

OIL FIELD RESEARCH LABORATORIES
CHANUTE, KANSAS

February 3, 1951

3-31-16E
Natural Resources Corporation
Box 205
Neodesha, Kansas

Attention: Mr. John M. Keahy

Gentlemen:

Enclosed herewith is the report of the partial analysis of the Cable Tool core taken from the Hazen Lease, Well No. 3-B, Montgomery County, Kansas, and submitted to our laboratory on January 27, 1951.

In calculating the recovery for the sand within the vicinity of this well, an allowance was made for oil lost during coring, and it is assumed that the true water saturation of the sand is 35 percent.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

Carl L. Pate
Carl L. Pate *By cm*

CLP:eam
c. c.

NATURAL RESOURCES CORPORATION

CORE ANALYSIS REPORT

HAZEN LEASE

WELL NO. 3-B

MONTGOMERY COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

FEBRUARY 3, 1951

Oil Field Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Natural Resources Corporation Lease Hasen Well No. 3-B

Location _____

Section 3 Twp. 31 S Rge. 16 E County Montgomery State Kansas

Name of Sand		Bartlesville
Top of Core		810.00
Bottom of Core		935.40
Top of Sand ^{Pay}		818.55
Bottom of Sand ^{Pay}		829.98
Total Feet of Permeable Sand Analyzed		5.80
Distribution of Permeable Sand:		
Permeability Range Millidarcys	Feet	Cum. Ft.
_____	_____	_____

Average ^{Effective} Permeability Millidarcys		6.15
Average Percent Porosity		17.00
Average Percent Oil Saturation		31.36
Average Percent Water Saturation		49.46
Average Oil Content, Bbls./A. Ft.		414.
Total Oil Content, Bbls./Acre		6,190.
Average Percent Oil Recovery by Laboratory Flooding Tests		8.01
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.		113.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre		657.
Total Calculated Oil Recovery, Bbls./Acre		1,850.
Packer Setting, Feet		-
Viscosity, Centipoises @		
A. P. I. Gravity, degrees @ 60 °F		

LOG

Company Natural Resources Corporation Lease Hazen Well No. 3-B

<u>Depth Interval,</u> <u>Feet</u>	<u>Description</u>
810.00 - 816.80	- Gray shale.
816.80 - 818.55	- Light brown fine grained micaceous slightly shaley sandstone.
818.55 - 822.60	- Brown fine grained micaceous sandstone.
822.60 - 823.25	- Brown fine grained micaceous slightly shaley sandstone.
823.25 - 824.13	- Brown very fine grained micaceous sandstone.
824.13 - 828.83	- Brown fine grained micaceous sandstone.
828.83 - 829.13	- Dark brown fine grained micaceous sandstone.
829.13 - 829.45	- Dark fine grained micaceous carbonaceous sandstone.
829.45 - 829.98	- Brown fine grained micaceous sandstone.
829.98 - 831.75	- Dark fine grained micaceous carbonaceous sandstone.
831.75 - 832.05	- Laminated sandy shale.
832.05 - 832.20	- Dark fine grained micaceous carbonaceous sandstone.
832.20 - 833.20	- Gray shale.
833.20 - 833.90	- Laminated sandy shale.
833.90 - 834.95	- Laminated shaley sandstone.
834.95 - 835.40	- Hard brown fine grained micaceous shaley sandstone.

Oil Field Research Laboratories
RESULTS OF SATURATION TESTS

TABLE III

Company **Natural Resources Corporation** Lease **Hazen** Well No. **3-B**

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation		Oil Content, Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water		Total	Ft.	
1	817.12	15.7	31.6	56.9	68.5	0.80	0.80	308
2	818.01	16.4	32.4	41.2	73.6	0.95	1.75	392
3	819.11	16.0	29.7	64.5	94.2	1.05	2.80	388
4	820.16	16.0	28.9	56.4	85.3	1.00	3.80	403
5	821.11	17.3	29.5	66.2	95.7	1.00	4.80	396
6	822.08	15.2	30.7	63.7	94.4	1.00	5.80	362
7	823.03	15.2	27.1	47.4	74.5	0.65	6.45	208
F-8	823.08	14.5	23.1	-	-	0.88	7.33	229
8	824.22	15.8	33.7	40.0	73.7	0.57	7.90	236
9	825.22	19.0	33.4	49.7	83.1	1.00	8.90	492
10	826.22	17.9	33.9	38.3	72.2	1.00	9.90	471
11	827.27	18.5	30.1	40.2	70.3	1.10	11.00	474
12	828.48	19.9	32.3	43.2	75.5	1.33	12.33	664
F-13	829.37	20.5	32.6	-	-	0.32	12.65	165
13	829.51	16.1	30.3	46.6	76.9	0.53	13.18	225
14	830.41	15.0	36.7	42.5	79.2	1.02	14.20	436
15	831.58	15.7	37.3	40.0	77.3	0.75	14.95	341
						Total	- - - - -	6,190

Oil Field Research Laboratories

SUMMARY OF SATURATION TESTS

TABLE IV

Company	<u>Natural Resources Corporation</u>	Lease	<u>Hazen</u>	Well No.	<u>3-3</u>	
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbls./A. Ft.	Total Oil Content Bbls./Acre
816.80-824.70	7.90	16.09	29.56	55.88	370	2,922
824.70-831.75	7.05	18.01	33.38	42.75	464	3,268
816.80-831.75	14.95	17.00	31.36	49.46	414	6,190

Oil Field Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company Natural Resource Corporation Lease Hazen Well No. 3-B

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	Effective Permeability, Millidarcys **	Initial Fluid Production Pressure Lbs./Sq. In.
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1-A	817.32	14.7	55.7	385	0.0	0	55.7	45.5	385	0	Imp.	50 ⁺
2	817.87	16.0	52.9	409	0.0	0	52.9	51.9	409	0	Imp.	50 ⁺
3	818.97	14.8	50.3	343	3.3	37	27.0	67.3	308	24	0.345	25
4	820.03	17.0	29.3	387	0.0	0	29.3	53.6	387	4	0.150	40
5-A	820.97	16.3	28.5	360	0.0	0	28.3	53.9	360	1	0.0885	50
6	821.93	19.8	29.9	387	0.0	0	29.9	63.3	387	0.5	0.0663	50
7	823.15	14.3	28.7	318	0.0	0	28.7	52.2	318	0.5	0.0316	50
8	824.08	14.5	23.1	260	0.0	0	23.1	48.2	260	0	Imp.	50 ⁺
9	825.07	18.7	53.8	490	12.2	177	21.6	62.4	313	190	8.37	15
10	826.07	17.0	54.6	458	8.8	90	27.8	50.0	386	133	6.04	15
11	827.42	18.2	31.5	445	8.0	113	23.5	51.7	332	138	8.81	10
12	828.32	19.1	51.4	466	10.1	150	21.3	57.2	316	133	8.11	10
13	829.37	20.5	32.6	518	5.4	88	27.2	39.9	432	99	0.94	15
14	830.27	16.2	38.1	454	0.0	0	36.1	43.2	454	0	Imp.	50 ⁺
15	831.42	16.5	55.6	456	0.0	0	55.6	45.0	456	0	Imp.	50 ⁺

Notes: cc - cubic centimeter
 *Volume of water recovered at the time of maximum oil recovery.
 **Determined by passing water through sample which still contains residual oil.
 "A" samples were taken from the core after it was received in the laboratory.

Oil Field Research Laboratories
SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

Company	Natural Resources Corporation	Lease	Hazen	Well No.	3-B
Depth Interval, Feet					
Feet of Core Analyzed	812.55		029.65		
Average Percent Porosity			5.80		
Average Percent Original Oil Saturation			17.76		
Average Percent Oil Recovery			12.26		
Average Percent Residual Oil Saturation			8.01		
Average Percent Residual Water Saturation			24.25		
Average Percent Total Residual Fluid Saturation			56.73		
Average Original Oil Content, Bbls./A. Ft.			80.98		
Average Oil Recovery, Bbls./A. Ft.			44.5		
Average Residual Oil Content, Bbls./A. Ft.			113		
Total Original Oil Content, Bbls./Acre			332		
Total Oil Recovery, Bbls./Acre			2,580		
Total Residual Oil Content, Bbls./Acre			657		
Average Effective Permeability, Millidarcys			1,923		
Average Initial Fluid Production Pressure, p.s.i.			6.15		
			15.0		

NOTE: Only those samples which recovered oil were used in calculating the above averages.