The language in (c) appears to be appropriate and timely given the recent well explosion/fire in Indiana Township, though not a Marcellus well, it points out in this quote, "Officials

² CNNMoney.com." Blowout preventers: Drilling's fail-safe failure",

say crews are still working to put out the fire and a gas valve needs to be shut off, but the flames and smoke are causing a problem in getting to it.”³ the importance of being able to reach equipment necessary to control an accident. This may or may not have been a blow out preventor, but the principal is the same. If there is fire, heat and smoke in an accident, any valves that need to be shut off should be remotely accessible at a distance from the well. Remote access should not only apply to blow out preventers with a rating greater than 3,000 psi (as mentioned in the proposed language), but to all possibly critical well shut down valves or blow out preventers. Will this regulation be retroactive to existing wells for critical valves? It should be to the extent of reasonable practicality.

[(f)] (h)

GASP Comment:

1. The BOP is such an important part of safety that some expectations and specificity concerning the phrase from the proposed regulation, “conditions are such that the use of a blowout preventer can be anticipated, “ should be made at least minimally explicit.
2. With respect to the individual in charge of the Blow out preventer, The DEP should require presentation of proof that the individual in charge of the blow out equipment has completed adequate training such as the suggested “Independent Association of Drilling Contractors” well control course as well as the allowable “equivalent study”.
3. Someone knowledgeable at DEP should verify an acceptable list of “equivalent training” (wording from subsection) that is adequate to the responsibility.

§78.73 General Provisions for well construction and operation

Proposed language for 78.73 as follows:

(d) Comment: It is not clear that the operator would need to report increased pressure beyond the requirement at (c) but this could be a serious situation. DEP should be notified.

(e) Language at (e) states, “Excess gas encountered during drilling, completion or stimulation shall be flared, captured or diverted away from the drilling rig in a manner that does not create a hazard to the public health or safety.”

Comment: “Typical well completions in the Barnett Shale area can release approximately 5000 Mcf of natural gas/well.⁴” “Cost effective control strategies are available that can substantially reduce emissions, and in some cases, reduce costs for oil and gas operators. These options include: use of “green completions” to capture methane and VOC compounds during well completions.”⁵ Green Completion could capture significant air pollutant emissions and valuable gases at well completion after the first completion where connection to pipeline for transmission of gas has been set up. Equipment would be necessary but payback from gas capture would likely cover the cost.

*The subsection language should change to include “reduced emissions completion known as green completions should be applied whenever possible as determined by DEP” “in order to minimize air pollution.

*Flaring should be permitted only where there is no other choice and venting would be the last choice. Best practices to reduce emissions should be incorporated at all areas of the drilling process. If flaring is used, inspection and workability of the igniters and other equipment pieces should have a regular rotation of inspection. Redundancy of critical pieces such as igniters should be included.

§78.83 Surface and coal protective casing and cementing procedures: (a)(2) Comment: 78.83 If a test indicates all gas and fluids will be contained at that moment, it may not be the same in the future, additional casing is there to protect at least in part from an unforeseen event-to provide an extra barrier of protection to ground water. How would the requested testing assure the ongoing safety? Should not best preventative practices be for all wells? This section 78.83(a) (2) should be dropped.

Comment: §78.83

(c) As per GASP comments at definition of surface casing seat, the cemented surface casing should extend at least 100 feet below the deepest fresh groundwater and at least 100 feet into consolidated rock⁶ not 50 feet as is suggested. The use of centralizers is important

³ KDKA AP, “Authorities Investigate Deadly Gas Well Explosion”, July 23,2010

⁴ Al Armendariz, for Ramon Alvarez Environmental Defense Fund, *Emissions from Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements*, p18, 1/26/2009

⁵ Ibid. Executive Summary, page 1

78.83(f)

Comment

The length of cement for cementing the additional casing into the surface casing is suggested at twenty feet, this does not seem long enough. As much as possible casing going through water of any kind should be entirely cemented in place.

78.83a. Casing and cementing plan.

(a)(3) Even if one knows the particulars of a casing history, this casing will be in the ground and in use possibly for decades with additional fracturing episodes. The casing and cement need to be of the best quality for everyone's ongoing safety. Only new pipe fitting the other requirements should be acceptable.

(a)(c) The proposal states, "Upon request, the operator shall provide a copy of the well specific casing and cementing plan to the Department for review and approval." It would be best to approve the Casing and Cementing Plan before starting. This should be explicitly stated as a part of DEP procedures so that well activities do not get underway before DEP approval is received.

§78.83b(b) Casing and Cementing-lost circulation

(b) Cementing quality of casing strings should be quality tested by bond logging or other equivalent methods whenever possible with appropriate remediation should problems be indicated.

§78.84 Casing Standards

(b)&(c) Surface casing should be new pipe as (b) states but that seems to be contradicted at (c)

At (b) "Surface casing must be a string of new pipe with a pressure rating that is at least 20% greater than the anticipated maximum pressure to which the surface casing will be exposed."

At (c) "Used casing may be approved for use as surface, intermediate or production casing but shall be pressure tested after cementing and before continuation of drilling."

(c)&(d) Comment: Despite various tests at these subsections, using any form of used pipe for casing is ill advised. Even if adequate testing is achieved on used pipe. that test is specific to the testing time. It is not going to be as long lasting as similar new pipe. Only new pipe capable of testing requirements with a margin of safety as specified in this section should be used as stated previously. Drilling especially involving fracking chemicals, sand at high pressure, flowback water with a variety of chemicals and ongoing use of these casings in refracturing and production require casing that at least starts out new and robust. Exterior cement requires at 78.85(a) considerable resistant qualities to degradation but some areas of pipe may have no exterior cement and therefore should be as sturdy and corrosion resistant as possible.

§78.85

(b) The last sentence, "After the casing cement is placed behind surface casing and intermediate casing when the intermediate casing is used in conjunction with the surface casing to isolate fresh groundwater, the operator shall permit the cement to set to a minimum designed compressive strength of 350 pounds per square inch (psi) at the casing seat."

Comment: The minimum designed strength of 350 psi at the casing seat does not follow recommendations from an API Guidance document which specifies "the cement surrounding the casing shoe should have a compressive strength of at least 500 psi and should achieve 1200 psi in 48 hours at the bottomhole conditions."⁷ This subsection and (c) should be changed to reflect this more protective standard.

6. Draft New York SGEIS 9/30/2009, Page 7-45

7. API guidance document HF1 first edition, section 7-1, October 2009,

<http://www.gwpc.org/e-library/documents/general/API%20Hydraulic%20Fracturing%20Guidance%20Document.pdf>

(f) A well in Marcellus may be refractured and last for many years, the operator should always have a copy of the cement job log. It is not clear, since the operator is maintaining a copy if the original is held by DEP. It should be.

§78.88 Mechanical Integrity of Operating Wells

(a) A well in Marcellus may be refractured and last for many years, the operator should always have a complete history of well inspections not just for 5 years.

(a) If a problem was developing such as leaking gas as at (3) or increasing well-head pressure, serious problems could develop in three months (one quarter). Operator inspections should be more frequent.

Is inspection by DEP and follow up to operator inspections going to be adequate to the increasing numbers of wells? It is not clear how often DEP will inspect wells. If DEP can not feel comfortable with their inspection schedule, number and training of qualified inspectors, then the number of permitted wells should only match the ability of DEP to effectively monitor and enforce regulations

§78.89 Gas migration response

3(d) The word effectively should be added before mitigate. As written, there could be a lot of investigation and mitigation measures but unless there are results that indicate the problem is resolved, it could simply continue without violating any directives in this section. There should be an effective stoppage of leaking gas.

(e) Add language to include the complainant in the information that is being produced for DEP concerning gas migration in as timely a manner as possible including written reports.

§78.92--95 Wells in coal fields—surface or coal protective casing is cemented

In all of these sections, nonporous material is required for areas of the wellbore. The definition of nonporous material in 25 PA Code Chapter 78 includes the use of drill cuttings, yet not all drill cuttings have the same porosity. It appears that Marcellus Shale has considerably higher porosity and permeability than some other common shales.⁸

Consideration of other physical and chemical qualities may also be important. No specificity is assigned to the size of drill cutting pieces which could also affect gas migration. Would there be a requirement that drill cuttings be mixed with cement? It would seem that some of the other "nonporous" materials might make a more robust choice and drill cuttings be removed from choices in plugging gas wells.

§78.96 Marking the location of a plugged well

Burying a marker for a gas well below ground even with a detectable amount of metal seems risky. Land can pass from one generation to the next, documents get lost, fire happens.

§78.122 Well Record and Completion Report

(b) 6. This subsection refers to a record for the stimulation process, *Stimulation Record*. Among other recordings, it requires that the "fracturing chemicals used" be identified. This should be more specific to insure that each chemical and its quantity is identified. Groups of chemicals should not be listed under one trade or generic name. Further an understanding of the safety to health and environment of each chemical during the Marcellus drilling and follow up unprocedures should be noted for each chemical alone or in combination and its possible reaction in the Marcellus Environment should be noted. If DEP or EPA determines any of these chemicals are hazardous to health or environment as used in the stimulation process, DEP should require that chemical be eliminated from the procedure. To know this information may mean waiting for the EPA study of hydro fracturing._

Thank you for the opportunity to make these comments on behalf of GASP.

Sue Seppi (GASP Project Manager)

8. *Porosity and Permeability of Eastern Devonian Gas Shale*, Daniel J. Soeder, p.1, Paper presented 1986 at *Unconventional Gas Technology Symposium* in Louisville.

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To the Environmental Quality Board,
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