

CORE LABORATORIES, INC.
 Petroleum Reservoir Engineering
 DALLAS, TEXAS

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CORE ANALYSIS RESULTS

Company **EL PASO NATURAL GAS COMPANY** Formation **GRANEROS** File **RP-3-1441**
 Well **CASE # 8** Core Type **DIAMOND CONV.** Date Report **5/26/61**
 Field **BASIN DAKOTA** Drilling Fluid **WATER BASE MUD** Analysts **McCOMAS**
 County **SAN JUAN** State **NEW MEX.** Elev **6245 GR** Location **SEC 18 T31N R11W**

Lithological Abbreviations

SAND-SD SHALE-SH LIME-LM	DOLOMITE-OL CHERT-CH GYPSUM-GYP	HYDRATE-AHHY CONGLOMERATE-CONG FOSSILIFEROUS-FOSS	SANDY-SOY SHALY-SHY LIMY-LMY	FINE-FN MEDIUM-MED COARSE-CSE	CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL	BROWN-BRN GRAY-GY LUGGY-VGY	FRACTURED-FRAC LAMINATION-LAM STYLOLITIC-STY	SLIGHTLY-SL VERY-V WITH-W
SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS		
				OIL	TOTAL WATER			
1	7251-52	0.04	3.8	18.4	57.6	VERTICAL FRACTURE		
2	52-53	0.65	3.9	17.9	38.3	" "		
3	53-54	0.07	3.9	17.9	46.0	" "		

7251-7254 This interval is essentially non-productive.

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Company	EL PASO NATURAL GAS COMPANY	Formation	GRANEROS	File	RP-3-1441
Well	CASE # 8	Core Type	DIAMOND CONV.	Date Report	5/27/61
Field	BASIN DAKOTA	Drilling Fluid	WATER BASE MUD	Analysts	McCOMAS
County	SAN JUAN	State	NEW MEX.	Elev	6245 GR
				Location	SEC 18 T31N R11W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				Oil	TOTAL WATER	
4	7254-55	0.41	3.4	20.3	53.0	VERTICAL FRACTURE
5	55-56	0.32	4.4	15.9	50.0	" "
6	56-57	0.11	3.2	15.6	68.6	" "
7	57-58	0.02	3.9	17.9	64.1	" "
8	58-59	0.03	3.8	13.1	65.8	" "
9	59-60	0.12	3.6	5.6	75.0	" "
10	60-61	0.02	3.7	5.4	78.4	" "
11	61-62	0.07	3.9	0.0	74.5	" "
12	62-63	0.04	4.2	4.8	83.4	" "
13	63-64	0.04	4.8	10.4	79.3	" "
14	64-65	0.01	3.5	5.7	83.0	" "
15	65-66	0.03	3.7	0.0	89.1	" "
16	66-67	0.01	3.8	13.1	65.9	" "
17	67-68	0.04	4.4	11.4	79.6	" "
18	68-69	0.01	4.0	17.5	60.1	" "
19	69-70	0.07	3.4	14.7	70.6	" "
20	70-71	0.01	3.8	18.4	63.2	" "
21	71-72	0.05	5.5	12.7	41.9	" "
22	72-73	0.01	4.8	14.5	50.0	" "
23	73-74	0.10	4.9	10.2	67.4	" "
24	74-75	0.01	5.1	13.7	56.9	" "
25	75-76	0.05	5.3	13.2	66.1	" "

7254-7276 This interval is essentially non-productive.

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CORE ANALYSIS RESULTS

Company **EL PASO NATURAL GAS COMPANY** Formation **DAKOTA** File **RP-3-1441**
 Well **CASE # 8** Core Type **DIAMOND CONV.** Date Report **5/29/61**
 Field **BASIN DAKOTA** Drilling Fluid **WATER BASE MUD** Analysts **McCOMAS**
 County **SAN JUAN** State **NEW MEX.** Elev **6245 GR** Location **SEC 18 T31N R11W**

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
26	7335-36	0.05	2.8	0.0	85.9	VERTICAL FRACTURE
27	36-37	0.04	2.3	0.0	74.1	"
28	37-38	0.05	2.7	0.0	74.1	"
29	38-39	0.09	3.3	6.1	60.6	"
30	39-40	0.12	3.7	5.4	78.1	"
31	40-41	0.04	2.8	0.0	71.6	"
32	41-42	0.04	1.9	0.0	89.5	"
33	42-43	0.04	4.0	17.5	59.8	"
34	43-44	0.04	2.8	0.0	71.6	"
35	44-45	0.02	2.5	0.0	64.1	"
36	45-46	0.06	4.2	0.0	59.4	"
37	46-47	0.07	4.8	0.0	45.7	"
38	47-48	0.29	5.0	4.0	40.0	"
39	48-49	0.03	4.7	0.0	25.4	"
40	49-50	0.14	7.8	0.0	20.4	"
41	50-51	0.07	7.4	0.0	24.3	"
42	51-52	0.04	2.2	0.0	77.4	"

7335-7345 This interval is essentially non-productive.

7345-7351 This interval is capable of producing gas, the average characteristics are: Porosity (5.7% average) Total Water saturation (35.8% average), Residual Oil Saturation (0.7% average) and Permeability (0.11 md./ft. average). The fractures in this interval are open and will enhance the permeability quite a bit.

7351-7352 This one foot interval is essentially non-productive.

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Company	EL PASO NATURAL GAS COMPANY	Formation	DAKOTA	File	RP-3-1441
Well	CASE # 8	Core Type	DIAMOND CONV.	Date Report	5/30/61
Field	BASIN DAKOTA	Drilling Fluid	WATER BASE MUD	Analysts	McCOMAS
County	SAN JUAN	State	NEW MEXICO	Log	6245 GR
				Location	SEC 18 T31N R11W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARREYS	POROSITY PERCENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
43	7353-54	0.56	1.4	0.0	42.9	VERTICAL FRACTURE
44	54-55	0.01	1.1	0.0	36.3	" "
45	55-56	0.24	2.0	0.0	65.0	" "
46	7363-64	0.02	4.5	0.0	40.0	" "
47	64-65	0.07	6.9	0.0	20.0	" "

7353-7356 This interval is essentially non-productive from the matrix rock. It is possible that the fractures could contribute gas.

7363-7365 This two foot interval is capable of producing a low capacity gas, with most of the gas coming from the fractures.

CORE ANALYSIS RESULTS

Company **EL PASO NATURAL GAS COMPANY** Formation **DAKOTA** File **RP-3-1441**
 Well **CASE # 8** Core Type **DIAMOND CONV.** Date Report **5/31/61**
 Field **BASIN DAKOTA** Drilling Fluid **WATER BASE MUD** Analysts **McCOMAS**
 County **SAN JUAN** State **NEW MEX.** Elev **6245 GR** Location **SEC 18 T31N R11W**

Lithological Abbreviations

SAND, SH SHALE, SH LIME, LM	DOLOMITE, DC CHERT, CH GYPSUM, GYP	ANHYDRITE, ANHY CONGLOMERATE, CONG FOSSILIFEROUS, FOSS	SANDY, SDY SHALY, SHY LIMY, LMY	FINE, FN MEDIUM, MED COARSE, CSE	CRYSTALLINE, XLN GRAIN, GRN GRANULAR, GRNL	BROWN, BRN GRAY, GR VUGGY, VGY	FRACTURED, FRAC LAMINATION, LAM STYLOLITIC, STY	SLIGHTLY, SLT VERY, VY WITH, W
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SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARREYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
55	7375-76	0.17	3.0	0.0	50.0	VERTICAL FRACTURE
56	76-77	0.07	2.0	0.0	65.0	" "
57	7383-84	0.07	6.2	0.0	33.9	" "
58	84-85	0.34	9.4	0.0	28.8	" "
59	85-86	0.07	6.7	0.0	35.8	" "
60	86-87	0.12	3.5	0.0	34.4	" "
61	87-88	0.02	3.6	0.0	69.5	" "
62	7390-91	0.33	2.4	0.0	87.4	" "
63	91-92	0.03	1.8	0.0	72.2	" "
64	92-93	0.02	3.5	0.0	54.4	" "
65	93-94	0.02	3.5	0.0	57.1	" "
66	94-95	0.15	3.7	0.0	45.9	" "
67	95-96	0.02	2.1	0.0	71.3	" "
68	96-97	0.04	2.5	0.0	67.9	" "
69	97-97.5	0.02	1.4	0.0	64.1	" "

7375-7377 This interval is essentially non-productive.

7383-7388 This interval is capable of producing gas, primarily from the fractures. The average characteristics are: Porosity (5.8% average) Total Water saturation (40.4% average) Residual Oil saturation (0.0% average) and Permeability (0.12 md./ft average)

7390-7397.5 This interval is essentially non-productive.

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CORE ANALYSIS RESULTS

Company **EL PASO NATURAL GAS COMPANY** Formation **DAKOTA** File **RP-3-1441**
 Well **CASE # 8** Core Type **DIAMOND CONV.** Date Report **6/1/61**
 Field **BASIN DAKOTA** Drilling Fluid **WATER BASE MUD** Analysts **McCOMAS**
 County **SAN JUAN** State **NEW MEX.** Elev. **6245 GR** Location **SEC 18 T31N R11W**

Lithological Abbreviations

SAND-SD SHALE-SH LIME-LM	DOLOMITE-DR CHERT-CH GYPSUM-GYP	ANHYDRITE-ANHY CONGLOMERATE-CONG FOSSILIFEROUS-FOSS	SANDY-SBY SHALY-SHY MY-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	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
70	7422-23	<0.01	1.8	0.0	94.6	VERTICAL FRACTURE
71	23-24	<0.01	0.6	0.0	66.6	" "
72	24-25	<0.01	2.3	0.0	95.6	" "
73	25-26	<0.01	1.6	0.0	81.2	" "
74	26-27	0.01	1.9	0.0	89.5	" "

7422-7427 This interval is essentially non-productive.

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CORE ANALYSIS RESULTS

Company **EL PASO NATURAL GAS COMPANY** Formation **DAKOTA** File **RP-3-1441**
Well **CASE #8** Core Type **DIAMOND CONV.** Date Report **6/2/61**
Field **BASIN DAKOTA** Drilling Fluid **WATER BASE MUD** Analysts **McCombs**
County **SAN JUAN** State **NEW MEX.** Elev. **6245 GR** Location **SEC 18 T31N R11W**

Lithological Abbreviations

SAND - SL	DOLomite - DOL	ANhydrite - ANHY	SANDY - SDY	FINE - FN	CRYSTALLINE - XIN	BROWN - BRN	FRACTURED - FRAC	SLIGHTLY - SL/
SHALE - SH	CHERT - CH	CONGLOMERATE - CONG	SHALY - SHY	MEDIUM - MED	GRAIN - GRN	GRAY - GR	LAMINATION - LAM	VERY - V/
LIME - LM	GYPSUM - GYP	POSSIBLE - POSS	CLAY - CLY	COARSE - CSE	GRANULAR - GRNL	VUGGY - VGY	STYLOLITIC - STY	WITH - W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PERCENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
75	7445-46	0.02	1.0	0.0	90.0	VERTICAL FRACTURE
76	46-47	0.02	2.6	0.0	96.2	
77	7454-55	0.03	2.6	19.2	65.5	VERTICAL FRACTURE

7445-7447 This interval is essentially non-productive.

7454-7455 This interval is essentially non-productive.

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CORE ANALYSIS RESULTS

Company	EL PASO NATURAL GAS COMPANY	Formation	DAKOTA	File	RP-3-1441
Well	CASE # 8	Core Type	DIAMOND CONV.	Date Report	6/2/61
Field	BASIN DAKOTA	Drilling Fluid	WATER BASE MUD	Analysts	McCOMAS
County	SAN JUAN	State	NEW MEX.	Location	SEC 18 T31N R11W
			6245 GR		

Lithological Abbreviations

SAND, SD SHALE, SH LIME, LM	DOLOMITE, DOL CHERT, CH GYPSUM, GYP	ANHYDRITE, ANHY CONGLOMERATE, CONG FOSSILIFEROUS, FOSS	SANDY, SDY SHALY, SHY LIMY, 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	POROSITY PERCENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
78	7462-63	0.03	6.0	0.0	71.8	VERTICAL FRACTURE
79	63-64	0.03	3.5	0.0	74.0	" "
80	64-65	0.02	2.4	0.0	91.6	" "
81	65-66	0.80	5.4	0.0	68.5	" "
82	66-67	0.69	4.0	0.0	10.0	" "

7462-7467 This interval is essentially non-productive. It is possible that continuation of this interval will be low-capacity water productive.

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CORE ANALYSIS RESULTS

Company **EL PASO NATURAL GAS COMPANY** Formation **DAKOTA** File **RP-3-1441**
 Well **CASE # 8** Core Type **DIAMOND CONV.** Date Report **6/4/61**
 Field **BASIN DAKOTA** Drilling Fluid **WATER BASE MUD** Analysts **McCOMAS**
 County **SAN JUAN** State **NEW MEXICO** Elev. **6245 GR** Location **SEC 18 T31N R11W**

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
83	7473-74	0.03	2.7	0.0	92.7	
84	74-75	0.07	4.6	0.0	34.6	
85	75-76	0.30	5.6	0.0	28.5	VERTICAL FRACTURE
86	76-77	0.13	2.5	0.0	72.0	" "
87	77-78	0.10	4.6	0.0	26.0	
88	78-79	0.28	5.0	0.0	39.8	
89	79-80	0.22	6.0	0.0	26.6	
90	80-81	0.39	5.4	0.0	25.8	VERTICAL FRACTURE
91	81-82	22	6.7	0.0	23.8	" "
92	82-83	11	15.0	0.0	75.5	
93	83-84	11	14.4	0.0	81.5	

7473-7482 Although this interval has water saturations normally associated with gas production, it is in permeable contact with interval from 7482 to 7484, which is definitely water productive. Any completion in the interval from 7473 to 7482 would probably result in water.

CORE ANALYSIS RESULTS

Company EL PASO NATURAL GAS COMPANY Formation DAKOTA File RP-3-1441
 Well CASE # 8 Core Type DIAMOND CONV. Date Report 6/5/61
 Field BASIN DAKOTA Drilling Fluid WATER BASE MUD Analysts McCOMAS
 County SAN JUAN State NEW MEX. Elev. 6245 GR Location SEC 18 T31N R11W

Lithological Abbreviations

SAND-SD SHALE-SH LIM-LM DOLOMITE-DO CHERT-CH GYPSUM-GYP ANHYDRITE-ANHY CONGLOMERATE-CONG FOSSILIFEROUS-FOSS SANDY-SDY SHALY-SHY LIMY-LMY FINE FN MED LM-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 MILLIDARCS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
94	7489-90	137	14.9	0.0	64.4	
95	90-91	0.52	7.7	0.0	75.4	
96	91-92	0.25	9.1	2.2	82.4	
97	92-93	19	11.2	0.0	61.6	
98	93-94	149	13.5	0.0	69.6	
99	94-95	97	13.7	1.5	71.5	
100	95-96	0.44	14.1	0.0	71.0	
101	96-97	0.32	15.3	1.3	69.2	
102	97-98	0.11	13.8	0.0	75.6	
103	98-99	0.17	15.2	0.0	77.0	
104	99-7500	128	19.1	0.0	66.0	
105	7500-01	99	16.0	0.0	68.1	
106	01-02	152	16.1	1.2	72.6	
107	02-03	201	16.7	1.2	77.4	
108	03-04	88	17.2	0.0	72.6	
109	04-05	167	17.6	0.0	73.0	
110	05-06	4.4	13.5	0.0	69.5	
111	06-07	0.68	9.1	0.0	74.6	
112	07-08	0.01	8.5	0.0	76.5	
113	08-09	0.07	8.9	0.0	72.0	
114	09-10	0.03	5.9	0.0	61.0	
115	10-11	0.38	6.9	0.0	58.0	
116	11-12	0.08	7.0	0.0	68.5	
117	12-13	0.12	7.2	0.0	85.0	

7489-7513 This interval is water productive.