

WELL REPORT
ANDERSON OIL COMPANY
EL NORTE #2
SAN JUAN COUNTY, NEW MEXICO



WATER RESOURCES
INVESTIGATION
NO. 10

1-1-1-1

Revised 1968. This report is based on the most recent data available at the time of publication.

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FORMATION TOPS - CONTINUED

<u>Cretaceous</u>	<u>Depth</u>	<u>KB Datum</u>
Dakota "B" (Kdb)	4524'	+2050
Dakota "D" (Kdd)	4612'	+1962
Dakota Burro Canyon (Kdbc)	4670'	+1904

Jurassic

Morrison (Jm)	4751'	+1823
Total Depth (Logger)	4760'	+1814
Total Depth (Driller)	4765'	

WELL CUTTINGS

30' samples from 3000' to 4200'
10' samples from 4200' to 4765' (Driller TD)

Samples described below from 4200' to 4765' (Driller TD)

SAMPLE DESCRIPTION

4200-40 100% sh, dk gy, gy brn, carb: Tr sltstn, gy, hd, calc, shy
4240-60 90% sh, as above: 10% sltstn, as above
4260-4310 80% sh, as above: 20% sltstn, as above
4310-30 90% sh, as above: 10% sltstn, as above

TOP GREENHORN 4336' LOGS

4330-60 80% sh, as above: 20% sltstn, as above
4360-70 100% sh, as above: Tr sltstn, as above

TOP GRANEROS 4386' LOGS

4370-90 100% sh, gy brn, sl/calc: Tr sltstn, as above
4390-4400 90% sh, as above: 10% ls, gy brn, v/f-xln, shy, Tr
sltstn, as above

TOP DAKOTA "A" 4406' LOGS

4400-10 90% sh, as above: Tr sh, dk gy, platy: 10% ls, as above
4410-20 100% sh, dk gy, gy brn: Tr ls, as above: Tr sltstn, as above
4420-30 100% sh, dk gy, platy, bcm silty, sdy in part: Tr ss, gy,
v-f-f-g, SA-SR, arkosic, abt intstl clay, N-S
4430-40 90% sh, as above: 10% ss, uncons, f-g, SA-SR, arkosic, N-S

SAMPLE DESCRIPTION - CONTINUED

- 4440-70 100% sh, as above: Tr ss, lt gy, f-g, arkosic, SA-SR, calc, tite, N-S
- 4470-80 50% ss, wht, v-f-f-g, SA-SR, arkosic, por & friable, N-S: 50% sh, as above
- 4480-90 50% ss, as above, bcm shy in part: 50% sh, as above
- 4490-4500 50% ss, as above, domin uncons, N-S: 50% sh, as above
- 4500-10 90% sh, as above: 10% ss, as above, N-S
- 4510-20 80% sh, as above: 10% ss, gy, v-f-f-g, as above, silty, calc, N-S: 10% sltstn, gy, hd, calc, sdy in part

TOP DAKOTA "B" 4524' LOGS

- 4520-30 70% sh, as above: 30% sltstn, as above
- 4530-40 100% sh, dk gy, platy: Tr sltstn, as above
- 4540-60 100% sh, as above: Tr sltstn, as above: Tr ss, dk gy, v-f-g, shy, glauc, N-S
- 4560-70 70% ss, wht, v-f-f-g, SA-SR, arkosic, por & friable, N-S: 30% sh, as above
- 4570-80 70% sh, as above: 30% ss, as above

TOP DAKOTA "D" 4612' LOGS

- 4580-4620 100% sh, as above: Tr ss, as above
- Core #1 4620-62
- 4662-70 100% sh, dk gy, as above: Tr ss, dk gy, v-f-g, shy, tite, N-S

TOP DAKOTA BURRO CANYON 4670' LOGS

- 4670-90 100% sh, dk gy, platy, silty in part: Tr ss, as above: Tr sltstn, gy, calc, shy
- 4690-4700 100% sh, as above: Tr ss, wht, f-m-g, SA-SR, por & friable, N-S: Tr sh, grn, wxy
- 4700-20 50% ss, wht-lt gy, f-m-g, domin f-g, arkosic, SA-SR, por & friable in part, silic & tite in part, N-S: 50% sh, as above: Abt coal

SAMPLE DESCRIPTION - CONTINUED

TOP MORRISON 4751' LOGS

4720-65 20% ss, as above: 10% ss, uncons, f-c-g, A-R, congl,
N-S: 60% sh, dk gy, as above: 10% sh, grn, wxy, sdy
in part

4765 TD Driller

4760 TD Logger

DRILLING TIME

Five foot drilling time from 4200' to 4765' (Driller TD) is listed below

05-10-15-20-25-30-35-40-45-50-55-60-65-70-75-80-85-90-95-100

4200-4300	10-14-12-11-11-11-14-10- 9-12-12-11-11-11-12-12-12-12-10-11
4300-4400	12-12-16-14-14-14-11-12-15-18-15-19-16-12- 9-13-13-13-13-13
4400-4500	11-14-13-12- 7- 8-11-11-12- 4- 4- 8- 9- 9-11-10- 8-14-11-13
4500-4600	14-13-13-13-20-17-15- 5- 6- 6- 6- 8-12-19-19-18-15-16-30-23
4600-4700	21-24-17-15- Core #1 26-26-17- 6-11-13- 6
4700-4765	8- 4- 3-44-10- 6-10- 6- 7- 5-30- 9- 5

CORING TIME

One foot coring time (4620-62) is listed below.

4620-40	15- 3- 9- 7- 8- 7- 4-12- 9- 7-12- 8- 3- 7- 4- 3- 3- 3- 3- 3
4640-60	4- 4- 4- 4- 3- 3- 3- 4- 4- 5- 5- 6- 4- 8- 6- 5- 9- 8-13-17
4660-62	15-15

CHRONOLOGICAL LOG

11-10-71 ø 499' w/Bit #1
8 5/8" - 76' with 40 sacks, 2% cacl.
PD: 5:30 P.M. 11-08-71
ø out 4:15 A.M. 11-10-71

Dr1g (2 3/4 hrs)

11-11-71 ø 2504' w/Bit #2
Bit #1: OSCIG - 1561'- 10 1/4 hrs

Dr1g (19 3/4 hrs) Trips (3 1/4 hrs) Service rig (1/2 hr)
Rig repair (1/2 hr)

11-12-71 ø 3274' w/Bit #4
Bit #2: OSCIG - 921' - 13 hrs
Bit #3: OSCIG - 647' - 12 1/4 hrs

Dr1g (15 hrs) Trips (5 1/2 hrs) Service Rig (1/4 hr)
Rig repair (3 1/4 hrs)

CHRONOLOGICAL LOG - CONTINUED

11-13-71 ø 3860' w/Bit #5
Bit #4: OSCIG - 439' - 14 1/2 hrs
Mud Properties: Wt: 9.1; Vis: 36; WL: 10.6
Drlg (20 1/2 hrs) Trips (3 1/4 hrs) Service rig (1/4 hr)

11-14-71 ø 4372' w/Bit #6
Bit #5: OSCIG - 421' - 15 1/2 hrs
Mud Properties: Wt: 9.2; Vis: 37; WL: 8.8
Drlg (19 3/4 hrs) Trips (4 hrs) Rig service (1/4 hr)

11-15-71 Coring 4662'
Bit #6: S-88 - 558' - 23 1/2 hrs
Mud Properties: Wt: 9.4+; Vis: 51; WL: 4.2
Drlg (11 hrs) Trip (5 3/4 hrs) Service Rig (1/4 hr)
Condition mud & circ (2 hrs) Coring (5 hrs)

11-16-71 TD 4765' - Circ for logs
Core #1: 42' - 5 hrs
Bit #8: RR - 103' - 5 hrs
Mud Properties: Wt: 9.4; Vis: 62; WL: 6.2
Drlg (5 hrs) Trips (5 hrs) Cond mud (1/4 hr)
Rig repair (1 1/4 hrs) Drillstem Test (8 hrs)
Lay down core & test tools, WO tester (4 1/2 hrs)

11-17-71 TD 4760' Logger: Rng Csg

BIT RECORD

<u>No.</u>	<u>Make</u>	<u>Size</u>	<u>Type</u>	<u>From</u>	<u>To</u>	<u>Footage</u>	<u>Hours Run</u>
1	Hughes	7 7/8	OSC-3	73'	1634'	1561'	10 1/4
2	Hughes	7 7/8	OSCIG	1634'	2555'	921'	13
3	Hughes	7 7/8	OSCIG	2555'	3202'	647'	12 1/4
4	Hughes	7 7/8	OSCIG	3202'	3641'	439'	14 1/2
5	Hughes	7 7/8	OSCIG	3641'	4062'	421'	15 1/2
6	Hughes	7 7/8	S-88	4062'	4620'	558'	23 1/2
7	Christensen	Core #1		4620'	4662'	42'	5
8	Hughes	7 7/8	S-88	4662'	4765'	103'	5

TOTAL ROTATING HOURS - 99

DEVIATION RECORD

<u>No.</u>	<u>Degree</u>	<u>Depth</u>	<u>Date</u>
1	1/4°	500'	11-11-71
2	1/4°	1000'	11-11-71
3	1/4°	1634'	11-11-71
4	1-1/4°	2100'	11-12-71
5	2-1/4°	2555'	11-12-71
6	1-3/4°	3202'	11-12-71
7	3/4°	3641'	11-13-71
8	3/4°	4062'	11-14-71

ELECTRICAL SURVEY CALCULATIONS

<u>Formation</u>	<u>Depth</u>	<u>Porosity</u>		<u>Rw</u>	<u>Water Saturation</u>	<u>Q</u>
		<u>Densilog</u>	<u>Acoustilog</u>			
Dakota "D"	4642-46	16%	16%	.7	57%	--
Dakota "D"	4638-42	20%	18%	.7	45%	--
Dakota "D"	4636-38	19%	18%	.7	47%	--
Dakota "D"	4634-36	19%	18%	.7	50%	--
Dakota "D"	4626-30	17%	17%	.7	50%	--
Dakota "D"	4616-20	19%	15%	.3	47%	--
Dakota "D"	4612-16	17%	13%	.3	62%	--
Dakota "B"	4553-57	12%	12%	.3	100%	--
Dakota "B"	4534-38	17%	19%	.3	100%	.103
Dakota "A"	4432-42	17%	17%	.3	100%	--

Rw's calculated from SP.

CORE RECORD

Core #1: 4620-4662 Recovered 32.5' (4613-55 Adjusted to logs)

<u>Feet</u>	<u>Depth</u>	<u>Description</u>
8.0	4620-28	ss, wht, f-g, arkosic, SA-SR, por, faint gas odor, no fluor
1.5	4628-29.5	ss, as above, less porous
2.0	4629.5-31.5	sh, dk gy-blk carb
1.5	4631.5-33	ss, tan, f-g, arkosic, SA-SR, carb inclusions, porous, <u>N-S</u>

CORE RECORD - CONTINUED

<u>Feet</u>	<u>Depth</u>	<u>Description</u>
7.0	4633-40	ss, buff, f-g, arkosic, SA-SR, porous, <u>N-S</u>
4.0	4640-44	ss, as above, carb inclus, <u>N-S</u>
1.0	4644-45	ss, lt gy, f-m-g, arkosic, SA-SR, porous, <u>N-S</u>
2.0	4645-47	ss, as above, domin f-g, carb inclus
1.0	4647-48	ss, tan, f-g, SA-SR, arkosic, porous, oil sat, excell. blue grn fluor, excell. cut
3.0	4648-51	ss, tan, f-m-g, as above
1.5	4651-52.5	ss, lt gy, v-f-g, SA-SR, arkosic, sl/glauc, calc, tite, <u>N-S</u>
<u>32.5</u>		

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 1**CORE ANALYSIS RESULTS**

Company ANDERSON OIL COMPANY Formation DAKOTA File RP-3-2507
 Well EL NORTE-FEDERAL NO. 2 Core Type DIAMOND 4" Date Report 11-15-71
 Field UNDESIGNATED Drilling Fluid WATER BASE MUD Analysts RG
 County SAN JUAN State NEW MEX. Elev. 6574'KB Location SW SW SEC 17-T21N-R8W

Lithological Abbreviations

SAND-SD SHALE-SH LINE-LM	DOLOMITE-DOL CHERT-CN GYPSUM-GYP	ANHYDRITE-ANHY CONGLOMERATE-CONG FOSSILIFEROUS-FOSS	SANDY-SDV SHALY-SHY LMY-LMY	FINE-FN MEDIUM-MED COARSE-CSE	CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL	BROWN-BRN GRAY-GY VUGGY-VGY	FRACTURED-FRAC LAMINATION-LAM STYLOLITIC-STY	SLIGHTLY-SL/ VERY-V/ WITH-W/
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SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY (K _A)	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS	
				OIL	TOTAL WATER		
(CONVENTIONAL ANALYSIS)							
1	4620-21	86	17.9	0.0	37.4	Sd Lt Gy Fn Grn	
2	21-22	57	18.7	0.0	40.6	Sd Lt Gy Fn Grn	
3	22-23	62	17.8	0.0	33.7	Sd Lt Gy Fn Grn	Frac
4	23-24	48	17.9	0.0	47.5	Sd Lt Gy Fn Grn	
5	24-25	66	17.8	0.0	35.4	Sd Lt Gy Fn Grn	Frac
6	25-26	79	18.0	0.0	37.2	Sd Lt Gy Fn Grn	Frac
7	26-27	65	18.0	0.0	38.3	Sd Lt Gy Fn Grn	Frac
8	27-28	50	15.6	0.0	34.6	Sd Lt Gy Fn Grn	
9	28-29	29	15.5	0.0	38.7	Sd Lt Gy Fn Grn Carb	
4629-31.5		NO ANALYSIS - SHALE					
10	4631.5-32	5.8	17.9	0.6	57.0	Sd Tn-Gy Fn Grn Sl/Shy	
11	32-33	32	14.3	0.0	45.3	Sd Tn-Gy Fn Grn	
12	33-34	93	20.2	0.0	47.5	Sd Tn-Gy Fn-Med Grn Sl/Clay	Frac
13	34-35	37	20.3	0.0	52.7	Sd Tn-Gy Fn-Med Grn Clay	
14	35-36	39	21.0	0.0	54.3	Sd Tn-Gy Fn Grn Clay	
15	36-37	67	17.8	0.0	55.0	Sd Tn-Gy Fn Grn Clay	
16	37-38	60	20.2	0.0	56.5	Sd Tn-Gy Fn Grn Clay	
17	38-39	3.7	18.3	0.0	51.9	Sd Lt Gy Fn Grn Clay Carb Strks	
18	39-40	31	18.4	0.0	61.4	Sd Lt Gy Fn Grn Clay Carb Strks	Frac
19	40-41	27	16.3	0.0	52.1	Sd Lt Gy Fn Grn Clay Carb Strks	Frac
20	41-42	84	19.1	0.0	48.6	Sd Lt Gy Fn Grn Clay	
21	42-43	96	19.2	0.0	54.1	Sd Lt Gy Fn-Med Grn Clay Sl/Shy	
22	43-44	44	19.0	0.0	50.5	Sd Lt Gy Fn-Med Grn Clay Sl/Shy	
23	44-45	112	18.2	0.0	52.7	Sd Lt Gy Med Grn Clay Carb Strks	
24	45-46	205	19.8	0.0	45.9	Sd Gy Med Grn	
25	46-47	160	20.6	0.0	42.7	Sd Gy Med Grn	
26	47-48	165	17.5	0.6	42.8	Sd Gy Med Grn Carb	Frac
27	48-49	185	20.4	6.4	46.5	Sd Gy Med Grn	
28	49-50	255	19.2	6.8	42.6	Sd Gy Med Grn	Frac
29	50-51	195	20.2	6.5	45.5	Sd Gy Med Grn	
30	51-52	<0.1	5.4	0.0	72.1	Sd Drk Gy V/Fn Grn Silty	
31	52-52.5	<0.1	4.8	0.0	72.9	Sd Drk Gy V/Fn Grn Silty	

DRILLSTEM TEST RECORD

SP DST #1: 4617-29 (Dakota "D") (4610-22 Adjusted to logs)

Open 15 minutes: strong blow G-T-S 4", ggd 1274
MCF in 15 minutes

Shut In 30 minutes:

Open 60 minutes:	ggd	371 MCF	1 psi	1½ ck
10 minutes	ggd	1824 MCF	18 psi	1½ ck
20 minutes	ggd	2200 MCF	24 psi	1½ ck
30 minutes	ggd	2503 MCF	29 psi	1½ ck
40 minutes	ggd	2737 MCF	33 psi	1½ ck
50 minutes	ggd	2737 MCF	33 psi	1½ ck
60 minutes	ggd	2737 MCF	33 psi	1½ ck

Recovered: 45' distillate, Grav. 54, corr 60°F

Initial hydrostatic pressure	2360 psi
Final hydrostatic pressure	2299 psi
Initial flow pressure (1)	146 psi
Final flow pressure (1)	293 psi
Initial flow pressure (2)	310 psi
Final flow pressure (2)	517 psi
Initial shut in pressure	1930 psi
Final shut in pressure	1912 psi

Bottom Hole Temperature: 123°F

Bottom Hole Sampler: 175 psi
12.7 cu. ft. gas
No Dist.

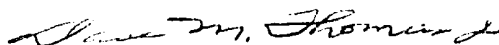
SUMMATION

This well was spudded November 8, 1971 and 5½" casing was set to total depth November 17, 1971. The well was drilled to a total depth of 4760' Logger: 4765' Driller, in the Morrison formation of Jurassic age. A total of 99 rotating hours were required for the drilling of this test.

All formations from 4200' to 4765' (Driller TD) were evaluated by (1) careful examination of rotary cuttings by a geologist in the field; (2) the entire stratigraphic section was evaluated by quantitative and qualitative analysis of the electrical surveys. A core was cut in the Dakota "D" zone (4620-62). Examination of the core revealed faint gas odor in the top of the Dakota "D" zone (4620-29). A drillstem test was run 4617' - 29'. Gas flowed at the rate of 2,737 MCF. The pressures and detailed drillstem test data are recorded in the text of the report. Core analysis and electrical surveys indicate another zone of interest in the lower Dakota "D" zone 4640-44, adjusted to logs.

The well ran structurally 5' lower than the Davis Oil Company: Snake Eyes #1, located in Section 20, Township 21 North, Range 8 West, San Juan County, New Mexico, on top of the Dakota "D" zone.

Rotary samples were saved from 3000' to total depth and shipped to the Four Corners Sample Cut in Farmington, New Mexico. The core was analyzed by Core Lab and a preliminary report is included in the text of the report. An Induction Electrolog and Densilog were run from surface to total depth. An acoustilog was run over a selected interval.



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