

***Interactive comment on “Vertical hydraulic conductivity of a clayey-silt aquitard: accelerated fluid flow in a centrifuge permeameter compared with in situ conditions” by W. A. Timms et al.***

**Anonymous Referee #1**

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This paper needs major revisions concerning the discussion of results. The  $K_v$  values presented cause me to conclude that flow in vertical fractures is common in many of the samples because the values reported are higher than what is expected from unfractured, intact silty clay samples with more than 10–15 percent clay size particles, particularly clay that is smectite rich.

So there needs to be discussion of the evidence for and against the presence of vertical fractures. This needs to include a discussion of the geologic origins and post depositional influences on the deposits focused on the evidence for the presence or absence of fractures. This would require a geologic literature review–best to discuss with a ge-

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ologist. Aquitard science is mostly about the presence or absence of fracture effects because this is generally what governs aquitard integrity. I suspect that the centrifuge method errors on the high side. The issue of error or bias needs more consideration.

In general  $K_v$  values for smectite rich silty clay sample at insitu stress conditions should be less than 10–8 cm/sec.

This paper represents a lot of good work and I hope that the authors will hang in there and elevate the discussion of the results and re submit.

Comparison to slug tests done in piezometers is not very useful because these tests mainly show  $K_h$  and  $K_h$  is typically much larger than  $K_v$  due to micro bedding effects. That is why papers that address  $K_v$  are so important. Good  $K_v$  values are hard to come by.  $K_h$  is easy and that is why we have so much  $K_h$  in the literature.

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