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GEOLOGICAL REPORT

Horizon Oil & Gas Co. of Texas

#1-30 Adams C
SW NW Sec. 30-34S-30W
Meade County, Kansas

by

WILLIAM R. ATKINSON
Geologist

GEOLOGICAL REPORT

Horizon Oil & Gas Co. of Texas
 #1-30 Adams C
 SW NW Sec. 30-34S-30W
 Meade County, Kansas
 Kneeland East Field Development Well

Commencement Date: 5/15/69
 Completion Date: 5/25/69 pipe set
 Elevation: 2461 K.B. (Datum)
 2452 G.L. (Seward County Engineer)
 Total Depth: 4380 Driller
 4379 Schlumberger
 Contractor: Sage Drilling Co., Rig #4
 Electrical Surveys: Schlumberger Dual Induction Laterolog,
 BHC Sonic-Gamma Ray-Caliper and Proximity
 Log-Microlog with Caliper.
 Casing: Surface: 8 5/8" @ 1247'
 Production: 4 1/2" @ 4378' w/125 sx
 Special Equipment: Baroid Gas Detecting Equipment from approximately
 4030' to T.D.

Drilling of this well was witnessed and samples examined from
 approximately 4100 feet to T.D.

FORMATION TOPS AND STRUCTURAL COMPARISONS

	Horizon Oil & Gas Co. #1-30 Adams C, SW NW Sec. 30-34S-30W	Anadarko Prod. Co. #1 Adams, NE SW Sec. 30-34S-30W	Relative Position
Wreford	2808 (-347)	2812 (-352)	5' high
Council Grove Lime	2858 (-397)	2866 (-406)	9' high
Heebner Shale	4160 (-1699)	4174 (-1714)	16' high
Toronto Limestone	4188 (-1727)	4204 (-1744)	17' high
Lansing Limestone	4301 (-1840)	4314 (-1854)	14' high
Lansing Pay Zone			
Porosity	4311 (-1850)	4326 (-1866)	16' high
Total Depth	4380	6301	

SAMPLE DESCRIPTIONS

Toronto Limestone
 4188-4196 Cream to light buff colored, rough textured, medium
 crystalline, fossiliferous, slightly chalky limestone.

Fair to good small vug and fossilcast porosity. Some visible fractures. Fair yellow fluorescence and slight cut in carbontetrachloride. A 50 unit methane gas increase in the drilling mud was logged from this interval.

4196-4214

Limestone as described above except for a notable increase of chalk and lower quality porosity. The 50 unit mud gas reading described above, dropped to zero from 4196 to 4198, but increased to 10 units from 4198 to 4206.

These zones were covered by Drill Stem Test #1, 4190 to 4210.

D.S.T. #1 - 4190 to 4210

Tool open for 15 min. Pre-flow with strong blow immediately. Gas to surface in 1 min.

Gas gauged 3,500 MCF in 3 min. and stabilized.

Tool closed in for 30 min. shutin pressure.

Tool re-opened for 45 min. final flow period

Gas gauged 3,500 MCF in 3 min.

Gas gauged 3,800 MCF in 5, 10 and 20 mins.

Spray of mud in 23 min.

Spray of condensate in 25 min.

Gas gauged 3,100 MCF in 25 min.

Gas gauged 3,200 MCF in 30 min.

Gas gauged 3,400 MCF in 40 and 45 min.

Tool closed in for 30 min. shutin pressure

Recovered 240' of slightly mud cut condensate (gravity 50° @ 60° F), and 60' of salt water (124,000 ppm chlorides, .04 Rw @ 98° F).

ISIP 1330/30"

FSIP 1278/30"

FP 621-580 and 653-580

HH 2170-2150

BHT 110° F

Mud filtrate before test contained 49,500 ppm chlorides.

The salt water recovered on the above test is believed to have come from the porosity zone at 4200' to 4204', while the gas and condensate originated from the porosity at 4190' to 4194'.

4216-4230

White to light gray, medium crystalline to dense, very chalky, slightly fossiliferous limestone. Poor to no visible porosity. Actual mud gas readings from this

zone were unobtainable because of the contamination with gas from DST being approximately 300 units at the time of drilling this interval. However, from sample examination and electric log characteristics, it is not felt there is any gas or oil in the zone.

4236-4249 White to light gray, very chalky limestone as described above. Gas readings from this zone were partially masked by a recirculation of the 300 unit trip gas increase mentioned above. From the shape of the gas recorder curve, it was felt there possibly could have been a small gas increase coming from this zone. Electric log character of the zone, however, make it appear doubtful that the zone is gas bearing.

4258-4282 Light grayish-tan, medium crystalline, fossiliferous limestone with some fair visible vuggy and fossilcast porosity above 4266'. Below 4266' the zone was logged as being mostly white, dense very chalky, limestone with black fossils and oolites. Interbedded with this limestone was a considerable amount of light to medium gray, subwaxy shale. No shows or gas increases were logged from this interval.

Lansing Limestone

4301-4311 Light to medium gray, smooth textured, microcrystalline, dense limestone.

4311-4324 Tannish gray, very fine crystalline - succrosic dolomite or dolomitic limestone interbedded with gray, dense, microcrystalline to coarse crystalline, chunky, slightly chalky, fossiliferous limestone. Minute droplets of free oil in dolomite portion. The described succrosic-crystalline dolomite is believed to have good inter-crystalline porosity and permeability, although of such minute size that it is not apparent even under 45 power magnification. The coarse crystalline limestone portions were logged as having some small vug and fossilcast porosity and a few fracture planes which were noted to be bubbling gas in fresh wet samples. The limestone fragments displayed only poor shows of free oil and only a very slight amount of fluorescence and cut was noted in a few pieces. Wet samples, however, had a fair oil odor. A maximum mud gas increase of 15 units of methane was logged as coming from 4311 to 4322.

In anticipation of additional porosity zones and possible shows of oil from deeper intervals, the decision was made to drill to total depth and run logs prior to conducting any drill stem tests of the Lansing.

4324-4340 This interval was logged as being medium gray, slightly fossiliferous, very dense limestone which was somewhat shaley and contained some gray opeque sharp chert. The rate of penetration through this interval was quite slow, ranging from 8 to 12 minutes per foot. No visable porosity, oil shows or mud gas increases were logged from this interval.

4340-4351 Light gray and tannish gray, fine crystalline, mealy textured fossiliferous limestone containing small to medium sized oolites. Fair intercrystalline and fossilcast porosity as well as some oolitic porosity was present. Very slight fluorescence and cut, fair oil stain and oil odor was noted in part of the sample fragments. A fair number of limestone fragments which contained gray shale inclusions were seen. Penetration rate improved drastically through this interval, reaching a drilling time of 2 minutes per foot at 4343 and 4 minutes per foot at 4348.

A 10 unit methane mud gas increase was logged from 4340 to 4346, 5 units from 4346 to 4347 and 15 units from 4347 to 4350.

The above described Lansing intervals were covered by drill stem test number 2, run as a straddle test after drilling to total depth and running electric logs.

DST #2 - 4308-4356 (straddle packers, T.D. 4380)
Tool open for 30 min. pre-flow with weak blow increasing to strong in 5 min. No gas to surface pre-flow period.
Tool closed in 40 min. for shutin pressure.
Tool re-opened for 60 min. final flow period.
Gas to surface in 29 min. Gas volume remained too small to measure throughout.
Tool closed in for 40 min. shutin pressure.
Recovered 60' slightly oil and gas cut mud,
180' heavily oil and gas cut mud and
90' very heavily oil and gas cut mud.

ISIP 1372/40"

FSIP 1340/40"

FP 0-62 and 83-151

HH 2170-2160

BHT 111°

4351-4360 White to gray, very dense slightly cherty limestone with black and white sharp opeque chert. No shows or mud gas increases. No visable porosity.

4360-4380 White to light gray, fine crystalline to dense,
T.D. slightly fossiliferous, slightly oolitic limestone
 with white and light gray opeque sharp chert. No
 visable porosity, no shows or mud gas increases.

Based on the results of drill stem tests, favorable log calculations and structural position, 4 1/2 inch production casing was set at 4,378 feet and cemented with 125 sacks.

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DRILLING TIME

Drilling time by 1 ft. intervals from 2400 ft. to total depth.

2400-2410	2	-	2	-	2	-	2	-	2	-	2	-	1	-	2	-	2
-2420	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2
-2430	2	-	2	-	2	-	2	-	2	-	1	-	1	-	3	-	1
-2440	1	-	1	-	1	-	1	-	1	-	2	-	2	-	1	-	2
-2450	3	-	2	-	1	-	2	-	2	-	2	-	1	-	1	-	2
-2460	1	-	1	-	2	-	2	-	2	-	3	-	2	-	2	-	2
-2470	2	-	2	-	3	-	4	-	5	-	2	-	3	-	3	-	3
-2480	3	-	3	-	4	-	3	-	5	-	5	-	4	-	4	-	4
-2490	4	-	4	-	3	-	2	-	2	-	2	-	1	-	2	-	2
-2500	2	-	2	-	2	-	1	-	2	-	2	-	2	-	1	-	1
2500-2510	2	-	2	-	3	-	2	-	2	-	2	-	2	-	2	-	2
-2520	3	-	3	-	2	-	4	-	5	-	4	-	4	-	4	-	5
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-2540	5	-	5	-	6	-	6	-	4	-	4	-	4	-	5	-	4
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-2560	2	-	3	-	2	-	2	-	2	-	3	-	3	-	2	-	1
-2570	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1
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-2790	3	-	4	-	3	-	3	-	4	-	2	-	2	-	4	-	4
-2800	3	-	3	-	3	-	4	-	2	-	2	-	4	-	3	-	4

Trip @ 2586, Bit #3

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 Drilling Time

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2800-2810	3	-	2	-	2	-	4	-	2	-	3	-	2	-	2	-	2	-	3
-2820	2	-	2	-	2	-	2	-	2	-	2	-	1	-	2	-	2	-	2
-2830	3	-	4	-	3	-	3	-	3	-	2	-	4	-	3	-	3	-	4
-2840	3	-	4	-	4	-	3	-	3	-	3	-	4	-	3	-	4	-	3
-2850	2	-	2	-	2	-	2	-	2	-	2	-	3	-	2	-	3	-	3
-2860	2	-	2	-	3	-	5	-	3	-	4	-	3	-	3	-	3	-	2
-2870	3	-	2	-	2	-	1	-	2	-	2	-	2	-	1	-	1	-	1
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Drilling Time

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3600	-3610	4 - 5 - 5 - 4 - 4 - 4 - 5 - 4 - 4 - 5
	-3620	4 - 5 - 4 - 4 - 4 - 4 - 4 - 5 - 3 - 4
	-3630	2 - 3 - 3 - 2 - 2 - 5 - 2 - 3 - 2 - 4
	-3640	2 - 2 - 3 - 3 - 3 - 2 - 3 - 2 - 2 - 3
	-3650	2 - 3 - 2 - 2 - 2 - 3 - 3 - 2 - 2 - 2
	-3660	2 - 2 - 1 - 2 - 1 - 2 - 2 - 2 - 1 - 2
	-3670	1 - 2 - 2 - 2 - 1 - 1 - 2 - 2 - 1 - 1
	-3680	2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2
	-3690	2 - 1 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 1
	-3700	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1

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3700-3710	1	-	1	-	1	-	1	-	1	-	1	-	2
-3720	1	-	1	-	1	-	1	-	1	-	1	-	1
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4150-4160	13-	9-	2-	3-	3-	3-	3-	2-	1-	2-	Trip @ 4152
-4170	1-	1-	1-	2-	2-	5-	3-	4-	3-	3-	
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-4280	7-	5-	5-	5-	6-	5-	5-	7-	8-	8-	
-4290	6-	6-	5-	6-	4-	4-	4-	4-	4-	4-	
-4300	4-	4-	4-	6-	5-	7-	5-	5-	5-	4-	
4300-4310	5-	5-	6-	7-	7-	8-	9-	7-	6-	7-	
-4320	7-	6-	6-	6-	6-	6-	5-	5-	4-	5-	
-4330	6-	7-	7-	9-	9-	10-	10-	9-	9-	9-	Trip @ 4329
-4340	12-	10-	10-	10-	10-	12-	12-	12-	12-	8-	
-4350	5-	4-	2-	3-	4-	7-	7-	4-	5-	5-	
-4360	7-	10-	7-	7-	7-	9-	8-	10-	7-	5-	
-4370	6-	6-	5-	5-	4-	6-	7-	9-	7-	5-	
-4380	5-	6-	4-	5-	5-	5-	5-	6-	7-	8-	