

WELL SUMMARY

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Location ID: ST-4-690 Field Representative(s): D. Menzie, M. Canavan

Date Started: 08/18/92 Date Completed: 10/05/92

Northing: 232181.75 Easting: 400374.63

Brass Cap: 4491.16 Outer Casing: 4493.57 Inner Casing: 4494.11

Drilling Method: Mud/Air Foam Rotary Drilling Contractor: Larjon Drilling Co.

Driller: J. Gower

Total Depth Borehole: 763' Total Depth Well Casing: 715.71' G.S.

Total Depth Surface Casing: 75'

Diameter Well Casing: 4" Diameter Surface Casing: 10"

Length of Bottom Blank: 5.29'

Type of Screen: extra strength 0.02 slot

Screen Interval: 690.42' to 710.42'

Water First Detected: 470' Water Level Open Borehole: 422.0' G. S. (09/03/92)

Water Level Cased Borehole: 422.18' G. S. (10/13/92)

Quik-Foam Use: 17 gallons

Estimated Water Use: 35,200 gallons

Well Casing:

4in x 3ft SCD 40 PVC:

4in x 5ft SCD 40 PVC:

4in x 10ft SCD 40 PVC:

4in x 20ft SCD 40 PVC:

Total SCD 40 PVC pipe: ft

custom SS centralizers:

4"x2' SS locking riser: 1 x 2'

4" SS locking cap:

4" SS female cap: .28'

Adaptor(s): 1.25' (3)

4in x 3ft SCD 5 SS pipe: 1 (cut to .41')

4in x 5ft SCD 5 SS pipe:

4in x 10ft SCD 5 SS pipe:

4in x 20ft SCD 5 SS pipe: 20 x 20' = 402.06'

4in x 5ft SCD 10 SS pipe: 1 x 5.01'

4in x 10ft SCD 10 SS pipe: 1 x 9.97'

4in x 20ft SCD 10 SS pipe: 14 x 20'

280.02'

Total SCD 5 SS pipe: 402.06'

Total SCD 10 SS pipe: 295.83'

Well Completion:

100# bags 16/40 sand: 3 bags
 100# bags 8/20 sand: 150 bags
 94# bags cement: 180 bags
 50# bentonite powder: 18 bags
 Benseal: 2 bags

Surface Casing:

94# bags cement: 40 bags
 50# bags bentonite powder: 4 bags

Pertinent Field Notes:

08/17/92 Steam clean and mobilize mud rotary equipment. Set up to drill for surface casing. - Menzie

08/18/92 Finish set up to drill. Drill 12 1/4" pilot hole with mill tooth bit from 0'-75'. Ream pilot hole to 16" from 0'-40'. - Menzie

08/19/92 Finish reaming pilot hole to 16" from 40'-75'. - Menzie

08/20/92 Run 75' of 10" steel surface casing and grout annulus to surface. - Menzie

08/21/92 Demobilize mud rotary equipment. Finish repairs to air-foam rotary drill rig. - Menzie

08/24/92 Steam clean and mobilize air/foam rotary equipment to site. Begin set up to drill. - Menzie

08/25/92 Finish set up drill. Drill air/foam rotary with 9 7/8" tri-cone button bit from 75' to 307'. - Menzie

08/26/92 Repair fan bearings on rig engine. Drill 307' to 413'. - Menzie

08/27/92 Drill 413' to 613'. Burned compressed air filters. - Menzie

08/31/92 Perform equipment maintenance while waiting for filters. - Menzie

09/01/92 Install new compressed air filters. Drill 613' to 737'. - Menzie

09/02/92 Repair hydraulic line on BE rig. Drill 737' to 763' (TD). - Menzie

09/03/92 Tried to run geophysical logs but hole is blocked at 619'. Try to break through with bailer with no success. - Menzie

Pertinent Field Notes: (cont'd)

- 09/04/92 Set up to go into blocked borehole with mud rotary equipment. - Menzie
- 09/08/92 Haul water for mud and finish set up for drilling. - Menzie
- 09/09/92 Go back into borehole using mud rotary method to clear bridge at 619'. - Menzie
- 09/10/92 Ran full suite of geophysical logs to 762'. Steam clean and mobilize completion materials and equipment. - Menzie
- 09/11/92 Ran tremie to 735' and pumped 3,500 gallons of clear water to thin mud. Pumped extra thick bottom plug. Assembled and hung 195' of 4" SS casing in borehole. - Menzie
- 09/12/92 Ran the rest of the 4" SS casing to 700'. Placed 20' extra strength 0.02 slot screen at 670'-690'. Installed gravel pack of 8/20 sand and pumped upper plug. - Menzie
- 09/14/92 Bailed well as directed by project hydrogeologist and 4" SS casing separated because of defective weld at 280' below ground surface. Set up and begin fishing for the remaining 480' of 4" SS casing in borehole. - Menzie
- 09/15/92 Continue fishing for lost casing string. - Menzie
- 09/16/92 Continue fishing for lost casing string. - Menzie
- 09/17/92 Use downhole camera to locate top of casing string. It had sunk through gravel pack, plugs, and heavy mud to bottom of hole. Lock on to casing with fishing tool and retrieve the whole string. - Menzie
- 09/18/92 Clean casing and set up to re-drill hole using mud rotary method. - Canavan
- 09/21/92 Continue setting up to re-drill hole. - Menzie
- 09/22/92 Re-drill borehole to 748'. Run caliper log to 746'. - Menzie
- 09/23/92 Pump lower benseal plug. Ran 715' of 4" SS casing with 20' extra strength 0.02 slot screen placed at 690'-710' interval. Installed gravel pack of 8/20 sand and pumped upper benseal plug. - Menzie
- 09/24/92 Poured filler sand to \approx 10' above static water level. - Menzie
- 09/25/92 Pump 1st load of grout in annulus. - Menzie
- 09/28/92 Pump 2nd load of grout. - Menzie
- 09/29/92 Surge and bail well for initial development. Install 1 1/2 HP submersible pump at 609'. Pump well for final development. - Menzie

Pertinent Field Notes: (cont'd)

- 10/01/92 Pump well for development. - Menzie
- 10/02/92 Pump well for development. - Menzie
- 10/05/92 Pump well for development. pH, temperature and conductivity are stable. Turbidity is consistently less than 5 NTU's. Well developed, pull pump and demobilize completion and development equipment. - Menzie
- 10/13/92 Measure post-development water level at 422.18' G.S. - Menzie