

New Mexico Bureau of Mines and Mineral Resources
Open File Report No. OF-210

HYDROCARBON SOURCE-ROCK EVALUATION STUDY
GETTY OIL CO. NO. 2 WEST ELEPHANT BUTTE FEDERAL WELL
SIERRA COUNTY, NEW MEXICO

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GeoChem Laboratories, Inc.
Houston, Texas
April 8, 1983

GEOCHEMICAL SERVICE REPORT

GETTY OIL COMPANY

WEST ELEPHANT BUTTE FEDERAL 3 NO. 2 WELL

SIERRA COUNTY, NEW MEXICO



Prepared

for

GETTY OIL COMPANY

Midland, Texas

CONFIDENTIAL

FEBRUARY 1983

1143-C BRITTMORE ROAD, HOUSTON, TEXAS 77043

COMPANY PROPRIETARY

WEST ELEPHANT BUTTE FEDERAL 3 NO. 2 WELL

LOCATION: SEC. 3, T13S, R4W

SIERRA COUNTY, NEW MEXICO

Enclosed please find the results of the organic geochemical analyses performed on a suite of eighty-four (84) wet canned cutting samples from the West Elephant Butte Federal 3 No. 2 Well located in Sec. 3, T13S, R4W, Sierra County, New Mexico.

Douglas A. Muckelroy
Geologist
GEOCHEM LABORATORIES, INC.

TABLE I-A

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE

GeoChem Sample Number	Well Interval*	Methane C1 PPM	Ethane C2 PPM	Propane C3 PPM	Isobutane iC4 PPM	Butane nC4 PPM	Total C5-C7 PPM	Total C1-C4 PPM	Total C2-C4 PPM	Gas Wetness %	iC4/nC4
G260-001	995 -1010	127.8	1.1	1.3	2.5	3.9	13.2	136.8	8.9	6.6	0.63
G260-002	1050 -1100	20.2	21.7	0.5	0.8	2.2	14.4	45.8	25.5	55.7	0.39
G260-003	1100 -1150	6.3	1.0	0.2	0.2	0.3	4.1	8.2	1.8	22.5	0.88
G260-004	1150 -1200	8.1	2.5	0.3	0.5	0.4	4.2	12.0	3.8	32.3	1.10
G260-005	1200 -1250	5.3	0.7	0.1	0.1	0.2	2.7	6.6	1.3	19.7	0.84
G260-006	1250 -1300	10.1	2.3	0.3	0.1	0.3	1.3	13.3	3.1	23.9	0.43
G260-007	1300 -1350	9.1	1.6	0.2	0.4	0.1	1.7	11.6	2.4	21.1	3.29
G260-008	1350 -1400	17.0	2.7	0.5	0.3	0.3	3.9	21.0	3.9	18.9	1.13
G260-009	1400 -1450	5.8	2.1	2.2	1.0	0.1	2.7	11.4	5.5	49.0	9.57
G260-010	1450 -1500	4.7	1.1	3.1	7.7	0.0	2.8	16.7	12.0	72.0	-
G260-011	1500 -1550	4.7	0.8	0.9	1.0	0.1	1.7	7.7	2.9	38.3	6.29
G260-012	1550 -1600	5.6	0.3	0.3	0.4	0.0	1.6	6.9	1.3	19.1	5.49
G260-013	1600 -1650	11.7	6.3	0.6	0.5	1.3	5.7	20.5	8.7	42.8	0.39
G260-014	1650 -1700	6.2	2.4	0.2	0.2	0.1	1.7	9.3	3.0	33.1	1.26
G260-015	1700 -1750	3.4	0.8	0.1	0.1	0.1	2.3	4.6	1.2	26.0	1.12
G260-016	1750 -1800	4.4	0.5	0.3	0.2	0.0	1.3	5.6	1.2	21.3	4.82
G260-017	1800 -1850	14.9	0.2	0.1	0.1	0.2	0.4	15.6	0.7	4.7	0.58
G260-019	1900 -1950	34.1	0.3	0.1	0.1	0.2	0.4	35.1	0.9	2.7	0.61
G260-021	2000 -2050	42.8	0.8	1.9	0.4	0.4	1.4	46.4	3.6	7.8	1.08
G260-023	2100 -2150	340.3	8.6	1.7	0.3	0.9	2.7	351.9	11.6	3.3	0.33
G260-025	2200 -2250	136.8	7.2	28.2	7.8	28.3	87.9	208.5	71.7	34.4	0.28
G260-027	2300 -2350	79.2	6.7	26.5	14.2	48.5	424.9	175.3	96.1	54.8	0.29
G260-029	2400 -2450	138.4	13.0	47.3	25.3	85.4	723.7	309.6	171.1	55.3	0.30
G260-031	2500 -2550	216.7	7.0	7.1	4.0	12.5	130.4	247.4	30.6	12.4	0.32
G260-033	2600 -2650	4849.1	36.8	11.2	10.6	25.1	257.0	4933.0	83.8	1.7	0.42
G260-035	2700 -2750	460.2	13.6	10.8	5.7	11.7	66.3	502.2	41.9	8.4	0.49
G260-037	2800 -2850	391.1	35.4	17.6	7.9	9.6	30.6	461.8	70.6	15.3	0.83
G260-039	2900 -2950	323.5	20.6	10.5	5.0	10.5	35.6	370.2	46.7	12.6	0.48
G260-041	3000 -3050	349.6	11.2	7.0	4.0	6.6	23.0	378.6	28.9	7.6	0.61
G260-043	3100 -3150	727.9	17.7	10.5	5.9	11.9	56.6	774.0	46.1	6.0	0.50
G260-045	3200 -3250	3161.1	53.7	6.6	3.2	8.1	88.5	3232.9	71.8	2.2	0.40
G260-047	3300 -3350	248.9	5.4	1.3	0.5	1.1	13.2	257.3	8.4	3.3	0.45
G260-049	3400 -3450	1050.4	9.4	3.8	2.1	4.4	21.4	1070.4	19.9	1.9	0.49
G260-051	3500 -3550	141.1	4.3	4.1	2.6	6.8	33.6	159.1	17.9	11.3	0.39
G260-053	3600 -3650	195.6	5.0	4.4	2.1	2.9	26.7	210.1	14.5	6.9	0.73
G260-054	3650 -3700	17.7	0.9	0.5	0.2	0.3	1.4	19.7	2.0	10.4	0.81
G260-057	3800 -3850	60.4	9.8	6.1	1.9	3.1	21.8	81.5	21.0	25.8	0.62
G260-059	3900 -3950	5.9	0.5	1.5	0.1	0.2	1.8	8.4	2.5	29.9	0.76
G260-061	4000 -4050	10.7	1.2	1.0	0.2	0.4	3.8	13.7	2.9	21.5	0.64
G260-063	4100 -4150	22.2	1.0	1.1	0.0	0.3	33.2	24.8	2.6	10.8	0.28
G260-065	4200 -4250	28.0	0.9	0.6	0.0	0.3	20.3	29.9	1.9	6.6	0.28
G260-067	4300 -4350	12.4	0.5	1.0	1.4	0.1	6.9	15.7	3.3	21.0	7.59
G260-069	4400 -4450	24.1	0.9	1.4	0.0	0.2	18.5	26.8	2.7	10.1	0.11
G260-071	4500 -4550	29.5	1.0	1.2	0.0	0.2	31.3	32.1	2.5	7.9	0.11
G260-073	4600 -4650	14.7	0.8	2.5	0.1	0.2	22.1	18.4	3.7	20.4	0.58
G260-075	4700 -4750	24.4	1.0	2.0	0.1	0.2	14.4	27.8	3.4	12.4	0.70
G260-077	4800 -4850	27.8	4.5	1.0	0.0	0.4	27.3	34.0	6.1	18.0	0.19
G260-079	4900 -4950	22.9	1.4	0.7	0.0	0.1	12.7	25.3	2.4	9.7	0.37

TABLE I-A

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE

GeoChem Sample Number	Well Interval*	Methane C1 PPM	Ethane C2 PPM	Propane C3 PPM	Isobutane iC4 PPM	Butane nC4 PPM	Total C5-C7 PPM	Total C1-C4 PPM	Total C2-C4 PPM	Gas Wetness %	iC4/nC4
G260-081	5000 -5050	33.6	1.6	1.5	2.1	0.3	23.6	39.3	5.6	14.5	6.51
G260-083	5100 -5150	29.2	1.2	1.5	0.0	0.1	6.1	32.2	3.0	9.4	0.56
G260-085	5200 -5250	143.6	4.5	13.3	64.7	22.5	130.7	248.9	105.3	42.3	2.87
G260-087	5300 -5350	33.6	6.6	4.4	13.1	4.0	45.9	61.9	28.3	45.7	3.23
G260-089	5400 -5450	61.0	16.6	3.0	1.0	0.2	9.4	82.0	20.9	25.6	3.67
G260-091	5500 -5550	75.3	13.2	3.3	2.8	0.5	20.0	95.3	20.0	21.0	4.78
G260-093	5600 -5650	261.1	22.0	8.9	4.3	1.5	43.0	298.0	36.9	12.4	2.85
G260-095	5700 -5750	161.0	17.5	5.3	4.0	0.9	34.5	188.8	27.8	14.7	4.28
G260-097	5800 -5850	379.8	47.3	8.8	2.6	0.8	7.8	439.5	59.6	13.6	3.16
G260-099	5900 -5950	470.1	40.3	7.3	2.0	0.8	4.9	520.8	50.6	9.7	2.31
G260-101	6000 -6050	259.7	31.9	3.3	0.7	0.2	2.6	295.9	36.2	12.2	2.43
G260-103	6100 -6150	158.3	19.4	2.7	1.0	0.3	2.5	181.8	23.5	12.9	3.11
G260-105	6200 -6250	101.3	11.0	1.5	0.4	0.1	0.5	114.5	13.2	11.5	2.85
G260-107	6300 -6350	161.0	12.9	2.3	0.3	0.1	1.3	176.8	15.8	8.9	1.72
G260-109	6400 -6450	587.7	22.7	1.2	0.2	0.1	0.1	612.1	24.3	4.0	1.96
G260-111	6500 -6550	332.0	16.1	0.9	0.1	0.1	1.1	349.5	17.4	5.0	1.44
G260-112	6550 -6600	3405.0	21.3	1.4	0.1	0.0	0.9	3428.0	23.0	0.7	2.70
G260-113	6600 -6650	1154.6	34.8	1.1	0.1	0.1	1.4	1190.9	36.2	3.0	1.83
G260-114	6650 -6700	1372.2	17.7	0.9	0.1	0.0	2.1	1391.1	18.9	1.4	2.03
G260-115	6700 -6750	374.3	13.6	1.4	0.2	0.1	2.8	389.8	15.5	4.0	1.65
G260-116	6750 -6800	287.8	8.4	0.5	0.1	0.0	0.8	296.9	9.1	3.1	1.57
G260-117	6800 -6850	346.5	10.6	1.6	0.3	0.1	1.5	359.3	12.8	3.6	2.17
G260-118	6850 -6900	788.3	20.4	1.8	0.2	0.1	1.6	810.9	22.6	2.8	1.82
G260-119	6900 -6950	317.2	10.6	0.8	0.1	0.1	1.4	329.0	11.7	3.6	1.46
G260-120	6950 -7000	309.6	7.2	2.6	0.7	0.4	1.6	320.6	11.0	3.4	1.61
G260-121	7000 -7050	864.1	16.5	3.2	0.5	0.3	2.5	884.7	20.6	2.3	1.55
G260-122	7050 -7100	454.8	13.4	1.3	0.3	0.2	1.6	470.1	15.3	3.3	1.57
G260-123	7100 -7150	266.7	6.2	0.7	0.2	0.1	0.0	274.1	7.4	2.7	1.82
G260-124	7150 -7200	200.5	4.6	0.5	0.1	0.0	0.8	206.0	5.4	2.7	1.87
G260-126	7200 -7250	170.3	4.5	0.6	0.1	0.0	0.8	175.8	5.4	3.1	1.61
G260-127	7250 -7300	87.1	3.4	0.7	0.1	0.0	0.8	91.6	4.4	4.9	2.06
G260-128	7300 -7350	3179.9	64.1	3.7	1.0	0.6	7.7	3249.5	69.5	2.1	1.61
G260-129	7350 -7400	126.5	4.6	0.7	0.1	0.1	0.7	132.2	5.7	4.3	1.38
G260-130	7400 -7450	101.6	5.4	0.9	0.1	0.2	1.6	108.3	6.7	6.2	0.86
G260-131	7450 -7500	93.3	4.0	2.4	0.8	0.2	1.2	100.9	7.5	7.5	3.45
G260-132	7500 -7550	120.5	5.4	1.2	0.2	0.2	1.1	127.6	7.1	5.6	1.10

PPM values expressed as volumes of gas per million volumes of cuttings

TABLE I-B

C1-C7 HYDROCARBON ANALYSES OF CUTTINGS GAS

GeoChem Sample Number	Well Interval*	Methane C1 PPM	Ethane C2 PPM	Propane C3 PPM	Isobutane iC4 PPM	Butane nC4 PPM	Total C5-C7 PPM	Total C1-C4 PPM	Total C2-C4 PPM	Gas Wetness %	iC4/nC4
G260-081	5000 -5050	54.5	3.0	10.0	0.2	0.6	19.1	68.5	14.0	20.4	0.45
G260-083	5100 -5150	40.9	2.7	6.6	0.1	0.2	19.4	50.8	9.9	19.5	0.66
G260-085	5200 -5250	300.6	13.9	18.8	92.1	46.0	452.4	471.6	170.9	36.2	2.00
G260-087	5300 -5350	117.8	8.2	3.4	10.8	5.5	140.6	145.9	28.0	19.2	1.93
G260-089	5400 -5450	218.0	20.4	3.5	2.0	1.3	16.2	245.5	27.4	11.2	1.53
G260-091	5500 -5550	142.7	8.2	2.2	2.0	1.3	33.9	156.6	13.9	8.9	1.49
G260-093	5600 -5650	767.6	41.4	15.9	5.7	6.3	45.8	837.0	69.4	8.3	0.90
G260-095	5700 -5750	462.3	15.2	5.7	3.7	1.8	38.9	488.9	26.5	5.4	2.00
G260-097	5800 -5850	626.0	24.6	5.8	1.7	1.3	9.2	659.6	33.6	5.1	1.26
G260-099	5900 -5950	1177.1	32.9	7.8	2.0	1.8	5.1	1221.8	44.6	3.7	1.09
G260-101	6000 -6050	1335.4	78.6	13.4	3.8	3.0	12.8	1434.3	98.9	6.9	1.28
G260-103	6100 -6150	1028.3	39.9	8.8	5.7	3.3	5.4	1086.2	57.9	5.3	1.73
G260-105	6200 -6250	841.8	29.2	6.0	2.1	1.5	2.8	880.7	38.9	4.4	1.35
G260-107	6300 -6350	940.5	28.7	6.7	2.0	1.6	2.1	979.6	39.1	4.0	1.27
G260-109	6400 -6450	1870.4	50.4	7.8	1.9	1.2	1.6	1931.8	61.4	3.2	1.53
G260-111	6500 -6550	1210.7	38.0	5.5	1.3	1.0	3.0	1256.7	46.0	3.7	1.29
G260-112	6550 -6600	1480.8	52.3	4.1	1.0	0.7	2.6	1539.1	58.3	3.8	1.38
G260-113	6600 -6650	1088.5	42.4	5.5	1.5	0.7	2.0	1138.9	50.4	4.4	1.95
G260-114	6650 -6700	1107.8	29.4	3.2	0.7	0.6	2.0	1141.9	34.1	3.0	1.20
G260-115	6700 -6750	805.6	19.3	2.7	0.7	0.5	2.2	829.0	23.4	2.8	1.26
G260-116	6750 -6800	3566.8	52.2	3.9	0.7	0.5	1.8	3624.3	57.5	1.6	1.21
G260-117	6800 -6850	6982.0	72.8	9.5	1.6	1.2	2.8	7067.2	85.2	1.2	1.32
G260-118	6850 -6900	5732.3	112.2	17.5	2.2	2.1	0.5	5866.5	134.1	2.3	1.03
G260-119	6900 -6950	4164.6	53.6	8.2	1.1	1.3	1.9	4229.1	64.4	1.5	0.90
G260-120	6950 -7000	3001.8	47.2	7.7	2.0	1.8	0.0	3060.7	58.9	1.9	1.10
G260-121	7000 -7050	3502.2	39.3	8.1	1.7	1.6	0.9	3553.1	50.9	1.4	1.11
G260-122	7050 -7100	2656.5	41.0	5.4	1.2	1.3	1.0	2705.6	49.0	1.8	0.95
G260-123	7100 -7150	1531.6	25.6	2.9	0.6	0.6	0.6	1561.5	29.9	1.9	0.89
G260-124	7150 -7200	2050.5	35.0	3.8	0.7	0.8	0.5	2091.0	40.5	1.9	0.94
G260-126	7200 -7250	2558.6	44.2	4.8	0.8	0.8	0.2	2609.4	50.7	1.9	1.00
G260-127	7250 -7300	536.6	10.5	1.3	0.2	0.3	0.4	549.1	12.5	2.3	0.80
G260-128	7300 -7350	508.2	12.1	1.2	0.2	0.4	0.3	522.4	14.1	2.7	0.72
G260-129	7350 -7400	411.3	8.6	1.0	0.2	0.2	0.0	421.6	10.2	2.4	0.86
G260-130	7400 -7450	282.0	7.0	1.7	0.3	0.3	0.0	291.6	9.5	3.3	1.10
G260-131	7450 -7500	750.1	15.1	1.8	0.4	0.4	0.9	768.2	18.0	2.3	0.92
G260-132	7500 -7550	1655.3	32.7	4.0	0.7	0.8	0.0	1693.7	38.3	2.3	0.90

PPM values expressed as volumes of gas per million volumes of cuttings

TABLE I-B

C1-C7 HYDROCARBON ANALYSES OF CUTTINGS GAS

GeoChem Sample Number	Well Interval*	Methane C1 PPM	Ethane C2 PPM	Propane C3 PPM	Isobutane iC4 PPM	Butane nC4 PPM	Total C5-C7 PPM	Total C1-C4 PPM	Total C2-C4 PPM	Gas Witness %	iC4/nC4
G260-001	995 -1010	94.2	0.6	1.6	0.5	0.3	1.3	97.4	3.2	3.4	1.50
G260-002	1050 -1100	50.6	8.5	1.3	0.8	1.3	3.1	62.7	12.1	19.4	0.65
G260-003	1100 -1150	87.1	3.7	1.5	0.8	1.0	2.4	94.2	7.1	7.6	0.85
G260-004	1150 -1200	88.7	3.7	1.6	0.4	0.7	3.7	95.3	6.6	7.0	0.63
G260-005	1200 -1250	55.7	2.6	2.3	0.8	0.9	1.5	62.5	6.7	10.9	0.89
G260-006	1250 -1300	69.9	2.9	1.2	0.8	0.9	1.5	75.8	5.9	7.8	0.86
G260-007	1300 -1350	65.5	2.3	1.0	0.7	0.9	1.5	70.6	5.0	7.2	0.77
G260-008	1350 -1400	37.4	3.3	2.7	0.7	0.6	1.5	44.9	7.4	16.7	1.22
G260-009	1400 -1450	69.0	1.5	0.7	0.1	0.3	1.2	71.9	2.8	4.0	0.51
G260-010	1450 -1500	64.1	2.2	0.9	0.7	0.8	2.5	68.9	4.7	6.9	0.87
G260-011	1500 -1550	57.5	1.8	0.8	0.7	0.7	1.3	61.7	4.2	6.9	1.06
G260-012	1550 -1600	100.8	1.4	0.9	0.5	1.2	1.9	105.1	4.2	4.0	0.43
G260-013	1600 -1650	54.7	2.3	0.7	1.0	0.8	2.0	59.7	5.0	8.4	1.19
G260-014	1650 -1700	76.3	1.6	0.7	0.5	0.6	1.1	79.9	3.6	4.5	0.82
G260-015	1700 -1750	70.2	1.6	0.7	0.6	0.6	2.0	73.9	3.6	5.0	1.03
G260-016	1750 -1800	63.6	1.8	6.0	0.8	0.8	2.2	73.2	9.5	13.1	1.06
G260-017	1800 -1850	107.0	1.9	0.9	0.7	0.7	1.4	111.4	4.3	3.9	1.02
G260-019	1900 -1950	70.1	1.7	2.7	0.9	1.1	0.9	76.7	6.5	8.6	0.85
G260-021	2000 -2050	61.9	2.0	4.5	0.9	0.8	1.2	70.2	8.3	11.9	1.14
G260-023	2100 -2150	197.3	9.9	1.8	0.7	1.1	1.8	211.0	13.6	6.5	0.72
G260-025	2200 -2250	76.8	7.3	18.1	5.3	16.1	49.2	123.7	46.9	37.9	0.33
G260-027	2300 -2350	62.7	3.1	10.7	5.5	17.3	236.7	99.5	36.8	37.0	0.32
G260-029	2400 -2450	89.4	4.3	3.5	1.9	4.5	151.9	103.7	14.3	13.8	0.42
G260-031	2500 -2550	134.9	14.0	15.3	6.2	18.3	457.2	188.9	54.0	28.6	0.34
G260-033	2600 -2650	563.3	28.6	12.7	6.9	18.8	402.6	630.5	67.1	10.7	0.37
G260-035	2700 -2750	1145.9	272.9	116.5	26.2	47.6	210.8	1609.2	463.3	28.8	0.55
G260-037	2800 -2850	662.3	196.8	87.5	21.1	34.2	80.3	1002.1	339.7	33.9	0.62
G260-039	2900 -2950	977.1	265.1	106.8	28.4	43.8	105.4	1421.4	444.2	31.3	0.65
G260-041	3000 -3050	563.0	116.0	56.5	15.8	25.6	72.8	777.1	214.1	27.6	0.62
G260-043	3100 -3150	570.6	121.0	60.2	16.1	28.2	101.8	796.2	225.6	28.3	0.57
G260-045	3200 -3250	725.2	125.2	51.7	13.4	23.5	163.0	939.2	214.0	22.8	0.57
G260-047	3300 -3350	524.6	91.0	96.8	9.4	15.5	77.4	737.4	212.8	28.9	0.61
G260-049	3400 -3450	1063.4	183.1	85.4	21.5	35.3	127.1	1388.8	325.3	23.4	0.61
G260-051	3500 -3550	476.1	118.2	59.3	13.0	27.2	69.0	694.1	217.9	31.4	0.48
G260-053	3600 -3650	39.3	4.0	2.4	0.8	1.0	9.8	47.6	8.3	17.5	0.78
G260-054	3650 -3700	206.5	40.1	21.9	6.3	9.4	39.1	284.4	77.8	27.4	0.67
G260-057	3800 -3850	83.2	12.3	6.3	1.4	3.0	20.3	106.5	23.3	21.9	0.48
G260-059	3900 -3950	24.7	1.6	1.2	0.2	0.4	6.0	28.4	3.6	12.8	0.55
G260-061	4000 -4050	37.5	2.1	1.0	0.2	0.4	5.0	41.3	3.8	9.4	0.55
G260-063	4100 -4150	43.5	3.5	6.0	0.4	0.7	12.9	54.3	10.7	19.9	0.53
G260-065	4200 -4250	31.9	2.3	1.3	2.0	1.2	12.5	38.9	6.9	17.9	1.66
G260-067	4300 -4350	43.8	1.9	0.7	0.1	0.3	18.2	47.0	3.2	6.9	0.56
G260-069	4400 -4450	25.2	1.5	0.7	0.1	0.2	8.7	28.0	2.7	9.8	0.62
G260-071	4500 -4550	31.9	1.5	1.1	0.2	0.4	28.2	35.3	3.4	9.7	0.52
G260-073	4600 -4650	32.9	1.9	2.8	0.8	0.5	16.6	39.1	6.2	15.9	1.67
G260-075	4700 -4750	33.2	2.0	6.1	0.2	0.2	10.2	41.9	8.7	20.8	0.71
G260-077	4800 -4850	42.5	2.9	4.7	0.2	0.6	22.9	51.2	8.6	16.8	0.43
G260-079	4900 -4950	65.7	3.6	1.0	0.3	0.6	9.2	71.3	5.5	7.8	0.50

TABLE I-C

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE AND CUTTINGS GAS

GeoChem Sample Number	Well Interval*	Methane C1 PPM	Ethane C2 PPM	Propane C3 PPM	Isobutane iC4 PPM	Butane nC4 PPM	Total C5-C7 PPM	Total C1-C4 PPM	Total C2-C4 PPM	Gas Witness %	iC4/nC4
G260-001	995 -1010	222.0	1.7	3.0	3.1	4.3	14.6	234.3	12.2	5.2	0.71
G260-002	1050 -1100	70.8	30.2	1.9	1.7	3.6	17.6	108.5	37.7	34.7	0.49
G260-003	1100 -1150	93.5	4.7	1.7	1.1	1.3	6.6	102.5	8.9	8.8	0.86
G260-004	1150 -1200	96.8	6.3	2.0	0.9	1.2	7.9	107.4	10.5	9.8	0.81
G260-005	1200 -1250	61.0	3.4	2.5	1.0	1.1	4.2	69.1	8.0	11.7	0.88
G260-006	1250 -1300	80.0	5.3	1.5	0.9	1.2	2.9	89.1	9.0	10.2	0.75
G260-007	1300 -1350	74.7	3.9	1.3	1.1	1.0	3.2	82.2	7.5	9.1	1.11
G260-008	1350 -1400	54.5	6.1	3.2	1.1	0.9	5.4	65.9	11.4	17.4	1.18
G260-009	1400 -1450	74.9	3.7	2.9	1.2	0.4	3.9	83.4	8.4	10.2	2.64
G260-010	1450 -1500	68.8	3.4	4.1	8.4	0.8	5.4	85.6	16.8	19.7	10.18
G260-011	1500 -1550	62.3	2.7	1.8	1.7	0.8	3.0	69.5	7.2	10.4	2.01
G260-012	1550 -1600	106.5	1.8	1.3	1.0	1.3	3.5	112.1	5.5	5.0	0.76
G260-013	1600 -1650	66.5	8.6	1.4	1.5	2.1	7.8	80.3	13.8	17.2	0.70
G260-014	1650 -1700	82.5	4.0	0.9	0.7	0.8	2.8	89.2	6.6	7.5	0.91
G260-015	1700 -1750	73.6	2.4	0.9	0.7	0.7	4.3	78.5	4.8	6.2	1.04
G260-016	1750 -1800	68.0	2.3	6.4	1.0	0.8	3.5	78.8	10.7	13.7	1.27
G260-017	1800 -1850	122.0	2.1	1.1	0.8	0.9	1.8	127.0	5.0	4.0	0.92
G260-019	1900 -1950	104.3	2.0	2.9	1.1	1.3	1.4	111.9	7.5	6.7	0.80
G260-021	2000 -2050	104.7	2.8	6.4	1.3	1.2	2.7	116.7	11.9	10.2	1.12
G260-023	2100 -2150	537.6	18.6	3.6	1.0	2.0	4.6	563.0	25.3	4.5	0.54
G260-025	2200 -2250	213.6	14.6	46.3	13.1	44.4	137.2	332.3	118.6	35.7	0.30
G260-027	2300 -2350	142.0	9.8	37.3	19.8	65.8	661.7	274.9	132.9	48.3	0.30
G260-029	2400 -2450	227.9	17.3	50.9	27.2	90.0	875.6	413.4	185.5	44.9	0.30
G260-031	2500 -2550	351.6	21.0	22.4	10.2	30.9	587.7	436.3	84.6	19.4	0.33
G260-033	2600 -2650	5412.5	65.5	24.0	17.5	43.9	659.6	5563.5	151.0	2.7	0.40
G260-035	2700 -2750	1606.1	286.5	127.3	32.0	59.3	277.1	2111.5	505.3	23.9	0.54
G260-037	2800 -2850	1053.5	232.2	105.2	29.1	43.8	110.9	1463.9	410.4	28.0	0.66
G260-039	2900 -2950	1300.6	285.7	117.4	33.4	54.3	141.1	1791.7	491.0	27.4	0.62
G260-041	3000 -3050	912.6	127.3	63.6	19.8	32.2	95.8	1155.7	243.0	21.0	0.62
G260-043	3100 -3150	1298.5	138.7	70.7	22.1	40.1	158.4	1570.3	271.7	17.3	0.55
G260-045	3200 -3250	3886.3	178.9	58.4	16.7	31.7	251.5	4172.1	285.8	6.9	0.53
G260-047	3300 -3350	773.5	96.4	98.2	9.9	16.6	90.6	994.8	221.3	22.2	0.60
G260-049	3400 -3450	2113.9	192.5	89.3	23.6	39.8	148.5	2459.2	345.3	14.0	0.59
G260-051	3500 -3550	617.3	122.6	63.4	15.7	34.1	102.7	853.3	235.9	27.6	0.46
G260-053	3600 -3650	234.9	9.0	6.8	2.9	3.9	36.5	257.7	22.8	8.9	0.74
G260-054	3650 -3700	224.2	41.0	22.5	6.5	9.7	40.5	304.2	79.9	26.3	0.67
G260-057	3800 -3850	143.7	22.2	12.4	3.4	6.2	42.2	188.1	44.4	23.6	0.55
G260-059	3900 -3950	30.6	2.2	2.7	0.4	0.7	7.8	36.8	6.1	16.7	0.62
G260-061	4000 -4050	48.2	3.4	2.0	0.5	0.8	8.9	55.1	6.8	12.4	0.59
G260-063	4100 -4150	65.7	4.6	7.2	0.4	1.0	46.2	79.2	13.4	17.0	0.45
G260-065	4200 -4250	60.0	3.2	2.0	2.1	1.5	32.8	68.9	8.9	13.0	1.37
G260-067	4300 -4350	56.3	2.5	1.8	1.6	0.5	25.2	62.8	6.5	10.4	3.28
G260-069	4400 -4450	49.4	2.4	2.2	0.1	0.5	27.3	54.8	5.4	9.9	0.37
G260-071	4500 -4550	61.4	2.5	2.4	0.2	0.7	59.5	67.4	5.9	8.9	0.38
G260-073	4600 -4650	47.6	2.8	5.4	0.9	0.7	38.8	57.6	9.9	17.3	1.35
G260-075	4700 -4750	57.6	3.1	8.2	0.3	0.4	24.6	69.8	12.1	17.4	0.71
G260-077	4800 -4850	70.4	7.4	5.8	0.3	1.1	50.3	85.2	14.7	17.3	0.33
G260-079	4900 -4950	88.6	5.1	1.7	0.3	0.7	22.0	96.7	8.0	8.3	0.47

TABLE I-C

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE AND CUTTINGS GAS

GeoChem Sample Number	Well Interval*	Methane C1 PPM	Ethane C2 PPM	Propane C3 PPM	Isobutane iC4 PPM	Butane nC4 PPM	Total C5-C7 PPM	Total C1-C4 PPM	Total C2-C4 PPM	Gas Wetness %	iC4/nC4
G260-081	5000 -5050	88.1	4.7	11.6	2.4	0.9	42.7	107.8	19.7	18.3	2.52
G260-083	5100 -5150	70.2	4.0	8.1	0.2	0.4	25.6	83.1	12.9	15.6	0.63
G260-085	5200 -5250	444.3	18.5	32.1	156.9	68.5	583.1	720.5	276.2	38.3	2.29
G260-087	5300 -5350	151.4	14.8	7.8	23.9	9.6	186.5	207.9	56.4	27.1	2.48
G260-089	5400 -5450	279.1	37.0	6.6	3.0	1.6	25.6	327.5	48.4	14.8	1.89
G260-091	5500 -5550	218.0	21.5	5.6	4.8	1.9	53.9	252.0	33.9	13.5	2.49
G260-093	5600 -5650	1028.7	63.5	24.8	10.1	7.8	88.8	1135.1	106.3	9.4	1.28
G260-095	5700 -5750	623.4	32.8	11.1	7.7	2.7	73.4	677.8	54.4	8.0	2.76
G260-097	5800 -5850	1005.9	71.9	14.7	4.3	2.2	17.1	1099.1	93.2	8.5	1.98
G260-099	5900 -5950	1647.3	73.3	15.2	4.0	2.7	10.1	1742.6	95.2	5.5	1.48
G260-101	6000 -6050	1595.1	110.5	16.7	4.6	3.3	15.5	1730.3	135.1	7.8	1.38
G260-103	6100 -6150	1186.6	59.3	11.6	6.7	3.6	7.9	1268.1	81.4	6.4	1.85
G260-105	6200 -6250	943.2	40.3	7.5	2.5	1.7	3.3	995.3	52.1	5.2	1.50
G260-107	6300 -6350	1101.5	41.6	9.1	2.4	1.8	3.5	1156.5	54.9	4.8	1.32
G260-109	6400 -6450	2458.1	73.2	9.1	2.1	1.3	1.8	2543.9	85.8	3.4	1.57
G260-111	6500 -6550	1542.8	54.2	6.5	1.5	1.1	4.2	1606.3	63.5	4.0	1.30
G260-112	6550 -6600	4885.8	73.6	5.6	1.2	0.8	3.6	4967.2	81.3	1.6	1.46
G260-113	6600 -6650	2243.1	77.2	6.7	1.7	0.8	3.4	2329.8	86.6	3.7	1.94
G260-114	6650 -6700	2480.0	47.1	4.2	0.9	0.7	4.1	2533.1	53.0	2.1	1.30
G260-115	6700 -6750	1180.0	32.9	4.2	1.0	0.7	5.0	1218.9	38.9	3.2	1.35
G260-116	6750 -6800	3854.7	60.6	4.4	0.8	0.6	2.6	3921.3	66.6	1.7	1.24
G260-117	6800 -6850	7328.5	83.4	11.2	1.9	1.3	4.3	7426.6	98.0	1.3	1.42
G260-118	6850 -6900	6520.7	132.6	19.4	2.4	2.2	2.2	6677.4	156.7	2.3	1.07
G260-119	6900 -6950	4481.9	64.2	9.0	1.3	1.4	3.3	4558.1	76.2	1.7	0.94
G260-120	6950 -7000	3311.4	54.4	10.3	2.8	2.3	1.6	3381.4	69.9	2.1	1.20
G260-121	7000 -7050	4366.3	55.8	11.4	2.2	1.9	3.5	4437.9	71.6	1.6	1.18
G260-122	7050 -7100	3111.3	54.4	6.8	1.5	1.5	2.6	3175.7	64.4	2.0	1.03
G260-123	7100 -7150	1798.3	31.9	3.7	0.8	0.7	0.6	1835.7	37.3	2.0	1.02
G260-124	7150 -7200	2251.0	39.7	4.3	0.9	0.9	1.4	2297.0	46.0	2.0	1.03
G260-126	7200 -7250	2728.9	48.8	5.5	0.9	0.9	1.1	2785.2	56.2	2.0	1.05
G260-127	7250 -7300	623.7	14.0	2.0	0.4	0.4	1.2	640.7	17.0	2.7	1.03
G260-128	7300 -7350	3688.2	76.3	5.0	1.3	1.0	8.0	3771.9	83.7	2.2	1.27
G260-129	7350 -7400	537.8	13.3	1.8	0.4	0.4	0.7	553.8	16.0	2.9	1.01
G260-130	7400 -7450	383.7	12.5	2.7	0.5	0.5	1.6	400.0	16.3	4.1	1.00
G260-131	7450 -7500	843.4	19.2	4.3	1.3	0.7	2.2	869.1	25.6	2.9	1.77
G260-132	7500 -7550	1775.8	38.1	5.2	1.0	1.0	1.1	1821.3	45.5	2.5	0.95

PPM values expressed as volumes of gas per million volumes of cuttings

Table II

SCREEN ANALYSIS SUMMARY

GeoChem Sample Number	Well Interval (Feet)	Brief Lithological Description	Total Organic Carbon (% of Rock)
G260-001	995-1010	100% Casing cement and gypsum, no sample picked.	
G260-002	1050-1100	100% Shale, pale red.	0.05
G260-003	1100-1150	100% Shale, pale red.	0.03
G260-004	1150-1200	100% Shale, pale red.	0.04/0.04
G260-005	1200-1250	100% Shale, pale red.	0.03
G260-006	1250-1300	100% Shale, pale red.	0.05
G260-007	1300-1350	100% Shale, pale red.	0.05
G260-008	1350-1400	75% Shale, pale red. 25% Pebble, varied color.	0.05
G260-009	1400-1450	75% Shale, pale red. 25% Pebble, varied color.	0.04/0.04
G260-010	1450-1500	75% Shale, pale red. 25% Pebble, varied color.	0.03
G260-011	1500-1550	75% Shale, pale red. 25% Pebble, varied color.	0.04
G260-012	1550-1600	50% Shale, pale red. 30% Anhydrite, white. 20% Quartz, light gray.	0.02
G260-013	1600-1650	40% Shale, pale red. 30% Anhydrite, white. 30% Quartz, light gray.	0.02
G260-014	1650-1700	50% Shale, pale red. 30% Anhydrite and chert, light gray. 20% Anhydrite, white.	0.02
G260-015	1700-1750	50% Shale, pale red. 30% Quartz fragments, light gray. 20% Shale, dark gray.	0.11

Table II

SCREEN ANALYSIS SUMMARY

GeoChem Sample Number	Well Interval (Feet)	Brief Lithological Description	Total Organic Carbon (% of Rock)
G260-016	1750-1800	50% Shale, pale red. 30% Quartz fragments, light gray. 20% Shale, dark gray.	0.16
G260-017	1800-1850	60% Shale, pale red. 20% Anhydrite, white. 20% Shale, dark gray. Trace of quartz fragments.	0.13/0.12
G260-019	1900-1950	60% Shale, pale red. 20% Anhydrite, white. 20% Shale, dark gray. Trace of quartz fragments.	0.11
G260-021	2000-2050	75% Shale, pale red. 15% Anhydrite, white. 10% Shale, dark gray.	0.08
G260-023	2100-2150	70% Shale, pale red. 20% Anhydrite, white. 10% Shale, dark gray.	0.18
G260-025	2200-2250	50% Shale, pale red. 40% Sand, light gray. 10% Shale, dark gray.	0.19
G260-027	2300-2350	60% Shale, pale red. 20% Sand, light gray. 20% Anhydrite, light gray.	0.10
G260-029	2400-2450	60% Shale, pale red. 20% Sand, light gray. 20% Anhydrite, light gray.	0.08
G260-031	2500-2550	100% Shale, medium dark gray.	0.95
G260-033	2600-2650	100% Shale, medium dark gray.	1.28/1.27
G260-035	2700-2750	100% Dolomite, brownish gray.	0.29
G260-037	2800-2850	100% Limestone, brownish gray.	0.30
G260-039	2900-2950	100% Limestone, brownish gray.	0.25

Table II

SCREEN ANALYSIS SUMMARY

GeoChem Sample Number	Well Interval (Feet)	Brief Lithological Description	Total Organic Carbon (% of Rock)
G260-041	3000-3050	60% Dolomite, brownish gray. 40% Sandstone, dolomitic, light gray.	0.23
G260-043	3100-3150	100% Dolomite, brownish gray.	0.25/0.25
G260-045	3200-3250	100% Dolomite, brownish gray.	0.22
G260-047	3300-3350	60% Limestone, brownish gray. 40% Red shale.	0.38
G260-049	3400-3450	100% Dolomite, brownish gray.	0.24
G260-051	3500-3550	100% Dolomite, brownish gray.	0.20
G260-053	3600-3650	80% Siltstone, dolomitic, light gray. 20% Dolomite, brownish gray.	0.13
G260-054	3650-3700	100% Limestone grading to dolomite, anhydritic, light brownish gray.	0.16
G260-057	3800-3850	Possibly casing cement with silt? No sample picked.	
G260-059	3900-3950	Igneous rock? No sample picked.	
G260-061	4000-4050	100% Casing cement. No sample picked.	
G260-063	4100-4150	40% Shale, grayish red and medium dark gray. 40% Siltstone, light gray. 20% Casing cement.	0.11
G260-065	4200-4250	70% Shale, grayish red. 30% Siltstone, light gray.	0.09
G260-067	4300-4350	60% Shale, grayish red. 40% Siltstone, pinkish red.	0.04
G260-069	4400-4450	60% Shale, grayish red. 40% Siltstone, pinkish red.	0.04
G260-071	4500-4550	80% Siltstone, grayish red and light gray. 20% Shale, grayish red.	0.04/0.06

Table II

SCREEN ANALYSIS SUMMARY

GeoChem Sample Number	Well Interval (Feet)	Brief Lithological Description	Total Organic Carbon (% of Rock)
G260-073	4600-4650	60% Siltstone, grayish red and light gray. 40% Shale, grayish red.	0.04
G260-075	4700-4750	70% Shale, grayish red. 30% Siltstone, grayish red and light gray.	0.04
G260-077	4800-4850	80% Shale, grayish red. 20% Siltstone, grayish red and light gray.	0.06
G260-079	4900-4950	80% Shale, grayish red. 20% Siltstone, grayish red and light gray.	0.04
G260-081	5000-5050	80% Shale, grayish red. 20% Siltstone, grayish red and light gray.	0.05
G260-083	5100-5150	80% Shale, grayish red and medium dark gray. 20% Limestone, light brownish gray.	0.11
G260-085	5200-5250	60% Shale, grayish red and medium dark gray. 40% Limestone, light brownish gray.	0.29
G260-087	5300-5350	60% Limestone, light brownish gray. 40% Shale, grayish red and medium dark gray.	0.10/0.11
G260-089	5400-5450	60% Limestone, light brownish gray. 40% Shale, grayish red and medium dark gray.	0.43
G260-091	5500-5550	60% Limestone, light brownish gray. 40% Shale, grayish red and medium dark gray.	0.15/0.15
G260-093	5600-5650	100% Dolomite, light brownish gray.	0.23
G260-095	5700-5750	60% Limestone, light brownish gray. 40% Shale, pale red to medium dark gray.	0.21
G260-097	5800-5850	80% Limestone, light brownish gray. 20% Shale, pale red to medium dark gray.	0.39
G260-099	5800-5850	70% Limestone, light brownish gray. 30% Shale, pale red to medium dark gray.	0.37/0.37
G260-101	6000-6050	60% Limestone, light brownish gray. 40% Shale, pale red to medium dark gray.	0.40
G260-103	6100-6150	85% Dolomite, light brown gray to brownish gray. 15% Shale, medium dark gray.	0.14
G260-105	6200-6250	70% Limestone, light brownish gray. 30% Shale, pale red and medium dark gray.	0.22

Table II

SCREEN ANALYSIS SUMMARY

GeoChem Sample Number	Well Interval (Feet)	Brief Lithological Description	Total Organic Carbon (% of Rock)
G260-107	6300-6350	100% Limestone, grading to dolomite, light brownish gray.	0.12
G260-109	6400-6450	100% Limestone, grading to dolomite, light brownish gray.	0.23
G260-111	6500-6550	70% Limestone, light brownish gray. 30% Shale, pale red to medium dark gray.	0.42
G260-112	6550-6600	60% Shale, pale red to medium dark gray. 40% Limestone, light brownish gray.	0.71
G260-113	6600-6650	60% Shale, pale red to medium dark gray. 40% Limestone, light brownish gray.	0.84/0.85
G260-114	6650-6700	100% Limestone, light brownish gray.	0.14
G260-115	6700-6750	50% Limestone, light brownish gray. 50% Shale, pale red and medium dark gray.	0.26
G260-116	6750-6800	70% Limestone, light brownish gray. 30% Shale, pale red to medium dark gray.	0.22
G260-117	6800-6850	60% Limestone, light brownish gray. 40% Shale, pale red and medium dark gray.	0.30
G260-118	6850-6900	80% Dolomite, light brownish gray. 10% Quartz, white. 10% Shale, medium dark gray.	0.21
G260-119	6900-6950	100% Limestone, grading to dolomite, light brownish gray.	0.09
G260-120	6950-7000	100% Limestone, grading to dolomite, light brownish gray.	0.09
G260-121	7000-7050	100% Limestone, grading to dolomite, light brownish gray.	0.07/0.09
G260-122	7050-7100	100% Limestone, grading to dolomite, light brownish gray.	0.06
G260-123	7100-7150	100% Limestone, grading to dolomite, light brownish gray.	0.09
G260-124	7150-7200	100% Limestone, light brownish gray.	0.05

Table II

SCREEN ANALYSIS SUMMARY

GeoChem Sample Number	Well Interval (Feet)	Brief Lithological Description		Total Organic Carbon (% of Rock)
G260-126	7200-7250	100%	Limestone, light brownish gray.	0.04
G260-127	7250-7300	85% 15%	Limestone, light brownish gray. Shale, pale red and medium dark gray.	0.07
G260-128	7300-7350	70% 30%	Limestone, light brownish gray. Shale, pale red and medium dark gray.	0.08
G260-129	7350-7400	70% 40%	Limestone, light brownish gray. Shale, pale red and medium dark gray.	0.14
G260-130	7400-7450	50% 30% 20%	Limestone, light brownish gray. Shale, pale red and medium dark gray. Sandstone, silicified, chloritic, light green.	0.11/0.11
G260-131	7450-7500	100%	Igneous rock. No sample picked.	No sample
G260-132	7500-7550	100%	Igneous rock. No sample picked.	No sample

T.O.C. = Total organic carbon, wt. %
 S1 = Free hydrocarbons, mg HC/g of rock
 S2 = Residual hydrocarbon potential
 (mg HC/g of rock)
 S3 = CO₂ produced from kerogen pyrolysis
 (mg CO₂/g of rock)
 PC* = 0.083 (S1 + S2)

Hydrogen
 Index = mg HC/g organic carbon
 Oxygen
 Index = mg CO₂/g organic carbon
 PI = S1/S1+S2
 Tmax = Temperature Index, degrees C.

TABLE III

WEST ELEPHANT BUTTE FEDERAL 3 NO. 2
 SIERRA COUNTY, NEW MEXICO

RESULTS OF ROCK-EVAL PYROLYSIS

GeoChem Sample No.	Depth Interval (Ft)	Tmax (C)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	PI	PC*	T.O.C. (wt. %)	Hydrogen Index	Oxygen Index
G260-002	1050-1100	444	0.02	0.01	0.15	1.00	0.00	0.05	20	300
G260-003	1100-1150	190	0.01	0.00	0.13	0.01	0.00	0.03	0	433
G260-004	1150-1200	172	0.02	0.00	0.10	1.00	0.00	0.04	0	250
G260-005	1200-1250	226	0.02	0.01	0.11	1.00	0.00	0.03	33	366
G260-006	1250-1300	308	0.01	0.00	0.12	0.01	0.00	0.05	0	240
G260-007	1300-1350	248	0.04	0.06	0.13	0.40	0.00	0.05	120	260
G260-008	1350-1400	248	0.03	0.04	0.11	0.50	0.00	0.05	80	220
G260-009	1400-1450	275	0.04	0.06	0.13	0.40	0.00	0.04	150	325
G260-010	1450-1500	226	0.01	0.00	0.15	0.01	0.00	0.03	0	500
G260-011	1500-1550	226	0.02	0.00	0.14	1.00	0.00	0.04	0	350
G260-012	1550-1600	308	0.01	0.00	0.10	0.01	0.00	0.02	0	500
G260-013	1600-1650	226	0.01	0.00	0.12	0.01	0.00	0.02	0	600
G260-014	1650-1700	338	0.00	0.00	0.10	0.00	0.00	0.02	0	500
G260-015	1700-1750	322	0.02	0.00	0.10	1.00	0.00	0.11	0	90
G260-016	1750-1800	269	0.01	0.02	0.09	0.50	0.00	0.16	12	56
G260-017	1800-1850	269	0.01	0.00	0.08	0.01	0.00	0.13	0	61
G260-019	1900-1950	445	0.02	0.02	0.12	0.50	0.00	0.11	18	109
G260-021	2000-2050	306	0.02	0.01	0.18	1.00	0.00	0.08	12	225
G260-023	2100-2150	336	0.02	0.07	0.13	0.25	0.00	0.18	38	72
G260-025	2200-2250	371	0.02	0.10	0.15	0.17	0.01	0.19	52	78
G260-027	2300-2350	301	0.01	0.02	0.07	0.50	0.00	0.10	20	70
G260-029	2400-2450	275	0.01	0.01	0.10	0.50	0.00	0.08	12	125
G260-031	2500-2550	449	0.05	0.56	0.19	0.08	0.05	0.95	58	20
G260-033	2600-2650	447	0.03	0.85	0.29	0.03	0.07	1.28	66	22
G260-035	2700-2750	452	0.03	0.19	0.21	0.14	0.01	0.29	65	72
G260-037	2800-2850	452	0.03	0.13	0.24	0.19	0.01	0.30	43	80
G260-039	2900-2950	448	0.04	0.15	0.21	0.22	0.01	0.25	60	84
G260-041	3000-3050	400	0.04	0.10	0.21	0.29	0.01	0.23	43	91
G260-043	3100-3150	409	0.04	0.15	0.21	0.22	0.01	0.25	60	84
G260-045	3200-3250	358	0.02	0.07	0.20	0.25	0.00	0.22	31	90
G260-047	3300-3350	393	0.02	0.15	0.29	0.12	0.01	0.38	39	76
G260-049	3400-3450	358	0.04	0.13	0.19	0.25	0.01	0.24	54	79

T.O.C. = Total organic carbon, wt. %
 S1 = Free hydrocarbons, mg HC/g of rock
 S2 = Residual hydrocarbon potential
 (mg HC/g of rock)
 S3 = CO₂ produced from kerogen pyrolysis
 (mg CO₂/g of rock)
 PC* = 0.083 (S₁ + S₂)

Hydrogen
 Index = mg HC/g organic carbon
 Oxygen
 Index = mg CO₂/g organic carbon
 PI = S₁/S₁+S₂
 Tmax = Temperature Index, degrees C.

TABLE III

RESULTS OF ROCK-EVAL PYROLYSIS

WEST ELEPHANT BUTTE FEDERAL 3 NO. 2
 SIERRA COUNTY, NEW MEXICO

GeoChem Sample No.	Depth Interval (Ft)	Tmax (C)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	PI	PC*	T.O.C. (wt. %)	Hydrogen Index	Oxygen Index
G260-051	3500-3550	427	0.02	0.09	0.22	0.20	0.00	0.20	45	110
G260-053	3600-3650	370	0.06	0.21	0.26	0.23	0.02	0.13	161	200
G260-054	3650-3700	358	0.06	0.13	0.22	0.33	0.01	0.16	81	137
G260-063	4100-4150	313	0.04	0.07	0.36	0.40	0.00	0.11	63	327
G260-065	4200-4250	272	0.03	0.02	0.25	0.75	0.00	0.09	22	277
G260-067	4300-4350	246	0.02	0.01	0.22	1.00	0.00	0.04	25	550
G260-069	4400-4450	247	0.03	0.01	0.31	0.75	0.00	0.04	25	775
G260-071	4500-4550	356	0.02	0.00	0.20	1.00	0.00	0.05	0	400
G260-073	4600-4650	220	0.01	0.00	0.18	0.01	0.00	0.04	0	450
G260-075	4700-4750	224	0.02	0.00	0.21	1.00	0.00	0.04	0	525
G260-077	4800-4850	274	0.01	0.00	0.25	0.01	0.00	0.06	0	416
G260-079	4900-4950	224	0.02	0.00	0.18	1.00	0.00	0.04	0	450
G260-081	5000-5050	210	0.00	0.00	0.19	0.00	0.00	0.05	0	380
G260-083	5100-5150	400	0.04	0.16	0.21	0.20	0.01	0.11	145	190
G260-085	5200-5250	395	0.02	0.01	0.20	1.00	0.00	0.29	3	68
G260-087	5300-5350	266	0.02	0.00	0.19	1.00	0.00	0.11	0	172
G360-089	5400-5450	356	0.03	0.04	0.22	0.50	0.00	0.43	9	51
G260-091	5500-5550	442	0.00	0.00	0.17	0.00	0.00	0.15	0	113
G260-093	5600-5650	427	0.02	0.08	0.18	0.20	0.00	0.23	34	78
G260-095	5700-5750	317	0.01	0.01	0.19	0.50	0.00	0.21	4	90
G260-097	5800-5850	361	0.01	0.08	0.27	0.12	0.00	0.39	20	69
G260-099	5900-5950	273	0.03	0.06	0.22	0.37	0.00	0.37	16	59
G260-101	6000-6050	313	0.01	0.04	0.18	0.25	0.00	0.40	10	45
G260-103	6100-6150	261	0.01	0.01	0.20	0.50	0.00	0.14	7	142
G260-105	6200-6250	341	0.01	0.02	0.23	0.50	0.00	0.22	9	104
G260-107	6300-6350	415	0.02	0.03	0.20	0.50	0.00	0.12	25	166
G260-109	6400-6450	321	0.02	0.02	0.18	0.50	0.00	0.23	8	78
G260-111	6500-6550	418	0.02	0.17	0.32	0.11	0.01	0.42	40	76
G260-112	6550-6600	472	0.02	0.29	0.28	0.07	0.02	0.71	40	39
G260-113	6600-6650	397	0.02	0.10	0.19	0.17	0.01	0.85	11	22
G260-114	6650-6700	320	0.01	0.03	0.26	0.25	0.00	0.14	21	185
G260-115	6700-6750	324	0.02	0.01	0.19	1.00	0.00	0.26	3	73
G260-116	6750-6800	281	0.00	0.01	0.21	0.00	0.00	0.22	4	95
G260-117	6800-6850	288	0.01	0.02	0.14	0.50	0.00	0.30	6	46
G260-118	6850-6900	391	0.01	0.01	0.30	0.50	0.00	0.21	4	142
G260-119	6900-6950	290	0.01	0.00	0.19	0.01	0.00	0.09	0	211
G260-120	6950-7000	430	0.01	0.05	0.24	0.17	0.00	0.09	55	266

T.O.C. = Total organic carbon, wt. %
 S1 = Free hydrocarbons, mg HC/g of rock
 S2 = Residual hydrocarbon potential
 (mg HC/g of rock)
 S3 = CO₂ produced from kerogen pyrolysis
 (mg CO₂/g of rock)
 PC* = 0.083 (S₁ + S₂)

Hydrogen
 Index = mg HC/g organic carbon
 Oxygen
 Index = mg CO₂/g organic carbon
 PI = S1/S1+S2
 Tmax = Temperature Index, degrees C.

TABLE III

RESULTS OF ROCK-EVAL PYROLYSIS

WEST ELEPHANT BUTTE FEDERAL 3 NO. 2
 SIERRA COUNTY, NEW MEXICO

GeoChem Sample No.	Depth Interval (Ft.)	Tmax (C)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	PI	PC*	T.O.C. (wt. %)	Hydrogen Index	Oxygen Index
G260-121	7000-7050	344	0.01	0.04	0.17	0.25	0.00	0.08	50	212
G260-122	7050-7100	290	0.00	0.01	0.17	0.00	0.00	0.06	16	283
G260-123	7100-7150	318	0.02	0.03	0.19	0.50	0.00	0.09	33	211
G260-124	7150-7200	296	0.01	0.02	0.17	0.50	0.00	0.05	40	340
G260-126	7200-7250	443	0.00	0.00	0.22	0.00	0.00	0.04	0	550
G260-127	7250-7300	367	0.00	0.01	0.20	0.00	0.00	0.07	14	285
G260-128	7300-7350	435	0.01	0.06	0.22	0.17	0.00	0.08	75	275
G260-129	7350-7400	344	0.01	0.06	0.19	0.17	0.00	0.14	42	135
G260-130	7400-7450	390	0.01	0.05	0.15	0.17	0.00	0.11	45	136

Table V

VITRINITE REFLECTANCE SUMMARY

GEOCHEM SAMPLE NUMBER	DEPTH (feet)	TYPE OF SAMPLE	POPULATION	NUMBER OF READINGS	MINIMUM REFLECTANCE (% Ro)	MAXIMUM REFLECTANCE (% Ro)	MEAN REFLECTANCE (% Ro)	STD. DEV. (% Ro)	REMARKS
G260-002	1100	CTG	NO VITRINITE						
G260-021	2050	CTG	(1)	3	0.66	0.69	0.68	0.015	INDIGENOUS
			(2)	23	0.73	1.16	1.05	0.112	REWORKED
			(3)	9	1.26	1.73	1.46	0.177	REWORKED
G260-031	2550	CTG	(1)	16	0.50	0.65	0.58	0.056	INDIGENOUS
			(2)	27	0.68	0.89	0.77	0.073	REWORKED
			(3)	17	0.93	1.20	1.03	0.091	REWORKED
G260-037	2850	CTG	(1)	14	0.50	0.64	0.56	0.043	INDIGENOUS
			(2)	27	0.67	0.86	0.76	0.056	REWORKED
			(3)	4	1.04	1.21	1.12	0.074	REWORKED
G260-043	3150	CTG	(1)	11	0.51	0.63	0.57	0.040	INDIGENOUS
			(2)	22	0.68	0.90	0.78	0.068	REWORKED
			(3)	27	0.96	1.51	1.18	0.184	REWORKED
G260-049	3450	CTG	(1)	13	0.55	0.64	0.59	0.029	INDIGENOUS
			(2)	25	0.68	0.89	0.78	0.066	REWORKED
			(3)	19	0.92	1.55	1.15	0.199	REWORKED
G260-054	3700	CTG	(1)	2	0.64	0.72	0.68	-	INDIGENOUS
			(2)	4	1.27	1.47	1.39	0.092	REWORKED
G260-067	4350	CTG	(1)	1	0.78	0.78	0.78	-	CAVED?
			(2)	1	1.35	1.35	1.35	-	INDIGENOUS?
			(3)	5	1.88	2.49	2.15	0.236	REWORKED
G260-073	4650	CTG	(1)	1	0.89	0.89	0.89	-	INDIGENOUS
			(2)	2	1.76	2.04	1.90	-	REWORKED

WEST ELEPHANT BUTTE FEDERAL 3 NO. 2
SIERRA COUNTY, NEW MEXICO

Table V

VITRINITE REFLECTANCE SUMMARY

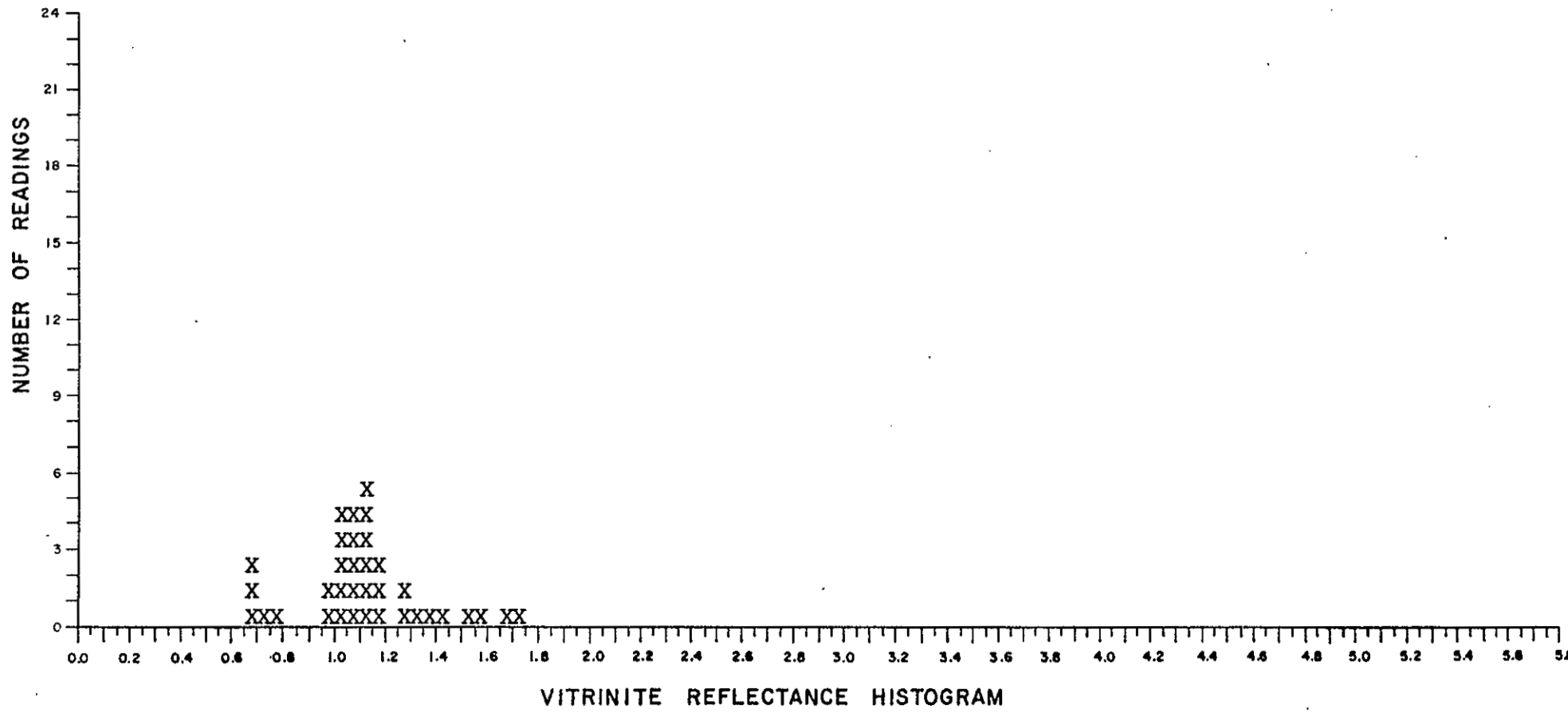
GEOCHEM SAMPLE NUMBER	DEPTH (feet)	TYPE OF SAMPLE	POPULATION	NUMBER OF READINGS	MINIMUM REFLECTANCE (% Ro)	MAXIMUM REFLECTANCE (% Ro)	MEAN REFLECTANCE (% Ro)	STD. DEV. (% Ro)	REMARKS
G260-079	4950	CTG	(1)	1	0.66	0.66	0.66	-	INDIGENOUS
G260-085	5250	CTG	(1)	4	0.48	0.56	0.52	0.033	CAVED
			(2)	3	0.86	1.09	0.97	0.116	INDIGENOUS
			(3)	53	1.25	2.55	1.97	0.349	REWORKED
G260-091	5550	CTG	(1)	2	0.51	0.52	0.52	-	CAVED
			(2)	8	1.28	1.45	1.38	0.063	INDIGENOUS
			(3)	50	1.57	2.62	2.05	0.288	REWORKED
G260-097	5850	CTG	(1)	6	1.25	1.53	1.40	0.103	INDIGENOUS
			(2)	19	1.55	1.97	1.74	0.130	REWORKED
			(3)	35	2.02	2.67	2.32	0.181	REWORKED
G260-103	6150	CTG	(1)	6	1.14	1.58	1.42	0.170	INDIGENOUS
			(2)	6	1.66	1.88	1.78	0.094	REWORKED
			(3)	48	1.95	2.70	2.34	0.207	REWORKED
G260-109	6450	CTG	(1)	5	1.17	1.34	1.25	0.068	INDIGENOUS
			(2)	10	1.69	1.93	1.80	0.088	REWORKED
			(3)	45	2.05	2.65	2.33	0.160	REWORKED
G260-111	6550	CTG	(1)	3	1.31	1.45	1.37	0.071	INDIGENOUS
			(2)	16	1.63	1.94	1.82	0.103	REWORKED
			(3)	41	2.03	2.68	2.30	0.167	REWORKED

GEOCHEM NO. G260-021 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 2050

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 35) 0.66 0.68 0.69 0.73 0.75 0.97 0.98 1.00 1.01 1.03 1.04 1.04 1.06 1.06
 1.07 1.08 1.09 1.10 1.11 1.12 1.12 1.13 1.13 1.15 1.16 1.16 1.26 1.28 1.31 1.37 1.40 1.54
 1.59 1.68 1.73

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV. (%)	REMARKS
(1)	3	0.66	0.69	0.68	0.015	
(2)	23	0.73	1.16	1.05	0.112	
(3)	9	1.26	1.73	1.46	0.177	

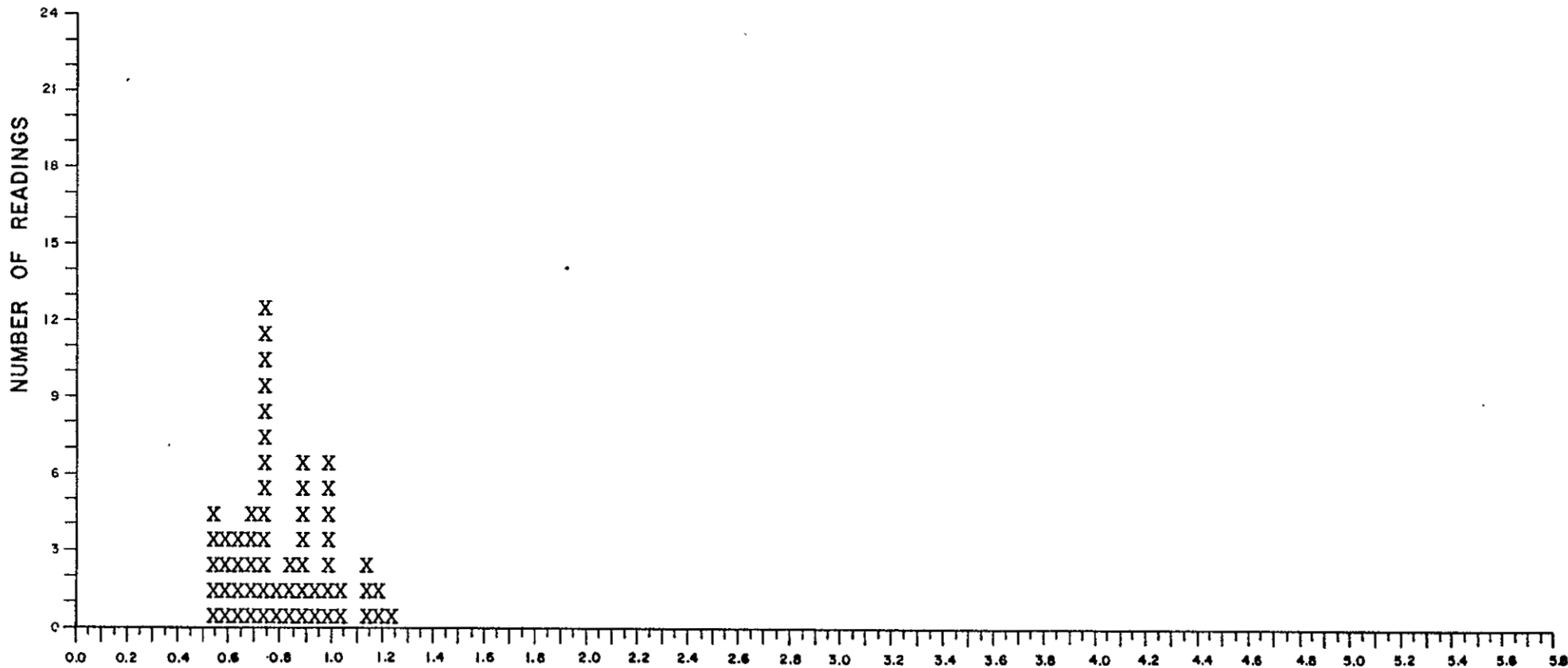


GEOCHEM NO. G260-031 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 2550

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 60) 0.50 0.50 0.51 0.52 0.54 0.55 0.56 0.57 0.59 0.61 0.62 0.63 0.64 0.65
 0.65 0.65 0.68 0.69 0.70 0.70 0.70 0.71 0.71 0.71 0.72 0.72 0.72 0.73 0.73 0.74 0.74 0.76
 0.77 0.81 0.84 0.84 0.85 0.86 0.86 0.88 0.88 0.89 0.89 0.93 0.94 0.95 0.95 0.95 0.96 0.98
 0.98 0.99 1.00 1.02 1.10 1.11 1.12 1.15 1.17 1.20

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV. (%)	REMARKS
(1)	16	0.50	0.65	0.58	0.056	
(2)	27	0.68	0.89	0.77	0.073	
(3)	17	0.93	1.20	1.03	0.091	



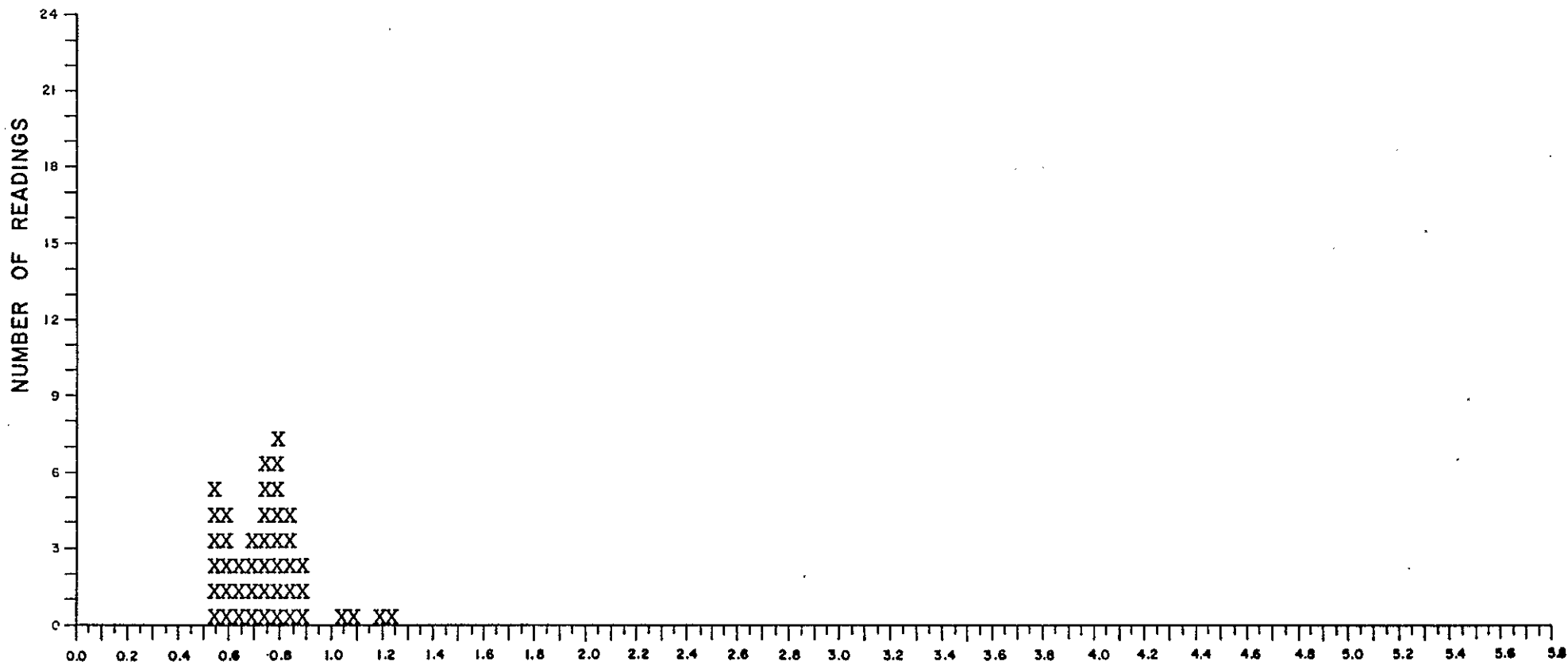
VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-037 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 2850

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 45) 0.50 0.50 0.52 0.53 0.54 0.54 0.55 0.55 0.56 0.57 0.59 0.60 0.63 0.64
 0.67 0.68 0.69 0.69 0.70 0.70 0.71 0.71 0.72 0.73 0.74 0.75 0.75 0.76 0.76 0.77 0.78 0.79
 0.79 0.80 0.80 0.81 0.82 0.83 0.85 0.85 0.86 1.04 1.09 1.15 1.21

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV. (%)	REMARKS
(1)	14	0.50	0.64	0.56	0.043	
(2)	27	0.67	0.86	0.76	0.056	
(3)	4	1.04	1.21	1.12	0.074	

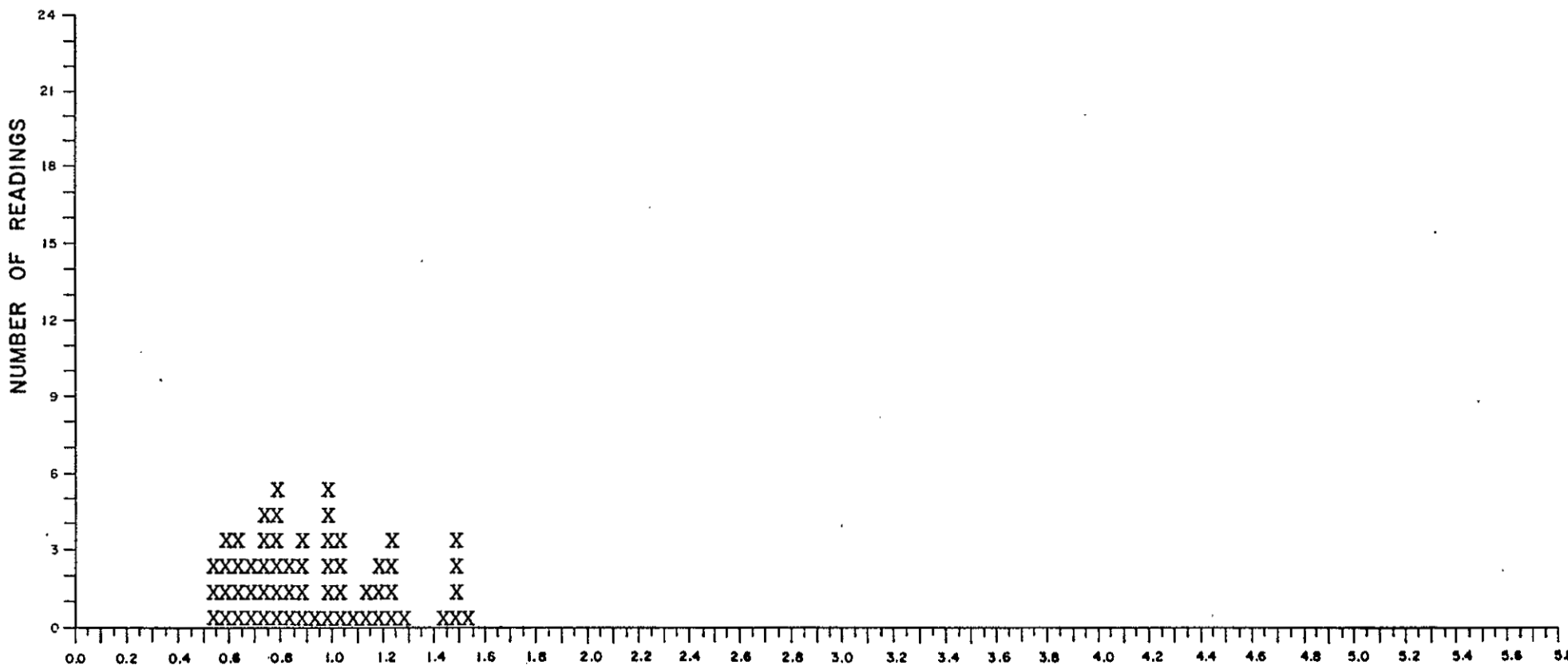


VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-043 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 3150
 CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 60) 0.51 0.51 0.54 0.56 0.58 0.59 0.59 0.60 0.60 0.61 0.63 0.68 0.69 0.69
 0.71 0.72 0.72 0.72 0.73 0.75 0.76 0.77 0.77 0.79 0.79 0.83 0.84 0.84 0.85 0.86 0.86 0.88
 0.90 0.96 0.97 0.97 0.98 0.98 0.99 1.02 1.03 1.04 1.04 1.05 1.13 1.13 1.15 1.17 1.18 1.21
 1.22 1.22 1.23 1.26 1.43 1.45 1.47 1.48 1.48 1.51

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV. (%)	REMARKS
(1)	11	0.51	0.63	0.57	0.040	
(2)	22	0.68	0.90	0.78	0.068	
(3)	27	0.96	1.51	1.18	0.184	



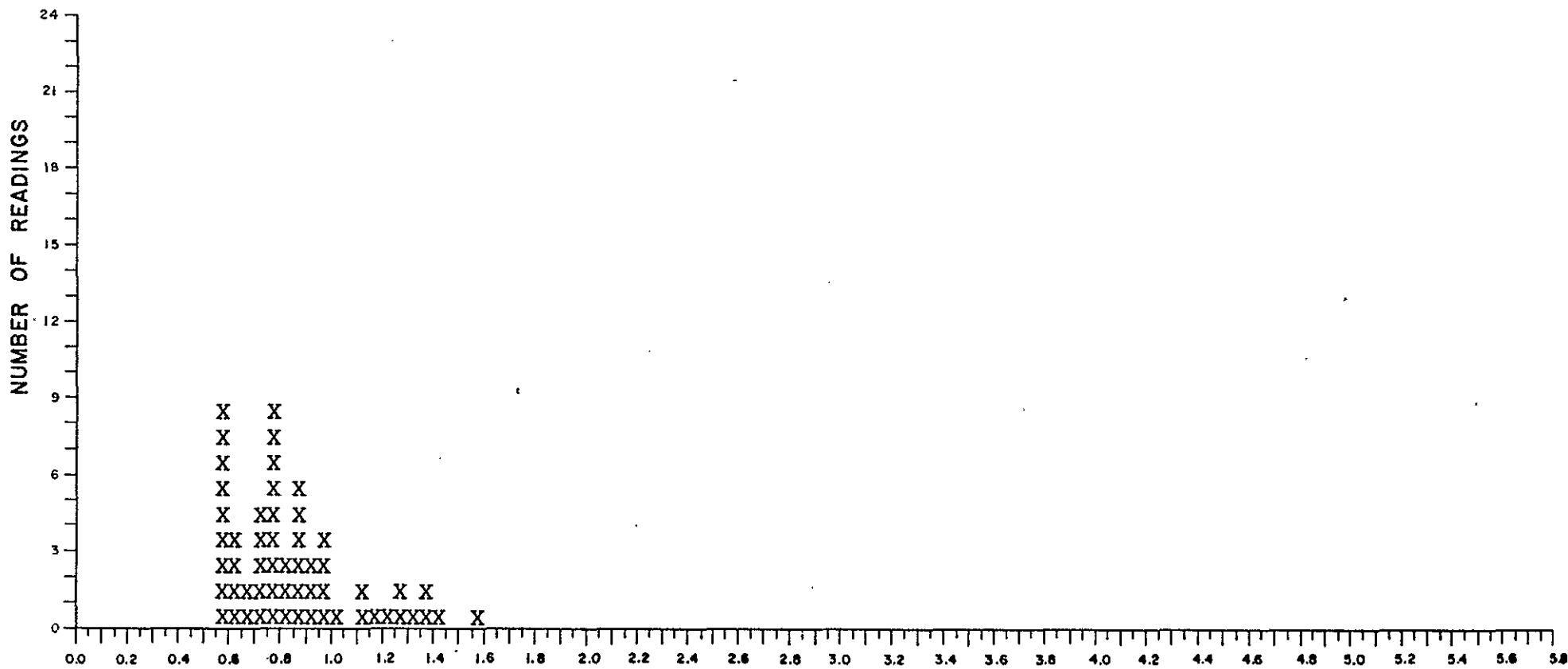
VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-049 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 3450

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 57) 0.55 0.56 0.57 0.57 0.58 0.58 0.58 0.59 0.59 0.61 0.62 0.64 0.64 0.68
 0.69 0.70 0.70 0.71 0.73 0.74 0.75 0.75 0.75 0.75 0.76 0.77 0.77 0.78 0.79 0.81 0.82 0.82
 0.86 0.87 0.87 0.88 0.88 0.89 0.92 0.93 0.94 0.95 0.95 0.96 0.97 1.00 1.10 1.11 1.15 1.24
 1.28 1.28 1.30 1.37 1.38 1.41 1.55

<u>POPULATION</u>	<u>NO. OF READINGS</u>	<u>MIN. Ro (%)</u>	<u>MAX. Ro (%)</u>	<u>MEAN Ro (%)</u>	<u>STD. DEV. (%)</u>	<u>REMARKS</u>
(1)	13	0.55	0.64	0.59	0.029	
(2)	25	0.68	0.89	0.78	0.066	
(3)	19	0.92	1.55	1.15	0.199	



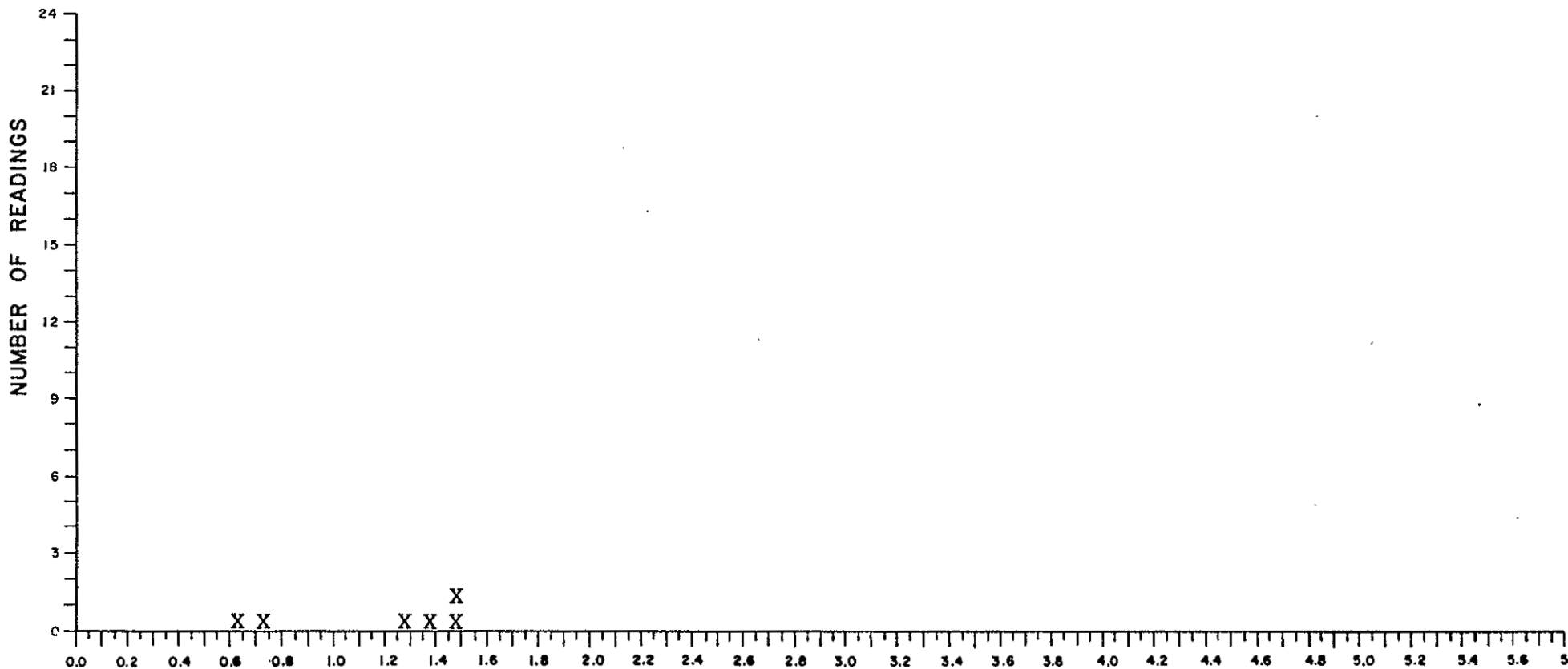
VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-054 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 3700

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 6) 0.64 0.72 1.27 1.36 1.45 1.47

<u>POPULATION</u>	<u>NO. OF READINGS</u>	<u>MIN. Ro (%)</u>	<u>MAX. Ro (%)</u>	<u>MEAN Ro (%)</u>	<u>STD. DEV. (%)</u>	<u>REMARKS</u>
(1)	2	0.64	0.72	0.68	-	
(2)	4	1.27	1.47	1.39	0.092	

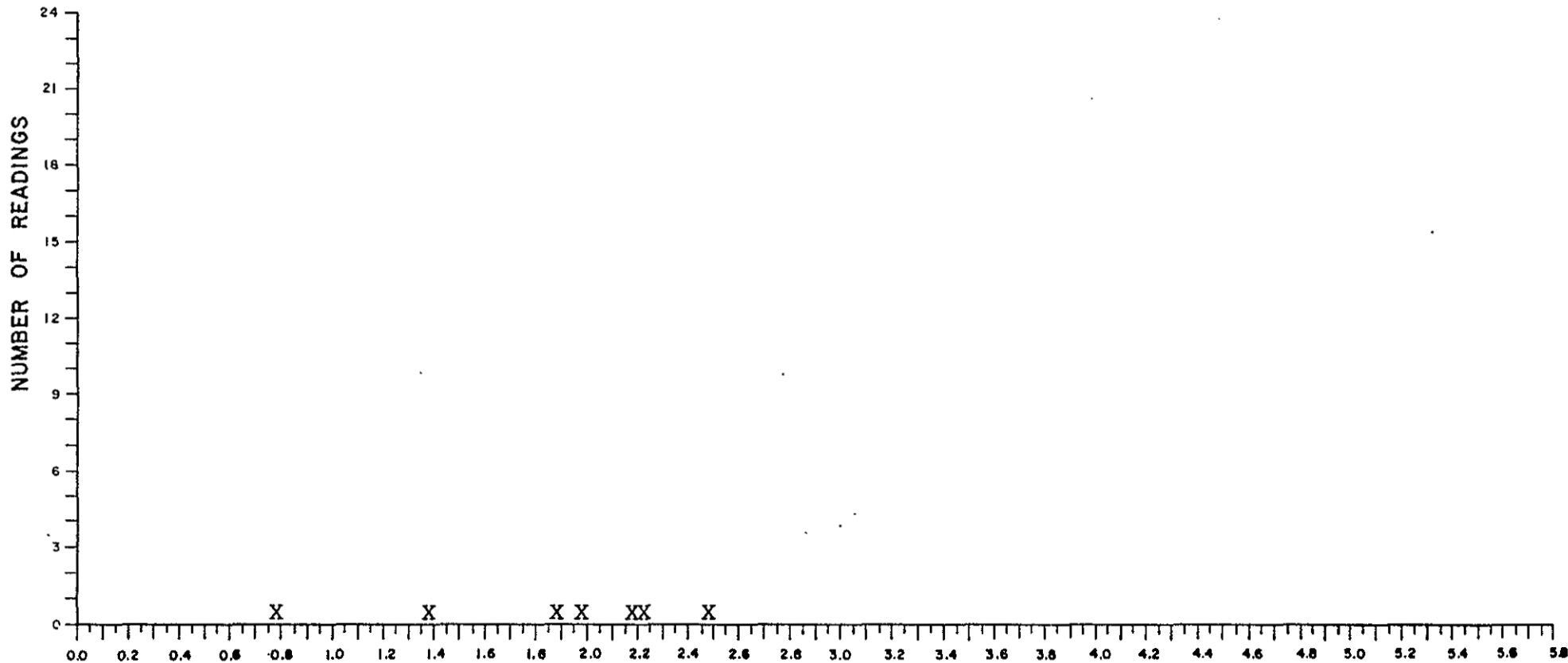


VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-067 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 4350
 CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 7) 0.78 1.35 1.88 1.98 2.16 2.22 2.49

<u>POPULATION</u>	<u>NO. OF READINGS</u>	<u>MIN. R_o (%)</u>	<u>MAX. R_o (%)</u>	<u>MEAN R_o (%)</u>	<u>STD. DEV. (%)</u>	<u>REMARKS</u>
(1)	1	0.78	0.78	0.78	-	
(2)	1	1.35	1.35	1.35	-	
(3)	5	1.88	2.49	2.15	0.236	

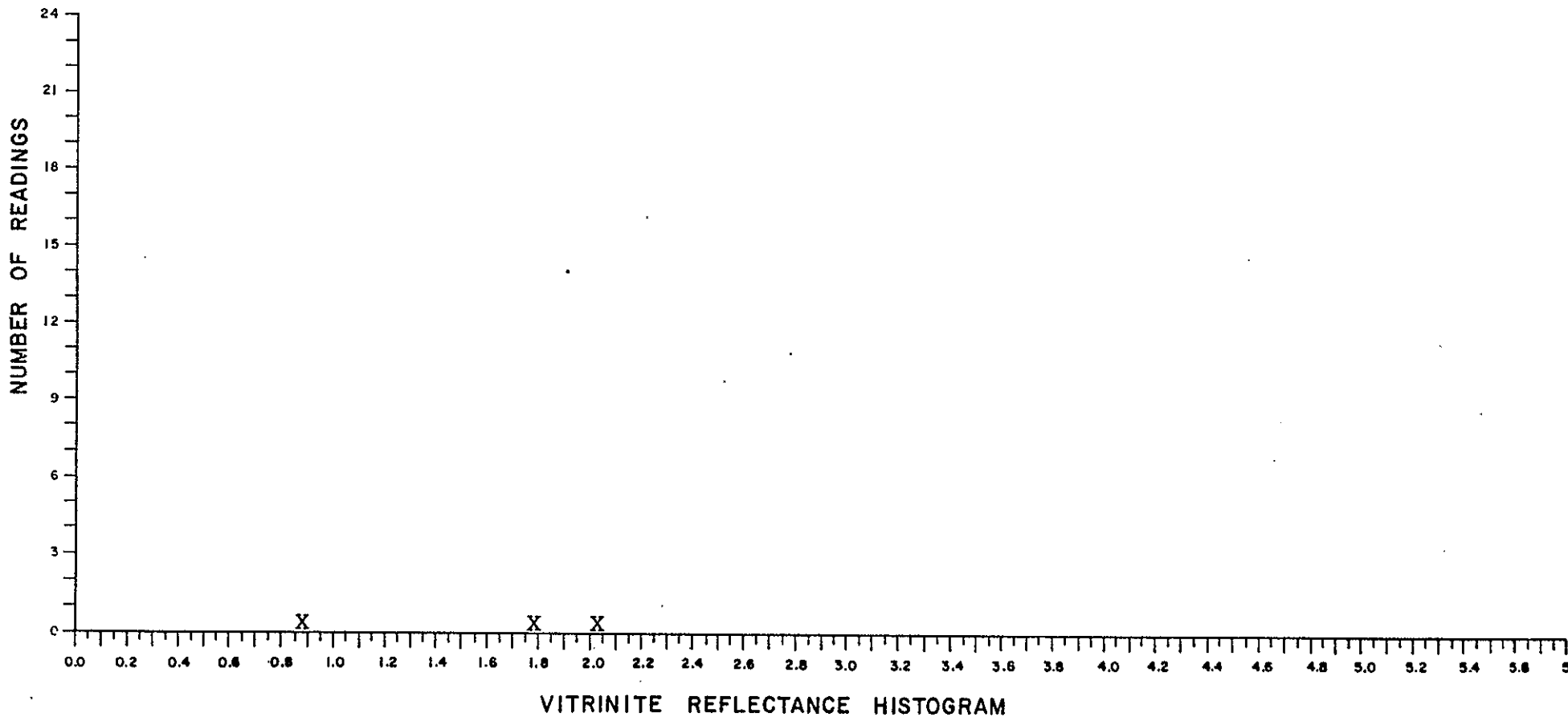


VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-073 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 4650
 CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 3) 0.89 1.76 2.04

<u>POPULATION</u>	<u>NO. OF READINGS</u>	<u>MIN. Ro (%)</u>	<u>MAX. Ro (%)</u>	<u>MEAN Ro (%)</u>	<u>STD. DEV. (%)</u>	<u>REMARKS</u>
(1)	1	0.89	0.89	0.89	-	
(2)	2	1.76	2.04	1.90	-	

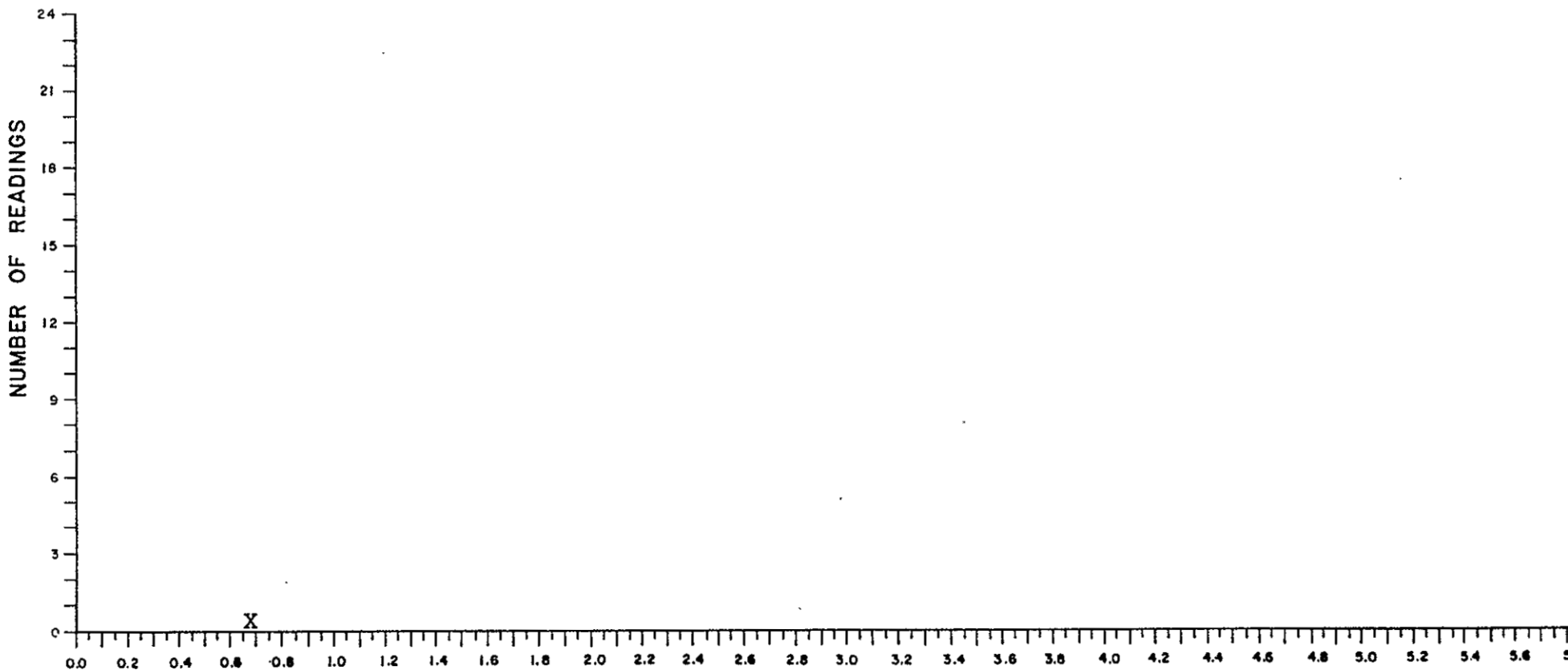


GEOCHEM NO. G260-079 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 4950

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 1) 0.66

<u>POPULATION</u>	<u>NO. OF READINGS</u>	<u>MIN. Ro (%)</u>	<u>MAX. Ro (%)</u>	<u>MEAN Ro (%)</u>	<u>STD. DEV (%)</u>	<u>REMARKS</u>
(1)	1	0.66	0.66	0.66	-	



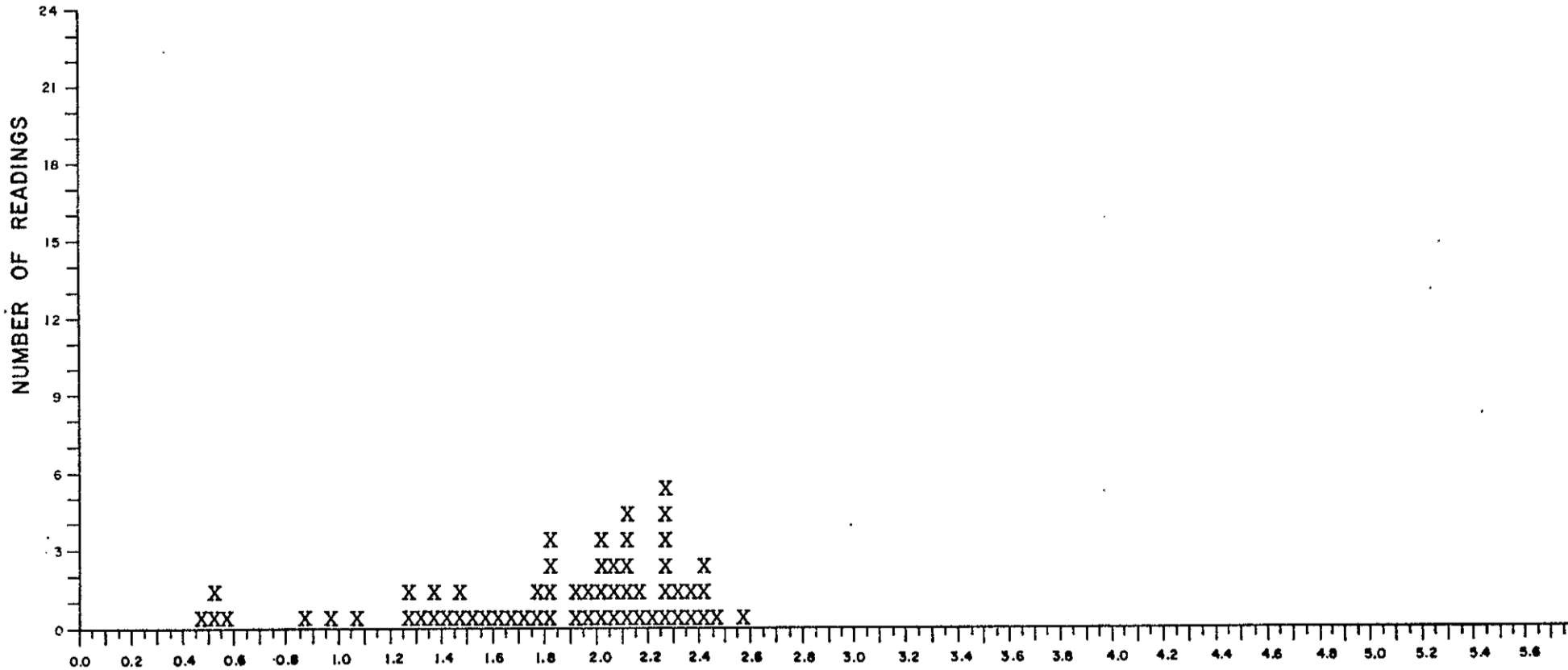
VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-085 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 5250

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 60) 0.48 0.52 0.52 0.56 0.86 0.95 1.09 1.25 1.29 1.33 1.35 1.37 1.42 1.45
 1.47 1.52 1.55 1.64 1.65 1.73 1.76 1.78 1.80 1.81 1.83 1.83 1.94 1.94 1.95 1.97 2.02 2.03
 2.03 2.04 2.06 2.08 2.09 2.10 2.10 2.13 2.13 2.14 2.15 2.16 2.21 2.25 2.25 2.26 2.27 2.27
 2.29 2.31 2.32 2.35 2.39 2.40 2.41 2.44 2.48 2.55

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV. (%)	REMARKS
(1)	4	0.48	0.56	0.52	0.033	
(2)	3	0.86	1.09	0.97	0.116	
(3)	53	1.25	2.55	1.97	0.349	

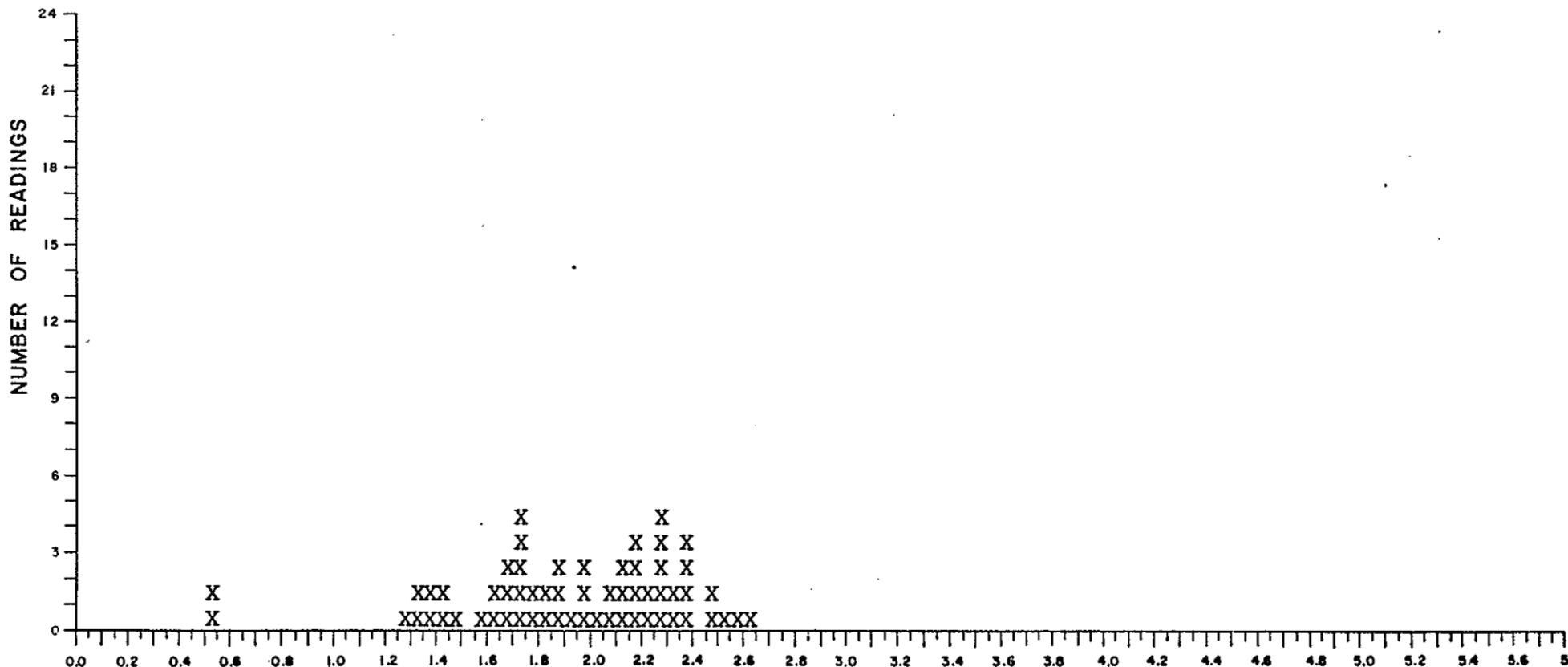


VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-091 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 5550
 CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 60) 0.51 0.52 1.28 1.31 1.34 1.39 1.39 1.43 1.44 1.45 1.57 1.62 1.64 1.66
 1.66 1.69 1.70 1.71 1.72 1.73 1.73 1.77 1.79 1.80 1.82 1.86 1.87 1.88 1.93 1.95 1.97 1.98
 2.02 2.06 2.08 2.10 2.11 2.13 2.15 2.16 2.16 2.16 2.21 2.22 2.25 2.26 2.27 2.28 2.28 2.32
 2.33 2.35 2.36 2.38 2.38 2.46 2.47 2.52 2.59 2.62

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV. (%)	REMARKS
(1)	2	0.51	0.52	0.52	-	
(2)	8	1.28	1.45	1.38	0.063	
(3)	50	1.57	2.62	2.05	0.288	



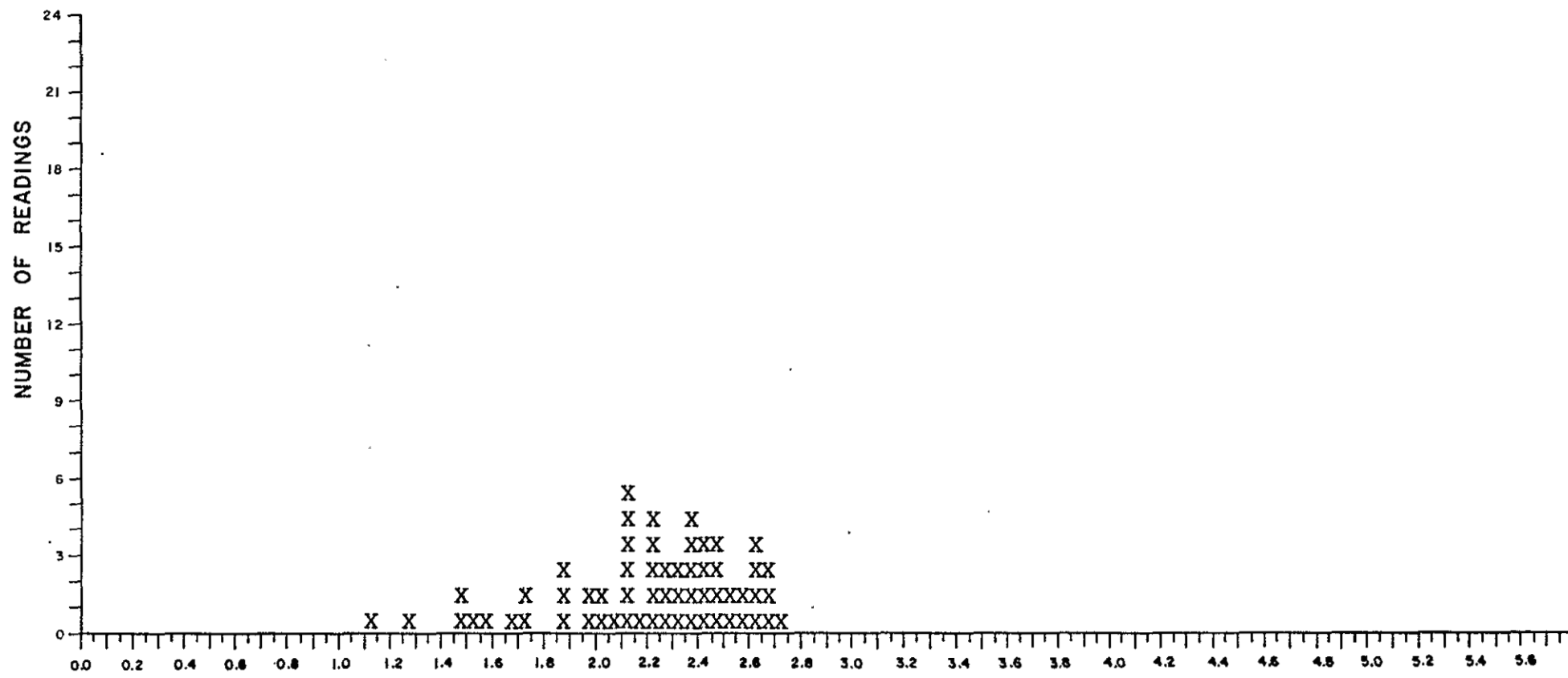
VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-103 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 6150

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 60) 1.14 1.28 1.47 1.48 1.54 1.58 1.66 1.71 1.72 1.85 1.86 1.88 1.95 1.96
 2.02 2.04 2.06 2.10 2.11 2.12 2.12 2.13 2.13 2.15 2.20 2.22 2.23 2.24 2.24 2.25 2.26 2.28
 2.30 2.31 2.33 2.35 2.37 2.38 2.39 2.39 2.40 2.42 2.43 2.43 2.46 2.46 2.48 2.49 2.50 2.53
 2.55 2.57 2.60 2.61 2.62 2.64 2.65 2.67 2.69 2.70

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV (%)	REMARKS
(1)	6	1.14	1.58	1.42	0.170	
(2)	6	1.66	1.88	1.78	0.094	
(3)	48	1.95	2.70	2.34	0.207	



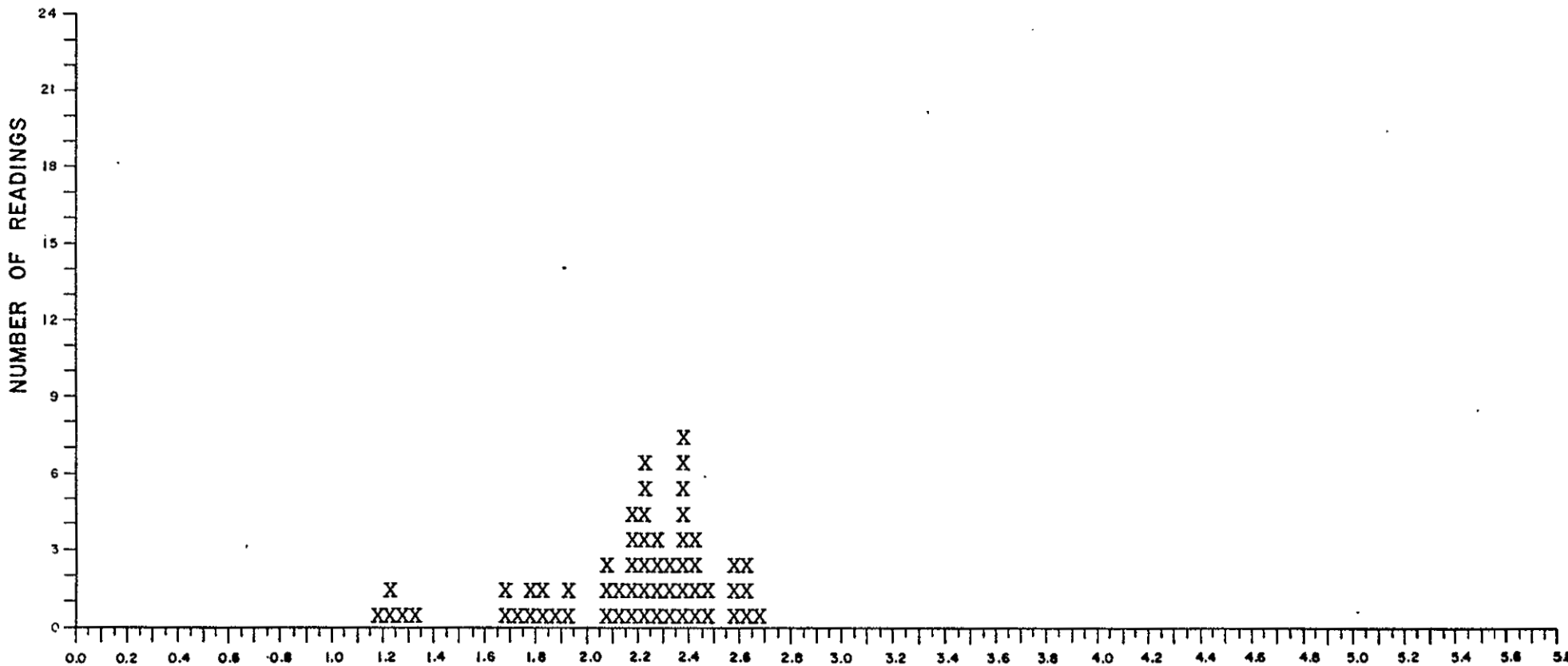
VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-109 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 6450

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 60) 1.17 1.20 1.24 1.29 1.34 1.69 1.69 1.72 1.75 1.77 1.80 1.82 1.89 1.90
 1.93 2.05 2.06 2.07 2.11 2.14 2.15 2.17 2.18 2.19 2.19 2.20 2.21 2.21 2.22 2.23 2.23 2.24
 2.25 2.26 2.28 2.28 2.31 2.32 2.34 2.35 2.35 2.36 2.37 2.37 2.38 2.38 2.39 2.40 2.42 2.43
 2.44 2.45 2.47 2.56 2.56 2.59 2.60 2.61 2.63 2.65

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV. (%)	REMARKS
(1)	5	1.17	1.34	1.25	0.068	
(2)	10	1.69	1.93	1.80	0.088	
(3)	45	2.05	2.65	2.33	0.160	



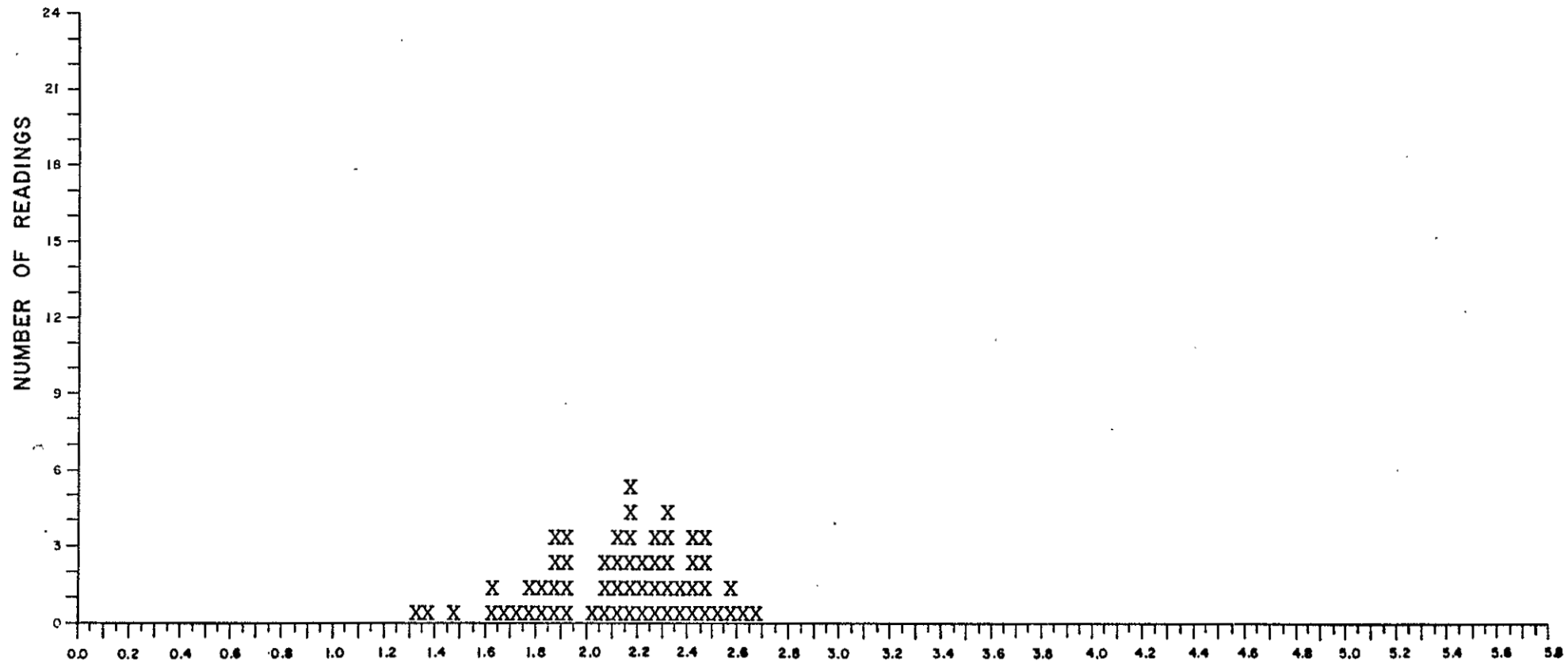
VITRINITE REFLECTANCE HISTOGRAM

GEOCHEM NO. G260-111 TYPE OF SAMPLE: CTG DEPTH/SAMPLE NO. 6550

CLIENT'S NAME GETTY OIL COMPANY WELL NAME WEST ELEPHANT BUTTE FEDERAL 3 NO. 2

(NO. OF READINGS = 60) 1.31 1.36 1.45 1.63 1.64 1.66 1.74 1.79 1.79 1.80 1.84 1.85 1.87 1.88
 1.88 1.91 1.92 1.93 1.94 2.03 2.05 2.07 2.08 2.11 2.12 2.13 2.13 2.15 2.16 2.17 2.18 2.19
 2.19 2.20 2.21 2.23 2.25 2.26 2.27 2.29 2.30 2.32 2.33 2.34 2.34 2.38 2.38 2.40 2.41 2.43
 2.44 2.46 2.46 2.47 2.48 2.53 2.56 2.56 2.62 2.68

POPULATION	NO. OF READINGS	MIN. Ro (%)	MAX. Ro (%)	MEAN Ro (%)	STD. DEV (%)	REMARKS
(1)	3	1.31	1.45	1.37	0.071	
(2)	16	1.63	1.94	1.82	0.103	
(3)	41	2.03	2.68	2.30	0.167	



VITRINITE REFLECTANCE HISTOGRAM

GETTY OIL COMPANY

WEST ELEPHANT BUTTE FEDERAL 3 NO.2

by

GEOCHEM LABORATORIES, INC.
1143-C Brittmoore Road
Houston, Texas 77043

Job No. : G260
Date: April 8, 1983
Reporting: Rudolph R. Schwarzer, Ph.D
Thomas J. Stiff, Jr.

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- A. Table of Formation Tops
- B. Simplified Flow Diagram of interpretive program
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- B. Sample by sample interpretations

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SECTION III - Data Plots (separate)

INTRODUCTION

This report on Getty Oil Company's West Elephant Butte Federal 3 No.2 Well is composed of three sections as described below.

SECTION I - Computerized Geochemical Interpretations

- A. A computerized formation by formation interpretation is using selected geochemical data that are available on all samples. The geochemical interpretation of each formation uses the following geochemical information from samples within a given formation:

- (1) sample lithology
- (2) thermal maturity (TAI)
- (3) total organic carbon content (TOC)
- (4) volatile hydrocarbon (S1 peak)
- (5) kerogen type

The formation interpretations are computed for a shale source, a carbonate source, and a sand/silt nonsource when present. The formation interpretation section is comprised of three tables:

Table I Foramtion Interpretation

Table II Formation Summary Interpretation

Table III Formation Summary of Geochemical Data

- B. A computerized sample by sample interpretation is presented using selected geochemical data that are available on all samples. The geochemical interpretation of each sample uses the following geochemical information:

- (1) sample lithology
- (2) thermal maturity (TAI)
- (3) total organic crbon content (TOC)
- (4) volatile hydrocarbon (S1 peak)
- (5) kerogen type

The sample interpretation section is composed of three tables and two figures:

Table IV	Sample Interpretation
Table V	Sample Summary Interpretation
Table VI	Sample Summary of Geochemical Data
Figure 1	Thermal Alteration Index (TAI) Maturity Profile
Figure 2	Vitrinite Reflectance (% Ro) Maturity Profile (No data; samples not run)

SECTION II

Section II consists of a series of data tables which display the original data along with all tops (formational, zone, paleontological, and seismic) inserted in proper order. The data tables included are as follows:

Table I	C1-C7 Hydrocarbon Analyses
	A. Air Space
	B. Cuttings Gas
	C. Air Space and Cuttings Gas
Table II	Summary of Organic Carbon and Visual Kerogen Analysis
Table III	(No Data)
Table IV	(No Data)
Table V	(No Data)
Table VI	Vitrinite Reflectance Summary
Table VII	Results of Rock-Eval Pyrolysis

SECTION III Data Plots (separate)

- A. A series of large computer generated diagrams of the geochemical data plotted in well profile format is provided. The sample lithology and formational tops are presented in every plot. The diagrams are labeled as follows:

Figure 1 Summary of Organic Analyses - C1-C7 Hydrocarbons

Figure 2 Summary of Organic Analysis - C4-C7 Hydrocarbons
(no data)

Figure 3 Summary of Organic Analyses - Source Character

Figure 4 C15+ Paraffin-Naphthene Gas Chromatograms (reduced)/
with lithology diagram (no data)

Figure 5 Thermal Maturity Profiles

Figure 6 Summary of Pyrolysis Analyses

Figure 7B Tissot Diagram - Hydrogen Index vs. Oxygen Index

- B. Other Computer Generated Plots

1. GEOCHEM LOG

2. Cross Sections displaying the geochemical data

TABLE OF FORMATION TOPS

<u>DEPTH (Feet)</u>	<u>FORMATION</u>
25	Tertiary
1300	Cretaceous
2677	Permian
5156	Pennsylvanian
6528	Mississippian
6662	Ordovician
7334	Cambrian
7462	Precambrian
7556	T.D.

Simplified Flow Diagram

STEP I/DATA INPUT

- | | |
|---------------------------|---------------------------------------|
| 1. Sample ID | 1. Volatile hydrocarbon (S1) |
| 2. Depth | 2. Generated hydrocarbon (S2) |
| 3. Lithology | 3. Temperature (°C) of S2 peak (TMAX) |
| a. % Sandstone (Ss) | b. Total organic carbon (TOC) |
| b. % Siltstone (St) | c. Kerogen type |
| c. % Shale (Sh) | 1. % Amorphous (Am) |
| d. % Carbonate (Cb) | 2. % Herbaceous (H) |
| e. % Evaporite (E) | 3. % Woody (W) |
| f. % Coal (C) | 4. % Coaly (C) |
| g. % Other (Ot) | d. Thermal maturity indicators |
| h. % Metamorphic (M) | 1. Thermal alteration index (TAI) |
| 4. Geochemical parameters | 2. Vitrinite reflectance (%Ro) |
| a. Pyrolysis data | |

Output

Formations:
Table III
Samples:
Table VI
Fig. 1
Fig. 2

STEP II/LITHOLOGY CHECK

If the sample is uninterpretable because it contains coal, mud additives, or metamorphics, a statement is printed to that effect. If a significant portion of the sample is composed of "other" lithologies, the interpretation is referred to a footnote. If the sample is composed of 60% or more of either source rocks (shale and/or carbonate) or nonsource rocks (siltstones and/or sandstones) the sample is interpreted in Step III below.

STEP III/INTERPRETATION PROCEDURES

Interpretations are based on the following parameters:

- | | |
|-------------------------------|------------------------------|
| 1. Lithology | 4. Volatile hydrocarbon (S1) |
| 2. Thermal maturity using TAI | 5. Kerogen type |
| 3. Total organic carbon (TOC) | |

If a particular sample lacks only a TAI value, a TAI value is taken from a three term moving average curve (Figure 1). The descriptive terminology used relative to the parameter values is given below.

Output

Formations
Table I
Table II
Samples
Table IV
Table V

INTERPRETIVE DESCRIPTIVE TERMINOLOGY

Thermal Alteration Index (TAI)

<u>Value</u>	<u>Descriptive Terminology</u>
1.0 - 1.7	Immature
1.8 - 2.1	Moderately Immature
2.2 - 2.5	Moderately Mature
2.6 - 3.5	Mature
3.6 - 4.1	Very Mature
4.2 - 4.9	Severely Altered
<u>> 5.0</u>	Metamorphosed

<u>Value</u>	<u>Associated Hydrocarbon Type</u>
1.3 - 1.5	Biogenic Gas
1.5 - 2.2	Biogenic Gas and Immature Oil
2.2 - 2.5	Immature Heavy Oil
2.5 - 3.2	Mature Oil
3.2 - 3.4	Mature Oil, Condensate, and Wet Gas
3.4 - 3.8	Condensate and Wet Gas
<u>> 3.8</u>	Petrogenic Methane Gas

Total Organic Carbon (TOC)

<u>Value in %</u>	<u>Descriptive Terminology</u>	
	<u>Shale</u>	<u>Carbonate</u>
<u>< 0.12</u>	Poor	Poor
0.13 - 0.25	Poor	Fair
0.26 - 0.50	Poor	Good
0.51 - 1.00	Fair	Very Good
1.01 - 2.00	Good	Excellent
2.01 - 4.00	Very Good	Excellent
<u>> 4.00</u>	Excellent	Excellent

Volatile Hydrocarbon (S1)

<u>Value in ppm</u>	<u>Descriptive Terminology</u>
<u>< 200</u>	Very Poor
201 - 400	Poor
401 - 800	Fair
801 - 1600	Good
1601 - 3200	Very Good
<u>> 3200</u>	Excellent

Kerogen Oil/Gas Factor

$$\% \text{ Oil} = (\% \text{ Am}) + 0.6 (\% \text{ H}) + 0.3 (\% \text{ W}) + 0.1 (\% \text{ C})$$

$$\% \text{ Gas} = 100 - \% \text{ Oil}$$

Vitrinite Reflectance (% Ro)

<u>Value</u>	<u>Descriptive Terminology</u>
0.0 - 0.42	Immature
0.43 - 0.55	Moderately Immature
0.56 - 0.80	Moderately Mature
0.81 - 1.62	Mature
1.63 - 2.37	Very Mature
2.38 - 4.50	Severely Altered
> 4.50	Metamorphosed

<u>Value</u>	<u>Associated Hydrocarbon Type</u>
0.30 - 0.35	Biogenic Gas
0.35 - 0.60	Biogenic Gas and Immature Oil
0.60 - 0.80	Immature Heavy Oil
0.80 - 1.20	Mature Oil
1.20 - 1.50	Mature Oil, Condensate and Wet Gas
1.50 - 2.00	Condensate and Wet Gas
<u>> 2.00</u>	Petrogenic Methane Gas

TABLE I

FORMATION INTERPRETATION

This table gives a formation by formation interpretation based on the following parameters:

- (1) Lithology
- (2) Thermal alteration index (TAI)
- (3) Total organic carbon (TOC)
- (4) Volatile hydrocarbon (S1)
- (5) Kerogen type

If a TAI value is lacking for an otherwise interpretable sample, a TAI value is taken from a three term moving average plot of all the TAI data for this well (see Figure 1).

The kerogen type oil/gas factor expressed as a percentage should be used as a modifier to the interpretation; i.e., a high oil factor will enhance the oil quality of the sample whereas correspondingly, a high gas factor will enhance the gas ratio of the sample and diminish the oil prospectiveness.

JOB NUMBER: 6250
WELL NAME: WEB FEDRL 3 NO. 2

FORMATION INTERPRETATION*

GEOCHEM SAMPLE NUMBER***	DEPTH	INTERPRETATION
	25	----- TOP OF TERTIARY -----
01SH	25- 1300	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 83% GAS TYPE 17%
	1300	----- TOP OF CRETACEOUS -----
02SH	1300- 2677	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 56% GAS TYPE 44%
	2677	----- TOP OF PERMIAN -----
03SH	2677- 5156	SHALE , MATURE NONSOURCE FOR OIL AND ASSOCIATED GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 65% GAS TYPE 35%
03CB	2677- 5156	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - GOOD POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 70% GAS TYPE 30%
03NS	2677- 5156	SAND NONSOURCE - NO EVIDENCE OF RESERVOIRED HYDROCARBON KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 57% GAS TYPE 43%
	5156	----- TOP OF PENNSYLVANIAN -----
04SH	5156- 6528	SHALE , MODERATELY MATURE POOR SOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 51% GAS TYPE 49%
04CB	5156- 6528	CARB , MODERATELY MATURE POOR TO FAIR IMMATURE OIL AND ASSOCIATED GAS SOURCE KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 58% GAS TYPE 42%
	6528	----- TOP OF MISSISSIPPIAN -----
	6662	----- TOP OF ORDOVICIAN -----
	7334	----- TOP OF CAMBRIAN -----

* Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** All footnotes typed on separate sheets.

*** Sample Type: CB-Carbonate Source, SH-Shale Source, NS-Sand/Silt Non-Source.

TABLE II

FORMATION SUMMARY INTERPRETATION

This table gives a formation by formation interpretation of each parameter used in Table I. The descriptive terminology used for each parameter is listed in the introduction.

JOB NUMBER: 0260
 WELL NAME: WEB FEDRL 3 NO. 2

FORMATION SUMMARY INTERPRETATION*

GEOCHEM SAMPLE NUMBER****	DEPTH	LITHOLOGY	THERMAL*** TAI MATURITY	XRO	TOC RICHNESS	HC RICHNESS	PRODUCTIVITY INDEX	% OIL FACTOR	% GAS FACTOR
	25	----- TOP OF TERTIARY -----							
01SH	25- 1300	SHALE	MM		POOR	VERY POOR	0.80	83	17
	1300	----- TOP OF CRETACEOUS -----							
02SH	1300- 2677	SHALE	MI	MM	POOR	VERY POOR	0.17	56	44
	2677	----- TOP OF PERMIAN -----							
03SH	2677- 5156	SHALE	M	M	POOR	VERY POOR	0.46	65	35
03CB	2677- 5156	CARB	MI	MM	GOOD	VERY POOR	0.21	70	30
03NS	2677- 5156	SAND	MM	M	POOR	VERY POOR	0.30	57	43
	5156	----- TOP OF PENNSYLVANIAN -----							
04SH	5156- 6528	SHALE	MM	M	POOR	VERY POOR	0.67	51	49
04CB	5156- 6528	CARB	MM	M	GOOD	VERY POOR	0.57	58	42
	6528	----- TOP OF MISSISSIPPIAN -----							
	6662	----- TOP OF ORDOVICIAN -----							
	7334	----- TOP OF CAMBRIAN -----							

*Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** Value taken from a 3 term running average for all values of this parameter.

*** Thermal Maturity Abbreviations: I=Immature, MI=Moderately Immature, MM=Moderately Mature, M=Mature, VM=Very Mature, SA=Severely Altered, MT=Metamorphosed.

**** Sample Type: CB-Carbonate Source, SH-Shale Source, NS-Sand/Silt Non-Source.

***** All footnotes typed on separate sheets.

TABLE III

FORMATION SUMMARY OF GEOCHEMICAL DATA

This table gives a formation by formation listing of the data used in the computerized interpretations. The information given for each formation is as follows:

- | | |
|-------------------------------------|--|
| (1) Sample number | (7) Total organic carbon (TOC, %) |
| (2) Depth | (8) Kerogen composition (amorphous (Am), herbaceous (H), woody (W), and coaly (C)) |
| (3) Lithology | (9) Thermal alteration index (TAI) |
| (4) Volatile hydrocarbon (S1, ppm) | (10) Vitrinite reflectance (%Ro) |
| (5) Generated hydrocarbon (S2, ppm) | |
| (6) Maximum temperature of S2 peak | |

JOB NUMBER: G260
 WELL NAME: HEB FEDRL 3 NO. 2

TABLE III
 FORMATION SUMMARY OF GEOCHEMICAL DATA

FORMATION NAME: TERTIARY (25- 1300)

SEDIMENT FACIES (NO/ %)*	PYROLYSIS DATA (PPM)				TOC	MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR	
	S1	S2	S3	TMAX		TAI**	%R0**	%A	%H	%W	%C			
SHALE SOURCE (5/100)														
AVG	16.	4.	122.	268	0.04	2.2	----	75	0	25	0	83	17	
MIN	10.	0.	100.	172	0.03	2.2	----							
MAX	20.	10.	150.	444	0.05	2.2	----							

CARBONATE SOURCE NOT PRESENT IN THIS FORMATION

SAND-SILT NON-SOURCE NOT PRESENT IN THIS FORMATION

FORMATION NAME: CRETACEOUS (1300- 2677)

SEDIMENT FACIES (NO/ %)*	PYROLYSIS DATA (PPM)				TOC	MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR
	S1	S2	S3	TMAX		TAI**	%R0**	%A	%H	%W	%C		
SHALE SOURCE (18/100)													
AVG	21.	101.	131.	314	0.21	2.1	0.63	23	33	45	0	56	44
MIN	0.	0.	70.	226	0.02	2.1	0.57						
MAX	50.	850.	290.	449	1.28	2.2	0.68						

CARBONATE SOURCE NOT PRESENT IN THIS FORMATION

SAND-SILT NON-SOURCE NOT PRESENT IN THIS FORMATION

FORMATION NAME: PERMIAN (2677- 5156)

SEDIMENT FACIES (NO/ %)*	PYROLYSIS DATA (PPM)				TOC	MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR
	S1	S2	S3	TMAX		TAI**	%R0**	%A	%H	%W	%C		
SHALE SOURCE (8/ 38)													
AVG	21.	25.	228.	262	0.06	2.6	0.96	25	59	17	0	65	35
MIN	0.	0.	180.	210	0.04	2.3	0.66						
MAX	40.	160.	310.	400	0.11	3.0	1.35						

* Number of samples and percent occurrence in this Formation.

** Value taken from a 3 term smoothing for all values for this parameter.

*** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite.

FORMATION SUMMARY OF GEOCHEMICAL DATA

FORMATION NAME: PERMIAN (2677- 5156)

SEDIMENT FACIES (NO/ %)*	PYROLYSIS DATA (PPM)					MATURITY		KEROGEN				%OIL FACTOR	%GAS FACTOR	
	S1	S2	S3	TMAX	TOC	TAI**	XR0**	%A	%H	%H	%C			
CARBONATE SOURCE (10/ 48)														
AVG	34.	129.	220.	405	0.26	2.1	0.59	42	36	22	0	70	30	
MIN	20.	70.	190.	358	0.16	2.1	0.56							
MAX	60.	190.	290.	452	0.38	2.3	0.68							
SAND-SILT NON-SOURCE (3/ 14)														
AVG	30.	70.	213.	315	0.07	2.4	0.89	17	50	33	0	57	43	
MIN	10.	0.	180.	220	0.04	2.2	0.63							
MAX	60.	210.	260.	370	0.13	2.7	1.12							

FORMATION NAME: PENNSYLVANIAN (5156- 6528)

SEDIMENT FACIES (NO/ %)*	PYROLYSIS DATA (PPM)					MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR	
	S1	S2	S3	TMAX	TOC	TAI**	XR0**	%A	%H	%H	%C			
SHALE SOURCE (1/ 7)														
AVG	20.	10.	200.	395	0.30	2.5	0.98	13	38	50	0	51	49	
MIN	20.	10.	200.	395	0.29	2.5	0.97							
MAX	20.	10.	200.	395	0.29	2.5	0.97							
CARBONATE SOURCE (13/ 93)														
AVG	17.	13.	193.	354	0.27	2.5	1.35	20	47	34	0	58	42	
MIN	0.	0.	170.	266	0.10	2.5	1.17							
MAX	30.	40.	220.	442	0.43	2.6	1.42							

SAND-SILT NON-SOURCE NOT PRESENT IN THIS FORMATION

* Number of samples and percent occurrence in this Formation.
 ** Value taken from a 3 term smoothing for all values for this parameter.
 *** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite.

FORMATION NAME: MISSISSIPPIAN (6528- 6662)

SEDIMENT FACIES	(NO/ %)*	PYROLYSIS DATA (PPM)				TOC	MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR
		S1	S2	S3	TMAX		TAI**	%R0**	%A	%H	%W	%C		
SHALE SOURCE	(2/ 67)	-----	-----	-----	---	0.78	2.6	1.31	---	---	---	---	---	---
AVG		-----	-----	-----	---	0.71	2.6	1.31						
MIN		-----	-----	-----	---	0.84	2.6	1.31						
MAX		-----	-----	-----	---									
CARBONATE SOURCE	(1/ 33)	-----	-----	-----	---	0.15	3.0	1.37	---	---	---	---	---	---
AVG		-----	-----	-----	---	0.14	3.0	1.37						
MIN		-----	-----	-----	---	0.14	3.0	1.37						
MAX		-----	-----	-----	---									

SAND-SILT NON-SOURCE NOT PRESENT IN THIS FORMATION

FORMATION NAME: ORDOVICIAN (6662- 7334)

SEDIMENT FACIES	(NO/ %)*	PYROLYSIS DATA (PPM)				TOC	MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR
		S1	S2	S3	TMAX		TAI**	%R0**	%A	%H	%W	%C		
SHALE SOURCE	NOT PRESENT IN THIS FORMATION													
CARBONATE SOURCE	(12/100)	-----	-----	-----	---	0.12	3.1	1.37	---	---	---	---	---	---
AVG		-----	-----	-----	---	0.04	3.0	1.37						
MIN		-----	-----	-----	---	0.30	3.1	1.37						
MAX		-----	-----	-----	---									

SAND-SILT NON-SOURCE NOT PRESENT IN THIS FORMATION

* Number of samples and percent occurrence in this Formation.

** Value taken from a 3 term smoothing for all values for this parameter.

*** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite.

FORMATION NAME: CAMBRIAN (7334- 7462)

SEDIMENT FACIES	(NO/ %)*	PYROLYSIS DATA (PPM)				TOC	MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR
		S1	S2	S3	TMAX		TAI**	%R0**	%A	%H	%W	%C		
SHALE SOURCE	NOT PRESENT IN THIS FORMATION													
CARBONATE SOURCE	(1/100)													
AVG		-----	-----	-----	---	0.15	3.1	1.37	---	---	---	---	---	---
MIN		-----	-----	-----	---	0.14	3.1	1.37						
MAX		-----	-----	-----	---	0.14	3.1	1.37						
SAND-SILT NON-SOURCE	NOT PRESENT IN THIS FORMATION													

FORMATION NAME: PRE-CAMBRIAN (7462- 7556)

SEDIMENT FACIES	(NO/ %)*	PYROLYSIS DATA (PPM)				TOC	MATURITY		KEROGEN TYPE ***				%OIL FACTOR	%GAS FACTOR
		S1	S2	S3	TMAX		TAI**	%R0**	%A	%H	%W	%C		
SHALE SOURCE	NOT PRESENT IN THIS FORMATION													
CARBONATE SOURCE	NOT PRESENT IN THIS FORMATION													
SAND-SILT NON-SOURCE	NOT PRESENT IN THIS FORMATION													

* Number of samples and percent occurrence in this Formation.
 ** Value taken from a 3 term smoothing for all values for this parameter.
 *** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite.

TABLE IV

SAMPLE INTERPRETATION

This table gives a sample by sample interpretation based on the following parameters:

- (1) Lithology
- (2) Thermal alteration index (TAI)
- (3) Total organic carbon (TOC)
- (4) Volatile hydrocarbon (S1)
- (5) Kerogen type

If a TAI value is lacking for an otherwise interpretable sample, a TAI value is taken from a three term moving average plot of all the TAI data for this well (see Figure 1).

The kerogen type oil/gas factor expressed as a percentage should be used as a modifier to the interpretation; i.e., a high oil factor will enhance the oil quality of the sample whereas correspondingly, a high gas factor will enhance the gas ratio of the sample and diminish the oil prospectiveness.

JOB NUMBER: G260
WELL NAME: HEB FEDRL 3 NO. 2

TABLE IV
SAMPLE INTERPRETATION*

GEOCHEM SAMPLE NUMBER***	DEPTH	INTERPRETATION
	25	----- TOP OF TERTIARY -----
002	1050- 1100	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 83% GAS TYPE 17%
003	1100- 1150	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
004	1150- 1200	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
005	1200- 1250	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
006	1250- 1300	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
	1300	----- TOP OF CRETACEOUS -----
007	1300- 1350	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
008	1350- 1400	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
009	1400- 1450	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
010	1450- 1500	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
011	1500- 1550	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE

* Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** All footnotes typed on separate sheets.

*** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.

GEOCHEM SAMPLE NUMBER***	DEPTH	INTERPRETATION
012	1550- 1600	MIXED SOURCE/NONSOURCE LITHO
013	1600- 1650	MIXED SOURCE/NONSOURCE LITHO
014	1650- 1700	MIXED SOURCE/NONSOURCE LITHO
015	1700- 1750	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
016	1750- 1800	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
017	1800- 1850	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
019	1900- 1950	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
021	2000- 2050	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 55% GAS TYPE 45%
023	2100- 2150	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
025	2200- 2250	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
027	2300- 2350	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
029	2400- 2450	SHALE , MODERATELY IMMATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE

* Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** All footnotes typed on separate sheets.

*** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.

GEOCHEM

SAMPLE
 NUMBER*** DEPTH INTERPRETATION

031	2500- 2550	SHALE , MODERATELY IMMATURE FAIR BIOGENIC GAS SOURCE - FAIR POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 56% GAS TYPE 44%
033	2600- 2650	SHALE , MODERATELY IMMATURE GOOD BIOGENIC GAS SOURCE - GOOD POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
	2677	----- TOP OF PERMIAN -----
035	2700- 2750	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - GOOD POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
037	2800- 2850	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - GOOD POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 73% GAS TYPE 27%
039	2900- 2950	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - FAIR POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
041	3000- 3050	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - FAIR POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
043	3100- 3150	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - FAIR POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 70% GAS TYPE 30%
045	3200- 3250	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - FAIR POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
047	3300- 3350	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - GOOD POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
049	3400- 3450	CARB , MODERATELY IMMATURE POOR BIOGENIC GAS SOURCE - FAIR POTENTIAL FOR OIL AND GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 63% GAS TYPE 37%
051	3500- 3550	CARB , MODERATELY MATURE POOR IMMATURE OIL AND ASSOCIATED GAS SOURCE KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE

* Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** All footnotes typed on separate sheets.

*** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.

GEOCHEM SAMPLE NUMBER***	DEPTH	INTERPRETATION
053	3600- 3650	SILT NONSOURCE - NO EVIDENCE OF RESERVOIRED HYDROCARBON KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
054	3650- 3700	CARB , MODERATELY MATURE POOR IMMATURE OIL AND ASSOCIATED GAS SOURCE KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 74% GAS TYPE 26%
063	4100- 4150	MIXED SOURCE/NONSOURCE LITHO
065	4200- 4250	SHALE , MATURE NONSOURCE FOR OIL AND ASSOCIATED GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
067	4300- 4350	SHALE , MATURE NONSOURCE FOR OIL AND ASSOCIATED GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 62% GAS TYPE 38%
069	4400- 4450	SHALE , MATURE NONSOURCE FOR OIL AND ASSOCIATED GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
071	4500- 4550	SILT NONSOURCE - NO EVIDENCE OF RESERVOIRED OIL KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
073	4600- 4650	SILT NONSOURCE - NO EVIDENCE OF RESERVOIRED HYDROCARBON KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 57% GAS TYPE 43%
075	4700- 4750	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
077	4800- 4850	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
079	4900- 4950	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 67% GAS TYPE 33%
081	5000- 5050	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
083	5100- 5150	SHALE , MODERATELY MATURE NONSOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE

* Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** All footnotes typed on separate sheets.

*** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.

GEOCHEM SAMPLE NUMBER***	DEPTH	INTERPRETATION
	5156	----- TOP OF PENNSYLVANIAN -----
085	5200- 5250	SHALE , MODERATELY MATURE POOR SOURCE FOR OIL/ASSOCIATED GAS OR BIOGENIC GAS KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 51% GAS TYPE 49%
087	5300- 5350	CARB , MODERATELY MATURE VERY POOR IMMATURE OIL AND ASSOCIATED GAS SOURCE KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
089	5400- 5450	CARB , MODERATELY MATURE POOR TO FAIR IMMATURE OIL AND ASSOCIATED GAS SOURCE KEROGEN TYPE OIL/GAS FACTOR NOT AVAILABLE
091	5500- 5550	CARB , MODERATELY MATURE POOR IMMATURE OIL AND ASSOCIATED GAS SOURCE KEROGEN TYPE OIL/GAS FACTOR: OIL TYPE 55% GAS TYPE 45%
	6528	----- TOP OF MISSISSIPPIAN -----
	6662	----- TOP OF ORDOVICIAN -----
	7334	----- TOP OF CAMBRIAN -----
	7462	----- TOP OF PRE-CAMBRIAN -----

* Rating parameters as defined in GeoChem's Source Rock Reference Manual.
 ** All footnotes typed on separate sheets.
 *** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.

TABLE V

SAMPLE SUMMARY INTERPRETATION

This table gives a sample by sample interpretation of each parameter used in Table IV. The descriptive terminology used for each parameter is listed in the introduction.

GEOCHEM SAMPLE NUMBER*****	DEPTH	LITHOLOGY	THERMAL*** TAI MATURITY	%R0	TOC RICHNESS	HC RICHNESS	PRODUCTIVITY INDEX	% OIL FACTOR	% GAS FACTOR
----- TOP OF TERTIARY -----									
	25								
002	1050- 1100	SHALE	MM		POOR	VERY POOR	0.67	83	17
003	1100- 1150	SHALE	MM**		POOR	VERY POOR	1.00	--	--
004	1150- 1200	SHALE	MM**		POOR	VERY POOR	1.00	--	--
005	1200- 1250	SHALE	MM**		POOR	VERY POOR	0.67	--	--
006	1250- 1300	SHALE	MI**		POOR	VERY POOR	1.00	--	--
----- TOP OF CRETACEOUS -----									
	1300								
007	1300- 1350	SHALE	MI**		POOR	VERY POOR	0.40	--	--
008	1350- 1400	SHALE	MI**		POOR	VERY POOR	0.43	--	--
009	1400- 1450	SHALE	MI**		POOR	VERY POOR	0.40	--	--
010	1450- 1500	SHALE	MI**		POOR	VERY POOR	1.00	--	--
011	1500- 1550	SHALE	MI**		POOR	VERY POOR	1.00	--	--
012	1550- 1600	MIXED SOURCE/NONSOURCE LITHOLOGY							
013	1600- 1650	MIXED SOURCE/NONSOURCE LITHOLOGY							
014	1650- 1700	MIXED SOURCE/NONSOURCE LITHOLOGY							
015	1700- 1750	SHALE	MI**		POOR	VERY POOR	1.00	--	--
016	1750- 1800	SHALE	MI**		POOR	VERY POOR	0.33	--	--
017	1800- 1850	SHALE	MI**		POOR	VERY POOR	1.00	--	--
019	1900- 1950	SHALE	MI**		POOR	VERY POOR	0.50	--	--
021	2000- 2050	SHALE	MI	MM	POOR	VERY POOR	0.67	55	45

*Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** Value taken from a 3 term running average for all values of this parameter.

*** Thermal Maturity Abbreviations: I=Immature, MI=Moderately Immature, MM=Moderately Mature, M=Mature, VM=Very Mature, SA=Severly Altered, MT=Metamorphosed.

**** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.

***** All footnotes typed on separate sheets.

GEOCHEM SAMPLE NUMBER****	DEPTH	LITHOLOGY	THERMAL***		TOC RICHNESS	HC RICHNESS	PRODUCTIVITY INDEX	% OIL FACTOR	% GAS FACTOR
			TAI	MATURITY %R0					
023	2100- 2150	SHALE	MI**	MM**	POOR	VERY POOR	0.22	--	--
025	2200- 2250	SHALE	MI**	MM**	POOR	VERY POOR	0.17	--	--
027	2300- 2350	SHALE	MI**	MM**	POOR	VERY POOR	0.33	--	--
029	2400- 2450	SHALE	MI**	MM**	POOR	VERY POOR	0.50	--	--
031	2500- 2550	SHALE	MI	MM	FAIR	VERY POOR	0.08	56	44
033	2600- 2650	SHALE	M.***	MM**	GOOD	VERY POOR	0.03	--	--
2677	----- TOP OF PERMIAN -----								
035	2700- 2750	CARB	MI**	MM**	GOOD	VERY POOR	0.14	--	--
037	2800- 2850	CARB	MI	MM	GOOD	VERY POOR	0.19	73	27
039	2900- 2950	CARB	MI**	MM**	FAIR	VERY POOR	0.21	--	--
041	3000- 3050	CARB	MI**	MM**	FAIR	VERY POOR	0.29	--	--
043	3100- 3150	CARB	MI	MM	FAIR	VERY POOR	0.21	70	30
045	3200- 3250	CARB	MI**	MM**	FAIR	VERY POOR	0.22	--	--
047	3300- 3350	CARB	MI**	MM**	GOOD	VERY POOR	0.12	--	--
049	3400- 3450	CARB	MI	MM	FAIR	VERY POOR	0.24	63	37
051	3500- 3550	CARB	MM**	MM**	FAIR	VERY POOR	0.18	--	--
053	3600- 3650	SILT	MM**	MM**	POOR	VERY POOR	0.22	--	--
054	3650- 3700	CARB	MM	MM	FAIR	VERY POOR	0.32	74	26
063	4100- 4150	MIXED SOURCE/NONSOURCE LITHOLOGY							
065	4200- 4250	SHALE	M **	M **	POOR	VERY POOR	0.60	--	--

*Rating parameters as defined in GeoChem's Source Rock Reference Manual.

** Value taken from a 3 term running average for all values of this parameter.

*** Thermal Maturity Abbreviations: I=Immature, MI=Moderately Immature, MM=Moderately Mature, M=Mature, VM=Very Mature, SA=Severly Altered, MT=Metamorphosed.

**** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.

***** All footnotes typed on separate sheets.

GEOCHEM SAMPLE NUMBER****	DEPTH	LITHOLOGY	TAI	THERMAL*** MATURITY %R0	TOC RICHNESS	HC RICHNESS	PRODUCTIVITY INDEX	% OIL FACTOR	% GAS FACTOR
067	4300- 4350	SHALE	M	M	POOR	VERY POOR	0.67	62	38
069	4400- 4450	SHALE	M **	M **	POOR	VERY POOR	0.75	--	--
071	4500- 4550	SILT	M **	M **	POOR	VERY POOR	1.00	--	--
073	4600- 4650	SILT	MM	M	POOR	VERY POOR	1.00	57	43
075	4700- 4750	SHALE	MM**	MM**	POOR	VERY POOR	1.00	--	--
077	4800- 4850	SHALE	MM**	MM**	POOR	VERY POOR	1.00	--	--
079	4900- 4950	SHALE	MM	MM	POOR	VERY POOR	1.00	67	33
081	5000- 5050	SHALE	MM**	M **	POOR	VERY POOR	----	--	--
083	5100- 5150	SHALE	MM**	M **	POOR	VERY POOR	0.20	--	--
	5156	----- TOP OF PENNSYLVANIAN -----							
085	5200- 5250	SHALE	MM	M	POOR	VERY POOR	0.67	51	49
087	5300- 5350	CARB	MM**	M **	POOR	VERY POOR	1.00	--	--
089	5400- 5450	CARB	MM**	M **	GOOD	VERY POOR	0.43	--	--
091	5500- 5550	CARB	MM	M	FAIR	VERY POOR	----	55	45
	6528	----- TOP OF MISSISSIPPIAN -----							
	6662	----- TOP OF ORDOVICIAN -----							
	7334	----- TOP OF CAMBRIAN -----							
	7462	----- TOP OF PRE-CAMBRIAN -----							

*Rating parameters as defined in GeoChem's Source Rock Reference Manual.
 ** Value taken from a 3 term running average for all values of this parameter.
 *** Thermal Maturity Abbreviations: I=Immature, MI=Moderately Immature, MM=Moderately Mature, M=Mature,
 VM=Very Mature, SA=Severly Altered, MT=Metamorphosed.
 **** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core.
 ***** All footnotes typed on separate sheets.

TABLE VI

SAMPLE SUMMARY OF GEOCHEMICAL DATA

This table gives a sample by sample listing of the data used in the computerized interpretations. The information given for each formation is as follows:

- | | |
|-------------------------------------|--|
| (1) Sample number | (7) Total organic carbon (TOC, %) |
| (2) Depth | (8) Kerogen composition (amorphous (Am), herbaceous (H), woody (W), and coaly (C)) |
| (3) Lithology | (9) Thermal alteration index (TAI) |
| (4) Volatile hydrocarbon (S1, ppm) | (10) Vitrinite reflectance (%Ro) |
| (5) Generated hydrocarbon (S2, ppm) | |
| (6) Maximum temperature of S2 peak | |

The TAI and %Ro values are plotted on Figures 1 and 2 respectively; values of TAI or %Ro indicated with an asterisk (*) are taken from the three term moving average plot of the respective parameter. Sample types are indicated by "blank" (cuttings), "C" (conventional core) and "S" (sidewall core). Casing points and the tops of all formations penetrated by the well are displayed on all tables with associated depths.

TABLE VI: SAMPLE SUMMARY OF GEOCHEMICAL DATA

GEOCHEM SAMPLE NUMBER***	DEPTH	LITHOLOGY**	PYROLYSIS DATA (PPM)				TOC	KEROGEN TYPE****				THERMAL MATURITY	
			TMAX	S1	S2	S3		%Am	%H	%W	%C	TAI	%R0
	25	----- TOP OF TERTIARY -----											
001	995- 1010	1000t	---	---	---	---	---	--	--	--	--	---	---
002	1050- 1100	100Sh	444	20.	10.	150.	0.05	75	0	25	0	2.2	----
003	1100- 1150	100Sh	190	10.	0.	130.	0.03	--	--	--	--	(2.2)*	----
004	1150- 1200	100Sh	172	20.	0.	100.	0.04	--	--	--	--	(2.2)*	----
005	1200- 1250	100Sh	226	20.	10.	110.	0.03	--	--	--	--	(2.2)*	----
006	1250- 1300	100Sh	308	10.	0.	120.	0.05	--	--	--	--	(2.2)*	----
	1300	----- TOP OF CRETACEOUS -----											
007	1300- 1350	100Sh	248	40.	60.	130.	0.05	--	--	--	--	(2.2)*	----
008	1350- 1400	75Sh 250t	248	30.	40.	110.	0.05	--	--	--	--	(2.2)*	----
009	1400- 1450	75Sh 250t	275	40.	60.	130.	0.04	--	--	--	--	(2.2)*	----
010	1450- 1500	75Sh 250t	226	10.	0.	150.	0.03	--	--	--	--	(2.2)*	----
011	1500- 1550	75Sh 250t	226	20.	0.	140.	0.04	--	--	--	--	(2.2)*	----
012	1550- 1600	50Sh 30E 20S*	308	10.	0.	100.	0.02	--	--	--	--	(2.1)*	----
013	1600- 1650	40Sh 30S* 30E	226	10.	0.	120.	0.02	--	--	--	--	(2.1)*	----
014	1650- 1700	50Sh 50E	338	0.	0.	100.	0.02	--	--	--	--	(2.1)*	----
015	1700- 1750	70Sh 30Ss	322	20.	0.	100.	0.11	--	--	--	--	(2.1)*	----
016	1750- 1800	70Sh 30Ss	269	10.	20.	90.	0.16	--	--	--	--	(2.1)*	----
017	1800- 1850	80Sh 20E	269	10.	0.	80.	0.13	--	--	--	--	(2.1)*	----
019	1900- 1950	80Sh 20E	445	20.	20.	120.	0.11	--	--	--	--	(2.1)*	----

* Value taken from a 3 term smoothing for this parameter.
 ** Lithologies: Ss-Sandstone, St-Siltstone, Sh-Shale, Cb-Carbonate, E-Evaporite, C-Coal, Ot-Other.
 *** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core
 **** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite

GEOCHEM SAMPLE NUMBER***	DEPTH	LITHOLOGY**		PYROLYSIS DATA (PPM)				TOC	KEROGEN TYPE****				THERMAL MATURITY	
				TMAX	S1	S2	S3		%Am	%H	%W	%C	TAI	%R0
021	2000~ 2050	85Sh	15E	306	20.	10.	180.	0.08	25	25	50	0	2.1	0.68
023	2100~ 2150	80Sh	20E	336	20.	70.	130.	0.18	--	--	--	--	(2.1)*(0.68)*	
025	2200~ 2250	60Sh	40S*	371	20.	100.	150.	0.19	--	--	--	--	(2.1)*(0.68)*	
027	2300~ 2350	80Sh	20E	301	10.	20.	70.	0.10	--	--	--	--	(2.1)*(0.58)*	
029	2400~ 2450	60Sh	20S* 20E	275	10.	10.	100.	0.08	--	--	--	--	(2.1)*(0.58)*	
031	2500~ 2550	100Sh		449	50.	560.	190.	0.95	20	40	40	0	2.1	0.58
033	2600~ 2650	100Sh		447	30.	850.	290.	1.28	--	--	--	--	(2.1)*(0.57)*	
	2677	----- TOP OF PERMIAN -----												
035	2700~ 2750	100Cb		452	30.	190.	210.	0.29	--	--	--	--	(2.1)*(0.57)*	
037	2800~ 2850	100Cb		452	30.	130.	240.	0.30	50	25	25	0	2.1	0.56
039	2900~ 2950	100Cb		448	40.	150.	210.	0.25	--	--	--	--	(2.1)*(0.56)*	
041	3000~ 3050	60Cb	40S*	400	40.	100.	210.	0.23	--	--	--	--	(2.1)*(0.56)*	
043	3100~ 3150	100Cb		409	40.	150.	210.	0.25	40	40	20	0	2.1	0.57
045	3200~ 3250	100Cb		358	20.	70.	200.	0.22	--	--	--	--	(2.1)*(0.58)*	
047	3300~ 3350	60Cb	40Sh	393	20.	150.	290.	0.38	--	--	--	--	(2.1)*(0.58)*	
049	3400~ 3450	100Cb		358	40.	130.	190.	0.24	33	33	33	0	2.1	0.59
051	3500~ 3550	100Cb		427	20.	90.	220.	0.20	--	--	--	--	(2.2)*(0.63)*	
053	3600~ 3650	80St	20Cb	370	60.	210.	260.	0.13	--	--	--	--	(2.2)*(0.63)*	
054	3650~ 3700	100Cb		358	60.	130.	220.	0.16	44	44	11	0	2.3	0.68
057	3800~ 3850	100Ot		---	---	---	---	---	--	--	--	--	---	---

* Value taken from a 3 term smoothing for this parameter.

** Lithologies: Ss-Sandstone, St-Siltstone, Sh-Shale, Cb-Carbonate, E-Evaporite, C-Coal, Ot-Other.

*** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core

**** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite

TABLE VI: SAMPLE SUMMARY OF GEOCHEMICAL DATA

GEOCHEM SAMPLE NUMBER***	DEPTH	LITHOLOGY**	PYROLYSIS DATA (PPM)				TOC	KEROGEN TYPE****				THERMAL MATURITY		
			TMAX	S1	S2	S3		%Am	%H	%W	%C	TAI	%R0	
059	3900- 3950	1000t	---	-----	-----	-----	---	---	---	---	---	---	---	---
061	4000- 4050	1000t	---	-----	-----	-----	---	---	---	---	---	---	---	---
063	4100- 4150	40St 40Sh 200t	313	40.	70.	360.	0.11	---	---	---	---	---	(3.0)%(1.35)%	
065	4200- 4250	70Sh 30St	272	30.	20.	250.	0.09	---	---	---	---	---	(3.0)%(1.35)%	
067	4300- 4350	60Sh 40St	246	20.	10.	220.	0.04	20	60	20	0	3.0	1.35	
069	4400- 4450	60Sh 40St	247	30.	10.	310.	0.04	---	---	---	---	---	(2.7)%(1.12)%	
071	4500- 4550	80St 20Sh	356	20.	0.	200.	0.04	---	---	---	---	---	(2.7)%(1.12)%	
073	4600- 4650	60St 40Sh	220	10.	0.	180.	0.04	17	50	33	0	2.3	0.89	
075	4700- 4750	70Sh 30St	224	20.	0.	210.	0.04	---	---	---	---	---	(2.3)%(0.77)%	
077	4800- 4850	80Sh 20St	274	10.	0.	250.	0.06	---	---	---	---	---	(2.3)%(0.77)%	
079	4900- 4950	80Sh 20St	224	20.	0.	180.	0.04	29	57	14	0	2.4	0.66	
081	5000- 5050	80Sh 20St	210	0.	0.	190.	0.05	---	---	---	---	---	(2.5)%(0.81)%	
083	5100- 5150	80Sh 20Cb	400	40.	160.	210.	0.11	---	---	---	---	---	(2.5)%(0.81)%	
	5156	----- TOP OF PENNSYLVANIAN -----												
085	5200- 5250	60Sh 40Cb	395	20.	10.	200.	0.29	13	38	50	0	2.5	0.97	
087	5300- 5350	60Cb 40Sh	266	20.	0.	190.	0.10	---	---	---	---	---	(2.5)%(1.17)%	
089	5400- 5450	60Cb 40Sh	356	30.	40.	220.	0.43	---	---	---	---	---	(2.5)%(1.17)%	
091	5500- 5550	60Cb 40Sh	442	0.	0.	170.	0.15	25	25	50	0	2.5	1.38	
093	5600- 5650	100Cb	---	-----	-----	-----	0.23	---	---	---	---	---	---	---
095	5700- 5750	60Cb 40Sh	---	-----	-----	-----	0.21	---	---	---	---	---	---	---

* Value taken from a 3 term smoothing for this parameter.

** Lithologies: Ss-Sandstone, St-Siltstone, Sh-Shale, Cb-Carbonate, E-Evaporite, C-Coal, Ot-Other.

*** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core

**** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite

TABLE VI: SAMPLE SUMMARY OF GEOCHEMICAL DATA

GEOCHEM SAMPLE NUMBER***	DEPTH	LITHOLOGY**	PYROLYSIS DATA (PPM)				TOC	KEROGEN TYPE****				THERMAL MATURITY	
			TMAX	S1	S2	S3		%Am	%H	%W	%C	TAI	%R0
097	5800- 5850	80Cb 20Sh	---	---	---	---	0.39	20	40	40	0	2.5	1.40
099	5900- 5950	70Cb 30Sh	---	---	---	---	0.37	--	--	--	--	---	---
101	6000- 6050	60Cb 40Sh	---	---	---	---	0.40	--	--	--	--	---	---
103	6100- 6150	85Cb 15Sh	---	---	---	---	0.14	13	62	25	0	2.6	1.42
105	6200- 6250	70Cb 30Sh	---	---	---	---	0.22	--	--	--	--	---	---
107	6300- 6350	100Cb	---	---	---	---	0.12	--	--	--	--	---	---
109	6400- 6450	100Cb	---	---	---	---	0.23	20	60	20	0	2.6	1.25
111	6500- 6550	70Cb 30Sh	---	---	---	---	0.42	--	--	--	--	---	1.37
	6528	----- TOP OF MISSISSIPPIAN -----											
112	6550- 6600	60Sh 40Cb	---	---	---	---	0.71	--	--	--	--	---	---
113	6600- 6650	60Sh 40Cb	---	---	---	---	0.84	--	--	--	--	---	---
114	6650- 6700	100Cb	---	---	---	---	0.14	--	--	--	--	---	---
	6662	----- TOP OF ORDOVICIAN -----											
115	6700- 6750	50Sh 50Cb	---	---	---	---	0.26	--	--	--	--	---	---
116	6750- 6800	70Cb 30Sh	---	---	---	---	0.22	--	--	--	--	---	---
117	6800- 6850	60Cb 40Sh	---	---	---	---	0.30	--	--	--	--	---	---
118	6850- 6900	80Cb 10Ss 10Sh	---	---	---	---	0.21	--	--	--	--	---	---
119	6900- 6950	100Cb	---	---	---	---	0.09	--	--	--	--	3.0	---
120	6950- 7000	100Cb	---	---	---	---	0.09	--	--	--	--	3.0	---
121	7000- 7050	100Cb	---	---	---	---	0.07	--	--	--	--	3.0	---

* Value taken from a 3 term smoothing for this parameter.
 ** Lithologies: Ss-Sandstone, St-Siltstone, Sh-Shale, Cb-Carbonate, E-Evaporite, C-Coal, Ot-Other.
 *** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core
 **** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite

GEOCHEM SAMPLE NUMBER***	DEPTH	LITHOLOGY**	PYROLYSIS DATA (PPM)				TOC	KEROGEN TYPE*****				THERMAL MATURITY	
			TMAX	S1	S2	S3		%Am	%H	%W	%C	TAI	%R0
122	7050- 7100	100Cb	---	-----	-----	-----	0.06	--	--	--	--	3.1	----
123	7100- 7150	100Cb	---	-----	-----	-----	0.09	--	--	--	--	3.1	----
124	7150- 7200	100Cb	---	-----	-----	-----	0.05	--	--	--	--	3.1	----
126	7200- 7250	100Cb	---	-----	-----	-----	0.04	--	--	--	--	3.1	----
127	7250- 7300	85Cb 15Sh	---	-----	-----	-----	0.07	--	--	--	--	3.1	----
128	7300- 7350	70Cb 30Sh	---	-----	-----	-----	0.08	--	--	--	--	3.1	----
	7334	----- TOP OF CAMBRIAN -----											
129	7350- 7400	70Cb 30Sh	---	-----	-----	-----	0.14	--	--	--	--	3.1	----
130	7400- 7450	50Cb 30Sh 20S*	---	-----	-----	-----	0.11	--	--	--	--	3.1	----
131	7450- 7500	1000t	---	-----	-----	-----	-----	--	--	--	--	---	----
	7462	----- TOP OF PRE-CAMBRIAN -----											
132	7500- 7550	1000t	---	-----	-----	-----	-----	--	--	--	--	---	----

* Value taken from a 3 term smoothing for this parameter.

** Lithologies: Ss-Sandstone, St-Siltstone, Sh-Shale, Cb-Carbonate, E-Evaporite, C-Coal, Ot-Other.

*** Sample Type: Blank-Cuttings, C-Core, S-Sidewall Core

**** Kerogen Type: Am-Amorphous-Sapropel, H-Herbaceous, W-Woody, C-Coaly/Inertinite

FIGURE 1

THERMAL MATURITY PROFILE

USING THE THERMAL ALTERATION INDEX (TAI)

This figure displays a thermal maturity profile for the well using the thermal alteration index (TAI). The raw data plot displays the TAI values of individual samples plotted versus depth (150 foot intervals). Within a particular interval an "A" indicates one TAI values and a "B" indicates two TAI determinations of the same value, etc. The "AVG" gives the average TAI value for that interval.

The three term moving average plot displays a TAI profile smoothed by a three term moving average. The "AVG" gives the average for the particular interval. When a sample lacks a TAI value for interpretation, a TAI value is taken from this smoothed curve for that sample depth.

The descriptive terminology used to define thermal maturity, the associated hydrocarbon type, and the numerical values of TAI corresponding to this terminology is given below.

<u>TAI Value</u>	<u>Descriptive Terminology</u>	<u>TAI Value</u>	<u>Associated Hydrocarbon Type</u>
1.0 - 1.7	Immature (I)	1.3 - 1.5	Biogenic Gas
1.8 - 2.1	Moderately Immature (MI)	1.5 - 2.2	Biogenic Gas and Immature Oil
2.2 - 2.5	Moderately Mature (MM)	2.2 - 2.5	Immature Heavy Oil
2.6 - 3.5	Mature (M)	2.5 - 3.2	Mature Oil
3.6 - 4.1	Very Mature (VM)	3.2 - 3.4	Mature Oil, Condensate and Wet Gas
4.2 - 4.9	Severely Altered (SA)	> 3.8	Petrogenic Methane Gas
> 5.0	Metamorphosed		

Seismic tops are shown by a dashed line (---) and the names are indicated along the right hand margin. The exact depth of the seismic tops are given in the Introduction. Total well depth is indicated and labeled with appropriate depth.

FIGURE 1: TAI MATURITY PROFILE

JOB NUMBER: G260
 WELL NAME: WEB FEDRL 3 NO. 2

INTERVAL	TAI RAW DATA PLOT						AVG	TAI 3 TERM MOVING AVERAGE						AVG	
	I	MI	MM	M	VM	SA		I	MI	MM	M	VM	SA		
1- 150															<u>Tertiary</u>
151- 300			
301- 450			
451- 600			
601- 750			
751- 900			
901- 1050		.	A	.	.	.	2.2		.	*	.	.	.	2.2	
1051- 1200		*	.	.	.	2.2	
1201- 1350		*	.	.	.	2.2	<u>Cretaceous</u>
1351- 1500		*	.	.	.	2.2	
1501- 1650		*	.	.	.	2.1	
1651- 1800		*	.	.	.	2.1	
1801- 1950		*	.	.	.	2.1	
1951- 2100		.	A	.	.	.	2.1		.	*	.	.	.	2.1	
2101- 2250		*	.	.	.	2.1	
2251- 2400		*	.	.	.	2.1	
2401- 2550		.	A	.	.	.	2.1		.	*	.	.	.	2.1	
2551- 2700		*	.	.	.	2.1	<u>Permian</u>
2701- 2850		.	A	.	.	.	2.1		.	*	.	.	.	2.1	
2851- 3000		*	.	.	.	2.1	
3001- 3150		.	A	.	.	.	2.1		.	*	.	.	.	2.1	
3151- 3300		*	.	.	.	2.1	
3301- 3450		.	A	.	.	.	2.1		.	*	.	.	.	2.1	
3451- 3600		*	.	.	.	2.2	
3601- 3750		.	A	.	.	.	2.3		.	*	.	.	.	2.3	
3751- 3900		*	.	.	.	2.3	
3901- 4050		*	.	.	.	2.7	
4051- 4200		*	.	.	.	3.0	
4201- 4350		.	.	A	.	.	3.0		.	*	.	.	.	3.0	
4351- 4500		*	.	.	.	2.7	
4501- 4650		.	A	.	.	.	2.3		.	*	.	.	.	2.3	
4651- 4800		*	.	.	.	2.3	
4801- 4950		.	A	.	.	.	2.4		.	*	.	.	.	2.4	
4951- 5100		*	.	.	.	2.5	<u>Pennsylvanian</u>
5101- 5250		.	A	.	.	.	2.5		.	*	.	.	.	2.5	
5251- 5400		*	.	.	.	2.5	
5401- 5550		.	.	A	.	.	2.5		.	*	.	.	.	2.5	
5551- 5700		*	.	.	.	2.5	
5701- 5850		.	.	A	.	.	2.5		.	*	.	.	.	2.5	
5851- 6000		*	.	.	.	2.6	
6001- 6150		.	.	A	.	.	2.6		.	*	.	.	.	2.6	
6151- 6300		*	.	.	.	2.6	
6301- 6450		.	.	A	.	.	2.6		.	*	.	.	.	2.6	
6451- 6600		*	.	.	.	2.6	<u>Mississippian</u>
6601- 6750		*	.	.	.	3.0	<u>Ordovician</u>
6751- 6900		.	.	.	A	.	3.0		.	*	.	.	.	3.0	
6901- 7050		.	.	.	BA	.	3.0		.	*	.	.	.	3.0	
7051- 7200		.	.	.	C	.	3.1		.	*	.	.	.	3.1	
7201- 7350		.	.	.	C	.	3.1		.	*	.	.	.	3.1	<u>Cambrian</u>
7351- 7500		.	.	.	A	.	3.1		.	*	.	.	.	3.1	<u>Precambrian</u>
7501- 7650		*	.	.	.	3.1	TD 7556

FIGURE 2

THERMAL MATURITY PROFILE

USING VITRINITE REFLECTANCE

This figure displays a thermal maturity profile for the well using vitrinite reflectance (%Ro). The raw data plot displays the %Ro values of individual samples plotted versus depth (150 foot intervals). Within a particular interval an "A" indicates one %Ro value, a "B" indicates two %Ro determinations of the same value, etc. The "AVG" gives the average %Ro value for that interval.

The three term moving average plot displays a %Ro profile smoothed by a three term moving average. The "AVG" gives the average for the particular interval.

The descriptive terminology used to define thermal maturity, the associated hydrocarbon type, and the numerical values of %Ro corresponding to this terminology is given below.

<u>%Ro Value</u>	<u>Descriptive Terminology</u>	<u>%Ro Value</u>	<u>Associated Hydrocarbon Type</u>
0.0 - 0.42	Immature (I)	0.30 - 0.35	Biogenic Gas
0.43 - 0.55	Moderately Immature (MI)	0.35 - 0.60	Biogenic Gas and Immature Oil
0.56 - 0.80	Moderately Mature (MM)	0.60 - 0.80	Immature Heavy Oil
0.81 - 1.62	Mature (M)	0.80 - 1.20	Mature Oil
1.63 - 2.37	Very Mature (VM)	1.20 - 1.50	Mature Oil, Condensate and Wet Gas
2.38 - 4.50	Severely Altered (SA)	1.50 - 2.00	Condensate and Wet Gas
> 4.50	Metamorphosed	> 2.00	Petrogenic Methane Gas

Moderately immature and moderately mature are plotted together on the profile under MM.

Seismic tops are shown by a dashed line (---) with the names are indicated. The exact depth of the seismic tops are given in the Introduction. Total well depth is indicated and labeled with appropriate depth.

FIGURE 2: XR0 MATURITY PROFILE

JOB NUMBER: G260
 WELL NAME: WEB FEDRL 3 NO. 2

INTERVAL	XR0 RAW DATA PLOT					AVG	XR0 3 TERM MOVING AVERAGE PLOT					AVG	
	I	MM	M	VM	SA		MT	I	MM	M	VM		SA	MT
1- 150													
151- 300	
301- 450	
451- 600	
601- 750	
751- 900	
901- 1050	
1051- 1200	
1201- 1350	
1351- 1500	
1501- 1650	
1651- 1800	
1801- 1950	
1951- 2100	.	A.	.	.	.	0.68	.	*	.	.	.	.	0.68
2101- 2250	*	0.68
2251- 2400	*	0.58
2401- 2550	.	A.	.	.	.	0.58	.	*	.	.	.	.	0.58
2551- 2700	*	0.57
2701- 2850	.	A.	.	.	.	0.56	.	*	.	.	.	.	0.56
2851- 3000	*	0.56
3001- 3150	.	A.	.	.	.	0.57	.	*	.	.	.	.	0.57
3151- 3300	*	0.58
3301- 3450	.	A.	.	.	.	0.59	.	*	.	.	.	.	0.59
3451- 3600	*	0.63
3601- 3750	.	A.	.	.	.	0.68	.	*	.	.	.	.	0.68
3751- 3900	*	0.68
3901- 4050	*	.	.	.	1.01
4051- 4200	*	*	.	.	1.35
4201- 4350	.	.	A.	.	.	1.35	.	.	*	*	.	.	1.35
4351- 4500	*	.	.	.	1.12
4501- 4650	.	A.	.	.	.	0.89	.	.	*	.	.	.	0.89
4651- 4800	*	.	.	.	0.77
4801- 4950	.	A.	.	.	.	0.66	.	.	*	.	.	.	0.66
4951- 5100	*	.	.	.	0.81
5101- 5250	.	.	A.	.	.	0.97	.	.	*	.	.	.	0.97
5251- 5400	*	.	.	.	1.17
5401- 5550	.	.	A.	.	.	1.38	.	.	*	.	.	.	1.38
5551- 5700	*	.	.	.	1.39
5701- 5850	.	.	A.	.	.	1.40	.	.	*	.	.	.	1.40
5851- 6000	*	.	.	.	1.41
6001- 6150	.	.	A.	.	.	1.42	.	.	*	.	.	.	1.42
6151- 6300	*	.	.	.	1.34
6301- 6450	.	.	A.	.	.	1.25	.	.	*	.	.	.	1.31
6451- 6600	*	.	.	.	1.31
6601- 6750	.	.	A.	.	.	1.37	.	.	*	.	.	.	1.37
6751- 6900	*	.	.	.	1.37
6901- 7050	*	.	.	.	1.37
7051- 7200	*	.	.	.	1.37
7201- 7350	*	.	.	.	1.37
7351- 7500	*	.	.	.	1.37
7501- 7650	*	.	.	.	1.37

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7
	25	** TOP OF TERTIARY												
G260-001	995- 1010	128	1	1	3	4	13	137	9	6.6	0.75	85.3	6.0	8.7
G260-002	1050- 1100	20	22	1	1	2	14	46	26	56.5	0.50	33.3	43.3	23.3
G260-003	1100- 1150	6	1	0	0	0	4	7	1	14.3	-	54.5	9.1	36.4
G260-004	1150- 1200	8	3	0	1	0	4	12	4	33.3	-	50.0	25.0	25.0
G260-005	1200- 1250	5	1	0	0	0	3	6	1	16.7	-	55.6	11.1	33.3
G260-006	1250- 1300	10	2	0	0	0	1	12	2	16.7	-	76.9	15.4	7.7
G260-007	1300- 1350	9	2	0	0	0	2	11	2	18.2	-	69.2	15.4	15.4
	1300	** TOP OF CRETACEOUS												
G260-008	1350- 1400	17	3	1	0	0	4	21	4	19.0	-	68.0	16.0	16.0
G260-009	1400- 1450	6	2	2	1	0	3	11	5	45.5	-	42.9	35.7	21.4
G260-010	1450- 1500	5	1	3	8	0	3	17	12	70.6	-	25.0	60.0	15.0
G260-011	1500- 1550	5	1	1	1	0	2	8	3	37.5	-	50.0	30.0	20.0
G260-012	1550- 1600	6	0	0	0	0	2	6	0	0.0	-	75.0	0.0	25.0
G260-013	1600- 1650	12	6	1	1	1	6	21	9	42.9	1.00	44.4	33.3	22.2
G260-014	1650- 1700	6	2	0	0	0	2	8	2	25.0	-	60.0	20.0	20.0
G260-015	1700- 1750	3	1	0	0	0	2	4	1	25.0	-	50.0	16.7	33.3
G260-016	1750- 1800	4	1	0	0	0	1	5	1	20.0	-	66.7	16.7	16.7
G260-017	1800- 1850	15	0	0	0	0	0	15	0	0.0	-	100.0	0.0	0.0
G260-019	1900- 1950	34	0	0	0	0	0	34	0	0.0	-	100.0	0.0	0.0
G260-021	2000- 2050	43	1	2	0	0	1	46	3	6.5	-	91.5	6.4	2.1
G260-023	2100- 2150	340	9	2	0	1	3	352	12	3.4	0.00	95.8	3.4	0.8
G260-025	2200- 2250	137	7	28	8	28	88	208	71	34.1	0.29	46.3	24.0	29.7
G260-027	2300- 2350	79	7	27	14	49	425	176	97	55.1	0.29	13.1	16.1	70.7
G260-029	2400- 2450	138	13	47	25	85	724	308	170	55.2	0.29	13.4	16.5	70.2
G260-031	2500- 2550	217	7	7	4	13	130	248	31	12.5	0.31	57.4	8.2	34.4
G260-033	2600- 2650	4849	37	11	11	25	257	4933	84	1.7	0.44	93.4	1.6	5.0
	2677	** TOP OF PERMIAN												
G260-035	2700- 2750	460	14	11	6	12	66	503	43	8.5	0.50	80.8	7.6	11.6
G260-037	2800- 2850	391	35	18	8	10	31	462	71	15.4	0.80	79.3	14.4	6.3
G260-039	2900- 2950	324	21	11	5	11	36	372	48	12.9	0.45	79.4	11.8	8.8
G260-041	3000- 3050	350	11	7	4	7	23	379	29	7.7	0.57	87.1	7.2	5.7
G260-043	3100- 3150	728	18	11	6	12	57	775	47	6.1	0.50	87.5	5.6	6.9
G260-045	3200- 3250	3161	54	7	3	8	89	3233	72	2.2	0.38	95.2	2.2	2.7
G260-047	3300- 3350	249	5	1	1	1	13	257	8	3.1	1.00	92.2	3.0	4.8
G260-049	3400- 3450	1050	9	4	2	4	21	1069	19	1.8	0.50	96.3	1.7	1.9
G260-051	3500- 3550	141	4	4	3	7	34	159	18	11.3	0.43	73.1	9.3	17.6
G260-053	3600- 3650	196	5	4	2	3	27	210	14	6.7	0.67	82.7	5.9	11.4
G260-054	3650- 3700	18	1	1	0	0	1	20	2	10.0	-	85.7	9.5	4.8
G260-057	3800- 3850	60	10	6	2	3	22	81	21	25.9	0.67	58.3	20.4	21.4
G260-059	3900- 3950	6	1	2	0	0	2	9	3	33.3	-	54.5	27.3	18.2
G260-061	4000- 4050	11	1	1	0	0	4	13	2	15.4	-	64.7	11.8	23.5
G260-063	4100- 4150	22	1	1	0	0	33	24	2	8.3	-	38.6	3.5	57.9
G260-065	4200- 4250	28	1	1	0	0	20	30	2	6.7	-	56.0	4.0	40.0
G260-067	4300- 4350	12	1	1	1	0	7	15	3	20.0	-	54.5	13.6	31.8
G260-069	4400- 4450	24	1	1	0	0	19	26	2	7.7	-	53.3	4.4	42.2

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7
G260-071	4500- 4550	30	1	1	0	0	31	32	2	6.3	-	47.6	3.2	49.2
G260-073	4600- 4650	15	1	3	0	0	22	19	4	21.1	-	36.6	9.8	53.7
G260-075	4700- 4750	24	1	2	0	0	14	27	3	11.1	-	58.5	7.3	34.1
G260-077	4800- 4850	28	5	1	0	0	27	34	6	17.6	-	45.9	9.8	44.3
G260-079	4900- 4950	23	1	1	0	0	13	25	2	8.0	-	60.5	5.3	34.2
G260-081	5000- 5050	34	2	2	2	0	24	40	6	15.0	-	53.1	9.4	37.5
G260-083	5100- 5150	29	1	2	0	0	6	32	3	9.4	-	76.3	7.9	15.8
	5156	** TOP OF PENNSYLVANIAN												
G260-085	5200- 5250	144	5	13	65	23	131	250	106	42.4	2.83	37.8	27.8	34.4
G260-087	5300- 5350	34	7	4	13	4	46	62	28	45.2	3.25	31.5	25.9	42.6
G260-089	5400- 5450	61	17	3	1	0	9	82	21	25.6	-	67.0	23.1	9.9
G260-091	5500- 5550	75	13	3	3	1	20	95	20	21.1	3.00	65.2	17.4	17.4
G260-093	5600- 5650	261	22	9	4	2	43	298	37	12.4	2.00	76.5	10.9	12.6
G260-095	5700- 5750	161	18	5	4	1	35	189	28	14.8	4.00	71.9	12.5	15.6
G260-097	5800- 5850	380	47	9	3	1	8	440	60	13.6	3.00	84.8	13.4	1.8
G260-099	5900- 5950	470	40	7	2	1	5	520	50	9.6	2.00	89.5	9.5	1.0
G260-101	6000- 6050	260	32	3	1	0	3	296	36	12.2	-	87.0	12.0	1.0
G260-103	6100- 6150	158	19	3	1	0	3	181	23	12.7	-	85.9	12.5	1.6
G260-105	6200- 6250	101	11	2	0	0	1	114	13	11.4	-	87.8	11.3	0.9
G260-107	6300- 6350	161	13	2	0	0	1	176	15	8.5	-	91.0	8.5	0.6
G260-109	6400- 6450	588	23	1	0	0	0	612	24	3.9	-	96.1	3.9	0.0
G260-111	6500- 6550	332	16	1	0	0	1	349	17	4.9	-	94.9	4.9	0.3
	6528	** TOP OF MISSISSIPPIAN												
G260-112	6550- 6600	3405	21	1	0	0	1	3427	22	0.6	-	99.3	0.6	0.0
G260-113	6600- 6650	1155	35	1	0	0	1	1191	36	3.0	-	96.9	3.0	0.1
G260-114	6650- 6700	1372	18	1	0	0	2	1391	19	1.4	-	98.5	1.4	0.1
	6662	** TOP OF ORDOVICIAN												
G260-115	6700- 6750	374	14	1	0	0	3	389	15	3.9	-	95.4	3.8	0.8
G260-116	6750- 6800	288	8	1	0	0	1	297	9	3.0	-	96.6	3.0	0.3
G260-117	6800- 6850	347	11	2	0	0	2	360	13	3.6	-	95.9	3.6	0.6
G260-118	6850- 6900	788	20	2	0	0	2	810	22	2.7	-	97.0	2.7	0.2
G260-119	6900- 6950	317	11	1	0	0	1	329	12	3.6	-	96.1	3.6	0.3
G260-120	6950- 7000	310	7	3	1	0	2	321	11	3.4	-	96.0	3.4	0.6
G260-121	7000- 7050	864	17	3	1	0	3	885	21	2.4	-	97.3	2.4	0.3
G260-122	7050- 7100	455	13	1	0	0	2	469	14	3.0	-	96.6	3.0	0.4
G260-123	7100- 7150	267	6	1	0	0	0	274	7	2.6	-	97.4	2.6	0.0
G260-124	7150- 7200	201	5	1	0	0	1	207	6	2.9	-	96.6	2.9	0.5
G260-126	7200- 7250	170	5	1	0	0	1	176	6	3.4	-	96.0	3.4	0.6
G260-127	7250- 7300	87	3	1	0	0	1	91	4	4.4	-	94.6	4.3	1.1
G260-128	7300- 7350	3180	64	4	1	1	8	3250	70	2.2	1.00	97.6	2.1	0.2
	7334	** TOP OF CAMBRIAN												
G260-129	7350- 7400	127	5	1	0	0	1	133	6	4.5	-	94.8	4.5	0.7
G260-130	7400- 7450	162	5	1	0	0	2	168	6	5.6	-	92.7	5.5	1.8
G260-131	7450- 7500	93	4	2	1	0	1	100	7	7.0	-	92.1	6.9	1.0
	7462	** TOP OF PRE-CAMBRIAN												
G260-132	7500- 7550	121	5	1	0	0	1	127	6	4.7	-	94.5	4.7	0.8

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7
	7556	** TOTAL DEPTH												

C1-C7 HYDROCARBON ANALYSES OF CUTTINGS GAS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7
	25	** TOP OF TERTIARY												
G260-001	995- 1010	94	1	2	1	0	1	98	4	4.1	-	94.9	4.0	1.0
G260-002	1050- 1100	51	9	1	1	1	3	63	12	19.0	1.00	77.3	18.2	4.5
G260-003	1100- 1150	87	4	2	1	1	2	95	8	8.4	1.00	89.7	8.2	2.1
G260-004	1150- 1200	89	4	2	0	1	4	96	7	7.3	0.00	89.0	7.0	4.0
G260-005	1200- 1250	56	3	2	1	1	2	63	7	11.1	1.00	86.2	10.8	3.1
G260-006	1250- 1300	70	3	1	1	1	2	76	6	7.9	1.00	89.7	7.7	2.6
G260-007	1300- 1350	66	2	1	1	1	2	71	5	7.0	1.00	90.4	6.8	2.7
	1300	** TOP OF CRETACEOUS												
G260-008	1350- 1400	37	3	3	1	1	2	45	8	17.8	1.00	78.7	17.0	4.3
G260-009	1400- 1450	69	2	1	0	0	1	72	3	4.2	-	94.5	4.1	1.4
G260-010	1450- 1500	64	2	1	1	1	3	69	5	7.2	1.00	88.9	6.9	4.2
G260-011	1500- 1550	58	2	1	1	1	1	63	5	7.9	1.00	90.6	7.8	1.6
G260-012	1550- 1600	101	1	1	1	1	2	105	4	3.8	1.00	94.4	3.7	1.9
G260-013	1600- 1650	55	2	1	1	1	2	60	5	8.3	1.00	88.7	8.1	3.2
G260-014	1650- 1700	76	2	1	1	1	1	81	5	6.2	1.00	92.7	6.1	1.2
G260-015	1700- 1750	70	2	1	1	1	2	75	5	6.7	1.00	90.9	6.5	2.6
G260-016	1750- 1800	64	2	6	1	1	2	74	10	13.5	1.00	84.2	13.2	2.6
G260-017	1800- 1850	107	2	1	1	1	1	112	5	4.5	1.00	94.7	4.4	0.9
G260-019	1900- 1950	70	2	3	1	1	1	77	7	9.1	1.00	89.7	9.0	1.3
G260-021	2000- 2050	62	2	5	1	1	1	71	9	12.7	1.00	86.1	12.5	1.4
G260-023	2100- 2150	197	10	2	1	1	2	211	14	6.6	1.00	92.5	6.6	0.9
G260-025	2200- 2250	77	7	18	5	16	49	123	46	37.4	0.31	44.8	26.7	28.5
G260-027	2300- 2350	63	3	11	6	17	237	100	37	37.0	0.35	18.7	11.0	70.3
G260-029	2400- 2450	89	4	4	2	5	152	104	15	14.4	0.40	34.8	5.9	59.4
G260-031	2500- 2550	135	14	15	6	18	457	188	53	28.2	0.33	20.9	8.2	70.9
G260-033	2600- 2650	563	29	13	7	19	403	631	68	10.8	0.37	54.4	6.6	39.0
	2677	** TOP OF PERMIAN												
G260-035	2700- 2750	1146	273	117	26	48	211	1610	464	28.8	0.54	62.9	25.5	11.6
G260-037	2800- 2850	662	197	88	21	34	80	1002	340	33.9	0.62	61.2	31.4	7.4
G260-039	2900- 2950	977	265	107	28	44	105	1421	444	31.2	0.64	64.0	29.1	6.9
G260-041	3000- 3050	563	116	57	16	26	73	778	215	27.6	0.62	66.2	25.3	8.6
G260-043	3100- 3150	571	121	60	16	28	102	796	225	28.3	0.57	63.6	25.1	11.4
G260-045	3200- 3250	725	125	52	13	24	163	939	214	22.8	0.54	65.8	19.4	14.8
G260-047	3300- 3350	525	91	97	9	16	77	738	213	28.9	0.56	64.4	26.1	9.4
G260-049	3400- 3450	1063	183	85	22	35	127	1388	325	23.4	0.63	70.2	21.5	8.4
G260-051	3500- 3550	476	118	59	13	27	69	693	217	31.3	0.48	62.5	28.5	9.1
G260-053	3600- 3650	39	4	2	1	1	10	47	8	17.0	1.00	68.4	14.0	17.5
G260-054	3650- 3700	207	40	22	6	9	39	284	77	27.1	0.67	64.1	23.8	12.1
G260-057	3800- 3850	83	12	6	1	3	20	105	22	21.0	0.33	66.4	17.6	16.0
G260-059	3900- 3950	25	2	1	0	0	6	28	3	10.7	-	73.5	8.8	17.6
G260-061	4000- 4050	38	2	1	0	0	5	41	3	7.3	-	82.6	6.5	10.9
G260-063	4100- 4150	44	4	6	0	1	13	55	11	20.0	0.00	64.7	16.2	19.1
G260-065	4200- 4250	32	2	1	2	1	13	38	6	15.8	2.00	62.7	11.8	25.5
G260-067	4300- 4350	44	2	1	0	0	18	47	3	6.4	-	67.7	4.6	27.7
G260-069	4400- 4450	25	2	1	0	0	9	28	3	10.7	-	67.6	8.1	24.3
G260-071	4500- 4550	32	2	1	0	0	28	35	3	8.6	-	50.8	4.8	44.4

C1-C7 HYDROCARBON ANALYSES OF CUTTINGS GAS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7
G260-073	4600- 4650	33	2	3	1	1	17	40	7	17.5	1.00	57.9	12.3	29.8
G260-075	4700- 4750	33	2	6	0	0	10	41	8	19.5	-	64.7	15.7	19.6
G260-077	4800- 4850	43	3	5	0	1	23	52	9	17.3	0.00	57.3	12.0	30.7
G260-079	4900- 4950	66	4	1	0	1	9	72	6	8.3	0.00	81.5	7.4	11.1
G260-081	5000- 5050	55	3	10	0	1	19	69	14	20.3	0.00	62.5	15.9	21.6
G260-083	5100- 5150	41	3	7	0	0	19	51	10	19.6	-	58.6	14.3	27.1
	5156	** TOP OF PENNSYLVANIAN												
G260-085	5200- 5250	301	14	19	92	46	452	472	171	36.2	2.00	32.6	18.5	48.9
G260-087	5300- 5350	118	8	3	11	6	141	146	28	19.2	1.83	41.1	9.8	49.1
G260-089	5400- 5450	218	20	4	2	1	16	245	27	11.0	2.00	83.5	10.3	6.1
G260-091	5500- 5550	143	8	2	2	1	34	156	13	8.3	2.00	75.3	6.8	17.9
G260-093	5600- 5650	768	41	16	6	6	46	837	69	8.2	1.00	87.0	7.8	5.2
G260-095	5700- 5750	462	15	6	4	2	39	489	27	5.5	2.00	87.5	5.1	7.4
G260-097	5800- 5850	626	25	6	2	1	9	660	34	5.2	2.00	93.6	5.1	1.3
G260-099	5900- 5950	1177	33	8	2	2	5	1222	45	3.7	1.00	95.9	3.7	0.4
G260-101	6000- 6050	1335	79	13	4	3	13	1434	99	6.9	1.33	92.3	6.8	0.9
G260-103	6100- 6150	1028	40	9	6	3	5	1086	58	5.3	2.00	94.2	5.3	0.5
G260-105	6200- 6250	842	29	6	2	2	3	881	39	4.4	1.00	95.2	4.4	0.3
G260-107	6300- 6350	941	29	7	2	2	2	981	40	4.1	1.00	95.7	4.1	0.2
G260-109	6400- 6450	1870	50	8	2	1	2	1931	61	3.2	2.00	96.7	3.2	0.1
G260-111	6500- 6550	1211	38	6	1	1	3	1257	46	3.7	1.00	96.1	3.7	0.2
	6528	** TOP OF MISSISSIPPIAN												
G260-112	6550- 6600	1481	52	4	1	1	3	1539	58	3.8	1.00	96.0	3.8	0.2
G260-113	6600- 6650	1089	42	6	2	1	2	1140	51	4.5	2.00	95.4	4.5	0.2
G260-114	6650- 6700	1108	29	3	1	1	2	1142	34	3.0	1.00	96.9	3.0	0.2
	6662	** TOP OF ORDOVICIAN												
G260-115	6700- 6750	806	19	3	1	1	2	830	24	2.9	1.00	96.9	2.9	0.2
G260-116	6750- 6800	3567	52	4	1	1	2	3625	58	1.6	1.00	98.3	1.6	0.1
G260-117	6800- 6850	6982	73	10	2	1	3	7068	86	1.2	2.00	98.7	1.2	0.0
G260-118	6850- 6900	5732	112	18	2	2	1	5866	134	2.3	1.00	97.7	2.3	0.0
G260-119	6900- 6950	4165	54	8	1	1	2	4229	64	1.5	1.00	98.4	1.5	0.0
G260-120	6950- 7000	3002	47	8	2	2	0	3061	59	1.9	1.00	98.1	1.9	0.0
G260-121	7000- 7050	3502	39	8	2	2	1	3553	51	1.4	1.00	98.5	1.4	0.0
G260-122	7050- 7100	2657	41	5	1	1	1	2705	48	1.8	1.00	98.2	1.8	0.0
G260-123	7100- 7150	1532	26	3	1	1	1	1563	31	2.0	1.00	98.0	2.0	0.1
G260-124	7150- 7200	2051	35	4	1	1	1	2092	41	2.0	1.00	98.0	2.0	0.0
G260-126	7200- 7250	2559	44	5	1	1	0	2610	51	2.0	1.00	98.0	2.0	0.0
G260-127	7250- 7300	537	11	1	0	0	0	549	12	2.2	-	97.8	2.2	0.0
G260-128	7300- 7350	508	12	1	0	0	0	521	13	2.5	-	97.5	2.5	0.0
	7334	** TOP OF CAMBRIAN												
G260-129	7350- 7400	411	9	1	0	0	0	421	10	2.4	-	97.6	2.4	0.0
G260-130	7400- 7450	282	7	2	0	0	0	291	9	3.1	-	96.9	3.1	0.0
G260-131	7450- 7500	750	15	2	0	0	1	767	17	2.2	-	97.7	2.2	0.1
	7462	** TOP OF PRE-CAMBRIAN												
G260-132	7500- 7550	1655	33	4	1	1	0	1694	39	2.3	1.00	97.7	2.3	0.0
	7556	** TOTAL DEPTH												

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE AND CUTTINGS GAS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7
	25	** TOP OF TERTIARY												
G260-001	995- 1010	222	2	3	4	4	14	235	13	5.5	1.00	89.2	5.2	5.6
G260-002	1050- 1100	71	31	2	2	3	17	109	38	34.9	0.67	56.3	30.2	13.5
G260-003	1100- 1150	93	5	2	1	1	6	102	9	8.8	1.00	86.1	8.3	5.6
G260-004	1150- 1200	97	7	2	1	1	8	108	11	10.2	1.00	83.6	9.5	6.9
G260-005	1200- 1250	61	4	2	1	1	5	69	8	11.6	1.00	82.4	10.8	6.8
G260-006	1250- 1300	80	5	1	1	1	3	88	8	9.1	1.00	87.9	8.8	3.3
G260-007	1300- 1350	75	4	1	1	1	4	82	7	8.5	1.00	87.2	8.1	4.7
	1300	** TOP OF CRETACEOUS												
G260-008	1350- 1400	54	6	4	1	1	6	66	12	18.2	1.00	75.0	16.7	8.3
G260-009	1400- 1450	75	4	3	1	0	4	83	8	9.6	-	86.2	9.2	4.6
G260-010	1450- 1500	69	3	4	9	1	6	86	17	19.8	9.00	75.0	18.5	6.5
G260-011	1500- 1550	63	3	2	2	1	3	71	8	11.3	2.00	85.1	10.8	4.1
G260-012	1550- 1600	107	1	1	1	1	4	111	4	3.6	1.00	93.0	3.5	3.5
G260-013	1600- 1650	67	8	2	2	2	8	81	14	17.3	1.00	75.3	15.7	9.0
G260-014	1650- 1700	82	4	1	1	1	3	89	7	7.9	1.00	89.1	7.6	3.3
G260-015	1700- 1750	73	3	1	1	1	4	79	6	7.6	1.00	88.0	7.2	4.8
G260-016	1750- 1800	68	3	6	1	1	3	79	11	13.9	1.00	82.9	13.4	3.7
G260-017	1800- 1850	122	2	1	1	1	1	127	5	3.9	1.00	95.3	3.9	0.8
G260-019	1900- 1950	104	2	3	1	1	1	111	7	6.3	1.00	92.9	6.3	0.9
G260-021	2000- 2050	105	3	7	1	1	2	117	12	10.3	1.00	88.2	10.1	1.7
G260-023	2100- 2150	537	19	4	1	2	5	563	26	4.6	0.50	94.5	4.6	0.9
G260-025	2200- 2250	214	14	46	13	44	137	331	117	35.3	0.30	45.7	25.0	29.3
G260-027	2300- 2350	142	10	38	20	66	662	276	134	48.6	0.30	15.1	14.3	70.6
G260-029	2400- 2450	227	17	51	27	90	876	412	185	44.9	0.30	17.6	14.4	68.0
G260-031	2500- 2550	352	21	22	10	31	587	436	84	19.3	0.32	34.4	8.2	57.4
G260-033	2600- 2650	5412	66	24	18	44	660	5564	152	2.7	0.41	87.0	2.4	10.6
	2677	** TOP OF PERMIAN												
G260-035	2700- 2750	1606	287	128	32	60	277	2113	507	24.0	0.53	67.2	21.2	11.6
G260-037	2800- 2850	1053	232	106	29	44	111	1464	411	28.1	0.66	66.9	26.1	7.0
G260-039	2900- 2950	1301	286	118	33	55	141	1793	492	27.4	0.60	67.3	25.4	7.3
G260-041	3000- 3050	913	127	64	20	33	96	1157	244	21.1	0.61	72.9	19.5	7.7
G260-043	3100- 3150	1299	139	71	22	40	159	1571	272	17.3	0.55	75.1	15.7	9.2
G260-045	3200- 3250	3886	179	59	16	32	252	4172	286	6.9	0.50	87.8	6.5	5.7
G260-047	3300- 3350	774	96	98	10	17	90	995	221	22.2	0.59	71.3	20.4	8.3
G260-049	3400- 3450	2113	192	89	24	39	148	2457	344	14.0	0.62	81.1	13.2	5.7
G260-051	3500- 3550	617	122	63	16	34	103	852	235	27.6	0.47	64.6	24.6	10.8
G260-053	3600- 3650	235	9	6	3	4	37	257	22	8.6	0.75	79.9	7.5	12.6
G260-054	3650- 3700	225	41	23	6	9	40	304	79	26.0	0.67	65.4	23.0	11.6
G260-057	3800- 3850	143	22	12	3	6	42	186	43	23.1	0.50	62.7	18.9	18.4
G260-059	3900- 3950	31	3	3	0	0	8	37	6	16.2	-	68.9	13.3	17.8
G260-061	4000- 4050	49	3	2	0	0	9	54	5	9.3	-	77.8	7.9	14.3
G260-063	4100- 4150	66	5	7	0	1	46	79	13	16.5	0.00	52.8	10.4	36.8
G260-065	4200- 4250	60	3	2	2	1	33	68	8	11.8	2.00	59.4	7.9	32.7
G260-067	4300- 4350	56	3	2	1	0	25	62	6	9.7	-	64.4	6.9	28.7
G260-069	4400- 4450	49	3	2	0	0	28	54	5	9.3	-	59.8	6.1	34.1

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE AND CUTTINGS GAS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7
G260-071	4500- 4550	62	3	2	0	0	59	67	5	7.5	-	49.2	4.0	46.8
G260-073	4600- 4650	48	3	6	1	1	39	59	11	18.6	1.00	49.0	11.2	39.8
G260-075	4700- 4750	57	3	8	0	0	24	68	11	16.2	-	62.0	12.0	26.1
G260-077	4800- 4850	71	8	6	0	1	50	86	15	17.4	0.00	52.2	11.0	36.8
G260-079	4900- 4950	89	5	2	0	1	22	97	8	8.2	0.00	74.8	6.7	18.5
G260-081	5000- 5050	89	5	12	2	1	43	109	20	18.3	2.00	58.6	13.2	28.3
G260-083	5100- 5150	70	4	9	0	0	25	83	13	15.7	-	64.8	12.0	23.1
	5156	** TOP OF PENNSYLVANIAN												
G260-085	5200- 5250	445	19	32	157	69	583	722	277	38.4	2.28	34.1	21.2	44.7
G260-087	5300- 5350	152	15	7	24	10	187	208	56	26.9	2.40	38.5	14.2	47.3
G260-089	5400- 5450	279	37	7	3	1	25	327	48	14.7	3.00	79.3	13.6	7.1
G260-091	5500- 5550	218	21	5	5	2	54	251	33	13.1	2.50	71.5	10.8	17.7
G260-093	5600- 5650	1029	63	25	10	8	89	1135	106	9.3	1.25	84.1	8.7	7.3
G260-095	5700- 5750	623	33	11	8	3	74	678	55	8.1	2.67	82.8	7.3	9.8
G260-097	5800- 5850	1006	72	15	5	2	17	1100	94	8.5	2.50	90.1	8.4	1.5
G260-099	5900- 5950	1647	73	15	4	3	10	1742	95	5.5	1.33	94.0	5.4	0.6
G260-101	6000- 6050	1595	111	16	5	3	16	1730	135	7.8	1.67	91.4	7.7	0.9
G260-103	6100- 6150	1186	59	12	7	3	8	1267	81	6.4	2.33	93.0	6.4	0.6
G260-105	6200- 6250	943	40	8	2	2	4	995	52	5.2	1.00	94.4	5.2	0.4
G260-107	6300- 6350	1102	42	9	2	2	3	1157	55	4.8	1.00	95.0	4.7	0.3
G260-109	6400- 6450	2458	73	9	2	1	2	2543	85	3.3	2.00	96.6	3.3	0.1
G260-111	6500- 6550	1543	54	7	1	1	4	1606	63	3.9	1.00	95.8	3.9	0.2
	6528	** TOP OF MISSISSIPPIAN												
G260-112	6550- 6600	4886	73	5	1	1	4	4966	80	1.6	1.00	98.3	1.6	0.1
G260-113	6600- 6650	2244	77	7	2	1	3	2331	87	3.7	2.00	96.1	3.7	0.1
G260-114	6650- 6700	2480	47	4	1	1	4	2533	53	2.1	1.00	97.8	2.1	0.2
	6662	** TOP OF ORDOVICIAN												
G260-115	6700- 6750	1180	33	4	1	1	5	1219	39	3.2	1.00	96.4	3.2	0.4
G260-116	6750- 6800	3855	60	5	1	1	3	3922	67	1.7	1.00	98.2	1.7	0.1
G260-117	6800- 6850	7329	84	12	2	1	5	7428	99	1.3	2.00	98.6	1.3	0.1
G260-118	6850- 6900	6520	132	20	2	2	3	6676	156	2.3	1.00	97.6	2.3	0.0
G260-119	6900- 6950	4482	65	9	1	1	3	4558	76	1.7	1.00	98.3	1.7	0.1
G260-120	6950- 7000	3312	54	11	3	2	2	3382	70	2.1	1.50	97.9	2.1	0.1
G260-121	7000- 7050	4366	56	11	3	2	4	4438	72	1.6	1.50	98.3	1.6	0.1
G260-122	7050- 7100	3112	54	6	1	1	3	3174	62	2.0	1.00	98.0	2.0	0.1
G260-123	7100- 7150	1799	32	4	1	1	1	1837	38	2.1	1.00	97.9	2.1	0.1
G260-124	7150- 7200	2252	40	5	1	1	2	2299	47	2.0	1.00	97.9	2.0	0.1
G260-126	7200- 7250	2729	49	6	1	1	1	2786	57	2.0	1.00	97.9	2.0	0.0
G260-127	7250- 7300	624	14	2	0	0	1	640	16	2.5	-	97.3	2.5	0.2
G260-128	7300- 7350	3688	76	5	1	1	8	3771	83	2.2	1.00	97.6	2.2	0.2
	7334	** TOP OF CAMBRIAN												
G260-129	7350- 7400	538	14	2	0	0	1	554	16	2.9	-	96.9	2.9	0.2
G260-130	7400- 7450	384	12	3	0	0	2	399	15	3.8	-	95.8	3.7	0.5
G260-131	7450- 7500	843	19	4	1	0	2	867	24	2.8	-	97.0	2.8	0.2
	7462	** TOP OF PRE-CAMBRIAN												
G260-132	7500- 7550	1776	38	5	1	1	1	1821	45	2.5	1.00	97.5	2.5	0.1

C1-C7 HYDROCARBON ANALYSES OF AIR SPACE AND CUTTINGS GAS

C1-C7 NORMALIZED DATA

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	METHANE C1 (PPM)	ETHANE C2 (PPM)	PROPANE C3 (PPM)	ISOBUT- ANE IC4 (PPM)	BUTANE NC4 (PPM)	TOTAL C5-C7 (PPM)	TOTAL C1-C4 (PPM)	TOTAL C2-C4 (PPM)	GAS WETNESS (%)	IC4/ NC4	C1-C7 NORMALIZED DATA		
												%C1	%C2-C4	%C5-C7

7556 ** TOTAL DEPTH

SUMMARY OF ORGANIC CARBON AND VISUAL KEROGEN ANALYSIS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	PERCENT ORGANIC CARBON	PERCENT TOTAL CARBON	VISUAL KEROGEN	
				ORGANIC MATTER TYPE (%)	ALTERATION INDEX, TAI (1-5 SCALE)
	25	** TOP OF TERTIARY			
G260-002	1050 - 1100	0.05	-	Am(75)W(25)	2.2
G260-003	1100 - 1150	0.03	-		-
G260-004	1150 - 1200	0.04; 0.04R	-		-
G260-005	1200 - 1250	0.03	-		-
G260-006	1250 - 1300	0.05	-		-
G260-007	1300 - 1350	0.05	-		-
	1300	** TOP OF CRETACEOUS			
G260-008	1350 - 1400	0.05	-		-
G260-009	1400 - 1450	0.04; 0.04R	-		-
G260-010	1450 - 1500	0.03	-		-
G260-011	1500 - 1550	0.04	-		-
G260-012	1550 - 1600	0.02	-		-
G260-013	1600 - 1650	0.02	-		-
G260-014	1650 - 1700	0.02	-		-
G260-015	1700 - 1750	0.11	-		-
G260-016	1750 - 1800	0.16	-		-
G260-017	1800 - 1850	0.13; 0.12R	-		-
G260-019	1900 - 1950	0.11	-		-
G260-021	2000 - 2050	0.08	-	W(50)Am(25)H(25)	2.1
G260-023	2100 - 2150	0.18	-		-
G260-025	2200 - 2250	0.19	-		-
G260-027	2300 - 2350	0.10	-		-
G260-029	2400 - 2450	0.08	-		-
G260-031	2500 - 2550	0.95	-	H(40)W(40)Am(20)	2.1
G260-033	2600 - 2650	1.28; 1.27R	-		-
	2677	** TOP OF PERMIAN			
G260-035	2700 - 2750	0.29	-		-
G260-037	2800 - 2850	0.30	-	Am(50)H(25)W(25)	2.1
G260-039	2900 - 2950	0.25	-		-
G260-041	3000 - 3050	0.23	-		-
G260-043	3100 - 3150	0.25; 0.25R	-	Am(40)H(40)W(20)	2.1
G260-045	3200 - 3250	0.22	-		-
G260-047	3300 - 3350	0.38	-		-
G260-049	3400 - 3450	0.24	-	Am(33)H(33)W(33)	2.1

SUMMARY OF ORGANIC CARBON AND VISUAL KEROGEN ANALYSIS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	PERCENT ORGANIC CARBON	PERCENT TOTAL CARBON	VISUAL KEROGEN	
				ORGANIC MATTER TYPE (%)	ALTERATION INDEX, TAI (1-5 SCALE)
G260-051	3500 - 3550	0.20	-		-
G260-053	3600 - 3650	0.13	-		-
G260-054	3650 - 3700	0.16	-	Am(44)H(44)W(11)	2.3
G260-063	4100 - 4150	0.11	-		-
G260-065	4200 - 4250	0.09	-		-
G260-067	4300 - 4350	0.04	-	H(60)Am(20)W(20)	3.0
G260-069	4400 - 4450	0.04	-		-
G260-071	4500 - 4550	0.04; 0.06R	-		-
G260-073	4600 - 4650	0.04	-	H(50)W(33)Am(17)	2.3
G260-075	4700 - 4750	0.04	-		-
G260-077	4800 - 4850	0.06	-		-
G260-079	4900 - 4950	0.04	-	H(57)Am(29)W(14)	2.4
G260-081	5000 - 5050	0.05	-		-
G260-083	5100 - 5150	0.11	-		-
	5156	** TOP OF PENNSYLVANIAN			
G260-085	5200 - 5250	0.29	-	W(50)H(38)Am(13)	2.5
G260-087	5300 - 5350	0.10; 0.11R	-		-
G260-089	5400 - 5450	0.43	-		-
G260-091	5500 - 5550	0.15; 0.15R	-	W(50)Am(25)H(25)	2.5
G260-093	5600 - 5650	0.23	-		-
G260-095	5700 - 5750	0.21	-		-
G260-097	5800 - 5850	0.39	-	H(40)W(40)Am(20)	2.5
G260-099	5900 - 5950	0.37; 0.37R	-		-
G260-101	6000 - 6050	0.40	-		-
G260-103	6100 - 6150	0.14	-	H(63)W(25)Am(13)	2.6
G260-105	6200 - 6250	0.22	-		-
G260-107	6300 - 6350	0.12	-		-
G260-109	6400 - 6450	0.23	-	H(60)Am(20)W(20)	2.6
G260-111	6500 - 6550	0.42	-		-
	6528	** TOP OF MISSISSIPPIAN			
G260-112	6550 - 6600	0.71	-		-
G260-113	6600 - 6650	0.84; 0.85R	-		-
G260-114	6650 - 6700	0.14	-		-
	6662	** TOP OF ORDOVICIAN			
G260-115	6700 - 6750	0.26	-		-

SUMMARY OF ORGANIC CARBON AND VISUAL KEROGEN ANALYSIS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	PERCENT ORGANIC CARBON	PERCENT TOTAL CARBON	VISUAL KEROGEN	
				ORGANIC MATTER TYPE (%)	ALTERATION INDEX, TAI (1-5 SCALE)
G260-116	6750 - 6800	0.22	-	-	-
G260-117	6800 - 6850	0.30	-	-	-
G260-118	6850 - 6900	0.21	-	-	-
G260-119	6900 - 6950	0.09	-	-	3.0
G260-120	6950 - 7000	0.09	-	-	3.0
G260-121	7000 - 7050	0.07; 0.09R	-	-	3.0
G260-122	7050 - 7100	0.06	-	-	3.1
G260-123	7100 - 7150	0.09	-	-	3.1
G260-124	7150 - 7200	0.05	-	-	3.1
G260-126	7200 - 7250	0.04	-	-	3.1
G260-127	7250 - 7300	0.07	-	-	3.1
G260-128	7300 - 7350	0.08	-	-	3.1
	7334	** TOP OF CAMBRIAN			
G260-129	7350 - 7400	0.14	-	-	3.1
G260-130	7400 - 7450	0.11; 0.11R	-	-	3.1
	7462	** TOP OF PRE-CAMERIAN			
	7556	** TOTAL DEPTH			

TABLE VI

VITRINITE REFLECTANCE SUMMARY

GRI SAMPLE NUMBER	DEPTH (FEET)	NUMBER OF READINGS	MINIMUM REFLECTANCE (% R ₀)	MAXIMUM REFLECTANCE (% R ₀)	MEAN REFLECTANCE (% R ₀)	STD. DEV. (% R ₀)
	25					
	1300	** TOP OF TERTIARY				
		** TOP OF CRETACEOUS				
G260-021	2000- 2050	3	0.66	0.69	0.68	0.015
G260-031	2500- 2550	16	0.50	0.65	0.58	0.056
	2677	** TOP OF PERMIAN				
G260-037	2800- 2850	14	0.50	0.64	0.56	0.043
G260-043	3100- 3150	11	0.51	0.63	0.57	0.040
G260-049	3400- 3450	13	0.55	0.64	0.59	0.029
G260-054	3650- 3700	2	0.64	0.72	0.68	-
G260-067	4300- 4350	1	1.35	1.35	1.35	-
G260-073	4600- 4650	1	0.89	0.89	0.89	-
G260-079	4900- 4950	1	0.66	0.66	0.66	-
	5156	** TOP OF PENNSYLVANIAN				
G260-085	5200- 5250	3	0.86	1.09	0.97	0.116
G260-091	5500- 5550	8	1.28	1.45	1.38	0.063
G260-097	5800- 5850	6	1.25	1.53	1.40	0.103
G260-103	6100- 6150	6	1.14	1.58	1.42	0.170
G260-109	6400- 6450	5	1.17	1.34	1.25	0.068
G260-111	6500- 6550	3	1.31	1.45	1.37	0.071
	6528	** TOP OF MISSISSIPPIAN				
	6662	** TOP OF ORDOVICIAN				
	7334	** TOP OF CAMBRIAN				
	7462	** TOP OF PRE-CAMBRIAN				
	7556	** TOTAL DEPTH				

RESULTS OF ROCK-EVAL PYROLYSIS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	PERCENT ORGANIC CARBON	S1 (MG/G)	S2 (MG/G)	S3 (MG/G)	S1+S2 (MG/G)	HYDROGEN INDEX	OXYGEN INDEX	S1/S1+S2	TMAX (C)
	25	** TOP OF TERTIARY								
G260-002	1050 - 1100	0.05	0.02	0.01	0.15	0.03	20	300	0.67	444
G260-003	1100 - 1150	0.03	0.01	0.00	0.13	0.01	0	433	1.00	190
G260-004	1150 - 1200	0.04; 0.04R	0.02	0.00	0.10	0.02	0	250	1.00	172
G260-005	1200 - 1250	0.03	0.02	0.01	0.11	0.03	33	367	0.67	226
G260-006	1250 - 1300	0.05	0.01	0.00	0.12	0.01	0	240	1.00	308
G260-007	1300 - 1350	0.05	0.04	0.06	0.13	0.10	120	260	0.40	248
	1300	** TOP OF CRETACEOUS								
G260-008	1350 - 1400	0.05	0.03	0.04	0.11	0.07	80	220	0.43	248
G260-009	1400 - 1450	0.04; 0.04R	0.04	0.06	0.13	0.10	150	325	0.40	275
G260-010	1450 - 1500	0.03	0.01	0.00	0.15	0.01	0	500	1.00	226
G260-011	1500 - 1550	0.04	0.02	0.00	0.14	0.02	0	350	1.00	226
G260-012	1550 - 1600	0.02	0.01	0.00	0.10	0.01	0	500	1.00	308
G260-013	1600 - 1650	0.02	0.01	0.00	0.12	0.01	0	600	1.00	226
G260-014	1650 - 1700	0.02	0.00	0.00	0.10	0.00	0	500	-	338
G260-015	1700 - 1750	0.11	0.02	0.00	0.10	0.02	0	91	1.00	322
G260-016	1750 - 1800	0.16	0.01	0.02	0.09	0.03	12	56	0.33	269
G260-017	1800 - 1850	0.13; 0.12R	0.01	0.00	0.08	0.01	0	62	1.00	269
G260-019	1900 - 1950	0.11	0.02	0.02	0.12	0.04	18	109	0.50	445
G260-021	2000 - 2050	0.08	0.02	0.01	0.18	0.03	12	225	0.67	306
G260-023	2100 - 2150	0.18	0.02	0.07	0.13	0.09	39	72	0.22	336
G260-025	2200 - 2250	0.19	0.02	0.10	0.15	0.12	53	79	0.17	371
G260-027	2300 - 2350	0.10	0.01	0.02	0.07	0.03	20	70	0.33	301
G260-029	2400 - 2450	0.08	0.01	0.01	0.10	0.02	12	125	0.50	275
G260-031	2500 - 2550	0.95	0.05	0.56	0.19	0.61	59	20	0.08	449
G260-033	2600 - 2650	1.28; 1.27R	0.03	0.85	0.29	0.88	66	23	0.03	447
	2677	** TOP OF PERMIAN								
G260-035	2700 - 2750	0.29	0.03	0.19	0.21	0.22	66	72	0.14	452
G260-037	2800 - 2850	0.30	0.03	0.13	0.24	0.16	43	80	0.19	452
G260-039	2900 - 2950	0.25	0.04	0.15	0.21	0.19	60	84	0.21	448
G260-041	3000 - 3050	0.23	0.04	0.10	0.21	0.14	43	91	0.29	400
G260-043	3100 - 3150	0.25; 0.25R	0.04	0.15	0.21	0.19	60	84	0.21	409
G260-045	3200 - 3250	0.22	0.02	0.07	0.20	0.09	32	91	0.22	358
G260-047	3300 - 3350	0.38	0.02	0.15	0.29	0.17	39	76	0.12	393
G260-049	3400 - 3450	0.24	0.04	0.13	0.19	0.17	54	79	0.24	358
G260-051	3500 - 3550	0.20	0.02	0.09	0.22	0.11	45	110	0.18	427
G260-053	3600 - 3650	0.13	0.06	0.21	0.26	0.27	162	200	0.22	370
G260-054	3650 - 3700	0.16	0.06	0.13	0.22	0.19	81	137	0.32	358
G260-063	4100 - 4150	0.11	0.04	0.07	0.36	0.11	64	327	0.36	313
G260-065	4200 - 4250	0.09	0.03	0.02	0.25	0.05	22	278	0.60	272
G260-067	4300 - 4350	0.04	0.02	0.01	0.22	0.03	25	550	0.67	246
G260-069	4400 - 4450	0.04	0.03	0.01	0.31	0.04	25	775	0.75	247
G260-071	4500 - 4550	0.04; 0.06R	0.02	0.00	0.20	0.02	0	500	1.00	356
G260-073	4600 - 4650	0.04	0.01	0.00	0.18	0.01	0	450	1.00	220
G260-075	4700 - 4750	0.04	0.02	0.00	0.21	0.02	0	525	1.00	224
G260-077	4800 - 4850	0.06	0.01	0.00	0.25	0.01	0	417	1.00	274

RESULTS OF ROCK-EVAL PYROLYSIS

GRI SAMPLE NUMBER	WELL INTERVAL (FEET)	PERCENT ORGANIC CARBON	S1 (MG/G)	S2 (MG/G)	S3 (MG/G)	S1+S2 (MG/G)	HYDROGEN INDEX	OXYGEN INDEX	S1/S1+S2	TMAX (C)
G260-079	4900 - 4950	0.04	0.02	0.00	0.18	0.02	0	450	1.00	224
G260-081	5000 - 5050	0.05	0.00	0.00	0.19	0.00	0	380	-	210
G260-083	5100 - 5150	0.11	0.04	0.16	0.21	0.20	145	191	0.20	400
	5156	** TOP OF PENNSYLVANIAN								
G260-085	5200 - 5250	0.29	0.02	0.01	0.20	0.03	3	69	0.67	395
G260-087	5300 - 5350	0.10; 0.11R	0.02	0.00	0.19	0.02	0	190	1.00	266
G260-089	5400 - 5450	0.43	0.03	0.04	0.22	0.07	9	51	0.43	356
G260-091	5500 - 5550	0.15; 0.15R	0.00	0.00	0.17	0.00	0	113	-	442
	6528	** TOP OF MISSISSIPPIAN								
	6662	** TOP OF ORDOVICIAN								
	7334	** TOP OF CAMBRIAN								
	7462	** TOP OF PRE-CAMBRIAN								
	7556	** TOTAL DEPTH								

CONTRACT 6
HOUSTON INSTRUMENT

2500	G260-031	447	66	23					
2600	G260-033	452	66	72					
2700	G260-035	452	49	88					
2800	G260-037	448	68	84			58	25	8 2.1
2900	G260-039	460	43	91					
3000	G260-041	489	60	84			48	48	28 8 2.1
3100	G260-043	358	32	91					
3200	G260-045	393	39	76					
3300	G260-047	358	54	79			33	33	39 8 2.1
3400	G260-049	427	45	118					
3500	G260-051	378	162	228					
3600	G260-053	358	81	138			44	44	11 8 2.3
3650	G260-054								
3800	G260-057								
3900	G260-059								
4000	G260-061	313	64	327					
4100	G260-063	272	22	278					
4200	G260-065	246	25	550			28	68	28 8 3.8
4300	G260-067	247	25	775					
4400	G260-069	356		500					
4500	G260-071	228		450			17	58	33 8 2.3
4600	G260-073	224		525					
4700	G260-075	274		417					
4800	G260-077	224		450			29	57	14 8 2.4
4900	G260-079	218		380					
5000	G260-081	488	145	191					
5100	G260-083	395	3	69			19	38	58 8 2.5
5200	G260-085	266		190					
5300	G260-087	356	9	51					
5400	G260-089	442		113			25	25	58 0 2.5
5500	G260-091								
5600	G260-093								
5700	G260-095						28	48	48 8 2.5
5800	G260-097								
5900	G260-099								
6000	G260-101								
6100	G260-103						13	63	25 8 2.6
6200	G260-105								
6300	G260-107								

