

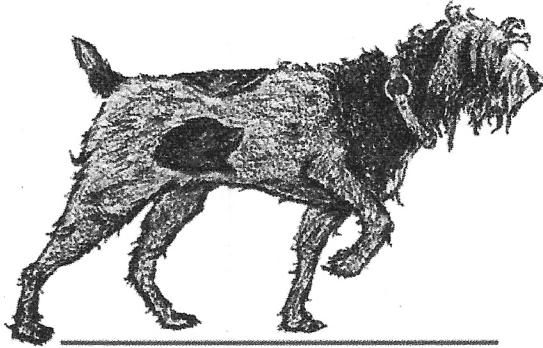
**OPERATOR**

Company: Bird Dog Oil, LLC  
 Address: 1801 Broadway  
 Suite #200  
 Denver, CO 80202

Contact Geologist: Scott Stewart  
 Contact Phone Nbr: 303-534-1686  
 Well Name: Pioneer-Carter #2-14  
 Location: Sec. 14 - T19S -R10W  
 API: 15-159-22853-0000

Pool:   
 State: KANSAS

Field: Chase-Silica  
 Country: USA



**BIRD DOG OIL, LLC**

Scale 1:240 Imperial

Well Name: Pioneer-Carter #2-14  
 Surface Location: Sec. 14 - T19S -R10W  
 Bottom Location:  
 API: 15-159-22853-0000  
 License Number: 34655  
 Spud Date: 6/28/2018  
 Region: Rice  
 Drilling Completed: 7/4/2018  
 Surface Coordinates: 490' FSL & 540 FEL  
 Bottom Hole Coordinates:  
 Ground Elevation: 1741.00ft  
 K.B. Elevation: 1749.00ft  
 Logged Interval: 2600.00ft  
 Total Depth: 3360.00ft  
 Formation: Arbuckle  
 Drilling Fluid Type: Chemical/Fresh Water Gel

Time: 2:45 PM  
 Time: 5:10 AM  
 To: 3360.00ft

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude: -98.38976  
 Latitude: 38.39252  
 N/S Co-ord: 490' FSL  
 E/W Co-ord: 540 FEL

**LOGGED BY**

***Keith Reavis***  
*Consulting Geologist*

Company: Keith Reavis, Inc.  
 Address: 3420 22nd Street  
 Great Bend, KS 67530

Phone Nbr: 620-617-4091  
 Logged By: KLG #136

Name: Keith Reavis

**CONTRACTOR**

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude: -98.38976  
 Latitude: 38.39252  
 N/S Co-ord: 490' FSL  
 E/W Co-ord: 540 FEL

**LOGGED BY**

***Keith Reavis***  
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Company: Keith Reavis, Inc.  
 Address: 3420 22nd Street  
 Great Bend, KS 67530

Phone Nbr: 620-617-4091  
 Logged By: KLG #136

Name: Keith Reavis

**CONTRACTOR**

Contractor: Southwind Drilling  
 Rig #: Rig 3  
 Rig Type: mud rotary  
 Spud Date: 6/28/2018  
 TD Date: 7/4/2018  
 Rig Release:

Time: 2:45 PM  
 Time: 5:10 AM  
 Time:

**ELEVATIONS**

K.B. Elevation: 1749.00ft  
 K.B. to Ground: 6.00ft

Ground Elevation: 1741.00ft

**NOTES**

Due to negative drill stem tests and electrical log evaluation, it was determined that the Pioneer-Carter #2-14 should be plugged and abandoned as a dry test.

A Bloodhound gas detection system operated by Bluestem Labs was employed during the drilling of this well. ROP and gas data were imported into this log, as well as gamma ray and caliper curves from the electrical log suite.

IMPORTANT NOTE: The electrical log measurements were consistently 4-6 ft high to rotary measurement. At request of the operator, drill time and gas data were slid uphole 5 ft to match the log. The lithology column, sample descriptions and drill stem test intervals were also slid uphole 5 ft. However, all cfs depths that were notated in the depth column were left as recorded in the field.

Respectfully submitted,  
 Keith Reavis

**daily drilling report**

DATE	7:00 AM DEPTH	REMARKS
06/30/2018		Geologist Keith Reavis on location @ 2205 hrs, 2717 ft, drilling ahead
07/01/2018	2856	drilling ahead, Queen Hill, Plattsmouth, Heebner, Toronto, Douglas, short trip, TOH w/bit, conduct and complete DST #1, successful test, TIH w/bit, drill lower sand, show warrants test, conduct and complete DST #2 successful test
07/02/2018	2980	TIH w/bit, resume drilling, Douglas, Brown Lime, Lansing, gas kicks in D & E zones warrant test, TOH for DST, conduct and complete DST #3, successful test, TIH w/bit, resume drilling, F and G zones
07/03/2018	3204	drilling ahead, Muncie, H, I, J, Stark, BKC, Arbuckle, show and kick in Arbuckle warrants test, TOH w/bit, in w/tools, conduct and complete DST #4, successful test, TIH w/bit

07/02/2018 2980 TIH w/bit, resume drilling, Douglas, Brown Lime, Lansing, gas kicks in D & E zones warrant test, TOH for DST, conduct and complete DST #3, successful test, TIH w/bit, resume drilling, F and G zones

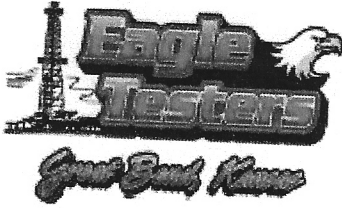
07/03/2018 3204 drilling ahead, Muncie, H, I, J, Stark, BKC, Arbuckle, show and kick in Arbuckle warrants test, TOH w/bit, in w/tools, conduct and complete DST #4, successful test, TIH w/bit

07/04/2018 3360 resume drilling Arbuckle, rathole ahead TD @ 3360', 0510 hrs 7/4/18 conduct and complete electrical logging operations, released @ 1200 hrs

## well comparison sheet

DRILLING WELL					COMPARISON WELL			
Pioneer-Carter #2-14 490' FSL & 540' FEL Sec 14-T19S-R10W					Bird Dog Pioneer Stroud 2-23 360' FNL & 670' FEL Sec 23-T19S-R10W			
1749 KB					1751 KB		Structural Relationship	
Formation	Sample	Sub-Sea	Log	Sub-Sea	Log	Sub-Sea	Sample	Log
Queen Hill	2711	-962	2706	-957	2712	-961	-1	4
Heebner	2799	-1050	2795	-1046	2802	-1051	1	5
Toronto	2823	-1074	2818	-1069	2824	-1073	-1	4
Douglas	2833	-1084	2828	-1079	2834	-1083	-1	4
Brown Lime	2921	-1172	2917	-1168	2924	-1173	1	5
Lansing	2953	-1204	2948	-1199	2955	-1204	0	5
Muncie Creek	3084	-1335	3078	-1329	3083	-1332	-3	3
Stark Shale	3160	-1411	3158	-1409	3158	-1407	-4	-2
Base KC	3219	-1470	3215	-1466	3215	-1464	-6	-2
Arbuckle	3294	-1545	3290	-1541	3266	-1515	-30	-26
Total Depth	3360	-1611	3356	-1607	3373	-1622	11	15

### Drill Stem Test #1

	<b>DRILL STEM TEST REPORT</b>	
	Bird Dog Oil LLC  1801 Broadway Suite 200 Denver, Colorado 80202  ATTN: Keith Feavis	14-19s-10w Rice  Pioneer-Carter #2-14 Job Ticket: 01037      DST#:1 Test Start: 2018.07.01 @ 10:00:00

<b>GENERAL INFORMATION:</b>	
Formation: Douglas Sand Deviated: No Whipstock:      ft (KB) Time Tool Opened: 11:11:00 Time Test Ended: 00:00:00  Interval: 2831.00 ft (KB) To 2856.00 ft (KB) (TVD) Total Depth:      ft (KB) (TVD) Hole Diameter: 7.88 inches - to Condibn: Fair	Test Type: Conventional Bottom Hole (hitia) Tester: Gene Budig Unit No: 1  Reference Elevations: 1749.00 ft (KB) 1741.00 ft (CF) KB to GR/CF: 8.00 ft

Serial #: 9119      Inside Press@RunDepth: 706.35 psig @ 2851.00 ft (KB) Start Date: 2018.07.01      End Date: 2018.07.01 Start Time: 10:00:00      End Time: 13:53:30	Capacity: 5000.00 psig Last Calb.: 2018.07.01 Time On Btm: 2018.07.01 @ 11:22:30 Time Off Btm: 2018.07.01 @ 12:41:00
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**TEST COMMENT:**

1st Opening 10 Minutes very weak blow for 2 minutes and died  
 1st Shut-h 45 Minutes no blow back  
 2nd Opening 10 Minutes no blow flushed tool no help  
 2nd shut-h 10 Minutes no blow ack

Serial #: 9119

Inside

Press@RunDepth: 706.35 psig @ 2851.00 ft (KB)

Start Date: 2018.07.01

End Date:

2018.07.01

Capacity: 5000.00 psig

Last Calb.: 2018.07.01

Start Time: 10:00:00

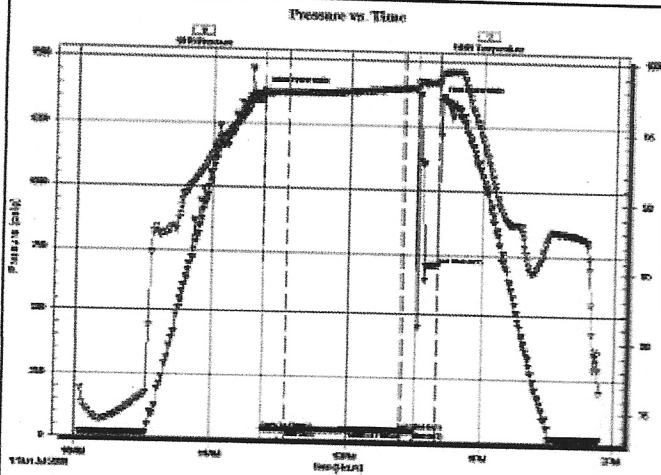
End Time:

13:53:30

Time On Btm: 2018.07.01 @ 11:22:30

Time Off Btm: 2018.07.01 @ 12:41:00

TEST COMMENT: 1st Opening 10 Minutes very weak blow for 2 minutes and died  
1st Shut-in 45 Minutes no blow back  
2nd Opening 10 Minutes no blow flushed tool no help  
2nd shut-in 10 Minutes no blow ack



### PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1379.19	97.67	Initial Hydro-static
1	38.58	97.54	Open To Flow (1)
11	39.25	97.68	Shut-In(1)
62	42.80	98.07	End Shut-In(1)
63	38.90	98.08	Open To Flow(2)
68	38.54	98.15	Shut-In(2)
78	706.35	98.57	End Shut-In(2)
79	1352.86	98.88	Final Hydro-static

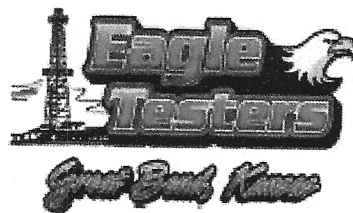
### Recovery

Length (ft)	Description	Volume (bbl)
1.00	Drilling Mud	0.01

### Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (M/d)

## Drill Stem Test #2



## DRILL STEM TEST REPORT

Bird Dog Oil LLC

1801 Broadway Suite 200  
Denver, Colorado 80202

ATTN: Keth Feavis

14-19s-10w Rice

Pioneer-Carter #2-14

Job Ticket: 01088 DST#: 2

Test Start: 2018.07.01 @ 08:47:00

### GENERAL INFORMATION:

Formation: Douglas Sand  
Deviated: No Whipstock: ft (KB)

Time Tool Opened: 09:58:00

Time Test Ended: 12:20:00

Interval: 2830.00 ft (KB) To 2886.00 ft (KB) (TVD)

Total Depth: 2886.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches - Job Condition: Fair

Test Type: Conventional Bottom Hole (Initial)

Tester: Gene Budig

Unit No: 1

Reference Elevations: 1749.00 ft (KB)

1741.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 9139

Outside

Press@RunDepth: 60.40 psig @ 2878.46 ft (KB)

Start Date: 2018.07.01

End Date:

2018.07.02

Capacity: 5000.00 psig

Last Calb.: 1899.12.30

Start Time: 20:47:00

End Time:

00:18:59

Time On Btm: 2018.07.01 @ 21:57:00

Time Off Btm: 2018.07.01 @ 23:08:30

TEST COMMENT:

Interval: 2830.00 ft (KB) To 2886.00 ft (KB) (TVD)  
 Total Depth: 2886.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches -to-b Condition: Fair

Reference Elevations: 1749.00 ft (KB)  
 1741.00 ft (CF)  
 KB to GR/CF: 8.00 ft

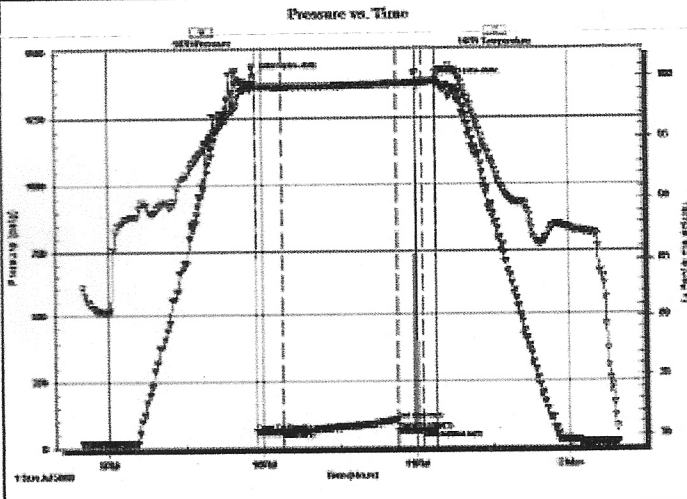
Serial #: 9139

Outside

Press@RunDepth: 60.40 psig @ 2878.46 ft (KB)  
 Start Date: 2018.07.01 End Date: 2018.07.02  
 Start Time: 20:47:00 End Time: 00:18:59

Capacity: 5000.00 psig  
 Last Calb.: 1899.12.30  
 Time On Btm: 2018.07.01 @ 21:57:00  
 Time Off Btm: 2018.07.01 @ 23:08:30

TEST COMMENT: 1st Opening 10Minutes very weak surface blow for 6 minutes and died  
 2nd opening 45 minutes no blow back  
 2nd Opening 10Minutes no blow flushed tool no help  
 2nd Shut-In 5 Minutes



PRESSURE SUMMARY

Time (Mn.)	Pressure (psig)	Temp (deg F)	Annotation
0	1405.38	99.51	Initial Hydro-static
1	57.93	99.21	Open To Flow (1)
11	58.48	99.19	Shut-in(1)
56	97.58	99.45	End Shut-in(1)
56	58.60	99.45	Open To Flow(2)
66	58.33	99.57	Shut-In(2)
71	60.40	99.63	End Shut-In(2)
72	1980.80	100.45	Final Hydro-static

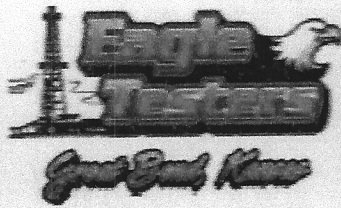
Recovery

Length (ft)	Description	Volume (bbl)
2.00	Drilling Mud	0.03

Gas Rates

	Choke (Inches)	Pressure (psig)	Gas Rate (Mcf/D)

Drill Stem Test #3



DRILL STEM TEST REPORT

Bird Dog Oil LLC  
 1801 Broadway Suite 200  
 Denver, Colorado 80202  
 ATTN: Keith Peavis

14-19a-10a Rice  
 Pioneer-Carter #2-14  
 Job Ticket: 01089 DST# 3  
 Test Start: 2018.07.02 @ 11:36:00

GENERAL INFORMATION:

Formation: Lansing "D&E"  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 12:47:00  
 Time Test Ended: 17:43:00

Test Type: Conventional Bottom Hole (Initial)  
 Tester: Gene Budig  
 Unit No: 1

Interval: 2983.00 ft (KB) To 2911.00 ft (KB) (TVD)  
 Total Depth: ft (KB) (TVD)  
 Hole Diameter: 7.88 inches -to-b Condition: Fair

Reference Elevations: 1749.00 ft (KB)  
 1741.00 ft (CF)  
 KB to GR/CF: 8.00 ft

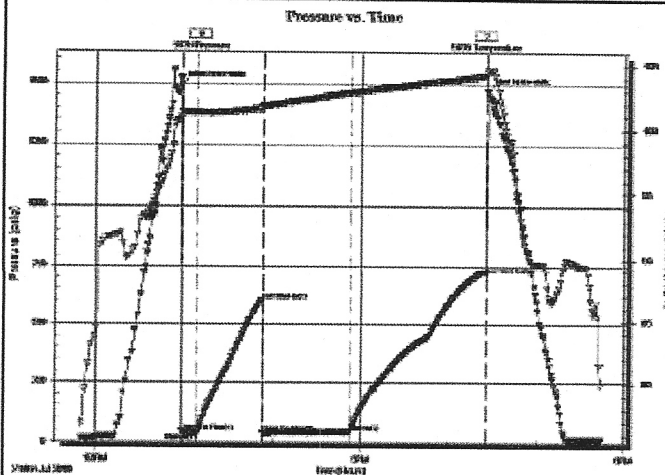
Serial #: 9139

Outside

Press@RunDepth: 714.04 psig @ 3006.00 ft (KB)  
 Start Date: 2018.07.02 End Date: 2018.07.02  
 Start Time: 11:47:00 End Time: 17:44:29

Capacity: 5000.00 psig  
 Last Calb.: 2018.07.02  
 Time On Btm: 2018.07.02 @ 12:57:30  
 Time Off Btm: 2018.07.02 @ 18:28:00

**TEST COMMENT:** 1st Opening 10 Minutes fair blow built to 11 inches into the water  
 1st Shut-in 45 Minutes fair blow back  
 2nd Opening 60 Minutes Strong blow decreased to fair blow  
 2nd Shut-in 80 Minutes fair blow back



**PRESSURE SUMMARY**

Time (Mn.)	Pressure (psig)	Temp (deg F)	Annotation
0	1492.33	100.91	Initial Hydro-static
1	43.27	101.30	Open To Flow (1)
11	38.97	101.25	Shut-in(1)
55	598.81	101.54	End Shut-in(1)
56	38.75	101.78	Open To Flow(2)
115	4.226	102.79	Shut-in(2)
208	714.04	104.10	End Shut-in(2)
209	1468.56	104.52	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
25.00	oL CUT mUD 20% Oil 80% Mud	0.35

**Gas Rates**

Choke (Inches)	Pressure (psig)	Gas Rate (M cfd)

**Drill Stem Test #4**



**DRILL STEM TEST REPORT**

Bled Dog Oil LLC

1801 Broadway Suite 200  
 Denver, Colorado 80202

ATTN: Keith Feavis

14-19s 10w Rice

Pioneer-Center #2-14

Job Ticket: 01090 DSTM-4

Test Start: 2018.07.03 @ 17:45:00

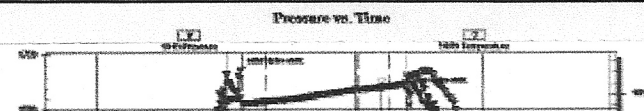
**GENERAL INFORMATION:**

Formation: **Arbuckle**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 19:07:00  
 Time Test Ended: 01:00:00  
 Interval: 3219.00 ft (KB) To 3299.00 ft (KB) (TYD)  
 Total Depth: 3299.00 ft (KB) (TYD)  
 Hole Diameter: 7.88 inches -to-b Condition: Fair

Test Type: Conventional Bottom Hole (Initial)  
 Tester: Gene Budig  
 Unit No: 1  
 Reference Elevations: 1748.00 ft (KB)  
 1741.00 ft (CF)  
 KB to GRCP: 8.00 ft

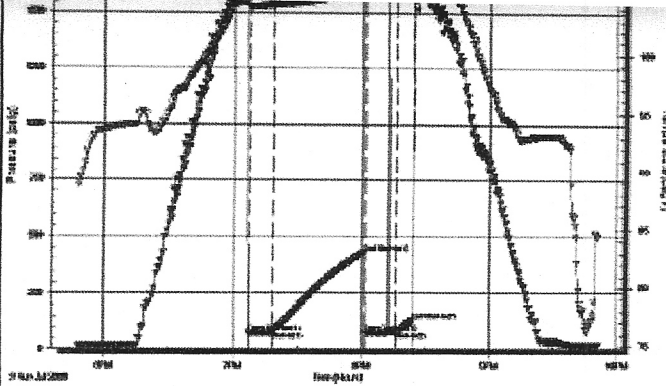
Serial #: 9119 inside  
 Press@RunDepth: 126.56 psig @ 3293.35 ft (KB) Capacity: 3000.00 psig  
 Start Date: 2018.07.03 End Date: 2018.07.03 Last Calc.: 2018.07.03  
 Start Time: 17:45:00 End Time: 21:50:30 Time On Blm: 2018.07.03 @ 18:56:30  
 Time Off Blm: 2018.07.03 @ 20:24:00

**TEST COMMENT:** 1st Opening 10 Minutes very weak surface blow through out  
 1st Shut-in 45 Minutes  
 2nd Opening 16 Minutes no blow flushed tool no help  
 2ND SHUT-IN 5 Minutes



**PRESSURE SUMMARY**

Time (Mn.)	Pressure (psig)	Temp (deg F)	Annotation
0	1677.64	104.72	Initial Hydro-static



0	167.64	104.72	Initial Hydro-static
1	73.22	104.21	Open To Flow (1)
12	78.12	104.34	Shut-In(1)
55	433.07	105.45	End Shut-In(1)
55	75.02	105.38	Open To Flow(2)
69	79.72	105.73	Shut-In(2)
77	126.56	105.95	End Shut-In(2)
78	158.678	106.66	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
25.00	Drilling Mud	0.35

**Gas Rates**

Choke (inches)	Pressure (psig)	Gas Rate (M cfd)
----------------	-----------------	------------------

**ROCK TYPES**

Dolprim    
  Lmst fw7>    
  shale, gry    
  shale, red    
  Siltst  
 Lmst fw<7    
  shale, grn    
  Carbon Sh    
  Ss

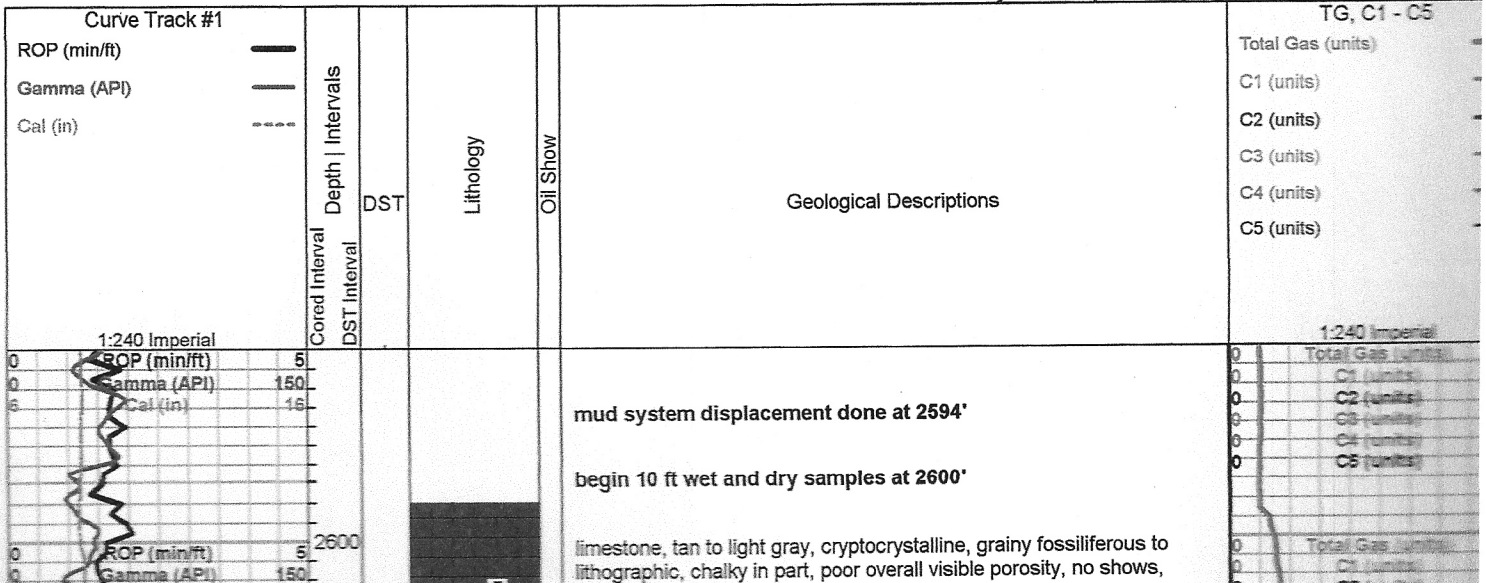
**ACCESSORIES**

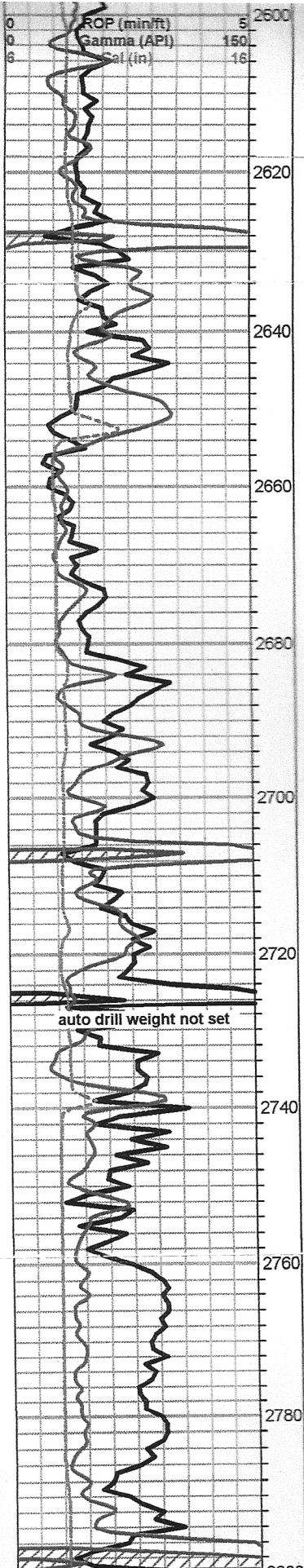
**MINERAL**  
 ▲ Chert, dark  
 △ Chert White  
**FOSSIL**  
 ∩ Bioclastic or Fragmental  
 F Fossils < 20%  
 φ Oolite  
 ⚡ Pellets  
 ⚡ Oomoldic  
**STRINGER**  
 ■ Limestone  
 ··· Sandstone  
 --- Siltstone  
**TEXTURE**  
 C Chalky  
 L Lithogr

**OTHER SYMBOLS**

**Oil Show**  
 ● Good Show  
 ○ Fair Show  
 ⊙ Poor Show  
 ⊖ Spotted or Trace  
 ○ Questionable Strn  
 D Dead Oil Strn  
 ■ Fluorescence  
 \* Gas  
**DST**  
 ■ DST Int  
 ■ DST alt  
 ■ Core  
 || tail pipe

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limestone, tan to light gray, cryptocrystalline, grainy fossiliferous to lithographic, chalky in part, poor overall visible porosity, no shows, carrying abundant shales

Total Sol Units	100
C1 (units)	100
C2 (units)	100
C3 (units)	100
C4 (units)	100
C5 (units)	100

**King Hill Shale 2627 -878 (log)**

shale, black carbonaceous

abundant gray shales, mixed fossiliferous limestone, dark gray cherty limestones

limestone, tan, mixed gray and cream, micro-cryptocrystalline, fossiliferous, grainy in part, some lithographic, sub-chalky, scattered interclast porosity, no shows

fossiliferous limestone a.a., grainier, some bioclastic, scattered porosity, influx chalk and mottled with and gray fossiliferous chert, weathered in part, no shows

a.a.

**Queen Hill Shale 2706 -957 (log)**

shale, black carbonaceous

limestone, light gray, some gray/brown mottled, microcrystalline, fossiliferous to bioclastic, some large clasts, scattered porosity, no shows

limestones a.a.

mixed fossiliferous to bioclastic limestones a.a., poor overall visible porosity

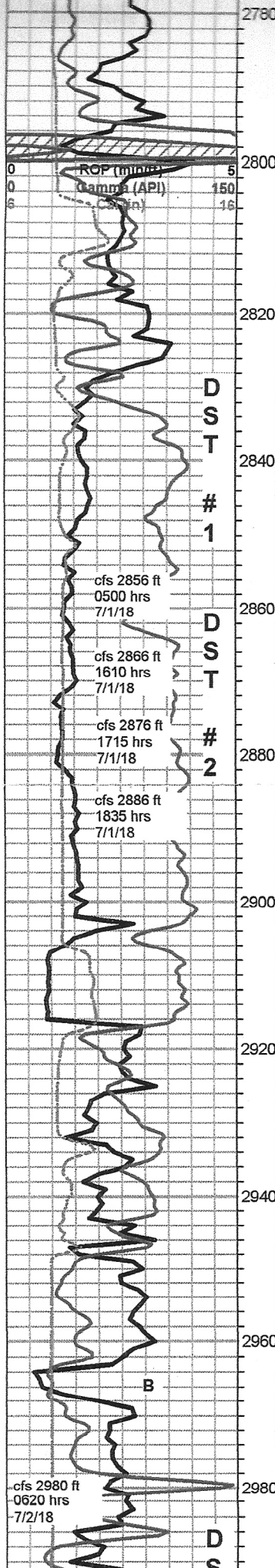
limestone, cream to light gray, mostly cryptocrystalline, fossiliferous to sub-lithographic, poor visible porosity, dense to chalky, no shows

limestones, mixed fossiliferous, marked increase in grainy fossiliferous, poor overall visible porosity, carrying abundant shale in samples, no shows

**Heebner 2795 -1046 (log)**

shale, black carbonaceous





limestones, mixed fossiliferous, marked increase in grainy fossiliferous, poor overall visible porosity, carrying abundant shale in samples, no shows

**Heebner 2795 -1046 (log)**

shale, black carbonaceous

**Toronto 2818 -1069 (log)**

limestone, cream, cryptocrystalline, fossiliferous, trace very fine oolitic, fairly chalky, poor visible porosity, no shows, abundant chalk

**Douglas 2828 -1079 (log)**

gray and green shales with siltstone, gray, micaceous, pyritic, few very small clusters sandstone, quartz, well rounded, very fine grain, micaceous, silty, very friable, abundant loose sand grains in tray, no visible shows

flood pyrite, with siltstone and trace sandstone, dark gray, very fine grain, silty, micaceous, sub-angular to rounded, fairly cemented, mostly good saturated black stain and oil saturation, good show oil on break, questionable odor, good fluorescence, excellent bright white streaming cut, 40 min sample, increase in sand - 2876 sample, sand a.a., marked increase in amount of sand, 20 min sample, a.a. with slight decrease in show, 40 min sample, still very abundant s.s. a.a., maintaining show appx 30% of sample

sand drops out, white gray and green shales, increase in gray micaceous siltstones

soft gray silty shale, micaceous siltstone, some scattered gray sandstone, silty, micaceous, very fine grain, well cemented, no shows

very soft, mushy, heavy gray wash in samples

**Brown Lime 2917 -1168 (log)**

limestone, tan to brown, cryptocrystalline, fossiliferous, some large clasts, dense, cherty, no shows

mixed gray shales, still heavy sluff from above

**Lansing 2948 -1199 (log)**

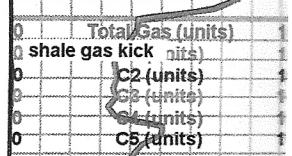
poor samples, still mostly shale sluff from above, limestone, cream, chalky, soft, fossiliferous, with gray to tan, cryptocrystalline, fossiliferous, dense, cherty, no shows or odor, no fluorescence

limestone, tan to light gray, oomoldic, sub-oolitic, some good mold porosity, no visible shows, no odor, poor fluorescence

limestones, mixed gray and cream, cryptocrystalline dense fossiliferous, to grainy bioclastic and fossiliferous, some scattered porosity, no show

as above

limestone, gray, mottled, micro-cryptocrystalline, fossiliferous, poor visible porosity, with scattered very fine oolitic, tan, some friable with

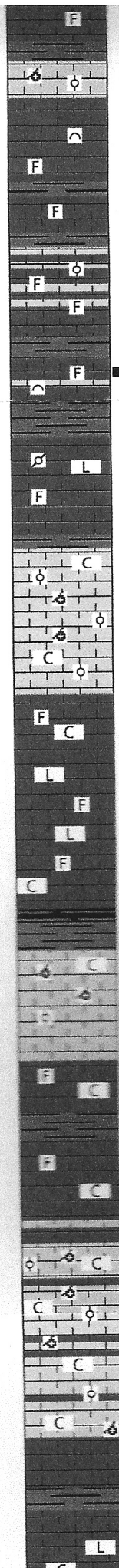
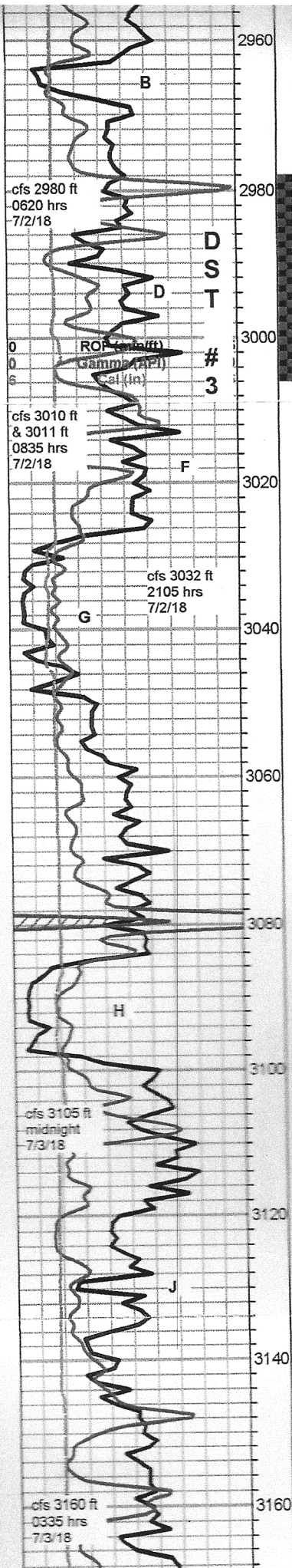


pipe strap  
0.11' stb

gas spike 2  
unit above  
background

Mudco Mud Ch  
0730 hrs 7/2/18  
2990 ft  
vis 51 wt 9.0  
pv 12 yp 16  
WL 8.8 pH 11.0  
cake 1/32  
Chl 5600 Ca 20  
solids 4.7 LCM  
dmc \$573.05  
cmc \$5657.17

158 unit total



fossiliferous, dense, cherty, no shows or odor, no fluorescence

limestone, tan to light gray, oomoldic, sub-oolitic, some good mold porosity, no visible shows, no odor, poor fluorescence

limestones, mixed gray and cream, cryptocrystalline dense fossiliferous, to grainy bioclastic and fossiliferous, some scattered porosity, no show

as above

limestone, gray, mottled, micro-cryptocrystalline, fossiliferous, poor visible porosity, with scattered very fine oolitic, tan, some friable with inter-oolite porosity, no shows, good odor, no fluorescence, no cut but slight halo

limestone, cream to light gray, micro-cryptocrystalline, fossiliferous, chalky in part, some scattered grainy and vuggy bioclastic, no visible shows, fair odor, fair fluorescence, no cut but has halo

limestone, mixed gray to cream, some mottled, microcrystalline, fossiliferous to pelletal, grainy, some cream cryptocrystalline, chalky to dense, lithographic, 1 specimen with pin-point porosity and slight show oil on break, no other shows noted

limestone, gray to tan, oolitic to oomoldic, some good porosity, abundant chalk, abundant grainy flattened oolitic, no shows

limestone, white to cream and light gray, chalky fossiliferous, with limestone, dark gray, cryptocrystalline, dense compact lithographic, abundant chalk, no shows

**Muncie Creek 3078 -1329 (log)**

limestone, white to light gray and cream, mostly oomoldic, some oolitic, good porosity, abundant chalk, barren

limestone, cream to gray, mostly cryptocrystalline, chalky fossiliferous to dense cherty fossiliferous, poor visible porosity, abundant chalk, no shows

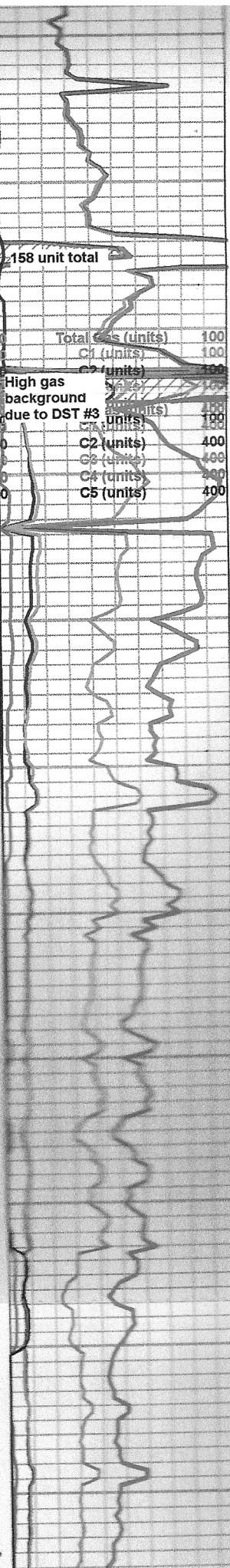
a.a.

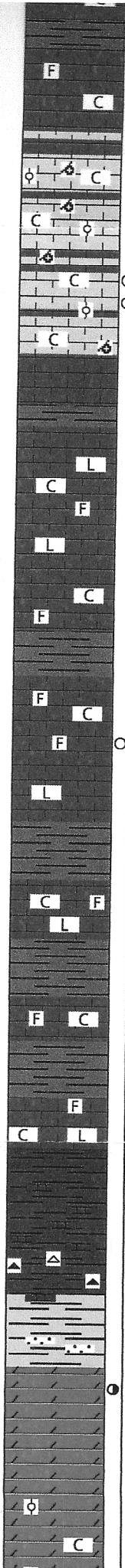
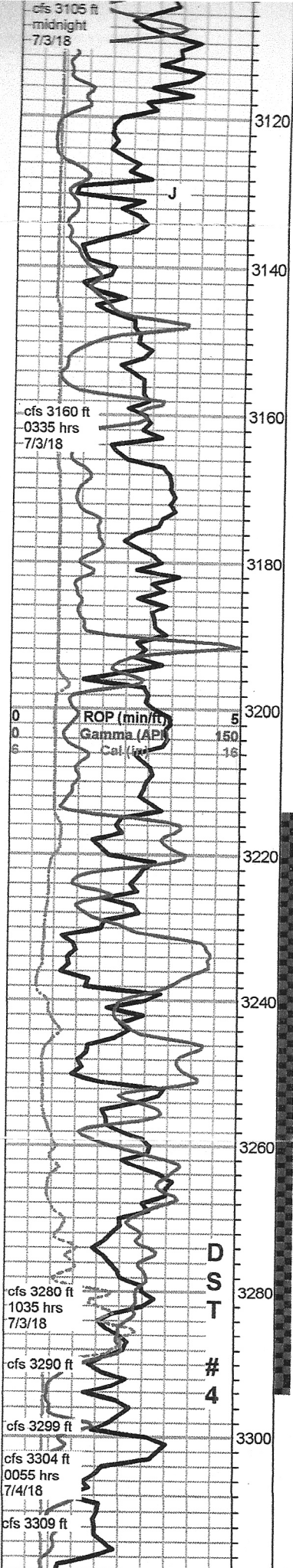
limestone, white to cream and gray, mixed size oolitic and oomoldic, chalky/weathered to dense, some scattered fair porosity, few scattered specimens with good fluorescence, flood chalk in samples, no visible shows

a.a., faint sour odor in 3160 sample, tested few good fluorescent specimens for cut, no cut, 30 min sample, few small pieces with slight staining, 1 with droplet free oil when broken,

**Stark Shale 3158 -1409 (log)**

limestone, cream to light gray, cryptocrystalline, lithographic, dense, some scattered fossiliferous, chalky in part, moderate chalk in samples, no shows





shows

a.a.

limestone, white to cream and gray, mixed size oolitic and oomoldic, chalky/weathered to dense, some scattered fair porosity, few scattered specimens with good fluorescence, flood chalk in samples, no visible shows

a.a., faint sour odor in 3160 sample, tested few good fluorescent specimens for cut, no cut, 30 min sample, few small pieces with slight staining, 1 with droplet free oil when broken,

**Stark Shale 3158 -1409 (log)**

limestone, cream to light gray, cryptocrystalline, lithographic, dense, some scattered fossiliferous, chalky in part, moderate chalk in samples, no shows

limestones, a.a. with chalk, 1 specimen with slight oily stain, no odor in samples, no other shows noted, trace gray frosted cherts

**Base KC 3215 -1466 (log)**

limestone, light gray to cream, crypto-microcrystalline, fossiliferous, trace oolitic, chalky, with variable gray cryptocrystalline, lithographic, moderate chalk in samples, no shows

limestone a.a.

limestones a.a.

mixed limestones a.a. with marked influx red silty shales

cfs samples, a.a. with chert, variable grays with frosted white, no shows

flood shales, red, green and gray, mixed chert and limestone a.a. 30 min sample, increase shales, plus waxy green shale (Simpson?) trace argillaceous gray and green sandstone, soft, no porosity or shows

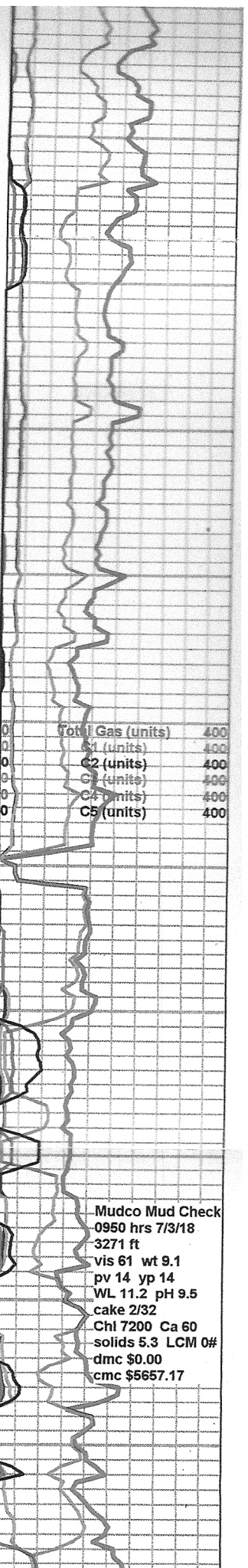
**Arbuckle 3290 -1541 (log)**

dolomite, cream, microcrystalline, sub-rhombic, recrystallized rhombic and some sucrosic, scattered light golden stain, streaming sheen, slight show oil on break, strong sweet odor, good bright green/white fluorescence, fair to poor cuts,

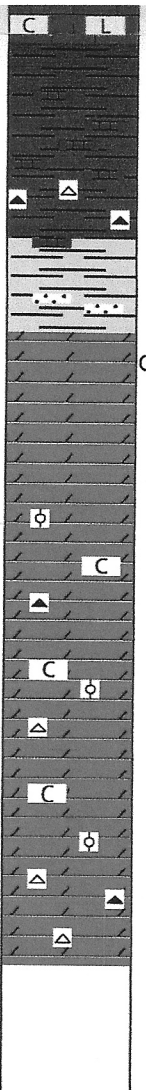
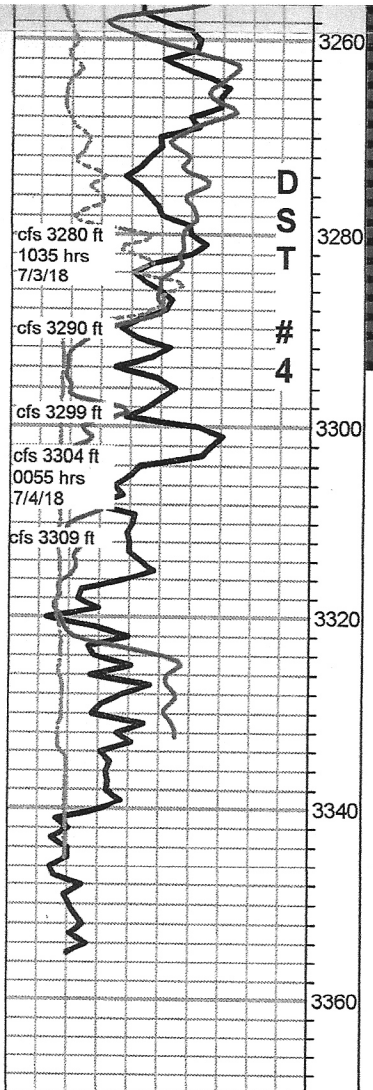
3299-3304 a.a. with trace sandy dolomite, abundant shales

3304-09 dolomite, white to cream, mixed crystalline, poor visible porosity, scattered light golden stain, trace oil with gas on break, good odor, more sour than above, good fluorescence

3310 - 3344 dolomite, cream to light gray, cryptocrystalline, dense, sub-lithographic with chalky sub-sucrosic and oolitic, some recrystallized, poor



**Mudco Mud Check**  
 0950 hrs 7/3/18  
 3271 ft  
 vis 61 wt 9.1  
 pv 14 yp 14  
 WL 11.2 pH 9.5  
 cake 2/32  
 Chl 7200 Ca 60  
 solids 5.3 LCM 0#  
 dmc \$0.00  
 cmc \$5657.17



limestones a.a.

mixed limestones a.a. with marked influx red silty shales

cfs samples, a.a. with chert, variable grays with frosted white, no shows

flood shales, red, green and gray, mixed chert and limestone a.a. 30 min sample, increase shales, plus waxy green shale (Simpson?) trace argillaceous gray and green sandstone, soft, no porosity or shows

**Arbuckle 3290 -1541 (log)**

dolomite, cream, microcrystalline, sub-rhombic, recrystallized rhombic and some sucrosic, scattered light golden stain, streaming sheen, slight show oil on break, strong sweet odor, good bright green/white fluorescence, fair to poor cuts,

3299-3304 a.a. with trace sandy dolomite, abundant shales

3304-09 dolomite, white to cream, mixed crystalline, poor visible porosity, scattered light golden stain, trace oil with gas on break, good odor, more sour than above, good fluorescence

3310 - 3344 dolomite, cream to light gray, cryptocrystalline, dense, sub-lithographic with chalky sub-sucrosic and oolitic, some recrystallized, poor visible porosity, no staining, trace sheen, good odor and stain, abundant boney white to gray cherts, abundant caliche

dolomite, mixed crystalline and oolitic a.a., increase in chert, decrease in caliche, no shows, good sour odor

rotary TD 3360 ft 0510 hrs 7/4/18  
Pioneer Wireline TD 3356 ft

Mudco Mud Check  
0950 hrs 7/3/18  
3271 ft  
vis 61 wt 9.1  
pv 14 yp 14  
WL 11.2 pH 9.5  
cake 2/32  
Chl 7200 Ca 60  
solids 5.3 LCM 0#  
dmc \$0.00  
cmc \$5657.17

Mudco Mud Check  
1005 hrs 7/4/18  
3360 ft  
vis 68 wt 9.2  
pv 16 yp 16  
WL 10.4 pH 10.0  
cake 2/32  
Chl 5700 Ca 40  
solids 6.1 LCM 0#  
dmc \$580.73  
cmc \$6237.90