

Scale: 5" / 100'
Measured Depth Log

Well Name FEDERAL #20-3

State IDAHO

County BONNEVILLE

Country USA

Rig Number CAPSTAR 330

API Number 11-019-200014

Field Wildcat

Type of Drilling Fluid WBM

Operator

Company BHI/CPC Minerals, LLC

Geologist

Name MILES WENTLAND, GARY PLEMONS

Company FIELD GEO SERVICES, INC.

Address 533 BOGART LANE, UNIT A
GRAND JUNCTION, CO 81505
(970) 424-5162 OFFICE



Zone Color Coding

- | | | |
|-------|------------|----------|
| Oil | Condensate | Gas |
| Note | Core | Pressure |
| Error | Water | Seal |

Rock Types

- | | | | |
|----------------------|---------------|--------------|-------------|
| UNKNOWN | CHERT | SILTSTONE | IGNEOUS |
| ANHYDRITE | COAL | SANDSTONE | METAMORPHIC |
| GYPSUM | MARLSTONE | CONGLOMERATE | CEMENT |
| SALT | CLAYSTONE | BRECCIA | Chalk |
| SIDERITE or LIMONITE | SHALE | TILL | |
| LIMESTONE | SHALE GRAY | BENTONITE | |
| DOLOMITE | SHALE COLORED | TUFF | |

Accessories

- | | | | | |
|----------------|-------------|-----------------|---------------|--------------------|
| Fossils | F FOSSIL | ARGILLACEOUS | GLAUCONITE | Stringer |
| ALGAE | G GASTROPOD | ARGILLITE GRAIN | GYPSIFEROUS | ANHYDRITE STRINGER |
| | O OOLITE | B BENTONITE | HEAVY MINERAL | |

- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHIOPOD
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA

- OSTRACOD
 - PELECYPOD
 - PELLET
 - PISOLITE
 - PLANT REMAINS
 - PLANT SPORES
 - SCAPHOPOD
 - STROMATOPOROID
- Minerals**
- ANHYDRITIC

- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHTLT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS

- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- SILTY
- TUFFACEOUS

- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (CALC) STRG
- MARLSTONE (DOL) STRG
- SANDSTONE STRINGER
- SHALE STRINGER
- SILTSTONE STRINGER

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- EARTHY
- FENESTRAL
- FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC
- MOLDIC

- ORGANIC
- PINPOINT
- VUGGY

Engineering

- BIT
- CASING
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL
- FAULT

- FORMATION TOP
- GAS SHOW
- MN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- SLIDE
- SURVEY
- TRIP GAS
- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

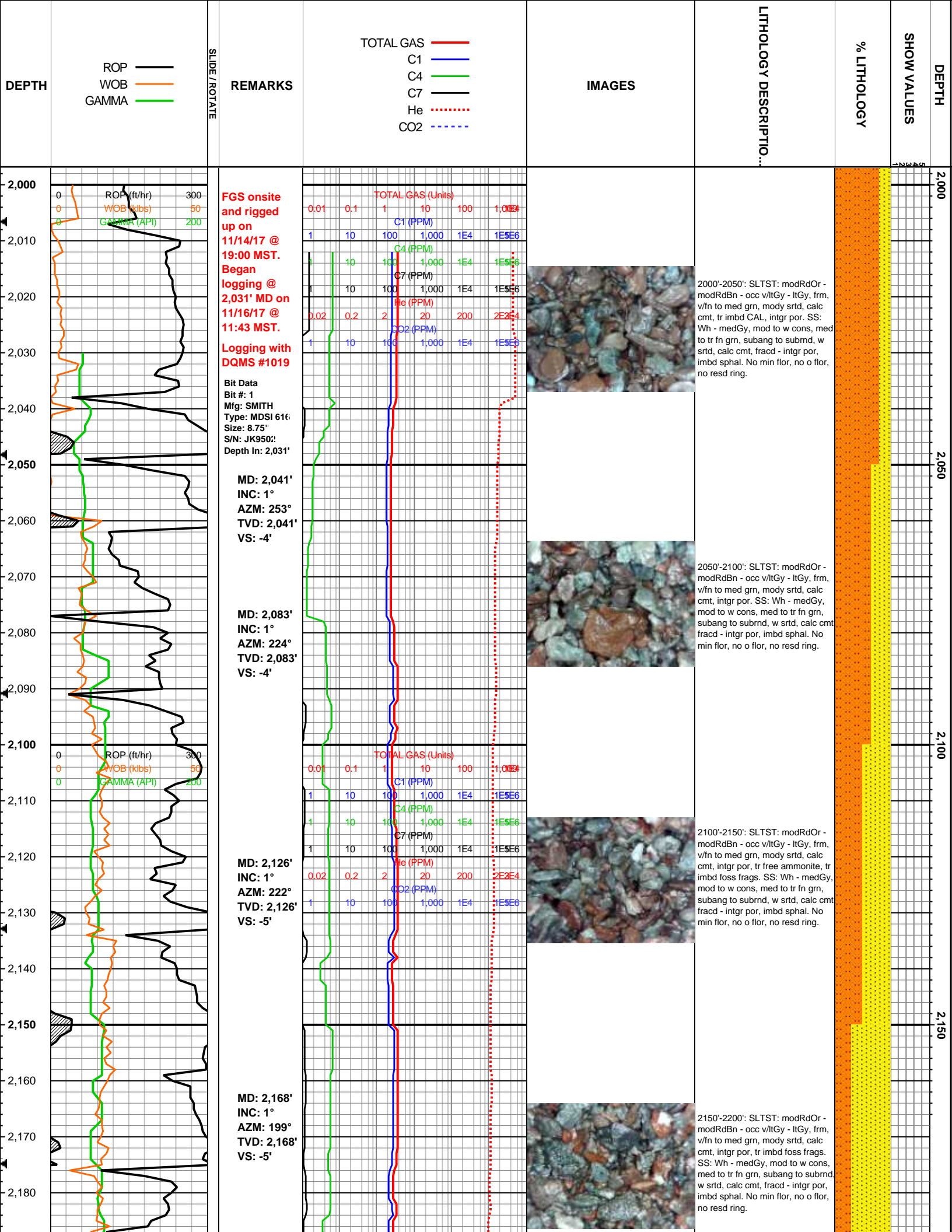
Textures

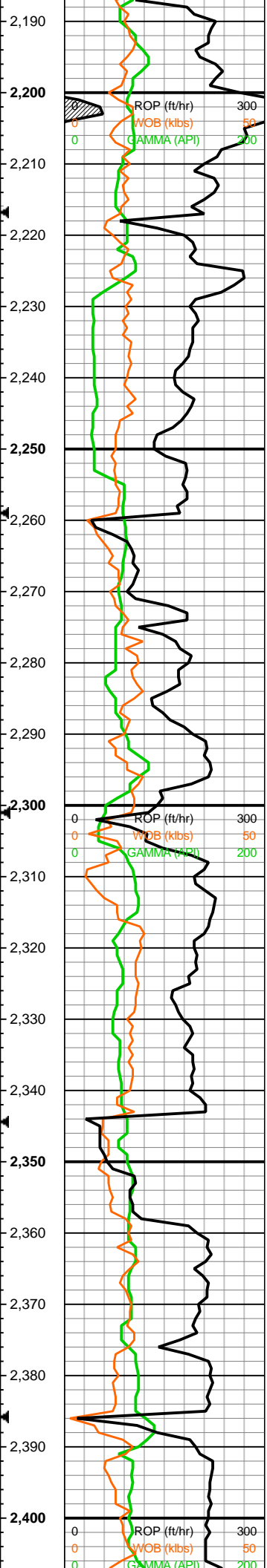
- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- EARTHY
- FINELYXLN
- GRAINSTONE

- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE

Sorting

- MODERATE
- POOR
- WELL





WOB: 17
RPM: 125
SPM: 118/0
PP: 1,376
GPM: 480

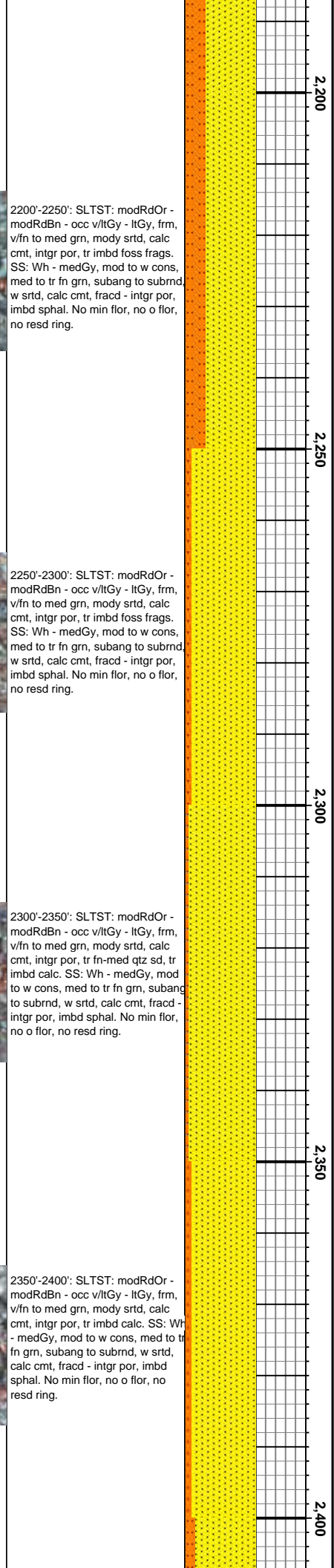
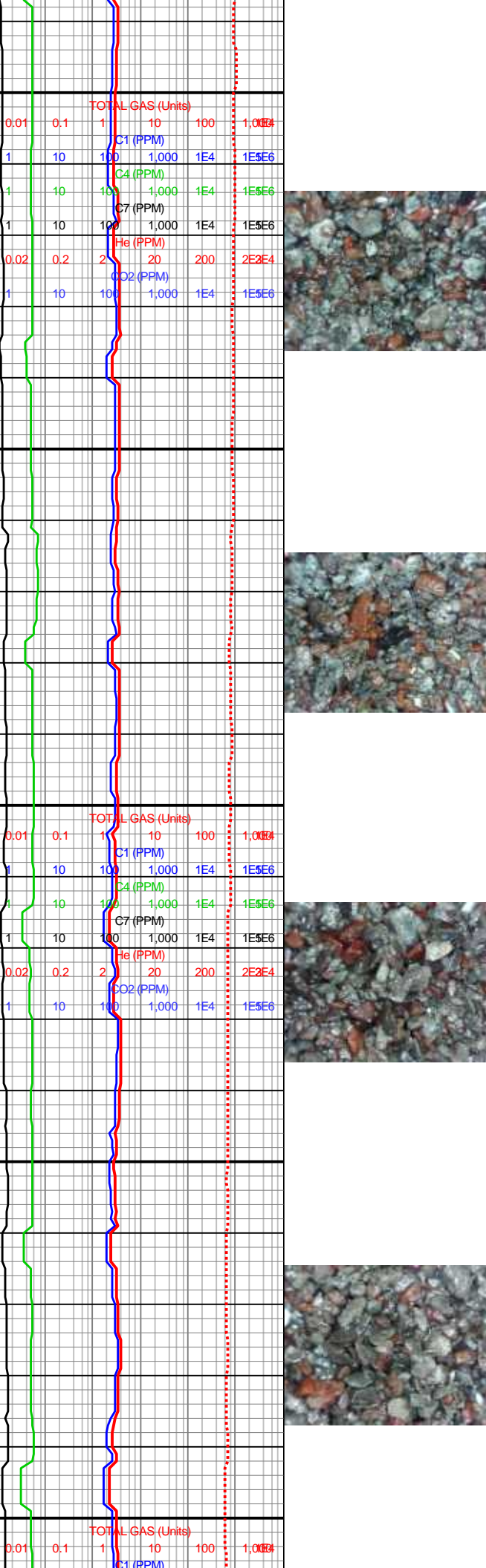
MD: 2,210'
INC: 1°
AZM: 177°
TVD: 2,210'
VS: -6'

MD: 2,252'
INC: 2°
AZM: 173°
TVD: 2,252'
VS: -7'

MD: 2,294'
INC: 2°
AZM: 169°
TVD: 2,294'
VS: -8'

MD: 2,379'
INC: 1°
AZM: 160°
TVD: 2,379'
VS: -10'

WOB: 16
RPM: 124
SPM: 117/0
PP: 1,453
GPM: 477

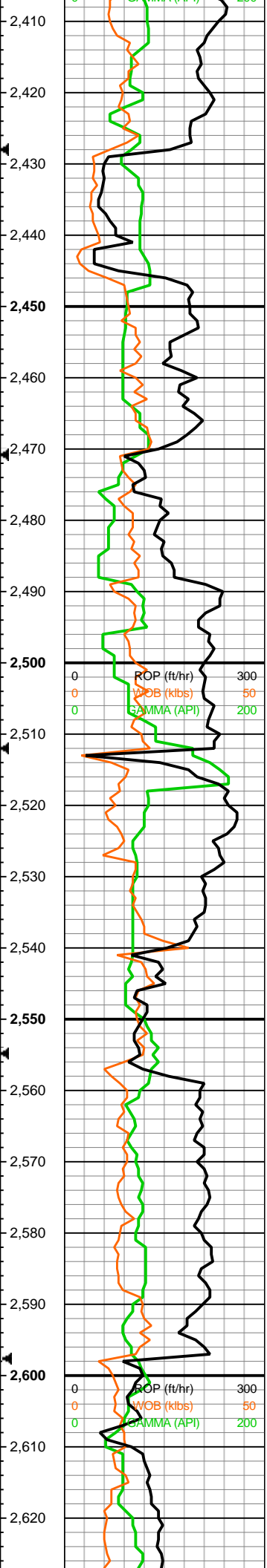


2200'-2250': SLTST: modRdOr - modRdBn - occ v/litGy - litGy, frm, v/fn to med grn, mody srtcd, calc cmt, intr por, tr imbd foss frags. SS: Wh - medGy, mod to w cons, med to tr fn grn, subang to subrnd, w srtcd, calc cmt, fracd - intr por, imbd sphal. No min flor, no o flor, no resd ring.

2250'-2300': SLTST: modRdOr - modRdBn - occ v/litGy - litGy, frm, v/fn to med grn, mody srtcd, calc cmt, intr por, tr imbd foss frags. SS: Wh - medGy, mod to w cons, med to tr fn grn, subang to subrnd, w srtcd, calc cmt, fracd - intr por, imbd sphal. No min flor, no o flor, no resd ring.

2300'-2350': SLTST: modRdOr - modRdBn - occ v/litGy - litGy, frm, v/fn to med grn, mody srtcd, calc cmt, intr por, tr imbd calc. SS: Wh - medGy, mod to w cons, med to tr fn grn, subang to subrnd, w srtcd, calc cmt, fracd - intr por, imbd sphal. No min flor, no o flor, no resd ring.

2350'-2400': SLTST: modRdOr - modRdBn - occ v/litGy - litGy, frm, v/fn to med grn, mody srtcd, calc cmt, intr por, tr imbd calc. SS: Wh - medGy, mod to w cons, med to tr fn grn, subang to subrnd, w srtcd, calc cmt, fracd - intr por, imbd sphal. No min flor, no o flor, no resd ring.

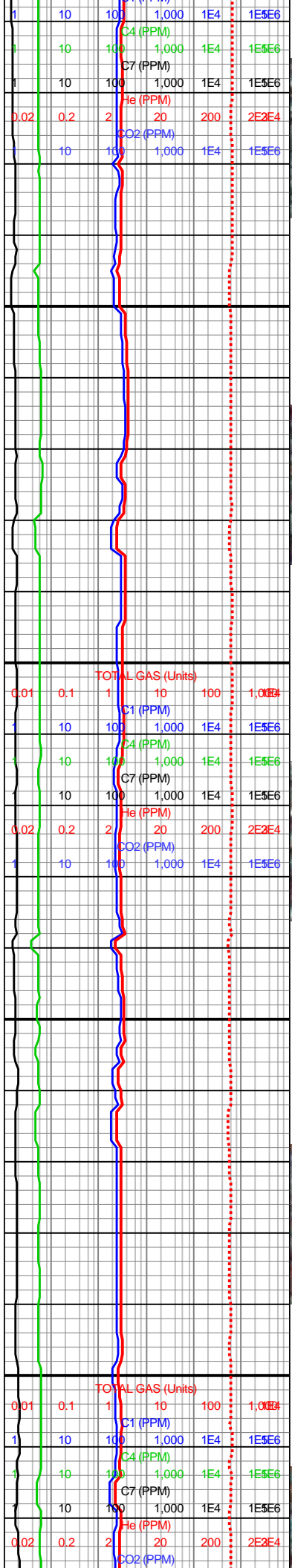


MD: 2,463'
INC: 0°
AZM: 163°
TVD: 2,463'
VS: -11'

Gas Lag
Depth: 2,500'
Strokes:
1,446
Minutes:
18.51

MD: 2,548'
INC: 0°
AZM: 193°
TVD: 2,548'
VS: -11'

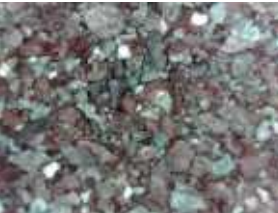
WOB: 15
RPM: 107
SPM: 117
PP: 1,050
GPM: 477



2400'-2450': SLTST: modRdOr - modRdBn - occ v/litGy - litGy, frm, v/fn to med grn, mody srted, calc cmt, intrg por, tr imbd calc. SS: W - medGy, mod to w cons, med to tr fn grn, subang to subrnd, w srted, calc cmt, fracd - intrg por, imbd sphal. No min flor, no o flor, no resd ring.



2450' - 2500' MD: SLTST: pred modRdBn - medlitGy, frm to hd, v/fn grn, v/w srted, calc cmt, free CAL, unident foss, tt por. SS: v/litGy - medlitGy, mod cons, fn grn, subang, w srted, calc cmt, imbd rk frags. LS: brilGn - v/litGy, subblky, v/fn/xln to micxln, frm, tt por, no str fnt litYl min flor, no cut, no ng.



2500' - 2550' MD: SLTST: pred modRdBn - medlitGy, frm to hd, v/fn grn, v/w srted, calc cmt, free CAL, tt por. SS: v/litGy - medlitGy, mod cons, fn grn, subang to subrnd, w srted, calc cmt, imbd rk frags. No str, fnt litYl min flor, no cut, no ng.



2550' - 2600' MD: SLTST: pred modRdBn - medlitGy, frm to hd, v/fn grn, v/w srted, calc cmt, free CAL, tt por. SS: v/litGy - medlitGy, mod cons, fn grn, subang to subrnd, w srted, calc cmt, imbd rk frags. No str, fnt litYl min flor, no cut, no ng.



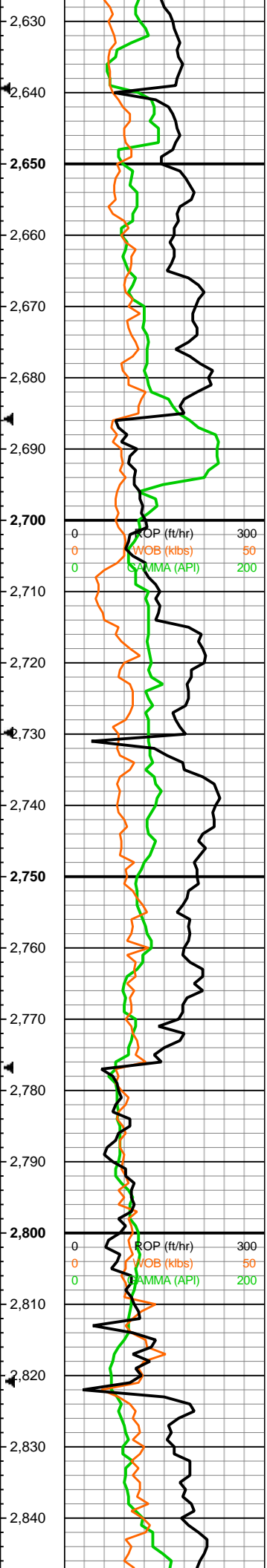
2600' - 2650' MD: SLTST: pred modRdBn - medlitGy, frm to hd, v/fn grn, v/w srted, calc cmt, free CAL, tt por. SS: v/litGy - medlitGy, mod cons, fn grn, subang to subrnd, w srted, calc cmt, imbd rk frags. LS: brilGn - v/litGy, subblky, v/fn/xln to micxln, frm, tt por, no str fnt litYl min flor, no cut, no ng.

2,450

2,500

2,550

2,600

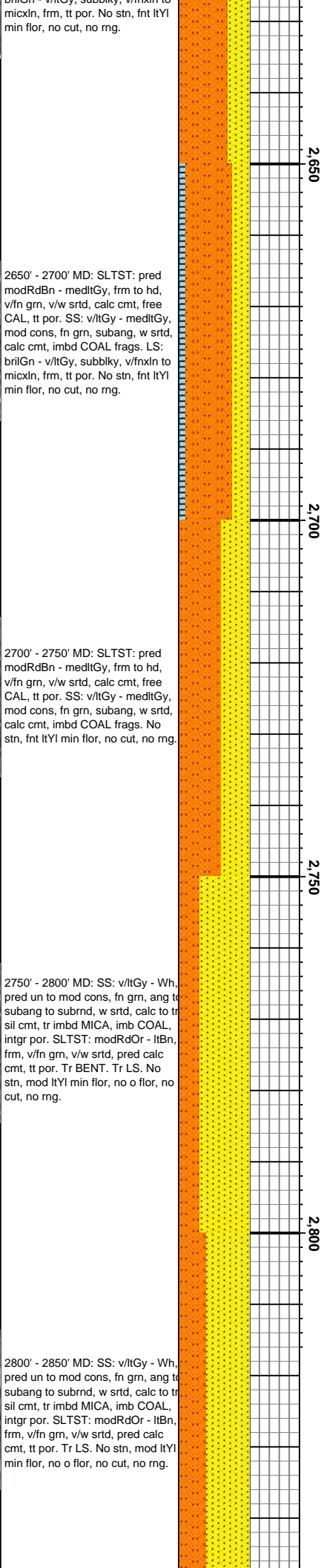
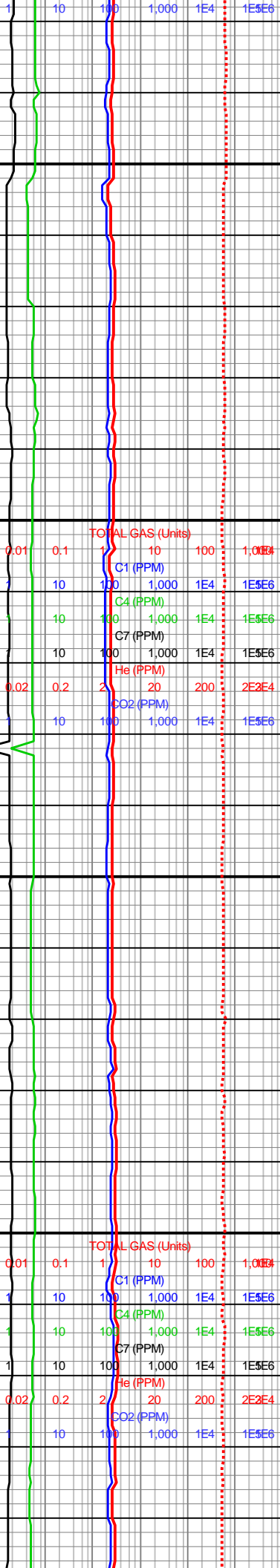


MD: 2,636'
 INC: 1°
 AZM: 190°
 TVD: 2,636'
 VS: -12'

MD: 2,727'
 INC: 1°
 AZM: 200°
 TVD: 2,727'
 VS: -13'

WOB: 17
 RPM: 0
 SPM: 116
 PP: 1,070
 GPM: 475

MD: 2,818'
 INC: 1°
 AZM: 230°
 TVD: 2,818'
 VS: -15'

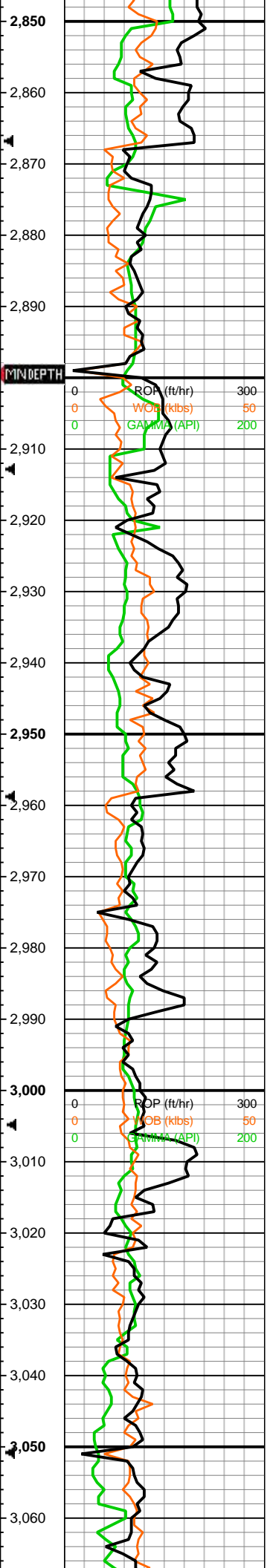


2650' - 2700' MD: SLTST: pred modRdBn - medltGy, frm to hd, v/fn grn, v/w srtd, calc cmt, free CAL, tt por. SS: v/ltGy - medltGy, mod cons, fn grn, subang, w srtd, calc cmt, imbd COAL frags. LS: brllGn - v/ltGy, subblky, v/fnxln to micxln, frm, tt por. No stn, frnt ltYI min flor, no cut, no rng.

2700' - 2750' MD: SLTST: pred modRdBn - medltGy, frm to hd, v/fn grn, v/w srtd, calc cmt, free CAL, tt por. SS: v/ltGy - medltGy, mod cons, fn grn, subang, w srtd, calc cmt, imbd COAL frags. No stn, frnt ltYI min flor, no cut, no rng.

2750' - 2800' MD: SS: v/ltGy - Wh, pred un to mod cons, fn grn, ang to subang to subrnd, w srtd, calc to sil cmt, tr imbd MICA, imb COAL, intgr por. SLTST: modRdOr - ltBn, frm, v/fn grn, v/w srtd, pred calc cmt, tt por. Tr BENT. Tr LS. No stn, mod ltYI min flor, no o flor, no cut, no rng.

2800' - 2850' MD: SS: v/ltGy - Wh, pred un to mod cons, fn grn, ang to subang to subrnd, w srtd, calc to sil cmt, tr imbd MICA, imb COAL, intgr por. SLTST: modRdOr - ltBn, frm, v/fn grn, v/w srtd, pred calc cmt, tt por. No stn, mod ltYI min flor, no o flor, no cut, no rng.

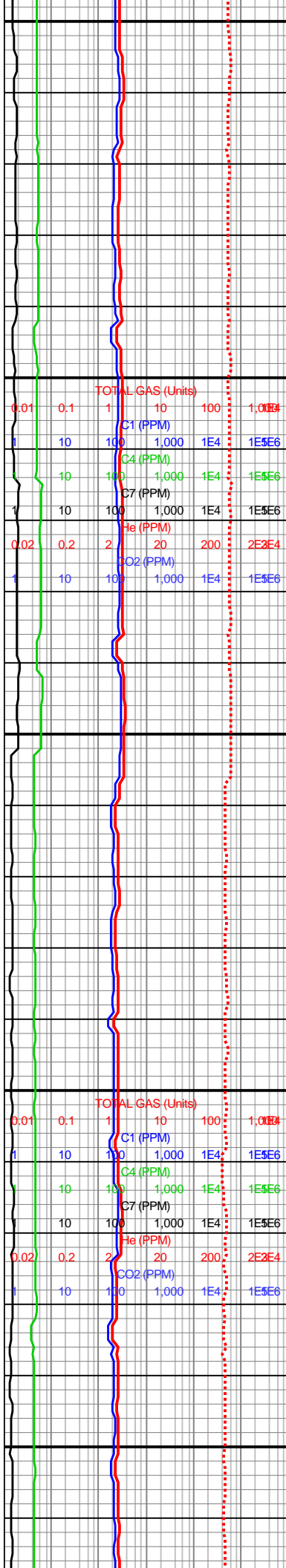


11/17/17
MD: 2,909'
INC: 1°
AZM: 214°
TVD: 2,909'
VS: -16'

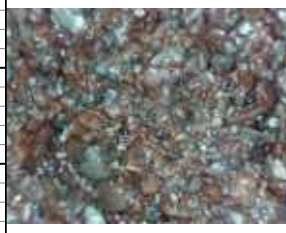
Gas Lag
Depth: 3,000'
Strokes:
1,711
Minutes:
20.06

MD: 3,001'
INC: 1°
AZM: 207°
TVD: 3,001'
VS: -17'

WOB: 14
RPM: 0
SPM: 115
PP: 1,320
GPM: 475



2850' - 2900' MD: SLTST: modRdOr - ltBn, frm, v/fn grn, v/w srt, pred calc cmt, tt por. SS: v/ltGy - Wh, pred un to mod cons, fn grn, ang to subang to subrnd, w srt, calc to tr sil cmt, tr imbd MICA, imb COAL, intrgr por. Tr LS. No stn, mod ltYl min flor, no o flor, no cut, no rng.



2900' - 2950' MD: SLTST: modRdOr - ltBn, frm, v/fn grn, v/w srt, pred calc cmt, tt por. SS: v/ltGy - Wh, mod cons, fn grn, ang to subang to subrnd, w srt, calc to tr sil cmt, imbd SPHALERITE, intrgr por. Tr LS. No stn, tr ltYl min flor, no o flor, no cut, no rng.



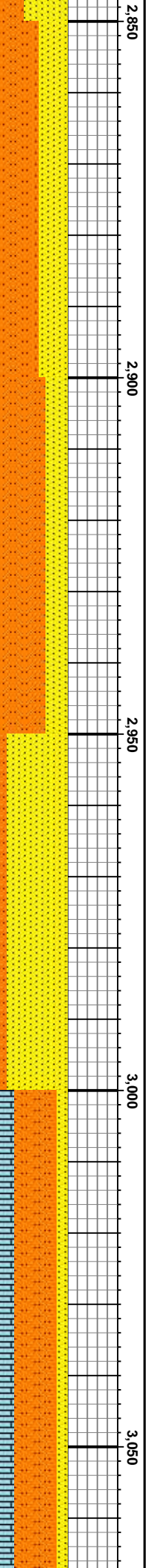
2950' - 3000' MD: SLTST: modRdOr - ltBn, frm, v/fn grn, v/w srt, pred calc cmt, tt por. SS: v/ltGy, pred mod cons, fn grn, ang to subang to subrnd, w srt, calc to tr sil cmt, intrgr por. Tr LS. No stn, tr ltYl min flor, no o flor, no cut, no rng.

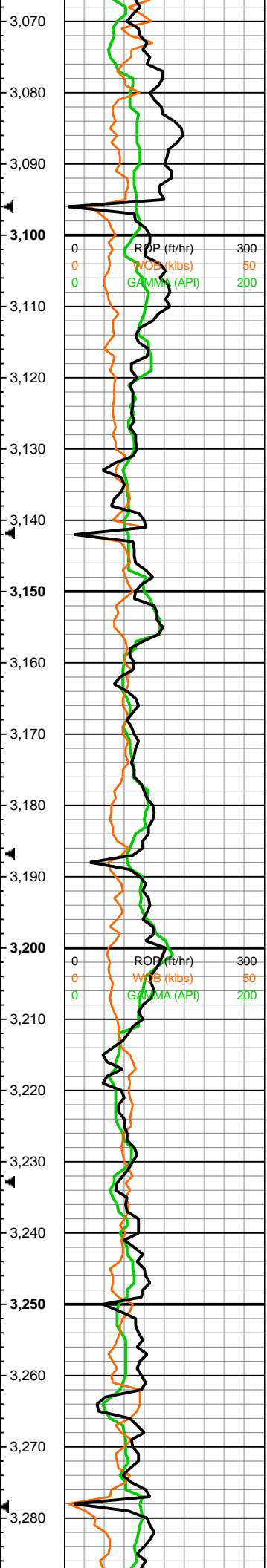


3000' - 3050' MD: SLTST: pred modRdBn - medltGy, frm to hd, v/fn grn, v/w srt, calc cmt, tt por. SS: v/ltGy - medltGy, mod cons, fn grn, subang, w srt, calc cmt, imbd COAL frags. LS: v/ltGy, subblky, v/fn/xln to micxln, frm, tt por. No stn, mod ltYl min flor, no cut, no rng.



3050' - 3100' MD: SLTST: pred





MW: 8.7 ppg
 VIS: 38 sec/L

MD: 3,092'
 INC: 1°
 AZM: 217°
 TVD: 3,092'
 VS: -18'

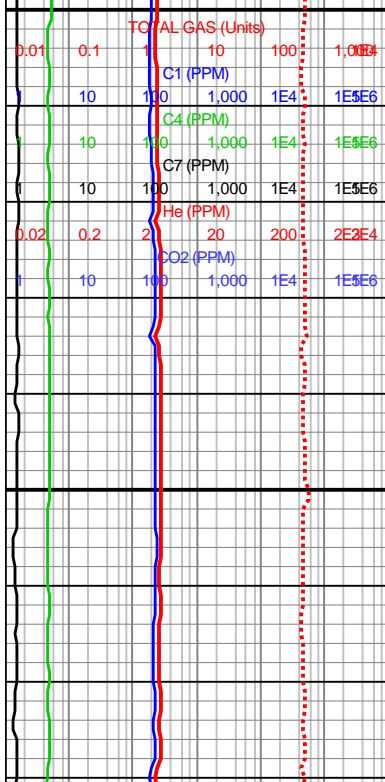
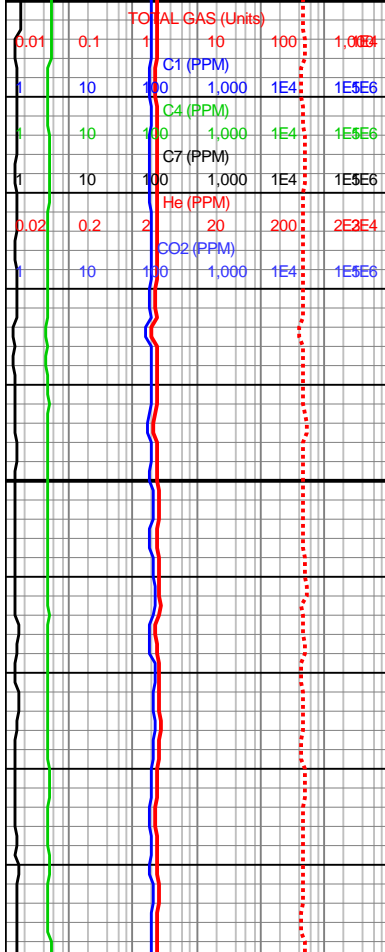
VIS: 38/38 sec/L

MD: 3,183'
 INC: 0°
 AZM: 317°
 TVD: 3,183'
 VS: -19'

WOB: 10
 RPM: 0
 SPM: 1,294
 PP: 1,294
 GPM: 474

MD: 3,229'
 INC: 1°
 AZM: 355°
 TVD: 3,229'
 VS: -18'

MD: 3,274'
 INC: 2°
 AZM: 10°
 TVD: 3,274'
 VS: -17'



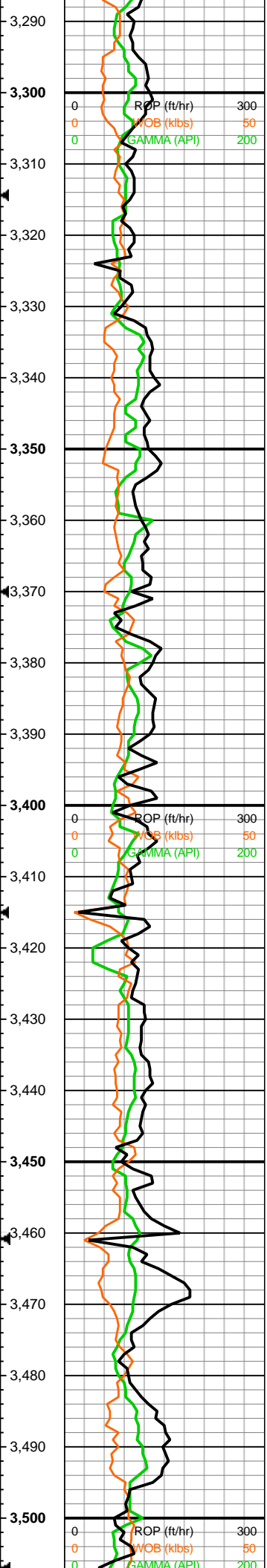
medltGy - mod RdBn, frm to hd, v/fn grn, v/w srt, calc cmt, tt por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. SS: v/ltGy - medltGy, mod cons, fn grn, subang w srt, calc cmt. No stn, mod ltYI min flor, no cut, no mg.

3100' - 3150' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn grn v/w srt, calc cmt, tt por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, subang, v/w srt, calc cmt, imbd MICA, tr free CAL, intrgr - tt por. No stn, fnt ltYI min flor, no o flor, no cut.

3150' - 3200' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn grn v/w srt, calc cmt, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, subang, v/w srt, calc cmt, imbd MICA, tr free CAL, intrgr - tt por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. No stn, fnt ltYI min flor, no o flor, no cut.

3200' - 3250' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn grn v/w srt, calc cmt, tt por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, subang, v/w srt, calc cmt, imbd MICA, tr free CAL, intrgr - tt por. No stn, fnt ltYI min flor, no o flor, no cut.

3250' - 3300' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod srt, calc cmt, tt por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt, tr mod srt, calc cmt, intrgr - tt por. CHK: Wh, subblky to md, chky, sft, chk frmwrk, pp por. TR free CAL. No stn, fnt ltYI min flor, no o flor, no cut.



MD: 3,320'
INC: 2°
AZM: 11°
TVD: 3,320'
VS: -16'

MD: 3,366'
INC: 2°
AZM: 11°
TVD: 3,366'
VS: -14'

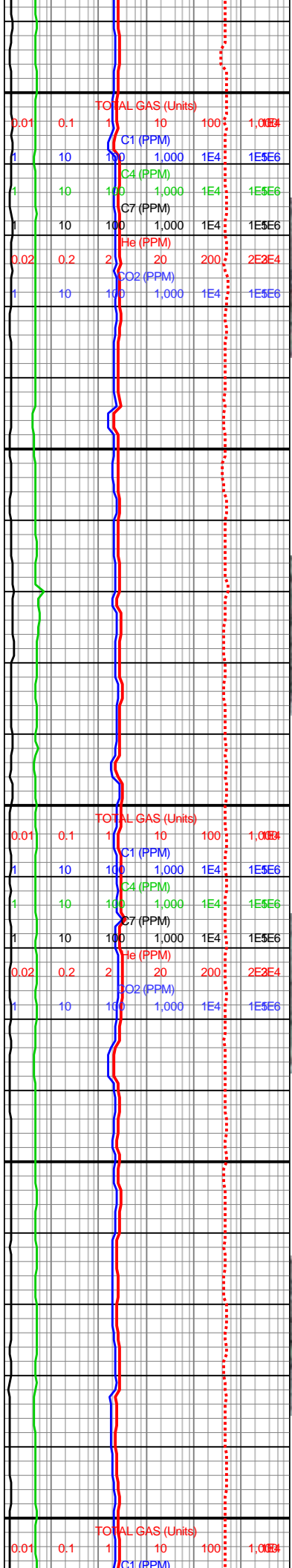
WOB: 18
RPM: 123
SPM: 0/115
PP: 1,322
GPM: 471

MD: 3,412'
INC: 3°
AZM: 18°
TVD: 3,411'
VS: -12'

MD: 3,457'
INC: 4°
AZM: 25°
TVD: 3,456'
VS: -9'

Gas Lag
Depth: 3,500'
Strokes:
1,927
Minutes:
21.34

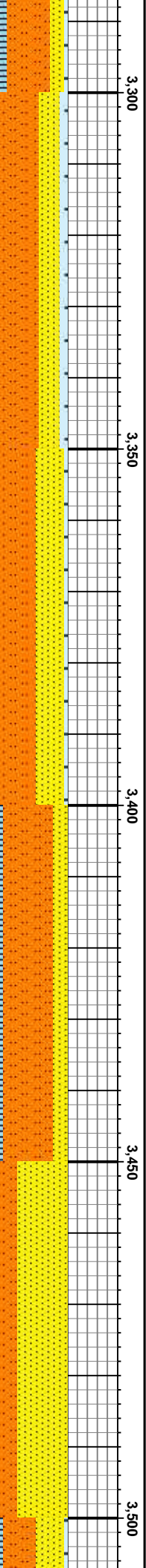
MD: 3,503'
INC: 5°

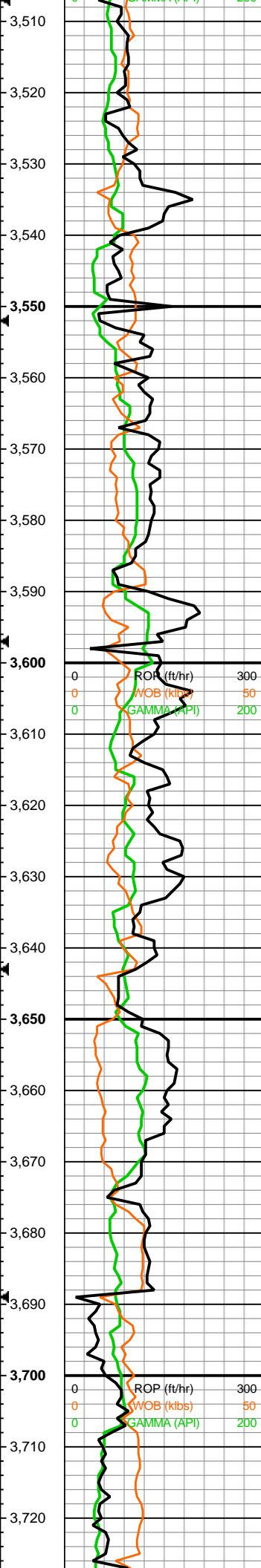


3300' - 3350' MD: SLTST:
modRdOr - ltBn, hd to frm,
v/fn-med grn, mod srtcd, calc cmt,
por, tr benthic foram. LS: v/ltGy,
subbly, v/fnxln to micxln, frm, tt
por. SS: ltGy - ltBn - modOrPk,
mod cons, v/fn grn, tr fn-med grn,
subang-subrd, v/w srtcd, tr mod
srtcd, calc cmt, intrgr - tt por. CHK:
Wh, subbly to rnd, chky, sft, chk
frmwrk, pp por. TR free CAL. No
stn, fnt ltYl min flor, no o flor, no
cut.

3350' - 3400' MD: SLTST:
modRdOr - ltBn, hd to frm,
v/fn-med grn, mod srtcd, calc cmt,
por, tr benthic foram. LS: v/ltGy,
subbly, v/fnxln to micxln, frm, tt
por. SS: ltGy - ltBn - modOrPk,
mod cons, v/fn grn, tr fn-med grn,
subang-subrd, v/w srtcd, tr mod
srtcd, calc cmt, intrgr - tt por. CHK:
Wh, subbly to rnd, chky, sft, chk
frmwrk, pp por. TR free CAL. No
stn, fnt ltYl min flor, no o flor, no
cut.

3400' - 3450' MD: SLTST:
modRdOr - ltBn, hd to frm,
v/fn-med grn, mod srtcd, calc cmt,
por. LS: v/ltGy, subbly, v/fnxln to
micxln, frm, tt por. SS: ltGy - ltBn -
modOrPk, mod cons, v/fn grn, tr
fn-med grn, subang-subrd, v/w
srtcd, tr mod srtcd, calc cmt, intrgr - tt
por. No stn, No min flor, no o flor,
no cut.





AZM: 25°
TVD: 3,502'
VS: -6'

MD: 3,548'
INC: 6°
AZM: 24°
TVD: 3,547'
VS: -2'

MD: 3,594'
INC: 8°
AZM: 27°
TVD: 3,593'
VS: 4'

MD: 3,640'
INC: 9°
AZM: 27°
TVD: 3,638'
VS: 10'

MD: 3,685'
INC: 9°
AZM: 24°
TVD: 3,683'
VS: 17'

MD: 3,731'

Depth (ft)	C1 (PPM)	C2 (PPM)	C3 (PPM)	C4 (PPM)	C5 (PPM)	C6 (PPM)	C7 (PPM)	He (PPM)	CO2 (PPM)	TOTAL GAS (Units)
3510	1	10	100	1,000	1E4	1E5E6				
3520	1	10	100	1,000	1E4	1E5E6				
3530	1	10	100	1,000	1E4	1E5E6				
3540	1	10	100	1,000	1E4	1E5E6				
3550	1	10	100	1,000	1E4	1E5E6				
3560	1	10	100	1,000	1E4	1E5E6				
3570	1	10	100	1,000	1E4	1E5E6				
3580	1	10	100	1,000	1E4	1E5E6				
3590	1	10	100	1,000	1E4	1E5E6				
3600	0.01	0.1	1	10	100	1,000	1E4	1E5E6		
3610	1	10	100	1,000	1E4	1E5E6				
3620	1	10	100	1,000	1E4	1E5E6				
3630	0.02	0.2	2	20	200	2E2E4				
3640	1	10	100	1,000	1E4	1E5E6				
3650	1	10	100	1,000	1E4	1E5E6				
3660	1	10	100	1,000	1E4	1E5E6				
3670	1	10	100	1,000	1E4	1E5E6				
3680	1	10	100	1,000	1E4	1E5E6				
3690	1	10	100	1,000	1E4	1E5E6				
3700	0.01	0.1	1	10	100	1,000	1E4	1E5E6		
3710	1	10	100	1,000	1E4	1E5E6				
3720	1	10	100	1,000	1E4	1E5E6				
3730	0.02	0.2	2	20	200	2E2E4				



3500' - 3550' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod strd, calc cmt, t por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w strd, tr mod strd, calc cmt, intrgr - tt por. CHK: Wh, subblky to md, chky, sft, chk frmwrk, pp por. TR free CAL & GLAU. No str, fnt lTYI min flor, no o flor, no cut.

3550' - 3600' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod strd, calc cmt, t por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w strd, tr mod strd, calc cmt, intrgr - tt por. CHK: Wh, subblky to md, chky, sft, chk frmwrk, pp por. TR free CAL & GLAU. No str, no min flor, no o flor, no cut.

3600' - 3650' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod strd, calc cmt, t por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w strd, tr mod strd, calc cmt, intrgr - tt por. CHK: Wh, subblky to md, chky, sft, chk frmwrk, pp por. TR free CAL & GYP & GLAU. No str, no min flor, no o flor, no cut.

3650' - 3700' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod strd, calc cmt, t por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w strd, tr mod strd, calc cmt, intrgr - tt por. CHK: Wh, subblky to md, chky, sft, chk frmwrk, pp por. TR free CAL & GYP & GLAU. No str, no min flor, no o flor, no cut.

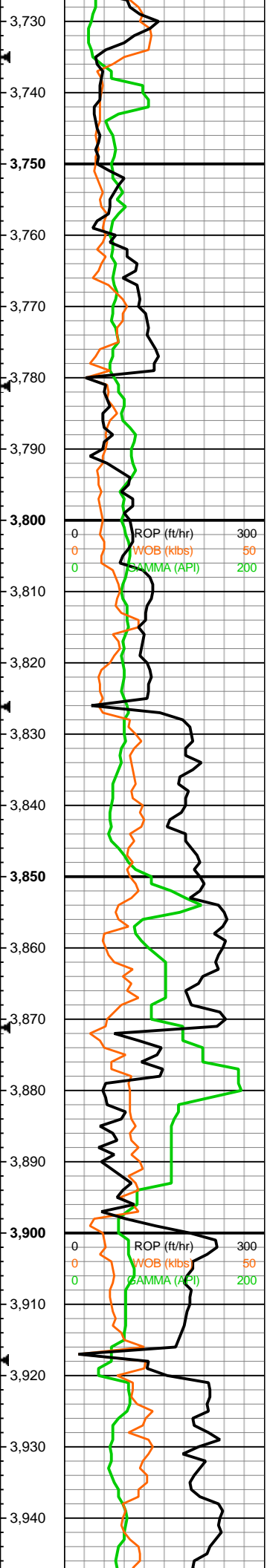
3700' - 3750' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod strd, calc cmt, t por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w strd, tr mod strd, calc cmt, intrgr - tt por. CHK: Wh, subblky to md, chky, sft, chk frmwrk, pp por. TR free CAL & GYP & GLAU. No str, no min flor, no o flor, no cut.

WOB: 15
RPM: 120
SPM: 0/108
PP: 1,308
GPM: 441

MW: 8.8 ppg
VIS: 29 sec/L

ROP (ft/hr) 300
WOB (kips) 50
GAMMA (API) 200

ROP (ft/hr) 300
WOB (kips) 50
GAMMA (API) 200



MD: 3,731'
INC: 10°
AZM: 20°
TVD: 3,728'
VS: 25'

MD: 3,777'
INC: 11°
AZM: 15°
TVD: 3,773'
VS: 33'

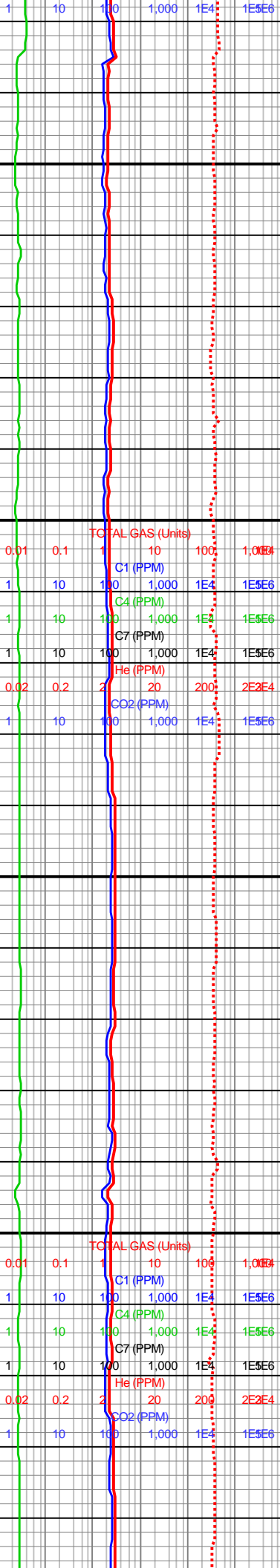
WOB: 10
RPM: 113
SPM: 107/0
PP: 955
GPM: 436

MD: 3,822'
INC: 11°
AZM: 14°
TVD: 3,817'
VS: 41'

MW: 8.5 ppg
VIS: 33 sec/L

MD: 3,868'
INC: 12°
AZM: 13°
TVD: 3,862'
VS: 51'

MD: 3,914'
INC: 12°
AZM: 10°
TVD: 3,907'
VS: 60'



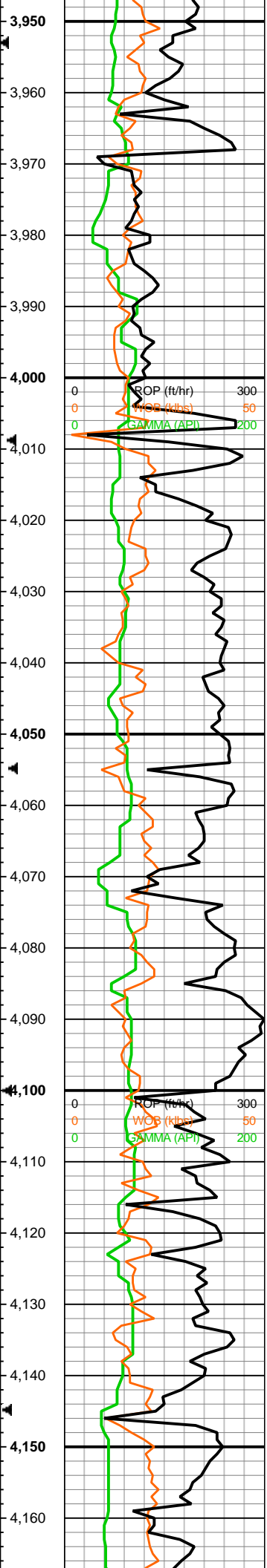
3750' - 3800' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod srted, calc cmt, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srted, tr mod srted, calc cmt, intr - tt por. CHK: Wh, subbly to md, chky, sft, chk frmwrk, pp por. TR free CAL & GYP & GLAU. No stn, no min flor, no o flor, no cut.

3800' - 3850' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn-med grn, mod srted, calc cmt, tt por. SS: ltGy - ltBn - modOrPk, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srted, tr mod srted, calc cmt, intr - tt por. CHK: Wh, subbly to md, chky, sft, chk frmwrk, pp por. TR free CAL & GLAU. No stn, no min flor, no o flor, no cut.

3850' - 3900' MD: SLTST: modRdOr - ltBn - dskyGn, hd to frm, v/fn grn, v/w srted, pred cal cmt, dskyGn clay cem, tt por. LS: meddrkGy - ltBn, subbly, v/fnxln, hd, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn grn, subang to subrd, w srted, calc cmt, imbd rk frags, intr por. Tr CLK, No stn, mod ltYl min flor, no o flor, no cut, no rng.

3900' - 3950' MD: SLTST: modRdOr - ltBn - dskyGn, hd to frm, v/fn grn, v/w srted, pred cal cmt, dskyGn clay cem, tt por. LS: meddrkGy - ltBn, subbly, v/fnxln, hd, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn grn, subang to subrd, w srted, calc cmt, imbd rk frags, intr por. Tr CLK, No stn, mod ltYl min flor, no o flor, no cut, no rng.





MW: 8.5/8.5 ppg
VIS: 33/34 sec/L

MD: 3,959'
INC: 11°
AZM: 9°
TVD: 3,952'
VS: 69'

Gas Lag
Depth: 4,000'
Strokes: 2,192
Minutes: 22.89

MD: 4,005'
INC: 10°
AZM: 7°
TVD: 3,997'
VS: 78'

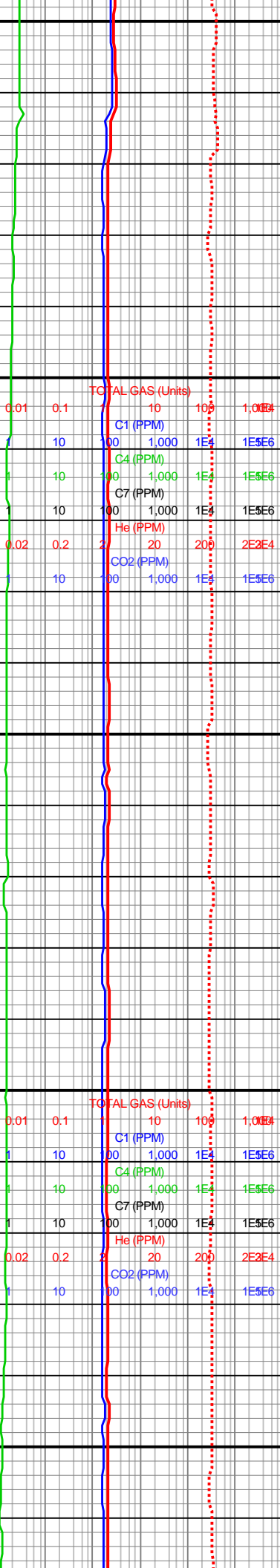
ROP: 16
WOB: 39
SPM: 55/55
PP: 1,302
GPM: 450

MD: 4,050'
INC: 10°
AZM: 6°
TVD: 4,041'
VS: 86'

MD: 4,096'
INC: 10°
AZM: 5°
TVD: 4,086'
VS: 93'

MW: 8.5/8.5 ppg
VIS: 34/34 sec/L

MD: 4,141'
INC: 9°
AZM: 5°
TVD: 4,131'
VS: 101'



3950' - 4000' MD: SLTST: modRdOr - ltBn - dskyGn, hd to frm, v/fn grn, v/w srted, pred cal cmt, dskyGn clay cem, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn grn, subang to subrnd, w srted, calc cmt, imbd rk frags, intgr por. Tr CLK. No stn, mod ltYI min flor, no o flor, no cut, no rng.



4000' - 4050' MD: SLTST: ModRdOr - ltBn - dskyGn, hd to frm, v/fn grn, v/w srted, pred cal cmt, dskyGn clay cem, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tr free CAL, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn grn, subang to subrnd, w srted, calc cmt imbd rk frags, intgr por. Tr CLK. No stn, mod ltYI min flor, no o flor, no cut, no rng.



4050' - 4100' MD: SLTST: modRdOr - ltBn - dskyGn, hd to frm, v/fn grn, v/w srted, pred cal cmt, dskyGn clay cem, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn grn, subang to subrnd, w srted, calc cmt, imbd rk frags, intgr por. No stn, mod ltYI min flor, no o flor, no cut, no rng.

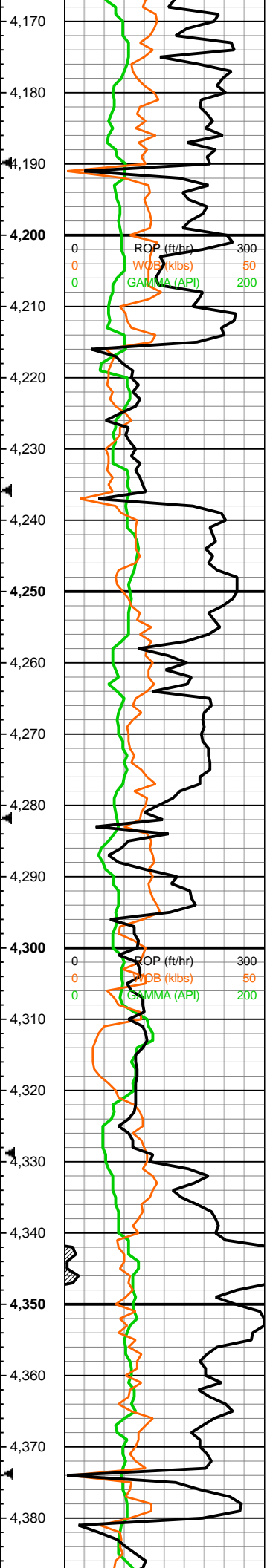


4100' - 4150' MD: SLTST: modRdOr - ltBn - dskyGn, hd to frm, v/fn grn, v/w srted, pred cal cmt, dskyGn clay cem, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn grn, subang to subrnd, w srted, calc cmt, imbd rk frags, intgr por. No stn, mod ltYI min flor, no o flor, no cut, no rng.



4150' - 4200' MD: SLTST: medGy-LtGy, LtBn hd to frm, v/fn

3,950
4,000
4,050
4,100
4,150



MD: 4,187'
 INC: 10°
 AZM: 6°
 TVD: 4,176'
 VS: 108'

WOB: 21
 RPM: 39
 SPM: 59/59
 PP: 1,449
 GPM: 482

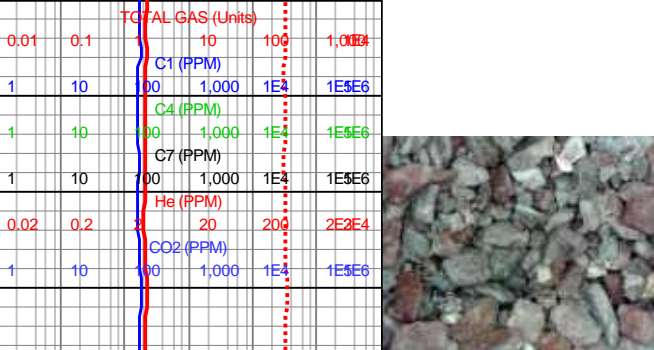
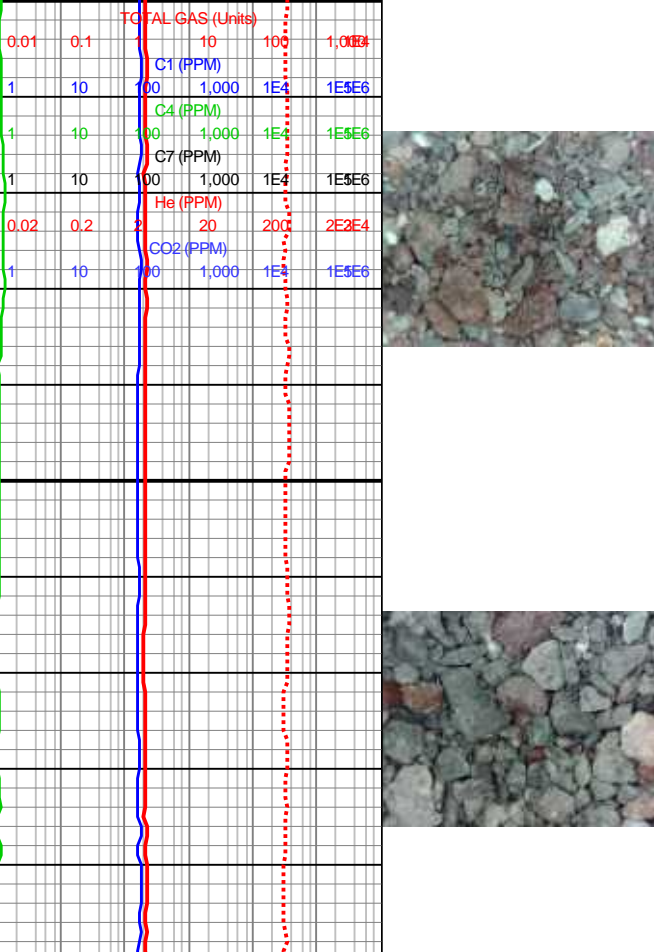
MD: 4,233'
 INC: 10°
 AZM: 10°
 TVD: 4,221'
 VS: 116'

MD: 4,279'
 INC: 11°
 AZM: 12°
 TVD: 4,267'
 VS: 125'

MW: 8.6/8.5 ppg
 VIS: 34/35 sec/L

MD: 4,324'
 INC: 11°
 AZM: 13°
 TVD: 4,311'
 VS: 133'

MD: 4,370'
 INC: 12°
 AZM: 14°
 TVD: 4,356'
 VS: 142'



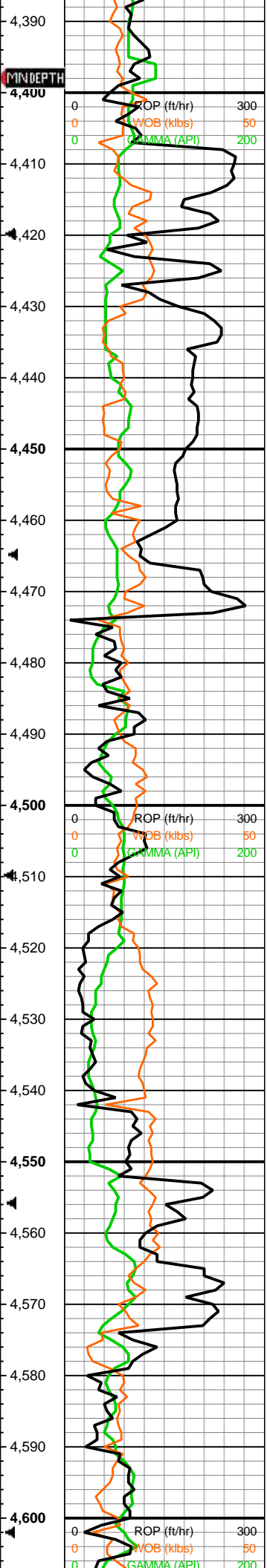
4,170 - 4,187' MD: cal-clay cem, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn gm, subang to subrnd, w srted, calc cmt, imbd rk frags, intrgr por. Free CAL. No stn, mod ltYI min flor, no o flor, no cut, no rng.

4,187' - 4,233' MD: SLTST: modRdOr - ltBn, hd to frm, v/fn gm v/w srted, pred cal cmt, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tr free CAL, tt por. SS: ltGy - tr Wh, mod to un cons, fn to v/fn gm, subang to subrnd, w srted, calc cmt imbd rk frags, intrgr por. No stn, mod ltYI min flor, no o flor, no cut, no rng.

4,233' - 4,279' MD: SLTST: medGy-ltBn-OrRd, hd to frm, v/fn gm, v/w srted, pred cal cmt, dskyGr clay cem, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tr free CAL, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn gm, subang to subrnd, w srted, calc cmt, imbd rk frag, intrgr por. No stn, tr ltYI min flor, no o flor, no cut, no rng.

4,279' - 4,324' MD: SLTST: medGy-ltBn-OrRd, hd to frm, v/fn gm, v/w srted, pred cal cmt, tt por. LS: meddrkGy - ltBn, subblky, v/fnxln, hd, tr free CAL, tt por. SS: ltGy - tr Wh, mod to w cons, fn to v/fn gm, subang to subrnd, w srted, calc cmt, imbd rk frags, intrgr por. Free CAL. No stn, mod ltYI min flor, no o flor, no cut, no rng.

4,324' - 4,370' MD: SLTST: medGy - modRdOr - ltBn, hd to frm, v/fn gm, v/w srted, calc cmt, tt por. SS: ltGy - ltBn, mod cons, v/fn gm, tr fn-med gm, subang-subrd, v/w srted, tr mod srted, calc cmt, intrgr - tt por. LS: v/ltGy, subblky, v/fnxln to micxln, frm, tt por. Mod CLK. No stn, mod ltYI min flor, no o flor, no cut, no rng.



11/18/17

WOB: 15
RPM: 124
SPM: 116/0
PP: 1,338
GPM: 475

MD: 4,415'
INC: 11°
AZM: 14°
TVD: 4,400'
VS: 151'

MD: 4,461'
INC: 12°
AZM: 15°
TVD: 4,445'
VS: 160'

MW: 8.6/8.6 ppg
VIS: 33/33 sec/L

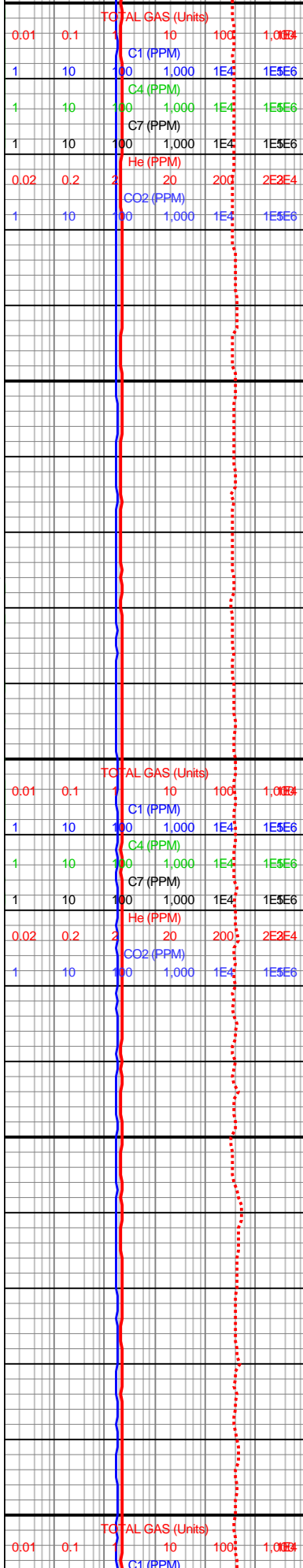
Gas Lag
Depth: 4,500'
Strokes: 2,456
Minutes: 24.45

MD: 4,506'
INC: 11°
AZM: 15°
TVD: 4,489'
VS: 169'

MD: 4,552'
INC: 11°
AZM: 15°
TVD: 4,534'
VS: 178'

MD: 4,598'
INC: 10°
AZM: 15°
TVD: 4,580'
VS: 186'

WOB: 12
RPM: 124
SPM: 117



4400' 4450' MD: SLTST: medGy - modRdOr - ItBn, hd to frm, v/fn grn v/w srt'd, calc cmt, tt por. SS: ItGy - ItBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt'd, tr mod srt'd, calc cmt, integr - tt por. LS: v/ltGy, subblky, v/fnxln to micxn, frm, tt por. No stn, mod ItYI min flor, no o flor, no cut, no mg.



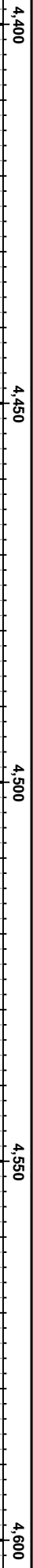
4450' - 4500' MD: SLTST: modRdOr - medGy - ItBn, hd to frm, v/fn grn, v/w srt'd, calc cmt, tt por. LS: v/ltGy, subblky, v/fnxln to micxn, frm, tt por. SS: ItGy - ItBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt'd, tr mod srt'd, calc cmt, integr - tt por. No stn, mod ItYI min flor, no o flor, no cut, no mg.

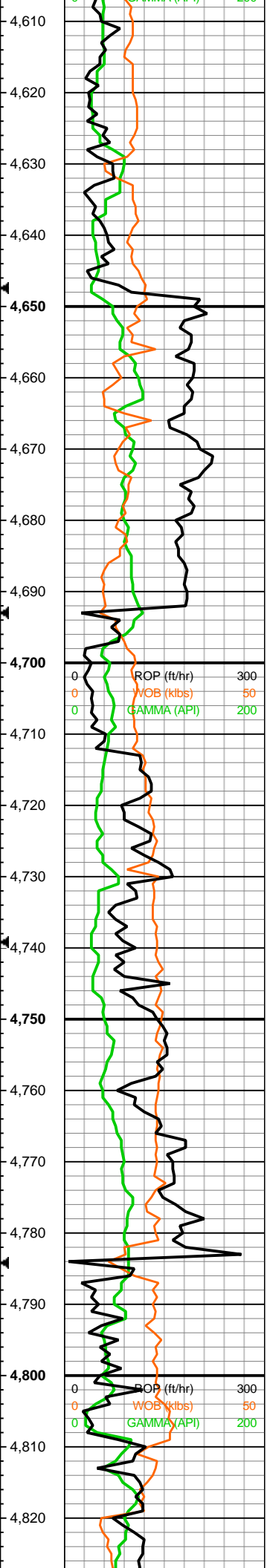


4500' - 4550' MD: SLTST: medGy - modOrRd - ItBn, hd to frm, v/fn grn, v/w srt'd, calc cmt, tt por. LS: v/ltGy, subblky, v/fnxln to micxn, frm, tt por. SS: ItGy - Wh - ItBn, un - mod cons, v/fn grn, tr fn-med grn subang-subrd, v/w srt'd, tr mod srt'd, calc cmt, integr - tt por. No stn, mod ItYI min flor, no o flor, no cut, no mg.



4550' - 4600' MD: SLTST: medGy - modOrRd - ItBn, hd to frm, v/fn grn, v/w srt'd, calc cmt, tt por. LS: v/ltGy, subblky, v/fnxln to micxn, frm, tt por. SS: ItGy - Wh - ItBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt'd, tr mod srt'd, calc cmt, integr - tt por. No stn, mod ItYI min flor, no o flor, no cut, no mg.





SPM: 117
PP: 1,217
GPM: 478

MD: 4,643'
INC: 9°
AZM: 14°
TVD: 4,624'
VS: 193'

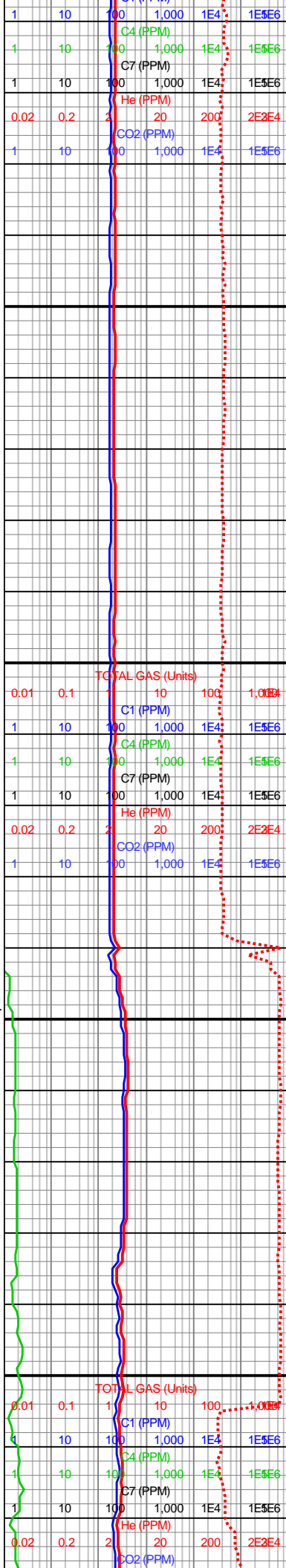
MD: 4,689'
INC: 9°
AZM: 13°
TVD: 4,670'
VS: 201'

MD: 4,735'
INC: 9°
AZM: 12°
TVD: 4,715'
VS: 208'

MD: 4,780'
INC: 9°
AZM: 14°
TVD: 4,759'
VS: 215'

WOB: 23
RPM: 113
SPM: 0/106
PP: 1,141
GPM: 435

MD: 4,826'
INC: 10°
AZM: 16°
TVD: 4,805'
VS: 223'



4650' - 4650' MD: SLTST: medGy - modOrRd - ltBn, hd to frm, v/fn grn, v/w srt, calc cmt, tt por. LS: v/lTgy-v/dkGy, subblky, medxln to micxn, frm, tt por. SS: ltGy - Wh - ltBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt, tr mod srt, calc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no mc

4650' - 4700' MD: LS: v/lTgy-v/dkGy, subblky, medxln to micxn, frm, tt por. SS: ltGy - Wh - ltBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt, tr mod srt, calc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no mc

4700' - 4750' MD: LS: v/lTgy-v/dkGy, subblky, medxln to micxn, frm, tt por. SS: ltGy - Wh - ltBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt, tr mod srt, calc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no mc

4750' - 4800' MD: LS: v/lTgy-v/dkGy, subblky, medxln to micxn, frm, tt por. SS: ltGy - Wh - ltBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt, tr mod srt, calc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no mc

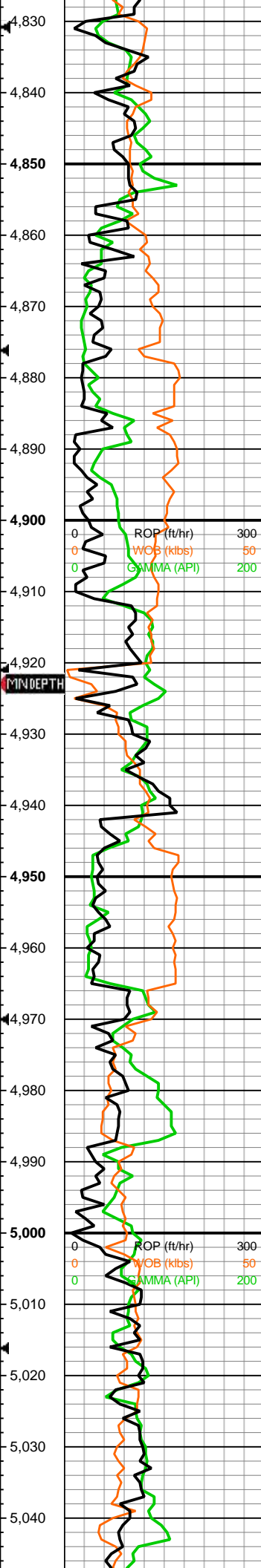
4800' - 4850' MD: LS: v/lTgy-v/dkGy, subblky, medxln to micxn, frm, tt por. SS: ltGy - Wh - ltBn, mod cons, v/fn grn, tr fn-med grn, subang-subrd, v/w srt, tr mod srt, calc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no mc

4,650

4,700

4,750

4,800



Carbide Gas Test @ 4,831' MD

MD: 4,872'
INC: 9°
AZM: 21°
TVD: 4,850'
VS: 230°

MW: 8.5 ppg
VIS: 30 sec/L

TRIP 4,921'
TOOH on: 11/18/17 @ 13:06 MST
REASON: Bit & Motor
BOB on: 11/19/17 @ 07:29 MST

MD: 4,918'
INC: 9°
AZM: 24°
TVD: 4,896'
VS: 237°

11/19/17
Bit Data
Bit #: 2
Mfg: Halliburton
Type: 6 Blade PDC
Size: 8.75"
S/N: 12070924
Depth In: 4,921'

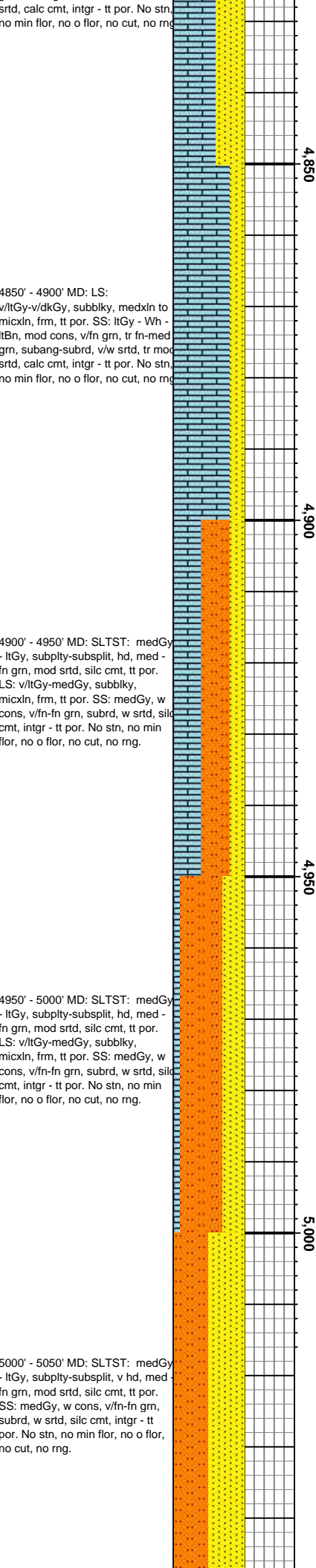
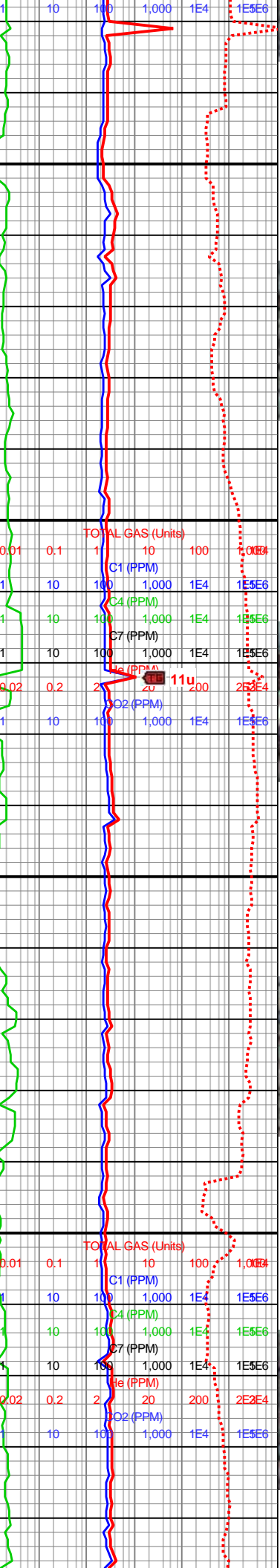
MD: 4,963'
INC: 9°
AZM: 24°
TVD: 4,940'
VS: 244°

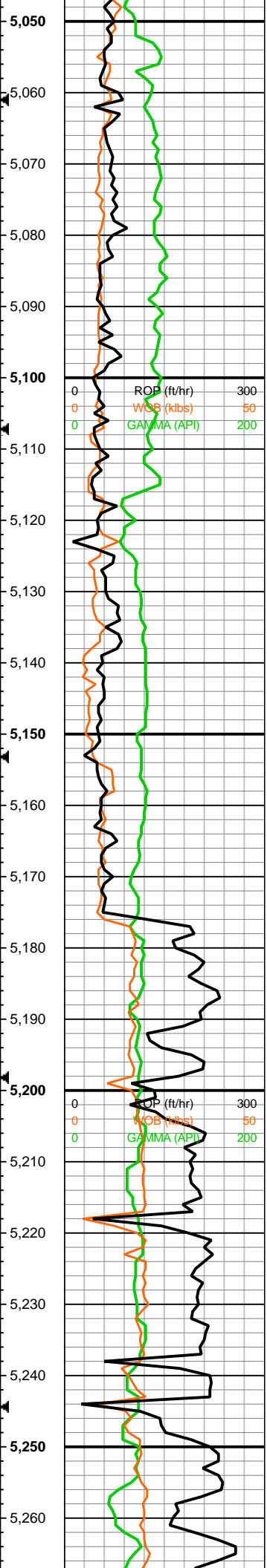
WOB: 14
RPM: 138
SPM: 66/63
PP: 1,348
GPM: 529

Gas Lag
Depth: 5,000'
Strokes: 2,721
Minutes: 26

MD: 5,009'
INC: 9°
AZM: 21°
TVD: 4,986'
VS: 251°

MW: 8.5+ ppg
VIS: 31 sec/L





MD: 5,054'
 INC: 9°
 AZM: 20°
 TVD: 5,030'
 VS: 258'

MW: 8.5+ ppg
 VIS: 30 sec/L

MD: 5,100'
 INC: 10°
 AZM: 15°
 TVD: 5,075'
 VS: 265'

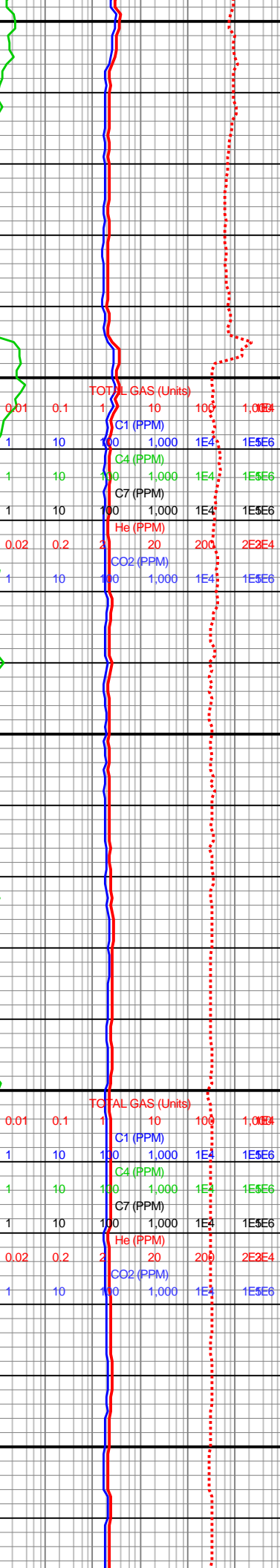
MW: 8.5 ppg
 VIS: 30 sec/L

MD: 5,146'
 INC: 9°
 AZM: 12°
 TVD: 5,121'
 VS: 273'

MD: 5,191'
 INC: 8°
 AZM: 17°
 TVD: 5,165'
 VS: 279'

WOB: 18
 RPM: 166
 SPM: 118/0
 PP: 1,184
 GPM: 482

MD: 5,237'
 INC: 7°
 AZM: 18°
 TVD: 5,211'
 VS: 285'



5050' - 5100' MD: SLTST: medGy
 - ltGy, subpty-subsplit, v hd, med-fn grn, mod srted, silc cmt, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, silc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no rng.



5100' - 5150' MD: SLTST: medGy
 - ltGy, subpty-subsplit, v hd, med-fn grn, mod srted, silc cmt, tt por, dissim pp pyr, tr yelGn stn. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, silc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no rng.



5150' - 5200' MD: SLTST: medGy
 - ltGy, subpty-subsplit, hd, med-fn grn, mod srted, pred silc cmt, tr calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, pred silc cmt, tr calc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no rng.

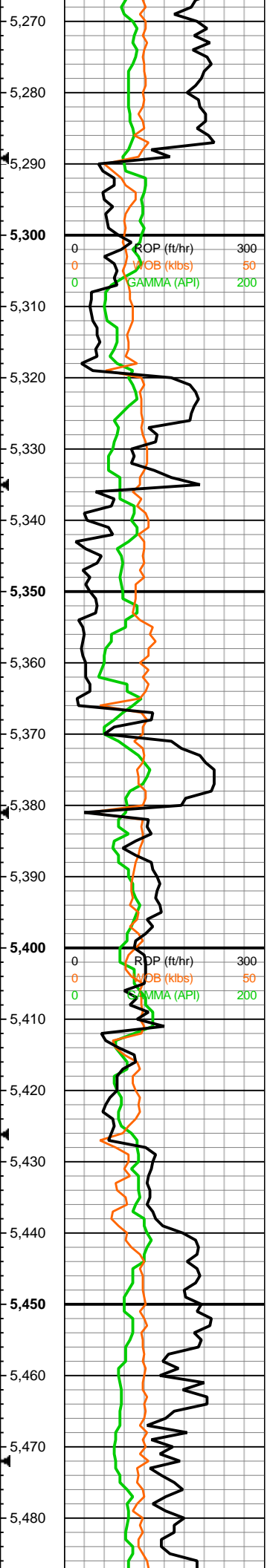


5200' - 5250' MD: SLTST: medGy
 - ltGy, tr redOr - lIBrn, subpty-subsplit, hd, med-fn grn, mod srted, pred silc cmt, tr calc cmt, tt por, dissem pp pyr, tr gnYel stn. LS: v/ltGy-medGy, subblky, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, pred silc cmt, tr calc cmt, intrgr - tt por. No stn, no min flor, no o flor, no cut, no rng.



5250' - 5300' MD: SLTST: medGy





MD: 5,283'
 INC: 6°
 AZM: 20°
 TVD: 5,257'
 VS: 290'

MW: 8.7+ ppg
 VIS: 33 sec/L

0	ROP (ft/hr)	300
0	WOB (kibs)	50
0	GAMMA (API)	200

MD: 5,328'
 INC: 6°
 AZM: 11°
 TVD: 5,301'
 VS: 295'

MW: 9.7+/8.7 ppg
 VIS: 33/33 sec/L

MD: 5,374'
 INC: 6°
 AZM: 358°
 TVD: 5,347'
 VS: 300'

WOB: 16
 RPM: 176
 SPM: 65/64
 PP: 1,341
 GPM: 527

MD: 5,420'
 INC: 6°
 AZM: 359°
 TVD: 5,393'
 VS: 304'

MD: 5,465'
 INC: 5°
 AZM: 360°
 TVD: 5,438'
 VS: 309'



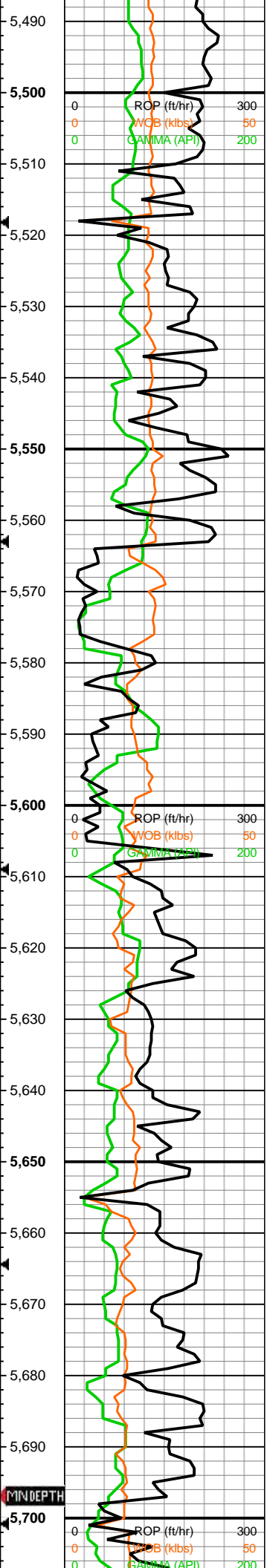
5,300
 5,350
 5,400
 5,450

5300' - 5350' MD: SLTST: medGy - ltGy, tr redOr - ltBrn, subply-subsplit, hd, med - fn grn, mod srtd, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxn, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srtd, pred silc cmt, tr calc cmt, intgr - tt por. No stn, no min flor, no o flor, no cut, n rng.

5350' - 5400' MD: LS: v/ltGy-medGy, subblky, micxn, frm, tt por, tr imbd pyr. CHK: Wh, subblky to rnd, chky, sft, chk frmwrk, pp por. Tr free GLAU & CALC. No stn, gnYel min flor, no o flor, no cut, n rng.

5400' - 5450' MD: LS: v/ltGy-medGy, subblky, micxn, frm, tt por, tr imbd pyr. CHK: Wh, subblky to rnd, chky, sft, chk frmwrk, pp por. Tr free GLAU & CALC. No stn, gnYel min flor, no o flor, no cut, n rng.

5450' - 5500' MD: LS: v/ltGy-medGy, subblky, micxn, frm, tt por, tr imbd pyr. CHK: Wh, subblky to rnd, chky, sft, chk frmwrk, pp por. Tr free PYR. No stn, gnYel min flor, no o flor, no cu no rng.



Gas Lag
Depth: 5,500'
Strokes: 2,985
Minutes: 27.56

MD: 5,511'
INC: 5°
AZM: 357°
TVD: 5,483'
VS: 312'

MD: 5,557'
INC: 5°
AZM: 357°
TVD: 5,529'
VS: 316'

MW: 8.8/8.7 ppg
VIS: 36/34 sec/L

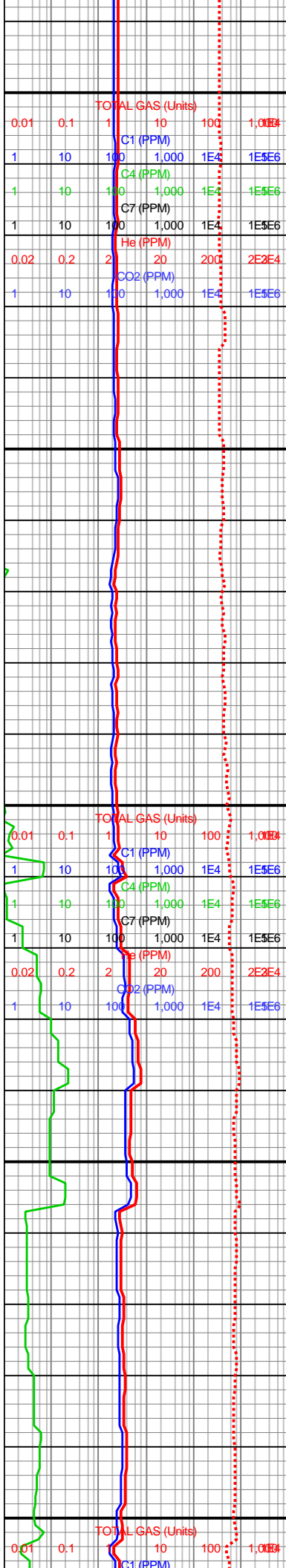
WOB: 17
RPM: 136
SPM: 64/64
PP: 1,330
GPM: 523

MD: 5,602'
INC: 7°
AZM: 8°
TVD: 5,574'
VS: 321'

MD: 5,648'
INC: 8°
AZM: 10°
TVD: 5,620'
VS: 326'

MD: 5,694'
INC: 8°
AZM: 10°
TVD: 5,665'
VS: 332'

11/20/17
MW: 8.8/8.7 ppg
VIS: 35/34 sec/L

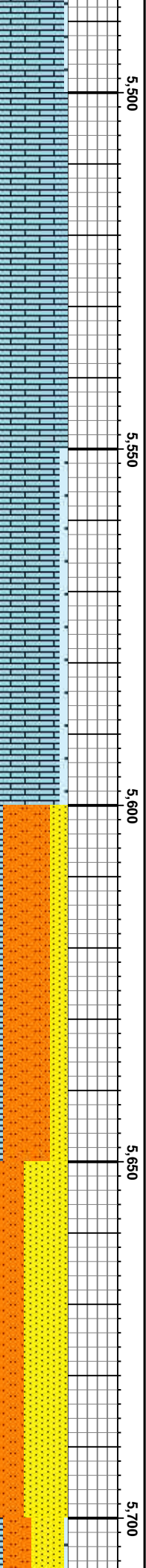


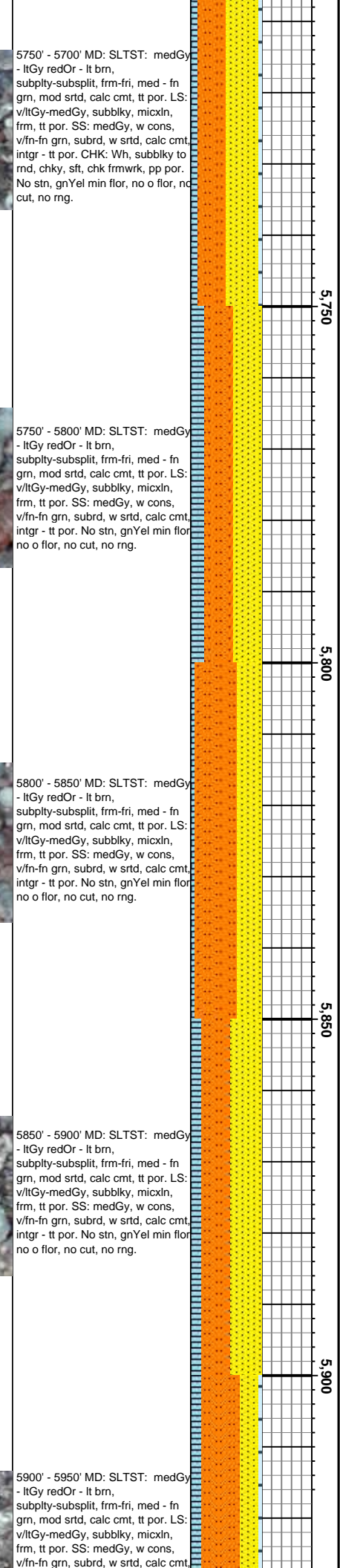
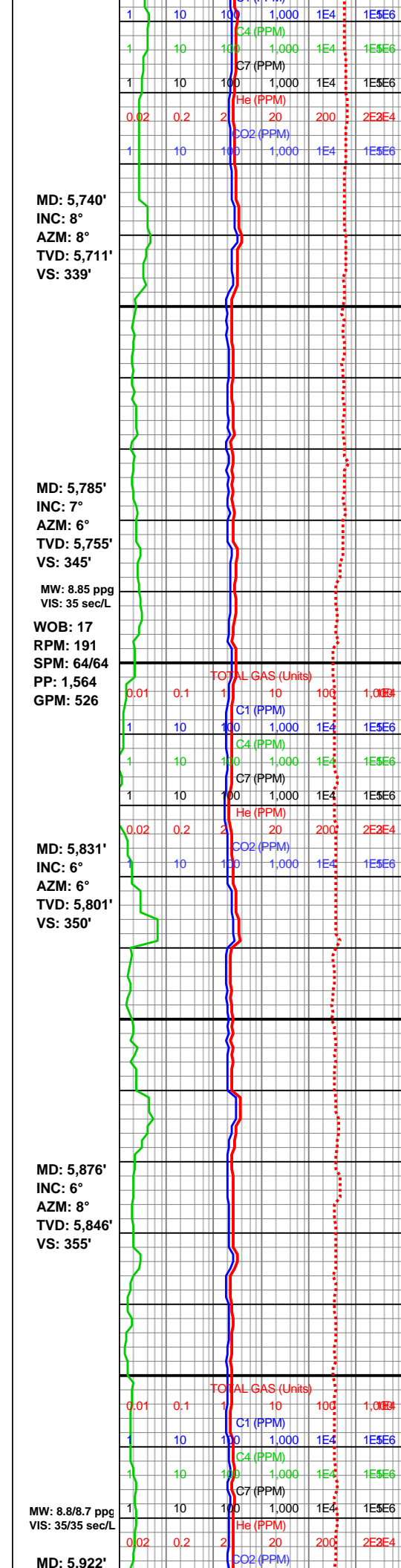
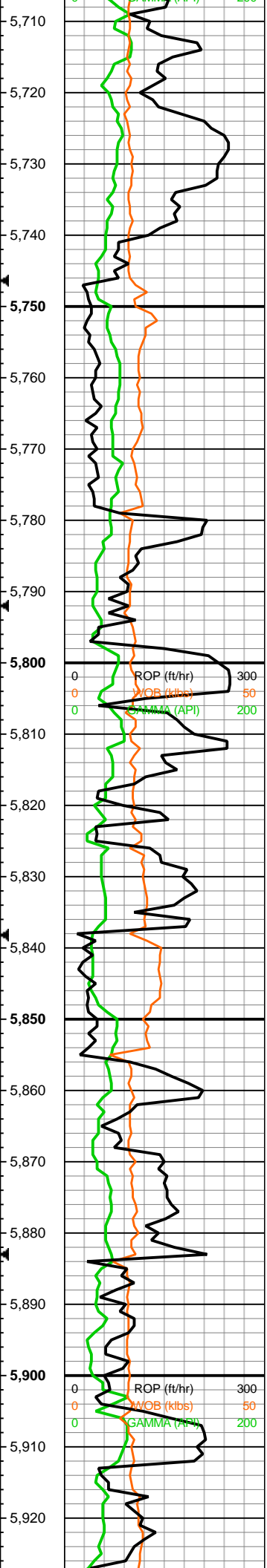
5500' - 5550' MD: LS:
 v/lTgy-medGy, subblky, micxn,
 frm, tt por, tr imbd pyr. No stn,
 gnYel min flor, no o flor, no cut, no
 rng.

5550' - 5600' MD: LS:
 v/lTgy-medGy, subblky, micxn,
 frm, tt por, tr imbd pyr. CHK: Wh,
 subblky to rnd, chky, sft, chk
 frmwrk, pp por. Tr free PYR &
 CALC No stn, gnYel min flor, no o
 flor, no cut, no rng.

5600' - 5650' MD: SLTST: medGy
 - ltGy redOr - lt brn,
 subpty-subsplit, frm-fri, med - fn
 grn, mod srt'd, calc cmt, tt por. LS:
 v/lTgy-medGy, subblky, micxn,
 frm, tt por. SS: medGy, w cons,
 v/fn-fn grn, subrd, w srt'd, calc cmt,
 intrgr - tt por. No stn, gnYel min flor
 no o flor, no cut, no rng.

5650' - 5700' MD: SLTST: medGy
 - ltGy redOr - lt brn,
 subpty-subsplit, frm-fri, med - fn
 grn, mod srt'd, calc cmt, tt por. SS:
 medGy, w cons, v/fn-fn grn, subrd,
 w srt'd, calc cmt, intrgr - tt por. No
 stn, no min flor, no o flor, no cut, no
 rng.





MD: 5,740'
INC: 8°
AZM: 8°
TVD: 5,711'
VS: 339'

MD: 5,785'
INC: 7°
AZM: 6°
TVD: 5,755'
VS: 345'

MW: 8.85 ppg
VIS: 35 sec/L
WOB: 17
RPM: 191
SPM: 64/64
PP: 1,564
GPM: 526

MD: 5,831'
INC: 6°
AZM: 6°
TVD: 5,801'
VS: 350'

MD: 5,876'
INC: 6°
AZM: 8°
TVD: 5,846'
VS: 355'

MW: 8.8/8.7 ppg
VIS: 35/35 sec/L
MD: 5,922'

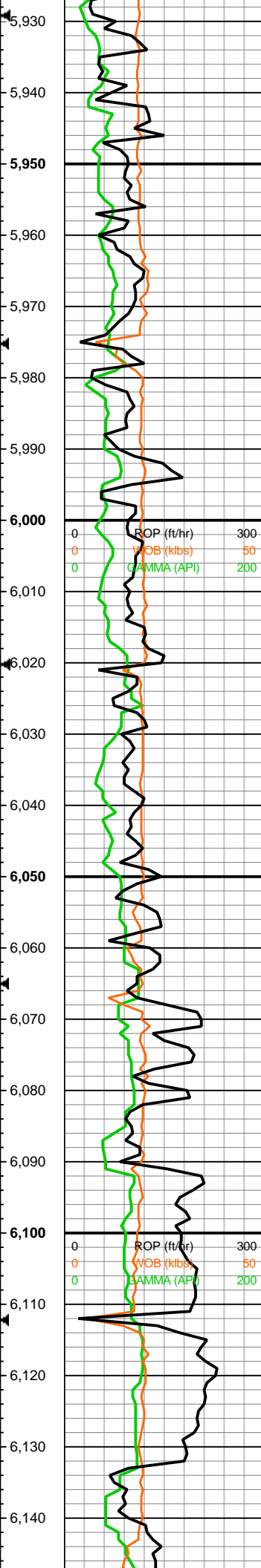
5750' - 5700' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxin, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. CHK: Wh, subblky to rnd, chky, sft, chk frmwrk, pp por. No stn, gnYel min flor, no o flor, no cut, no rng.

5750' - 5800' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxin, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.

5800' - 5850' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxin, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.

5850' - 5900' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxin, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.

5900' - 5950' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxin, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.



INC: 6°
AZM: 6°
TVD: 5,892'
VS: 359'

MD: 5,968'
INC: 6°
AZM: 5°
TVD: 5,937'
VS: 364'

WOB: 19
RPM: 192
SPM: 64/64
PP: 1,583
GPM: 523

MD: 6,013'
INC: 7°
AZM: 5°
TVD: 5,982'
VS: 369'

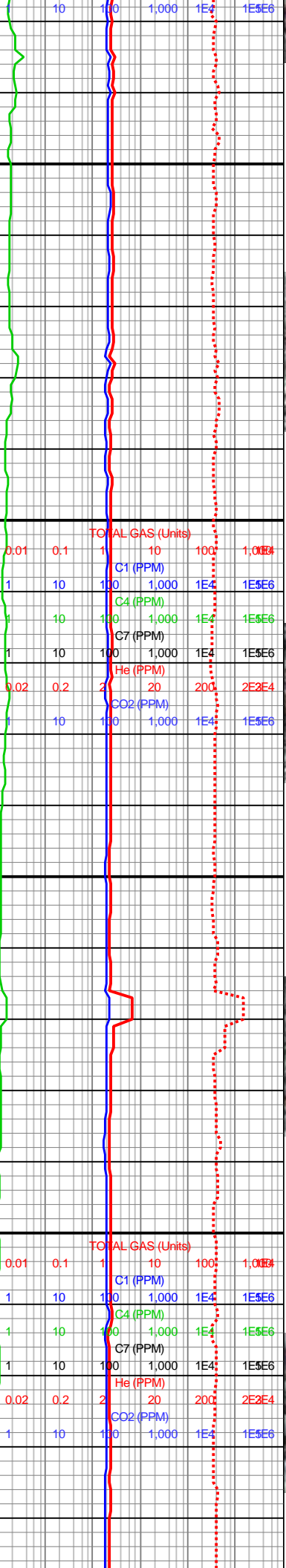
MD: 6,059'
INC: 7°
AZM: 6°
TVD: 6,028'
VS: 375'

MW: 9.0/9.0+ ppg
VIS: 37/35 sec/L

Carbide Gas Test

MD: 6,105'
INC: 8°
AZM: 7°
TVD: 6,073'
VS: 380'

MD: 6,150'



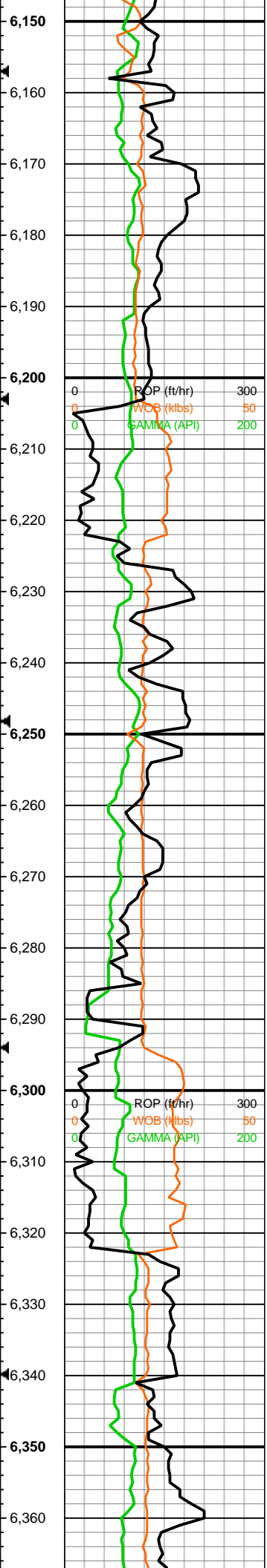
intgr - tt por. CHK: Wh, subbly to rnd, chky, sft, chk frmwrk, pp por. No stn, gnYel min flor, no o flor, no cut, no rng.

5950' - 6000' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subbly, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. No stn, gnYel min flor, no o flor, no cut, no rng.

6000' - 6050' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subbly, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. CHK: Wh, subbly to rnd, chky, sft, chk frmwrk, pp por. No stn, gnYel min flor, no o flor, no cut, no rng.

6050' - 6100' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subbly, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. CHK: Wh, subbly to rnd, chky, sft, chk frmwrk, pp por. No stn, gnYel min flor, no o flor, no cut, no rng.

6100' - 6150' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srted, calc cmt, tt por. LS: v/ltGy-medGy, subbly, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srted, calc cmt, intrgr - tt por. No stn, gnYel min flor, no o flor, no cut, no rng.



INC: 8°
 AZM: 9°
 TVD: 6,118'
 VS: 387'

MD: 6,196'
 INC: 9°
 AZM: 12°
 TVD: 6,163'
 VS: 394'

WOB: 18
 RPM: 192
 SPM: 66/64
 PP: 1,710
 GPM: 530

MD: 6,242'
 INC: 8°
 AZM: 14°
 TVD: 6,209'
 VS: 400'

MD: 6,287'
 INC: 8°
 AZM: 15°
 TVD: 6,253'
 VS: 407'

MW: 9.1+9.0+ ppg
 VIS: 41/36 sec/L

MD: 6,333'
 INC: 7°
 AZM: 17°
 TVD: 6,299'
 VS: 413'

MW: 9.1 ppg
 VIS: 39 sec/L

MD: 6,379'

TOTAL GAS (Units)					
	0.01	0.1	1	10	100
C1 (PPM)	1	10	100	1,000	1E4
C4 (PPM)	1	10	100	1,000	1E4
C7 (PPM)	1	10	100	1,000	1E4
He (PPM)	0.02	0.2	2	20	200
CO2 (PPM)	1	10	100	1,000	1E4

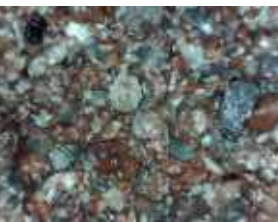
TOTAL GAS (Units)					
	0.01	0.1	1	10	100
C1 (PPM)	1	10	100	1,000	1E4
C4 (PPM)	1	10	100	1,000	1E4
C7 (PPM)	1	10	100	1,000	1E4
He (PPM)	0.02	0.2	2	20	200
CO2 (PPM)	1	10	100	1,000	1E4



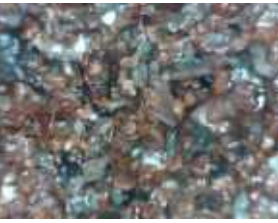
6150' - 6200' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srtcd, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srtcd, calc cmt, intgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.



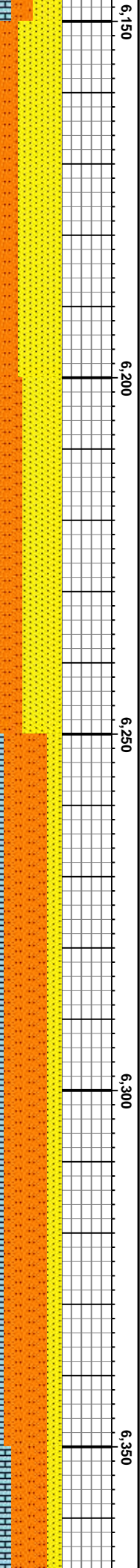
6200' - 6250' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srtcd, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srtcd, calc cmt, intgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.

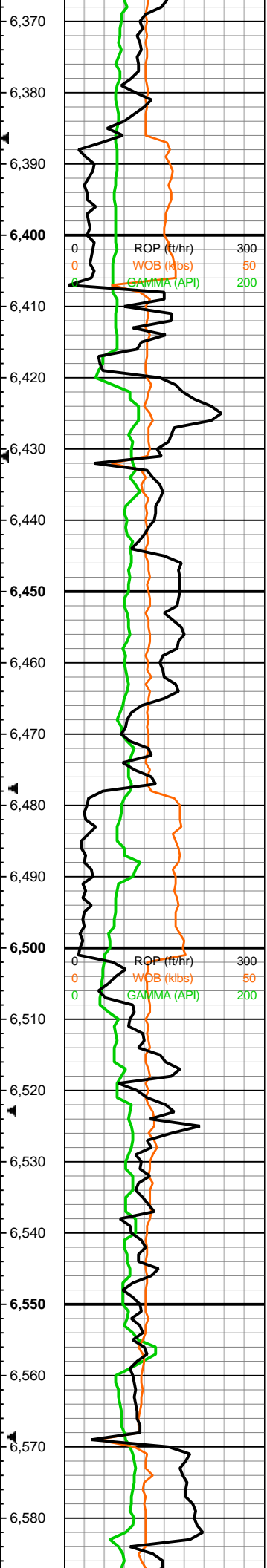


6250' - 6300' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srtcd, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srtcd, calc cmt, intgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.



6300' - 6350' MD: SLTST: medGy - ltGy redOr - lt brn, subpty-subsplit, frm-fri, med - fn grn, mod srtcd, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxln, frm, tt por. SS: medGy, w cons, v/fn-fn grn, subrd, w srtcd, calc cmt, intgr - tt por. No stn, gnYel min flor no o flor, no cut, no rng.





INC: 8°
AZM: 17°
TVD: 6,345'
VS: 419'

WOB: 26
RPM: 139
SPM: 66/65
PP: 1,657
GPM: 534

MD: 6,424'
INC: 8°
AZM: 13°
TVD: 6,389'
VS: 425'

MD: 6,470'
INC: 8°
AZM: 12°
TVD: 6,435'
VS: 431'

MD: 6,522'
INC: 8°
AZM: 12°
TVD: 6,486'
VS: 438'

MD: 6,561'
INC: 7°
AZM: 9°
TVD: 6,525'
VS: 442'

MW: 9.1/9.1 ppg
VIS: 38/37 sec/L

WOB: 17

ROP (ft/hr) 300
WOB (kbs) 50
GAMMA (API) 200

MW: 9.1/9.1 ppg
VIS: 38/37 sec/L

Gas Lag
Depth: 6,500'
Strokes: 3,514
Minutes: 30.67

MW: 9.1/9.1 ppg
VIS: 40/38 sec/L

ROP (ft/hr) 300
WOB (kbs) 50
GAMMA (API) 200

MW: 9.1/9.1 ppg
VIS: 40/38 sec/L

ROP (ft/hr) 300
WOB (kbs) 50
GAMMA (API) 200

MW: 9.1/9.1 ppg
VIS: 40/38 sec/L

ROP (ft/hr) 300
WOB (kbs) 50
GAMMA (API) 200



6350' - 6400' MD: SLTST: medGy - ltGy redOr - lt brn, subply-subsplit, frm-fri, med - fn gm, mod strd, calc cmt, tt por. LS: v/ltGy-medGy, subblky, micxn, frm, tt por. SS: medGy, w cons, v/fn-fn gm, subrd, w strd, calc cmt, intgr - tt por. No stn, gnYel min flor, no o flor, no cut, no rng.

6400' - 6450' MD: SLTST: ltBn - medGy, frm, v/fn gm, v/w strd, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxn, frm, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w strd, calc cmt, intgr por. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

6450' - 6500' MD: SLTST: ltBn - medGy, frm, v/fn gm, v/w strd, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxn, frm, free CAL, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w strd, calc cmt, intgr por. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

6500' - 6550' MD: SLTST: ltBn - medGy, frm, v/fn gm, v/w strd, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxn, frm, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w strd, calc cmt, intgr por. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

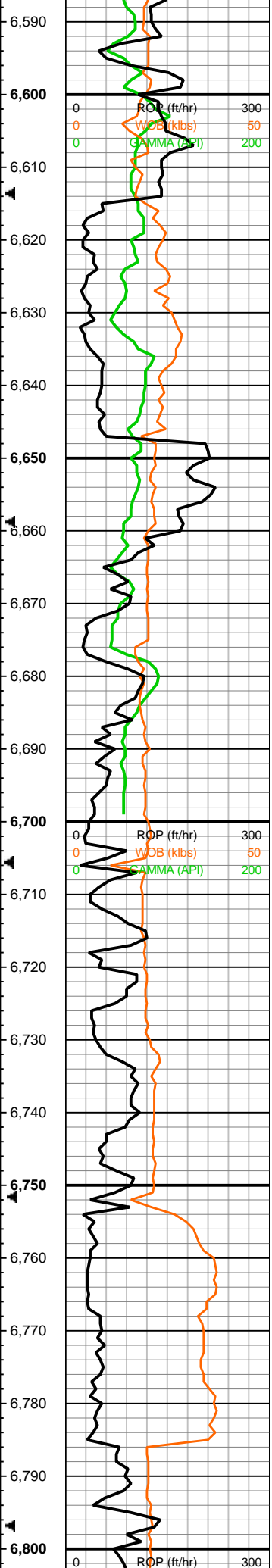
6550' - 6600' MD: SLTST: ltBn - medGy, frm, v/fn gm, v/w strd, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxn, frm, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w strd, calc cmt, intgr por. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

6,400

6,450

6,500

6,550



RPM: 193
SPM: 70/70
PP: 1,864
GPM: 575

MD: 6,607'
INC: 7°
AZM: 12°
TVD: 6,571'
VS: 448'

MW: 9.1/9.1 ppg
VIS: 38/38 sec/L

MD: 6,659'
INC: 7°
AZM: 12°
TVD: 6,622'
VS: 454'

Carbide Gas Test

MW: 9.2/9.2 ppg
VIS: 46/46 sec/L

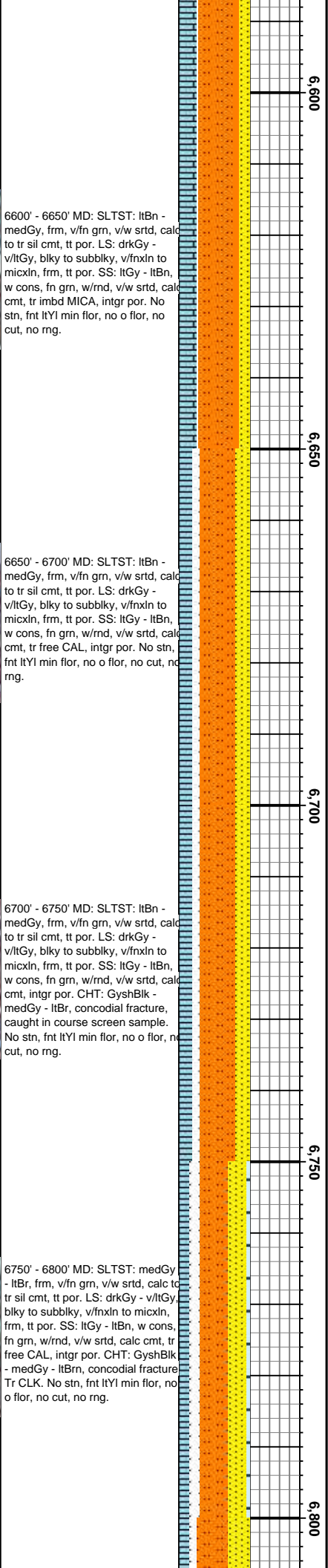
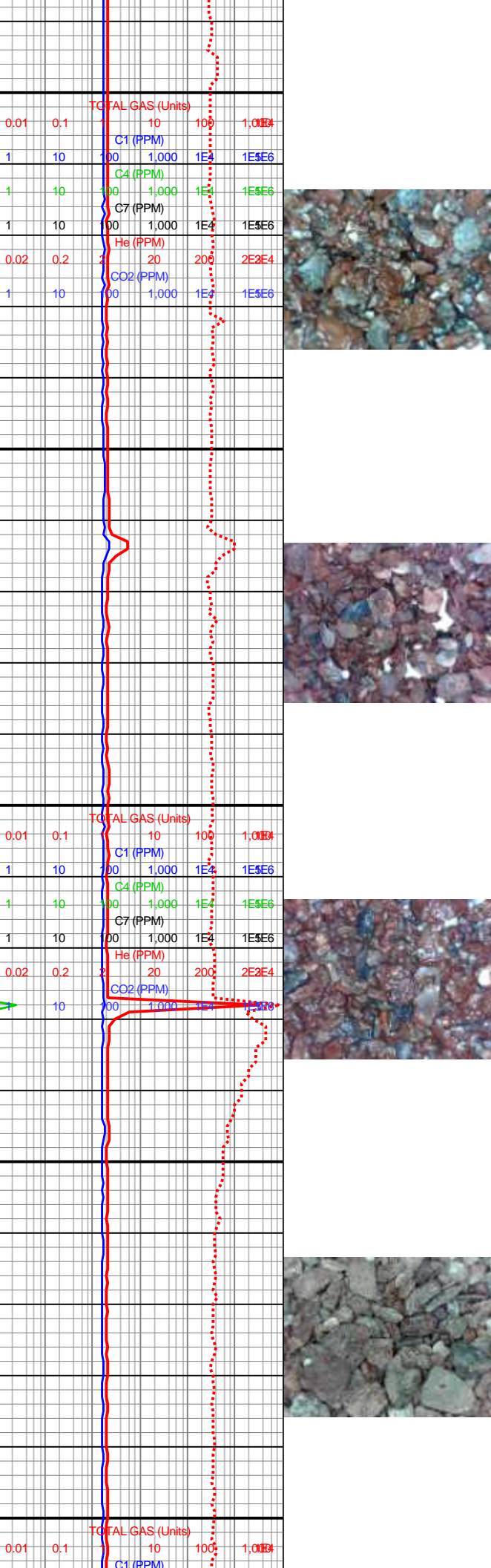
MD: 6,699'
INC: 6°
AZM: 20°
TVD: 6,662'
VS: 458'

Direct Carbide Test At Gas Trap.

MD: 6,744'
INC: 6°
AZM: 22°
TVD: 6,707'
VS: 463'

MD: 6,796'
INC: 6°
AZM: 22°
TVD: 6,759'
VS: 468'

WOB: 21

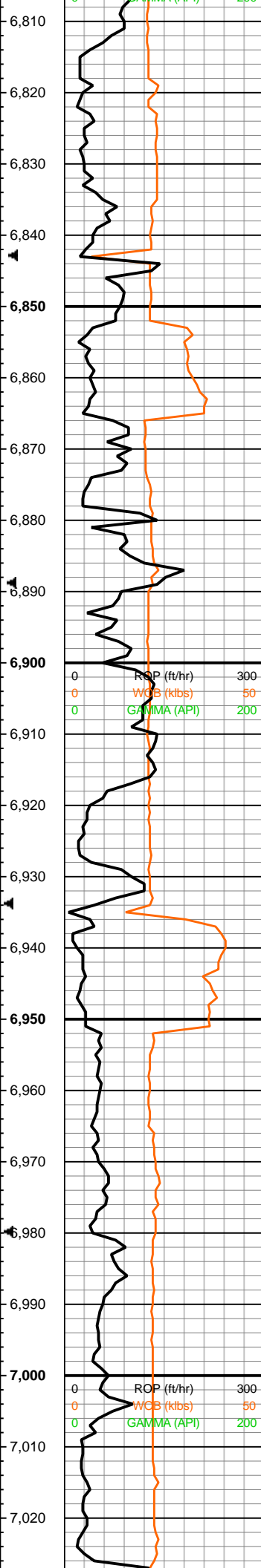


6600' - 6650' MD: SLTST: ltBn - medGy, frm, v/fn gm, v/w srted, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w srted, calc cmt, tr imbd MICA, intrgr por. No stn, fnt ltYI min flor, no o flor, no cut, no rng.

6650' - 6700' MD: SLTST: ltBn - medGy, frm, v/fn gm, v/w srted, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w srted, calc cmt, tr free CAL, intrgr por. No stn, fnt ltYI min flor, no o flor, no cut, no rng.

6700' - 6750' MD: SLTST: ltBn - medGy, frm, v/fn gm, v/w srted, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w srted, calc cmt, intrgr por. CHT: GyshBlk - medGy - ltBr, concoidal fracture, caught in course screen sample. No stn, fnt ltYI min flor, no o flor, no cut, no rng.

6750' - 6800' MD: SLTST: medGy - ltBr, frm, v/fn gm, v/w srted, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn, w cons, fn gm, w/md, v/w srted, calc cmt, tr free CAL, intrgr por. CHT: GyshBlk - medGy - ltBrn, concoidal fracture Tr CLK. No stn, fnt ltYI min flor, no o flor, no cut, no rng.



RPM: 181
 SPM: 70/70
 PP: 1,729

MD: 6,836'
 INC: 4°
 AZM: 32°
 TVD: 6,799'
 VS: 470'

MW: 46/46 ppg
 VIS: 9.2/9.2 sec/L

MD: 6,888'
 INC: 4°
 AZM: 32°
 TVD: 6,850'
 VS: 474'

MD: 6,927'
 INC: 5°
 AZM: 19°
 TVD: 6,889'
 MVVS: 477' pg
 VIS: 43/44 sec/L

MD: 6,979'
 INC: 5°
 AZM: 19°
 TVD: 6,941'
 VS: 482'

Gas Lag
 Depth: 7,000'
 Strokes: 3,779
 Minutes: 32.23

1	10	100	1,000	1E4	1E5E6
C4 (PPM)	10	100	1,000	1E4	1E5E6
C7 (PPM)	10	100	1,000	1E4	1E5E6
He (PPM)	0.02	0.2	2	20	2E2E4
CO2 (PPM)	1	10	100	1,000	1E4
TOTAL GAS (Units)					
C1 (PPM)	0.01	0.1	10	100	1,000
C4 (PPM)	1	10	100	1,000	1E5E6
C7 (PPM)	1	10	100	1,000	1E5E6
He (PPM)	0.02	0.2	2	20	2E2E4
CO2 (PPM)	1	10	100	1,000	1E4
TOTAL GAS (Units)					
C1 (PPM)	0.01	0.1	10	100	1,000
C4 (PPM)	1	10	100	1,000	1E5E6
C7 (PPM)	1	10	100	1,000	1E5E6
He (PPM)	0.02	0.2	2	20	2E2E4
CO2 (PPM)	1	10	100	1,000	1E4



6800' - 6850' MD: SLTST: redOr - medGy - ltBr, frm, v/fn grn, v/w srtcd, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn, w cons, fn grn, w/rnd, v/w srtcd, calc cmt, tr free CAL, intrgr por. CHT: GyshBlk - medGy - ltBrn, concoal fracture. Tr CLK. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

6850' - 6900' MD: SLTST: redOr - medGy - ltBr, frm, v/fn grn, v/w srtcd, calc to tr sil cmt, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn, w cons, fn grn, w/rnd, v/w srtcd, calc cmt, tr free CAL, intrgr por. CHT: GyshBlk - medGy - ltBrn, con fr. Tr CLK. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

6900' - 6950' MD: SLTST: ltBn - modRdBn - GyshBlk, frm to hd, v/fn to fn grn, v/w srtcd, pred calc to tr sil cmt, imbd CAL, free CHT, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por. SS: ltGy - ltBn, w cons, fn grn, w/rnd, v/w srtcd, calc cmt, mod free CAL, intrgr por. Tr CLK. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

6950' - 7000' MD: SLTST: ltBn - modRdBn - GyshBlk, frm to hd, v/fn to fn grn, v/w srtcd, pred calc to tr sil cmt, imbd CAL, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por, mod imbd DOL. SS: ltGy - ltBn, w cons, fn grn, w/rnd, v/w srtcd, calc cmt, mod free CAL, intrgr por. CHK: Wh subblky to rnd, chky, sft, chk frmwrk, pp por, tr foram. No stn, fnt ltYl min flor, no o flor, no cut, no rng.

7000' - 7035' MD: SLTST: ltBn - modRdBn - GyshBlk, frm to hd, v/fn to fn grn, v/w srtcd, pred calc to tr sil cmt, imbd CAL, tt por. LS: drkGy - v/ltGy, blkly to subblky, v/fnxln to micxln, frm, tt por, mod imbd DOL. SS: ltGy - ltBn, w cons, fn grn, w/rnd, v/w srtcd, calc cmt,



<p>7,030</p> <p>7,040</p> <p>7,050</p>		<p>Reached a TD of 7,035' MD on 11/21/17 @ 06:56 MST.</p>			<p>mod free CAL, integr por. CHK: Wh subbly to rd, chky, sft, chk frmwrk, pp por, tr foram. No str, fn ltYl min flor, no o flor, no cut, no rng.</p>		<p>7,050</p>
<p>DEPTH</p>	<p>ROP ———</p> <p>WOB ———</p> <p>GAMMA ———</p>	<p>REMARKS</p>	<p>TOTAL GAS ———</p> <p>C1 ———</p> <p>C4 ———</p> <p>C7 ———</p> <p>He ·····</p> <p>CO2 - - - -</p>	<p>IMAGES</p>	<p>LITHOLOGY DESCRIPTIO...</p>	<p>% LITHOLOGY</p>	<p>DEPTH</p> <p>SHOW VALUES</p>