



Matthew H. Mead, Governor

# Department of Environmental Quality

*To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.*



John Corra, Director

March 28, 2012

VIA E-MAIL

Donna N. Myers  
U.S. Geological Survey  
Chief, Office of Water Quality  
National Center, MS 412  
12201 Sunrise Valley Drive  
Reston, VA 20192

Dear Ms. Myers,

During our joint USGS-EPA-State-Tribes (Technical Team) meeting in Denver on March 15, 2012, there was a long discussion about the *DRAFT Sampling and Analysis Plan* calling for purging three (3) well casing volumes from well EPA MW01 before sample collection. Upon deliberation, EPA and USGS recommended to the Technical Team to reduce the purge volume for sampling EPA MW01 from three (3) well casing volumes to one (1) effective borehole volume (well casing volume for unscreened length plus the borehole volume for the length of the screened interval) plus the volume necessary to reach parameter stabilization for five consecutive readings spaced five minutes apart for the FINAL Sampling and Analysis Plan (SAP).

That approach will be acceptable to the State of Wyoming if a second sample is collected after 3-well casing volumes have been purged. In consultation with David Mott (Director, USGS Water Science Center, Cheyenne, WY) and other members of the Technical Team there is good reason to believe that MW01 will produce a representative ground water sample following a 3-well casing volume purge from MW01.

EPA is resistant to conducting the 3-well casing volume purge of MW01 for the following reasons:

1. Concern with managing the additional volume of water if the well were purged three times, rather than once;
2. Concern that purging 3-well casing volumes may de-water the sandstone bed in MW01;
3. Concern that purging 3-well casing volumes may cause inflow of ground water within overlying or underlying water bearing zones into the sandstone bed in MW01, and;
4. Volatile Organic Compound (VOC) concentrations can be biased when wells are purged beyond what is necessary to achieve a steady flow of formation water.

In response to concern #1, above, Wyoming DEQ has already arranged to have a 2,000-gallon wastewater tank on site that will easily contain the roughly 1,100 gallons calculated for a 3-well casing volume purge of MW01.

In response to concern #2, as acknowledged by EPA during the March 15, 2012 meeting, a total of 11,000 gallons of ground water were produced from this MW01 during well development, demonstrating that there is sufficient ground water in storage to support a 3-well casing volume purge.



In response to concern #3, as represented by EPA in Figure 20 (lithologic cross-section) of EPA's December 2011 *DRAFT Investigation of Ground Water Contamination near Pavillion, Wyoming* report, the sandstone bed in MW01 is roughly 135 feet in thickness, is laterally continuous for more than one-quarter mile on either side of the well, and is isolated from overlying and underlying by shale. Given EPA's interpretation, we fail to see the basis for their concern and believe there is little, if any, chance for communication between isolated sand units and the sandstone unit in MW01 during a 3-well casing volume purge.

In response to concern #4, collection of an initial sample after one effective borehole volume is purged, and a second sample after three casing volumes have been purged, would allow for direct comparison of VOC concentrations (as well as other parameters) with the two approaches.

A 3-well casing volume purge before sampling is a widely accepted and is the nation-wide environmental industry standard operating procedure (SOP) for purging monitoring wells where the well is capable of producing 3-well casing volumes during purging. As stated in USGS' National Field Manual: *"As a rule of thumb, the standard USGS purge procedure removes three or more well volumes of standing water while monitoring the water level and the stabilization of routine field measurements."*<sup>1</sup>

Furthermore, EPA Region 8's own well purging guidance<sup>2</sup> states: *"Removal of at least three casing volumes before sampling is required for all wells except for low yield wells that require  $\geq 24$  hours to recover, and for sampling using low-flow sampling methods."* MW01 should recover well within a 24 hour period. Wyoming DEQ's *Ground Water Section Quality Assurance Project Plan (September 2011)* (establishing procedures and protocols followed by this agency when purging wells) has incorporated this protocol and we believe that a 3-well casing volume purge is consistent with the environmental industry, EPA, and USGS protocols. Further, we are concerned that the State of Wyoming, USGS, and EPA will be subject to widespread public criticism if this sampling event varies from the same industry standards that others are held to.

We believe that it is imperative to have a second sample collected from MW01 (after a 3-well casing volume purge) following the collection of a sample after the 1-effective borehole volume purge. To ignore widely accepted well purge protocols is not acceptable to the State of Wyoming.

In closing, please know that we appreciate USGS's assistance to the State of Wyoming, and in particular the fine work that David Mott and his crew, as well as Warren Day have done in helping to make this project a successful one.

Thank you for your consideration and I look forward to your reply. I'm available (307-777-5985) to answer any questions or discuss further if you desire.

Sincerely,



Kevin D. Frederick, P.G.  
Manager  
Groundwater Section

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<sup>1</sup> U.S. Geological Survey, variously dated, National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chaps. A1-A9, available online at <http://water.usgs.gov/owq/FieldManual/>.

<sup>2</sup> Region VIII Guidance, SOP #4.1 - Well Purging, Version 1, June, 1994.

cc: Jerimiah Rieman, Governor's Office  
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John Corra, DEQ  
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