

~~G. W. Henderson~~
Denver

4-29 5-42 W
Tucker

140
CNS

83011ART0061

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

SOURCE ROCK EVALUATION

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

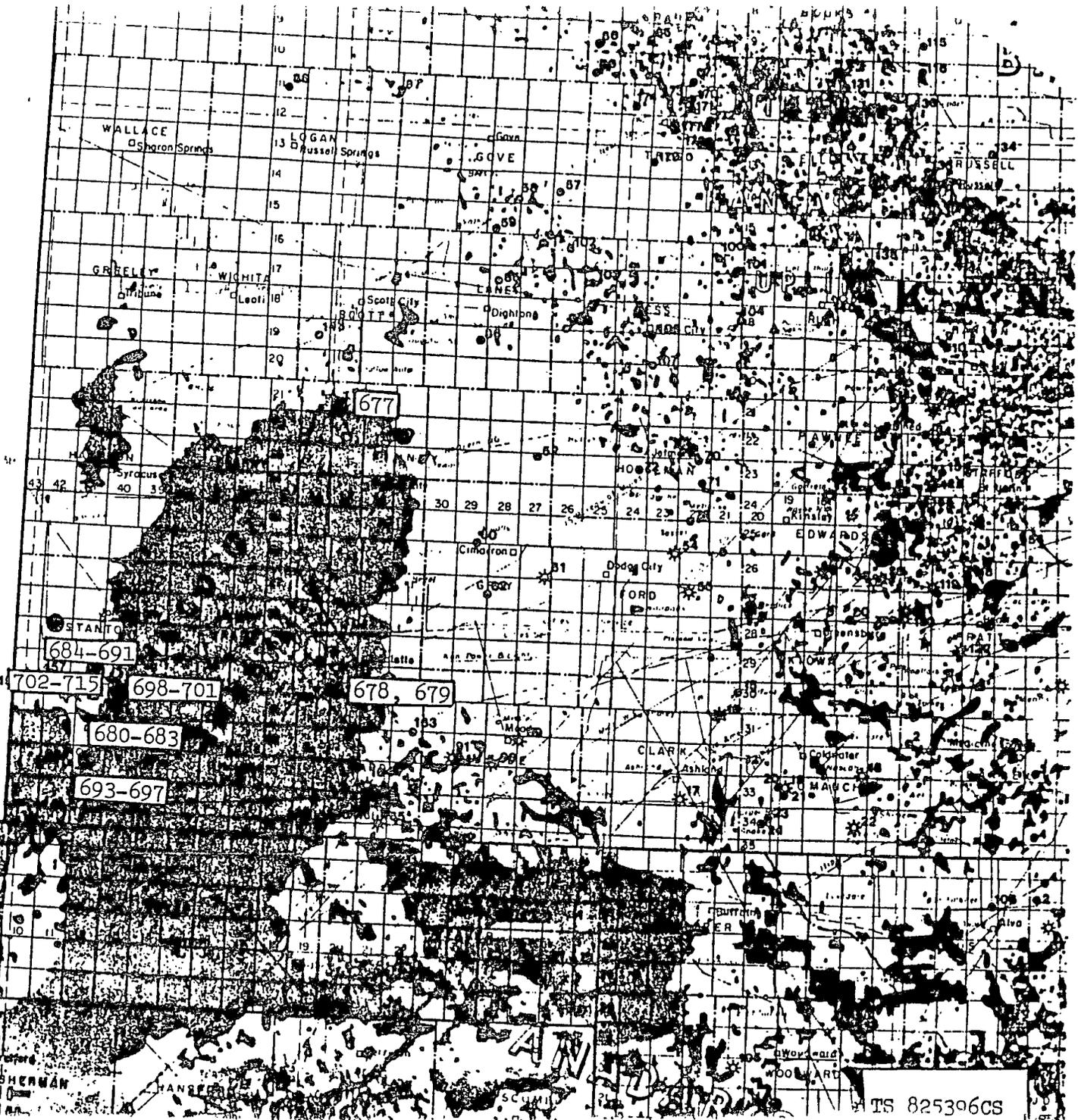
Geochemistry Services Group

R. J. Harwood

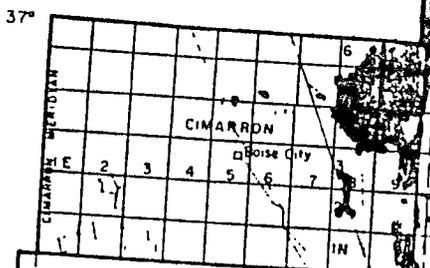
Technical Service 825396CS
Requested by K. C. Sawyer
APC (USA) DENVER SOUTHERN

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



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Amoco Production Company



DALLAM
DALLAM

IRON
HERMAN

HANSEN

LAN

Woolart

TS 825396CS

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 WELL NAME CITIES SERVICE LEASE THOMPSON #2-E 115°F @ ~4600' Grad: 14.1°F/1000'								
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 WELL NAME AMOCO LEASE DOTTIE CHAFFIN #1 121°F @ ~5000' Grad: 14.2°F/1000'								
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

OFFICE DENVER
 AUTHORIZED BY O R HILLE
 TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN

825396

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

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 COUNTY STANTON WELL LOCATION SEC4-T29S-R42W WELL NAME SUPERIOR 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 WELL NAME ANADARKO LEASE JONES #B-1 120°F @ 5100' Grad: 13.7°F/1000'								
-693	CR	MORROW	PENN SH		5039	VERY GOOD	GAS-CONDE	EARLY GAS
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 WELL NAME PAN AM LEASE P A WILLIAMS #2 110°F @ 5100' Grad: 11.8°F/1000'								
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 WELL NAME AMOCO LEASE SLINKER #2 119°F @ 5100' Grad: 13.5°F/1000'								
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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 Amoco Production Company

OFFICE DENVER
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
825396

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

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOL. AGE	INSOL RESID% TOP**BOTTOM	TOTAL ORG C WT%	BITUMEN		SAT HC		SAT HC/BITUMEN	BITUMEN/TL ORG C	REMARKS
	BOTTOM	TOP				BBL/AF	PPM	BBL/AF	PPM			
STATE KS COUNTY FINNEY WELL LOCATION SEC31-T21S-R33W												
WELL NAME SHALLOW WATER LEASE MAUNE #4												
S-677	4648		MISS	90	1.0	1	46					BBL/AF = (PPM X .0180) Sat. δC13 ^o /oo Pristane/Phytane
STATE KS COUNTY HASKELL WELL LOCATION SEC31-T30S-R33W												
WELL NAME CITIES SERVICE 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 COUNTY MORTON WELL LOCATION SEC29-T31S-R40W												
WELL NAME AMOCO 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 COUNTY STANTON WELL LOCATION SEC4-T29S-R42W												
WELL NAME SUPERIOR 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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SOURCE ROCK DATA
TABLE 3.b
DATE 01/04/83

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOL. AGE	INSOL RESID%	TOTAL ORG C WT%	BITUMEN		SAT HC		SAT HC/BITUMEN	BITUMEN/TL ORG C	REMARKS
	TOP	BOTTOM				BBL/AF	PPM	BBL/AF	PPM			
STATE KS COUNTY STANTON WELL NAME SUPERIOR												
WELL LOCATION SEC4-T29S-R42W LEASE H L TUCKER #68-A4												
S-691	5397	5398	PENN	78	.8	2	99					BBL/AF = (PPM X .0180) Sat. δC^{13} o/oo Pristane/Phytane
											.01	
STATE KS COUNTY MORTON WELL NAME ANADARKO												
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 COUNTY MORTON WELL NAME PAN AM												
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 COUNTY MORTON WELL NAME AMOCO												
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	

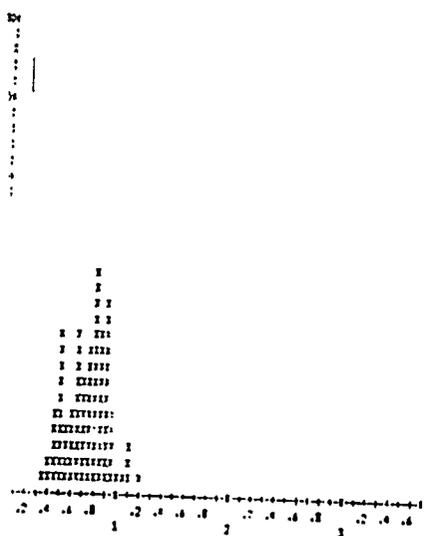
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Amoco Production Company

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 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	

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-484
 REFIN/SAMPLE NO. N.L. TUCKER 8 68-64 TYPE OF SAMPLE..... CORE CHIP, 3.25"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION: 0.21 START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.20 MAX. 1.21 AVG. 0.74 STD. DEV. 0.18

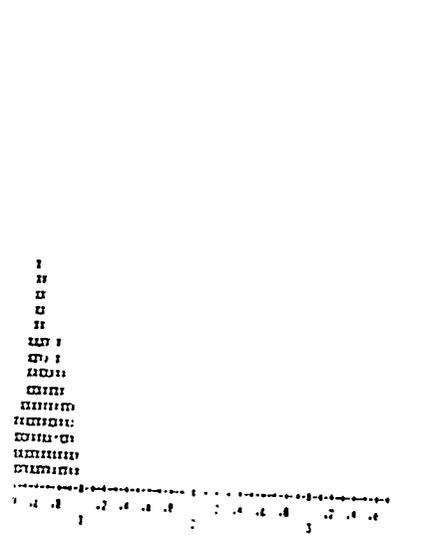


POP. # 1 TOTAL CTS. 27 MIN. 0.37 MAX. 0.64 AVG. 0.53 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 67 MIN. 0.62 MAX. 0.99 AVG. 0.87 STD. DEV. 0.20
 POP. # 3 TOTAL CTS. 6 MIN. 1.00 MAX. 1.21 AVG. 1.10 STD. DEV. 0.07

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-484
 REFIN/SAMPLE NO. N.L. TUCKER 8 68-64 TYPE OF SAMPLE..... CORE CHIP, 3.25"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION: 0.21 START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 0.99 AVG. 0.67 STD. DEV. 0.14

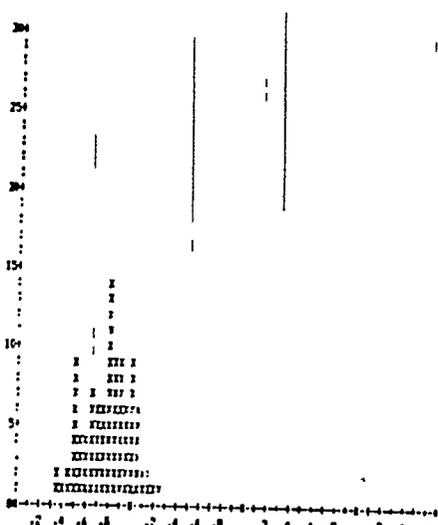


POP. # 1 TOTAL CTS. 56 MIN. 0.37 MAX. 0.64 AVG. 0.53 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 11 MIN. 0.71 MAX. 1.06 AVG. 0.89 STD. DEV. 0.09

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-487
 REFIN/SAMPLE NO. N.L. TUCKER 8 68-64 TYPE OF SAMPLE..... CORE CHIP, 3.25"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION: 0.21 START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.37 MAX. 1.29 AVG. 0.81 STD. DEV. 0.20

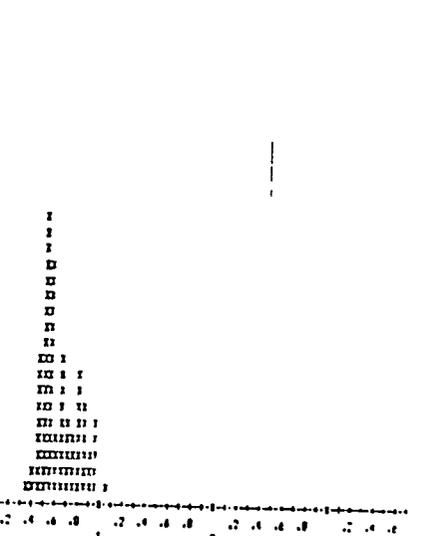


POP. # 1 TOTAL CTS. 25 MIN. 0.37 MAX. 0.62 AVG. 0.53 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 72 MIN. 0.65 MAX. 1.09 AVG. 0.87 STD. DEV. 0.12
 POP. # 3 TOTAL CTS. 3 MIN. 1.11 MAX. 1.29 AVG. 1.18 STD. DEV. 0.07

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-490
 REFIN/SAMPLE NO. N.L. TUCKER 8 68-64 TYPE OF SAMPLE..... CORE CHIP, 3.25"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION: 0.21 START: 1.02 FINISH: 1.02

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

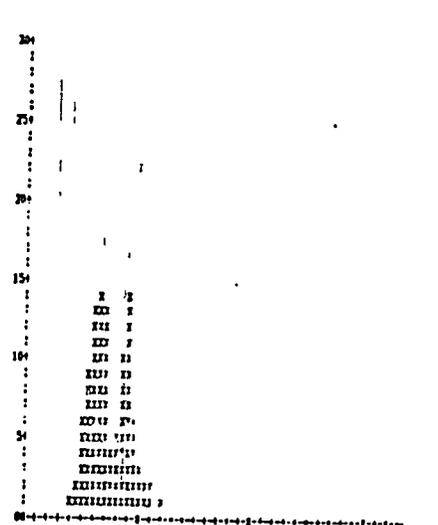


POP. # 1 TOTAL CTS. 56 MIN. 0.37 MAX. 0.64 AVG. 0.53 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 11 MIN. 0.71 MAX. 1.06 AVG. 0.89 STD. DEV. 0.09

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-486
 REFIN/SAMPLE NO. N.L. TUCKER 8 68-64 TYPE OF SAMPLE..... CORE CHIP, 3.25"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION: 0.21 START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 1.22 AVG. 0.74 STD. DEV. 0.18

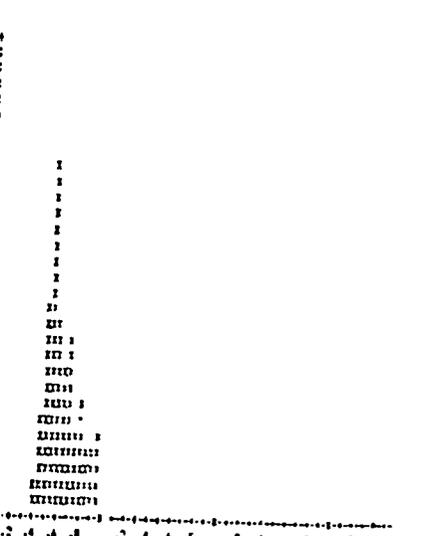


POP. # 1 TOTAL CTS. 21 MIN. 0.43 MAX. 0.64 AVG. 0.57 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 74 MIN. 0.62 MAX. 1.22 AVG. 0.84 STD. DEV. 0.21

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-492
 REFIN/SAMPLE NO. N.L. TUCKER 8 68-64 TYPE OF SAMPLE..... CORE CHIP, 3.25"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION: 0.21 START: 1.02 FINISH: 1.02

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



POP. # 1 TOTAL CTS. 77 MIN. 0.41 MAX. 0.74 AVG. 0.58 STD. DEV. 0.07
 POP. # 2 TOTAL CTS. 27 MIN. 0.71 MAX. 0.99 AVG. 0.82 STD. DEV. 0.07

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 Arco Products Company

TS 825396CS
 Figure 2b

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-708
 DEPTH/SAMPLE NO. AMOCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 4.992"
 LOCATION..... WORTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. B. SCHMIDT NO. OF OBSERVATIONS. 119

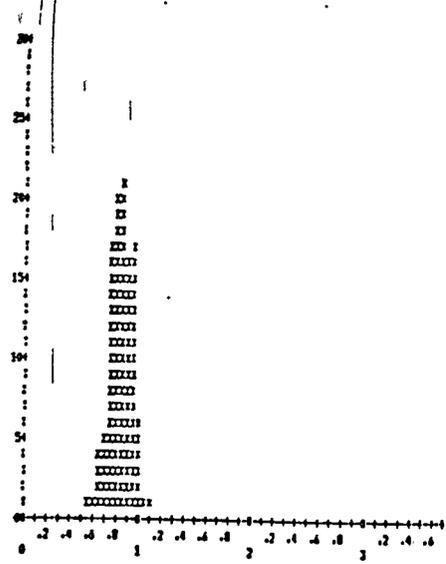
CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-709
 DEPTH/SAMPLE NO. AMOCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 5.001"
 LOCATION..... WORTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. B. SCHMIDT NO. OF OBSERVATIONS. 90

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-710
 DEPTH/SAMPLE NO. AMOCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 5.012"
 LOCATION..... WORTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. B. SCHMIDT NO. OF OBSERVATIONS. 99

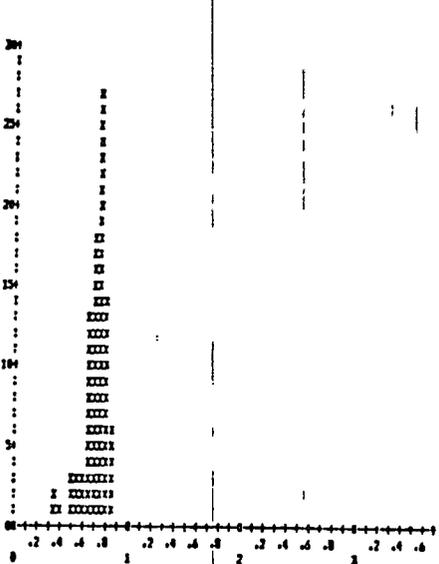
STANDARD Dev START: 1.82 FINISH: 1.82
 REFLECTANCE DATA: MIN. 0.38 MAX. 1.13 AVG. 0.86 STD. DEV. 0.10

STANDARD Dev START: 1.82 FINISH: 1.82
 REFLECTANCE DATA: MIN. 0.37 MAX. 0.89 AVG. 0.72 STD. DEV. 0.10

STANDARD Dev START: 1.82 FINISH: 1.82
 REFLECTANCE DATA: MIN. 0.48 MAX. 0.82 AVG. 0.68 STD. DEV. 0.04

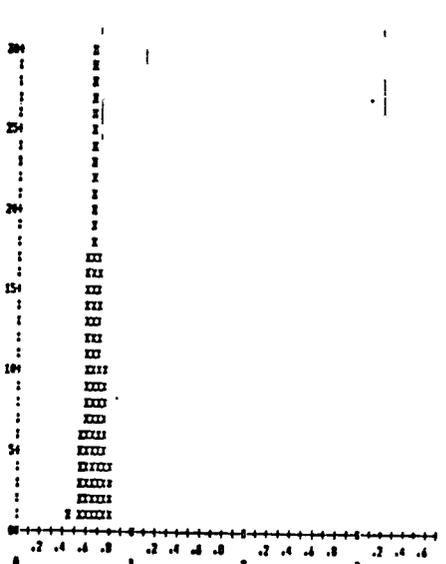


POP.# 1 TOTAL CTS. 119 MIN. 0.38 MAX. 1.13 AVG. 0.86 STD. DEV. 0.10



POP.# 1 TOTAL CTS. 3 MIN. 0.37 MAX. 0.43 AVG. 0.39 STD. DEV. 0.03

POP.# 2 TOTAL CTS. 87 MIN. 0.58 MAX. 0.89 AVG. 0.74 STD. DEV. 0.08



POP.# 1 TOTAL CTS. 99 MIN. 0.48 MAX. 0.82 AVG. 0.68 STD. DEV. 0.04

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-711
 DEPTH/SAMPLE NO. AMOCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 5.027"
 LOCATION..... WORTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. B. SCHMIDT NO. OF OBSERVATIONS. 108

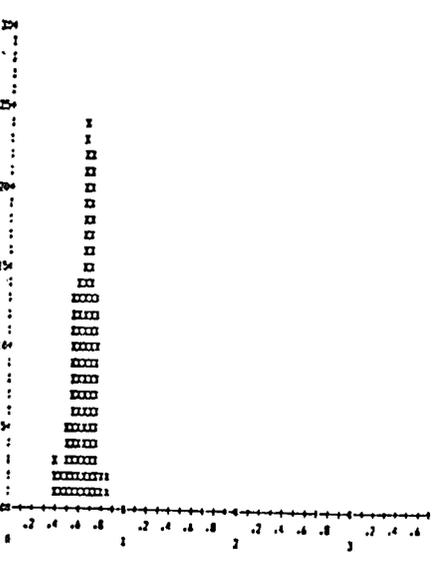
CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-712
 DEPTH/SAMPLE NO. AMOCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 5.031"
 LOCATION..... WORTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. B. SCHMIDT NO. OF OBSERVATIONS. 90

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-713
 DEPTH/SAMPLE NO. AMOCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 5.038"
 LOCATION..... WORTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. B. SCHMIDT NO. OF OBSERVATIONS. 80

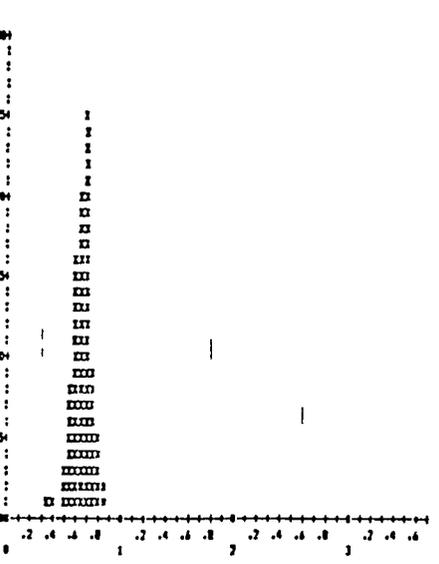
STANDARD Dev START: 1.82 FINISH: 1.82
 REFLECTANCE DATA: MIN. 0.48 MAX. 0.88 AVG. 0.64 STD. DEV. 0.09

STANDARD Dev START: 1.82 FINISH: 1.82
 REFLECTANCE DATA: MIN. 0.25 MAX. 0.87 AVG. 0.65 STD. DEV. 0.09

STANDARD Dev START: 1.82 FINISH: 1.82
 REFLECTANCE DATA: MIN. 0.39 MAX. 0.89 AVG. 0.67 STD. DEV. 0.11

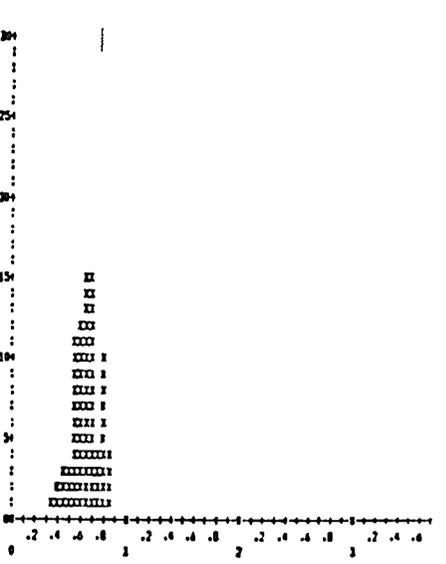


POP.# 1 TOTAL CTS. 108 MIN. 0.48 MAX. 0.88 AVG. 0.64 STD. DEV. 0.09



POP.# 1 TOTAL CTS. 2 MIN. 0.25 MAX. 0.41 AVG. 0.33 STD. DEV. 0.04

POP.# 2 TOTAL CTS. 88 MIN. 0.53 MAX. 0.87 AVG. 0.68 STD. DEV. 0.08



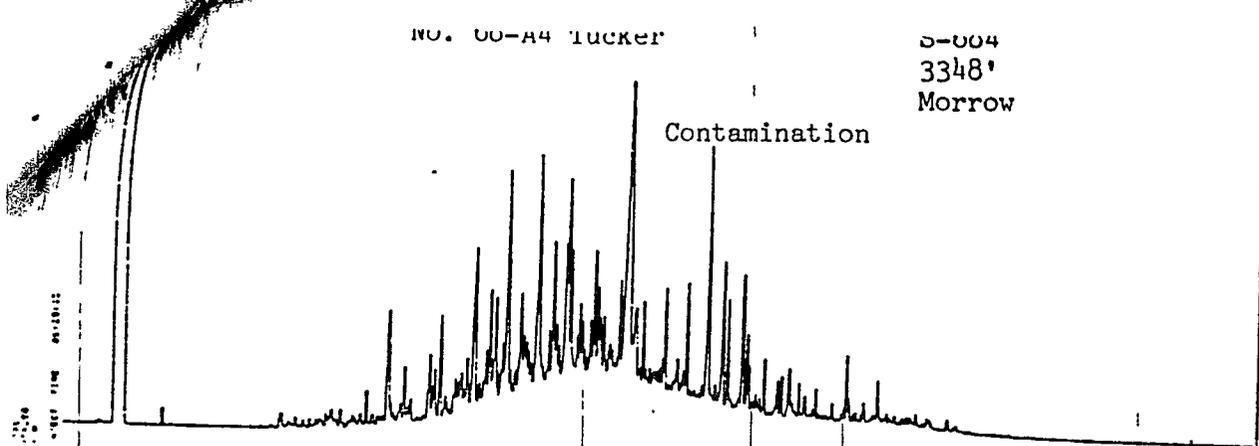
POP.# 1 TOTAL CTS. 9 MIN. 0.39 MAX. 0.53 AVG. 0.47 STD. DEV. 0.01

POP.# 2 TOTAL CTS. 53 MIN. 0.55 MAX. 0.74 AVG. 0.65 STD. DEV. 0.04

POP.# 3 TOTAL CTS. 18 MIN. 0.74 MAX. 0.89 AVG. 0.82 STD. DEV. 0.04

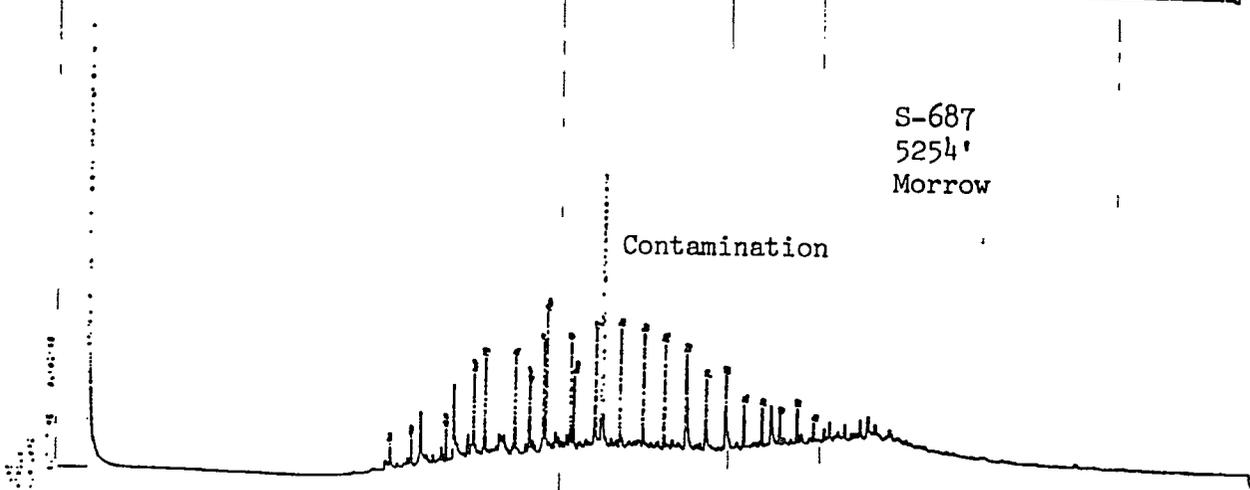
NO. 00-A4 Tucker

S-004
3348'
Morrow



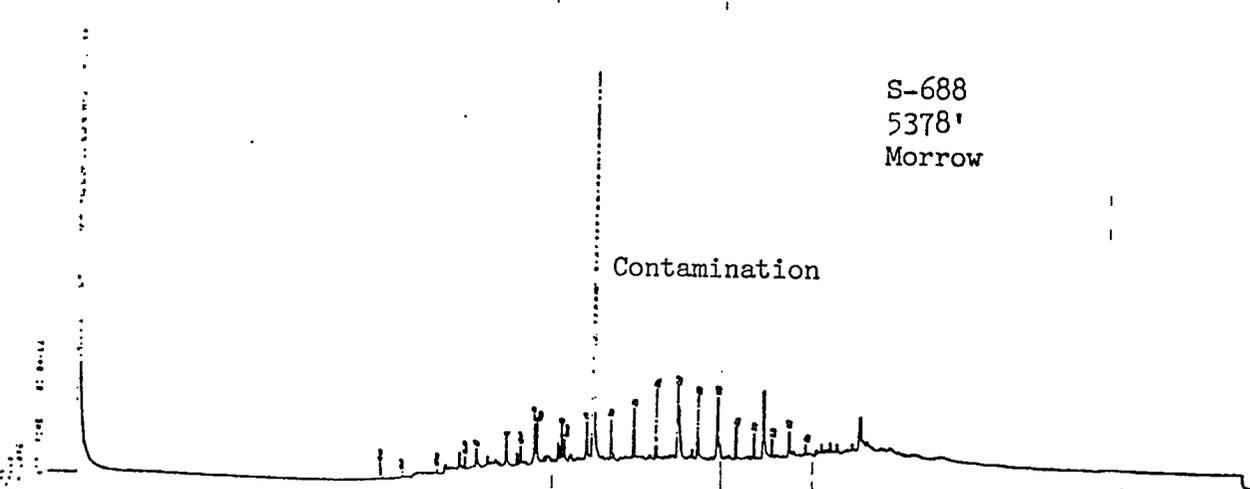
S-687
5254'
Morrow

Contamination



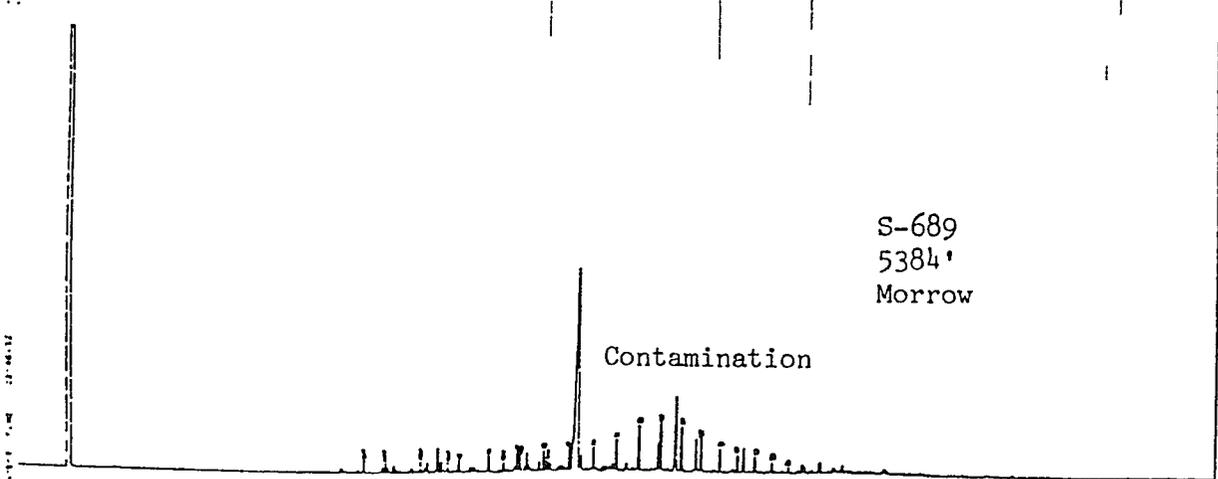
S-688
5378'
Morrow

Contamination



S-689
5384'
Morrow

Contamination



Whole Extract Chromatograms

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Amoco Production Company

TS 825396CS
Figure 3c

No. 68-A4 Tucker

S-690
5391'
Morrow

Contamination

Contamination

S-691
5397'
Morrow

Whole Extract Chromatograms

TS 825396CS
Figure 3d

Proprietary - To Be Maintained In Confidence
Amoco Production Company

~~G. W. Henderson~~
Denver

4-29 5-42 W

140
CUB

Fisher

83011ART0061

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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

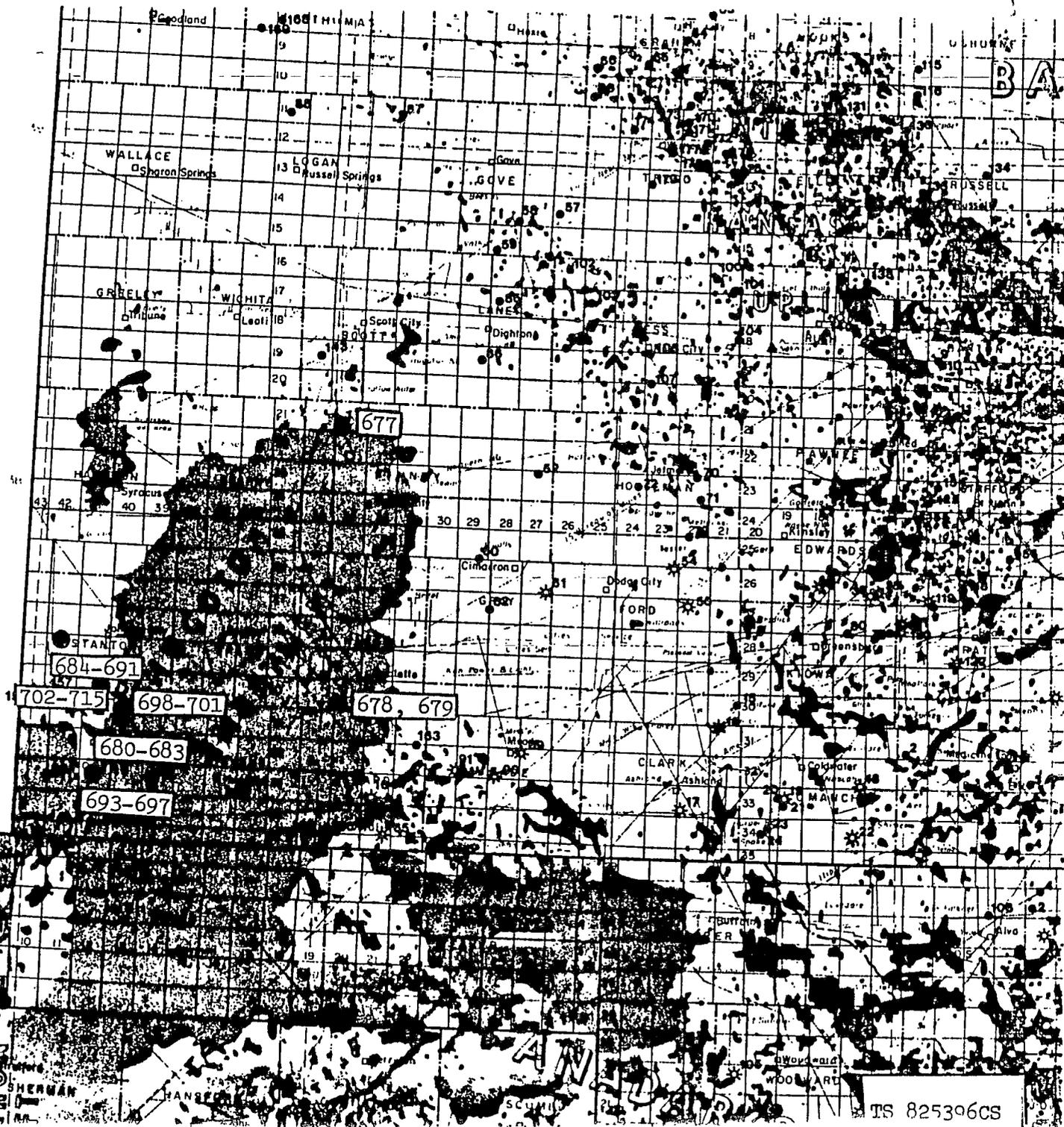
Requested by K. C. Sawyer

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



677

684-691

702-715

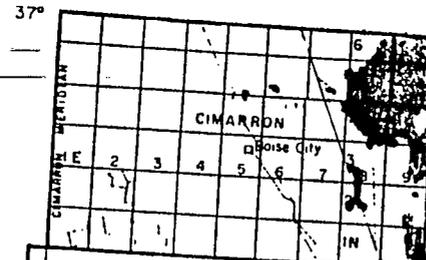
698-701

678, 679

680-683

693-697

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DALLAM

TS 825306CS

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TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN

825396

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

SAMPLE NUMBER LAB NO.	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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TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
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 WELL NAME		COUNTY ANADARKO	MORTON		WELL LOCATION SEC9-T33S-R41W LEASE JONES #B-1 120°F @ 5100' Grad: 13.7°F/1000'			
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 WELL NAME		COUNTY PAN AM	MORTON		WELL LOCATION SEC21-T31S-R40W LEASE P A WILLIAMS #2 110°F @ 5100' Grad: 11.8°F/1000'			
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 WELL NAME		COUNTY AMOCO	MORTON		WELL LOCATION SEC21-T31S-R40W LEASE SLINKER #2 119°F @ 5100' Grad: 13.5°F/1000'			
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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825396

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

SAMPLE NUMBER LAB NO.	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 AMOCO		COUNTY MORTON		WELL LOCATION SEC21-T31S-R40W 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

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 %	BITUMEN		SAT HC		SAT HC/BITUMEN	BITUMEN/TOTAL ORGANIC C	REMARKS
	TOP	BOTTOM				BBL/AF	PPM	BBL/AF	PPM			
STATE KS COUNTY FINNEY WELL LOCATION SEC31-T21S-R33W												
WELL NAME SHALLOW WATER LEASE MAUNE #4												
S-677	4648		MISS	90	1.0	1	46				<.01	BBL/AF = (PPM X .0180) Sat. $\delta^{13}C$ /oo Pristane/Phytane
STATE KS COUNTY HASKELL WELL LOCATION SEC31-T30S-R33W												
WELL NAME CITIES SERVICE 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 COUNTY MORTON WELL LOCATION SEC29-T31S-R40W												
WELL NAME AMOCO 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 COUNTY STANTON WELL LOCATION SEC4-T29S-R42W												
WELL NAME SUPERIOR LEASE H L TUCKER #68-A1												
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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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		GEOL. AGE	INSOL RESID%	TOTAL ORG C WT%	BITUMEN		SAT HC		SAT HC/BITUMEN	BITUMEN/TL ORG C	REMARKS
	TOP	BOTTOM				BBL/AF	PPM	BBL/AF	PPM			
STATE KS COUNTY STANTON WELL LOCATION SEC4-T29S-R42W WELL NAME SUPERIOR LEASE H L TUCKER #68-A4												
S-691	5397	5398	PENN	78	.8	2	99				.01	BBL/AF = (PPM X .0180) Sat. δC ¹³ o/oo Pristane/Phytane
STATE KS COUNTY MORTON WELL LOCATION SEC9-T33S-R41W WELL NAME ANADARKO 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 COUNTY MORTON WELL LOCATION SEC21-T31S-R40W WELL NAME PAN AM 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 COUNTY MORTON WELL LOCATION SEC21-T31S-R40W WELL NAME AMOCO 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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OFFICE DENVER
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
825396

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

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET TOP***BOTTOM	GEOLOGICAL AGE	INSOLUBLE RESIDUE %	TOTAL ORGANIC CARBON WT %	BITUMEN		SATURATED HYDROCARBONS		BITUMEN/ORGANIC CARBON		REMARKS	
					BBL/AF	PPM	BBL/AF	PPM	BITUMEN/TL	ORG C		
STATE KS COUNTY MORTON WELL LOCATION SEC21-T31S-R40W												
WELL NAME AMOCO LEASE SLINKER #2												
BBL/AF = (PPM X .0180)												
											Sat. $\delta C^{13}O/oo$	
											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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TECHNICAL SERVICE NUMBER — 825396
DISTRICT SOUTHERN

KEROGEN DATA
TABLE 4.8
DATE 01/04/83

LAB SAMPLE NUMBER	FIELD NO. OR DEPTH — FEET TOP***BOTTOM		GEOLOGICAL AGE	NORM. ELEMENTAL ANALYSIS, WT.				ATOMIC	ATOMIC	VISUAL KEROGEN TYPE	CARBONIZ. SCALE	VIT. REFLECT %RO
				CARBON	HYDROGEN	OXYGEN	NITROGEN	RATIO O/C	RATIO H/C			
STATE KS COUNTY FINNEY WELL NAME 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 COUNTY HASKELL WELL NAME 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 COUNTY MORTON WELL NAME 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 COUNTY STANTON WELL NAME 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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OFFICE DENVER DISTRICT SOUTHERN
TECHNICAL SERVICE NUMBER 825396

KEROGEN DATA
TABLE 4. b
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 COUNTY MORTON WELL NAME 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 COUNTY MORTON WELL NAME 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 COUNTY MORTON WELL NAME 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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AMOCO PRODUCTION COMPANY
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OFFICE DENVER
TECHNICAL SERVICE NUMBER 825396
DISTRICT SOUTHERN

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

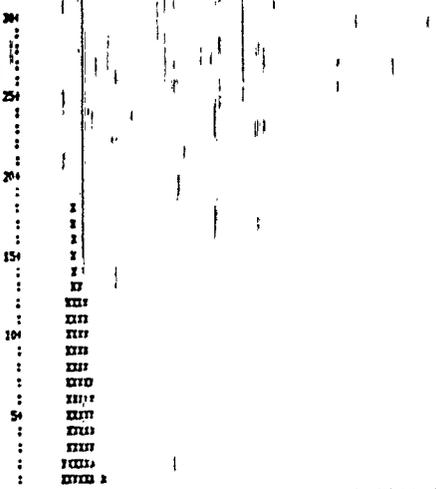
LAB SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOL. AGE	NORM. ELEMENTAL ANALYSIS, WT.				ATOMIC RATIO O/C	ATOMIC RATIO H/C	VISUAL KEROGEN TYPE	CARBNZ. SCALE	VIT REFLECT %RO
	TOP***	BOTTOM		CARBON	HYDROGEN	OXYGEN	NITROGEN					
STATE KS WELL NAME	AMOCO	COUNTY MORTON		WELL LOCATION SEC21-T31S-R40W								
				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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Amoco Production Company

CLIENT..... ARCEL FROD. COMPANY FILE NAME..... 8-477
REFIN/SAMPLE NO. BOTTLE NUMBER 4 TYPE OF SAMPLE..... CORE DRIF. 4.648
LOCATION..... FIMMELY CO., KANSAS DATE..... 12-1-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS. 45

STANDARD ZIN START: 1.03 FINISH: 1.02

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



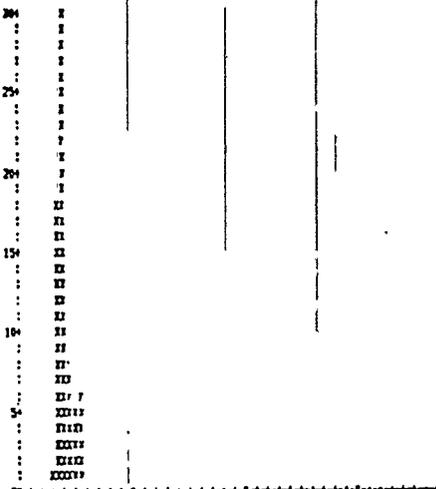
VITRINITE REFLECTANCE HISTOGRAM - ZIN

POP. 1 TOTAL CTS. 45 MIN. 0.41 MAX. 0.75 AVG. 0.52 STD. DEV. 0.07

CLIENT..... ARCEL FROD. COMPANY FILE NAME..... 13-678
REFIN/SAMPLE NO. CITEO THOMPSON 12-E TYPE OF SAMPLE..... CORE DRIF. 4.531
LOCATION..... MARCELL CO., KANSAS DATE..... 12-1-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS. 76

STANDARD ZIN START: 1.02 FINISH: 1.02

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



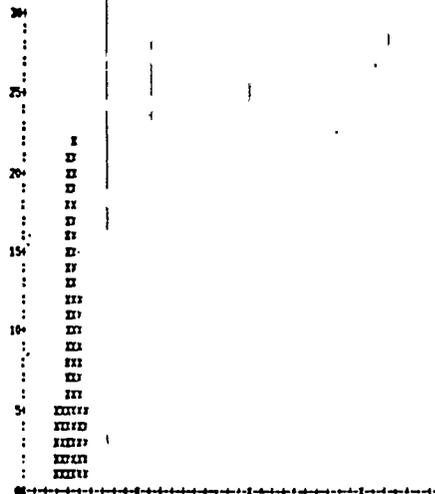
VITRINITE REFLECTANCE HISTOGRAM - ZIN

POP. 1 TOTAL CTS. 76 MIN. 0.31 MAX. 0.59 AVG. 0.43 STD. DEV. 0.04

CLIENT..... ARCEL FROD. COMPANY FILE NAME..... 13-679
REFIN/SAMPLE NO. CITEO THOMPSON 12-E TYPE OF SAMPLE..... CORE DRIF. 4.534
LOCATION..... MARCELL CO., KANSAS DATE..... 12-1-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS. 76

STANDARD ZIN START: 1.03 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.31 MAX. 0.59 AVG. 0.42 STD. DEV. 0.04



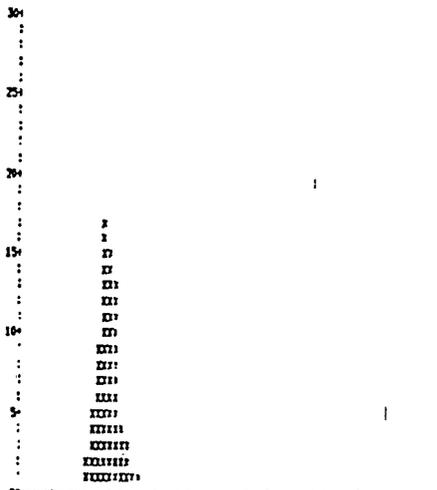
VITRINITE REFLECTANCE HISTOGRAM - ZIN

POP. 1 TOTAL CTS. 76 MIN. 0.31 MAX. 0.59 AVG. 0.42 STD. DEV. 0.04

CLIENT..... ARCEL FROD. COMPANY FILE NAME..... 13-482
REFIN/SAMPLE NO. BOTTLE CHWFFIN 8 1 TYPE OF SAMPLE..... CORE DRIF. 4.972
LOCATION..... HORTON CO., KANSAS DATE..... 12-1-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS. 76

STANDARD ZIN START: 1.02 FINISH: 1.02

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



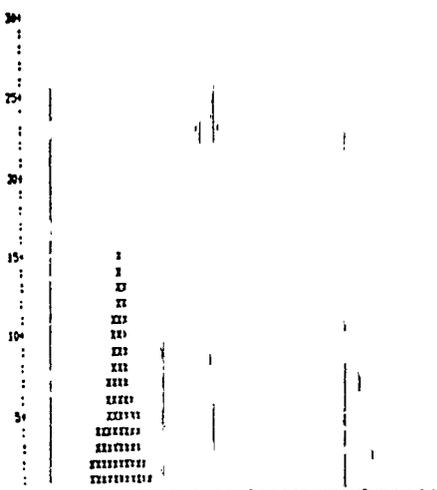
VITRINITE REFLECTANCE HISTOGRAM - ZIN

POP. 1 TOTAL CTS. 76 MIN. 0.61 MAX. 1.09 AVG. 0.81 STD. DEV. 0.09

CLIENT..... ARCEL FROD. COMPANY FILE NAME..... 13-483
REFIN/SAMPLE NO. BOTTLE CHWFFIN 8 1 TYPE OF SAMPLE..... CORE DRIF. 4.972
LOCATION..... HORTON CO., KANSAS DATE..... 12-1-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS. 76

STANDARD ZIN START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.64 MAX. 1.11 AVG. 0.84 STD. DEV. 0.11



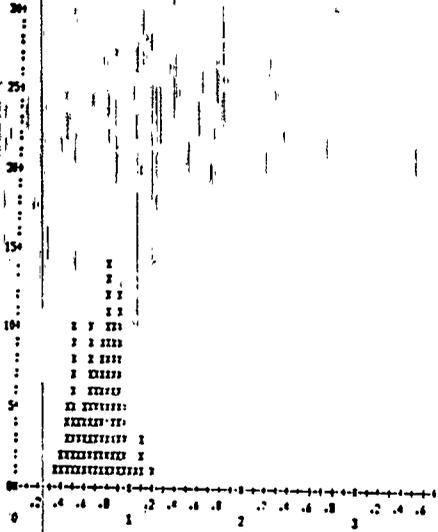
VITRINITE REFLECTANCE HISTOGRAM - ZIN

POP. 1 TOTAL CTS. 76 MIN. 0.64 MAX. 1.11 AVG. 0.84 STD. DEV. 0.11

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-484
 REPIN/SAMPLE NO. N.L. TUCKER 6 48-44 TYPE OF SAMPLE..... CORE CHIP, 3.34"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS, 10

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.28 MAX. 1.21 AVG. 0.74 STD. DEV. 0.18



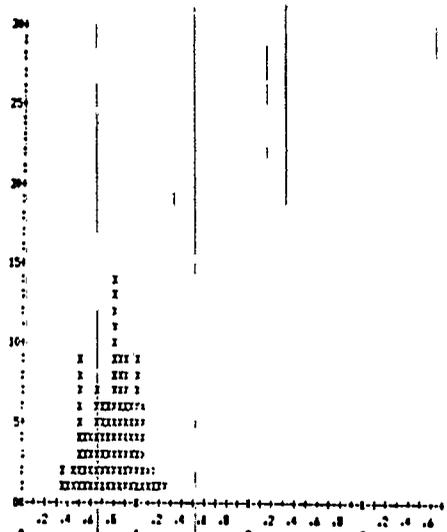
VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 27 MIN. 0.37 MAX. 0.64 AVG. 0.53 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 67 MIN. 0.42 MAX. 0.99 AVG. 0.67 STD. DEV. 0.20
 POP. 3 TOTAL CTS. 6 MIN. 1.00 MAX. 1.21 AVG. 1.10 STD. DEV. 0.10

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-487
 REPIN/SAMPLE NO. N.L. TUCKER 6 48-44 TYPE OF SAMPLE..... CORE CHIP, 3.25"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS, 10

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.37 MAX. 1.29 AVG. 0.81 STD. DEV. 0.20



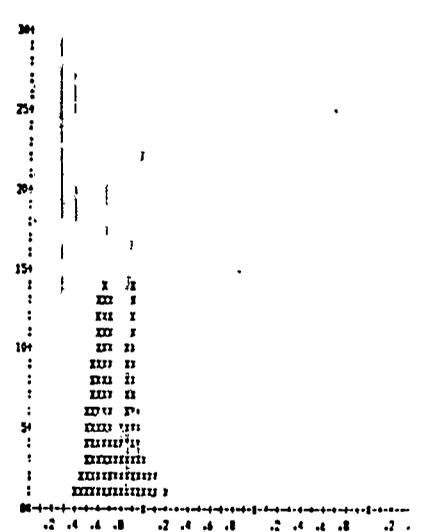
VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 22 MIN. 0.37 MAX. 0.62 AVG. 0.52 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 72 MIN. 0.45 MAX. 1.09 AVG. 0.67 STD. DEV. 0.21
 POP. 3 TOTAL CTS. 6 MIN. 1.11 MAX. 1.29 AVG. 1.18 STD. DEV. 0.10

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-488
 REPIN/SAMPLE NO. N.L. TUCKER 6 48-44 TYPE OF SAMPLE..... CORE CHIP
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS, 10

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.43 MAX. 1.22 AVG. 0.76 STD. DEV. 0



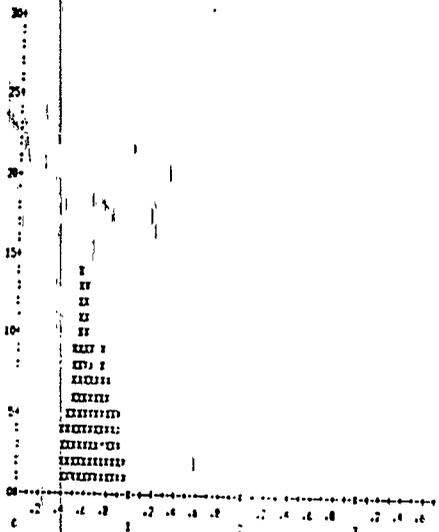
VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 31 MIN. 0.43 MAX. 0.64 AVG. 0.57 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 74 MIN. 0.45 MAX. 1.22 AVG. 0.84 STD. DEV. 0.21

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-489
 REPIN/SAMPLE NO. N.L. TUCKER 6 48-44 TYPE OF SAMPLE..... CORE CHIP, 3.34"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS, 90

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 0.98 AVG. 0.67 STD. DEV. 0.14



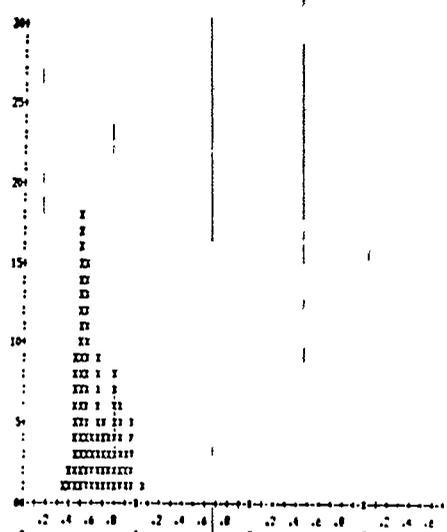
VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 54 MIN. 0.41 MAX. 0.64 AVG. 0.57 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 36 MIN. 0.70 MAX. 0.98 AVG. 0.82 STD. DEV. 0.08

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-490
 REPIN/SAMPLE NO. N.L. TUCKER 6 48-44 TYPE OF SAMPLE..... CORE CHIP, 3.37"
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS, 90

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.37 MAX. 1.04 AVG. 0.66 STD. DEV. 0.16



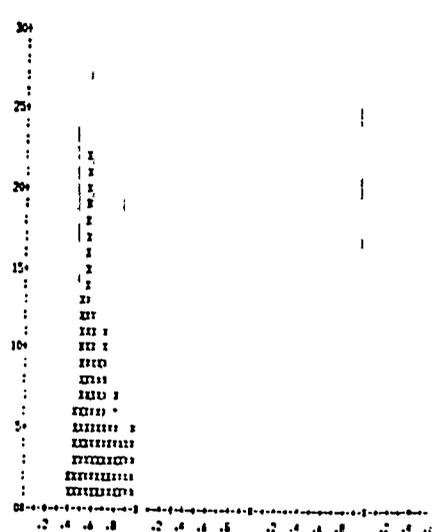
VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 56 MIN. 0.37 MAX. 0.64 AVG. 0.52 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 34 MIN. 0.71 MAX. 1.04 AVG. 0.85 STD. DEV. 0.09

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-491
 REPIN/SAMPLE NO. N.L. TUCKER 6 48-44 TYPE OF SAMPLE..... CORE CHIP
 LOCATION..... STANTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... R. W. SCHMIDT NO. OF OBSERVATIONS, 10

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 0.99 AVG. 0.64 STD. DEV. 0.14



VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 77 MIN. 0.41 MAX. 0.74 AVG. 0.56 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-472
DEPTH/SAMPLE NO.: ANADARKO JONES 88-1 TYPE OF SAMPLE..... CORE CHIP, 5.04"
LOCATION..... WORTON CO., KANSAS DATE..... 12-1-82
ANALYST..... E. M. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.24 MAX. 0.78 AVG. 0.51 STD. DEV. 0.06

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-474
DEPTH/SAMPLE NO.: ANADARKO JONES 88-1 TYPE OF SAMPLE..... CORE CHIP, 5.04"
LOCATION..... WORTON CO., KANSAS DATE..... 12-1-82
ANALYST..... E. M. SCHMIDT NO. OF OBSERVATIONS: 95

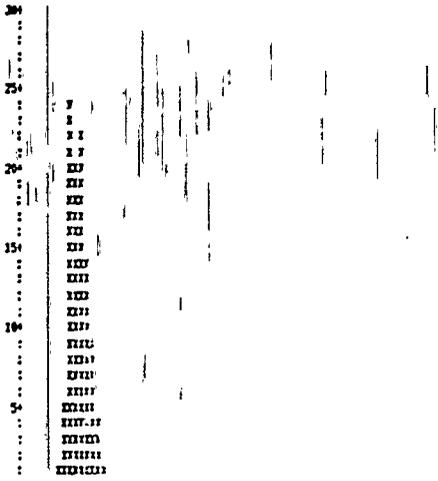
STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.25 MAX. 0.80 AVG. 0.42 STD. DEV. 0.06

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-477
DEPTH/SAMPLE NO.: ANADARKO JONES 88-1 TYPE OF SAMPLE..... CORE CHIP
LOCATION..... WORTON CO., KANSAS DATE..... 12-1-82
ANALYST..... E. M. SCHMIDT NO. OF OBSERVATIONS: 95

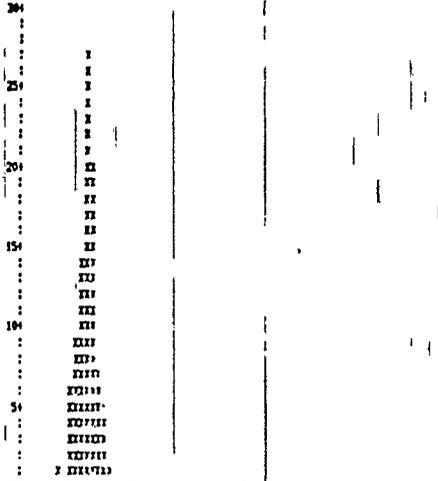
STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.22 MAX. 0.77 AVG. 0.43 STD. DEV. 0.06



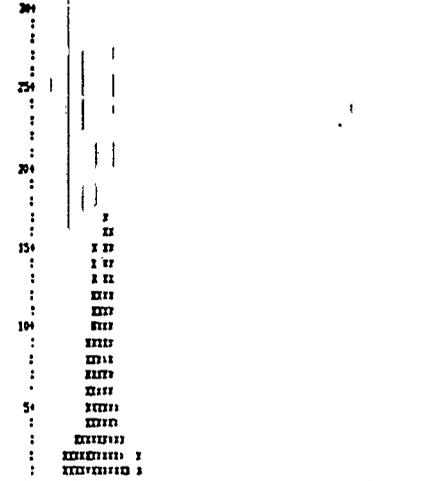
VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 100 MIN. 0.24 MAX. 0.78 AVG. 0.51 STD. DEV. 0.06



VITRINITE REFLECTANCE HISTOGRAM - 2%

POP. 1 TOTAL CTS. 95 MIN. 0.25 MAX. 0.80 AVG. 0.42 STD. DEV. 0.06



VITRINITE REFLECTANCE HISTOGRAM - 2%

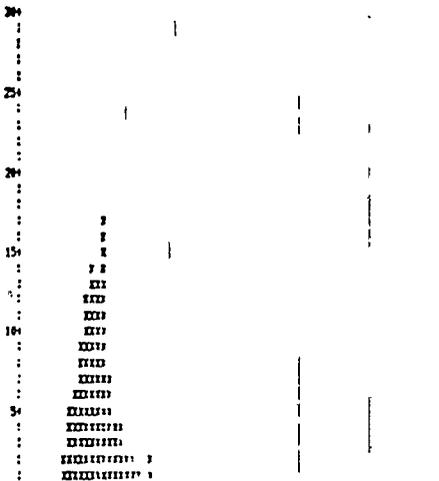
POP. 1 TOTAL CTS. 95 MIN. 0.22 MAX. 0.77 AVG. 0.43 STD. DEV. 0.06

POP. 2 TOTAL CTS. 2 MIN. 0.78 MAX. 0.79 AVG. 0.79 STD. DEV. 0.01

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-476
DEPTH/SAMPLE NO.: ANADARKO JONES 88-1 TYPE OF SAMPLE..... CORE CHIP, 5.04"
LOCATION..... WORTON CO., KANSAS DATE..... 12-1-82
ANALYST..... E. M. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.43 MAX. 1.18 AVG. 0.71 STD. DEV. 0.15



VITRINITE REFLECTANCE HISTOGRAM - 2%

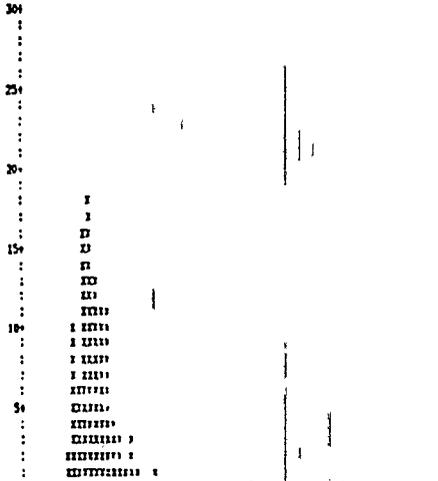
POP. 1 TOTAL CTS. 92 MIN. 0.43 MAX. 0.92 AVG. 0.68 STD. DEV. 0.12

POP. 2 TOTAL CTS. 8 MIN. 0.99 MAX. 1.17 AVG. 1.06 STD. DEV. 0.08

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-477
DEPTH/SAMPLE NO.: ANADARKO JONES 88-1 TYPE OF SAMPLE..... CORE CHIP, 5.04"
LOCATION..... WORTON CO., KANSAS DATE..... 12-1-82
ANALYST..... E. M. SCHMIDT NO. OF OBSERVATIONS: 100

STANDARD DEVIATION START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.41 MAX. 1.18 AVG. 0.64 STD. DEV. 0.14



VITRINITE REFLECTANCE HISTOGRAM - 2%

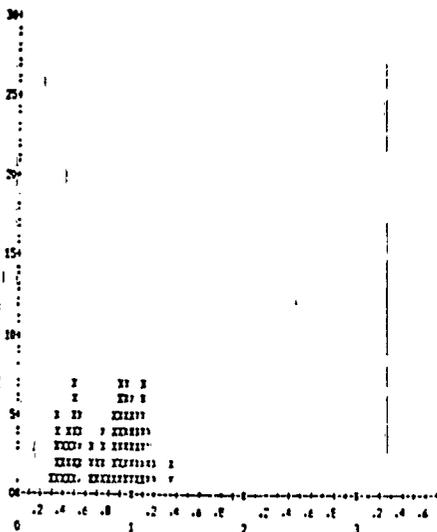
POP. 1 TOTAL CTS. 94 MIN. 0.41 MAX. 0.98 AVG. 0.64 STD. DEV. 0.12

POP. 2 TOTAL CTS. 6 MIN. 0.94 MAX. 1.18 AVG. 1.02 STD. DEV. 0.08

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-698
 DEPTH/SAMPLE NO.: P.A. WILLIAMS 82 TYPE OF SAMPLE..... CORE CHIP, 5.00"
 LOCATION..... NORTH CO., KANSAS DATE..... 12-1-82
 ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS: 40

STANDARD 246 START: 1.02 FINISH: 1.02

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



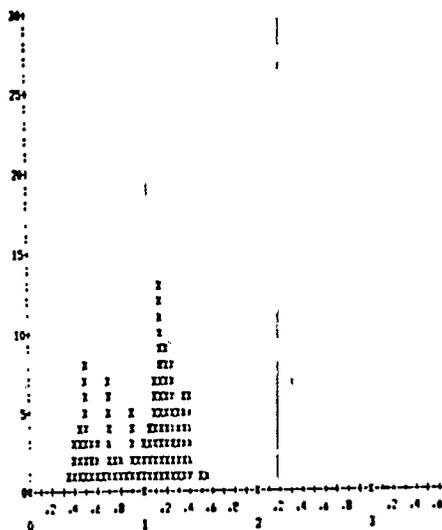
VITRINITE REFLECTANCE HISTOGRAM - DR

POP. 1 TOTAL CTS. 25 MIN. 0.34 MAX. 0.58 AVG. 0.47 STD. DEV. 0.17
 POP. 2 TOTAL CTS. 35 MIN. 0.62 MAX. 0.82 AVG. 0.74 STD. DEV. 0.10
 POP. 3 TOTAL CTS. 41 MIN. 0.82 MAX. 1.27 AVG. 1.01 STD. DEV. 0.24
 POP. 4 TOTAL CTS. 4 MIN. 1.22 MAX. 1.39 AVG. 1.31 STD. DEV. 0.10

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-701
 DEPTH/SAMPLE NO.: P.A. WILLIAMS 8 2 TYPE OF SAMPLE..... CORE CHIP, 5.00"
 LOCATION..... NORTH CO., KANSAS DATE..... 12-1-82
 ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS: 112

STANDARD 246 START: 1.02 FINISH: 1.02

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



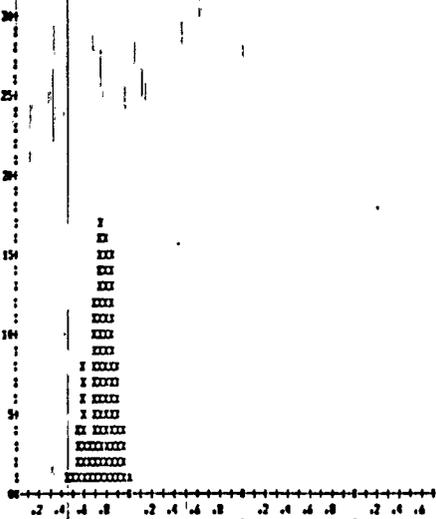
VITRINITE REFLECTANCE HISTOGRAM - DR

POP. 1 TOTAL CTS. 23 MIN. 0.37 MAX. 0.67 AVG. 0.52 STD. DEV. 0.15
 POP. 2 TOTAL CTS. 27 MIN. 0.76 MAX. 1.04 AVG. 0.82 STD. DEV. 0.13
 POP. 3 TOTAL CTS. 58 MIN. 1.06 MAX. 1.44 AVG. 1.24 STD. DEV. 0.16
 POP. 4 TOTAL CTS. 2 MIN. 1.52 MAX. 1.53 AVG. 1.52 STD. DEV. 0.01

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-702
DEPTH/SAMPLE NO. AMOCO SLINKER # 2 TYPE OF SAMPLER..... CORE CHIP, 3.974'
LOCATION..... BERTON CO., KANSAS DATE..... 12-2-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS, 70

STANDARD DEVIATION START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.47 MAX. 1.01 AVG. 0.70 STD. DEV. 0.11



VITRINITE REFLECTANCE HISTOGRAM - No.

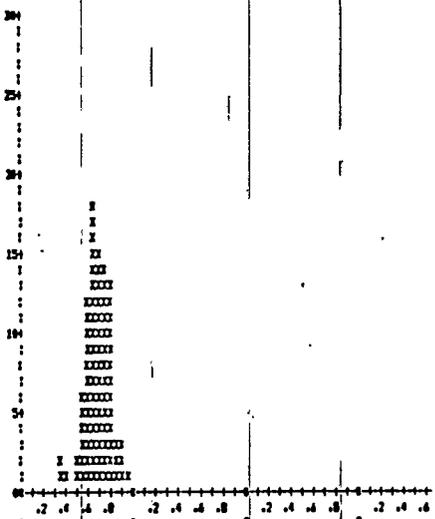
POP. # 1 TOTAL CTS. 24 MIN. 0.47 MAX. 0.64 AVG. 0.59 STD. DEV. 0.05

POP. # 2 TOTAL CTS. 76 MIN. 0.67 MAX. 1.01 AVG. 0.82 STD. DEV. 0.08

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-703
DEPTH/SAMPLE NO. AMOCO SLINKER # 2 TYPE OF SAMPLER..... CORE CHIP, 4.9
LOCATION..... BERTON CO., KANSAS DATE..... 12-2-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS, 70

STANDARD DEVIATION START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.36 MAX. 0.77 AVG. 0.71 STD. DEV. 0.11



VITRINITE REFLECTANCE HISTOGRAM - No.

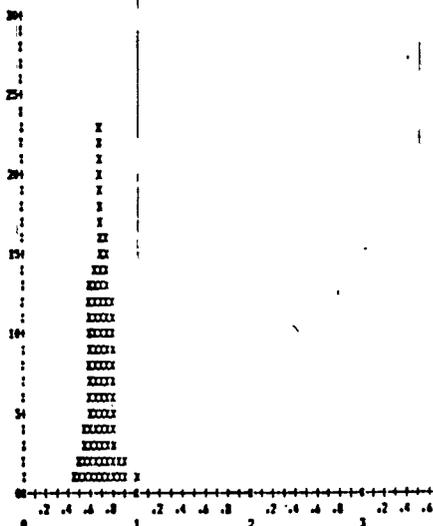
POP. # 1 TOTAL CTS. 2 MIN. 0.36 MAX. 0.42 AVG. 0.39 STD. DEV. 0.03

POP. # 2 TOTAL CTS. 67 MIN. 0.52 MAX. 0.77 AVG. 0.72 STD. DEV. 0.10

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-704
DEPTH/SAMPLE NO. AMOCO SLINKER # 2 TYPE OF SAMPLER..... CORE CHIP, 6.98'
LOCATION..... BERTON CO., KANSAS DATE..... 12-2-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS, 70

STANDARD DEVIATION START: 1.82 FINISH: 1.82

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



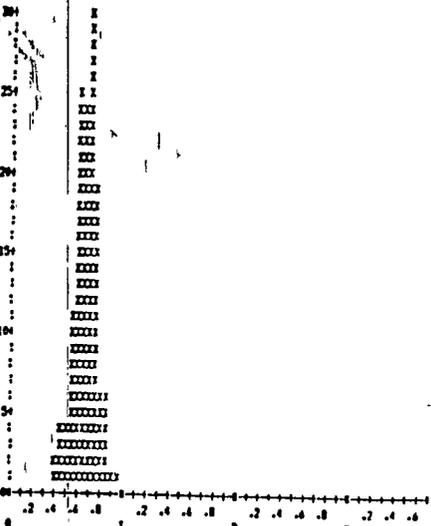
VITRINITE REFLECTANCE HISTOGRAM - No.

POP. # 1 TOTAL CTS. 98 MIN. 0.45 MAX. 1.00 AVG. 0.72 STD. DEV. 0.09

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-705
DEPTH/SAMPLE NO. AMOCO SLINKER # 2 TYPE OF SAMPLER..... CORE CHIP, 4.984'
LOCATION..... BERTON CO., KANSAS DATE..... 12-2-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS, 100

STANDARD DEVIATION START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.43 MAX. 0.78 AVG. 0.68 STD. DEV. 0.10



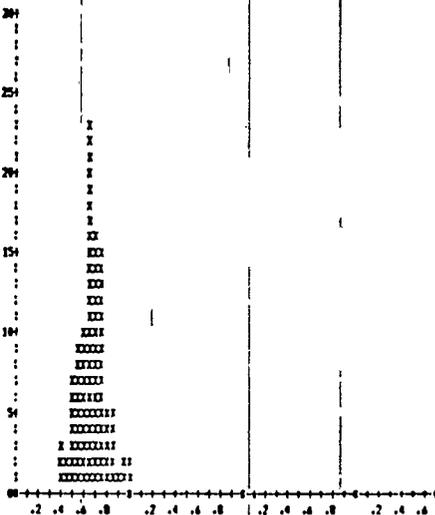
VITRINITE REFLECTANCE HISTOGRAM - No.

POP. # 1 TOTAL CTS. 100 MIN. 0.43 MAX. 0.78 AVG. 0.68 STD. DEV. 0.10

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-706
DEPTH/SAMPLE NO. AMOCO SLINKER # 2 TYPE OF SAMPLER..... CORE CHIP, 4.997'
LOCATION..... BERTON CO., KANSAS DATE..... 12-2-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS, 100

STANDARD DEVIATION START: 1.82 FINISH: 1.82

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



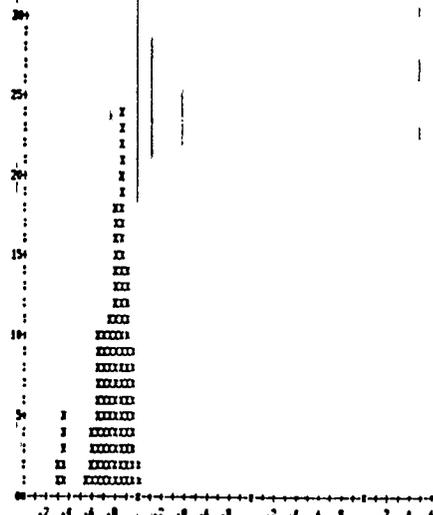
VITRINITE REFLECTANCE HISTOGRAM - No.

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

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-707
DEPTH/SAMPLE NO. AMOCO SLINKER # 2 TYPE OF SAMPLER..... CORE CHIP, 4.997'
LOCATION..... BERTON CO., KANSAS DATE..... 12-2-82
ANALYST..... E. W. SCHMIDT NO. OF OBSERVATIONS, 110

STANDARD DEVIATION START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.31 MAX. 1.04 AVG. 0.71 STD. DEV. 0.15



VITRINITE REFLECTANCE HISTOGRAM - No.

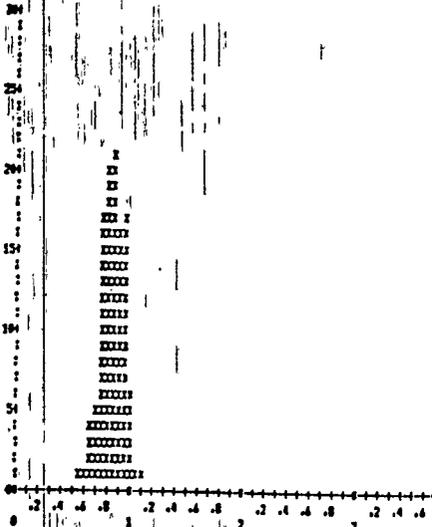
POP. # 1 TOTAL CTS. 7 MIN. 0.31 MAX. 0.37 AVG. 0.35 STD. DEV. 0.02

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-708
DEPTH/SAMPLE NO.. AMCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 4,975'
LOCATION..... WINTON CO., KANSAS DATE..... 12-3-82
ANALYST..... E. W. SCHMID NO. OF OBSERVATIONS. 110

STANDARD Dev START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.38 MAX. 1.13 AVG. 0.84 STD. DEV. 0.10

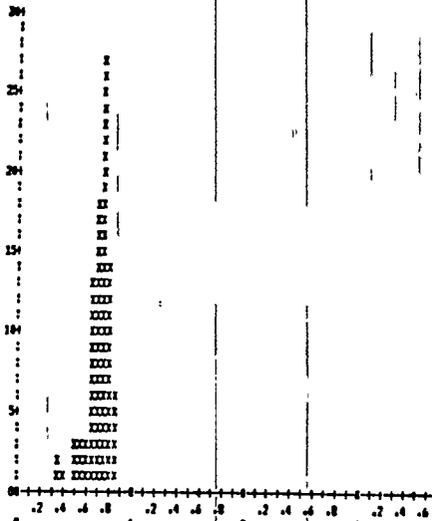


POP.# 1 TOTAL CTS. 118 MIN. 0.38 MAX. 1.13 AVG. 0.84 STD. DEV. 0.10

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-709
DEPTH/SAMPLE NO.. AMCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 3,000'
LOCATION..... WINTON CO., KANSAS DATE..... 12-3-82
ANALYST..... E. W. SCHMID NO. OF OBSERVATIONS. 90

STANDARD Dev START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.37 MAX. 0.89 AVG. 0.72 STD. DEV. 0.10



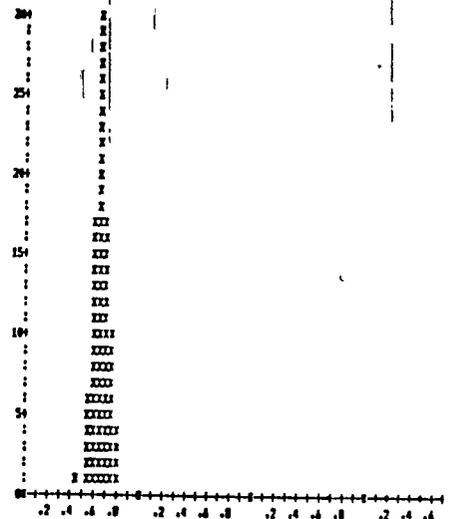
POP.# 1 TOTAL CTS. 3 MIN. 0.37 MAX. 0.43 AVG. 0.39 STD. DEV. 0.03

POP.# 2 TOTAL CTS. 87 MIN. 0.50 MAX. 0.89 AVG. 0.74 STD. DEV. 0.08

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-710
DEPTH/SAMPLE NO.. AMCO BLINDER # 2 TYPE OF SAMPLE..... CORE, 5,012'
LOCATION..... WINTON CO., KANSAS DATE..... 12-3-82
ANALYST..... E. W. SCHMID NO. OF OBSERVATIONS. 90

STANDARD Dev START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.48 MAX. 0.82 AVG. 0.68 STD. DEV. 0.04

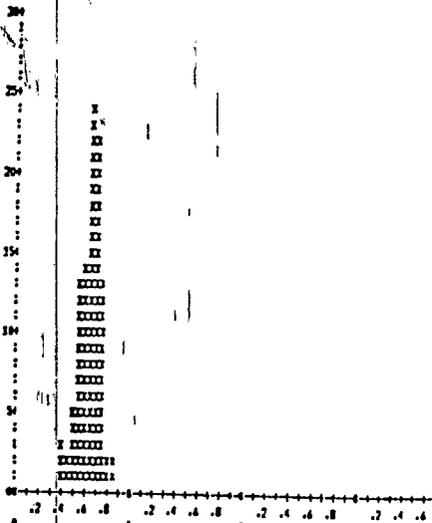


POP.# 1 TOTAL CTS. 90 MIN. 0.48 MAX. 0.82 AVG. 0.68 STD. DEV. 0.04

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-711
DEPTH/SAMPLE NO.. AMCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 3,027'
LOCATION..... WINTON CO., KANSAS DATE..... 12-3-82
ANALYST..... E. W. SCHMID NO. OF OBSERVATIONS. 104

STANDARD Dev START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.40 MAX. 0.90 AVG. 0.64 STD. DEV. 0.09

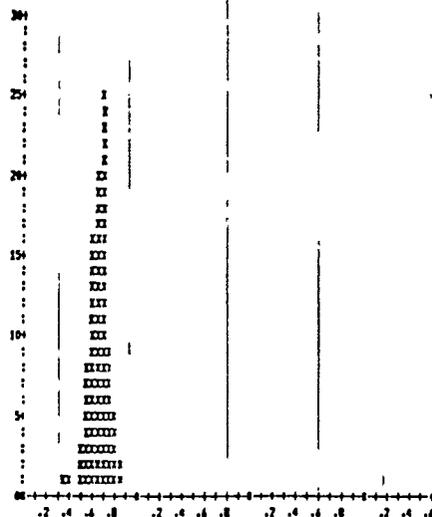


POP.# 1 TOTAL CTS. 180 MIN. 0.40 MAX. 0.88 AVG. 0.64 STD. DEV. 0.09

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-712
DEPTH/SAMPLE NO.. AMCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 3,033'
LOCATION..... WINTON CO., KANSAS DATE..... 12-3-82
ANALYST..... E. W. SCHMID NO. OF OBSERVATIONS. 90

STANDARD Dev START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.25 MAX. 0.87 AVG. 0.48 STD. DEV. 0.09



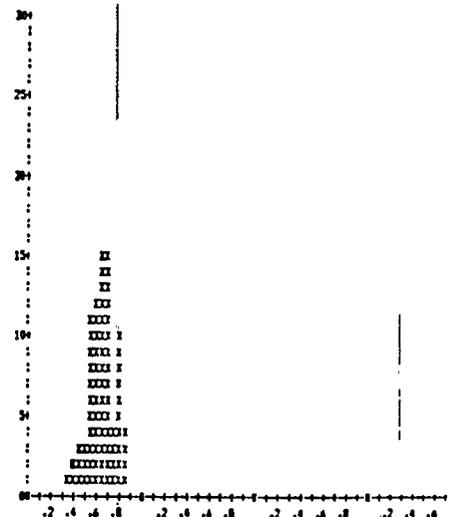
POP.# 1 TOTAL CTS. 2 MIN. 0.25 MAX. 0.41 AVG. 0.38 STD. DEV. 0.04

POP.# 2 TOTAL CTS. 88 MIN. 0.53 MAX. 0.87 AVG. 0.68 STD. DEV. 0.08

CLIENT..... AMCO PROD. COMPANY FILE NAME..... CS-713
DEPTH/SAMPLE NO.. AMCO BLINDER # 2 TYPE OF SAMPLE..... CORE CHIP, 5,030'
LOCATION..... WINTON CO., KANSAS DATE..... 12-3-82
ANALYST..... E. W. SCHMID NO. OF OBSERVATIONS. 80

STANDARD Dev START: 1.82 FINISH: 1.82

REFLECTANCE DATA: MIN. 0.39 MAX. 0.89 AVG. 0.67 STD. DEV. 0.11



POP.# 1 TOTAL CTS. 9 MIN. 0.39 MAX. 0.53 AVG. 0.47 STD. DEV. 0.05

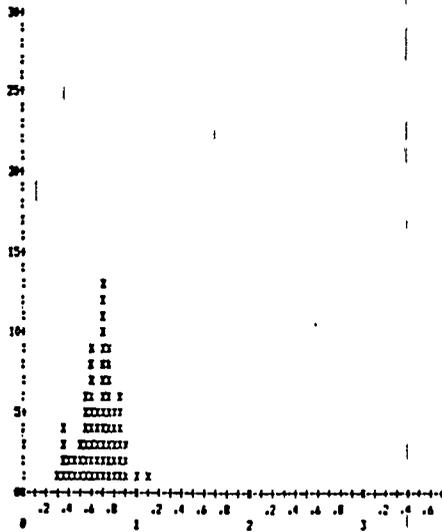
POP.# 2 TOTAL CTS. 53 MIN. 0.53 MAX. 0.74 AVG. 0.65 STD. DEV. 0.04

POP.# 3 TOTAL CTS. 18 MIN. 0.74 MAX. 0.89 AVG. 0.87 STD. DEV. 0.04

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-714
 DEPTH/SAMPLE NO.. AMOCO SLINKEP # 2 TYPE OF SAMPLE..... CORE CHIP, 5.043'
 LOCATION..... BERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. H. SCHWAB NO. OF OBSERVATIONS. 70

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.33 MAX. 1.12 AVG. 0.68 STD. DEV. 0.16



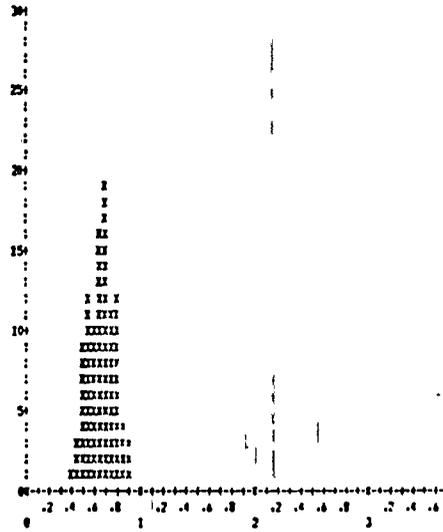
VITRINITE REFLECTANCE HISTOGRAM - Dev

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..... AMOCO PROD. COMPANY FILE NAME..... CS-715
 DEPTH/SAMPLE NO.. AMOCO SLINKEP # 2 TYPE OF SAMPLE..... CORE CHIP, 5.044'
 LOCATION..... BERTON CO., KANSAS DATE..... 12-3-82
 ANALYST..... E. H. SCHWAB NO. OF OBSERVATIONS. 100

STANDARD Dev START: 1.02 FINISH: 1.02

REFLECTANCE DATA: MIN. 0.44 MAX. 0.93 AVG. 0.69 STD. DEV. 0.11



VITRINITE REFLECTANCE HISTOGRAM - Dev

POP.# 1 TOTAL CTS. 100 MIN. 0.44 MAX. 0.93 AVG. 0.69 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

Contamination

Whole Extract Chromatograms

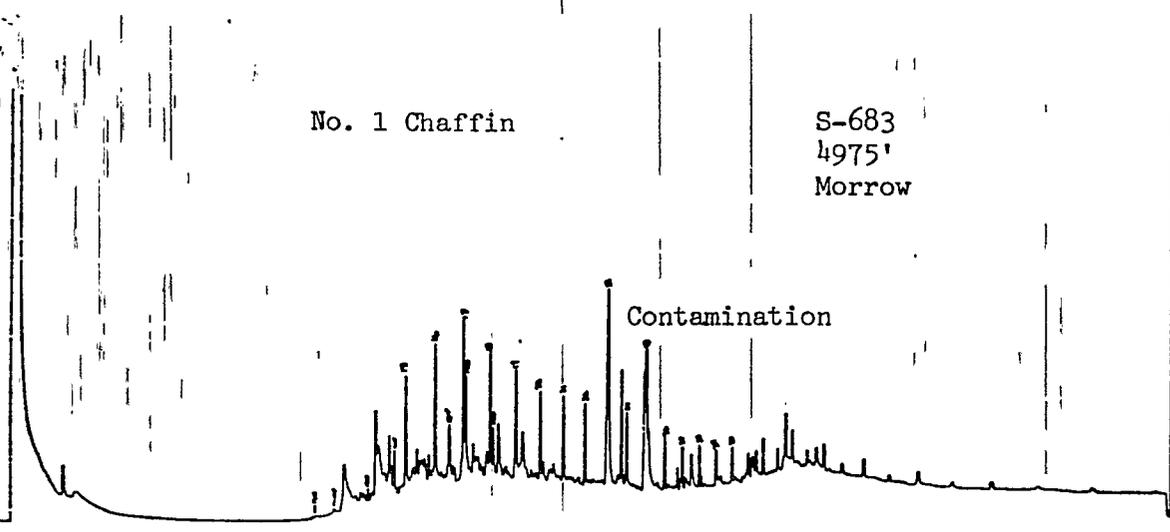
Proprietary - To Be Maintained in Confidence
Amoco Production Company

TS 825396CS
Figure 3a

No. 1 Chaffin

S-683
4975'
Morrow

Contamination

A chromatogram plot showing detector response over time. The y-axis is labeled 'SIGNAL' and the x-axis is labeled 'MINUTES'. The plot shows a very sharp, high-intensity peak at the beginning, followed by a long, low-intensity tail. In the middle of this tail, there is a cluster of several smaller peaks, with the tallest one labeled 'Contamination'. The signal returns to a baseline after the tail ends.

Whole Extract Chromatogram

TS 825396CS
Figure 3b

Proprietary - To Be Maintained In Confidence
Amoco Production Company

NO. 60-A4 rucker

S-604
3348'
Morrow

Contamination

S-687
5254'
Morrow

Contamination

S-688
5378'
Morrow

Contamination

S-689
5384'
Morrow

Contamination

Whole Extract Chromatograms

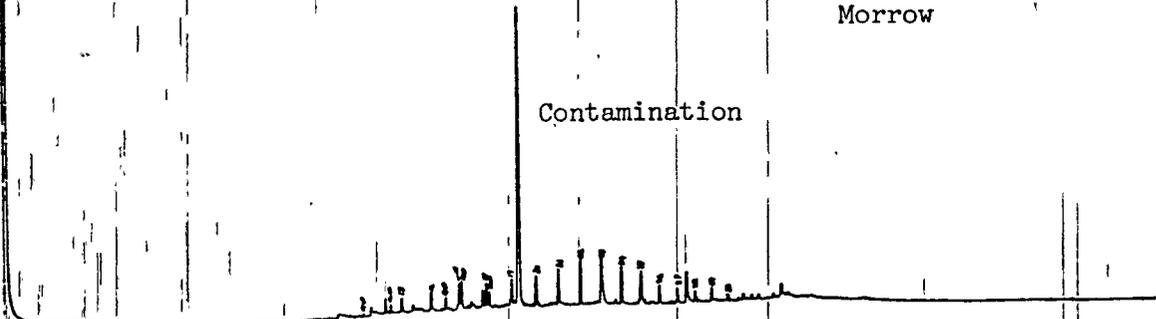
TS 825396CS
Figure 3c

Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. 68-A4 Tucker

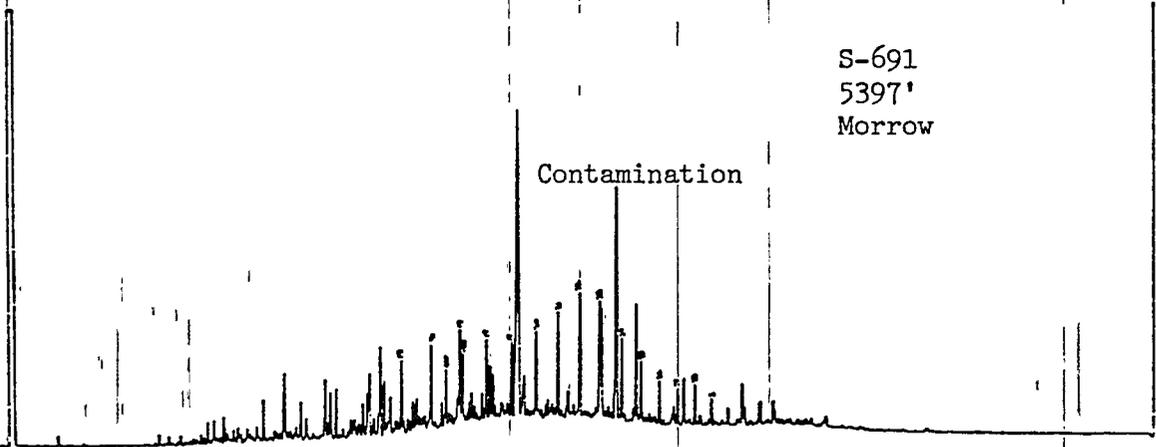
S-690
5391'
Morrow

Contamination

A chromatogram plot showing detector response over time. The baseline is relatively flat with a series of small, regular peaks. A single, much taller and sharper peak is labeled 'Contamination'.

S-691
5397'
Morrow

Contamination

A chromatogram plot showing detector response over time. The baseline is relatively flat with a series of small, regular peaks. A single, much taller and sharper peak is labeled 'Contamination'.

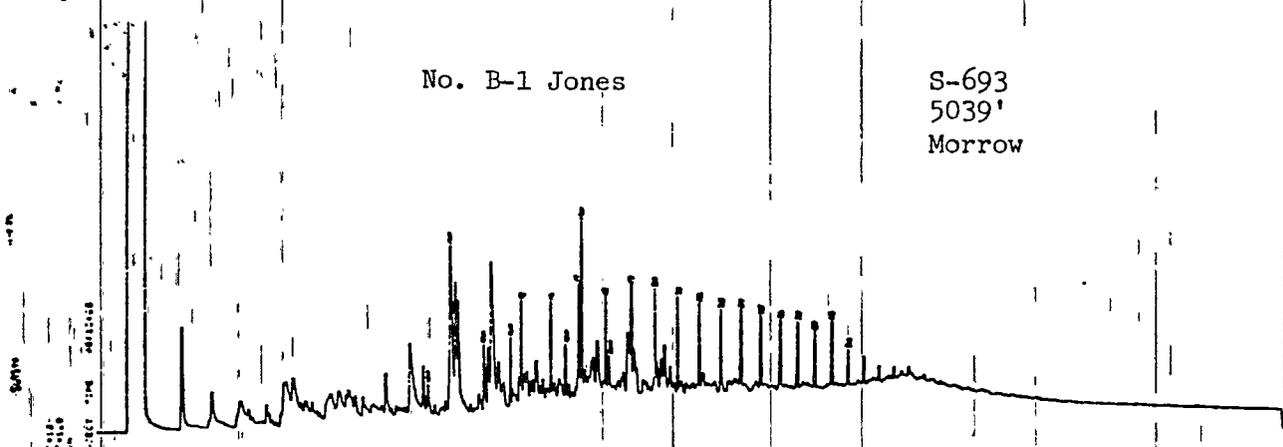
Whole Extract Chromatograms

TS 825396CS
Figure 3d

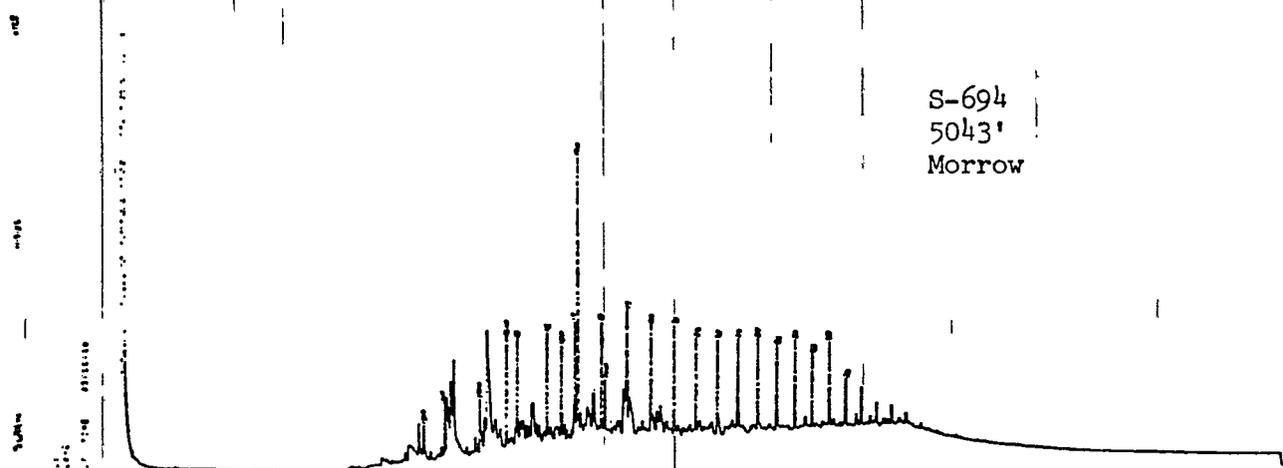
Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. B-1 Jones

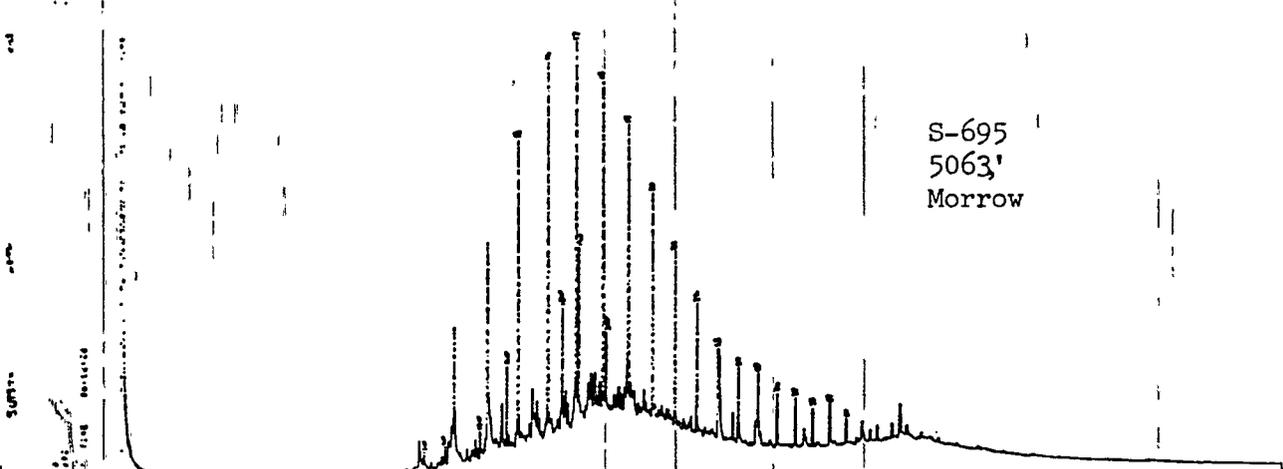
S-693
5039'
Morrow



S-694
5043'
Morrow



S-695
5063'
Morrow



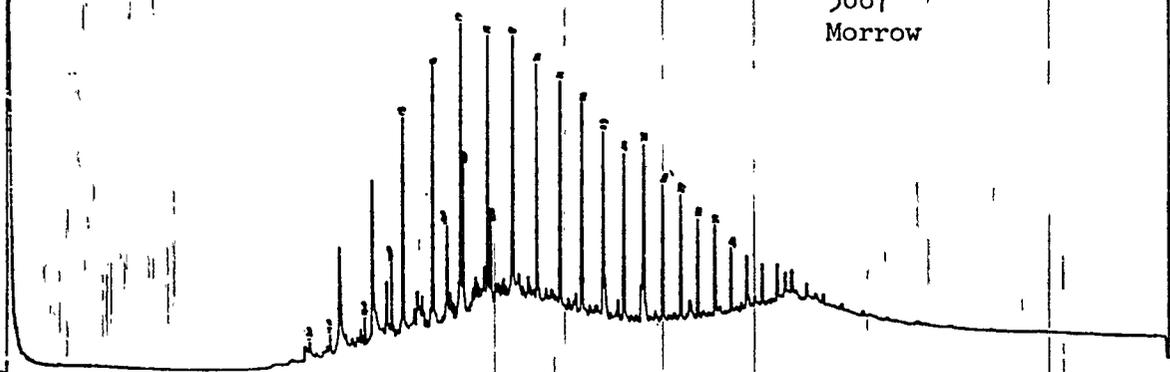
Whole Extract Chromatograms

TS 825396CS
Figure 3e

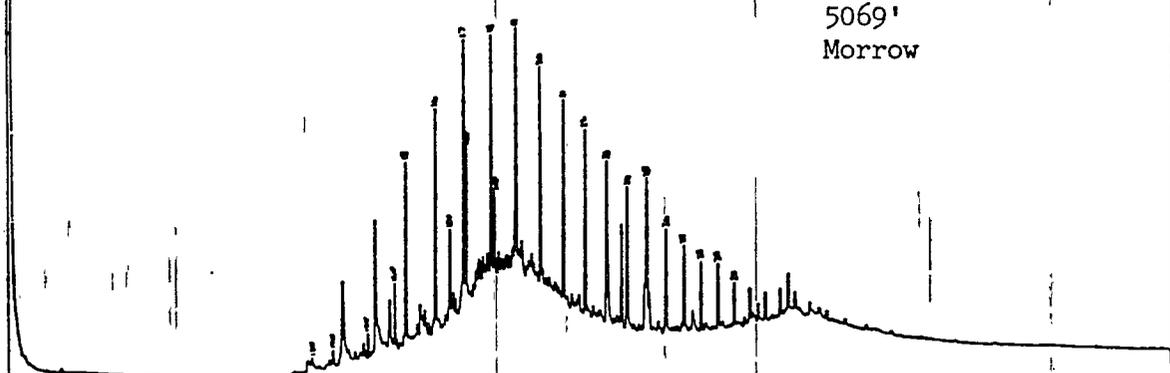
Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. B-1 Jones

S-696
5067'
Morrow



S-697
5069'
Morrow



Whole Extract Chromatograms

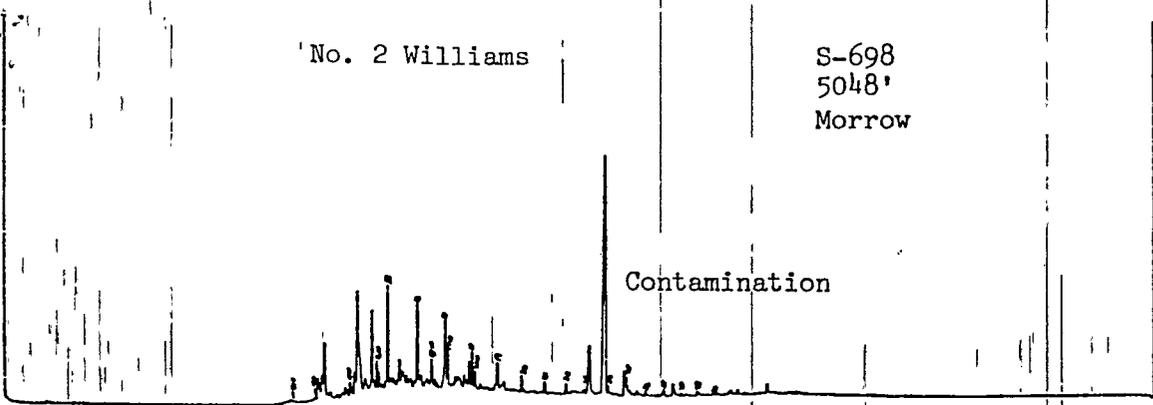
TS 825396CS
Figure 3f

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Amoco Production Company

No. 2 Williams

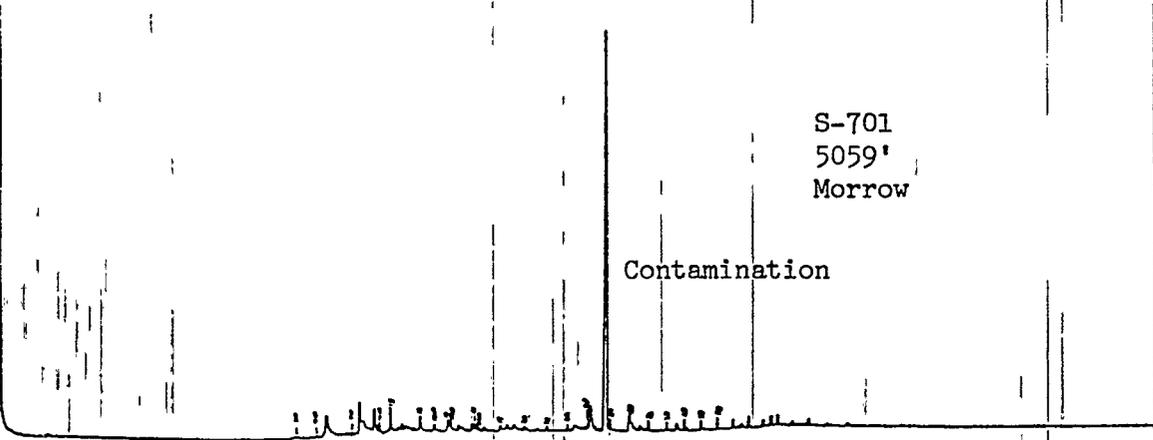
S-698
5048'
Morrow

Contamination



S-701
5059'
Morrow

Contamination



Whole Extract Chromatograms

TS 825396CS
Figure 3g

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Amoco Production Company

NO. 2 Sinker

S-702
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