



## Flow logs

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Cc: wdanskin, rji45, Anthony A Brown

11/22/2012 11:07 AM

Good morning - some musings on last night's flow logs (Wes, the email to you from last night got kicked back to me - I re-sent this morning, but please let me know if it hasn't reached you).

Specific yield of the well =  $52 \text{ gpm} / 265 \text{ ft} = 0.2 \text{ gpm/ft}$

I've attached some work-ups of the pumping data that I threw together quickly this morning. I'll send the flow-logs separately since they are pretty big. I did a quick and dirty % flow based on the raw 15 fpm flow log, which is to be **taken with a HUGE grain of salt**.

A rough reading of the uncalibrated flow-log would suggest that the contribution of the screens at shallower than 430' are under-represented in the logs (since it appears the tool pegged). Even if the top portion is not under-represented, greater than ~80% of the flow is contributed above 720 (per the 15 fpm, again taken with a grain of salt) or 830 (per the 20 fpm).....I tend to think that the 15 fpm is probably the better of the two logs.

We were only able to log to ~1115' due to sediment in the bottom of the well. Even though we didn't get all the way down, given the portion of the screen that is below where we logged, the bottom is probably close to zero flow. The fact that there is up to 15' of sediment in the bottom of the hole could further indicate that there isn't much upward flow from down there.

Not sure what people want to do next.

If we do run the pump down deeper to try to stress the bottom of the aquifer and want to collect flow logs, **we should run the tool down in front of the pump** (before placing the pump any deeper). It was mildly challenging getting the tool below the pump at 273' and will only get harder with more column in the hole (Steve had suggested this a while back).

A list of 'pies in the sky' (things that would be good to do, but that we may not have the time/\$\$ to do) [with relative difficulty rating and estimated time investment in brackets]:

1. Step test with the pump at it's current depth: pump at 4 rates for ~1.5 hours each (15, 30, 45, and 60 gpm) [moderate - 1 day]. We could concurrently run 15 fpm flow-logs at each of these pump rates during the step test without adding additional time - **lizzy**, do you think we could vary the pump rate (vs. varying the drop rate) to calibrate the tool (at least in the blank casing)?
2. Run unpumped stop-counts at 280' and run a 15 fpm unpumped log in the blank casing at the top of the hole. I was planning to get a zero flow stop-count in the sump, but was unable to due to sediment in the casing - there was not time last night after we finished the 15 fpm logs to allow the well to recover and collect stop-counts or a log in the blank casing. [easy - a few hours]
3. Collect 5 and 10 fpm flow logs with the pump at its current location. [moderate - 1 day]
4. Is flow contribution from the 'Lusardi Fm' at ~500' preventing the lower portions of the well from contributing flow (Darcian vs. Pipe Flow philosophies....)? If so, do we want to drop the pump to the blank at 760' - 780'? If so, which pump (big/little)? If we do want to lower the pump, then as I said, I would recommend placing the tool in the hole first. Do we want to just pump, or run step-tests from this depth? [moderate to difficult - >1 day]
5. Run step tests at 760-780 (see above). [moderate to difficult - 1 day]

6. The cheese stands alone.

Hope everyone has a great thanksgiving!

-David

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SDSE Pump Tests.xlsx