



good idea to reconsider this issue in the future. Craig noted that this draft procedure primarily focuses on vertical travel-time downward from the vicinity of the leachfield, down to the top of the aquifer proposed to be tapped by a drilled well (regardless of whether that aquifer is a sand-and-gravel aquifer (“unconsolidated”) or a bedrock aquifer.

Mark reviewed the details of the draft procedure. Subcommittee member Steve Revell saying noted that there could be a lot of questions from the full TAC as the Subcommittee found there were several issues that were hard to decide. The procedure could be applied to existing wells when considering installation of a wastewater system but only if the well construction complies with the draft procedure. Most drilled wells for single family residences are not grouted as specified in the draft procedure.

Ernie asked about the requirement to grout the well to a depth of at least 50’ and wondered if this might result in more grouting than necessary. Ernie gave an example of a gravel well that is 20’ deep. The soil profile is 4’ of sand, 8’ of clay, and 8’ of gravel with a watertable at 12’. In this case the well only need be grouted to a depth of 12’. As drafted, the procedure would require a well that extends through the same soil profile into bedrock at 20’ to be grouted to a depth of at least 50’.

Roger asked if there is consensus that 8’ of low-permeability material is sufficient for the protection of the underlying aquifer.

Craig explained the Subcommittee’s calculations to arrive at this 8-foot minimum thickness of low- permeability materials. The Subcommittee started with a Darcy equation for groundwater velocity:

$$V = \frac{(k)(i)}{n}$$

where k is saturated hydraulic conductivity, i is the hydraulic gradient (in this case the vertical hydraulic gradient, and n is the porosity of the low-permeability material.

The Subcommittee applied this equation to vertical saturated flow downward through an impeding layer of low-permeability material, using an estimated K-sat. value of 0.01 ft/day for soil textures described in the draft procedure (generally clays, silts, and silt or clay loams). This is a typical value for clays and silts such as glacial lake or marine bottom sediments, and for tills, used by DEC in other evaluations related to two-year time-of-travel calculations, and by the WSD in source protection area calculations. The hydraulic gradient was assumed to be 0.40, and the porosity was assumed to be 36% ( a reasonable value for low-permeability materials, which can range from 30% to 40% or higher. In the past, very conservative analysis of vertical time-travel downward through impeding materials have typically used a hydraulic gradient of 1.0 (the maximum likely gradient). Craig and Steve indicated that in their experience, field testing on sites with

slow-permeability overburden materials typically had hydraulic gradients in the range of 0.1 to 0.4.

The calculation of vertical saturated groundwater velocity then appears as:

$$V = \frac{(0.01)(0.40)}{0.36} \quad \text{therefore } V = 0.0111\text{ft/day}$$

At that velocity, to achieve at least two years of travel time (730 days), 8.1 ft. thickness of low-permeability material is needed.

Claude asked about situations where there is an unconfined aquifer overlying a confined aquifer and the proposal is to complete the well in the underlying confined aquifer. Craig suggested that these situations could support a reduction in isolation distance, and the existing rules allow for a reduction, but the analysis should require a site-specific hydrogeologic evaluation that is not included in the simplified approach in the draft procedure unless the impeding layer between the two aquifers, and the well design, meet the requirements in the draft procedure.

Ernie asked about the grouting of the annular space around the well casing and if grouting can be done when the well is drilled using the concentric method. Craig said this was discussed in the Subcommittee: when the well is drilled through a clay layer, the expectation is that the clay will be saturated for most or all of its thickness, and therefore it will be plastic enough that it will quickly settle tightly against the well casing. However, to provide multiple barriers the Subcommittee included the grouting requirement in all situations. So, in all situations, including drilling through a clay impeding layer, to meet the criteria in the draft procedure the casing must be sealed by grout. In the concentric drilling method, this can be accomplished with minor cost and time by sprinkling bentonite around the outside of the casing as the casing is advanced into the well bore.

Peter asked about the vertical travel rate under leachfields constructed in sand. Craig replied that travel time in 4' of sand or gravel required above bedrock in the current rules would be minutes or hours at the most. Peter also asked about the fate of nitrates discharged from a leachfield. The nitrates are only slowly converted to nitrogen during passage through the soil.

Peter asked if till soils would be classified as low-permeability under the draft procedure (and therefore meet the phrase "impeding layer" in the current WSR). Craig said they would and that was the intent of the Subcommittee, though Ernie and Roger said that some ablation tills might be a concern. This needs to be evaluated and clarified.

Mark suggested that the procedure could be used to reduce the overshadowing issues because a neighbor would be able to install a well closer to a proposed leachfield. This would have an impact on the neighbor, as they would have to agree to grout their well.

However it might be a reasonable approach if it allowed both landowners to develop their property.

Ernie said he is concerned about stating that three test pits are sufficient to evaluate the site. The Subcommittee said that three is the minimum number and agreed to look at the issue some more. The best approach will be to discuss the proposal with the regional office staff in advance and agree on the number of test pits needed, just as with a seasonal groundwater monitoring program where the number of monitoring wells can be agreed upon in advance, because each case will be site specific.

Roger asked again if there is consensus about relying on 8' of slowly permeable soil. Ernie said he wanted to review the issue with his staff before committing to the concept. Steve Rebillard said that based on his work in Alaska he would be very comfortable with relying on 8' of low-permeability materials ("impeding layer" per WSR). Scott asked how long it would take to get feedback from the Regional Office staff and Ernie said a couple of weeks or less.

#### **Innovative/Alternative Systems:**

Cindy said that she is getting requests for the use of plastic septic tanks and asked for TAC comments. Gail asked if there are various quality tanks. Steve Revell and Justin said there are variations with some tanks being very well constructed and that well constructed tanks should be approved. Craig asked if there is an NSF certification for septic tanks. The answer was not known but people noted that with the expense of getting an NSF certification for every different tank it was so expensive that most companies do not apply.

Cindy said that she is also reviewing the Geoflow product which is a large diameter plastic pipe with a filter fabric and plastic mesh wrap. The product is similar to the currently approved EnviroSeptic pipe and the TAC consensus was that it could be approved.

#### **UIC Draft Conditional Exemptions:**

Cindy gave a quick overview noting that the goal is to have as many injection wells as possible qualify for an conditional exemption that would still prohibit improper discharges but not require the expense and time of getting a UIC permit for things such as foundation drains or the disposal of water treatment system backwash for single family residences. Rodney asked that injection well be used instead of discharge well and Kim urged the use of standard language for stormwater discharges. Scott asked about the 20,000 GPD limit for the conditional exemption for geothermal wells and if there is a relation to the groundwater withdrawal rules. Jim Ashley talked about geothermal systems and said that many systems, 50% or more, need more than 20,000 GPD based on 24 hour run cycle. For example, a 6 ton capacity system would require 26,000 GPD. The reason for a limit extends back several years when there were initial concerns about thermal impacts on neighboring properties. More recent information indicates that the

thermal impact does not extend very far horizontally from the well. Roger said that he had heard that was some recent concern that the temperature change was changing the water chemistry in the well. Cindy said that there is an ongoing study in New Hampshire to see if there are any problems with metal mobilization with high temperature discharge water.

Anne said that there is an underlying assumption that a UIC permit is not required if the discharge is regulated by the Department under another set of rules and therefore it may be possible remove some categories of exemptions that are always regulated under other rules.

Items prioritized for discussion with high, low, and medium ranking

1. Soil identification vs. perc test **medium**
2. Curtain drain with presumption of effectiveness **high**
3. Revisions to desktop hydro chart **medium**
4. Minimum amount of sand under a mound **high**
5. Water Supply Rule update **high**
6. Seasonal High Water Table determination for performance based systems **high**
7. Wastewater Strength

### **Executive Committee**

Steve Revell, Ernest Christianson, Roger Thompson  
Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

### **Subcommittees**

Hydrogeology –

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, and Steve Revell.

Overshadowing of Isolation Distance Issues –

Anne Whiteley, Ernie Christianson, Roger Thompson, John Beauchamp,  
Gail Center, Chris Thompson

UIC Rules and Geothermal Wells -

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart,  
Rodney Pingree, Kim Greenwood, Cindy Parks

SHWT Monitoring –

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski,  
Dan Wilcox

UIC Rules and Disposal of Wastewater from Water Treatment Systems –

John Beauchamp, Gary Adams, Roger Thompson, Ernie Christianson,  
Gail Center, Cindy Parks

Wastewater Strength -

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson,  
John Akielaszek,

Bottomless Sand Filters-

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk