



October 11, 2013

Wyoming Oil and Gas Conservation Commission
2211 King Blvd
P.O. Box 2640
Casper, WY 82602
Phone No. 1-307-234-7147
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Dear Supervisor Black,

Please accept these comments from the Wyoming Outdoor Council and Environmental Defense Fund. The Wyoming Outdoor Council is Wyoming's oldest environmental advocacy organization. In much of our work, we advocate for policies that provide for Wyoming's energy development coupled with the necessary consideration and protection of public health and our state's inimitable and irreplaceable land and water resources. EDF's mission is to preserve the natural systems on which all life depends. Guided by science and economics, we find practical and lasting solutions to the most serious environmental problems.

As stated in our previous comments on the draft rule, we are very pleased to see the Commission moving forward with a state groundwater testing rule. We would also like to thank the Commission for taking into consideration our earlier suggestions during the informal public comment period.

It is clear that this rule can provide the state, industry, and Wyoming residents important information about baseline groundwater quality and monitoring data as oil and gas development proceeds. With its adoption, this rule will further establish Wyoming as a leader on management of oil and gas operations and the protection of water resources. We commend the work that has been done in this effort and, while we do feel some improvements are needed, we offer our strong support for the general approach outlined in the rule.

On the whole, we agree that the rule would create a strong, scientifically-valid groundwater testing program. The Wyoming draft rule's statewide applicability, use of a radial approach without an artificial cap on the number of wells tested, ability to rely on the experienced

technical staff of the WOGCC and their understanding of local hydrogeological conditions in reviewing and approving testing plans, and the use of a required Sampling and Analysis Protocol (SAP) are of special importance. In particular, Wyoming's proposed SAP, to our knowledge, is currently the most detailed guidance provided by any state regarding how private wells should be sampled. And, it should be noted, the Wyoming rule does this all without costing operators any more than what they will need to spend to comply with other states' less rigorous programs.

Suggested Improvements

The proposed rule's general approach is a strong one, but there are two issues that should be improved as the Commission moves toward finalizing the program. These are both issues that were added to the proposed rule at the request of industry following the informal public comment phase. In both cases, and absent further improvement from the Commission, the additions could weaken what is otherwise a strong approach to assessing potential groundwater impacts from oil and gas development.

1. Dissolved Methane

In Chapter 3, Section 46, Paragraph I, the WOGCC's rules includes a dissolved methane level to trigger further scientific analysis of groundwater to detect possible impacts from oil and gas development. While this level had been set at 1 mg/l in the initial draft rule presented last summer, it was changed to 10 mg/l in the current proposed rule at the request of industry following the informal public comment period. This should not be confused with the separate 10 mg/l level to trigger immediate notification of landowners and regulators provided for in Chapter 3 Section 46 Paragraph j. Setting both of these triggers at 10 mg/l is a major flaw in the proposed rule that can and should be fixed. Please see the letter submitted to the Commission by Robert Puls, PhD. and attached to these comments for further discussion of this issue.

Weakening the scientific analysis trigger by a factor of 10 provides inadequate protection for the public. Setting the trigger at such a high level would fail to ensure that potential water contamination caused by drilling is caught quickly and the state's ability to act proactively would therefore be lost. Both the Colorado Oil and Gas Conservation Commission's rule and the Colorado Oil and Gas Association's voluntary program include a 1 mg/l level to trigger further scientific analysis, while even Colorado's separate groundwater testing rule for areas of the state with coal bed methane development includes a 2 mg/l analysis trigger. A weak 10 mg/l initial trigger has the potential of subverting one of the key purposes of the groundwater testing program - to better understand potential drilling impacts as quickly as possible so that they may be addressed expeditiously.

For these reasons Dr. Puls has recommended the following for the Wyoming program and we concur with his expert advice:

"It is appropriate for additional analysis, including compositional analysis and carbon isotopic analyses to determine the source of the gas when methane concentrations in water are found at an elevated level. This level should be set no higher than 2 mg/L. It should be noted that a trigger of 2 mg/L is also consistent with what the state of Colorado requires in the special case of coal bed methane formations. If levels are found to be greater than 10 mg/L, all parties including the water well owner, regulators and the health department should be notified and mitigation measures enacted. If greater than 28 mg/L, immediate action must be taken to remedy the situation."

2. Master Plans

The draft rule was also amended at the request of industry to allow developers to seek approval for "master plans" that would cover multiple wells over potentially large geographic areas. If these plans are simply a way to better coordinate the required testing protocols with a company's drilling program, to improve data management, or to seek efficiencies in submittals to the WOGCC, this could be positive. However, these master plans should in no way undermine the strong, well-by-well approach taken in the larger rule. Mandating that at a minimum these plans are open for public review could help address some of these issues. Please see the suggested clarifications below:

Chapter 3, Section 46, paragraph L

The operator may submit a master groundwater baseline sampling, analysis and monitoring plan for a geographic area of development. The Supervisor may approve the operators plan if, after public notice, at least a 30 day public comment period, and review of public comments, the Supervisor determines that the plan meets or exceeds the intent of Chapter 3, Section 46 Groundwater Baseline Sampling Analysis and Monitoring, Appendix K Sampling and Analysis Procedures for the Wyoming Oil and Gas Conservation Commission Groundwater Baseline Sampling Analysis and Monitoring Program, and that the plan is consistent with the core purpose of the Groundwater Baseline Sampling and Analysis and Monitoring Program, to quickly establish baseline groundwater quality conditions around all new oil and gas well locations and to promptly monitor water quality in the vicinity of the oil and gas wells before and after drilling and completion activities have concluded. Once approved, all master plans will be subject to the same enforcement capabilities as the rule itself.

Other Issues

Lab Capacity: We have heard some concern with the capacity of analytical labs to handle the volume of work anticipated to be created by Wyoming's proposed groundwater testing program. There are a number of national and regional National Environmental Laboratory Accreditation Program (NELAP) accredited labs capable of performing the required

analyses. After checking with industry contacts, we are confident that there is adequate capacity to do the work contemplated under the Wyoming rule generally, and specifically that there is adequate capacity to perform the needed dissolved methane isotopic analysis work at a 1 - 2 mg/l trigger level.

Further Public Notice of the Rule: The improvements we have suggested above to the dissolved methane and master plan provisions should not necessitate a re-noticing of the rule and will not in any way hamper the Commission from making these needed changes and then proceeding with the final rule at their anticipated date of consideration by the WOGCC (November 12, 2013). Because these changes are within the scope of what was originally noticed and more generally within the scope of what was contemplated, we do not believe the changes we advocate are substantive to the extent the rule-making needs to be restarted. Nor are we aware of any legal requirement in the Wyoming Administrative Procedure Act that would require further delay in this instance.

Appreciation for Changes Since the Initial Draft Rule

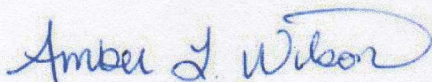
As we indicated above, we appreciate the Commission's consideration of our earlier comments during the informal public comment period in developing the current version of the proposed rule. In particular we note two changes that have been made in response to our earlier comments. First, in Chapter 3 Section 46 Paragraph f "scientific standards" has been added to the list of reasons for updating Appendix K. We appreciate this change in response to our earlier comments. Second, in Chapter 3 Section 46 Paragraph m it has been clarified that there is neither a presumption for or against liability. Again, we appreciate this change in response to our earlier comments.

Conclusion

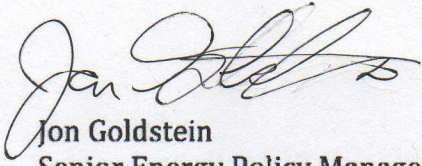
We offer our sincere appreciation to the Commission and to Governor Mead and his staff for the efforts they have made in developing this rule. We urge that the suggestions we offer in this document be given careful consideration for the sake of Wyoming's residents and our continued national status as leaders in energy development.

We look forward to continuing our involvement in this process as Wyoming moves toward implementation of an effective, scientifically-valid groundwater testing rule.

Sincerely,



Amber Wilson
Environmental Quality Coordinator
Wyoming Outdoor Council

A handwritten signature in black ink, appearing to read "Jon Goldstein". The signature is fluid and cursive, with the first name "Jon" being particularly prominent.

Jon Goldstein
Senior Energy Policy Manager
Environmental Defense Fund

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Dear Supervisor Black,

Please accept these comments concerning the Wyoming Oil and Gas Conservation Commission's consideration of a statewide ground water testing rule. These comments are submitted on behalf of the Environmental Defense Fund and the Wyoming Outdoor Council and will also be attached to their formal written comments on this matter.

The expert opinions expressed herein are based upon my 25-plus years of technical ground water experience as Senior Research Scientist, Branch Chief, Director of Research, and Laboratory Director of the Ground Water and Ecosystems Restoration Division at the U.S. Environmental Protection Agency's (EPA) Robert S. Kerr Environmental Research Center in Ada, Oklahoma and currently as the Director of the Oklahoma Water Survey and Associate Professor at the University of Oklahoma, College of Atmospheric and Geographic Sciences (resume attached.) I hold a B.S. in Soil Science and Natural Resources from the University of Wisconsin, a Masters in Forest Resources from the University of Washington, and a Ph.D. in Soil and Water Science from the University of Arizona.

Methane in Ground Water

I. Action levels for dissolved methane in ground water

While debate rages over the potential transport of fracking compounds to ground water, there is no scientific debate concerning the potential for methane transport. Transport of methane has been clearly documented in many locations. Therefore, it is not a question of if methane can impact ground water resources in areas with oil and gas drilling, but rather the questions should be, if methane is present, at what concentration should it be a concern? At what concentration should an immediate warning be issued to the homeowner? And, at what concentration should mitigation measures be taken and by whom?

There are at least two ways of answering these questions. One is from the perspective of examining at what level a dissolved methane concentration requires further study into its cause (stray gas from hydrocarbon production or naturally occurring.) The other is from the standpoint of human health and safety from explosive risk.

It is appropriate that a lower level be chosen in the first instance (efforts to discern the cause of the elevated methane level). This information will help get out ahead of the problem so that if a stray gas issue is found, attempts may be made to correct the leak before explosive levels are encountered. Dissolved methane can also be a strong indicator of well integrity problems that, if left unaddressed, can mean groundwater supplies are

potentially at risk for contamination from the full range of chemicals that are used downhole and the naturally occurring materials that are brought up from the formation in flowback and produced water. An initial dissolved methane testing level that is set at a protective and low level will therefore serve to both protect the public from undue explosive risk and from potential groundwater pollution from the entire suite of possible oil and gas related contaminants.

However, to date, state guidance has varied widely on sampling for methane in ground water. About the only thing they agree on is that the solubility of methane in water is approximately 28 mg/L depending on atmospheric pressure, that it should be sampled for in any ground water baseline assessment and follow-up monitoring program, and that the primary hazard is one of fire and explosion in terms of human health.

A 2001 U.S. Department of Interior Office of Surface Mining Reclamation and Enforcement report is often cited regarding the 10 mg/L threshold for warning occupants and indication of the need for additional investigation.¹ The report offers little scientific basis for this level other than "The recommended action levels are based on site-specific information, application of scientifically valid methodology, and the exercise of common sense". However, the report continues and states "There may be occasions when the investigator will determine that a potentially harmful situation may later develop and immediate action is required even though recorded methane concentrations are below the recommended action levels."

The state to address this issue most recently, Colorado, has set this action level at 1 mg/l in its statewide rule. This is also the level set by the Colorado Oil and Gas Association (COGA) in their voluntary testing program. Meanwhile, even in Colorado's separate groundwater testing rule applying to areas with Coal Bed Methane (CBM) development, this dissolved methane trigger for further isotopic analysis is set at 2 mg/l.

Given the rapid increase in reports of methane migration near oil and gas operations across the U.S., it is generally acknowledged that there can be substantial variability in methane concentrations. This can be due to spatial and temporal factors as well as sampling methodology. It is strongly recommended that new programs for state water quality baseline assessment and follow-up monitoring build on prior observations and experiences, and use response protocol that are more protective of human health.

It should be noted that finding methane in the 1 to 2 mg/L range in ground water is commonly feasible, and not inconvenient, for certified labs. Current common laboratory methods (RSK 175) provide detection limits of 0.026 mg/L.

I therefore recommend the following as reasonable for the Wyoming Baseline Water Quality Program:

It is appropriate for additional analysis, including compositional analysis and carbon isotopic analyses to determine the source of the gas when methane concentrations

¹ Eltschlager, K. K., Hawkins, J. W., Ehler, W. C., & Baldassare, F. (2001). Technical measures for the investigation and mitigation of fugitive methane hazards in areas of coal mining. Pittsburgh, PA. Retrieved from <http://www.ntis.gov/search/product.aspx?ABBR=PB2002106133>

