#2857 Rec'd 4/12/10

To: Tate, Michele; Adams, Duke; Chambers, Laura M.
Cc: Robert.Schnitzler@amwater.com
Subject: Additional Comments to Chapter 78 Regulatory Package

Dear EQB and IRRC Agents: Please accept our additional comments to the Oil and Gas Regulation. These are being presented to the EQB and also the IRRC for consideration prior to finalizing the regulation.

Original Comments with PADEP Responses:

Original Comment: Operators should be required to determine, through a test well, the depth of "deepest fresh groundwater" for a given area. How else would an operator know the depth of the deepest fresh groundwater in a particular area? (1829)

PADEP Response: The Board agrees that the determination of the deepest fresh groundwater is sometimes problematic when there is little groundwater use in the area. The operator is making the determination based on available well information and typically other wells in the area as water well data is of questionable accuracy in making this determination. The Department is continuing to collect casing depths and working toward providing this data to the public electronically. Currently, if the first estimate is too shallow, the operator must set additional surface casing to achieve this requirement. The Board disagrees with the concept of requiring a test well just to make this determination. As the commentator should be aware, any drilling through the aquifer causes some degree of disturbance whether the well is for water or oil and gas. Fewer disruptions are preferable.

Original Comment: The definition of fresh groundwater should include some reference to potability, eg:. total dissolved solids less than 500 mg/l. (1829)

PADEP Response: The Board received and considered many comments ranging from 500 – 10,000 TDS, to groundwater that could be treated to drinking water standards. While frac flowback can be treated to drinking water standards or above, the Board does not believe this is feasible or necessary for PA. The Board protects the fresh water that is typically in that portion of the groundwater that is in the normal hydrologic cycle in Pennsylvania. Deeper formations and groundwater that is not "fresh" must be excluded from co-mingling with the fresh water zones. However, the lower formation waters may be considered a suitable source in certain situations and in other jurisdictions.

Follow-Up Comment: A better evaluation method is needed by the DEP on the determination of "deepest fresh groundwater" and the definition of "fresh groundwater". As stated by PADEP in the first response on page 7 of the Comment/Response document: "....the regulations have been revised to require the operator to identify how the deepest fresh groundwater was determined and record the information in the casing and cementing plan." Without a clear definition of "fresh groundwater", how is the operator supposed to determine the top or bottom of it? Furthermore, wouldn't it be prudent to establish some minimum standard? Additionally, the operator is not required to submit their Casing and Cementing Plan to PADEP for review and approval, prior to drilling. Therefore, the Department would not have the opportunity to review or approve the methodology or results. Minimum regulations should also be set to protect the drinking water criteria of 500 mg/l for total dissolved solids.

Original Comment: Will the Department allow the use of cement additives within the fresh-groundwater zone in the vicinity of drinking water wells? If so, what additives will be allowed and will they meet NSF Standard 60 referenced by the Safe Drinking Water Act? (1829) (1989)

PADEP Response: The Department may approve use of additives specifically in the area of drinking water wells if conditions warrant modification of the cement slurry to address a specific localized condition where use of the additive would prevent impact to the water supply. As the additive would not be in direct contact with the water supply NSF Standard 60 would not be applicable.

Follow-Up Comment: Depending on the proximity of the Water Supply well and the Oil/Gas well, both cement and "fresh water based drilling fluid" could come in direct with the water supply. Some minimum standards should be set for their composition. Additionally, the operator is not required to submit their Casing and Cementing Plan to PADEP for review and approval, prior to drilling. Therefore, the Department would not have the opportunity to review or approve such additives prior to use.

New Comments: PAW has the following additional comments to the current set of revisions made to the Regulations:
§78.73 General provisions for well construction and operator

[(b)] (c) After a well have been completed, recompleted, reconditioned or altered the operator shall prevent SURFACE shut-in pressure [or] and SURFACE producing back pressure [at] INSIDE the surface casing ~~[seat,][or]~~ coal protective casing ~~[seat or intermediate casing seat when the intermediate casing is used in conjunction with the surface casing to isolate fresh groundwater]~~ from exceeding THE FOLLOWING PRESSURE: 80 percent (80%) ~~[of the hydrostatic pressure of the surrounding fresh groundwater system in accordance with the following formula. The maximum allowable shut in pressure [or] and producing back pressure to be exerted at the [surface casing seat, or coal protective] casing seat may not exceed the [hydrostatic] pressure calculated as follows: Maximum pressure = (0.8 x 0.433 psi/foot) multiplied by (casing length in feet).]~~ MULTIPLIED BY 0.433 PSI PER FOOT MULTIPLIED BY THE CASING LENGTH (IN FEET) OF THE APPLICABLE CASING.

New Comment:- The original calculations for maximum "shut-in pressure" was the casing length multiplied by 0.433 psi/foot. This calculation assumes a hydrostatic pressure at the casing seat with the static water level at ground surface, which could over estimate hydrostatic pressure in many cases and therefore not be protective by allowing "shut-in pressure" that is greater than hydrostatic pressure. This most recent calculation adds a safety factor of 0.8; however, this calculations is only protective if the static water level is at a depth of less than or equal to 20% of the casing length.

To be protective, the calculation should be 0.8 x 0.433 psi/foot x [casing length – static water level]. This calculation takes the actual conditions into account and provides for a 20% factor of safety.

(f) If additional fresh groundwater is encountered in drilling below the permanently cemented surface casing, the operator shall DOCUMENT THE DEPTH OF THE FRESH GROUND WATER ZONE IN THE WELL RECORD AND protect the additional fresh groundwater by installing and cementing a subsequent string of casing or other procedures approved by the Department to completely isolate and protect fresh groundwater. The string of casing may also penetrate zones bearing salty or brackish water with cement in the annular space being used to segregate the various zones. Sufficient cement shall be used to cement the casing ~~[at least 20 feet into the permanently cemented surface casing]~~ TO THE SURFACE. THE OPERATOR SHALL INSTALL AT LEAST ONE CENTRALIZER WITHIN 50 FEET OF THE CASING SEAT AND THEN INSTALL A CENTRALIZER IN INTERVALS NO GREATER THAN, IF POSSIBLE, EVERY 150 FEET ABOVE THE FIRST CENTRALIZER.

New Comment: The word "sufficient" should be removed from this requirement, it is not necessary and allows for a much weaker interpretation. The sentence can be easily revised to read: "Cement shall be used to cement the casing to the surface." This qualifier – "sufficient," should be removed where is proceeds cement in the following: 78.83(a)(i), 78.83(c)(A).

§ 78.83b. Casing and cementing – lost circulation.

(a) If cement used to permanently cement the surface or coal protective casing is not circulated to the surface

despite pumping a volume of cement equal to or greater than 120% of the calculated annular space, the operator shall DETERMINE THE TOP OF THE CEMENT, notify the Department, and meet one of the following requirements AS APPROVED BY THE DEPARTMENT:

New Comment: This requirement allows for the potential of a significant amount of cement to be lost into the subsurface. Additional requirements must be developed for wells drilled in proximity to water supply wells.
New Comment: There is no guidance on filling/sealing the horizontal portion of the borehole associated with the "nonconventional" Marcellus wells.

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