PY

GEOLOGIC REPORT

Richlan Drilling Company
#1 B&D

App. SE/SE/SE/ 25-17-12W
Barton County, KS

GENERAL INFORMATION

Contractor	:	Allen Drilling Co. Rig #3
Commenced	:	June 16, 1993
Elevations	:	GL 1826 KB 1831
Surgace Casing	:	305' of new 8 5/8" cemented with III sacks common, 74 sack pozimix, 2% gel and 3% calcium chloride
Drilling Time	:	Great Guns, Radiation-Guard Microresistivity
Samples Examined	:	2600 - 3336'
Drill Stem Test	:	#1 2924 - 2953 #2 3037 - 3119 #3 3173 - 3259 #4 3269 - 3302
Electric Log	:	Great Guns, Radiation-Guard Microresistivity
Pipe	:	3329' of 5 1/2", with 150 sacks 40/60 pozimix
Completed	:	June 23, 1993

GEOLOGICAL & LOG TOPS

	Rotary	Log
Anhydrite	None	None
Howard Limestone	2605 (-744)	2607 (-776)
Topeka Limestone	2638 (-807)	2639 (-808)
Heebner Shale	2930 (-1099)	2931 (-1100)
Toronto Limestone	2945 (-1114)	2950 (-1119)
Douglas Shale	2963 (-1132)	2966 (-1135)
Lansing-Kansas City	3046 (-1215)	3050 (-1219)
Base Kansas City	3302 (-1471)	3300 (-1496)
Arbuckle Dolomite	3325 (-1494)	3327 (-1496)

GEOLOGICAL TOPS AND ZONES

Top Anhydrite None

Top Howard Limestone 2605(-774) ELOG 2607(-776)

Top Topeka Limestone 2638(-807) ELOG 2639(-808)

2856-2860 Limestone - light brown, medium hard, with a few pieces very slightly friable, fine xln, fossiliferous (some secondary xln), trace residual stain, no show free oil.

2881-2886 Limestone - cream to tan, trace moderately friable to medium hard in part, fine xln with trace medium xln, slightly sucrosic in part, some slightly chalky in part, some fair to good, fine oolicastic porosity, some residual stain, trace to some fair light to medium brown saturation (partial in part), faint to fair odor fair show free oil perforate.

2894-2910 Limestone - off white to very light gray, slightly friable to medium hard, very fine to trace medium xln, some secondary xln, very slightly sucrosic in part, slight to moderately oolitic in part, slightly fossil-ferous, some fair to good oolicastic porosity, some residual stain, some fair to good stain to saturation, very faint odor, slight to fair odor, slight to fair show free oil ? perforate.

Top Heebner Shale 2930(-1099) ELOG 2931(-1100)

Top Toronto Limestone 2945(-1114) ELOG 2950(-1119)

2950-2960 Dolomite - very light to light brown, trace very slightly friable to medium hard, fine to medium in part xln, sucrosic in part some moderately calcareous, some moderate to very oolitic in part (in upper part of zone), some fair to/good interoolitic to vugular porosity, trace to some poor to fair interxln to vugular porosity, good saturation, fair to good odor, good show free oil (light to meduim brown) perforate.

Top Douglas Shale 2963(-1132) ELOG 2966(-1135)

DST#1 2924-2963; 30-30-30-30; weak building to strong blow thru-test; Recovery 560' of gas in pipe, 40' oil cut mud (23% oil); 60' of oil cut mud (10% oil); ISIP 943, FSIP 931, IFP 35-35, FFP 47-47

Top Brown Limestone 3033(-1202) ELOG 3034(-1203)

Top Lansing-KC Limestone 3046(-1215) ELOG 3050(-1209)

3056-3060 Limestone - cream to light brown, medium hard to hard, very fine to fine, with trace medium xln, trace to some secondary xln fossils with some poor to fair, fine to medium vugular porosity (round to elongate), some fair scattered stain to partial saturation (medium to trace dark brown), slight to fair odor, fair show free oil, perforate before abandonment.

3082-3088	Limestone - off white to cream, very slightly friable to medium hard, very fine to fine xln, slight to moderately chalky in part, oolitic in part, trace fair oolicastic and some fair vugular porosity, some partial saturation and stain, fair odor, slight to fair show free oil, perforate before abandonment.
3096-3102	Limestone - cream to medium brown to trace dark brown, slightly friable to hard dense, some moderate to very oolitic, fossiliferous becoming chalky bottom of zone, trace fair interoolitic to vugular porosity some residual stain to saturation, faint odor, very slight show free oil ? perforate.
3119-3124	Limestone - cream to tan, medium hard to hard becoming slightly softer (chalky), slightly fossilifereous, slightly oolitic, trace fair ineroolitic and trace poor fine vugular porosity, slight odor, trace partial saturation to stain, ? very slight show free oil.
DST#2	3037-3119 30-30-30-30; recovery 750' of gas in pipe, 30' of very slightly oil cut mud; ISIP 400, FSIP 589, IFP 35-35, FFP 58-47, weak building to strong blow thru-test.
3129-3136	Limestone - cream to very light brown friable to some medium hard, very fine to fine with trace medium xln, very oolitic, good oolicastic porosity, good saturation with some partial saturation and some barren (20%) good to very good odor, good show free oil (medium to slightly dark brown oil) perforate.
3188-3196	Limestone - off white to cream to tan, medium hard to hard, very fine to fine xln with trace medium xln, trace poor fine vugular porosity, trace poor partial stain ? perforate.
3204-3208	Limestone - off white to cream, slightly friable to medium hard, very fine to fine with trace medium xln, moderate to very (medium) oolitic, very slightly chalky in part, trace to some poor to fair interoolitic to slightly vugular and trace fair oolicastic porosity, some residual to dead oil stain, fair saturation in part, slight to fair odor, fair show free oil, ? perforate.
3222-3232	Limestone - off white to cream to tan hard to moderately friable, fine xln, slightly sucrosic, moderate to some very oolitic (fine to medium in part), some fair to good oolicastic porosity, trace interoolitic porosity, very faint odor, very slight show free oil, ? perforate.
3258-3262	Limestone - off white to slightly cream, slightly friable to medium hard, fine to some very fine xln, some moderately oolitic, some fair to good oolicastic and trace poor to fair interoolitic to slightly vugular porosity, slight partial saturation and stain, trace residual stain very faint odor, very slight show free oil, ? perforate.

DST#3 3173-3259; 30-30-15-15; very weak blow for 30 minutes, recovered 30' of mud; ISIP #1151 FSIF #1036, IFP #58-58, FFP #70-47.

3288-3294 Limestone - cream to light brown, slightly friable to medium hard, fine to very fine xln, slight to moderately oolitic trace fair oolicastic and some fair to trace good interoolitic to slightly vugular porosity, trace scattered brown stain and saturation, slight to fair show free oil, perforate before abandonment.

Base Kansas City 3302(-1471)ELOG 3300(-1469)

DST#4 3269-3302; 30-15-15-15; very weak blow, dead 9 minutes, recovered 15' of slightly oil cut mud; ISIP #82, FSIP #58, IFP #23-23, FFP #23-23.

Arbuckle Dolomite 3325(-1494) ELOG 3327(-1496)

3327-3331 Dolomite - off white, very light gray, light brown, very slightly friable to medium hard, fine to some medium xln, sucrosic in part, trace imbedded white chert, some (very fine to fine) fair interxln and trace good interxln, with trace good vugular porosity, some good saturation, good odor, good show free oil.

3332-3336 Dolomite - cream, very light gray, light brown, medium hard to some hard dense tight, very fine to fine xln, trace very fine interxln porosity, some brown stain slight odor, slight show free oil with trace to some moderate oolitic (chert oolites), slightly dolomitic, with trace interoolitic porosity, some brown saturation very slight show free oil.

REMARKS

All above figures are from rotary bushing measurements at and elevation of 1831 feet, 5 feet above ground level.

The #1 B&D was correlated to the #1 Hipp located 660 feet southeast. The Lansing-Kansas City ran flat to the #1 Hipp and ran 6 feet high to the #1 Huslig. The conglomerate section thinned on the #1 B&D and the Arbuckle ran 37 feet high to the #1 Hipp and 18 feet high to the #1 Huslig. The Arbuckle was penetrated 9 feet, with a good show of oil. Four DST's were ran with a favorable one in the Toronto Limestone and moderately favorable in top of Lansing-Kansas City for secondary zones. Due to good structural position, with good shows in Arbuckle and DST #1 & 2. Pipe was set on the #1 B&D

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