TCEQ Interoffice Memorandum

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Thru: David Van Soest, Regional Director, Austin and Waco Regions
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From: Edwards Aquifer Protection Program Committee

Date: May 12, 2021

Subject: Defining Non-Shrink Grout in Relation to Boreholes

The Edwards Aquifer Protection Program (EAPP) regulates activities that have the potential to pollute the Edwards Aquifer. The purpose of this memorandum is to clarify what can be considered non-shrink grout and any equivalents regarding the plugging and abandoning of boreholes over the Recharge Zone (RZ) and Contributing Zone (CZ) of the Edwards Aquifer.

Both the EAPP and the regulated community will benefit from a written policy providing clarification on the materials allowed and guidance on making rule applicability determinations. The interpretation of the definition of a non-shrink grout will allow common practices to continue without seeking a separate approval for each borehole and thereby allow for the Texas Department of Licensing and Regulation (TDLR) rules to be utilized for wells and boreholes.

The general usage of grout is to fill voids and boreholes and to seal spaces for controlling or preventing water movement.

Brief Description of Issue

Historically, the regulated community has proposed cement mixtures, concrete slurry, or bentonite grout as the method for sealing and abandoning wells and boreholes. The review is to determine if bentonite grout is equivalent to 'non-shrink grout.' To date, each proposed use has initiated a variance request to Title 30, Texas Administrative Code Section 213.7 (30 TAC Section 213.7) which specifies "All borings with depths greater than or equal to 20 feet must be plugged with a non-shrink grout from the bottom of the hole to within three (3) feet of the surface."

Background

In 1998, the Commission commented on and referred to TDLR on this subject matter by stating "Rules currently proposed by the Texas Department of Licensing and Regulation provide procedures and guidelines for closure of abandoned water wells.", "by adding standards for plugging borings to prevent the movement of pollution from the surface to the Edwards Aquifer through open borings", and "this new requirement should provide better protection of the Edwards Aquifer."

The 30 TAC Chapter 213 does not define grout or non-shrink grout; however, the TDLR has.

The referenced TDLR rules are located in Title 16 TAC Section 76.10:

(7) Bentonite grout--A fluid mixture of sodium bentonite and potable water mixed at manufacturers' specifications to a slurry consistency that can be pumped through a pipe directly into the annular space between the casing and the borehole wall. Its primary function is

to seal the borehole in order to prevent the subsurface migration or communication of fluids, and

(31) Grout--This term shall include cement or bentonite mixed with water, or a combination of bentonite and cement mixed with water and/or department-approved additives.

Plugging is also discussed in TDLR rules. The 16 TAC Section 76.104 Standards for Capping and Plugging of Wells and Plugging Wells that Penetrate Injurious Water Zones offers methods for plugging wells: "with cement" in (3), or alternately with "bentonite grout to not less than 2 feet below land surface with cement as an atmospheric barrier" in (4).

Further, the TDLR uses cement slurry and bentonite grout interchangeably in 16 TAC Section 76.101 Technical Requirements--Standards of Completion for Water Wells Encountering Water Injurious to Vegetation, Land or Other Water.

Consideration and Rules Interpretation

There is a common practice to allow drilling contractors to use bentonite grout to backfill geotechnical borings in lieu of the cement-slurry grout. In this practice, the use of bentonite is preferred within karst settings because it can be hydrated in stages to allow proper sealing of the boreholes, while not penetrating deeply into the surrounding (dissolutioned) carbonate rock. Hydrated bentonite is routinely used to plug borings completed in the Austin Chalk, Glen Rose, and other karst formations that are encountered in the State.

The primary concern of the Commission was in 1998, and remains, to plug open penetrations to prevent the movement of pollution from the surface to the Edwards Aquifer through wells or borings. Since bentonite grout with a cement plug, as stated in the definition, and as utilized in practice, achieves a seal equivalent to the cement slurry method, it should be allowed as meeting the "non-shrink grout" test while having separate mechanical properties.

Committee Recommendation

The EAPP recommends that a bentonite grout with concrete cap method be considered as an equivalent plugging method for purposes of the Edwards Aquifer Protection Program when compared to a non-shrink grout, or cement slurry.

This will result in consistency among EAPP staff and the regulated community when determining the utilization of bentonite grout for drilling and plugging applications.

Support for this conclusion comes from TDLR rulemaking and current common drilling practices.

Feedback to the Committee

☑ The recommendation is accepted as proposed.

☐ The recommendation is accepted with the following modifications. Comments:

Click here to enter text.

☐ The recommendation is being returned for further consideration. Comments: Click here to enter text.