CORE ANALYSIS RESULTS

Company EL PASO NATURAL GAS COMPANY | Formation DAKOTA | File RP-3-1014
Well SAN JUAN 28-7 NO.109 | Core Type DIAMOND CONV. | Date Report 6/22/59
Field BLANCO | Drilling Fluid WATER BASE MUD | Analyst CLIFFORD
County SAN JUAN State NEW MEX. Elev. 6557 DF Location SEC 18 27N 7W

Lithological Abbreviations

SH-SHALE-SHY | DOL-DOLOMITE-DOL | ANH-ANHYDRITE-ANH | SD-SAND-SDY | FN-FINE-FN | CRY-CRYSTALLINE-XLN | BRN-BROWN-BRN | FOS-FOSSILIFEROUS-FOS | SLTY-SILTY-SLTY
SHY-SHALY-SHY | LS-LIMESTONE-LS | ANHY-ANHYDRITIC-ANH | SDY-SANDY-SDY | MED-MEDIUM-MED | GRN-GRAIN-GRN | GY-GRAY-GY | LAM-LAMINATION-LAM | LY-LAYER-LY
 | | | | CSE-COARSE-CSE | GRNL-GRANULAR-GRNL | VGY-VUGGY-VGY | STY-STICKY-STY | W-WAVY-W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
41	7402-03	<0.01	3.9	17.9	74.3	
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42	7410-11	<0.01	1.4	0.0	64.2	
43	11-12	0.01	3.5	14.3	71.4	
44	7416-17	<0.01	1.1	0.0	91.0	
45	7423-24	<0.01	0.9	0.0	89.0	

7315-21 HIGH TOTAL WATER SATURATIONS (69.2 % AVERAGE) AND LOW POROSITY (4.7 % AVERAGE) SHOW THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (0.01 md/ft AVERAGE) AND RESIDUAL OIL SATURATIONS (6.5 % AVERAGE)

7321-23 THE RESIDUAL OIL SATURATIONS (9.6 % AVERAGE) AND THE TOTAL WATER SATURATIONS (46.3% AVERAGE) ARE CHARACTERISTIC OF SANDS THAT PRODUCE A RICH GAS. THE PERMEABILITY (<0.01 md/ft AVERAGE) IS LOW AND ANY PRODUCTION FROM THIS INTERVAL WILL BE DEPENDENT ON THE ABILITY OF A FORMATION TREATMENT TO INCREASE THIS VERY LOW PERMEABILITY . THE AVERAGE POROSITY IS 6.2 %.

7323-29 HIGH TOTAL WATER SATURATIONS (63.3 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (0.01 md/ft AVERAGE) ; POROSITY (4.3 % AVERAGE) AND RESIDUAL OIL SATURATIONS (9.3 % AVERAGE).

7358-61 LOW POROSITY (4.4 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (<0.01 md/ft AVERAGE) ; RESIDUAL OIL SATURATIONS (16.3 % AVERAGE) AND TOTAL WATER SATURATIONS (56.6 % AVERAGE).

7361-69 THE RESIDUAL OIL SATURATIONS (10.4 % AVERAGE) AND THE TOTAL WATER SATURATIONS (31.0 % AVERAGE) SHOW THIS INTERVAL IS CAPABLE OF PRODUCING A RICH GAS. THE PERMEABILITY (0.07 md/ft AVERAGE) IS LOW AND A FORMATION TREATMENT WILL BE NECESSARY TO ESTABLISH AND MAINTAIN COMMERCIAL RATES OF PRODUCTION. THE AVERAGE POROSITY IS 8.3 %.

7369-78 HIGH TOTAL WATER SATURATIONS (72.1 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (0.03 md/ft AVERAGE) ; POROSITY (5.1 % AVERAGE) AND RESIDUAL OIL SATURATIONS (9.5 % AVERAGE).

7396-7403 LOW POROSITY (3.6 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL : PERMEABILITY (0.03 md/ft AVERAGE) ; RESIDUAL OIL SATURATIONS (11.5 % AVERAGE) AND TOTAL WATER SATURATIONS (68.9 % AVERAGE).

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DALLAS, TEXAS

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Lithological Abbreviations

SHALE-SH CHERT-CH GYPSUM-GYP FOSS.-FERROUS FOSS. SANDY-SDY SHALY-SHY MARLY-MRY FINE-FN MEDIUM-MED COARSE-CSE CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL BROWN-BRN GRAY-GY VUGGY-VGY FRACTURED-FRAC LAMINATION-LAM SLIGHTLY-SLI VERY-V WITH-W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
7410-24						HIGH TOTAL WATER SATURATIONS (78.9 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (<0.01 md/ft AVERAGE) ; POROSITY (1.7 % AVERAGE) AND RESIDUAL OIL SATURATIONS (3.6 % AVERAGE).

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County RIO ARRIBA State NEW MEX. Elev. 6557 DF Location SEC 18 27N 7W

Lithological Abbreviations

SAND-SD SHALE-SH LIME-LM | DOLOMITE-DOL CHERT-CH GYPSUM-GYP | ANHYDRITE-ANHY CONGLOMERATE-CONG FOSSIL-FEROUS-FOSS | SANDY-SDY SHALY-SHY MYSIDS | 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/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
46	7431-32	0.01	4.6	0.0	71.8	
47	32-33	0.10	6.1	0.0	54.0	
48	33-34	<0.01	3.7	0.0	83.8	VERTICAL FRACTURE
49	34-35	<0.01	5.2	0.0	59.9	VERTICAL FRACTURE
50	35-36	0.02	4.4	0.0	65.8	VERTICAL FRACTURE
51	7447-48	0.02	3.8	0.0	39.6	
52	48-49	0.01	3.2	0.0	47.1	
53	49-50	0.03	4.2	0.0	64.3	VERTICAL FRACTURE
54	50-51	0.03	2.5	0.0	91.8	VERTICAL FRACTURE

7431-36 LOW POROSITY (4.8 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (0.03 md/ft AVERAGE) ; RESIDUAL OIL SATURATIONS (0.0 % AVERAGE) AND TOTAL WATER SATURATIONS (67.1 % AVERAGE).

7447-51 LOW POROSITY (3.4 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (0.03 md/ft AVERAGE) ; RESIDUAL OIL SATURATIONS (0.0 % AVERAGE) AND TOTAL WATER SATURATIONS (60.7 % AVERAGE).

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File RF-3-1014
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Analyst CLIFFORD

Lithological Abbreviations

SAND-SD SHALE-SH LIME-LM | DOLOMITE-DOL CHERT-CH GYPSUM-GYP | ANHYDRITE-ANHY CONGLOMERATE-CONG FOSS-FOSSILIFEROUS | SANDY-SDY SHALY-SHY LIMEY-LMY | FINE-FN MEDIUM-MED COARSE-CSE | CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL | BROWN-BRN GRAY-GY VUGGY-VGY | FRACTURED-FRAC LAMINATION-LAM SPECKLED-SPKL | SLIGHTLY-SL VERY-V WITH-W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
55	7452-53	0.04	5.0	0.0	16.0	
56	53-54	<0.01	5.4	0.0	13.0	
57	54-55	<0.01	5.2	0.0	11.5	

7452-55 LOW POROSITY (5.2 % AVERAGE) SHOWS THIS INTERVAL TO BE OF NO COMMERCIAL VALUE. OTHER PROPERTIES OF THIS INTERVAL: PERMEABILITY (0.02 md/ft AVERAGE) ; RESIDUAL OIL SATURATIONS (0.0 % AVERAGE) AND TOTAL WATER SATURATIONS (13.5 % AVERAGE).

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Lithological Abbreviations

SAND-SD SHALE-SH LIME-LM
DOLOMITE-DOL CHERT-CH ANHYDRITE-ANHY GYP-GYP
SANDY-SDY SHALY-SHY CALCAREOUS-CALC
FINE-FN MEDIUM-MED COARSE-CSE
CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL
BROWN-BRN GRAY-GY VUGGY-VGY
FRACTURE-FRAC LAMINATION-LAM SLIGHTLY-SLY WITH-W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS	CHLORIDE PPM
1	7315-16	0.01	5.3	3.8	88.7		
2	16-17	<0.01	3.1	6.5	67.7		
3	17-18	<0.01	4.1	4.9	73.2		
4	18-19	0.01	5.8	3.4	65.5		
5	19-20	<0.01	5.4	9.3	59.3	VERTICAL FRACTURE	38900
6	20-21	<0.01	4.6	10.9	60.8	VERTICAL FRACTURE	
7	21-22	<0.01	6.1	11.5	41.0	VERTICAL FRACTURE	
8	22-23	<0.01	6.4	7.8	51.6		
9	23-24	<0.01	4.6	10.9	71.7		
10	24-25	<0.01	5.4	13.0	68.5		20400
11	25-26	<0.01	5.5	9.1	67.2		
12	26-27	<0.01	4.7	10.6	74.4		
13	27-28	0.03	5.6	8.9	78.6		
14	28-29	<0.01	4.0	12.5	85.0		
15	7358-59	<0.01	5.0	14.0	68.0		
16	59-60	0.01	3.7	18.9	54.1		
17	60-61	0.01	4.4	15.9	47.7		
18	61-62	0.03	6.5	12.3	30.8		
19	62-63	0.02	8.8	12.5	21.6		
20	63-64	0.09	10.5	8.6	24.8		
21	64-65	0.22	9.7	7.2	25.8		
22	65-66	0.10	9.9	9.1	28.4		
23	66-67	0.03	8.9	10.1	28.1		
24	67-68	0.01	7.0	10.0	35.8		
25	68-69	0.08	5.1	13.7	53.0		
26	69-70	0.02	4.7	10.6	70.2		
27	70-71	0.04	5.6	16.1	57.2		
28	71-72	0.02	5.2	13.5	59.7		
29	72-73	0.06	5.4	13.0	64.9		
30	73-74	<0.01	4.5	4.5	88.9		32500
31	74-75	0.08	4.8	4.2	83.4		
32	75-76	0.04	5.8	3.4	77.6		
33	76-77	0.02	5.5	9.1	67.3		
34	77-78	0.01	4.4	11.4	79.6		
35	7396-97	0.05	4.7	14.9	61.8		49300
36	97-98	0.05	3.1	16.2	64.5		
37	98-99	0.01	3.2	15.6	62.4		
38	7399-00	<0.01	3.2	6.3	78.2		
39	7400-01	0.08	5.0	10.0	60.0		
40	01-02	<0.01	2.1	0.0	81.1		75400