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

Well Name:	ML Investments 3-10	ALTA MESA SERVICES	
API:	11-075-20031		
Location:	Sec 10, T8N, R4W	Payette County, ID	
License Number:	AFE: 0004310DC1	Region:	Payette
Spud Date:	11/11/2017	Drilling Completed:	11/20/2017
Surface Coordinates:	See drilling report		
Bottom Hole Coordinates:	See drilling report		
Ground Elevation (ft):	2251'	K.B. Elevation (ft):	2263'
Logged Interval (ft):	136' To: 5000'	Total Depth (ft):	5000'
Formation:	Willow		
Type of Drilling Fluid:	Water/Gel to SCP, LSND/Poly		

Printed by StripLog from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Alta Mesa Services
Address: 15021 Katy Freeway
4th Floor
Houston, TX 77094-1813

GEOLOGIST

Name: Phil Littlefield, Lester Ballard
Company: King Canyon Buffalo, Inc.
Address: 33 King Canyon Rd.
Chadron, NE 69337

Comments

Company Man: Richard Walling
Alta Mesa Geologist: Mike McMennamy/Dave Smith
Contractor: PGDS Rig #7 (Paul Graham Drilling Service)
Tool Pusher: Jeff Lopez, Dave Gilbert
Mud Company: Sinclair Well Products Services
Mud Engineer: Randy Osenbaugh
KCB Wellsite Geology: Phil Littlefield, Lester Ballard, Nosreddine Madbouhi & Mike Kaul

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ROCK TYPES

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- Dol gy
- Anhy rose
- Anhy wh
- Bent
- Cht
- Coal
- Ls off wh
- Ls crmtn
- Congl
- Dol brn
- Ls ltgy
- Ls tn
- Ls wh
- Ls med brn
- Ls medgy
- Sh medgy
- Sltst brn
- sltst wh
- sltst ltgy
- Sltst tn
- Ss clr-trnsl, vf-mgr
- sltst mgy
- Ss clr-trnsl, crs-v/crs, uncon
- Sltst
- Ss crs
- Ss gy
- Ss
- Sh rdbrn
- Shale sndy
- Sh brn
- Sh tan
- Sh ltbl
- Carbshdkgy
- Sh carb
- Sh dkgy
- Sh grn
- Sh medgy
- Sh ltgy
- nosmpl
- Csgpt
- clyst tan/buff
- clyst brn
- clyst mar
- clyst wh
- clyst ltgrn
- clyst rdbrn
- clyst blgy
- clyst lt-mgy
- Coal
- Tuff ltgy
- Tuff ltgrn
- Tuff white
- Tuff dkgy
- Tuff orng
- Basalt flow top
- Basalt entab
- Basalt columnade
- Carbsh
- clyst m-mdkgy

ACCESSORIES

MINERAL

- Vertfrac
- Anhy
- Arggrn
- Arg
- Mica
- Bent
- Bit
- Brecfrag
- Calc
- Carb
- Chtdk
- Chtlt
- Dol
- Feldspar
- Ferrpel
- Ferr
- Glau
- Gyp
- Hvymin
- Kaol
- Marl
- Qtz or calct xls
- Nodule
- Phos
- Pyr
- Salt
- Sandy
- Silt
- Sil
- Sulphur
- Tuff

FOSSIL

- Algae
- Amph
- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram
- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite
- Plant
- Strom

STRINGER

- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Sltstrg
- Ssstrg
- Clyst gy
- Lsgy
- Lscrmtn

TEXTURE

- Boundst
- Chalky
- Cryxln
- Earthy
- Finexln
- Grainst
- Lithogr
- Microxln
- Mudst
- Packst
- Wackest

OTHER SYMBOLS

POROSITY

- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

SORTING

- Well
- Moderate
- Poor

ROUNDING

- Rounded
- Subrnd
- Subang
- Angular

OIL SHOW

- Even
- Spotted
- Ques
- Dead

INTERVAL

- Core
- Dst
- Casing

EVENT

- Rft
- Sidewall
- New bit

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ROP (min/ft)

ROP (min/ft)
Gamma (API)
Caliper (inches)

DEPTH

Lithology

Geological Descriptions

Mass Spec Total Gas

MS Total Gas (Units)

0 ROP (min/ft) 2
0 Gamma (API) 200
0 Caliper (inches) 12

KING CANYON BUFFALO, INC.
33 King Canyon Rd, Chadron, NE 69337
109 E 17th St, Ste 4159, Cheyenne, WY 82001
kcbison@yahoo.com
http://www.kingcanyonbuffalo.com/wellsite/

Mr. Chris Nerud,
President
(970) 212-6868
jcnerud@yahoo.com

Well Logged by Phil Littlefield,
Lester Ballard, Nasreddine Madbouhi
& Mike Kaul with FIT "dq1000" Mass
Spectrometer (#1080) and QGM Trap

0
100
150
200

ALTA MESA SERVICES
ML Investments 3-10
API # 11-075-20031
AFE: 0004310DC1
GL Elevation: 2251 ft
KB Elevation: 2263 ft

King Canyon Buffalo, Inc.
On location 11/9/2017 @ 1000 hrs,
Rigged up & fully operational 11/10/2017 @ 1200 hrs

SPUD on 11-11-2017 @ 0730 hrs MT

KCB mudloggers catching 30' lagged samples starting at 136'

16" Conductor set at 122' (136' KB)

CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, rr slty-occ mod sdy, tr inbd biot & clr crs gr qtx

CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, rr slty-occ mod sdy, tr inbd biot & clr crs gr qtx

CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, rr slty-occ sl sdy, tr inbd biot & clr crs gr qtx

CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, rr slty-occ sl sdy, tr inbd biot & clr crs gr qtx, w/ tr ltgy v/ clyish SLTST sft, v/ sl calc ip

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0 MS Total Gas (Units) 500

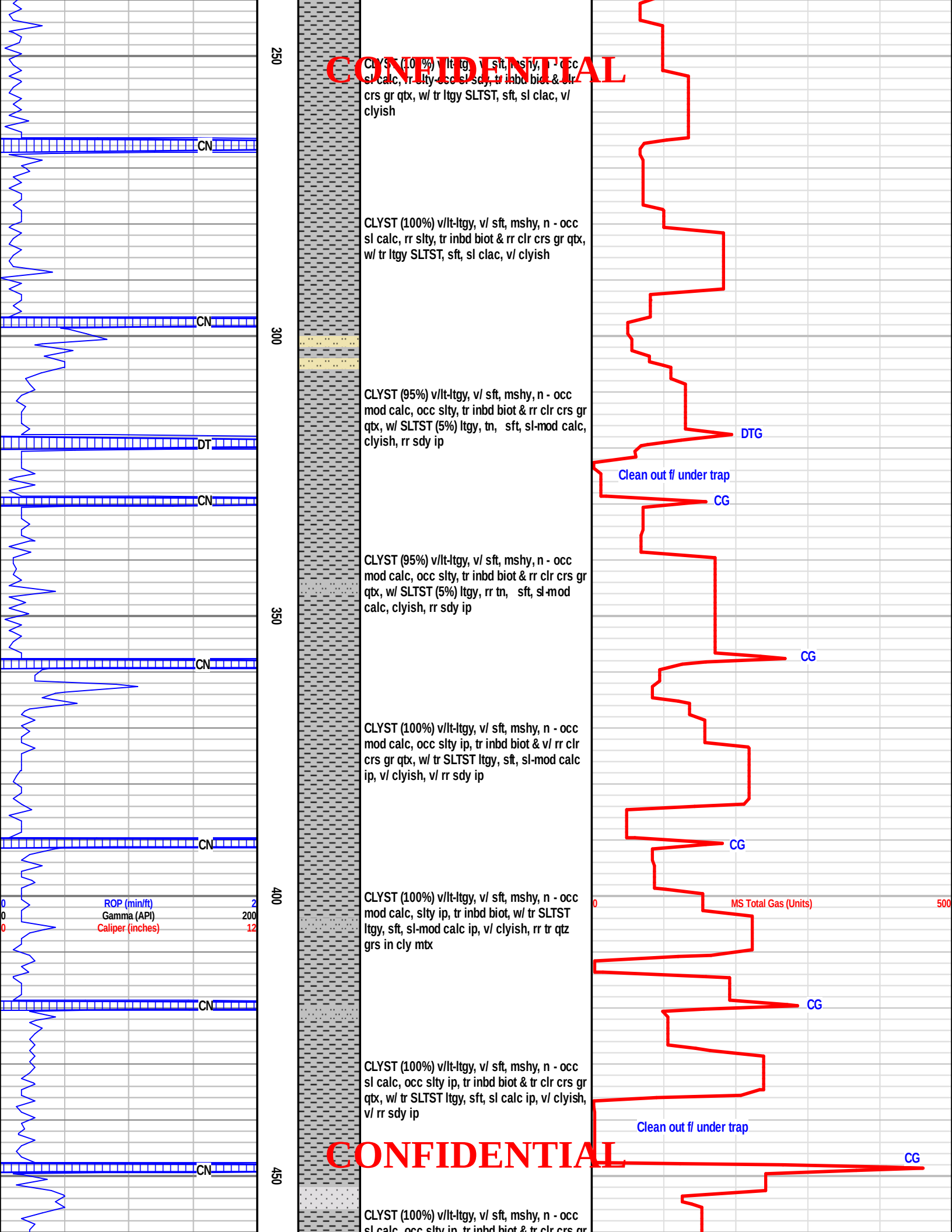
BGG = Background Gas
BIB = Break in Bit
CN = Connection
CG = Connection gas
CO = Circulate out
DOT = Dropped on trip
DT = Downtime
DTG = Downtime gas
FMG = Formation gas
LTC = Lagged to Connection
LTD = Lagged to Downtime
NB = New Bit
ST = Short Trip
STG = Short Trip Gas
TG = Trip Gas
WLS = Wireline Survey

CN
CN
CN
CN

CG
CG

0 ROP (min/ft) 2
0 Gamma (API) 200
0 Caliper (inches) 12

0 MS Total Gas (Units) 500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CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, rr slty-occ sl sdy, tr inbd biot & clr crs gr qtx, w/ tr ltgy SLTST, sft, sl clac, v/ clyish
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, rr slty, tr inbd biot & rr clr crs gr qtx, w/ tr ltgy SLTST, sft, sl clac, v/ clyish
CLYST (95%) v/lt-ltgy, v/ sft, mshy, n - occ mod calc, occ slty, tr inbd biot & rr clr crs gr qtx, w/ SLTST (5%) ltgy, tn, sft, sl-mod calc, clyish, rr sdy ip
CLYST (95%) v/lt-ltgy, v/ sft, mshy, n - occ mod calc, occ slty, tr inbd biot & rr clr crs gr qtx, w/ SLTST (5%) ltgy, rr tn, sft, sl-mod calc, clyish, rr sdy ip
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ mod calc, occ slty ip, tr inbd biot & v/ rr clr crs gr qtx, w/ tr SLTST ltgy, sft, sl-mod calc ip, v/ clyish, v/ rr sdy ip
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ mod calc, slty ip, tr inbd biot, w/ tr SLTST ltgy, sft, sl-mod calc ip, v/ clyish, rr tr qtz grs in cly mtx
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, occ slty ip, tr inbd biot & tr clr crs gr qtx, w/ tr SLTST ltgy, sft, sl calc ip, v/ clyish, v/ rr sdy ip
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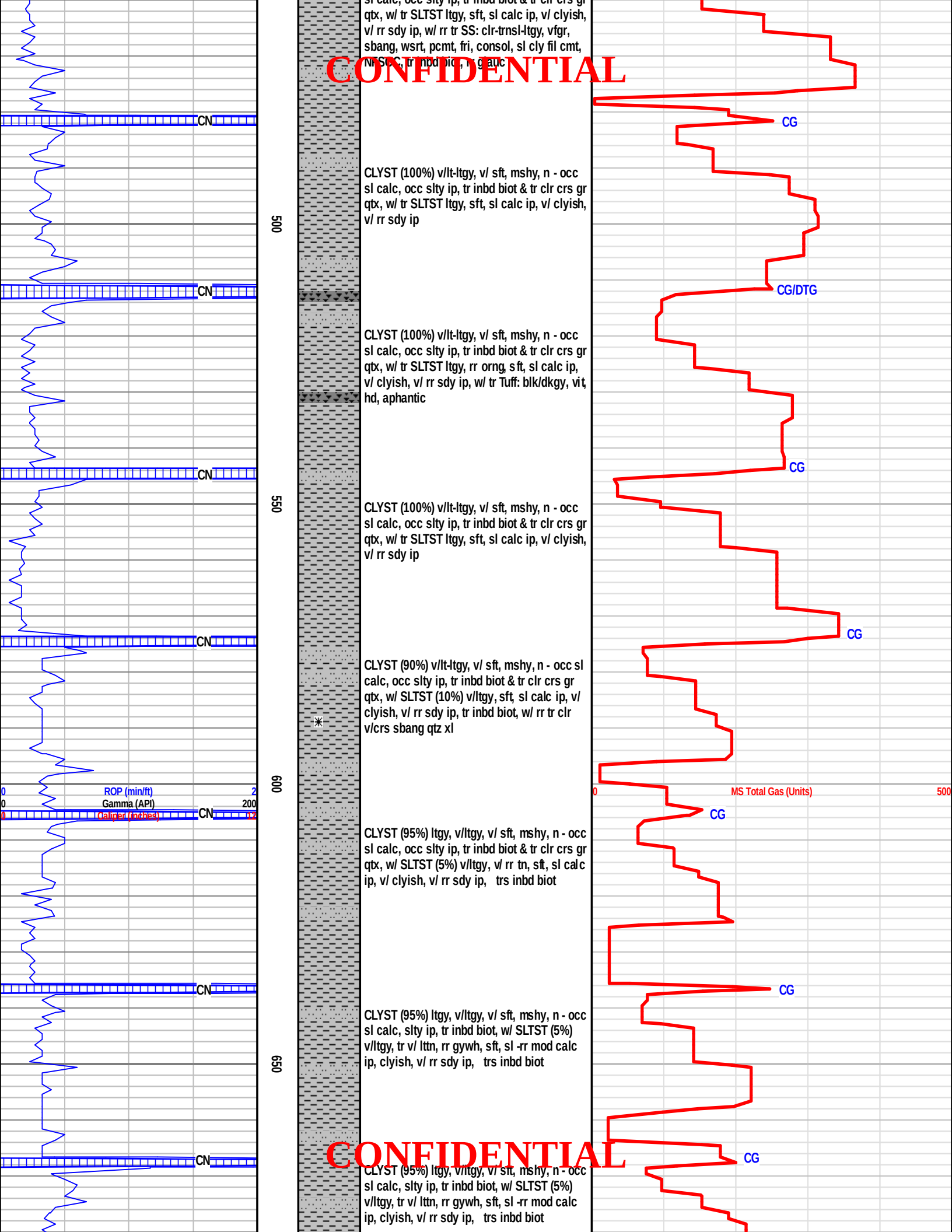
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, occ slty ip, tr inbd biot & tr clr crs gr
DTG
Clean out f/ under trap
CG
CG
CG
Clean out f/ under trap
CG
CN
DT
250
300
350
400
450
0
ROP (min/ft)
2
Gamma (API)
200
Caliper (inches)
12
0
MS Total Gas (Units)
500


qtx, w/ tr SLTST ltgy, sft, sl calc ip, v/ clyish, v/ rr sdy ip, w/ rr tr SS: clr-trnsl-ltgy, vfgr, sbang, wsrt, pcmt, fri, consol, sl cly fil cmt,
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CN
CG
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, occ slty ip, tr inbd biot & tr clr crs gr qtx, w/ tr SLTST ltgy, sft, sl calc ip, v/ clyish, v/ rr sdy ip
CG/DTG
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, occ slty ip, tr inbd biot & tr clr crs gr qtx, w/ tr SLTST ltgy, rr orng, sft, sl calc ip, v/ clyish, v/ rr sdy ip, w/ tr Tuff: blk/dkgy, vit, hd, aphantic
CG
CLYST (100%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, occ slty ip, tr inbd biot & tr clr crs gr qtx, w/ tr SLTST ltgy, sft, sl calc ip, v/ clyish, v/ rr sdy ip
CG
CLYST (90%) v/lt-ltgy, v/ sft, mshy, n - occ sl calc, occ slty ip, tr inbd biot & tr clr crs gr qtx, w/ SLTST (10%) v/ltgy, sft, sl calc ip, v/ clyish, v/ rr sdy ip, tr inbd biot, w/ rr tr clr v/crs sbang qtz xl
0
ROP (min/ft)
2
0
Gamma (API)
200
Caliper (inches)
MS Total Gas (Units)
0
500
CG
CLYST (95%) ltgy, v/ltgy, v/ sft, mshy, n - occ sl calc, occ slty ip, tr inbd biot & tr clr crs gr qtx, w/ SLTST (5%) v/ltgy, v/ rr tn, sft, sl calc ip, v/ clyish, v/ rr sdy ip, trs inbd biot
CG
CLYST (95%) ltgy, v/ltgy, v/ sft, mshy, n - occ sl calc, slty ip, tr inbd biot, w/ SLTST (5%) v/ltgy, tr v/ lttn, rr gywh, sft, sl -rr mod calc ip, clyish, v/ rr sdy ip, trs inbd biot
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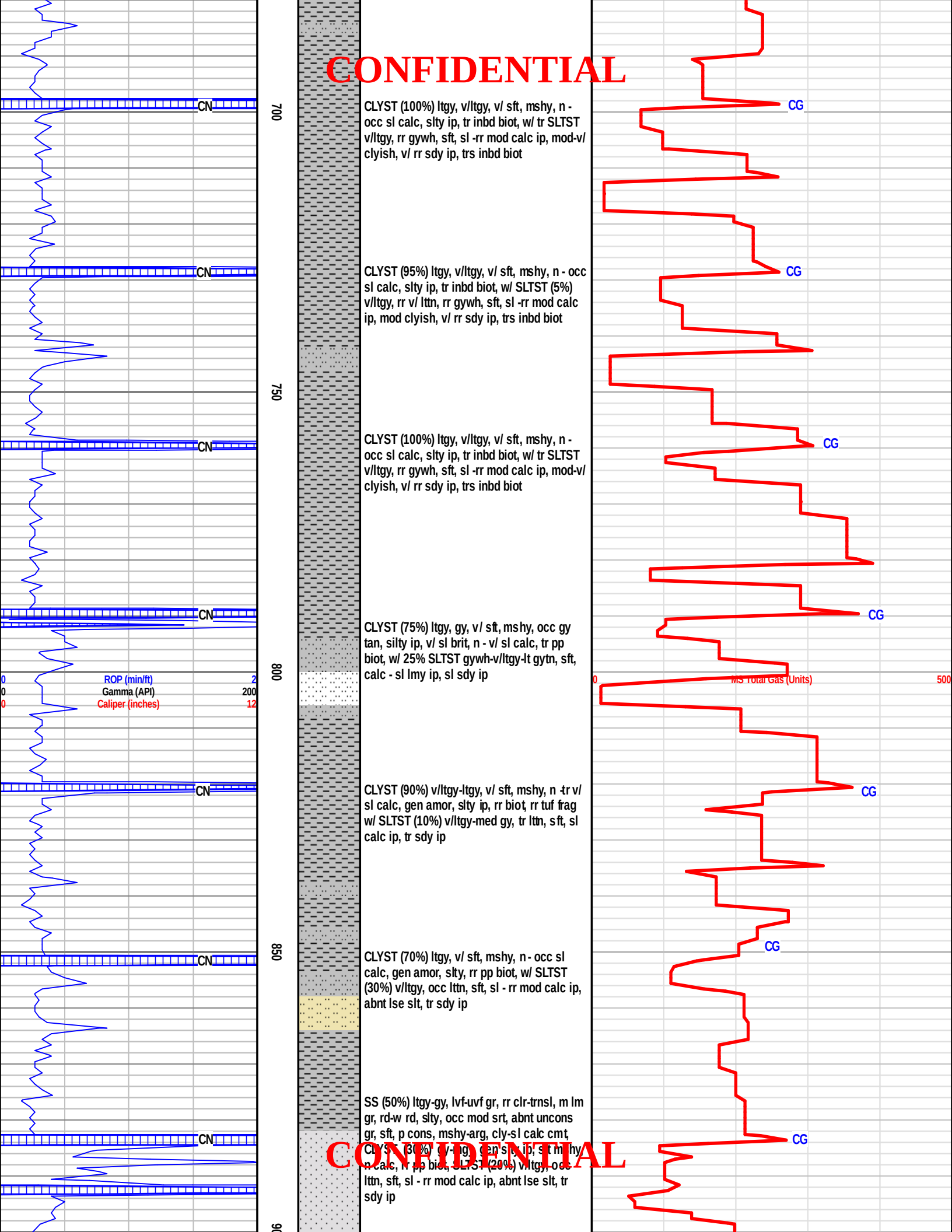
CG
CLYST (95%) ltgy, v/ltgy, v/ sft, mshy, n - occ sl calc, slty ip, tr inbd biot, w/ SLTST (5%) v/ltgy, tr v/ lttn, rr gywh, sft, sl -rr mod calc ip, clyish, v/ rr sdy ip, trs inbd biot
500
550
600
650


CONFIDENTIAL
CN
CN
CN
CN
CN
CN
CN
700
750
800
850
ROP (min/ft)
Gamma (API)
Caliper (inches)
CLYST (100%) ltgy, v/ltgy, v/ sft, mshy, n - occ sl calc, slty ip, tr inbd biot, w/ tr SLTST v/ltgy, rr gywh, sft, sl -rr mod calc ip, mod-v/ clyish, v/ rr sdy ip, trs inbd biot
CLYST (95%) ltgy, v/ltgy, v/ sft, mshy, n - occ sl calc, slty ip, tr inbd biot, w/ SLTST (5%) v/ltgy, rr v/ lttn, rr gywh, sft, sl -rr mod calc ip, mod clyish, v/ rr sdy ip, trs inbd biot
CLYST (100%) ltgy, v/ltgy, v/ sft, mshy, n - occ sl calc, slty ip, tr inbd biot, w/ tr SLTST v/ltgy, rr gywh, sft, sl -rr mod calc ip, mod-v/ clyish, v/ rr sdy ip, trs inbd biot
CLYST (75%) ltgy, gy, v/ sft, mshy, occ gy tan, silty ip, v/ sl brit, n - v/ sl calc, tr pp biot, w/ 25% SLTST gywh-v/ltgy-lt gytn, sft, calc - sl lmy ip, sl sdy ip
CLYST (90%) v/ltgy-ltgy, v/ sft, mshy, n -tr v/ sl calc, gen amor, slty ip, rr biot, rr tuf frag w/ SLTST (10%) v/ltgy-med gy, tr lttn, sft, sl calc ip, tr sdy ip
CLYST (70%) ltgy, v/ sft, mshy, n - occ sl calc, gen amor, slty, rr pp biot, w/ SLTST (30%) v/ltgy, occ lttn, sft, sl - rr mod calc ip, abnt lse slt, tr sdy ip
SS (50%) ltgy-gy, lvf-uvf gr, rr clr-trnsl, m lm gr, rd-w rd, slty, occ mod srt, abnt uncons gr, sft, p cons, mshy-arg, cly-sl calc cmt,
CLYST (30%) gy-ltgy, gen slty ip, sft mshy, n calc, rr pp biot, SLTST (20%) v/ltgy, occ lttn, sft, sl - rr mod calc ip, abnt lse slt, tr sdy ip
CG
CG
CG
CG
CG
CG
CG
MS Total Gas (Units)
500
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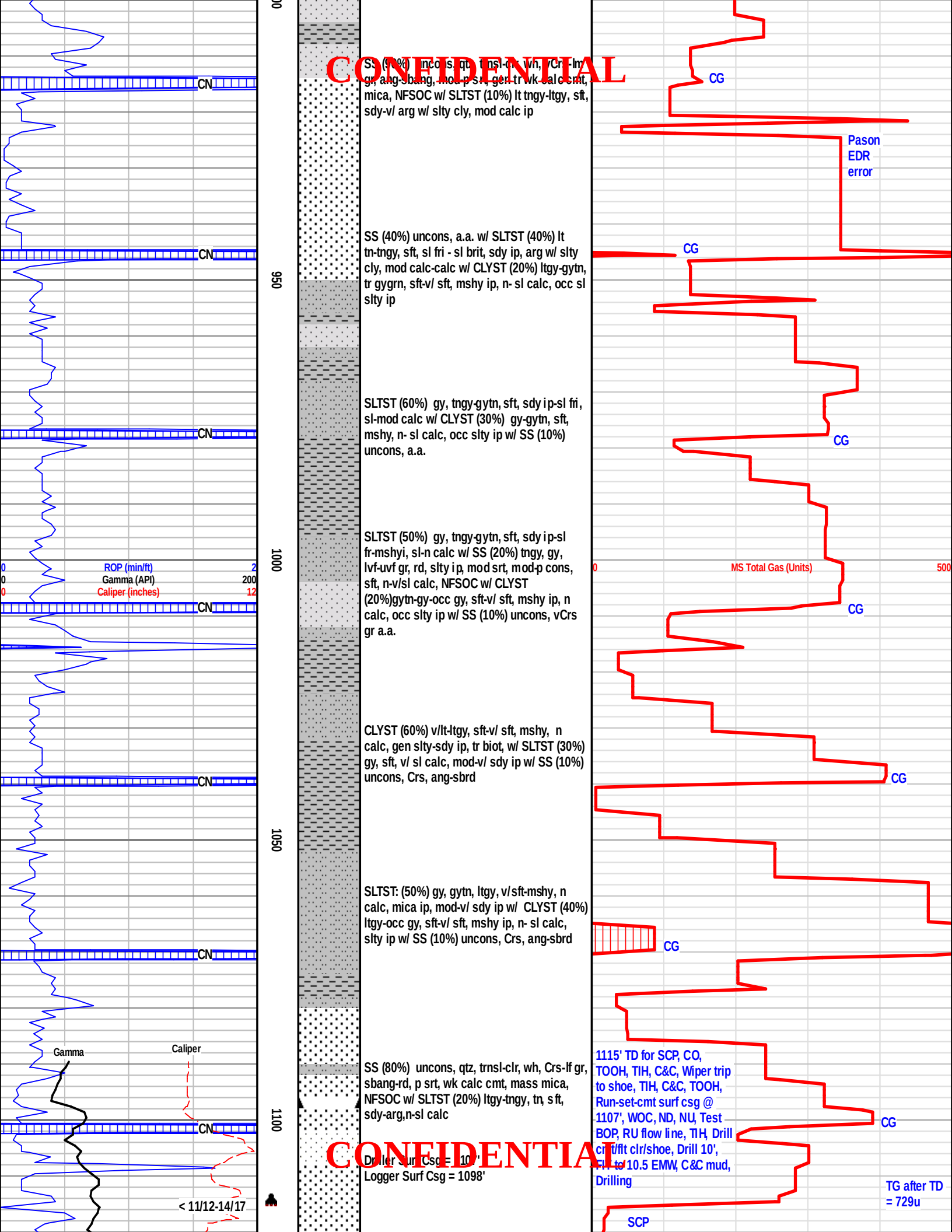
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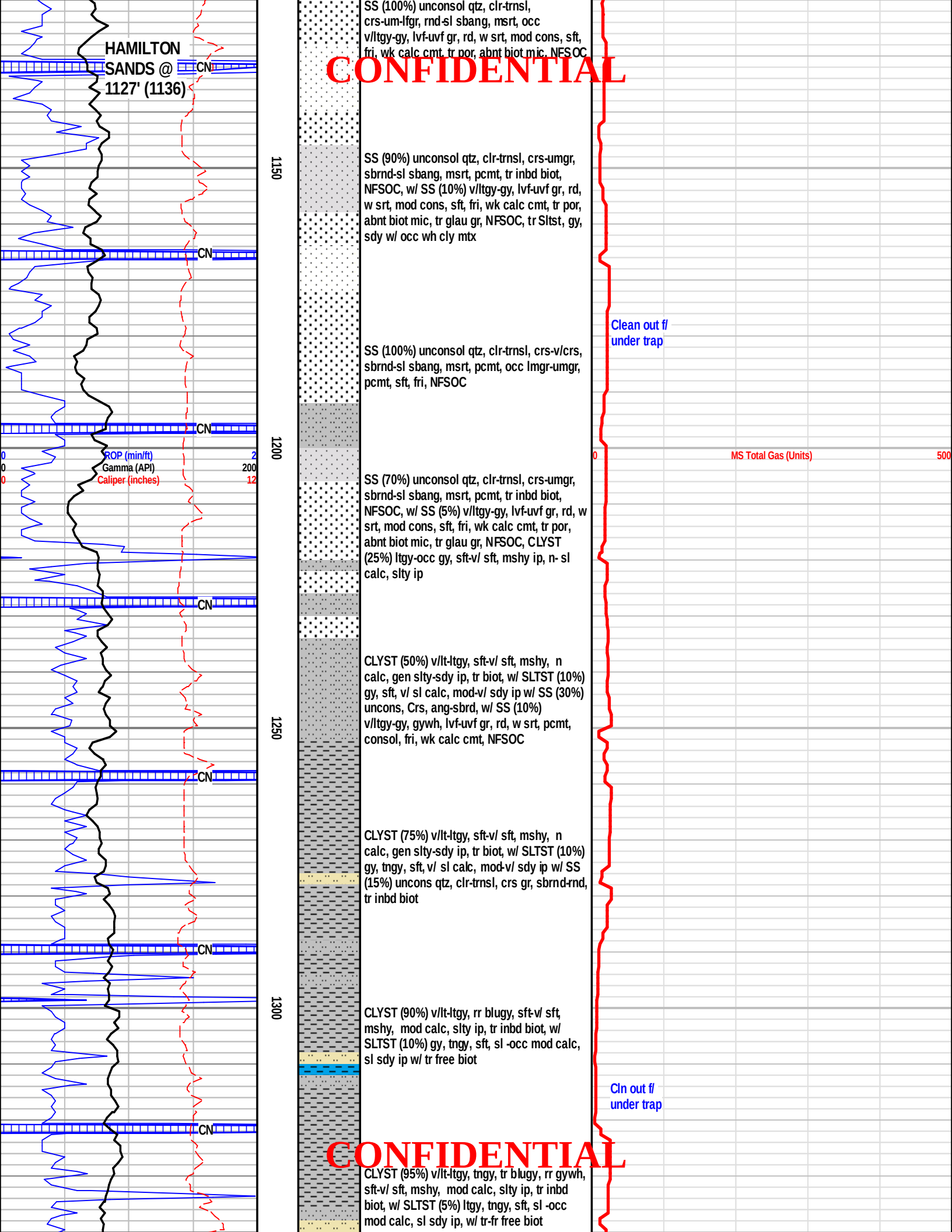
CONFIDENTIAL
ROP (min/ft)
Gamma (API)
Caliper (inches)
MS Total Gas (Units)
Gamma
Caliper
CN
CG
Pason EDR error
SS (90%) uncons, qtz, trnsl-clr, wh, vCrs-lrn gr, ang-sbang, mod-p srt, gen-tr wk calc cmt, mica, NFSOC w/ SLTST (10%) lt tngy-ltgy, sft, sdy-v/ arg w/ slty cly, mod calc ip
SS (40%) uncons, a.a. w/ SLTST (40%) lt tn-tngy, sft, sl fri - sl brit, sdy ip, arg w/ slty cly, mod calc-calc w/ CLYST (20%) ltgy-gytn, tr gygrn, sft-v/ sft, mshy ip, n- sl calc, occ sl slty ip
SLTST (60%) gy, tngy-gytn, sft, sdy ip-sl fri, sl-mod calc w/ CLYST (30%) gy-gytn, sft, mshy, n- sl calc, occ slty ip w/ SS (10%) uncons, a.a.
SLTST (50%) gy, tngy-gytn, sft, sdy ip-sl fr-mshyi, sl-n calc w/ SS (20%) tngy, gy, lvf-uvf gr, rd, slty ip, mod srt, mod-p cons, sft, n-v/sl calc, NFSOC w/ CLYST (20%)gytn-gy-occ gy, sft-v/ sft, mshy ip, n calc, occ slty ip w/ SS (10%) uncons, vCrs gr a.a.
CLYST (60%) v/lt-ltgy, sft-v/ sft, mshy, n calc, gen slty-sdy ip, tr biot, w/ SLTST (30%) gy, sft, v/ sl calc, mod-v/ sdy ip w/ SS (10%) uncons, Crs, ang-sbrd
SLTST: (50%) gy, gytn, ltgy, v/sft-mshy, n calc, mica ip, mod-v/ sdy ip w/ CLYST (40%) ltgy-occ gy, sft-v/ sft, mshy ip, n- sl calc, slty ip w/ SS (10%) uncons, Crs, ang-sbrd
SS (80%) uncons, qtz, trnsl-clr, wh, Crs-lf gr, sbang-rd, p srt, wk calc cmt, mass mica, NFSOC w/ SLTST (20%) ltgy-tngy, tn, sft, sdy-arg,n-sl calc
Driller Surf Csg = 1107'
Logger Surf Csg = 1098'
1115' TD for SCP, CO, TOOH, TIH, C&C, Wiper trip to shoe, TIH, C&C, TOOH, Run-set-cmt surf csg @ 1107', WOC, ND, NU, Test BOP, RU flow line, TIH, Drill cmt/flt clr/shoe, Drill 10', FIT to 10.5 EMW, C&C mud, Drilling
TG after TD = 729u
SCP
< 11/12-14/17


HAMILTON SANDS @ 1127' (1136)
CN
CN
CN
CN
CN
CN
CN
ROP (min/ft)
Gamma (API)
Caliper (inches)
0
0
0
2
200
12
1150
1200
1250
1300
SS (100%) unconsol qtz, clr-trnsl, crs-um-lfgr, rnd-sl sbang, msrt, occ v/ltgy-gy, lvf-uvf gr, rd, w srt, mod cons, sft, fri, wk calc cmt, tr por, abnt biot mic, NFSOC
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SS (90%) unconsol qtz, clr-trnsl, crs-umgr, sbrnd-sl sbang, msrt, pcmt, tr inbd biot, NFSOC, w/ SS (10%) v/ltgy-gy, lvf-uvf gr, rd, w srt, mod cons, sft, fri, wk calc cmt, tr por, abnt biot mic, tr glau gr, NFSOC, tr Sltst, gy, sdy w/ occ wh cly mtx
SS (100%) unconsol qtz, clr-trnsl, crs-v/crs, sbrnd-sl sbang, msrt, pcmt, occ lmgr-umgr, pcmt, sft, fri, NFSOC
Clean out f/ under trap
SS (70%) unconsol qtz, clr-trnsl, crs-umgr, sbrnd-sl sbang, msrt, pcmt, tr inbd biot, NFSOC, w/ SS (5%) v/ltgy-gy, lvf-uvf gr, rd, w srt, mod cons, sft, fri, wk calc cmt, tr por, abnt biot mic, tr glau gr, NFSOC, CLYST (25%) ltgy-occ gy, sft-v/ sft, mshy ip, n- sl calc, slty ip
CLYST (50%) v/lt-ltgy, sft-v/ sft, mshy, n calc, gen slty-sdy ip, tr biot, w/ SLTST (10%) gy, sft, v/ sl calc, mod-v/ sdy ip w/ SS (30%) uncons, Crs, ang-sbrd, w/ SS (10%) v/ltgy-gy, gywh, lvf-uvf gr, rd, w srt, pcmt, consol, fri, wk calc cmt, NFSOC
CLYST (75%) v/lt-ltgy, sft-v/ sft, mshy, n calc, gen slty-sdy ip, tr biot, w/ SLTST (10%) gy, tngy, sft, v/ sl calc, mod-v/ sdy ip w/ SS (15%) uncons qtz, clr-trnsl, crs gr, sbrnd-rnd, tr inbd biot
CLYST (90%) v/lt-ltgy, rr blugy, sft-v/ sft, mshy, mod calc, slty ip, tr inbd biot, w/ SLTST (10%) gy, tngy, sft, sl -occ mod calc, sl sdy ip w/ tr free biot
Cln out f/ under trap
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CLYST (95%) v/lt-ltgy, tngy, tr blugy, rr gywh, sft-v/ sft, mshy, mod calc, slty ip, tr inbd biot, w/ SLTST (5%) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ tr-fr free biot
0
MS Total Gas (Units)
500

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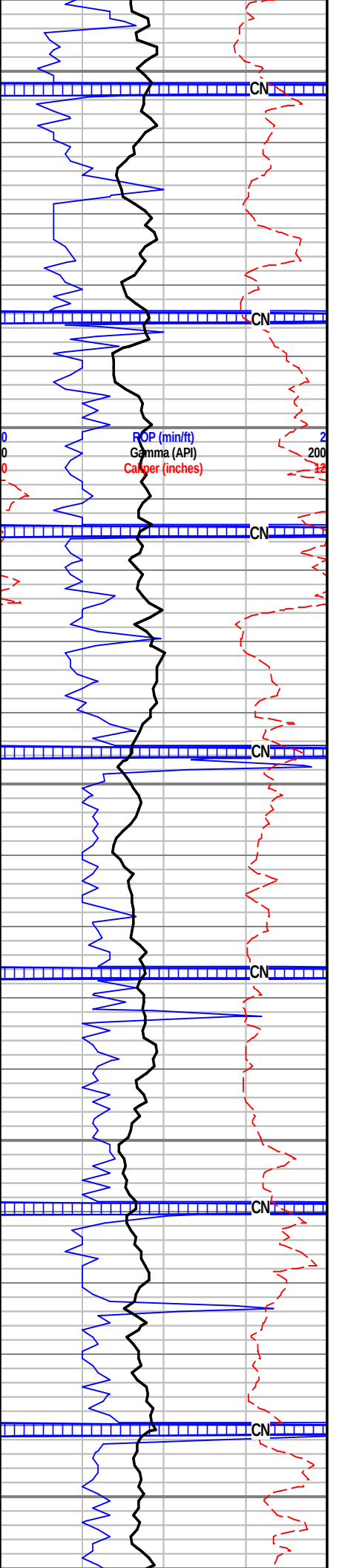

1350

CLYST (100%) v/lt-ltgy, tngy, tr blugy, rr gywh, sft-v/ sft, mshy, mod calc, slty ip, tr inbd biot, w/ tr SLTST ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ tr-fr free biot

1400

CLYST (100%) v/lt-ltgy, tngy, tr blugy, sft-v/ sft, mshy, mod calc, slty ip, tr inbd biot, w/ tr SLTST ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ tr-fr free biot

0 MS Total Gas (Units) 500

CG

CLYST (95%) v/lt-ltgy, tngy, tr blugy, sft-v/ sft, mshy, mod calc, slty ip, tr inbd biot, w/ SLTST (5%) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ tr-fr free biot

Cln out f/ under trap

1450

CLYST (95%) v/lt-ltgy, tngy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ SLTST (5%) ltgy, tngy-tn, sft, sl -occ mod calc, sl sdy ip, w/tr unconsol qtz, clr-trnsl, m-crsgr, w/ tr-fr free biot

Cln out f/ under trap

CLYST (95%) v/lt-ltgy, tngy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ SLTST (5%) ltgy, tngy-tn, sft, sl -occ mod calc, sl sdy ip, w/tr unconsol qtz, clr-trnsl, m-crsgr, w/ tr free biot

1500

CLYST (100%) v/lt-ltgy, tngy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ tr SLTST ltgy, tngy-tn, sft, sl -occ mod calc, sl sdy ip, w/ rr free biot

CLYST (100%) v/lt-ltgy, tngy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ tr SLTST ltgy, tngy-tn, sft, sl -occ mod calc, sl sdy ip, w/ tr-fr free biot

tr CG

1550

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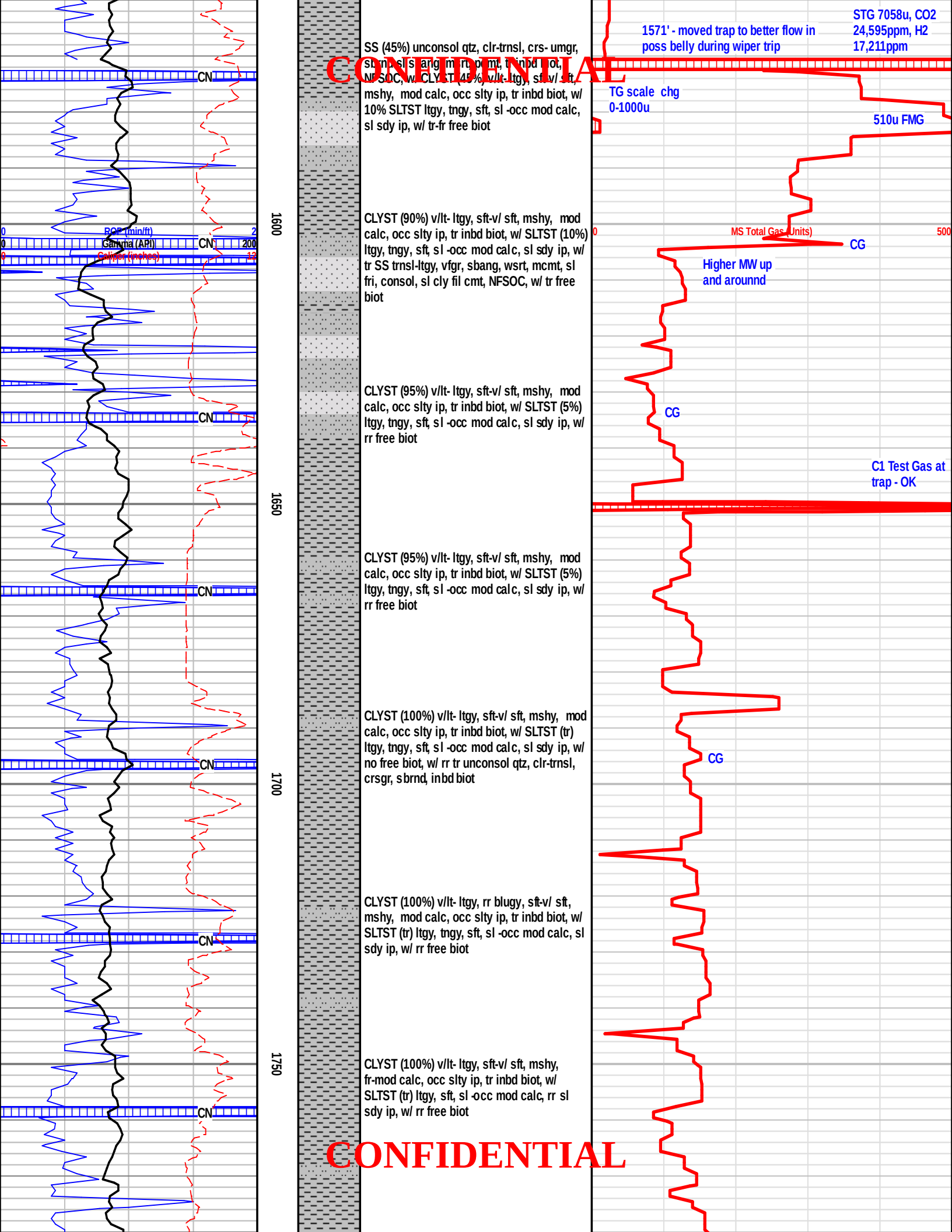
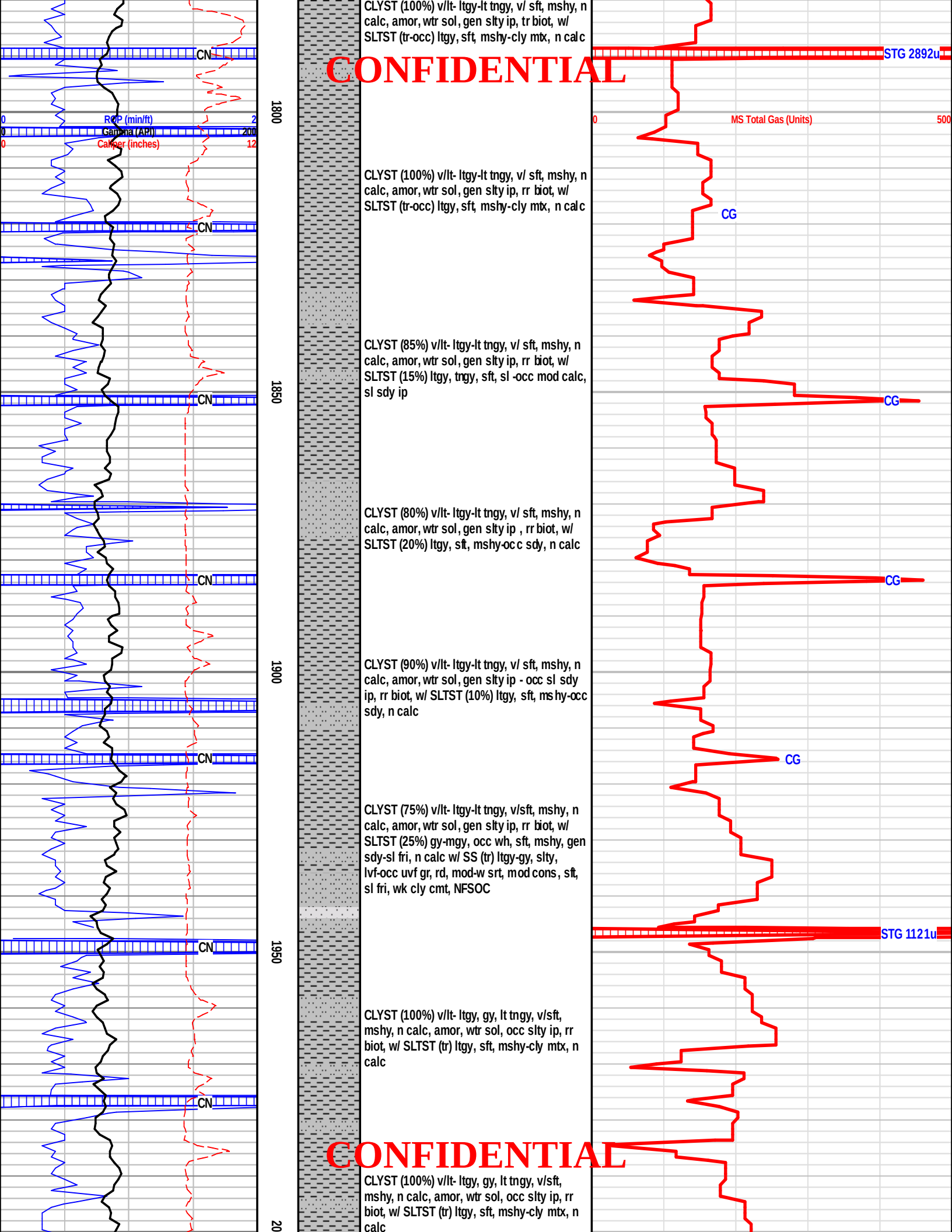
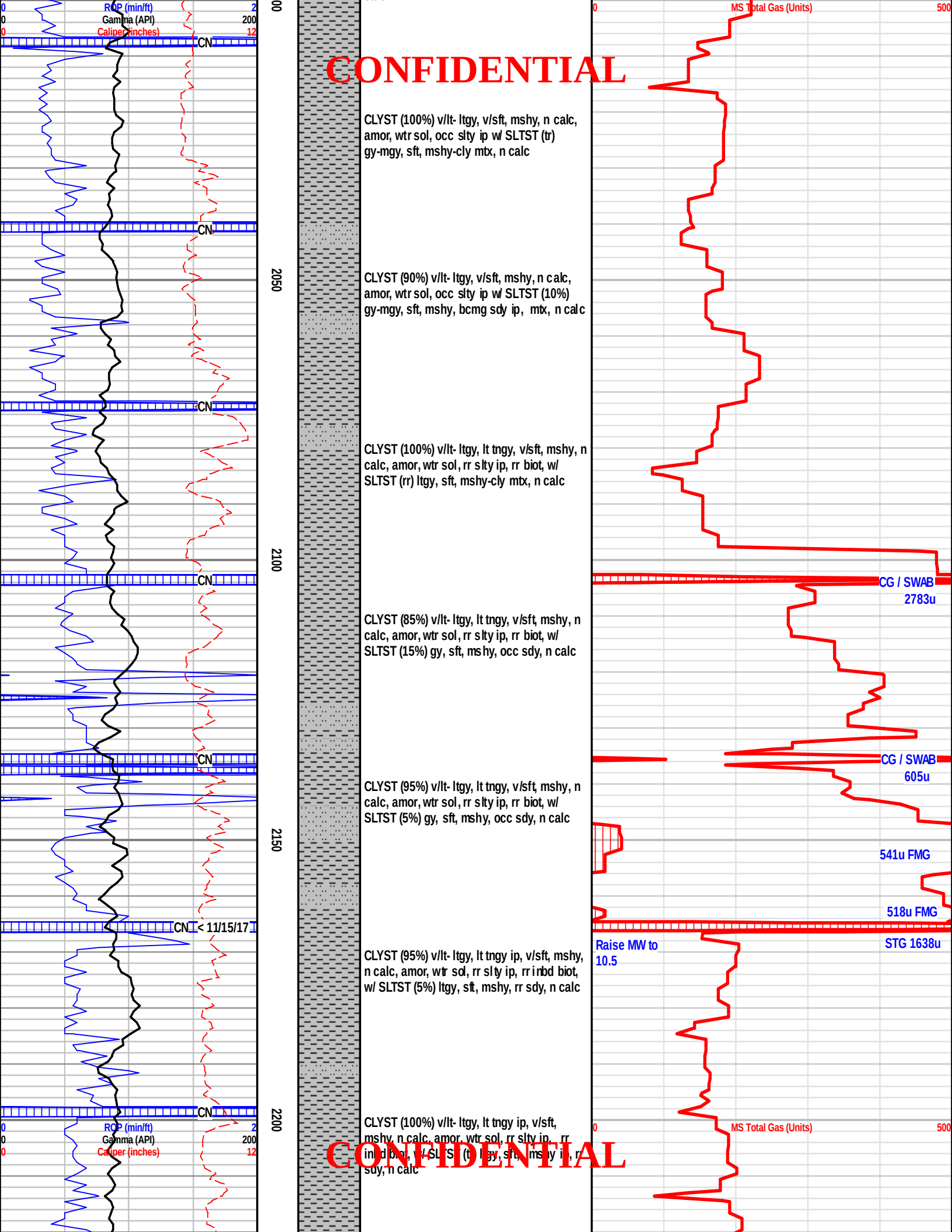
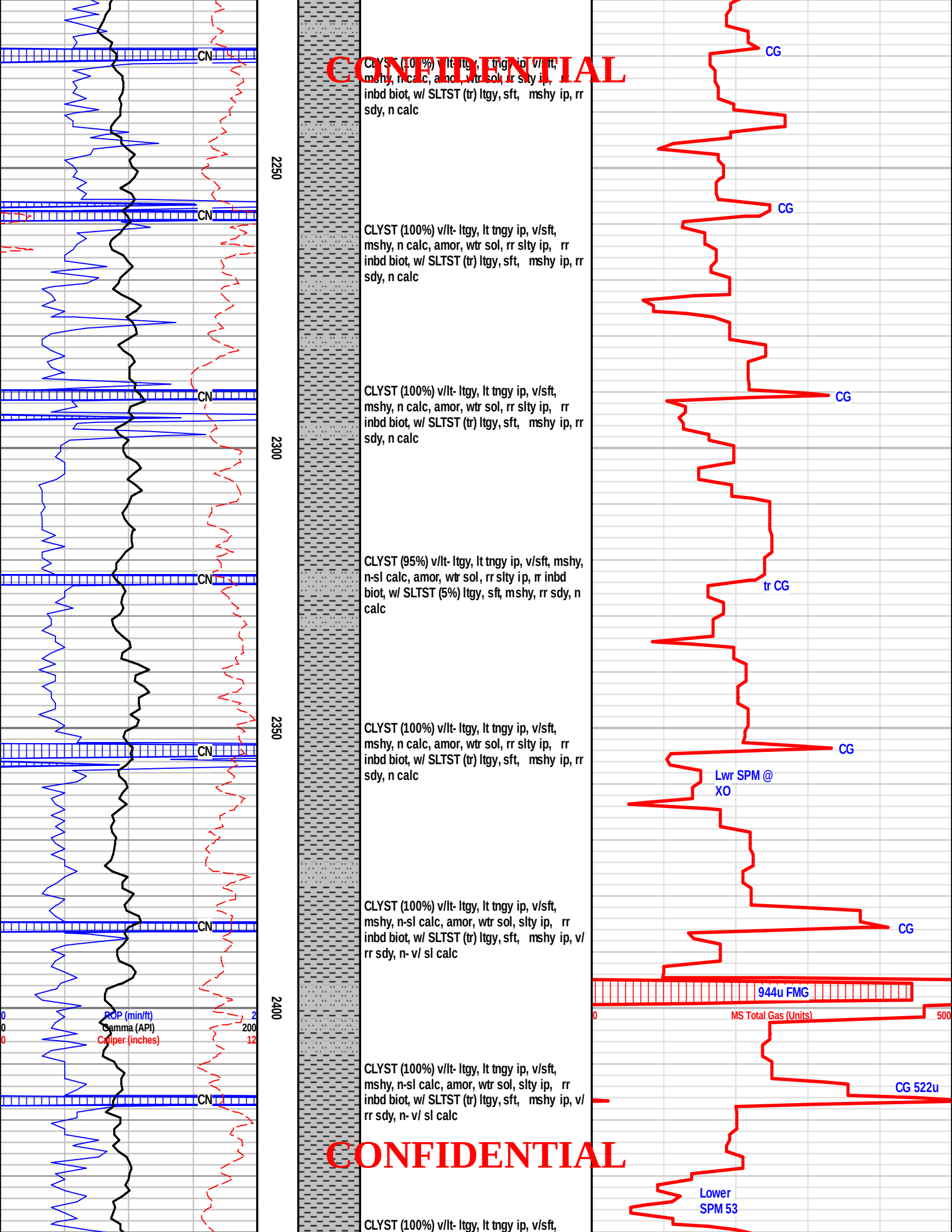
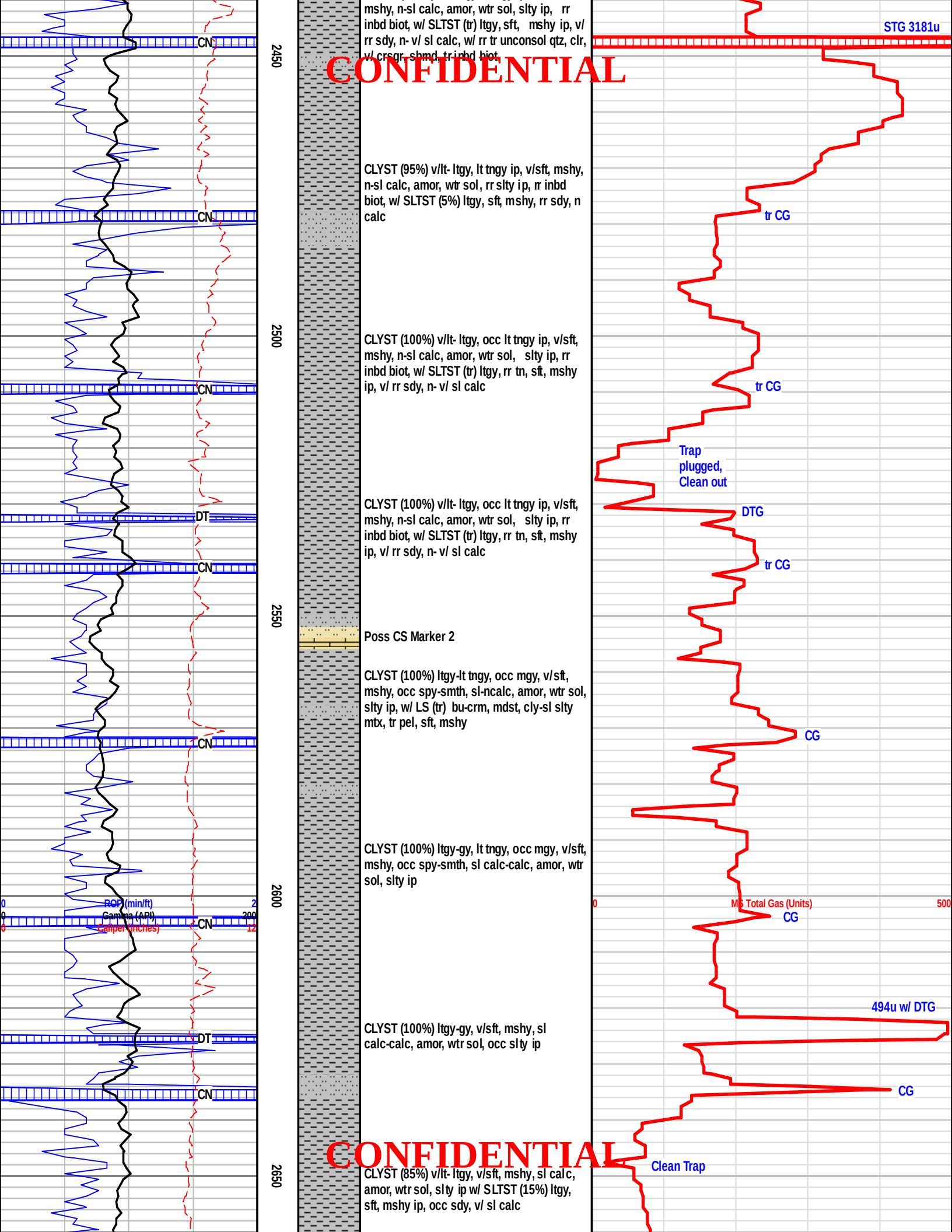

CONFIDENTIAL
SS (45%) unconsol qtz, clr-trnsl, crs- umgr, sbrnd, sl s'lang, mcmt, p cmt, tr inbd biot, NFSOC, w/ CLYST (45%) v/lt- ltgy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ 10% SLTST ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ tr-fr free biot
CLYST (90%) v/lt- ltgy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ SLTST (10%) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ tr SS trnsl-ltgy, vfgr, sbang, wsrt, mcmt, sl fri, consol, sl cly fil cmt, NFSOC, w/ tr free biot
CLYST (95%) v/lt- ltgy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ SLTST (5%) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ rr free biot
CLYST (95%) v/lt- ltgy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ SLTST (5%) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ rr free biot
CLYST (100%) v/lt- ltgy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ SLTST (tr) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ no free biot, w/ rr tr unconsol qtz, clr-trnsl, crsgr, sbrnd, inbd biot
CLYST (100%) v/lt- ltgy, rr blugy, sft-v/ sft, mshy, mod calc, occ slty ip, tr inbd biot, w/ SLTST (tr) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip, w/ rr free biot
CLYST (100%) v/lt- ltgy, sft-v/ sft, mshy, fr-mod calc, occ slty ip, tr inbd biot, w/ SLTST (tr) ltgy, sft, sl -occ mod calc, rr sl sdy ip, w/ rr free biot
CONFIDENTIAL
1571' - moved trap to better flow in poss belly during wiper trip
STG 7058u, CO2 24,595ppm, H2 17,211ppm
TG scale chg 0-1000u
510u FMG
MS Total Gas (Units)
CG
Higher MW up and arounnd
CG
C1 Test Gas at trap - OK
CG
ROP (min/ft)
Gamma (API)
Caliper (inches)
CN
1600
1650
1700
1750

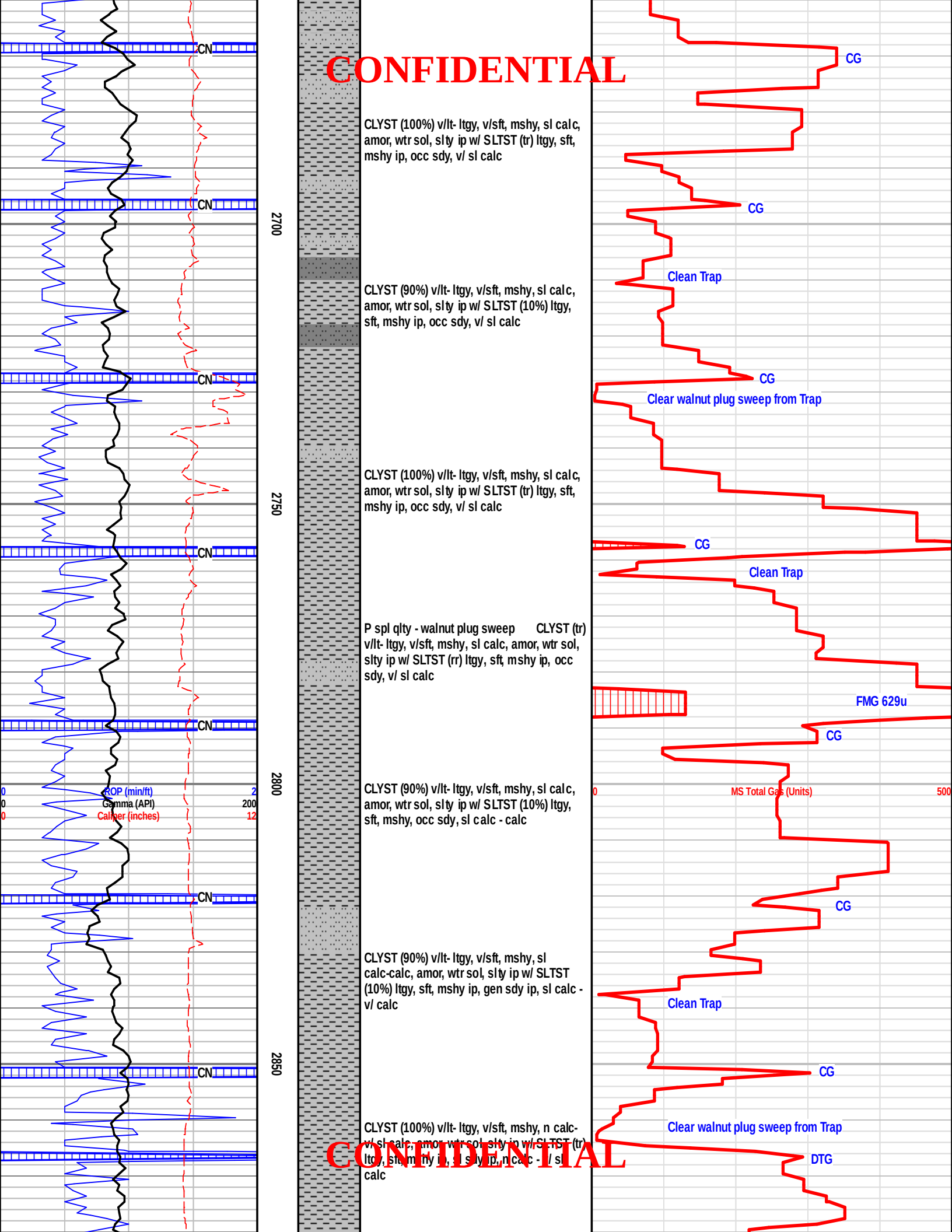

CN
0
ROP (min/ft)
2
0
Gamma (API)
200
0
Caliper (inches)
12
1800
1850
1900
1950
2000
CLYST (100%) v/lt- ltgy-lt tngy, v/ sft, mshy, n calc, amor, wtr sol, gen slty ip, tr biot, w/ SLTST (tr-occ) ltgy, sft, mshy-cly mtx, n calc
CONFIDENTIAL
CLYST (100%) v/lt- ltgy-lt tngy, v/ sft, mshy, n calc, amor, wtr sol, gen slty ip, rr biot, w/ SLTST (tr-occ) ltgy, sft, mshy-cly mtx, n calc
CLYST (85%) v/lt- ltgy-lt tngy, v/ sft, mshy, n calc, amor, wtr sol, gen slty ip, rr biot, w/ SLTST (15%) ltgy, tngy, sft, sl -occ mod calc, sl sdy ip
CLYST (80%) v/lt- ltgy-lt tngy, v/ sft, mshy, n calc, amor, wtr sol, gen slty ip , rr biot, w/ SLTST (20%) ltgy, sft, mshy-occ sdy, n calc
CLYST (90%) v/lt- ltgy-lt tngy, v/ sft, mshy, n calc, amor, wtr sol, gen slty ip - occ sl sdy ip, rr biot, w/ SLTST (10%) ltgy, sft, mshy-occ sdy, n calc
CLYST (75%) v/lt- ltgy-lt tngy, v/sft, mshy, n calc, amor, wtr sol, gen slty ip, rr biot, w/ SLTST (25%) gy-mgy, occ wh, sft, mshy, gen sdy-sl fri, n calc w/ SS (tr) ltgy-gy, slty, lvf-occ uvf gr, rd, mod-w srt, mod cons, sft, sl fri, wk cly cmt, NFSOC
CLYST (100%) v/lt- ltgy, gy, lt tngy, v/sft, mshy, n calc, amor, wtr sol, occ slty ip, rr biot, w/ SLTST (tr) ltgy, sft, mshy-cly mtx, n calc
CONFIDENTIAL
CLYST (100%) v/lt- ltgy, gy, lt tngy, v/sft, mshy, n calc, amor, wtr sol, occ slty ip, rr biot, w/ SLTST (tr) ltgy, sft, mshy-cly mtx, n calc
STG 2892u
0
MS Total Gas (Units)
500
CG
CG
CG
STG 1121u


ROP (min/ft)
Gamma (API)
Caliper (inches)
CN
CN
CN
CN
CN
CN < 11/15/17
CN
2050
2100
2150
2200
CONFIDENTIAL
CLYST (100%) v/lt- ltgy, v/sft, mshy, n calc, amor, wtr sol, occ slty ip w/ SLTST (tr) gy-mgy, sft, mshy-cly mtx, n calc
CLYST (90%) v/lt- ltgy, v/sft, mshy, n calc, amor, wtr sol, occ slty ip w/ SLTST (10%) gy-mgy, sft, mshy, bcmg sdy ip, mtx, n calc
CLYST (100%) v/lt- ltgy, lt tngy, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr biot, w/ SLTST (rr) ltgy, sft, mshy-cly mtx, n calc
CLYST (85%) v/lt- ltgy, lt tngy, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr biot, w/ SLTST (15%) gy, sft, mshy, occ sdy, n calc
CLYST (95%) v/lt- ltgy, lt tngy, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr biot, w/ SLTST (5%) gy, sft, mshy, occ sdy, n calc
CLYST (95%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (5%) ltgy, sft, mshy, rr sdy, n calc
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, rr sdy, n calc
CONFIDENTIAL
MS Total Gas (Units)
CG / SWAB
2783u
CG / SWAB
605u
541u FMG
518u FMG
Raise MW to
10.5
STG 1638u
MS Total Gas (Units)

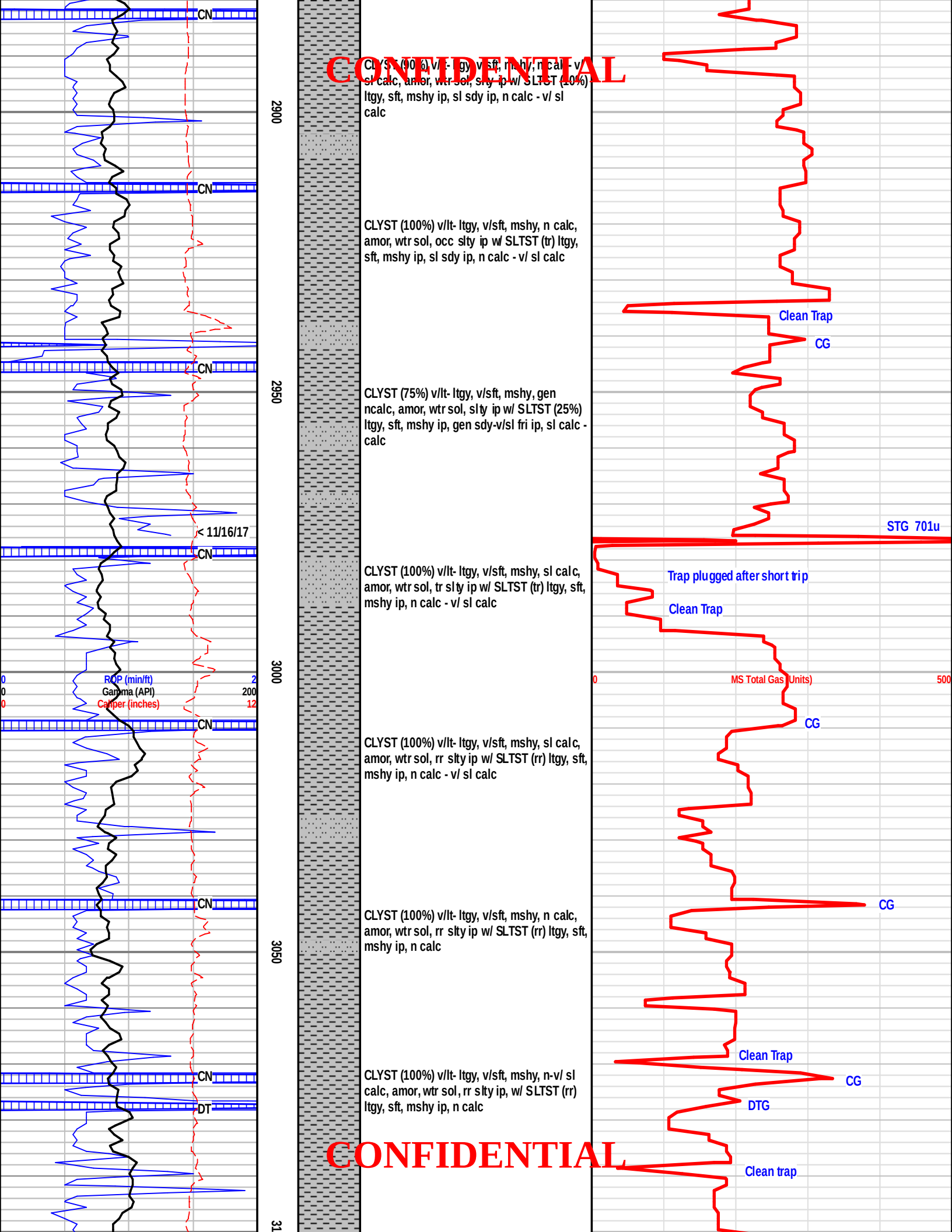

CONFIDENTIAL
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, rr sdy, n calc
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, rr sdy, n calc
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, rr sdy, n calc
CLYST (95%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n-sl calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (5%) ltgy, sft, mshy, rr sdy, n calc
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, rr sdy, n calc
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n-sl calc, amor, wtr sol, slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, v/ rr sdy, n- v/ sl calc
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n-sl calc, amor, wtr sol, slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, v/ rr sdy, n- v/ sl calc
CONFIDENTIAL
CLYST (100%) v/lt- ltgy, lt tngy ip, v/sft,
CN
CN
CN
CN
CN
CN
2250
2300
2350
2400
ROP (min/ft)
Gamma (API)
Caliper (inches)
0
0
0
2
200
12
CG
CG
CG
tr CG
CG
Lwr SPM @ XO
CG
944u FMG
0
MS Total Gas (Units)
500
CG 522u
Lower SPM 53

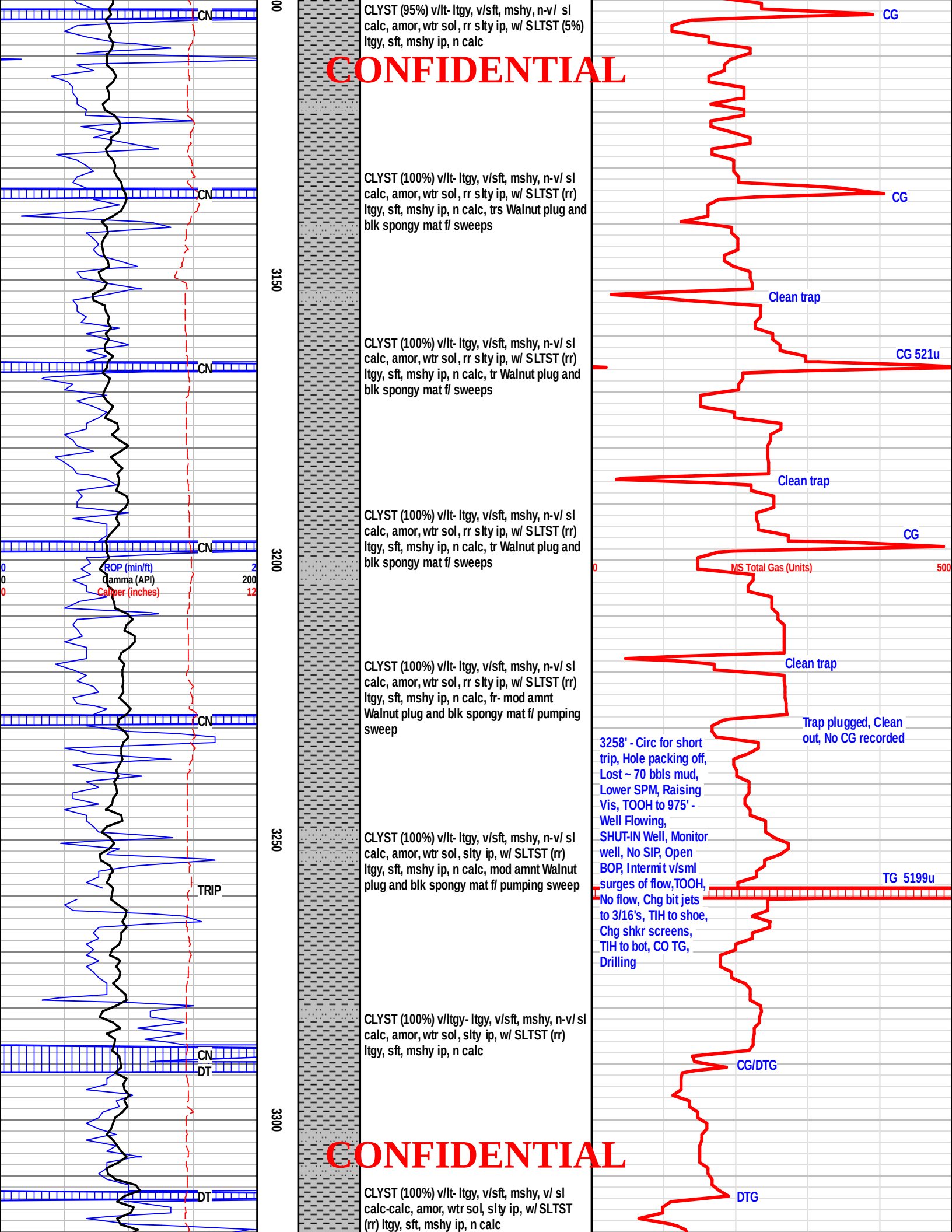

CN
CN
CN
DT
CN
CN
DT
CN
2450
2500
2550
2600
2650
0
ROP (min/ft)
2
0
Gamma (API)
200
0
Caliper (inches)
12
mshy, n-sl calc, amor, wtr sol, slty ip, rr inbd biot, w/ SLTST (tr) ltgy, sft, mshy ip, v/ rr sdy, n- v/ sl calc, w/ rr tr unconsol qtz, clr, v/ crsgr, sbrnd, tr inbd biot
CONFIDENTIAL
CLYST (95%) v/lt- ltgy, lt tngy ip, v/sft, mshy, n-sl calc, amor, wtr sol, rr slty ip, rr inbd biot, w/ SLTST (5%) ltgy, sft, mshy, rr sdy, n calc
CLYST (100%) v/lt- ltgy, occ lt tngy ip, v/sft, mshy, n-sl calc, amor, wtr sol, slty ip, rr inbd biot, w/ SLTST (tr) ltgy, rr tn, sft, mshy ip, v/ rr sdy, n- v/ sl calc
CLYST (100%) v/lt- ltgy, occ lt tngy ip, v/sft, mshy, n-sl calc, amor, wtr sol, slty ip, rr inbd biot, w/ SLTST (tr) ltgy, rr tn, sft, mshy ip, v/ rr sdy, n- v/ sl calc
Poss CS Marker 2
CLYST (100%) ltgy-lt tngy, occ mgy, v/sft, mshy, occ spy-smth, sl-ncalc, amor, wtr sol, slty ip, w/ LS (tr) bu-crm, mdst, cly-sl slty mtx, tr pel, sft, mshy
CLYST (100%) ltgy-gy, lt tngy, occ mgy, v/sft, mshy, occ spy-smth, sl calc-calc, amor, wtr sol, slty ip
CLYST (100%) ltgy-gy, v/sft, mshy, sl calc-calc, amor, wtr sol, occ slty ip
CONFIDENTIAL
CLYST (85%) v/lt- ltgy, v/sft, mshy, sl calc, amor, wtr sol, slty ip w/ SLTST (15%) ltgy, sft, mshy ip, occ sdy, v/ sl calc
STG 3181u
tr CG
tr CG
Trap plugged, Clean out
DTG
tr CG
CG
0
MS Total Gas (Units)
500
CG
494u w/ DTG
CG
Clean Trap

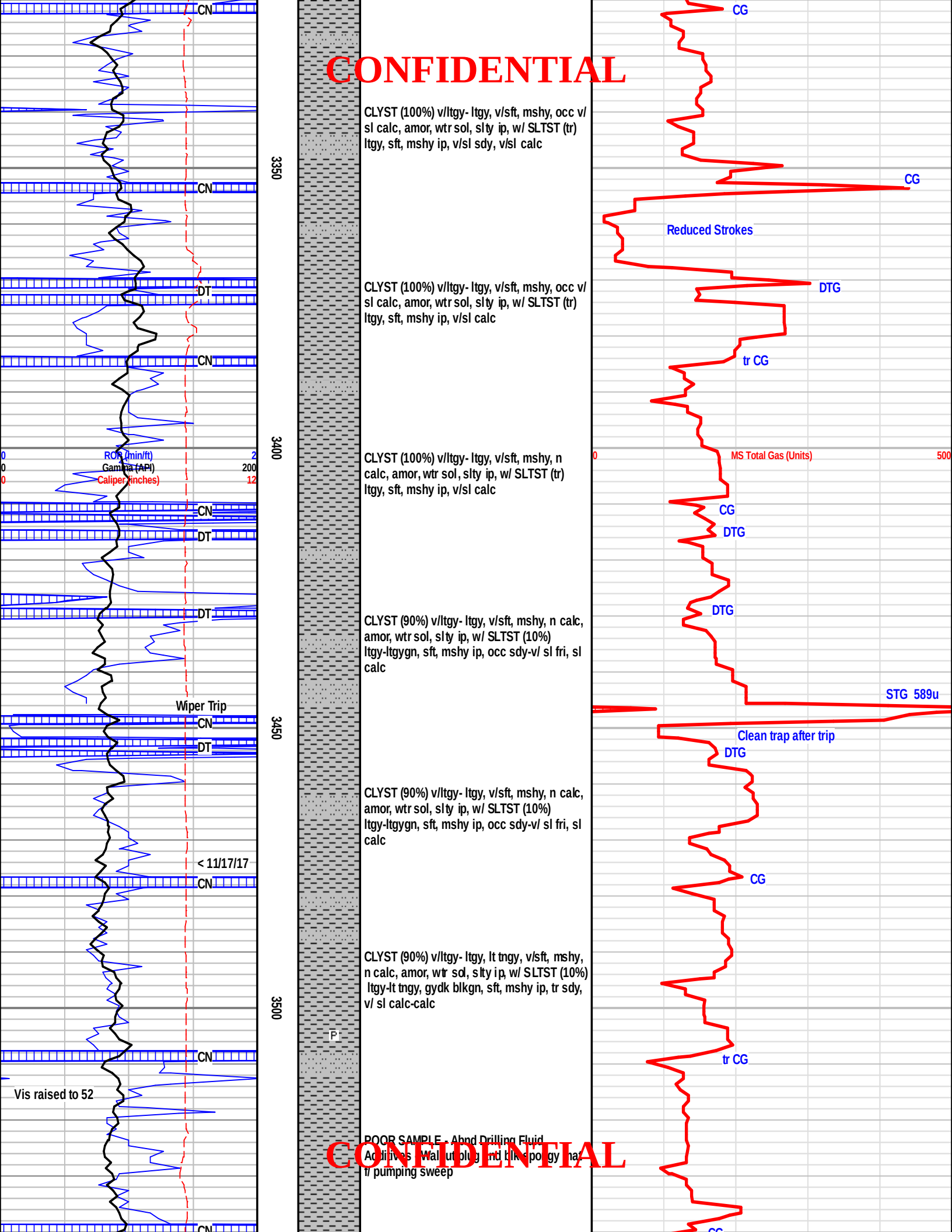
CONFIDENTIAL

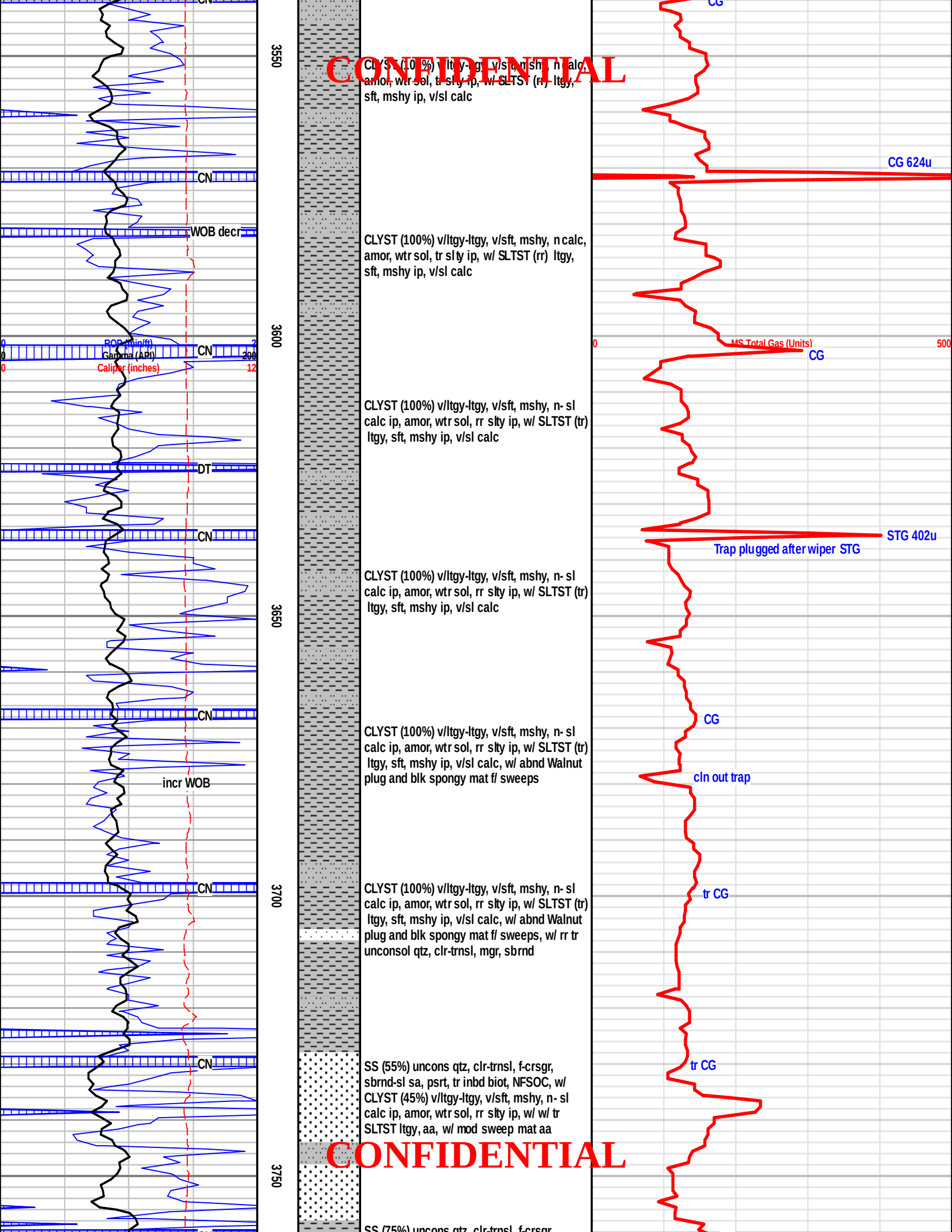


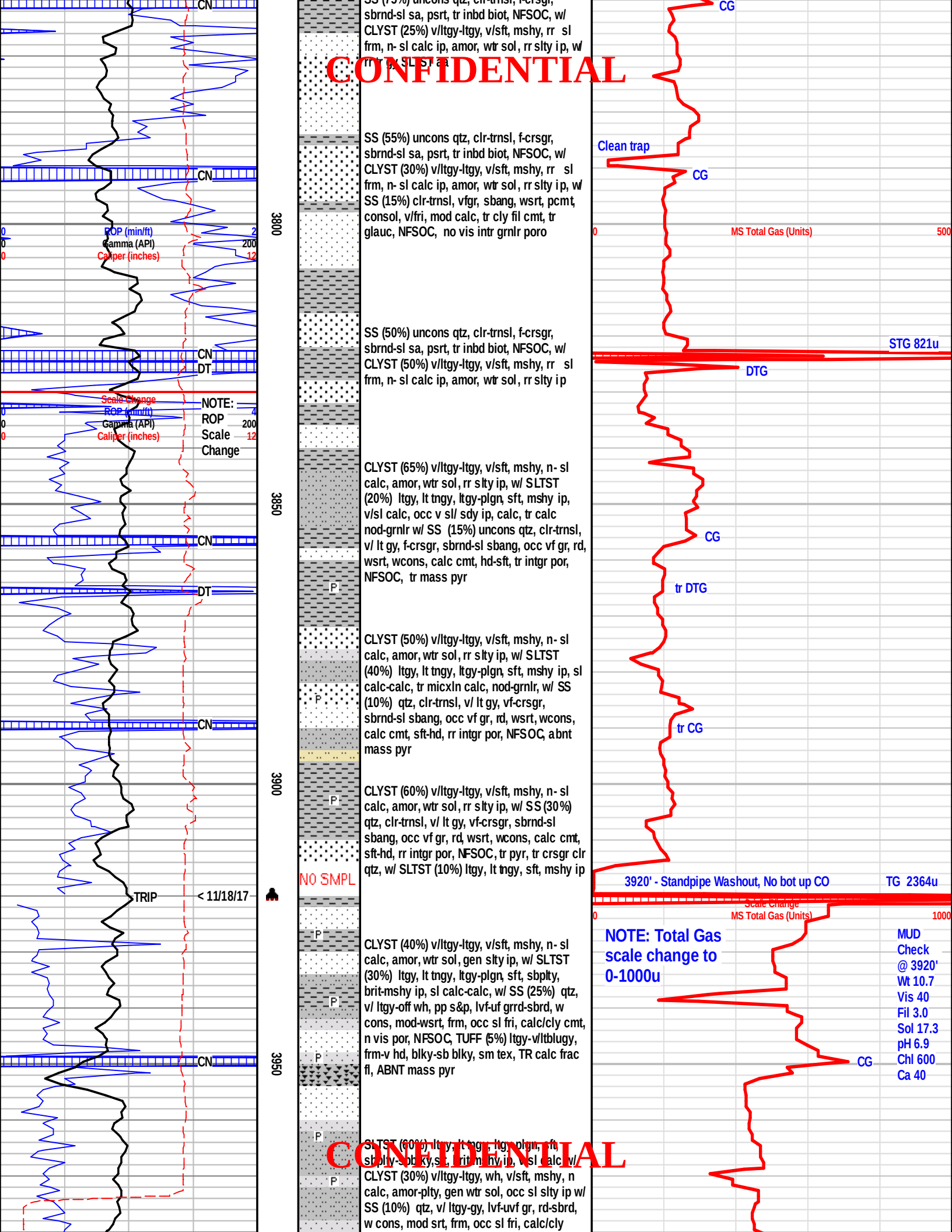
CONFIDENTIAL

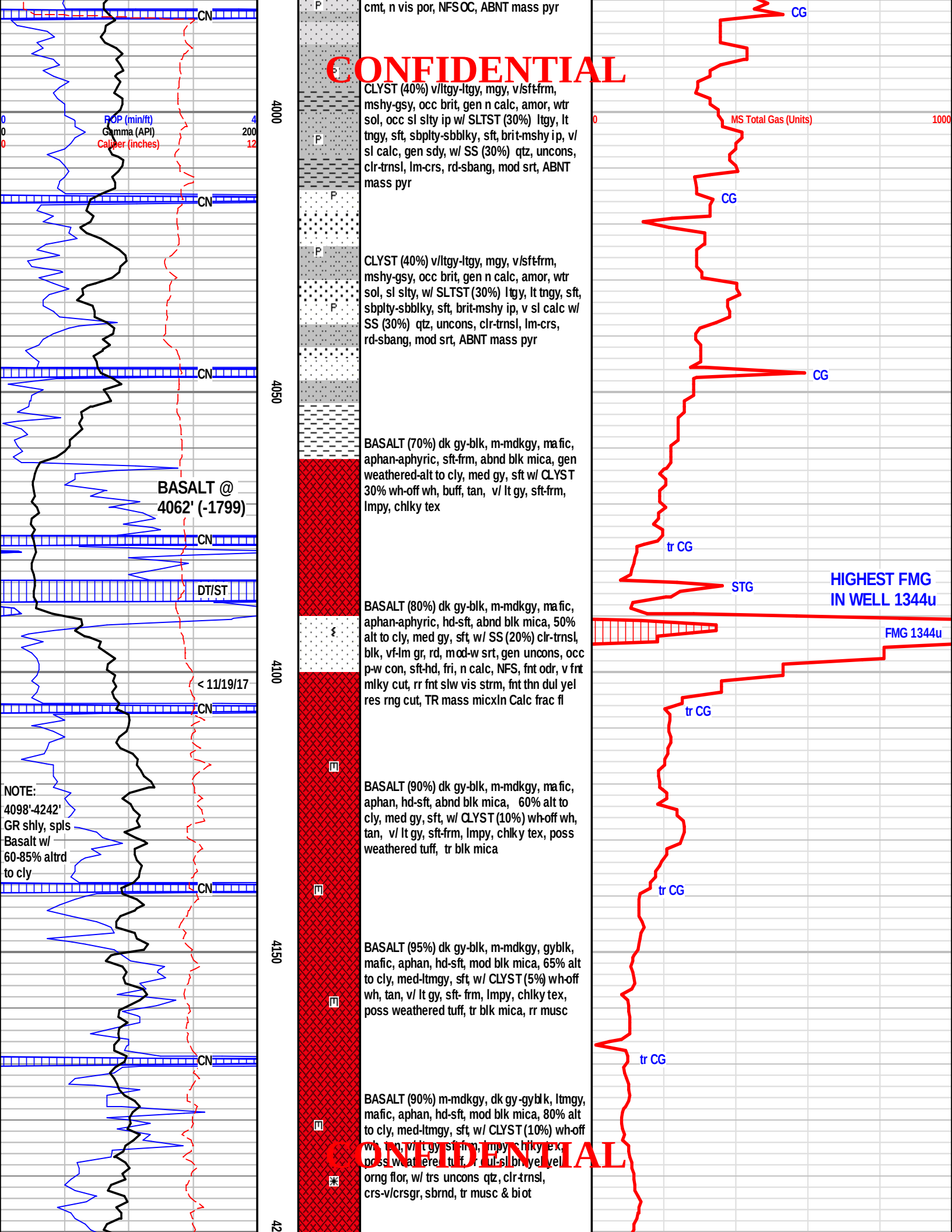

CONFIDENTIAL
CLYST (90%) v/lt- ltgy, v/sft, mshy, n calc - v/ sl calc, amor, wtr sol, slty ip w/ SLTST (10%) ltgy, sft, mshy ip, sl sdy ip, n calc - v/ sl calc
CLYST (100%) v/lt- ltgy, v/sft, mshy, n calc, amor, wtr sol, occ slty ip w/ SLTST (tr) ltgy, sft, mshy ip, sl sdy ip, n calc - v/ sl calc
CLYST (75%) v/lt- ltgy, v/sft, mshy, gen ncalc, amor, wtr sol, slty ip w/ SLTST (25%) ltgy, sft, mshy ip, gen sdy-v/sl fri ip, sl calc - calc
CLYST (100%) v/lt- ltgy, v/sft, mshy, sl calc, amor, wtr sol, tr slty ip w/ SLTST (tr) ltgy, sft, mshy ip, n calc - v/ sl calc
CLYST (100%) v/lt- ltgy, v/sft, mshy, sl calc, amor, wtr sol, rr slty ip w/ SLTST (rr) ltgy, sft, mshy ip, n calc - v/ sl calc
CLYST (100%) v/lt- ltgy, v/sft, mshy, n calc, amor, wtr sol, rr slty ip w/ SLTST (rr) ltgy, sft, mshy ip, n calc
CLYST (100%) v/lt- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, rr slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc
CONFIDENTIAL
CN
CN
CN
CN
CN
CN
CN
DT
< 11/16/17
2900
2950
3000
3050
ROP (min/ft)
Gamma (API)
Caliper (inches)
0
0
0
2
200
12
Clean Trap
CG
STG 701u
Trap plugged after short trip
Clean Trap
0
MS Total Gas (Units)
500
CG
CG
Clean Trap
CG
DTG
Clean trap

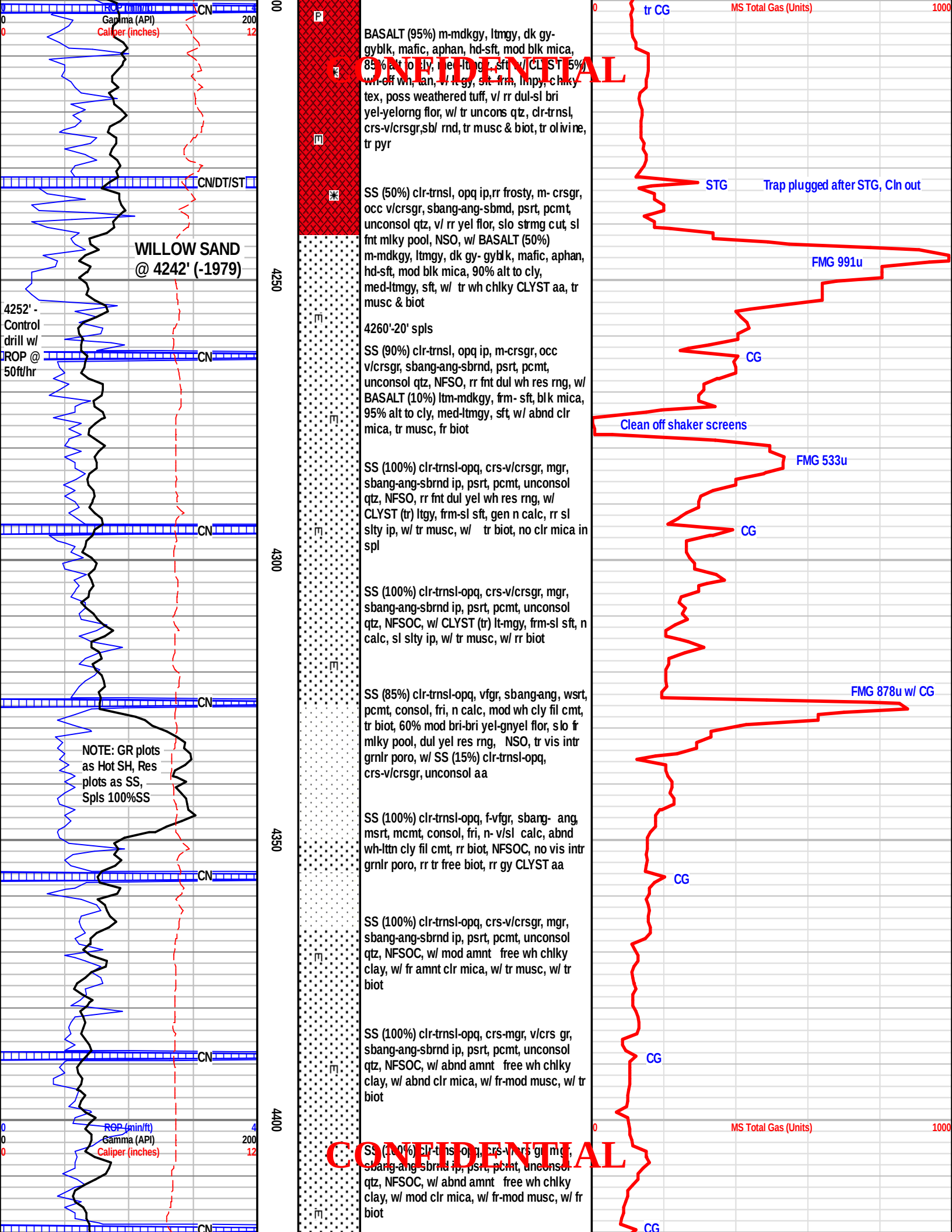

CN
CN
CN
CN
CN
TRIP
CN
DT
DT
3150
3200
3250
3300
ROP (min/ft)
Gamma (API)
Caliper (inches)
CLYST (95%) v/lt- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, rr slty ip, w/ SLTST (5%) ltgy, sft, mshy ip, n calc
CONFIDENTIAL
CLYST (100%) v/lt- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, rr slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc, trs Walnut plug and blk spongy mat f/ sweeps
CLYST (100%) v/lt- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, rr slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc, tr Walnut plug and blk spongy mat f/ sweeps
CLYST (100%) v/lt- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, rr slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc, tr Walnut plug and blk spongy mat f/ sweeps
CLYST (100%) v/lt- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, rr slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc, fr- mod amnt Walnut plug and blk spongy mat f/ pumping sweep
CLYST (100%) v/lt- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc, mod amnt Walnut plug and blk spongy mat f/ pumping sweep
CLYST (100%) v/ltgy- ltgy, v/sft, mshy, n-v/ sl calc, amor, wtr sol, slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc
CONFIDENTIAL
CLYST (100%) v/lt- ltgy, v/sft, mshy, v/ sl calc-calc, amor, wtr sol, slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, n calc
CG
CG
Clean trap
CG 521u
Clean trap
CG
MS Total Gas (Units)
Clean trap
Trap plugged, Clean out, No CG recorded
3258' - Circ for short trip, Hole packing off, Lost ~ 70 bbls mud, Lower SPM, Raising Vis, TOOH to 975' - Well Flowing, SHUT-IN Well, Monitor well, No SIP, Open BOP, Intermit v/sml surges of flow,TOOH, No flow, Chg bit jets to 3/16's, TIH to shoe, Chg shkr screens, TIH to bot, CO TG, Drilling
TG 5199u
CG/DTG
DTG

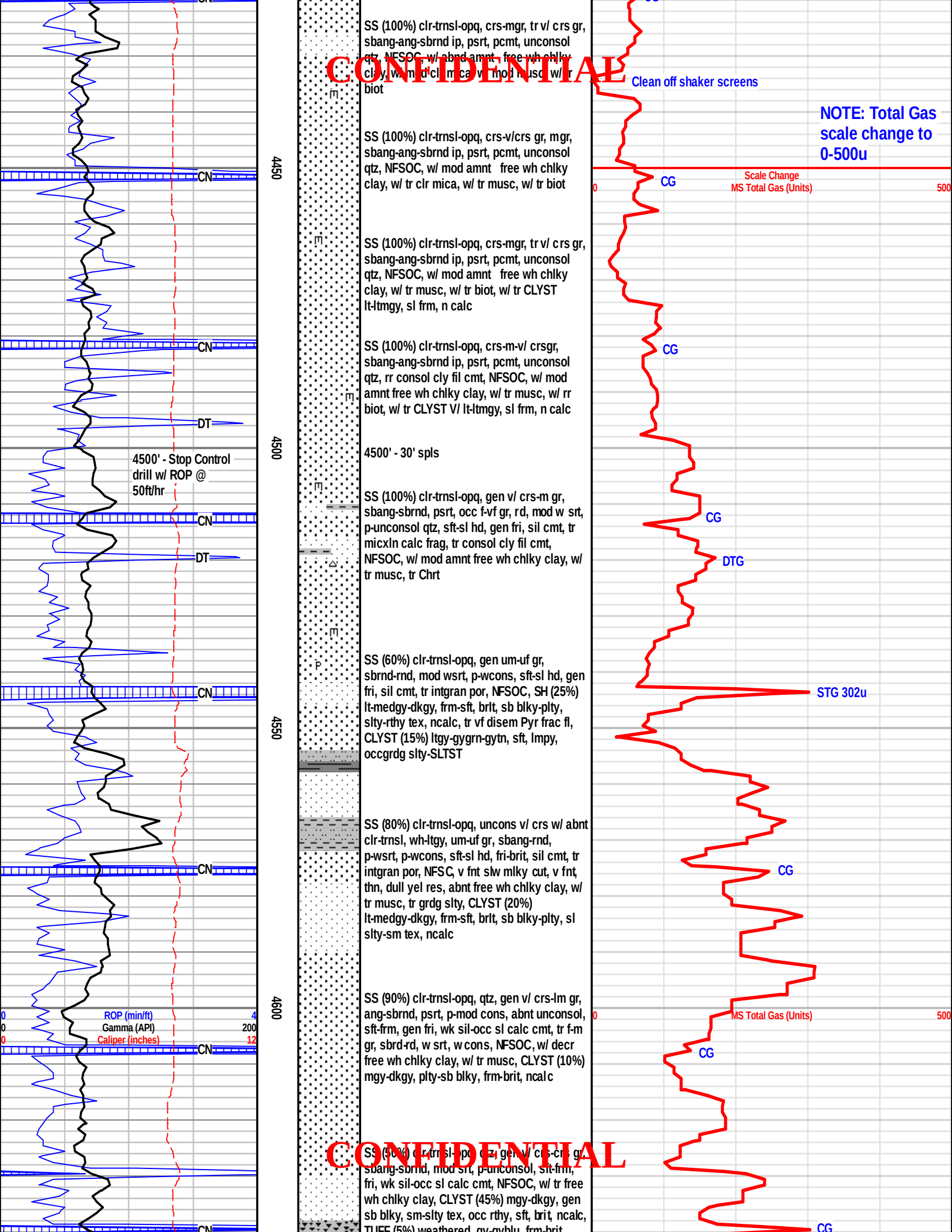

CONFIDENTIAL
CN
DT
3350
3400
3450
3500
0
ROP (/min/ft)
2
0
Gamma (API)
200
0
Caliper (inches)
12
Wiper Trip
< 11/17/17
Vis raised to 52
CLYST (100%) v/ltgy- ltgy, v/sft, mshy, occ v/ sl calc, amor, wtr sol, slty ip, w/ SLTST (tr) ltgy, sft, mshy ip, v/sl sdy, v/sl calc
CLYST (100%) v/ltgy- ltgy, v/sft, mshy, occ v/ sl calc, amor, wtr sol, slty ip, w/ SLTST (tr) ltgy, sft, mshy ip, v/sl calc
CLYST (100%) v/ltgy- ltgy, v/sft, mshy, n calc, amor, wtr sol, slty ip, w/ SLTST (tr) ltgy, sft, mshy ip, v/sl calc
CLYST (90%) v/ltgy- ltgy, v/sft, mshy, n calc, amor, wtr sol, slty ip, w/ SLTST (10%) ltgy-ltgygn, sft, mshy ip, occ sdy-v/ sl fri, sl calc
CLYST (90%) v/ltgy- ltgy, v/sft, mshy, n calc, amor, wtr sol, slty ip, w/ SLTST (10%) ltgy-ltgygn, sft, mshy ip, occ sdy-v/ sl fri, sl calc
CLYST (90%) v/ltgy- ltgy, lt tngy, v/sft, mshy, n calc, amor, wtr sol, slty ip, w/ SLTST (10%) ltgy-lt tngy, gydk blkgn, sft, mshy ip, tr sdy, v/ sl calc-calc
POOR SAMPLE - Abnd Drilling Fluid
Additives - Walnut plug and blk spongy mat
f/ pumping sweep
CONFIDENTIAL
0
MS Total Gas (Units)
500
CG
CG
Reduced Strokes
DTG
tr CG
CG
DTG
DTG
STG 589u
Clean trap after trip
DTG
CG
tr CG

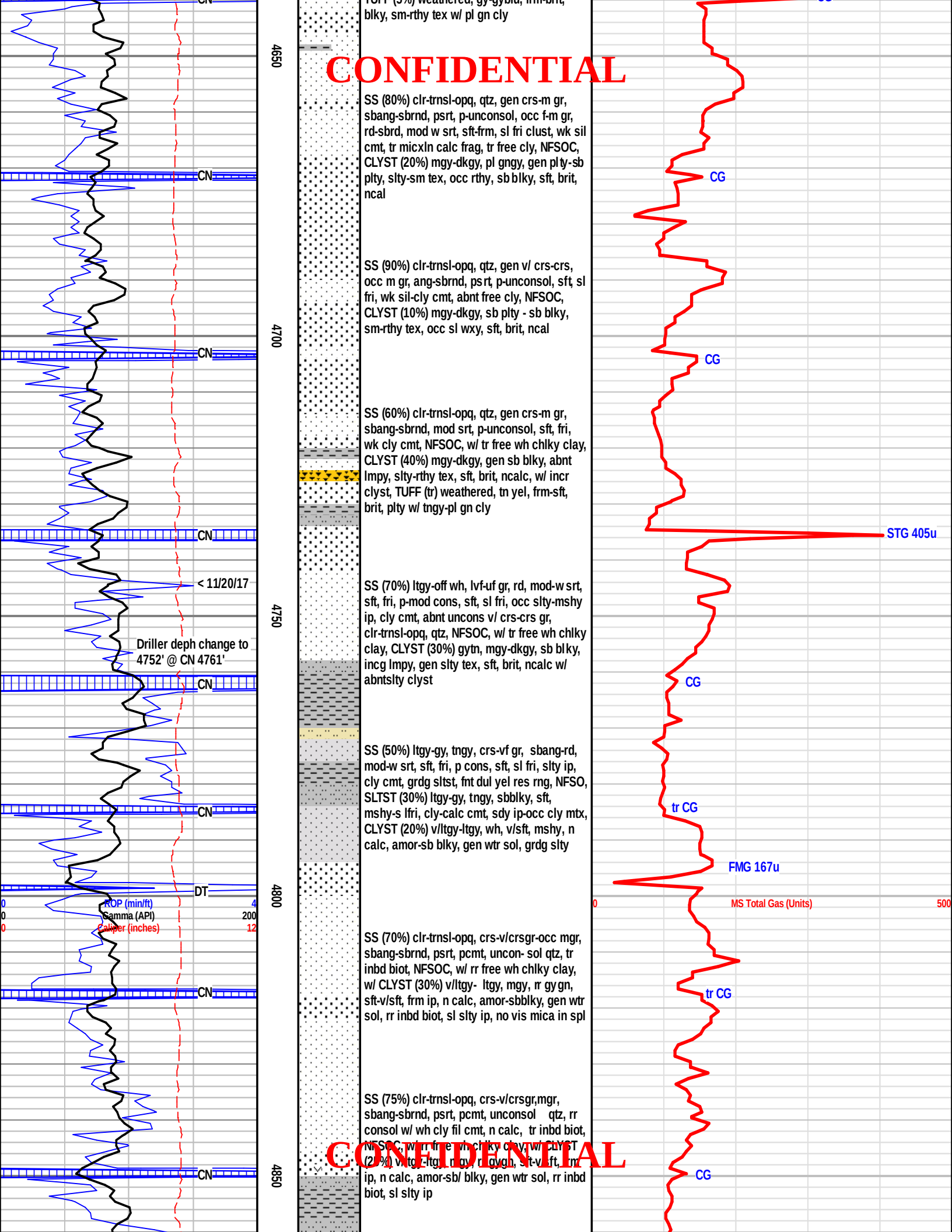

CONFIDENTIAL
CN
WOB decr
ROP (min/ft)
Gamma (API)
Caliper (inches)
DT
incr WOB
3550
3600
3650
3700
3750
CLYST (100%) v/ltgy-ltgy, v/sft, mshy, n calc, amor, wtr sol, tr slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, v/sl calc
CLYST (100%) v/ltgy-ltgy, v/sft, mshy, n calc, amor, wtr sol, tr slty ip, w/ SLTST (rr) ltgy, sft, mshy ip, v/sl calc
CLYST (100%) v/ltgy-ltgy, v/sft, mshy, n- sl calc ip, amor, wtr sol, rr slty ip, w/ SLTST (tr) ltgy, sft, mshy ip, v/sl calc
CLYST (100%) v/ltgy-ltgy, v/sft, mshy, n- sl calc ip, amor, wtr sol, rr slty ip, w/ SLTST (tr) ltgy, sft, mshy ip, v/sl calc, w/ abnd Walnut plug and blk spongy mat f/ sweeps
CLYST (100%) v/ltgy-ltgy, v/sft, mshy, n- sl calc ip, amor, wtr sol, rr slty ip, w/ SLTST (tr) ltgy, sft, mshy ip, v/sl calc, w/ abnd Walnut plug and blk spongy mat f/ sweeps, w/ rr tr unconsol qtz, clr-trnsl, mgr, sbrnd
SS (55%) uncons qtz, clr-trnsl, f-crsgr, sbrnd-sl sa, psrt, tr inbd biot, NFSOC, w/ CLYST (45%) v/ltgy-ltgy, v/sft, mshy, n- sl calc ip, amor, wtr sol, rr slty ip, w/ w/ tr SLTST ltgy, aa, w/ mod sweep mat aa
SS (75%) uncons qtz, clr-trnsl, f-crsgr,
CONFIDENTIAL
MS Total Gas (Units)
0
500
CG
CG 624u
CG
STG 402u
Trap plugged after wiper STG
CG
cln out trap
tr CG
tr CG


CONFIDENTIAL
CONFIDENTIAL
CN
CN
CN
DT
CN
DT
CN
CN
ROP (min/ft)
Gamma (API)
Caliper (inches)
Scale Change
NOTE:
ROP
Scale
Change
TRIP
< 11/18/17
3800
3850
3900
3950
SS (75%) uncons qtz, clr-trnsl, f-crsgr, sbrnd-sl sa, psrt, tr inbd biot, NFSOC, w/ CLYST (25%) v/ltgy-ltgy, v/sft, mshy, rr sl frm, n- sl calc ip, amor, wtr sol, rr slty ip, w/ rr tr % SLTST as
SS (55%) uncons qtz, clr-trnsl, f-crsgr, sbrnd-sl sa, psrt, tr inbd biot, NFSOC, w/ CLYST (30%) v/ltgy-ltgy, v/sft, mshy, rr sl frm, n- sl calc ip, amor, wtr sol, rr slty ip, w/ SS (15%) clr-trnsl, vfgr, sbang, wsrt, pcmt, consol, v/fri, mod calc, tr cly fil cmt, tr glauc, NFSOC, no vis intr grnlr poro
SS (50%) uncons qtz, clr-trnsl, f-crsgr, sbrnd-sl sa, psrt, tr inbd biot, NFSOC, w/ CLYST (50%) v/ltgy-ltgy, v/sft, mshy, rr sl frm, n- sl calc ip, amor, wtr sol, rr slty ip
CLYST (65%) v/ltgy-ltgy, v/sft, mshy, n- sl calc, amor, wtr sol, rr slty ip, w/ SLTST (20%) ltgy, lt tngy, ltgy-plgn, sft, mshy ip, v/sl calc, occ v sl/ sdy ip, calc, tr calc nod-grnlr w/ SS (15%) uncons qtz, clr-trnsl, v/ lt gy, f-crsgr, sbrnd-sl sbang, occ vf gr, rd, wsrt, wcons, calc cmt, hd-sft, tr intgr por, NFSOC, tr mass pyr
CLYST (50%) v/ltgy-ltgy, v/sft, mshy, n- sl calc, amor, wtr sol, rr slty ip, w/ SLTST (40%) ltgy, lt tngy, ltgy-plgn, sft, mshy ip, sl calc-calc, tr micxln calc, nod-grnlr, w/ SS (10%) qtz, clr-trnsl, v/ lt gy, vf-crsgr, sbrnd-sl sbang, occ vf gr, rd, wsrt, wcons, calc cmt, sft-hd, rr intgr por, NFSOC, abnt mass pyr
CLYST (60%) v/ltgy-ltgy, v/sft, mshy, n- sl calc, amor, wtr sol, rr slty ip, w/ SS (30%) qtz, clr-trnsl, v/ lt gy, vf-crsgr, sbrnd-sl sbang, occ vf gr, rd, wsrt, wcons, calc cmt, sft-hd, rr intgr por, NFSOC, tr pyr, tr crsgr clr qtz, w/ SLTST (10%) ltgy, lt tngy, sft, mshy ip
NO SMPL
CLYST (40%) v/ltgy-ltgy, v/sft, mshy, n- sl calc, amor, wtr sol, gen slty ip, w/ SLTST (30%) ltgy, lt tngy, ltgy-plgn, sft, sbplty, brit-mshy ip, sl calc-calc, w/ SS (25%) qtz, v/ ltgy-off wh, pp s&p, lvf-uf grrd-sbrd, w cons, mod-wsrt, frm, occ sl fri, calc/cly cmt, n vis por, NFSOC, TUFF (5%) ltgy-v/ltblugy, frm-v hd, blky-sb blky, sm tex, TR calc frac fl, ABNT mass pyr
SLTST (60%) ltgy, lt tngy, ltgy-plgn, sft, sbplty-sb blky,sl, brit-mshy, ip, v/sl calc, w/ CLYST (30%) v/ltgy-ltgy, wh, v/sft, mshy, n calc, amor-plty, gen wtr sol, occ sl slty ip w/ SS (10%) qtz, v/ ltgy-gy, lvf-uvf gr, rd-sbrd, w cons, mod srt, frm, occ sl fri, calc/cly
CG
Clean trap
CG
0
MS Total Gas (Units)
500
STG 821u
DTG
CG
tr DTG
tr CG
3920' - Standpipe Washout, No bot up CO
TG 2364u
Scale Change
0
MS Total Gas (Units)
1000
NOTE: Total Gas scale change to 0-1000u
CG
MUD Check @ 3920'
Wt 10.7
Vis 40
Fil 3.0
Sol 17.3
pH 6.9
Chl 600
Ca 40

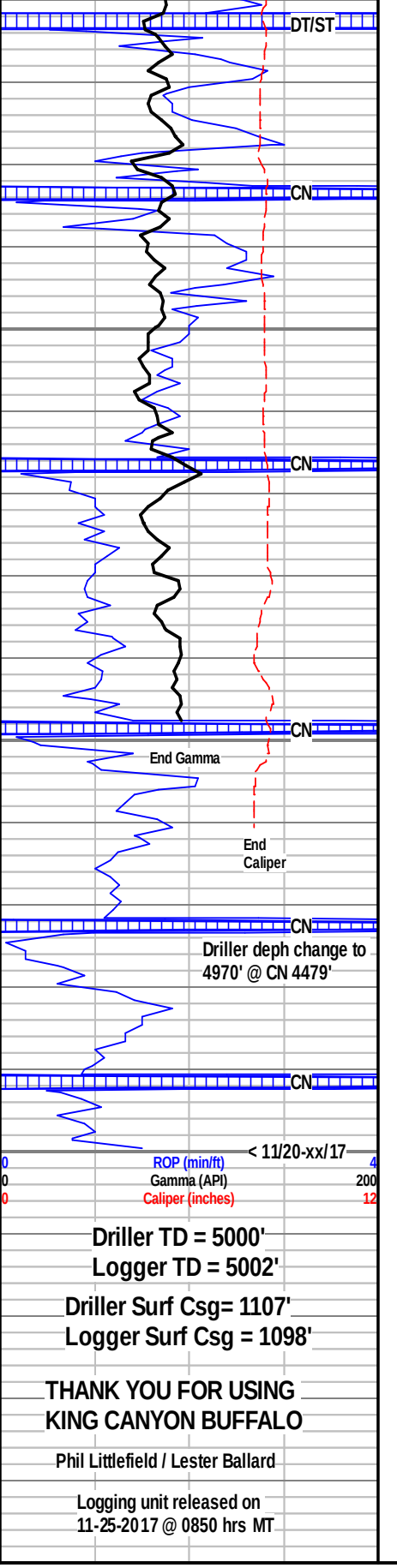

CONFIDENTIAL
CONFIDENTIAL
ROP (min/ft)
Gamma (API)
Caliper (inches)
0
200
12
4
CN
DT/ST
BASALT @
4062' (-1799)
< 11/19/17
NOTE:
4098'-4242'
GR shly, spls
Basalt w/
60-85% altrd
to cly
4000
4050
4100
4150
cmt, n vis por, NFS OC, ABNT mass pyr
CLYST (40%) v/ltgy-ltgy, mgy, v/sft-frm, mshy-gsy, occ brit, gen n calc, amor, wtr sol, occ sl slty ip w/ SLTST (30%) ltgy, lt tngy, sft, sbplty-sbblky, sft, brit-mshy ip, v/ sl calc, gen sdy, w/ SS (30%) qtz, uncons, clr-trnsl, lm-crs, rd-sbang, mod srt, ABNT mass pyr
CLYST (40%) v/ltgy-ltgy, mgy, v/sft-frm, mshy-gsy, occ brit, gen n calc, amor, wtr sol, sl slty, w/ SLTST (30%) ltgy, lt tngy, sft, sbplty-sbblky, sft, brit-mshy ip, v sl calc w/ SS (30%) qtz, uncons, clr-trnsl, lm-crs, rd-sbang, mod srt, ABNT mass pyr
BASALT (70%) dk gy-blk, m-mdkgy, mafic, aphan-aphyric, sft-frm, abnd blk mica, gen weathered-alt to cly, med gy, sft w/ CLYST 30% wh-off wh, buff, tan, v/ lt gy, sft-frm, lmpy, chlky tex
BASALT (80%) dk gy-blk, m-mdkgy, mafic, aphan-aphyric, hd-sft, abnd blk mica, 50% alt to cly, med gy, sft, w/ SS (20%) clr-trnsl, blk, vf-lm gr, rd, mod-w srt, gen uncons, occ p-w con, sft-hd, fri, n calc, NFS, fnt odr, v fnt mlky cut, rr fnt slw vis strm, fnt thn dul yel res rng cut, TR mass micxln Calc frac fl
BASALT (90%) dk gy-blk, m-mdkgy, mafic, aphan, hd-sft, abnd blk mica, 60% alt to cly, med gy, sft, w/ CLYST (10%) wh-off wh, tan, v/ lt gy, sft-frm, lmpy, chlky tex, poss weathered tuff, tr blk mica
BASALT (95%) dk gy-blk, m-mdkgy, gyblk, mafic, aphan, hd-sft, mod blk mica, 65% alt to cly, med-ltmgy, sft, w/ CLYST (5%) wh-off wh, tan, v/ lt gy, sft- frm, lmpy, chlky tex, poss weathered tuff, tr blk mica, rr musc
BASALT (90%) m-mdkgy, dk gy-gyblk, ltmgy, mafic, aphan, hd-sft, mod blk mica, 80% alt to cly, med-ltmgy, sft, w/ CLYST (10%) wh-off wh, tan, v/ lt gy, sft-frm, lmpy, chlky tex, poss weathered tuff, tr dul-sl brn yel vel orng flor, w/ trs uncons qtz, clr-trnsl, crs-v/crsgr, sbrnd, tr musc & biot
0
MS Total Gas (Units)
1000
CG
CG
CG
tr CG
STG
HIGHEST FMG
IN WELL 1344u
FMG 1344u
tr CG
tr CG
tr CG


ROP (min/ft)
Gamma (API)
Caliper (inches)
CN
CN/DT/ST
WILLOW SAND
@ 4242' (-1979)
4252' -
Control
drill w/
ROP @
50ft/hr
NOTE: GR plots
as Hot SH, Res
plots as SS,
Spls 100%SS
4250
4300
4350
4400
BASALT (95%) m-mdkgy, ltmgy, dk gy-
gyblk, mafic, aphan, hd-sft, mod blk mica,
85% alt to cly, med-ltmgy, sft, w/ CLYST (5%)
wh-off wh, tan, v/ lt gy, slt-frm, lmpy, chlky
tex, poss weathered tuff, v/ rr dul-sl bri
yel-yelorng flor, w/ tr uncons qtz, clr-trnsl,
crs-v/crsgr,sb/ rnd, tr musc & biot, tr olivine,
tr pyr
SS (50%) clr-trnsl, opq ip,rr frosty, m- crsgr,
occ v/crsgr, sbang-ang-sbmd, psrt, pcmt,
unconsol qtz, v/ rr yel flor, slo strmg cut, sl
fnt mlky pool, NSO, w/ BASALT (50%)
m-mdkgy, ltmgy, dk gy- gyblk, mafic, aphan,
hd-sft, mod blk mica, 90% alt to cly,
med-ltmgy, sft, w/ tr wh chlky CLYST aa, tr
musc & biot
4260'-20' spls
SS (90%) clr-trnsl, opq ip, m-crsgr, occ
v/crsgr, sbang-ang-sbrnd, psrt, pcmt,
unconsol qtz, NFSO, rr fnt dul wh res rng, w/
BASALT (10%) ltm-mdkgy, frm- sft, blk mica,
95% alt to cly, med-ltmgy, sft, w/ abnd clr
mica, tr musc, fr biot
SS (100%) clr-trnsl-opq, crs-v/crsgr, mgr,
sbang-ang-sbrnd ip, psrt, pcmt, unconsol
qtz, NFSO, rr fnt dul yel wh res rng, w/
CLYST (tr) ltgy, frm-sl sft, gen n calc, rr sl
slty ip, w/ tr musc, w/ tr biot, no clr mica in
spl
SS (100%) clr-trnsl-opq, crs-v/crsgr, mgr,
sbang-ang-sbrnd ip, psrt, pcmt, unconsol
qtz, NFSOC, w/ CLYST (tr) lt-mgy, frm-sl sft, n
calc, sl slty ip, w/ tr musc, w/ rr biot
SS (85%) clr-trnsl-opq, vfgr, sbang-ang, wsrt,
pcmt, consol, fri, n calc, mod wh cly fil cmt,
tr biot, 60% mod bri-bri yel-gnyel flor, slo fr
mlky pool, dul yel res rng, NSO, tr vis intr
grnlr poro, w/ SS (15%) clr-trnsl-opq,
crs-v/crsgr, unconsol aa
SS (100%) clr-trnsl-opq, f-vfgr, sbang- ang,
msrt, mcmt, consol, fri, n- v/sl calc, abnd
wh-lttn cly fil cmt, rr biot, NFSOC, no vis intr
grnlr poro, rr tr free biot, rr gy CLYST aa
SS (100%) clr-trnsl-opq, crs-v/crsgr, mgr,
sbang-ang-sbrnd ip, psrt, pcmt, unconsol
qtz, NFSOC, w/ mod amnt free wh chlky
clay, w/ fr amnt clr mica, w/ tr musc, w/ tr
biot
SS (100%) clr-trnsl-opq, crs-mgr, v/crs gr,
sbang-ang-sbrnd ip, psrt, pcmt, unconsol
qtz, NFSOC, w/ abnd amnt free wh chlky
clay, w/ abnd clr mica, w/ fr-mod musc, w/ tr
biot
SS (100%) clr-trnsl-opq, crs-v/crs gr, mgr,
sbang-ang-sbrnd ip, psrt, pcmt, unconsol
qtz, NFSOC, w/ abnd amnt free wh chlky
clay, w/ mod clr mica, w/ fr-mod musc, w/ fr
biot
CONFIDENTIAL
CONFIDENTIAL
MS Total Gas (Units)
tr CG
STG
Trap plugged after STG, Cln out
FMG 991u
CG
Clean off shaker screens
FMG 533u
CG
FMG 878u w/ CG
CG
CG
CG
MS Total Gas (Units)


CONFIDENTIAL
CONFIDENTIAL
CN
DT
4450
4500
4550
4600
4500' - Stop Control drill w/ ROP @ 50ft/hr
ROP (min/ft)
Gamma (API)
Caliper (inches)
SS (100%) clr-trnsl-opq, crs-mgr, tr v/ crs gr, sbang-ang-sbrnd ip, psrt, pcmt, unconsol qtz, NFSOC, w/ abnd amnt free wh chlky clay, w/ mod clr mica, w/ mod musc, w/ tr biot
SS (100%) clr-trnsl-opq, crs-v/crs gr, mgr, sbang-ang-sbrnd ip, psrt, pcmt, unconsol qtz, NFSOC, w/ mod amnt free wh chlky clay, w/ tr clr mica, w/ tr musc, w/ tr biot
SS (100%) clr-trnsl-opq, crs-mgr, tr v/ crs gr, sbang-ang-sbrnd ip, psrt, pcmt, unconsol qtz, NFSOC, w/ mod amnt free wh chlky clay, w/ tr musc, w/ tr biot, w/ tr CLYST lt-ltmgy, sl frm, n calc
SS (100%) clr-trnsl-opq, crs-m-v/ crsgr, sbang-ang-sbrnd ip, psrt, pcmt, unconsol qtz, rr consol cly fil cmt, NFSOC, w/ mod amnt free wh chlky clay, w/ tr musc, w/ rr biot, w/ tr CLYST V/ lt-ltmgy, sl frm, n calc
4500' - 30' spls
SS (100%) clr-trnsl-opq, gen v/ crs-m gr, sbang-sbrnd, psrt, occ f-vf gr, rd, mod w srt, p-unconsol qtz, sft-sl hd, gen fri, sil cmt, tr micxln calc frag, tr consol cly fil cmt, NFSOC, w/ mod amnt free wh chlky clay, w/ tr musc, tr Chrt
SS (60%) clr-trnsl-opq, gen um-uf gr, sbrnd-rnd, mod wsrt, p-wcons, sft-sl hd, gen fri, sil cmt, tr intgran por, NFSOC, SH (25%) lt-medgy-dkgy, frm-sft, brlt, sb blky-plty, slty-rthy tex, ncalc, tr vf disem Pyr frac fl, CLYST (15%) ltgy-gygrn-gytn, sft, lmpy, occgrdg slty-SLTST
SS (80%) clr-trnsl-opq, uncons v/ crs w/ abnt clr-trnsl, wh-ltgy, um-uf gr, sbang-rnd, p-wsrt, p-wcons, sft-sl hd, fri-brit, sil cmt, tr intgran por, NFSC, v fnt slw mlky cut, v fnt, thn, dull yel res, abnt free wh chlky clay, w/ tr musc, tr grdg slty, CLYST (20%) lt-medgy-dkgy, frm-sft, brlt, sb blky-plty, sl slty-sm tex, ncalc
SS (90%) clr-trnsl-opq, qtz, gen v/ crs-lm gr, ang-sbrnd, psrt, p-mod cons, abnt unconsol, sft-frm, gen fri, wk sil-occ sl calc cmt, tr f-m gr, sbrd-rd, w srt, w cons, NFSOC, w/ decr free wh chlky clay, w/ tr musc, CLYST (10%) mgy-dkgy, plty-sb blky, frm-brit, ncalc
SS (50%) clr-trnsl-opq, qtz, gen v/ crs-crs gr, sbang-sbrnd, mod srt, p-unconsol, sft-frm, fri, wk sil-occ sl calc cmt, NFSOC, w/ tr free wh chlky clay, CLYST (45%) mgy-dkgy, gen sb blky, sm-slty tex, occ rthy, sft, brit, ncalc, TUFF (5%) weathered, gy-gyblu, frm-brit
Clean off shaker screens
NOTE: Total Gas scale change to 0-500u
Scale Change
MS Total Gas (Units)
CG
DTG
STG 302u


CN
4650
CN
4700
CN
CN
< 11/20/17
Driller deph change to
4752' @ CN 4761'
4750
CN
CN
DT
4800
0
ROP (min/ft)
4
0
Gamma (API)
200
0
Caliper (inches)
12
CN
CN
4850
blky, sm-rthy tex w/ pl gn cly
SS (80%) clr-trnsl-opq, qtz, gen crs-m gr, sbang-sbrnd, psrt, p-unconsol, occ f-m gr, rd-sbrd, mod w srt, sft-frm, sl fri clust, wk sil cmt, tr micxln calc frag, tr free cly, NFSOC, CLYST (20%) mgy-dkgy, pl gngy, gen plty-sb plty, slty-sm tex, occ rthy, sb blky, sft, brit, ncal
SS (90%) clr-trnsl-opq, qtz, gen v/ crs-crs, occ m gr, ang-sbrnd, psrt, p-unconsol, sft, sl fri, wk sil-cly cmt, abnt free cly, NFSOC, CLYST (10%) mgy-dkgy, sb plty - sb blky, sm-rthy tex, occ sl wxy, sft, brit, ncal
SS (60%) clr-trnsl-opq, qtz, gen crs-m gr, sbang-sbrnd, mod srt, p-unconsol, sft, fri, wk cly cmt, NFSOC, w/ tr free wh chlky clay, CLYST (40%) mgy-dkgy, gen sb blky, abnt lmpy, slty-rthy tex, sft, brit, ncalc, w/ incr clyst, TUFF (tr) weathered, tn yel, frm-sft, brit, plty w/ tngy-pl gn cly
SS (70%) ltgy-off wh, lvf-uf gr, rd, mod-w srt, sft, fri, p-mod cons, sft, sl fri, occ slty-mshy ip, cly cmt, abnt uncons v/ crs-crs gr, clr-trnsl-opq, qtz, NFSOC, w/ tr free wh chlky clay, CLYST (30%) gytn, mgy-dkgy, sb blky, incg lmpy, gen slty tex, sft, brit, ncalc w/ abntslty clyst
SS (50%) ltgy-gy, tngy, crs-vf gr, sbang-rd, mod-w srt, sft, fri, p cons, sft, sl fri, slty ip, cly cmt, grdg sltst, fnt dul yel res rng, NFSO, SLTST (30%) ltgy-gy, tngy, sbblky, sft, mshy-s lfri, cly-calc cmt, sdy ip-occ cly mtx, CLYST (20%) v/ltgy-ltgy, wh, v/sft, mshy, n calc, amor-sb blky, gen wtr sol, grdg slty
SS (70%) clr-trnsl-opq, crs-v/crsgr-occ mgr, sbang-sbrnd, psrt, pcmt, uncon- sol qtz, tr inbd biot, NFSOC, w/ rr free wh chlky clay, w/ CLYST (30%) v/ltgy- ltgy, mgy, rr gy gn, sft-v/sft, frm ip, n calc, amor-sbblky, gen wtr sol, rr inbd biot, sl slty ip, no vis mica in spl
SS (75%) clr-trnsl-opq, crs-v/crsgr,mgr, sbang-sbrnd, psrt, pcmt, unconsol qtz, rr consol w/ wh cly fil cmt, n calc, tr inbd biot, NFSOC, w/ rr free wh chlky clay, w/ CLYST (20%) v/ltgy-ltgy, mgy, rr gy gn, sft-v/sft, frm ip, n calc, amor-sb/ blky, gen wtr sol, rr inbd biot, sl slty ip
CONFIDENTIAL
CONFIDENTIAL
CG
CG
STG 405u
CG
tr CG
FMG 167u
0
MS Total Gas (Units)
500
tr CG
CG

CONFIDENTIAL



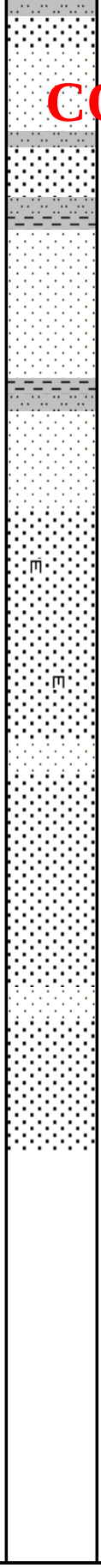
Driller TD = 5000'
Logger TD = 5002'

Driller Surf Csg= 1107'
Logger Surf Csg = 1098'

THANK YOU FOR USING
KING CANYON BUFFALO

Phil Littlefield / Lester Ballard

Logging unit released on
11-25-2017 @ 0850 hrs MT



CLYST (55%) v/ltgy-ltgy, mgy, mdkgy, sft-frm ip, n calc, amor-sbblky, gen wtr sol, rr inbd biot, sl slty ip, w/ SLTST (45%) clr-trnsl-opq, crs-v/crsgr,mgr, sbang-sbrnd, psrt, pcmt, unconsol qtz, rr consol w/ wh cly fil cmt, n calc, tr inbd biot, NFSOC, w/ rr free wh chlky clay

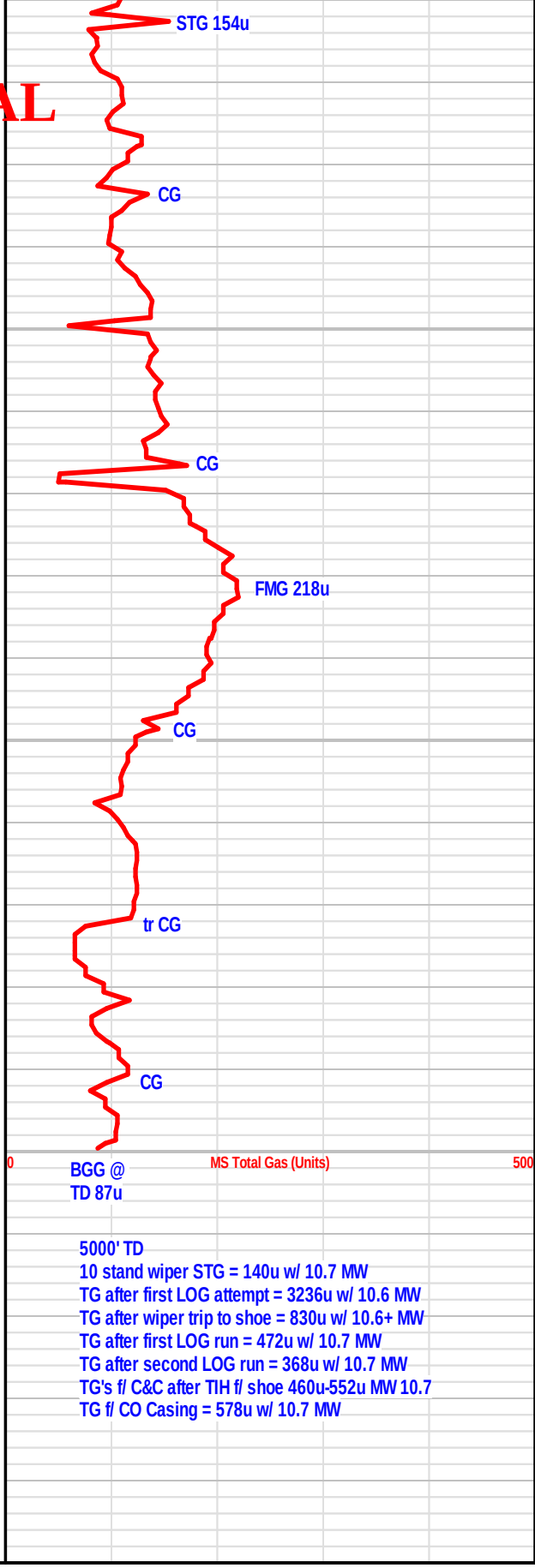
CLYST (70%) v/ltgy-ltgy, mgy, mdkgy, sft-frm ip, n calc, amor-sbblky, gen wtr sol, rr inbd biot, sl slty ip, w/ SLTST (15%) lt-ltmgy, v /lttn-tn, mod sft, n calc, arg ip, sl sdy ip, w/ SS (15%) clr-trnsl- opq, crs-v/crsgr,mgr, sbang- sbrnd, psrt, pcmt, unconsol qtz NFSOC

SS (95%) clr-trnsl-opq, crs-v/crsgr,mgr, sbang-sbrnd, psrt, pcmt, unconsol qtz, rr consol w/fr wh cly fil cmt, n calc, tr inbd biot, NFSOC, w/tr free wh chlky clay, w/ CLYST (25%) v/ltgy-ltgy, mgy, sft-frm ip, n calc, amor-sbblky, gen wtr sol, rr inbd biot, sl slty, fr free wh cly, tr clr mica

SS (90%) clr-trnsl-opq, crs-v/crsgr,mgr, sbang-sbrnd, psrt, pcmt, unconsol qtz, rr consol w/ mod wh cly fil cmt, n calc, tr inbd biot, NFSOC, w/ tr free wh chlky clay, w/ CLYST (10%) v/ltgy-ltgy, mgy, sft-frm ip, n calc, amor-sbblky, gen wtr sol, rr inbd biot, sl slty

SS (95%) clr-trnsl-opq, crs-v/crsgr, occ mgr, sbang-sbrnd, ang ip, psrt, pcmt, unconsol qtz, rr consol w/ mod wh cly fil cmt, n calc, tr inbd biot, NFSOC, w/ fr amnt free wh chlky clay, w/ CLYST (5%) v/ltgy-ltgy, mgy, sft-frm, n calc, amor- sbblky, gen wtr sol, rr inbd biot, sl slty ip, trs inbd pyr

TD on 11-20-2017 @ 1100 hrs MT, CO, Pump Sweep, Short trip 10 stnds, TIH, C&C, Lower MW 10.6, TOOH for LOGS, RU/RIH LOGS, Stuck tool @ 2574', WO fishing tool, Log tool came free on its own downhole, TOOH w/ tools, TIH, C&C, Wiper trip to shoe, TIH, C&C, TOOH for LOGS, Run triple combo LOGS, TIH, C&C, MW 10.7, TOOH for LOGS, Run Sonic LOG, TIH, C&C, TOOH to shoe, WO cementers, TIH, C&C, TOOH to shoe, WO frac tank, TIH, C&C, LD DP, RU csg crew, Run 5 1/2" Production Casing, CO csg, KCB Logging Unit released



BGG @
TD 87u

5000' TD
10 stand wiper STG = 140u w/ 10.7 MW
TG after first LOG attempt = 3236u w/ 10.6 MW
TG after wiper trip to shoe = 830u w/ 10.6+ MW
TG after first LOG run = 472u w/ 10.7 MW
TG after second LOG run = 368u w/ 10.7 MW
TG's f/ C&C after TIH f/ shoe 460u-552u MW 10.7
TG f/ CO Casing = 578u w/ 10.7 MW

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