Location ID: BLM-13-300 Field Representative(s): P. Egan

Northing: 226664.58 Easting: 410157.20

Date Started: 16 August 1988 Date Completed: 2 September 1988

Drilling Method: Mud/Air-foam rotary Drilling Contractor: Larjon

Driller: J. Gower

Total Depth Borehole: 322' Total Depth Well Casing: 316'

Total Depth Surface Casing: 101'

Diameter Well Casing: 4" Diameter Surface Casing: 8"

Length of Bottom Blank: 5.34'

Type of Screen: regular strength 0.02 slot

Screen Interval: 300' to 310'

Water First Detected: 281' Water Level Open Borehole: 237.3' (ground level)

Water Level Cased Borehole: 236.15' (ground level)

Quik-Foam Use: 5 gallons, 10 bags economy gel for mud drilling

Estimated Water Use: 2300 gallons used during drilling
1030 gallons recovered
1270 gallons lost to formation

Well Casing:

| | | | |
|---|---|---|---|
| 4in x 3ft SCD 40 PVC: | 2 | stock SS centralizers: | |
| 4in x 5ft SCD 40 PVC: | 1 | custom SS centralizers: | 1 |
| 4in x 10ft SCD 40 PVC: | 16 | 4"x2' SS locking riser: | 1 |
| 4in x 20ft SCD 40 PVC: | 2 | 4" SS locking cap: | 1 |
| Total SCD 40 PVC pipe: | 211 ft | 4" SS female cap: | 1 |

| | | | |
|---|---|---|---|
| 4in x 3ft SCD 5 SS pipe: | | 4in x 5ft SCD 10 SS pipe: | |
| 4in x 5ft SCD 5 SS pipe: | 1 | 4in x 10ft SCD 10 SS pipe: | |
| 4in x 10ft SCD 5 SS pipe: | 1 | 4in x 20ft SCD 10 SS pipe: | |
| 4in x 20ft SCD 5 SS pipe: | 4 | | |
| Total SCD 5 SS pipe: | 95 ft | Total SCD 10 SS pipe: | ft |

Well Completion:

| | | |
|---|---|---|
| 100# bags 16/40 sand: | 4 | bags |
| 100# bags 10/20 sand: | | bags |
| 100# bags 8/14 sand: | | bags |
| 100# bags 8/20 sand: | 17 | bags |
| 94# bags cement: | 60 | bags |
| 5 gal. buckets bentonite: | 1 | buckets (1/4" pellets) |
| 50# bentonite powder: | 8 | bags |

Surface Casing:

| | | |
|---|---|---|
| 94# bags cement: | 45 | bags |
| 50# bags bentonite powder: | 3 | bags |

Pertinent Field Notes:

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| 8/16/88 | Steam clean equipment. Drilled 0'-75', 12 1/4" bit with mud rotary. Used 10 sacks gel. 150 gallons water used. |
| 8/17/88 | Drilled 75'-100', 12 1/4" bit with mud rotary. Grouted 8" x 101' surface casing. Used 45 sacks cement, 3 sacks economy gel. 50 gallons water used during drilling. |
| 8/24/88 | Steam clean CP rig and drill pipe and set up on well pad. |
| 8/25/88 | Drilled 100'-107', 7 7/8" air foam rotary. Engine overheated. Let engine cool, drill 107'-108'. Blew head gasket on engine. Rig down for day. |
| 8/26/88 | Cotton and Tommy repaired rig by 3 pm. Drill from 108'-241'. Encountered bedrock at 215'-220' interval. No water detected. 1500 gallons water used. |
| 8/27/88 | Drilled 241'-322' (total depth). Water first observed at 281'. Monitor main and auxiliary compressors. 500 gallons water used. Static measured in evening at 259.1'. |
| 8/28/88 | Let borehole recover before logging. Monitored static: 10 am = 237.3', 2:30 pm = 237.3'. |
| 8/29/88 | Hole logged by Don Pearson of Southwest Surveys. Ran standard suite of logs plus drift. Chose screened interval 302'-312' (4' tolerance). No bottom plug. Install bottom sand. Install 100' of 4" well casing and suspend in surface casing for safety. |

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|---|---|
| 8/30/88 | Install remainder of casing. Total casing = 319.13′ x 4". (Well casing is Sch 5 stainless steel to ≈ 20′ above static, then Sch 40 PVC to surface). Install gravel pack and top plug. Had problems with bentonite pellets reaching desired location. Most of the pellets were sticking to sides of borehole. Sounder was stuck several times. Lost stainless steel weight from sounder in the bentonite. Decided to pump bentonite gel for upper plug. Successfully pumped plug but had a difficult time sounding top of slurry. Let set overnight to allow the slurry to thicken (slurry mixture: 40 gallons water and 1 1/4 bags bentonite gel). |
| 8/31/88 | Slurry thickened enough to sound. Upper plug is 11′ thick. Emplace 16/40 sand and filler sand above plug. Grout to surface. |
| 9/1/88 | Begin development by bailing. Set pump at 301′. Well can sustain a pump rate of 2 gpm for ≈ 1/2 hour. After this, pump must be shut off and well given an hour to recover. |
| 9/2/88 | Continue development. |
| 9/6/88 | Pour pad. |
| 9/7/88 | Development complete. Pumped 477.5 gallons. |