

New Mexico Bureau of Mines and Mineral Resources
Open File Report No. OF-236

ORGANIC GEOCHEMICAL ANALYSIS, GULF OIL CORP.
NO. 1 SIERRA STATE K WELL, SIERRA COUNTY, NEW MEXICO

By Stephen R. Jacobson, James S. Rankin,
and James D. Saxton
Chevron U.S.A., Inc.
Denver, Colorado

and Gary W. Ruth
Brown and Ruth Laboratories, Inc.
Houston, Texas

May 11, 1984



Chevron U.S.A. Inc.

700 South Colorado Blvd., P. O. Box 599, Denver, CO 80201

May 11, 1984

Mr. S. Thompson III
New Mexico Bureau of
Mines and Mineral Resources
Socorro, NM 87801

Dear Mr. Thompson:

Enclosed please find the completed results of the organic geochemical analyses performed on samples from the Gulf #1 Sierra State "K", 35-12S-1W, Sierra Co., and the Plymouth #1 Federal, 15-20S-9E, Otero Co. Enclosed also is the corrected report for the Houston Oil and Minerals well. As you may recall there was a mix-up with the samples, and we actually analyzed the #2 Lewelling (10-12S-9E, Otero Co.), rather than the #1 Lewelling (12-12S-9E).

Sincerely,

A handwritten signature in cursive script, appearing to read "J. S. Vietti".

J. S. Vietti
District Geologist

Enclosures

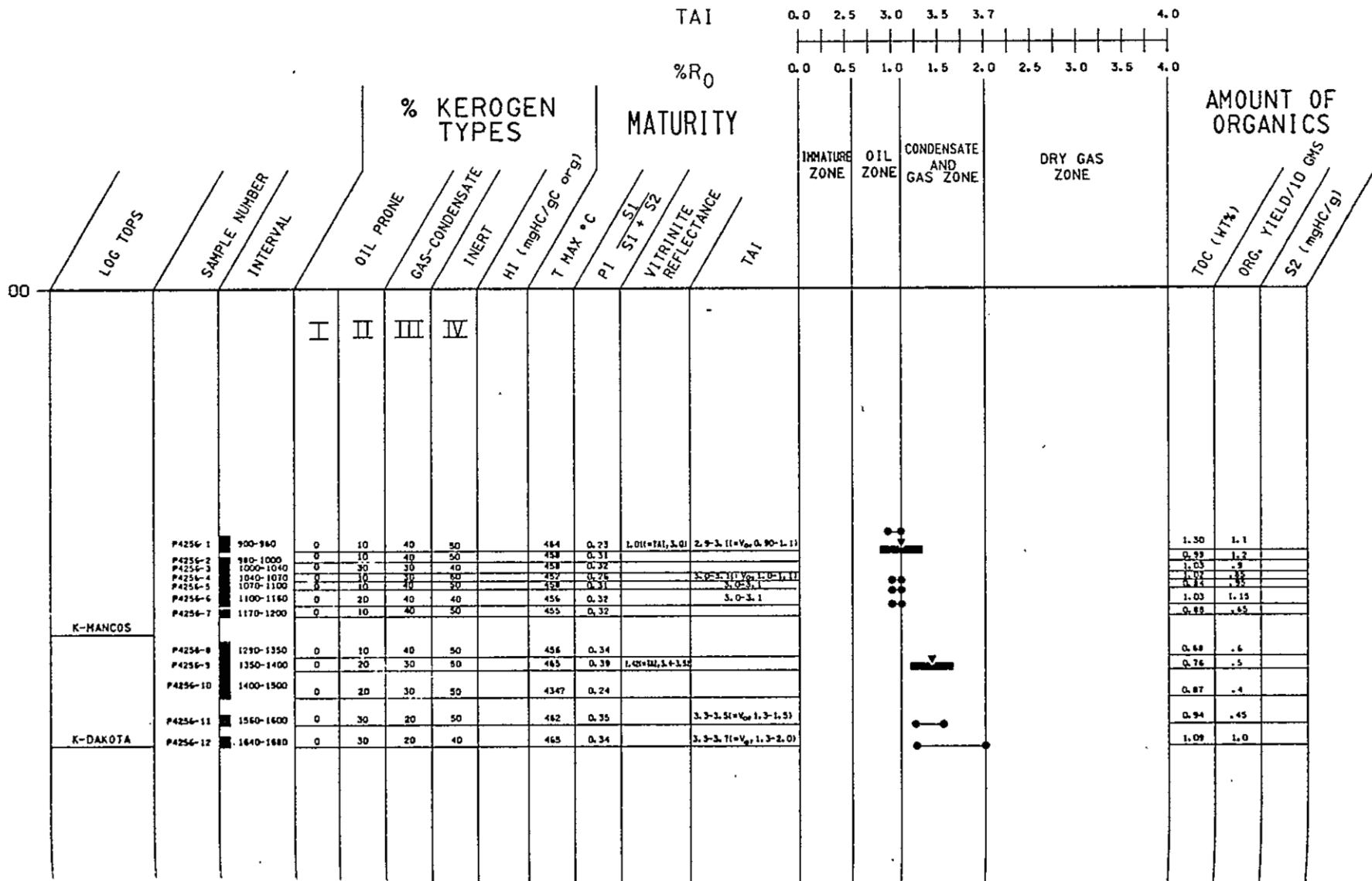
GULF OIL SIERRA "K"

SEC. 35-12S-1W

SIERRA CO., NEW MEXICO

HYDROCARBON GENERATION ZONES

BIOSTUDY NO. 1245



K-DAKOTA										
P4256-12		1640-1640	0	30	20	40	465	0.34	3.3-3.7 (=V _g , 1.3-2.0)	
PENN. CISC0?										
P4256-13		1480-5510	0	60	10	30				
P4256-14		5510-5140	0	60	10	30				
PENN. - CANYON?										
P4256-15		5580-5620	0	60	10	30			1.8-3.8 (=V _g , 2.7-3.4)	
P4256-16		5620-5660	0	60	10	30				
PENN. - STRAWN?										
P4256-17		6000-6030	0	60	10	30				
P4256-18		6030-6060	0	70	10	20				

0.94	.45
1.09	1.0
0.79	.9
1.31	1.3
0.62	2.5
0.84	1.2
1.53	3.75

PENNL - STRAWN?

P4256-17	6000-6030	0	60	10	30					
P4256-18	6030-6080	0	70	10	20					
P4256-19	6230-6270	0	10	40	50	2.35 (=TAI), 3, 7-5, 81				

PENNL - ATOKA?

P4256-20	7120-7200	0	10	40	50					
P4256-21	7290-7350	0	10	40	50					
P4256-22	7700-7450	0	10	30	60					
P4256-23	7450-7600	0	10	30	40	2.91 (TAI), 8/21				
MISS.?	P4256-24	7550-7600	0	10	30	60	3.9			

V

1.53	3.74
2.17	4.1
0.92	.5
1.40	1.6
1.28	1.9
1.10	1.1
1.68	2.32
1.27	1.25



V₀ DATA
TAI DATA

BIOSTUDY 1245
J.D. SAXTON D7-9108
4/84 DO-8249

COMPUTER DRAFTED

GEOCHEMICAL REPORT

TOC & Rock-Eval Pyrolysis Results

Gulf Oil Sierra State "K"
Sierra County, New Mexico
35-12S-1W 1980' FNL, 660' FEL

Bo# 1245

P# 4256.

BROWN & RUTH LABORATORIES, INC.
10690 Shadow Wood, Suite 130
Houston, Texas 77043
713/464-3284



BROWN & RUTH LABORATORIES, INC.

10690 SHADOW WOOD DRIVE, SUITE 130, HOUSTON, TEXAS 77043 ☎ (713) 464-3284

September 22, 1983

Chevron U.S.A. Inc.
Central Region
P. O. Box 599
Denver, CO 80201

Attention: S. R. Jacobson

Gentlemen:

Attached are the results of our analysis of the 25 samples from Gulf Oil Sierra State "K", Sierra County, New Mexico. The work was authorized by your Work No. CMEN2100.

All unused sample is being returned under separate cover.

We appreciate the opportunity to be of service to Chevron. If you have any questions regarding these data, then please contact us.

Very truly yours,

BROWN & RUTH LABORATORIES, INC.

Gary W. Ruth
Gary W. Ruth

GWR/kr/19
Enclosures

CLIENT: CHEVRON U.S.A. INC.
P. O. Box 599
Denver, Colorado 80201

WELL: Gulf Sierra State "K"

LOCATION: Sierra County, New Mexico
35-12S-1W

SAMPLE MATERIAL:

A total of 25 samples of well cuttings were received. Each appeared in reasonably good condition, and no evidence of major contamination was apparent.

SAMPLE PREPARATION:

Each sample was visually examined for contaminants and cleaned where necessary. Splits of the samples were taken, ground to a fine powder, and then analyzed.

DATA EVALUATION:

The results of the analyses are presented in the attached Table. The following criteria are suggested for interpreting the pyrolysis data:

SOURCE POTENTIAL	PETROLEUM TYPE		THERMAL MATURITY
S ₂	HYDROGEN INDEX	S ₂ /S ₃	T _{max}
<2.0 POOR	<200 GAS PRONE	<2.5 DRY GAS	<440 IMMATURE
2.0-5.0 MARGINAL	200-300 MIXED	2.5-5.0 WET GAS	440-470 OIL
>5.0 GOOD	>300 OIL PRONE	>5.0 OIL	>470 GAS

TABLE I

Gulf Oil Sierra State "K"
Sierra County, New Mexico

File No. 746
September 21, 1983

Results of Organic Carbon Analysis and Rock-Eval Pyrolysis

Sample Number	Client I.D.	T.O.C. (% Wt.)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	Production Index	$\frac{S2}{S3}$	Hydrogen Index	Oxygen Index
746-001	P4256-1 900-960'	<i>FAIR TO GOOD.</i> 1.30	0.19	<i>post org quantity</i> 0.62	0.31	<i>upper oil window</i> 464	0.23	<i>6.0</i> 2.00	48	24
746-002	P4256-2 980-1000'	0.99	0.22	0.50	0.38	458	0.31	1.34	51	38
746-003	P4256-3 1000-1040'	1.03	0.25	0.53	0.37	458	0.32	1.44	52	36
746-004	P4256-4 1040-1070'	1.02	0.22	0.63	0.39	452	0.26	1.62	61	38
746-005	P4256-5 1070-1100'	0.84	0.21	0.47	0.37	458	0.31	1.27	56	44
746-006	P4256-6 1100-1160'	1.03	0.35	0.75	0.28	456	0.32	2.66	73	28
746-007	P4256-7 1170-1200'	0.88	0.25	0.53	0.22	455	0.32	2.39	60	25
746-008	P4256-8 1290-1350'	0.68	0.17	0.34	0.25	456	0.34	1.38	50	36
746-009	P4256-9 1350-1400'	0.76	0.15	0.24	0.31	465	0.39	0.76	31	41
746-010	P4256-10 1400-1450'	0.87	0.24	0.75	0.32	<i>434</i> 434	0.24	2.34	86	37
746-011	P4256-11 1560-1600'	0.94	0.32	0.59	0.38	462	0.35	1.55	63	40

*More
view
sketch*

*More
sketch*

TABLE I

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Sierra County, New Mexico

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September 21, 1983

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Sample Number	Client I.D.	T.O.C. (% Wt.)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	Production Index	S2/S3	Hydrogen Index	Oxygen Index
<i>Maness</i> 746-012	P4256-12 1640-1680'	1.09	0.29	0.57	0.32	465	0.34	1.78	52	29
<i>Cisco</i> 746-013	P4256-13 5480-5510'	<i>FAIR H G.P.D.</i> 0.79	0.14	<i>cooked</i> <0.10	0.33	**	---	---	---	42
746-014	P4256-14 5510-5540'	1.51	0.26	<0.10	0.49	**	---	---	---	33
746-015	P4256-15 5580-5620'	0.82	0.14	<0.10	0.40	**	---	---	---	49
<i>Camp?</i> 746-016	P4256-16 5620-5660'	0.84	0.13	<0.10	0.42	**	---	---	---	50
746-017	P4256-17 6000-6030'	1.53	0.38	<0.10	0.53	**	---	---	---	35
<i>Shaw?</i> 746-018	P4256-18 6030-6080	2.17 (<i>vigord</i>)	0.35	<0.10	0.23	**	---	---	---	11
746-019	P4256-19 6230-6270'	0.95	<0.10	<0.10	0.21	**	---	---	---	22
746-020	P4256-20 7120-7200'	1.40	0.11	<0.10	0.28	**	---	---	---	20
<i>Alta-Min</i> 746-021	P4256-21 7290-7350'	1.28	0.12	<0.10	0.33	**	---	---	---	26
746-022	P4256-22 7380-7450'	1.10	<0.10	<0.10	0.29	**	---	---	---	26

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Gulf Oil Sierra State "K"
Sierra County, New Mexico

File No. 746
September 21, 1983

Results of Organic Carbon Analysis and Rock-Eval Pyrolysis

Sample Number	Client I.D.	T.O.C. (% Wt.)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	Production Index	S2/S3	Hydrogen Index	Oxygen Index
<i>Atoka - Morrison.</i> 746-023	P4256-23 7450-7500'	1.08	< 0.10	< 0.10	0.36	**	---	---	---	34
<i>Miss</i> 746-024	P4256-24 7550-7600'	1.27	< 0.10	0.10	0.39	414	---	0.27	8	30
<i>Dev Permian</i> 746-025	P4256-25 7600-7700'	1.25	< 0.10	< 0.10	0.38	**	---	---	---	31

*Fair to good T.O.C.'s - gas or inert oil,
upper oil windows in Sect.
Permian & worked.*

**Unable to determine due to insufficient S2 yield, multiple peaks, etc.