

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'								
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 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

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					BBL/AF = (PPM X .0180) Sat. δC^{13} o/oo Pristane/ Phytane
											.01	
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	

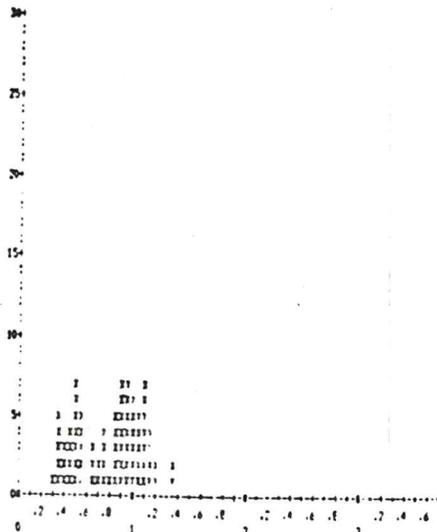
Proprietary - To Be Maintained In Confidence
Amoco Production Company

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 COUNTY MORTON WELL LOCATION SEC9-T33S-R41W WELL NAME ANADARKO 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 LOCATION SEC21-T31S-R40W WELL NAME PAN AM 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 LOCATION SEC21-T31S-R40W WELL NAME AMOCO 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	

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-498
 DEPTH/SAMPLE NO. P.A. WILLIAMS #2 TYPE OF SAMPLE..... CORE CHIP, 5.048
 LOCATION..... HORTON CO., KANSAS DATE..... 12-11-82
 ANALYST..... K. G. SCHMAL 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



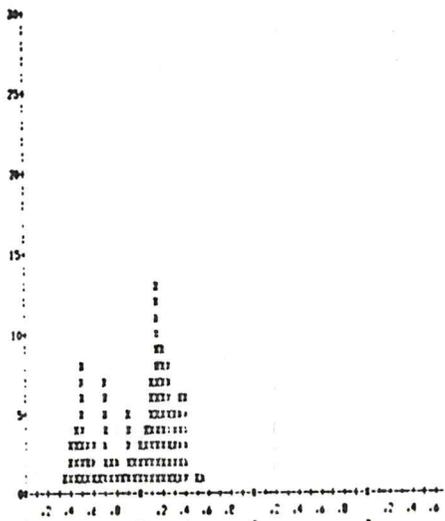
VITRINITE REFLECTANCE HISTOGRAM - DR

POP. 1 TOTAL CTS: 27 MIN: 0.34 MAX: 0.58 AVG: 0.47 STD. DEV: 0.17
 POP. 2 TOTAL CTS: 16 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: 1.02 STD. DEV: 0.24
 POP. 4 TOTAL CTS: 4 MIN: 1.22 MAX: 1.39 AVG: 1.30 STD. DEV: 0.10

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-701
 DEPTH/SAMPLE NO. P.A. WILLIAMS #2 TYPE OF SAMPLE..... CORE CHIP, 5.099
 LOCATION..... HORTON CO., KANSAS DATE..... 12-11-82
 ANALYST..... K. G. SCHMAL NO. OF OBSERVATIONS: 192

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: 0.17
 POP. 2 TOTAL CTS: 27 MIN: 0.76 MAX: 1.04 AVG: 0.82 STD. DEV: 0.13
 POP. 3 TOTAL CTS: 58 MIN: 1.04 MAX: 1.44 AVG: 1.24 STD. DEV: 0.18
 POP. 4 TOTAL CTS: 2 MIN: 1.52 MAX: 1.53 AVG: 1.54 STD. DEV: 0.02

TS 825396CS
 Figure 2d

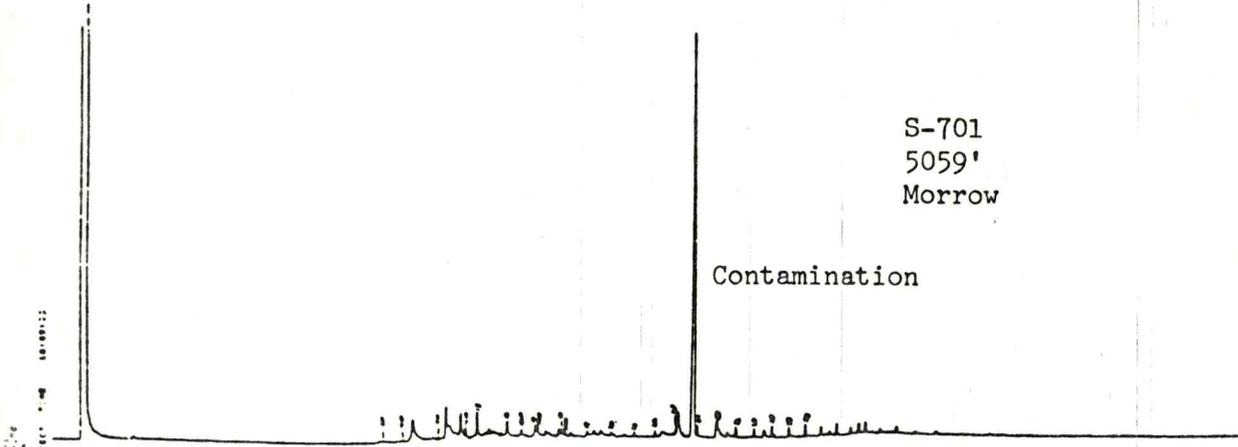
Proprietary - To Be Maintained In Confidence
 Amoco Production Company

No. 2 Williams

S-698
5048'
Morrow



S-701
5059'
Morrow



Whole Extract Chromatograms

TS 825396CS
Figure 3g

Proprietary - To Be Maintained In Confidence
Amoco Production Company

Tucker

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER
 AUTHORIZED BY O R HILLE
 TECHNICAL SERVICE NUMBER 825396

DISTRICT SOUTHERN

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	LEASE	MAUNE #4	TEMP
		SHALLOW WATER						1w
		S-677	CR ST LOUIS	MISS SH			4648	
								1w
STATE	KS	COUNTY	WASKELL	WELL LOCATION	SEC31-T30S-R33W	LEASE	THOMPSON #2-E	TEMP
		CITIES SERVICE						115°F @ ~4600' Grad: 14.1°F/1000'
		S-678	CR LANSING	PENN SH			4531	VERY GOOD
		S-679	CR LANSING	PENN SH			4534	VERY GOOD

STATE	KS	COUNTY	STANTON	WELL LOCATION	SEC4-T29S-R42W	LEASE	H I. TUCKER #68-A4	TEMP
		SUPERIOR						
		S-684	CR MORROW	PENN SH			3348	MARGINAL
		S-685	CR MORROW	PENN SH			5246	5247 MARGINAL
		S-686	CR MORROW	PENN SH			5250	5251 MARGINAL
		S-687	CR MORROW	PENN SH			5254	5255 MARGINAL
		S-688	CR MORROW	PENN SH			5378	5379 MARGINAL
		S-689	CR MORROW	PENN SH			5384	5385 MARGINAL
		S-690	CR MORROW	PENN SH			5391	5392 MARGINAL

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER
AUTHORIZED BY O R HILLE
CHEMICAL 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 SUPERIOR		COUNTY 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 ANADARKO		COUNTY MORTON	WELL LOCATION SEC9-T33S-R41W LEASE JONES #B-1					
S-693	CR	MORROW	PENN SH		5039	VERY GOOD		
S-694	CR	MORROW	PENN SH		5043	VERY GOOD		
S-695	CR	MORROW	PENN SH		5063	MARGINAL		
S-696	CR	MORROW	PENN SH		5067	MARGINAL		
S-697	CR	MORROW	PENN SH		5069	MARGINAL		

120°F @ 5100' Grad: 13.7°F/1000'

8:45 THURSDAY, DECEMBER 30, 1982

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-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

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
825396

SOURCE ROCK DATA
TABLE 3a
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 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. $\delta C_{13}^o/oo$ Pristane/Phytane
												<.01
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 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

Proprietary - To Be Maintained In Confidence
Amoco Production Company

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER
CHEMICAL SERVICE NUMBER

DISTRICT SOUTHERN
825396

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

SAMPLE NUMBER	FIELD NO. OR DEPTH FEET		GEOLOGICAL AGE	INSOLUBLE RESIDUE %	TOTAL ORGANIC CARBON WT%	BITUMEN		SATURATED HYDROCARBONS		BITUMEN/TL ORGANIC CARBON	REMARKS		
	TOP	BOTTOM				BBL/AF	PPM	BBL/AF	PPM				
<p>ATE KS COUNTY STANTON WELL LOCATION SEC4-T29S-R42W LL NAME SUPERIOR LEASE H L TUCKER #68-A4</p> <p style="text-align: right;">BBL/AF = (PPM X .0180) Sat. δC^{13} o/oo Pristane/Phytane</p>													
S-691	5397	5398	PENN	78	.8	2	99			.01			
<p>ATE KS COUNTY MORTON WELL LOCATION SEC9-T33S-R41W LL NAME ANADARKO LEASE JONES #B-1</p>													
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		

AMOCO PRODUCTION COMPANY
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		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 SUPERIOR	STANTON		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	

Proprietary - To Be Maintained In Confidence
Amoco Production Company

AMOCO PRODUCTION COMPANY
RESEARCH CENTER

OFFICE DENVER
TECHNICAL SERVICE NUMBER

DISTRICT SOUTHERN
825396

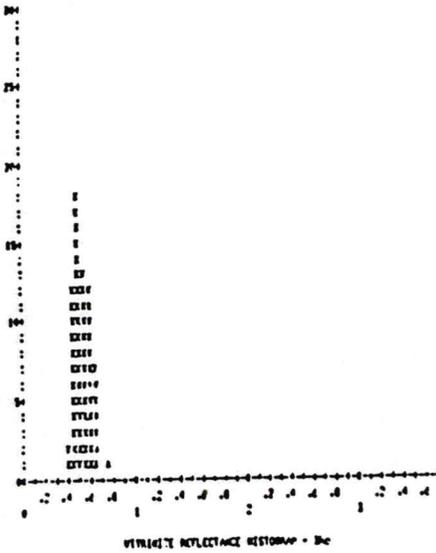
KEROGEN DATA
TABLE 4. D
DATE 01/04/83

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	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

BLKNT..... AMCO PROD. COMPANY FILE NAME..... 0-077
 REF/SAMPLE NO. DATE TIME MADE-1 TYPE OF SAMPLE..... CORE DRIF. 4.541
 LOCATION..... FARMLEY CO., GARGAS DATE..... 12-1-62
 ANALYST..... G. G. BOGARD NO. OF OBSERVATIONS, 18

STANDARD Dev START: 1.43 FINISH: 1.42

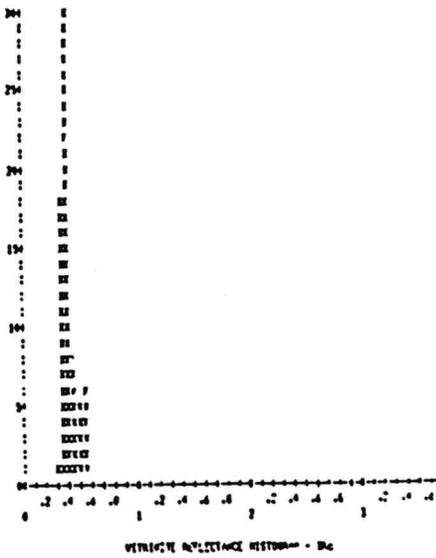
REFLECTANCE DATA: MIN. 0.41 MAX. 0.75 AVG. 0.52 STD. DEV. 0.07



BLKNT..... AMCO PROD. COMPANY FILE NAME..... 00-470
 REF/SAMPLE NO. DATE TIME MADE-1 TYPE OF SAMPLE..... CORE DRIF. 4.531
 LOCATION..... HANWELL CO., GARGAS DATE..... 12-1-62
 ANALYST..... G. G. BOGARD NO. OF OBSERVATIONS, 18

STANDARD Dev START: 1.42 FINISH: 1.42

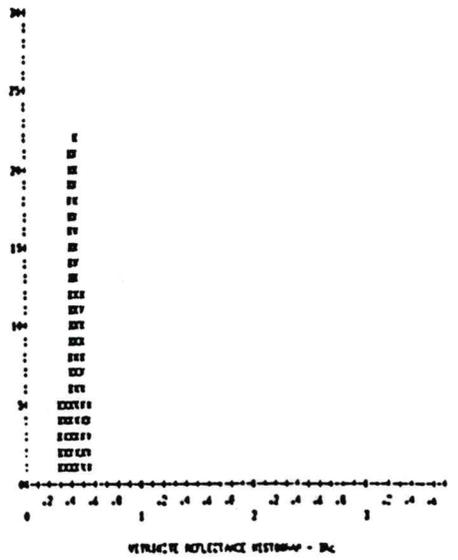
REFLECTANCE DATA: MIN. 0.31 MAX. 0.79 AVG. 0.43 STD. DEV. 0.04



BLKNT..... AMCO PROD. COMPANY FILE NAME..... 00-470
 REF/SAMPLE NO. DATE TIME MADE-1 TYPE OF SAMPLE..... CORE DRIF. 4.531
 LOCATION..... HANWELL CO., GARGAS DATE..... 12-1-62
 ANALYST..... G. G. BOGARD NO. OF OBSERVATIONS, 18

STANDARD Dev START: 1.43 FINISH: 1.42

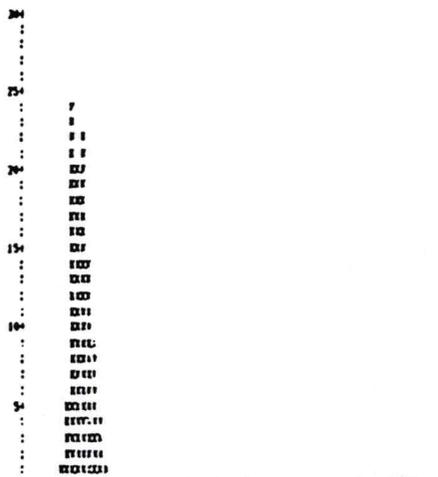
REFLECTANCE DATA: MIN. 0.31 MAX. 0.79 AVG. 0.43 STD. DEV. 0.04



CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-477
 REPT/SAMPLE NO. ANNAHMC JONES 00-1 TYPE OF SAMPLE..... CORE CHIP, 3.04"
 LOCATION..... HERTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... E. U. SCHWAB NO. OF OBSERVATIONS, 140

STANDARD DEVIATION START: 1.43 FINISH: 1.42

REFLECTANCE DATA: MIN. 0.24 MAX. 0.70 AVG. 0.57 STD. DEV. 0.06



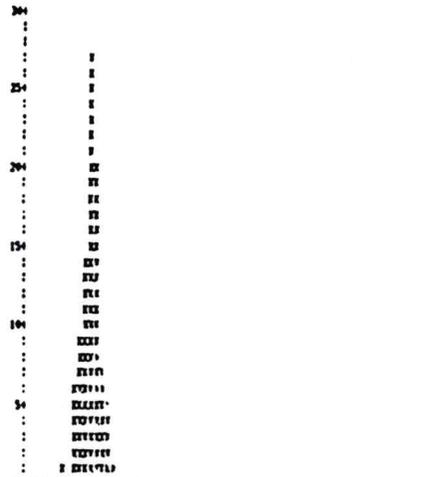
VERTICAL REFLECTANCE HISTOGRAM - DE

POP. 1 TOTAL CTS. 140 MIN. 0.24 MAX. 0.70 AVG. 0.57 STD. DEV. 0.06

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-477
 REPT/SAMPLE NO. ANNAHMC JONES 00-1 TYPE OF SAMPLE..... CORE CHIP, 3.04"
 LOCATION..... HERTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... E. U. SCHWAB NO. OF OBSERVATIONS, 90

STANDARD DEVIATION START: 1.42 FINISH: 1.42

REFLECTANCE DATA: MIN. 0.25 MAX. 0.66 AVG. 0.42 STD. DEV. 0.06



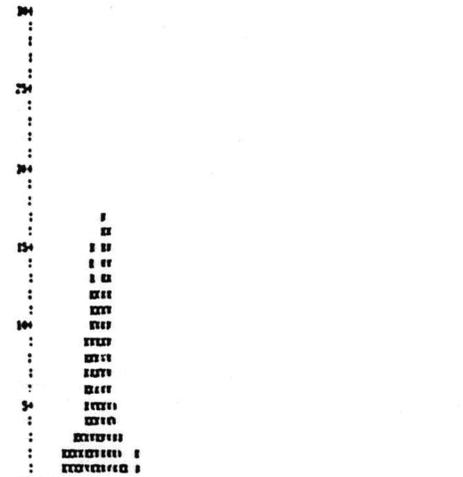
VERTICAL REFLECTANCE HISTOGRAM - DE

POP. 1 TOTAL CTS. 90 MIN. 0.25 MAX. 0.66 AVG. 0.42 STD. DEV. 0.06

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-477
 REPT/SAMPLE NO. ANNAHMC JONES 00-1 TYPE OF SAMPLE..... CORE CHIP, 3.04"
 LOCATION..... HERTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... E. U. SCHWAB NO. OF OBSERVATIONS, 90

STANDARD DEVIATION START: 1.42 FINISH: 1.42

REFLECTANCE DATA: MIN. 0.32 MAX. 0.69 AVG. 0.43 STD. DEV. 0.13



VERTICAL REFLECTANCE HISTOGRAM - DE

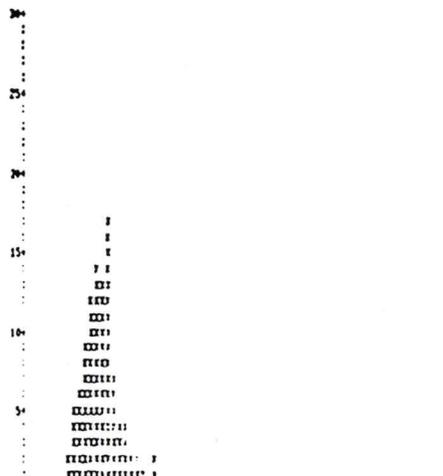
POP. 1 TOTAL CTS. 90 MIN. 0.32 MAX. 0.69 AVG. 0.43 STD. DEV. 0.13

POP. 2 TOTAL CTS. 2 MIN. 0.70 MAX. 0.70 AVG. 0.70 STD. DEV. 0.00

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-477
 REPT/SAMPLE NO. ANNAHMC JONES 00-1 TYPE OF SAMPLE..... CORE CHIP, 3.04"
 LOCATION..... HERTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... E. U. SCHWAB NO. OF OBSERVATIONS, 140

STANDARD DEVIATION START: 1.42 FINISH: 1.42

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



VERTICAL REFLECTANCE HISTOGRAM - DE

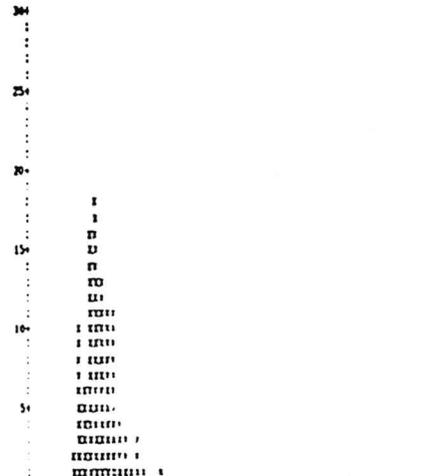
POP. 1 TOTAL CTS. 140 MIN. 0.43 MAX. 1.10 AVG. 0.71 STD. DEV. 0.15

POP. 2 TOTAL CTS. 7 MIN. 0.99 MAX. 1.10 AVG. 1.04 STD. DEV. 0.08

CLIENT..... AMOCO PROD. COMPANY FILE NAME..... CS-477
 REPT/SAMPLE NO. ANNAHMC JONES 00-1 TYPE OF SAMPLE..... CORE CHIP, 3.04"
 LOCATION..... HERTON CO., KANSAS DATE..... 12-1-82
 ANALYST..... E. U. SCHWAB NO. OF OBSERVATIONS, 140

STANDARD DEVIATION START: 1.42 FINISH: 1.42

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



VERTICAL REFLECTANCE HISTOGRAM - DE

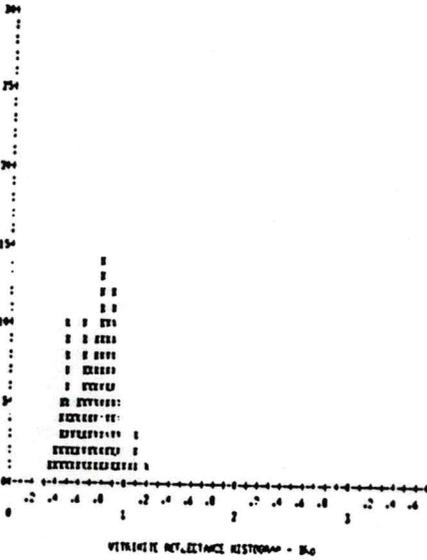
POP. 1 TOTAL CTS. 140 MIN. 0.41 MAX. 1.10 AVG. 0.64 STD. DEV. 0.14

POP. 2 TOTAL CTS. 6 MIN. 0.94 MAX. 1.10 AVG. 1.00 STD. DEV. 0.08

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-404
 DEPTH/SAMPLE NO. H.L. INDEX 0 60-64 TYPE OF SAMPLE..... CORE DRIP. S.347
 LOCATION..... STARTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... E. G. SCHMID NO. OF OBSERVATIONS. 100

STANDARD DEVIATION START: 1.42 FINISH: 1.42

REFLECTANCE DATA: MIN. 0.20 MAX. 1.21 AVG. 0.76 STD. DEV. 0.18

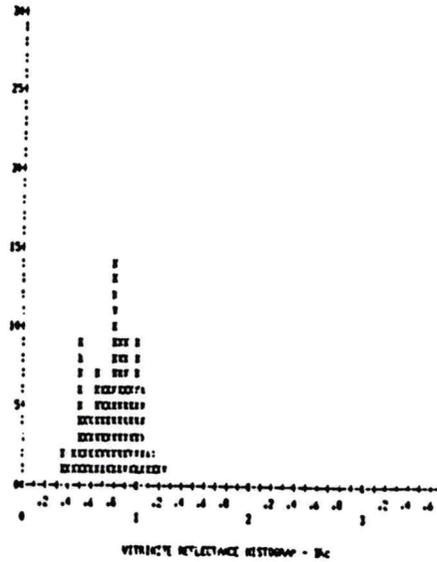


POP. 1 TOTAL CTS. 27 MIN. 0.37 MAX. 0.64 AVG. 0.53 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 47 MIN. 0.42 MAX. 0.94 AVG. 0.67 STD. DEV. 0.20
 POP. 3 TOTAL CTS. 6 MIN. 1.06 MAX. 1.21 AVG. 1.12 STD. DEV. 0.07

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-407
 DEPTH/SAMPLE NO. H.L. INDEX 0 60-64 TYPE OF SAMPLE..... CORE DRIP. S.351
 LOCATION..... STARTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... E. G. SCHMID NO. OF OBSERVATIONS. 100

STANDARD DEVIATION START: 1.42 FINISH: 1.42

REFLECTANCE DATA: MIN. 0.31 MAX. 1.29 AVG. 0.81 STD. DEV. 0.20

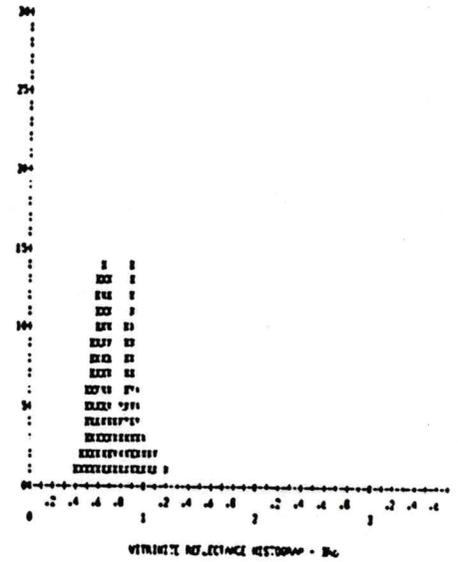


POP. 1 TOTAL CTS. 22 MIN. 0.37 MAX. 0.42 AVG. 0.52 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 72 MIN. 0.45 MAX. 1.09 AVG. 0.67 STD. DEV. 0.12
 POP. 3 TOTAL CTS. 6 MIN. 1.11 MAX. 1.29 AVG. 1.18 STD. DEV. 0.07

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-408
 DEPTH/SAMPLE NO. H.L. INDEX 0 60-64 TYPE OF SAMPLE..... CORE DRIP. S.357
 LOCATION..... STARTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... E. G. SCHMID NO. OF OBSERVATIONS. 100

STANDARD DEVIATION START: 1.42 FINISH: 1.42

REFLECTANCE DATA: MIN. 0.43 MAX. 1.22 AVG. 0.76 STD. DEV. 0.17

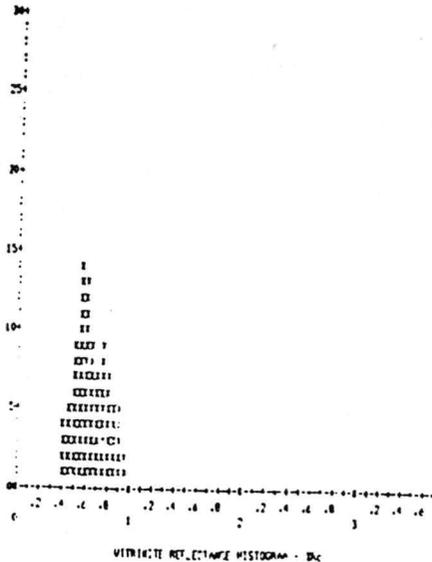


POP. 1 TOTAL CTS. 21 MIN. 0.43 MAX. 0.69 AVG. 0.57 STD. DEV. 0.08
 POP. 2 TOTAL CTS. 74 MIN. 0.42 MAX. 1.22 AVG. 0.64 STD. DEV. 0.20

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-409
 DEPTH/SAMPLE NO. H.L. INDEX 0 60-64 TYPE OF SAMPLE..... CORE DRIP. S.364
 LOCATION..... STARTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... E. G. SCHMID NO. OF OBSERVATIONS. 100

STANDARD DEVIATION START: 1.42 FINISH: 1.42

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

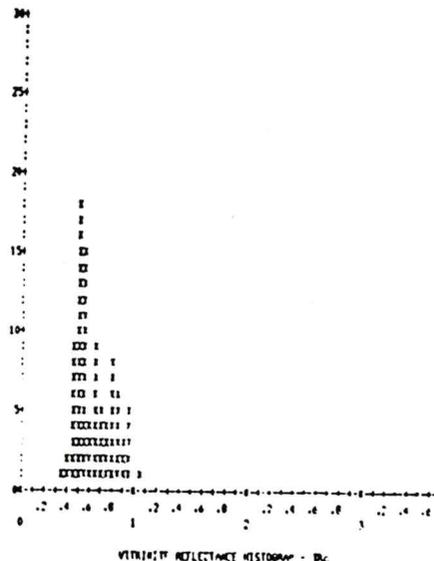


POP. 1 TOTAL CTS. 54 MIN. 0.41 MAX. 0.69 AVG. 0.57 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 31 MIN. 0.70 MAX. 0.98 AVG. 0.82 STD. DEV. 0.08

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-410
 DEPTH/SAMPLE NO. H.L. INDEX 0 60-64 TYPE OF SAMPLE..... CORE DRIP. S.371
 LOCATION..... STARTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... E. G. SCHMID NO. OF OBSERVATIONS. 100

STANDARD DEVIATION START: 1.42 FINISH: 1.42

REFLECTANCE DATA: MIN. 0.31 MAX. 1.04 AVG. 0.64 STD. DEV. 0.16

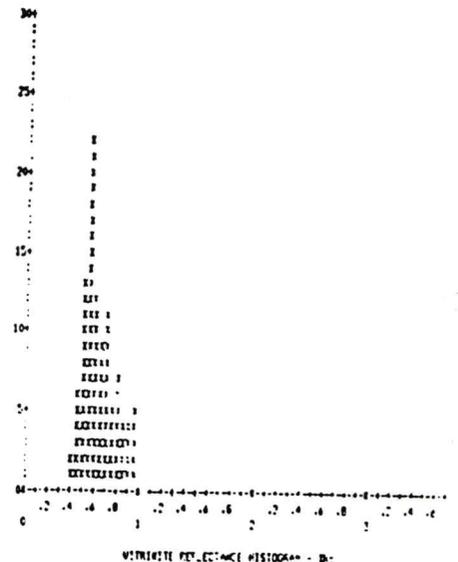


POP. 1 TOTAL CTS. 56 MIN. 0.31 MAX. 0.69 AVG. 0.52 STD. DEV. 0.07
 POP. 2 TOTAL CTS. 32 MIN. 0.71 MAX. 1.04 AVG. 0.85 STD. DEV. 0.08

CLIENT..... ARCO PROD. COMPANY FILE NAME..... CS-411
 DEPTH/SAMPLE NO. H.L. INDEX 0 60-64 TYPE OF SAMPLE..... CORE DRIP. S.377
 LOCATION..... STARTON CO., KANSAS DATE..... 12-1-62
 ANALYST..... E. G. SCHMID NO. OF OBSERVATIONS. 100

STANDARD DEVIATION START: 1.42 FINISH: 1.42

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



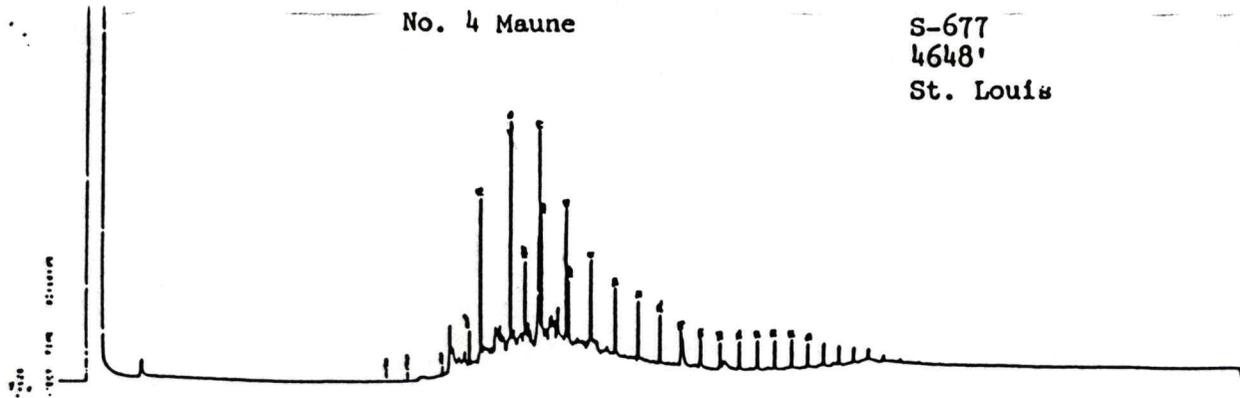
POP. 1 TOTAL CTS. 77 MIN. 0.41 MAX. 0.74 AVG. 0.59 STD. DEV. 0.08
 POP. 2 TOTAL CTS. 23 MIN. 0.75 MAX. 0.99 AVG. 0.82 STD. DEV. 0.07

Proprietary - To Be Maintained in Confidence
 Amoco Production Company

TS 825396CS
 Figure 2b

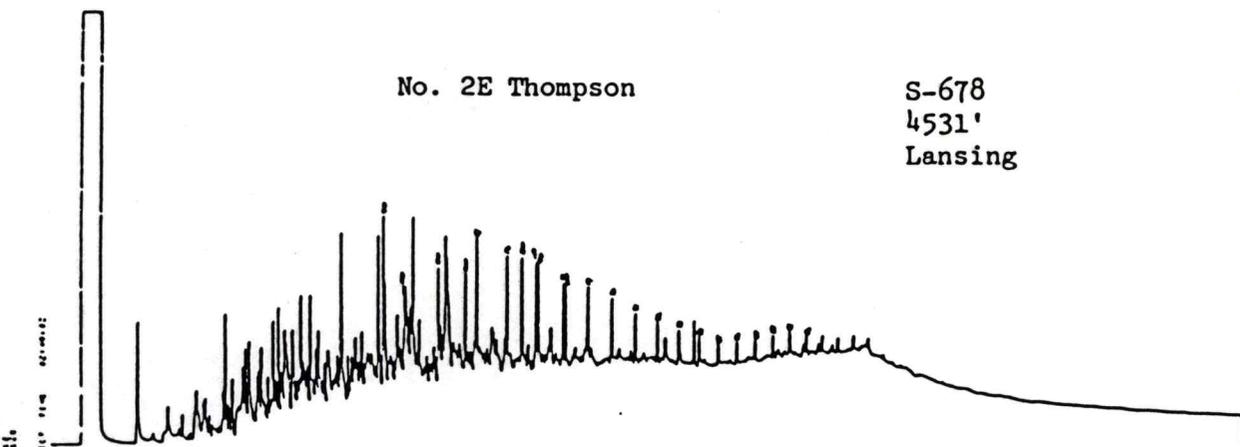
No. 4 Maune

S-677
4648'
St. Louis

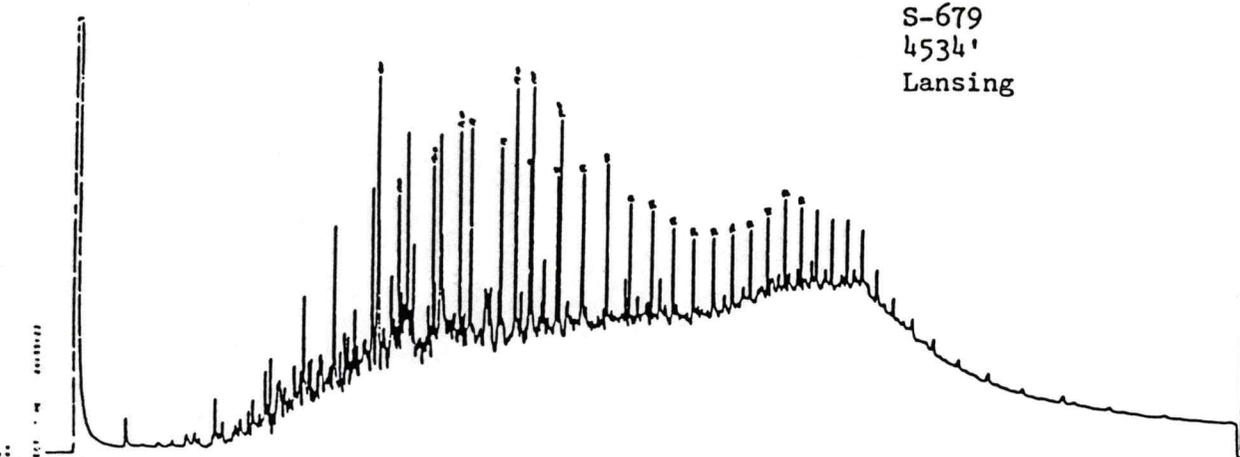


No. 2E Thompson

S-678
4531'
Lansing



S-679
4534'
Lansing



Whole Extract Chromatograms

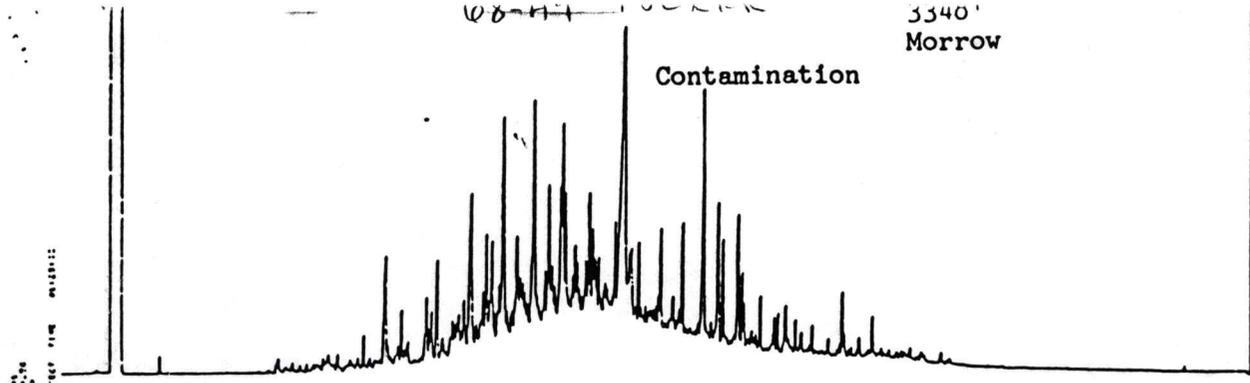
Proprietary - To Be Maintained in Confidence
Amoco Production Company

TS 825396CS
Figure 3a

08-11-11

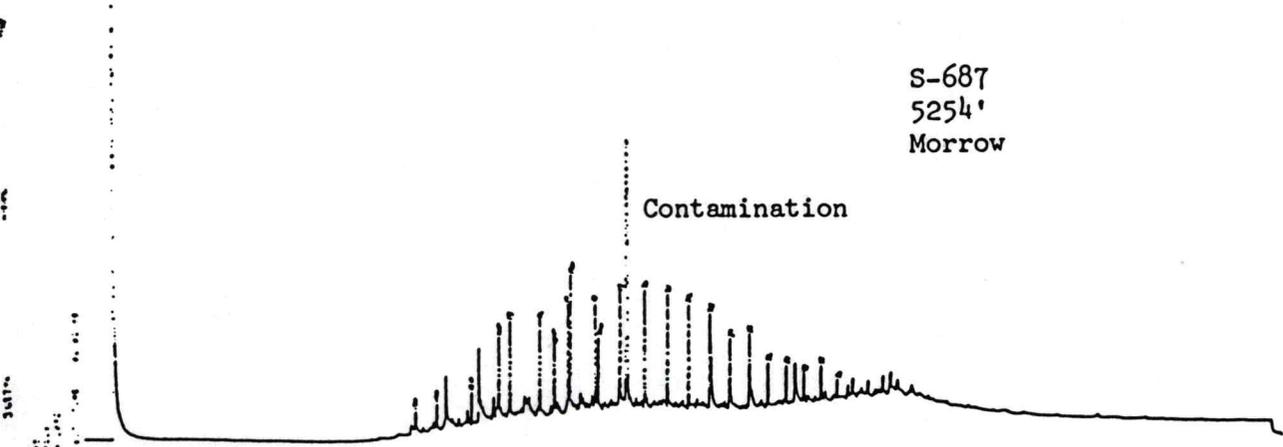
3340'
Morrow

Contamination



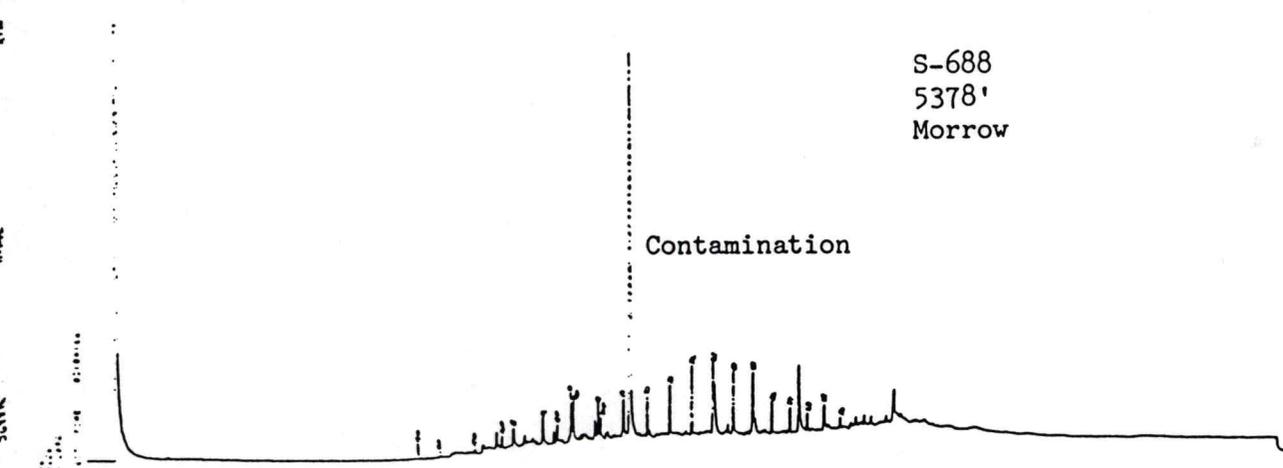
S-687
5254'
Morrow

Contamination



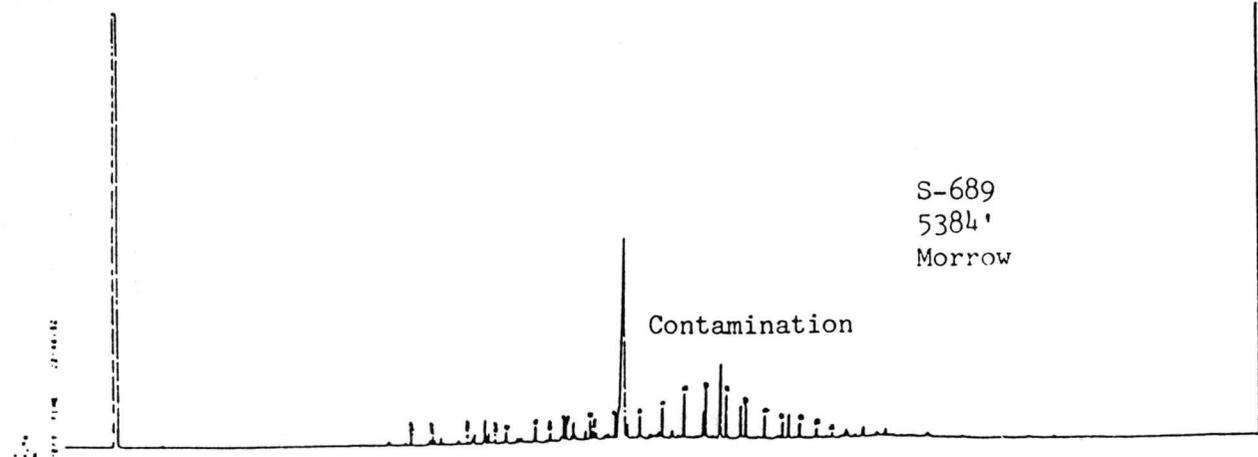
S-688
5378'
Morrow

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

Contamination

S-691
5397'
Morrow

Whole Extract Chromatograms

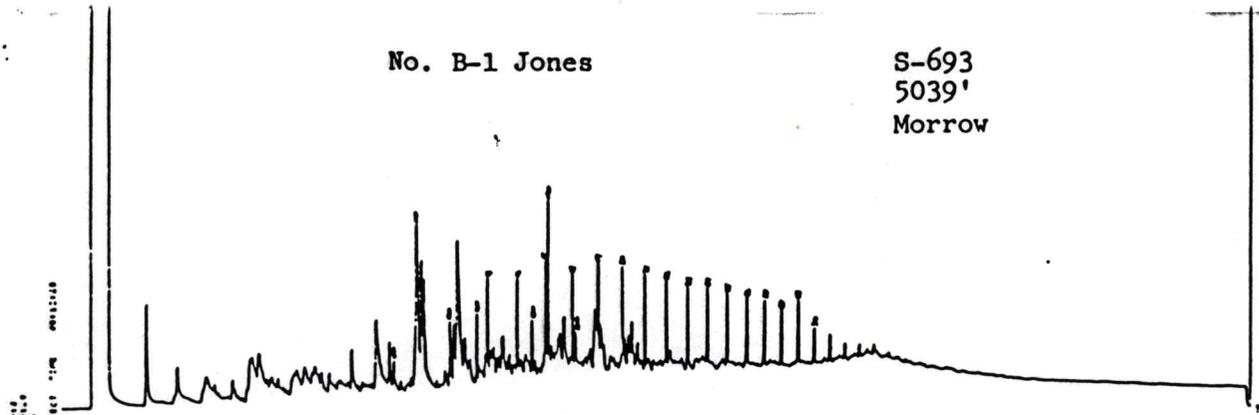
TS 825396CS
Figure 3d

Proprietary - To Be Maintained In Confidence
Amoco Production Company

No. B-1 Jones

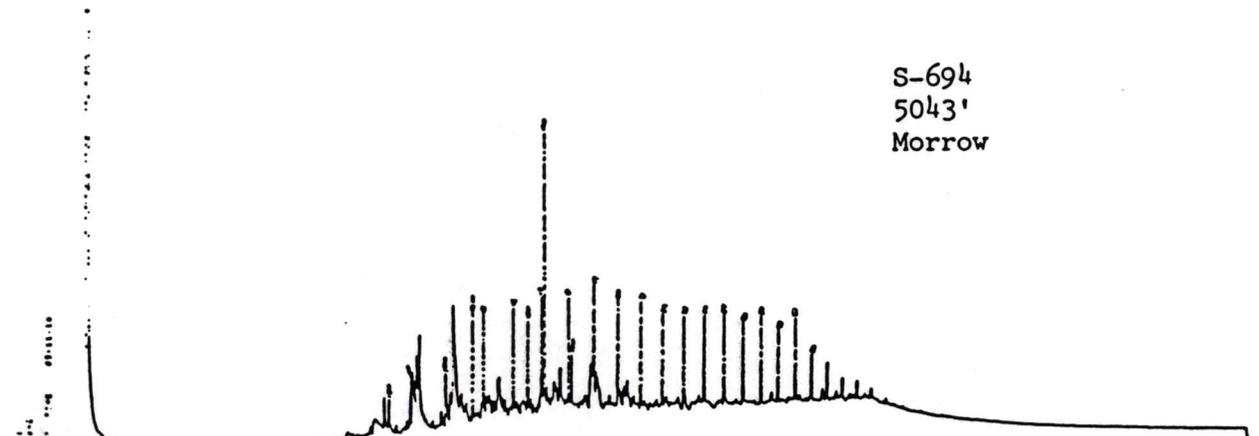
S-693
5039'
Morrow

30000
20000
10000
0
-10000
-20000
-30000



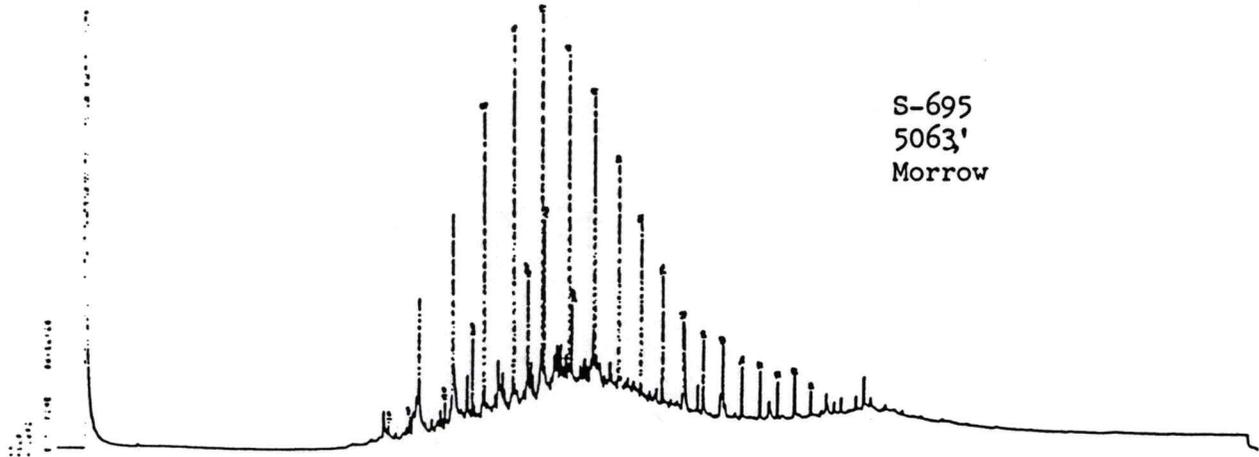
S-694
5043'
Morrow

30000
20000
10000
0
-10000
-20000
-30000



S-695
5063'
Morrow

30000
20000
10000
0
-10000
-20000
-30000



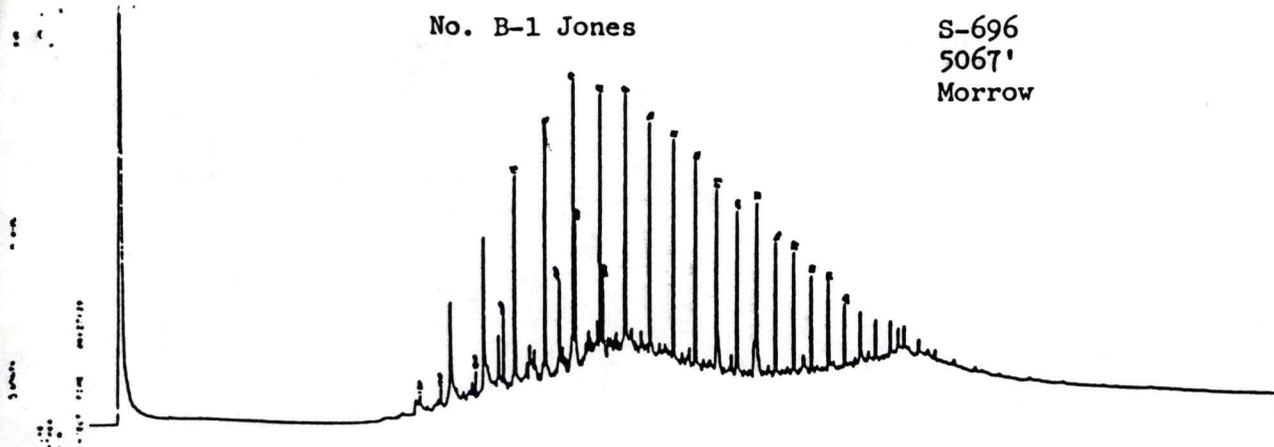
Whole Extract Chromatograms

TS 825396CS
Figure 3e

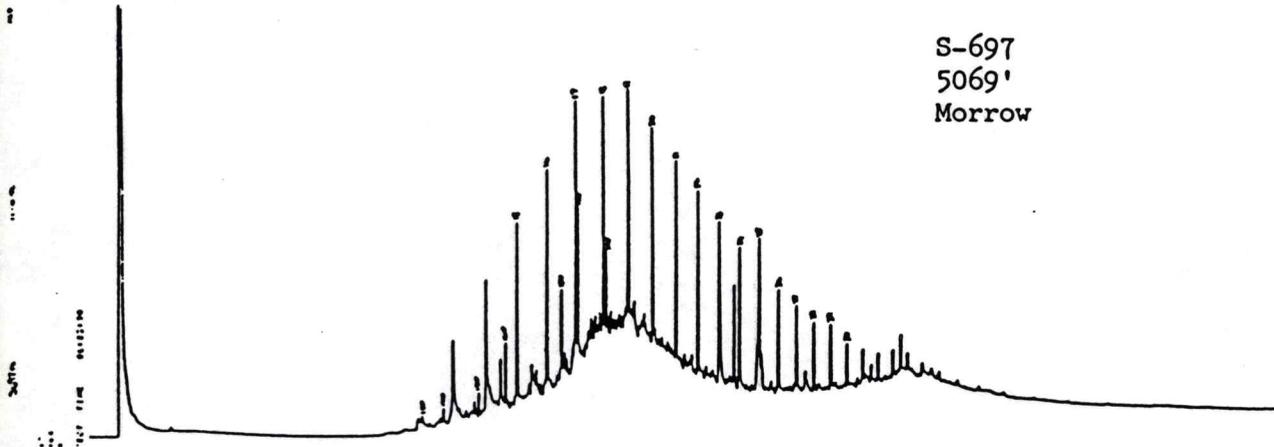
Proprietary - To Be Maintained In Confidence
Amoco Production Company

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