								Cored Interval			
Well No.	**API No.**	**Operator**	**Well Name**	**QQ**	**S**	**T**	**R**	**Top**	**Bottom**	**TOC**	**Comments**
8474	007-00690	Tenneco Oil Co.	Graham USA #1-15	NESW	15	144	102	10331	10394	Y	
12886	007-01213	Shell Western Expl. & Prod.	Connell #24-27	SESW	27	144	102	10479	10581	Y	V & H; ML-DTF
2618	025-00017	Pan American Petroleum Corp.	Jacob Huber #1	SWSE	15	145	91	9794	9844	Y	
527	053-00026	California Oil Co.	Rough Creek Unit #1	NWNE	13	148	98	11225	11340	Y	ML-DTF
607	025-00003	Socony-Vacuum Oil Co.	Angus Kennedy #F32-24-D	SWNE	24	149	93	10508	10681	Y	ML-MBK
1405	053-00226	Amerada Petroleum Corp.	Catherine E. Peck #2	NWNE	27	150	96	10759	10874	Y	MBK
13098	053-02357	Oryx Energy Co.	Stenejhem HD #1-27	NESE	27	150	97	10888	11045	Y	MBK-DTF
8177	101-00260	Marathon Oil Co.	Dobrinski #18-44	SESE	18	151	87	8629	8667	Y	MBK
11617	053-02076	Edwin L. Cox & Berry R. Cox	Hagen #1-13	SESW	13	153	95	10363	10423	Y	
8069	061-00257	Marathon Oil Co.	Jensen #12-44	SESE	12	154	90	9157	9216	Y	MBK
4340	105-00667	Pan American Petroleum Corp.	Clifford Marmon #1	SWSW	2	154	95	9886	10060	Y	
12786	061-00394	Marathon Oil Co.	Laredo #26-1	SWNE	26	156	91	9265	9350	Y	MBK
5088	061-00187	Shell Oil Co.	Shell-Texel #21-35	NENW	35	156	93	10145	10321	Y	ML-DTF
5656	105-00732	Texakota, Inc.	H. Borstad #1	SWSW	3	157	95	9634	9674	Y	MBK
8697	101-00272	Clarion Resources, Inc.	Pullen #1-33	NENE	33	159	88	7685	7716	Y	
8699	101-00273	Clarion Resources, Inc.	Fleckten #1-20	NENE	20	160	89	7651	7691	Y	MBK
8637	075-00873	Clarion Resources, Inc.	Pierce #1-18	SENE	18	161	87	6760	6790	Y	MBK
9001	013-00877	Clarion Resources, Inc.	Negaard #1	NWNE	21	163	93	7375	7418	Y	MBK

X-RAY DIFFRACTION ANALYSIS BY STANDARD GEOLOGIC SERVICES INC. for L.C. Price USGS.
Numbers are in weight percent for Core Samples, Williston Basin: North Dakota, Montana.
Core samples are small chip composites taken by L.C. Price

Well No.*	T	R	S	QQ	Opr	Well	Depth, Formation	Quartz	Potassium Feldspar	Plagioclase	Calcite	Dolomite	Pyrite	Halite	Chlorite	Kaolinite	Illite	Illite-Smectite (% smectite)*	Insoluble Residue
NDGS 7887	142	100	17	swne	Tenneco	Mee 3-17 USA	10720'5"-10742'11" Lodgepole	11.2	0.8	0.9	70.6	-	1.7	1.2	4.5	-	6.9	2.2 (12)	24.5
NDGS 7887	142	100	17	swne	Tenneco	Mee 3-17 USA	10742'2"-10753'10" Lodgepole	7.6	-	0.8	71.6	2.1	1.2	1.4	4.8	-	7.4	3.1 (14)	23.9
NDGS 7887	142	100	17	swne	Tenneco	Mee 3-17 USA	10759'6"-10766'4" Lodgepole	10.2	1.1	1.1	53.8	5.3	2.2	1.1	3.4	2.1	14.6	5.1 (10)	39.3
NDGS 4340	154	95	2	nesw	Pan Am	Marmon 1	9910'-9912' Bakken	29.7	1.3	1.4	9.5	31.4	3.1	0.8	2.7	1.4	13.1	5,6 (8)	54.9
NDGS 4340	154	95	2	nesw	Pan Am	Marmon 1	10011'4"-10034' Three Forks	13.8	1.7	1.5	2.1	40.8	3.6	-	6.9	2.6	21.6	5.4 (14)	58.4
NDGS 4340	154	95	2	nesw	Pan Am	Marmon 1	10011'4"-10034' Three Forks	14.5	2.3	2.2	2.7	19.6	6	-	9.8	3.1	32.8	7.0 (15)	74.9
NDGS 4340	154	95	2	nesw	Pan Am	Marmon 1	10052'-10059' Three Forks	11.8	1.6	1.2	3.2	37	0.7	-	15.3	2.2	22.4	4.6 (13)	60.3
NDGS 12772	146	99	12	nwne	AHEL	Grassy Butte 12-31	11227'-11228'10" Lodgepole	7.9	0.8	0.7	52.9	7.1	3.2	-	3.6	2.9	14.6	6.3 (14)	45.5
NDGS 12772	146	99	12	nwne	AHEL	Grassy Butte 12-31	11231'5"-11241'8" Lodgepole	6.1	-	-	77.4	5.7	1.8	1.3	3.4	1.9	-	2.4 (9)	15.3
USGS R311	24	54	24	sese	Balcron	Vaira 44-24	10036'5"-10044'3" Three Forks	13.6	1.3	1.1	1.2	41.8	3.1	-	7.3	1.7	22.5	6.4 (10)	55.8
USGS R311	24	54	24	sese	Balcron	Vaira 44-24	10044'8" Three Forks	15.4	2.1	-	-	80.8	-	-	1.7	-	-	-	17.4

* NDGS - North Dakota Geological Survey well number; USGS - U.S. Geological Survey Core Laboratory number.

TOC & ROCK-EVAL PYROLYSIS FOR:										
CALIFORNIA OIL NO. 1 ROUGH CREEK										
NDGS # 5270										
				Tmax	S1	S2	S3			Tr.
Depth	(Feet)	EPR No.	TOC	C	mg/g	mg/g	mg/g	HI	OI	Ratio
11225.0	11228.0	126258-A	0.42	401	0.84	0.63	0.76	150	181	0.58
11228.0	11231.0	126258-B	0.50	416	1.82	0.84	0.66	168	132	0.68
11231.0	11234.0	126258-C	0.43	421	1.22	0.59	0.66	137	153	0.68
11234.0	11237.0	126258-D	0.50	415	1.15	0.61	0.66	122	132	0.65
11238.0	11238.0	126258-E	0.43	422	0.84	0.62	0.63	144	147	0.58
11240.0	11240.0	126258-F	0.37	421	0.82	0.31	0.67	84	181	0.73
11240.0	11243.0	126258-G	0.18	393	0.31	0.07	0.46	39	256	0.82
11243.0	11246.0	126258-H	0.41	418	0.78	0.51	0.77	124	188	0.61
11246.0	11249.0	126258-I	0.49	412	0.83	0.64	0.87	131	178	0.57
11249.0	11252.0	126258-J	0.42	422	0.90	0.52	0.80	124	190	0.63
11252.0	11255.0	126258-K	0.48	421	0.86	0.62	0.80	129	167	0.58
11255.0	11258.0	126258-L	0.45	418	0.68	0.51	0.72	113	160	0.58
11258.0	11261.0	126258-M	1.08	432	1.43	1.04	0.91	96	84	0.58
11262.0	11265.0	126258-N	11.01	451	6.38	13.59	1.69	123	15	0.32
11265.0	11268.0	126258-O	10.44	450	6.75	13.70	1.77	131	17	0.33
11268.0	11271.0	126258-P	12.18	453	6.98	17.57	1.82	144	15	0.28
11277.0	11277.0	126269-A	2.04	437	1.76	2.06	0.92	101	45	0.46
11274.0	11277.0	126258-Q	1.80	440	1.84	2.11	0.98	117	54	0.47
11278.0	11278.0	126269-B	1.92	442	1.81	1.97	1.10	103	57	0.48
11279.0	11279.0	126269-C	1.97	441	1.89	2.06	1.21	105	61	0.48
11280.0	11280.0	126269-D	2.05	442	2.05	2.24	1.09	109	53	0.48
11282.0	11282.0	126269-E	1.37	440	1.31	1.43	0.95	104	69	0.48
11283.0	11283.0	126269-F	1.45	438	1.51	1.64	1.01	113	70	0.48
11283.0	11286.0	126269-G	1.03	433	1.12	1.03	0.97	100	94	0.52
11286.0	11289.0	126269-H	0.94	432	1.02	0.93	0.91	99	97	0.53
11289.0	11292.0	126269-I	1.09	438	1.30	0.90	1.02	83	94	0.59

Table 9. ROCK EVAL data for the California Co. #1 Rough Creek Unit (NWNE Sec 13 T148N R98W; NDGS 527). Electric log tops for NDGS 527 are 11194' top of upper Bakken shale; 11216' top of middle Bakken siltstone; 11253' top of lower Bakken shale; 11275' top of Three Forks Formation. In NDGS 527: all of the siltstone; 9' of lower Bakken shale and 66' of Three Forks formation were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
11225.00	11228.00	11226.5 (1)	0.42	840	630	760	200	150	181	0.571	401	SS
11226.00	11226.00	11226 (3)	0.65	520	1010	780	80	155	120	0.340	396	SS
11228.00	11231.00	11229.5 (1)	0.50	1820	840	660	364	168	132	0.684	416	SS
11229.00	11229.00	11229 (3)	0.74	730	1230	780	99	166	105	0.372	412	SS
11231.00	11231.00	11231 (3)	0.47	510	730	640	109	155	136	0.411	415	SS
11231.00	11234.00	11232.5 (1)	0.43	1220	590	660	284	137	153	0.674	421	SS
11233.00	11233.00	11233 (3)	0.51	480	800	660	94	157	129	0.375	412	SS
11234.00	11237.00	11235.5 (1)	0.50	1150	610	660	230	122	132	0.653	415	SS
11236.00	11236.00	11236 (3)	0.52	520	670	940	100	129	181	0.437	413	SS
11238.00	11238.00	11238 (3)	0.37	380	440	770	103	119	208	0.463	418	SS
11238.00	11238.00	11238 (1)	0.43	840	620	630	195	144	147	0.575	422	SS
11240.00	11240.00	11240 (1)	0.37	820	310	670	222	84	181	0.726	421	SS
11240.00	11243.00	11241.5 (1)	0.18	310	70	460	172	39	256	0.816	393	SS
11241.00	11241.00	11241 (3)	0.23	180	200	560	78	87	243	0.474	413	SS
11243.00	11243.00	11243 (3)	0.65	500	860	740	77	132	114	0.368	411	SS
11243.00	11246.00	11244.5 (1)	0.41	780	510	770	190	124	188	0.605	418	SS
11246.00	11246.00	11246 (3)	0.54	380	670	760	70	124	141	0.362	415	SS
11246.00	11249.00	11247.5 (1)	0.49	830	640	870	169	131	178	0.565	412	SS
11248.00	11248.00	11248 (3)	0.44	320	570	920	73	130	209	0.360	411	SS
11248.00	11248.00	11248(4)	1.42	980	900	420	69	63	30	0.521	423	SS
11249.00	11252.00	11250.5 (1)	0.42	900	520	800	214	124	190	0.634	422	SS
11252.00	11252.00	11252 (3)	0.57	360	720	820	63	126	144	0.333	411	SS
11252.00	11255.00	11253.5 (1)	0.48	860	620	800	179	129	167	0.581	421	SS
11254.00	11254.00	11254 (3)	0.58	420	690	810	72	119	140	0.378	415	SS
11255.00	11258.00	11256.5 (1)	0.45	680	510	720	151	113	160	0.571	418	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
11256.00	11256.00	11256 (3)	0.53	240	350	100	45	66	19	0.407	428	SS
11258.00	11258.00	11258 (3)	0.65	400	800	1090	62	123	168	0.333	420	SS
11258.00	11261.00	11259.5 (1)	1.08	1430	1040	910	132	96	84	0.579	432	SS
11260.00	11260.00	11260 (3)	0.72	350	770	790	49	107	110	0.313	412	SS
11262.00	11265.00	11263.5 (1)	11.01	6380	13590	1690	58	123	15	0.319	451	LS
11262.00	11265.00	11263.5(4)	13.06	7480	9900	1430	57	76	11	0.430	450	LS
11262.00	11286.00	11274(4)	7.62	4930	7040	760	65	92	10	0.412	446	LS
11264.00	11264.00	11264 (3)	14.01	5490	11390	1520	39	81	11	0.325	445	LS
11265.00	11268.00	11266.5 (1)	10.44	6750	13700	1770	65	131	17	0.330	450	LS
11265.00	11265.00	11265(4)	11.01	6130	10450	680	56	95	6	0.370	450	LS
11266.00	11266.00	11266(4)	9.56	6860	7580	1210	72	79	13	0.475	453	LS
11267.00	11267.00	11267(4)	11.94	4490	10440	780	38	87	7	0.301	450	LS
11268.00	11271.00	11269.5 (1)	12.18	6980	17570	1820	57	144	15	0.284	453	LS
11268.00	11268.00	11268(4)	12.88	5120	11620	0	40	90	0	0.306	453	LS
11268.00	11271.00	11269.5(4)	11.55	4810	10180	0	42	88	0	0.321	453	LS
11269.00	11269.00	11269(4)	11.30	5170	11030	220	46	98	2	0.319	453	LS
11269.50	11269.50	11269.5(4)	10.39	5340	10930	340	51	105	3	0.328	453	LS
11270.25	11270.25	11270.25(4)	10.73	4780	9650	80	45	90	1	0.331	452	LS
11271.00	11271.00	11271(4)	11.81	7430	10580	1340	63	90	11	0.412	453	LS
11274.00	11277.00	11275.5 (1)	1.80	1840	2110	980	102	117	54	0.466	440	3F
11274.00	11274.00	11274(4)	1.92	1540	1360	180	80	71	9	0.531	436	3F
11275.50	11275.50	11275.5(4)	1.49	1170	1070	250	79	72	17	0.522	431	3F
11277.00	11277.00	11277 (1)	2.04	1760	20600	920	86	1010	45	0.079	437	3F
11278.00	11278.00	11278 (1)	1.92	1810	1970	1100	94	103	57	0.479	442	3F
11278.50	11278.50	11278.5(4)	2.15	1380	1180	60	64	55	3	0.539	442	3F
11279.00	11279.00	11279 (1)	1.97	1890	2060	1210	96	105	61	0.478	441	3F
11280.00	11280.00	11280 (1)	2.05	2050	2240	1090	100	109	53	0.478	442	3F
11280.00	11280.00	11280(4)	1.91	1380	1150	280	72	60	15	0.545	428	3F
11280.75	11280.75	11280.75(4)	1.49	1100	770	600	74	52	40	0.588	408	3F
11281.50	11281.50	11281.5(4)	1.92	1450	1340	160	76	70	8	0.520	442	3F
11282.00	11282.00	11282 (1)	1.37	1310	1430	950	96	104	69	0.478	440	3F

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
11282.50	11282.50	11282.5(4)	1.69	1160	1010	350	69	60	21	0.535	441	3F
11283.00	11283.00	11283 (1)	1.45	1510	1640	1010	104	113	70	0.479	438	3F
11283.00	11286.00	11284.5 (1)	1.03	1120	1030	970	109	100	94	0.521	433	3F
11285.00	11285.00	11285(4)	1.76	1530	1800	400	87	102	23	0.459	432	3F
11286.00	11289.00	11287.5 (1)	0.94	1020	930	910	109	99	97	0.523	432	3F
11286.00	11286.00	11286(4)	1.29	1030	1080	380	80	84	30	0.488	435	3F
11287.00	11287.00	11287(4)	1.36	940	950	420	69	70	31	0.497	433	3F
11288.25	11288.25	11288.25(4)	1.35	1060	1600	440	79	119	33	0.398	425	3F
11288.75	11288.75	11288.75(4)	0.48	490	520	280	102	108	58	0.485	391	3F
11289.00	11292.00	11290.5 (1)	1.09	1300	900	1020	119	83	94	0.591	438	3F
11290.00	11290.00	11290(4)	0.55	320	530	290	58	96	53	0.376	362	3F
11291.00	11291.00	11291(4)	0.47	390	350	300	83	75	64	0.527	425	3F
11292.00	11292.00	11292(4)	0.64	1140	980	280	178	153	44	0.538	359	3F
11293.00	11293.00	11293.00	0.68	950	2060	790	140	303	116	0.320	418	3F
11293.50	11293.50	11293.5(4)	0.67	790	800	440	118	119	66	0.497	336	3F
11294.00	11294.00	11294.00	0.70	660	770	590	94	110	84	0.460	294	3F
11295.00	11295.00	11295(4)	0.49	740	630	340	151	129	69	0.540	388	3F
11295.50	11295.50	11295.50	0.68	460	690	810	68	101	119	0.400	352	3F
11296.00	11296.00	11296(4)	0.63	520	820	440	83	130	70	0.388	345	3F
11296.00	11296.00	11296.00	0.48	220	580	810	46	121	169	0.270	376	3F
11297.00	11297.00	11297(4)	0.63	390	580	450	62	92	71	0.402	356	3F
11297.00	11297.00	11297.00	0.31	260	630	600	84	203	194	0.300	414	3F
11298.00	11298.00	11298(4)	0.38	140	200	680	37	53	179	0.412	307	3F
11298.00	11298.00	11298.00	0.48	160	350	740	33	73	154	0.320	584	3F
11299.00	11299.00	11299.00	0.69	250	560	800	36	81	116	0.310	291	3F
11300.00	11300.00	11300.00	1.03	290	510	540	28	50	52	0.360	508	3F
11301.00	11301.00	11301(4)	0.43	160	250	600	37	58	140	0.390	362	3F
11301.00	11301.00	11301.00	0.40	370	700	900	93	175	225	0.350	296	3F
11302.00	11302.00	11302(4)	0.34	170	260	600	50	77	177	0.395	322	3F
11302.00	11302.00	11302.00	0.78	340	510	670	44	65	86	0.400	292	3F
11303.00	11303.00	11303(4)	0.46	310	400	400	67	87	87	0.437	359	3F

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
11303.00	11303.00	11303.00	0.21	190	650	930	90	310	443	0.230	464	3F
11304.00	11304.00	11304(4)	0.31	470	500	260	152	161	84	0.485	359	3F
11304.00	11304.00	11304.00	0.29	450	1110	680	155	383	234	0.290	296	3F
11305.00	11305.00	11305.00	0.18	110	490	1030	61	272	572	0.180	436	3F
11305.50	11305.50	11305.5(4)	0.41	540	520	290	132	127	71	0.509	361	3F
11306.00	11306.00	11306.00	0.31	550	850	600	177	274	194	0.390	285	3F
11307.00	11307.00	11307(4)	0.74	150	160	560	20	22	76	0.484	310	3F
11307.00	11307.00	11307.00	0.25	250	590	860	100	236	344	0.300	295	3F
11308.00	11308.00	11308.00	0.20	360	780	580	180	390	290	0.320	287	3F
11309.00	11309.00	11309.00	0.33	330	440	660	100	133	200	0.430	288	3F
11310.00	11310.00	11310.00	0.32	320	500	600	100	156	188	0.390	355	3F
11311.00	11311.00	11311.00	0.21	130	360	590	62	171	281	0.270	372	3F
11312.00	11312.00	11312.00	0.27	230	390	900	85	144	333	0.370	292	3F
11313.00	11313.00	11313.00	0.88	270	500	490	31	57	56	0.360	403	3F
11314.00	11314.00	11314.00	0.31	310	320	590	100	103	190	0.500	287	3F
11315.00	11315.00	11315.00	0.26	70	130	1010	27	50	388	0.350	296	3F
11316.00	11316.00	11316.00	0.33	220	270	640	67	82	194	0.460	292	3F
11317.00	11317.00	11317.00	0.15	40	170	960	27	113	640	0.200	362	3F
11318.00	11318.00	11318.00	0.27	380	550	560	141	204	207	0.410	291	3F
11319.00	11319.00	11319.00	0.14	160	220	780	114	157	557	0.420	284	3F
11320.00	11320.00	11320.00	0.18	230	310	690	128	172	383	0.430	287	3F
11321.00	11321.00	11321.00	0.27	420	970	470	156	359	174	0.300	298	3F
11322.00	11322.00	11322.00	0.19	210	340	91	111	179	48	0.390	294	3F
11323.00	11323.00	11323.00	0.22	370	480	660	168	218	300	0.440	286	3F
11324.00	11324.00	11324.00	0.22	290	480	530	132	218	241	0.380	290	3F
11325.00	11325.00	11325.00	0.26	260	530	730	100	204	281	0.330	354	3F
11326.00	11326.00	11326.00	0.28	530	710	740	189	254	264	0.430	287	3F
11327.00	11327.00	11327.00	0.42	740	910	470	176	217	112	0.450	288	3F
11328.00	11328.00	11328.00	0.41	520	880	1270	127	215	310	0.370	320	3F
11329.00	11329.00	11329.00	0.25	700	680	790	280	272	316	0.510	282	3F
11330.00	11330.00	11330.00	0.17	100	260	960	59	153	565	0.280	291	3F

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
11331.00	11331.00	11331.00	0.25	240	470	640	96	188	256	0.340	290	3F
11332.00	11332.00	11332.00	0.10	100	260	480	100	260	480	0.280	290	3F
11333.00	11333.00	11333.00	0.17	230	400	710	135	235	418	0.370	291	3F
11334.00	11334.00	11334.00	0.14	100	130	890	71	93	636	0.450	288	3F
11335.00	11335.00	11335.00	0.15	70	140	1010	47	93	673	0.350	294	3F
11336.00	11336.00	11336.00	0.20	60	120	1130	30	60	565	0.330	287	3F
11337.00	11337.00	11337.00	0.13	100	220	970	77	169	746	0.310	290	3F
11338.00	11338.00	11338.00	0.15	200	210	740	133	140	493	0.500	280	3F
11339.00	11339.00	11339.00	0.12	70	130	1260	58	108	1050	0.350	291	3F
11340.00	11340.00	11340.00	0.16	220	300	880	138	188	550	0.420	414	3F

TOC & ROCK-EVAL PYROLYSIS FOR:										
SOCONY NO.F32-24P ANGUS KENNEDY										
NDGS# 607.0										
				Tmax	S1	S2	S3			Tr.
Depth	(Feet)	EPR No.	TOC	C	mg/g	mg/g	mg/g	HI	OI	Ratio
10514.0	10514.0	125818-A	12.65	441	8.43	53.18	1.21	420	10	0.14
10516.0	10516.0	125818-C	11.63	441	8.32	52.34	0.93	450	8	0.14
10518.0	10518.0	125818-F	12.48	440	8.43	58.16	0.68	466	5	0.13
10519.0	10519.0	125818-H	14.36	440	8.45	65.71	0.82	458	6	0.11
10519.5	10519.5	125818-I	13.79	440	8.40	59.89	0.83	434	6	0.12
10520.0	10520.0	125818-J	16.48	437	9.90	71.63	1.04	435	6	0.12
10520.5	10520.5	125818-K	14.26	439	8.74	61.82	0.72	434	5	0.12
10520.8	10520.8	125818-L	11.38	438	7.23	46.70	0.90	410	8	0.13
10521.0	10521.0	125818-M	0.81	431	0.74	0.75	0.95	93	117	0.50
10521.5	10521.5	125818-N	0.18	433	0.09	0.07	0.82	39	3	0.56
10522.0	10522.0	125818-O	0.32	412	1.06	0.43	0.81	134	253	0.72
10522.5	10522.5	125829-A	0.27	395	0.72	0.27	0.80	100	296	0.73
10523.0	10523.0	125829-B	0.31	420	0.82	0.45	0.71	145	229	0.65
10524.0	10524.0	125829-D	0.24	397	0.91	0.14	0.71	58	296	0.87
10526.0	10526.0	125829-H	0.30	408	1.19	0.27	0.68	90	227	0.82
10528.0	10528.0	125829-K	0.38	401	1.42	0.62	0.60	163	158	0.70
10530.0	10530.0	125840-B	0.07	254	0.09	0.00	0.31	0	443	1.00
10532.5	10532.5	125840-E	0.08	218	0.16	0.00	0.29	0	363	1.00
10537.0	10537.0	125840-H	0.18	327	0.42	0.06	0.40	33	222	0.87
10541.0	10541.0	125840-J	0.49	416	1.93	0.86	0.58	176	118	0.69
10545.0	10545.0	125840-L	0.27	402	0.86	0.33	0.54	122	200	0.73
10549.0	10549.0	125851-A	0.40	417	1.43	0.76	0.57	190	143	0.66
10553.0	10553.0	125851-C	0.44	417	1.41	0.64	0.56	145	127	0.69
10557.0	10557.0	125851-E	0.14	429	0.22	0.08	0.39	57	279	0.73
10561.0	10561.0	125851-G	0.46	421	1.44	0.89	0.58	193	126	0.62
10564.0	10564.0	125851-J	0.30	421	0.93	0.44	0.51	147	170	0.68
10568.0	10568.0	125851-N	0.42	423	1.26	0.62	0.50	148	119	0.67
10570.0	10570.0	125862-B	0.45	421	1.43	0.70	0.52	156	116	0.67
10572.0	10572.0	125862-F	0.22	381	0.58	0.22	0.43	100	195	0.72
10572.5	10572.5	125862-G	0.29	406	0.81	0.28	0.45	97	155	0.75
10573.0	10573.0	125862-H	0.39	414	1.11	0.47	0.52	121	133	0.70
10573.5	10573.5	125862-I	12.19	441	7.43	50.12	1.09	411	9	0.13
10574.0	10574.0	125862-J	12.33	442	7.28	54.25	1.21	440	10	0.12
10575.0	10575.0	125862-L	11.27	443	6.91	45.92	0.94	407	8	0.13
10575.5	10575.5	125873-A	11.21	443	6.94	47.32	0.89	422	8	0.13
10576.0	10576.0	125873-B	11.41	442	7.14	41.59	1.00	365	9	0.15
10577.0	10577.0	125873-D	12.75	441	7.47	49.02	1.08	384	8	0.13
10579.0	10579.0	125873-H	14.10	443	8.13	60.89	0.90	432	6	0.12
10574.5	10579.0	125862-K	11.82	442	6.73	47.06	0.99	398	8	0.13
10581.0	10581.0	125873-K	13.55	443	8.14	58.70	0.92	433	7	0.12
10583.0	10583.0	125884-A	12.33	442	6.56	49.75	1.26	403	10	0.12
10585.0	10585.0	125884-C	12.82	442	6.69	53.79	1.09	420	9	0.11
10587.0	10587.0	125884-E	11.37	442	7.05	49.78	0.98	438	9	0.12
10589.0	10589.0	125884-G	11.17	444	6.50	46.69	0.88	418	8	0.12
10591.0	10591.0	125884-I	10.76	444	6.72	46.09	0.83	428	8	0.13
10593.0	10593.0	125884-K	9.94	440	5.41	39.37	1.10	396	11	0.12
10595.0	10595.0	125884-M	4.34	442	2.89	12.12	0.98	279	23	0.19

10597.0	10597.0	125895-A	2.92	443	2.44	7.75	0.99	265	34	0.24
10599.0	10599.0	125895-C	2.17	443	2.04	5.32	1.00	245	46	0.28
10601.0	10601.0	125895-E	2.93	443	2.11	7.02	1.03	240	35	0.23
10603.0	10603.0	125895-H	1.83	442	1.82	3.89	0.99	213	54	0.32

Table 10. ROCK EVAL data for the Socony-Vacuum Angus Kennedy F32-24-P (SWNE Sec 24 T149N R93W; NDGS 607). Electric log tops for NDGS 607 are 10508' top of upper Bakken shale; 10522' top of middle Bakken siltstone; 10574' top of lower Bakken shale; 10600' top of Three Forks Formation. In NDGS 607:m92' of the Lodgepole Formation; all (14') of the upper Bakken shale; all (52') of the siltstone; all (26') of the lower Bakken shale; all (233') of the Three Forks Formation; all (95') of the Birdbear Formation; and 56' of the Duperow Formation were analysed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10416.00	10416.00	10416 (3)	0.55	250	770	660	45	140	120	0.245	434	LP
10445.00	10445.00	10445 (3)	0.62	280	970	850	45	156	137	0.224	431	LP
10471.00	10471.00	10471 (3)	0.36	290	590	800	81	164	222	0.330	434	LP
10483.17	10483.17	10483.17(4)	1.33	1310	2330	480	98	175	36	0.360	436	LP
10483.18	10483.18	10483.18(4)	0.19	300	110	240	158	58	126	0.732	355	LP
10483.19	10483.19	10483.19(4)	2.12	2030	4770	540	96	225	26	0.299	442	LP
10483.20	10483.20	10483.2(4)	0.94	1010	1730	480	107	184	51	0.369	422	LP
10483.21	10483.21	10483.21(4)	0.70	880	1530	360	126	219	51	0.365	425	LP
10483.22	10483.22	10483.22(4)	0.82	850	1380	490	104	168	60	0.381	422	LP
10483.23	10483.23	10483.23(4)	0.91	1130	1860	390	124	204	43	0.378	426	LP
10496.00	10496.00	10496(4)	0.18	360	140	170	200	78	94	0.720	307	LP
10497.00	10497.00	10497(4)	1.04	1150	1840	670	111	177	64	0.385	418	LP
10498.00	10498.00	10498(4)	0.44	710	870	250	161	198	57	0.449	424	LP
10499.00	10499.00	10499(4)	0.37	680	770	200	184	208	54	0.469	425	LP
10500.00	10500.00	10500(4)	0.58	630	620	240	109	107	41	0.504	415	LP
10501.00	10501.00	10501(4)	0.21	540	450	260	257	214	124	0.545	409	LP
10502.00	10502.00	10502(4)	0.36	950	1070	260	264	297	72	0.470	424	LP
10503.08	10503.08	10503.08(4)	0.65	1250	1400	310	192	215	48	0.472	420	LP
10504.17	10504.17	10504.17(4)	3.28	6460	6740	1300	197	206	40	0.489	426	FB
10505.00	10505.00	10505(4)	0.39	540	530	200	138	136	51	0.505	427	LP
10505.92	10505.92	10505.92(4)	0.37	590	730	160	159	197	43	0.447	431	LP
10506.58	10506.58	10506.58(4)	0.46	650	760	170	141	165	37	0.461	427	LP
10507.17	10507.17	10507.17(4)	0.54	940	1130	230	174	209	43	0.454	428	LP
10507.67	10507.67	10507.67(4)	0.81	1580	1800	270	195	222	33	0.467	425	LP
10508.00	10508.00	10508(4)	0.34	490	550	190	144	162	56	0.471	425	LP
10508.42	10508.42	10508.42(4)	0.22	260	150	130	118	68	59	0.634	412	LP
10508.67	10508.67	10508.67(4)	0.36	450	540	170	125	150	47	0.455	427	LP
10508.67	10508.67	10508.67(4)	9.81	4010	33920	1170	41	346	12	0.106	443	US
10508.83	10508.83	10508.83(4)	9.87	6370	44050	1720	65	446	17	0.126	439	US
10509.00	10509.00	10509(4)	12.28	4470	35770	810	36	291	7	0.111	440	US
10509.50	10509.50	10509.5(4)	13.58	4330	39240	940	32	289	7	0.099	444	US
10510.00	10510.00	10510(4)	4.55	1930	11120	800	42	244	18	0.148	443	US

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10510.25	10510.25	10510.25(4)	4.54	3510	20160	1440	77	444	32	0.148	441	US
10510.92	10510.92	10510.92(4)	7.42	5170	29000	2340	70	391	32	0.151	440	US
10511.00	10511.00	10511(4)	4.46	4170	15780	1380	93	354	31	0.209	434	US
10512.00	10512.00	10512(4)	10.23	3860	30220	560	38	295	6	0.113	443	US
10513.00	10513.00	10513(4)	5.97	4140	18590	1270	69	311	21	0.182	443	US
10514.00	10514.00	10514 (3)	12.65	8430	53180	1210	67	420	10	0.137	441	US
10514.00	10514.00	10514(4)	13.06	8240	51680	1090	63	396	8	0.137	443	US
10515.00	10515.00	10515(4)	7.91	5780	30960	1660	73	391	21	0.157	440	US
10516.00	10516.00	10516 (3)	11.63	8320	52340	930	72	450	8	0.137	441	US
10516.00	10516.00	10516(4)	10.86	7850	42420	2360	72	391	22	0.156	441	US
10517.00	10517.00	10517(4)	15.18	7200	41760	1470	47	275	10	0.147	439	US
10518.00	10518.00	10518 (3)	12.48	8430	58160	680	68	466	5	0.127	440	US
10518.42	10518.42	10518.42(4)	10.05	7280	48100	1560	72	479	16	0.131	435	US
10519.00	10519.00	10519 (3)	14.36	8450	65710	820	59	458	6	0.114	440	US
10519.50	10519.50	10519.5 (3)	13.79	8400	59890	930	61	434	7	0.123	440	US
10519.50	10519.50	10519.5(4)	11.90	8020	59460	1010	67	500	9	0.119	437	US
10520.00	10520.00	10520 (3)	16.48	9900	71630	1040	60	435	6	0.121	437	US
10520.00	10520.00	10520(4)	15.85	5640	47520	940	36	300	6	0.106	439	US
10520.33	10520.33	10520.33(4)	11.65	7740	53920	1960	66	463	17	0.126	439	US
10520.42	10520.42	10520.42(4)	12.36	4780	39650	430	39	321	4	0.108	440	US
10520.50	10520.50	10520.5 (4)	14.26	8740	61820	720	61	434	5	0.124	439	US
10520.58	10520.58	10520.58(4)	8.64	4230	28920	760	49	335	9	0.128	440	US
10520.75	10520.75	10520.75(4)	1.25	740	1370	560	59	110	45	0.351	432	US
10521.25	10521.25	10521.25(4)	3.16	6800	6110	1430	215	193	45	0.527	412	US
10521.50	10521.50	10521.5 (3)	0.18	90	70	820	50	39	456	0.563	433	SS
10521.67	10521.67	10521.67(4)	0.61	700	560	420	115	92	69	0.556	348	SS
10522.00	10522.00	10522 (3)	0.32	1060	430	810	331	134	253	0.711	412	SS
10522.42	10522.42	10522.42(4)	0.66	1020	910	490	155	138	74	0.528	306	SS
10522.50	10522.50	10522.5 (3)	0.27	720	270	800	267	100	296	0.727	395	SS
10523.00	10523.00	10523 (3)	0.31	820	450	710	265	145	229	0.646	420	SS
10524.00	10524.00	10524 (3)	0.24	910	140	710	379	58	296	0.867	397	SS
10524.00	10524.00	10524(4)	0.51	770	620	470	151	122	92	0.554	342	SS
10524.92	10524.92	10524.92(4)	0.65	1480	1200	260	228	185	40	0.552	412	SS
10525.75	10525.75	10525.75(4)	0.58	1040	820	410	179	141	71	0.559	349	SS
10526.00	10526.00	10526 (3)	0.30	1190	270	68	397	90	23	0.815	408	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10526.67	10526.67	10526.67(4)	0.70	810	1020	640	116	146	91	0.443	310	SS
10527.83	10527.83	10527.83(4)	0.82	1070	1190	420	130	145	51	0.473	359	SS
10528.00	10528.00	10528 (3)	0.38	1420	620	600	374	163	158	0.696	401	SS
10528.58	10528.58	10528.58(4)	0.34	760	570	180	224	168	53	0.571	408	SS
10530.00	10530.00	10530 (3)	0.07	90	0	310	129	0	443	1.000	254	SS
10530.00	10530.00	10530(4)	0.35	710	490	190	203	140	54	0.592	412	SS
10531.00	10531.00	10531(4)	0.26	700	480	180	269	185	69	0.593	406	SS
10532.08	10532.08	10532.08(4)	0.05	90	0	130	180	0	260	1.000	318	SS
10532.50	10532.50	10532.5 (3)	0.08	160	0	29	200	0	36	1.000	218	SS
10533.75	10533.75	10533.75(4)	0.14	340	140	110	243	100	79	0.708	353	SS
10535.25	10535.25	10535.25(4)	0.22	620	320	130	282	146	59	0.660	409	SS
10537.00	10537.00	10537 (3)	0.18	420	60	400	233	33	222	0.875	327	SS
10537.25	10537.25	10537.25(4)	0.15	300	130	140	200	87	93	0.698	358	SS
10538.42	10538.42	10538.42(4)	0.34	840	500	160	247	147	47	0.627	408	SS
10540.17	10540.17	10540.17(4)	0.54	950	1490	270	176	276	50	0.389	403	SS
10541.00	10541.00	10541 (3)	0.49	1930	860	580	394	176	118	0.692	416	SS
10542.00	10542.00	10542(4)	0.62	1050	1210	500	169	195	81	0.465	353	SS
10543.58	10543.58	10543.58(4)	0.48	900	1060	300	188	221	63	0.459	413	SS
10545.00	10545.00	10545 (3)	0.27	860	330	540	319	122	200	0.723	402	SS
10545.33	10545.33	10545.33(4)	0.27	400	280	210	148	104	78	0.588	356	SS
10547.25	10547.25	10547.25(4)	0.63	1220	1240	290	194	197	46	0.496	413	SS
10548.58	10548.58	10548.58(4)	0.59	1010	1000	270	171	170	46	0.502	410	SS
10549.00	10549.00	10549 (3)	0.40	1430	760	570	358	190	143	0.653	417	SS
10550.41	10550.41	10550.41(4)	0.31	310	270	340	100	87	110	0.534	390	SS
10552.00	10552.00	10552(4)	0.53	1010	1120	330	191	211	62	0.474	413	SS
10553.00	10553.00	10553 (3)	0.44	1410	640	560	320	145	127	0.688	417	SS
10553.92	10553.92	10553.92(4)	0.73	1140	1110	320	156	152	44	0.507	407	SS
10555.92	10555.92	10555.92(4)	0.55	890	990	370	162	180	67	0.473	414	SS
10557.00	10557.00	10557 (3)	0.14	220	80	390	157	57	279	0.733	429	SS
10558.00	10558.00	10558(4)	0.24	190	310	380	79	129	158	0.380	415	SS
10559.92	10559.92	10559.92(4)	0.28	320	350	370	114	125	132	0.478	364	SS
10561.00	10561.00	10561 (3)	0.46	1440	890	58	313	193	13	0.618	421	SS
10561.50	10561.50	10561.5(4)	0.64	910	1450	460	142	227	72	0.386	418	SS
10562.50	10562.50	10562.5(4)	0.46	700	800	400	152	174	87	0.467	417	SS
10564.00	10564.00	10564 (3)	0.30	930	440	510	310	147	170	0.679	421	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10564.00	10564.00	10564(4)	0.71	1100	1350	560	155	190	79	0.449	413	SS
10565.50	10565.50	10565.5(4)	0.64	970	1310	550	152	205	86	0.425	416	SS
10566.08	10566.08	10566.08(4)	1.73	830	820	590	48	47	34	0.503	346	SS
10567.00	10567.00	10567(4)	0.64	950	1140	540	148	178	84	0.455	406	SS
10567.67	10567.67	10567.67(4)	0.59	920	1040	430	156	176	73	0.469	413	SS
10568.00	10568.00	10568 (3)	0.42	1260	620	500	300	148	119	0.670	423	SS
10568.42	10568.42	10568.42(4)	0.28	280	180	400	100	64	143	0.609	358	SS
10569.00	10569.00	10569(4)	0.54	860	990	390	159	183	72	0.465	411	SS
10569.50	10569.50	10569.5(4)	0.64	950	1100	360	148	172	56	0.463	404	SS
10570.00	10570.00	10570 (3)	0.45	1430	700	520	318	156	116	0.671	421	SS
10570.00	10570.00	10570(4)	0.65	940	1120	480	145	172	74	0.456	418	SS
10570.50	10570.50	10570.5(4)	0.65	860	900	420	132	139	65	0.489	415	SS
10571.00	10571.00	10571(4)	0.50	620	690	360	124	138	72	0.473	411	SS
10571.50	10571.50	10571.5(4)	1.91	1410	1830	810	74	96	42	0.435	439	SS
10571.83	10571.83	10571.83(4)	0.46	130	130	380	28	28	83	0.500	361	SS
10572.00	10572.00	10572 (3)	0.22	580	220	430	264	100	195	0.725	381	SS
10572.25	10572.25	10572.25(4)	0.34	450	460	260	132	135	77	0.495	415	SS
10572.50	10572.50	10572.5 (3)	0.29	810	280	450	279	97	155	0.743	406	SS
10572.58	10572.58	10572.58(4)	0.40	490	570	270	123	143	68	0.462	412	SS
10572.92	10572.92	10572.92(4)	0.52	790	830	340	152	160	65	0.488	408	SS
10573.00	10573.00	10573 (3)	0.39	1110	470	520	285	121	133	0.703	414	SS
10573.17	10573.17	10573.17(4)	0.71	880	1000	370	124	141	52	0.468	420	SS
10573.42	10573.42	10573.42(4)	12.37	3330	33330	680	27	269	6	0.091	442	LS
10573.50	10573.50	10573.5 (3)	12.19	7430	50120	1090	61	411	9	0.129	441	LS
10573.67	10573.67	10573.67(4)	8.89	4090	21470	650	46	242	7	0.160	443	LS
10573.83	10573.83	10573.83(4)	8.73	4050	31640	750	46	362	9	0.113	440	LS
10574.00	10574.00	10574 (3)	12.33	7280	54250	1210	59	440	10	0.118	442	LS
10574.00	10574.00	10574(4)	4.04	5280	26330	1270	131	652	31	0.167	441	LS
10574.50	10579.00	10576.75 (3)	11.82	6730	4760	990	57	40	8	0.586	442	LS
10575.00	10575.00	10575 (3)	11.27	6910	45920	940	61	407	8	0.131	443	LS
10575.12	10575.12	10575.12 (3)	6.70	6780	34520	1440	101	515	21	0.164	441	LS
10575.17	10575.17	10575.17(4)	6.70	6780	34520	1440	101	515	22	0.164	441	LS
10575.50	10575.50	10575.5 (3)	11.21	6940	47320	890	62	422	8	0.128	443	LS
10576.00	10576.00	10576 (3)	11.41	7140	41590	1000	63	365	9	0.147	442	LS
10576.00	10576.00	10576(4)	7.46	6940	37480	1630	93	502	22	0.156	442	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10577.00	10577.00	10577 (3)	12.75	7470	49020	1080	59	384	8	0.132	441	LS
10577.00	10577.00	10577(4)	12.88	7200	64880	1340	56	504	10	0.100	439	LS
10578.33	10578.33	10578.33(4)	11.47	3980	33480	1850	35	293	16	0.106	439	LS
10579.00	10579.00	10579 (3)	14.10	8130	60890	900	58	432	6	0.118	443	LS
10579.67	10579.67	10579.67(4)	10.91	5170	41770	1620	47	364	14	0.115	440	LS
10580.92	10580.92	10580.92(4)	14.29	7750	55680	1750	54	390	12	0.122	438	LS
10581.00	10581.00	10581 (3)	13.55	8140	58700	920	60	433	7	0.122	443	LS
10582.25	10582.25	10582.25(4)	12.35	6570	44930	1810	53	364	15	0.128	434	LS
10583.00	10583.00	10583 (3)	12.33	6560	49750	1260	53	403	10	0.116	442	LS
10583.33	10583.33	10583.33(4)	11.24	5430	40440	1840	48	360	16	0.118	433	LS
10584.50	10584.50	10584.5(4)	12.47	6150	35140	1750	49	282	14	0.149	427	LS
10585.00	10585.00	10585 (3)	12.82	6690	53790	1090	52	420	9	0.111	442	LS
10586.00	10586.00	10586(4)	12.07	6790	44120	2440	56	366	20	0.133	436	LS
10586.25	10586.25	10586.25(4)	11.06	6980	41490	1930	63	375	17	0.144	439	LS
10587.00	10587.00	10587 (3)	11.37	7050	49780	980	62	438	9	0.124	442	LS
10587.50	10587.50	10587.5(4)	10.43	6480	46540	2000	62	446	19	0.124	433	LS
10588.42	10588.42	10588.42(4)	9.00	6780	47550	1270	75	528	14	0.125	437	LS
10589.00	10589.00	10589 (3)	11.17	6500	46690	880	58	418	8	0.122	444	LS
10589.92	10589.92	10589.92(4)	6.95	4660	30030	1240	67	432	18	0.134	441	LS
10591.00	10591.00	10591 (3)	10.76	6720	46090	830	62	428	8	0.127	444	LS
10591.00	10591.00	10591(4)	9.92	4300	28670	1460	43	289	15	0.130	435	LS
10593.00	10593.00	10593 (3)	9.94	5410	39370	1100	54	396	11	0.121	440	LS
10595.00	10595.00	10595 (3)	4.34	2890	12120	980	67	279	23	0.193	442	LS
10595.33	10595.33	10595.33(4)	3.52	2820	7250	770	80	206	22	0.280	446	LS
10596.25	10596.25	10596.25(4)	2.55	1310	5320	1520	51	209	60	0.198	439	LS
10597.00	10597.00	10597 (3)	2.92	2440	7750	990	84	265	34	0.239	443	LS
10597.33	10597.33	10597.33(4)	3.18	2740	6150	1570	86	193	49	0.308	441	LS
10598.42	10598.42	10598.42(4)	2.23	2750	6260	700	123	281	31	0.305	435	LS
10599.00	10599.00	10599 (3)	2.17	2040	5320	1000	94	245	46	0.277	443	LS
10599.00	10599.00	10599(4)	2.03	1670	4190	360	82	206	18	0.285	441	LS
10599.42	10599.42	10599.42(4)	2.32	1790	4180	380	77	180	16	0.300	443	LS
10599.83	10599.83	10599.83(4)	1.80	2400	4620	1100	133	257	61	0.342	443	LS
10600.00	10600.00	10600(4)	2.46	2500	5120	1060	102	208	43	0.328	442	LS
10600.17	10600.17	10600.17(4)	2.14	1590	4270	360	74	200	17	0.271	442	LS
10600.50	10600.50	10600.5(4)	2.54	1870	5750	410	74	226	16	0.245	445	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10600.83	10600.83	10600.83(4)	2.83	1870	4910	380	66	174	13	0.276	444	LS
10601.00	10601.00	10601 (3)	2.93	2110	7020	1030	72	240	35	0.231	443	LS
10603.00	10603.00	10603 (3)	1.83	1820	3890	990	99	213	54	0.319	442	LS
10607.00	10607.00	10607(4)	0.54	570	460	260	106	85	48	0.553	438	3F
10607.58	10607.58	10607.58(4)	0.43	440	470	240	102	109	56	0.484	434	3F
10608.00	10608.00	10608(4)	0.49	500	430	320	102	88	65	0.538	436	3F
10608.25	10608.25	10608.25(4)	1.00	1540	1170	260	154	117	26	0.568	436	3F
10608.75	10608.75	10608.75(4)	0.20	300	240	140	150	120	70	0.556	424	3F
10609.50	10609.50	10609.5(4)	0.99	770	690	440	78	70	44	0.527	428	3F
10610.92	10610.92	10610.92(4)	0.60	710	680	540	118	113	90	0.511	402	3F
10612.17	10612.17	10612.17(4)	0.60	1390	1020	180	232	170	30	0.577	423	3F
10613.00	10613.00	10613(4)	0.54	1100	740	200	204	137	37	0.598	419	3F
10614.17	10614.17	10614.17(4)	0.61	1230	980	560	202	161	92	0.557	352	3F
10615.50	10615.50	10615.5(4)	0.57	520	480	670	91	84	118	0.520	312	3F
10617.17	10617.17	10617.17(4)	0.43	600	650	430	140	151	100	0.480	405	3F
10618.67	10618.67	10618.67(4)	0.45	660	690	380	147	153	84	0.489	408	3F
10620.83	10620.83	10620.83(4)	0.27	510	570	270	189	211	100	0.472	412	3F
10622.50	10622.50	10622.5(4)	0.61	630	610	700	103	100	115	0.508	397	3F
10624.08	10624.08	10624.08(4)	1.13	1150	940	570	102	83	50	0.550	332	3F
10626.00	10626.00	10626(4)	0.39	110	150	710	28	39	182	0.423	320	3F
10627.75	10627.75	10627.75(4)	0.57	770	850	780	135	149	137	0.475	347	3F
10632.00	10632.00	10632 (4)	0.55	800	1410	1280	145	256	233	0.362	409	3F
10641.00	10641.00	10641 (4)	0.38	320	1950	900	84	513	237	0.141	380	3F
10647.00	10647.00	10647 (4)	0.13	250	320	890	192	246	685	0.439	586	3F
10666.00	10666.00	10666 (4)	0.33	130	1350	1180	39	409	358	0.088	539	3F
10676.00	10676.00	10676 (4)	0.25	170	1390	1130	68	556	452	0.109	538	3F
10686.00	10686.00	10686 (4)	0.29	210	2060	1380	72	710	476	0.093	500	3F
10696.00	10696.00	10696 (4)	0.62	320	2720	1310	52	439	211	0.105	328	3F
10704.00	10704.00	10704 (4)	0.24	160	1850	1340	67	771	558	0.080	501	3F
10710.00	10710.00	10710 (4)	0.24	120	1360	940	50	567	392	0.081	498	3F
10716.00	10716.00	10716 (4)	0.26	200	2230	1420	77	858	546	0.082	496	3F
10722.00	10722.00	10722 (4)	0.20	50	1570	1230	25	785	615	0.031	516	3F
10728.00	10728.00	10728 (4)	0.42	210	3400	1120	50	810	267	0.058	476	3F
10734.00	10734.00	10734 (4)	0.29	190	2370	1290	66	817	445	0.074	494	3F
10740.00	10740.00	10740 (4)	0.07	40	490	160	57	700	229	0.075	595	3F

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10746.00	10746.00	10746 (4)	0.24	110	2020	960	46	842	400	0.052	553	3F
10786.00	10786.00	10786 (4)	0.16	60	1330	950	38	831	594	0.043	590	3F
10792.00	10792.00	10792 (4)	0.27	170	1570	970	63	581	359	0.098	542	3F
10798.00	10798.00	10798 (4)	0.56	180	4900	1080	32	875	193	0.035	581	3F
10851.00	10851.00	10851 (4)	0.04	40	230	60	100	575	150	0.148	597	3F
10859.00	10859.00	10859 (4)	0.08	60	280	200	75	350	250	0.176	586	3F
10879.00	10879.00	10879 (4)	0.11	40	140	210	36	127	191	0.222	436	3F
10899.00	10899.00	10899 (4)	0.25	60	260	240	24	104	96	0.188	597	3F
10914.00	10914.00	10914 (4)	0.22	110	230	240	50	105	109	0.324	433	3F
10929.00	10929.00	10929 (4)	0.05	20	120	140	40	240	280	0.143	510	3F
10944.00	10944.00	10944 (4)	0.14	20	190	190	14	136	136	0.095	597	3F
10957.00	10957.00	10957 (4)	0.03	10	420	280	33	1400	933	0.023	585	3F
10969.00	10969.00	10969 (4)	0.04	30	100	160	75	250	400	0.231	597	3F
10981.00	10981.00	10981 (4)	0.27	130	440	360	48	163	133	0.228	591	3F
10990.00	10990.00	10990 (4)	0.08	40	200	150	50	250	188	0.167	436	3F
10999.00	10999.00	10999 (4)	0.04	10	210	160	25	525	400	0.045	581	3F

Table 11. ROCK EVAL data for the Amerada #2 C. E. Peck (NWNE Sec 27 T150N R96W; NDGS 1405 ~~1504~~). Electric log tops for NDGS 1405 are 10737' top of upper Bakken shale; 10760' top of middle Bakken siltstone; 10794' top of lower Bakken shale; 10822' top of Three Forks Formation. In NDGS 1405: 25' of the siltstone; all 20' of the lower Bakken shale, and 28' of Three Forks were analyzed. See Table 1 caption for further explanation. The difference between the thickness of the upper shale in the core and electric-log tapes is likely due to a lagging gamma -ray response.

TOP	BOTTOM	AVG DEPTH	TOC	S1(PPM)	S2(PPM)	S3(PPM)	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10770.75	10770.75	10770.75(4)	0.69	730	740	310	106	107	45	0.497	413	SS
10772.67	10772.67	10772.67(4)	0.76	820	820	240	108	108	32	0.500	419	SS
10774.83	10774.83	10774.83(4)	0.63	940	790	300	149	125	48	0.543	411	SS
10776.67	10776.67	10776.67(4)	0.69	840	730	240	122	106	35	0.535	413	SS
10778.83	10778.83	10778.83(4)	0.92	1210	1100	280	132	120	30	0.524	418	SS
10780.67	10780.67	10780.67(4)	0.63	940	950	270	149	151	43	0.497	421	SS
10782.67	10782.67	10782.67(4)	0.93	1120	880	270	120	95	29	0.560	422	SS
10784.33	10784.33	10784.33(4)	0.57	690	670	220	121	118	39	0.507	424	SS
10785.42	10785.42	10785.42(4)	0.89	910	650	280	102	73	32	0.583	420	SS
10786.67	10786.67	10786.67(4)	0.83	1150	1020	230	139	123	28	0.530	420	SS
10788.25	10788.25	10788.25(4)	0.82	1020	890	270	124	109	33	0.534	423	SS
10789.25	10789.25	10789.25(4)	0.92	1120	1250	290	122	136	32	0.473	421	SS
10790.08	10790.08	10790.08(4)	0.77	1010	1210	330	131	157	43	0.455	421	SS
10791.00	10791.00	10791(4)	0.77	1110	1000	330	144	130	43	0.526	418	SS
10791.67	10791.67	10791.67(4)	0.80	710	500	370	89	63	46	0.587	413	SS
10792.92	10792.92	10792.92(4)	0.75	910	880	390	121	117	52	0.508	417	SS
10793.92	10793.92	10793.92(4)	0.47	260	110	260	55	23	55	0.703	296	SS
10794.58	10794.58	10794.58(4)	1.05	630	420	490	60	40	47	0.600	359	SS
10795.17	10795.17	10795.17(4)	0.58	570	410	300	98	71	52	0.582	415	SS
10795.42	10795.42	10795.42(4)	0.53	430	270	330	81	51	62	0.614	416	SS
10795.75	10795.75	10795.75(4)	1.49	670	590	420	45	40	28	0.532	407	SS
10795.83	10795.83	10795.83(4)	22.61	6300	20470	710	28	91	3	0.235	449	LS
10795.88	10795.88	10795.88(4)	13.33	3490	11260	470	26	85	4	0.237	449	LS
10796.50	10796.50	10796.5(4)	14.58	5620	12870	2410	39	88	17	0.304	443	LS
10797.50	10797.50	10797.5(4)	10.49	5820	14330	1620	56	138	16	0.286	448	LS
10799.00	10799.00	10799(4)	10.36	4910	13020	1260	47	126	12	0.274	448	LS
10800.08	10800.08	10800.08(4)	11.04	5180	13880	1470	47	126	13	0.272	448	LS
10801.00	10801.00	10801(4)	8.51	5560	15330	1570	65	180	18	0.266	448	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1(PPM)	S2(PPM)	S3(PPM)	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10803.50	10803.50	10803.5(4)	10.47	3850	10150	1400	37	97	13	0.275	444	LS
10804.00	10804.00	10804(4)	12.12	5870	16530	2100	49	136	17	0.262	448	LS
10805.50	10805.50	10805.5(4)	12.32	4580	11160	1570	37	91	13	0.291	451	LS
10806.00	10806.00	10806(4)	9.52	4570	11160	1570	48	117	17	0.291	451	LS
10807.00	10807.00	10807(4)	11.34	4580	14810	1400	40	131	12	0.236	448	LS
10807.67	10807.67	10807.67(4)	14.92	5500	11610	2540	37	78	17	0.321	451	LS
10808.50	10808.50	10808.5(4)	12.21	5660	14850	1260	46	122	10	0.276	448	LS
10809.50	10809.50	10809.5(4)	11.01	6020	16330	1500	55	148	14	0.269	445	LS
10810.33	10810.33	10810.33(4)	11.16	6740	21350	1330	60	191	12	0.240	449	LS
10811.00	10811.00	10811(4)	16.06	3410	15440	500	21	96	3	0.181	452	LS
10811.58	10811.58	10811.58(4)	4.20	990	2570	490	24	61	12	0.278	447	LS
10812.00	10812.00	10812(4)	2.04	570	950	380	28	47	19	0.375	449	LS
10812.33	10812.33	10812.33 (1)	2.29	640	1290	400	28	56	17	0.332	447	LS
10812.75	10812.75	10812.75 (1)	13.20	4430	14090	680	34	107	5	0.239	452	LS
10814.00	10814.00	10814 (1)	13.79	2810	13220	410	20	96	3	0.175	451	LS
10814.75	10814.75	10814.75 (1)	14.91	2960	13450	490	20	90	3	0.180	450	LS
10815.25	10815.25	10815.25(4)	12.21	3510	12870	530	29	105	4	0.214	452	LS
10815.38	10815.38	10815.38 (1)	16.16	3920	16510	620	24	102	4	0.192	452	LS
10815.83	10815.83	10815.83 (1)	15.03	4650	14300	580	31	95	4	0.245	452	LS
10818.00	10818.00	10818(4)	0.67	1260	650	100	188	97	15	0.660	353	3F
10818.33	10818.33	10818.33(4)	1.85	2310	650	250	125	35	14	0.780	349	3F
10818.75	10818.75	10818.75(4)	1.09	2490	970	290	228	89	27	0.720	420	3F
10819.33	10819.33	10819.33(4)	0.65	1500	500	270	231	77	42	0.750	390	3F
10819.83	10819.83	10819.83(4)	1.30	4470	1630	350	344	125	27	0.733	422	3F
10821.00	10821.00	10821(4)	0.62	1600	530	190	258	86	31	0.751	415	3F
10821.83	10821.83	10821.83(4)	0.65	1600	430	480	246	66	74	0.788	297	3F
10822.50	10822.50	10822.5(4)	1.39	3130	1020	310	225	73	22	0.754	360	3F
10823.33	10823.33	10823.33(4)	1.15	1670	680	380	145	59	33	0.711	293	3F
10824.33	10824.33	10824.33(4)	0.81	670	160	460	83	20	57	0.807	255	3F
10824.92	10824.92	10824.92(4)	1.52	2360	950	340	155	63	22	0.713	391	3F
10825.92	10825.92	10825.92(4)	0.77	590	320	640	77	42	83	0.648	266	3F

TOP	BOTTOM	AVG DEPTH	TOC	S1(PPM)	S2(PPM)	S3(PPM)	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10826.17	10826.17	10826.17(4)	0.90	880	470	540	98	52	60	0.652	266	3F
10827.08	10827.08	10827.08(4)	1.14	1450	520	500	127	46	44	0.736	297	3F
10828.00	10828.00	10828(4)	0.99	810	350	570	82	35	58	0.698	261	3F
10829.00	10829.00	10829(4)	0.49	260	170	550	53	35	112	0.605	251	3F
10830.33	10830.33	10830.33(4)	0.53	110	200	530	21	38	100	0.355	243	3F
10831.50	10831.50	10831.5(4)	0.62	600	410	460	97	66	74	0.594	262	3F
10833.42	10833.42	10833.42(4)	0.91	1500	510	560	165	56	62	0.746	292	3F
10836.50	10836.50	10836.5(4)	0.80	540	530	350	68	66	44	0.505	422	3F
10837.50	10837.50	10837.5(4)	2.27	1430	500	420	63	22	19	0.741	245	3F
10839.50	10839.50	10839.5(4)	0.57	690	410	550	121	72	97	0.627	258	3F
10841.33	10841.33	10841.33(4)	1.15	1010	250	570	88	22	50	0.802	249	3F
10842.42	10842.42	10842.42(4)	1.15	770	120	520	67	10	45	0.865	255	3F
10844.50	10844.50	10844.5(4)	1.18	690	230	590	59	20	50	0.750	329	3F
10846.00	10846.00	10846(4)	0.64	1010	440	410	158	69	64	0.697	439	3F

Table 3. ROCK EVAL data for the Pan American Jacob Huber #1 (SWSE Sec 15 T145N R91W; NDGS 2618). Electric log tops for NDGS 2618 are 9778' top of upper Bakken shale; 9792' top of middle Bakken siltstone; 9826' top of lower Bakken shale; 9838' top of Three Forks Formation. In NDGS, 2618: 27.5' (of 34') of the siltstone and 5' (of 12') of lower Bakken shale were analyzed. See Table 1 caption for further explanation. The S2 and HI values for the lower shale are underestimates.

TOP	BOTTOM	AVE DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9801.00	9801.00	9801(4)	0.30	30	40	390	10	13	130	0.429	356	SS
9803.33	9803.33	9803.33(4)	0.45	20	40	430	4	9	96	0.333	365	SS
9805.42	9805.42	9805.42(4)	0.23	10	20	200	4	9	87	0.333	296	SS
9808.08	9808.08	9808.08(4)	0.13	10	30	180	8	23	139	0.250	400	SS
9810.25	9810.25	9810.25(4)	0.23	20	90	280	9	39	122	0.182	428	SS
9812.00	9812.00	9812(4)	0.38	20	110	300	5	29	79	0.154	427	SS
9814.67	9814.67	9814.67(4)	0.32	30	100	260	9	31	81	0.231	430	SS
9816.83	9816.83	9816.83(4)	0.34	20	70	230	6	21	68	0.222	431	SS
9818.50	9818.50	9818.5(4)	0.40	40	200	340	10	50	85	0.167	428	SS
9819.58	9819.58	9819.58(4)	0.29	40	100	330	14	35	114	0.286	425	SS
9820.50	9820.50	9820.5(4)	0.32	30	140	310	9	44	97	0.176	427	SS
9822.00	9822.00	9822(4)	0.40	30	100	390	8	25	98	0.231	426	SS
9823.00	9823.00	9823(4)	0.19	10	40	210	5	21	111	0.200	426	SS
9823.50	9823.50	9823.5(4)	0.42	50	150	410	12	36	98	0.250	427	SS
9824.00	9824.00	9824(4)	0.44	30	110	400	7	25	91	0.214	425	SS
9824.58	9824.58	9824.58(4)	0.29	20	90	440	7	31	152	0.182	423	SS
9825.58	9825.58	9825.58(4)	0.42	30	130	440	7	31	105	0.188	426	SS
9826.08	9826.08	9826.08(4)	0.44	30	100	460	7	23	105	0.231	423	SS
9827.00	9827.00	9827(4)	0.46	30	270	580	7	59	126	0.100	420	SS
9827.33	9827.33	9827.33(4)	0.25	10	50	310	4	20	124	0.167	425	SS
9827.67	9827.67	9827.67(4)	0.21	20	40	340	10	19	162	0.333	415	SS
9828.21	9828.21	9828.21(4)	0.65	80	490	460	12	75	71	0.140	426	LS
9828.29	9828.29	9828.29(4)	0.78	160	820	450	21	105	58	0.163	428	LS
9828.42	9828.42	9828.42(4)	12.54	4290	44950	990	34	359	8	0.087	427	LS
9828.50	9828.50	9828.5(4)	13.41	6330	80000	1380	47	597	10	0.073	428	LS
9829.00	9829.00	9829(4)	11.20	7170	53800	1530	64	480	14	0.117	429	LS
9829.50	9829.50	9829.5(4)	12.09	4950	51700	810	41	428	7	0.087	430	LS
9830.00	9830.00	9830(4)	12.19	5170	52680	730	42	432	6	0.089	431	LS
9828.00	9837.00	9832.5(4)	15.10	7120	86300	1210	47	572	8	0.076	421	LS
9831.00	9831.00	9831(4)	13.55	7790	64600	1280	58	477	9	0.108	428	LS
9833.00	9833.00	9833(4)	14.37	7040	84900	1460	49	591	10	0.077	429	LS
9833.67	9833.67	9833.67(4)	19.01	6340	77690	1150	33	409	6	0.075	428	LS

TOP	BOTTOM	AVE DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9834.08	9834.08	9834.08(4)	18.22	6020	73970	1230	33	406	7	0.075	428	LS
9834.67	9834.67	9834.67(4)	17.58	5780	67500	930	33	384	5	0.079	425	LS
9835.00	9835.00	9835(4)	17.47	9790	89600	1420	56	513	8	0.098	424	LS
9835.42	9835.42	9835.42(4)	17.18	6020	66150	1280	35	385	8	0.083	428	LS
9836.75	9836.75	9836.75(4)	17.97	5270	76290	1380	29	425	8	0.065	426	LS
9836.92	9836.92	9836.92(4)	0.35	680	660	120	194	189	34	0.507	368	3F
9837.25	9837.25	9837.25(4)	0.37	50	200	390	14	54	105	0.200	360	3F
9837.67	9837.67	9837.67(4)	0.61	50	160	390	8	26	64	0.238	395	3F
9838.17	9838.17	9838.17(4)	0.20	40	160	470	20	80	235	0.200	396	3F
9838.50	9838.50	9838.5(4)	0.34	20	110	440	6	32	129	0.154	416	3F
9839.17	9839.17	9839.17(4)	0.53	10	70	460	2	13	87	0.125	393	3F
9840.00	9840.00	9840(4)	0.37	20	130	600	5	35	162	0.133	418	3F
9841.00	9841.00	9841(4)	0.59	20	80	460	3	14	78	0.200	418	3F
9841.33	9841.33	9841.33(4)	0.42	10	50	270	2	12	64	0.167	351	3F
9841.67	9841.67	9841.67(4)	0.54	20	120	810	4	22	150	0.143	416	3F
9842.50	9842.50	9842.5(4)	0.49	20	60	650	4	12	133	0.250	365	3F

TOC & ROCK-EVAL PYROLYSIS FOR:										
AMOCO NO.1 CLIFFORD MARMON										
NDGS# 4340										
				Tmax	S1	S2	S3			Tr.
Depth	(Feet)	EPR No.	TOC	C	mg/g	mg/g	mg/g	HI	OI	Ratio
9886.0	9889.0	125697-A	9.62	449	4.33	20.22	1.05	210	11	0.18
9889.0	9891.0	125697-B	9.77	449	4.55	19.92	1.18	204	12	0.19
9891.0	9893.0	125697-C	10.20	448	4.95	21.60	1.33	212	13	0.19
9893.0	9895.0	125697-D	11.56	448	5.60	24.92	1.50	216	13	0.18
9895.0	9897.0	125697-E	9.49	448	4.84	20.28	1.54	214	16	0.19
9897.0	9900.0	125697-F	10.40	448	5.58	23.78	1.69	229	16	0.19
9900.0	9902.0	125697-G	13.27	444	6.88	30.69	1.01	231	83	0.18
9902.0	9905.0	125697-H	11.69	443	5.31	26.88	0.98	230	8	2.17
9905.0	9905.0	125697-I	14.39	446	5.79	33.05	1.26	230	9	3.15
9906.0	9906.0	125697-L	13.63	444	5.35	35.32	1.05	259	8	3.13
9907.0	9907.0	125697-N	0.33	432	0.19	0.29	0.87	88	264	0.40
9909.0	9909.0	125708-A	0.43	395	1.93	0.55	0.64	128	149	0.78
9911.0	9911.0	125708-C	0.09	428	0.04	0.00	0.52	0	578	1.00
9914.0	9914.0	125708-F	0.18	342	0.17	0.00	0.49	0	272	1.00
9916.0	9916.0	125708-H	0.13	303	0.23	0.13	0.31	100	238	0.64
9918.0	9918.0	125708-I	0.04	270	0.25	0.02	0.27	50	675	0.96
9920.0	9920.0	125708-J	0.13	326	0.42	0.08	0.31	62	238	0.84
9922.0	9922.0	125708-K	0.05	270	0.05	0.00	0.23	0	460	1.00
9924.0	9924.0	125708-M	0.23	385	0.85	0.28	0.39	122	170	0.76
9926.0	9926.0	125708-O	0.10	320	0.09	0.01	0.26	10	260	0.90
9928.0	9928.0	125708-Q	0.21	399	0.73	0.23	0.35	110	167	0.76
9930.0	9930.0	125719-B	0.21	429	0.49	0.02	0.39	10	186	0.98
9932.0	9932.0	125719-D	0.06	347	0.02	0.00	0.23	0	383	1.00
9934.0	9934.0	125719-F	0.19	352	0.32	0.11	0.32	58	168	0.76
9936.0	9936.0	125719-G	0.17	366	0.42	0.07	0.34	41	200	0.87
9938.0	9938.0	125719-I	0.17	330	0.49	0.12	0.34	71	200	0.82
9940.0	9940.0	125719-K	0.20	389	0.36	0.15	0.34	75	170	0.72
9942.5	9942.5	125719-M	0.13	266	0.14	0.01	0.40	8	308	1.00
9945.0	9945.0	125719-O	0.22	359	0.35	0.13	0.41	59	186	0.73
9947.0	9947.0	125730-A	0.19	369	0.23	0.09	0.36	47	189	0.72
9949.5	9949.5	125730-C	0.26	429	0.31	0.02	0.44	8	169	0.97
9951.0	9951.0	125730-E	0.22	361	0.38	0.10	0.36	45	164	0.79
9953.0	9953.0	125730-G	0.26	383	0.30	0.18	0.39	69	150	0.62
9955.0	9955.0	125730-I	0.21	428	0.15	0.03	0.49	14	233	0.83
9957.0	9957.0	125730-K	0.28	371	0.31	0.17	0.49	61	175	0.65
9959.0	9959.0	125730-M	0.23	356	0.21	0.07	0.40	30	174	0.75
9961.0	9961.0	125730-P	0.25	424	0.22	0.12	0.51	48	204	0.65
9963.0	9963.0	125741-D	0.34	391	0.24	0.12	0.46	35	135	0.67
9963.5	9963.5	125741-E	0.12	355	0.07	0.03	0.27	25	225	0.70
9964.0	9964.0	125741-F	0.17	270	0.05	0.00	0.33	0	194	1.00
9964.5	9964.5	125741-G	0.38	353	0.19	0.08	0.40	21	105	0.73
9965.0	9965.0	125741-H	0.35	405	0.31	0.15	0.37	43	6	0.67
9965.5	9965.5	125741-I	0.43	435	0.34	0.25	0.46	58	107	0.59
9965.8	9965.8	125741-J	0.42	471	0.25	0.04	0.56	10	133	0.89
9967.0	9967.0	125741-K	5.02	446	2.46	7.94	0.71	158	14	0.24
9968.0	9971.0	125741-L	14.04	446	5.63	28.88	1.00	206	7	0.16
9971.0	9973.0	125741-M	13.13	446	5.82	27.36	1.28	208	10	0.18

9975.0	9979.0	125741-O	13.32	447	5.45	28.14	1.08	211	8	0.16
9983.0	9985.0	125741-P	11.46	447	5.26	23.35	1.11	204	10	0.18
9985.0	9988.0	125752-A	8.66	446	4.81	17.75	1.05	205	12	0.21
9990.0	9991.0	125752-C	8.83	446	5.58	18.62	0.93	211	11	0.23
9993.0	9993.0	125752-E	14.32	447	6.44	29.29	1.24	205	9	0.18
9995.0	9995.0	125752-G	9.48	447	5.38	20.32	0.80	214	8	0.21
9997.0	9997.0	125752-I	8.48	445	4.88	15.95	0.90	188	11	0.23
10000.0	10002.0	125752-L	5.96	445	3.87	11.03	0.86	185	14	0.26
10002.0	10005.0	125752-M	3.27	443	3.01	5.64	0.75	172	23	0.35
10005.0	10008.0	125752-N	1.94	438	2.61	3.35	0.81	173	42	0.44
10010.0	10010.0	125752-O	0.69	426	1.16	0.99	0.82	143	119	0.54
10011.0	10011.0	125752-Q	0.89	428	1.38	1.28	0.39	144	44	0.52

Table 12. ROCK EVAL data for the Pan American #1 Clifford Marmon (SWSW Sec 2 T154N R95W; NDGS 4340). Electric log tops for NDGS 4340 are 9894' top of upper Bakken shale; 9916' top of middle Bakken siltstone; 9978' top of lower Bakken shale; 10014' top of Three Forks Formation. In NDGS 4340: 9.5' (of 22') of upper shale, 60' (of 62') of the siltstone and all of lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9886.00	9889.00	9887.5 (3)	9.62	4330	20220	1050	45	210	11	0.176	449	US
9889.00	9891.00	9890 (3)	9.77	4550	19920	1180	47	204	12	0.186	449	US
9891.00	9893.00	9892 (3)	10.20	4950	21600	1330	49	212	13	0.186	448	US
9893.00	9895.00	9894 (3)	11.56	5600	24920	1500	48	216	13	0.183	448	US
9895.00	9897.00	9896 (3)	9.49	4840	20280	1540	51	214	16	0.193	448	US
9897.00	9900.00	9898.5 (3)	10.40	5580	23780	1690	54	229	16	0.190	448	US
9900.00	9902.00	9901 (3)	13.27	6880	30690	1010	52	231	8	0.183	444	US
9902.00	9905.00	9903.5 (3)	11.69	5310	26880	980	45	230	8	0.165	443	US
9905.00	9905.00	9905 (3)	14.39	5790	33050	1260	40	230	9	0.149	446	US
9906.00	9906.00	9906 (3)	13.63	5350	35320	1050	39	259	8	0.132	444	US
9907.00	9907.00	9907 (3)	0.33	190	290	870	58	88	264	0.396	432	SS
9909.00	9909.00	9909 (3)	0.43	1930	550	640	449	128	149	0.778	395	SS
9911.00	9911.00	9911 (3)	0.09	40	0	520	44	0	578	1.000	428	SS
9914.00	9914.00	9914 (3)	0.18	170	0	490	94	0	272	1.000	342	SS
9916.00	9916.00	9916 (3)	0.13	230	130	310	177	100	238	0.639	303	SS
9918.00	9918.00	9918 (3)	0.04	250	20	270	625	50	675	0.926	270	SS
9920.00	9920.00	9920 (3)	0.13	420	80	310	323	62	238	0.840	326	SS
9922.00	9922.00	9922 (3)	0.05	50	0	230	100	0	460	1.000	270	SS
9924.00	9924.00	9924 (3)	0.23	850	280	390	370	122	170	0.752	385	SS
9926.00	9926.00	9926 (3)	0.10	90	10	260	90	10	260	0.900	320	SS
9928.00	9928.00	9928 (3)	0.21	730	230	350	348	110	167	0.760	399	SS
9930.00	9930.00	9930 (3)	0.21	490	20	390	233	10	186	0.961	429	SS
9932.00	9932.00	9932 (3)	0.06	20	0	230	33	0	383	1.000	347	SS
9934.00	9934.00	9934 (3)	0.19	320	110	320	168	58	168	0.744	352	SS
9936.00	9936.00	9936 (3)	0.17	420	70	340	247	41	200	0.857	366	SS
9938.00	9938.00	9938 (3)	0.17	490	120	340	288	71	200	0.803	330	SS
9940.00	9940.00	9940 (3)	0.20	360	150	340	180	75	170	0.706	389	SS
9942.50	9942.50	9942.5 (3)	0.13	140	10	400	108	8	308	0.933	266	SS
9945.00	9945.00	9945 (3)	0.22	350	130	410	159	59	186	0.729	359	SS
9947.00	9947.00	9947 (3)	0.19	230	90	360	121	47	189	0.719	369	SS
9949.50	9949.50	9949.5 (3)	0.26	310	20	440	119	8	169	0.939	429	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9951.00	9951.00	9951 (3)	0.22	380	100	360	173	45	164	0.792	361	SS
9953.00	9953.00	9953 (3)	0.26	300	180	390	115	69	150	0.625	383	SS
9955.00	9955.00	9955 (3)	0.21	150	30	490	71	14	233	0.833	428	SS
9957.00	9957.00	9957 (3)	0.28	310	170	490	111	61	175	0.646	371	SS
9959.00	9989.00	9974 (3)	0.23	210	70	400	91	30	174	0.750	356	SS
9961.00	9961.00	9961 (3)	0.25	220	120	510	88	48	204	0.647	424	SS
9963.00	9963.00	9963 (3)	0.34	240	120	460	71	35	135	0.667	391	SS
9963.50	9963.50	9963.5 (3)	0.12	70	30	270	58	25	225	0.700	355	SS
9964.00	9964.00	9964 (3)	0.17	50	0	330	29	0	194	1.000	270	SS
9964.50	9964.50	9964.5 (3)	0.38	190	80	400	50	21	105	0.704	353	SS
9965.00	9965.00	9965 (3)	0.35	310	150	370	89	43	106	0.674	405	SS
9965.50	9965.50	9965.5 (3)	0.43	340	250	460	79	58	107	0.576	435	SS
9965.80	9965.80	9965.8 (3)	0.42	250	40	560	60	10	133	0.862	471	SS
9967.00	9967.00	9967 (3)	5.02	2460	7940	710	49	158	14	0.237	446	LS
9968.00	9971.00	9969.5 (3)	14.04	5630	28880	1000	40	206	7	0.163	446	LS
9971.00	9973.00	9972 (3)	13.13	5820	27360	1280	44	208	10	0.175	446	LS
9975.00	9979.00	9977 (3)	13.32	5450	28140	1080	41	211	8	0.162	447	LS
9983.00	9985.00	9984 (3)	11.46	5260	23350	1110	46	204	10	0.184	447	LS
9985.00	9988.00	9986.5 (3)	8.66	4810	17750	1050	56	205	12	0.213	446	LS
9990.00	9991.00	9990.5 (3)	8.83	5580	18620	930	63	211	11	0.231	446	LS
9993.00	9993.00	9993 (3)	14.32	6440	29290	1240	45	205	9	0.180	447	LS
9995.00	9995.00	9995 (3)	9.48	5380	20320	800	57	214	8	0.209	447	LS
9997.00	9997.00	9997 (3)	8.48	4880	15950	900	58	188	11	0.234	445	LS
10000.00	10002.00	10001 (3)	5.96	3870	11030	860	65	185	14	0.260	445	LS
10002.00	10005.00	10003.5 (3)	3.27	3010	5640	750	92	172	23	0.348	443	LS
10005.00	10008.00	10006.5 (3)	1.94	2610	3350	810	135	173	42	0.438	438	LS
10010.00	10010.00	10010 (3)	0.69	1160	990	820	168	143	119	0.540	426	3F
10011.00	10011.00	10011 (3)	0.89	1380	1280	390	155	144	44	0.519	428	3F
10011.00	10011.00	10011.00	0.46	250	990	690	54	215	150	0.200	411	3F
10011.60	10011.60	10011.60	0.68	450	1320	820	66	194	121	0.260	414	3F
10012.00	10012.00	10012.00	0.24	260	810	500	108	338	208	0.250	287	3F
10012.60	10012.60	10012.60	0.41	500	930	640	122	227	156	0.350	288	3F
10013.00	10013.00	10013.00	0.59	840	1450	720	142	246	122	0.370	412	3F
10013.60	10013.60	10013.60	0.71	850	1380	740	120	194	104	0.380	408	3F
10015.00	10015.00	10015.00	0.48	450	820	750	94	171	156	0.360	412	3F

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10018.00	10018.00	10018.00	0.49	720	1200	680	147	245	139	0.370	411	3F
10020.00	10020.00	10020.00	0.56	660	1110	670	118	198	120	0.370	409	3F
10022.00	10022.00	10022.00	0.46	700	1230	800	152	267	174	0.360	378	3F
10024.00	10024.00	10024.00	0.50	420	670	830	84	134	166	0.390	286	3F
10026.00	10026.00	10026.00	0.46	310	590	660	67	128	143	0.340	284	3F
10028.00	10028.00	10028.00	0.06	80	420	420	133	700	700	0.160	406	3F
10030.00	10030.00	10030.00	0.23	10	130	600	4	57	261	0.070	512	3F
10032.00	10032.00	10032.00	0.34	80	220	740	24	65	218	0.270	289	3F
10034.00	10034.00	10034.00	0.63	100	290	660	16	46	105	0.260	431	3F
10036.00	10036.00	10036.00	0.39	280	470	660	72	121	169	0.380	289	3F
10038.00	10038.00	10038.00	1.34	450	810	610	34	60	46	0.360	298	3F
10040.00	10040.00	10040.00	0.56	280	740	600	50	132	107	0.270	367	3F
10042.00	10042.00	10042.00	0.45	290	580	730	64	129	162	0.340	294	3F
10044.00	10044.00	10044.00	0.06	60	220	450	100	367	750	0.210	498	3F
10046.00	10046.00	10046.00	0.04	10	140	320	25	350	800	0.070	499	3F
10048.00	10048.00	10048.00	0.27	760	1050	600	281	389	222	0.420	286	3F
10050.00	10050.00	10050.00	0.28	410	740	640	146	264	229	0.360	413	3F
10052.00	10052.00	10052.00	0.13	10	400	550	8	308	423	0.020	540	3F
10054.00	10054.00	10054.00	0.17	10	370	640	6	218	376	0.220	543	3F
10056.00	10056.00	10056.00	0.19	130	360	540	68	189	284	0.270	580	3F
10058.00	10058.00	10058.00	0.48	610	990	720	127	206	150	0.380	291	3F
10060.00	10060.00	10060.00	0.21	80	270	620	38	129	295	0.240	554	3F

Shell #21-35 Bakken Fm

NDGS	CORE DEPTH	LOG DEPTH	ROSS LG DEPTH	SAMPLE		TOC		TMAX
5088	10160	10162	10145	140976	A	12.25		447
5088	10161	10163	10146		B	17.68		447
5088	10162	10164	10147		C	9.53		446
5088	10163	10165	10148		D	20.42		448
5088	10164	10166	10149		E	16.29		446
5088	10164.5	10166.5	10149.5		F	14.35		445
5088	10165	10167	10150		G	9.97		448
5088	10167	10169	10152		H	14.14		444
5088	10168	10170	10153		I	9.93		445
5088	10169	10172	10155		J	15.25		448
5088	10170	10173	10156		K	11.52		444
5088	10242	10244	10221		L	18.91		446
5088	10243	10245	10222		M	17.8		448
5088	10244	10246	10223		N	21.22		447
5088	10245	10247	10224		O	14.62		446
5088	10246	10248	10225	140987	A	13.68		448
5088	10247	10249	10226		B	10.2		445
5088	10248	10250	10227		C	10.04		447
5088	10249	10251	10228		D	10.22		448
5088	10250	10252	10229		E	8.62		445
5088	10251	10253	10230		F	9.53		444
5088	10252	10254	10231		G	11.16		447
5088	10253	10255	10232		H	13.19		445
5088	10254	10256	10233		I	19.4		447
5088	10256	10258	10235		J	9.48		443
5088	10257	10259	10236		K	13.64		446
5088	10259	10261	10238		L	11.45		446
5088	10260	10262	10239		M	10.03		448
5088	10261	10263	10240		N	9.73		447
5088	10264	10266	10243	140998	A	9.31		447
5088	10265	10267	10244		B	11.12		445
5088	10268	10270	10247		C	17.09		443
5088	10269	10271	10248		D	13.71		447
5088	10270	10272	10249		E	9.94		446
5088	10271	10273	10250		F	8		444
5088	10273	10275	10252		G	15.09		448
5088	10274	10276	10253		H	10.28		447
5088	10275	10277	10254		I	10.58		447
5088	10280	10282	10259		K	10.66		448
5088	10284	10286	10263		L	8.43		449
5088	10284.5	10286.5	10263.5		M	9.83		446
5088	10285	10287	10264		N	8.75	12.11968	445
5088	10286	10292	10269		O	4.87		442
5088	10287	10293	10270	141009	A	3.53		449
5088	10288	10294	10271		B	3.08		448
5088	10289	10295	10272		C	2.54	3.505	448

Table 13. ROCK EVAL data for the Shell Oil Co. L. Texel #21-35 (NENW Sec 35 T156N R93W; NDGS 5088). Electric log tops for NDGS 5088 are 10160' top of upper Bakken shale; 10169' top of middle Bakken siltstone; 10246' top of lower Bakken shale; 10293' top of Three Forks Formation. In NDGS 5088: 17' of Lodgepole Formation; all (9') of the upper Bakken shale; all (77') of the siltstone and all (47'0 of the lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10145.00	10145.00	10145.00	0.31	310	630	450	100	203	145	0.330	422	LP
10145.00	10145.00	10145.00	0.47	780	1430	510	166	304	109	0.350	421	LP
10146.00	10146.00	10146.00	0.71	740	1490	600	104	210	85	0.330	421	LP
10146.60	10146.60	10146.60	0.69	850	1380	610	123	200	88	0.380	421	LP
10147.00	10147.00	10147.00	0.56	850	990	600	152	177	107	0.460	418	LP
10147.50	10147.50	10147.50	0.79	1460	1710	630	185	216	80	0.460	426	LP
10148.00	10148.00	10148.00	0.82	800	1360	640	98	166	78	0.370	422	LP
10148.60	10148.60	10148.60	0.25	270	450	520	108	180	208	0.370	421	LP
10149.00	10149.00	10149.00	0.25	160	260	600	64	104	240	0.380	383	LP
10149.60	10149.60	10149.60	0.59	970	1180	620	164	200	105	0.450	418	LP
10150.00	10150.00	10150.00	0.72	880	1470	650	122	204	90	0.380	428	LP
10150.60	10150.60	10150.60	0.59	980	1460	690	166	247	117	0.400	351	LP
10151.00	10151.00	10151.00	0.20	180	490	490	90	245	245	0.270	421	LP
10151.60	10151.60	10151.60	0.60	138	1860	640	23	310	107	0.430	408	LP
10152.00	10152.00	10152.00	0.39	61	1240	550	16	318	141	0.330	419	LP
10152.60	10152.60	10152.60	0.24	22	700	670	9	292	279	0.240	418	LP
10153.00	10153.00	10153.00	0.46	700	1420	560	152	309	122	0.330	417	LP
10153.60	10153.60	10153.60	0.14	110	510	720	79	364	514	0.180	420	LP
10154.00	10154.00	10154.00	0.28	290	620	660	104	221	236	0.320	413	LP
10160.00	10162.00	10161 (3)	12.25	3300	32700	1870	27	267	15	0.092	447	US
10161.00	10163.00	10162 (3)	17.68	4280	53610	3100	24	303	18	0.074	447	US
10162.00	10164.00	10163 (3)	9.53	3560	28540	1050	37	299	11	0.111	446	US
10163.00	10165.00	10164 (3)	20.42	3440	26150	2710	17	128	13	0.116	448	US
10164.00	10166.00	10165 (3)	16.29	4450	47810	3550	27	293	22	0.085	446	US
10164.50	10166.50	10165.5 (3)	14.35	4270	39170	2890	30	273	20	0.098	445	US
10165.00	10167.00	10166 (3)	9.97	3710	26800	1730	37	269	17	0.122	448	US
10167.00	10169.00	10168 (3)	14.14	4290	40470	3000	30	286	21	0.096	444	US
10168.00	10170.00	10169 (3)	9.93	3660	28000	2510	37	282	25	0.116	445	US
10169.00	10172.00	10170.5 (3)	15.25	4480	49650	3530	29	326	23	0.083	448	US
10169.00	10169.00	10169.00	0.21	130	660	1060	62	314	505	0.170	325	SS
10170.00	10170.00	10170.00	0.30	100	860	500	33	287	167	0.100	484	SS
10170.60	10170.60	10170.60	0.30	50	220	960	17	73	320	0.190	583	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10171.00	10171.00	10171.00	0.22	110	400	790	50	182	359	0.220	555	SS
10171.60	10171.60	10171.60	0.18	70	270	870	39	150	483	0.210	428	SS
10172.00	10172.00	10172.00	0.28	240	960	850	86	343	304	0.200	390	SS
10173.00	10173.00	10173.00	0.24	120	550	690	50	229	288	0.180	447	SS
10174.00	10174.00	10174.00	0.28	220	680	630	79	243	225	0.240	359	SS
10175.00	10175.00	10175.00	0.19	220	530	680	116	279	358	0.300	436	SS
10176.00	10176.00	10176.00	0.26	370	620	740	142	238	285	0.380	286	SS
10177.00	10177.00	10177.00	0.29	330	420	730	114	145	252	0.450	284	SS
10178.00	10178.00	10178.00	0.35	240	510	630	69	146	180	0.320	415	SS
10179.00	10179.00	10179.00	0.26	220	380	740	85	146	285	0.370	347	SS
10180.00	10180.00	10180.00	0.18	120	300	720	67	167	400	0.290	296	SS
10181.00	10181.00	10181.00	0.30	290	530	640	97	177	213	0.350	416	SS
10182.00	10182.00	10182.00	0.18	570	550	430	317	306	239	0.510	286	SS
10183.00	10183.00	10183.00	0.12	210	210	380	175	175	317	0.500	308	SS
10184.00	10184.00	10184.00	0.02	70	120	330	350	600	1650	0.390	314	SS
10185.00	10185.00	10185.00	0.05	180	160	330	360	320	660	0.530	356	SS
10187.00	10187.00	10187.00	0.22	330	610	480	150	277	218	0.350	322	SS
10188.00	10188.00	10188.00	0.02	40	110	290	200	550	1450	0.290	416	SS
10190.00	10190.00	10190.00	0.00	20	20	170	0	0	0	0.500	428	SS
10190.00	10190.00	10190.00	0.00	20	20	220	0	0	0	0.500	298	SS
10191.00	10191.00	10191.00	0.31	630	1040	500	203	335	161	0.380	418	SS
10192.00	10192.00	10192.00	0.20	380	670	520	190	335	260	0.370	420	SS
10193.00	10193.00	10193.00	0.12	160	310	540	133	258	450	0.350	429	SS
10194.00	10194.00	10194.00	0.21	230	460	530	110	219	252	0.340	351	SS
10195.00	10195.00	10195.00	0.22	400	630	470	182	286	214	0.390	418	SS
10196.00	10196.00	10196.00	0.24	230	460	530	96	192	221	0.340	342	SS
10197.00	10197.00	10197.00	0.20	420	790	570	210	395	285	0.350	283	SS
10198.00	10198.00	10198.00	0.16	180	360	570	113	225	356	0.330	393	SS
10199.00	10199.00	10199.00	0.19	250	590	580	132	311	305	0.300	423	SS
10200.00	10200.00	10200.00	0.23	260	650	520	113	283	226	0.290	421	SS
10201.00	10201.00	10201.00	0.23	280	610	480	122	265	209	0.320	422	SS
10202.00	10202.00	10202.00	0.06	50	80	390	83	133	650	0.420	500	SS
10203.00	10203.00	10203.00	0.24	270	600	500	113	250	208	0.310	423	SS
10204.00	10204.00	10204.00	0.30	250	500	530	83	167	177	0.340	345	SS
10205.00	10205.00	10205.00	0.36	190	330	570	53	92	158	0.370	419	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10206.00	10206.00	10206.00	0.36	270	580	550	75	161	153	0.320	363	SS
10207.00	10207.00	10207.00	0.35	280	560	510	80	160	146	0.330	352	SS
10209.00	10209.00	10209.00	0.58	300	450	480	52	78	83	0.410	343	SS
10209.00	10209.00	10209.00	0.22	330	480	480	150	218	218	0.410	422	SS
10210.00	10210.00	10210.00	0.21	210	330	490	100	157	233	0.390	413	SS
10211.00	10211.00	10211.00	0.22	320	490	490	145	223	223	0.400	421	SS
10212.00	10212.00	10212.00	0.22	290	430	500	132	195	227	0.400	424	SS
10213.00	10213.00	10213.00	0.27	250	810	670	93	300	248	0.240	431	SS
10214.00	10214.00	10214.00	0.25	260	440	600	104	176	240	0.370	421	SS
10215.00	10215.00	10215.00	0.22	240	560	560	109	255	255	0.300	398	SS
10216.00	10216.00	10216.00	0.10	40	120	680	40	120	680	0.250	410	SS
10217.00	10217.00	10217.00	0.18	220	450	500	122	250	278	0.330	395	SS
10218.00	10218.00	10218.00	0.31	190	380	630	61	123	203	0.340	355	SS
10219.00	10219.00	10219.00	0.18	160	340	610	89	189	339	0.320	423	SS
10220.00	10220.00	10220.00	0.18	210	420	580	117	233	322	0.340	397	SS
10221.00	10221.00	10221.00	0.16	160	360	530	100	225	331	0.310	424	SS
10222.00	10222.00	10222.00	0.21	20	390	570	10	186	271	0.340	427	SS
10223.00	10223.00	10223.00	0.20	110	250	500	55	125	250	0.310	423	SS
10224.00	10224.00	10224.00	0.15	60	200	530	40	133	353	0.230	419	SS
10225.00	10225.00	10225.00	0.10	10	80	440	10	80	440	0.120	419	SS
10226.00	10226.00	10226.00	0.11	40	270	400	36	245	364	0.130	426	SS
10227.00	10227.00	10227.00	0.13	60	350	450	46	269	346	0.150	428	SS
10228.00	10228.00	10228.00	0.11	30	190	430	27	173	391	0.140	498	SS
10229.00	10229.00	10229.00	0.13	30	280	360	23	215	277	0.100	503	SS
10230.00	10230.00	10230.00	0.19	40	510	440	21	268	232	0.070	448	SS
10231.00	10231.00	10231.00	0.25	140	570	460	56	228	184	0.200	430	SS
10232.00	10232.00	10232.00	0.20	60	340	500	30	170	250	0.150	480	SS
10233.00	10233.00	10233.00	0.04	20	60	290	50	150	725	0.250	430	SS
10234.00	10234.00	10234.00	0.07	30	110	310	43	157	443	0.210	419	SS
10235.00	10235.00	10235.00	0.24	170	390	460	71	163	192	0.300	420	SS
10236.00	10236.00	10236.00	0.27	110	370	500	41	137	185	0.230	413	SS
10237.00	10237.00	10237.00	0.26	80	300	500	31	115	192	0.210	464	SS
10237.60	10237.60	10237.60	0.25	110	330	540	44	132	216	0.250	456	SS
10238.00	10238.00	10238.00	0.32	150	430	580	47	134	181	0.260	418	SS
10238.60	10238.60	10238.60	0.32	180	380	560	56	119	175	0.320	415	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10239.00	10239.00	10239.00	0.49	260	610	550	53	124	112	0.300	419	SS
10239.60	10239.60	10239.60	0.09	40	90	580	44	100	644	0.330	410	SS
10239.60	10239.60	10239.60	0.20	50	120	610	25	60	305	0.310	412	SS
10242.00	10244.00	10221 (3)	18.91	4790	60200	3970	25	318	21	0.074	446	LS
10243.00	10245.00	10222 (3)	17.80	4130	52520	4020	23	295	23	0.073	448	LS
10244.00	10246.00	10223 (3)	21.22	4750	64260	4590	22	303	22	0.069	447	LS
10245.00	10247.00	10224 (3)	14.62	3900	40950	3040	27	280	21	0.087	446	LS
10246.00	10248.00	10225 (3)	13.68	3940	40210	2700	29	294	20	0.089	448	LS
10247.00	10249.00	10226 (3)	10.20	2640	30110	1780	26	295	17	0.081	445	LS
10248.00	10250.00	10227 (3)	10.04	3560	27180	2240	35	271	22	0.116	447	LS
10249.00	10251.00	10228 (3)	10.22	3460	28570	2780	34	280	27	0.108	448	LS
10250.00	10252.00	10229 (3)	8.62	2540	24800	1280	29	288	15	0.093	445	LS
10251.00	10253.00	10230 (3)	9.53	3620	25350	2690	38	266	28	0.125	444	LS
10252.00	10254.00	10231 (3)	11.16	4300	30490	2820	39	273	25	0.124	447	LS
10253.00	10255.00	10232 (3)	13.19	5220	39090	4860	40	296	37	0.118	445	LS
10254.00	10256.00	10233 (3)	19.40	4290	33440	3220	22	172	17	0.114	447	LS
10256.00	10258.00	10235 (3)	9.48	4620	29800	1090	49	314	11	0.134	443	LS
10257.00	10259.00	10236 (3)	13.64	5000	39870	2780	37	292	20	0.111	446	LS
10259.00	10261.00	10238 (3)	11.45	4920	33270	2360	43	291	21	0.129	446	LS
10260.00	10262.00	10239 (3)	10.03	4540	29310	1880	45	292	19	0.134	448	LS
10261.00	10263.00	10240 (3)	9.73	4170	28170	2570	43	290	26	0.129	447	LS
10264.00	10266.00	10243 (3)	9.31	3870	27050	1930	42	291	21	0.125	447	LS
10265.00	10267.00	10244 (3)	11.12	4360	31990	2650	39	288	24	0.120	445	LS
10268.00	10270.00	10247 (3)	17.09	5190	49010	5680	30	287	33	0.096	443	LS
10269.00	10271.00	10248 (3)	13.71	4460	38860	2730	33	283	20	0.103	447	LS
10270.00	10272.00	10249 (3)	9.94	4320	29500	3080	43	297	31	0.128	446	LS
10271.00	10273.00	10250 (3)	8.00	4180	24760	1350	52	310	17	0.144	444	LS
10273.00	10275.00	10252 (3)	15.09	4910	55080	3020	33	365	20	0.082	448	LS
10274.00	10276.00	10253 (3)	10.28	3910	33390	3070	38	325	30	0.105	447	LS
10275.00	10277.00	10254 (3)	10.58	3810	39880	2540	36	377	24	0.087	447	LS
10277.00	10279.00	10256 (3)	1.45	1040	4380	570	72	302	39	0.192	412	LS
10280.00	10282.00	10259 (3)	10.66	3530	24740	3030	33	232	28	0.125	448	LS
10284.00	10286.00	10263 (3)	8.43	3750	22910	1810	44	272	21	0.141	449	LS
10284.50	10286.50	10263.5 (3)	9.83	3490	28340	2020	36	288	21	0.110	446	LS
10285.00	10287.00	10264 (3)	8.75	3250	24090	1370	37	275	16	0.119	445	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10286.00	10292.00	10269 (3)	4.87	1970	10970	820	40	225	17	0.152	442	LS
10287.00	10293.00	10270 (3)	3.53	1730	7800	750	49	221	21	0.182	449	LS
10288.00	10294.00	10271 (3)	3.08	1570	6970	970	51	226	31	0.184	448	LS
10289.00	10295.00	10272 (3)	2.54	1220	5280	1000	48	208	39	0.188	448	LS

Marathon Jensen12-44

DEPTH	SMPL NO.	TMAX (CENT.)		TOC (PCT)		S1 (MG/GRM)		S2 (MG/GRM)		S3 (MG/GRM)		HYDROGEN INDEX	OXYGEN INDEX
9157	140866 A	437		12.19		4.32		63.2		3.6		518	29
9158	B	438		14.91		4.15		65.95		3.82		442	25
9159	C	439		6.13		2.69		28.96		2.07		472	33
9160	D	436		15.74		5.36		89.09		3.81		566	24
9161	E	437		13.2		3.85		52.1		5.26		394	39
9162	F	437		14.88		6.48		73.19		4.89		491	32
9163	G	433		20.88		8.13		103.72		6.16		496	29
9164	H	432		22.63		8.73		116.05		6.76		512	29
9165	I	437		10.08		5.32		47.41		4.27		470	42
9166	J	430		16.74		8.35		72.08		6.86		430	40
9167	K	432		15.89		7.63		75.52		6.57		475	41
9168	L	433		18.89		8.65		79.63		4.26		421	22
9169	M	433		20.93		8.4		105.79		6.08		505	29
9170	N	434	434.8571	11.45	15.32429	5.31	6.240714	52.6	73.235	4.06	4.890714	459	35
9205	O	433		7.35		2.11		20.61		1.53		280	20
9206	P	433		18.93		7.14		77.14		5.23		407	27
9207	Q	436		23.81		8		111.83		6.83		469	28
9208	R	432		21.67		7.29		88.37		10.54		407	48
9209	140877 A	432		18.6		8.53		93.73		3.13		503	16
9210	B	435		17.52		5.91		93.33		3.11		532	17
9213	E	433		19.86		5.75		94.86		4.24		477	21
9214	F	436		19.27		5		91.17		5.73		473	29
9215	G	435		16.62		4.86		71.97		5.26		433	31
9216	H	434	433.9	16.33	17.996	4.91	5.95	71.69	81.47	5.33	5.093	439	32
9211	C	438		3.64		1.77		18.55		1.15		509	31
9212	D	437	437.5	1.74	2.69	0.67	1.22	9.05	13.8	0.79	0.97	520	45

TRANSF. RATIO	S2/S3
0.06	17.56
0.06	17.26
0.09	13.99
0.06	23.38
0.07	9.90
0.08	14.97
0.07	16.84
0.07	17.17
0.1	11.10
0.1	10.51
0.09	11.49
0.1	18.69
0.07	17.40
0.09	12.96
0.09	13.47
0.08	14.75
0.07	16.37
0.08	8.38
0.08	29.95
0.06	30.01
0.06	22.37
0.05	15.91
0.06	13.68
0.06	13.45
0.09	16.13
0.07	11.46

Table 2. ROCK EVAL data for the Marathon Dobrinski 18-44 (SENE Sec 18 T151N R87W; NDGS 8177). Electric log tops for NDGS 8177 are 8620' top of upper Bakken shale; 8636' top of middle Bakken siltstone; 8660' top of lower Bakken shale; 8670' top of Three Forks Formation. In NDGS: 8177 9.5' (of 16') of upper Bakken shale, all of the siltstone (24') and 6' (of 10') of lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
8629.00	8629.00	8629 (3)	3.03	1090	5990	380	36	198	13	0.154	425	US
8629.00	8639.00	8634(4)	15.00	6550	101000	2340	44	672	16	0.061	418	US
8630.00	8630.00	8630 (1)	17.54	7210	101900	1610	41	581	9	0.066	420	US
8631.00	8631.00	8631 (1)	14.10	5940	74400	2260	42	528	16	0.074	421	US
8631.00	8631.00	8631 (3)	15.19	9670	87200	1760	64	574	12	0.100	422	US
8632.50	8632.50	8632.5 (1)	14.16	6200	77200	1880	44	545	13	0.074	419	US
8633.00	8633.00	8633 (3)	16.73	9970	96680	1390	60	578	8	0.093	422	US
8633.50	8633.50	8633.5 (1)	16.78	7360	90500	1840	44	539	11	0.075	423	US
8635.00	8635.00	8635 (3)	17.86	11330	100230	1480	63	561	8	0.102	420	US
8635.50	8635.50	8635.5 (1)	17.79	8300	97500	1870	47	548	11	0.078	421	US
8636.08	8636.08	8636.08 (1)	11.54	4250	54040	2120	37	468	18	0.073	421	US
8637.00	8637.00	8637 (3)	25.34	14750	128720	1660	58	508	7	0.103	419	US
8637.50	8637.50	8637.5 (1)	21.82	9540	121100	2310	44	555	11	0.073	418	US
8638.00	8638.00	8638 (3)	19.98	12440	110050	1180	62	551	6	0.102	421	US
8638.25	8638.25	8638.25(4)	17.71	8610	106000	2270	49	598	13	0.075	425	US
8638.50	8638.50	8638.5 (1)	13.98	5740	76290	2870	41	546	21	0.070	422	US
8638.50	8638.50	8638.5 (3)	0.17	70	50	1070	41	29	629	0.583	420	SS
8638.58	8638.58	8638.58 (1)	0.59	30	120	670	5	20	114	0.200	414	SS
8638.92	8638.92	8638.92 (1)	0.47	40	30	500	9	6	106	0.571	384	SS
8639.00	8639.00	8639 (3)	0.25	120	110	1400	48	44	560	0.522	422	SS
8639.42	8639.42	8639.42 (1)	0.81	2410	1910	440	298	236	54	0.558	335	SS
8639.50	8639.50	8639.5 (3)	0.11	60	0	1270	55	0	1155	1.000	222	SS
8640.00	8640.00	8640 (1)	0.37	40	180	650	11	49	176	0.182	400	SS
8640.00	8640.00	8640 (3)	0.06	80	0	800	133	0	1333	1.000	428	SS
8640.50	8640.50	8640.5 (3)	0.21	390	190	1030	186	90	490	0.672	352	SS
8641.00	8641.00	8641 (1)	0.43	20	50	640	5	12	149	0.286	353	SS
8641.00	8641.00	8641 (3)	0.11	110	0	790	100	0	718	1.000	255	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
8641.67	8641.67	8641.67 (1)	0.20	10	50	320	5	25	160	0.167	360	SS
8642.00	8642.00	8642 (3)	0.06	50	30	500	83	50	833	0.625	226	SS
8642.42	8642.42	8642.42 (1)	0.42	0	50	720	0	12	171	0.000	402	SS
8643.50	8643.50	8643.5 (1)	0.55	30	140	680	5	25	124	0.176	412	SS
8644.00	8644.00	8644 (3)	0.07	40	0	440	57	0	629	1.000	220	SS
8644.42	8644.42	8644.42 (1)	0.37	20	120	600	5	32	162	0.143	361	SS
8645.42	8645.42	8645.42 (1)	0.50	30	230	530	6	46	106	0.115	409	SS
8646.00	8646.00	8646 (1)	0.72	30	160	550	4	22	76	0.158	416	SS
8646.00	8646.00	8646 (3)	0.12	90	20	620	75	17	517	0.818	252	SS
8647.00	8647.00	8647 (1)	0.80	20	50	470	3	6	59	0.286	364	SS
8647.00	8647.00	8647 (1)	0.23	30	50	350	13	22	152	0.375	295	SS
8647.67	8647.67	8647.67 (1)	0.67	20	60	540	3	9	81	0.250	399	SS
8648.00	8648.00	8648 (3)	0.10	100	20	460	100	20	460	0.833	245	SS
8649.17	8649.17	8649.17 (1)	0.42	120	230	260	29	55	62	0.343	425	SS
8650.00	8650.00	8650 (1)	0.17	40	50	180	24	29	106	0.444	425	SS
8650.00	8650.00	8650 (3)	0.12	50	0	380	42	0	317	1.000	217	SS
8651.00	8651.00	8651 (1)	0.15	80	80	140	53	53	93	0.500	363	SS
8652.00	8652.00	8652 (1)	0.15	50	50	140	33	33	93	0.500	355	SS
8652.00	8652.00	8652 (3)	0.13	60	10	310	46	8	238	0.857	255	SS
8653.00	8653.00	8653 (1)	0.27	30	30	280	11	11	104	0.500	332	SS
8654.00	8654.00	8654 (1)	0.17	20	40	280	12	24	165	0.333	373	SS
8654.00	8654.00	8654 (3)	0.18	120	80	400	67	44	222	0.600	429	SS
8654.33	8654.33	8654.33 (1)	0.25	20	40	410	8	16	164	0.333	335	SS
8655.50	8655.50	8655.5 (1)	0.24	20	80	350	8	33	146	0.200	363	SS
8656.00	8656.00	8656 (3)	0.12	80	0	500	67	0	417	1.000	356	SS
8656.42	8656.42	8656.42 (1)	0.21	10	0	340	5	0	162	1.000	273	SS
8657.00	8657.00	8657 (1)	0.19	0	0	310	0	0	163	0.000	295	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
8657.00	8657.00	8657(4)	0.23	30	50	350	13	22	152	0.375	295	SS
8658.00	8658.00	8658 (3)	0.12	70	0	410	58	0	342	1.000	270	SS
8658.00	8658.00	8658(4)	0.19	0	0	310	0	0	163	.	295	SS
8658.50	8658.50	8658.5 (1)	0.23	0	0	380	0	0	165	0.000	480	SS
8659.00	8659.00	8659 (1)	0.20	0	20	320	0	10	160	0.000	296	SS
8659.50	8659.50	8659.5 (1)	0.26	40	100	460	15	38	177	0.286	367	SS
8660.00	8660.00	8660 (1)	0.41	30	110	510	7	27	124	0.214	417	SS
8660.00	8660.00	8660 (3)	0.11	120	50	490	109	45	445	0.706	332	SS
8660.50	8660.50	8660.5 (3)	0.12	60	20	450	50	17	375	0.750	362	SS
8661.00	8661.00	8661 (3)	0.12	110	20	550	92	17	458	0.846	295	SS
8661.50	8661.50	8661.5 (3)	0.13	110	0	530	85	0	408	1.000	215	SS
8661.80	8661.80	8661.8 (3)	0.15	200	630	120	133	420	80	0.241	543	SS
8661.90	8661.90	8661.9 (3)	3.12	1380	2800	570	44	90	18	0.330	415	LS
8662.00	8662.00	8662 (3)	4.15	1370	5260	450	33	127	11	0.207	420	LS
8662.50	8662.50	8662.5 (3)	3.05	740	2250	400	24	74	13	0.247	416	LS
8662.67	8662.67	8662.67 (1)	0.97	70	460	270	7	47	28	0.132	432	LS
8663.00	8663.00	8663 (1)	5.13	460	5800	930	9	113	18	0.073	428	LS
8663.00	8667.00	8665 (1)	8.71	1600	27700	740	18	318	8	0.055	420	LS
8663.00	8663.00	8663 (3)	2.46	640	1930	370	26	78	15	0.249	418	LS
8663.50	8663.50	8663.5 (1)	1.25	40	250	580	3	20	46	0.138	429	LS
8663.75	8663.75	8663.75 (1)	2.44	150	1060	750	6	43	31	0.124	424	LS
8664.00	8664.00	8664 (1)	6.02	560	4300	1860	9	71	31	0.115	426	LS
8664.00	8664.00	8664 (3)	3.45	1110	5870	350	32	170	10	0.159	421	LS
8664.42	8664.42	8664.42 (1)	6.84	650	7050	930	10	103	14	0.084	425	LS
8664.75	8664.75	8664.75 (1)	4.59	470	5660	470	10	123	10	0.077	430	LS
8665.67	8665.67	8665.67 (1)	14.04	4120	58500	1370	29	417	10	0.066	425	LS
8666.00	8666.00	8666 (1)	10.18	1720	31610	210	17	311	2	0.052	427	LS
8666.00	8666.00	8666 (3)	16.55	6990	90120	2420	42	545	15	0.072	423	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
8666.58	8666.58	8666.58 (1)	9.65	1380	20460	150	14	212	2	0.063	423	LS
8667.00	8667.00	8667 (1)	15.75	3530	65050	1710	22	413	11	0.051	424	LS
8668.00	8668.00	8668 (3)	15.87	6060	96330	2880	38	607	18	0.059	425	LS

Table 1. ROCK EVAL data for the Marathon Jensen 12-44 (Sec 12 SESE T154N R90W); NDGS-8069. In this and all subsequent tables a number "3" in parentheses after the average depth refers to data supplied by Rick Webster (then of Exxon Corp.) to the North Dakota Geological Survey. The numbers 1,2,4 in parentheses, or no number at all, refer to data taken by the U. S. Geological Survey. Stratigraphic (electric log) tops for NDGS-8069 are 9156' top of upper Bakken shale; 9174' top of middle Bakken member (siltstone); 9207' top of lower Bakken shale; 9236' top of Three Forks Formation. In this and all other wells of this report, coring (drilling) depths are not necessarily equivalent to the (correct) electric log tops. In NDGS-8069 the upper Bakken shale (13' of 28'), all of the siltstone (33') and the lower Bakken shale (10' of 19') were analyzed. The S_2 (ppm) and HI values for the two shales are likely underestimates.

TOC is total organic carbon. S1, S2, and S3 PPM are the ROCK EVAL S1, S2, and S3 pyrolysis peaks in parts per million (PPM) by dry rock weight. S1, S2, and S3 mg/GOC are the ROCK EVAL, S1, S2, and S3 pyrolysis peaks normalized to TOC (OC) in milligrams/gram (mg/G). TR is the transformation ratio (a.k.a. the production index, "PI"; S1/S1+S2). Tmax is the pyrolysis temperature at the maximum of the S2 pyrolysis peak in °C. UNIT stands for stratigraphic unit: LP, US, SS, LS, and 3F respectively stand for Lodgepole, upper Bakken shale, middle Bakken siltstone, lower Bakken shale, and Three Forks shale. FB stands for false Bakken: a thin organic rich shale in the lowermost Lodgepole formation. Significant differences between samples analyzed by the USGS (no number, 1, 2,4) and Rick Webster (3) for samples at the same depth are more likely due to different actual sampling depths, than to analytical differences or error.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9157.00	9157.00	9157 (3)	12.19	4320	63200	3600	35	518	30	0.064	437	US
9158.00	9158.00	9158 (3)	14.91	4150	65950	3820	28	442	26	0.059	438	US
9159.00	9159.00	9159 (3)	6.13	2690	28960	2070	44	472	34	0.085	439	US
9160.00	9160.00	9160 (3)	15.74	5360	89090	3810	34	566	24	0.057	436	US
9161.00	9161.00	9161 (3)	13.20	3850	52100	5260	29	395	40	0.069	437	US
9162.00	9162.00	9162 (3)	14.88	6480	73190	4890	44	492	33	0.081	437	US
9163.00	9163.00	9163 (3)	20.88	8130	103720	6160	39	497	30	0.073	433	US
9164.00	9164.00	9164 (3)	22.63	8730	116050	6760	39	513	30	0.070	432	US
9165.00	9165.00	9165 (3)	10.08	5320	47410	4270	53	470	42	0.101	437	US
9166.00	9166.00	9166 (3)	16.74	8350	72080	6860	50	431	41	0.104	430	US
9167.00	9167.00	9167 (3)	15.89	7630	75520	6570	48	475	41	0.092	432	US
9168.00	9168.00	9168 (3)	18.89	8650	79630	4260	46	422	23	0.098	433	US
9169.00	9169.00	9169 (3)	20.93	8400	105790	6080	40	505	29	0.074	433	US
9170.00	9170.00	9170 (3)	11.45	5310	52600	4060	46	459	35	0.092	434	US
9170.00	9170.00	9170.00	0.32	230	340	960	72	106	300	0.410	339	SS
9170.60	9170.60	9170.60	0.59	1580	1830	900	268	310	153	0.460	349	SS
9171.00	9171.00	9171.00	0.72	1950	2300	740	271	319	103	0.460	348	SS
9171.80	9171.80	9171.80	0.69	1480	1990	990	214	288	143	0.430	350	SS
9172.00	9172.00	9172.00	0.54	1320	1390	900	244	257	167	0.490	302	SS
9172.60	9172.60	9172.60	0.55	1220	1790	970	222	325	176	0.410	303	SS
9173.00	9173.00	9173.00	0.47	1320	1090	890	281	232	189	0.550	288	SS
9174.00	9174.00	9174.00	0.52	1730	1550	880	333	298	169	0.530	290	SS
9175.00	9175.00	9175.00	0.17	240	430	790	141	253	465	0.360	405	SS
9176.20	9176.20	9176.20	0.61	1730	2050	750	284	336	123	0.460	403	SS
9177.20	9177.20	9177.20	0.53	1660	1820	720	313	343	136	0.480	344	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9178.11	9178.11	9178.11	0.73	1900	1730	1000	260	237	137	0.520	405	SS
9179.00	9179.00	9179.00	0.93	2620	3430	610	282	369	66	0.430	298	SS
9180.00	9180.00	9180.00	0.63	1290	1560	740	205	248	117	0.450	356	SS
9181.10	9181.10	9181.10	0.58	1660	1950	700	286	336	121	0.460	398	SS
9182.00	9182.00	9182.00	0.92	2080	2070	640	226	225	70	0.500	297	SS
9183.00	9183.00	9183.00	0.58	2170	2290	750	374	395	129	0.490	399	SS
9184.00	9184.00	9184.00	0.67	2550	2220	670	381	331	100	0.540	299	SS
9185.00	9185.00	9185.00	0.34	1190	1240	510	350	365	150	0.490	399	SS
9186.00	9186.00	9186.00	0.28	1030	810	620	368	289	221	0.560	294	SS
9187.00	9187.00	9187.00	0.38	1300	1130	680	342	297	179	0.540	297	SS
9188.00	9188.00	9188.00	0.38	1290	1340	720	339	353	189	0.490	404	SS
9189.10	9189.10	9189.10	0.49	1530	1870	580	312	382	118	0.450	405	SS
9190.10	9190.10	9190.10	0.39	1370	1150	700	351	295	179	0.540	350	SS
9191.00	9191.00	9191.00	0.46	1350	1450	810	293	315	176	0.480	300	SS
9192.00	9192.00	9192.00	0.44	1240	1720	660	282	391	150	0.420	403	SS
9193.00	9193.00	9193.00	0.37	1320	1370	640	357	370	173	0.490	408	SS
9194.00	9194.00	9194.00	0.39	1380	1550	560	354	397	144	0.470	402	SS
9195.20	9195.20	9195.20	0.30	1010	1150	750	337	383	250	0.470	348	SS
9196.20	9196.20	9196.20	0.45	1600	1870	340	356	416	76	0.460	408	SS
9197.00	9197.00	9197.00	0.36	1130	1010	670	314	281	186	0.530	342	SS
9199.00	9199.00	9199.00	0.41	1430	1720	700	349	420	171	0.460	406	SS
9200.10	9200.10	9200.10	0.32	1170	1130	670	366	353	209	0.510	349	SS
9201.00	9201.00	9201.00	0.28	890	1200	720	318	429	257	0.430	382	SS
9201.60	9201.60	9201.60	0.37	990	1380	800	268	373	216	0.420	409	SS
9202.00	9202.00	9202.00	0.33	980	1000	930	297	303	282	0.490	295	SS
9202.50	9202.50	9202.50	0.34	870	1130	870	256	332	256	0.430	350	SS
9203.60	9203.60	9203.60	0.37	1010	1060	810	273	286	219	0.490	298	SS
9204.00	9204.00	9204.00	0.41	1210	1540	760	295	376	185	0.440	411	SS
9205.00	9205.00	9205 (3)	7.35	2110	20610	1530	29	280	21	0.093	433	SS
9205.20	9205.20	9205.20	0.54	1190	1490	990	220	276	183	0.440	397	SS
9206.00	9206.00	9206 (3)	18.93	7140	77140	5230	38	408	28	0.085	433	LS
9207.00	9207.00	9207 (3)	23.81	8000	111830	6830	34	470	29	0.067	436	LS
9208.00	9208.00	9208 (3)	21.67	7290	88370	10540	34	408	49	0.076	432	LS
9209.00	9209.00	9209 (3)	18.60	8530	93730	3130	46	504	17	0.083	432	LS
9210.00	9210.00	9210 (3)	17.52	5910	93330	3110	34	533	18	0.060	435	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9211.00	9211.00	9211 (3)	3.64	1770	18550	1150	49	510	32	0.087	438	LS
9212.00	9212.00	9212 (3)	1.74	670	9050	790	39	520	45	0.069	437	LS
9213.00	9213.00	9213 (3)	19.86	5750	94860	4240	29	478	21	0.057	433	LS
9214.00	9214.00	9214 (3)	19.27	5000	91170	5730	26	473	30	0.052	436	LS
9215.00	9215.00	9215 (3)	16.62	4860	71970	5260	29	433	32	0.063	435	LS
9216.00	9216.00	9216 (3)	16.33	4910	71690	5330	30	439	33	0.064	434	LS

TOC AND ROCK-EVAL PYROLYSIS FOR:										
MARATHON NO.18-44 DOBRINSKI										
NDGS #8177										
				Tmax	S1	S2	S3			Tr.
Depth	(Feet)	EPR No.	TOC	C	mg/g	mg/g	mg/g	HI	OI	Ratio
8629.0	8629.0	125334-A	3.03	425	1.09	5.99	0.38	198	13	0.15
8631.0	8631.0	125334-C	15.19	422	9.67	87.20	1.76	574	12	0.10
8633.0	8633.0	125334-F	16.73	422	9.97	96.68	1.39	578	8	0.09
8635.0	8635.0	125334-I	17.86	420	11.33	100.23	1.48	561	8	0.10
8637.0	8637.0	125334-K	25.34	419	14.75	128.72	1.66	508	7	0.10
8638.5	8638.5	125334-M	0.17	420	0.07	0.05	1.07	29	629	0.58
8639.0	8639.0	125334-N	0.25	422	0.12	0.11	1.40	44	560	0.55
8639.5	8639.5	125345-A	0.11	222	0.06	0.00	1.27	0	1155	1.00
8638.0	8640.0	125334-L	19.98	421	12.44	110.05	1.18	551	6	0.10
8640.0	8640.0	125345-B	0.06	428	0.08	0.00	0.80	0	1333	1.00
8640.5	8640.5	125345-C	0.21	352	0.39	0.19	1.03	90	490	0.67
8641.0	8641.0	125345-D	0.11	255	0.11	0.00	0.79	0	718	1.00
8642.0	8642.0	125345-F	0.06	226	0.05	0.03	0.50	50	833	0.62
8644.0	8644.0	125345-I	0.07	220	0.04	0.00	0.44	0	629	1.00
8646.0	8646.0	125345-K	0.12	252	0.09	0.02	0.62	17	517	0.90
8648.0	8648.0	125345-M	0.10	245	0.10	0.02	0.46	20	460	0.83
8650.0	8650.0	125356-A	0.12	217	0.05	0.00	0.38	0	317	1.00
8652.0	8652.0	125356-C	0.13	255	0.06	0.01	0.31	8	238	1.00
8654.0	8654.0	125356-E	0.18	429	0.12	0.08	0.40	44	222	0.60
8656.0	8656.0	125356-G	0.12	356	0.08	0.00	0.50	0	417	1.00
8658.0	8658.0	125356-K	0.12	270	0.07	0.00	0.41	0	342	1.00
8660.0	8660.0	125367-A	0.11	332	0.12	0.05	0.49	45	445	0.75
8660.5	8660.5	125367-B	0.12	362	0.06	0.02	0.45	17	375	0.75
8661.0	8661.0	125367-C	0.12	295	0.11	0.02	0.55	17	458	0.92
8661.5	8661.5	125367-D	0.13	215	0.11	0.00	0.53	0	408	1.00
8661.8	8661.8	125367-E	0.15	543	0.20	0.63	0.12	420	80	0.24
8661.9	8661.9	125367-F	3.12	415	1.38	2.80	0.57	90	18	0.33
8662.0	8662.0	125367-G	4.15	420	1.37	5.26	0.45	127	11	0.21
8662.5	8662.5	125367-H	3.05	416	0.74	2.25	0.40	74	13	0.25
8663.0	8663.0	125367-I	2.46	418	0.64	1.93	0.37	78	15	0.25
8664.0	8664.0	125367-J	3.45	421	1.11	5.87	0.35	170	10	0.16
8666.0	8666.0	125367-L	16.55	423	6.99	90.12	2.42	545	15	8.07
8668.0	8668.0	125367-N	15.87	425	6.06	95.33	2.88	601	18	8.06

Table 14. ROCK EVAL data for the Tenneco Oil Co. 1-15 Graham USA (NESW Sec 15 T144N R102W; NDGS 8474). Electric log tops for NDGS 8474 are 10366' top of upper Bakken shale; 10374' top of middle Bakken siltstone; 10379' top of lower Bakken shale; 10380' top of Three Forks Formation. In NDGS 8474: 31' pf the Lodgepole Formation (including 3.4' of false Bakken); all (5') of the siltstone, and 20' of Three Forks Formation were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10330.60	10330.60	10330.6 (2)	0.15	40	60	580	27	40	387	0.400	423	LP
10331.00	10331.00	10331 (2)	0.33	230	170	640	70	52	194	0.575	431	LP
10331.80	10331.80	10331.8 (2)	0.55	180	230	420	33	42	76	0.439	435	LP
10332.00	10332.00	10332 (2)	0.13	30	40	560	23	31	431	0.429	432	LP
10332.70	10332.70	10332.7 (2)	0.66	210	300	580	32	45	88	0.412	439	LP
10333.00	10333.00	10333 (2)	0.11	40	70	600	36	64	545	0.364	415	LP
10334.10	10334.10	10334.1 (2)	0.15	50	70	870	33	47	580	0.417	389	LP
10334.70	10334.70	10334.7 (2)	0.15	40	60	580	27	40	387	0.400	428	LP
10335.00	10335.00	10335 (2)	0.13	50	40	480	38	31	369	0.556	425	LP
10335.70	10335.70	10335.7 (2)	0.16	90	110	350	56	69	219	0.450	437	LP
10336.10	10336.10	10336.1 (2)	0.22	150	140	520	68	64	236	0.517	433	LP
10336.10	10336.10	10336.1 (2)	0.40	150	160	580	38	40	145	0.484	432	LP
10337.40	10337.40	10337.4 (2)	0.32	350	230	750	109	72	234	0.603	429	LP
10338.00	10338.00	10338 (2)	0.28	180	160	580	64	57	207	0.529	427	LP
10338.10	10338.10	10338.1 (2)	0.40	130	230	580	33	58	145	0.361	430	LP
10339.00	10339.00	10339 (2)	0.33	90	210	530	27	64	161	0.300	430	LP
10339.80	10339.80	10339.8 (2)	0.54	390	500	890	72	93	165	0.438	365	LP
10340.20	10340.20	10340.2 (2)	0.43	170	230	620	40	53	144	0.425	428	LP
10340.70	10340.70	10340.7 (2)	0.46	140	380	740	30	83	161	0.269	427	LP
10341.00	10341.00	10341 (2)	0.54	100	290	710	19	54	131	0.256	430	LP
10341.60	10341.60	10341.6 (2)	0.55	180	400	680	33	73	124	0.310	430	LP
10342.10	10342.10	10342.1 (2)	0.58	510	560	920	88	97	159	0.477	439	LP
10342.60	10342.60	10342.6 (2)	0.60	230	340	760	38	57	127	0.404	437	LP
10343.00	10343.00	10343 (2)	0.51	260	380	710	51	75	139	0.406	433	LP
10343.60	10343.60	10343.6 (2)	0.54	200	280	790	37	52	146	0.417	432	LP
10344.00	10344.00	10344 (2)	0.62	170	430	800	27	69	129	0.283	430	LP
10344.60	10344.60	10344.6 (2)	0.70	330	550	970	47	79	139	0.375	429	LP
10345.00	10345.00	10345 (2)	0.44	140	220	760	32	50	173	0.389	425	LP
10345.60	10345.60	10345.6 (2)	0.52	130	230	790	25	44	152	0.361	423	LP
10346.00	10346.00	10346 (2)	0.70	220	470	820	31	67	117	0.319	428	LP
10346.60	10346.60	10346.6 (2)	1.17	690	690	1100	59	59	94	0.500	444	FB
10347.40	10347.40	10347.4 (2)	6.03	1900	7120	2170	32	118	36	0.211	450	FB

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10347.90	10347.90	10347.9 (2)	6.35	1820	7080	2390	29	111	38	0.204	449	FB
10348.00	10348.00	10348 (2)	3.70	1760	4110	1430	48	111	39	0.300	449	FB
10348.70	10348.70	10348.7 (2)	1.36	1050	1140	1350	77	84	99	0.479	442	FB
10349.00	10349.00	10349 (2)	0.81	940	520	1340	116	64	165	0.644	438	FB
10350.00	10350.00	10350 (2)	2.27	1820	2660	1910	80	117	84	0.406	446	FB
10350.50	10350.50	10350.5 (2)	1.95	1320	2120	2400	68	109	123	0.384	448	FB
10351.00	10351.00	10351 (2)	0.72	670	330	1540	93	46	214	0.670	442	LP
10351.90	10351.90	10351.9 (2)	0.55	630	240	1070	115	44	195	0.724	428	LP
10352.30	10352.30	10352.30	0.10	50	4	220	50	4	220	0.620	337	LP
10353.00	10353.00	10353.00	0.26	200	360	480	77	138	185	0.360	318	LP
10354.00	10354.00	10354.00	0.62	660	810	560	106	131	90	0.450	348	LP
10355.00	10355.00	10355.00	0.19	140	300	600	74	158	316	0.320	347	LP
10356.00	10356.00	10356.00	0.09	160	370	450	178	411	500	0.310	378	LP
10357.00	10357.00	10357.00	0.30	480	820	490	160	273	163	0.370	387	LP
10358.00	10358.00	10358.00	0.22	360	470	420	164	214	191	0.440	349	LP
10359.00	10359.00	10359.00	0.16	200	700	480	125	438	300	0.220	361	LP
10359.60	10359.60	10359.60	0.52	880	1380	400	169	265	77	0.390	417	LP
10360.00	10360.00	10360.00	0.17	230	400	390	135	235	229	0.370	422	LP
10360.60	10360.60	10360.60	0.24	380	730	490	158	304	204	0.350	415	LP
10361.00	10361.00	10361.00	0.13	120	380	490	92	292	377	0.240	418	LP
10361.60	10361.60	10361.60	0.12	170	240	530	142	200	442	0.420	355	LP
10369.00	10369.00	10369.00	0.73	780	1230	790	107	168	108	0.390	410	SS
10370.00	10370.00	10370.00	0.50	360	610	540	72	122	108	0.370	347	SS
10370.60	10370.60	10370.60	0.98	960	1670	1050	98	170	107	0.370	407	SS
10371.00	10371.00	10371.00	0.69	660	950	700	96	138	101	0.410	414	SS
10372.00	10372.00	10372.00	0.82	1080	1620	640	132	198	78	0.400	348	SS
10374.00	10374.00	10374.00	0.32	210	330	900	66	103	281	0.390	346	3F
10375.00	10375.00	10375.00	0.28	150	500	960	54	179	343	0.230	398	3F
10376.00	10376.00	10376.00	0.46	670	860	910	146	187	198	0.440	322	3F
10377.00	10377.00	10377.00	0.81	580	1130	1200	72	140	148	0.340	409	3F
10378.00	10378.00	10378.00	0.60	490	900	1000	82	150	167	0.360	406	3F
10379.00	10379.00	10379.00	0.42	510	460	850	121	110	202	0.530	294	3F
10380.00	10380.00	10380.00	0.30	280	590	790	93	197	263	0.330	413	3F
10381.00	10381.00	10381.00	0.08	10	60	750	13	75	938	0.170	403	3F
10382.00	10382.00	10382.00	0.41	160	360	760	39	88	185	0.310	293	3F

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10383.00	10383.00	10383.00	0.25	310	300	1040	124	120	416	0.520	294	3F
10384.00	10384.00	10384.00	0.32	520	500	640	163	156	200	0.510	298	3F
10385.00	10385.00	10385.00	0.34	360	390	1060	106	115	312	0.490	295	3F
10387.00	10387.00	10387.00	0.38	810	970	700	213	255	184	0.460	295	3F
10388.00	10388.00	10388.00	0.41	470	780	570	115	190	139	0.380	359	3F
10389.00	10389.00	10389.00	0.63	730	690	780	116	110	124	0.510	292	3F
10390.00	10390.00	10390.00	0.59	400	740	1170	68	125	198	0.350	354	3F
10391.00	10391.00	10391.00	0.38	80	250	1180	21	66	311	0.250	576	3F
10392.00	10392.00	10392.00	0.25	40	270	1410	16	108	564	0.130	564	3F
10393.00	10393.00	10393.00	0.45	70	330	1150	16	73	256	0.170	577	3F
10394.00	10394.00	10394.00	0.61	100	150	1040	16	25	170	0.420	596	3F

TOC & ROCK-EVAL PYROLYSIS FOR:										
CLARION NO. 1-18 PIERCE										
NDGS# 8637										
				Tmax	S1	S2	S3			Tr.
Depth	(Feet)	EPR No.	TOC	C	mg/g	mg/g	mg/g	HI	OI	Ratio
6760.0	6760.0	125543-A	19.28							
6760.5	6760.5	125543-B	0.18	429	0.11	0.03	1.15	17	639	0.79
6761.5	6761.5	125543-D	0.17	429	0.67	0.00	0.63	0	371	1.00
6763.0	6763.0	125543-F	0.07	344	0.05	0.00	0.44	0	629	1.00
6765.0	6765.0	125543-H	0.11	270	0.12	0.04	0.39	36	355	0.75
6767.0	6767.0	125543-J	0.06	270	0.06	0.05	0.41	83	683	0.60
6770.5	6770.5	125543-N	0.04	386	0.08	0.06	0.35	150	875	0.57
6772.5	6772.5	125543-P	0.09	428	0.09	0.00	0.41	0	456	1.00
6775.0	6775.0	125554-B	0.10	325	0.19	0.05	0.18	50	180	0.79
6777.0	6777.0	125554-D	0.10	270	0.17	0.05	0.20	50	200	0.77
6779.0	6779.0	125554-F	0.13	360	0.14	0.08	0.26	62	200	0.64
6781.0	6781.0	125554-I	0.07	428	0.09	0.00	0.28	0	400	1.00
6782.0	6782.0	125554-K	0.09	430	0.28	0.02	0.22	22	244	0.93
6783.0	6783.0	125554-L	0.07	335	0.03	0.00	0.17	0	243	1.00
6783.8	6783.8	125554-M	0.19	302	0.09	0.06	0.35	32	184	0.64
6784.0	6784.0	125554-N	0.39	414	0.14	0.31	0.15	79	38	0.32
6784.5	6784.5	125554-O	3.01	425	0.74	1.86	0.33	62	11	0.28
6785.0	6785.0	125565-A	2.33	421	0.40	1.78	0.28	76	12	0.18
6785.5	6785.5	125565-B	2.23	423	0.45	2.29	0.23	103	10	0.16
6786.0	6786.0	125565-C	1.66	428	0.57	0.65	0.25	39	15	0.47
6786.5	6786.5	125565-D	3.48	423	1.23	2.62	0.30	75	9	0.32
6787.0	6787.0	125565-E	2.68	425	0.91	3.22	0.28	120	10	0.22
6787.5	6787.5	125565-G	1.99	421	0.67	1.17	0.13	59	7	0.36
6788.5	6788.5	125565-I	2.47	421	0.57	1.33	0.17	54	7	0.30
6790.0	6790.0	125565-L	3.41	426	0.86	3.25	0.24	95	5	0.21

Table 7. ROCK EVAL data for the Clarion Resources Inc. Pierce 1-18 (SENE Sec 18 T161N R87W; NDGS #8637). Electric log tops for NDGS 8637 are 6750' top of upper Bakken shale; 6756' top of middle Bakken siltstone; 6779' top of lower Bakken shale; 6796' top of Three Forks Formation. In NDGS 8637: 1' (of 6') of upper Bakken shale all 24' of the siltstone and 6' (of 8') of lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
6760.00	6760.00	6760(4)	17.88	7420	118500	2020	42	662	11	0.059	425	US
6760.00	6760.00	6760.00	19.47	5290	11490	4830	27	590	24	0.040	433	US
6760.50	6760.50	6760.5 (3)	0.18	110	30	1150	61	17	639	0.786	429	SS
6761.50	6761.50	6761.5 (3)	0.17	670	0	630	394	0	371	1.000	429	SS
6763.00	6763.00	6763 (3)	0.07	50	0	440	71	0	629	1.000	344	SS
6765.00	6765.00	6765 (3)	0.11	120	40	390	109	36	355	0.750	270	SS
6767.00	6767.00	6767 (3)	0.06	60	50	410	100	83	683	0.545	270	SS
6770.50	6770.50	6770.5 (3)	0.04	80	60	350	200	150	875	0.571	386	SS
6772.50	6772.50	6772.5 (3)	0.09	90	0	410	100	0	456	1.000	428	SS
6775.00	6775.00	6775 (3)	0.10	190	50	180	190	50	180	0.792	325	SS
6777.00	6777.00	6777 (3)	0.10	170	50	200	170	50	200	0.773	270	SS
6779.00	6779.00	6779 (3)	0.13	140	80	260	108	62	200	0.636	360	SS
6781.00	6781.00	6781 (3)	0.07	90	0	280	129	0	400	1.000	428	SS
6782.00	6782.00	6782 (3)	0.09	280	20	220	311	22	244	0.933	430	SS
6783.00	6783.00	6783 (3)	0.07	30	0	170	43	0	243	1.000	335	SS
6783.80	6783.80	6783.8 (3)	0.19	90	60	350	47	32	184	0.600	302	SS
6784.00	6784.00	6784 (3)	0.39	140	310	150	36	79	38	0.311	414	SS
6784.30	6784.30	6784.30	0.08	100	260	480	125	325	600	0.280	299	SS
6784.50	6784.50	6784.5 (3)	3.01	740	1860	330	25	62	11	0.285	425	LS
6785.00	6785.00	6785 (3)	2.33	400	1780	280	17	76	12	0.183	421	LS
6785.00	6785.00	6785.00	2.55	330	5760	0	13	225	0	0.050	568	LS
6785.42	6785.42	6785.42 (1)	2.84	140	930	100	5	33	4	0.131	422	LS
6785.50	6785.50	6785.5 (3)	2.23	450	2290	230	20	103	10	0.164	423	LS
6785.60	6785.60	6785.60	2.69	310	3450	90	12	128	3	0.080	426	LS
6786.00	6786.00	6786 (3)	1.66	570	650	250	34	39	15	0.467	428	LS
6786.00	6786.00	6786.00	3.11	460	1810	260	15	58	8	0.200	423	LS
6786.50	6786.50	6786.5 (1)	2.34	180	1750	70	8	75	3	0.093	426	LS
6786.50	6786.50	6786.5 (3)	3.48	1230	2620	300	35	75	9	0.319	423	LS
6786.50	6786.50	6786.5(4)	2.34	180	1750	70	8	75	3	0.093	426	LS
6786.60	6786.60	6786.60	2.73	520	1760	390	19	64	14	0.230	419	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
6787.00	6787.00	6787 (3)	2.68	910	3220	280	34	120	10	0.220	425	LS
6787.00	6787.00	6787.00	3.07	330	5560	460	11	181	14	0.060	430	LS
6787.50	6787.50	6787.5 (3)	1.99	670	1170	130	34	59	7	0.364	421	LS
6787.70	6787.70	6787.70	1.79	610	2340	460	34	130	25	0.210	423	LS
6787.83	6787.83	6787.83 (1)	3.97	290	2450	190	7	62	5	0.106	427	LS
6788.00	6788.00	6788 (2)	5.56	2530	12800	370	46	230	7	0.165	430	LS
6788.00	6788.00	6788.00	3.98	730	5380	150	18	135	3	0.120	427	LS
6788.17	6788.17	6788.17 (1)	4.36	320	3640	150	7	83	3	0.081	428	LS
6788.50	6788.50	6788.5 (3)	2.47	570	1330	170	23	54	7	0.300	421	LS
6788.60	6788.60	6788.6 (2)	6.44	3130	18920	290	49	294	5	0.142	428	LS
6788.60	6788.60	6788.60	3.04	260	3880	0	9	127	0	0.060	432	LS
6789.00	6789.00	6789 (1)	3.70	150	1690	120	4	46	3	0.082	426	LS
6789.00	6789.00	6789 (2)	6.46	4570	24850	280	71	385	4	0.155	502	LS
6789.00	6789.00	6789(4)	3.70	150	1690	120	4	46	3	0.082	426	LS
6789.00	6789.00	6789.00	3.25	330	6880	0	10	211	0	0.050	429	LS
6789.00	6789.00	6789.00	4.00	730	7730	0	18	193	0	0.090	433	LS
6789.42	6789.42	6789.42 (1)	3.69	240	2210	180	7	60	5	0.098	426	LS
6789.60	6789.60	6789.6 (2)	7.39	3780	33240	540	51	450	7	0.102	583	LS
6790.00	6790.00	6790 (3)	3.41	860	3250	240	25	95	7	0.209	426	LS

Table 4. ROCK EVAL data for the Tri-W Corp. Slater 1-24 (SWSW Sec 24 T161N R91W; NDGS 8638). Electric log tops for NDGS 8638 are 7882' top of upper Bakken shale; 7893' top of middle Bakken siltstone; 7940' top of lower Bakken shale; 7964' top of Three Forks Formation. In NDGS 8638: 9' (of 11') of upper Bakken shale and 39' (of 47') of the siltstone were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7714.00	7714.00	7714.00	0.16	100	140	390	63	88	244	0.420	385	LP
7815.00	7815.00	7815.00	0.12	40	230	440	33	192	367	0.150	569	LP
7816.00	7816.00	7816.00	0.13	30	270	370	23	208	285	0.100	575	LP
7817.00	7817.00	7817.00	0.43	100	130	300	23	30	70	0.450	423	LP
7872.00	7872.00	7872.00	0.17	120	260	580	71	153	341	0.320	423	LP
7872.10	7872.10	7872.10	0.14	140	220	440	100	157	314	0.390	418	LP
7874.00	7874.00	7874.00	0.07	60	70	280	86	100	400	0.500	414	LP
7875.00	7875.00	7875.00	0.22	70	400	430	32	182	195	0.150	416	LP
7875.11	7875.11	7875.11	0.03	50	50	270	167	167	900	0.500	414	LP
7877.80	7877.80	7877.80	0.10	110	180	380	110	180	380	0.390	431	LP
7878.00	7878.00	7878.00	26.59	4140	192970	2680	16	726	10	0.020	434	FB
7879.00	7879.00	7879.00	0.52	650	1900	650	125	365	125	0.260	414	LP
7880.00	7880.00	7880.00	0.52	880	1290	760	169	248	146	0.410	427	LP
7881.00	7881.00	7881.00	0.19	140	300	460	74	158	242	0.320	422	LP
7882.00	7882.00	7882.00	0.01	50	100	310	500	1000	3100	0.360	424	LP
7882.11	7882.11	7882.11	0.07	90	180	300	129	257	429	0.350	429	LP
7884.20	7884.20	7884.20	0.04	150	70	370	375	175	925	0.680	346	LP
7885.10	7885.10	7885.10	0.16	470	570	430	294	356	269	0.450	348	LP
7886.20	7886.20	7886.20	0.23	470	490	460	204	213	200	0.490	295	LP
7887.00	7887.00	7887.00	0.39	330	320	660	85	82	169	0.520	375	LP
7887.60	7887.60	7887.60	0.11	90	110	490	82	100	445	0.450	286	LP
7888.00	7888.00	7888.00	0.21	460	420	550	219	200	262	0.520	288	LP
7888.60	7888.60	7888.60	0.25	200	200	530	80	80	212	0.500	422	LP
7888.90	7888.90	7888.90	0.31	50	150	690	16	48	223	0.250	404	LP
7889.00	7889.00	7889 (1)	14.42	6400	80750	1800	44	560	12	0.073	426	US
7889.20	7889.20	7889.20	13.01	3810	66250	3610	29	509	27	0.050	431	US
7889.60	7889.60	7889.60	20.37	4530	117460	5330	22	576	26	0.040	431	US
7890.00	7890.00	7890 (1)	17.28	10620	151500	2180	61	877	13	0.066	426	US

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7890.20	7890.20	7890.20	26.99	6440	163030	5650	24	600	20	0.040	429	US
7890.70	7890.70	7890.70	28.26	6250	181570	5520	22	642	19	0.030	428	US
7891.00	7891.00	7891.00	26.09	6050	15019	5720	23	575	21	0.040	432	US
7891.70	7891.70	7891.70	18.22	4830	102280	5360	27	561	29	0.050	432	US
7892.00	7892.00	7892 (1)	17.18	8060	99170	2150	47	577	13	0.075	423	US
7892.00	7892.00	7892.00	21.79	6070	135940	5350	28	623	24	0.040	426	US
7892.70	7892.70	7892.70	17.03	5610	103560	4380	33	608	25	0.050	430	US
7893.00	7893.00	7893 (1)	15.24	5740	120800	2530	38	793	17	0.045	425	US
7893.00	7893.00	7893.00	22.21	5710	134280	5000	26	604	22	0.040	433	US
7893.60	7893.60	7893.60	13.18	5060	70130	6210	38	532	47	0.070	432	US
7894.00	7894.00	7894 (1)	12.63	9560	100180	2450	76	793	19	0.087	425	US
7894.00	7894.00	7894.00	13.66	5530	72130	6260	40	528	45	0.070	433	US
7894.50	7894.50	7894.50	28.98	6710	167300	6180	23	577	21	0.040	427	US
7895.00	7895.00	7895.00	29.98	6680	156620	5890	22	522	19	0.040	427	US
7895.70	7895.70	7895.70	28.60	5920	155130	6050	21	542	21	0.040	429	US
7896.00	7896.00	7896 (1)	10.81	8650	76050	2370	80	704	22	0.102	428	US
7896.10	7896.10	7896.10	24.85	5600	142000	5600	23	571	22	0.040	430	US
7896.50	7896.50	7896.50	21.27	5420	115680	4640	25	543	21	0.040	427	US
7897.00	7897.00	7897.00	27.86	5960	185030	5360	21	664	19	0.030	428	US
7897.10	7897.10	7897.10	21.66	4370	133170	5230	20	614	24	0.030	428	US
7897.40	7897.40	7897.40	18.87	3980	118300	4960	21	626	26	0.030	430	US
7898.00	7898.00	7898.00	23.42	4230	148940	5490	18	635	23	0.030	433	US
7898.60	7898.60	7898.60	0.30	60	270	460	20	90	153	0.190	440	SS
7899.00	7899.00	7899.00	0.31	210	250	540	68	81	174	0.460	282	SS
7899.60	7899.60	7899.60	0.20	100	330	660	50	165	330	0.240	330	SS
7900.00	7900.00	7900.00	0.32	610	600	720	191	188	225	0.510	285	SS
7900.60	7900.60	7900.60	0.28	180	470	670	64	168	239	0.280	293	SS
7901.00	7901.00	7901.00	0.25	70	230	620	28	92	248	0.230	430	SS
7902.00	7902.00	7902.00	0.26	170	350	730	65	135	281	0.330	345	SS
7903.00	7903.00	7903.00	0.30	40	200	640	13	67	213	0.170	516	SS
7904.00	7904.00	7904.00	0.20	200	300	440	100	150	220	0.400	346	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7905.00	7905.00	7905.00	0.18	20	410	490	11	228	272	0.050	499	SS
7907.00	7907.00	7907.00	0.23	310	290	500	135	126	217	0.520	286	SS
7908.00	7908.00	7908.00	0.41	90	150	580	22	37	141	0.370	410	SS
7909.00	7909.00	7909.00	0.33	30	210	540	9	64	164	0.120	583	SS
7910.20	7910.20	7910.20	0.37	20	210	710	5	57	192	0.090	579	SS
7911.00	7911.00	7911.00	0.36	20	110	680	6	31	189	0.170	584	SS
7912.00	7912.00	7912.00	0.12	40	120	420	33	100	350	0.250	496	SS
7913.00	7913.00	7913.00	0.20	150	250	360	75	125	180	0.370	531	SS
7919.10	7919.10	7919.10	0.37	210	240	290	57	65	78	0.480	352	SS
7920.00	7920.00	7920.00	0.29	80	100	210	28	34	72	0.440	409	SS
7921.30	7921.30	7921.30	0.30	40	80	170	13	27	57	0.330	539	SS
7922.00	7922.00	7922.00	1.17	40	90	190	3	8	16	0.330	421	SS
7923.20	7923.20	7923.20	0.36	210	420	420	58	117	117	0.340	415	SS
7924.00	7924.00	7924.00	0.15	100	250	460	67	167	307	0.290	424	SS
7925.10	7925.10	7925.10	0.00	100	30	150	0	0	0	0.250	428	SS
7926.00	7926.00	7926.00	0.04	20	90	170	50	225	425	0.200	424	SS
7927.00	7927.00	7927.00	0.12	150	200	370	125	167	308	0.440	420	SS
7928.00	7928.00	7928.00	0.01	10	10	120	100	100	1200	0.500	425	SS
7929.00	7929.00	7929.00	0.02	0	10	160	0	50	800	0.060	372	SS
7930.00	7930.00	7930.00	0.12	60	200	440	50	167	367	0.230	507	SS
7931.00	7931.00	7931.00	0.10	60	130	520	60	130	520	0.330	478	SS
7932.00	7932.00	7932.00	0.08	40	50	340	50	63	425	0.500	332	SS
7933.00	7933.00	7933.00	0.08	60	80	310	75	100	388	0.430	341	SS
7934.00	7934.00	7934.00	0.12	60	150	350	50	125	292	0.300	480	SS
7935.00	7935.00	7935.00	0.14	90	120	320	64	86	229	0.450	463	SS
7936.00	7936.00	7936.00	0.04	40	70	420	100	175	1050	0.400	349	SS
7937.00	7937.00	7937.00	0.10	100	17	330	100	17	330	0.380	400	SS

Table 6. ROCK EVAL data for the Clarion Resources Inc. 1-33 Pullen (NENE Sec 33 T159N R88W; NDGS 8967). Electric log tops for NDGS 8967 are 7680' top of upper Bakken shale; 7691' top of middle Bakken siltstone; 7714' top of lower Bakken shale; 7732' top of Three Forks Formation. In NDGS 8967: 3' (of 11') of upper shale, and 2' (of 18') of lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7685.00	7685.00	7685(4)	12.09	7760	84330	1100	64	698	9	0.084	425	US
7685.25	7685.25	7685.25 (1)	9.91	5540	49920	690	56	504	7	0.100	429	US
7685.83	7685.83	7685.83 (1)	9.17	5340	44880	830	58	489	9	0.106	430	US
7686.10	7686.10	7686.10	21.09	7060	128400	6260	33	608	29	0.050	431	US
7686.33	7686.33	7686.33 (1)	9.52	5590	47610	830	59	500	9	0.105	430	US
7686.50	7686.50	7686.50	11.76	5600	64200	5060	48	545	43	0.080	430	US
7686.60	7686.60	7686.60	20.28	5920	120780	6110	29	595	30	0.050	432	US
7687.08	7687.08	7687.08 (1)	12.00	6070	65770	1180	51	548	10	0.084	428	US
7687.50	7687.50	7687.5 (1)	12.96	8640	105800	980	67	816	8	0.075	423	US
7687.75	7687.75	7687.75 (1)	15.29	6790	90140	1490	44	590	10	0.070	426	US
7688.00	7688.00	7688.00	25.86	8150	178350	5680	32	689	21	0.040	428	US
7688.10	7688.10	7688.10	2.61	1600	13430	820	61	514	31	0.110	430	US
7688.17	7688.17	7688.17(4)	19.95	7900	88000	2000	40	441	10	0.082	427	US
7688.33	7688.33	7688.33(4)	19.87	8180	109810	2360	41	553	12	0.069	427	US
7688.60	7688.60	7688.60	14.46	4590	102830	4660	32	711	32	0.040	429	US
7688.75	7688.75	7688.75(4)	10.42	3910	57390	1520	38	551	15	0.064	427	US
7713.20	7713.20	7713.20	0.76	280	2710	380	37	356	50	0.090	425	LS
7713.80	7713.80	7713.80	1.57	540	1890	1010	34	120	64	0.220	513	LS
7714.00	7714.00	7714.00	2.53	390	5880	130	15	232	5	0.060	428	LS
7715.10	7715.10	7715.10	1.89	840	3070	60	44	162	3	0.220	430	LS

Table 8. ROCK EVAL data for the Clarion Resources Inc. Fleckton 1-20 (NENE Sec 20 T160N R89W; NDGS 8699). Electric log tops for NDGS 8699 are 7650' top of upper Bakken shale; 7660' top of middle Bakken siltstone; 7690' top of lower Bakken shale; 7709' top of Three Forks Formation. In NDGS 8699: all 11' of upper Bakken shale, 24' (of 30') of the siltstone, and 3' (of 19') of lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7651.00	7651.00	7651(4)	16.76	9260	126800	2100	55	756	13	0.080	423	US
7651.00	7651.00	7651.00	11.63	6250	70510	4380	54	606	37	0.080	431	US
7651.33	7651.33	7651.33(4)	18.07	7460	86930	2800	41	481	16	0.079	425	US
7651.58	7651.58	7651.58(4)	13.16	6020	68380	2040	46	520	16	0.081	424	US
7651.70	7651.70	7651.70	23.32	6350	165940	5870	27	711	25	0.040	430	US
7652.10	7652.10	7652.10	25.02	7410	173770	5960	30	694	23	0.040	429	US
7652.50	7652.50	7652.5(4)	13.13	8570	103020	1330	65	784	10	0.077	422	US
7652.67	7652.67	7652.67(4)	10.67	5450	58180	1930	51	545	18	0.086	427	US
7652.70	7652.70	7652.70	22.70	6620	16450	5890	29	711	25	0.040	431	US
7652.83	7652.83	7652.83(4)	17.17	6660	86660	2540	39	505	15	0.071	427	US
7653.10	7653.10	7653.10	21.93	6510	154070	5780	30	702	26	0.040	427	US
7653.17	7653.17	7653.17(4)	15.82	6660	90370	2030	42	571	13	0.069	425	US
7653.42	7653.42	7653.42(4)	18.56	7340	108120	3120	40	583	17	0.064	425	US
7653.60	7653.60	7653.60	20.98	6670	160670	5770	32	765	27	0.030	428	US
7653.62	7653.62	7653.62(4)	12.01	5040	66540	1850	42	554	15	0.070	425	US
7653.88	7653.88	7653.88(4)	16.51	7190	95700	2140	44	580	13	0.070	424	US
7655.20	7655.20	7655.20	0.18	30	130	750	17	72	417	0.190	570	SS
7655.70	7655.70	7655.70	0.24	40	140	500	17	58	208	0.220	497	SS
7656.00	7656.00	7656.00	0.31	20	170	800	6	55	258	0.110	498	SS
7656.50	7656.50	7656.50	0.25	40	250	520	16	100	208	0.140	462	SS
7657.00	7657.00	7657.00	0.29	60	110	680	21	38	234	0.370	407	SS
7657.50	7657.50	7657.50	0.34	20	130	550	6	38	162	0.140	468	SS
7658.20	7658.20	7658.20	0.37	30	210	600	8	57	162	0.120	448	SS
7659.00	7659.00	7659.00	0.17	10	390	420	6	229	247	0.020	500	SS
7659.10	7659.10	7659.1 (2)	0.39	20	610	880	5	156	226	0.032	586	SS
7660.00	7660.00	7660.00	0.22	110	360	670	50	164	305	0.240	418	SS
7662.10	7662.10	7662.10	0.29	160	330	630	55	114	217	0.330	351	SS
7663.00	7663.00	7663.00	0.41	40	610	470	10	149	115	0.060	415	SS
7663.30	7663.30	7663.3 (2)	0.65	40	1280	690	6	197	106	0.030	557	SS
7665.20	7665.20	7665.20	0.33	20	120	530	6	36	161	0.140	436	SS
7666.10	7666.10	7666.10	0.28	30	340	560	11	121	200	0.080	413	SS
7667.20	7667.20	7667.20	0.32	180	670	710	56	209	222	0.210	417	SS

8699

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7668.00	7668.00	7668.00	0.29	230	30	630	79	10	217	0.440	345	SS
7669.00	7669.00	7669.00	0.34	310	460	630	91	135	185	0.410	294	SS
7670.00	7670.00	7670.00	0.43	290	390	630	67	91	147	0.430	299	SS
7673.00	7673.00	7673.00	0.21	110	240	490	52	114	233	0.320	376	SS
7674.00	7674.00	7674.00	0.34	20	140	510	6	41	150	0.120	542	SS
7675.00	7675.00	7675.00	0.27	90	220	600	33	81	222	0.300	360	SS
7676.00	7676.00	7676.00	0.26	110	210	480	42	81	185	0.340	318	SS
7677.00	7677.00	7677.00	0.18	130	190	430	72	106	239	0.410	350	SS
7678.00	7678.00	7678.00	0.11	190	180	430	173	164	391	0.530	347	SS
7679.00	7679.00	7679.00	0.32	290	430	600	91	134	188	0.400	342	SS
7680.00	7680.00	7680.00	0.18	130	150	460	72	83	256	0.460	347	SS
7681.00	7681.00	7681.00	0.13	70	140	370	54	108	285	0.350	546	SS
7682.00	7682.00	7682.00	0.17	10	160	360	6	94	212	0.060	592	SS
7683.00	7683.00	7683.00	0.21	30	180	400	14	86	190	0.150	595	SS
7684.00	7684.00	7684.00	0.27	30	140	590	11	52	219	0.190	597	SS
7684.11	7684.11	7684.11	0.17	20	190	410	12	112	241	0.100	597	SS
7685.11	7685.11	7685.11	0.17	10	150	370	6	88	218	0.060	586	SS
7685.60	7685.60	7685.60	0.11	10	120	420	9	109	382	0.080	519	SS
7686.60	7686.60	7686.60	0.19	20	180	320	11	95	168	0.100	596	SS
7687.10	7687.10	7687.10	0.21	20	100	310	10	48	148	0.170	590	SS
7687.70	7687.70	7687.70	0.16	0	300	440	0	188	275	0.000	560	SS
7688.00	7688.00	7688 (1)	5.91	570	6610	1150	10	112	19	0.079	430	LS
7688.25	7688.25	7688.25(4)	5.34	500	5000	1070	9	94	20	0.091	430	LS
7688.42	7688.42	7688.42(4)	3.81	290	2890	780	8	76	21	0.091	428	LS
7688.50	7688.50	7688.50	2.30	820	4660	440	36	202	19	0.150	422	LS
7688.58	7688.58	7688.58(4)	5.87	700	8670	780	12	148	13	0.075	431	LS
7688.60	7688.60	7688.60	4.37	490	13160	70	11	301	1	0.040	433	LS
7689.10	7689.10	7689.10	5.14	1050	9270	390	20	180	7	0.100	429	LS
7689.25	7689.25	7689.25(4)	3.54	440	5350	500	12	151	14	0.076	430	LS
7689.54	7689.54	7689.54(4)	9.02	1580	17560	1150	18	195	13	0.083	427	LS
7689.60	7689.60	7689.60	5.66	1050	9600	460	19	169	8	0.100	426	LS
7690.00	7690.00	7690.00	9.15	2270	26620	510	25	290	5	0.080	431	LS
7690.50	7690.50	7690.5(4)	7.79	2510	16840	870	32	216	11	0.130	427	LS
7690.60	7690.60	7690.60	4.38	1130	4930	600	26	112	13	0.190	423	LS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7691.00	7691.00	7691.00	6.25	1174	10000	670	19	160	10	0.150	422	LS
7691.20	7691.20	7691.20	7.96	3090	21440	980	39	269	12	0.130	432	LS
7691.55	7691.55	7691.55	7.42	3090	17170	1110	42	231	14	0.150	433	LS

TOC & ROCK-EVAL PYROLYSIS FOR:										
CLARION NO. 1 NEGAARD										
NDGS# 9001										
				Tmax	S1	S2	S3			Tr.
Depth	(Feet)	EPR No.	TOC	C	mg/g	mg/g	mg/g	HI	OI	Ratio
7375.0	7375.0	126071-A	10.93	438	5.12	61.35	2.00	561	18	0.08
7376.6	7376.6	126071-E	19.93	436	9.70	117.12	3.72	588	191	0.08
7377.5	7377.5	126071-G	21.78	436	8.01	134.55	2.59	618	121	0.06
7378.5	7378.5	126071-I	14.96	434	6.68	86.18	1.22	576	8	0.07
7379.0	7379.0	126071-J	1.04	435	1.08	2.83	0.73	272	70	0.28
7379.3	7379.3	126071-K	0.16	427	0.21	0.06	0.72	38	450	0.81
7380.0	7380.0	126071-L	0.16	356	0.28	0.06	0.64	38	400	0.82
7380.5	7380.5	126071-M	0.17	297	0.41	0.04	0.57	24	335	0.93
7381.0	7381.0	126071-N	0.17	271	0.55	0.04	0.54	24	318	0.95
7381.5	7381.5	126071-O	0.17	289	0.61	0.05	0.59	29	347	0.92
7382.0	7382.0	126071-P	0.20	270	0.91	0.15	0.67	75	335	0.86
7383.0	7383.0	126082-A	0.14	416	0.51	0.00	0.51	0	364	1.00
7385.0	7385.0	126082-D	0.17	300	0.45	0.01	0.49	6	288	0.98
7387.0	7387.0	126082-F	0.17	280	0.33	0.00	0.50	0	294	1.00
7389.5	7389.5	126082-H	0.14	256	0.17	0.01	0.47	7	336	0.94
7391.3	7391.3	126082-J	0.09	270	0.15	0.01	0.36	11	400	0.94
7393.5	7393.5	126082-L	0.06	263	0.06	0.00	0.39	0	650	1.00
7395.5	7395.5	126082-N	0.07	224	0.09	0.00	0.27	0	386	1.00
7398.0	7398.0	126082-Q	0.09	216	0.06	0.00	0.34	0	378	1.00
7400.0	7400.0	126093-B	0.04	424	0.01	0.00	0.21	0	525	0.00
7402.0	7402.0	126093-D	0.09	255	0.01	0.00	0.16	0	178	0.00
7404.0	7404.0	126093-F	0.11	438	0.08	0.08	0.49	73	445	0.50
7406.0	7406.0	126093-H	0.09	537	0.11	0.29	0.59	322	656	0.27
7408.3	7408.3	126093-J	0.10	323	0.18	0.01	0.25	10	250	1.00
7410.3	7410.3	126093-L	0.08	306	0.21	0.39	0.29	488	363	0.35
7412.0	7412.0	126093-N	0.05	339	0.05	0.03	0.48	60	960	0.62
7415.0	7415.0	126093-Q	0.06	454	0.13	0.15	0.30	250	500	0.46

Table 5. ROCK EVAL data for the Clarion Resources Inc. Negaard #1 (NWNE Sec 21 T163N R93W; NDGS 9001). Electric log tops for NDGS 9001 are 7363' top of upper Bakken shale; 7376' top of middle Bakken siltstone; 7435' top of lower Bakken shale; 7460' top of Three Forks Formation. In NDGS 9001: 4' (of 13') of upper Bakken shale, and 36' (of 59') of the siltstone were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
7375.00	7375.00	7375 (3)	10.93	5120	61350	2000	47	561	18	0.077	438	US
7376.60	7376.60	7376.6 (3)	19.93	9700	117120	3720	49	588	19	0.076	436	US
7377.50	7377.50	7377.5 (3)	21.78	8010	134550	2590	37	618	12	0.056	436	US
7378.50	7378.50	7378.5 (3)	14.96	6680	86180	1220	45	576	8	0.072	434	US
7379.00	7379.00	7379 (3)	1.04	1080	2830	730	104	272	70	0.276	435	US
7379.30	7379.30	7379.3 (3)	0.16	210	60	720	131	38	450	0.778	427	SS
7380.00	7380.00	7380 (3)	0.16	280	60	640	175	38	400	0.824	356	SS
7380.50	7380.50	7380.5 (3)	0.17	410	40	570	241	24	335	0.911	297	SS
7381.00	7381.00	7381 (3)	0.17	550	40	540	324	24	318	0.932	271	SS
7381.50	7381.50	7381.5 (3)	0.17	610	50	590	359	29	347	0.924	289	SS
7382.00	7382.00	7382 (3)	0.20	910	150	670	455	75	335	0.858	270	SS
7383.00	7383.00	7383 (3)	0.14	510	0	510	364	0	364	1.000	416	SS
7385.00	7385.00	7385 (3)	0.17	450	10	490	265	6	288	0.978	300	SS
7387.00	7387.00	7387 (3)	0.17	330	0	500	194	0	294	1.000	280	SS
7389.50	7389.50	7389.5 (3)	0.14	170	10	470	121	7	336	0.944	256	SS
7391.50	7391.50	7391.5 (3)	0.09	150	10	360	167	11	400	0.938	270	SS
7393.50	7393.50	7393.5 (3)	0.06	60	0	390	100	0	650	1.000	263	SS
7395.50	7395.50	7395.5 (3)	0.07	90	0	270	129	0	386	1.000	224	SS
7398.00	7398.00	7398 (3)	0.09	60	0	340	67	0	378	1.000	216	SS
7400.00	7400.00	7400 (3)	0.04	10	0	210	25	0	525	1.000	424	SS
7402.00	7402.00	7402 (3)	0.09	10	0	160	11	0	178	1.000	255	SS
7404.00	7404.00	7404 (3)	0.11	80	80	490	73	73	445	0.500	438	SS
7406.00	7406.00	7406 (3)	0.09	110	290	590	122	322	656	0.275	537	SS
7408.30	7408.30	7408.3 (3)	0.10	180	10	250	180	10	250	0.947	323	SS
7410.30	7410.30	7410.3 (3)	0.08	210	390	290	263	488	363	0.350	306	SS
7412.00	7412.00	7412 (3)	0.05	50	30	480	100	60	960	0.625	339	SS
7415.00	7415.00	7415 (3)	0.00	130	150	300	0	0	0	0.464	454	SS

...17PY.WQ1

Edwin Barry Cox Hagen 1-13
NDGS 11617

NDGS	CORE DEPTH	LOG DEPTH	SAMPLE	TOC		S1		S2		S3		TMAX	
11617	10376	10376	140954 A	10.24		2.97		11.28		5.34		453	
11617	10377	10377	B	15.1		4.22		18.59		3.09		456	
11617	10378	10378	C	10.87		3.28		10.82		2.23		455	
11617	10379	10379	D	14.88		4.27		18.09		2.1		453	
11617	10380	10380	E	13.2		3.8		12.38		2.06		457	
11617	10381	10381	F	12.74		4.13		13.86		2.53		453	
11617	10382	10382	G	12.38		3.82		13.25		2.24		455	
11617	10383	10383	H	13.17		3.97		15.76		2.43		456	
11617	10384	10384	I	14.77		4.3		16.11		2.77		455	
11617	10385	10385	J	14.65		4.09		16.02	14.616	2.65		456	
11617	10386	10386	K	15.27		5.4		18.78		2.43		452	
11617	10387	10387	L	14.41		4.19		16.41		2.46		454	
11617	10388	10388	M	12.72		3.75		13.47		2.5		457	
11617	10389	10389	N	12.09		3.63		13.52		2.15		456	
11617	10390	10390	140965 A	13.64		4.36		14.72		2.72		455	
11617	10391	10391	B	12.29		3.48		13.18		2.12		457	
11617	10392	10392	C	11.79		3.33		11.16	14.46286	2.16		454	
11617	10393	10393	D	9.41		3.21		9.28		2.26		452	
11617	10394	10394	E	9.52		4.05		9.5		2.37		455	
11617	10395	10395	F	9.99		4.06		10		1.61		455	
11617	10396	10396	G	9.31		3.66		9.73		1.69		455	
11617	10397	10397	H	9.81		4.22		10.11		2.55		455	
11617	10398	10398	I	9.9		3.57		7.96		1.95		450	
11617	10399	10399	J	10		3.82		10	9.511429	1.59		454	
11617	10400	10400	K	12.21		3.92		14.2		2.55		454	
11617	10401	10401	L	12.77	12.19731	3.79	3.895769	17.09	13.27962	1.38	2.381923	455	454.5769
11617	10402	10402	M	6.64		2.89		7.4		0.76		450	
11617	10403	10404	N	3.96		2.9		4.09		0.39		444	
11617	10404	10406	O	0.51	5.3	0.21	2.895	0.56	5.745	0.46	0.575	421	447
					12.19731								454.5769

HI	OI	TR	S2/S3
110	52	0.21	2.11
123	20	0.19	6.02
99	21	0.23	4.85
121	14	0.19	8.61
93	15	0.23	6.01
108	19	0.23	5.48
107	18	0.22	5.92
119	18	0.2	6.49
109	18	0.21	5.82
109	18	0.2	6.05
122	15	0.22	7.73
113	17	0.2	6.67
105	19	0.22	5.39
111	17	0.21	6.29
107	19	0.23	5.41
107	17	0.21	6.22
94	18	0.23	5.17
98	24	0.26	4.11
99	24	0.3	4.01
100	16	0.29	6.21
104	18	0.27	5.76
103	25	0.29	3.96
80	19	0.31	4.08
100	15	0.28	6.29
116	20	0.22	5.57
133	10	0.18	12.38
111	11	0.28	9.74
103	9	0.42	10.49
109	90	0.28	1.22

Table 15. ROCK EVAL data for the Edwin I. Cox & Berry R. Co. (SESW Sec 13 T153N R95W; NDGS 11617). Electric log tops for NDGS 11617 are 10309' top of upper Bakken shale; 10331' top of middle Bakken siltstone; 10377' top of lower Bakken shale; 10405' top of Three Forks Formation. In NDGS 11617: 13' of the siltstone (of 46') and all of the lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10363.60	10363.60	10363.60	0.49	570	1080	590	116	220	120	0.350	417	SS
10364.00	10364.00	10364.00	0.34	440	680	610	129	200	179	0.390	328	SS
10365.00	10365.00	10365.00	0.22	220	300	560	100	136	255	0.420	403	SS
10367.00	10367.00	10367.00	0.35	430	570	610	123	163	174	0.430	352	SS
10368.00	10368.00	10368.00	0.31	330	550	690	106	177	223	0.370	317	SS
10369.00	10369.00	10369.00	0.34	440	620	660	129	182	194	0.420	321	SS
10370.00	10370.00	10370.00	0.37	420	650	590	114	176	159	0.400	298	SS
10371.00	10371.00	10371.00	0.35	390	520	650	111	149	186	0.430	351	SS
10372.00	10372.00	10372.00	0.39	420	570	610	108	146	156	0.430	305	SS
10372.00	10372.00	10372.00	0.37	410	610	630	111	165	170	0.400	308	SS
10373.00	10373.00	10373.00	0.37	430	590	570	116	159	154	0.420	325	SS
10373.00	10373.00	10373.00	0.48	460	630	570	96	131	119	0.430	301	SS
10374.00	10374.00	10374.00	0.26	220	580	610	85	223	235	0.270	302	SS
10374.00	10374.00	10374.00	0.26	40	90	330	15	35	127	0.330	494	SS
10375.00	10375.00	10375.00	0.76	50	710	600	7	93	79	0.420	297	SS
10376.00	10376.00	10376 (3)	10.24	2970	11280	5340	29	110	52	0.208	453	LS
10377.00	10377.00	10377 (3)	15.10	4220	18590	3090	28	123	20	0.185	456	LS
10378.00	10378.00	10378 (3)	10.87	3280	10820	2230	30	100	21	0.233	455	LS
10379.00	10379.00	10379 (3)	14.88	4270	18090	2100	29	122	14	0.191	453	LS
10380.00	10380.00	10380 (3)	13.20	3800	12380	2060	29	94	16	0.235	457	LS
10381.00	10381.00	10381 (3)	12.74	4130	13860	2530	32	109	20	0.230	453	LS
10382.00	10382.00	10382 (3)	12.38	3820	13250	2240	31	107	18	0.224	455	LS
10383.00	10383.00	10383 (3)	13.17	3970	15760	2430	30	120	18	0.201	456	LS
10884.00	10384.00	10634 (3)	14.77	4300	16110	2770	29	109	19	0.211	455	LS
10385.00	10385.00	10385 (3)	14.65	4090	16020	2650	28	109	18	0.203	456	LS
10386.00	10386.00	10386 (3)	15.27	5400	18780	2430	35	123	16	0.223	452	LS
10387.00	10387.00	10387 (3)	14.41	4190	16410	2460	29	114	17	0.203	454	LS
10388.00	10388.00	10388 (3)	12.72	3750	13470	2500	29	106	20	0.218	457	LS
10389.00	10389.00	10389 (3)	12.09	3630	13520	2150	30	112	18	0.212	456	LS
10390.00	10390.00	10390 (3)	13.64	4360	14720	2720	32	108	20	0.229	455	LS
10391.00	10391.00	10391 (3)	12.29	3480	13180	2120	28	107	17	0.209	457	LS
10392.00	10392.00	10392 (3)	11.79	3330	11160	2160	28	95	18	0.230	454	LS

11617

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10393.00	10393.00	10393 (3)	9.41	3210	9280	2260	34	99	24	0.257	452	LS
10394.00	10394.00	10394 (3)	9.52	4050	9500	2370	43	100	25	0.299	455	LS
10395.00	10395.00	10395 (3)	9.99	4060	10000	1610	41	100	16	0.289	455	LS
10396.00	10396.00	10396 (3)	9.31	3660	9730	1690	39	105	18	0.273	455	LS
10397.00	10397.00	10397 (3)	9.81	4220	10110	2550	43	103	26	0.294	455	LS
10398.00	10398.00	10398 (3)	9.90	3570	7960	1950	36	80	20	0.310	450	LS
10399.00	10399.00	10399 (3)	10.00	3820	10000	1590	38	100	16	0.276	454	LS
10400.00	10400.00	10400 (3)	12.21	3920	14200	2550	32	116	21	0.216	454	LS
10401.00	10401.00	10401 (3)	12.77	3790	17090	1380	30	134	11	0.182	455	LS
10402.00	10402.00	10402 (3)	6.64	2890	7400	760	44	111	11	0.281	450	LS
10403.00	10404.00	10403.5 (3)	3.96	2900	4090	390	73	103	10	0.415	444	LS
10404.00	10406.00	10405 (3)	0.51	210	560	460	41	110	90	0.273	421	3F

ROCK-EVAL PYROLYSIS FOR:
MERIDIAN MOI NO. 13-21
NDGS 12162 (file name 12162py.wk1)

NDGS	Top Depth	Base Depth	sample	TOC	Tmax C	S1 mg/g	S2 mg/g	S3 mg/g	HI	OI	Tr. Ratio
12162	10708.0	10708.0	126016-A	0.81	429	1.26	1.37	0.77	169	95	0.48
12162	10708.5	10708.5	126016-B	1.81	436	3.08	2.89	0.76	159	41	0.52
12162	10709.0	10709.0	126016-C	4.37	448	5.17	7.41	0.94	169	21	0.41
12162	10709.5	10709.5	126016-D	1.73	434	2.49	2.95	0.91	170	52	0.46
12162	10710.0	10710.0	126016-E	0.99	430	1.47	1.43	0.71	144	71	0.51
12162	10710.5	10710.5	126016-F	6.76	453	4.75	11.23	1.06	166	15	0.30
12162	10711.0	10711.0	126016-G	0.87	419	1.47	1.15	0.77	132	88	0.56
12162	10711.5	10711.5	126016-H	0.60	353	1.25	0.84	0.67	140	111	0.60
12162	10713.0	10713.0	126016-J	0.51	413	1.13	0.63	0.52	123	101	0.64
12162	10715.0	10715.0	126016-L	0.33	404	0.70	0.40	0.51	121	154	0.64
12162	10717.0	10717.0	126016-N	0.36	420	1.34	0.74	0.46	205	127	0.64
12162	10719.0	10719.0	126027-C	0.41	409	2.21	0.61	0.54	148	131	0.78
12162	10720.0	10720.0	126027-D	0.16	446	0.32	0.00	0.44	0	275	1.00
12162	10721.0	10721.0	126027-F	10.27	453	6.19	17.12	0.94	167	9	0.27
12162	10722.0	10722.0	126027-H	7.06	452	5.53	11.90	1.08	169	15	0.32
12162	10723.0	10723.0	126027-I	10.99	452	6.82	19.87	1.15	181	10	0.26
12162	10724.0	10724.0	126027-K	8.83	453	4.76	15.21	1.16	172	13	0.24
12162	10725.0	10725.0	126027-L	8.14	452	5.46	13.35	1.14	164	14	0.29
12162	10726.0	10726.0	126027-M	8.28	452	5.04	14.17	1.16	171	14	0.26
12162	10727.0	10727.0	126038-A	15.84	452	6.02	29.18	0.85	184	5	0.17
12162	10728.0	10728.0	126038-C	0.72	417	2.06	0.57	0.67	79	93	0.79
12162	10729.0	10729.0	126038-E	0.56	419	2.90	0.44	0.80	79	143	0.87
12162	10731.0	10731.0	126038-H	0.61	406	3.37	0.59	0.89	97	146	0.85
12162	10732.8	10732.8	126038-K	0.40	386	2.39	0.29	0.89	73	223	0.89
12162	10734.5	10734.5	126049-B	0.39	410	2.19	0.48	0.72	123	185	0.82
12162	10736.5	10736.5	126049-D	0.38	395	3.60	0.66	0.99	174	261	0.82

Table 16. ROCK EVAL data for the Meridian Oil Inc. MOI 13-21 (SESW Sec 21 T143N R101W; NDGS 12162). Electric log tops for NDGS 12162 are 10722' top of upper Bakken shale; 10728' top of middle Bakken siltstone; 10745' top of Three Forks Formation. In NDGS 12162: 12' of Lodgepole formation (including 2' of false Bakken); all (6') of upper Bakken shale; and 8.5' of siltstone were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
10708.00	10708.00	10708 (3)	0.81	1260	1370	770	156	169	95	0.479	429	FB
10708.50	10708.50	10708.5 (3)	1.81	3080	2890	760	170	160	42	0.516	436	FB
10709.00	10709.00	10709 (3)	4.37	5170	7410	940	118	170	22	0.411	448	FB
10709.50	10709.50	10709.5 (3)	1.73	2490	2950	910	144	171	53	0.458	434	FB
10710.00	10710.00	10710 (3)	0.99	1470	1430	710	148	144	72	0.507	430	FB
10710.50	10710.50	10710.5 (3)	6.76	4750	11230	1060	70	166	16	0.297	453	FB
10711.00	10711.00	10711 (3)	0.87	1470	1150	770	169	132	89	0.561	419	FB
10711.50	10711.50	10711.5 (3)	0.60	1250	840	670	208	140	112	0.598	353	LP
10713.00	10713.00	10713 (3)	0.51	1130	630	520	222	124	102	0.642	413	LP
10715.00	10715.00	10715 (3)	0.33	700	400	510	212	121	155	0.636	404	LP
10717.00	10717.00	10717 (3)	0.36	1340	740	460	372	206	128	0.644	420	LP
10719.00	10719.00	10719 (3)	0.41	2210	610	540	539	149	132	0.784	409	LP
10720.00	10720.00	10720 (3)	0.16	320	0	440	200	0	275	1.000	446	LP
10721.00	10721.00	10721 (3)	10.27	6190	17120	940	60	167	9	0.266	453	US
10722.00	10722.00	10722 (3)	7.06	5530	11900	1080	78	169	15	0.317	452	US
10723.00	10723.00	10723 (3)	10.99	6820	19870	1150	62	181	10	0.256	452	US
10724.00	10724.00	10724 (3)	8.83	4760	15210	1160	54	172	13	0.238	453	US
10725.00	10725.00	10725 (3)	8.14	5460	13350	1140	67	164	14	0.290	452	US
10726.00	10726.00	10726 (3)	8.28	5040	14170	1160	61	171	14	0.262	452	US
10727.00	10727.00	10727 (3)	15.84	6020	29180	850	38	184	5	0.171	452	US
10728.00	10728.00	10728 (3)	0.72	2060	570	670	286	79	93	0.783	417	SS
10729.00	10729.00	10729 (3)	0.56	2900	440	800	518	79	143	0.868	419	SS
10731.00	10731.00	10731 (3)	0.61	3370	590	890	552	97	146	0.851	406	SS
10732.75	10732.75	10732.75 (3)	0.40	2390	290	890	598	73	223	0.892	386	SS
10734.50	10734.50	10734.5 (3)	0.39	2190	480	720	562	123	185	0.820	410	SS
10736.50	10736.50	10736.5 (3)	0.38	3600	660	990	947	174	261	0.845	395	SS

Table 17. ROCK EVAL data for the Marathon Oil Co. Larado 26-1 (NESWNE Sec 26 T156N R91W; NDGS 12786). Electric log tops for NDGS 12786 are 9265' top of upper Bakken shale; 9273' top of middle Bakken siltstone; 9314' top of lower Bakken shale; 9350' top of Three Forks Formation. In NDGS 12786: all (8.5') of the Upper Bakken shale; all (44.5') of the siltstone, and 30' (of 36') of tthe lower Bakken shale were analyzed. See Table 1 caption for further explanation.

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9265.00	9265.00	9265 (3)	16.19	6180	84570	N/A	38	522	N/A	0.068	434	US
9266.00	9266.00	9266 (3)	13.70	5550	84160	N/A	41	614	N/A	0.062	435	US
9268.00	9268.00	9268 (3)	15.42	5520	76050	N/A	36	493	N/A	0.068	437	US
9269.00	9269.00	9269 (3)	13.29	5970	68960	N/A	45	519	N/A	0.080	439	US
9271.00	9271.00	9271 (3)	15.38	6660	87860	N/A	43	571	N/A	0.070	438	US
9272.00	9272.00	9272 (3)	17.65	7440	113670	N/A	42	644	N/A	0.061	436	US
9273.00	9273.00	9273 (3)	16.11	5640	90290	N/A	35	560	N/A	0.059	440	US
9273.50	9273.50	9273.5 (3)	14.32	5800	86170	N/A	41	602	N/A	0.063	436	US
9274.00	9274.00	9274.00	0.22	240	350	1780	109	159	809	0.410	297	SS
9274.60	9274.60	9274.60	0.47	1480	1000	590	315	213	126	0.600	299	SS
9275.00	9275.00	9275.00	0.46	810	1030	1130	176	224	246	0.440	388	SS
9275.60	9275.60	9275.60	0.36	420	470	580	117	131	161	0.480	348	SS
9276.00	9276.00	9276.00	0.28	550	460	940	196	164	336	0.550	312	SS
9276.60	9276.60	9276.60	0.32	260	470	360	81	147	113	0.360	348	SS
9277.00	9277.00	9277.00	0.44	1240	1030	1340	282	234	305	0.550	289	SS
9278.00	9278.00	9278.00	0.46	950	690	870	207	150	189	0.580	319	SS
9279.00	9279.00	9279.00	0.31	1080	980	780	348	316	252	0.520	296	SS
9280.00	9280.00	9280.00	0.61	1860	1850	700	305	303	115	0.500	313	SS
9281.00	9281.00	9281.00	0.70	1470	1450	1230	210	207	176	0.500	298	SS
9282.00	9282.00	9282.00	0.54	1640	1040	720	304	193	133	0.610	292	SS
9283.00	9283.00	9283.00	0.43	1240	1050	780	288	244	181	0.540	295	SS
9284.00	9284.00	9284.00	0.06	180	160	250	300	267	417	0.530	419	SS
9285.00	9285.00	9285.00	0.28	910	750	530	325	268	189	0.550	286	SS
9286.00	9286.00	9286.00	0.72	2750	2410	520	382	335	72	0.530	289	SS
9287.00	9287.00	9287.00	0.07	120	40	200	171	57	286	0.750	348	SS
9288.00	9288.00	9288.00	0.39	1090	1020	570	279	262	146	0.520	347	SS
9289.00	9289.00	9289.00	0.03	180	50	200	600	167	667	0.820	415	SS
9290.50	9290.50	9290.50	0.46	2160	1260	450	470	274	98	0.630	282	SS

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9291.00	9291.00	9291.00	0.11	150	120	270	136	109	245	0.580	416	SS
9292.00	9292.00	9292.00	0.05	70	40	140	140	80	280	0.700	498	SS
9293.00	9293.00	9293.00	0.02	60	50	150	300	250	750	0.600	455	SS
9294.00	9294.00	9294.00	0.03	40	50	210	133	167	700	0.500	418	SS
9295.60	9295.60	9295.60	0.14	660	460	600	471	329	429	0.590	313	SS
9296.00	9296.00	9296.00	0.35	1230	680	570	351	194	163	0.650	351	SS
9297.30	9297.30	9297.30	0.31	910	890	650	294	287	210	0.510	415	SS
9298.20	9298.20	9298.20	0.46	990	1020	640	215	222	139	0.490	417	SS
9299.00	9299.00	9299.00	0.06	50	40	190	83	67	317	0.620	421	SS
9300.00	9300.00	9300.00	0.57	2780	1920	740	488	337	130	0.590	293	SS
9301.00	9301.00	9301.00	0.52	2070	1810	730	398	348	140	0.530	289	SS
9302.00	9302.00	9302.00	0.20	560	280	600	280	140	300	0.670	287	SS
9303.00	9303.00	9303.00	0.23	820	810	680	357	352	296	0.510	294	SS
9304.00	9304.00	9304.00	0.17	760	540	660	447	318	388	0.580	290	SS
9305.00	9305.00	9305.00	0.75	1570	1320	790	209	176	105	0.550	293	SS
9306.00	9306.00	9306.00	0.24	630	850	600	263	354	250	0.430	348	SS
9307.00	9307.00	9307.00	0.09	60	40	390	67	44	433	0.600	507	SS
9308.00	9308.00	9308.00	0.14	570	430	550	407	307	393	0.570	289	SS
9309.00	9309.00	9309.00	0.34	1130	1190	720	332	350	212	0.490	292	SS
9310.00	9310.00	9310.00	0.15	150	200	880	100	133	587	0.440	512	SS
9311.00	9311.00	9311.00	0.30	840	1000	770	280	333	257	0.460	301	SS
9312.00	9312.00	9312.00	0.07	70	30	460	100	43	657	0.700	350	SS
9313.00	9313.00	9313.00	0.13	140	120	570	108	92	438	0.540	504	SS
9314.00	9314.00	9314.00	0.39	900	1080	870	231	277	223	0.450	298	SS
9315.00	9315.00	9315.00	0.29	540	740	760	186	255	262	0.420	297	SS
9316.00	9316.00	9316.00	0.29	370	490	990	128	169	341	0.430	346	SS
9316.50	9316.50	9316.50	0.19	10	70	970	5	37	511	0.120	446	SS
9317.00	9317.00	9317.00	0.14	30	150	710	21	107	507	0.170	587	SS
9317.50	9317.50	9317.50	0.12	10	80	850	8	67	708	0.120	477	SS
9318.00	9318.00	9318.00	0.11	10	80	510	9	73	464	0.120	497	SS
9318.50	9318.50	9318.50	0.20	0	110	1210	0	55	605	0.000	495	SS

12786

TOP	BOTTOM	AVG DEPTH	TOC	S1 PPM	S2 PPM	S3 PPM	S1 mg/GOC	S2 mg/GOC	S3 mg/GOC	TR	TMAX	UNIT
9319.00	9319.00	9319 (3)	7.09	2200	14670	N/A	31	207	N/A	0.130	440	LS
9320.00	9320.00	9320 (3)	15.41	5490	66590	N/A	36	432	N/A	0.076	440	LS
9321.00	9321.00	9321 (3)	12.72	4570	61520	N/A	36	484	N/A	0.069	438	LS
9323.00	9323.00	9323 (3)	16.37	5500	84490	N/A	34	516	N/A	0.061	439	LS
9325.00	9325.00	9325 (3)	13.92	4770	86720	N/A	34	623	N/A	0.052	440	LS
9326.00	9326.00	9326 (3)	9.80	4140	56170	N/A	42	573	N/A	0.069	444	LS
9327.00	9327.00	9327 (3)	13.11	4590	70340	N/A	35	537	N/A	0.061	441	LS
9328.50	9328.50	9328.5 (3)	13.28	5090	71270	N/A	38	537	N/A	0.067	440	LS
9329.00	9329.00	9329 (3)	11.44	4760	57380	N/A	42	502	N/A	0.077	438	LS
9330.00	9330.00	9330 (3)	10.93	4460	56170	N/A	41	514	N/A	0.074	440	LS
9331.00	9331.00	9331 (3)	11.45	4600	62100	N/A	40	542	N/A	0.069	440	LS
9332.00	9332.00	9332 (3)	13.00	5140	66610	N/A	40	512	N/A	0.072	439	LS
9333.00	9333.00	9333 (3)	12.45	4310	60000	N/A	35	482	N/A	0.067	441	LS
9334.00	9334.00	9334 (3)	10.23	3440	50000	N/A	34	489	N/A	0.064	442	LS
9335.00	9335.00	9335 (3)	10.35	3920	51510	N/A	38	498	N/A	0.071	441	LS
9337.00	9337.00	9337 (3)	12.57	4140	58900	N/A	33	469	N/A	0.066	441	LS
9338.00	9338.00	9338 (3)	9.38	3480	45110	N/A	37	481	N/A	0.072	441	LS
9339.00	9339.00	9339 (3)	8.41	3160	40370	N/A	38	480	N/A	0.073	442	LS
9340.00	9340.00	9340 (3)	13.73	4220	73210	N/A	31	533	N/A	0.055	438	LS
9341.00	9341.00	9341 (3)	14.90	4950	84350	N/A	33	566	N/A	0.055	437	LS
9342.00	9342.00	9342 (3)	11.52	4210	50130	N/A	37	435	N/A	0.077	437	LS
9344.00	9344.00	9344 (3)	18.31	7340	103130	N/A	40	563	N/A	0.066	438	LS
9345.00	9345.00	9345 (3)	15.20	6260	69090	N/A	41	455	N/A	0.083	439	LS
9346.00	9346.00	9346 (3)	10.47	4330	52350	N/A	41	500	N/A	0.076	442	LS
9347.00	9347.00	9347 (3)	18.20	7060	95710	N/A	39	526	N/A	0.069	435	LS
9348.00	9348.00	9348 (3)	18.25	5280	108590	N/A	29	595	N/A	0.046	434	LS
9349.00	9349.00	9349 (3)	17.76	5280	106030	N/A	30	597	N/A	0.047	435	LS

3098

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
0F	ND-M-2A OIL + SAND MIX DRILLING MUD DRILLING MUD SAMPLE #1 RECEIVED ~30 ML	WELL	ASIS	Y	MUD	603/GRNR	OS	5	0.02	0.06	0.02	0.10			53073	1	07-MAR-91		
0F	ND-M-3A OIL + SAND MIX DRILLING MUD DRILLING MUD SAMPLE #2 RECEIVED ~30 ML	WELL	ASIS	Y	MUD	603/GRNR	OS	5	0.01	0.03	0.02	0.06			53074	1	08-MAR-91		
10800F	ND-M-4A SAMPLE OF MUD FROM VERTICAL HOLE	MPT	ASIS	Y		351/LDGP	ASIS	5	0.00	0.01	0.01	0.02			53151	1	10-APR-91		
10888.58F	ND-S-1551A SH CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.03	0.09	0.04	0.16	495	1.06	53160	1	06-MAY-91		
10890.5F	ND-S-1552A SH CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.05	0.12	0.05	0.21	480	<1.05	53161	1	26-APR-91		
10893.58F	ND-S-1553A SH CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.10	0.12	0.07	0.29	480	<1.05	53162	1	26-APR-91		
10895.58F	ND-S-1554A SH CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.07	0.09	0.03	0.19	485	<1.05	53163	1	26-APR-91		
10897.5-10897F	ND-S-1555A SH CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.03	0.05	0.01	0.09	475	<1.05	53164	1	26-APR-91		
10899.5F	ND-S-1556A SH CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.02	0.01	0.01	0.04	490	<1.05	53165	1	26-APR-91		
10901.58F	ND-S-1557A SH CALC M DK BRN GRY PERM PLUG BUTTS NEW 7/24/91 TEC AND GLCR	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.19	0.20	0.08	0.47	480	<1.05	53166	1	26-APR-91		
10903.5F	ND-S-1558A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	351/LDGP	FROZ	5	0.04	0.03	0.01	0.08	470	<1.05	53167	1	26-APR-91		

Pyrolysis-FID/Total Organic Carbon Richness Report
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Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10905.2F	ND-S-1605A	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.18	0.36	1.43	1.98	500	1.12	53417	1	09-JUL-91	8.48	27-JUN-91
	SH CALC BLK																		
	SH CALC BLK CORE CHIPS																		
	CORE CHIPS																		
	NONROU=LOW TEM THERMAL EXTRACTION BY ELL																		
10905.2F	ND-S-1605X	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.00	0.03	1.15	1.18	500	1.12	53538	1	05-AUG-91		
	NEW 8/2/91 PFID ON SPL EXTRACTED W/TOLUENE																		
10905.2F	ND-S-1605X2	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.01	0.03	1.25	1.29	505	1.18	53564	1	20-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10905.2F	ND-S-1631A	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.18	0.38	1.43	1.99	500	1.12	53443	1	15-JUL-91	8.48	27-JUN-91
	SH CALC GRY BLK																		
	WAFERS																		
	NEW 7/24/91 TEC AND GLCR AND VRCP																		
10905.7F	ND-S-1606A	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.31	0.42	1.88	2.61	500	1.12	53418	1	09-JUL-91	10.76	27-JUN-91
	SH CALC BLK																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10905.7F	ND-S-1606X	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.00	0.03	1.63	1.67	500	1.12	53539	1	05-AUG-91		
	NEW 8/2/91 PFID ON SPL EXTRACTED W/TOLUENE																		
10905.7F	ND-S-1606X2	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.01	0.05	1.76	1.82	500	1.12	53565	1	20-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10905.7F	ND-S-1632A	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.24	0.40	1.95	2.58	495	1.06	53444	1	15-JUL-91	11.00	27-JUN-91
	SH CALC GRY BLK																		
	WAFERS																		
10906.3F	ND-S-1607A	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.20	0.41	1.45	2.06	500	1.12	53419	1	10-JUL-91	8.57	27-JUN-91
	SH CALC BLK																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10906.3F	ND-S-1607X	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.00	0.03	1.12	1.15	505	1.18	53540	1	05-AUG-91		
	NEW 8/2/91 PFID ON SPL EXTRACTED W/TOLUENE																		
10906.3F	ND-S-1607X2	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.00	0.02	0.81	0.83	500	1.12	53566	1	08-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10906.3F	ND-S-1633A	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.32	0.48	1.31	2.11	505	1.18	53445	1	15-JUL-91	7.95	27-JUN-91
	SH CALC GRY BLK																		
	WAFERS																		
10907.4F	ND-S-1608A	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.34	0.41	1.37	2.12	505	1.18	53420	1	10-JUL-91	8.07	27-JUN-91

Pyrolysis-FID/Total Organic Carbon Richness Report
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Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Start Prep	Temp.	-- WT% St-195	Hydrocarbon Yield --- 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
	SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10907.4F	ND-S-1608X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.00	0.04	1.15	1.18	500	1.12	53541	1	05-AUG-91		
10907.4F	ND-S-1608X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	351/LDGP	EXTR	5	0.01	0.04	1.09	1.14	500	1.12	53567	1	08-AUG-91		
10907.4F	ND-S-1634A SH CALC SANDY GRY BLK WAFERS	CO	ASIS	Y	SH	351/LDGP	FROZ	5	0.23	0.39	1.38	2.00	505	1.18	53446	1	15-JUL-91	8.40	27-JUN-91
10912F	ND-S-1529A SH BRN BLK TO BLK	CO	ASIS	Y	SH	351/LDGP												10.82	06-MAR-91
10912.1F	ND-S-1530A SH BRN BLK TO BLK	CO	ASIS	Y	SH	351/LDGP	PO	5	0.28	0.36	1.45	2.09	500	1.12	53065	1	07-MAR-91	8.21	06-MAR-91
10919F	ND-S-1531A SH BRN BLK TO BLK	CO	ASIS	Y	SH	319/BKKN	PO	5	0.46	0.60	2.19	3.25	500	1.12	53066	1	07-MAR-91	10.95	06-MAR-91
10919.4F	ND-S-1609A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.60	0.62	2.08	3.31	495	1.06	53421	1	10-JUL-91	10.98	27-JUN-91
10919.4F	ND-S-1609X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.06	1.69	1.75	495	1.06	53542	1	05-AUG-91		
10919.4F	ND-S-1609X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.03	1.74	1.78	500	1.12	53568	1	08-AUG-91		
10919.4F	ND-S-1635A SH CALC SANDY GRY BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.58	0.77	2.25	3.59	500	1.12	53447	1	15-JUL-91	10.88	27-JUN-91
10920.2F	ND-S-1610A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.57	0.68	2.26	3.51	495	1.06	53422	1	10-JUL-91	11.35	27-JUN-91
10920.2F	ND-S-1610X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.78	1.82	495	1.06	53543	1	05-AUG-91		
10920.2F	ND-S-1610X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.05	1.83	1.88	500	1.12	53569	1	08-AUG-91		

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API Number: 33053023570000
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sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10920.2F	ND-S-1636A SH CALC SANDY GRY BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.37	0.69	2.37	3.42	500	1.12	53448	1	15-JUL-91	11.10	27-JUN-91
10921.7F	ND-S-1611A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.45	0.58	2.36	3.39	495	1.06	53423	1	10-JUL-91	12.54	27-JUN-91
10921.7F	ND-S-1611X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.05	1.97	2.02	500	1.12	53544	1	05-AUG-91		
10921.7F	ND-S-1611X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.04	2.09	2.13	500	1.12	53570	1	09-AUG-91		
10921.7F	ND-S-1637A SH SLIGHTLY CALC GRY BLK WAFERS NEW 7/24/91 TEC AND GLCR AND VRCP	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.18	0.57	2.24	2.99	495	1.06	53449	1	15-JUL-91	11.72	27-JUN-91
10923.7F	ND-S-1612A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.59	0.47	1.34	2.40	500	1.12	53424	1	10-JUL-91	7.35	27-JUN-91
10923.7F	ND-S-1612X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.07	1.10	500	1.12	53545	1	05-AUG-91		
10923.7F	ND-S-1612X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.02	1.16	1.19	500	1.12	53571	1	09-AUG-91		
10923.7F	ND-S-1638A SH CALC DK BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.25	0.28	0.75	1.28	500	1.12	53450	1	15-JUL-91	7.41	27-JUN-91
10924F	ND-S-1532A SH BRN BLK TO BLK	CO	ASIS	Y	SH	319/BKKN	PO	5	0.47	0.54	1.82	2.84	500	1.12	53067	1	07-MAR-91	9.84	06-MAR-91
10926.3F	ND-S-1613A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.31	0.40	1.41	2.11	495	1.06	53425	1	10-JUL-91	8.27	27-JUN-91
10926.3F	ND-S-1613X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.22	1.24	495	1.06	53546	1	06-AUG-91		
10926.3F	ND-S-1613X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.03	1.37	1.41	495	1.06	53572	1	09-AUG-91		

Pyrolysis-FID/Total Organic Carbon Richness Report
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Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10926.3F	ND-S-1639A SH SLIGHTLY CALC GRY BLK WAFERS NEW 7/24/91 TEC AND GLCR AND VRCP	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.13	0.44	1.64	2.21	490	<1.05	53451	1	15-JUL-91	8.61	27-JUN-91
10927.5F	ND-S-1559A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.09	0.07	0.03	0.18	475	<1.05	53168	1	03-MAY-91		
10929.5F	ND-S-1560A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.08	0.07	0.01	0.16	470	<1.05	53169	1	29-APR-91		
10931.5F	ND-S-1561A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.13	0.10	0.02	0.25	465	<1.05	53170	1	29-APR-91		
10933.5F	ND-S-1562A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.07	0.07	0.01	0.15	465	<1.05	53171	1	29-APR-91		
10935.5F	ND-S-1563A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.01	0.00	0.00	0.01	725	3.93	53172	1	29-APR-91		
10937.5F	ND-S-1564A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS NEW 7/24/91 TEC AND GLCR	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.25	0.19	0.06	0.50	470	<1.05	53173	1	29-APR-91		
10939.5F	ND-S-1565A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.15	0.13	0.03	0.32	455	<1.05	53174	1	29-APR-91		
10941.5F	ND-S-1566A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.16	0.10	0.02	0.29	455	<1.05	53175	1	29-APR-91		
10943.5F	ND-S-1567A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.04	0.02	0.15	0.21	495	1.06	53176	1	30-APR-91		
10945.58F	ND-S-1568A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.10	0.11	0.01	0.22	470	<1.05	53177	1	30-APR-91		

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sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	-- WT% Hydrocarbon Yield --- St-195	200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10947.5F	ND-S-1569A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.12	0.10	0.04	0.27	475	<1.05	53178	1	30-APR-91		
10950.5F	ND-S-1570A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.08	0.08	0.02	0.18	460	<1.05	53179	1	30-APR-91		
10952.5F	ND-S-1571A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS NEW 7/24/91 TEC AND GLCR	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.12	0.11	0.03	0.25	460	<1.05	53180	1	30-APR-91		
10954.58F	ND-S-1572A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.08	0.06	0.01	0.15	460	<1.05	53181	1	30-APR-91		
10956.5F	ND-S-1573A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.12	0.11	0.02	0.26	470	<1.05	53182	1	30-APR-91		
10958.5F	ND-S-1574A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.08	0.07	0.01	0.16	475	<1.05	53183	1	30-APR-91		
10960.5F	ND-S-1575A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.08	0.05	0.01	0.14	470	<1.05	53184	1	01-MAY-91		
10962.5F	ND-S-1576A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.09	0.09	0.04	0.22	475	<1.05	53185	1	01-MAY-91		
10964.5F	ND-S-1577A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.10	0.09	0.02	0.22	465	<1.05	53186	1	01-MAY-91		
10966.5F	ND-S-1578A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.10	0.08	0.02	0.20	475	<1.05	53187	1	01-MAY-91		
10968.5F	ND-S-1579A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.09	0.09	0.03	0.20	470	<1.05	53188	1	01-MAY-91		
10970.3F	ND-S-1614A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.34	0.53	2.13	3.00	495	1.06	53426	1	10-JUL-91	12.74	27-JUN-91

Pyrolysis-FID/Total Organic Carbon Richness Report
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API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
	SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10970.3F	ND-S-1614X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.77	1.82	495	1.06	53547	1	06-AUG-91		
10970.3F	ND-S-1614X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.98	2.01	495	1.06	53573	1	09-AUG-91		
10970.3F	ND-S-1640A SH BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.22	0.45	1.88	2.55	490	<1.05	53452	1	23-JUL-91	11.51	27-JUN-91
10970.8F	ND-S-1615A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.33	0.60	2.34	3.27	495	1.06	53427	1	10-JUL-91	13.54	27-JUN-91
10970.8F	ND-S-1615X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.92	1.97	495	1.06	53548	1	06-AUG-91		
10970.8F	ND-S-1615X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.00	2.09	2.09	495	1.06	53574	1	13-AUG-91		
10970.8F	ND-S-1641A SH BRN BLK WAFERS NEW 7/24/91 TEC AND GLCR AND VRCP	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.33	1.46	8.58	10.36	495	1.06	53453	1	23-JUL-91	14.35	27-JUN-91
10971.6F	ND-S-1616A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.28	0.53	2.47	3.27	490	<1.05	53428	1	10-JUL-91	13.25	27-JUN-91
10971.6F	ND-S-1616X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.91	1.96	495	1.06	53549	1	06-AUG-91		
10971.6F	ND-S-1616X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.01	2.10	2.12	500	1.12	53575	1	13-AUG-91		
10971.6F	ND-S-1642A SH BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.18	0.55	2.54	3.27	490	<1.05	53454	1	16-JUL-91	12.66	27-JUN-91
10972.6F	ND-S-1617A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.24	0.35	2.32	2.91	495	1.06	53429	1	11-JUL-91	9.84	27-JUN-91

Pyrolysis-FID/Total Organic Carbon Richness Report
Fri Feb 28 16:43:11 1992

Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% Hydrocarbon Yield --- St-195	200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10972.6F	ND-S-1617X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.72	1.77	500	1.12	53550	1	06-AUG-91		
10972.6F	ND-S-1617X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.01	1.94	1.95	500	1.12	53576	1	13-AUG-91		
10972.6F	ND-S-1643A SH BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.33	0.57	2.31	3.20	495	1.06	53455	1	16-JUL-91	12.23	27-JUN-91
10974F	ND-S-1533A SH BRN BLK TO BLK	CO	ASIS	Y	SH	319/BKKN	PO	5	0.40	0.48	1.70	2.58	495	1.06	53068	1	08-MAR-91	9.68	06-MAR-91
10974.1F	ND-S-1534A SH BRN BLK TO BLK	CO	ASIS	Y	SH	319/BKKN	PO	5	0.46	0.51	1.77	2.73	500	1.12	53069	1	08-MAR-91	10.00	06-MAR-91
10974.8F	ND-S-1618A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.34	0.48	1.92	2.74	495	1.06	53430	1	11-JUL-91	11.00	27-JUN-91
10974.8F	ND-S-1618X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.57	1.61	500	1.12	53551	1	06-AUG-91		
10974.8F	ND-S-1618X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.00	1.71	1.71	505	1.18	53577	1	13-AUG-91		
10974.8F	ND-S-1644A SH BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.28	0.52	1.94	2.75	500	1.12	53456	1	16-JUL-91	10.87	27-JUN-91
10976.4F	ND-S-1619A SH CALC BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.35	0.57	2.26	3.18	495	1.06	53431	1	11-JUL-91	11.87	27-JUN-91
10976.4F	ND-S-1619X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.79	1.83	500	1.12	53552	1	06-AUG-91		
10976.4F	ND-S-1619X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.03	2.01	2.05	505	1.18	53578	1	14-AUG-91		
10976.4F	ND-S-1645A SH BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.24	0.56	2.86	3.66	495	1.06	53457	1	16-JUL-91	13.59	27-JUN-91
10978.5F	ND-S-1620A SH CALC BLK	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.22	0.55	2.22	2.99	500	1.12	53432	1	11-JUL-91	11.42	27-JUN-91

Pyrolysis-FID/Total Organic Carbon Richness Report
Fri Feb 28 16:43:11 1992

Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% Hydrocarbon Yield St-195	200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10978.5F	ND-S-1620X	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.76	1.80	500	1.12	53553	1	06-AUG-91		
	NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE																		
10978.5F	ND-S-1620X2	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.04	1.97	2.03	505	1.18	53579	1	14-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10978.5F	ND-S-1646A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.19	0.58	2.44	3.22	495	1.06	53458	1	16-JUL-91	11.81	27-JUN-91
	SH BRN BLK																		
	WAFERS																		
10984F	ND-S-1535A	CO	ASIS	Y	SH	319/BKKN	PO	5	0.44	0.55	1.79	2.78	500	1.12	53070	1	08-MAR-91	10.23	06-MAR-91
	SH BRN BLK TO BLK																		
10985F	ND-S-1536A	CO	ASIS	Y	SH	319/BKKN	PO	5	0.29	0.43	1.59	2.31	500	1.12	53071	1	08-MAR-91	9.23	06-MAR-91
	SH BRN BLK TO BLK																		
10985.15F	ND-S-1621A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.33	0.41	1.32	2.06	500	1.12	53433	1	11-JUL-91	7.05	27-JUN-91
	SH CALC BLK																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10985.15F	ND-S-1621X	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.02	0.94	0.97	500	1.12	53554	1	06-AUG-91		
	NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE																		
10985.15F	ND-S-1621X2	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.02	1.08	1.11	505	1.18	53580	1	14-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10985.15F	ND-S-1647A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.11	0.49	1.66	2.26	495	1.06	53459	1	16-JUL-91	7.91	27-JUN-91
	SH BRN BLK																		
	WAFERS																		
10985.6F	ND-S-1622A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.43	0.59	2.11	3.13	500	1.12	53434	1	11-JUL-91	10.89	27-JUN-91
	SH CALC BLK																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10985.6F	ND-S-1622X	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.62	1.65	500	1.12	53555	1	06-AUG-91		
	NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE																		
10985.6F	ND-S-1622X2	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.93	1.96	510	1.24	53581	1	14-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10985.6F	ND-S-1648A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.29	0.47	1.76	2.52	495	1.06	53460	1	23-JUL-91	10.65	27-JUN-91
	SH BRN BLK																		
	WAFERS																		

Pyrolysis-FID/Total Organic Carbon Richness Report
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Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10986.25F	ND-S-1623A CALC BRN BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.28	0.60	2.27	3.16	495	1.06	53435	1	11-JUL-91	12.76	27-JUN-91
10986.25F	ND-S-1623X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.77	1.80	495	1.06	53556	1	06-AUG-91		
10986.25F	ND-S-1623X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.04	1.95	1.99	500	1.12	53582	1	20-AUG-91		
10986.25F	ND-S-1649A SH BRN BLK WAFERS NEW 7/24/91 TEC AND GLCR AND VRCP	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.25	0.50	1.64	2.38	495	1.06	53461	1	23-JUL-91	12.11	27-JUN-91
10986.7F	ND-S-1624A SH CALC BRN BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.27	0.49	2.26	3.02	500	1.12	53436	1	11-JUL-91	12.36	27-JUN-91
10986.7F	ND-S-1624X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.04	1.81	1.86	500	1.12	53557	1	06-AUG-91		
10986.7F	ND-S-1624X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.99	2.03	500	1.12	53583	1	20-AUG-91		
10986.7F	ND-S-1650A SH BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.31	0.64	2.69	3.63	495	1.06	53462	1	16-JUL-91	13.19	27-JUN-91
10988.6F	ND-S-1625A SH SANDY CALC BRN BLK CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.26	0.43	1.85	2.54	495	1.06	53437	1	11-JUL-91	9.53	27-JUN-91
10988.6F	ND-S-1625X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.03	1.64	1.67	500	1.12	53558	1	19-AUG-91		
10988.6F	ND-S-1625X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.04	1.91	1.96	505	1.18	53584	1	20-AUG-91		
10988.6F	ND-S-1651A SH BRN BLK WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.20	0.53	2.35	3.08	500	1.12	53463	1	17-JUL-91	11.53	27-JUN-91
10990F	ND-S-1537A SH BRN BLK TO BLK	CO	ASIS	Y	SH	319/BKKN	PO	5	0.41	0.48	2.26	3.14	495	1.06	53072	1	08-MAR-91	12.38	06-MAR-91

Pyrolysis-FID/Total Organic Carbon Richness Report
Fri Feb 28 16:43:11 1992

Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10991.2F	ND-S-1626A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.30	0.50	1.66	2.46	500	1.12	53438	1	11-JUL-91	9.66	27-JUN-91
	SH SANDY CALC BRN BLK																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10991.2F	ND-S-1626X	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.03	1.30	1.34	505	1.18	53559	1	19-AUG-91		
	NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE																		
10991.2F	ND-S-1626X2	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.03	1.50	1.53	505	1.18	53585	1	20-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10991.2F	ND-S-1652A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.35	0.62	1.86	2.82	495	1.06	53464	1	17-JUL-91	9.67	27-JUN-91
	SH BLK																		
	WAFERS																		
10992F	ND-S-1627A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.26	0.61	2.94	3.82	495	1.06	53439	1	11-JUL-91	15.13	27-JUN-91
	SH SANDY CALC BRN BLK																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10992F	ND-S-1627X	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.02	0.04	2.24	2.31	500	1.12	53560	1	19-AUG-91		
	NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE																		
10992F	ND-S-1627X2	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.06	2.49	2.56	500	1.12	53586	1	20-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10992F	ND-S-1653A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.37	0.75	2.74	3.87	495	1.06	53465	1	17-JUL-91	13.47	27-JUN-91
	SH BLK																		
	WAFERS																		
	NEW 7/24/91 TEC AND GLCR AND VRCP																		
10992.7F	ND-S-1628A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.12	0.36	2.01	2.50	495	1.06	53440	1	11-JUL-91	11.31	27-JUN-91
	SH SANDY CALC BRN BLK																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		
10992.7F	ND-S-1628X	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.02	0.04	1.37	1.42	505	1.18	53561	1	19-AUG-91		
	NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE																		
10992.7F	ND-S-1628X2	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.01	0.04	1.63	1.67	500	1.12	53587	1	21-AUG-91		
	EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE																		
10992.7F	ND-S-1654A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.18	0.47	1.96	2.61	495	1.06	53466	1	17-JUL-91	10.21	27-JUN-91
	SH BLK																		
	WAFERS																		
10992.9F	ND-S-1629A	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.16	0.12	0.05	0.33	495	1.06	53441	1	15-JUL-91	1.64	27-JUN-91
	SH SANDY CALC BRN GRY																		
	CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL																		

Pyrolysis-FID/Total Organic Carbon Richness Report
Fri Feb 28 16:43:11 1992

Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	-- WT% St-195	Hydrocarbon Yield --- 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
10992.9F	ND-S-1629X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.01	0.02	0.03	500	1.12	53562	1	20-AUG-91		
10992.9F	ND-S-1629X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.00	0.03	0.03	500	1.12	53588	1	21-AUG-91		
10992.9F	ND-S-1655A SH BRN GRY WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.18	0.18	0.12	0.48	490	<1.05	53467	1	17-JUL-91	1.53	27-JUN-91
10993.65F	ND-S-1630A SH SANDY CALC BRN GRY CORE CHIPS NONEROU=LOW TEMP THERMAL EXTRACTION BY ELL	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.15	0.08	0.01	0.23			53442	1	15-JUL-91	0.56	27-JUN-91
10993.65F	ND-S-1630X NEW 8/2/91 PFID ON SAMPLE EXTRACTED W/TOLUENE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.00	0.01	0.01	490	<1.05	53563	1	20-AUG-91		
10993.65F	ND-S-1630X2 EXTRACTED W/METHANOL FOR 24 HOURS AND THEN CYCLOHEXANE	CO	EXTR	N	SH	319/BKKN	EXTR	5	0.00	0.00	0.01	0.01	505	1.18	53589	1	21-AUG-91		
10993.65F	ND-S-1656A SH BRN GRY WAFERS	CO	ASIS	Y	SH	319/BKKN	FROZ	5	0.19	0.14	0.03	0.36			53468	1	17-JUL-91	0.55	27-JUN-91
10994.5F	ND-S-1580A SH SANDY CALC M DK BRN GRY PERM PLUG BUTTS NEW 7/24/91 TEC AND GLCR AND VRCP	CO	FROZ	Y	SH	319/BKKN	FROZ	5	0.15	0.08	0.01	0.24	405	<1.05	53189	1	01-MAY-91		
10996.5F	ND-S-1581A SS GRY PERM PLUG BUTTS	CO	FROZ	Y	SS	319/BKKN	FROZ	5	0.17	0.11	0.01	0.29	470	<1.05	53190	1	03-MAY-91		
10998.5F	ND-S-1582A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	319/BKKN	FROZ	5	0.24	0.22	0.03	0.49	470	<1.05	53191	1	01-MAY-91		
11000.5F	ND-S-1583A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	319/BKKN	FROZ	5	0.04	0.05	0.05	0.14	490	<1.05	53192	1	02-MAY-91		
11002.5F	ND-S-1584A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	319/BKKN	FROZ	5	0.09	0.09	0.01	0.18			53193	1	02-MAY-91		
11004.5F	ND-S-1585A	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.07	0.07	0.01	0.15	460	<1.05	53194	1	02-MAY-91		

Pyrolysis-FID/Total Organic Carbon Richness Report
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Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	WT% St-195	Hydrocarbon Yield 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
	SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS																		
11006.5F	ND-S-1586A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.02	0.03	0.01	0.06	470	<1.05	53195	1	02-MAY-91		
11008.42F	ND-S-1587A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.04	0.05	0.01	0.10			53196	1	02-MAY-91		
11010.5F	ND-S-1588A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.09	0.08	0.01	0.18			53197	1	02-MAY-91		
11012.5F	ND-S-1589A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.10	0.12	0.02	0.25	470	<1.05	53198	1	02-MAY-91		
11014.25F	ND-S-1590A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.11	0.09	1.50	1.70	490	<1.05	53199	1	02-MAY-91		
11016.5F	ND-S-1591A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.06	0.06	0.01	0.14	745	4.18	53200	1	02-MAY-91		
11018.5F	ND-S-1592A SS BLUE GRY SLST BLUISH TRACES OF PYRITE PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.10	0.14	0.03	0.28	475	<1.05	53201	1	02-MAY-91		
11020.5F	ND-S-1593A SS LT BRN GRY TRACES OF PYRITE OF PYRITE PERM PLUG BUTTS NEW 7/24/91 TEC AND GLCR	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.12	0.08	0.01	0.21			53202	1	06-MAY-91		
11022.5F	ND-S-1594A SS BLUE GRY AND BLUISH PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.02	0.02	0.01	0.05			53203	1	06-MAY-91		
11024.5F	ND-S-1595A SS LT BRN GRY; SLST BLUISH PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.01	0.01	0.00	0.01			53204	1	06-MAY-91		
11026.5F	ND-S-1596A SS BRN TO BRN GRY	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.03	0.02	0.00	0.06			53205	1	06-MAY-91		

Pyrolysis-FID/Total Organic Carbon Richness Report
Fri Feb 28 16:43:11 1992

Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	Start Temp.	-- WT% St-195	Hydrocarbon Yield --- 200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC	Date of Analysis
	PERM PLUG BUTTS																		
11028.5F	ND-S-1597A SS BRN TO BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.04	0.04	0.01	0.08			53206	1	06-MAY-91		
11030.5F	ND-S-1598A SS DK GRY;SLST LT BRN BLUISH PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.04	0.03	0.00	0.07			53207	1	06-MAY-91		
11032.5F	ND-S-1599A SLST BLUISH GRY PERM PLUG BUTTS	CO	FROZ	Y	SLST	306/TRFK	FROZ	5	0.00	0.00	0.00	0.01			53208	1	07-MAY-91		
11034.58F	ND-S-1600A SS DK GRY PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.00	0.00	0.00	0.00			53209	1	09-MAY-91		
11036.5F	ND-S-1601A SS BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.09	0.03	0.00	0.13			53210	1	09-MAY-91		
11038.5F	ND-S-1602A SS BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SS	306/TRFK	FROZ	5	0.00	0.00	0.01	0.01			53211	1	09-MAY-91		
11042.5F	ND-S-1603A SH SANDY BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	306/TRFK	FROZ	5	0.00	0.00	0.01	0.01			53212	1	09-MAY-91		
11044.58F	ND-S-1604A SH SANDY BRN GRY PERM PLUG BUTTS	CO	FROZ	Y	SH	306/TRFK	FROZ	5	0.00	0.00	0.00	0.01			53213	1	09-MAY-91		
11540F	ND-M-5A SAMPLE OF OIL BASE MUD FROM HORIZONTAL HOLE;NONROU=FLASH PT FLASH POINT=150 DEG F (PENSKY MATER CLOSED CUP METHOD:ASTM D-93) HORIZONTALLY MEASURED DEPTH	MPT	ASIS	Y		319/BKKN	ASIS	5	21.35	17.83	2.42	41.60	460	<1.05	53152	1	10-APR-91		

STANDARD COMMENTS REGARDING P-FID

Fid peak temperature is not our most reliable indicator of maturity. Other methods (especially VR) should be used to confirm the VRE if at all possible. The most reliable range for P-FID is VRE of 1-2%. Below a VRE of 1% the calibration is not useable and above a VRE of 2% the yields are often so low that the maturity indicated may be in considerable error. Salts and minerals when present interfere with the pyrolysis peak and may produce an unreliable VRE determination by P-FID. Hydrocarbon yields in the >600 deg C temperature range may be associated with salt and/or heavy minerals incorporated into the sample, or with a mainly humic rock. The d/p ratios (0-300 deg C / 350-750 deg C) reported on the P-FID pyrogram may be questionable if the total hydrocarbon yield of the sample is < 0.05 wt%.

---------- ORIGIN ----------

ADD = Additive
ARTI = Artificial
BLLN = Blooey Line
CO = Core
DST = Drill Stem Test
FIT = Formation interval test
FLLN = Flowline
HEAD = Wellhead
JB = Junk Basket
MFT = Mud Filtrate
MGAS = Mud gas
MI = Mine
MPT = Mudpit
MS = Quarry
OB = Ocean Bottom
OT = Outcrop
PD = Picked Ditch
RFT = Repeat formation test
SEEP = Seep Sample
SEPR = Separator
SW = Sidewall
TANK = Tank Farm
UD = Unpicked Ditch
WELL = sampling location at well not known

---------- SAMPLE PREP ----------

ADSB = Adsorted Organics
ASIS = As Received
CENT = Centrifuged
COMB = Combined/Composited
DIAL = Dialyzed
DISA = Disaggregation-heated at 345 deg C for 3 wks
EXPT = Experimental (Artificial samples with prep undefined)
EXTC = Extracted in GCS w/chlorothene
EXTH = Extracted in analytical w/cyclo-hexane
EXTR = Extracted in analytical with chloroform-methanol
FDRY = Freeze Dried
FROZ = Frozen
HEAT = Heated
HLS = Heavy Liquid Separation
LCHD = Leached
ODRY = Oven Dried
OGAS = Oil gas ratio (PFID)
PYRO = Pyrolyzed
SIMU = simulation
WASH = Washed with Solvent

---------- FID PREP ----------

ASIS = As Received
CG = Coarse Grained
CHIP = 1 Chip (not powdered)
DIAL = Dialyzed
EXTC = Extracted w-chlorothene
FROZ = Frozen
OG = Oil gas ratio
OS = Oil and sand mix
PO = Powdered

---------- QUALITY ----------

Y = Yes, sample is appropriate for well interpretation.
N = No, sample is not appropriate for well interpretation.

Maturity/VKA (Reflectance) Report
Fri Feb 28 16:43:11 1992

Requestor: ln smith

API Number: 33053023570000
operator: ORYX-SWEPI lease: STENEHJEM well: 27-1HD
sec. 27, twp. 150N, rge. 97W

					VISUAL KEROGEN ANALYSIS																	REFLECTANCE					
Depth/Outcrop Id	Smpl Type	Smpl Lith	Geologic Age/Fm	Prep	B	A	KA	KM	KI	KU	KO	R	L	H	VS	V	VR	G	IN	K	ADD	CAV	Num Mac	Ro Obs	S	Conf Mean	Lim.	Plug Date
10905.2F	CO	SH	351/LDGP	CP	3				91							2			4				V	19	X	1.39	0.11	06-AUG-91
																							V	11	A	1.24	0.08	
																							B	19	X	0.95	0.09	
																							B*	19	X	1.40	0.09	
																							B	15	A	1.03	0.04	
																							B*	15	A	1.47	0.04	
10921.7F	CO	SH	319/BKKN	CP	5				90							2			3				V	20	X	1.37	0.10	06-AUG-91
																							V	18	A	1.32	0.07	
																							B	54	X	0.96	0.03	
																							B*	54	X	1.41	0.03	
																							B	45	A	0.97	0.02	
																							B*	45	A	1.42	0.02	
10926.3F	CO	SH	319/BKKN	CP	3	<1			92							2			3				V	12	X	1.44	0.13	06-AUG-91
																							V	9	A	1.46	0.08	
																							B	31	X	0.98	0.04	
																							B*	31	X	1.43	0.04	
																							B	24	A	1.02	0.03	
																							B*	24	A	1.47	0.03	
																							A	1	X	0.99		
																							A*	1	X	1.44		
10970.8F	CO	SH	319/BKKN	CP	3				94							1			2				V	9	X	1.39	0.14	06-AUG-91
																							B	23	X	1.01	0.06	
																							B*	23	X	1.45	0.06	
																							B	19	A	1.06	0.03	
																							B*	19	A	1.50	0.03	
10986.25F	CO	SH	319/BKKN	CP	3				94							1			2				V	9	X	1.41	0.15	06-AUG-91
																							B	29	X	0.95	0.05	
																							B*	29	X	1.40	0.05	
																							B	18	A	1.00	0.03	
																							B*	18	A	1.45	0.03	
10992F	CO	SH	319/BKKN	CP	5				90							2			3				V	20	X	1.41	0.09	06-AUG-91
																							V	17	A	1.40	0.07	
																							B	53	X	1.00	0.03	
																							B*	53	X	1.45	0.03	
																							B	47	A	1.03	0.03	
																							B*	47	A	1.47	0.03	

SAMPLE TYPE (Smpl Type)

CO = Core
JB = Junk Basket
MI = Mine
MS = Quarry
OB = Ocean Bottom
OT = Outcrop
PD = Picked Ditch
SW = Sidewall
UD = Unpicked Ditch
X = Extracted

PREPARATION TYPES (Prep)

Preparation methods for reflected light analysis include the following:

1) Rock Mount (RM) - a piece of whole rock mounted perpendicular to bedding
2) Crushed Pellet or Coal Pellet (CP) - crushed pieces of rock or coal
3) Rock Pellet (RP) - randomly oriented pieces of uncrushed or slightly crushed rock
4) Kerogen Concentrate (KC) - the HF/HCl insoluble portion of a rock sample; organic matter is concentrated relative to the whole rock

All four sample types are mounted (or mixed) with epoxy and polished.

MACERAL KEY

A = Alginite
AD = Additive
B = Solid Hydrocarbons
CV = Caved Material
G = Graptolites
H = Huminite
IN = Inertinite
K = Coked Material
KA = Amorphous Structureless Organic Matter
KI = Micrinized Structureless Organic Matter
KM = Massive Structureless Organic Matter
KO = Oxidized Structureless Organic Matter
KU = Undifferentiated Structureless Organic Matter
L = Liptinite
R = Resinite
V = Vitrinite
VR = Oxidized, Reworked Vitrinite
VS = Saprovitrinite

REFLECTANCE COLUMN ABBREVIATIONS

Mac = Code of measured maceral
Num Obs = Number of observations
S = Split code (X = Whole population, A = selected population)
Ro Mean = Mean random reflectance in oil
Conf Lim = 95\023onfidence limit (reported only for Num Obs > 4)

STANDARD COMMENTS REGARDING REFLECTED LIGHT ANALYSIS

Visual Kerogen Analysis

A visual kerogen analysis is an estimate of the maceral composition, expressed as a percentage, of the visually identifiable organic matter in a sample. The visual kerogen analysis describes kerogen type, but not sample richness.

Sample preparation affects visual kerogen analysis. Small, hydrogen-rich macerals such as alginite, sporinite, resinite, and cutinite may be visible in a whole rock preparation, but be washed away during preparation of a kerogen concentrate. However, SOM, which is often dispersed throughout the rock, may be difficult to see and therefore grossly underestimated in whole rock preparations. The best VKA estimates are made when both a whole rock preparation and a kerogen concentrate have been prepared from the same sample (most often core or outcrop).

Liptinite attains a reflectance similar to that of vitrinite at about VRE 1.2-1.5% and can no longer be distinguished from vitrinite.

Saprovitrinite is fluorescing vitrinite which usually has a lower reflectance than that of non-fluorescing vitrinite.

Reflectance Analysis

The standard measure of maturity is vitrinite reflectance. Other measures of maturity are calibrated to vitrinite reflectance and expressed in terms of Vitrinite Reflectance Equivalent (VRE). The symbol '*' following a maceral type indicates an alternate maturity measurement was used. The reflectance value reported for the maceral with the '*' is the VRE.

The Vitrinite Reflectance Equivalent (VRE) reported for sporinite is based upon the tentative calibration for liptinite macerals established by Greg C. Smith and Alan C. Cook in their report entitled Coalification Paths of Extinite, Vitrinite, and Inertinite in Fuel, Sept. 1980 Vol. 59 p.644.

Where two or more mean reflectance values are presented for a particular maceral, the 'A' mean refers to the selected population of reflectance values and the 'X' group includes all of the reflectance values measured on this maceral in the sample.

The mean reflectance values for macerals with fewer than ten (10) observations are reported for information only. They are not considered to be statistically valid measures of maturity.

SHELL DEVELOPMENT COMPANY
PETROPHYSICAL SERVICES SECTION
SPONGE CORE ANALYSIS DATA

DATE : May 6, 1991
COMPANY : Shell Western E&P Inc.
LEASE : Stenehjem
FIELD : Williston Basin
WELL NO : 27-1
API NO : 33-053-02357-0000
STATE : McKenzie County, North Dakota

Comments: Oil volume determined by NMR analysis. In remarks column, numbers are percent (+) increase or (-) decrease in amount of sponge present.

Core No.	Sample No.	Depth ft	in	Oil Volume cc	Length in.	Remarks
7-1	120	10985	0.0	>.01%	12.0	
7-1	121	10986	0.0	>.01%	12.0	
7-1	122	10987	0.0	>.01%	12.0	
7-1	123	10988	0.0	>.01%	12.0	
7-2	124	10989	0.0	>.01%	12.0	
7-2	125	10990	0.0	>.01%	12.0	
7-2	126	10991	0.0	>.01%	12.0	
7-2	127	10992	0.0	>.01%	12.0	
7-2	128	10993	0.0	0.41	12.0	→ 10993.8' Top Trks
7-3	129	10994	0.0	4.10	12.0	
7-3	130	10995	0.0	5.65	12.0	
7-3	131	10996	0.0	2.97	12.0	
7-3	132	10997	0.0	1.94	12.0	
7-3	133	10998	0.0	2.77	12.0	
7-4	134	10999	0.0	1.93	12.0	
7-4	135	11000	0.0	1.76	12.0	
7-4	136	11001	0.0	2.41	12.0	
7-4	137	11002	0.0	2.26	12.0	
7-4	138	11003	0.0	2.43	12.0	
7-5	139	11004	0.0	2.15	12.0	
7-5	140	11005	0.0	1.73	12.0	
7-5	141	11006	0.0	2.53	12.0	
7-5	142	11007	0.0	2.41	12.0	
7-5	143	11008	0.0	2.22	12.0	
7-6	144	11009	0.0	4.02	12.0	
7-6	145	11010	0.0	3.81	12.0	
7-6	146	11011	0.0	2.32	12.0	
7-6	147	11012	0.0	1.39	12.0	
7-6	148	11013	0.0	3.07	12.0	

Pyrolysis-FID Report
Run on 13-Mar-91 at 07:36:04 AM

Requestor: SMITH

API Number: 33053023570000
Operator: ORYX-SWEPI Lease: STENEHJEM Well: 27-1HD
Sec. 27, Twp. 150N, Rge. 97W

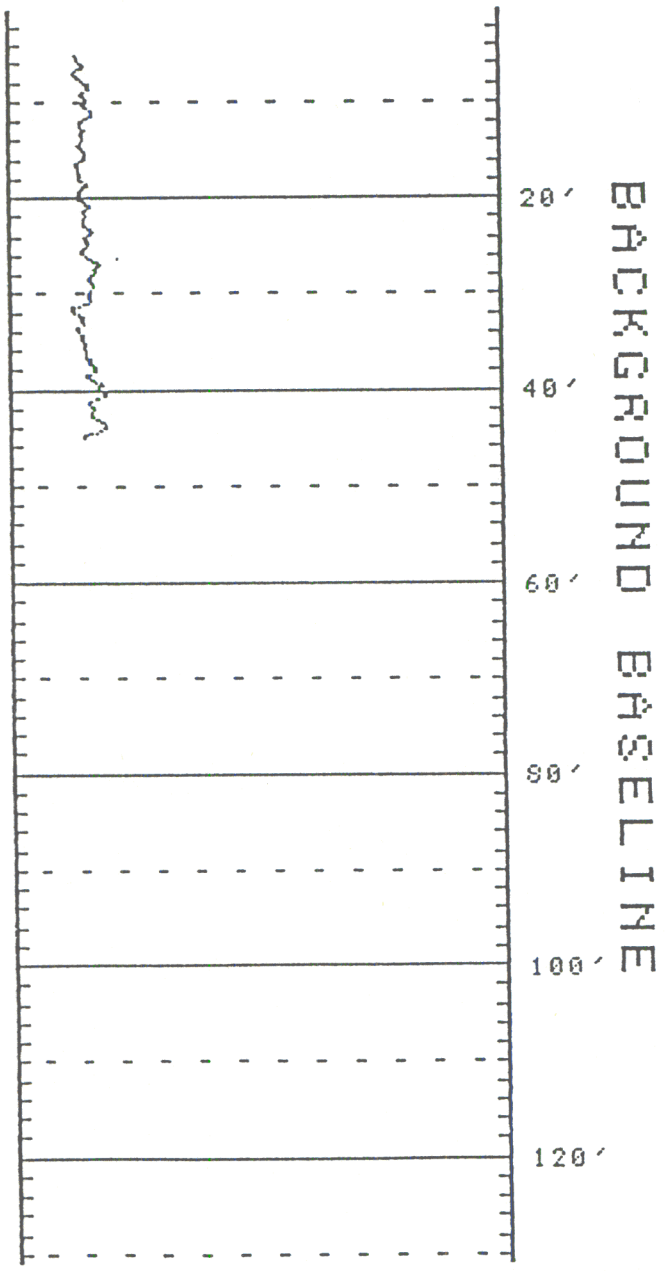
Depth/Outcrop Id	SAM Number	Smpl Type	Smpl Prep	Smpl Qual	Smpl Lith	Geologic Age/Fm	PFID Prep	PFID Start Temp.	WT% Hydrocarbon Yield St-195	200-395	400+	Total	Peak Temp	Est. VRE	PFID Number	Run	Date of Analysis	TOC
10912.1F	ND-S-1530A SH BRN BLK TO BLK	CO	ASIS	Y	SH	UBKKN	PO	5	0.28	0.36	1.45	2.09	500	1.12	53065	1	07-MAR-91	8.21
10919F	ND-S-1531A SH BRN BLK TO BLK	CO	ASIS	Y	SH	UBKKN	PO	5	0.46	0.60	2.19	3.25	500	1.12	53066	1	07-MAR-91	10.95
10924F	ND-S-1532A SH BRN BLK TO BLK	CO	ASIS	Y	SH	UBKKN	PO	5	0.47	0.54	1.82	2.84	500	1.12	53067	1	07-MAR-91	9.84
10974F	ND-S-1533A SH BRN BLK TO BLK	CO	ASIS	Y	SH	LBKKN	PO	5	0.40	0.48	1.70	2.58	495	1.06	53068	1	08-MAR-91	9.68
10974.1F	ND-S-1534A SH BRN BLK TO BLK	CO	ASIS	Y	SH	LBKKN	PO	5	0.46	0.51	1.77	2.73	500	1.12	53069	1	08-MAR-91	10.00
10984F	ND-S-1535A SH BRN BLK TO BLK	CO	ASIS	Y	SH	LBKKN	PO	5	0.44	0.55	1.79	2.78	500	1.12	53070	1	08-MAR-91	10.23
10985F	ND-S-1536A SH BRN BLK TO BLK	CO	ASIS	Y	SH	LBKKN	PO	5	0.30	0.43	1.59	2.31	500	1.12	53071	1	08-MAR-91	9.23
10990F	ND-S-1537A SH BRN BLK TO BLK	CO	ASIS	Y	SH	LBKKN	PO	5	0.41	0.48	2.26	3.14	495	1.06	53072	1	08-MAR-91	12.38

Pyrolysis-FID Report
Run on 13-Mar-91 at 07:36:04 AM

Requestor: SMITH

API Number: 33053023570000
Operator: ORYX-SWEPI Lease: STENEHJEM Well: 27-1HD
Sec. 27, Twp. 150N, Rge. 97W

Depth/Outcrop Id	SAM Number	PFID Number	Run	Sample Comments/Remarks
10912.1F	ND-S-1530A	53065	1	SH BRN BLK TO BLK
10919F	ND-S-1531A	53066	1	SH BRN BLK TO BLK
10924F	ND-S-1532A	53067	1	SH BRN BLK TO BLK
10974F	ND-S-1533A	53068	1	SH BRN BLK TO BLK
10974.1F	ND-S-1534A	53069	1	SH BRN BLK TO BLK
10984F	ND-S-1535A	53070	1	SH BRN BLK TO BLK
10985F	ND-S-1536A	53071	1	SH BRN BLK TO BLK
10990F	ND-S-1537A	53072	1	SH BRN BLK TO BLK

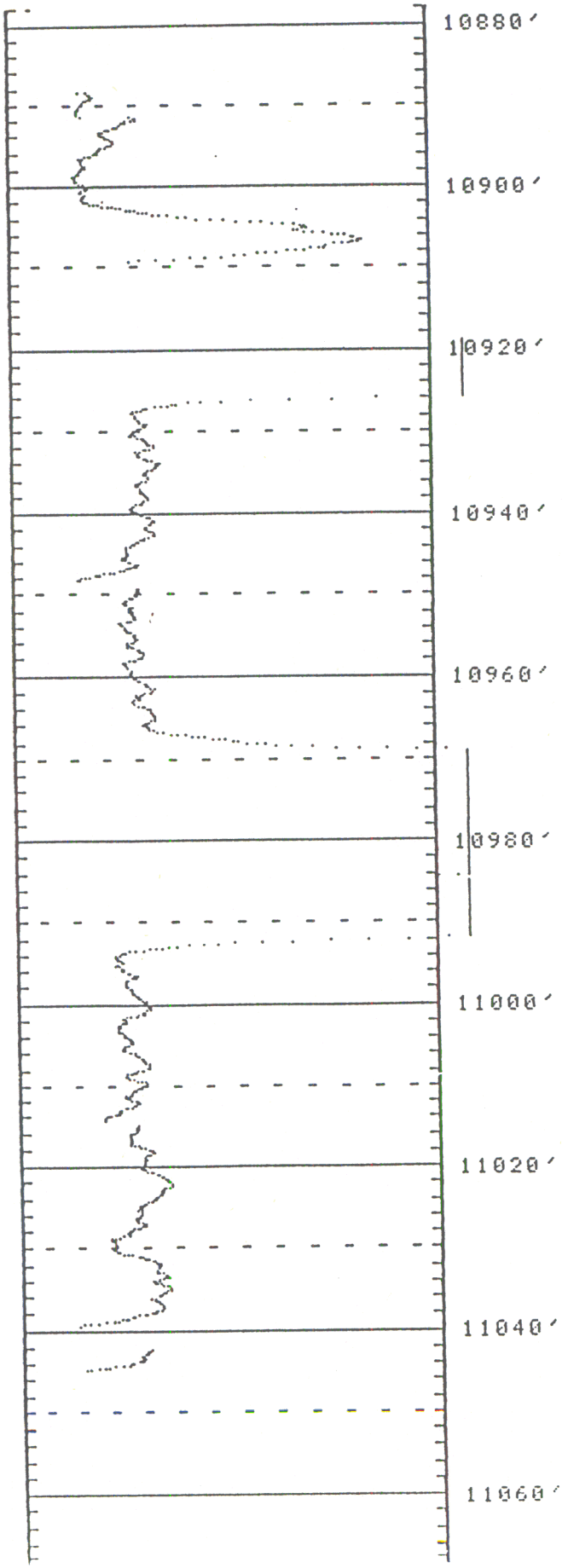


SHELL DEVELOPMENT CO.

PETROPHYSICAL SERVICE SECTION LABORATORY

CORE GAMMA SURFACE LOG

FILE ..... : STENEHJE
COMPANY ..... : SHELL WESTERN E&P INC.
LEASE ..... : STENEHJEM
WELL NO ..... : 27-1
FIELD ..... : WILDCAT
STATE/COUNTRY : MCKENZIE., NORTH DAKOTA
API/UCN NO .. : 33-053-02357-0000
DATE ..... : MARCH 13., 1991



SHELL DEVELOPMENT CO.

PETROPHYSICAL SERVICE SECTION LABORATORY

CORE GAMMA SURFACE LOG

FILE ..... : STENEHJE

COMPANY ..... : SHELL WESTERN E&P INC.

LEASE ..... : STENEHJEM

WELL NO ..... : 27-1

FIELD ..... : WILDCAT

STATE/COUNTRY : MCKENZIE., NORTH DAKOTA

API/UCN NO .. : 33-053-02357-0000

DATE ..... : MARCH 13., 1991