CORE LABORATORIES, INC. *Petroleum Reservoir Engineering*

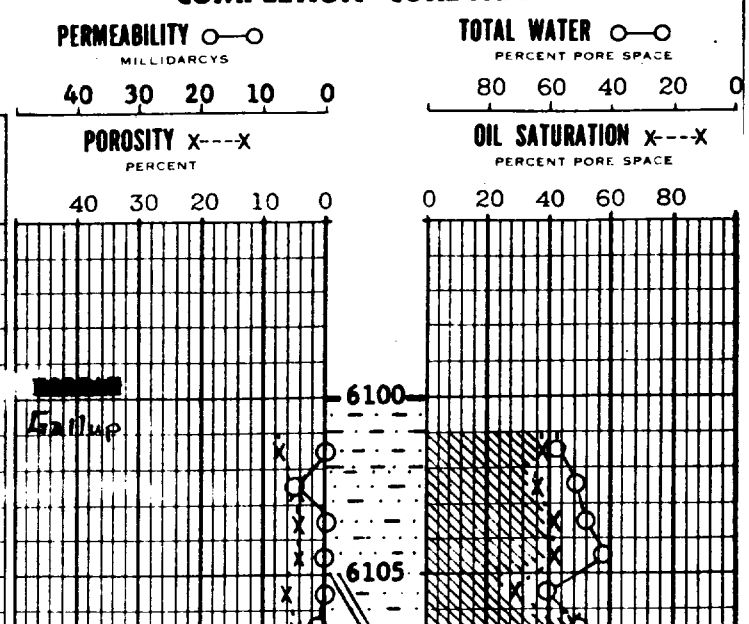
COMPANY SKELLY OIL COMPANY — DATE ON 7/3/57 — FILE NO. RP-3-513 FC
WELL JICARILLA "C" NO. 16 — DATE OFF 7/18/57 — ENGRS. WJC, JE
FIELD JICARILLA — FORMATION AS NOTED — ELEV.
COUNTY SANDOVAL — STATE NEW MEX. — DRLG. FLD. WATER BASE MUD — CORES DOWDCO
LOCATION SEC 34-T25N-R5W — REMARKS SAMPLED BY CLI ENGINEER AS DIRECTED BY REPRESENTATIVE OF CLIENT

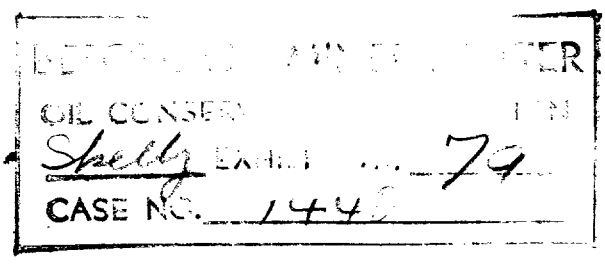
SAND · LIMESTONE · CONGLOMERATE · CHERT · SHALE · DOLOMITE · VERTICAL FRACTURES

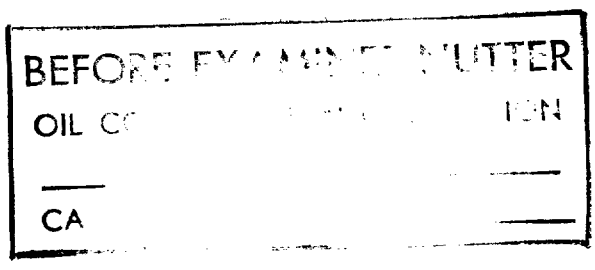
TABULAR DATA and INTERPRETATION

SAMPLE NUMBER	DEPTH FEET	PERM. MD.	POROSITY %	RESIDUAL SATURATION % PORE SPACE OIL	RESIDUAL SATURATION % PORE SPACE TOTAL WATER		PROD
	f DENOTES FRACTURED PERMEABILITY PLUGS						
1	6101-02	0.40	7.5	38.7	57.4		
2	02-03	5.4	3.6	36.1	52.8		
3	03-04	0.06	4.0	42.5	47.6		
4	04-05	0.10	4.5	42.3	42.3		
5	05-06	0.42	5.8	29.3	60.3		
6	06-07	1.3	4.6	47.8	50.0		
7	07-08	0.24	6.1	36.1	59.0		
8	08-09	f	5.8	38.0	50.2		
9	6109-10	0.19	5.1	43.2	54.9		
	Average	1.01	5.2	39.3	52.7		
10	6117-18	0.03	3.4	47.0	47.0		
11	18-19	f	6.8	42.7	51.4		
12	19-20	0.13	2.9	24.1	65.5		
13	20-21	0.13	3.8	21.1	63.2		
14	21-22	0.09	4.2	35.6	50.0		
15	22-23	0.03	5.1	43.2	49.0		
16	23-24	0.05	4.5	35.5	44.5		
17	24-25	0.04	4.0	52.5	45.0		
18	25-26	0.07	4.1	43.9	39.0		
19	26-27	0.12	5.3	34.0	45.3		
20	27-28	0.05	5.6	39.3	48.3		
21	28-29	0.08	5.4	40.8	50.0		
22	29-30	0.08	4.9	26.5	61.3		
23	30-31	f	4.4	38.6	47.7		
24	31-32	f	4.8	29.2	66.8		
25	32-33	0.05	6.6	51.6	42.4		
26	6133-34	0.12	7.2	40.3	40.3		
	Average	0.08	4.9	37.9	50.4		
27	6139-40	0.02	4.6	26.1	58.8		
28	40-41	0.32	5.9	20.4	62.8		
29	41-42	0.06	5.5	23.7	63.8		
30	42-43	0.16	8.0	20.0	63.9		
31	43-44	0.28	6.6	19.7	63.7		
32	44-45	0.36	4.3	16.6	58.0		
33	45-46	f	7.5	20.0	58.7		
34	46-47	0.14	5.2	23.1	59.7		
35	47-48	0.21	4.1	24.3	51.3		
36	48-49	0.30	6.3	19.0	60.3		
37	49-50	0.08	5.3	22.7	51.0		
38	50-51	f	8.1	25.9	45.6		
39	51-52	0.14	9.1	30.8	39.6		
40	52-53	0.53	6.9	30.5	34.8		
41	53-54	0.43	8.2	36.6	31.8		
42	54-55	0.23	7.6	42.3	42.3		
43	55-56	0.21	10.0	32.0	34.0		
44	56-57	0.14	8.8	36.4	38.6		
45	57-58	0.12	8.2	30.5	41.5		
46	58-59	0.04	8.6	33.8	47.8		
47	59-60	0.23	5.8	22.5	62.3		
48	60-61	0.10	6.8	28.0	61.8		
49	61-62	0.12	6.0	23.3	55.0		
50	62-63	0.10	5.9	22.0	62.8		
51	63-64	1.4	5.3	24.5	62.3		
52	64-65	f	7.2	13.9	69.4		
53	65-66	f	5.9	20.4	66.1		
54	66-67	0.8	5.5	12.8	76.5		
55	67-68	0.28	6.3	23.8	66.6		
56	68-69	0.16	5.4	18.5	74.3		
57	69-70	0.08	4.7	14.9	66.0		
58	70-71	f	4.1	17.1	70.8		
59	71-72	0.08	7.8	19.3	73.2		
60	72-73	f	6.3	19.1	73.0		
61	73-74	0.08	5.7	21.1	61.5		
62	74-75	0.38	5.7	17.6	66.7		
63	75-76	0.10	5.0	14.0	76.0		
64	76-77	0.10	8.2	20.8	75.8		
65	77-78	0.62	7.2	18.2	75.3		
66	78-79	0.16	7.6	21.1	69.6		
67	79-80	f	6.8	25.0	69.0		
68	80-81	f	6.2	25.8	66.1		
69	81-82	f	5.7	22.8	65.0		
70	82-83	f	4.5	26.7	64.5		
71	83-84	0.02	5.0	26.0	58.0		
72	84-85	0.11	4.1	24.4	61.0		
73	85-86	f	4.6	28.3	58.7		
74	86-87	f	4.4	29.5	56.8		
75	87-88	0.42	3.3	21.2	60.5		
76	88-89	0.61	5.5	30.9	60.0		
77	89-90	0.08	6.0	38.4	61.6		
78	6190-91	f	7.1	22.5	69.0		
	Average	0.25	6.2	24.0	60.0		

COMPLETION COREGRAPH







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CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS 1, TEXAS

July 25, 1957

REPLY TO
706 PATTERSON BLDG.
DENVER, COLORADO

Skelly Oil Company
Box 4115, Station A
Albuquerque, New Mexico

Attention: Mr. John Henderson

Subject: Core Analysis
Jicarilla "C" No. 16 Well
Jicarilla Field
Sandoval County, New Mexico
Location: Sec. 34-T25N-R5W

Gentlemen:

Diamond coring equipment and water base mud were used to core the intervals from 6100 to 6209, 6982 to 7054, 7099 to 7164, and 7180 to 7216 feet in the Jicarilla "C" No. 16. Engineers of Core Laboratories, Inc. selected and quick-froze samples of recovered formation as directed by representatives of Skelly Oil Company and transported these samples to the Farmington laboratory for analysis. The results are presented in this report.

Gallup formation from 6101 to 6140 feet exhibits very high total liquid saturations, indicating that very little of the fluid present in the pore space at reservoir conditions was expelled as the core was brought to the surface. The very low permeability of the matrix material indicates that any production obtained from this interval would be through the fractures noted at various points in the zone, and it is suggested that a drill stem test be made to establish the type and quantity of fluid which may be produced from the fracture system.

From 6140 to 6150 feet, low residual oil and high total water saturations indicate that oil production cannot be obtained from the matrix material in this zone. The vertical fracture system observed throughout the zone may, however, be capable of producing oil. Additional testing of this

interval also is suggested in order to determine the type and quantity of fluid which the fracture system may be capable of producing.

From 6150 to 6159 feet, the residual oil and total water saturations are characteristic of oil productive Hospah-Gallup formation in the area. This nine-foot interval has very low permeability, the points where permeability determinations were made having an arithmetic average permeability of only 0.23 millidarcy. The total observed productive capacity is limited to 2.1 millidarcy-feet, and commercial rates of oil production will be entirely dependent upon favorable response to treatment. The porosity in the zone averages 8.4 per cent, and the empirically calculated connate water saturation is 39 per cent of pore space.

Estimates of the original stock tank oil in place and of the maximum recoverable oil by solution gas drive have been computed for the zone using the observed core analysis data in conjunction with estimated reservoir fluid characteristics considered applicable. The original stock tank oil in place is calculated to be 318 barrels per acre-foot, and the maximum solution gas drive recovery is calculated to be 84 barrels per acre-foot, assuming that reservoir pressure could be continued until reservoir pressure declined to zero psig. The actual solution gas drive recovery to abandonment conditions may fall far short of this calculated maximum value and would more likely range from 10 to 15 barrels per acre-foot. A water drive recovery estimate has not been computed for the zone since the properties of the Hospah-Gallup sand indicate this production mechanism would be ineffective.

Formation from 6159 to 6178 feet has low residual oil and high total water saturations, and oil will not be produced from the matrix material in this zone. A vertical fracture system extends through the zone, however, and additional testing is recommended in order to determine the type and quantity of fluid which may be produced through the fracture system.

From 6178 to 6191 feet, the high total liquid saturation indicates that very little of the fluid present in the formation at reservoir conditions was produced as the core was brought to the surface. The fractures