

121-06925

20-2N-54W

DRILL STEM TEST RECORD



99999999

Drill Stem Test #1

4811 to 16

SCANNED

Tested between packers with total depth at 4852. The tool was open 3 minutes, shut in 30 minutes, open 60 minutes, shut in 30 minutes. It had a good blow building to 2 pounds in 5 minutes, 3 pounds in 15 minutes, 4 pounds in 25 minutes, 5 pounds in 35 minutes, 6 pounds in 45 minutes and 7 pounds in 55 minutes. Gas reached the surface 3 minutes after the tool was shut in for a total of 66 minutes. The volume was too small to measure. The test recovered 660 feet of fluid, 330 feet of 38 gravit oil at 58° partly mud cut and 330 feet of muddy water.

Due to the rapid drop of the bottom chart to 1200 pounds approximately the shut in pressure there is a question whether the bottom packer held and the water is from below the test interval.

Initial Flow Pressure	45	pounds per square inch
Final Flow Pressure	253	pounds per square inch
Initial Shut in Pressure	1134	pounds per square inch
Final Shut in Pressure	1090	pounds per square inch
Initial Hydrostatic Pressure	2612	pounds per square inch
Final Hydrostatic Pressure	2496	pounds per square inch
Bleed off Pressure	1200	pounds per square inch
Temperature	164°	

Drill Stem Test #2

4809 to 13

Tested between packers with the total depth at 4852. The tool was open 1 hour, then shut in for 30 minutes. It had a good blow building to 27 pounds in 5 minutes and to 35 pounds in 10 minutes when gas reached the surface. Gas measured 5 pounds thru 3/8 inch orifice in 25 minutes which was 30,100 cubic feet per day to 6 pounds in 40 minutes or 33,200 cubic feet per day and back to 5 pounds or 30,100 cubic feet per day at end of test period. The test recovered 570 feet of fluid, 520 feet of oil and 50 feet of water.

Initial Flow Pressure	60	pounds per square inch
Final Flow Pressure	177	pounds per square inch
Final Shut in Pressure	1018 building	pounds per square inch
Initial Hydrostatic Pressure	2644	pounds per square inch
Final Hydrostatic Pressure	2568	pounds per square inch
Bleed Off Pressure	1275	pounds per square inch
Temperature	164°	



00599753

CORE DESCRIPTION AND CORE ANALYSIS RECORD

Core #1	4800 to 52	Full Recovery
8' - 0"	Sand gray fine porous weak fluorescence (gas) streaks laminated with shale (3" between 01 and 02) (2" between 04 and 05), several streaks between 06 and 08.	
11" - 0"	Sand gray fine porous good fluorescence, odor, and saturation, streaks laminated with shale dark gray. 3" at 4810; 3" 13 to 14 and 14 to 15; 16½ to 17½ 50% shale.	
23' - 0"	Same, no show	
2' - 0"	Slightly reworked and thinly laminated shale dark gray and siltstone gray, 6" sand bed.	
3' - 0"	Sand as above, no show	
4' - 0"	Laminated sand shale and siltstone with few thin beds of sand, no show.	
1' - 0"	Shale dark gray.	

DATA SHEET AND DISCUSSION

LOCATION: SE SE (661 feet North of South line and 662 feet West of East line), Section 20, Township 2 North, Range 54 West, Washington County, Colorado.

COMMENCED: February 18, 1960

COMPLETED: February 24, 1960 set 4½ inch casing

CONTRACTOR: Exeter Drilling Company, Denver, Colorado

CASING: Set 3 joints, 90 feet of 8 5/8 inch, 24 pound, 8 round thread new casing at 102 feet with 90 sacks of cement, 2% Calcium Chloride 4% Gel. Set 162 joints, 4916.10 feet, of 4½ inch, 9.5 pound, 8 round thread new casing at 4926 feet with 125 sacks of 50-50 posmix, 2% Gel. Centralizers at 4918, 4884, 4848, 4829 and 4797. 6 sections Halliburton Roto Wall scratchers 4925 to 4886 and 10 sections, 4854 to 4790, plug at 4901.

MEASUREMENTS: All measurements are taken from the kelly bushing approximately 9 feet above the ground elevation. The "D" Sand, and core check within 1 foot, however, the "J" Sand and total depth are 4 feet deeper than drilled depths on the log. The kelly bushing was 10.85 feet above the casinghead.

ELEVATION: 4510 Ground (Powers) - 4519 Kelly Bushing

<u>Formation</u>	<u>Sample Tops</u>	<u>Log Tops</u>	<u>Datums</u>
Niobrara	3975	3980	✓ 539
Timpas	4332	4338	✓ 181
Carlile	4381	4391	✓ 128
Greenhorn	4470	4474	✓ 45
Mowry	4701	4706	- 187
Brown Lime	4707	4711	- 192
"D" Sand	4789	4790	- 271
"J" Sand	4877	4882	- 363
Total Depth	4925	4929	- 410

DISCUSSION: The "D" Sand, 4790 (-271) was cored 4800 to 4852. Judging from the samples and log the top bench, 4790-95, is a silty tight sand with no show. From 4798 to 4808, is gas sand cut with thin beds of laminated or slightly reworked tight sand and shale, 4808 to 19 is oil sand cut the same way and below 4819 is water sand. Using the core, core analysis, and drill stem tests, it is recommended this well be perforated at 4816 and the fluid tested. If sufficient oil can be obtained at this point, the zone 4815 to 17 should be perforated and the well produced until such time as block squeezing is warranted. Care should be taken not to perforate the tight sand, 4813 to 15, or in the shaley part, 4817 to 18. When block squeezing is warranted, at this time or in the future, the bottom foot of the tight sand, 4814 to 15 should be perforated and the well squeezed, then the zone 4809 to 13 perforated for production.

SAMPLE LOG

3900-10	Shale dark gray
20	Ditto
30	Ditto
40	Ditto
50	Ditto
60	Ditto
70	Ditto
3975	<u>Micbraca</u>
80	Ditto
90	Ditto
4000	Ditto
4000-10	Ditto
20	Ditto
30	Ditto; trace shale dark gray mottled buff calcareous
40	Ditto; trace ditto
50	Ditto; trace ditto
60	Ditto; little ditto
70	Shale gray to dark gray, mottled white to brown calcareous and shale dark gray
80	Ditto and ditto
90	Ditto and ditto
4100	Ditto and ditto
4100-10	Ditto; little ditto
20	Same
30	Same
40	Same
50	Same
60	Same
70	Same
80	Same
90	Same
4200	Same
4200-10	Same
20	Same
30	Same
40	Same; more shale
50	Same
60	Same
70	Same
80	Same
90	Same
4300	Same
4300-10	Same
20	Same
30	Same
4352	<u>Timpa</u>
40	Same
50	Same; trace limestone white dense
60	Same
70	Same and limestone white to buff dense
80	Same and ditto
4381	<u>Carilla</u>

4380-90	Shale dark gray and limestone white to buff dense; little calcareous shale as above
4400	Ditto and ditto; little ditto
4400-10	Ditto and ditto; trace ditto
20	Ditto; little ditto; trace ditto
30	Ditto; trace ditto
40	Ditto; trace ditto
50	Ditto; trace ditto
60	Ditto; trace ditto
70	Ditto; trace ditto
4470	<u>Greenhorn</u>
80	Ditto
90	Ditto
4500	Ditto; trace siltstone gray
4500-10	Ditto; little ditto
20	Ditto; little ditto
30	Ditto; little ditto
40	Ditto; little ditto
50	Ditto; little ditto
60	Ditto; trace ditto
70	Ditto; trace ditto
80	Ditto; trace ditto
90	Ditto; trace ditto; trace limestone buff crystalline
4600	Ditto
4600-10	Ditto
20	Ditto
30	Ditto
40	Ditto; trace limestone buff crystalline
50	Ditto; trace ditto
60	Ditto; trace ditto
70	Ditto; trace ditto
80	Ditto
90	Ditto
4700	Ditto; trace siltstone gray
4701	<u>Mowry</u>
4707	<u>Brownline</u>
4700-10	Ditto
20	Ditto
30	Ditto; trace limestone buff crystalline
40	Ditto; trace ditto; trace bentonite gray
50	Ditto; trace ditto; trace ditto
55	Ditto
60	Ditto
65	Ditto
70	Ditto
75	Ditto
80	Ditto
85	Ditto
4785 Circ.	
30 Min.	Shale dark gray to black
4785 Circ.	
60 Min.	Ditto; 1. cluster sand, no show
4789 (-270)	<u>"D" Sand</u>

Sample Log (Continued)

3

4785-90	Shale dark gray to black
95	Ditto
4800	Ditto; trace sand gray fine silty tight, no show
4800 Circ.	
30 Min.	Ditto; little ditto; little siltstone gray
4800 Circ.	
60 Min.	Ditto; Ditto and ditto; 1 cluster weak fluorescence
4800-52	See Core Description
4852-55	Ditto; little sand gray fine; 1 cluster fluorescence
4858	<u>Base of "D"</u>
60	Ditto; little ditto; no show
65	Ditto; trace ditto, no show
70	Ditto
75	Ditto
4877	<u>"J" Sand</u>
80	Ditto; trace siltstone gray
85	Ditto; trace ditto; trace sand gray fine porous, no show
90	Ditto; trace ditto
95	Ditto; little sand gray fine silty tight, no show
4900	Ditto; little ditto, no show
4900-05	Ditto; little sand gray fine hard tight, no show
10	Ditto; little ditto, some soft silty
15	Ditto; little sand gray fine partly silty, no show
20	Ditto; little ditto
25	Ditto; trace ditto; trace argillite white
4925 Circ.	
30 Min.	Ditto; trace ditto; trace ditto
4925 Circ.	
60 Min.	Ditto; trace ditto; trace ditto

Discussion (Continued)

2

The "J" Sand, 4882 (-363) was drilled to 4929 and the samples checked. No shows were noted in the samples and the log calculated too high a water content to warrant testing.

Submitted by,

A handwritten signature in blue ink, reading "George D. Volk". The signature is written in a cursive style with a large, stylized "G" and "V".

GEORGE D. VOLK
Petroleum Geologist

GDV:sh

CASING SUPPLIMENT

	4926	Centralizer 4918
1	<u>22.75</u>	3 Scratchers Halliburton Roto Wall scratchers
	4903.25	Plug 4901
2	<u>18.84</u>	3 Sections Halliburton Roto Wall scratchers
	4884.41	Centralizer
3	<u>18.54</u>	
	4865.87	
4	<u>18.15</u>	1 Section Halliburton Roto Wall scratcher
	4847.72	Centralizer
5	<u>18.43</u>	3 Sections Halliburton Roto Wall Scratchers
	4829.29	Centralizer
6	<u>31.55</u>	5 Sections Halliburton Roto Wall Scratchers
	4797.74	Centralizer
7	<u>21.41</u>	1 Section Halliburton Roto Wall Scratcher
	4776.33	
8	<u>20.30</u>	
	4756.03	
9	<u>28.78</u>	
	4727.25	
10	<u>20.00</u>	
	4707.25	
11	<u>23.02</u>	
	4684.23	
12	<u>20.38</u>	
	4663.85	
13	<u>20.29</u>	
	4643.56	
14	<u>19.46</u>	
	4624.10	
15	<u>20.60</u>	
	4603.50	

DRILLING TIME RECORD

<u>From - To:</u>	<u>Minutes per 5-foot intervals</u>	<u>Remarks</u>
3900-50	4-3-3-3-3-2-2-2-2	
3950-4000	2-2-2-2-2-3-2-3-2-3	
4000-50	3-2-3-2-3-2-2-5-4-4	
4050-4100	5-5-4-3-3-3-4-4-3-3	
4100-50	3-3-3-3-3-3-3-3-4-5	
4150-4200	7-2-2-2-2-3-3-3-3-3	
4200-50	3-3-3-3-3-3-3-3-3-3	
4250-4300	2-2-2-2-2-2-2-2-2-2	
4300-50	3-3-3-3-3-3-3-5-5-6	
4350-4400	6-5-4-4-5-5-4-4-4-4	
4400-50	3-4-3-4-4-4-4-3-4-3	
4450-4500	4-3-4-4-6-6-6-5-6-11	
4500-50	16*-7-7-7-6-7-7-6-7-5	
4550-4600	6-5-6-7-5-5-5-5-5-5	
4600-50	6-8-5-6-5-7-6-7-7-6	
4650-4700	5-5-6-6-7-5-6-5-7-7	
4700-50	9-6-5-5-5-6-5-5-5-5	

Minutes per 1-foot intervals

4750-60	1-1-1-1-1-1-1-1-1-1
4760-70	1-1-1-1-1-1-1-1-1-1
4770-80	1-1-1-1-1-1-1-1-1-1
4780-90	1-1-1-1-1-1-1-1-1-2
4790-4800	2-2-2-2-2-2-2-2-2-2*
4800-10	8-7-10-8-8-7-7-9-9-5
4810-20	9-9-9-6-8-8-7-11-11-12
4820-30	12-13-10-8-12-12-11-12-7-5
4830-40	4-6-8-8-6-8-9-9-11-12
4840-50	11-11-7-9-11-13-9-9-8-8
4850-52	14-13*
4852-60	1-3-4-5-3-4-1-2
4860-70	2-2-3-6-4-5-5-6-6-6
4870-80	7-7-6-5-5-6-5-2-1-1
4880-90	1-1-1-1-2-4-12-11-25-25*
4890-4900	9-10-1-4-3-3-4-3-4-4
4900-10	1-4-4-10-10-7-4-3-4-7
4910-20	6-4-4-5-7-8-8-10-9-8
4920-25	9-9-8-10-18*

** Circulated Samples

Core #1
Core #1
Core #1
Core #1
Core #1
Core #1

(* - Trip)