

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Vitrinite Reflectance Values of Coal from Drill-Hole Cuttings,
San Juan Basin, New Mexico

by

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INTRODUCTION

In 1988, a cooperative project between the New Mexico Oil Conservation Division and the U.S. Geological Survey was established to better understand the thermal maturity of coal beds in the Upper Cretaceous Fruitland Formation throughout the New Mexico portion of the San Juan Basin. The first product of this project was U.S. Geological Survey Open-File Report 90-290 (Fassett and Nuccio, 1990), which presented vitrinite reflectance (R_m) values for 125 coal samples. This report presents an additional 291 R_m values. Because this is an ongoing project, additional U.S. Geological Survey Open-File reports similar to this one will be published periodically.

Data for this report are tabulated by township, range, section, and quarter section for each well. The depths in feet of coal-cuttings were provided by the companies drilling the wells and no attempt was made to correct or adjust these depths precisely to specific coal beds on geophysical logs. In working with drill-hole cuttings, the possibility exists that samples reported to be from a given depth have been contaminated by up-hole caving. No evaluation regarding such contamination is included in this report. Because of the high density of R_m data for the San Juan Basin, any contamination should stand out as an anomaly, and can be deleted from the data set.

For this study, coal was prepared by crushing the sample, mounting it in epoxy on a microscope slide, planing it off when hardened, and polishing it. For all samples, percent mean random vitrinite reflectance was measured from randomly oriented vitrinite grains in immersion oil using a non-rotating stage on a Zeiss Universal research microscope. Plane-polarized incident white light and a 546 nm monochromatic filter were used (for a complete explanation see Stach and others, 1982). The number of readings per sample varied depending on the amount of clean vitrinite in the sample. In most of the samples vitrinite was abundant and the number of readings per sample was between 30 and 50 and the histograms were unimodal. If the number of readings is greater than 30, and the standard deviation is small, then the mean vitrinite reflectance value is statistically valid.

A general description of the geology and coal resources of the San Juan basin is in Fassett and Hinds (1971). The majority of the coals sampled for this study are from the Upper Cretaceous Fruitland Formation. No attempt was made to distinguish which horizon or individual coal bed of the Fruitland Formation the sample came from. A few of the samples are from the underlying Upper Cretaceous Menefee Formation and are distinguished from the Fruitland Formation by greater depth.

REFERENCES

- Fassett, J.E., and Hinds, J.S., 1971, Geology and fuel resources of the Fruitland Formation and Kirtland Shale of the San Juan Basin, New Mexico and Colorado: U.S. Geological Survey Professional Paper 676, 76 p.
- Fassett, J.E., and Nuccio, V.F., 1990, Vitrinite reflectance values of coal from drill-hole cuttings from the Fruitland and Menefee Formations, San Juan Basin, New Mexico: U.S. Geological Survey Open-File Report 90-290, 21 p.
- Stach, E., Mackowsky, M. Th., Teichmüller, M., Taylor, G.H., Chandra, D., and Teichmüller, R., 1982, Stach's textbook of coal petrology, 3rd edition: Berlin-Stuttgart, Borntraeger, 535 p.

Table---Vitrinite reflectance (Rm) values of coal from drill cuttings, San Juan Basin, New Mexico
[T.(N) = Township north, R.(W) = range west, Sec. = Section, 1/4 = quarter section, Rm = mean random vitrinite reflectance in percent,
mean = mean of measured reflectance readings, no. = number of readings, σ = standard deviation]

T.(N)	<u>Location</u>		Company	<u>Well name</u>	<u>Depth</u> (ft)	<u>Rm</u>		σ
	R.(W)	Sec. 1/4				mean	no.	
21	2	31	Shogoi Ltd.	Chijuilla 31-34, 1	3,720	.59	47	.04
23	4	14	Chase Oil Co., Inc.	Jicarilla Apache, 47-34	2,845	.51	35	.02
23	7	5	Dugan Prod. Corp.	Sapp C, 4	1,980-2,000	.51	31	.02
23	7	5	Dugan Prod. Corp.	Sapp C, 4	4,360-4,400	.64	35	.02
23	7	16	BCO Inc.	State J, 4	1,790-1,820	.49	25	.03
23	7	20	Yates Pet. Co.	Kite ACA Fed, 1	3,980-4,010	.60	21	.02
23	7	22	BCO Inc.	Federal B, 9	2,040-2,070	.48	25	.04
23	7	22	BCO Inc.	Federal B, 9	3,809	.58	35	.03
23	7	22	BCO Inc.	Federal B, 8	4,140-4,290	.45	21	.04
23	10	6	Dugan Prod. Corp.	Calgary, 4	900	.45	11	.02
23	10	9	Dugan Prod. Corp.	Helsinki, 52	3,220-3,260	.49	25	.01
23	11	1	Dugan Prod. Corp.	Flo-Jo, 1	980-990	.47	25	.03
23	11	1	Dugan Prod. Corp.	Flo-Jo, 1	3,247	.51	31	.03
23	11	1	Dugan Prod. Corp.	Flo-Jo, 2	920-930	.49	31	.03
23	11	1	Dugan Prod. Corp.	Flo-Jo, 2	3,150-3,200	.54	19	.04
24	6	31	BCO Inc.	Federal Bobby B, 3	1,796-1,826	.48	35	.02
24	6	31	BCO Inc.	Federal Bobby B, 3	4,139-4,169	.59	13	.06
24	6	31	BCO Inc.	Federal B, 4	4,087-4,117	.50	31	.02
24	9	32	Yates Pet. Co.	Ristra AGW Stat., 1	1,145	.45	35	.02
26	7	12	Unocal Oil & Gas Div.	Rincon Unit, 270	2,720-2,740	.59	35	.04
26	8	18	Meridian Oil Inc.	Kah Des Pah, 2	1,850-1,860	.55	35	.03
26	8	18	Meridian Oil Inc.	Kah Des Pah, 2	4,240-4,250	.62	35	.03
27	6	16	Unocal Oil & Gas Div.	Rincon Unit, 257	3,170-3,180	.61	38	.04
27	6	18	Unocal Oil & Gas Div.	Rincon Unit, 252	3,180-3,190	.63	35	.03
27	6	20	Unocal Oil & Gas Div.	Rincon Unit, 255	3,000-3,020	.60	35	.03
27	7	13	Unocal Oil & Gas Div.	Rincon Unit, 276	3,190-3,200	.68	37	.05
27	7	14	Unocal Oil & Gas Div.	Rincon Unit, 279	3,223-3,231	.60	35	.04
27	7	23	Unocal Oil & Gas Div.	Rincon Unit, 281	3,080-3,100	.61	35	.04
27	7	27	Unocal Oil & Gas Div.	Rincon Unit, 287	2,840-2,860	.60	35	.04

T.(N)	<u>Location</u>		Company	<u>Well name</u>	<u>Depth</u> (ft)	mean	<u>Rm</u>		σ
	R.(W)	Sec.					no.		
		1/4							
27	7	27	SW	Unocal Oil & Gas Div.	2,880-2,900	.62	35	.04	
27	9	4	NE	Meridian Oil Inc.	2,930-2,940	.61	45	.04	
27	9	19	SW	Unocal Oil & Gas Div.	2,260-2,280	.55	47	.04	
27	7	19	SW	Unocal Oil & Gas Div.	2,300-2,320	.58	35	.03	
27	9	21	NE	Meridian Oil Inc.	2,050-2,060	.61	45	.04	
27	10	11	NE/SW	McKenzie Methane Corp.	2,128-2,135	.60	41	.04	
27	10	13	SW/SW	McKenzie Methane Corp.	1,886	.60	41	.03	
27	10	15		Angel Peak 15 M, 7	1,865	.57	41	.04	
27	10	17	SW	McKenzie Methane Corp.	1,910-1,916	.53	45	.03	
27	10	22	NE	Meridian Oil Inc.	2,015-2,020	.59	45	.03	
28	4	18	SW	Meridian Oil Inc.	4,460-4,475	.64	35	.04	
28	5	16	NE	Meridian Oil Inc.	3,495-3,500	.71	35	.04	
28	5	18	NE	Meridian Oil inc.	3,561-3,587	.75	45	.04	
28	6	10	SW	Meridian Oil Inc.	3,327-3,345	.67	35	.03	
28	6	12		San Juan 28-6 U, 403	3,370-3,377	.76	45	.04	
28	8	12	SW	Meridian Oil Inc.	2,990-3,010	.68	45	.04	
28	8	26	NE	Hardie D, 800	2,290-2,300	.65	35	.04	
28	9	26	SW	Howell, 800	2,160-2,170	.62	45	.04	
28	9	30	SW	Lackey H, 709	2,350-2,362	.62	45	.04	
28	10	25	SW	Hancock, 713	1,850-1,880	.61	45	.04	
28	10	36	SW	Omler, 500	1,910-1,922	.61	45	.03	
29	7	5	NE	Omler, 501	2,900-2,910	.73	35	.04	
29	7	16	NE	San Juan 29-7 U, 505	3,020-3,030	.73	45	.05	
29	7	18	SW	San Juan 29-7 U, 509	3,616-3,624	.64	35	.04	
29	7	19	NE	San Juan 29-7 U, 511	3,360-3,370	.74	45	.04	
29	7	33	NE	San Juan 29-7 U, 512	2,859	.60	36	.03	
29	7	33	SE	Meridian Oil Inc.	2,940-2,948	.73	45	.04	
29	7	36	NE	Meridian Oil Inc.	3,188-3,198	.71	51	.04	
29	7	36	SW	Meridian Oil Inc.	3,612-3,622	.66	37	.03	
29	8	1	NE	San Juan 29-7 U, 516	2,780-2,790	.79	45	.04	
29	8	5	NE	Meridian Oil Inc.	2,840-2,850	.73	45	.04	
29	8	7	NW	Amoco Prod. Co.	2,821-2,836	.72	45	.04	
29	8	9	NW	Day B, 12	3,020-3,230	.71	45	.04	
29	8	10	SW	Day Com, 200	2,980-3,000	.66	41	.05	
				Relofs A, 200					

Location		Company	Well name	Depth	Rm				
T.(N)	R.(W)			Sec.	1/4	(ft)	mean	no.	σ
29	8	12	SW	Meridian Oil Inc.	Vanderwart, 200	3,010-3,020	.73	41	.04
29	8	14	NW	Meridian Oil Inc.	Roelofs A Com, 201	3,000-3,016	.69	45	.05
29	8	17	SW	Meridian Oil Inc.	Day, 201	3,010-3,020	.68	45	.04
29	8	24	NW	Meridian Oil Inc.	Hardie A Com, 210	3,203-3,228	.72	45	.04
29	8	26	NW	Meridian Oil Inc.	Hardie A, 211	2,930-2,960	.68	45	.04
29	9	1	NE	Meridian Oil Inc.	Riddle A, 717	2,940-2,960	.66	51	.05
29	9	13	NW	Meridian Oil Inc.	Feuille, 718	2,830-2,860	.66	47	.03
29	9	28	NE	Meridian Oil Inc.	Grambling, 722	1,940-1,957	.65	45	.04
29	10	8	NE	Meridian Oil Inc.	Nye, 290	2,152-2,161	.64	45	.04
29	10	12	NE	Meridian Oil Inc.	Lackey A, 292	2,055-2,060	.64	45	.05
29	10	20	NE	Meridian Oil Inc.	Hubbell Com, 296	1,710-1,740	.62	47	.04
29	10	23		Union Texas Pet.	Albright, 19	1,760-1,770	.58	35	.03
29	10	27		Union Texas Pet.	Albright, 20	1,670-1,680	.59	35	.04
29	11	1	SW	Meridian Oil Inc.	Lloyd B, 600	2,010-2,050	.57	51	.04
29	11	5	NE	Meridian Oil Inc.	Fiffels Com, 800	1,790-1,800	.62	51	.03
30	4	20	NE	Meridian Oil Inc.	San Juan 30-4 U, 101	4,220-4,230	.82	35	.04
30	6	7	NE	Meridian Oil Inc.	San Juan 30-6 U, 451	3,100-1,110	.88	45	.05
30	6	7	SW	Meridian Oil Inc.	San Juan 30-6 U, 450	3,250-3,260	.94	7	.02
30	6	8	NE	Meridian Oil Inc.	San Juan 30-6 U, 430	3,060-3,080	.93	45	.05
30	6	8	SW	Meridian Oil Inc.	San Juan 30-6 U, 459	3,150-3,160	.95	45	.03
30	6	10	NE	Meridian Oil Inc.	San Juan 30-6 U, 432	3,075-3,085	.95	45	.05
30	6	11	NE	Meridian Oil Inc.	San Juan 30-6 U, 437	3,080-3,090	1.03	45	.03
30	6	11	SW	Meridian Oil Inc.	San Juan 30-7 U, 433	2,840-2,850	.94	45	.03
30	6	12	NE	Meridian Oil Inc.	San Juan 30-6 U, 438	3,020-3,029	1.01	49	.05
30	6	12	SW	Meridian Oil Inc.	San Juan 30-6 U, 434	2,956-2,980	.88	45	.05
30	6	13		Meridian Oil Inc.	San Juan 30-6 U, 445	2,932-2,964	.97	45	.03
30	6	14	NE	Meridian Oil Inc.	San Juan 30-6 U, 442	3,136-3,152	1.02	45	.03
30	6	14	SW	Meridian Oil Inc.	San Juan 30-6 U, 439	3,160-3,180	.96	11	.03
30	6	15	NE	Meridian Oil Inc.	San Juan 30-6 U, 436	3,010-3,020	.93	45	.05
30	6	16	SW	Meridian Oil Inc.	San Juan 30-6 U, 408	3,350-3,360	.92	51	.03
30	6	17	NE	Meridian Oil Inc.	San Juan 30-6 U, 454	3,050-3,129	.96	45	.04
30	6	17	SW	Meridian Oil Inc.	San Juan 30-6 U, 453	3,580-3,590	.96	45	.04
30	6	18	NE	Meridian Oil Inc.	San Juan 30-6 U, 456	3,307-3,330	.98	45	.05
30	6	18	SW	Meridian Oil Inc.	San Juan 30-6 U, 455	3,452-3,470	.94	45	.04

Location		Company	Well name	Depth (ft)	mean	Rm		σ	
T.(N)	R.(W)					Sec.	1/4		no.
30	6	19	NE	Meridian Oil Inc.	San Juan 30-6 U, 458	3,180-3,190	.87	15	.04
30	6	19	SW	Meridian Oil Inc.	San Juan 30-6 U, 457	3,000-3,010	.94	45	.04
30	6	21		Meridian Oil Inc.	San Juan 30-6 U, 470	3,340-3,350	.93	35	.04
30	6	21	SW	Meridian Oil Inc.	San Juan 30-6 U, 471	2,540-2,550	.95	45	.04
30	6	22	SW	Meridian Oil Inc.	San Juan 30-6 U, 473	3,200-3,210	.91	45	.08
30	6	22	NE	Meridian Oil Inc.	San Juan 30-6 U, 472	3,230-3,240	.96	41	.03
30	6	22	SW	Meridian Oil Inc.	San Juan 30-6 U, 467	3,510-3,520	.82	35	.04
30	6	26	NE	Meridian Oil Inc.	San Juan 30-6 U, 410	3,480-3,490	.95	45	.03
30	6	27	NE	Meridian Oil Inc.	San Juan 30-6 U, 474	3,310-3,325	.90	47	.05
30	6	28	SW	Meridian Oil Inc.	San Juan 30-6 U, 477	3,100-3,110	.89	45	.04
30	6	30		Meridian Oil Inc.	San Juan 30-6 U, 480	3,111-3,127	.92	45	.04
30	6	34	NE	Meridian Oil Inc.	San Juan 30-6 U, 483	3,440-3,449	.99	45	.03
30	6	36	SW	Meridian Oil Inc.	San Juan 30-6 U, 444	3,460-3,470	.89	45	.04
30	7	2	SW/NE	Blackwood & Nichols	Northeast Blanco, 415	3,200-3,205	.90	41	.03
30	7	4	SW	Blackwood & Nichols	Northeast Blanco, 421R	3,105-3,110	.88	35	.04
30	7	6		Blackwood & Nichols	Northeast Blanco, 451	3,080-3,085	.89	35	.04
30	7	6	SW	Blackwood & Nichols	Northeast Blanco, 453	3,085-3,090	.83	25	.04
30	7	7	NE/NE	Blackwood & Nichols	Northeast Blanco, 432	3,120-3,125	.85	45	.04
30	7	10	NE	Meridian Oil Inc.	Northeast Blanco, 411	3,140-3,151	.91	43	.05
30	7	11	SW	Meridian Oil Inc.	San Juan 30-6 U, 461	3,070-3,090	.84	44	.03
30	7	11	SW	Meridian Oil Inc.	San Juan 30-6 U, 461	3,190-3,202	.93	41	.05
30	7	13	SW	Meridian Oil Inc.	San Juan 30-6 U, 401	3,340-3,350	.81	45	.03
30	7	14	NE	Meridian Oil Inc.	San Juan 30-6 U, 464	3,060-3,080	.87	45	.04
30	7	15	NW	Meridian Oil Inc.	San Juan 30-6 U, 465	2,970-2,980	.76	35	.04
30	7	16	NE	Meridian Oil Inc.	Frances Creek S, 100	3,030-3,040	.78	45	.04
30	7	20	NE/SW	Blackwood & Nichols	Northeast Blanco, 479	3,230-3,235	.79	41	.04
30	7	21	SW	Blackwood & Nichols	Northeast Blanco, 405	3,555-3,650	.83	45	.03
30	7	34	NE	Meridian Oil Inc.	San Juan 30-6 U, 421	3,170-3,180	.80	25	.06
30	7	34	SW	Meridian Oil Inc.	San Juan 30-6 U, 426	3,050-3,070	.81	42	.04
30	8	1	NE	Blackwood & Nichols	Northeast Blanco, 465	3,245-3,250	.84	41	.04
30	8	4	SW	Meridian Oil Inc.	Howell A, 301	3,018-3,050	.81	47	.04
30	8	6	SE/NE	Amoco Production Co.	Florance H, 3	2,881-2,897	.78	41	.04
30	8	7	NE	Meridian Oil Inc.	Howell Com C, 300	3,870-2,870	.71	45	.05
30	8	9	NE/SW	Amoco Production Co.	Moore Gas Com, 1	2,651-2,663	.79	41	.04

Location		Company	Well name	Depth (ft)	Rm		σ		
T.(N)	R.(W)				Sec.	1/4		mean	no.
30	8	10	NE	Amoco Production Co.	Howell Gas Com, 1	3,079-3109	.81	45	.03
30	8	14	NE/SW	Amoco Production Co.	Fiorance I, 3	3,321-3,334	.80	45	.04
30	8	18	NE/NE	Amoco Production Co.	Florence X, 1	3,148-3,159	.76	45	.03
30	8	18	NW	Meridian Oil Inc.	Howell C Com, 301	3,030-3,048	.72	39	.03
30	8	21	NW	Meridian Oil Inc.	Howell K, 303	2,605-2,610	.71	25	.04
30	8	22	NW	Meridian Oil Inc.	Howell K, 302	2,640-2,645	.76	35	.04
30	8	23	SW/NE	Amoco Production Co.	Florence J, 3	3,169-3,188	.80	53	.05
30	8	26	NW/SW	Amoco Production Co.	Gartner Gas Com B, 1	2,684-2,697	.73	41	.05
30	8	27	NW/SW	Amoco Production Co.	Gartner A, 12	2,876-2,886	.72	45	.03
30	8	29	SW	Meridian Oil Inc.	Howell E, 301	2,610-2,620	.74	47	.04
30	8	31	SW	Meridian Oil Inc.	Howell M, 300	2,890-2,929	.65	45	.02
30	8	33	NE	Amoco Production Co.	Gartner A, 15	2,940-2,958	.72	45	.06
30	8	34	NW/SW	Amoco Production Co.	Fiorance A, 1	2,927-2,941	.72	41	.04
30	8	35	SW/NE	Amoco Production Co.	Fiorance P, 3	2,802-2,820	.76	41	.04
30	8	36	SW	Meridian Oil Inc.	DPNG Com D, 300	2,770-2,780	.76	45	.05
30	9	2	SE	Meridian Oil Inc.	Turner B Com A, 200	2,700-2,737	.74	45	.03
30	9	3	NW	Meridian Oil Inc.	Riddle, 250	3,020-3,042	.70	45	.05
30	9	5	NW	Meridian Oil Inc.	Woodriver, 250	2,850-2,870	.74	45	.03
30	9	6	SW	Meridian Oil Inc.	Quigley Com, 250	3,260-3,280	.76	45	.04
30	9	7	NE	Meridian Oil Inc.	Pierce, 250	3,060-3,086	.74	51	.04
30	9	8	NE	Meridian Oil Inc.	Pierce Com, 251	2,970-2,984	.68	47	.05
30	9	9	SW	Meridian Oil Inc.	Duff Com, 260	2,830-2,840	.68	45	.04
30	9	10	NW/SW	Amoco Production Co.	Fiorance G C D, 1	2,924-2,938	.77	42	.05
30	9	11	NE	Meridian Oil Inc.	Lindsey Com, 250	2,640-2,656	.75	45	.05
30	9	11	NW/SW	Amoco Production Co.	Riorance 114 FT, 2	2,777-2,793	.71	41	.04
30	9	15	NW	Meridian Oil Inc.	Riddle A Com, 201	2,238-2,260	.68	45	.04
30	9	15	NW	Meridian Oil Inc.	Riddle A Com, 201	3,110-3,120	.72	41	.05
30	9	21	SW	Meridian Oil Inc.	Florence Com, 260	2,710-2,740	.67	45	.04
30	9	24	SW/NE	Amoco Production Co.	Fiorance O, 3	2,458-2,472	.76	41	.05
30	9	28	NE	Meridian Oil Inc.	Turner, 251	2,490-2,500	.65	47	.04
30	9	28	NW	Meridian Oil Inc.	Mansfield Com, 260	2,530-2,540	.65	45	.04
30	9	29	SW	Meridian Oil Inc.	Mansfield Com, 251	2,590-2,610	.66	45	.04
30	10	1	SW	Meridian Oil Inc.	Sunray B, 201	3,120-3,150	.65	45	.06
30	10	6	NW	Meridian Oil Inc.	Atlantic C, 202	2,584-2,600	.63	45	.08

T.(N)	Location		Company	Well name	Depth	mean	Rm		
	R.(W)	Sec.			(ft)		no.	σ	
30	10	7	SW	Meridian Oil Inc.	Sunray J, 210	2,920-2,930	.61	45	.05
30	10	10	SE	Meridian Oil Inc.	San Juan, 200	2,910-2,920	.62	45	.04
30	10	12	NE	Meridian Oil Inc.	Grambling C, 200	3,040-3,048	.67	45	.04
30	10	13	NE	Meridian Oil Inc.	Turner Federal, 210	3,350-3,360	.63	51	.03
30	10	13	SW	Meridian Oil Inc.	Pierce A, 210	2,984-2,993	.65	45	.04
30	10	15	SE	Meridian Oil Inc.	Sunray B, 215	2,810-2,820	.66	45	.05
30	10	21	NE	Meridian Oil Inc.	Sunray D, 225	2,780-2,790	.63	45	.04
30	10	23	NE	Meridian Oil Inc.	Riddle B, 223	2,830-2,840	.54	35	.06
30	10	25	NW	Meridian Oil Inc.	Florence A, 210	2,490-2,510	.63	45	.04
30	10	28	SW/SW	Amoco Production Co.	Stewart B, 1	2,653-2,663	.66	45	.05
30	11	16	SW/NE	Mesa Oper. Ltd.	FC State Com, 16	2,130-2,140	.60	41	.03
30	14	17		Dugan Prod. Corp.	Turks Toast, 4	1,130-1,140	.52	35	.02
30	14	17		Dugan Prod. Corp.	Turks Toast, 4	3,580-3,590	.63	35	.03
31	5	29	NE	Meridian Oil Inc.	Rosa Unit, 200	3,250-3,260	1.10	45	.04
31	6	11	SW	Meridian Oil Inc.	Rosa Unit, 216	3,060-3,071	1.05	35	.03
31	6	23	NE	Meridian Oil Inc.	Rosa Unit, 213	3,119-3,127	.97	45	.07
31	6	26	NE	Meridian Oil Inc.	Rosa Unit, 211	3,220-3,232	1.08	51	.03
31	6	21	SW	Meridian Oil Inc.	Rosa Unit, 260	3,160-3,170	1.07	45	.05
31	6	22	NE	Meridian Oil Inc.	Rosa Unit, 201	3,070-3,083	1.04	41	.04
31	6	30	SW	Blackwood & Nichols	Northeast Blanco, 495	3,255-3,260	.92	35	.04
31	7	1	SE/SW	Blackwood & Nichols	Northeast Blanco, 462	3,275-3,280	1.04	25	.04
31	7	11	NE/NE	Blackwood & Nichols	Northeast Blanco, 440	3,155-3,160	.96	45	.03
31	7	13	NE/NE	Blackwood & Nichols	Northeast Blanco, 458	3,160-3,165	.92	41	.03
31	7	15	SW	Blackwood & Nichols	Northeast Blanco, 482	3,390-3,395	.86	35	.04
31	7	15	SW/NE	Blackwood & Nichols	Northeast Blanco, 452	3,170-3,175	.91	41	.04
31	7	16	NE	Blackwood & Nichols	Northeast Blanco, 484	3,412-3,420	.98	35	.04
31	7	20	NE/NE	Blackwood & Nichols	Northeast Blanco, 408	3,155-3,160	.97	41	.05
31	7	22	SW	Blackwood & Nichols	Northeast Blanco, 476	3,185-3,190	.84	35	.04
31	7	24	NE/NE	Blackwood & Nichols	Northeast Blanco, 428	3,150-3,155	.89	41	.05
31	7	25	SE	Blackwood & Nichols	Northeast Blanco, 493	3,195-3,200	.94	25	.04
31	7	27	NE	Blackwood & Nichols	Northeast Blanco, 470	3,205-3,210	.88	35	.05
31	7	29	SE/SW	Blackwood & Nichols	Northeast Blanco, 412	3,170-3,175	.92	43	.03
31	7	29	SW/NE	Blackwood & Nichols	Northeast Blanco, 472	3,330-3,333	.97	31	.06
31	7	30	SE/NE	Blackwood & Nichols	Northeast Blanco, 414	3,270-3,275	.96	45	.05

T.(N)	Location		Company	Well name	Depth	mean	Rm		
	R.(W)	Sec.			(ft)		no.	σ	
		1/4							
31	7	32	SE/SW	Blackwood & Nichols	Northeast Blanco, 450	3,235-3,240	.95	51	.04
31	7	32	NE/NE	Blackwood & Nichols	Northeast Blanco, 448	3,160-3,165	.78	41	.04
31	7	33	NE/SW	Blackwood & Nichols	Northeast Blanco, 446	3,185-3,190	.92	45	.03
31	7	36	SW	Meridian Oil Inc.	Northeast Blanco, 481	3,380-3,390	.87	35	.04
31	7	36	NE	Meridian Oil Inc.	Northeast Blanco, 483	3,130-3,142	.99	45	.04
31	8	25	SW/NE	Blackwood & Nichols	Northeast Blanco, 471	3,275-3,280	.94	45	.04
31	8	25	SW/SW	Blackwood & Nichols	Northeast Blanco, 445	3,270-3,275	.94	45	.04
31	8	27	SW	Meridian Oil Inc.	Hale, 350	3,160-3,170	.88	45	.04
31	8	28	NW	Meridian Oil Inc.	Howell D, 350	3,383-3,393	.87	25	.04
31	8	29	SW	Meridian Oil Inc.	Howell D, 351	3,320-3,330	.75	35	.04
31	8	29	NE	Amoco Production Co.	Kernaghan B, 6	3,409-3,426	.82	41	.04
31	8	31		Meridian Oil Inc.	Howell D, 352	3,185-3,192	.76	35	.03
31	8	34		Meridian Oil Inc.	Hale, 353	3,120-3,128	.83	45	.04
31	9	2	NE	Meridian Oil Inc.	San Juan 32-9 U, 201	3,210	.90	45	.04
31	9	8	SE/NE	Amoco Production Co.	San Juan 32-9, 105	3,469-3,488	.83	21	.04
31	9	21	NW	Meridian Oil Inc.	Sunray G, 251	3,320-3,330	.79	49	.05
31	9	21	SE	Meridian Oil Inc.	Sunray G, 250	2,999-3,020	.78	47	.04
31	9	22	NE/SW	Amoco Production Co.	Riddle B-1, 2	3,047-3,052	.79	41	.04
31	9	28	SE	Meridian Oil Inc.	Sheets, 250	2,983-2,993	.72	35	.03
31	10	2	NE	Meridian Oil Inc.	San Juan 32-9, 209	2,890-2,900	.74	21	.03
31	10	2	SW	Meridian Oil Inc.	San Juan 32-9, 210	2,960-2,973	.82	45	.03
31	10	23	NE	Meridian Oil Inc.	Atlantic D Com, 205	3,340-3,350	.69	47	.04
31	10	29	NE	Meridian Oil Inc.	Atlantic A, 211	2,490-2,510	.64	35	.03
31	10	29	SW	Meridian Oil Inc.	Atlantic A, 210	2,700-2,710	.62	45	.03
31	10	31	NE	Meridian Oil Inc.	Atlantic C, 215	2,681-2,689	.67	45	.04
31	10	31	NE	Meridian Oil Inc.	Atlantic C, 200	3,152-3,155	.68	47	.05
31	10	35	NE	Meridian Oil Inc.	Atlantic C, 200	2,970-2,980	.64	35	.04
31	11	6	NE	Meridian Oil Inc.	Grenier, 100	2,580-2,590	.67	45	.04
31	11	7	SW	Meridian Oil Inc.	Grenier, 101	2,712-2,730	.70	35	.05
31	11	17	SW	Amoco Production Co.	Case B, 1	2,610-2,630	.69	45	.05
31	11	18	SW	Meridian Oil Inc.	Grenier, 102	2,228-2,248	.66	45	.04
31	11	27	SE	Meridian Oil Inc.	Calloway, 1-A	2,370-2,373	.62	35	.03
31	11	36	SW	Great Western Drilling	Pubco State Com, A-1	2,710-2,720	.70	45	.04
31	12	11	NE	Meridian Oil Inc.	Davis, 504	2,800-2,808	.67	35	.04
31	12	12	SW	Meridian Oil Inc.	Davis, 502				

T.(N)	<u>Location</u>		Company	Well name	<u>Depth</u> (ft)	<u>Rm</u>		σ
	R.(W)	Sec.				mean	no.	
31	12	14	Meridian Oil Inc.	Harper Com, 100	2,540-2,550	.65	45	.04
31	13	2	Quinoco	Jaquez K, 2-2	2,023-2,033	.56	35	.04
31	13	2	Quinoco	Chavez H, 2-2	1,999	.70	41	.04
32	4	26	Nassau Res., Inc.	Carracas Unit, 26B 16	3,958-3,968	1.20	45	.06
32	5	28	Meridian Oil Inc.	Quintana Mesa C, 100	3,890-3,905	1.14	45	.04
32	6	7	Meridian Oil Inc.	Allison Unit, 133	2,750-2,760	1.19	15	.06
32	6	16	Meridian Oil Inc.	Allison Unit, 100	2,770-2,781	1.25	45	.03
32	6	17	Meridian Oil Inc.	Allison Unit, 101	3,200-3,210	1.03	16	.07
32	6	18	Meridian Oil Inc.	Allison Unit, 111	3,050-3,060	1.17	45	.05
32	6	18	Meridian Oil Inc.	Allison Unit, 112	3,120-3,128	1.19	45	.04
32	6	19	Meridian Oil Inc.	Allison Unit, 114	3,140-3,150	1.20	45	.04
32	6	19	Meridian Oil Inc.	Allison Unit, 136	3,250-3,260	1.17	42	.04
32	6	20	Meridian Oil Inc.	Allison Unit, 116	2,940-2,960	1.26	51	.05
32	6	20	Meridian Oil Inc.	Allison Unit, 115	3,156-3,169	1.19	25	.05
32	6	21	Meridian Oil Inc.	EPNG A, 100	3,071-3,076	1.23	51	.04
32	6	21	Meridian Oil Inc.	Allison Unit, 117	3,150-3,161	1.15	45	.03
32	6	23	Meridian Oil Inc.	San Juan 32-5 U, 101	3,100-3,112	1.18	45	.05
32	6	23	Meridian Oil Inc.	San Juan 32-5 U, 100	4,360-4,369	1.12	45	.07
32	6	24	Meridian Oil Inc.	San Juan 32-5 U, 102	2,990-3,000	1.18	45	.07
32	6	25	Meridian Oil Inc.	San Juan 32-5 U, 104	3,110-3,121	1.19	51	.04
32	6	26	Meridian Oil Inc.	San Juan 32-5 U, 107	3,074-3,080	1.15	45	.04
32	6	28	Meridian Oil Inc.	EPNG B, 100	3,090-3,100	1.17	51	.04
32	6	29	Meridian Oil Inc.	Allison Unit, 102	3,190-3,200	1.16	45	.05
32	6	29	Meridian Oil Inc.	Allison Unit, 119	3,069-3,077	1.16	41	.05
32	6	30	Meridian Oil Inc.	Allison Unit, 120	3,073-3,087	1.15	45	.03
32	6	30	Meridian Oil Inc.	Allison Unit, 121	3,073-3,087	1.08	45	.03
32	6	30	Meridian Oil Inc.	Allison Unit, 123	3,220-3,240	1.22	45	.05
32	7	9	Meridian Oil Inc.	Allison Unit, 125	3,150-3,158	1.15	45	.04
32	7	12	Meridian Oil Inc.	Allison Unit, 126	3,270-3,275	1.25	51	.05
32	7	14	Meridian Oil Inc.	Allison Unit, 127	3,448-3,458	1.09	45	.04
32	7	14	Meridian Oil Inc.	Allison Unit, 107	3,074-3,080	1.07	45	.04
32	7	15	Meridian Oil Inc.	Allison Unit, 108	3,253-3,266	1.15	35	.06
32	7	23	Meridian Oil Inc.	Allison Unit, 132	3,165-3,168	1.12	51	.04
32	7	25	Meridian Oil Inc.	Burnt Mesa, 101	3,330-3,339	1.14	45	.04
32	7	25	Meridian Oil Inc.					

T.(N)	Location		Company	Well name	Depth (ft)	Rm		σ	
	R.(W)	Sec.				1/4	mean		no.
32	7	26	SW	Meridian Oil Inc.	Burnt Mesa, 100	3,404-3,433	1.06	45	.05
32	7	36		N.W. Pipeline	San Juan 32-7, 204	3,175-3,188	1.03	35	.03
32	8	8	SE	Meridian Oil Inc.	Trail Canyon, 101	3,340-3,350	1.07	45	.04
32	8	12	NE	Meridian Oil Inc.	Reese Mesa, 104	3,750-3,760	1.19	45	.04
32	8	13	NW	Meridian Oil Inc.	Reese Mesa, 100	3,950-3,961	1.15	45	.05
32	8	13	SE	Meridian Oil Inc.	Reese Mesa, 101	3,550-3,570	.96	33	.04
32	8	32	SE	Meridian Oil Inc.	Rattlesnake Can., 102	3,430-3,440	.93	35	.03
32	9	36	NE	Meridian Oil Inc.	San Juan 32-9 U, 228	3,370-3,380	.94	17	.04
32	10	11	NE	Meridian Oil Inc.	Carter Ute, 100	3,250-3,270	1.09	45	.04
32	10	16	NE	Meridian Oil Inc.	Burroughs Com A, 100	3,094-3,099	.98	45	.04
32	10	16	SW	Meridian Oil Inc.	EPNG Com C, 100	3,410-3,425	.86	45	.04
32	10	23	SE	Meridian Oil Inc.	Carter Ute, 104	3,240-3,263	.97	45	.02
32	11	7	SW	Great Western Drilling	J.E. Decker, 10	2,926-2,937	.71	35	.04
32	11	8		Great Western Drilling	Decker, 11	3,118-3,135	.77	43	.04
32	11	23	SE/NE	Amoco Production Co.	Barnes GC A, 1	2,881-2,903	.77	45	.03
32	11	30		Nassau Resources	Bettin' on Bisti 30, 9	1,180-1,210	.43	35	.02
32	11	33	NW/SW	Amoco Production Co.	Neal A, 1	2,837-2,857	.70	41	.04
32	12	25	SW/NE	Amoco Production Co.	Moore GC, B-1	2,718-2,740	.61	31	.04
32	12	28	SW	Meridian Oil Inc.	Culpepper Martin, 103	2,340-2,350	.65	35	.05
33	10	1	SE	Meridian Oil Inc.	Bondad 33-10 Co, 104	2,970-2,980	1.13	51	.04
33	11	12	NW	Meridian Oil Inc.	Ute, 201	3,252-3,275	.91	45	.04
33	11	12	SE	Meridian Oil Inc.	Ute, 200	3,450-3,470	1.02	45	.03
33	11	12	SE	Meridian Oil Inc.	Southern Ute, 300	2,283-2,293	.71	41	.03
33	11	33	NW	Meridian Oil Inc.	Southern Ute, 300	2,470-2,480	.73	35	.04