GEOLOGICAL REPORT

Will P. Ash
Borell #1
NW NE SE, Section 19-14S-10W
Ellsworth County, Kansas

By

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Elevations:	1673 Ground Level 1676 Derrick Floor 1678 Kelly Bushing
Contractor:	Sage Drilling Co. - Rig #1
Commenced:	December 13, 1966
Completed:	December 21, 1966
Rotary Total Depth:	3196'
Surface Pipe:	281' of 8-5/8" w/158 sx
Production Pipe:	2900' of 5-1/2" w/175 Sx
Electric Log:	Schlumberger
Remarks:	One foot drilling time was kept from 1900' to 3196'. Samples were saved from 1900' to 3196'. Geological supervision at the well site from 1900' to R.T.D.

Formation Tops: (All measurements are from Kelly Bushing)

	Sample	E. Log	Sub Sea
Indian Cave	2007	2007	(- 329)
Grandhaven	2058	2059	(- 381)
Dover Lm	2183	2081	(- 403)
Tarkio Lm	2136	2136	(- 458)
Willard Sh	2160	2160	(- 482)
Willard Sd	2172	2160	(- 492)
Elmont	2200	2201	(- 523)
Howard	2344	2344	(- 666)
Topeka	2423	2421	(- 743)
Queenhill	2585	2585	(- 907)

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Formation Tops: (Cont'd)

	Sample	E. Log	Sub Sea
Heebner	2669	2670	(- 992)
Toronto	2687	2687	(-1009)
Douglas	2703	2703	(-1025)
Brown Lime	2762	2763	(-1085)
Lansing	2779	2781	(-1103)
Base Kansas City	3049	3050	(-1372)
Arbuckle	3161	3161	(-1483)
Total Depth	3196	3195	(-1517)

Reservoirs: The following are descriptions of all reservoirs containing shows of oil or gas or reservoirs felt pertinent by the writer. All measurements are from Kelly Bushing.

Tarkio Section

2067-74 (Sample)
2068-74 (E. Log) (lst Tarkio Sand) Light grey very fine to silt size glauconitic micaceous and slightly limmy sand, no show, no odor. Electric log calculations thru this zone are as follows: (2069-74) 21% porosity - 60% SW

2090-2105 (Sample)
2098-2106 (E.Log) (2nd Tarkio Sand) Light grey very fine friable glauconitic, and micaceous sand with small show of gas and trace of free oil, fair flouresence, no odor. Electric log calculations as follows: (2101-04) 16% porosity - 77% SW

DST #1: 2061-2100 Open 15", Shut in 30", Open 60", Shut in 60" Gas to surface in 4 min, Gauged 250 MCFG Recovered 30' mud. IBHP 458#/30"; FP 83# - 116# FBHP 500#/60"

Willard Section

2172-81 (Sample)
2170-82 (E.Log) (Willard Sand) Light grey very fine very friable slightly glauconitic, micaceous sand with fair show free oil and gas, good flouresence and fair odor. Electric log calculations as follows: (2173-77) 19.5% Porosity - 76% SW

DST #2: 2159-85 Open 15", Shut in 30", Open 60", Shut in 60"- Recovered 400' Gas in pipe and 160' gas cut mud with few specks oil. IBHP 399#/30"; FP 66#/-74#; FBHP 647#/60"

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Topeka	2423 (-745) Sample	
	2423-30 (Sample) 2422-28 (E. Log)	Cream to tan very fine crystalline to sucrosic lite dolomitic lime with poor inter crystalline porosity, fair show free oil good even tan saturation, good flouresence. Electric log calculations as follows: (2425-29) 14.5% Porosity - 62% SW
	2499-2509 (Sample) 2499-2510 (E.Log)	Cream to light tan very fine crystalline to sucrosic dolomitic fossiliferous lime with poor inter crystalline porosity. Trace of free oil, good even tan saturation, good flouresence and fair odor. Electric log calculations follows: (2499-2505) 18% Porosity - 75% SW
Lansing	2779 (-1101) Sample	
	2800-18 (Sample) 2801-20 (E.Log)	30' Zone) White to cream fine crystalline coarse oocastic lime with good oocastic porosity, good show free oil, good even saturation, good odor and abundant free oil in wet samples. Approximately 10% of porosity barren. Electric log calculations as follows: (2800-10) 25% Porosity - 28% SW (2810-14) 21.5% Porosity - 49% SW (2814-20) 15.5% Porosity - 46% SW
DST #3:	2795 - 2815	Open 15", Shut in 30"; Open 60", Shut in 60". Recovered 1130' Gas in pipe, 70' very heavy oil and gas cut mud and 120' gassy oil. IBHP 905#/30"; FP 40# -90#; FBHP 890#/60"
	2862-73 (Sample) 2861-74 (E. Log)	(90' Zone) Cream to light tan very fine crystalline to sucrosic, slightly fossiliferous lime with poor to fair pin point porosity with scattered show free oil, good even tan saturation, fair to good odor, good flouresence.
DST #4:	2853 - 2880	Open 15"; Shut in 30"; Open 60"; Shut in 60". Recovered 235' Gas in pipe, 60' slightly oil and gas cut muddy water and 300' salt water. IBHP 920#/30"; FP 20#-195#; FBHP 800#/60"

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	2990-98 (Sample) 2991-98 (E. Log)	Buff to light grey very fossiliferous and oolitic lime with fair show free oil, very poor fossil cast and inter oolitic porosity, good even tan saturation. Electric log calculations as follows: (2991-94) 14% Porosity - 55% SW (2994-96) 15.5% Porosity - 57% SW (2996-3000) 13% Porosity - 70% SW
DST #6:	2980 - 3010	(Straddle Test) Open 15"; Shut in 30"; Open 60"; Shut in 60". Recovered 55' muddy salt water. IBHP 920#/30" FP 0# - 0#; FBHP 870#/60"
Conglomerate Sand		3137 (-1459) Sample
	3137-43 (Sample) 3138-43 (E. Log)	White very fine sub round friable good sorted slightly limy sand, no show, no odor. Electric log calculations as follows: (3137-41) 19% Porosity - 80% SW (3141-43) 17% Porosity - 87% SW
Arbuckle	3161 (-1483) Sample	
	3161-63 (Sample) 3161-63 (E. Log)	Buff to cream medium to coarse crystalline Rhombic dolomite with poor to fair inter crystalline porosity. No free oil, no stain. Trace of light flouresence, chalky in part.
DST #5	3112 - 3163	Open 15"; Shut in 30"; Open 105"; Shut in 60". Recovered 310' salt water with slight show of oil. IBHP 665#/30"; FP 25# - 145#; FBHP 355#/60"
	3163-74 (Sample)	Buff to cream medium to coarse crystalline Rhombic dolomite with fair to good inter crystalline porosity. No show, no odor, no flouresence.
	3174-96 (Sample)	Dolomitic as above and getting very chalky. No show, no odor. Electric log calculations as follows: (3164-68) 13% Porosity - 51% SW (3168-74) 15% Porosity - 57% SW

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Recommendations:

1.) It was recommended that 5-1/2" casing be set at 2900 feet.

2.) Perforate by electric log measurements from 2800 feet to 2804 feet; clean up with mud acid and test until desired fluid is obtained

3.) After depletion of Lansing 30' zone, it is recommended that the Willard sand be perforated from 2170 -2182 by electric log measurements, and adequately tested.

4.) After adequately testing Willard sand, it is recommended that the interval from 2098 - 2106 by electric log measurements be adequately tested.

5.) Perforate by electric log measurements from 2068 - 2074' and adequately test.

Respectfully submitted,

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