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R. M. LORKOWSKI
DENVER

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16 805-10152

83245ART0077

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

SOURCE ROCK EVALUATION

Pennsylvanian Core Samples from Three Kansas Wells

Geochemistry Services Group

R. J. Harwood

Technical Service 839266CS
Requested by R. M. Lorkowski
APC (USA) DENVER SOUTHERN

R. L. Ames
by BET (9-7-83)
RRJ

Distribution: R. C. Brooke, Denver
J. S. Arbogast, Denver
G. W. Henderson, Denver
C. L. Conrad, Denver
R. M. Lorkowski, Denver
R. R. Thompson/E. R. Michaelis

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* T.S. R839266 ROCKEVAL PYROLYSIS DATA

* SAMPLE NO.	TOP OF ANALYZED INTERVAL	FORMATION OR AGE	TOTAL ORGANIC CARBON WT% (TOC)	PPM VOLATILE HYDROCARBONS (S1 X 1000)	VOL/ TOC	PPM GENERATED HYDROCARBONS (S2 X 1000)	GEN/ TOC	TEMP OF MAX GEN	VOL/ VOL + GEN
S-777	5241	ATOKA	0.7	10	<0.01	90	0.01		0.10
S-778	4646	MORROW	1.2	320	0.03	1460	0.12		0.18
S-779	5988	MORROW	0.4	70	0.02	420	0.10		0.14
S-780	6072	MORROW	0.3	90	0.03	380	0.13		0.19
S-781	6088	MORROW	0.3	20	0.01	100	0.03		0.17

Table 2

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER DISTRICT SOUTHERN
TECHNICAL SERVICE NUMBER 839266

SOURCE ROCK DATA
TABLE 3.
DATE 08/31/83

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOLOGICAL AGE	INSOL RESID %	TOTAL ORG C WT %	BITUMEN		SAT HC		SAT HC / BITUMEN		REMARKS
	TOP	BOTTOM				BBL / AF	PPM	BBL / AF	PPM	TL ORG C	TL ORG C	
STATE KANSAS COUNTY CHEYENNE WELL LOCATION SFC5-T2S-R40W												
WELL NAME FARMER LEASE WAGONER #1												
S-777	5241	5242	PENN	93	.7							
STATE KANSAS COUNTY FINNEY WELL LOCATION SEC31-T21S-R33W												
WELL NAME SHALLOW WATER LEASE MAUNE #4												
S-778	4646	4649	PENN	92	1.2	3	184				.02	
STATE KANSAS COUNTY COMANCHE WELL LOCATION SEC27-T33S-R19W												
WELL NAME SINCLAIR LEASE EXCHANGE BANK #1												
S-779	5988	6012	PENN	67	.4							
S-780	6072	6073	PENN	67	.3							
S-781	6088	6089	PENN	58	.3							

BBL/AF = (PPM X .0180)

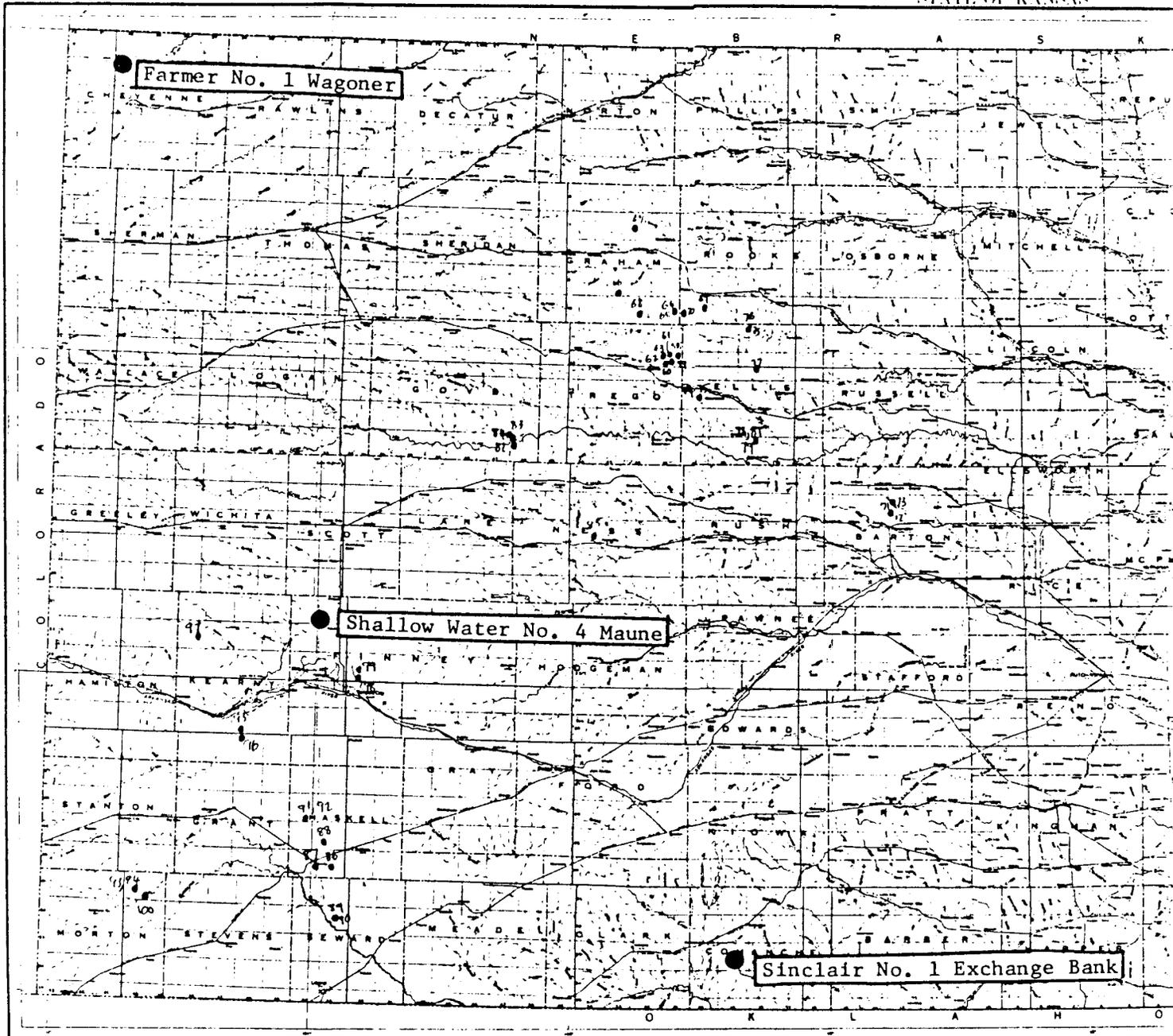
AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
839266

KEROGEN DATA
TABLE 4.
DATE 08/31/83

LAB SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOLOGICAL AGE	NORM. ELEMENTAL ANALYSIS, WT.				ATOMIC RATIO O/C	ATOMIC RATIO H/C	VISUAL KEROGEN TYPE	CARBONIZ. SCALE	VIT REFLECT %RO
	TOP	BOTTOM		CARBON	HYDROGEN	OXYGEN	NITROGEN					
STATE KANSAS COUNTY CHEYENNE WELL NAME FARMER				WELL LOCATION SEC5-T2S-R40W LEASE WAGONER #1								
S-777	5241	5242	PENN	86	2.6	9	2.3	.07	.36	MIXED		.93
STATE KANSAS COUNTY FINNEY WELL NAME SHALLOW WATER				WELL LOCATION SEC31-T21S-R33W LEASE MAUNE #4								
S-778	4646	4649	PENN	85	3.3	9	2.1	.08	.47	MIXED		.63
STATE KANSAS COUNTY COMANCHE WELL NAME SINCLAIR				WELL LOCATION SEC27-T33S-R19W LEASE EXCHANGE BANK #1								
S-779	5988	6012	PENN									
S-780	6072	6073	PENN									
S-781	6088	6089	PENN									

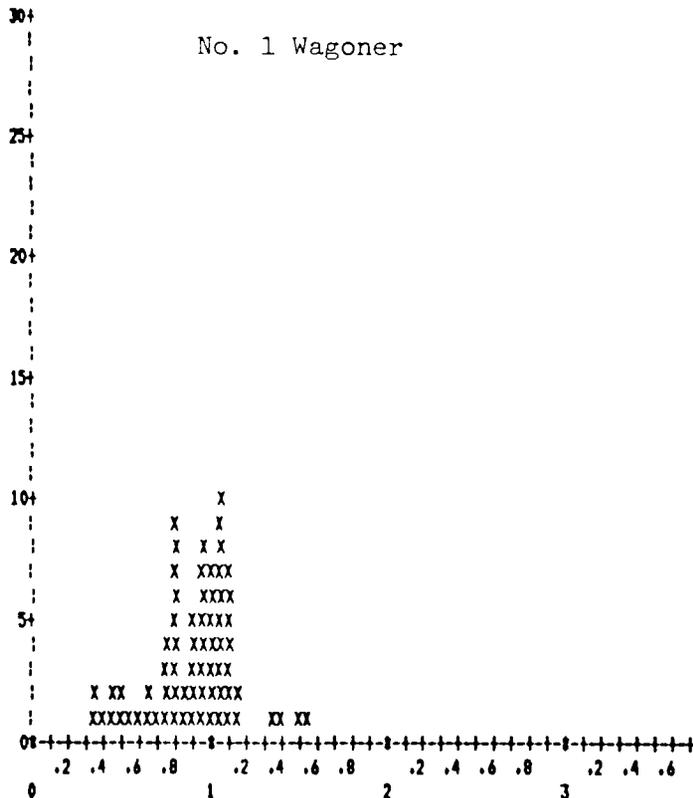


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CLIENT..... AMOCO PROD. COMPANY FILE NAME..... S-777
 DEPTH/SAMPLE NO., 5241'-5242' TYPE OF SAMPLE..... CORE; TS-9266
 LOCATION..... UNKNOWN; PENN. SH. DATE..... 8-22-83
 ANALYST..... K. W. SCHWAB NO. OF OBSERVATIONS. 70

STANDARD IRo START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.39 MAX. 1.59 AVG. 0.93 STD. DEV. 0.24



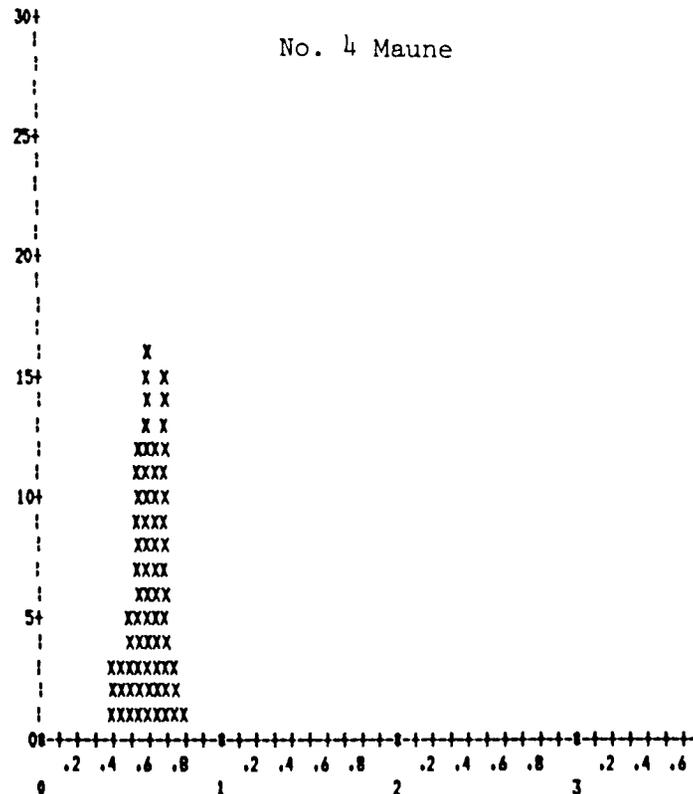
VITRINITE REFLECTANCE HISTOGRAM - IRo

POP.# 1 TOTAL CTS. 12 MIN. 0.39 MAX. 0.74 AVG. 0.54 STD. DEV. 0.12
 POP.# 2 TOTAL CTS. 54 MIN. 0.76 MAX. 1.16 AVG. 0.97 STD. DEV. 0.12
 POP.# 3 TOTAL CTS. 4 MIN. 1.37 MAX. 1.59 AVG. 1.47 STD. DEV. 0.10

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... S-778
 DEPTH/SAMPLE NO., 4646'-4649' TYPE OF SAMPLE..... CORE; TS-9266
 LOCATION..... UNKNOWN; PENN. SH. DATE..... 8-22-83
 ANALYST..... K. W. SCHWAB NO. OF OBSERVATIONS. 70

STANDARD IRo START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.42 MAX. 0.80 AVG. 0.63 STD. DEV. 0.09



VITRINITE REFLECTANCE HISTOGRAM - IRo

POP.# 1 TOTAL CTS. 70 MIN. 0.42 MAX. 0.80 AVG. 0.63 STD. DEV. 0.09

100680

1408 / 1001

10 X 1001

18225 45000

92266

1121

S-778 No. 4 Maune

15

18

19 IP

20 IP

20

25

30

Whole Extract Chromatogram
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TS 839266CS
Figure 3

~~G. W. Henderson~~
Denver

140
CMB

83011ART0061

AMOCO PRODUCTION COMPANY
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SOURCE ROCK EVALUATION

Mississippian and Pennsylvanian Cores, Seven Wells,
Hugoton Embayment, Western Kansas

Geochemistry Services Group

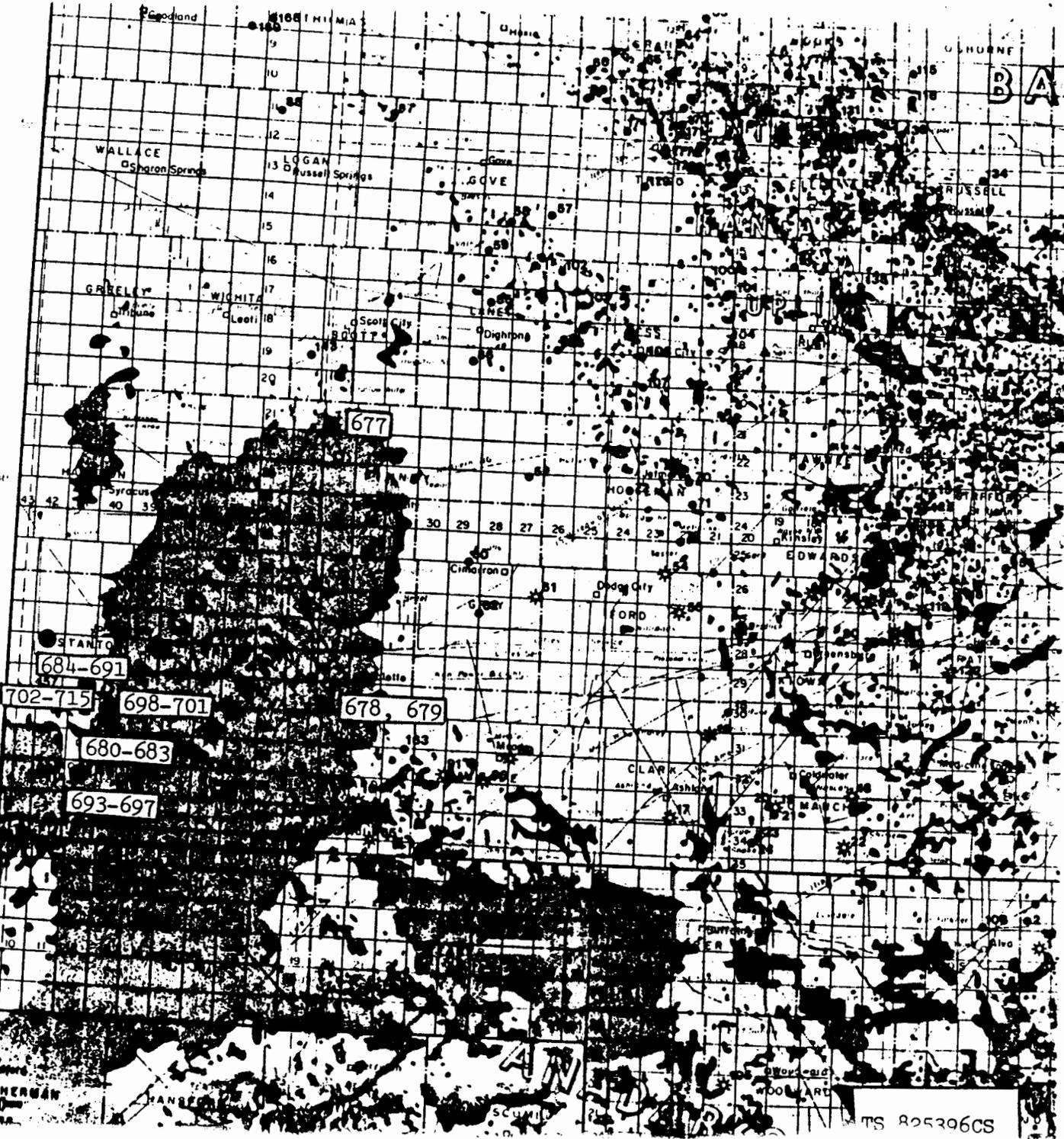
R. J. Harwood

Technical Service 825396CS
Requested by K. C. Sawyer
APC (USA) DENVER SOUTHERN

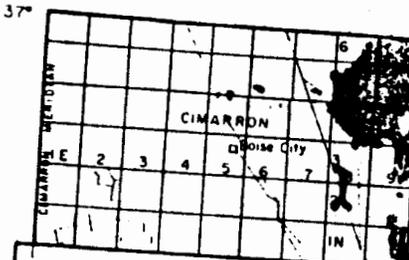
R. J. Harwood (1/12/83)
RRJ

Distribution: R. C. Brooke, Denver
G. W. Henderson, Denver
O. R. Hille, Denver
K. C. Sawyer, Denver
J. A. Babcock
R. R. Thompson/E. R. Michaelis

BA



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DALLAM
 DALHAR

IRON
 SHERMAN

AIN

TS 825396CS

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OFFICE DENVER
AUTHORIZED BY O R HILLE
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN

825396

SOURCE ROCK SUMMARY
TABLE 1a
DATE 01/04/83

SAMPLE NUMBER	SMPL TYPE	FORMATION	AGE	LITHOLOGY	FIELD NO. OR DEPTH FEET TOP***BASE	PETROLEUM GENERATION CAPABILITY	KEROGEN TYPE (OIL/GAS)	STAGE OF DIAGENESIS
STATE KS COUNTY FINNEY WELL LOCATION SEC31-T21S-R33W								
WELL NAME SHALLOW WATER LEASE MAUNE #4								
S-677	CR	ST LOUIS	MISS SH		4648	MARGINAL	GAS	EARLY GAS
STATE KS COUNTY HASKELL WELL LOCATION SEC31-T30S-R33W 115°F @ ~4600' Grad: 14.1°F/1000'								
WELL NAME CITIES SERVICE LEASE THOMPSON #2-E								
S-678	CR	LANSING	PENN SH		4531	VERY GOOD	OIL	EARLY PEAK OIL
S-679	CR	LANSING	PENN SH		4534	VERY GOOD	OIL	EARLY PEAK OIL
STATE KS COUNTY MORTON WELL LOCATION SEC29-T31S-R40W 121°F @ ~5000' Grad: 14.2°F/1000'								
WELL NAME AMOCO LEASE DOTTIE CHAFFIN #1								
S-680	CR	MORROW	PENN SH		4940	MARGINAL	GAS	EARLY GAS
S-681	CR	MORROW	PENN SH		4947	NON SOURCE		
S-682	CR	MORROW	PENN SH		4972	MARGINAL	GAS	EARLY GAS
S-683	CR	MORROW	PENN SH		4975	MARGINAL	GAS	EARLY GAS
STATE KS COUNTY STANTON WELL LOCATION SEC4-T29S-R42W								
WELL NAME SUPERIOR LEASE H L TUCKER #68-A4								
S-684	CR	MORROW	PENN SH		3348	MARGINAL	GAS	EARLY GAS
S-685	CR	MORROW	PENN SH		5246	5247 MARGINAL	GAS	EARLY GAS
S-686	CR	MORROW	PENN SH		5250	5251 MARGINAL	GAS	EARLY GAS
S-687	CR	MORROW	PENN SH		5254	5255 MARGINAL	GAS	EARLY GAS
S-688	CR	MORROW	PENN SH		5378	5379 MARGINAL	GAS	EARLY GAS
S-689	CR	MORROW	PENN SH		5384	5385 MARGINAL	GAS	EARLY GAS
S-690	CR	MORROW	PENN SH		5391	5392 MARGINAL	GAS	EARLY GAS

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A M O C O P R O D U C T I O N C O M P A N Y
R E S E A R C H C E N T E R

OFFICE DENVER DISTRICT SOUTHERN
AUTHORIZED BY O R HILLE
TECHNICAL SERVICE NUMBER 825396

SOURCE ROCK SUMMARY
TABLE 1. b
DATE 01/04/83

SAMPLE NUMBER	SMPL TYPE	FORMATION	AGE	LITHOLOGY	FIELD NO. OR DEPTH FEET TOP***BASE	PETROLEUM GENERATION CAPABILITY	KEROGEN TYPE (OIL/GAS)	STAGE OF DIAGENESIS

STATE KS WELL NAME	COUNTY SUPERIOR	STANTON	WELL LOCATION SEC4-T29S-R42W LEASE H L TUCKER #68-A4					
S-691	CR	MORROW	PENN SH	5397	5398	MARGINAL	GAS	EARLY GAS
STATE KS COUNTY MORTON WELL LOCATION SEC9-T33S-R41W 120°F @ 5100' Grad: 13.7°F/1000'								
WELL NAME ANADARKO LEASE JONES #B-1								
S-693	CR	MORROW	PENN SH	5039		VERY GOOD	GAS-CONDE	EARLY GAS
S-694	CR	MORROW	PENN SH	5043		VERY GOOD	GAS-CONDE	EARLY GAS
S-695	CR	MORROW	PENN SH	5063		MARGINAL	GAS	EARLY GAS
S-696	CR	MORROW	PENN SH	5067		MARGINAL	GAS	EARLY GAS
S-697	CR	MORROW	PENN SH	5069		MARGINAL	GAS	EARLY GAS
STATE KS COUNTY MORTON WELL LOCATION SEC21-T31S-R40W 110°F @ 5100' Grad: 11.8°F/1000'								
WELL NAME PAN AM LEASE P A WILLIAMS #2								
S-698	CR	MORROW	PENN SH	5048		MARGINAL	GAS	EARLY GAS
S-699	CR	MORROW	PENN SH	5054		NON SOURCE		
S-700	CR	MORROW	PENN SH	5057		NON SOURCE		
S-701	CR	MORROW	PENN SH	5059		NON SOURCE		
STATE KS COUNTY MORTON WELL LOCATION SEC21-T31S-R40W 119°F @ 5100' Grad: 13.5°F/1000'								
WELL NAME AMOCO LEASE SLINKER #2								
S-702	CR	MORROW	PENN SH	3976		MARGINAL	GAS	EARLY GAS
S-703	CR	MORROW	PENN SH	4979		MARGINAL	GAS	EARLY GAS
S-704	CR	MORROW	PENN SH	4983		MARGINAL	GAS	EARLY GAS
S-705	CR	MORROW	PENN SH	4986		MARGINAL	GAS	EARLY GAS

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R E S E A R C H C E N T E R

OFFICE DENVER
AUTHORIZED BY O R HILLE
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
825396

SOURCE ROCK SUMMARY
TABLE 1.C
DATE 01/04/83

SAMPLE NUMBER		SMPL TYPE	FORMATION	AGE	LITHOLOGY	FIELD NO. OR DEPTH FEET		PETROLEUM GENERATION CAPABILITY	KEROGEN TYPE (OIL/GAS)	STAGE OF DIAGENESIS	
LAB NO.						TOP***BASE					
STATE KS	COUNTY MORTON					WELL LOCATION SEC21-T31S-R40W					
WELL NAME	AMOCO					LEASE	SLINKER #2				
S-706	CR	MORROW	PENN SH			4989		MARGINAL	GAS	EARLY GAS	
S-707	CR	MORROW	PENN SH			4992		MARGINAL	GAS	EARLY GAS	
S-708	CR	MORROW	PENN COAL			4995		VERY GOOD	GAS	EARLY GAS	
S-709	CR	MORROW	PENN SH			5008		MARGINAL	GAS	EARLY GAS	
S-710	CR	MORROW	PENN COAL			5012		VERY GOOD	GAS	EARLY GAS	
S-711	CR	MORROW	PENN SH			5027		MARGINAL	GAS	EARLY GAS	
S-712	CR	MORROW	PENN SH			5033		MARGINAL	GAS	EARLY GAS	
S-713	CR	MORROW	PENN SH			5038		MARGINAL	GAS	EARLY GAS	
S-714	CR	MORROW	PENN SH			5043		MARGINAL	GAS	EARLY GAS	
S-715	CR	MORROW	PENN SH			5044		MARGINAL	GAS	EARLY GAS	

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R825396 ROCKEVAL PYROLYSIS DATA

* SAMPLE NO.	TOP OF ANALYZED INTERVAL	FORMATION	TOTAL ORGANIC CARBON WT% (TOC)	PPM VOLATILE HYDROCARBONS (S1 X 1000)	VOL/ TOC	PPM GENERATED HYDROCARBONS (S2 X 1000)	GEN/ TOC	TEMP OF MAX GEN	VOL/ VOL + GEN
S-677	4648	ST. LOUIS	1.0	80	0.01	190	0.02	437	0.30
S-678	4531	LANSING	13.7	5160	0.04	65570	0.48	431	0.07
S-679	4534	LANSING	5.9	2630	0.04	25160	0.43	430	0.09
S-680	4940	MORROW	0.5	40	0.01	20	<.01	434	0.67
S-681	4947	MORROW	0.3	40	0.01	130	0.04	437	0.24
S-682	4972	MORROW	0.7	30	<.01	130	0.02		0.19
S-683	4975	MORROW	0.7	50	0.01	150	0.02		0.25
S-684	3348	MORROW	0.6	30	0.01	50	0.01		0.38
S-685	5246	MORROW	0.5	40	0.01	70	0.01		0.36
S-686	5250	MORROW	0.5	50	0.01	40	0.01		0.56
S-687	5255	MORROW	1.3	40	<.01	480	0.04	431	0.08
S-688	5378	MORROW	1.1	50	<.01	200	0.02	434	0.20
S-689	5384	MORROW	0.7	60	0.01	110	0.02	400	0.35
S-690	5391	MORROW	0.9	50	0.01	180	0.02	434	0.22
S-691	5397	MORROW	0.8	60	0.01	120	0.01	422	0.33
S-693	5039	MORROW	5.0	580	0.01	4270	0.09	434	0.12
S-694	5043	MORROW	3.9	440	0.01	4330	0.11	435	0.09
S-695	5063	MORROW	1.0	80	0.01	280	0.03	439	0.22
S-696	5067	MORROW	0.7	50	0.01	160	0.02	438	0.24
S-697	5069	MORROW	0.7	60	0.01	150	0.02	437	0.29
S-698	5048	MORROW	0.6	90	0.01	130	0.02	427	0.41
S-699	5045	MORROW	0.4	50	0.01	70	0.02		0.42
S-700	5057	MORROW	0.4	50	0.01	160	0.04		0.24
S-701	5059	MORROW	0.5	70	0.01	170	0.03		0.29
S-702	3976	MORROW	0.8	140	0.02	310	0.04	456	0.31
S-703	4979	MORROW	2.9	70	<.01	210	0.01	434	0.25
S-704	4983	MORROW	0.9	60	0.01	220	0.02	441	0.21
S-705	4986	MORROW	0.9	90	0.01	250	0.03	444	0.26
S-706	4989	MORROW	0.9	90	0.01	360	0.04	440	0.20
S-707	4992	MORROW	0.8	70	0.01	390	0.05	450	0.15
S-708	4995	MORROW	55.5	11230	0.02	135670	0.24	446	0.08
S-709	5008	MORROW	0.8	80	0.01	600	0.07	470	0.12
S-710	5012	MORROW	75.8	20200	0.03	173120	0.23	438	0.10
S-711	5027	MORROW	0.8	80	0.01	320	0.04	423	0.20
S-712	5033	MORROW	1.1	80	0.01	310	0.03	441	0.21
S-713	5038	MORROW	1.0	90	0.01	400	0.04	443	0.18
S-714	5043	MORROW	1.0	80	0.01	410	0.04	444	0.16
S-715	5044	MORROW	1.0	110	0.01	470	0.05	440	0.19

Table 2

Accuracy - To be Maintained in Confidence
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AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER DISTRICT SOUTHERN
TECHNICAL SERVICE NUMBER 825396

SOURCE ROCK DATA
TABLE 3a
DATE 01/04/83

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOLOGICAL AGE	INSOLUBLE RESIDUE %	TOTAL ORGANIC C WT%	BITUMEN		SAT HC		SAT HC/BITUMEN TL	BITUMEN/ORG C	REMARKS
	TOP	BOTTOM				BBL/AF	PPM	BBL/AF	PPM			
BBL/AF = (PPM X .0180)												
STATE KS WELL NAME	COUNTY FINNEY SHALLOW WATER					WELL LOCATION SEC31-T21S-R33W LEASE MAUNE #4						Sat. $\delta C^{13}O$ /oo Pristane/Phytane
S-677	4648		MISS	90	1.0	1	46					<.01
STATE KS WELL NAME	COUNTY HASKELL CITIES SERVICE					WELL LOCATION SEC31-T30S-R33W LEASE THOMPSON #2-E						
S-678	4531		PENN	87	13.7	97	5392	26	1459	.27	.04	-28.5 1.26
S-679	4534		PENN	71	5.9	75	4171	28	1571	.38	.07	-28.3 1.15
STATE KS WELL NAME	COUNTY MORTON AMOCO					WELL LOCATION SEC29-T31S-R40W LEASE DOTTIE CHAFFIN #1						
S-680	4940		PENN	88	.5							
S-681	4947		PENN	92	.3							
S-682	4972		PENN	78	.7	1	62					.01
S-683	4975		PENN	87	.7	1	34					<.01
STATE KS WELL NAME	COUNTY STANTON SUPERIOR					WELL LOCATION SEC4-T29S-R42W LEASE H L TUCKER #68-A4						
S-684	3348		PENN	72	.6	1	81					.01
S-685	5246	5247	PENN	90	.5							
S-686	5250	5251	PENN	87	.5							
S-687	5254	5255	PENN	77	1.3	3	147					.01
S-688	5378	5379	PENN	83	1.1	2	86					.01
S-689	5384	5385	PENN	84	.7	3	140					.02
S-690	5391	5392	PENN	83	.9	2	108					.01

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AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER DISTRICT SOUTHERN
TECHNICAL SERVICE NUMBER 825396

SOURCE ROCK DATA
TABLE 3.b
DATE 01/04/83

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOLOGICAL AGE	INSOLUBLE RESIDUE %	TOTAL ORGANIC C WT%	BITUMEN		SAT HC		SAT HC/BITUMEN	BITUMEN/TOTAL ORGANIC C	REMARKS
	TOP	BOTTOM				BBL/AF	PPM	BBL/AF	PPM			
<p style="text-align: right;">BBL/AF = (PPM X .0180) Sat. δC^{13} ‰/‰ Pristane/Phytane</p>												
STATE KS WELL NAME	COUNTY SUPERIOR		STANTON	WELL LOCATION SEC4-T29S-R42W LEASE H L TUCKER #68-A4								
S-691	5397	5398	PENN	78	.8	2	99				.01	
STATE KS WELL NAME	COUNTY ANADARKO		MORTON	WELL LOCATION SEC9-T33S-R41W LEASE JONES #B-1								
S-693	5039		PENN	92	5.0	20	1099	5	261	.24	.02	-27.6 4.29
S-694	5043		PENN	94	3.9	10	549	2	103	.19	.01	-27.7 4.83
S-695	5063		PENN	80	1.0	2	135				.01	
S-696	5067		PENN	75	.7	3	147				.02	
S-697	5069		PENN	73	.7	2	125				.02	
STATE KS WELL NAME	COUNTY PAN AM		MORTON	WELL LOCATION SEC21-T31S-R40W LEASE P A WILLIAMS #2								
S-698	5048		PENN	91	.6	1	53				.01	
S-699	5054		PENN	53	.4							
S-700	5057		PENN	93	.4							
S-701	5059		PENN	93	.5	1	48				.01	
STATE KS WELL NAME	COUNTY AMOCO		MORTON	WELL LOCATION SEC21-T31S-R40W LEASE SLINKER #2								
S-702	3976		PENN	88	.8	2	86				.01	
S-703	4979		PENN	86	2.9	1	77				<.01	
S-704	4983		PENN	83	.9	2	93				.01	
S-705	4986		PENN	83	.9	2	93				.01	

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RESEARCH CENTER

OFFICE DENVER DISTRICT SOUTHERN
TECHNICAL SERVICE NUMBER 825396

SOURCE ROCK DATA
TABLE 3. c
DATE 01/04/83

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET TOP***BOTTOM	GEOL. AGE	INSOL RESID% ORG C	TOTAL WT%	BITUMEN		SAT HC		SAT HC/BITUMEN/TL ORG C	REMARKS
					BBL/AF	PPM	BBL/AF	PPM		
STATE KS	COUNTY MORTON	WELL LOCATION SEC21-T31S-R40W				BBL/AF = (PPM X .0180)				
WELL NAME	AMOCO	LEASE	SLINKER #2			Sat. $\delta^{13}O$ /oo	Pristane/Phytane			
S-706	4989	PENN 86	.9	4	214	2	113	.53	.02	-27.3 2.31
S-707	4992	PENN 88	.8	1	68				.01	
S-708	4995	PENN 72	55.5	109	6038	35	1952	.32	.01	-28.5 4.00
S-709	5008	PENN 92	.8	1	61				.01	
S-710	5012	PENN 96	75.8	106	5886	9	525	.09	.01	-28.4 4.30
S-711	5027	PENN 81	.8	2	83				.01	
S-712	5033	PENN 81	1.1	2	110				.01	
S-713	5038	PENN 83	1.0	2	83				.01	
S-714	5043	PENN 79	1.0	2	100				.01	
S-715	5044	PENN 83	1.0	1	82				.01	

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RESEARCH CENTER

OFFICE DENVER
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
825396

KEROGEN DATA
TABLE 4.8
DATE 01/04/83

LAB SAMPLE NUMBER	FIELD NO. OR DEPTH FEET TOP**BOTTOM		GEOL. AGE	NORM. ELEMENTAL ANALYSIS, WT.				ATOMIC RATIO O/C	ATOMIC RATIO H/C	VISUAL KEROGEN TYPE	CARBNZ. SCALE	VIT REFLECT %RO
				CARBON	HYDROGEN	OXYGEN	NITROGEN					
STATE KS WELL NAME	COUNTY FINNEY SHALLOW WATER			WELL LOCATION SEC31-T21S-R33W LEASE MAUNE #4								
S-677	4648		MISS	85	3.8	10	1.6	.08	.54	MIXED	.55	
STATE KS WELL NAME	COUNTY HASKELL CITIES SERVICE			WELL LOCATION SEC31-T30S-R33W LEASE THOMPSON #2-E								
S-678	4531		PENN	84	7.4	6	3.1	.05	1.06	MIXED	.43	
S-679	4534		PENN	84	7.1	6	2.6	.05	1.02	MIXED	.45	
STATE KS WELL NAME	COUNTY MORTON AMOCO			WELL LOCATION SEC29-T31S-R40W LEASE DOTTIE CHAFFIN #1								
S-680	4940		PENN									
S-681	4947		PENN									
S-682	4972		PENN	88	3.3	7	1.7	.06	.45	MIXED	.81	
S-683	4975		PENN	88	3.4	7	1.7	.06	.47	MIXED	.86	
STATE KS WELL NAME	COUNTY STANTON SUPERIOR			WELL LOCATION SEC4-T29S-R42W LEASE H L TUCKER #68-A4								
S-684	3348		PENN							STRUCTURED	.76	
S-685	5246	5247	PENN									
S-686	5250	5251	PENN									
S-687	5254	5255	PENN	86	4.0	8	2.0	.07	.56	MIXED	.81	
S-688	5378	5379	PENN	86	3.7	8	1.8	.07	.51	MIXED	.57	
S-689	5384	5385	PENN	87	3.6	8	1.6	.07	.50	MIXED	.57	
S-690	5391	5392	PENN	87	3.8	8	1.3	.06	.52	MIXED	.55	
S-691	5397	5398	PENN	84	4.0	10	2.2	.08	.58	MIXED	.59	

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DISTRICT SOUTHERN
825396

KEROGEN DATA
TABLE 4. b
DATE 01/04/83

LAB SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOL. AGE	NORM. ELEMENTAL ANALYSIS, WT.				ATOMIC RATIO O/C	ATOMIC RATIO H/C	VISUAL KEROGEN TYPE	CARBNZ. SCALE	VIT REFLECT %RO
	TOP***	BOTTOM		CARBON	HYDROGEN	OXYGEN	NITROGEN					

STATE KS WELL NAME	COUNTY MORTON ANADARKO			WELL LOCATION SEC9-T33S-R41W LEASE JONES #B-1								
S-693	5039		PENN	83	5.3	10	2.2	.08	.76	STRUCTURED	.55	
S-694	5043		PENN	82	5.5	10	1.9	.09	.81	MIXED	.62	
S-695	5063		PENN	87	4.1	8	1.4	.06	.57	MIXED	.62	
S-696	5067		PENN	87	3.7	7	1.9	.06	.51	MIXED	.68	
S-697	5069		PENN	88	3.7	6	1.7	.05	.51	MIXED	.64	

STATE KS WELL NAME	COUNTY MORTON PAN AM			WELL LOCATION SEC21-T31S-R40W LEASE P A WILLIAMS #2								
S-698	5048		PENN	84	4.1	10	2.5	.08	.59	MIXED	.47	
S-699	5054		PENN									
S-700	5057		PENN									
S-701	5059		PENN	85	4.0	9	2.4	.07	.56	MIXED	.52	

STATE KS WELL NAME	COUNTY MORTON AMOCO			WELL LOCATION SEC21-T31S-R40W LEASE SLINKER #2								
S-702	3976		PENN	85	4.4	9	2.3	.07	.62	MIXED	.78	
S-703	4979		PENN	84	4.2	10	1.7	.08	.59	MIXED	.71	
S-704	4983		PENN	89	3.6	6	1.7	.05	.49	MIXED	.72	
S-705	4986		PENN	85	3.5	10	1.6	.08	.49	MIXED	.68	
S-706	4989		PENN	87	3.7	7	1.9	.06	.51	MIXED	.69	
S-707	4992		PENN	86	4.2	8	2.2	.06	.59	MIXED	.79	
S-708	4995		PENN	86	4.2	9	1.5	.07	.59	MIXED	.86	

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825396

KEROGEN DATA
TABLE 4.C
DATE 01/04/83

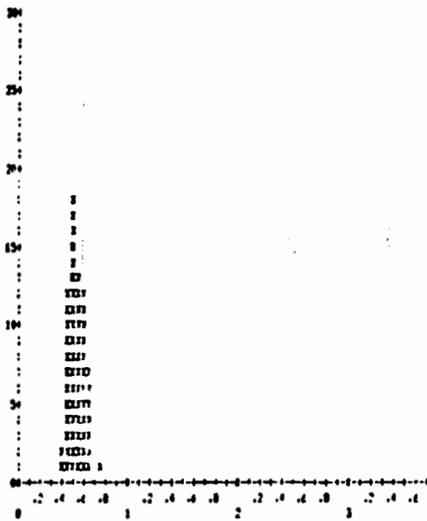
LAB SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOL. AGE	NORM. ELEMENTAL ANALYSIS, WT.				ATOMIC RATIO O/C	ATOMIC RATIO H/C	VISUAL KEROGEN TYPE	CARBNZ. SCALE	VIT REFLECT %RO
	TOP***	BOTTOM		CARBON	HYDROGEN	OXYGEN	NITROGEN					
STATE KS	COUNTY MORTON		WELL LOCATION SEC21-T31S-R40W									
WELL NAME	AMOCO		LEASE SLINKER #2									
S-709	5008		PENN	81	5.1	12	2.0	.10	.75	MIXED		.72
S-710	5012		PENN	84	5.6	9	1.2	.07	.80	STRUCTURED		.68
S-711	5027		PENN	84	4.2	10	1.6	.09	.61	MIXED		.66
S-712	5033		PENN							STRUCTURED		.68
S-713	5038		PENN							STRUCTURED		.67
S-714	5043		PENN							MIXED		.68
S-715	5044		PENN	84	4.1	10	2.1	.08	.58	MIXED		.69

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CLIENT..... ARCO PROD. COMPANY FILE NAME..... 9-677
 DEPTH/SAMPLE NO. WATER SAND-4 TYPE OF SAMPLE..... CORE CHIP, 4.64
 LOCATION..... FINNELL CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHWAB NO. OF OBSERVATIONS. 45

STANDARD IN: START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 0.75 AVG. 0.52 STD. DEV. 0.07



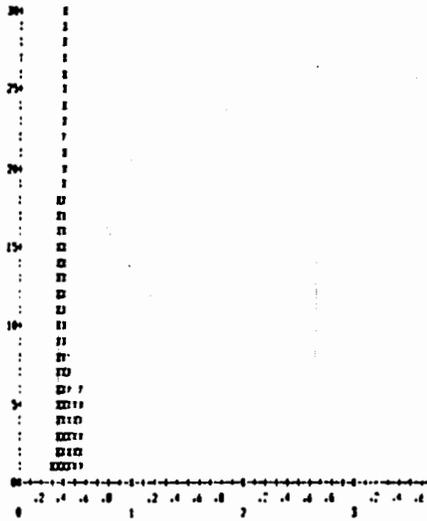
VITRINITE REFLECTANCE HISTOGRAM - 9-677

POP. 1 TOTAL CTS. 47 MIN. 0.41 MAX. 0.75 AVG. 0.52 STD. DEV. 0.07

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-678
 DEPTH/SAMPLE NO. CITEC THOMPSON 12-E TYPE OF SAMPLE..... CORE CHIP, 4.531
 LOCATION..... HASKELL CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHWAB NO. OF OBSERVATIONS. 74

STANDARD IN: START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.31 MAX. 0.59 AVG. 0.43 STD. DEV. 0.04



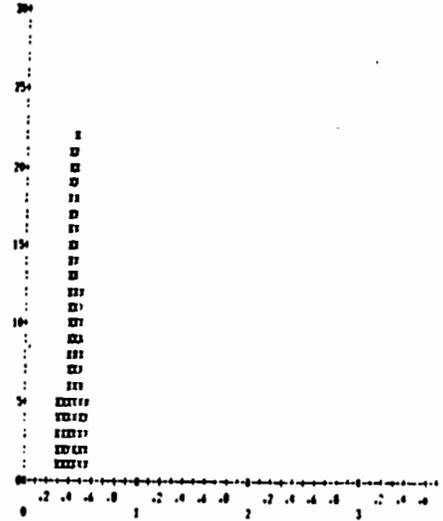
VITRINITE REFLECTANCE HISTOGRAM - CS-678

POP. 1 TOTAL CTS. 70 MIN. 0.31 MAX. 0.59 AVG. 0.43 STD. DEV. 0.04

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-679
 DEPTH/SAMPLE NO. CITEC THOMPSON 12-E TYPE OF SAMPLE..... CORE CHIP, 4.534
 LOCATION..... HASKELL CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHWAB NO. OF OBSERVATIONS. 74

STANDARD IN: START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.31 MAX. 0.59 AVG. 0.43 STD. DEV. 0.04



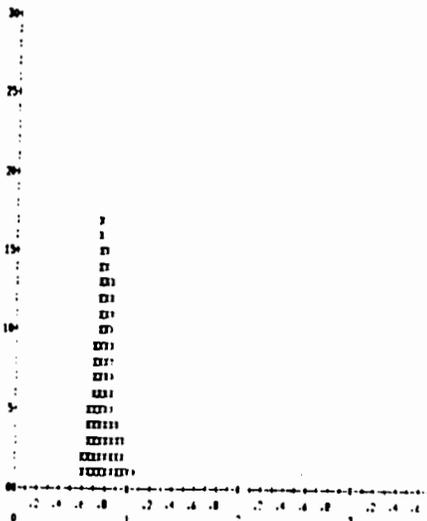
VITRINITE REFLECTANCE HISTOGRAM - CS-679

POP. 1 TOTAL CTS. 70 MIN. 0.31 MAX. 0.59 AVG. 0.43 STD. DEV. 0.04

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-682
 DEPTH/SAMPLE NO. BOTTLE CHIPPIN 0.1 TYPE OF SAMPLE..... CORE CHIP, 4.972
 LOCATION..... HORTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHWAB NO. OF OBSERVATIONS. 74

STANDARD IN: START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.61 MAX. 1.09 AVG. 0.81 STD. DEV. 0.09



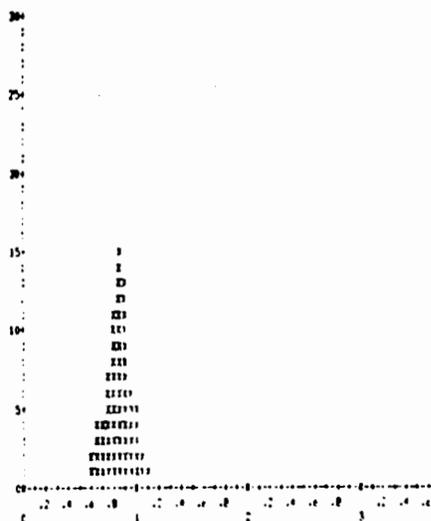
VITRINITE REFLECTANCE HISTOGRAM - CS-682

POP. 1 TOTAL CTS. 70 MIN. 0.61 MAX. 1.09 AVG. 0.81 STD. DEV. 0.09

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-683
 DEPTH/SAMPLE NO. BOTTLE CHIPPIN 0.1 TYPE OF SAMPLE..... CORE CHIP, 4.972
 LOCATION..... HORTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHWAB NO. OF OBSERVATIONS. 70

STANDARD IN: START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.64 MAX. 1.11 AVG. 0.86 STD. DEV. 0.11



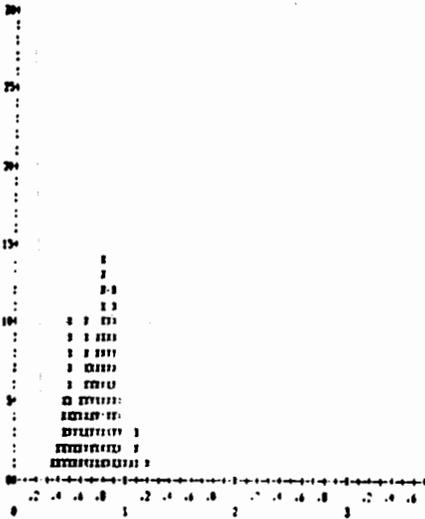
VITRINITE REFLECTANCE HISTOGRAM - CS-683

POP. 1 TOTAL CTS. 70 MIN. 0.64 MAX. 1.11 AVG. 0.86 STD. DEV. 0.11

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-484
 DEPTH/SAMPLE NO. N.I. TICKET # 68-44 TYPE OF SAMPLE..... CORE CHIP, 3.20"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMID NO. OF OBSERVATIONS, 10

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.28 MAX. 1.21 AVG. 0.76 STD. DEV. 0.18



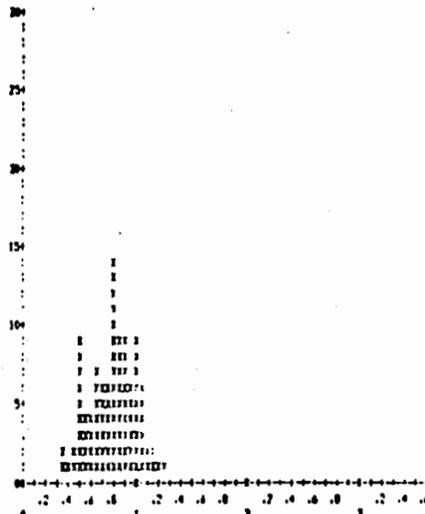
VITRINITE REFLECTANCE HISTOGRAM - 284

POP. # 1 TOTAL CTS. 27 MIN. 0.37 MAX. 0.94 AVG. 0.53 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 67 MIN. 0.62 MAX. 0.94 AVG. 0.80 STD. DEV. 0.09
 POP. # 3 TOTAL CTS. 6 MIN. 1.07 MAX. 1.21 AVG. 1.12 STD. DEV. 0.07

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-487
 DEPTH/SAMPLE NO. N.I. TICKET # 68-44 TYPE OF SAMPLE..... CORE CHIP, 3.20"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMID NO. OF OBSERVATIONS, 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.39 MAX. 1.29 AVG. 0.81 STD. DEV. 0.20



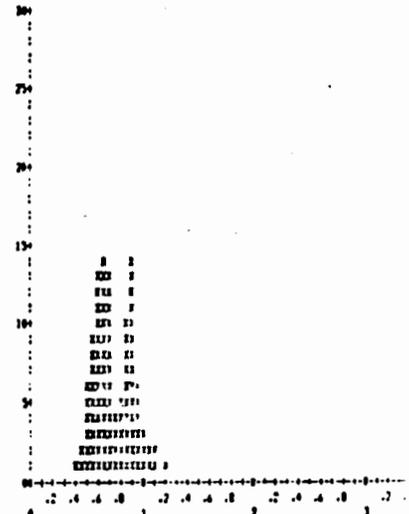
VITRINITE REFLECTANCE HISTOGRAM - 284

POP. # 1 TOTAL CTS. 22 MIN. 0.39 MAX. 0.62 AVG. 0.52 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 72 MIN. 0.65 MAX. 1.09 AVG. 0.87 STD. DEV. 0.11
 POP. # 3 TOTAL CTS. 6 MIN. 1.11 MAX. 1.29 AVG. 1.12 STD. DEV. 0.07

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-488
 DEPTH/SAMPLE NO. N.I. TICKET # 68-44 TYPE OF SAMPLE..... CORE CHIP, 3.20"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMID NO. OF OBSERVATIONS, 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.43 MAX. 1.22 AVG. 0.74 STD. DEV. 0.19



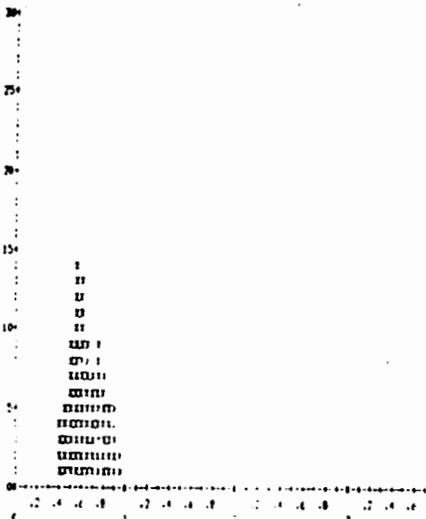
VITRINITE REFLECTANCE HISTOGRAM - 284

POP. # 1 TOTAL CTS. 31 MIN. 0.43 MAX. 0.64 AVG. 0.57 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 74 MIN. 0.62 MAX. 1.22 AVG. 0.84 STD. DEV. 0.11

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-489
 DEPTH/SAMPLE NO. N.I. TICKET # 68-44 TYPE OF SAMPLE..... CORE CHIP, 3.20"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMID NO. OF OBSERVATIONS, 90

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 0.95 AVG. 0.67 STD. DEV. 0.14



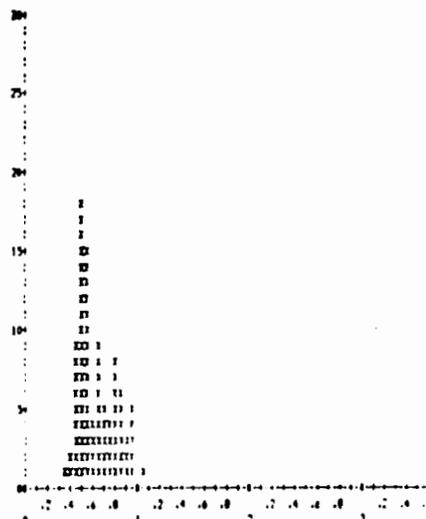
VITRINITE REFLECTANCE HISTOGRAM - 284

POP. # 1 TOTAL CTS. 54 MIN. 0.41 MAX. 0.64 AVG. 0.57 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 36 MIN. 0.74 MAX. 0.95 AVG. 0.82 STD. DEV. 0.09

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-490
 DEPTH/SAMPLE NO. N.I. TICKET # 68-44 TYPE OF SAMPLE..... CORE CHIP, 3.20"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMID NO. OF OBSERVATIONS, 90

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.39 MAX. 1.04 AVG. 0.66 STD. DEV. 0.16



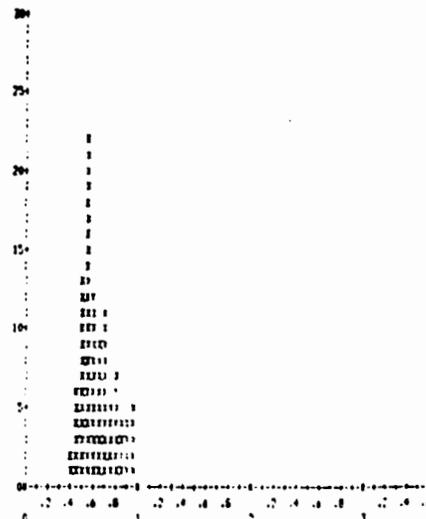
VITRINITE REFLECTANCE HISTOGRAM - 284

POP. # 1 TOTAL CTS. 56 MIN. 0.39 MAX. 0.64 AVG. 0.52 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 34 MIN. 0.71 MAX. 1.04 AVG. 0.82 STD. DEV. 0.09

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-491
 DEPTH/SAMPLE NO. N.I. TICKET # 68-44 TYPE OF SAMPLE..... CORE CHIP, 3.20"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMID NO. OF OBSERVATIONS, 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 0.99 AVG. 0.66 STD. DEV. 0.14



VITRINITE REFLECTANCE HISTOGRAM - 284

POP. # 1 TOTAL CTS. 77 MIN. 0.41 MAX. 0.74 AVG. 0.59 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 23 MIN. 0.72 MAX. 0.99 AVG. 0.82 STD. DEV. 0.07

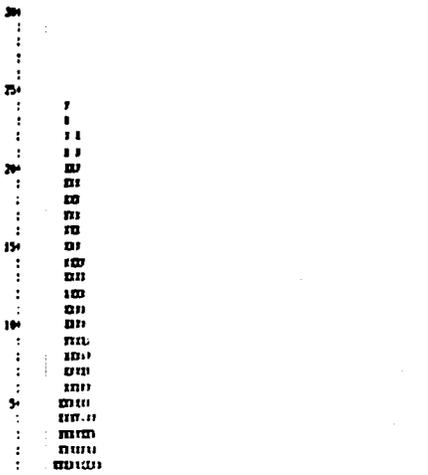
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TS 825396CS
 Figure 2b

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-67
 DEPTH/SAMPLE NO. ANWARAWC JONES 9 3-1 TYPE OF SAMPLE CORE CHIP, 5.04"
 LOCATION..... WYOMING CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMIDT NO. OF OBSERVATIONS 100

STANDARD Dev START: 1.03 FINISH: 1.02

REFLECTANCE DATA: MIN: 0.34 MAX: 0.70 AVG: 0.57 STD. DEV: 0.06



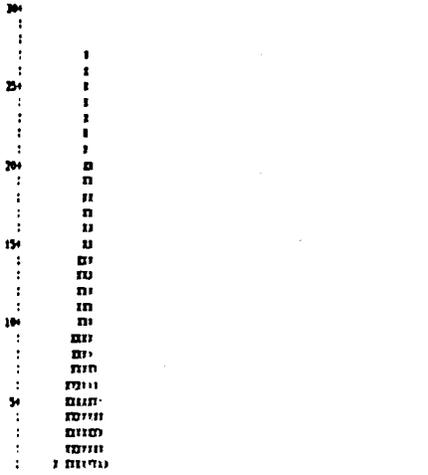
VITRINITE REFLECTANCE HISTOGRAM - 86c

POP. 1 TOTAL CTS. 100 MIN: 0.34 MAX: 0.70 AVG: 0.57 STD. DEV: 0.06

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-69A
 DEPTH/SAMPLE NO. ANWARAWC JONES 9 3-1 TYPE OF SAMPLE CORE CHIP, 5.04"
 LOCATION..... WYOMING CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMIDT NO. OF OBSERVATIONS 90

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN: 0.35 MAX: 0.80 AVG: 0.62 STD. DEV: 0.08



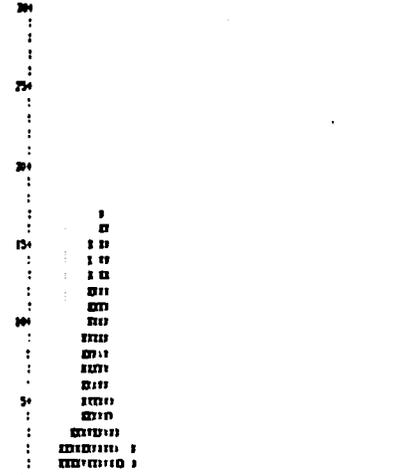
VITRINITE REFLECTANCE HISTOGRAM - 86a

POP. 1 TOTAL CTS. 90 MIN: 0.35 MAX: 0.80 AVG: 0.62 STD. DEV: 0.08

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-67
 DEPTH/SAMPLE NO. ANWARAWC JONES 9 1 TYPE OF SAMPLE CORE CHIP
 LOCATION..... WYOMING CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMIDT NO. OF OBSERVATIONS 90

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN: 0.32 MAX: 0.79 AVG: 0.63 STD. DEV: 0.08



VITRINITE REFLECTANCE HISTOGRAM - 86b

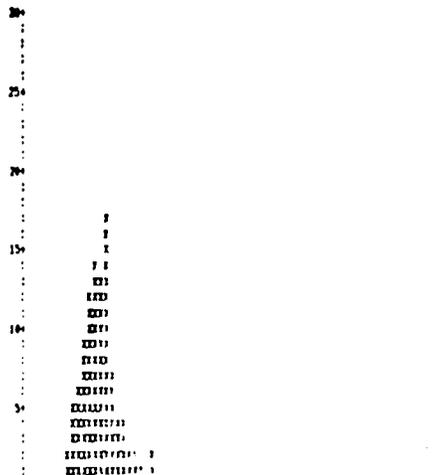
POP. 1 TOTAL CTS. 90 MIN: 0.32 MAX: 0.79 AVG: 0.63 STD. DEV: 0.08

POP. 2 TOTAL CTS. 2 MIN: 0.70 MAX: 0.79 AVG: 0.74 STD. DEV: 0.04

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-67
 DEPTH/SAMPLE NO. ANWARAWC JONES 9 1 TYPE OF SAMPLE CORE CHIP, 5.04"
 LOCATION..... WYOMING CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMIDT NO. OF OBSERVATIONS 100

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN: 0.43 MAX: 1.10 AVG: 0.71 STD. DEV: 0.15



VITRINITE REFLECTANCE HISTOGRAM - 86d

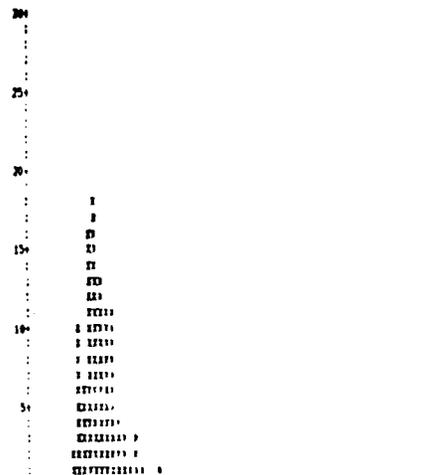
POP. 1 TOTAL CTS. 92 MIN: 0.43 MAX: 0.92 AVG: 0.66 STD. DEV: 0.12

POP. 2 TOTAL CTS. 8 MIN: 0.79 MAX: 1.10 AVG: 1.04 STD. DEV: 0.08

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-67
 DEPTH/SAMPLE NO. ANWARAWC JONES 9 1 TYPE OF SAMPLE CORE CHIP, 5.04"
 LOCATION..... WYOMING CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. B. SCHMIDT NO. OF OBSERVATIONS 100

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN: 0.41 MAX: 1.10 AVG: 0.64 STD. DEV: 0.14



VITRINITE REFLECTANCE HISTOGRAM - 86e

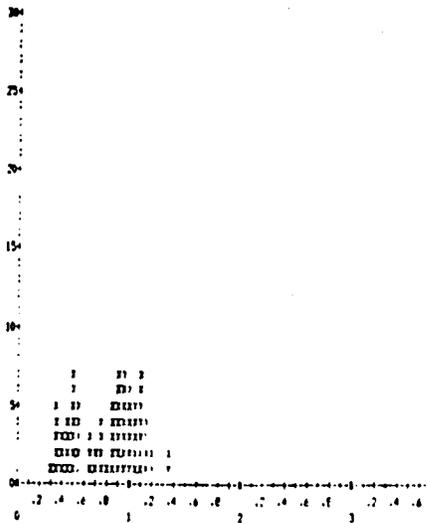
POP. 1 TOTAL CTS. 94 MIN: 0.41 MAX: 0.98 AVG: 0.64 STD. DEV: 0.12

POP. 2 TOTAL CTS. 6 MIN: 0.74 MAX: 1.10 AVG: 1.00 STD. DEV: 0.05

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-498
 DEPTH/SAMPLE NO. P.A. WILLIAMS #1 TYPE OF SAMPLE..... CORE (27, 5, 048)
 LOCATION..... HORTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 40

STANDARD DEVIATION: 0.02 START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.34 MAX. 1.39 AVG. 0.82 STD. DEV. 0.28



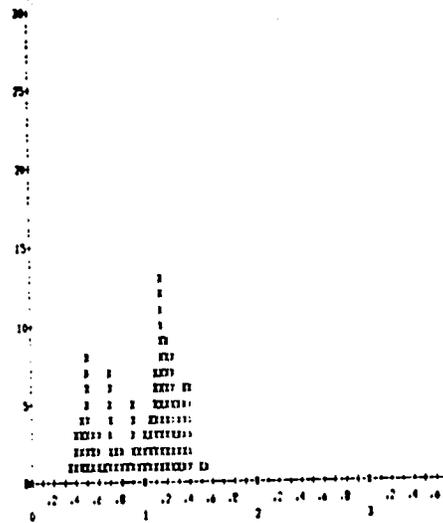
VITRINITE REFLECTANCE HISTOGRAM - DR

POP. 1 TOTAL CTS: 22 MIN: 0.34 MAX: 0.58 AVG: 0.47 STD. DEV: 0.17
 POP. 2 TOTAL CTS: 10 MIN: 0.42 MAX: 0.82 AVG: 0.74 STD. DEV: 0.20
 POP. 3 TOTAL CTS: 41 MIN: 0.82 MAX: 1.37 AVG: 1.01 STD. DEV: 0.29
 POP. 4 TOTAL CTS: 7 MIN: 1.02 MAX: 1.39 AVG: 1.30 STD. DEV: 0.18

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-701
 DEPTH/SAMPLE NO. P.A. WILLIAMS # 2 TYPE OF SAMPLE..... CORE (217, 5, 070)
 LOCATION..... HORTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 102

STANDARD DEVIATION: 0.02 START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.37 MAX. 1.53 AVG. 1.01 STD. DEV. 0.32



VITRINITE REFLECTANCE HISTOGRAM - DR

POP. 1 TOTAL CTS: 23 MIN: 0.37 MAX: 0.67 AVG: 0.52 STD. DEV: 0.17
 POP. 2 TOTAL CTS: 27 MIN: 0.70 MAX: 1.04 AVG: 0.87 STD. DEV: 0.18
 POP. 3 TOTAL CTS: 50 MIN: 1.09 MAX: 1.44 AVG: 1.24 STD. DEV: 0.16
 POP. 4 TOTAL CTS: 2 MIN: 1.52 MAX: 1.53 AVG: 1.54 STD. DEV: 0.02

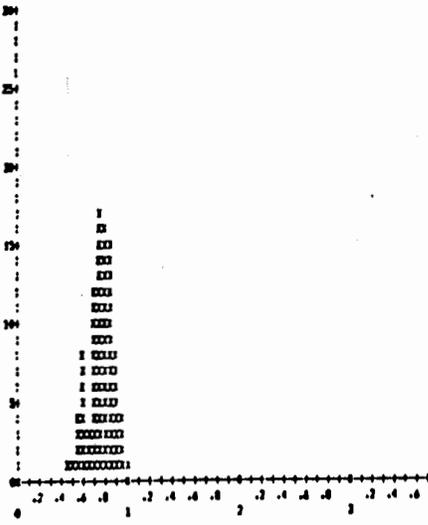
TS 825396CS
 Figure 2d

Proprietary - To Be Maintained in Confidence
 Amoco Production Company

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-793
 DEPTH/SAMPLE NO. AMCO S.LINCS 1.2 TYPE OF SAMPLE..... CORE CHIP, 1.7%
 LOCATION..... BERTON CO., KANSAS DATE..... 12-7-82
 ANALYST..... E. H. SCHMID NO. OF OBSERVATIONS. 99

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.47 MAX. 1.01 AVG. 0.78 STD. DEV. 0.11

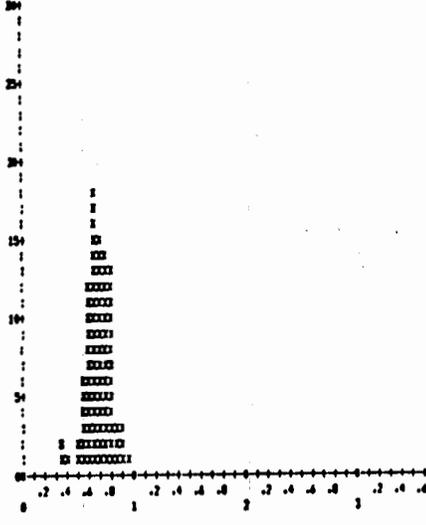


POP. # 1 TOTAL CTS. 14 MIN. 0.47 MAX. 0.64 AVG. 0.59 STD. DEV. 0.05
 POP. # 2 TOTAL CTS. 76 MIN. 0.47 MAX. 1.01 AVG. 0.82 STD. DEV. 0.08

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-793
 DEPTH/SAMPLE NO. AMCO S.LINCS 1.2 TYPE OF SAMPLE..... CORE CHIP, 4.9
 LOCATION..... BERTON CO., KANSAS DATE..... 12-7-82
 ANALYST..... E. H. SCHMID NO. OF OBSERVATIONS. 99

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.36 MAX. 0.97 AVG. 0.71 STD. DEV. 0.11

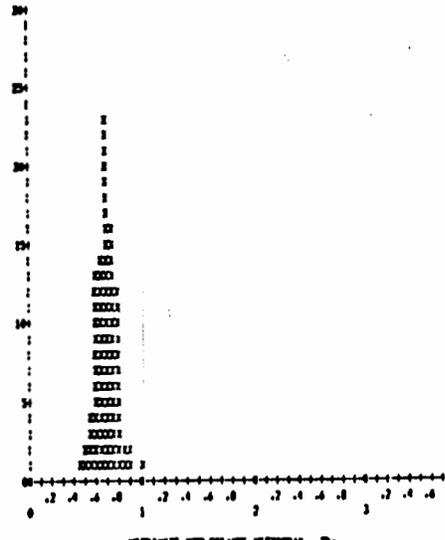


POP. # 1 TOTAL CTS. 2 MIN. 0.36 MAX. 0.42 AVG. 0.39 STD. DEV. 0.03
 POP. # 2 TOTAL CTS. 87 MIN. 0.32 MAX. 0.97 AVG. 0.72 STD. DEV. 0.10

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-794
 DEPTH/SAMPLE NO. AMCO S.LINCS 1.2 TYPE OF SAMPLE..... CORE CHIP, 4
 LOCATION..... BERTON CO., KANSAS DATE..... 12-7-82
 ANALYST..... E. H. SCHMID NO. OF OBSERVATIONS. 99

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.45 MAX. 1.00 AVG. 0.72 STD. DEV. 0.09

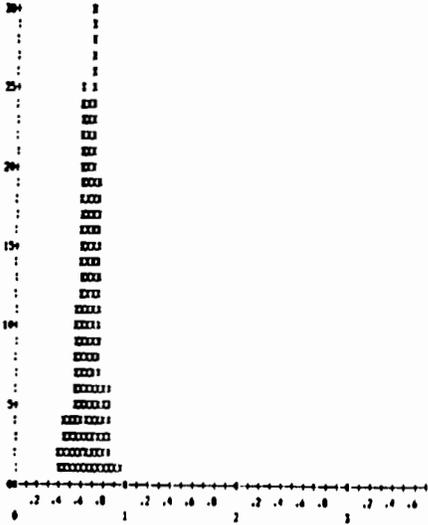


POP. # 1 TOTAL CTS. 99 MIN. 0.45 MAX. 1.00 AVG. 0.72 STD. DEV. 0.09

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-795
 DEPTH/SAMPLE NO. AMCO S.LINCS 1.2 TYPE OF SAMPLE..... CORE CHIP, 4.7%
 LOCATION..... BERTON CO., KANSAS DATE..... 12-7-82
 ANALYST..... E. H. SCHMID NO. OF OBSERVATIONS. 149

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.43 MAX. 0.79 AVG. 0.60 STD. DEV. 0.10

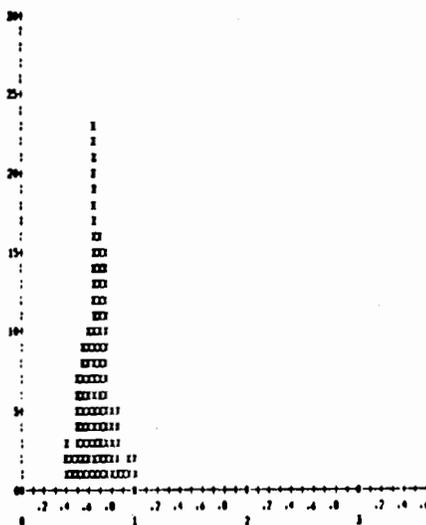


POP. # 1 TOTAL CTS. 140 MIN. 0.43 MAX. 0.79 AVG. 0.60 STD. DEV. 0.10

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-796
 DEPTH/SAMPLE NO. AMCO S.LINCS 1.2 TYPE OF SAMPLE..... CORE CHIP, 4.9%
 LOCATION..... BERTON CO., KANSAS DATE..... 12-7-82
 ANALYST..... E. H. SCHMID NO. OF OBSERVATIONS. 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 1.00 AVG. 0.69 STD. DEV. 0.12

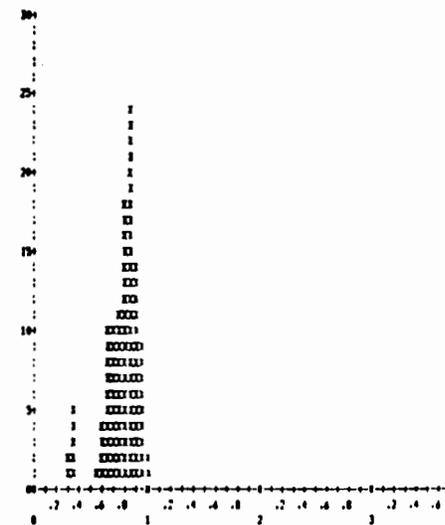


POP. # 1 TOTAL CTS. 100 MIN. 0.41 MAX. 1.00 AVG. 0.69 STD. DEV. 0.12

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-797
 DEPTH/SAMPLE NO. AMCO S.LINCS 1.2 TYPE OF SAMPLE..... CORE CHIP, 4.9%
 LOCATION..... BERTON CO., KANSAS DATE..... 12-7-82
 ANALYST..... E. H. SCHMID NO. OF OBSERVATIONS. 110

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.31 MAX. 1.04 AVG. 0.79 STD. DEV. 0.15



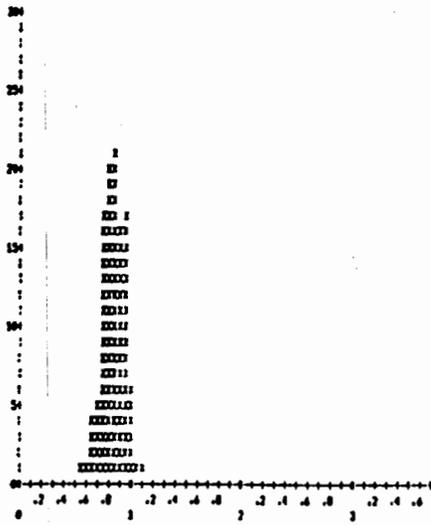
POP. # 1 TOTAL CTS. 7 MIN. 0.31 MAX. 0.37 AVG. 0.35 STD. DEV. 0.02

POP. # 2 TOTAL CTS. 103 MIN. 0.50 MAX. 1.04 AVG. 0.82 STD. DEV. 0.10

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-700
 DEPTH/SAMPLE NO. AMCO BLIND# 1 2 TYPE OF SAMPLE..... CORE CHIP, 4.99
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. B. SCHMID NO. OF OBSERVATIONS. 110

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.20 MAX. 1.13 AVG. 0.66 STD. DEV. 0.10



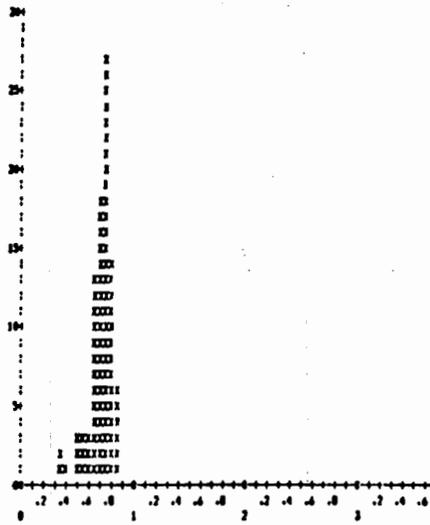
VITRULITE REFLECTANCE HISTOGRAM - IN0

POP.# 1 TOTAL CTS. 110 MIN. 0.20 MAX. 1.13 AVG. 0.66 STD. DEV. 0.10

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-700
 DEPTH/SAMPLE NO. AMCO BLIND# 1 2 TYPE OF SAMPLE..... CORE CHIP, 5.00
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. B. SCHMID NO. OF OBSERVATIONS. 90

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.27 MAX. 0.99 AVG. 0.72 STD. DEV. 0.10



VITRULITE REFLECTANCE HISTOGRAM - IN0

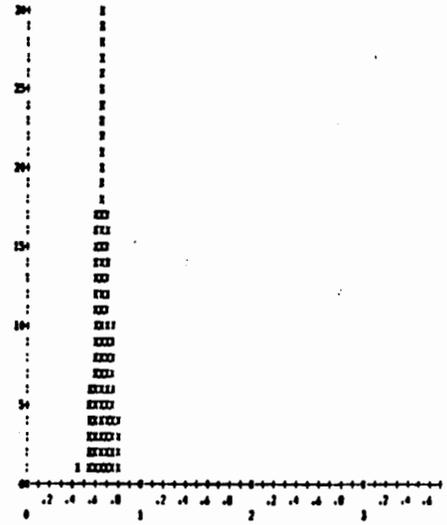
POP.# 1 TOTAL CTS. 90 MIN. 0.27 MAX. 0.99 AVG. 0.72 STD. DEV. 0.10

POP.# 2 TOTAL CTS. 07 MIN. 0.50 MAX. 0.99 AVG. 0.74 STD. DEV. 0.08

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-710
 DEPTH/SAMPLE NO. AMCO BLIND# 1 2 TYPE OF SAMPLE..... CORE, 5.012
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. B. SCHMID NO. OF OBSERVATIONS. 90

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.40 MAX. 0.82 AVG. 0.60 STD. DEV. 0.06



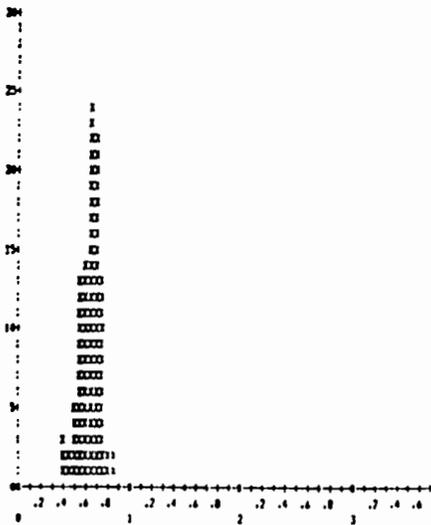
VITRULITE REFLECTANCE HISTOGRAM - IN0

POP.# 1 TOTAL CTS. 90 MIN. 0.40 MAX. 0.82 AVG. 0.60 STD. DEV. 0.06

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-711
 DEPTH/SAMPLE NO. AMCO BLIND# 1 2 TYPE OF SAMPLE..... CORE CHIP, 5.007
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. B. SCHMID NO. OF OBSERVATIONS. 100

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.40 MAX. 0.80 AVG. 0.64 STD. DEV. 0.09



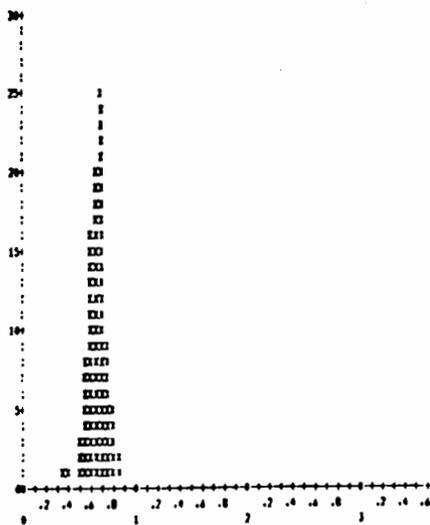
VITRULITE REFLECTANCE HISTOGRAM - IN0

POP.# 1 TOTAL CTS. 100 MIN. 0.40 MAX. 0.80 AVG. 0.64 STD. DEV. 0.09

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-712
 DEPTH/SAMPLE NO. AMCO BLIND# 1 2 TYPE OF SAMPLE..... CORE CHIP, 5.007
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. B. SCHMID NO. OF OBSERVATIONS. 90

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.25 MAX. 0.87 AVG. 0.60 STD. DEV. 0.09



VITRULITE REFLECTANCE HISTOGRAM - IN0

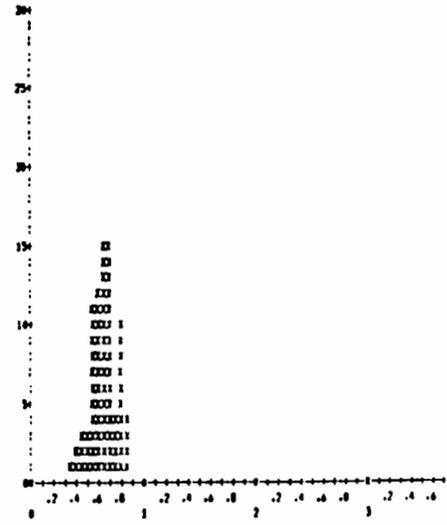
POP.# 1 TOTAL CTS. 72 MIN. 0.25 MAX. 0.87 AVG. 0.60 STD. DEV. 0.09

POP.# 2 TOTAL CTS. 00 MIN. 0.25 MAX. 0.87 AVG. 0.60 STD. DEV. 0.00

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-713
 DEPTH/SAMPLE NO. AMCO BLIND# 1 2 TYPE OF SAMPLE..... CORE CHIP, 5.007
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. B. SCHMID NO. OF OBSERVATIONS. 10

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.27 MAX. 0.89 AVG. 0.67 STD. DEV. 0.11



VITRULITE REFLECTANCE HISTOGRAM - IN0

POP.# 1 TOTAL CTS. 9 MIN. 0.27 MAX. 0.89 AVG. 0.67 STD. DEV. 0.05

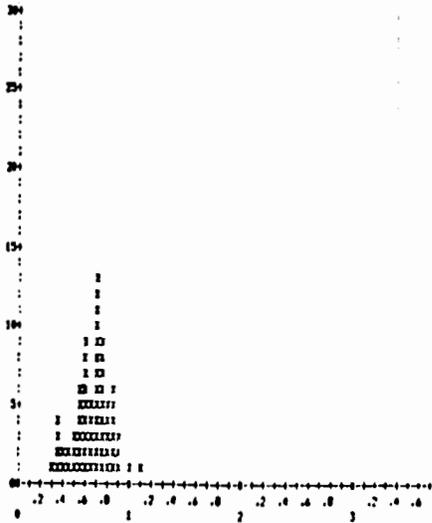
POP.# 2 TOTAL CTS. 53 MIN. 0.25 MAX. 0.74 AVG. 0.65 STD. DEV. 0.06

POP.# 3 TOTAL CTS. 10 MIN. 0.76 MAX. 0.89 AVG. 0.82 STD. DEV. 0.04

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-714
 DEPTH/SAMPLE NO. AMCO BULKED # 2 TYPE OF SAMPLE..... CORE DRIF. S.042
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. U. SCHNAU NO. OF OBSERVATIONS, 70

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.33 MAX. 1.12 AVG. 0.60 STD. DEV. 0.16

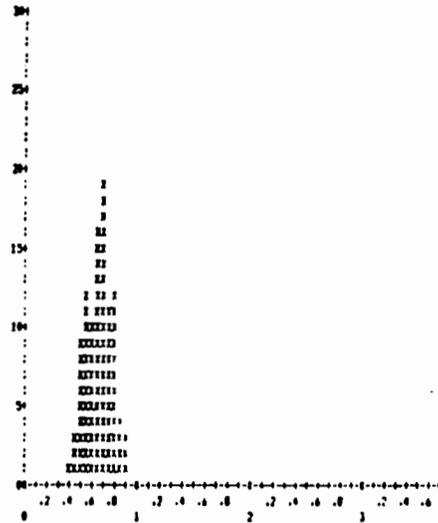


POP. # 1 TOTAL CTS. 9 MIN. 0.33 MAX. 0.47 AVG. 0.40 STD. DEV. 0.05
 POP. # 2 TOTAL CTS. 59 MIN. 0.52 MAX. 0.71 AVG. 0.71 STD. DEV. 0.11
 POP. # 3 TOTAL CTS. 2 MIN. 1.00 MAX. 1.12 AVG. 1.06 STD. DEV. 0.06

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-715
 DEPTH/SAMPLE NO. AMCO BULKED # 2 TYPE OF SAMPLE..... CORE DRIF. S.044
 LOCATION..... HERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... S. U. SCHNAU NO. OF OBSERVATIONS, 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.44 MAX. 0.93 AVG. 0.61 STD. DEV. 0.11

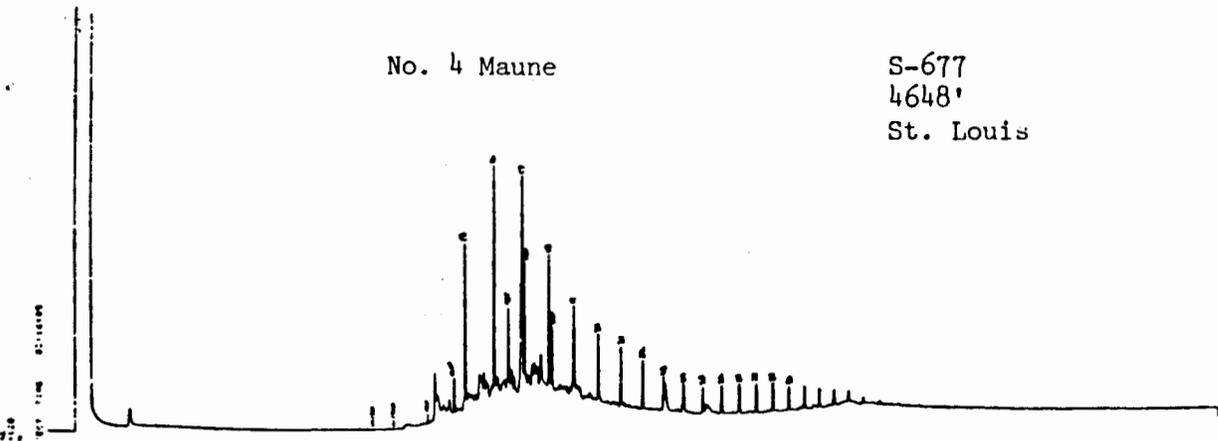


POP. # 1 TOTAL CTS. 100 MIN. 0.44 MAX. 0.93 AVG. 0.61 STD. DEV. 0.11

TS 825396CS
 Figure 2g

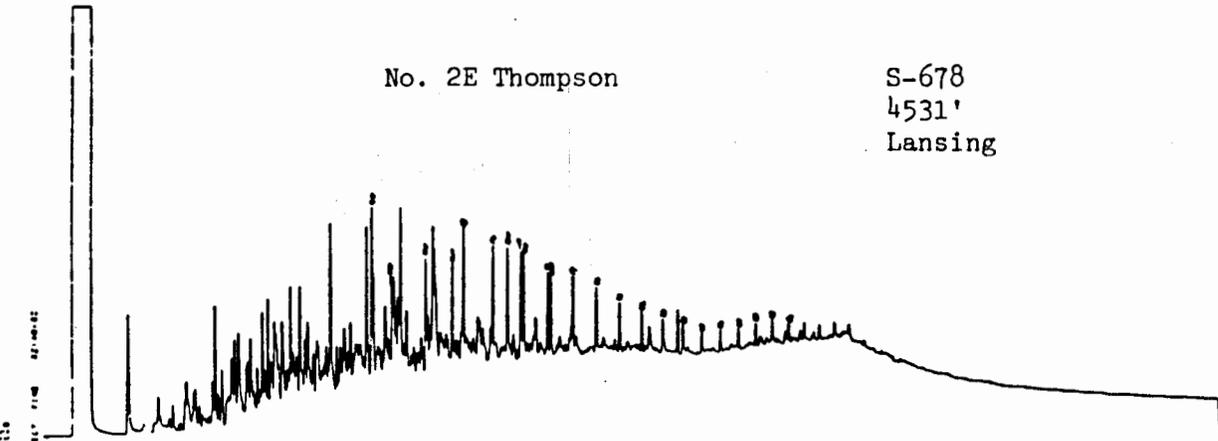
No. 4 Maune

S-677
4648'
St. Louis

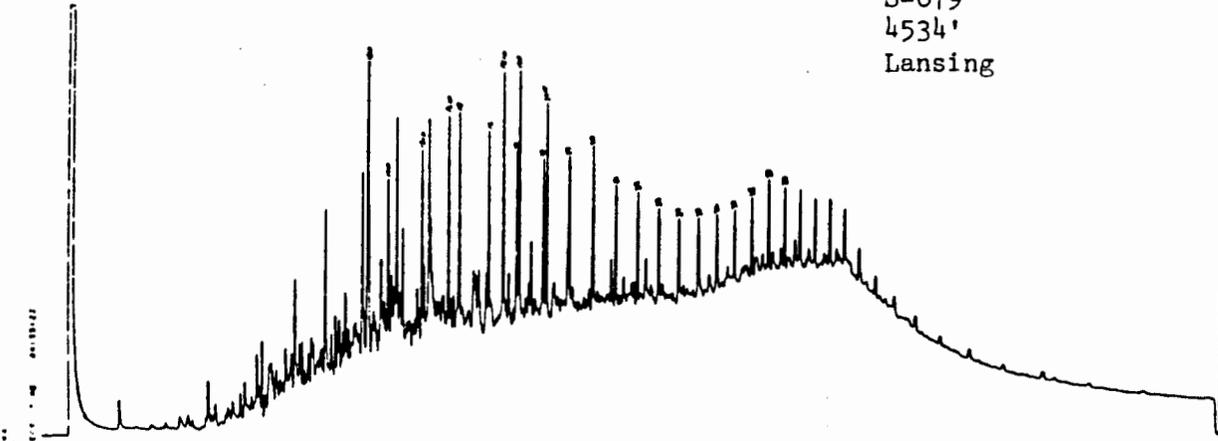


No. 2E Thompson

S-678
4531'
Lansing

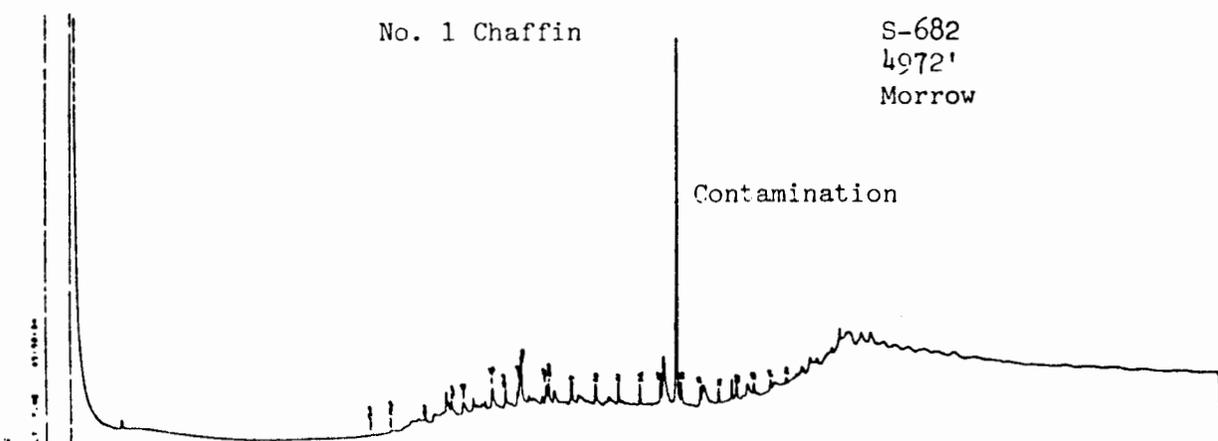


S-679
4534'
Lansing



No. 1 Chaffin

S-682
4972'
Morrow



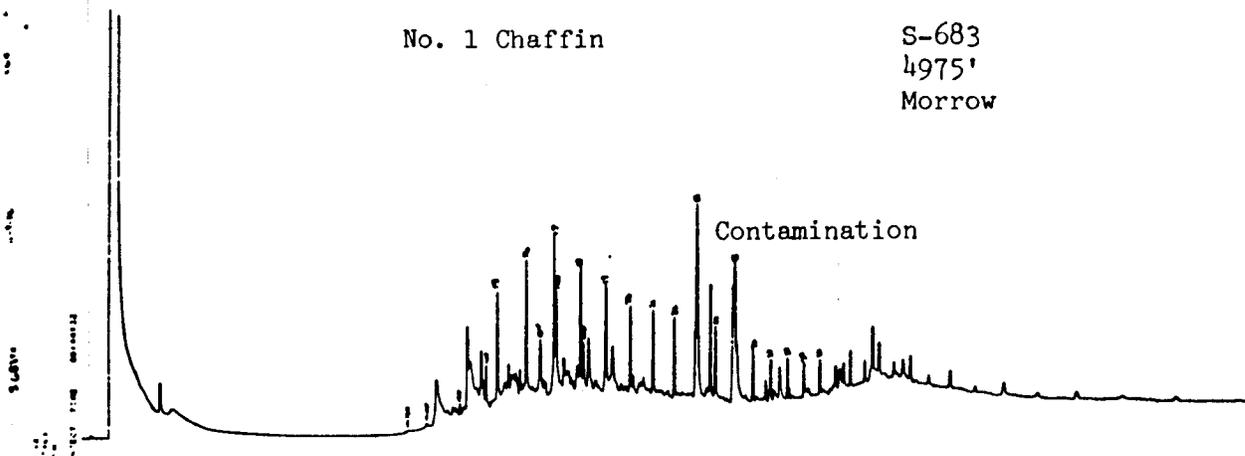
Whole Extract Chromatograms

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Amoco Production Company

TS 825396CS
Figure 3a

No. 1 Chaffin

S-683
4975'
Morrow



Whole Extract Chromatogram

TS 825396CS
Figure 3b

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Amoco Production Company

NO. 00-A4 TUCKER

S-004
3348'
Morrow

Contamination

S-687
5254'
Morrow

Contamination

S-688
5378'
Morrow

Contamination

S-689
5384'
Morrow

Contamination

Whole Extract Chromatograms

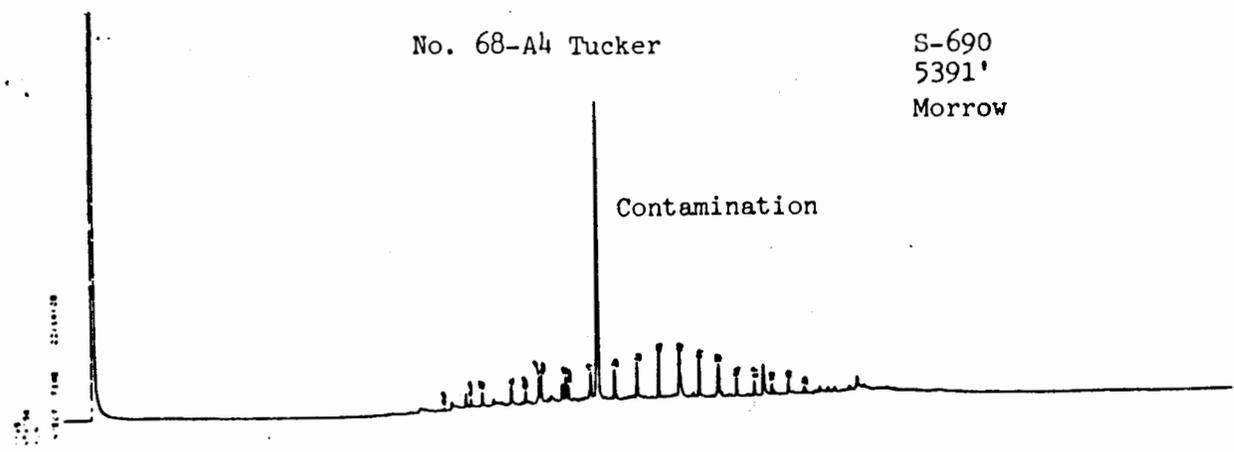
Proprietary - To Be Maintained In Confidence
Amoco Production Company

TS 825396CS
Figure 3c

No. 68-A4 Tucker

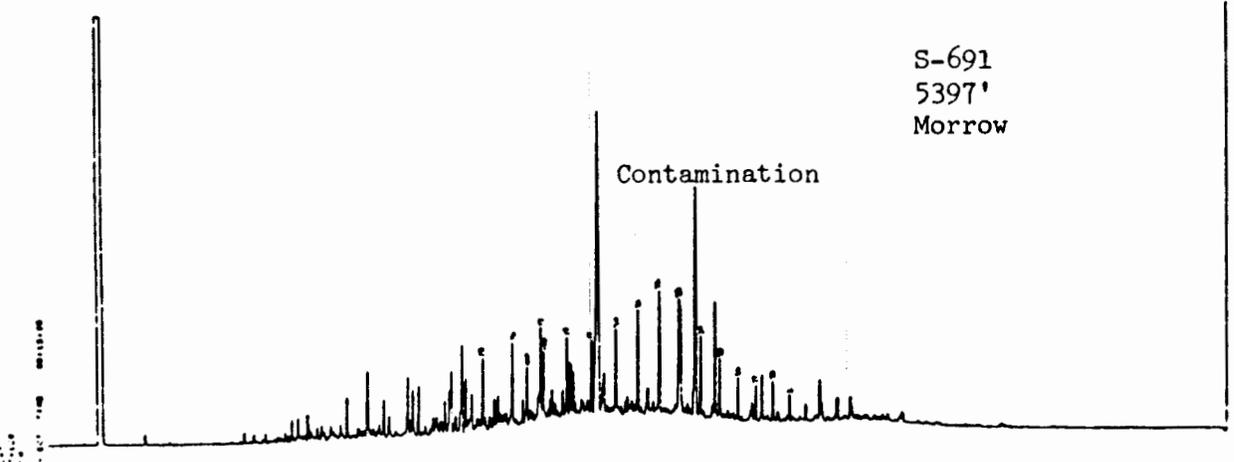
S-690
5391'
Morrow

Contamination



S-691
5397'
Morrow

Contamination



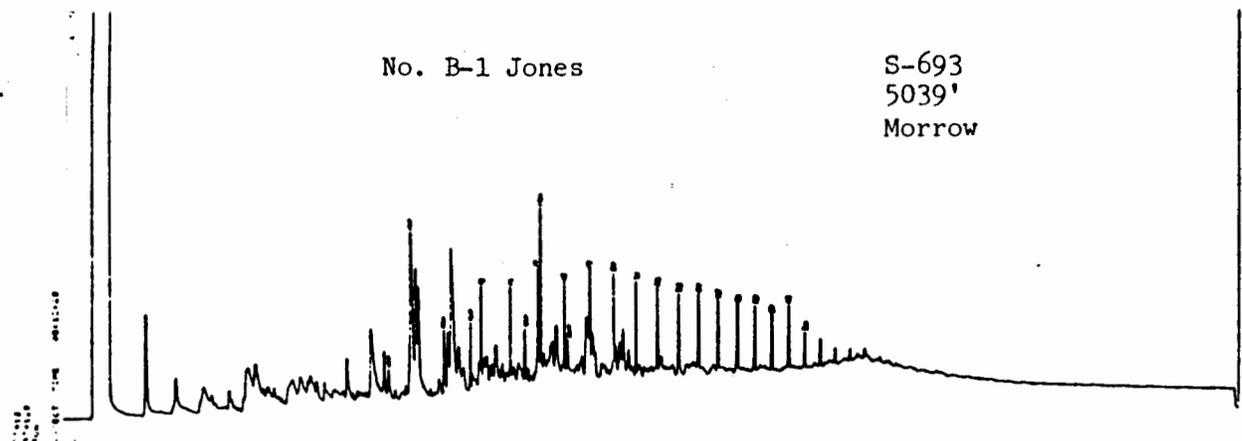
Whole Extract Chromatograms

TS 825396CS
Figure 3d

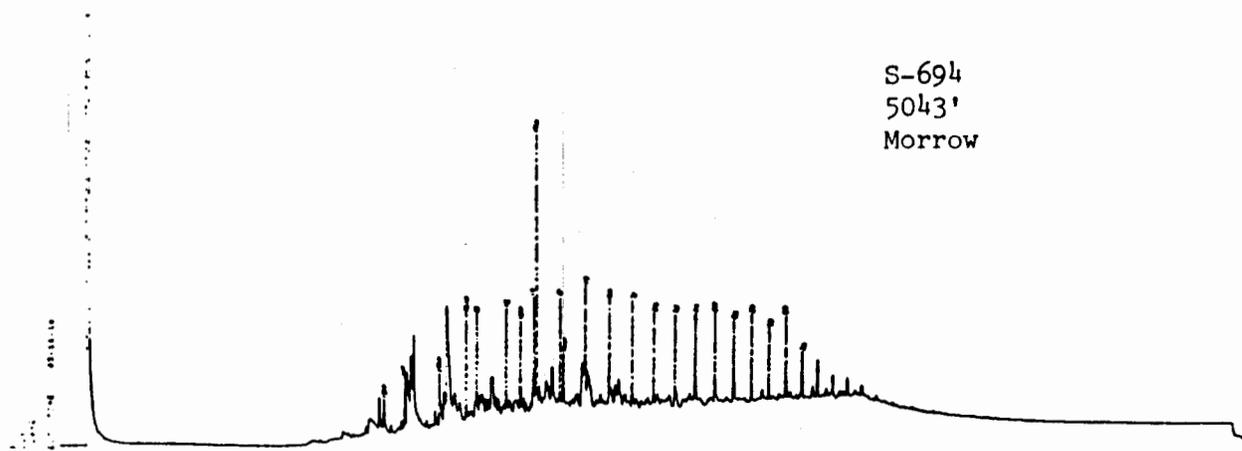
Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. B-1 Jones

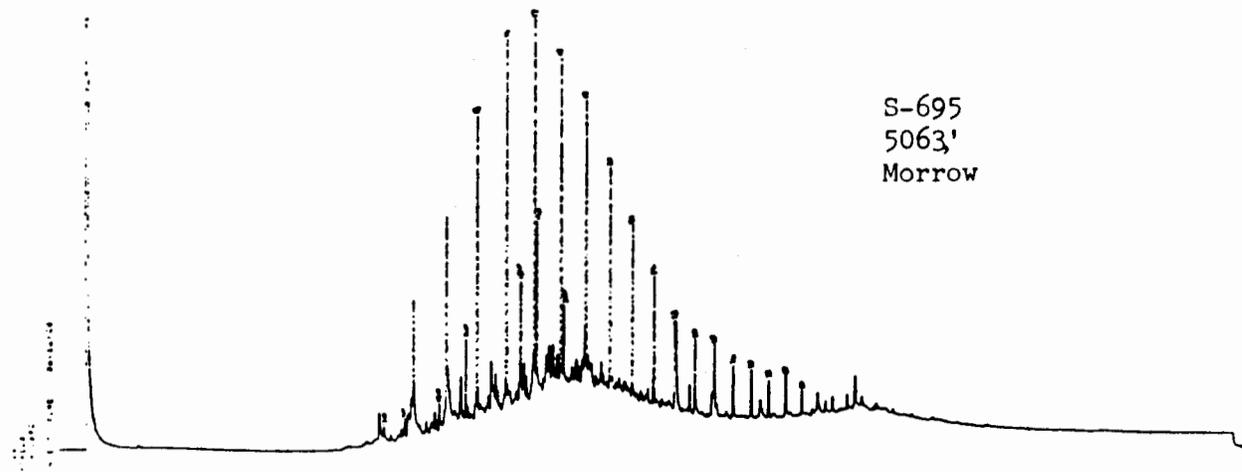
S-693
5039'
Morrow



S-694
5043'
Morrow



S-695
5063'
Morrow



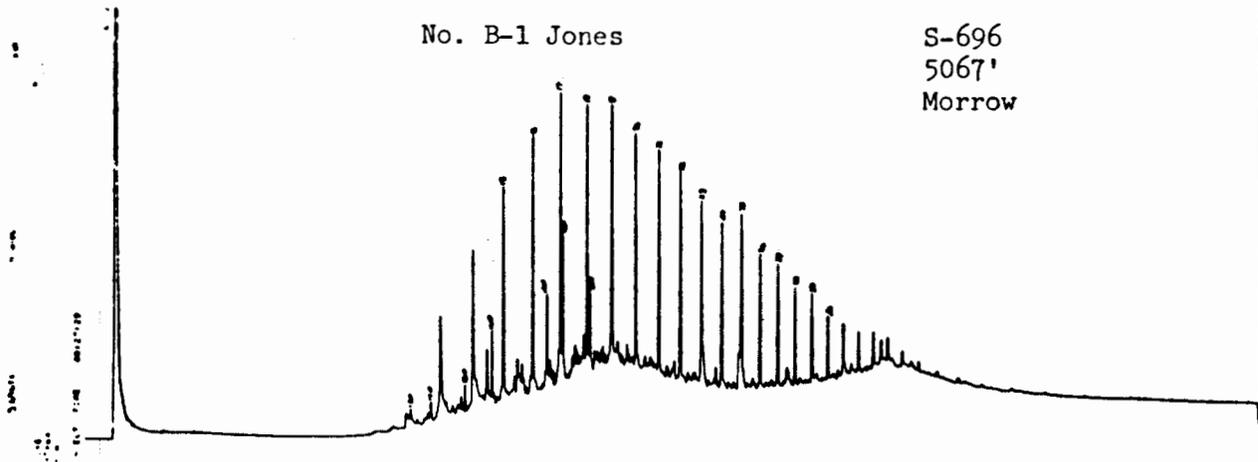
Whole Extract Chromatograms

TS 825396CS
Figure 3e

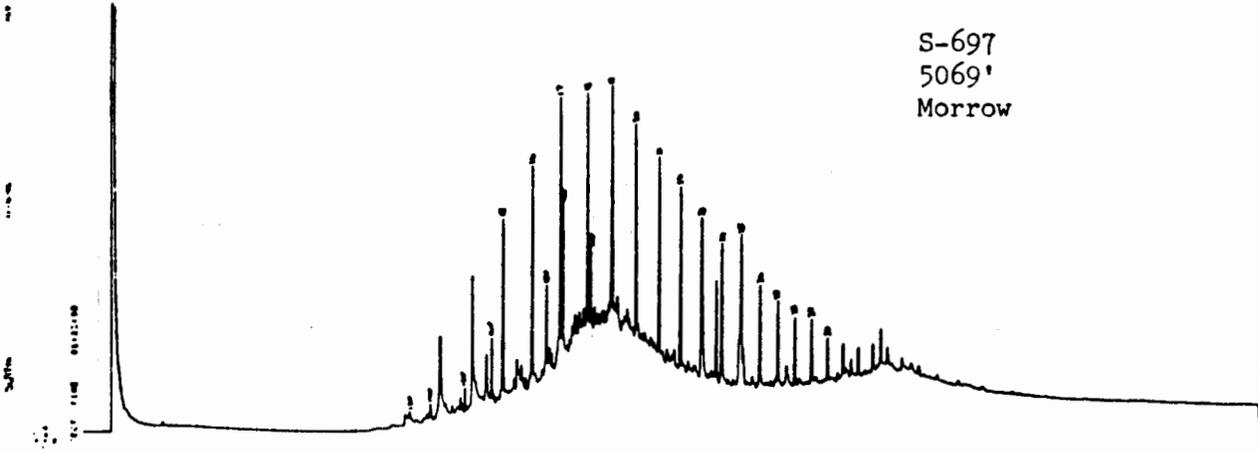
Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. B-1 Jones

S-696
5067'
Morrow



S-697
5069'
Morrow



Whole Extract Chromatograms

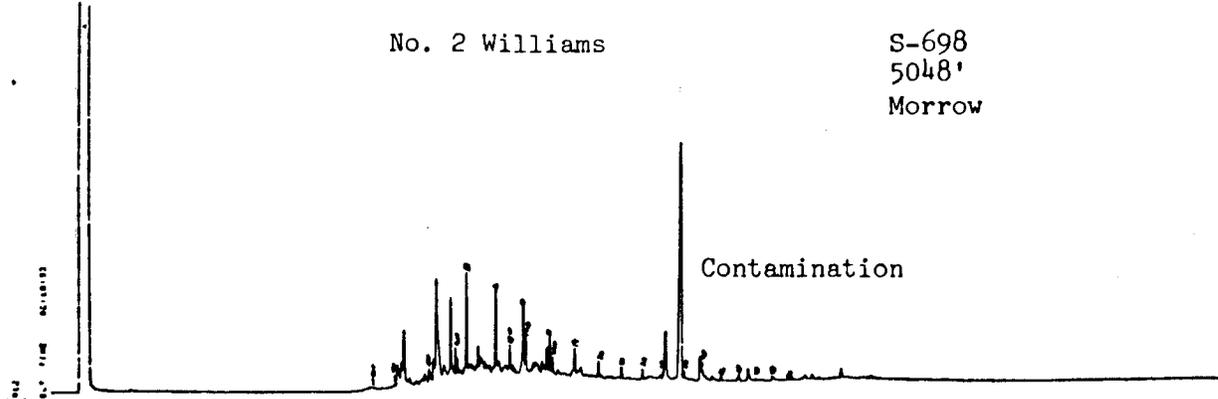
TS 825396CS
Figure 3f

Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. 2 Williams

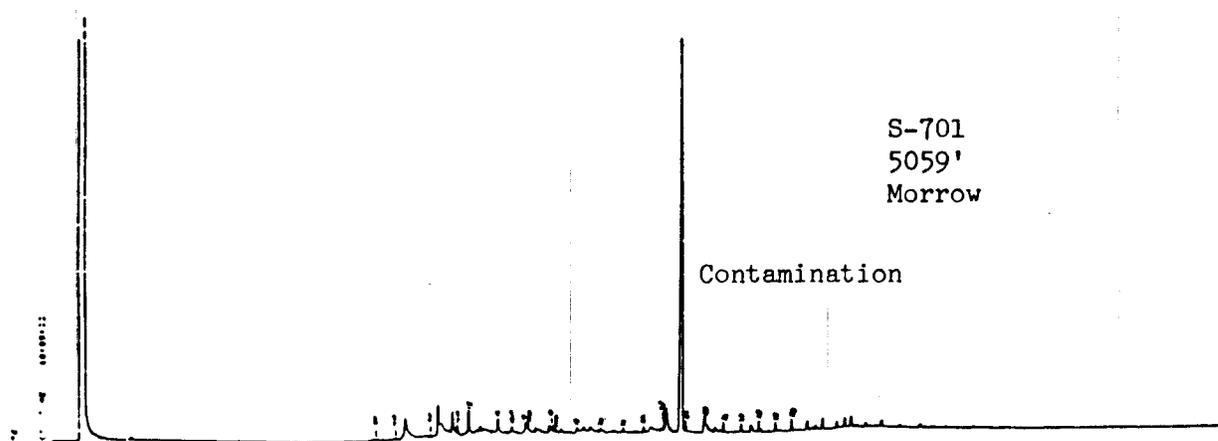
S-698
5048'
Morrow

Contamination



S-701
5059'
Morrow

Contamination



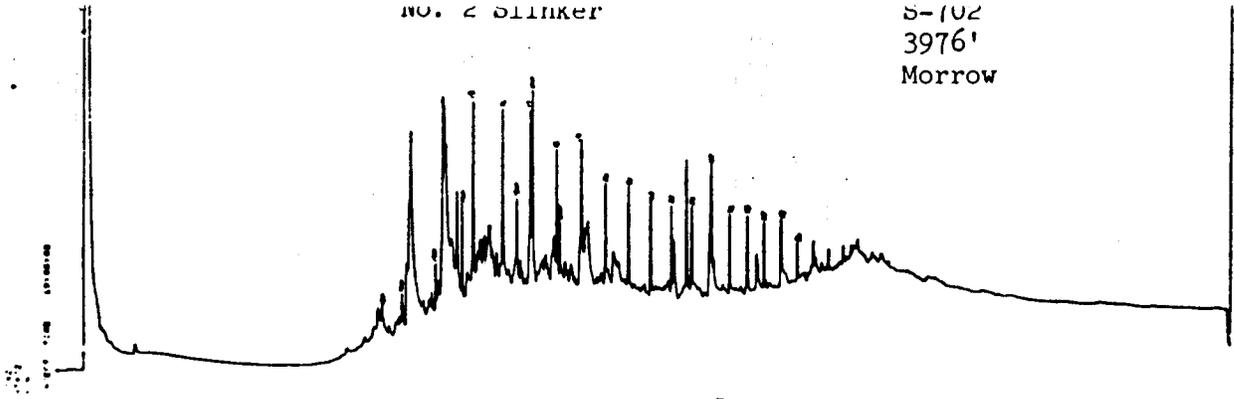
Whole Extract Chromatograms

TS 825396CS
Figure 3g

Proprietary - To Be Maintained In Confidence
Amoco Production Company

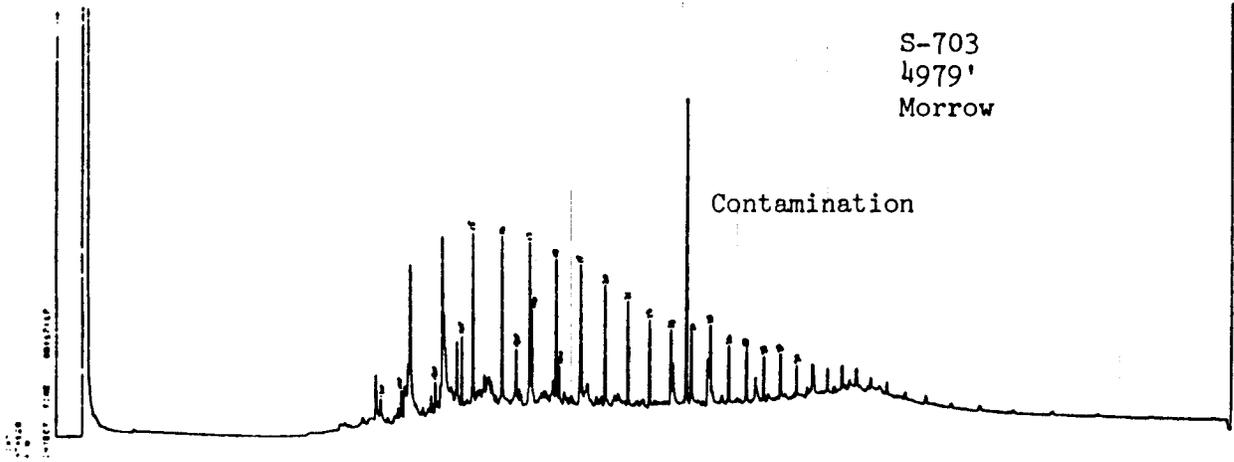
NO. 2 SLINKER

S-102
3976'
Morrow



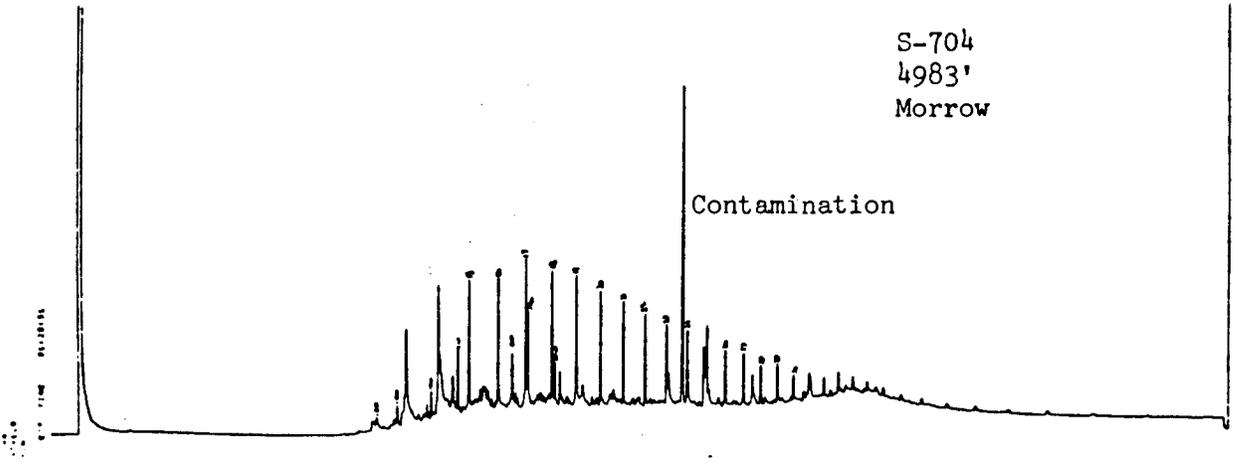
S-703
4979'
Morrow

Contamination



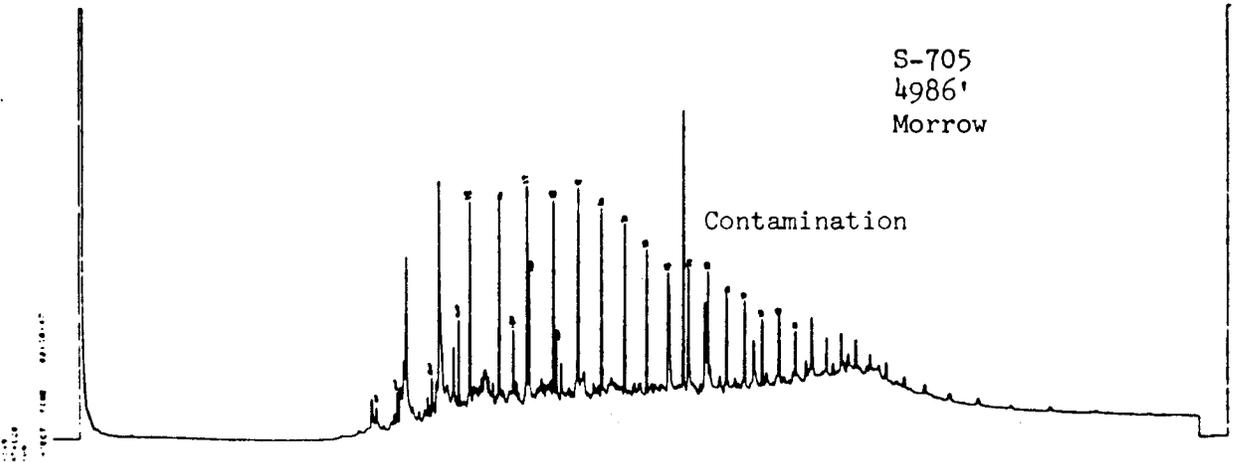
S-704
4983'
Morrow

Contamination



S-705
4986'
Morrow

Contamination



Whole Extract Chromatograms

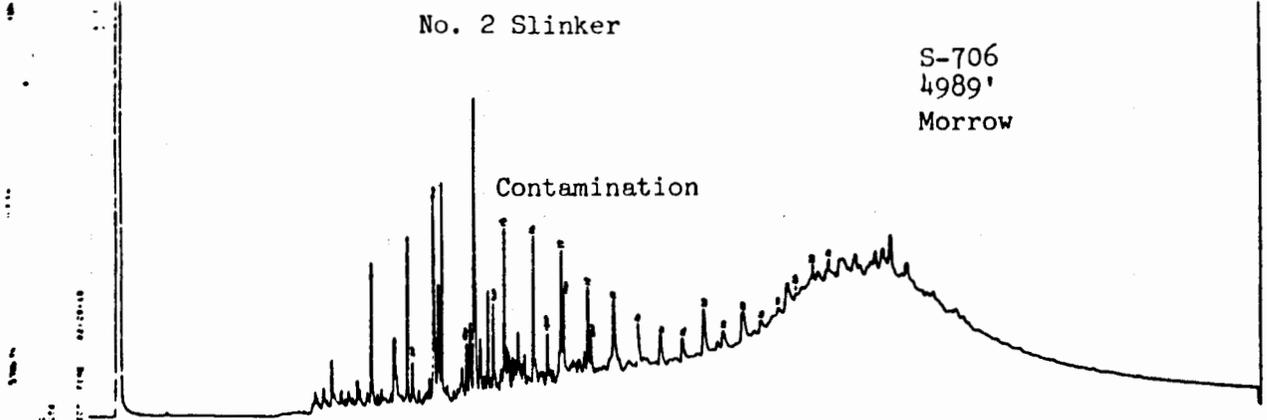
Proprietary - To Be Maintained In Confidence
Amoco Production Company

TS 825396CS
Figure 3h

No. 2 Slinker

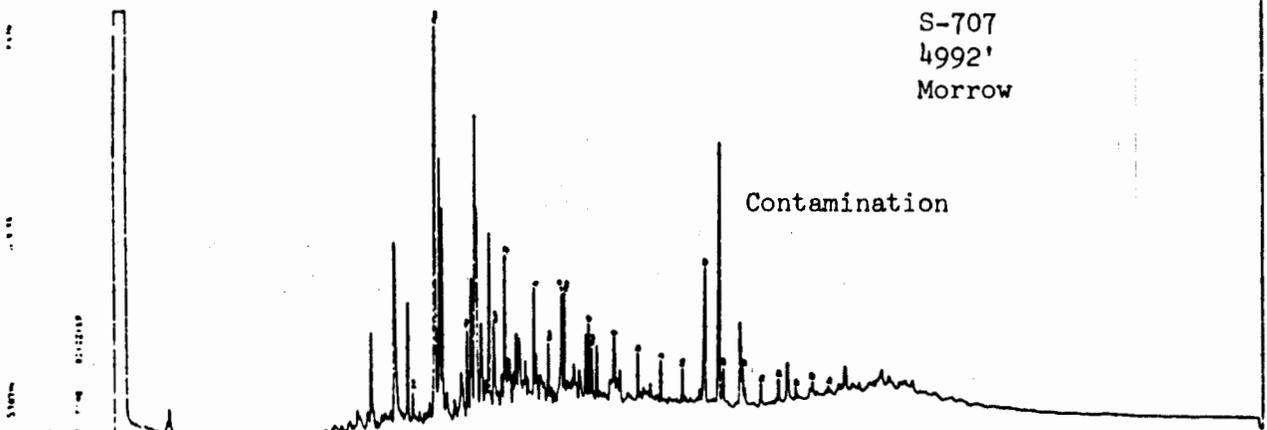
S-706
4989'
Morrow

Contamination

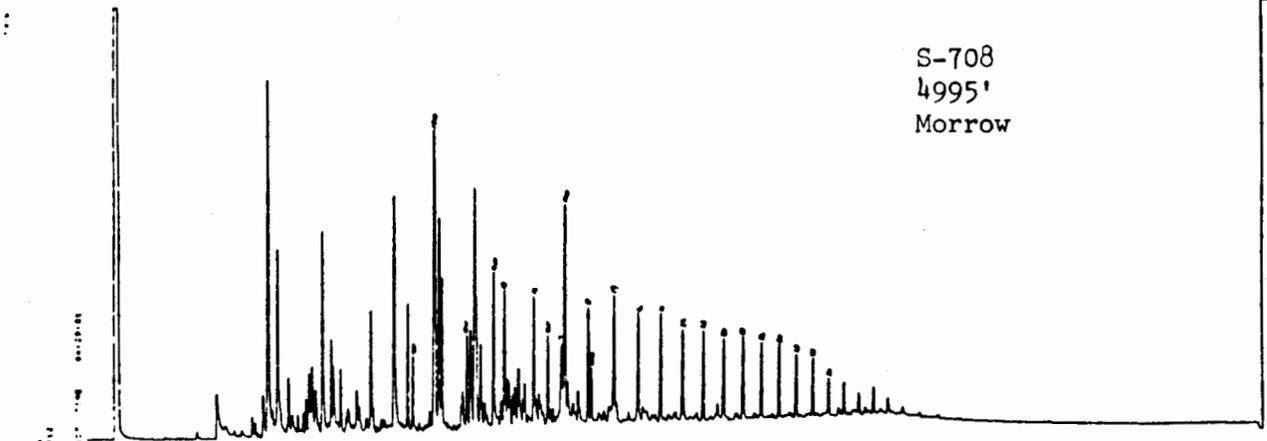


S-707
4992'
Morrow

Contamination

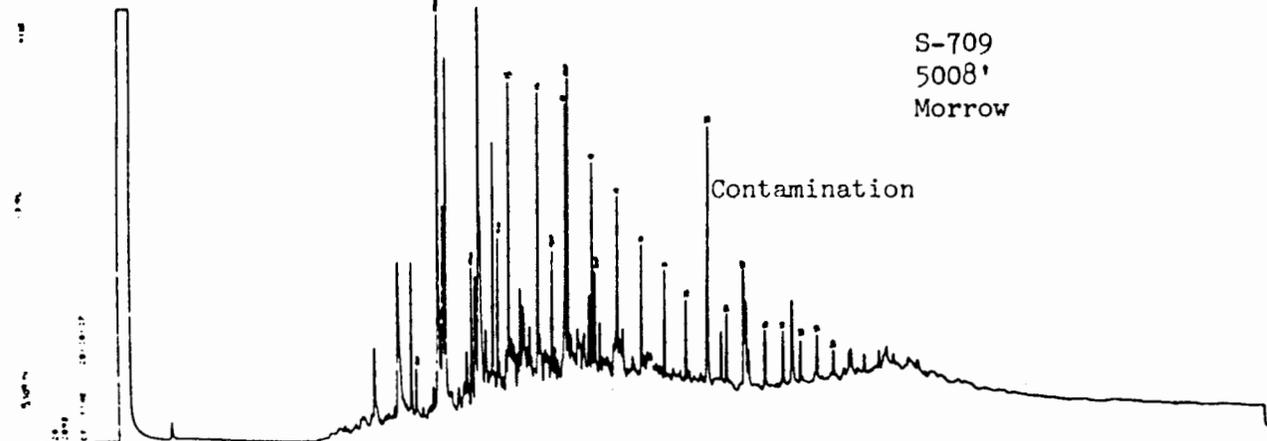


S-708
4995'
Morrow



S-709
5008'
Morrow

Contamination



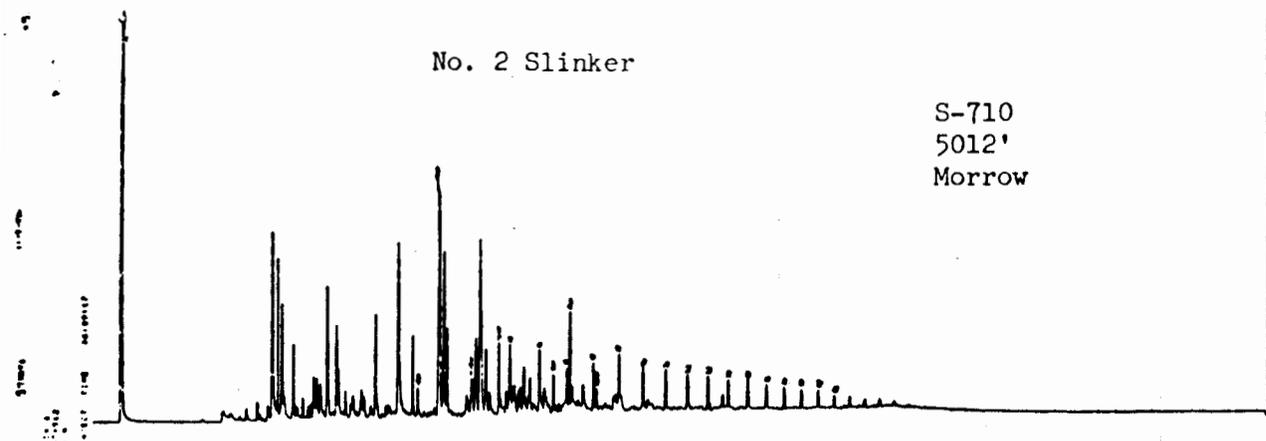
Whole Extract Chromatograms

Proprietary - To Be Maintained In Confidence
Amoco Production Company

TS 825396CS
Figure 3i

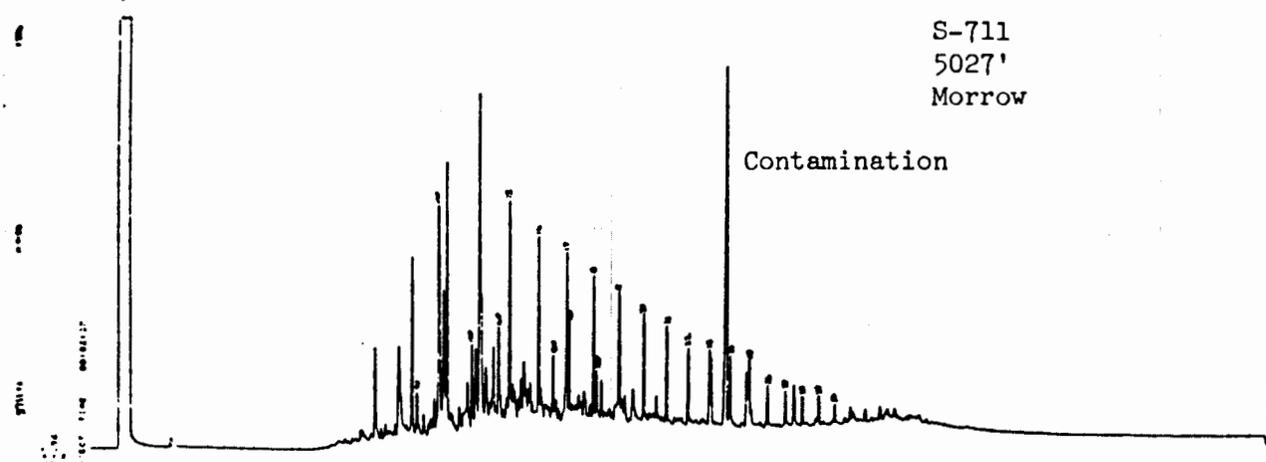
No. 2 Slinker

S-710
5012'
Morrow

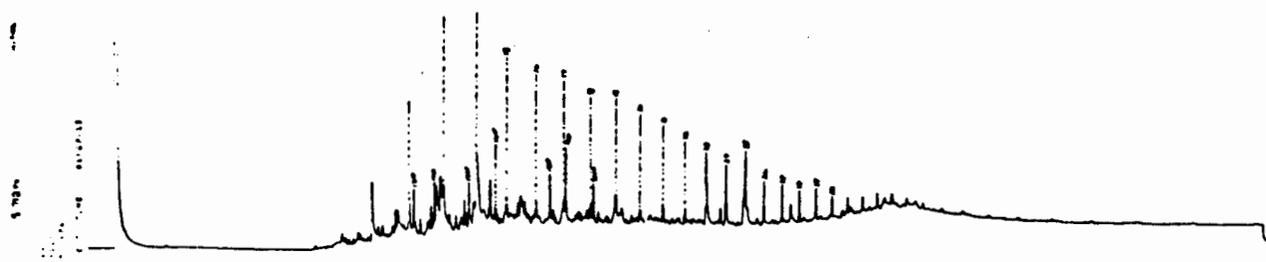


S-711
5027'
Morrow

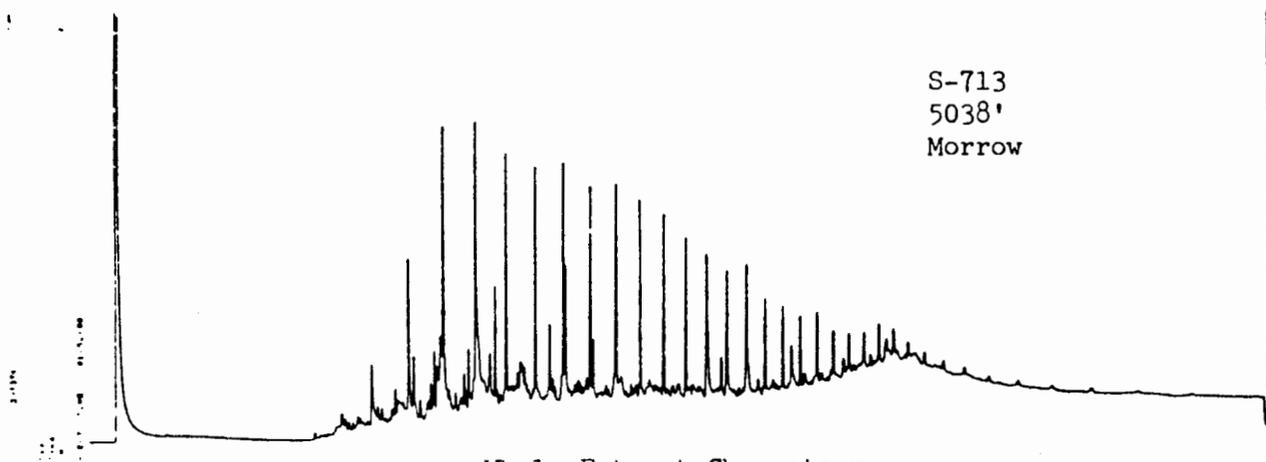
Contamination



S-712
5033'
Morrow



S-713
5038'
Morrow



Whole Extract Chromatograms

Proprietary - To Be Maintained In Confidence
Amoco Production Company

TS 825396CS
Figure 3j

No. 2 Slinker

S-714
5043'
Morrow

Contamination

S-715
5044'
Morrow

Whole Extract Chromatograms

TS 825396CS
Figure 3k

Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. 2 Slinker

S-714
5043'
Morrow

Contamination

S-715
5044'
Morrow

Whole Extract Chromatograms

TS 825396CS
Figure 3k

Proprietary - To Be Maintained In Confidence
Amoco Production Company

SI=4
RT=128
RUN

INJECT TIME 03:16:05

