



**M. Bradford Rine**  
*Consulting Geologist*  
*Licensed/Certified: Kansas, Wyoming, AAPG/DPA, SIPES*  
*Phone: (316) 250-5941*

**Scale 1:240 (5"=100') Imperial  
Measured Depth Log**

**Well Name:** VanZant #1 - Energy Partners, LLC  
**API:** 15-191-22812-00-00  
**Location:** NE-NE-NW, Section 23-34S-01W  
**License Number:** KCC # 35584  
**Spud Date:** April 04, 2019  
**Surface Coordinates:** 330' FNL & 2348' FWL,  
of Section  
**Bottom Hole Coordinates:** Vertical Wellbore  
**Ground Elevation (ft):** 1152 Ft.  
**Logged Interval (ft):** 3000 Ft. **To:** 4450 Ft. **Total Depth (ft):** RTD 4450 Ft. LTD ....  
**Formation:** Arbuckle at Total Depth  
**Type of Drilling Fluid:** Chemical

**Region:** Sumner County, Kansas  
**Drilling Completed:** April 16, 2019  
**Results:**  
**Field:** Mirt East  
**K.B. Elevation (ft):** 1161 Ft.

Printed by MudLog from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

**Operator**

**Company:** Energy Partners, LLC  
**Address:** 8918 West 21st Street North, #200-304  
Wichita, Kansas 67205

**Geologist**

**Name:** M. Bradford Rine  
**Company:** Consulting Geologist, Kansas Lic. #204, Wyo #189, AAPG Cert. #2647  
**Address:** 100 South Main, Suite #320A  
Wichita, Kansas 67202

**Remarks**

Based on sample observations, drill stem test results, and electric log evaluation, it was the decision of the Operator, to .....

## Drilling Information

Rig: C & G Drilling, Rig#2  
Pump: Emsco D375 6-1/2 x14  
Drawworks: Bethlehem S45  
Collars: 230' 2-1/4 x 6-1/4  
\*(2 collars removed after DST 1 @ 3907')  
Drillpipe: 4-1/2" 16.6# XH  
Toolpusher: Judd Gulick

Mud: Fud Mud (Aaron Rush)  
Gas Detector: None  
Drill Stem Tests: Trilobite (Leal Cason)  
Logs: ELI (  
Water: Stream on Mason Farm 1/2 mi West (C&G Tank)  
Company Representatives:  
Office: Jay Ablah and Jerry Honas  
Field: Jay Ablah

## Daily Drilling Status

Date:	Operations/Depth/Comments
04-04-19	MIRT, RU @ 0'
04-05-19	Prepare to Spud @ 0'
04-06-19	Waiting on Cement @ 239', Prepare to Drill Out
04-06-19	Drilling @ 1356'
04-07-19	Drilling @ 2111'
04-08-19	Drilling @ 3216'
04-09-19	Drilling @ 3875'
04-10-19	On Bottom with DST #1 @ 3907'
04-11-19	Trip Out of Hole with DST #2 @ 3970'
04-12-19	Drilling @ 4191'
04-13-19	Circulating to Condition Hole @ 4282'
04-14-19	Trip in Hole with DST #5 @ 4294'
04-15-19	Prepare To Trip in Hole With Bit @ 4302'
04-16-19	Circulating to Condition Hole for Logs @ 4450'

## Casing Record, Bit Record, Deviation Surveys, Pipe Straps

### CASING:

Conductor: None

Surface: Set 8-5/8" 23# new, set @ 223'. (Copeland) Cement with 200 sx 60/40 POZ, 2% gel, 3% CC. Cement did circulate.

### Production:

### BITS:

No.	Size	Make	Model	Depth In	Depth Out	Hours
1	12-1/4	Rr	PDC	0	239	2.00
2	7-7/8	Atlas	PDC 6-bl	239	3970	57.25
3	7-7/8	Security	PDC 7-bl	3970	4289	17.50
4	7-7/8	HTC	537 TC	4289	4450	16.25

Deviation:	Depth:	Deviation:	Depth:
1.00*	3907'	.....	4450'
1.75*	4282'		

### PIPE STRAPS:

Difference:	depth:
+ 0.71'	3907'

**DST #1: 3865-3907 (Mississippi)**

**Times: 30-60-90-90**

**Initial Open: Stg Blow, b.o.b. 45 sec.,**

**GTS 10 minutes**

**Final Open: Stg Blow, GTS instant**

**Rec: See gas readings below!**

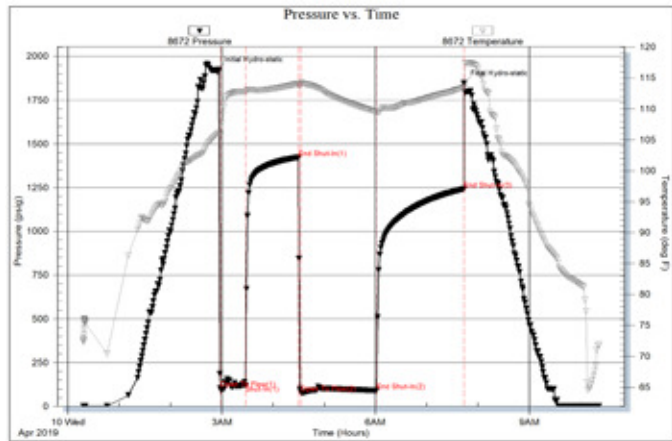
**Total Fluid, 63' SGCM: 02%g 98%mm**

**IHP: 1925 FHP: 1847**

**IFP: 104-122 FFP: 80-91**

**ISIP: 1423 FSIP: 1244**

**BHT: 113°F**



**DST #1: Gas Readings**

Min	Orifice	Pr.	CFGPD
10	1/4	31	49,178
20	3/8	42	153,856
30	3/8	42	153,856
10	3/8	44	161,182
20	3/8	50	183,162
30	3/8	52	190,488
40	3/8	51	186,825
50	3/8	50	183,162
60	3/8	49	179,498
70	3/8	47	172,172
80	3/8	46	168,509
90	3/8	44	161,182

**DST #2: 3928-3970 (Mississippi)**

**Times: 45-60-45-60**

**Initial Open: Stg Blow, b.o.b. 31 min,**

**built to 16 inches, No return blow**

**Final Open: Stg Blow, b.o.b. 18 min,**

**Built to 28 inches**

**Rec: 496' Total Fluid, 62' gas in pipe**

**186' SOCM: 02%o 98%m**

**127' MCW: 76%w 24%m**

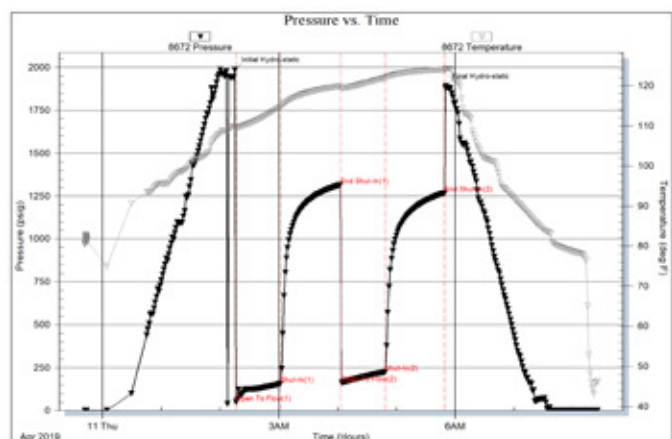
**183' Wtr: 100%w (Chl/wtr 78000 ppm)**

**IHP: 1985 FHP: 1891**

**IFP: 49-156 FFP: 162-225**

**ISIP: 1316 FSIP: 1269**

**BHT: 124°F**



**DST #3: 4238-4282 (Simpson)**

**Times: 30-30-60-60**

**Initial Open: Wk Blow,  
built to 1-1/2" i.b.**

**Final Open: Wk Blow,  
built to 5-1/2" i.b.**

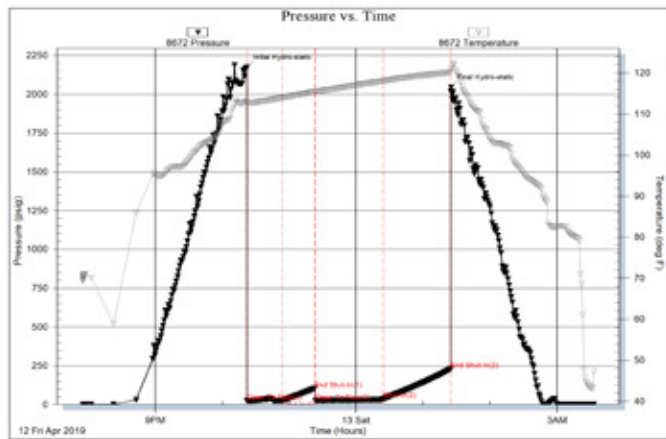
**Rec: 10' mud**

**IHP: 2173 FHP: 2043**

**IFP: 24-25 FFP: 24-36**

**ISIP: 104 FSIP: 229**

**BHT: 122°F**



**DST #4: 4238-4289 (Simpson)**

**Times: 30-30-60-60**

**Initial Open: Fr Blow, built to 6" i.b.,  
No return blow**

**Final Open: Stg Blow, b.o.b. 8 min,  
Blow built to 45 inches, no return blow**

**Rec: 868' gas in pipe**

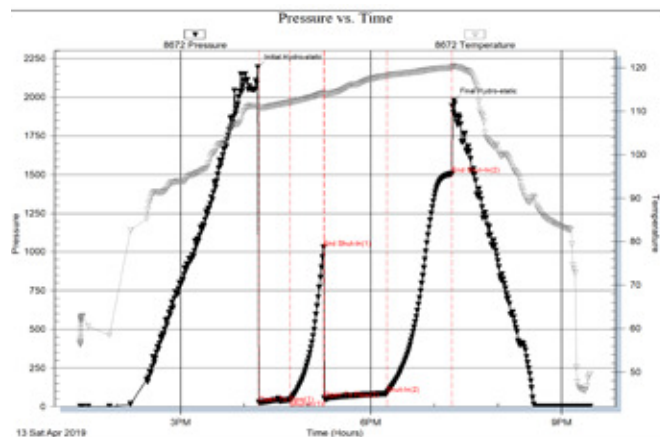
**126' SOGCM: 2%g 2%o 96%m**

**IHP: 2193 FHP: 1975**

**IFP: 27-47 FFP: 54-86**

**ISIP: 1029 FSIP: 1506**

**BHT: 120°F**



**DST #5: 4289-4294 (Simpson)**

**Times: 45-60-60-90**

**Initial Open: Stg Blow, b.o.b. 20 min,  
built to 39", No return blow**

**Final Open: Stg Blow, b.o.b. 8 min,  
built to 65", Return blow built to 1/2"**

**Rec: 993' gas in pipe**

**185' Total Fluid:**

**63' WMCO: 54%o 14%w 32%m**

**61' WMCO: 50%o 20%w 32%m**

**61' SOMCW: 2%o 78%w 20%m**

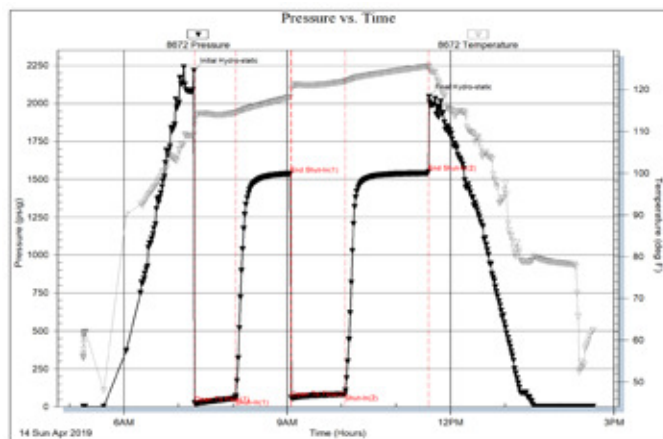
**(Chl/Wtr: 96,000 ppm)**

**IHP: 2214 FHP: 2043**

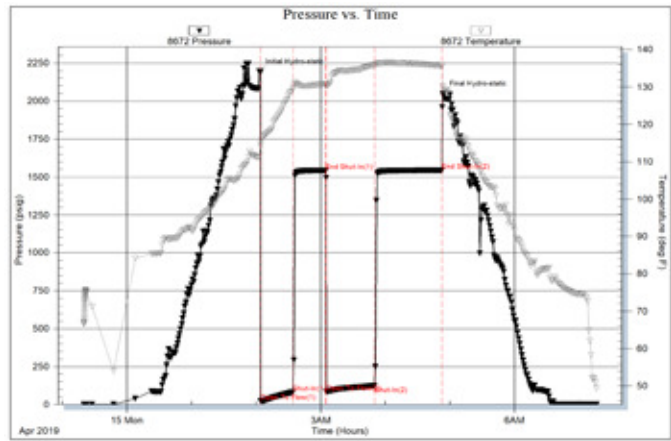
**IFP: 25-56 FFP: 58-84**

**ISIP: 1537 FSIP: 1550**

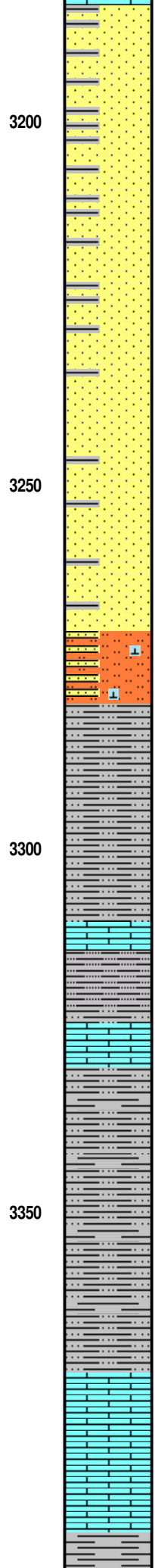
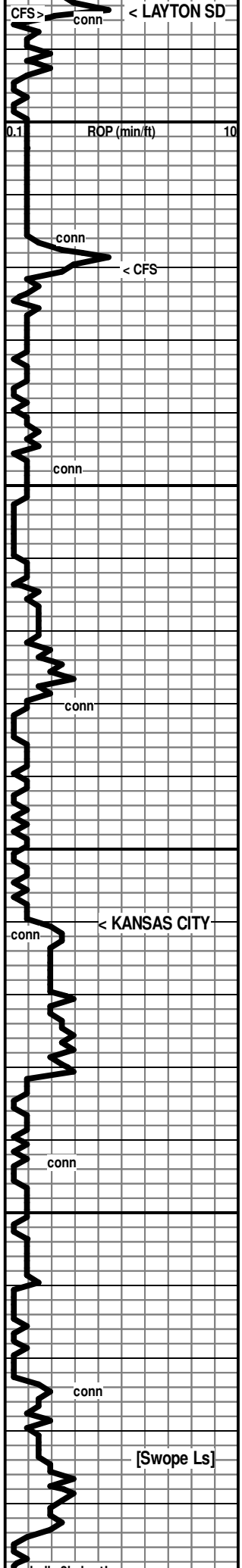
**BHT: 125°F**



**DST #6: 4295-4302 (Simpson)**  
**Times: 30-30-45-60**  
**Initial Open: Wk Blow, built to 4"**  
**Final Open: Wk Blow, built to 4-1/2"**  
**Rec: 193' Total Fluid**  
**10' MCW: 50%m 50%w**  
**183' Water (Chl 94,000 ppm)**  
**IHP: 2194 FHP: 2051**  
**IFP: 24-82 FFP: 84-124**  
**ISIP: 1544 FSIP: 1554**  
**BHT: 136°F**



ROP (min/ft) ROP (min/ft) ———	MD	Lithology	Geological Descriptions	Remarks
	<p>3000</p> <p>3050</p> <p>3100</p> <p>3150</p> <p>WOB 10K RPM 100 PP 720 SPM 57</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Shows</p>	<p>Sh gy, silty/ic text in great abund</p> <p>Sh mostly gy-dk gy, some brownish to reddish &amp; grn pcs, silty/ic text in great abund,</p> <p>Sh mostly gy-dk gy, some brownish to reddish &amp; grn pcs, silty/ic text in great abund,</p> <p>Sh mostly gy-dk gy, some brownish to reddish &amp; grn pcs, silty/ic text in great abund, few white siltst clusters</p> <p>Sh mostly gy-dk gy, some brownish to reddish &amp; grn pcs, silty/ic text in great abund,</p> <p>Sh mostly gy-dk gy, some brownish to reddish &amp; grn pcs, silty/ic text in great abund,</p> <p>Sh pl gy-gy-dk gy, silty to mic in pt</p> <p>Sh pl gy-gy-dk gy, few grn pcs, silty to mic in pt</p> <p>Sh pl gy-gy-dk gy, silty to mic in pt</p> <p>3175' cfs: 99% Sh pl gy-gy-dk gy, some black carb, soft-hard, silty to mic in pt; 01% Sd, white, fn grn, gd sort, subrd, pr-fr fri, scatt dk sh/min specks [NS]</p> <p>3185' cfs: 90% Sh gy-dk gy-blk, silty in pt; 10% Siltstone &amp; Sd, wh-gy, vfn-fn grn, cem in pt, pr-gd fri, subrd, fr-gd sort; Trace of hard calc fn grn sd [NS]</p>	<p>* Displace and Mudup @ 2785 ft!</p>
		<p>&lt; LIGNITE</p> <p>&lt; CFS</p>	<p>&lt;————— 3170 (-2009)</p>	



← 3385 (2024)

Sh & Silty Sh, gy-dk gy-black-gmish, argil to silty text, some siltstone pcs

60% Shales and silty shales as above; 40% Siltstone & Sd, vfn-fn grn, sh-gy, clean to cem, gd sort, subrd, pr-gd fri, some ls frag inclusions

[No Odor, Low % clusters with brt speckled fluor, widely scatt trace show of micro-spots brn stn, ? trace show of micro NVL FO]

50% Shales mostly gy-dk gy-blk, silty in pt; 50% Sd & siltstone, white-gy-clear, vfn-fn grn, subrd, gd sort, cem in pt, mic in pt, pr-gd fri

40% Shales mostly gy-dk gy-blk, silty in pt; 60% Sd & siltstone, white-gy-clear, vfn-fn grn (sli crsr with depth) subrd, gd sort, cem in pt, mic in pt, pr-gd fri

10% Shales mostly gy-dk gy-blk, silty in pt; 90% Sd & siltstone, white-gy-clear, vfn-fn grn (sli crsr with depth) subrd, gd sort, cem in pt, mic in pt, pr-gd fri

10% Shales mostly gy-dk gy-blk, silty in pt; 90% Sd & siltstone, white-gy-clear, vfn-fn grn (becoming more silt textured) subrd, gd sort, calc cem in pt, mic in pt, pr-gd fri

Sh pl gy-gy, abund silty mic text, some highly pyritic shale

← 3310 (-2149)

Ls cr-tan, fn xln, dns, foss in pt

Shaley Siltstone to silty shale, wh-gr, cem in pt, vfn grn, fr-gd fri

Ls wh-cr, fn xln, subchalky in pt, dns & firm in pt

Sh & silty Sh pl gy-gy-gmish, subsilty-silty text, mic

Sh & silty Sh pl gy-gy-gmish, a few reddish brn pcs, subsilty-silty text, mic

Ls cr-tan, mostly dns and hard, some softer and subchalky, foss

Sh gy, subsilty in pt

Mud Check Drlg @ 3185':

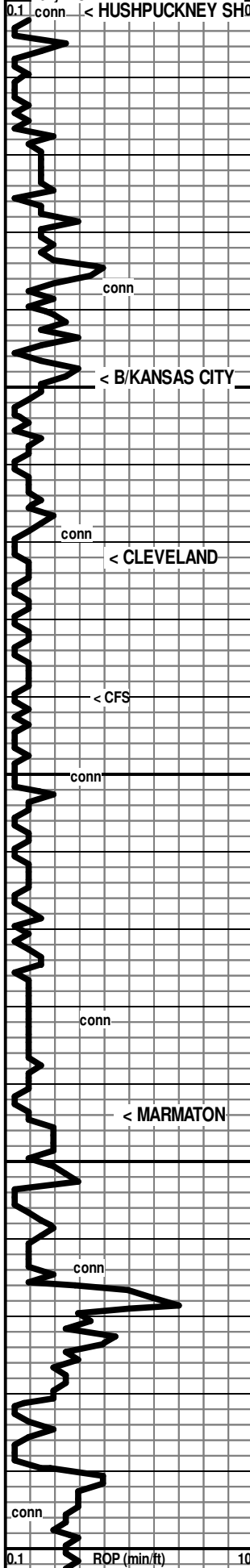
Vis	Wt	WL	PV	YP
37	9.6	15.0	5	12
Chl	Hd	pH	LCM	Solids
2400	80	9.5	0	9.2

7:00 AM, April 08, 2019

\* Lost returns at 3351-52 ft. (150 bbls) Add premix with hulls. (at low pp maintaining partial returns)!

\* Drill ahead with full returns!





3400

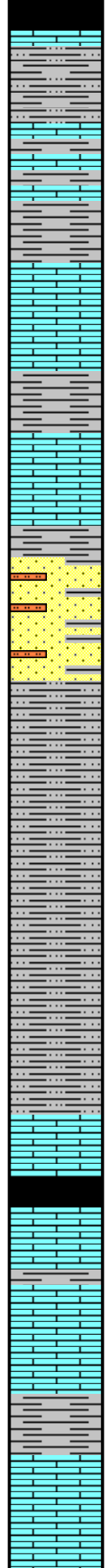
3450

3500

3550

3600

WOB 8k  
RPM 100  
PP 950  
SPM 48  
LCM 4#



< 3401 (-2240)

Sh black, carb

Sh gy-dk gy, subsilty/mic to silty with some shaley siltstone, scatt pyrite marbling; some dns cr-tan Ls

Sh gy, silty in pt

Ls wh-cr-tan-gy, fn xln, chalky in pt, dns in pt, foss in pt

< 3449 (-2288)

Sh gy-grn, siltstone gy-grn, glauc in pt

Ls wh-cr-tan, fn xln, chalky to dns, foss in pt, scatt glauc stained patches

Sh gy

< 3472 (-2311)

Sd wh-gy-grnish, fn grn, silty in pt, fr-gd sort, subrd, pr-fr-gd sort, mostly cem, foss in pt, abund glauc, shaley in pt to abund shale in spls, apparent lack of "clean" sand [NS]

Siltstone & Sd, shaley in pt, vfn-fn grn, mic text in pt, calc cem in abundance, gd sort, subrd, fr-gd fri, glauc in pt

Siltstone & Sd, shaley in pt, vfn-fn grn, mic text in pt, calc cem in abundance, gd sort, subrd, fr-gd fri, glauc in pt

< 3544 (-2383)

Ls wh-cr-tan, fn xln, chalky & soft in patches and pcs, dns in abund. silty text in pt [NS]

Abund shales in spls gy-grn-black, silty to mic to carb

Ls wh-cr-tan-brn, fn xln, chalky & soft in patches and pcs, dns in abund. silty text in pt

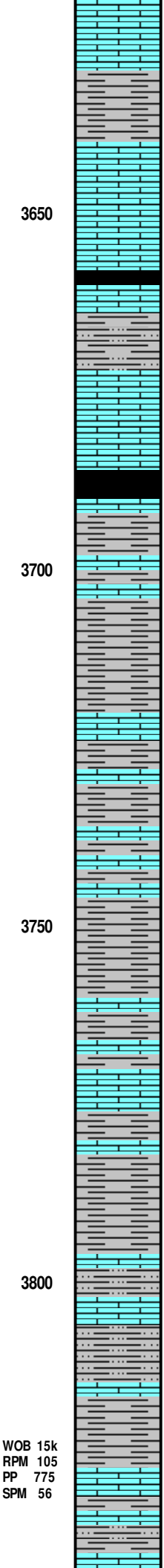
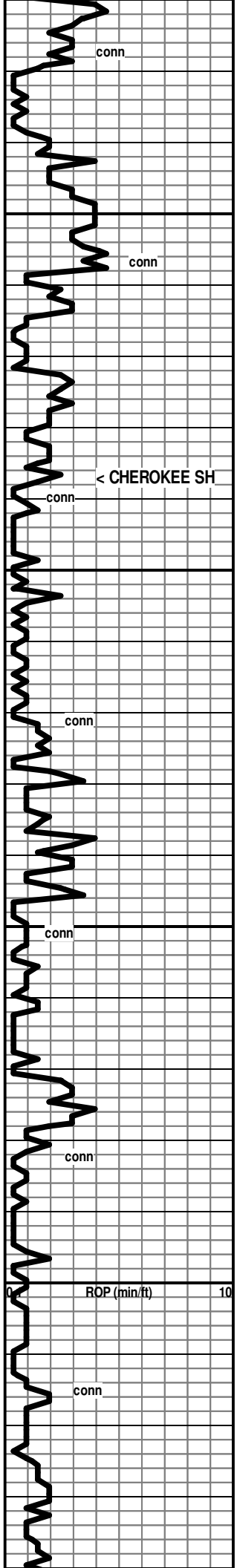
Abund shales in spls gy-grn-black, silty to mic to carb

Sh gy, silty in pt

Ls cr-tan, fnxln, mostly pr xln to dns, some pcs with pp foss pores, scatt chalky patches and edges, foss

Sh dk gy-black, carb in pt

\*Drilling with jet plugged in bit!

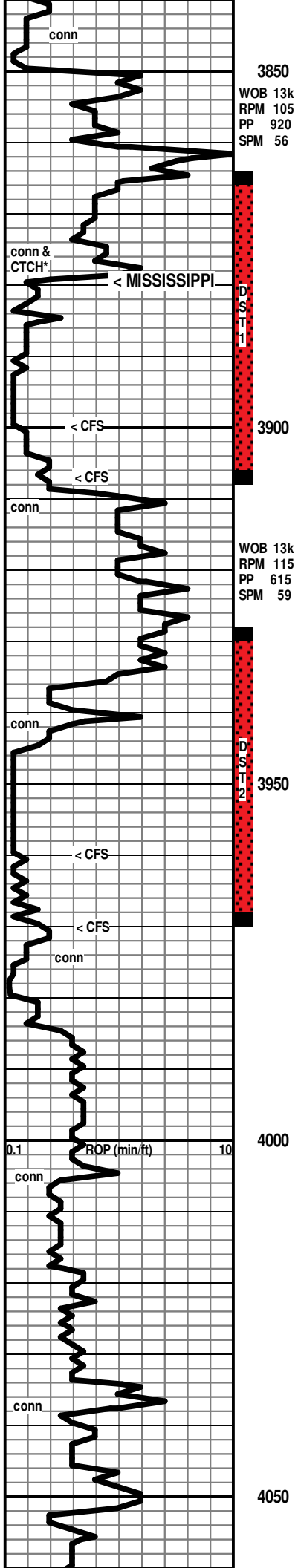


Ls cr-tan, fn xln, pr xln por to dns, foss in pt  
 Sh gy-dk gy-pl grnsh, subsilty in pt, scatt pyritic  
 Ls cr, fn xln, dns to pr xln por, foss in pt  
 Sh black, carb  
 Sh gy-dk gy, sub carb to subsilty  
 Ls cr-tan, fn xln, pr sln por to dns  
 ← 3687 (-2526)  
 Sh black carb  
 Sh gy-dk gy  
 Ls cr-tan, with some white chalky patches, fn xln, dns  
 Sh gy-dk gy-black, subcarb-carb in pt  
 Ls cr-tan-brn, fn xln, dns; mixed with abund Shale gy-dk gy-black  
 Sh pl gy-gy-dk gy, subsilty text in pt  
 Ls cr, fn xln, some white chalky patches & pcs  
 Sh gy-dk gy-black, carb in pt, subsilty/mic text in pt  
 Shaley siltstone to silty shale, gy-dk gy, some white-gy siltstone clusters, some ls in spls  
 Sh gy-reddish-lavendar, silty in pt, some whit-gy siltstone, some dns cr ls  
 Ls wh-cr, fn xln, mostly dns, some chalky, some shaley; siltstone wh-gy-gm, pyritic in pt; Shales gy-gm-red, earthy to silty, pyr in pt

WOB 15k  
 RPM 105  
 PP 775  
 SPM 56

**DST #1: 3865-3907 (Mississippi)**  
 Times: 30-60-90-90  
 Initial Open: Stg Blow, b.o.b. 45 sec. GTS 10 minutes  
 Final Open: Stg Blow, GTS instant  
 Rec: See gas readings below!  
 Total Fluid, 63' SGCM: 02%g 98%mm  
 IHP: 1925 FHP: 1847  
 IFP: 104-122 FFP: 80-91  
 ISIP: 1423 FSIP: 1244  
 BHT: 113°F

DST #1:		Gas Readings	
Min	Orifice	Pr.	CFGPD
10	1/4	31	49,178
20	3/8	42	153,856
30	3/8	42	153,856
10	3/8	44	161,182
20	3/8	50	183,162
30	3/8	52	190,488
40	3/8	51	186,825
50	3/8	50	183,162



Ls cr, fn xln, dns; Abund silty-sdy shale and shaley silty to sdy clusters, vfn gm, cem in pt, gy-wh-grn; abund pyritic shale and siltstone, abund loose pyrite in spls

Ls cr-gy, vfn-fnxln, silty in pt, dns; abund gy shales, silty shale and siltstone

Sh gy-grn-red-brn-lav, silty in pt, pyritic in pt, foss in pt

Ls & siltst as above

← 3879 (-2718)  
Possible congl shale of various colors and chert

Chert Mostly white, some cr-tan, mostly opaq, some subtransl, mostly sli weath'd to weath'd, lower % subtrip-trip in patches & pcs with depth, trace of pp pores and v sm vugs, mostly pr-fr crush with good crush

Show Descr. →

Chert white opaq to wh-cr-tan transl, more fresh and less weathering and trip than above, scatt pp pores & sm vugs

10% Ls wh-cr-gy, vfn-fn xln, dns, subsilty text in pt; 90% Shales mostly gy-dk gy, gmish, some reddish, argil to silty text

30% Ls cr-pl gy-gy, fn xln, dns, silty text in pt; 70% Shales as above

25% Ls cr-pl gy-gy, fn xln, dns, silty text in pt, pyritic in pt.; 75% Shales as above

Chert mostly wh, some cr, mostly fresh, some sli weath'd, Low % more weath'd

Show Descr. →

Chert mostly wh, some cr, mostly opaq-some subop, fresh to sli weath'd to weath'd,

Chert: Abund fresh, abund sli weath'd to weath'd, scatt pp pores & sm vugs

Show Descr. →

samples 99% shales, trace of fresh to sli weath'd chert, white, opaq in spls

4010' spl still 99% shales; trace of Ls cr-tan-brn, vfn-fn xln,dns, grainy text in pt, scatt chalky patches

Ls cr-tan-gy, vfn-fn xln, dns, sli foss in pt

\* 4000'-4100' mod % of shales, gy-dk gy

Ls cr-tan-gy, vfn-fn xln,dns with scatt white chalky patches

Ls tan-brn-gy, vfn-fnxln, dns, grainy text in pt

60	3/8	49	179,498
70	3/8	47	172,172
80	3/8	46	168,509
90	3/8	44	161,182

Mud Check CTCH& Mud @ 3879':  
Vis Wt WL PV YP  
40 9.4 13.0 5 5  
Chl Hd pH LCM Solids  
2400 80 9.5 2 9.5

7:00 AM, April 09, 2019  
\* 3879': CTCH, Add Premix to improve mud to dst specifications and to condition hole!

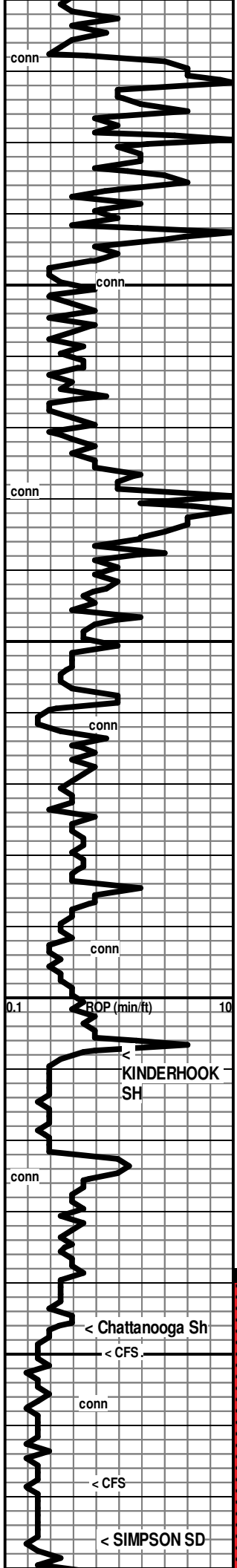
Mud Check @ 3900' had 49 Vis  
[Mild Odor, Mod-brt patchy-even Fluor, abund tan marbled to some even tan Stn, sli gassy at rest in tray, Mod gassy when crushed, abund micro-drops FO visible under black light on crush, gassing and str'g decreasing with depth]

7:00 AM, April 10, 2019  
Mud Check TOOH/DST1@ 3907':  
Vis Wt WL PV YP  
40 9.4 12.0 6 6  
Chl Hd pH LCM Solids  
2600 80 9.7 2 9.5

Mud Check @ 3932': Vis 47 Wt 9.3 LCM 2.5  
[3934-3960: Fnt Odor on agitation, Abund Brt Flour, low % of patchy tan stn, Rr pcs of sm blk Res patches, v sli gassy in pt, under blk light-fair spattering of micro-drops of fluor hydrocarbon on crush]

[3960-3970: V Fnt Odor on agitation, Mod amount of brt Flour, mod am't of pcs with patchy tan stn, some pcs more gassy than above, under black light fair spatter of micro-drops of fluor hydrocarbon on crush]

7:00 AM, April 11, 2019  
DST #2: 3928-3970 (Mississippi)  
Times: 45-60-45-60  
Initial Open: Stg Blow, b.o.b. 31 min, built to 16 inches, No return blow  
Final Open: Stg Blow, b.o.b. 18 min, Built to 28 inches  
Rec: 496' Total Fluid, 62' gas in pipe  
186' SOCM: 02%o 98%m  
127' MCW: 76%w 24%m  
183' Wtr: 100%w (Chl/wtr 78000 ppm)  
IHP: 1985 FHP: 1891  
IFP: 49-156 FFP: 162-225  
ISIP: 1316 FSIP: 1269  
BHT: 124°F



4100

4150

4200

4250

WOB 11k  
RPM 85  
PP 622  
SPM 59

0.1 ROP (min/ft) 10

D  
S  
T  
3

D  
S  
T  
4

Ls tan-brn-gy, vfn-fnxln, dns, grainy text in pt

Ls tan-brn-gy, vfn-fnxln, dns, grainy text in pt

Ls tan-brn-gy, vfn-fnxln, dns, grainy text in pt, Rr scatt chalky patches & edges, Rr scatt foss

\* continued mod shale % in spls, gy-dk gy-blk

Ls tan-brn-gy, vfn-fnxln, dns, grainy text in pt, Rr scatt vhalky patches & edges, Rr scatt foss

Ls Dol Ls wh-cr-tan-brn, fn xln, grainy to subsucrosic text, scatt white chalky patches & edges, scatt grn glauc specks

Dol Dol Ls cr-tan-brn, fn xln, subsucrosic-sucr text, dns to pr vis xln por, Rr wh chalky patches

Dol cr-tan-brn, fn xln, subsucrosic-sucr-grainy, dns to pr vis xln por, scatt glauc specks, scatt white spicules

Dol Sdy Dol Dol Sd, cr-tan-brnsh, withscatt white calc cem, fn xln/fn grn, sucr to grainy, pr vis xln por in pt, abund pl grn-dk grn glauc; some shale pl gy-pl grn, silty/sdy in pt, talc text in pt, scatt pyritic & loose pyr

← 4207 (-3046)

4225' & 4230' spls: much as above, with incr in Shale %: as above plus gy-dk gy-blk shales, abund pyritic & loose pyrite

4240' spl: 75% Shale & silty/mic shale, gy, abund scatt copper-colored specks/spores, some wh calc cem in silty pcs, glauc in pt; 25% Ls & dol ls as above

4250' spl: 90% shale & silt/mic shale, mostly as above with add several pcs per tray of dk gy shale, scratch gy

← 4246 (-3085)

4240' 20" spl: as above with sli incr in dk brn to dk gy shale, scratches brn

4240' 40" spl: Abund dk brn-black shale, subfiss to subsilty to carb, some pcs scratch brn on ceramic plate

4268' 20" spl: 80% dk gy-dk brn-black shales, carb to subsilty text, much scratches brown, some Ls pl gy-cr, fn xln, dns with scat white patches (slough?)

← 4276 (-3115)

< 4276-4282: Sd mostly glassy, some calc & glauc stn'd clusters,

7:00 AM, April 12, 2019

Mud Check Drlg @ 4215':

Vis	Wt	WL	PV	YP
41	9.2	11.0	18	15
Chl	Hd	pH	LCM	Solids
2500	80	9.7	2	9.7

DST #3: 4238-4282 (Simpson)

Times: 30-30-60-60

Initial Open: Wk Blow, built to 1-1/2" i.b.

Final Open: Wk Blow, built to 5-1/2" i.b.

Rec: 10' mud

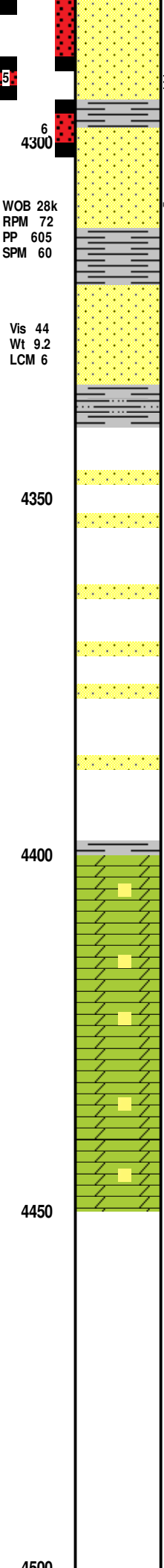
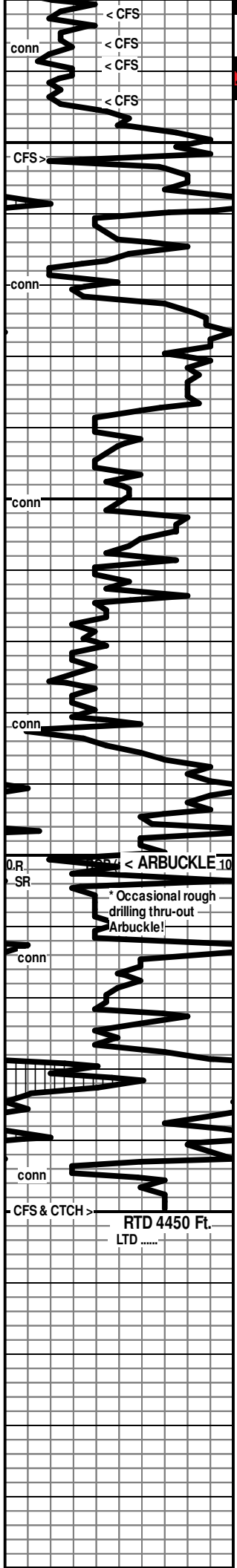
IHP: 2173 FHP: 2043

IFP: 24-25 FFP: 24-36

ISIP: 104 FSIP: 229

BHT: 122°F

[4276-4282: Fnt Odor, Abund spotty-even mod-brt fluor, under black light abund fluor-coated grns after crush, found a pc with lt tan stn, Rr fluor micro-drops on crush, some oily film on crush, some pcs barren of fluor, some pcs float, some



rd'd clusters, gd-exc tri, fn gm (125u-225u gm sz), rr-gd sort, subrd grms, low % clusters "dirty", some calc cem, some sharp clusters with pr fri, mix pr-fr-gd por

<4283-4289: Sd poorly represented, observed clusters-mixed and as above

<4289-4294: Some pl gm waxy shale; Sd Mix as above, fn grn-sli more crs than above in pt, gd sort, subrd-subang, cem in pt, pr-fr-gd-exc fri, clusters rd-subsharp, pr-fr-gd intergrmlr por

<4295-4302: Abund gr-grmish gy-pl grm-grmish waxy Sh.; Abund Sd, white, wh cem in pt, some pcs clean glassy, fn gm (100-125u gm sz), subrd, gd sort, rd'd clusters, much gd-exc fri, apparent fr-gd por, last cfs some subsharp to near sharp clusters with vpr-pr fri

<4303-4310: spl: 50% Sd as above; 50% Shale, gy-grmish gy-grm, waxy text

<4330' spl: 40% Sh gy-dk gy-blk-gm, subfiss to waxy; 60% Sd (appears much as above) white-offwhite, fn gm, subrd, gd sort, rd clusters to subang-anlgr clusters, pr-gd fri, pr to gd intergrmlr por

<4340' spl: 80% Sh gy-grmish, subwaxy to subargil; 20% Sd as above

<4350' & 4360' spl: 60% Sh gy-dk gy-grm, silty in pt; 40% Sd & silt, wh-gy, vfn-fn gm, gd sort, rd'd, pr-fr-gd fri, rd'd-subrd clusters, cem in pt, shaley in pt, glauc in pt, scatt shale specks/flecks, pr-frintergrmlr por, 60' had some pr sorted fn-md gm sd subrd-subanglr, dirty in pt

<4370' spl: 80% Sd gy, dirty in pt, fn-md gm, subrd-subang, pr-fr-gd sort, pr-gd fri, scatt blk sh specks/flecks, scatt pyr patches, some cem, scatt dk glauc specks; 20% Sh gy-dk gy, subsilty in pt [NS]

<4380' spl: 10% shale gy-grm, waxy; 90% Sd gy, vfn-fn gm, gd sort, subrd-subang, some rd clusters, abund subang-ang clusters, mostly pr fri, some fr-gd fri, scatt dk sh/min specks, scatt pl gm patches [NS]

<4390' spl: 05% shale as above; 95% Sd as above

<4400' spl: 05% shale gy-grm, waxy; 95% Sd pl gy-gy, vfn-fn gm, gd sort, subrd-subang, some rd clusters, abund subang-ang clusters, mostly pr fri, some fr-gd fri, scatt dk sh/min specks, scatt pl gm patches [NS]

<4410' spl: 20% Sh gy-dk gy-brt bold gm, gm shale is waxy; 80% Sd wh-gy-grm-cr, mostly fn gm-some md gm, fr-gd sort, subrd-subang, cem in pt, clusters rd'd to subang-anlgr, pr-gd fri

<----- 4401 (-3240)

<4420' spl: 90% Dol & limey Dol, cr, vfn-fn xln, subsucrosic, pr vis xln por to mostly dns [NS]; 10% Sd as above; Tr of Sh as above

Dol cr-tan-gy, vfn-fn xln, dns to pr vis xln por, sdy/ grainy text in pt, rr foss

\*(When drilling gets rough, driller backs off a bit to smooth out!)

Dol cr-tan-gy, vfn-fn xln, dns to pr vis xln por, subsucrosic, sdy/ grainy text in pt, rr foss

Dol cr-tan-gy, vfn-fn xln, dns to pr vis xln por, subsucrosic-sucr, sdy/ grainy text in pt to very grainy, rr foss

Mud Check CTCH @ 4450':  
 Vis Wt WL PV YP  
 46 9.2 15.0 7 38  
 Chl Hd pH LCM Solids  
 15500 90 9.0 12 9.2

float momentarily then sink]

7:00 AM, April 13, 2019

[4283-4289: V Fnt Odor, clusters have brt speckled to even fluor, few pcs per tray with fr show of gas, sli show of colorless FO on brk, few patches of v lt tan stn, scatt black specks/flecks of black sticky DO]

[4289-4294: Mild Odor, Abund Brt speckled even fluor, tr scatt blk DO specks/flecks, Abund oily film & colorless drops on brk, Rr show lt tan FO on brk, tr of patchy lt tan stn]

[4295-4302: V Fnt Odor on crush, abund moderate even mineral fluor?, Lower % clusters with Brt hydrocarbon fluor, with trace-v sli shows of colorless micro-drops on crush vis under blk light, few clusters v sli gassy on crush, v low % clusters with lt tan stn, Sd appears mostly barren]

[4303-4330: No Odor in cup-v fnt odor when crushed, Abund dull-mod mineral fluor, Mod am't of brt hydrocarbon fluor with fluor specks & micro-drops under blk lt, appears barren in white lite]

[4350' spl: NS, No Odor, No fluor]

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**DST #4: 4238-4289 (Simpson)**  
 Times: 30-30-60-60  
 Initial Open: Fr Blow, built to 6" i.b.,  
 No return blow  
 Final Open: Stg Blow, b.o.b. 8 min,  
 Blow built to 45 inches, no return blow  
 Rec: 868' gas in pipe  
 126' SOGCM: 2%g 2%o 96%om  
 IHP: 2193 FHP: 1975  
 IFP: 27-47 FFP: 54-86  
 ISIP: 1029 FSIP: 1506  
 BHT: 120°F

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**DST #5: 4289-4294 (Simpson)**  
 Times: 45-60-60-90  
 Initial Open: Stg Blow, b.o.b. 20 min,  
 built to 39", No return blow  
 Final Open: Stg Blow, b.o.b. 8 min,  
 built to 65", Return blow built to 1/2"  
 Rec: 993' gas in pipe  
 185' Total Fluid:  
 63' WMCO: 54%o 14%w 32%om  
 61' WMCO: 50%o 20%w 32%om  
 61' SOMCW: 2%o 78%w 20%om  
 (Chl/Wtr: 96,000 ppm)  
 IHP: 2214 FHP: 2043  
 IFP: 25-56 FFP: 58-84  
 ISIP: 1537 FSIP: 1550  
 BHT: 125°F

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RTD 4450 Ft. reached at  
 5:00 AM, April 16, 2019!

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**DST #6: 4295-4302 (Simpson)**  
 Times: 30-30-45-60  
 Initial Open: Wk Blow, built to 4"  
 Final Open: Wk Blow, built to 4-1/2"  
 Rec: 193' Total Fluid  
 10' MCW: 50%om 50%ow  
 183' Water (Chl 94,000 ppm)  
 IHP: 2194 FHP: 2051  
 IFP: 24-82 FFP: 84-124  
 ISIP: 1544 FSIP: 1554  
 BHT: 136°F

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Mud Check Drlg @ 4285':  
 Vis Wt WL PV YP  
 46 9.2 15.0 20 18  
 Chl Hd pH LCM Solids

