

OPERATOR

Company: Steffen Resource Development, LLC
 Address: 3500 N. Mayfield Road
 Hutchinson, KS 67502

Contact Geologist:
 Contact Phone Nbr: 620-802-1188
 Well Name: Steffen Family #1-19
 Location: Sec. 18 - T30S - R7W
 API: 15-095-22331-0000
 Pool:
 State: Kansas

Field: Spivey-Grabs-Basil
 Country: USA

Scale 1:240 Imperial

Well Name: Steffen Family #1-19
 Surface Location: Sec. 18 - T30S - R7W
 Bottom Location:
 API: 15-095-22331-0000
 License Number: 35666
 Spud Date: 8/30/2019 Time: 4:45 PM
 Region: Kingman County
 Drilling Completed: 9/8/2019 Time: 7:55 AM
 Surface Coordinates: 851' FNL & 2054' FEL
 Bottom Hole Coordinates:
 Ground Elevation: 1464.00ft
 K.B. Elevation: 1472.00ft
 Logged Interval: 2900.00ft To: 4283.00ft
 Total Depth: 4283.00ft
 Formation: Mississippian
 Drilling Fluid Type: Chemical/Fresh Water Gel

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -98.125046974
 Latitude: 37.440449585
 N/S Co-ord: 851' FNL
 E/W Co-ord: 2054' 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

Contractor: Duke Drilling Company
 Rig #: 2
 Rig Type: mud rotary
 Spud Date: 8/30/2019 Time: 4:45 PM
 TD Date: 9/8/2019 Time: 7:55 AM
 Rig Release: Time:

ELEVATIONS

K.B. Elevation: 1472.00ft Ground Elevation: 1464.00ft
 K.B. to Ground: 8.00ft

NOTES

Due to positive results of DST #2, favorable structural position and electrical log analysis, it was decided to run 5 1/2" production casing and further test the Mississippian chert through perforations and stimulation.

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

Respectfully submitted,
Keith Reavis

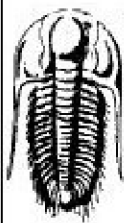
daily drilling report

DATE	7:00 AM DEPTH	REMARKS
08/31/2019		Geologist Keith Reavis on location @1450 hrs, 1130 ft, drilling ahead salt section, Chase group
09/01/2019	1596	drilling ahead
09/02/2019	2194	drilling ahead
09/03/2019	2782	drilling ahead, displace mud system, drilling Topeka, section, Heebner
09/04/2019	3380	drilling ahead, Toronto, Douglas, Lansing
09/05/2019	3743	drilling ahead LKC, Muncie Creek, Stark, BKC, Marmaton section
09/06/2019	4044	drilling ahead, Pawnee, Ft. Scott, Cherokee, Mississippian, show and gas kick in Miss warrants test, short trip, CTCH, TOH for DST #1, TIH with tools, conducting DST #1
09/07/2019	4137	complete DST #1, successful test, TIH with bit, resume drilling to base of Miss, gas kick and shows warrant test, TOH w/bit, in w/tools, conduct and complete DST #2, successful test
09/08/2019	4273	TIH w/bit, ctch, rathole ahead to TD, 4283 @ 0755 hrs, TOH w/bit, conduct logging operations, off loc @ 1600 hrs

well comparison sheet

DRILLING WELL					COMPARISON WELL				COMPARISON WELL			
Steffen Family Farms #1-19					Mull - Tjaden C#2				Sierra - Towner #1			
851' FNL & 2054' FEL					693' FNL & 712' FWL				C NE NE			
Sec 18-T30S-R7W					Sec 18-T30S-R7W				Sec 18-T30S-R7W			
1472 KB					1480 KB		Structural Relationship		1461 KB		Structural Relationship	
Formation	Sample	Sub-Sea	Log	Sub-Sea	Log	Sub-Sea	Sample	Log	Log	Sub-Sea	Sample	Log
Krider	1350	122	1335	137	1357	123	-1	14	1320	141	-19	-4
Indian Cave	2138	-666	2133	-661	2156	-676	10	15	2127	-666	0	5
Heebner	3111	-1639	3109	-1637	3128	-1648	9	11	3095	-1634	-5	-3
Toronto	3130	-1658	3130	-1658	3144	-1664	6	6	3110	-1649	-9	-9
Douglas	3142	-1670	3141	-1669	3157	-1677	7	8	3127	-1666	-4	-3
Lansing	3329	-1857	3334	-1862	3348	-1868	11	6	3318	-1857	0	-5
Muncie Creek	3646	-2174	3645	-2173	3660	-2180	6	7	3633	-2172	-2	-1
Stark	3761	-2289	3760	-2288	3775	-2295	6	7	3750	-2289	0	1
BKC	3862	-2390	3865	-2393	3877	-2397	7	4	3854	-2393	3	0
Cherokee	4009	-2537	4007	-2535	4020	-2540	3	5	3998	-2537	0	2
Mississippian	4128	-2656	4128	-2656	4147	-2667	11	11	4124	-2663	7	7
Total Depth	4283	-2811	4285	-2813	4602	-3122	311	309	4176	-2715	-96	-98

Drill Stem Test #1

DRILL STEM TEST REPORT	
 <p>TRILOBITE TESTING, INC.</p>	<p>Steffen Resources Development 3500 N Mayfield Rd Hutchinson, Ks. 67502</p> <p>ATTN: Keith Reavis</p>
<p>18-30s-7w Kingman Co., Ks.</p> <p>Steffen Family 1-19</p> <p>Job Ticket: 64940 DST#: 1</p> <p>Test Start: 2019.09.06 @ 20:08.31</p>	

GENERAL INFORMATION:

Formation:	Mississippi	Test Type:	Conventional Bottom Hole (Initial)
Deviated:	No Whipstock	Tester:	Matt Smith
Time Tool Opened:	22:59:46	Unit No.:	68
Time Test Ended:	04:41:16		

Interval: 4129.00 ft (KB) To 4137.00 ft (KB) (TVD)
 Total Depth: 4137.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 1472.00 ft (KB)
 1465.00 ft (CF)
 KB to GR/CF: 7.00 ft

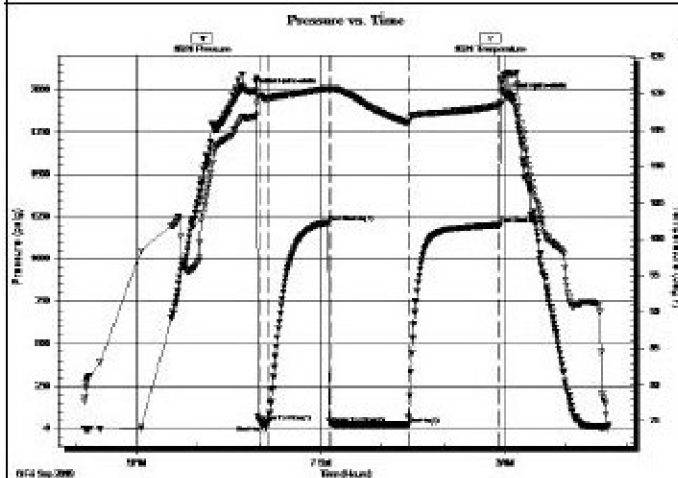
Serial #: 8931

Inside

Press@RunDepth: 20.57 psig @ 4130.00 ft (KB)
 Start Date: 2019.09.06 End Date: 2019.09.07
 Start Time: 20:08:36 End Time: 04:41:16

Capacity: 8000.00 psig
 Last Calib.: 2019.09.07
 Time On Btm: 2019.09.06 @ 22:53:46
 Time Off Btm: 2019.09.07 @ 02:59:46

TEST COMMENT: IF: Strong Blow . B.O.B. in 1 min. Built to 52.52'.
 IS: No Blow .
 FF: Strong Blow . B.O.B. immediate. Built to 200.65'. G.T.S. in 44 mins. Gauged Gas.
 FS: No Blow .



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1987.12	116.83	Initial Hydro-static
6	37.59	119.76	Open To Flow (1)
15	24.40	119.31	Shut-In(1)
74	1216.45	120.73	End Shut-In(1)
77	30.30	120.70	Open To Flow (2)
152	20.57	115.94	Shut-In(2)
242	1201.69	118.43	End Shut-In(2)
246	1960.01	122.55	Final Hydro-static

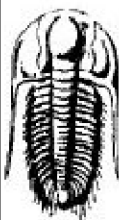
Recovery

Length (ft)	Description	Volume (bbl)
2.00	Drig Mud 100%rn	0.03
0.00	G.I.P. 100%g	0.00

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
First Gas Rate	0.13	6.31	7.75
Last Gas Rate	0.13	9.07	8.78
Max. Gas Rate	0.13	9.07	8.78

Drill Stem Test #2



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Steffen Resources Development 18-30s-7w Kingman Co., Ks.

3500 N Mayfield Rd Steffen Family 1-19
 Hutchinson, Ks. 67502

ATTN: Keith Reavis Job Ticket: 64941 DST#:2

Test Start: 2019.09.07 @ 14:13:46

GENERAL INFORMATION:

Formation: **Mississippi**
 Deviated: No Whipstock ft (KB)
 Time Tool Opened: 16:50:01
 Time Test Ended: 23:39:31

Test Type: Conventional Bottom Hole (Res et)
 Tester: Matt Smith
 Unit No: 68

Interval: 4139.00 ft (KB) To 4183.00 ft (KB) (TVD)
 Total Depth: 4183.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 1472.00 ft (KB)
 1465.00 ft (CF)
 KB to GR/CF: 7.00 ft

Serial #: 8931

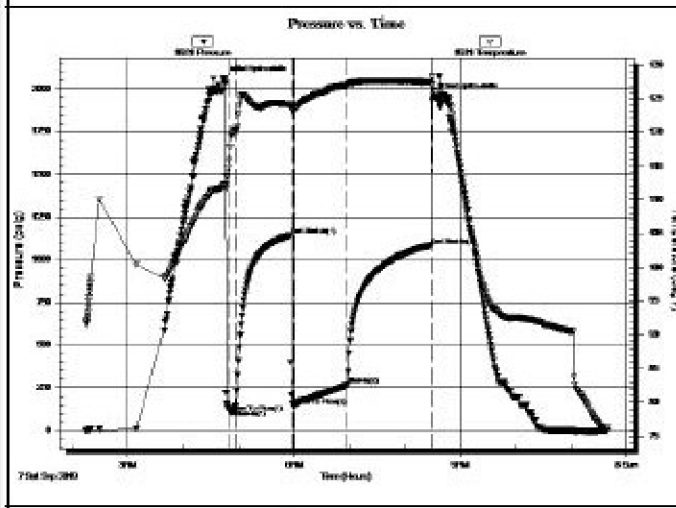
Inside

Press@RunDepth: 266.85 psig @ 4140.00 ft (KB)
 Start Date: 2019.09.07 End Date: 2019.09.07
 Start Time: 14:13:51 End Time: 23:39:31

Capacity: 8000.00 psig
 Last Calib.: 2019.09.07
 Time On Btm: 2019.09.07 @ 16:43:01
 Time Off Btm: 2019.09.07 @ 20:33:01

TEST COMMENT: IF: Strong Blow . B.O.B. in 20 sec. Built to 185.12'

TEST COMMENT: IP: Strong Blow. B.O.B. in 30 sec. Built to 405.42
 IST: No Blow.
 FF: Strong Blow. B.O.B. immediate. Built to 383". G.T.S. in 3 mins. Gauged Gas.
 FSt: Strong Blow. Built to 20.36".



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2062.48	112.08	Initial Hydro-static
7	108.23	117.75	Open To Flow (1)
13	122.11	120.47	Shut-In(1)
73	1144.07	124.14	End Shut-In(1)
76	142.99	123.23	Open To Flow (2)
135	266.85	126.88	Shut-In(2)
228	1085.70	127.48	End Shut-In(2)
230	1958.14	125.21	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
124.00	SOMCW5%o 3% m 92%w	1.74
62.00	GOWCM55%g 9%o 41%w 45%m	0.87
310.00	GOCM40%g 30%o 15%w 15%m	4.35
50.00	GOSM5%g 95%m	0.70

* Recovery from multiple tests

Gas Rates			
	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
First Gas Rate	0.13	6.65	6.70
Last Gas Rate	0.25	39.14	84.94
Max. Gas Rate	0.25	39.34	85.25

ROCK TYPES

Cht	sdy lmst	shale, grn	shale, red	Sltst
Cht vari	Lmst fw<7	shale, gry	Shcol	Cannot Int
Dolprim	Lmst fw>7	Carbon Sh	Ss	

ACCESSORIES

MINERAL - Argillaceous ⊥ Calcareous ▲ Chert, dark △ Chert White	FOSSIL ∩ Bioclastic or Fragmental F Fossils < 20% ⊕ Oolite ⚡ Pellets ⚡ Oomoldic	STRINGER Limestone Sandstone Siltstone Shale red shale carb shale	TEXTURE C Chalky CX Cryptocrystalline L Lithogr
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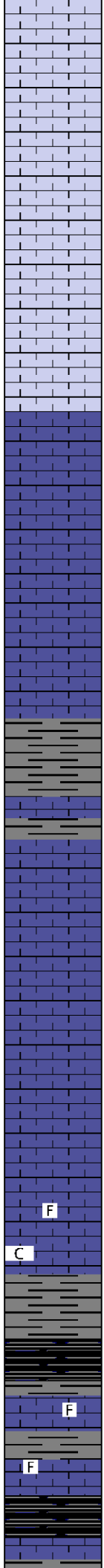
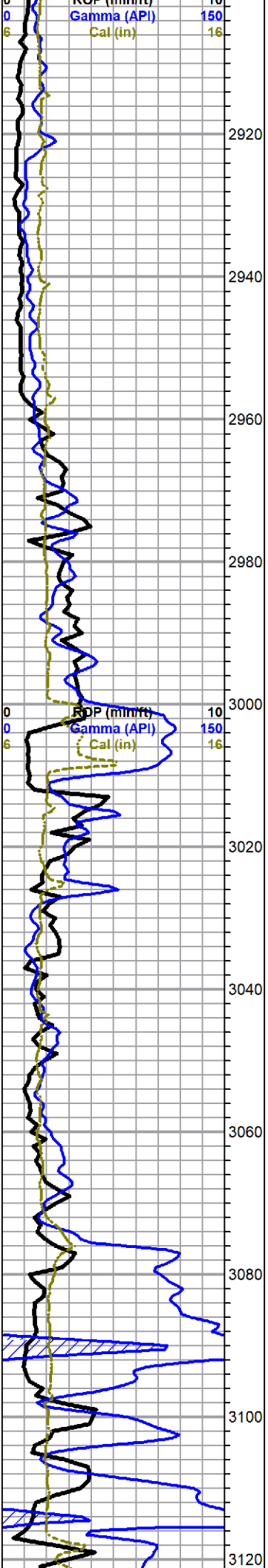
OTHER SYMBOLS

Oil Show ● Good Show ● Fair Show ● Poor Show ○ Spotted or Trace ○ Questionable Stn D Dead Oil Stn ■ Fluorescence * Gas	DST DST Int DST alt Core tail pipe
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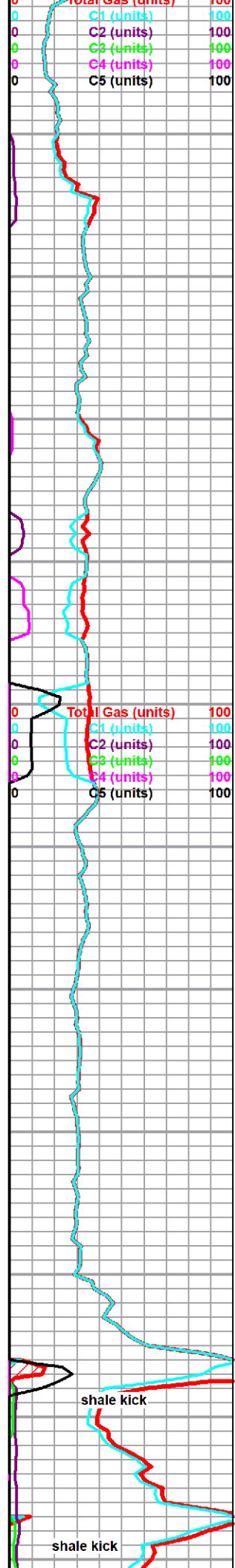
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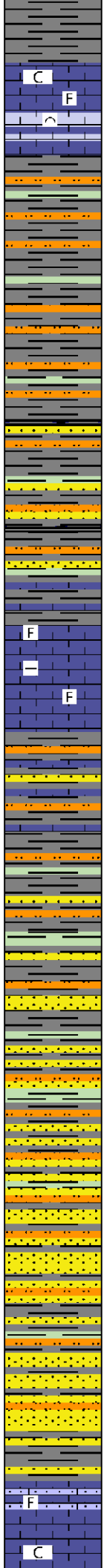
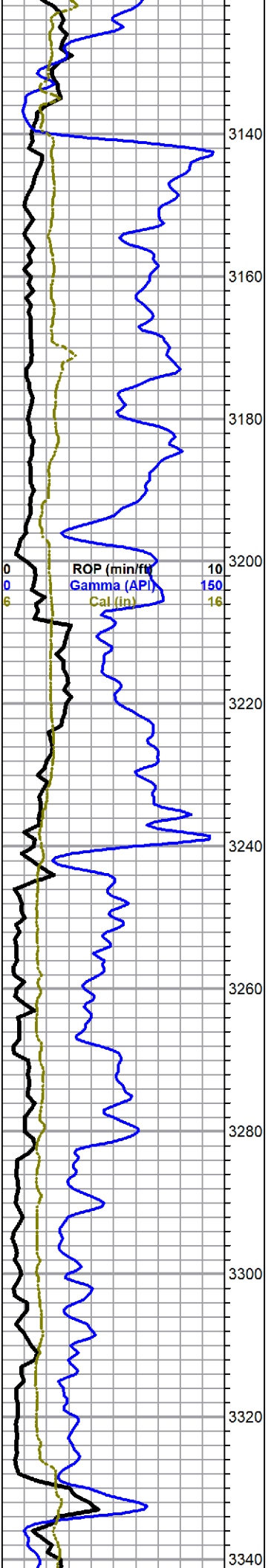
Curve Track #1				TG, C1 - C5				
ROP (min/ft)		Depth Intervals	DST	Lithology	Oil Show	Geological Descriptions	Total Gas (units)	
Gamma (API)							C1 (units)	
Cal (in)							C2 (units)	
							C3 (units)	
							C4 (units)	
							C5 (units)	

1:240 Imperial



F limestone, white to light gray, chalky, fossiliferous, grainy, poor visible porosity, no shows
C
 begin 10 ft wet and dry samples at 3100 ft
 shale, black carbonaceous
F limestone, gray, cryptocrystalline, fossiliferous, dense, no shows
F limestone a.a.
Heebner 3111 -1639
 shale, black carbonaceous





Toronto 3130 -1658

limestone, white to cream to light gray, mostly cryptocrystalline, chalky, fossiliferous, some calcite seams, some grainy bioclastic, poor overall visible porosity, no shows, moderate chalk

Douglas 3142 -1670

shale, variable, gray, some pale green, with salt and pepper siltstone

shales and siltstones a.a., with influx black shales, sandstone stringers, gray, very fine grain, rounded, fair sorting, fairly cemented, micaceous, no shows

limestone, brown to gray, cryptocrystalline, dense, argillaceous, fossiliferous, some laminar cleavage, no shows

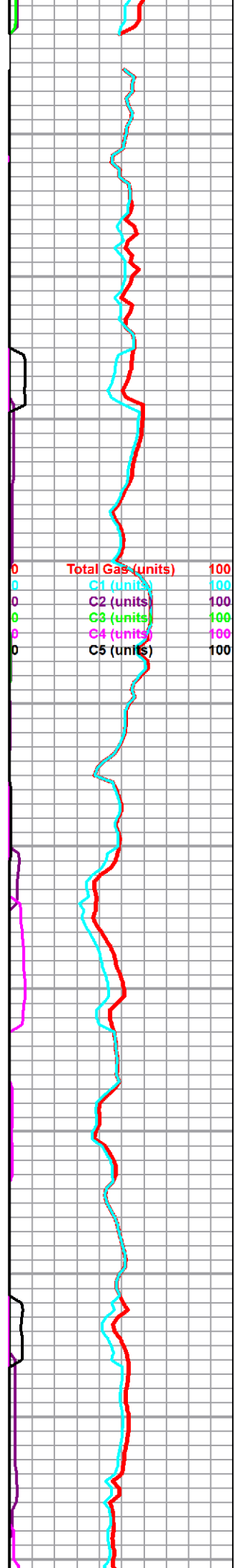
shale, siltstone and sandstones a.a., increasing sandstone

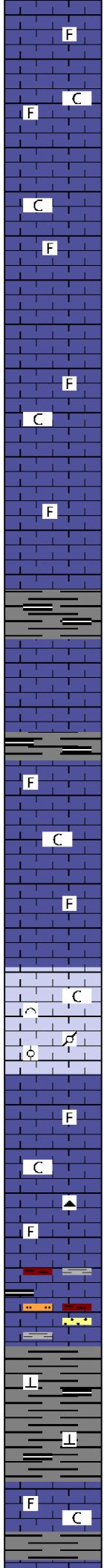
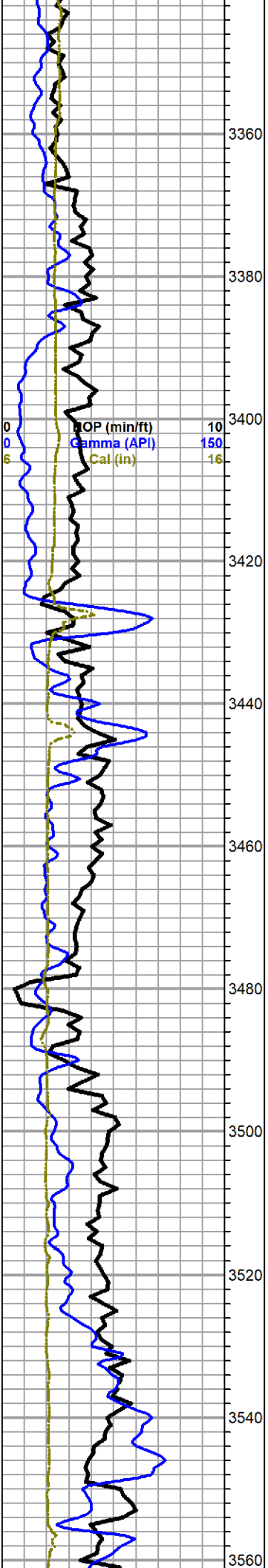
grades to mostly sandstone a.a.

Lansing 3329 -1857 (log 3334 -1862)

limestone, gray and tan with yellow tint, fossiliferous, sandy, dense, grades to:

limestone, cream to blue/gray, very fossiliferous, chalky, some inter-clast porosity. some friable. no shows. moderate chalk in samples





limestone a.a. with moderate chalk

limestone, brown and dark gray, cryptocrystalline, dense fossiliferous and re-crystallized dense oolitic, no show

limestone, variable gray and cream, some mottled, cryptocrystalline, fossiliferous, chalky in part, poor visible porosity, no shows

limestone a.a. with fine cream/white grainy bioclastic, gray mottled pelletal, chalky, some tan oolitic, very fine, dense, no shows

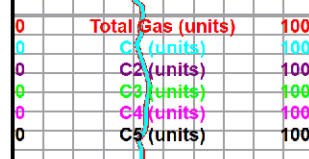
limestone, gray to brown, cryptocrystalline, fossiliferous to re-crystallized oolitic, dense, cherty, with limestone, gray to light gray, chalky, fossiliferous, no shows

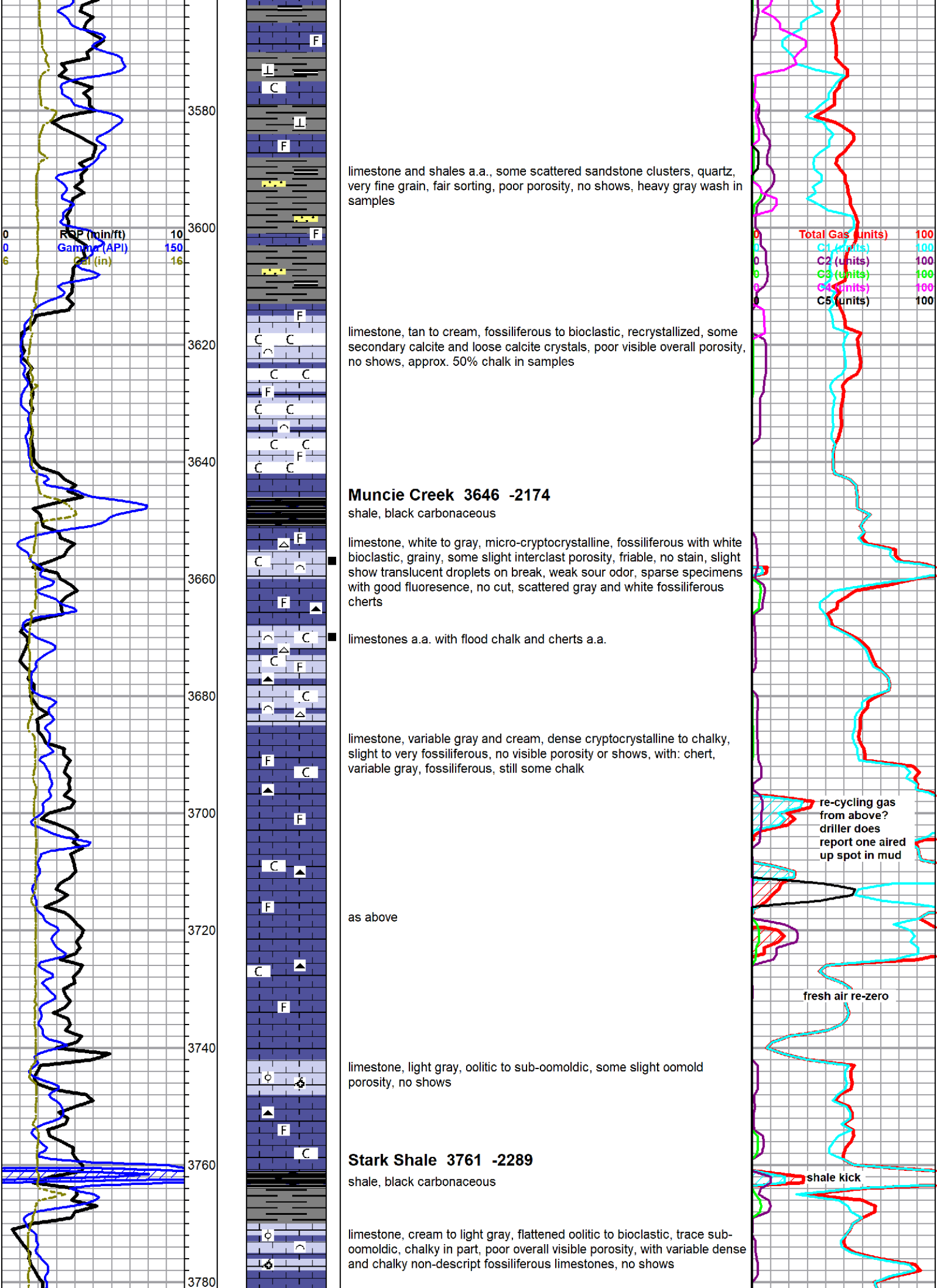
limestone a.a. with influx gray, black and red shales, some gray siltstone and very fine grain quartz sandstone clusters

grades to shale, gray with some black, dense but brittle in part, calcareous, heavy gray wash

limestone, variable gray, cryptocrystalline, fossiliferous and cherty to chalky and gritty, with shales a.a., no shows, heavy gray wash

Mud-Co Mud chk
@ 3463 ft.
1245 hrs, 9/4/19
Vis. 47 Wt. 9.1
PV 13 YP 14
WL 9.6
Cake 1/32,
pH 10.5
CHL 3000 ppm
Ca 80 ppm
Sol 5.5 LCM 3#
DMC \$2582.12
CMC \$11839.51





limestone and shales a.a., some scattered sandstone clusters, quartz, very fine grain, fair sorting, poor porosity, no shows, heavy gray wash in samples

limestone, tan to cream, fossiliferous to bioclastic, recrystallized, some secondary calcite and loose calcite crystals, poor visible overall porosity, no shows, approx. 50% chalk in samples

Muncie Creek 3646 -2174

shale, black carbonaceous

limestone, white to gray, micro-cryptocrystalline, fossiliferous with white bioclastic, grainy, some slight interclast porosity, friable, no stain, slight show translucent droplets on break, weak sour odor, sparse specimens with good fluorescence, no cut, scattered gray and white fossiliferous cherts

limestones a.a. with flood chalk and cherts a.a.

limestone, variable gray and cream, dense cryptocrystalline to chalky, slight to very fossiliferous, no visible porosity or shows, with: chert, variable gray, fossiliferous, still some chalk

re-cycling gas from above? driller does report one aired up spot in mud

as above

fresh air re-zero

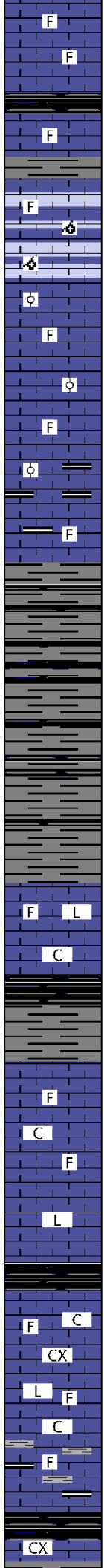
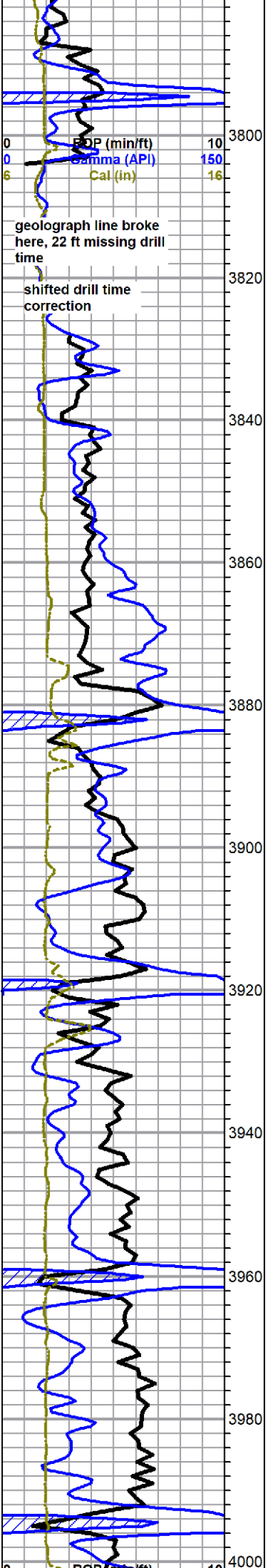
limestone, light gray, oolitic to sub-oomoldic, some slight oomold porosity, no shows

Stark Shale 3761 -2289

shale, black carbonaceous

shale kick

limestone, cream to light gray, flattened oolitic to bioclastic, trace sub-oomoldic, chalky in part, poor overall visible porosity, with variable dense and chalky non-descript fossiliferous limestones, no shows



shale, black carbonaceous

limestone, mixed fossiliferous with abundant gray oomoldic, good oomold porosity, no shows

limestone, mixed variable no-descript fossiliferous, abundant oolitic, dense, no shows

limestone a.a. with influx black and dark gray limestone, very cherty, fossiliferous, dense/hard black shales, no shows

Base KC 3862 -2390
black and gray shales, some silty

limestone, cream to tan, mostly cryptocrystalline, lithographic to re-crystallized fossiliferous, dense to chalky, poor visible porosity, no shows

black and gray shales

limestone, mixed non-descript fossiliferous, fairly chalky overall

influx limestone, dark grays, cryptocrystalline, dense lithographic, no shows

shale, black carbonaceous

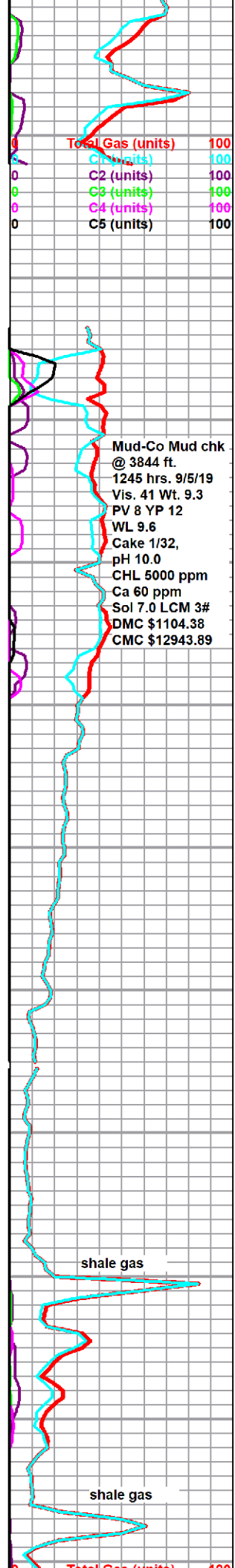
limestone, cream to tan, microcrystalline, chalky, slightly fossiliferous to arenaceous, with variable dark gray to black, cryptocrystalline, dense, lithographic to fossiliferous, some calcite seams, no shows

increase in chalky facies

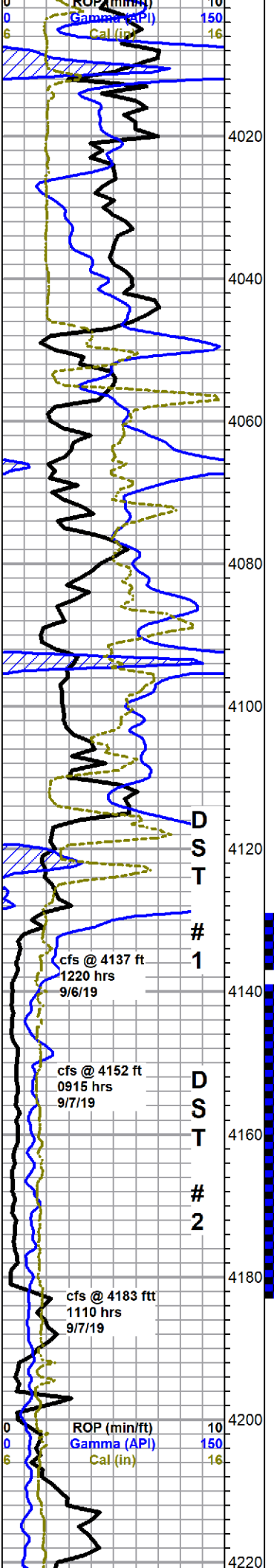
flood gray and black shales with limestone a.a.

shale, black carbonaceous

mixed gray and black shales with: limestone, gray to cream and tan,



Mud-Co Mud chk @ 3844 ft.
1245 hrs. 9/5/19
Vis. 41 Wt. 9.3
PV 8 YP 12
WL 9.6
Cake 1/32,
pH 10.0
CHL 5000 ppm
Ca 60 ppm
Sol 7.0 LCM 3#
DMC \$1104.38
CMC \$12943.89



mostly cryptocrystalline with some chalky, no visible porosity or shows

Cherokee 4009 -2537

brown and gray shales

limestone, gray to cream, cryptocrystalline, lithographic to fossiliferous, chalky in part, arenaceous in part, no visible porosity, no shows

shales a.a. with limestone streaks a.a., influx olive limestones

variable shales, shale a.a. including olive, red and green

shale, white to light gray and lavender, soft, soapy

Mississippian 4128 -2656

chert, white to cream, tripolitic to slightly tripolitic, some good pinpoint tripolitic porosity, spotty to saturated light golden stain, slight show bleeding gas, slight show free oil, fleeting odor, excellent bright white to green fluorescence, poor cut

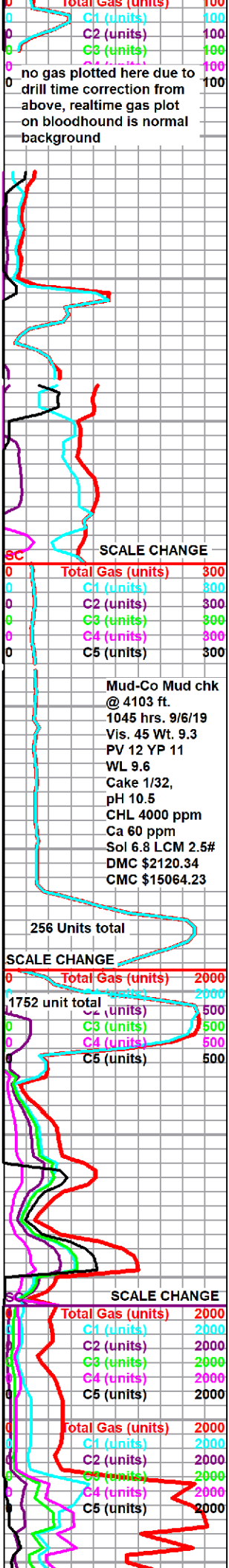
chert, gray/white to white, tripolitic, good deep tripolitic vugs, saturated gray/brown to black saturated staining, good show gas, streaming sheen with slight show oil droplets, fleeting odor, poor to fair fluorescence, excellent cut

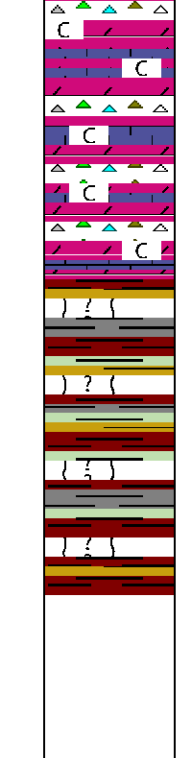
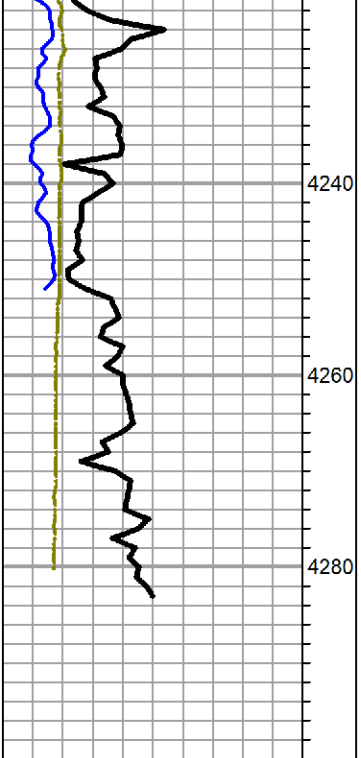
4183 30 min cfs sample, chert, white to cream and light gray, tripolitic to slightly tripolitic to rotten/friable, some fresh, good light brown staining spotty to saturated, heavy bleeding oil and gas, good odor, good fluorescence, slow blueish cut with halo

60 min sample, a.a. with: flood of chert, white to cream, mostly fresh, sharp, some with light etching and light stain, poor show oil from rocks above, no odor in samples

chert a.a. with dolomite, tan to cream, micro-cryptocrystalline, some sucrosic, some pin-point porosity, some saturated light brown staining, trace sheen on break, no free oil or odor in wet cup

dolomite, white to light gray, micro-cryptocrystalline, sub-rhombic to sub-lithographic, dense, limestone, mostly dolomitic, micro-cryptocrystalline, some recrystallized fossiliferous, dense, no shows, chert, white to frosted gray, to blue/gray, some fossiliferous, sharp,



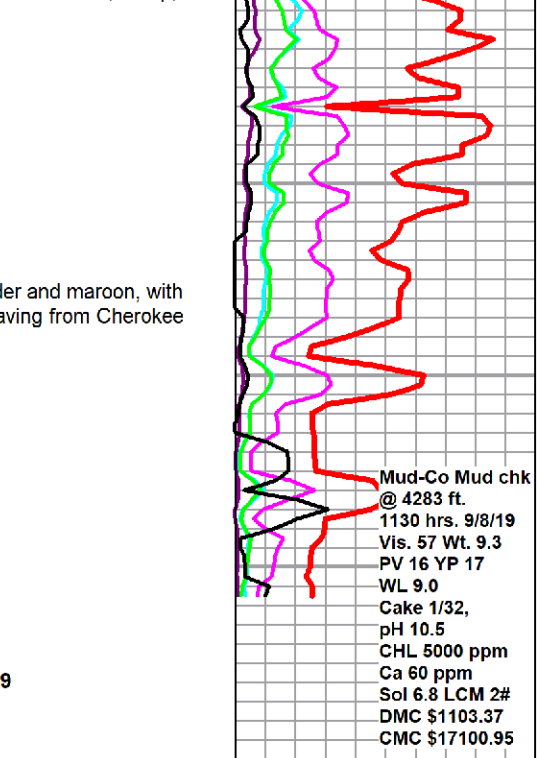


fresh, no shows - appx 30% chalk in samples

4260 sample, flood shales, multicolored, lavender and maroon, with gray and green, still carrying abundant cherts (caving from Cherokee shale? - all washed out on log caliper)

a.a.

Rotary TD 4283 ft. @ 0755 hrs 9/8/19
 ELI Wireline TD 4285 ft.
 complete logging operations 1530 hrs 9/8/19



Mud-Co Mud chk
 @ 4283 ft.
 1130 hrs. 9/8/19
 Vis. 57 Wt. 9.3
 PV 16 YP 17
 WL 9.0
 Cake 1/32,
 pH 10.5
 CHL 5000 ppm
 Ca 60 ppm
 Sol 6.8 LCM 2#
 DMC \$1103.37
 CMC \$17100.95