COLORADO
Division of Water Resources
Department of Natural Resources

Board of Examiners of Water Well Construction
and Pump Installation Contractors

October 1, 2024

Policy 2024-1

CONCERNING THE PLACEMENT OF FILTER PACK ABOVE OR BELOW THE PERMITTED PRODUCTION ZONE IN TYPE 1 WELLS (EXCLUDING THE CONFINED SAN LUIS VALLEY AQUIFER)

Background

The Board of Examiners of Water Well Construction and Pump Installation Contractors ("Board" or "BOE") was created under section 37-91-103, C.R.S., and is tasked with adopting rules as necessary to protect the public health and the protection and preservation of groundwater resources provided in article 91, title 37, C.R.S. In particular, Rule 10.1 (2 CCR 402-2) requires all wells constructed to withdraw or inject water must be constructed, maintained, or repaired in such a manner that will:

a. maintain existing natural protection against contamination of aquifers;

b. prevent the entry of contaminants through the borehole;

c. limit groundwater production to one aquifer unless otherwise permitted by the State Engineer

d. prevent the intermingling of groundwater from different sources through the borehole.

Rule 10.4.5 (2 CCR 402-2) outlines the construction requirements for Wells Constructed into Type 1 Aquifers (Aquifers underlying a confining layer). The minimum grout interval differs between Type 1 Aquifers penetrating a single confining layer and multiple confining layers, but each rule requires the grout interval to begin at the base of the confining layer directly above the permitted production zone.

Many well designers constructing municipal or other high capacity wells in the Denver Basin or Denver-Julesburg Basin seek to maximize well production by placing perforated screen intervals adjacent to all sandstone layers within the permitted production zone. In order to place screen intervals at the very top of the aquifer and to accommodate for the settling of filter pack, Board Staff receives requests to place additional filter pack, fine-grained sand, or bentonite (collectively "transition material") above the top of the permitted production zone. Similarly to accommodate geophysical tools and the sloughing of borehole sediment, Staff entertain requests to drill the borehole past the base of the permitted production zone, often called a sump and/or rathole.

Objective

This policy will provide guidance on the requirements to request adjustments and the parameters of the adjustments to the required grout interval above the permitted production interval or drilling below the base of the permitted aquifer interval to accommodate a sump and/or rathole in Type 1 aquifers (excluding the Confined San Luis Valley Aquifer).

Policy

Any change to the permitted production zone due to site specific information must receive prior approval from the Hydrogeology Section of the Division of Water Resources. Any changes to the required grouted interval above the base of the confining layer overlying the permitted production interval, or requests for a sump and/or rathole must receive prior approval[1] from Board Staff or the Board via the variance process required by Rule 18. Variances to adjust the required grout interval or to allow the installation of a sump and/or rathole below the permitted interval must be confirmed with a geophysical log of the subject well or other nearby, representative geophysical log(s).

At the top of the aquifer, the placement of filter pack, fine-grained sand, or bentonite must not exceed 40 feet above the top of the permitted production zone. The remaining annulus must be grouted with approved grout from the top of the transition material to the top of the well (in accordance with Rule 10.5.2.1). In order to consider a variance to the required grout interval, there must be a minimum 30-foot interval of confining unit between the top of the transition material and the overlying aquifer.

At the bottom of the aquifer, the sump/rathole must not exceed 40 feet below the permitted production zone. Variances for sumps or ratholes must maintain an undrilled 30-foot confining unit interval between the permitted aquifer and the aquifer below. If the sump/rathole interval is within a confining unit zone it may be filled with filter pack or other fill materials. If an underlying aquifer is encountered during the drilling of the sump or rathole, the borehole must be plugged with neat cement grout or cement-bentonite grout, from the bottom of the borehole back to the bottom of the permitted production zone.

Approval

This policy may only be modified or revoked in writing by the Board of Examiners of Water Well Construction and Pump Installation Contractors.

Approved October 1, 2024

Christoper J. Sanchez, P.G., Chairperson
Board of Examiners of Water Well Construction
and Pump Installation Contractors

[1] Prior Approval means verbal or written approval from Board Staff prior to drilling below the permitted production interval or prior to installing transition material above the permitted production interval. Variance requests must precede the drilling of the well, when practicable.