



Petrophysical Characterization of Mississippian Ooid-Shoal Reservoirs, Hugoton Embayment, Southwest Kansas

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MCBU - USOG**

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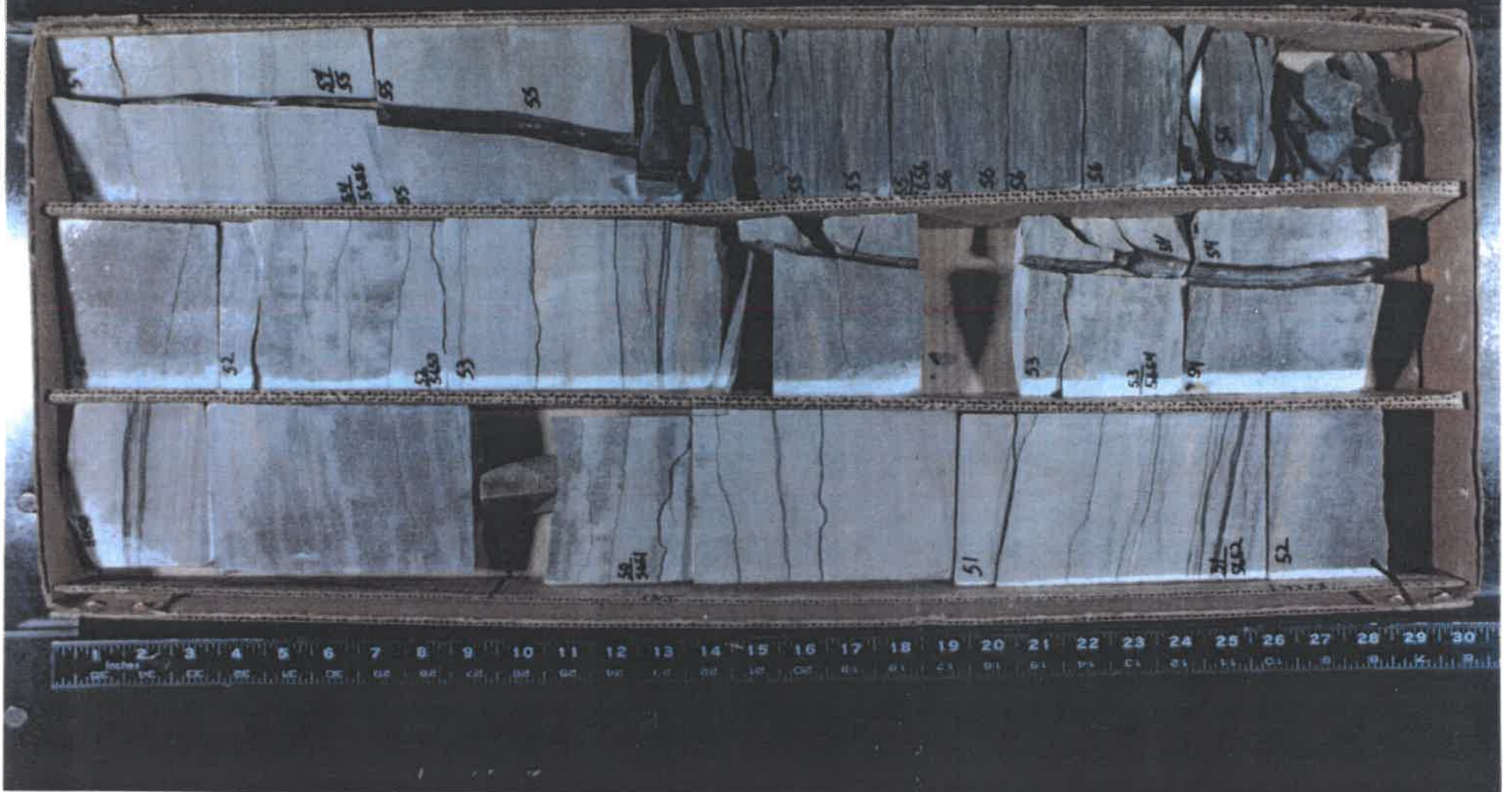
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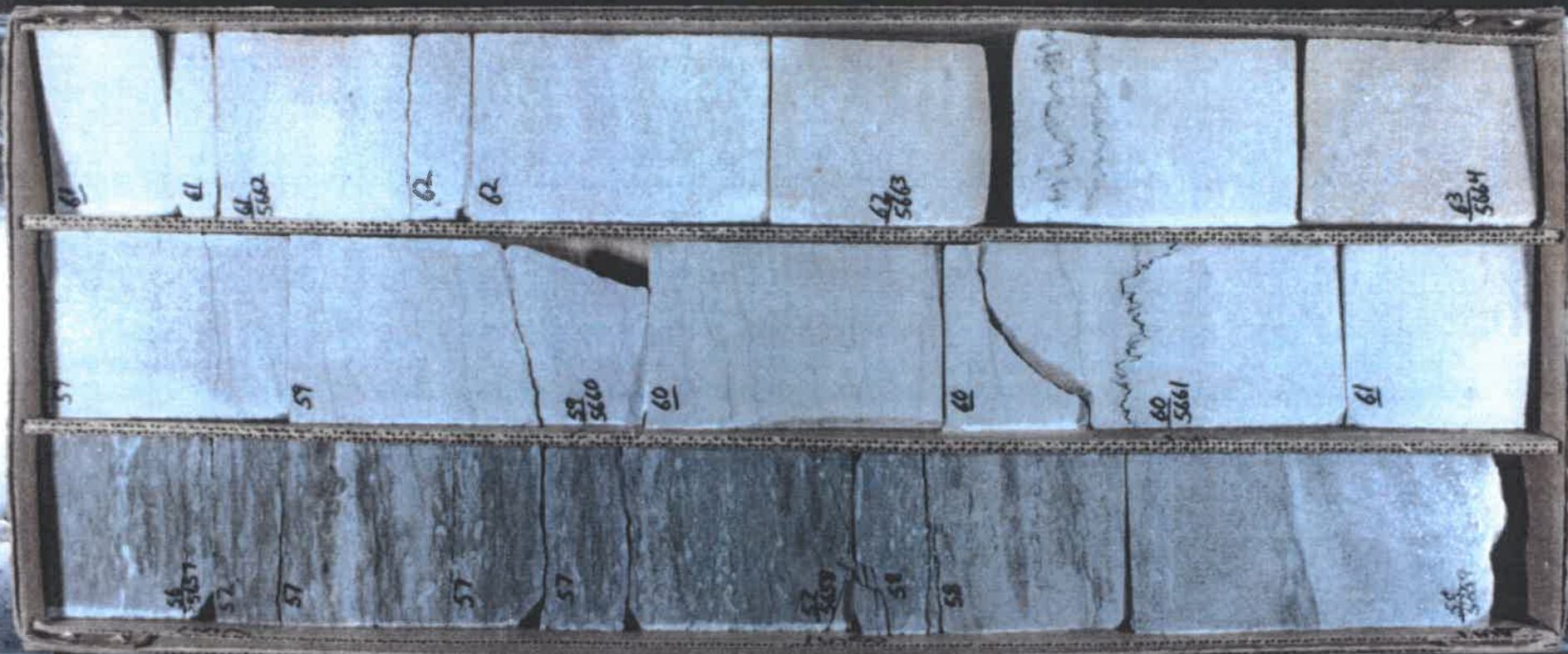
Amoco #1 Nardling
SEC. 30 T 29S R. 39W
Stanton CO. Kansas

5650 TO 5656
BOX 1 OF



Amoco #1 Nordling
SEC. 30 T. 29S R. 39W
Stanton CO., Kansas

5656 TO 5664
BOX 2 OF

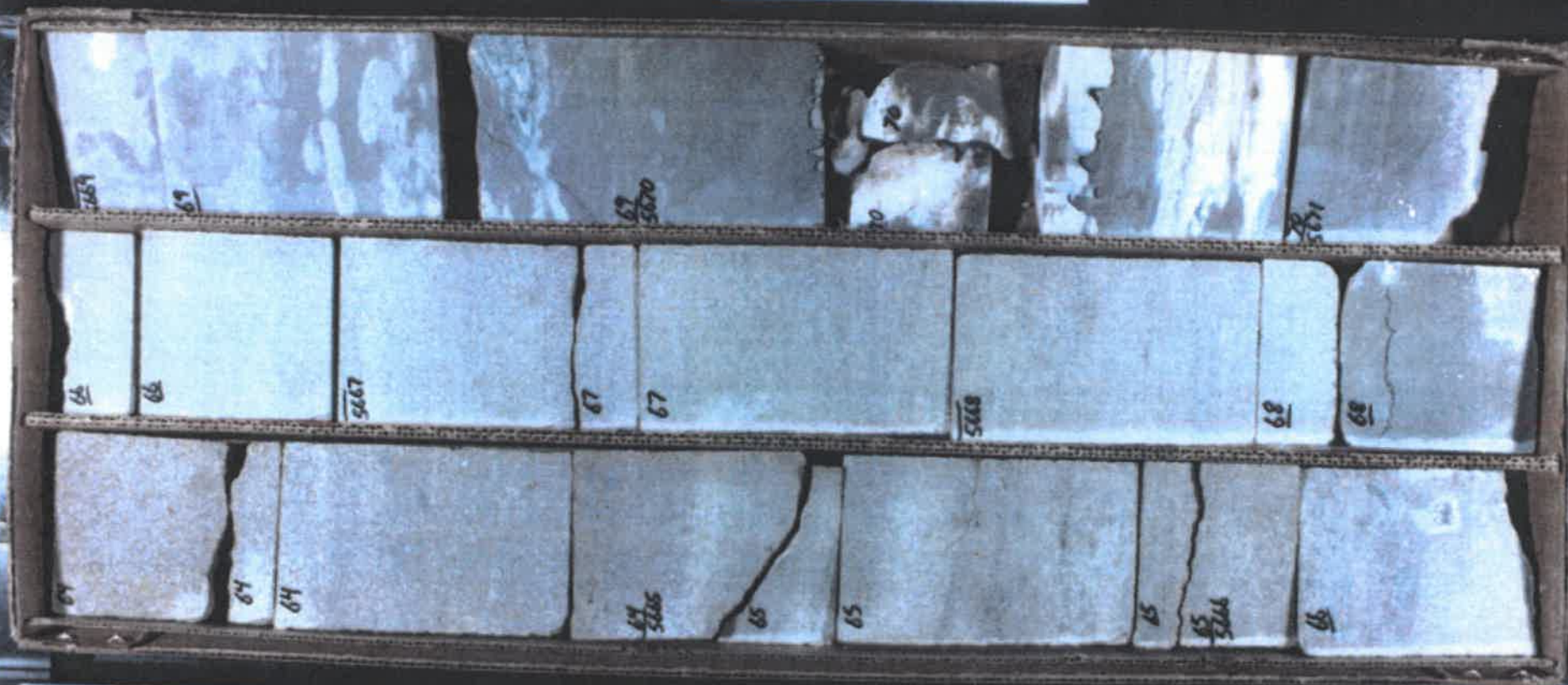


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Stanton CO., Kansas

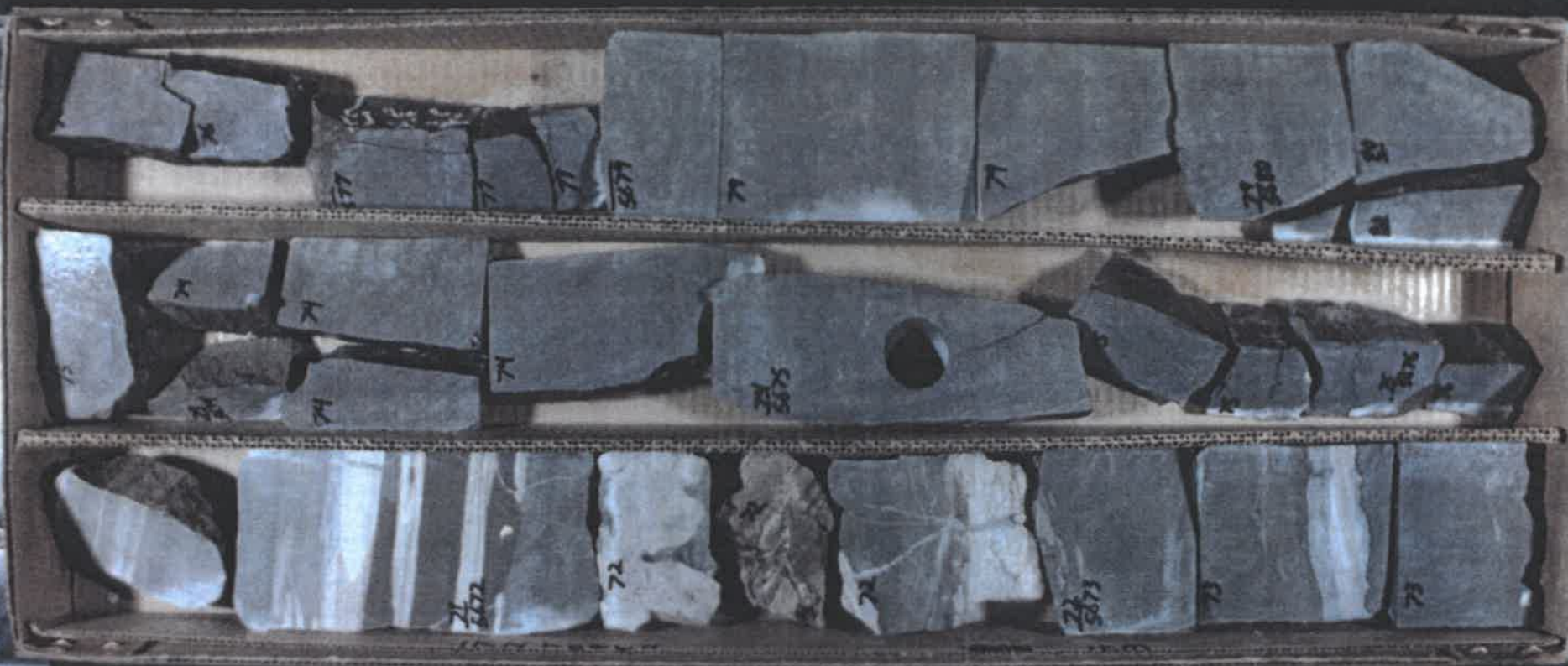
5664 TO 5671

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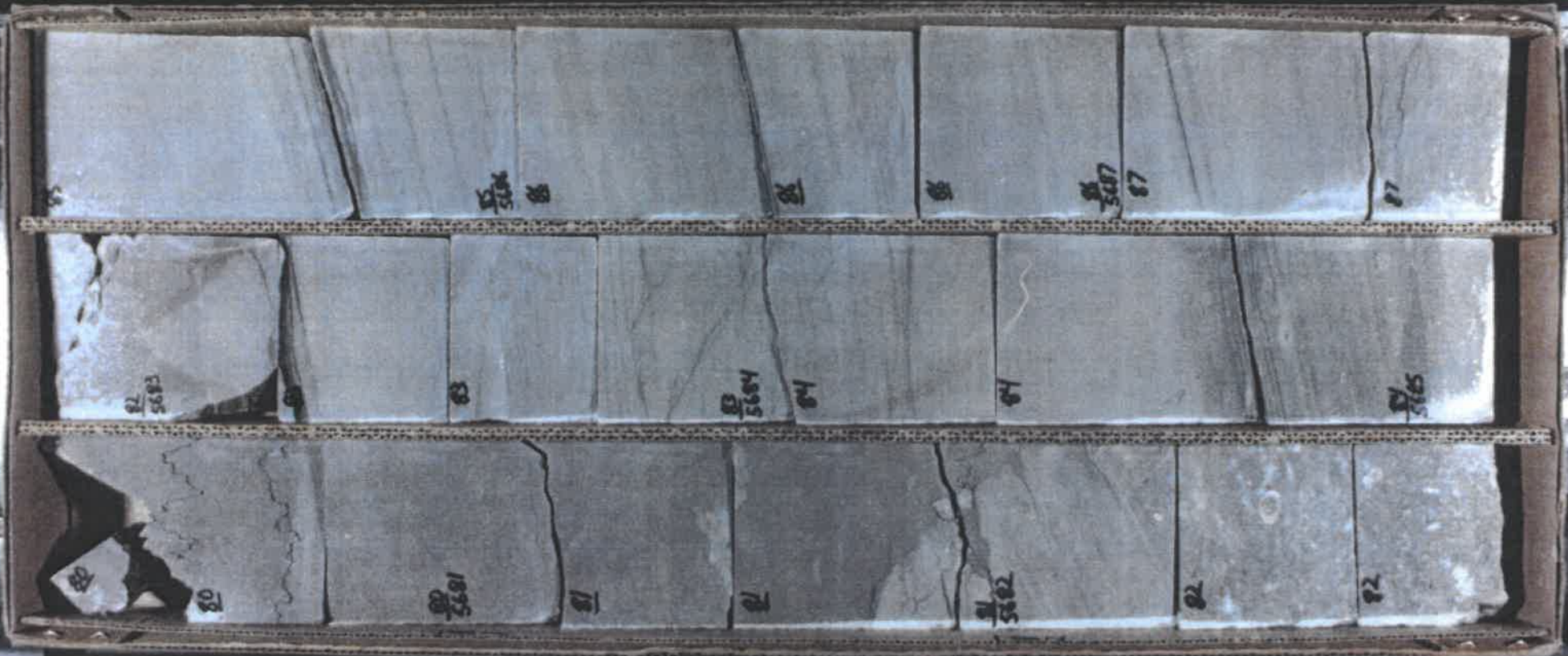
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5671 TO 5680
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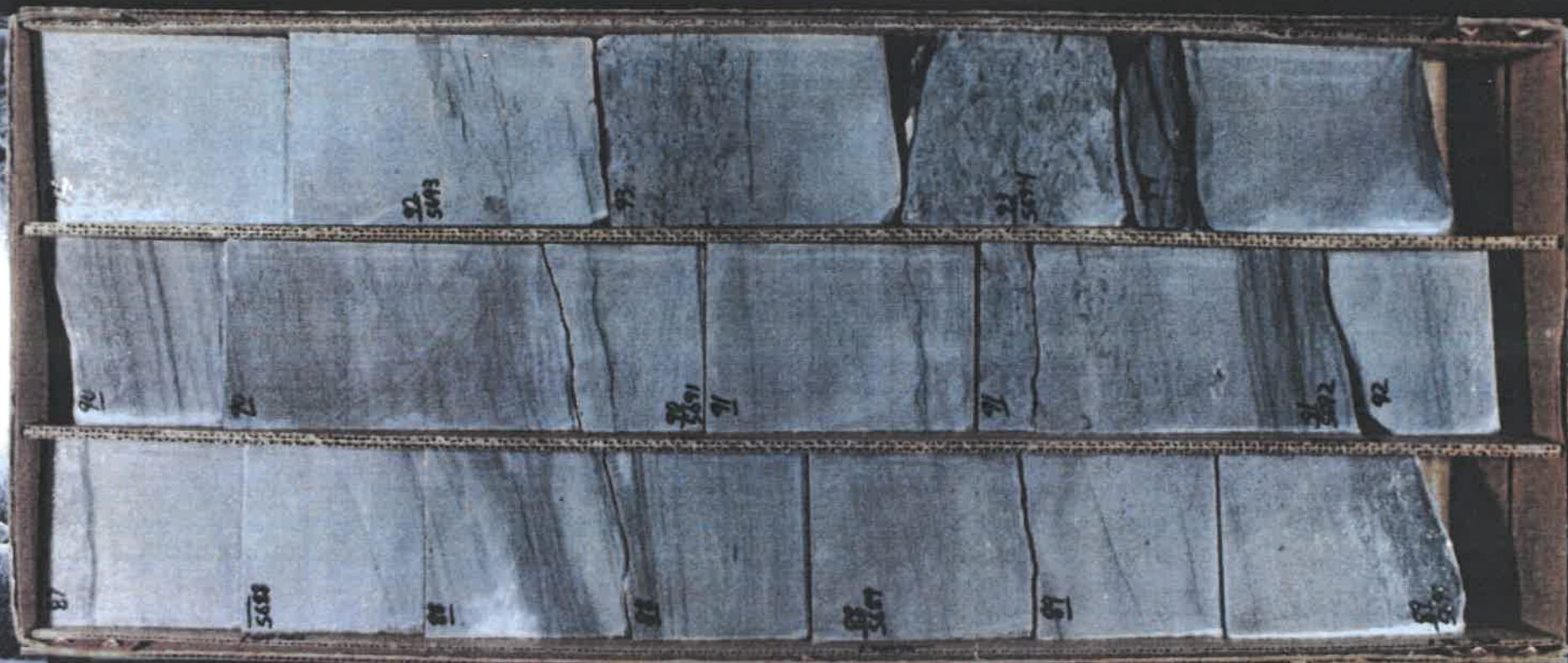
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5680 TO 5687
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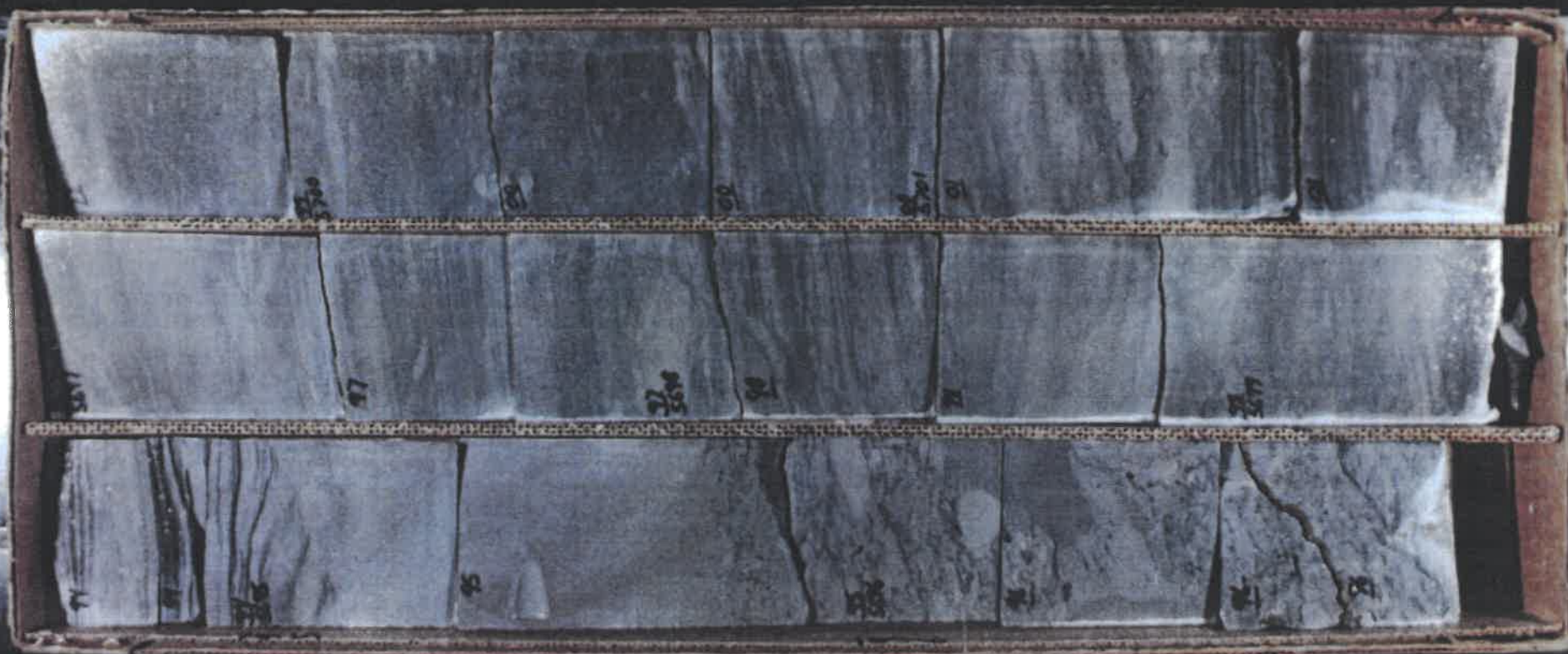
Amoco #1 Nardling
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Stanton CO. Kansas

5687 TO 5694
BOX 6 OF



Amoco #1 Nardling
SEC. 30 T. 29S R. 39W
Stanton CO. Kansas

5694 TO 5701
BOX 7 OF



Amoco #1 Nardling
SEC. 30 T29S R. 39W
Stanton CO. Kansas

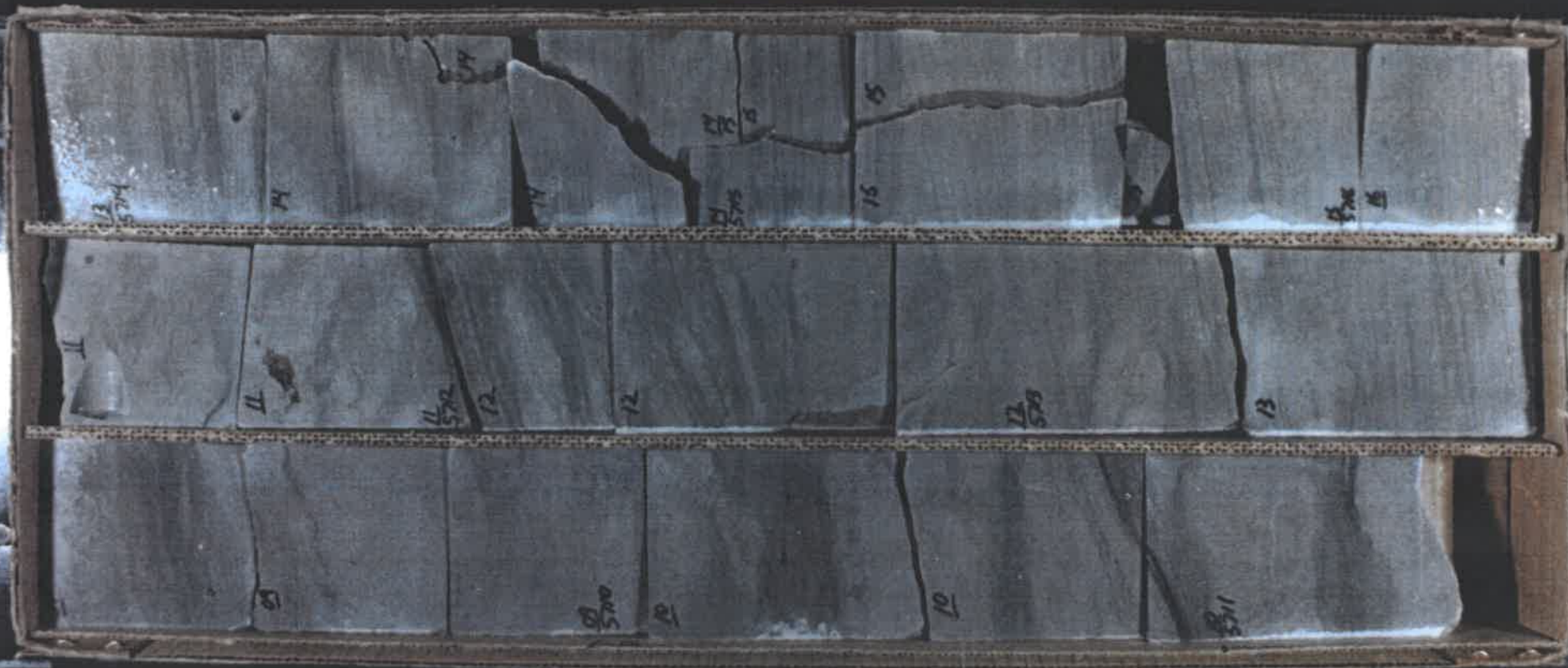
5701 to 5709

BOX 8 OF



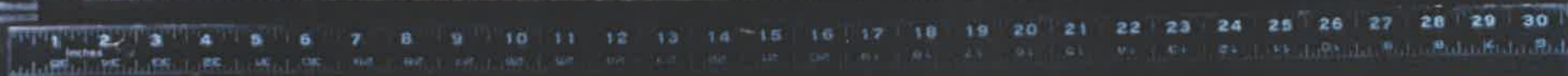
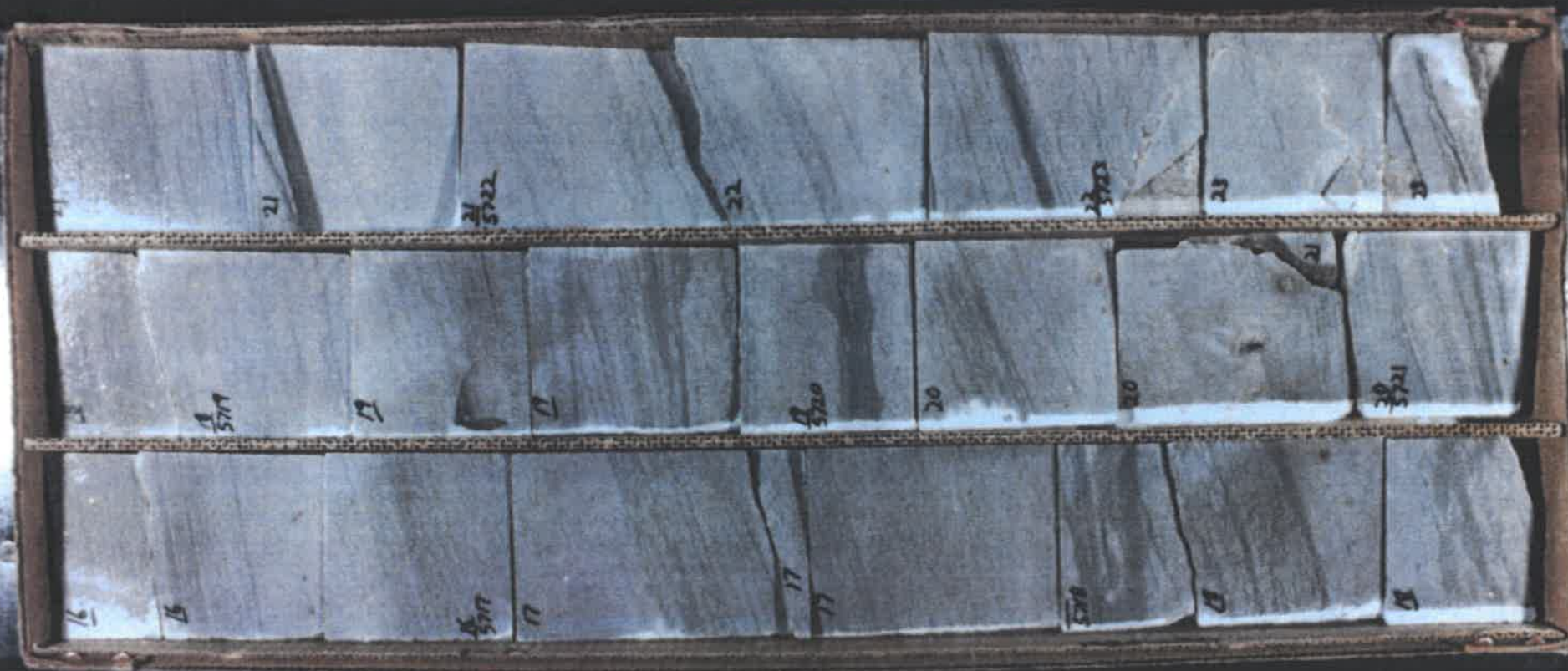
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5709 TO 5716
BOX 9 OF



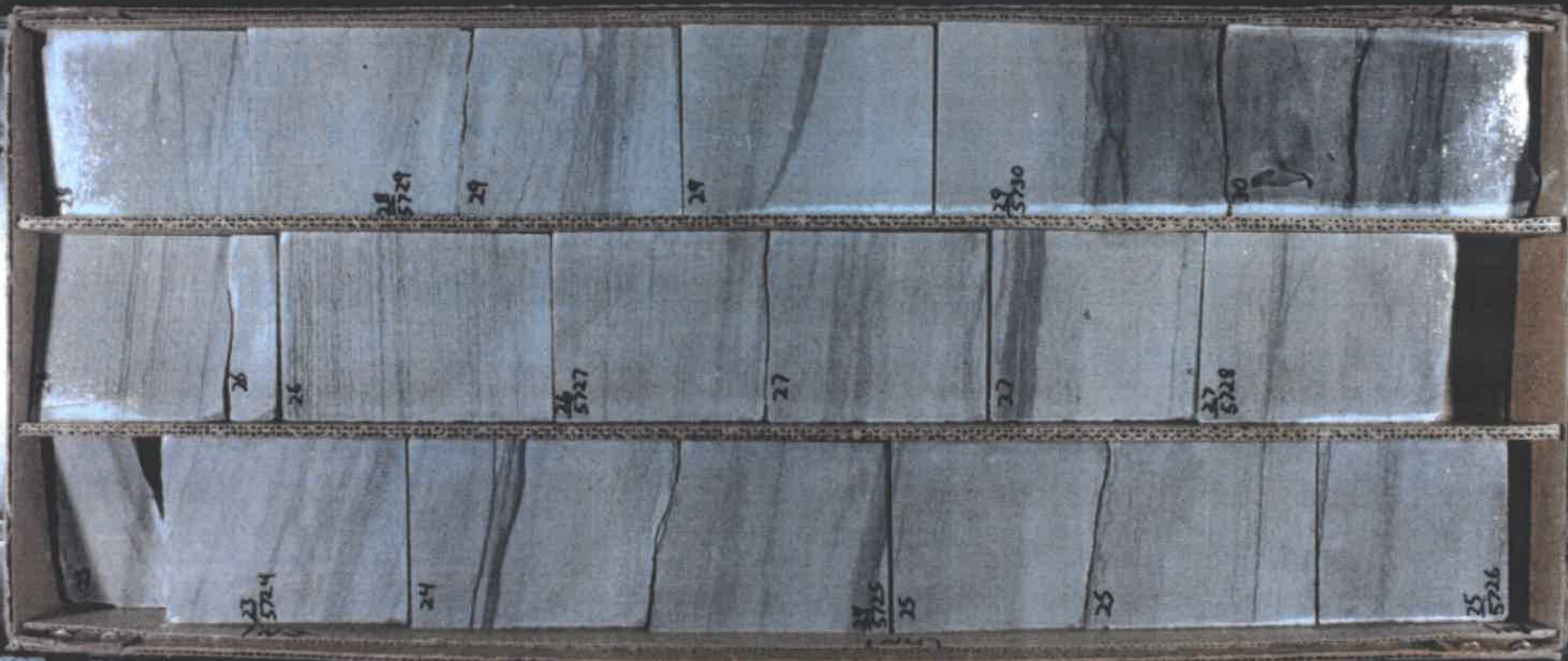
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5716 TO 5723
BOX 10 OF



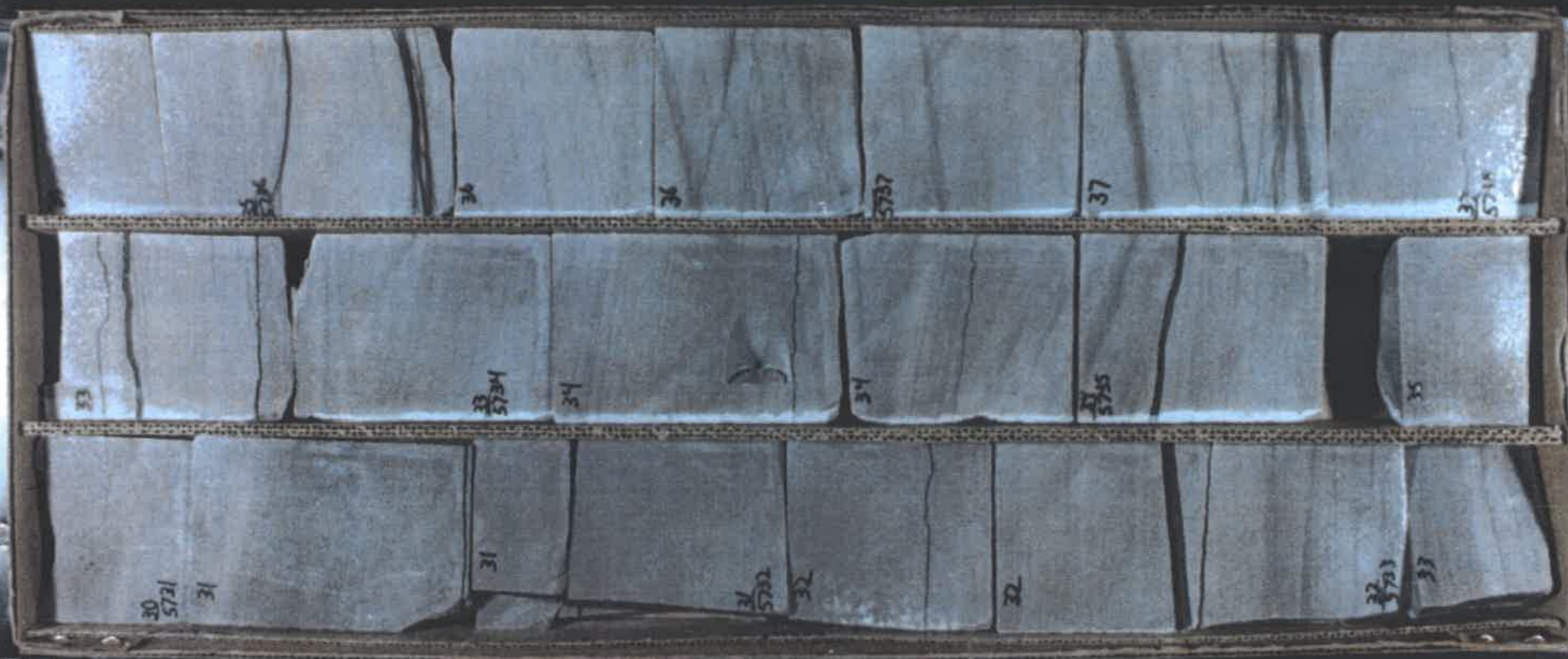
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5723 TO 5730
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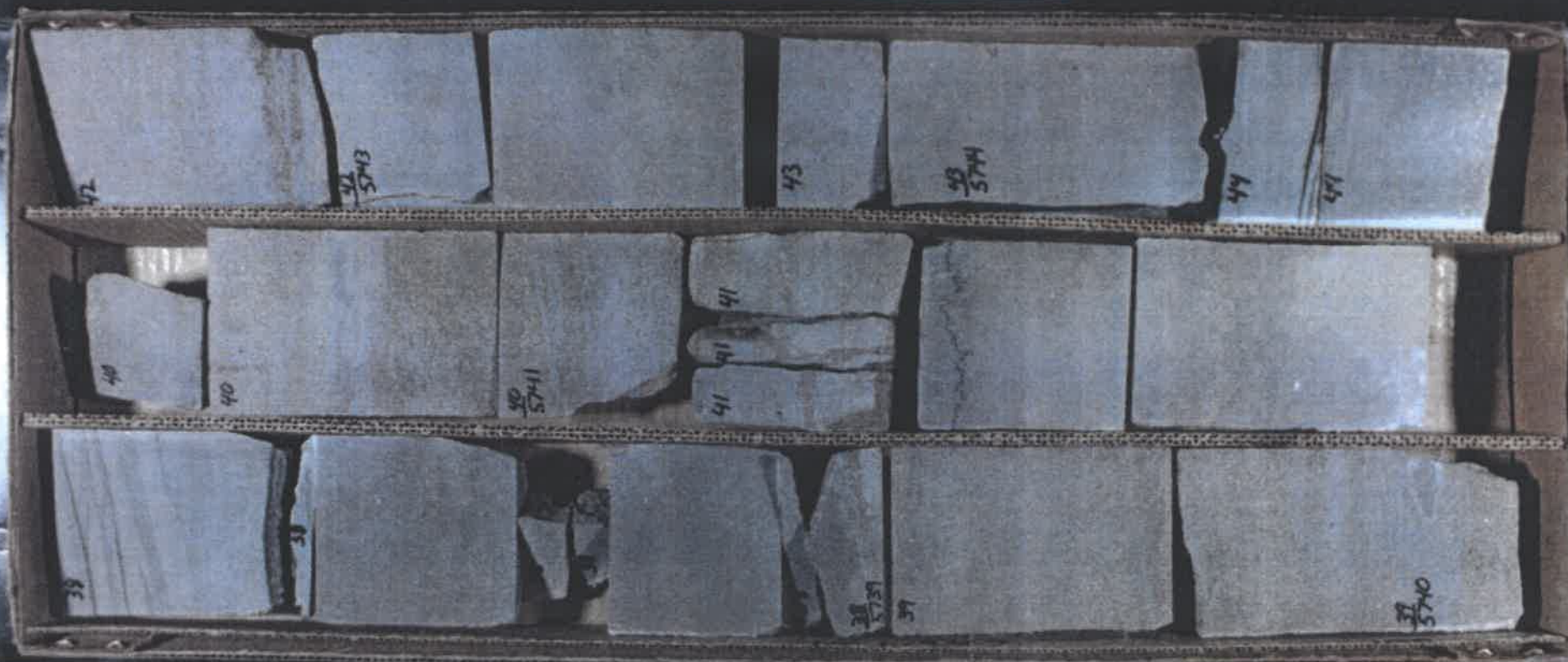
5730 TO 5738
BOX 12 OF



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Amoco #1 Nardling
SEC. 30 T. 29S R. 39W
Stanton CO. Kansas

5738 TO 5744
BOX 13 OF



Amoco #1 Nardling
SEC. 30 T. 29S R. 39W
Stanton CO. Kansas

5744 TO 5752
BOX 14 OF



Amoco #1 Nardling
SEC. 30 T. 29S R. 39W
Stanton CO. Kansas

5752 TO 5759
BOX 15 OF

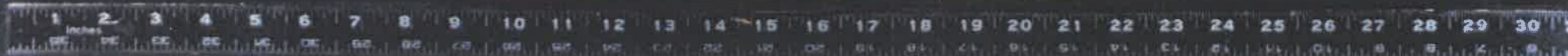
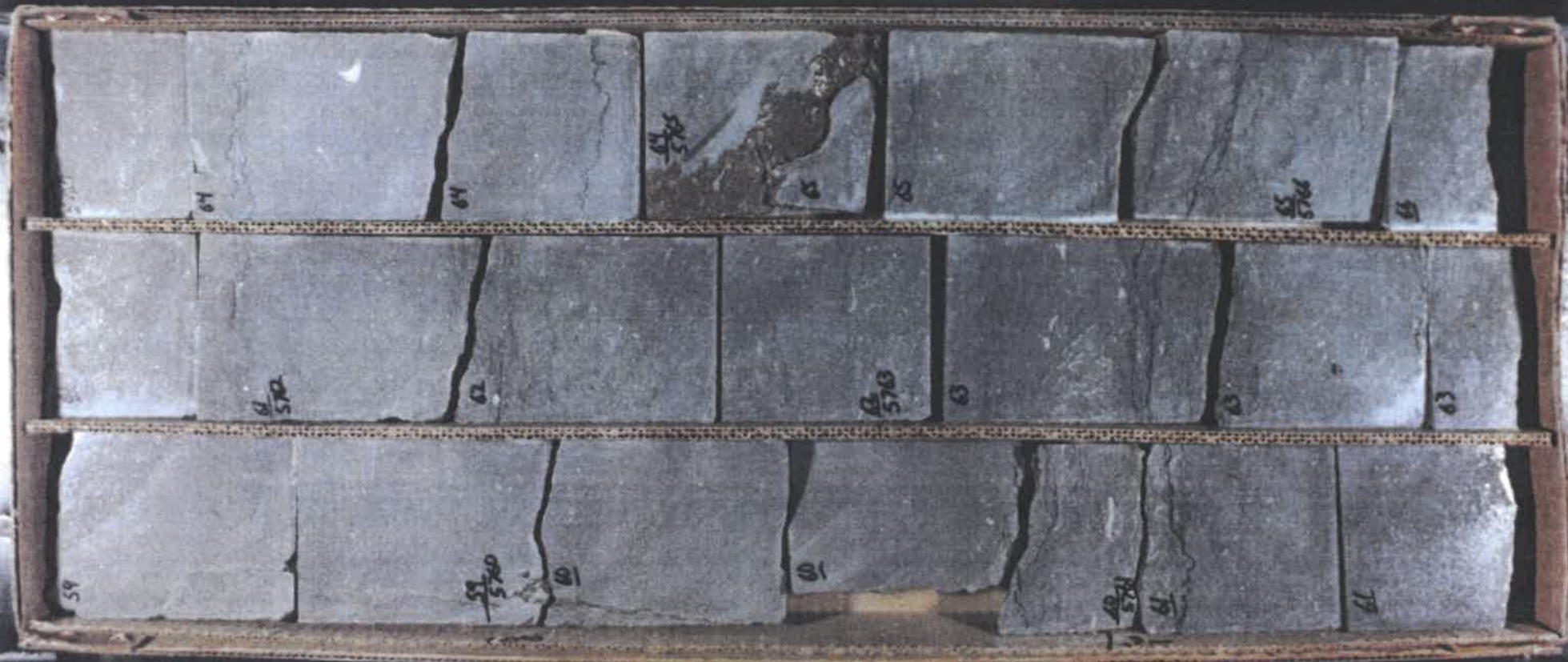


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SEC. 30 T. 29S R. 39W

Stanton CO. Kansas

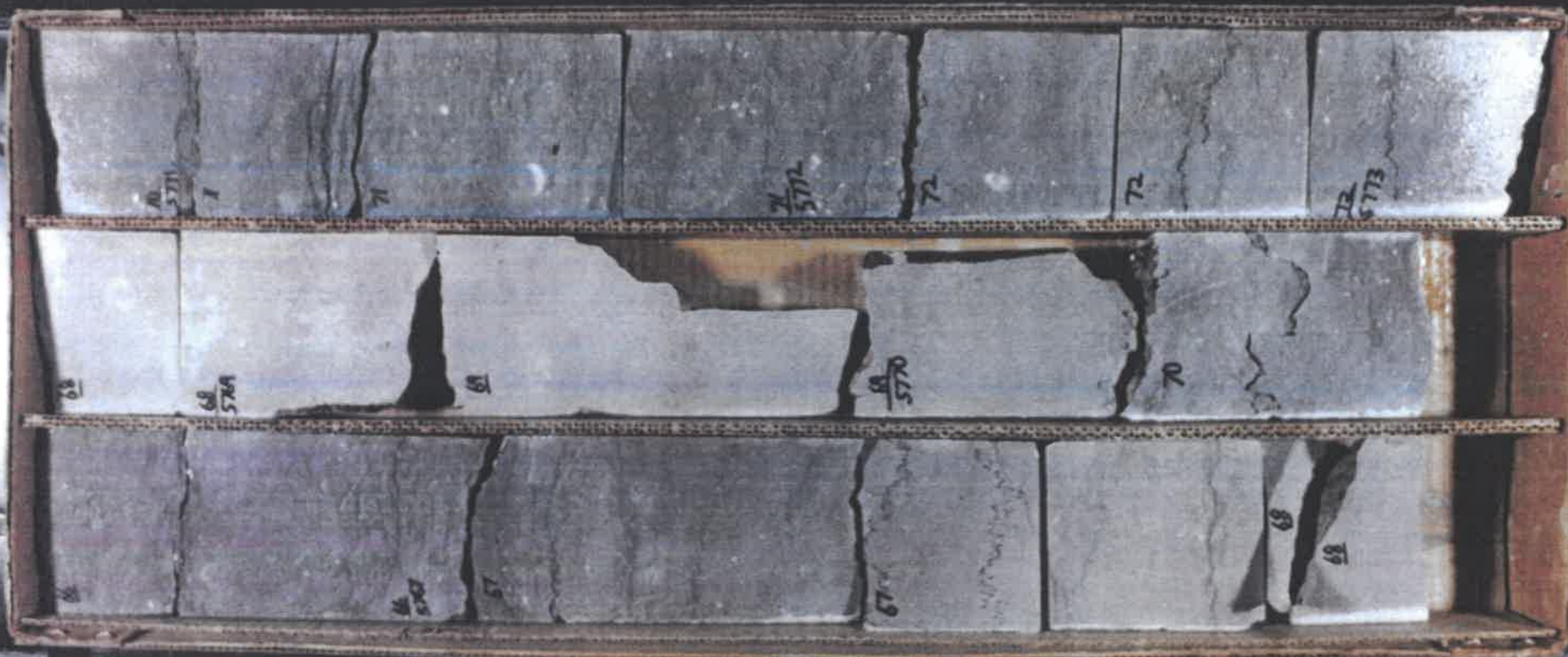
5759 TO 5766

BOX 16 OF



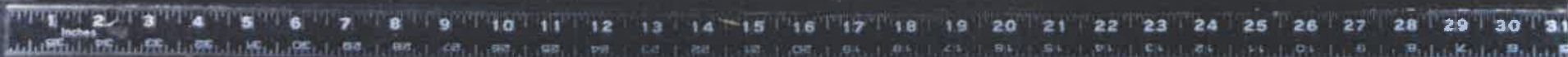
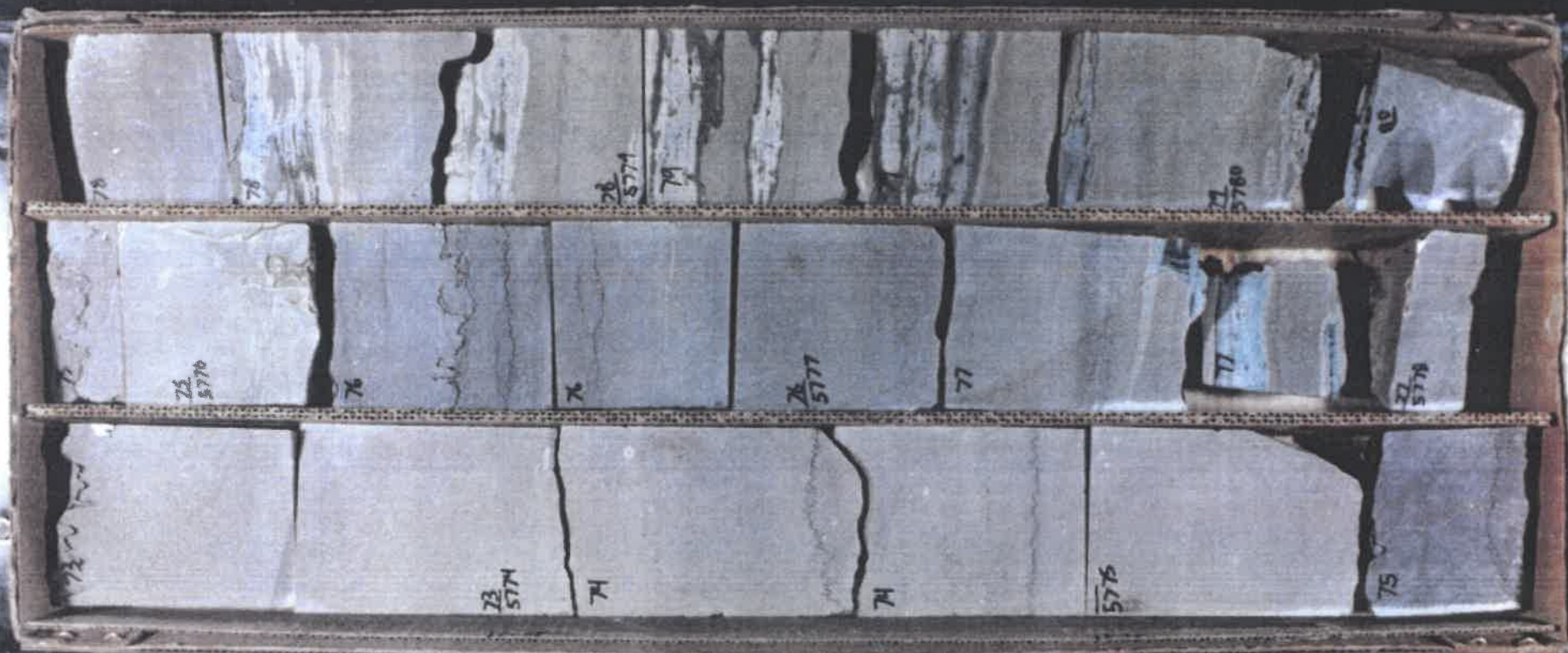
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5766 TO 5773
BOX 17 OF



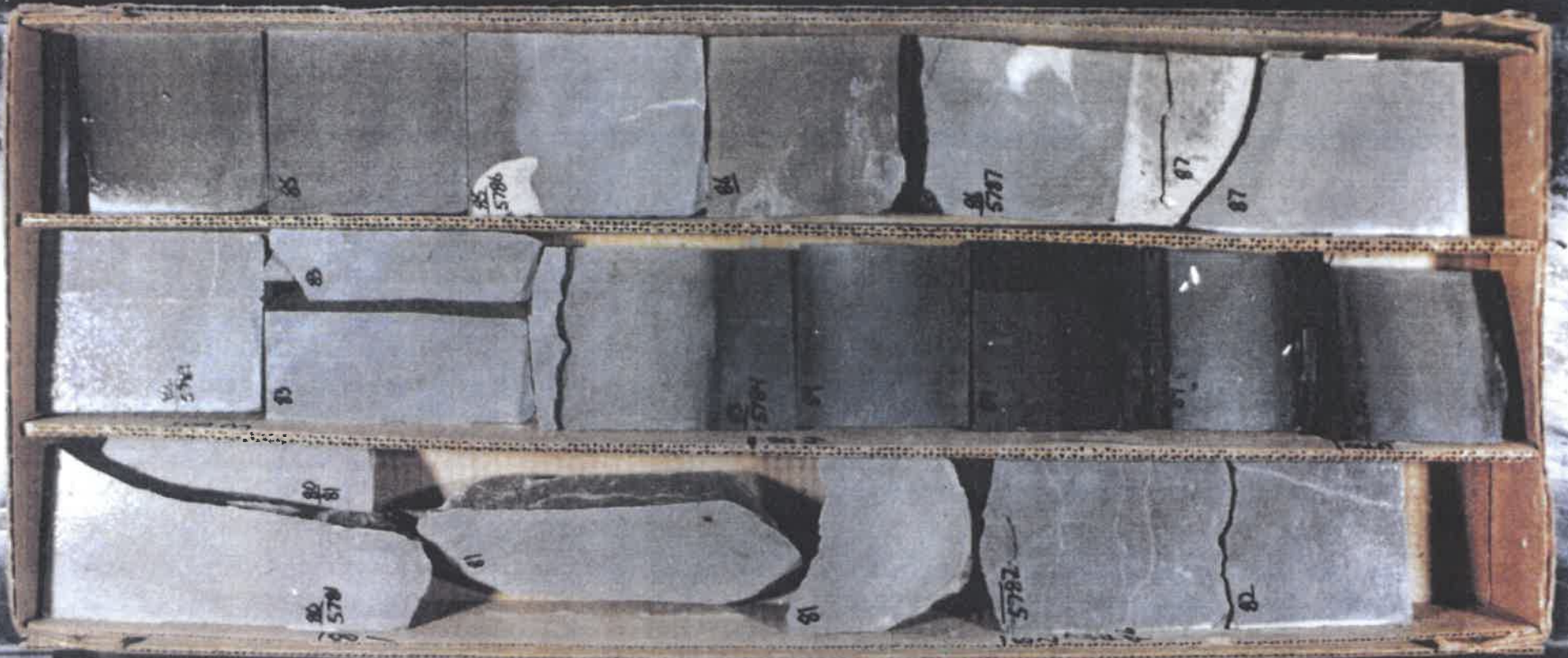
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Stanton CO. Kansas

5773 TO 5780
BOX 18 OF



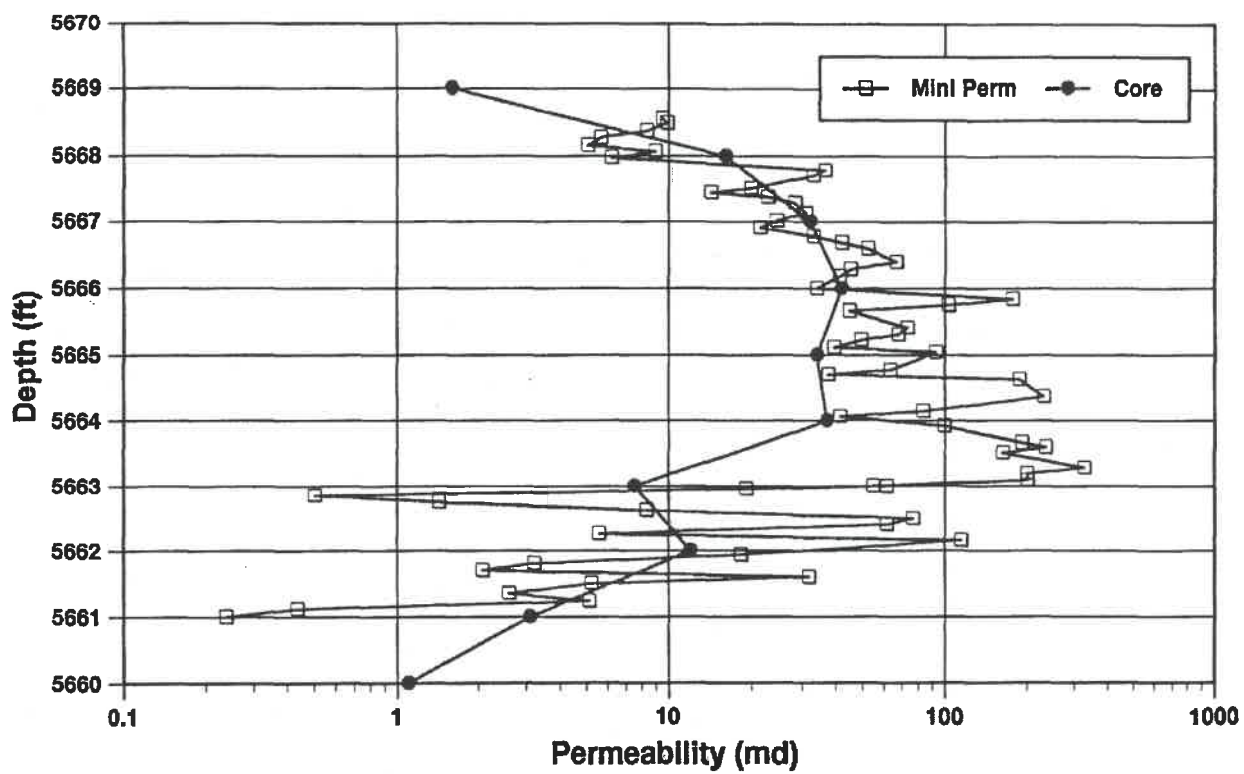
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SEC. 30 T. 29S R. 39W
Stanton CO. Kansas

5780 TO 5787
BOX 19 OF

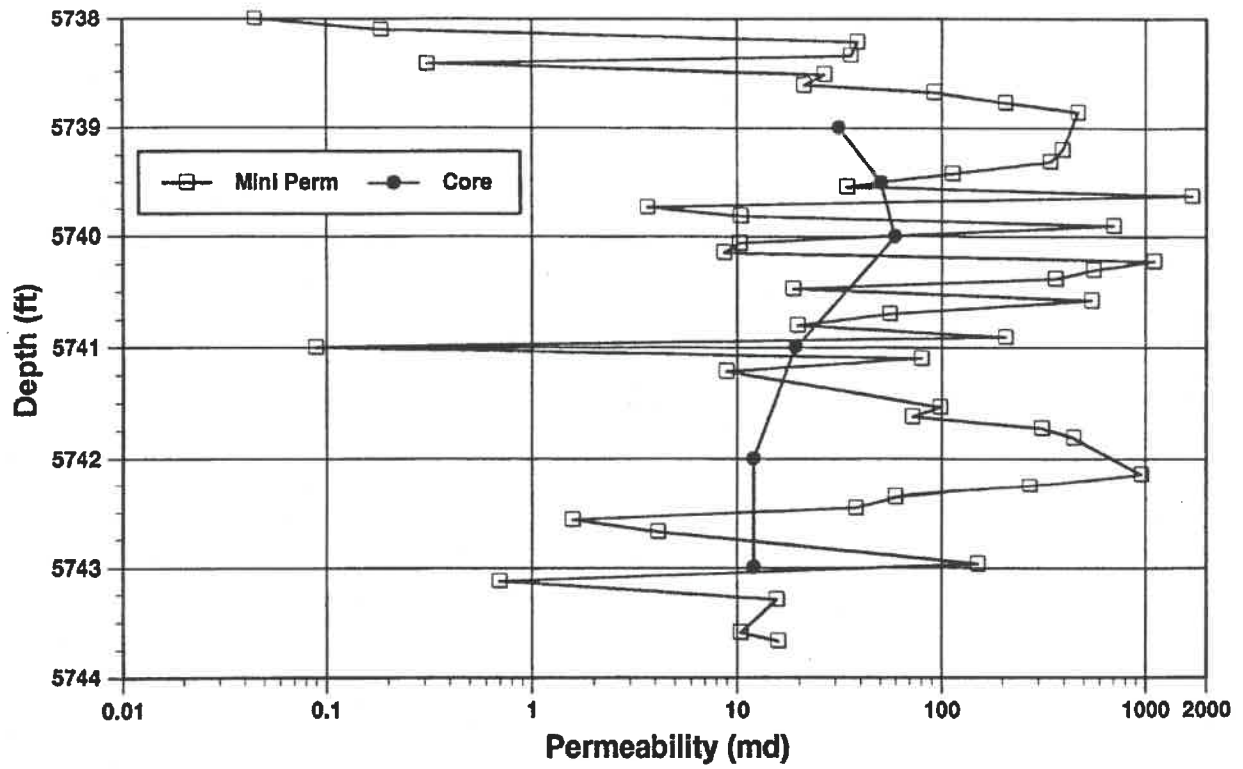


Basic PxP	
	Core
Depth	Data
Core	Perm
5661	3.1
5662	12
5663	7.5
5664	37
5665	34
5666	42
5667	32
5668	16
5739	31
5739.5	50
5740	59
5741	19
5742	12
5743	12

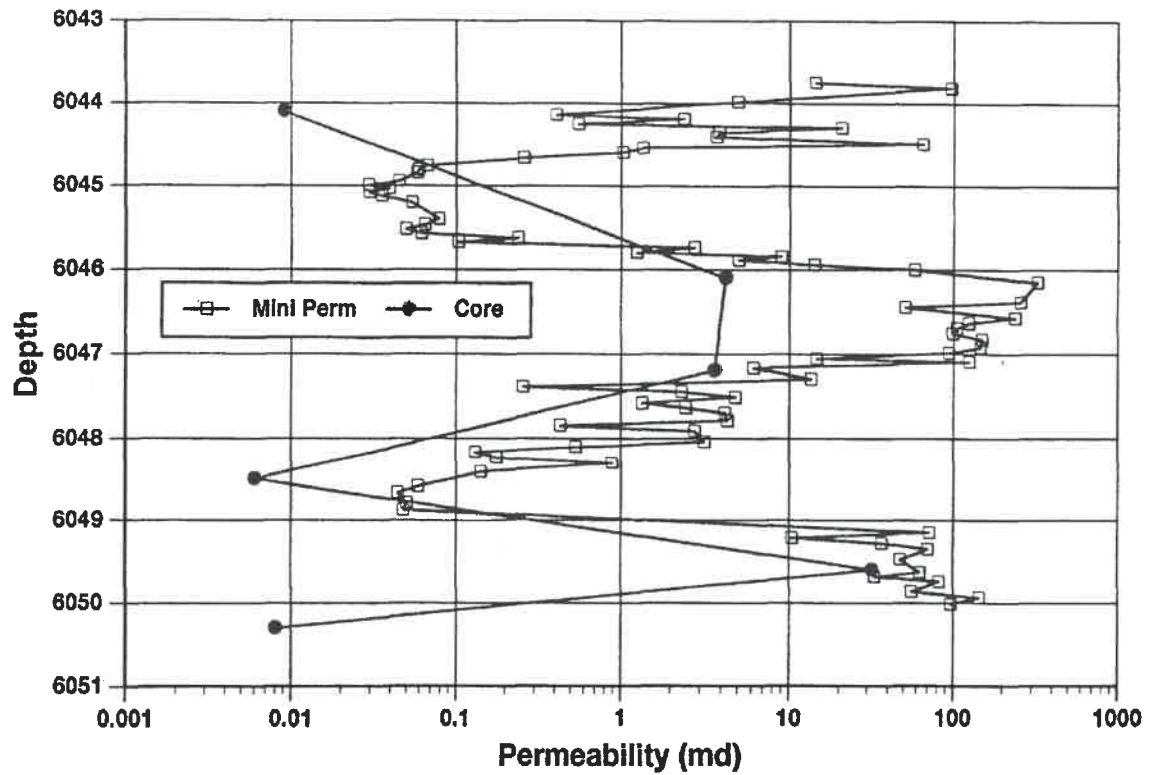
Minipermeameter vs Basic Core Permeability Nordling "B Zone"



Minipermeameter vs Basic Core Permeability Nordling "C Zone"



Minipermeameter vs Basic Core Permeability Loren Sullivan No.3 - "B Zone"



Net Confining Pressure Effects on Porosity and Permeability (800 psi, 2100 psi & 2600 psi)																			
Well	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent	Well	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent
L. E. Nordling No.1	1	5662.6	800	7.9	0.00	100.00	5.52	0.00	100.00	L. E. Nordling No.1	1	4989.6	800	8.7	0.00	100.00	2.28	0.00	100.00
	1	5662.6	2100	7.8	0.10	89.79	5.32	0.20	96.38		1	4989.6	2100	8.5	0.20	97.70	2.7	0.08	97.12
	1	5662.6	2600	7.8	0.10	89.79	5.27	0.25	95.47		1	4989.6	2600	8.4	0.30	96.55	2.7	0.10	96.40
	2	5666.2	800	15.7	0.00	100.00	252.00	0.00	100.00		2	4973	800	11.2	0.00	100.00	11.8	0.00	100.00
	2	5666.2	2100	15.5	0.20	98.39	254.00	0.20	100.79		2	4973	2100	11	0.20	98.21	11.6	2.00	98.31
	2	5666.2	2600	15.4	0.30	98.00	253.00	0.30	100.40		2	4973	2600	11.0	0.20	98.21	11.6	2.00	98.31
	3	5739.3	800	12.8	0.00	100.00	548.00	0.00	100.00										
	3	5739.3	2100	12.7	0.10	98.39	540.00	0.10	99.54										
	3	5739.3	2600	12.7	0.10	98.39	538.00	0.10	98.18										
	4	5740.8	800	13.8	0.00	100.00	999.00	0.00	100.00										
4	5740.8	2100	13.5	0.10	99.54	931.00	38.00	96.08											
4	5740.8	2600	13.4	0.20	99.54	931.00	38.00	96.08											
Well Loren Sullivan No.3	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent	Well Loren Sullivan No.3	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent
	1	8046.1	800	10.6	0.00	100.00	31.30	0.00	100.00		1	4982.5	800	14.6	0.00	100.00	570	0.00	100.00
	1	8046.1	2100	10.6	0.10	99.09	29.90	1.40	95.53		1	4982.5	2100	14.4	0.20	98.63	558	12.00	97.89
	1	8046.1	2600	10.4	0.20	98.11	29.70	1.60	94.89		1	4982.5	2600	14.4	0.20	98.63	558.0	12.00	97.89
	2	8047.7	800	8.4	0.00	100.00	4.81	0.00	100.00		2	4985.6	800	11.2	0.00	100.00	81.4	0.00	100.00
	2	8047.7	2100	8.2	0.20	97.69	4.62	0.19	96.05		2	4985.6	2100	11.0	0.20	98.21	80.3	1.10	98.21
	2	8047.7	2600	8.2	0.20	97.69	4.59	0.22	95.43		3	4988.8	800	10	0.00	100.00	80.1	1.30	97.88
	3	8049.6	800	10.1	0.00	100.00	29.00	0.00	100.00		3	4988.8	2100	9.8	0.20	98.00	15.3	0.00	100.00
	3	8049.6	2100	9.8	0.20	98.02	28.50	0.50	98.28		3	4988.8	2600	9.8	0.20	98.00	15.0	0.30	98.04
	3	8049.6	2600	9.8	0.20	98.02	28.60	0.40	98.82										
Well Crist No.6	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent	Well Crist No.6	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent
	1	4702	800	8.3	0.00	100.00	19.96	0.00	100.00		1	5680	800	17.6	0.00	100.00	1770	0.00	100.00
	1	4702	2100	8.1	0.20	97.86	17.86	0.10	97.81		1	5680	2100	17.3	0.30	98.30	1710	60.00	96.61
	1	4702	2600	8.1	0.20	97.85	17.80	0.10	97.27		1	5680	2600	17.2	0.40	97.73	1700.0	70.00	96.05
Well A. Mauna No.8	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent	Well A. Mauna No.8	Sample	Depth	Confining Pressure	Porosity	Porosity Reduction	Net Porosity Percent	Permeability	Permeability Reduction	Net Perm Percent
	1	4725.7	800	11.4	0.00	100.00	0.00	0.00	100.00		1	5311.4	800	10.1	0.00	100.00	2.23	0.00	100.00
	1	4725.7	2100	11.2	0.20	98.25	0.00	0.00	98.37		1	5311.4	2100	9.9	0.20	98.02	2.19	4.00	99.84
	1	4725.7	2600	11.1	0.30	97.97	0.00	0.00	97.68		1	5311.4	2600	9.9	0.20	98.02	2.18	5.00	97.76

Net Overburden		Calculations		Your Project	
		INPUT DATA		INPUT DATA	
Depth	5500	Feet			0
Lithostatic Pressure:		PSI			
Formation Pressure:	5500	PSI Initial			
Abandonment Press:	5500	PSI Final			
Lithostatic Gradient:	1	PSI/Ft			
Poissons (UNCONSOLIDATED)	0.2	Unconsolidated Sands			
Poissons (CONSOLIDATED):	0.3				
		Calculated Data			
Vertical Net Stress:	$S_v = \text{lithostatic} - \text{formation}$			INITIAL S_v	
Final S_v	$S_v = \text{Litho} - \text{abandonment}$			ABANDONMENT S_v	
Horizontal Net Stress	$S_h = (\text{Pois} / (1 - \text{Pois})) * S_v$			INITIAL S_v	
Horizontal Net Stress	$S_h = (\text{Pois} / (1 - \text{Pois})) * S_v$			ABANDONMENT S_v	
Mean Net Stress Ini	$S_m = (S_v + 2 * S_h) / 3$			Initial S_m	
Mean Net Stress Fin	$S_m = (S_v + 2 * S_h) / 3$			Final S_m	
				Initial Mean Stress	
				Aband. Mean Stress	

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DALLAS, TEXAS

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Company Anadarko Production Company Formation St. Louis
Well Low "C" No. 2 County Morton
Field Cimarron Valley Keyes State Kansas

Identification and Description of Samples

<u>Sample Number</u>	<u>Depth, Feet</u>	<u>Lithological Description</u>
1A	5687-88	Ls, gry, granular, pp to 2mm vugs, oolitic, foss
2A	5688-89	Ls, gry, granular, pp to 2mm vugs, oolitic, foss
3A	5691-92	Ls, gry, granular, pp to 1mm vugs, oolitic, foss
4A	5697-98	Ls, gry, granular, pp to 2mm vugs, oolitic, foss
5A	5725-26.5	Ls, gry, granular, pp to 2mm vugs, oolitic, foss
6A	5728-29	Ls, gry, granular, pp to 2mm vugs, oolitic, sl/ foss
7A	5731-33	Ls, gry, granular, pp to 1mm vugs, oolitic, sl/ foss

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Formation Factor and Resistivity Index Data

Resistivity of Saturating Brine, Ohm-Meters: 0.134 @ 77°F.

<u>Sample Number</u>	<u>Air Permeability, Millidarcys</u>	<u>Porosity, Per Cent</u>	<u>Formation Factor</u>	<u>Brine Saturation Per Cent Pore Space</u>	<u>Resistivity Index</u>
Z 1A	2.8	5.9	179	100.0	1.00
				67.1	1.83
				39.3	2.93
				33.6	3.34
Z 2A	164	11.3	70.4	100.0	1.00
				31.5	5.33
				23.6	7.66
				22.0	7.74
Z 3A	1560	16.6	32.3	100.0	1.00
				24.3	8.75
				21.2	11.2
				20.1	11.9
Z 4A	1040	13.9	45.0	100.0	1.00
				23.6	9.76
				18.8	14.2
				17.6	15.0
5A	194	12.9	50.4	100.0	1.00
				28.6	5.13
				21.3	9.74
				18.9	12.0

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Formation Factor and Resistivity Index Data

Resistivity of Saturating Brine, Ohm-Meters: 0.134 @ 77°F.

Sample Number	Air Permeability, Millidarcys	Porosity, Per Cent	Formation Factor	Brine Saturation		Resistivity Index
				Per Cent Pore Space		
6A	96	13.6	45.1	100.0	1.00	
				48.4	3.14	
				37.5	5.52	
				33.6	5.62	
7A	88	17.1	28.4	100.0	1.00	
				57.6	2.23	
				49.9	3.57	
				47.2	3.75	

DEAN-STARK STANDARD CORE ANALYSIS SUMMARY

AMOCO PRODUCTION COMPANY
WELL LOREN SULLIVAN NO. 3
LOST SPRING FIELD
MORTON COUNTY, KANSAS

Sample Number	Depth, feet	Air Permeability, md	Porosity, percent	Saturation,		Grain Density, gm/cc	Lithological Descriptions
				Oil	Pore Volume Water		
1	6,044.1	0.0093	5.4	24.7	31.5	2.70	ls, gnst, ool, well srt, calc cmt, intrgran pore.
2	6,045.4	0.0143	4.9	23.1	35.1	2.70	Same as Sample No. 1.
3	6,046.1	4.22	10.9	11.4	50.4	2.70	ls, gnst, ool, skel, bdg, calc cmt, intrgran pores.
4	6,047.2	3.63	8.7	10.8	45.1	2.70	ls, gnst, ool, skel, bdg, calc cmt, intrgran + mold pores.
5	6,048.5	0.00597	4.7	33.0	27.2	2.70	ls, gnst, ool, fnt bdg, calc cmt, intrgran pores.
6	6,049.6	31.8	10.6	17.7	43.8	2.70	ls, gnst, ool, skel, fnt bdg, calc cmt, intrgran pores.
7	6,050.3	0.00817	1.6	53.3	46.6	2.69	ls, sdy/slty, microstyl, pyr, bdg/bio, no pores.

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AMOCO PRODUCTION COMPANY

Well: Nordling #1
Field: Hugoton
Drilling Fluid: Dispersed
State: Kansas
County: Stanton
Location: Sec 30-T29S-R39W
Date: 02 Feb 1984
TICS File #: 437
Elevation: 32216L

FULL DIAMETER AND PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability Horz (md)	Horz-90' (md)	Porosity (%)	Saturation Oil (%)	H2O (%)	Grain Density (g/cm/cc)	Lithology
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MISSISSIPPIAN FORMATION

1	5650.0-51.0	0.40	0.01	3.2	0.0	54.8	2.69	Ls,ool	VF
2	5651.0-52.0	<0.01	<0.01	2.7	0.0	65.5	2.69	Ls,fxl,sl/ool	
3	5652.0-53.0	0.02	0.02	3.3	0.0	55.6	2.69	Ls,ool	
4	5653.0-54.0	851	0.01	2.9	0.0	53.3	2.69	Ls,ool	VF
5	5654.0-55.0	0.03	<0.01	3.0	0.0	46.9	2.70	Ls,fxl,sl/ool	VF
6	5655.0-56.0	595	<0.01	1.6	2.8	40.3	2.70	Ls,fxl,sl/ool	VF
7	5656.0 - 5660.0 *	1.1	<0.01	1.4	0.0	69.9	2.70	Ls,sh stks	
8	5660.0-61.0 *	3.1	3.0	7.0	7.1	42.2	2.71	Ls,ool	VF
9	5661.0-62.0	12	5.6	9.6	6.8	34.1	2.70	Ls,ool	
10	5662.0-63.0 *	7.5	6.3	9.3	6.3	40.7	2.71	Ls,ool,sty	
11	5663.0-64.0	37	34	13.5	12.1	31.9	2.70	Ls,ool	
12	5664.0-65.0 *	34	31	12.7	10.8	33.2	2.70	Ls,ool	
13	5665.0-66.0	42	31	13.7	11.5	40.9	2.70	Ls,ool	
14	5666.0-67.0	32	30	12.9	0.0	41.4	2.70	Ls,ool	
15	5667.0-68.0	16	15	11.0	0.0	49.9	2.70	Ls,ool	
16	5668.0-69.0	1.6	1.3	9.7	0.0	53.3	2.69	Ls,ool	
17	5669.0-70.0	1.4	1.2	4.1	0.0	44.7	2.69	Ls,fxl,sl/ool,sty	VF

* Run water

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AMOCO PRODUCTION COMPANY

TICS File #: 437

Well: Nordling #1

Date: 02 Feb 1984

FULL DIAMETER AND PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity (%)	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Horz-90° (md)		Oil (%)	H2O (%)		
5671.0 - 5674.0								
18	5674.0-75.0	0.08	*	3.3	0.0	58.0	2.69	Ls,fxl,sl/ool,sty
19P	5675.0-76.0	0.01		2.7	0.0	54.5	2.69	Ls,fxl,sl/ool
20P	5676.0-77.0	<0.01		1.2	0.0	68.0	2.69	Ls,vfxl,sl/ool
5677.0 - 5679.0								NOT RECOVERED
21	5679.0-80.0 *	0.02	0.01	4.4	0.0	55.3	2.70	Ls,vfxl,sl/ool
5680.0 - 5683.0								
22P	5683.0-84.0	<0.01		0.9	0.0	70.8	2.69	Ls,vfxl,sl/ool
5684.0 - 5687.0 *								
23P	5687.0-88.0	<0.01		1.0	0.0	63.9	2.70	Ls,vfxl,sl/ool
5688.0 - 5691.0								
24	5691.0-92.0	0.01	<0.01	1.3	0.0	70.0	2.70	Ls,vfxl,sl/ool
5692.0 - 5695.0 *								
25P	5695.0-96.0	<0.01		0.7	0.0	72.1	2.69	Ls,vfxl,sl/ool
5696.0 - 5699.0								
26P	5699.0-00.0	<0.01		0.9	0.0	85.9	2.69	Ls,vfxl,sl/ool
5700.0 - 5703.0								
27	5703.0-04.0	0.49†	0.18	1.4	0.0	55.3	2.70	Ls,vfxl
27A	5704.0-05.0	0.06	0.02	1.1			2.69	Ls,vfxl
5705.0 - 5707.0 *								Ls,vfxl
28P	5707.0-08.0	<0.01		1.1	0.0	85.7	2.68	Ls,vfxl
5708.0 - 5711.0								Ls,vfxl

* Plus permeability - sample not suitable for full diameter measurement
† Horizontal dehydration crack

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AMOCO PRODUCTION COMPANY

Well:

Nordling #1

Date: 02 Feb 1984

TICS File #: 437

FULL DIAMETER AND PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability Horz (md)	Horz-90° (md)	Porosity (%)	Saturation Oil (%)	H2O (%)	Grain Density (gm/cc)	Lithology
29P	5711.0-12.0	<0.01		0.9	0.0	72.9	2.69	Ls,vfxl
29A	5712.0-13.0	0.05	0.02	1.6			2.69	Ls,vfxl
	5713.0 - 5715.0							Ls,vfxl
30	5715.0-16.0	513	<0.01	1.7	0.0	61.9	2.70	Ls,vfxl
	5716.0 - 5717.0							Ls,vfxl
30A	5717.0-18.0	0.83	<0.01	1.8			2.69	Ls,vfxl
	5718.0 - 5719.0							Ls,vfxl
31P	5719.0-20.0	<0.01		1.1	0.0	66.1	2.69	Ls,vfxl
	5720.0 - 5723.0							Ls,vfxl
32P	5723.0-24.0	<0.01		2.0	0.0	69.1	2.70	Ls,vfxl
	5724.0 - 5726.0							Ls,vfxl
33	5726.0-27.0	0.01	0.01	2.0	0.0	63.5	2.70	Ls,vfxl
	5727.0 - 5730.0							Ls,vfxl
34P	5730.0-31.0	<0.01		1.2	0.0	72.7	2.69	Ls,vfxl
34A	5731.0-32.0	0.42	0.02	1.0			2.69	Ls,vfxl
	5732.0 - 5734.0							Ls,vfxl
35P	5734.0-35.0 *	<0.01		1.1	0.0	79.8	2.69	Ls,vfxl,sl/ool
	5735.0 - 5738.0							Ls,vfxl,sl/ool
36	5738.0-39.0	0.19	0.08	4.9	0.0	42.9	2.71	Ls,vfxl,ool
37	5739.0-39.5 *	31	29	8.2	0.0	48.3	2.71	Ls,vfxl,ool
	5739.5-40.0	50	49	13.0	0.0	64.1	2.70	Ls,vfxl,ool
39	5740.0-41.0 *	59	55	14.3	0.0	63.6	2.71	Ls,vfxl,ool

* Plus permeability - sample not suitable for full diameter measurement

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AMOCO PRODUCTION COMPANY

Well:

Nordling #1

Date: 02 Feb 1984

TICS File #: 437

FULL DIAMETER AND PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity (%)	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Horz-90 (md)		Oil (%)	H2O (%)		
40	5741.0-42.0	19	17	7.9	0.0	66.2	2.70	Ls,vfxl,ool
41	5742.0-43.0	12	7.7	9.3	0.0	60.1	2.72	Ls,vfxl,ool
42	5743.0-44.0 *	12	9.3	9.0	0.0	60.5	2.71	Ls,vfxl,ool
43	5744.0-45.0	<0.01	<0.01	1.5	0.0	59.9	2.70	Ls,vfxl,sty
5745.0 - 5748.0 *								Ls,vfxl
44P	5748.0-49.0	<0.01		1.8	0.0	52.9	2.71	Ls,vfxl,slt lam
45P	5752.0-53.0	<0.01		0.7	0.0	63.2	2.70	Ls,vfxl,slt lam
46	5756.0-57.0	<0.01	<0.01	0.9	0.0	48.0	2.70	Ls,vfxl
5757.0 - 5760.0								Ls,vfxl,fos
47P	5760.0-61.0	<0.01		0.5	0.0	64.7	2.70	Ls,vfxl,fos
47A	5761.0-62.0	0.01	<0.01	0.8			2.70	Ls,vfxl
48P	5764.0-65.0	<0.01		0.3	0.0	64.4	2.69	Ls,vfxl,fos
5765.0 - 5768.0								Ls,vfxl
49	5768.0-69.0	0.08+	0.01	3.3	0.0	64.0	2.71	Ls,vfxl,sty,fos
50P	5772.0-73.0	<0.01		0.6	0.0	63.3	2.70	Ls,vfxl,sty,fos
5773.0 - 5776.0								Ls,vfxl
51P	5776.0-77.0	<0.01		0.2	0.0	77.8	2.69	Ls,vfxl
5777.0 - 5780.0								Ls,vfxl

* Plus permeability - sample not suitable for full diameter measurement
+ Horizontal dehydration crack

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STANDARD CORE ANALYSIS SUMMARY

AMOCO PRODUCTION COMPANY
WELL FEDERAL LAND BANK "C"
ST. LOUIS FORMATION
SECTION 21-29S-39W
STANTON COUNTY, KANSAS

<u>Sample Number</u>	<u>Depth, feet</u>	<u>Air Permeability, md</u>	<u>Porosity, percent</u>	<u>Grain Density, gm/cc</u>
1	5,770.	1,750.	18.1	2.70
2	5,771.	619.	15.9	2.69
3	5,772.	593.	14.6	2.70
4	5,773.	21.9	8.9	2.69
5	5,774.	7.17	6.8	2.69
6	5,775.	1.50	4.5	2.71
7	5,776.	0.00846	3.3	2.70
8	5,780.	1.13	4.5	2.69

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ARCO OIL & GAS COMPANY

Well: A.M. WILLIAMS #3 State: KANSAS Date: 9/21/88
 Field: N/A County: STANTON TTCS File#: 89171
 Drilling Fluid: Water Location: N/A Elevation: N/A

Reamer No. 1

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability Horz (md)	Porosity (%)	Saturation Oil (%)	Saturation H2O (%)	Grain Density (gm/cc)	Lithology
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ST. LOUIS FORMATION

1	5634.0-35.0	<0.01	1.5	28.8	70.7	2.69	
2	5635.0-36.0	<0.01	1.4	31.7	59.9	2.69	
3	5636.0-37.0	<0.01	2.5	19.2	65.3	2.71	
4	5637.0-38.0	<0.01	2.6	35.2	63.0	2.69	
5	5638.0-39.0	<0.01	3.2	32.8	66.4	2.69	
6	5639.0-40.0	<0.01	3.3	46.2	59.6	2.69	
7	5640.0-41.0	<0.01	4.0	36.6	61.1	2.69	
8	5641.0-42.0	<0.01	4.2	48.9	48.3	2.69	
9	5642.0-43.0	<0.01	3.5	42.7	53.3	2.68	
10	5643.0-44.0	0.03	4.8	50.6	47.3	2.65	
11	5644.0-45.0	<0.01	1.7	14.2	72.5	2.68	
12	5645.0-46.0	<0.01	0.5	31.0	61.4	2.69	
13	5646.0-47.0	<0.01	0.7	31.6	62.2	2.69	
14	5647.0-55.0	<0.01	1.1	13.9	37.5	2.69	
15	5655.0-56.0	<0.01	0.1	20.5	69.7	2.69	
16	5656.0-57.0	<0.01	0.5	29.8	59.2	2.70	
17	5657.0-58.0	<0.01	0.4	24.1	61.5	2.69	
18	5658.0-59.0	<0.01	0.3	31.0	66.0	2.69	
19	5659.0-60.0	<0.01	0.4	23.9	71.2	2.69	

Shale, no analysis as per client.

TerraTek Core Services

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ARCO OIL & GAS COMPANY
Well: A.M. WILLIAMS #3

Date: 9/21/88

TACS File #: 89171

Sample Number	Depth (feet)	Permeability		Porosity (%)	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil (%)	H ₂ O (%)		
20	5661.0-62.0	130.41		11.0	28.7	41.2	2.69	
21	5662.0-63.0	310.09		13.2	20.3	50.5	2.69	
22	5663.0-64.0	342.77		13.6	26.3	69.5	2.69	
23	5664.0-64.3	31.26		17.5	19.4	58.0	2.69	
24	5664.3-65.0	61.11		13.5	47.4	41.9	2.67	
25	5665.0-66.0	209.15		14.9	31.6	47.8	2.69	
26	5666.0-67.0	14.33		9.3	36.2	32.2	2.69	
27	5667.0-68.0	461.21		13.1	21.2	57.9	2.67	
28	5668.0-69.0	217.03		12.6	24.4	55.9	2.68	
29	5669.0-70.0	109.48		11.5	56.4	40.2	2.69	
30	5670.0-71.0	0.01		2.8	55.4	29.4	2.69	
31	5671.0-72.0	11.40		7.1	33.3	54.2	2.69	
32	5672.0-73.0	13.74		8.1	20.0	75.7	2.69	
33	5673.0-74.0	1.27		6.6	31.3	66.5	2.69	
34	5674.0-75.0	0.01		3.1	55.0	41.3	2.68	
35	5675.0-76.0	<0.01		0.4	23.1	68.6	2.69	
36	5676.0-77.0	0.03		0.6	17.9	75.9	2.69	
37	5677.0-78.0	<0.01		1.0	38.1	60.7	2.70	
38	5678.0-79.0	<0.01		0.8	30.3	61.8	2.69	
39	5679.0-80.0	<0.01		1.0	26.0	61.8	2.69	

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ARCO OIL & GAS COMPANY
Well: A.M. WILLIAMS #3

Date: 9/21/88

TTCS File #: 89171

Sample Number	Depth (feet)	Permeability		Porosity (%)	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)			Oil (%)	H ₂ O (%)		
40	5680.0-81.0	<0.01		0.6	24.8	70.4	2.69	
41	5681.0-82.0	<0.01		1.0	36.1	57.0	2.70	
42	5682.0-83.0	<0.01		1.8	11.4	46.0	2.68	
43	5683.0-84.0	<0.01		0.4	12.0	81.7	2.69	
44	5684.0-85.0	<0.01		1.8	26.3	67.1	2.67	
45	5685.0-86.0	<0.01		1.9	25.3	64.4	2.67	
46	5686.0-87.0	<0.01		1.2	28.3	68.6	2.67	
47	5687.0-88.0	<0.01		1.4	31.9	63.2	2.68	
48	5688.0-89.0	<0.01		0.9	28.6	68.0	2.68	
49	5689.0-90.0	<0.01		1.6	46.3	47.2	2.70	
50	5690.0-91.0	<0.01		0.6	18.2	77.2	2.69	
51	5691.0-92.0	<0.01		1.6	42.8	49.4	2.69	
52	5692.0-93.0	<0.01		1.0	30.3	60.2	2.68	
53	5693.0-94.0	<0.01		0.7	21.9	74.3	2.69	
54	5694.0-95.0	<0.01		1.3	31.0	52.6	2.68	



Amoco Production Company

Denver Region
SOUTHERN DIVISION

GEOL. MEMO. SO-29-83

ST. LOUIS CORES, HUGOTON EMBAYMENT

AMOCO LEE #1

33-25S-36W

CORE ANALYSIS

By: K.C. SAWYER

Date: JULY 1983

Scale:

Encl. No. 10-2

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

File 3402-8231 Page No. 2

Well LEE "A" NO. 1

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		GRAIN DENS.	SAMPLE DESCRIPTION AND REMARKS
		MAX.	900		OIL	TOTAL WATER		
57	4954.0-55.0	0.1	<0.1	4.5	0.0	65.3	2.70	Lm, shy, sty
58	55.0-56.0	<0.1	<0.1	4.1	0.0	67.5	2.70	Lm, sty
59	56.0-57.0	0.1	<0.1	4.3	0.0	64.2	2.70	Lm, sl/shy, sty
60	57.0-58.0	0.1	0.1	4.3	0.0	65.6	2.70	Lm, sl/shy, sty
61	58.0-59.0	0.1	0.1	4.1	0.0	71.5	2.70	Lm, sty
62	59.0-60.0	<0.1	<0.1	4.5	0.0	65.7	2.70	Lm, sl/shy
63	60.0-61.0	0.1	0.1	4.2	0.0	69.8	2.70	Lm, sl/shy, sty
64	61.0-62.0	<0.1	<0.1	3.2	0.0	66.1	2.70	Lm, sl/shy, sty
65	62.0-63.0	<0.1	<0.1	4.0	0.0	63.0	2.70	Lm, sl/shy, sty
66	63.0-64.0	<0.1	<0.1	2.5	0.0	71.2	2.70	Lm, shy
67	64.0-65.0	<0.1	<0.1	1.1	0.0	77.0	2.70	Lm, shy
68	65.0-66.0	<0.1	<0.1	1.6	0.0	80.3	2.70	Lm, shy
69	66.0-67.0	<0.1	<0.1	1.3	0.0	76.0	2.70	Lm, shy
70	67.0-68.0	<0.1	<0.1	2.0	0.0	76.8	2.70	Lm, sl/shy
71	68.0-69.0	<0.1	<0.1	1.7	0.0	72.8	2.70	Lm, sl/shy
72	69.0-70.0	<0.1	<0.1	1.6	0.0	74.8	2.70	Lm, sl/shy
73	70.0-71.0	<0.1	<0.1	1.4	0.0	72.7	2.70	Lm
74	71.0-72.0	<0.1	<0.1	1.7	0.0	76.3	2.70	Lm, sl/shy
75	72.0-73.0	0.1	<0.1	1.8	0.0	70.9	2.70	Lm, sl/shy
76	73.0-74.0	0.2	<0.1	3.2	0.0	65.4	2.70	Lm, sl/shy, v f
10	74.0-75.0	133	83	10.3	22.7	48.8	2.70	Lm
11	75.0-76.0	70	62	11.5	26.0	44.5	2.70	Lm
12	76.0-77.0	62	54	12.4	23.0	44.6	2.70	Lm
13	77.0-78.0	16	14	8.8	21.0	34.3	2.70	Lm
14	78.0-79.0	53	48	8.9	16.0	37.6	2.70	Lm
	79.0-82.0							Lost Core
15	82.0-83.0	49	41	11.9	21.8	71.7	2.70	Lm
16	83.0-84.0	43	25	10.8	21.3	67.2	2.70	Lm
17	84.0-85.0	11	9.1	9.4	15.7	75.5	2.70	Lm
18	85.0-86.0	43	42	12.5	19.3	64.9	2.70	Lm
19	86.0-87.0	15	14	10.5	20.0	70.0	2.71	Lm
20	87.0-88.0	21	18	10.9	20.5	75.0	2.71	Lm
21	88.0-89.0	23	19	9.6	15.4	75.2	2.71	Lm
22	89.0-90.0	11	7.7	9.3	15.2	66.5	2.71	Lm
23	90.0-91.0	6.8	1.4	9.4	12.8	72.0	2.71	Lm
24	91.0-92.0	3.6	1.6	9.7	12.5	78.8	2.71	Lm
25	92.0-93.0	1.3	1.2	7.4	5.5	82.2	2.70	Lm, sl/shy
26	93.0-94.0	0.3	0.1	2.8	7.2	72.0	2.70	Lm, shy
27	94.0-95.0	0.4	0.2	4.0	0.0	79.9	2.70	Lm, sl/shy
77	95.0-96.0	<0.1	<0.1	2.5	0.0	67.3	2.70	Lm, shy, v f
78	96.0-97.0	<0.1	<0.1	1.8	0.0	70.7	2.70	Lm, shy, v f
79	97.0-98.0	0.1	0.1	2.6	0.0	66.2	2.70	Lm, shy, v f
80	98.0-99.0	<0.1	<0.1	2.1	0.0	70.1	2.70	Lm, v/shy
81	99.0-00.0	<0.1	<0.1	0.9	0.0	76.3	2.70	Lm, shy
82	5000.0-01.0	<0.1	<0.1	1.1	0.0	74.6	2.70	Lm, shy

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CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

File 3402-8231 Page No.

Well LEE "A" NO. 1

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		GRAIN DENS.	SAMPLE DESCRIPTION AND REMARKS
		MAX.	90°		OIL	TOTAL WATER		
83	5001.0-02.0	<0.1	<0.1	0.8	0.0	74.5	2.70	Lm
84	02.0-03.0	<0.1	<0.1	1.1	0.0	68.9	2.70	Lm
85	03.0-04.0	803	<0.1	1.1	0.0	69.5	2.70	Lm, v f
86	04.0-05.0	0.1	<0.1	1.3	0.0	71.4	2.70	Lm, v f
87	05.0-06.0	<0.1	<0.1	1.4	0.0	66.9	2.70	Lm, shy, sty
28	06.0-07.0	0.3	0.3	8.5	5.1	68.0	2.70	Lm
29	07.0-08.0	4.5	2.4	9.1	10.1	51.6	2.70	Lm
30	08.0-09.0	<0.1	<0.1	4.0	0.0	60.9	2.70	Lm
	5009.0-09.5							Lm, v/shy

* DENOTES PLUG PERMEABILITY
vf DENOTES VERTICAL FRACTURE

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ARCO OIL & GAS COMPANY
Well: D.C. Sullivan No. 1

Date: 18-MAR-1991

TTCS File #: 5883

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
21	5670.0-71.0	<.01		1.1	0.0	85.4	2.71	Ls,f-micxln,shly lams,sl pyr
22	5671.0-72.0	.07		4.6	0.0	62.2	2.69	Ls,micxln,ool,fos
23	5672.0-73.0	41.		10.4	0.0	86.3	2.69	Ls,micxln,ool,fos
24	5673.0-74.0	29.		10.8	0.0	96.5	2.70	Ls,vf-fxln,ool
25	5674.0-75.0	74.		12.6	0.0	93.8	2.70	Ls,vf-fxln,ool
26	5675.0-76.0	24.		11.4	0.0	97.7	2.70	Ls,vf-fxln,ool
27	5676.0-77.0	1.1		7.1	0.0	96.3	2.69	Ls,fxln,ool,sty
28	5677.0-78.0	5.6		8.5	0.0	89.8	2.69	Ls,fxln,ool
29	5678.0-79.0	<.01		3.0	0.0	93.2	2.69	Ls,vf-fxln,ool
30	5679.0-80.0	.06		4.0	0.0	77.5	2.69	Ls,fxln,ool
31	5680.0-81.0	.01		0.7	0.0	92.6	2.71	Ls,vfxln
32	5681.0-82.0	<.01		0.9	0.0	92.2	2.70	Ls,vfxln
33	5682.0-83.0	134.		7.9	0.0	80.3	2.70	Ls,vfxln,v ool
34	5683.0-84.0	.09		3.2	0.0	84.6	2.69	Ls,vfxln,ool,sty
35	5684.0-85.0	1.9		8.5	0.0	90.9	2.70	Ls,vfxln,ool
36	5685.0-86.0	21.		8.0	0.0	73.8	2.69	Ls,f-micxln,ool
37	5686.0-87.0	<.01		4.5	0.0	86.3	2.69	Ls,fxln,ool
38	5687.0-88.0	<.01		0.5	0.0	85.6	2.71	Ls,vfxln,sm calc frags
39	5688.0-89.0	<.01		0.5	0.0	66.7	2.70	Ls,vfxln
40	5689.0-90.0	<.01		0.3	0.0	77.5	2.70	Ls,vfxln

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ARCO OIL & GAS COMPANY

Well: D.C. Sullivan No. 1
Field: Wildcat
Drilling fluid: Polymer

State: Kansas
County: Grant
Location: Sec.22-T29S-R38W

Date: 18-MAR-1991
TICS File #: 5883
Elevation: 3081.6'

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
St. Louis Formation								
1	5650.0-51.0	<.01		3.0	0.0	80.2	2.66	Sd,vfg,slty,lmy
2	5651.0-52.0	.01		4.8	0.0	83.2	2.67	Sd,vfg,v lmy
3	5652.0-53.0	<.01		4.2	0.0	89.2	2.68	Sd,vfg,v lmy
4	5653.0-54.0	<.01		3.4	0.0	78.8	2.68	Ls,vfxln,ool,slty-sdy
5	5654.0-55.0	<.01		1.5	0.0	98.8	2.69	Ls,vfxln,shly lams,sl pyr
6	5655.0-56.0	.05		2.0	0.0	88.0	2.71	Ls,vfxln,shly lams,sl pyr
7	5656.0-57.0	<.01		1.8	0.0	97.4	2.71	Ls,vfxln,shly lams,pyr
8	5657.0-58.0	<.01		0.5	0.0	72.9	2.71	Ls,vfxln,sl ool
9	5658.0-59.0	<.01		0.4	0.0	75.4	2.70	Ls,vf-micxln,ool, sl pyr
10	5659.0-60.0	<.01		0.3	0.0	87.9	2.70	Ls,vfxln,sl ool
11	5660.0-61.0	<.01		0.4	0.0	88.2	2.71	Ls,vfxln
12	5661.0-62.0	<.01		0.5	0.0	90.7	2.71	Ls,vfxln
13	5662.0-63.0	<.01		0.6	0.0	95.0	2.71	Ls,vfxln,sl ool
14	5663.0-64.0	<.01		1.8	0.0	94.0	2.70	Ls,vfxln,sl ool
15	5664.0-65.0	.28		5.7	0.0	71.5	2.70	Ls,f-micxln,ool
16	5665.0-66.0	<.01		4.5	0.0	75.3	2.69	Ls,f-micxln,ool
17	5666.0-67.0	1.8		4.2	0.0	71.1	2.71	Ls,f-micxln,ool
18	5667.0-68.0	<.01		2.8	0.0	85.6	2.70	Ls,f-micxln
19	5668.0-69.0	<.01		1.0	0.0	89.5	2.70	Ls,f-micxln
20	5669.0-70.0	<.01		1.5	0.0	87.9	2.70	Ls,micxln,ool

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ARCO OIL & GAS COMPANY

Well: Lora Hickok #2
Field: Big Bow
Drilling fluid: Water Base

State: Kansas
County: Grant
Location:

Date: 25-OCT-1991
TTCS File #: 5043
Elevation:

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
St. Louis Formation								
1	5650.0-51.0	<.01		1.4	0.0	86.0	2.69	Sd,vfgr,silty,calc
2	5651.0-52.0*	<.01		1.2	0.0	76.5	2.69	Sd,vfgr,silty,v/calc
3	5652.0-53.0	<.01		1.1	0.0	86.4	2.69	Sd,vfgr,silty,v/calc
4	5653.0-54.0	<.01		0.8	0.0	76.3	2.70	Ls,vfxl,silty & sdy
5	5654.0-55.0	17.+		1.7	0.0	92.6	2.72	Ls,vfxl,shy,fos,pyr
6	→5655.0-56.0	<.01		0.7	0.0	62.3	2.70	Ls,vfxl,sl/ool
7	5656.0-57.0	12.+		0.9	0.0	95.0	2.70	Ls,vfxl,ool,sty
8	5657.0-58.0 *	<.01		1.3	0.0	91.0	2.70	Ls,vfxl,ool,sty
9	5658.0-59.0	<.01		1.3	0.0	85.9	2.70	Ls,vfxl,ool,sty
10	5659.0-60.0	<.01		0.8	0.0	86.7	2.70	Ls,fxl,ool,sty
11	5660.0-61.0	<.01		1.4	8.7	83.6	2.70	Ls,mic-fxl,ool
12	5661.0-62.0	3.8		6.2	10.9	73.9	2.64	Ls,mic-fxl,ool,vgy
13	5662.0-63.0	1.0		7.7	5.5	60.0	2.69	Ls,mic-fxl,ool,vgy
14	5663.0-64.0	.77		8.5	6.2	70.3	2.71	Ls,fxl,ool,pp vgs
15	5664.0-65.0	.81		8.1	2.9	78.5	2.70	Ls,fxl,ool,pp vgs
16	5665.0-66.0	3.6		7.9	2.1	92.3	2.68	Ls,mic-fxl,ool,vgy
17	5666.0-67.0 *	5.0		9.3	5.0	92.8	2.69	Ls,mic-fxl,ool,vgy
18	5667.0-68.0 *	2.2		9.3	2.5	89.1	2.70	Ls,mic-fxl,ool,pp vgs
19	5668.0-69.0	3.6		9.1	9.2	78.2	2.71	Ls,mic-fxl,ool,pp vgs

* Fracture affecting permeability

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ARCO OIL & GAS COMPANY
Well: Lora Hickok #2

Date: 25-OCT-1991

TICS File #: 5043

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
20	5669.0-70.0	.56		5.6	5.6	72.6	2.69	Ls,mic-fxl,ool,pp vgs
21	5670.0-71.0	.01		4.1	5.2	83.3	2.69	Ls,vf-fxl,calc str
22	5671.0-72.0	.20		4.0	5.2	75.5	2.69	Ls,vf-fxl,pp vgs
23	5672.0-73.0	<.01		0.8	0.0	85.1	2.67	Ls,fxl,sity
24	5673.0-74.0	<.01		1.2	0.0	92.0	2.66	Ls,fxl,ool,calc str

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ARCO OIL & GAS COMPANY
Well: Lora Hickok No.

Date: 4-MAR-1991

ITCS File #: 3807

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H ₂ O %		
43	5675.0-76.0	72.		11.0	17.6	78.5	2.68	Ls,micxn,ool,vugs
44	5676.0-77.0	185.		10.6	11.6	74.0	2.67	Ls,micxn,ool,vugs
45	5677.0-78.0	68.		9.5	19.5	80.4	2.67	Ls,micxn,ool,vugs
46	5678.0-79.0	.25		4.5	54.2	36.0	2.68	Ls,f-micxn,ool,sl vug
47	5679.0-80.0	.17		0.5	45.3	28.9	2.71	Ls,cryp-vfxln,ool,sl vugs
48	5680.0-81.0	<.01		0.7	28.8	30.5	2.70	Ls,vfxln,sl ool,sl vug
49	5681.0-82.0	<.01		2.2	34.3	38.8	2.70	Ls,vfxln,sl ool
50	5682.0-83.0	<.01		0.9	22.4	23.8	2.70	Ls,vfxln
51	5683.0-84.0	<.01		0.9	40.9	49.7	2.70	Ls,vfxln
52	5684.0-85.0	<.01		3.0	29.7	44.6	2.69	Ls,micxn,fos,ool
53	5685.0-86.0	<.01		1.2	8.4	17.9	2.70	Ls,f-micxn,slty strks
54	5686.0-87.0	<.01		1.0	10.3	22.0	2.69	Ls,fxln,pyr
55	5687.0-88.0	2.3+		1.6	32.2	62.9	2.72	Ls,vf-fxln
56	5688.0-89.0	<.01		1.0	15.5	21.9	2.69	Ls,fxln,slty-sdy
57	5689.0-90.0	<.01		1.1	14.3	20.3	2.71	Ls,f-micxn
58	5690.0-91.0	<.01		1.4	33.5	41.2	2.70	Ls,f-micxn

- Dehydration crack affecting permeability

ARCO OIL & GAS COMPANY

Well: Lora Hickok No. 1
 Field: N/A
 Drilling fluid: Water Base Mud

State: Kansas
 County: Grant
 Location: Sec.32-T29S-R38W

Date: 4-MAR-1991
 TTCS File #: 5807
 Elevation: 3104.3'

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
St. Louis Formation								
1	5633.0-34.0	<.01		2.5	12.1	70.3	2.67	Sd,vfg,slty,lmy
2	5634.0-35.0	<.01		2.2	9.3	79.3	2.68	Sd,vfg,slty,lmy
3	5635.0-36.0	<.01		1.9	13.3	74.7	2.68	Sd,vfg,slty,lmy
4	5636.0-37.0	<.01		1.4	10.5	71.6	2.68	Sd,vfg,slty strks,lmy
5	5637.0-38.0	<.01		2.0	21.0	69.1	2.68	Sd,vfg,slty,lmy
6	5638.0-39.0	<.01		2.0	23.3	65.9	2.67	Sd,vfg,slty,lmy
7	5639.0-40.0	<.01		1.7	9.2	73.1	2.68	Ls,vf-fxln,sl ool, sdy
8	5640.0-41.0	<.01		1.9	18.2	73.1	2.68	Ls,vf-fxln,v sdy
9	5641.0-42.0	<.01		1.3	32.1	64.8	2.68	Ls,vf-fxln, sdy
10	5642.0-43.0	<.01		1.7	11.7	76.8	2.68	Ls,vf-fxln, sdy
11	5643.0-44.0	<.01		2.3	11.1	84.8	2.68	Ls,vf-fxln, sdy
12	5644.0-45.0	<.01		2.6	37.0	44.7	2.67	Ls,vf-fxln,ool,v sdy
13	5645.0-46.0	.02		2.7	11.3	76.6	2.68	Ls,vf-fxln,ool, sdy
14	5646.0-47.0	.01		2.5	22.6	71.6	2.69	Ls,vf-fxln,ool, sdy
15	5647.0-48.0	.01		2.1	21.1	69.9	2.69	Ls,vf-fxln,ool, sdy
16	5648.0-49.0	.01		2.7	16.8	82.5	2.67	Sd,vfg,v lmy
17	5649.0-50.0	<.01		2.6	13.8	75.7	2.68	Sd,vfg,v lmy,ool
18	5650.0-51.0	<.01		1.4	25.3	67.6	2.71	Ls,vf-fxln, sdy,ool
19	5651.0-52.0	<.01		2.1	7.2	80.0	2.70	Ls,vfxln,slty strks, sdy
20	5652.0-53.0	<.01		0.9	17.7	80.5	2.69	Ls,vfxln,ss calc frags

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ARCO OIL & GAS COMPANY
Well: Lora Hickok No.

Date: 4-MAR-1991

ITCS File #: 5807

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (g/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
21	5653.0-54.0	<.01		1.4	24.6	74.7	2.69	Ls,vf-fxln,slty,pyr
22	5654.0-55.0	<.01		1.4	31.9	66.3	2.69	Ls,f-micxln,ool,sdy
23	5655.0-56.0	<.01		0.7	21.5	73.1	2.69	Ls,f-micxln,ool,sdy
24	5656.0-57.0	<.01		0.8	31.9	54.2	2.69	Ls,f-micxln,ool,sdy
25	5657.0-58.0	11.		0.9	43.1	47.1	2.63	Cht,silc,frac
26	5658.0-59.0	<.01		0.9	30.6	34.7	2.63	Cht,silc,frac
27	5659.0-60.0	.20		2.1	20.6	77.0	2.71	Ls,vfxln,sl pyr,frac
28	5660.0-61.0	15.+		2.1	13.9	85.0	2.70	Ls,vfxln
29	5661.0-62.0	.06		1.6	21.3	72.3	2.71	Ls,vfxln,pyr
30	5662.0-63.0	12.+		2.4	21.6	76.4	2.71	Ls,vfxln,pyr
31	5663.0-64.0	<.01		0.7	29.1	61.9	2.70	Ls,micxln,ool,pyr
32	5664.0-65.0	323.		12.8	29.8	41.7	2.68	Ls,micxln,ool,fos,vugs
33	5665.0-66.0	240.		14.2	22.0	42.5	2.68	Ls,micxln,ool,fos,vugs
34	5666.0-67.0	601.		15.0	22.1	47.1	2.67	Ls,micxln,pis,ool,vugs
35	5667.0-68.0	358.		14.0	31.0	44.7	2.68	Ls,micxln,pis,ool,vugs
36	5668.0-69.0	441.		13.3	30.2	36.2	2.68	Ls,micxln,ool,vugs
37	5669.0-70.0	262.		12.1	21.5	45.6	2.68	Ls,micxln,ool,vugs
38	5670.0-71.0	229.		14.9	19.3	49.2	2.68	Ls,micxln,ool,fos,vugs
39	5671.0-72.0	5.0		12.2	19.6	50.7	2.69	Ls,micxln,ool,w/sm scat qtz xls
40	5672.0-73.0	313.		14.1	17.0	51.6	2.69	Ls,micxln,ool,vugs
41	5673.0-74.0	237.		13.1	38.0	33.3	2.68	Ls,fimicxln,ool,vugs
42	5674.0-75.0	13.		11.0	22.2	47.2	2.71	Ls,f-micxln,ool,vugs

+ - Dehydration crack affecting permeability

13628 Gamma Road • Dallas, Texas 75244 • (214) 960-8777 • WATS (800) 338-3182 • FAX (214) 960-2939

ARCO OIL & GAS COMPANY
Well: Johnson Heirs #5 Well

Date: 28-JAN-1992

ITCS File #: 5136

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
20	5676.0-77.0	.01		0.9	12.2	82.8	2.69	Ls,lt gy,mic xl,ool
21	5677.0-78.0	<.01		0.8	33.5	59.4	2.70	Ls,lt gy,f-mic xl,calc
22	5678.0-79.0	<.01		2.2	32.2	59.8	2.68	Ls,lt gy,mic xl,ool,pp vgs
23	5679.0-80.0	<.01		2.4	40.2	56.2	2.69	Ls,lt gy,mic xl,ool,pp vgs
24	5680.0-81.0	11.		6.9	21.8	36.5	2.69	Ls,lt gy,mic xl,ool,vgy
25	5681.0-82.0	156.		10.5	14.6	65.6	2.68	Ls,lt gy,mic xl,ool,vgy
26	5682.0-83.0	311.		13.2	15.1	82.6	2.68	Ls,lt gy,mic xl,ool,vgy
27	5683.0-84.0	23.		8.4	13.4	66.4	2.69	Ls,lt gy,mic xl,ool,vgy
28	5684.0-85.0	1.3		10.3	13.6	75.2	2.69	Ls,lt gy,mic xl,ool,vgy,lse qtz grs
29	5685.0-86.0	15.		8.1	30.7	27.4	2.69	Ls,lt gy,mic xl,ool
30	5686.0-87.0	.01		2.3	45.8	45.8	2.69	Ls,lt gy,f-mic xl,ool,pp vgs
31	5687.0-88.0	<.01		2.5	44.0	44.0	2.69	Ls,lt gy,vf-f xl,sl ool,styl
32	5688.0-89.0	.10		5.9	32.1	22.8	2.68	Ls,lt gy,vf xl,sl ool,pp vgs
33	5689.0-90.0	.01		2.0	48.2	50.0	2.68	Ls,lt gy,vf xl,styl
34	5690.0-91.0	47.		10.9	24.1	49.5	2.68	Ls,lt gy,f xl,ool,vgy
35	5691.0-92.0	220.		13.9	40.1	42.4	2.69	Ls,lt gy,f xl,ool,vgy
36	5692.0-93.0	98.		11.1	26.4	54.1	2.68	Ls,lt gy,f xl,ool,frac,vgy
37	5693.0-94.0	62.		10.0	27.4	49.3	2.68	Ls,lt gy,f xl,ool,vgy
38	5694.0-95.0	82.		10.8	28.9	41.8	2.68	Ls,lt gy,f xl,ool,vgy
39	5695.0-96.0	.29		6.8	34.3	23.9	2.69	Ls,lt gy,f xl,ool,pp vgs
40	5696.0-97.0	.03		5.6	17.0	70.5	2.69	Ls,lt gy,f xl,ool,pp vgs
41	5697.0-98.0	.03		1.3	30.1	68.5	2.70	Ls,lt gy,vf xl,styl
42	5698.0-99.0	.31		1.9	47.0	48.7	2.70	Ls,lt gy,vf xl,styl

13628 Gamma Road • Dallas, Texas 75244 • (214) 960-8777 • WATS (800) 338-3182 • FAX (214) 960-2939

ARCO OIL & GAS COMPANY
Well: Johnson Heirs #5 Well

Date: 28-JAN-1992

TTCS File #: 5136

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
43	5699.0- 0.0	.01		0.4	40.3	53.9	2.70	Ls,lt gy,vf xl,styl
44	5700.0- 1.0	<.01		0.3	0.0	86.8	2.70	Ls,lt gy,vf xl,sity
45	5701.0- 2.0	<.01		1.4	0.0	91.8	2.69	Ls,lt gy,vf xl,sity-sdy
46	5702.0- 3.0	<.01		1.1	0.0	93.4	2.69	Ls,lt gy,vf xl,sity-sdy
47	5703.0- 4.0	<.01		1.3	0.0	94.6	2.69	Ls,lt gy,f xl,ool,pp vgs
48	5704.0- 5.0	<.01		1.3	0.0	94.1	2.69	Ls,lt gy,f xl,ool,sity
49	5705.0- 6.0	<.01		1.4	0.0	91.5	2.69	Ls,lt gy,f xl,ool,sity
50	5706.0- 7.0	<.01		1.2	0.0	92.3	2.69	Ls,lt gy,f xl,ool,sity
51	5707.0- 8.0	<.01		1.2	0.0	92.7	2.69	Ls,lt gy,f xl,ool,sity strks
52	5708.0- 9.0	<.01		1.3	0.0	92.0	2.69	Ls,lt gy,f xl,ool,sity strks
53	5709.0-10.0	.01		1.6	0.0	93.3	2.69	Ls,lt gy,f xl,ool,sity
54	5710.0-11.0	.01		1.5	0.0	91.8	2.69	Ls,lt gy,f xl,ool,sity
55	5711.0-12.0	1.0		4.9	0.0	88.5	2.68	Ls,lt gy,rypt-vf xl,pp vgs
56	5712.0-13.0	.64		7.3	0.0	85.4	2.69	Ls,lt gy crypt-vf xl,pp vgs
57	5713.0-14.0	<.01		0.8	0.0	87.7	2.69	Ls,lt-m gy,vf xl,sity
58	5714.0-15.0	<.01		1.6	0.0	93.7	2.68	Ls,m-dk gy,vf xl,sity
59	5715.0-16.0	<.01		1.5	0.0	92.1	2.69	Ls,m gy,vf xl,sity

ARCO OIL & GAS COMPANY

Well: Johnson Heirs #5 Well
 Field: Big Bow
 Drilling fluid: SW Gel

State: Kansas
 County: Grant
 Location: Sec.30, T29S, R39W

Date: 28-JAN-1992
 TTCS File #: 5136
 Elevation: NA

PLUG DEAN-STARK ANALYSIS

Sample Number	Depth (feet)	Permeability		Porosity %	Saturation		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil %	H2O %		
St. Louis Formation								
1	5657.0-58.0	<.01		1.4	0.0	91.7	2.69	Ls,lt gy,f-mic xl
2	5658.0-59.0	<.01		1.3	0.0	91.8	2.69	Ls,lt gy,f-mic xl
3	5659.0-60.0	<.01		1.6	0.0	91.9	2.69	Ls,lt gy,vf-f xl,sl ool,slty
4	5660.0-61.0	<.01		2.0	0.0	96.2	2.69	Ls,lt gy,vf-f xl,sl ool,slty
5	5661.0-62.0	<.01		1.7	0.0	92.1	2.69	Ls,lt gy,fg-f xl,sl ool
6	5662.0-63.0	<.01		1.7	0.0	93.7	2.69	Ls,lt gy,vf-f xl,sl ool
7	5663.0-64.0	<.01		2.7	0.0	94.6	2.69	Ls,lt gy,vf-f xl,sl ool
8	5664.0-65.0	<.01		4.0	40.4	51.3	2.69	Ls,lt gy,f xl,sl ool,pp vgs
9	5665.0-66.0	.02		4.2	56.9	38.2	2.67	Ls,lt gy,vf xl,sl ool,pp vgs
10	5666.0-67.0	<.01		3.6	46.3	49.8	2.68	Ls,lt gy,vf xl
11	5667.0-68.0	<.01		3.6	38.1	59.9	2.68	Ls,lt gy,vf xl,sl ool
12	5668.0-69.0	<.01		2.1	29.6	69.1	2.69	Ls,lt gy,vf xl
13	5669.0-70.0	<.01		2.3	0.0	90.8	2.72	Ls,lt-m gy,vf xl,sl shly
14	5670.0-71.0	<.01		2.5	0.0	91.1	2.71	Ls,lt-m gy,vf xl,shly
15	5671.0-72.0	193.+		2.7	0.0	87.0	2.72	Ls,lt-m gy,vf xl,shly,pyr
16	5672.0-73.0	10.+		2.7	0.0	85.7	2.75	Ls,lt-m gy,vf xl,shly,pyr
17	5673.0-74.0	9.6+		2.8	0.0	89.2	2.72	Ls,lt-m gy,vf xl,shly
18	5674.0-75.0	<.01		0.6	0.0	85.7	2.70	Ls,lt gy,vf xl,shly
19	5675.0-76.0	<.01		0.3	6.7	85.2	2.69	Ls,lt gy,vf xl,ool

- Dehydration crack affecting permeability

Precision Core Analysis, Inc.

Amoco Production Company
Wade Allen 1-36
Sec. 36 T29S R40W
Stanton County, Kansas

Job:
Date:

9608
12-Feb-96

Reference Number	Depth (ft)	Permeability Air (md)	Klink (md)	Helium Porosity (%)	Grain Density (g/cc)	Sample Description
---------------------	---------------	-----------------------------	---------------	---------------------------	----------------------------	-----------------------

1	5630.1	0.008	0.002	1.9	2.70	
2	5631.5	83.8	72.6	9.9	2.70	
3	5632.5	496.	458.	13.8	2.69	
4	5633.4	147.	130.	11.2	2.69	
5	5634.5	592.	550.	14.4	2.69	
6	5635.5	761.	711.	14.3	2.69	
7	5636.3	715.	668.	14.0	2.70	
8	5636.9	490.	453.	13.1	2.69	
9	5637.5	336.	307.	13.4	2.69	
10	5638.5	560.	520.	14.6	2.69	
11	5639.4	31.0	25.7	10.5	2.69	
12	5640.5	0.762	0.570	7.6	2.70	
13	5641.3	0.200	0.125	5.9	2.70	
14	5641.6	0.098	0.055	5.3	2.69	
15	5641.9	0.010	0.003	3.5	2.70	

Post-It™ brand fax transmittal memo 7671		# of pages 1 2
To	Charles Barberger	From
Co.	Amoco	Co.
Dept.		Dept.
Fax #		Phone #
		751-9244
		Fax #

27-25-37W



Amoco Production Company

Denver Region
SOUTHERN DIVISION

GEOL. MEMO. SO-29-83

**ST. LOUIS CORES, HUGOTON EMBAYMENT,
SOUTHWEST KANSAS**

AMOCO COHEN "C" #3 SENE 27-25S-37W

CORE ANALYSIS

By: K. C. SAWYER

Date: MAY 1984

Scale:

Encl. No. 24-3

B-1 INDUSTRIES, INC.

CORE ANALYSIS REPORT

COMPANY AMOCO PRODUCTION COMPANY-RESERVOIRS, INC **FILE NO.** 11483
WELL NO. 3 C COHAN **FORMATION** _____ **DATE** 12-3-83
FIELD _____ **CORE TYPE** _____ **ELEVATION** _____
COUNTY _____ **MUD TYPE** _____ **ANALYST** _____
STATE _____ **LOCATION** _____

SAMP NO	DEPTH	PERMEABILITY		POR %	OIL %	WATER %	GR DNS	DESCRIPTION
		HORIZ	VERT					
BOYLES LAW ANALYSIS, PERMEABILITY MEASURED AT 1000psi NET OVERBURDEN								
1	5226-27	0.02		1.8	2.0	52.5	2.69	LS GY XLN
2	5231-32	0.02		2.8	2.5	50.7	2.70	LS TAN XLN
3	5236-37	0.03		2.6	1.8	79.9	2.71	LS TAN FXLN
4	5241-42	0.03		3.5	4.7	66.3	2.68	LS GY FXLN
5	5246-47	0.02		2.7	2.0	49.9	2.69	LS TAN XLN
6	5251-52	0.02		2.3	3.3	49.5	2.69	LS TAN XLN SUC IN PART
7	5256-57	0.02		2.7	1.7	60.3	2.70	LS TAN XLN
8	5261-62	0.02		2.3	3.2	48.4	2.70	LS TAN XLN
9	5266-67	0.02		2.9	6.4	51.3	2.70	LS GY XLN
10	5271-72	0.02		2.7	4.3	72.0	2.70	LS GY XLN
11	5276-77	0.02		1.6	4.2	41.7	2.70	LS TAN XLN
12	5281-82	0.02		2.1	4.5	59.7	2.70	LS TAN XLN
13	5286-87	0.01		1.9	6.5	65.1	2.70	LS TAN XLN
14	5287-88	0.02		2.9	3.3	77.8	2.71	LS TAN XLN
15	-89	0.03		3.8	3.0	80.7	2.71	LS TAN XLN
16	-90	0.05		4.8	2.2	67.3	2.71	LS TAN XLN
17	-91	0.16		6.1	2.4	85.1	2.71	LS TAN FXLN
18	-92	0.39		2.6	3.8	75.2	2.71	LS TAN FXLN
19	-93	0.02		2.9	3.0	90.5	2.71	LS TAN FXLN
20	-94	0.07		3.3	2.1	51.9	2.71	LS TAN FXLN
21	-95	0.03		3.3	1.3	56.8	2.70	LS TAN FXLN
22	-96	0.01		2.5	2.3	69.3	2.70	LS TAN FXLN
23	-97	0.01		2.4	4.6	68.8	2.70	LS GY XLN
24	-98	0.01		1.7	4.1	61.8	2.70	LS GY XLN
25	-99	0.01		1.5	8.3	82.9	2.70	LS TAN VFXLN
26	5299-00	0.01		1.7	2.1	52.2	2.71	LS TAN XLN ARG LAM
27	5300-01	0.02		1.2	7.0	70.5	2.70	LS TAN FXLN
28	-02	0.02		1.9	5.0	74.9	2.71	LS TAN FXLN
29	-03	0.01		1.5	4.4	65.9	2.71	LS TAN FXLN
30	5303-04	0.07		1.9	6.2	61.9	2.70	LS TAN FXLN

B-1 INDUSTRIES, INC.

CORE ANALYSIS REPORT

COMPANY	AMOCO PRODUCTION COMPANY-RESERVOIRS, INC	FILE NO.	11483
VELL	NO. 3 C COHAN	FORMATION	DATE
FIELD		CORE TYPE	12-3-83
COUNTY		MUD TYPE	ELEVATION
STATE		ANALYST	
	LOCATION		

SAMP NO	DEPTH	PERMEABILITY MAX	90°	POR %	OIL %	WATER %	GR DNS	DESCRIPTION	
BOYLES LAW ANALYSIS, PERMEABILITY TO AIR MEASURED AT 1000psi NET OVERBURDEN									
31	5304-05	0.02	*	2.8	4.5	74.5	2.71	LS TAN XLN	
32	-06	0.01	*	1.6	0.0	78.9	2.71	LS TAN XLN	VF
33	-07	0.02	*	1.9	2.5	81.7	2.71	LS TAN XLN	VF
34	-08	0.02	*	1.3	6.0	60.0	2.71	LS TAN XLN	
35	-09	0.01	*	1.2	6.1	61.2	2.70	LS TAN XLN	VF
36	-10	0.01	*	1.4	0.0	51.9	2.70	LS TAN XLN	VF
37	-11	0.68	*	4.7	2.8	46.8	2.70	LS TAN XLN	VF
38	-12	33	31	7.8	2.6	78.2	2.69	LS TAN XLN OOL IN PT TR VUG	
39	-13	111	*	8.6	2.4	70.7	2.69	LS TAN XLN OOL IN PT TR VUG	
40	-14	11	*	6.2	1.7	78.2	2.69	LS TAN XLN OOL IN PT TR VUG	
41	-15	34	*	7.0	1.2	61.7	2.69	LS TAN XLN OOL IN PT TR VUG	
42	-16	12	7.3	6.6	1.2	62.7	2.70	LS TAN XLN OOL IN PT TR VUG	
43	-17	81	*	10.3	1.2	89.3	2.70	LS GY OOL	
44	-18	785	*	13.5	0.9	82.1	2.70	LS GY OOL	
45	-19	1250	*	13.7	1.0	86.2	2.70	LS GY OOL	
46	-20	45	29	10.5	1.5	66.6	2.70	LS GY OOL	
47	-21	0.01	*	1.6	6.0	59.5	0.69	LS TAN XLN OOL IN PT	
48	-22	0.01	*	1.6	4.6	69.2	2.70	LS TAN XLN	
49	-23	0.01	*	1.5	5.5	82.7	2.70	LS TAN FXLN	VF
50	-24	0.01	*	1.3	3.4	51.0	2.69	LS TAN DNS	VF
51	-25	0.01	*	1.2	8.0	80.1	2.71	LS TAN DNS	VF
52	-26	0.01	*	1.2	4.7	70.6	2.71	LS TAN DNS	
53	-27	0.01	*	1.4	8.1	80.9	2.71	LS TAN DNS	
54	-28	0.01	*	1.4	4.6	61.3	2.70	LS TAN DNS	
55	-29	0.01	*	1.1	3.8	56.3	2.72	LS TAN FXLN	VF
56	-30	0.01	*	1.4	8.2	82.2	2.70	LS TAN FXLN	VF
57	-31	0.02	*	1.3	3.6	53.4	2.71	LS TAN FXLN	
58	-32	0.01	*	1.4	3.1	46.1	2.70	LS TAN FXLN	
59	-33	0.01	*	1.1	4.9	49.2	2.70	LS TAN FXLN	
60	5333-34	0.11*	*	1.4	6.1	61.2	2.70	LS TAN FXLN	VF

DENOTES PLUG BOYLES LAW ANALYSIS

* DENOTES FRACTURE ON PFRM SAMPLE # 60

B-1 INDUSTRIES, INC.

CORE ANALYSIS REPORT

COMPANY AMOCO PRODUCTION COMPANY-RESERVOIRS INC FILE NO. 11483
 WELL NO. 3 C COHAN FORMATION _____ DATE 12-3-83
 FIELD _____ CORE TYPE _____ ELEVATION _____
 COUNTY _____ MUD TYPE _____ ANALYST _____
 STATE _____ LOCATION _____

SAMP NO	DEPTH	PERMEABILITY HORIZ VERT	POR %	OIL %	WATER %	GR DNS	DESCRIPTION
BOYLES LAW ANALYSIS, PERMEABILITY TO AIR AT 1000psi NET OVERBURDEN							
61	5334-35	2.0*	1.7	4.1	40.6	2.71	LS TAN XLN
62	-36	0.01	2.0	3.0	44.9	2.71	LS TAN FXLN
63	-37	0.01	1.6	5.2	51.9	2.70	LS TAN FXLN
64	-38	0.02	2.0	2.6	39.6	2.70	LS TAN FXLN
65	-39	0.01	1.9	2.9	31.1	2.70	LS TAN FXLN
66	-40	0.02	1.9	2.2	33.5	2.71	LS TAN FXLN
67	-41	0.02	1.9	3.4	34.0	2.71	LS TAN FXLN
68	-42	0.01	1.0	7.8	77.7	2.70	LS TAN FXLN
69	-43	0.02	2.6	6.3	62.5	2.71	LS TAN FXLN
70	-44	0.01	2.3	4.4	71.0	2.70	LS TAN VFXLN
71	-45	0.02	2.2	3.6	59.9	2.71	LS TAN FXLN
72	-46	0.15	5.3	2.2	56.5	2.71	LS TAN XLN
73	-47	1.9	8.6	1.7	62.5	2.72	LS TAN XLN OOL IN PT
74	-48	0.92	5.8	2.2	65.6	2.71	LS TAN XLN OOL IN PT
75	-49	0.01	2.7	2.8	55.8	2.71	LS TAN XLN OOL IN PT
76	-50	0.01	1.6	4.1	62.0	2.71	LS TAN FXLN
77	5350-51	0.01	1.4	4.0	60.5	2.70	LS TAN FXLN

* DENOTES REFILLED FRACTURE ON PERM SAMPLE # 61

THERE IS A DEPTH CORRECTION ON CORE # 3 CORE 2 ENDS AT 5351 & CORE 3 STARTS @ 5346

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

February 7, 1975

REPLY TO
8 N. W. 42ND ST.
OKLAHOMA CITY, OKLA.
73118

Amoco Production Company
Security Life Building
Denver, Colorado 82020

Attn: Mr. Lloyd C. Furer

Subject: Core Analysis Data
Lee "A" No. 1 Well
Wildcat Field
Kearny County, Kansas
CLI File 3402-8231

Gentlemen:

A series of diamond cores were taken in the St. Louis interval of the Lee "A" No. 1 Well between 4830 and 5009.5 feet. The recovered formation was preserved at the well-site and transported to the Oklahoma City laboratory where the accompanying Core-Gamma Surface Log was recorded to aid correlation with downhole electrical surveys.

Full diameter samples were used to furnish the data presented on pages one through three of this report.

The interval 4838 to 4846 feet has poor porosity and permeability development and good oil saturation.

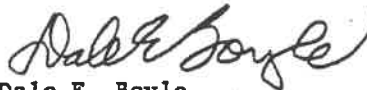
The interval 4974 to 4993 feet has physical properties and residual fluid saturation data indicative of oil productivity. However, decreasing residual oil saturation and increasing total water values suggests water cuts would be produced along with the oil production. Completion of the upper portion of this interval would minimize water cuts.

The cores are being prepared for shipment to Amoco in Denver.

We are pleased to have been of service.

Very truly yours,

CORE LABORATORIES, INC.



Dale E. Boyle
District Manager

DEB:es

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

Page No. 1

CORE ANALYSIS RESULTS

Company AMOCO PRODUCTION COMPANY Formation ST. LOUIS File 3402-8231
 Well LEE "A" NO. 1 Core Type DIAMOND Date Report 2-3-75
 Field WILDCAT Drilling Fluid WATER BASE MUD Analysts FUGH
 County KEARNY State KANSAS Elev. 3038' KB Location SEC. 4-26S-36W

Lithological Abbreviations

SAND - SD SHALE - SH LIME - LM	DOLomite - DOL CHERT - CH GYPSUM - GYP	ANhydrite - ANHY CONglomerate - CONG FOSSILIFEROUS - FOSS	SANDY - SDY SHALY - SHY LIMY - LIMY	FINE - FINE MEDIUM - MED COARSE - COSE	CRYSTALLINE - XLM GRAIN - GRN GRANULAR - GRNL	BROWN - BRN GRAY - GRV VUGGY - VUGY	FRACTURED - FRAC LAMINATION - LAM STYLOLITIC - STY	SLIGHTLY VERY WITH
SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		GRAIN DENS.	SAMPLE DESCRIPTION AND REMARKS
		PERM. MAX.	PERM. 30°		OIL	TOTAL WATER		

WHOLE-CORE ANALYSIS

	4830.0-36.0							Lm, shy
	36.0-38.0							Lm
1	38.0-39.0	4834 on log	<0.1	<0.1	1.6	4.9	79.2	2.73 Lm
2	39.0-40.0		0.1	0.1	2.1	6.2	78.9	2.71 Lm
3	40.0-41.0		0.1	0.1	2.8	10.2	73.9	2.70 Lm
4	41.0-42.0		0.1	0.1	2.4	15.5	55.0	2.70 Lm
5	42.0-43.0		0.1	0.1	2.1	12.1	50.1	2.70 Lm
6	43.0-44.0			2.2*	5.2	17.6	31.4	2.70 Lm
7	44.0-45.0		0.2	0.1	3.9	23.3	38.0	2.71 Lm
8	45.0-46.0		0.2	0.2	4.4	21.3	45.5	2.71 Lm
9	46.0-47.0		<0.1	<0.1	2.4	0.0	80.0	2.72 Lm
	47.0-84.0							Lm
	84.0-85.0							Lost Core
	85.0-28.0							Lm
31	4928.0-29.0		<0.1	<0.1	2.0	0.0	62.6	2.70 Lm, shy
32	29.0-30.0		0.1	0.1	2.7	0.0	64.0	2.72 Lm, shy
33	30.0-31.0		<0.1	<0.1	1.9	0.0	70.5	2.70 Lm, sl/shy
34	31.0-32.0		0.1	<0.1	2.0	0.0	67.8	2.70 Lm, sl/shy
35	32.0-33.0		0.1	0.1	2.4	0.0	61.0	2.70 Lm, sl/shy
36	33.0-34.0		<0.1	<0.1	2.0	0.0	66.9	2.70 Lm, sl/shy
37	34.0-35.0		<0.1	<0.1	1.2	0.0	79.0	2.70 Lm, shy
38	35.0-36.0		<0.1	<0.1	1.3	0.0	76.3	2.70 Lm, sl/shy, sty
39	36.0-37.0		0.1	0.1	2.2	0.0	68.1	2.70 Lm, sl/shy, sty
40	37.0-38.0		0.1	<0.1	2.3	0.0	71.1	2.70 Lm, sl/shy, sty
41	38.0-39.0		0.1	0.1	2.3	0.0	74.4	2.70 Lm, sl/shy, sty
42	39.0-40.0		0.1	0.1	2.4	0.0	73.1	2.70 Lm, sl/shy
43	40.0-41.0		0.1	<0.1	2.8	0.0	67.9	2.70 Lm, sl/shy
44	41.0-42.0			0.1*	3.7	0.0	63.8	2.70 Lm, sl/shy, sty, v f
45	42.0-43.0			0.1*	4.1	0.0	61.8	2.70 Lm, sl/shy, sty, v f
46	43.0-44.0			0.1*	3.3	0.0	63.7	2.70 Lm, sl/shy, v f
47	44.0-45.0		0.1	0.1	3.1	0.0	70.2	2.70 Lm, sl/shy, sty
48	45.0-46.0			0.1*	3.2	0.0	68.0	2.70 Lm, sl/shy
49	46.0-47.0		0.1	<0.1	2.7	0.0	73.8	2.70 Lm, sl/shy, sty
50	47.0-48.0		0.1	0.1	3.1	0.0	66.1	2.70 Lm, sl/shy, sty
51	48.0-49.0	44	0.3	0.1	3.4	0.0	67.9	2.70 Lm, sl/shy, sty
52	49.0-50.0		0.1	0.1	3.6	0.0	72.4	2.70 Lm, shy, sty
53	50.0-51.0		0.1	0.1	3.8	0.0	70.2	2.70 Lm, shy, sty
54	51.0-52.0		0.1	0.1	4.1	0.0	62.6	2.70 Lm, sl/shy
55	52.0-53.0		0.1	0.1	4.2	0.0	66.2	2.70 Lm, sl/shy
56	4953.0-54.0		0.1	0.1	4.8	0.0	67.1	2.70 Lm, shy, sty

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Gamma Ray Caliper	Texture Structure				Lithology	Lithofacies / Interpretation	Depth	Resistivity	Density/Neutron	
	gnst	pk	wke	mud					Porosity	
150						Cross Bedded Quartz Rich Carbonate Grainstone Eolian	5650			
							5655			Top of St. Louis
						Argillaceous Limestone - Deep Marine	2			
						Skeletal Wackestone - Open Marine	3			
						Ooid Skeletal Grainstone Mobile - Grain Shoal	5			"B Zone"
						Fenestral Lime Mud/Grainstone - Tidal Flat	4			
						Cemented Skeletal Ooid Grainstone Mobile - Grain Shoal	6			LLS
						Skeletal Wackestone - Open Marine	3			
						Cross Bedded Quartz Rich Carbonate Grainstone Eolian	1			
							5700			
							5710			Density
										Neutron
						Ooid Skeletal Grainstone Mobile - Grain Shoal	5			
						X-Bedded Qtz. Rich Carbonate Grainstone Eolian	1			
						Skeletal Wackestone Open Marine	3			"C Zone"
							5750			

Figure 8: St. Louis Lithofacies Distribution with Type Log

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