

FORMATION LOG

WENDELL S. JOHNS

Deep Rock #3 Lemon  
NE/NE/SE; 33-26S-13W  
Pratt County, Kansas  
Elevation: 1956 Derrick floor

Comm: 8-25-52  
Comp: 9-24-52  
8 5/8" casing 864'  
5 1/2" casing 4469'

Note: All measurements are from the top of the rotary bushing which is 3 feet above the derrick floor.

<u>Depth</u>	<u>Formation Description</u>	<u>Remarks</u>
0 - 280	Soil, sand and shale	Drillers log 0 - 3500
280 - 540	Shale and shells	
540 - 880	Shale and sand	
880 - 1410	Red beds, shale and shells	
1410 - 1810	Shale and shells	
1810 - 1985	Shale and limestone	
1985 - 2100	Limestone	
2100 - 2230	Limestone and shale	
2230 - 2490	Limestone	
2490 - 2760	Limestone and shale	
2760 - 2830	Shale	
2830 - 2852	Shale and sand	
2852 - 3110	Shale	Top Tarkie? 2944; electric log
3110 - 3150	Shale and sand	
3150 - 3395	Shale and limestone	Top Severy 3215; Top Topeka 3232 (both from electric log)
3395 - 3500	Limestone	
3500 - 3557	Limestone, tan to gray, sub-crystalline to finely crystalline	Sample log 3500 - T.D.
3557 - 3584	Limestone, buff to tan, finely sacrose, some good honeycomb porosity.	No show
3584 - 3586	Shale, black	
3586 - 3612	Limestone, brown to gray, dense	
3612 - 3617	Shale, soft, black	Heebner
3617 - 3622	Limestone, gray-blue to gray-brown sub-crystalline to dense	
3622 - 3635	Shale, gray and gray-green, trace brown, some silty shale	Leavenworth
3634 - 3652	Limestone, white to cream, sub-crystalline to finely crystalline.	Toronto
3652 - 3679	Shale, gray-green and gray, silty, streaks, brown, limestone, sub-crystalline, argillaceous.	Top Douglas 3652
3679 - 3719	Sand, white, fine to sub-medium, angular, fairly clean, pale green toward bottom with some glauconite.	Douglas Sand, no show
3719 - 3773	Shale, green, gray, brown, trace sand as above, much silty shale.	
3773 - 3780	Limestone, brown, dense, resinous.	Brown Lansing
3780 - 3798	Shale, gray and brown with streaks limestone as above.	
3798 - 3819	Limestone, light gray to brown, sub-crystalline to finely crystalline.	Top Lansing 3798

## (2) Formation log; Deep Rock #3 Lemon

<u>Depth</u>	<u>Formation Description</u>	<u>Remarks</u>
3819 - 3822	Shale, gray and brown	
3822 - 3824	Limestone, dense brown, clean	
3824 - 3842	Limestone, white to brown, sub <sup>o</sup> crystalline, resinous, good spotted vugular porosity.	Good odor, fair show free oil
3842 - 3850	Limestone, brown to gray, dense, mottled, fossiliferous.	
3850 - 3851	Shale, gray	
3851 - 3866	Limestone, gray to buff, finely crystalline, oolitic, crinoidal, spotted vugular porosity; chert, gray, oolitic, semi-devitrified.	Light spotted oil stain.
3866 - 3889	Limestone, gray to tan, sub-crystalline, chert, gray opaque.	
3889 - 3895	Shale, black, micaceous, some limestone, possibly some porosity - no show.	
3895 - 3902	Limestone, brown to dense mottled.	
3902 - 3904	Shale, dark gray and brown	
3904 - 3914	Limestone, brown, sub-crystalline to dense, good vugular porosity, chert, gray opaque.	No show
3914 - 3919	Limestone, brown, dense	
3919 - 3930	Limestone, gray to brown, sub-crystalline, crypto-oolitic, good vugular porosity.	No odor, slight show free oil.
3930 - 3934	Limestone, brown, dense	
3934 - 3938	Limestone, gray to buff, sub-crystalline, poor pin-point porosity.	No show
3938 - 3946	Limestone, as above, no porosity.	
3946 - 3949	Shale, green and brown	
3949 - 3955	Limestone, tan, finely sucrose oolitic, good oolitic porosity.	Trace odor; fair to good show free oil.
3955 - 3963	Limestone, gray to brown, sub-crystalline to dense, chert, tan to gray opaque.	
3963 - 3965	Shale, green and brown	
3965 - 3971	Limestone, gray to tan sub-crystalline, oolitic; fair vugular porosity.	Trace odor; fair show free oil.
3971 - 3981	Limestone, as above, no porosity.	
3981 - 3983	Shale, green and brown	
3983 - 3987	Limestone, as above	
3987 - 3990	Limestone, as above, good spotted vugular porosity.	No odor; trace free oil.
3990 - 3997	Limestone, brown, sub-crystalline to dense, fossiliferous.	
3997 - 4005	Limestone, tan to gray-brown, dense, oolitic, fossiliferous, some oolitic and pin-point porosity; chert, gray to white opaque.	Trace odor, slight to fair show free oil.
4005 - 4014	Limestone, tan to brown, dense, some chert, gray to dark brown translucent.	

## (3) Formation log; Deep Rock #3 Lemon

<u>Depth</u>	<u>Formation Description</u>	<u>Remarks</u>
4014 - 4017	Limestone, as above, streaks brown shale.	
4017 - 4020	Limestone, as above	
4020 - 4021	Shale, brown	
4021 - 4028	Limestone, gray to brown dense, some oolites and oolite casts, some good oolitic and vugular porosity; chert, white, brown and gray, opaque and translucent.	Fair odor, good show free oil
4028 - 4062	Limestone, tan, dense, trace chert	
4062 - 4064	Shale, gray and brown	
4064 - 4069	Limestone, as above	
4069 - 4073	Limestone, dark brown to gray, dense, oolitic, some oolitic and pin-point porosity.	Trace stain.
4073 - 4087	Limestone, brown dense to sub-crystalline	
4087 - 4090	Shale, brown and gray	
4090 - 4106	Limestone, brown to gray, dense to sub-crystalline, slightly oolitic.	
4106 - 4110	Shale, brown and gray	
4110 - 4114	Limestone, as above, more oolites.	Base Kansas City 4114
4114 - 4126	Shale, light green, calcareous, sandy. Trace black shale.	Marmaton.
4126 - 4134	Limestone, gray-green dense.	
4134 - 4144	Shale, green, brown and gray	
4144 - 4148	Limestone, as above, some chert, gray opaque.	
4148 - 4151	Shale, as above	
4151 - 4157	Limestone and chert, as above	
4157 - 4176	Shale, as above, few thin limestone streaks as above, some vari-colored chert, especially amber.	
4176 - 4184	Limestone, gray to dark brown dense, some gray and green shale; much chert, amber, brown, white, and gray, translucent to opaque, some devitrified chert.	Good brown stain in devitrified chert
4184 - 4193	Shale, as above, possibly some limestone, as above, much chert	
4193 - 4203	Chert, green, black, brown, opaque to translucent, some shale green & gray.	Black dead stain. Top Mississippi 4193 (Mississippi)
4203 - 4209	Mostly shale, as above, trace chert.	
4209 - 4220	Chert, white, vitreous opaque to translucent, trace brown and green opaque, much gray-green devitrified chert with good show black and brown dead oil. Some blue-gray vitreous porous chert with live brown oil show.	Much dead black stain. Trace live brown stain. Main Mississippi chert
4220 - 4227	Shale, green, brown and green-gray, some limestone brown and green dense. Possible trace chert.	Top Kinderhook 4220
4227 - 4242	Chert, white, amber, citrine, translucent to semi-transparent, very vitreous, some figured chert. Possibly some devitrified chert with dead oil stain.	Kinderhook Chert

(4) Formation log; Deep Rock #3 Lemon

<u>Depth</u>	<u>Formation Description</u>	<u>Remarks</u>
4242 - 4276	Shale, green, gray, brown; some limestone, blue-gray sub-crystalline to dense, probably some chert streaks.	
4276 - 4298	Chert, brown opaque to translucent, white chins chert, some white and brown devitrified, porous chert.	Top Viola 4276; slight odor, trace free oil, some gas bubbles. Much dark stain.
4298 - 4302	Limestone, tan sucrose, some chert.	
4302 - 4323	Chert, as above, some figured, much citrine chert.	Dark stain
4323 - 4328	Shale, dark green and light green; Limestone, white and red crystalline and gray to black, some brown sub-crystalline sandy limestone	
4328 - 4336	Shale, green sandy, trace green shaly sand.	Top Simpson 4328; cored 4330-78; (See core record on following pages)
4336 - 4354	Sand, calcareous (see core record)	Some oil show
4354 - 4364	Limestone, sandy, dolomitic, some vugular porosity.	Some oil show
4364 - 4367	Shale, green, sandy	
4367 - 4384	Sand, fine silty gray to green (see core record)	Trace oil show
4384 - 4429	Shale, green, some streaks shaly sand and brown crystalline dolomite.	
4429 - 4433	Sand, white calcareous to limestone white sandy. Some sand, light, medium, angular.	Trace oil stain in sand.
4433 - 4443	Dolomite, tan, finely sucrose and dolomite tan to white crystalline, some red crystals; slight trace inter-crystalline porosity.	Top Arbuckle 4433; slight odor, trace free oil.
4443 - 4444	Dolomite, as above, trace apple green shale.	
4444 - 4445	Dolomite, as above, trace chert	
4445 - 4453	Dolomite, brown, finely crystalline to dense, very oolitic and porous, trace chert.	Trace odor, spotted stain; trace free oil.
4453 - 4458	Dolomite, as above, tight, considerable chert, white opaque and brown and citrine translucent.	
4458 - 4464	Dolomite, brown to buff, crystalline oolitic and vugular porosity. Chert, white opaque, oolitic and brown opaque.	Fair odor, spotted stain; trace free oil.
4464 - 4470	Dolomite, buff to brown crystalline, tight. Some chert, brown, citrine, translucent.	Very little, if any, oil show
4470		TOTAL DEPTH Ran Laterolog

(5) Formation log; Deep Rock #3 Lemon

CORES:

The following cores were taken in the #3 Lemon - all in the Simpson:

#1 - 4330-47; Recovered 16' (probably lost most of other foot in fissile green shale at top).

Top 4" Green sandy shale and hard green shaly sand - streaks slightly calcareous. Crumbly and fissile

13" Calcareous sand to very sandy limestone. White, very hard.

13" Shale, greenish black, sandy; white calcite and limestone inclusions.

21" Shale, dark green; very thin streaks sandy shale. One 2" streak hard green sand in middle.

11" Sand, poorly sorted; black and white streaks inter-fingered; intercalated streaks bright green sandy shale; spots red limestone. Very tight, no show.

11" Sand medium, fairly well sorted, slightly calcareous; streaks bright green shale. Appears to have fair porosity. Fair odor and light oil stain.

9" Sand, brown, medium, fairly well sorted, slightly calcareous, good porosity, good odor and stain.

7" Sand, as above, some green shale streaks. Streaks dark brown and black oil stain. Good odor.

17" Sand, intercalated white and black streaks and streaks green sandy shale. Sand is calcareous, fairly tight, much gilsonite between sand grains. Slight odor. Trace live oil.

16" Sand, white, very calcareous, some almost sandy limestone. A few streaks bright green shale. Sand very tight. A few streaks dark brown oil stain.

Bottom 70" Sand, light brown, calcareous; streaks white very calcareous sand. A few very thin streaks green sandy shale. Sand medium, fairly well sorted, angular mostly fairly tight. A few thin streaks appear to have fair porosity. Slight odor and fair brown oil stain throughout.

#2 - 4347 - 60; Recovered 11½ feet.

Top 3½" Sand, very calcareous throughout. Many thin streaks green shale, many phosphate bubbles. Very poor porosity throughout. Slight odor and streaks light brown oil stain.

3' 3" Very calcareous sand and sandy limestone, white to yellow, crystalline. Sand grains poorly sorted. Many green shale streaks. Very tight throughout. Possible trace odor. A few streaks dark brown oil stain.

12" Limestone, gray-brown, dense to finely crystalline, with streaks dense yellow limestone and brown finely crystalline dolomite. A few scattered sand grains. Very tight, no show.

34" Limestone, as above. Scattered vugs with dark brown to black oil stain. Fair odor.

Bottom 11" Limestone, as above, very tight, no show.

(Cores cont'd.)

#3 4360 - 79; Recovered 14' and 3"

Top 3' 10" Limestone very hard and dense, dark brown, grading into dense brown dolomite at bottom. Very tight. Some fossils and a few scattered sand grains throughout. No show.

11" Shale, black to brown black, slightly sandy, considerable pyrite. Looks much like Chattanooga shale. No show.

20" Shale, green, sandy, many phosphate pebbles. No show.

7" Shale black, fairly sandy at top, grading into shaly sand at bottom.

4' 3" Sand, light gray to light green, to brown, fine, silty to muddy, some pyrite, no shale or calcareous material. Very highly crossbedded. Fair odor throughout, spots with brown stain bleeding oil very tight. (Probably about 8' of sand represented by this 4' 3").

Bottom 3" Sand, much as above, harder, tighter, more silty. Very little if any odor. A few small spots of brown stain bleeding a little oil.

#### DRILL STEM TESTS:

The following drill stem tests were run on the #3 Lemon:

##### Mississippi:

(1) 4180-4204 - Top Mississippi (Mississippi)

Double packer.

Open 1 hour - gas to surface in 7 min., gauged 1,020,000 cubic feet per day.

Recovered 30' slightly gas cut mud.

Initial flowing pressure 425#

Final flowing pressure 425#

Bottom hole pressure 1125# (30 min.)

(2) 4208-4225 - Main Chert.

Double packer.

Open 1 hour - good blow throughout, no gas to surface

Recovered 270' gas; 25' very slightly gas cut mud; no oil or water

No flowing pressure

Bottom hole pressure 375# (30 min. - still increasing)

Note: The first attempt to run test #2 failed when tool hit a bridge at about 3100'. Reconditioned hole and tool went alright on second try.

##### Kinderhook:

(3) 4225-55 - Double packer, open 1 hour; gas to surface in 23 min.

Volume not large enough to measure.

Recovered 37' slightly gas cut mud; no oil or water.

No flowing pressure.

Bottom hole pressure 1150# (30 min.)

##### Viola:

(4) 4275 - 4320 - Double packer. Open 1 hour - (gas to surface in 15 min.)

Recovered 3450' gassy oil. Some muddy oil at bottom. No water.

Initial flowing pressure 350#

Final flowing pressure 750#

Bottom hole pressure 1200# (30 min.)

(7) Formation log; Deep Rock #3 Lanon.

Simpson:

- (5) 4329 - 47; Upper Simpson sand  
Open 1 hour; good blow throughout  
Recovered 1800' gas; 50' heavily oil cut mud; some free oil in tool; no water  
No flowing pressure.  
Bottom hole pressure 360# (30 min. - still increasing)
- (6) 4346 - 60; Simpson limestone; open 1 hour; very small blow which quit  
in 9 min.  
Recovered 15' mud; no oil, gas or water  
No bottom hole pressure.
- (7) 4359 - 78; Lower Simpson sand; open 1 hour; fair blow which quit in 30 min.  
Recovered 40' mud; no oil, gas or water  
Bottom hole pressure 240# (30 min. - still increasing)

COMPLETION DATA:

Ran Lane-Wells Log  
Perf. 42 $\frac{1}{2}$  @ 4333-40  
Acidized 500 gal.  
S/5 goph - no water  
Sand-fract  
Acidized 500 gal.  
Lacked 59 barrels out of getting back load.

Set plug @ 4316  
Perf. 4280-92 - 6 holes per foot  
Gas to surface immediately  
S/2 $\frac{1}{2}$  boph/14 hrs.  
Acidized 500 gal.  
S/179 b.o./16 hrs.  
Potential 188 bo/24 hrs.  
1.6% water.

(Samples examined & log compiled by  
Wendell S. Johns)

T I M E L O G

WENT FORTH 1959

Deep Rock #3 Lemon  
 NE/NE/SE; 33-263-13W  
 Pratt County, Kansas  
 Elevation: 1956 derrick floor  
 1959 rotary bushing

Note: All measurements are from the top of the rotary bushing which is three feet above the derrick floor.

<u>Depth</u>	<u>Time</u>	<u>Remarks</u>
3500 - 10	3-3-3-3-3-3-3-3-3-3	
20	3-3-3-3-4-3-3-3-3-3	
30	4-3-4-4-3-3-4-4-3-3	
40	3-3-3-3-3-2-3-3-3-3	
50	3-3-2-2-3-3-2-2-3-2	
60	2-3-2-3-2-3-4-3-2-2	
70	2-2-2-1-1-2-2-2-2-2	
80	1-2-3-2-3-2-2-1-1-1	
90	2-1-1-1-2-1-3-3-2-1	
90 - 3600	1-1-3-2-2-2-5-3-3-3	
3600 - 10	3-3-4-3-3-9-6-5-3-3	
20	4-4-7-7-6-8-5-3-3-3	Heebner 3612
30	3-2-1-4-9-9-9-5-3-3	
40	3-3-3-3-3-3-6-9-11-11	
50	7-6-6-6-8-7-7-6-6-7	
60	7-5-4-4-5-4-3-3-2-3	
70	3-3-3-3-3-2-3-3-4-5	
80	6-5-5-3-3-4-5-5-5-4	
90	4-2-3-3-2-2-1-2-2-2	
90 - 3700	2-1-2-2-2-2-1-1-2-1	
3700 - 10	1-3-1-2-1-1-2-2-1-1	
20	2-2-3-2-2-3-3-2-2-3	
30	4-4-4-4-4-4-3-5-4-5	
40	4-5-5-5-4-5-5-5-5-5	
50	4-4-5-5-4-5-5-4-5-5-5-5	
60	5-5-5-6-5-5-5-5-6-6	
70	6-4-5-6-5-6-6-6-6-6	
80	6-6-6-8-10-8-11-16-12-12	Brown Lansing 3773; Trip 3775; OWS
90	8-8-6-6-5-4-4-6-7-8	
90 - 3800	7-6-6-7-12-10-11-10-6-6	Lansing 3798; Rough
3800 - 10	6-10-11-11-11-9-11-11-9-11	
20	9-10-16-14-10-9-10-11-10-7	SR
30	6-6-15-13-9-9-11-7-8-7	
40	6-7-7-5-5-6-6-7-4-6	
50	5-6-9-9-12-13-9-11-10-14	
60	9-7-7-4-3-4-7-6-7-6	Circ. 1 1/2 hrs. 3850
70	5-5-5-7-5-5-7-12-14-13	
80	13-13-14-11-9-14-14-10-14-14	Trip 3876; W7
90	13-12-11-11-18-15-14-14-8	
90 - 3900	6-12-12-14-10-15-16-15-11-12	
3900 - 10	10-11-10-9-6-6-7-7-6-7	
20	9-8-7-5-6-7-11-11-13-8	
30	9-9-11-8-6-8-6-7-7-6	
40	7-12-14-15-10-10-7-6-9-13	Circ. 1 1/2 hrs. 3930
50	14-16-15-10-10-10-13-14-17-7	

## (2) Time log; Deep Rock #3 Lemon

<u>Depth</u>	<u>Time</u>	<u>Remarks</u>
3950 - 60	12-10-3-3-2-9-14-12-12-12	
70	13-11-11-11-12-10-8-8-6-6	
80	5-7-8-11-12-21-14-14-11-10	Circ. 3975, 1½ hrs.
90	12-6-6-10-10-9-17-9-6-11	
90 - 4000	18-18-14-14-16-14-12-6-6-4	
4000 - 10	3-3-3-4-5-15-14-16-12-14	Circ. 1½ hrs. 4005
20	17-9-12-13-11-9-9-12-15-11	Trip 4011; W7
30	10-14-10-6-5-5-4-5-11-10	Circ. 1½ hr. 4028
40	10-13-13-10-12-10-10-16-9-10	
50	15-11-13-12-14-10-11-13-11-9	
60	8-10-13-9-13-13-14-12-9-10	
70	12-8-4-4-14-12-12-12-13-12	S.R. 4067-68
80	12-10-8-10-11-20-15-11-11-15	S.R. 4073
90	10-10-11-12-13-14-16-8-8-8	
90 - 4100	11-12-8-8-7-12-8-9-10-11	Rough 4095; SR 4096; Trip 4096; OWS
4100 - 10	8-10-10-10-10-10-9-9-9-9	
20	10-9-11-12-10-10-8-9-8-10	Base Kansas City 4114
30	10-8-8-8-7-6-8-8-9-8	
40	8-10-10-10-9-9-9-10-9-8	
50	8-9-10-7-9-12-12-11-11-8	
60	10-15-10-14-10-13-14-9-8-9	
70	9-8-11-7-9-9-9-8-11-7	
80	14-10-11-11-10-10-16-22-20-17	Trip 4179; W7
90	10-10-10-8-13-14-13-12-12-12	
90 - 4200	12-12-15-10-9-8-7-7-10-10	Top Mississippi 4193
4200 - 10	9-10-10-7-8-12-10-10-12-7-	Circ. 1½ hrs. 4204; DST; W7R
20	5-6-5-7-6-7-7-8-5-5	SR 4206-12
30	7-13-10-12-13-9-9-7-7-8	SR 4216
40	10-6-7-8-8-8-8-9-9-8	Top Kinderhook 4221; Circ. 1½ hrs
50	8-9-10-10-13-12-8-14-26-25	DST; new W7R
60	29-24-22-20-30-20-12-12-12-13	SR 4231
70	18-19-19-19-16-13-12-12-15-14	Circ. 1½ hrs. 4255; DST; new W7
80	12-12-12-11-12-9-8-9-8-8	
90	6-5-4-4-6-4-4-4-5-4	Top Viola 4276
90 - 4300	5-7-6-6-9-8-7-7-11-12	Rough 4282-4291
4300 - 10	16-12-6-8-11-6-7-10-10-12	SR 4292-4295
20	6-11-7-7-10-6-7-6-13-20	Rough 4302; 4308
30	5-4-4-7-10-12-14-23-18-15	SR 4311; 4313-14; SR 4315-16; SR 4328
40	15-22-27-16-30-20-19-15-15-20	Circ. 1½ hrs. 4320; DST; new W7
50	18-22-20-31-21-22-22-14-14-13	Circ. 1½ hrs. 4325; circ. 1½ hrs
60	15-17-22-27-26-20-24-27-46-54	4330
70	25-31-27-27-23-22-9-7-6-8	Coring 4330-78
80	8-8-11-10-10-15-15-20-7-7	Circ. 1½ hrs. 4347; DST; new
90	7-6-8-6-10-5-5-6-10-9	core head.
90 - 4400	8-9-9-7-10-9-10-12-10-10	Circ. 1½ hrs. 4360; DST; n w
		core head.
		Circ. 1½ hrs. 4378; DST; new W7

(3) Time log; Deep Rock #3 Lemon

<u>Depth</u>	<u>Time</u>	<u>Remarks</u>
4400 - 10	10-10-9-7-7-8-9-9-9-10	
20	9-8-8-8-9-10-10-10-9	
30	8-10-10-10-10-11-11-13-11-8	
40	10-8-9-16-15-15-20-18-18-14	Top Arbuckle 4433; Circ. 1 hr. 4337
50	13-14-12-19-9-8-13-5-9-16	Trip 4444; W7
60	15-8-16-13-20-15-14-12-10-11	Circ. 1 hr. 4451
70	10-10-10-13-15-11-13-12-27-15	Circ. 1½ hrs. 4465; circ. 1½ hrs. 4470 Total depth 4470 Ran electric log 9-14-52 Set 5½" casing 4469.

(Log condensed by Wendell S. Johns)