

OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS 66720 - PHONE (316) 431-2650

July 28, 1981

Big Foot Oil Enterprises, Ltd.
107 East Main, Box 683
Independence, Kansas 67301

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Waggoner Lease, Well No. 6-A, located in Labette County, Kansas and submitted to our laboratory on July 21, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

A handwritten signature in cursive script that reads "Sanford A. Michel".

Sanford A. Michel

SAM/kas

5 c to Independence, Kansas

Offield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Big Foot Oil Enterprises, Ltd. Lease Waggoner Well No. 6-A.
 Location 190' SNL & 1480' WEL NE
 Section 14 Twp. 32S Rge. 17E County Labette State Kansas

Elevation, Feet
 Name of Sand **Bartlesville**
 Top of Core **815.0**
 Bottom of Core **836.0**
 Top of Sand **815.0**
 Bottom of Sand **836.0**
 Total Feet of Permeable Sand **19.0**
 Total Feet of Floodable Sand **6.0**

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	7.0	7.0
10 - 20	5.0	12.0
20 - 30	3.0	15.0
100 - 350	3.0	18.0
700 & Above	1.0	19.0

Average Permeability Millidarcys **80.0**
 Average Percent Porosity **17.8**
 Average Percent Oil Saturation **39.2**
 Average Percent Water Saturation **36.7**
 Average Oil Content, Bbls./A. Ft. **547.**
 Total Oil Content, Bbls./Acre **10,400.**
 Average Percent Oil Recovery by Laboratory Flooding Tests **12.**
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. **192.**
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre **1,153.**
 Total Calculated Oil Recovery, Bbls./Acre

See "Calculated Recovery"
Section

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The core was sampled and the samples sealed in plastic bags by a representative of the client. The core was reported to be from a virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
815.0 - 823.0	Brown slightly calcareous sandstone.
823.0 - 824.0	Dark brown slightly calcareous slightly carbonaceous sandstone.
824.0 - 825.0	Black slightly calcareous carbonaceous shaly sandstone.
825.0 - 826.0	Grayish black slightly calcareous slightly carbonaceous shaly sandstone.
826.0 - 832.0	Grayish brown slightly calcareous shaly sandstone.
832.0 - 835.0	Brown slightly calcareous sandstone.
835.0 - 836.0	Grayish brown slightly calcareous slightly carbonaceous shaly sandstone with fine coal partings.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,153 barrels of oil per acre was obtained from 6.0 feet of sand. The weighted average percent oil saturation was reduced from 44.2 to 32.2, or represents an average recovery of 12.0 percent. The weighted average effective permeability of the samples is 24.2 millidarcys, while the average initial fluid production pressure is 10.8 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 19 samples tested, 6 produced water and oil, and 4 produced water only. This indicates that approximately 30 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 2,010 barrels of oil per acre. This is an average recovery of 336 barrels per acre foot from 6.0 feet of floodable sand analyzed in this core.

These recovery values were calculated using the following data and assumptions:

Original formation volume factor, estimated	1.06
Reservoir water saturation, percent, estimated	25.0
Average porosity, percent	20.4
Oil saturation after flooding, percent	32.2
Performance factor, percent, estimated	55.0
Net floodable sand, feet	6.0

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE I-B

Company Big Foot Oil Enterprises, Ltd.Lease WaggonerWell No. 6-A

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	815.4	17.9	30	38	68	417	13.	1.0	1.0	417	13.00
2	816.6	15.2	32	53	85	377	14.	1.0	2.0	377	14.00
3	817.5	13.2	42	33	75	430	24.	1.0	3.0	430	24.00
4	818.5	15.7	33	39	72	402	10.	1.0	4.0	402	10.00
5	819.5	21.1	50	33	83	819	118.	1.0	5.0	819	118.00
6	820.5	17.6	56	33	89	765	10.	1.0	6.0	765	10.00
7	821.5	21.0	43	33	76	701	158.	1.0	7.0	701	158.00
8	822.5	23.9	46	26	72	853	764.	1.0	8.0	853	764.00
9	823.5	22.1	39	32	71	669	335.	1.0	9.0	669	335.00
10	824.5	20.4	45	19	64	712	3.7	1.0	10.0	712	3.70
11	825.4	17.6	39	29	68	533	1.1	1.0	11.0	533	1.10
12	826.4	17.3	35	39	74	470	0.68	1.0	12.0	470	0.68
13	827.5	17.9	28	46	74	389	1.1	1.0	13.0	389	1.10
14	830.5	12.6	28	48	76	274	2.2	1.0	14.0	274	2.20
15	831.4	16.1	39	43	82	487	2.0	1.0	15.0	487	2.00
16	832.5	18.9	31	36	67	455	23.	1.0	16.0	455	23.00
17	833.5	17.2	35	43	78	467	25.	1.0	17.0	467	25.00
18	834.6	16.5	46	31	77	589	12.	1.0	18.0	589	12.00
19	835.4	16.2	47	44	91	591	4.0	1.0	19.0	591	4.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Big Foot Oil Enterprises, Ltd. Lease Waggoner Well No. 6-A

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
815.0 - 824.0	9.0	160.7	1446.00
824.0 - 836.0	10.0	7.5	74.78
815.0 - 836.0	19.0	80.0	1520.78

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
815.0 - 824.0	9.0	18.6	41.2	35.6	605	5,433
824.0 - 836.0	10.0	17.1	37.3	37.8	497	4,967
815.0 - 836.0	19.0	17.8	39.2	36.7	547	10,400

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Well No. 6-A

Lease Waggoner

Company Big Foot Oil Enterprises, Ltd.

Company

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.
			%	Bbbls./A. Ft.	%	Bbbls./A. Ft.	% Oil	% Water			
1	815.4	18.0	30	419	0	0	30	59	76	1.34	30
2	816.6	15.1	32	375	0	0	32	54	260	4.64	25
3	817.5	13.3	42	433	0	0	42	41	268	11.61	20
4	818.5	15.8	33	405	3	37	30	61	230	8.38	15
5	819.5	21.2	50	822	12	197	38	50	210	45.97	10
6	820.5	18.0	55	768	21	293	34	55	276	8.69	10
7	821.5	21.1	43	704	13	213	30	47	232	18.59	10
8	822.5	23.8	46	849	14	258	31	56	132	25.98	10
9	823.5	22.2	39	672	9	155	30	53	178	37.48	10
10	824.5	20.5	45	716	0	0	45	21	0	Imp.	-
11	825.4	18.0	38	531	0	0	38	31	0	Imp.	-
12	826.4	17.4	35	472	0	0	35	40	0	Imp.	-
13	827.5	17.8	28	387	0	0	28	47	0	Imp.	-
14	830.5	12.7	28	276	0	0	28	49	0	Imp.	-
15	831.4	16.2	39	490	0	0	39	44	0	Imp.	-
16	832.5	18.8	31	452	0	0	31	37	0	Imp.	-
17	833.5	17.1	35	464	0	0	35	44	20	0.44	45
18	834.6	16.6	46	592	0	0	46	32	0	Imp.	-
19	835.4	16.3	47	594	0	0	47	45	0	Imp.	-

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.

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

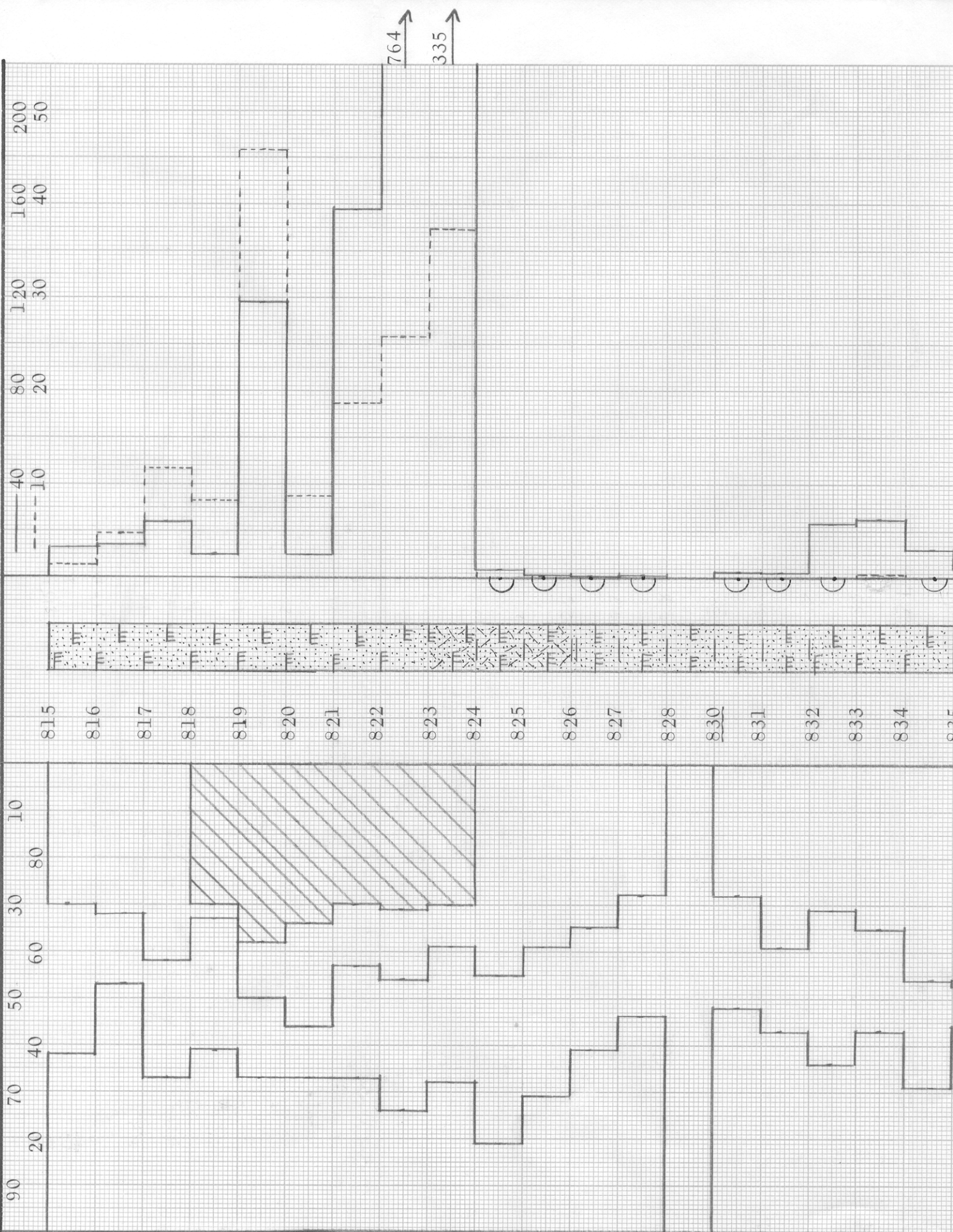
Company	Big Foot Oil Enterprises, Ltd.	Lease	Waggoner	Well No.	6-A
Depth Interval, Feet	815.0 - 824.0				
Feet of Core Analyzed	6.0				
Average Percent Porosity	20.4				
Average Percent Original Oil Saturation	44.2				
Average Percent Oil Recovery	12.0				
Average Percent Residual Oil Saturation	32.2				
Average Percent Residual Water Saturation	53.7				
Average Percent Total Residual Fluid Saturation	85.9				
Average Original Oil Content, Bbls./A. Ft.	691.				
Average Oil Recovery, Bbls./A. Ft.	192.				
Average Residual Oil Content, Bbls./A. Ft.	499.				
Total Original Oil Content, Bbls./Acre	4,148.				
Total Oil Recovery, Bbls./Acre	1,153.				
Total Residual Oil Content, Bbls./Acre	2,995.				
Average Effective Permeability, Millidarcys	24.2				
Average Initial Fluid Production Pressure, p.s.i.	10.8				

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

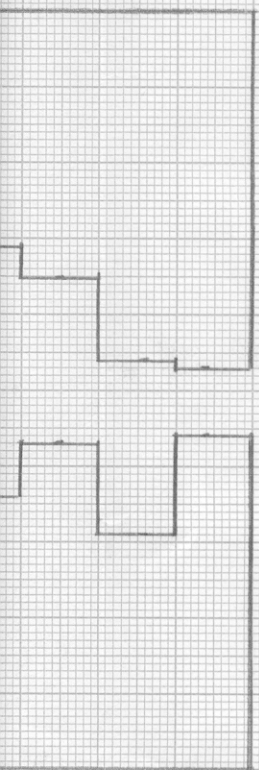
WATER SAT., PERCENT

OIL SAT., PERCENT




PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN
MILLIDARCYS







833
834
835
836



KEY:

-  CALCAREOUS SANDSTONE
-  SHALY CALCAREOUS SANDSTONE
-  FLOODPOT RESIDUAL OIL SATURATION

-  CARBONACEOUS CALCAREOUS SANDSTONE
-  CARBONACEOUS SHALY CALCAREOUS SANDSTONE
-  CARBONACEOUS SHALY CALCAREOUS SANDSTONE WITH COAL PARTINGS
-  IMPERMEABLE TO WATER

BIG FOOT OIL ENTERPRISES, LTD.

WAGGONER LEASE
WELL NO. 6-A

LABETTE COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE		AVG. WATER		AVERAGE		CALCULATED OIL RECOVERY BBLs. / ACRE
		PERCENT POROSITY	SATURATION	SATURATION PERCENT	PERMEABILITY, MILLIDARCYS	PERCENT	OIL RECOVERY	
815.0 - 824.0	9.0	18.6	41.2	35.6	160.7			2010
824.0 - 836.0	10.0	17.1	37.3	37.8	7.5			(PRIMARY AND WATERFLOODING)
815.0 - 836.0	19.0	17.8	39.2	36.7	80.0			

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JULY, 1981

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