



Woolsey Operating Company, LLC

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

Measured Depth Log

Well Name: Mackey #1

Location: Irreg Section 18 - Township 35 South - Range 12 West

License Number: 15-007-24109-0000

Region: Barber County, Kansas

Spud Date: February 17, 2014

Drilling Completed:

Surface Coordinates: Irreg 18 - 35S - 12W / N/2 N/2
330' FNL & 2635' FWL

Bottom Hole Coordinates:

Ground Elevation (ft): 1426 K.B. Elevation (ft): 1438

Logged Interval (ft): 4000 To: 5550 Total Depth (ft): 5550

Formation: Kansas City Group ---> Simpsons Group

Type of Drilling Fluid: Chemical Mud Displaced at 3361'

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

OPERATOR

Company: Woolsey Operating Company, LLC

Address: 125 N. Market, Suite 1000
Wichita, KS 67202

GEOLOGIST

Name: Blake Miller

Company: Woolsey Operating Co. LLC

Address: 125 N. Market, Wichita Kansas, 67202

COMMENTS

Surface Casing: : Spud at 4:45 pm on February 17,2014. Set 5 joints of 13 3/8" x 48#/ft new surface casing at 225' (tally 213') with 300 sacks Class A, 2% gel, 3% cc, 1/4# celoflake (by Allied). Plug down at 10:45 pm on February 17, 2014. Cement did circulate.

Production Casing:

Deviation Surveys: • 1/2° at 225', 1/4° at 1046', 1/4° at 1553', 1/4° at 2062', 1° at 2507', 3/4° at 3014', 1/2° at 3519', 3/4° at 4025', 1/2° at 4531', 1° at 4806'

Pipe Strap @ 4806'. Strap: 4817.27', Board: 4816.46'. Strap 1.19' short.

Contractor Bit Record:

- 1) 17 1/2" Hughes RT RR in at 0', out at 225', made 225' in 2.5 hours
- 2) 7 7/8" Varel HE21 in at 225', out at 4806', made 4581' in 107.5 hours
- 3) 7 7/8" Hughes GE27 in at 4806', out at 5550', made 744' in 58 hours

Gas Detector: Woolsey Operating Co., Gas Trailer #2

Mud System: Chemical Mud, Mud-Co., Brad Bortz, Engineer

DSTs: Trilobite Testing, Matt Smith, Tester

E-Logs: Nabors Completion and Production Services, Jeff Leubbie, Dual Induction Laterlog w/SP, CNL-FDC w/PE, Gamma Ray and Caliper.

DSTs

1) 4740-4806, 30-60-60-90, (1) flow fair 5" blow > weak 1/2" blow, (2) flow fair 4" blow > no blow, Rec: 20' SOCM (2% O, 98% M), IHP 2315, IFP 19-37, ISIP 197, FFP 37-46, FSIP 188, FHP 2292, BHT 122°

2.) 4825-4870, 30-60-60-120, (1) strong blow, B.O.B. 1" > no blow, (2) no blow-no blow, Rec: 5' drlg mud, IHP 2318, IFP 18-29, ISIP 1416, FHP 2246, *MIS-RUN*

CREWS

Jim Wenrich, Tool Pusher

Daniel Orrantea, Days

Ron Burns, Evening

Doug Dimitt, Morning

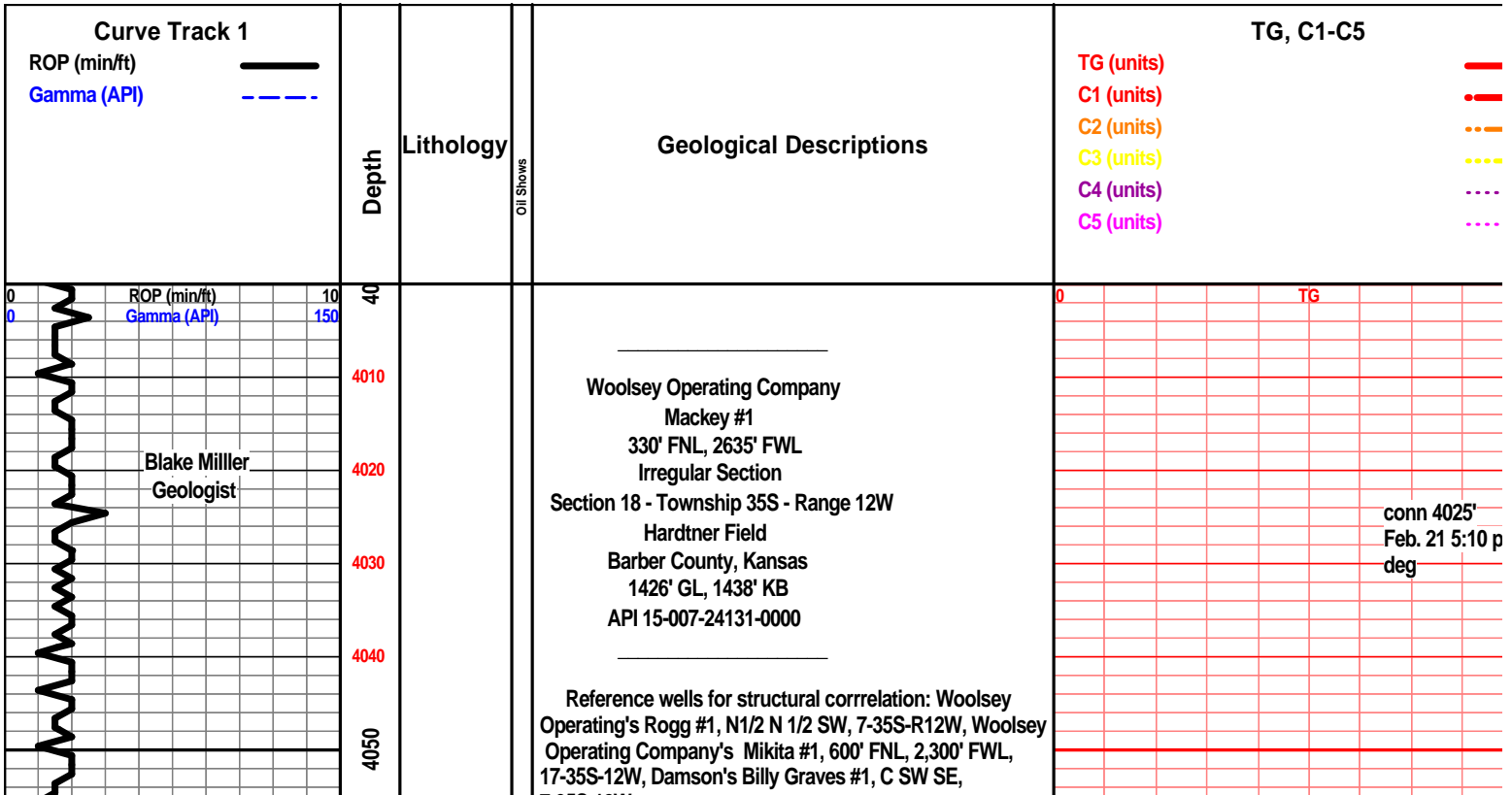
Chris Statts, Relief

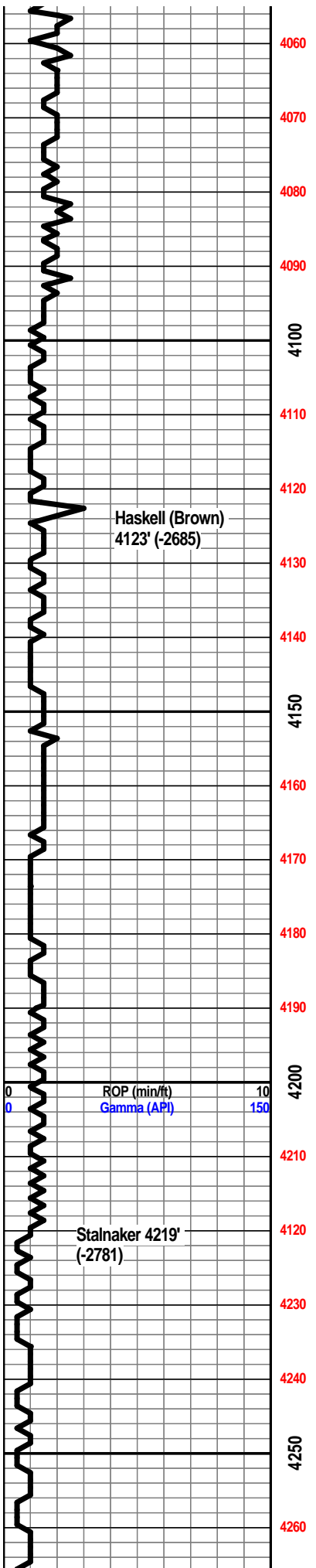
ROCK TYPES

	Anhy		Shy dolo		Sltst		Shale 3
	Bent		Dol		Ss		Silty dol
	Brec		Gyp		Black sh		Dol Imst
	Cht		Sdy Imst		Gry sh		Dol 2
	Clyst		Lmst		Shale		Granite wash
	Coal		Mrst		Shyslts		Lmst
	Congl		Salt		Sltys		Calc dol
	Sdy dolo		Shale		Ss 2		Shale 3

ACCESSORIES

MINERAL		Chlorite		Pelec		Grysh	
	Anhy		Dol		Gryslt		
	Arg		Sand		Lms		
	Bent		Silty		Sandylms		
	Bit				Sh		
	Brecfrag	FOSSIL		Strom		Sltstn	
	Calc		Algae		Fuss		
	Carb		Amph		Oomoldic	TEXTURE	
	Chtdk		Belm				Boundst
	Chtlt		Bioclst	STRINGER			Chalky
	Dol		Brach		Anhy		Cryxln
	Ferrpel		Bryozoa		Arg		Earthy
	Ferr		Cephal		Coal		Finexln
	Glau		Coral		Dol		Grainst
	Gyp		Crin		Gyp		Lithogr
	Marl		Echin		Ls		Microxln
	Nodule		Fish		Mrst		Mudst
	Phos		Foram		Sltstrg		Packst
	Pyr		Fossil		Ssstrg		Wackst
	Salt		Gastro		Carbsh		
	Sandy		Oolite		Clystn		
	Silt		Ostra		Dol		





7-35S-12W.

One minute drill time was recorded from 4375' to rotary total depth. Ten foot rotary cuttings were collected from 4500' to rotary total depth and were delivered to the Survey at the completion of the test.

7 am progress:

Feb. 17, 2014: MIRU

Feb. 18, 2014: drilling at 225'

Feb. 19, 2014: drilling at 1700'

Feb. 20, 2014: drilling at 2430'

Feb. 21, 2014: drilling at 3270'

Feb. 22, 2014: drilling at 4645'

Feb. 23, 2014: drilling at 4640'

Feb. 24, 2014: on btm w/ DST #1 at 4806'

Feb. 25, 2014: on btm w/ DST #2 at 4870'

Feb. 26, 2014: drilling at 5090'

Feb. 27, 2014: CFS @ 5298'

Feb. 28, 2014: drilling at 5521'

Oil & Gas Show Legend:

- Good show/saturation
- ◐ Slight show
- Very slight show/questionable
- ⊗ Gas

DSTs:

1.) 4740-4806, 30-60-60-90, (1) fair 5" blow > weak 1/2" blow, (2) fair 4" blow > no blow, 20' socm (2% O, 98% M), [197-188] FP 19-37/37-46

2.) 4825-4870, 30-60-60-120, (1) strong blow, B.O.B. 1" > no blow, (2) no blow - no blow, 5' drlg mud, [1416] FP 18-29, *MIS-RUN*

Mud Checks:

1.) 452': Wtr 100%, chls 200, SPM 56, PP 400#

2.) 2633': Wt 9.4, vis 28, pH 7, WL n/c, cake hvy, chls 98,000, sand tr, solids 2, LCM 0#, SPM 58, PP 800#

3.) 3435': Wt 8.7, vis 53, PV 15, YP 15, gel 14/54, pH 11.5, WL 9.2, cake 1/32, chls 3500, sand tr, solids 2.7, LCM trc, SPM 58, PP 600#

4.) 4214': Wt 9.1, vis 53, PV 15, YP 17, gel 17/49, pH 12.5, WL 8.8, cake 1/32, chls 3000, sand tr, solids 5.4, LCM 0#, SPM 58, PP 800#

5.) 4727': Wt 9.1, vis 56, PV 16, YP 17, gel 18/56, pH 12.5, WL 8.8, cake 1/32, chls 1800, sand tr, solids 5.6, LCM 4#, SPM 58, PP 900#

6.) 4806': Wt 9.1, vis 59, PV 15, YP 15, gel 17/51, pH 11, WL 9, cake 1/32, chls 2600, sand tr, solids 5.6, LCM 4#, SPM 56, PP 850#

conn 4057'

conn 4088

conn 4120'

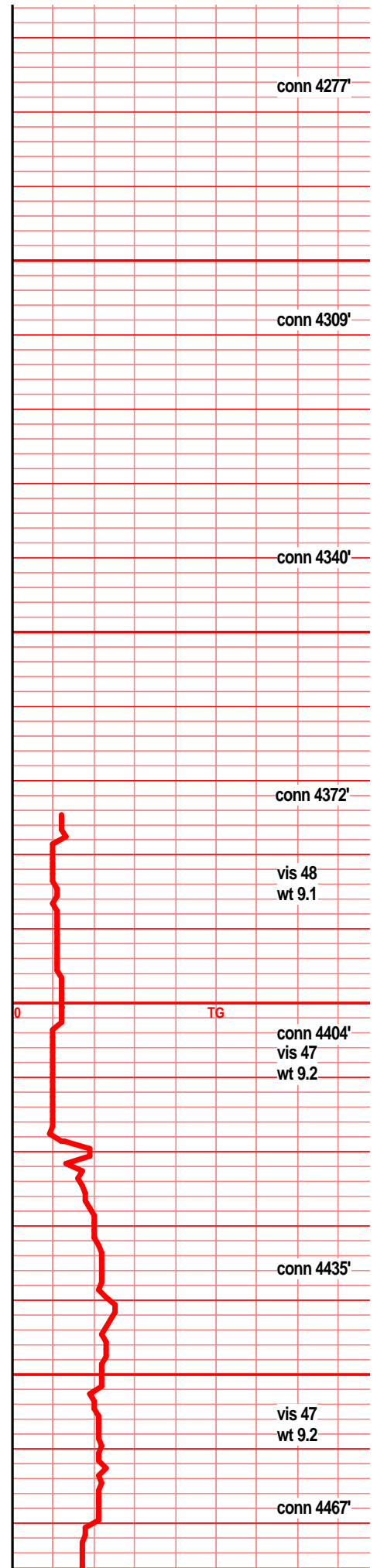
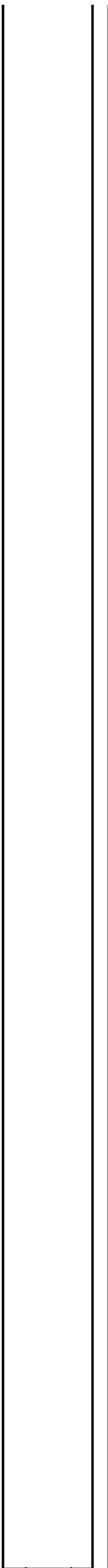
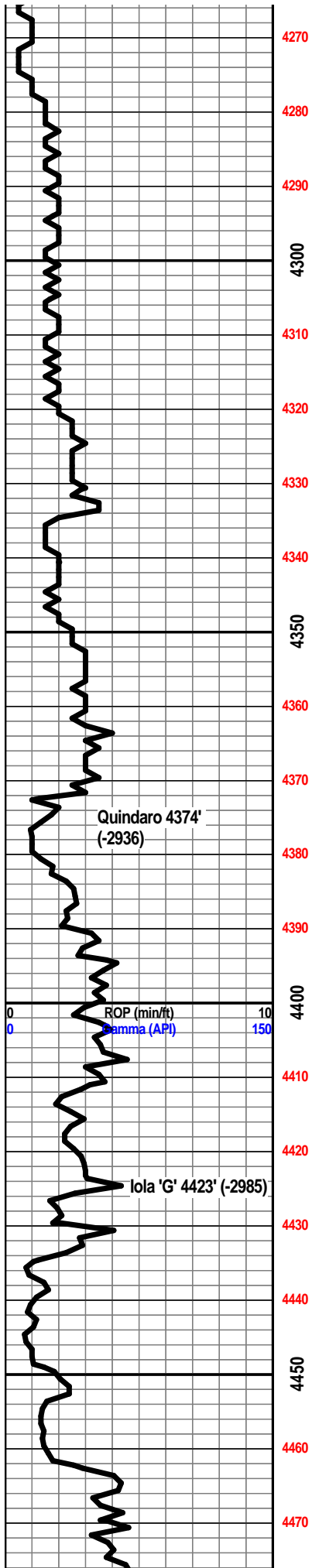
conn 4151'

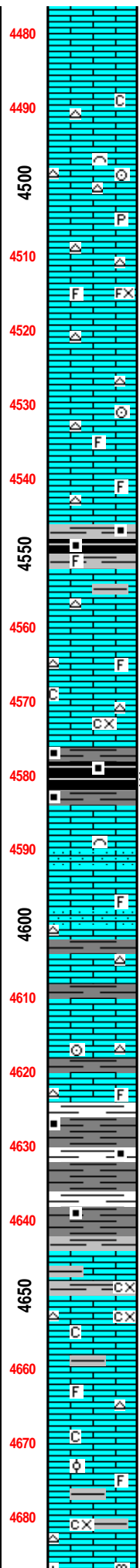
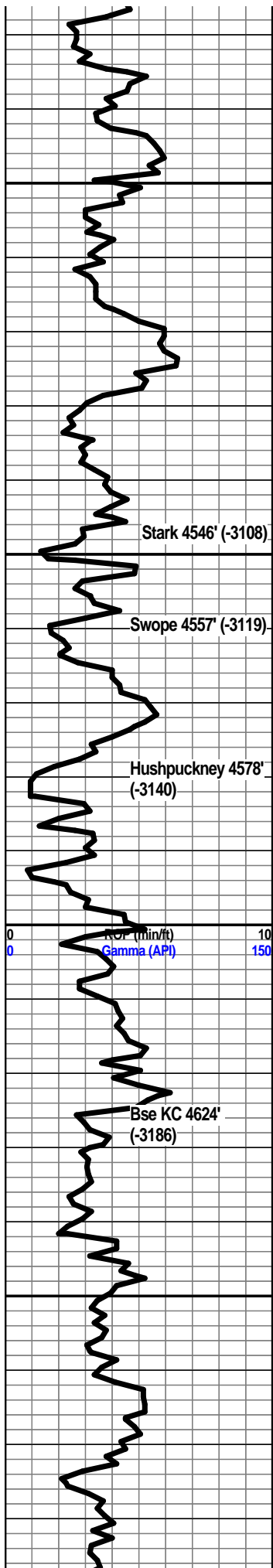
conn 4182'

conn 4214'

conn 4246'

Scale Change
TG





4480 LS- tan off wht, some chrt xln, vfn grn, chlk-sub chlk pcs, tite, sub ang, foss frag chrt xln, small pcs

4490 LS- tan gry off wht, xln, pyr xln, vfn-fn grn, hrd tite, soft sub chlk pcs, sub ang, foss cont, few crin, chrt foss xln, blkly pcs. CHRT- gry lt brn, hrd tite, shrp ang

4500 LS- gray off wht, fn grn, tite, low chlk cont, sub ang, fn re-xln foss frag, chrt xln, low pyr xln. blkly pcs. CHRT- gry brn, opa, tite, shrp ang

4510 LS- gry tan, fn grn, chrt & calc xln, hrd, low/no chlk, ang, hvy foss re-xln, foss moldic por, fusulinid mold re-xln. CHRT- wht tan lt brn, cln-drty, opa, shrp, tite

4520 LS- tan off wht, xln, fn grn, hrd, low chlk, ang subang, low foss frags, re-xln mold, crin. CHRT- few white opa pcs

4530 LS- tan off wht, vfn-fn grn, incr chlk cont, subang, fn foss frag, rexln moldic por, sm pcs

4540 SH- black gry, carb, vfn grn, poor lam, rare foss frag, wxy, sft, splintery & blkly

4550 LS- tan off wht, xln, fn grn, sub chlk, low fn foss frag, rexln. CHRT- wht tan, opa, hrd tite, ang, few

4560 LS- wht tan, fn grn, xln, chlky, sft, hrd ang pcs, foss cont re-xln. CHRT- wht gry opa, mostly cln, hrd dns ang pcs.

4570 SH- gry black, carb, vfn grn, sft, good lam, few black stringer in gry pcs, wxy, splintery flaky frac ptrn, gas bubs in black pcs.

4580 LS- off wht lt brn, drty, sdy, xln, fn-med grn, chlk in pcs, mostly sdy, subang, foss re-xln, better por. CHRT- brn, hrd, opa, shrp pcs, few

4590 LS- tan lt nrn off wht, drty pcs persist, some clean, fn-med grn, xln, hrd, sdy, sub ang, foss mold re-xln and por, ool present, blkly pcs. CHRT- brn, few hrd shrp pcs

4600 SH- predom gry, vfn grn, flaky-splintery, fissile, soft, black lam seen.

4610 LS- off wht brn, fn grn, chrt, xln, hrd, drty, ang, few foss, sing crin. SH- gry, vfn grn, splint-flaky-blky pc, few lam seen

4620 SH- predom gry gry blue sl red, vfn grn, wxy, soft, splintery-blky frac, rare lam seen

4630 SH- gry, vfn grn, soft, waxy, fissile, few black carb lam seen.

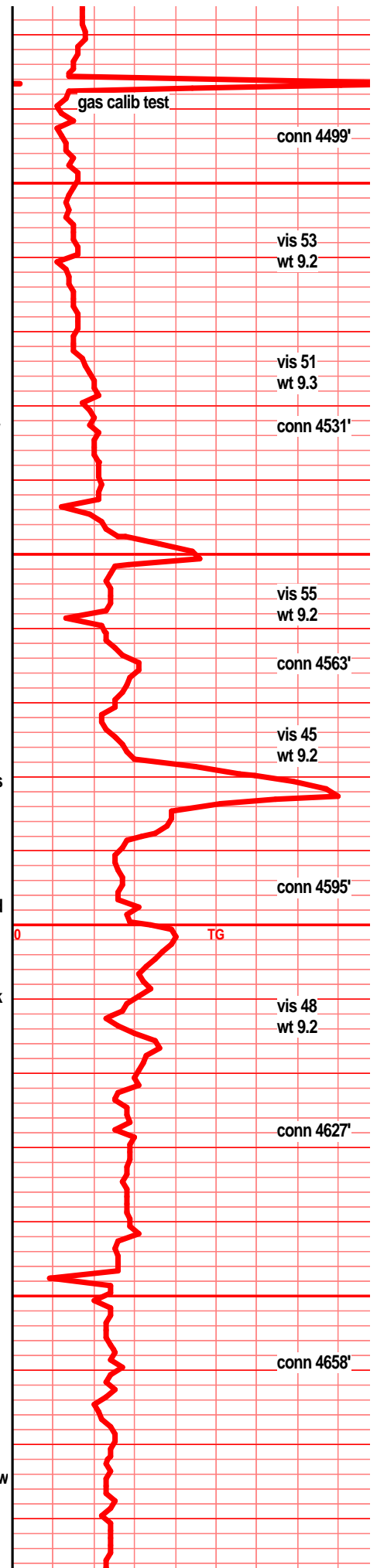
4640 SH-LS- gry gry brn, vfn grn shly lime, xln, hrd tite, ang irreg frac, no foss

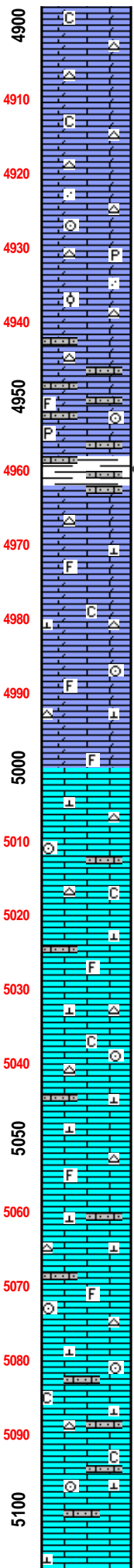
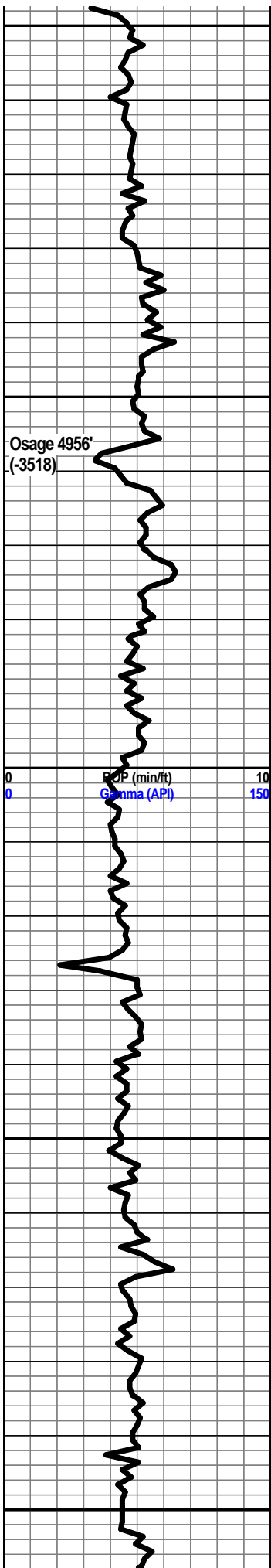
4650 LS- off wht tan gry, fn grn, xln, few sub chlk, fn-crs rexln foss frag in wht/tan, gry pcs grty w. low foss

4660 LS- off wht tan lt brn (drty), xln, vfn-fn grn, fewer sub chalk, hrd, some foss moldic por (drty pcs), foss rexln.

4670 LS- gry tan, fn grn, xln, hrd, grys sl slty & grty, subang, low foss, tan higher foss & crsr, ool, mod sort

4680 LS- predom gry, tan, grty, vfn-fn grn, sub chlk, sub ang,





foss seen, fnt foss struc prsvd, calc xln.

DOL/LS- wht gry tan, calc xln, vfn- fn grn, wt ylw opaq chrty, chlky, grty, friable-non, low inerstitial por, no foss, fnt foss struc prsvd, lrg blkly sub ang pcs

DOL/LS- wht off wht tan, xln, chrty, chlky, vfn-fn grn, grty, low interstitial por, tr microfoss/fn foss struc, mod sort

DOL/LS- wht off wht gry, xln, vfn-fn grn, wht sl trans chrty, chlky, grty text, vfn sdy, pyr&calc xln, vari hrdns, low interstitial por, few rexln ool, rexln crin-fnt struct prsvd

DOL/LS- wht gry lt grn, sdy slty, vfn grn, xln, wht chrty, grny text, sft friable cln dol/ls-low micro foss & crin; well cem clastic dol-hrd dns, low foss

DOL/LS- gry gry-grn wht, vfn grn, sdy, rare pyr, grty text, med-hrd, well cem, interstitial por, no foss. DOL/LS- mst of smpl cln wht vfn-fn grn grty chrty dol/ls, calc xln, few crin & foss frag

SH- grn gry, vfn grn, sft, wxy, glauc, V FEW PCS w/ gso

DOL/LS- wht gry tan, xln, vfn grn, calc&chrt xln, chlky, friable, grty text, xln foss, crin. few hrd sd pcs persist

DOL/LS- wht tan, calc&chrt xln, chlky, friable, low sdy pcs, sub ang, low interstitial por, fnt foss rexln in pcs, xln crin readily vis/prsvd

DOL/LS- wht tan gry, calc& chrt xln, chlky sft, grty, few sdy pcs, fnt foss, lsr crin

LS- wht tan gry, chrt prim calc xln, vfn grn, chlky, chlky friable text, grty text more xln pcs, friable, fnt foss strut, few calc crin

LS- wht tan lt gry, sm spty grn/stn, calc&chrt xln, chlky, friable, grty text, vfn-fn grn, few sdy lm pcs, vfn grn incl, incr calc crin, low foss pres/rexin

LS- wht tan gry, spty grn, sl chrty, calc xln, chlky, friable, fn grn, gry pcs vfn sdy, grty-xln text, low foss, crin calc xln

LS- wht tan gry grn, chrty, calc xln, chlky, friable, inc gry grn pcs w/ vfn sdy grn incl- sl intersitial por, low foss, few calc crin

LS- wht tan gry, sl gry grn, few red/brn clastic carb pcs, chrt&calc xln, vfn-fn grn, friable lm, clastic red/brn dol/ls hrd w/ vfn-fn grn incl, low foss, calc crin

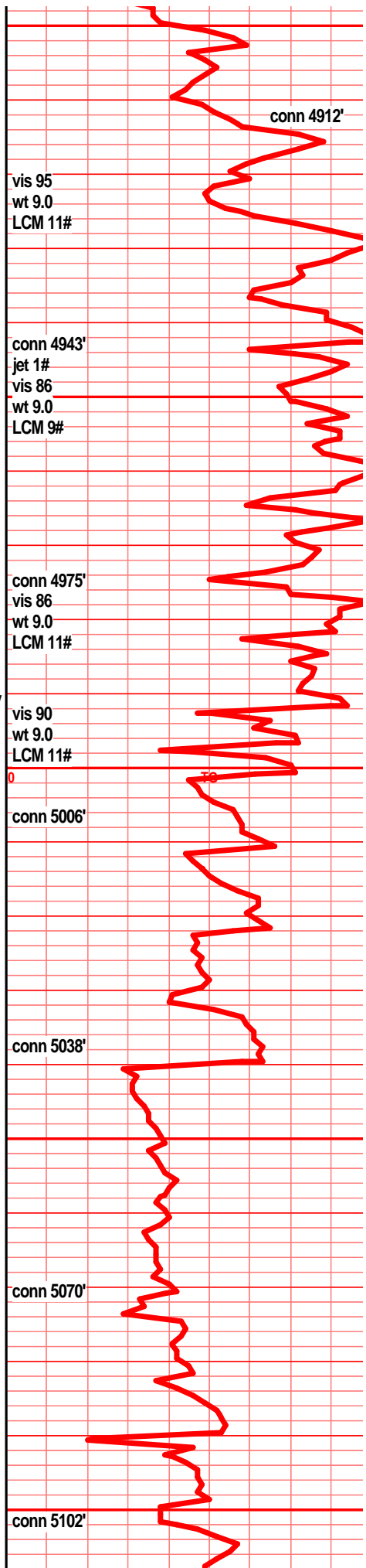
LS- wht tan gry/grn, low chrt, calc xln, sdy, grty text, friable-non, incr gry/grn clstic pcs w/ vfn-fn grn incl, lsr re/brn clastic carb, calc crin, low foss, clstic carb- low interstitial por

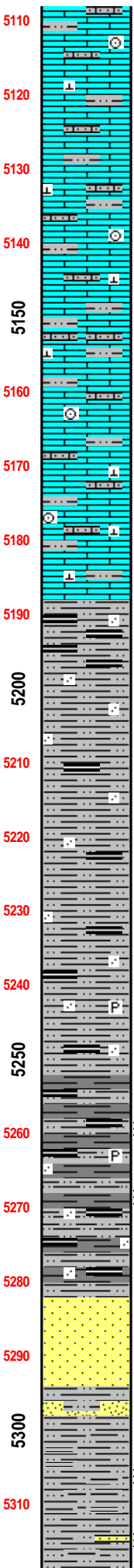
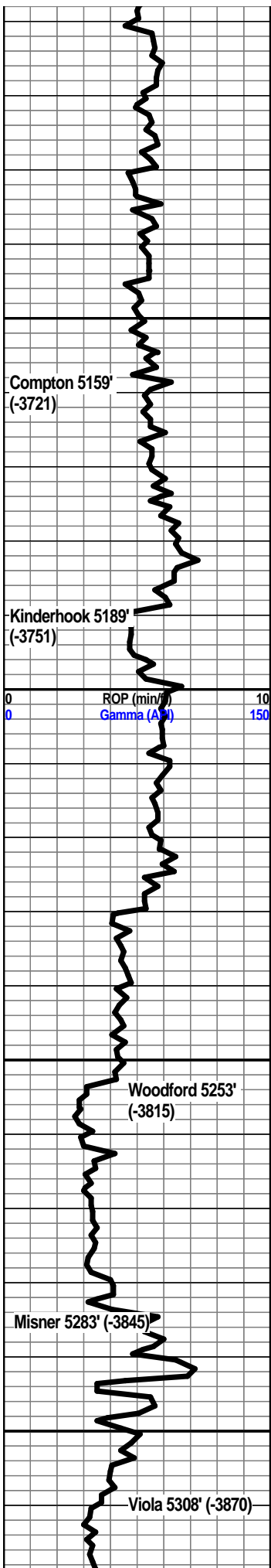
LS- wht brn gry/grn, calc xln, low foss, few calc crin, incr rd/brn gry grn fn-vfn sdy pcs

LS- wht gry grn, few rd/brn, clac xln, subchlky, subang blkly pcs, low foss and crin overall. gry grd rd/brn pcs incr- vfn-fn grn sdy incl, low interstitial por, hrd, grty sdy text. cln carb- friable

LS- gry wht tan, gry xln vfn-fn grn ls dom, sl grn color/stn, grty, friable-hrd xln, well cem whr sdy, calc xln, subchlky, calc crin

LS- gry wht tan grn, predom hrd gry xln, hrd-sft xln, clac





5110 xln, low chlck, incr hrdns, incr sdy slty grys, few gry/grn shly carb, low foss few calc crin

5120 LS- incr gry mtx, fn grn xln, grty, calc, few crin. few sdy slty gry/grn carb pcs, vis grn iclu.

5130 LS- gry off wht grn, predom gry xln fn grn grty carb, hrd, calc xln, subang, few wht calc crin. some sdy slty vfn-fn grn gry-gry/grn carb. mod-well sort.

5140 LS- gry gry/grn, vfn grn, xln, calc xln, grty text, some carb w/ sd slit, med hrdns, sub ang, low foss, fw calc crin

5150 LS- gry gry/grn, xln, vfn grn, grty text, sl sdy slty. CARB/SH- grn/blu, vfn grn, sdy slty, well cem, grty text, grns seen, no foss, some sl shly waxy friable

5160 LS- gry grn, xln, vfn-fn grn, calc, sdy, vis grn incl, friable-non, low foss/crin. shly pcs- drk grn/blu gry, friable, sdy, sl waxy text, few crin. all subang

5170 LS- gry off wht, xln, vfn grn, calc, grty text, sub ang, med hrdns, low foss, some drk gry grn/blu, sdy slty, well cem ls. gry grn/blu grty sdy shly carb, friable, sl grty & waxy text, few calc crin

5180 LS- gry gry grn, fn grn, xln, sl sdy slty, grty text, calc

5190 SH- blk drk gry red, vfn grn, slty sl sdy, grn incl seen, grny text, med/hrd-reds soft, lam seen, carb conc horiz

5200 SH- gry blk, vfn grn, slty sdy, grn incl seen, grty text, lam seen, grn & carb concs.

5210 SH- gry-blk, vfn grn, vry sdy slty, med hrdns, grn incl seen, grty text, irreg-sl fiss frac, rare lam seen

5220 SH- gry blk, vfn grn, slty sdy, sl fissile-blky frac, grty text, sft pcs wxy text, grn incl, fnt lam

5230 SH- gry blk, vfn grn, sdy slty, mstly soft friable, wxy grty text, irreg frac, lam seen- grn/carb conc

5240 SH- lt-drk gry blk, vfn grn, slty sdy, soft-med hrdns, mod cem, grty sl wxy text, lam-grn conc.

5250 SH- gry blk, vfn grn, less sdy, friable, waxy, still grn incl, soft, vfn grn pyr xln, fnt lam seen, crumbly frac

5260 SH- predom drk gry, blk, vfn grn, slty sdy, grn incl, sft-med hrdns, fnt lam

5270 SH- gry blk, vfn grn, sl slty, wxy text, carb lam, low pyr xln, friable-non, gas bub in blk pcs

5280 SH- gry blk brn, vfn grn, sdy slty, grns visbl, sft-hrd, pyr xln, crsr sdy pcs predom brn, hrd, well cem, blky irreg frac. sft pcs gry-blk, wxy, less sdy. good gas show/bubs throughout

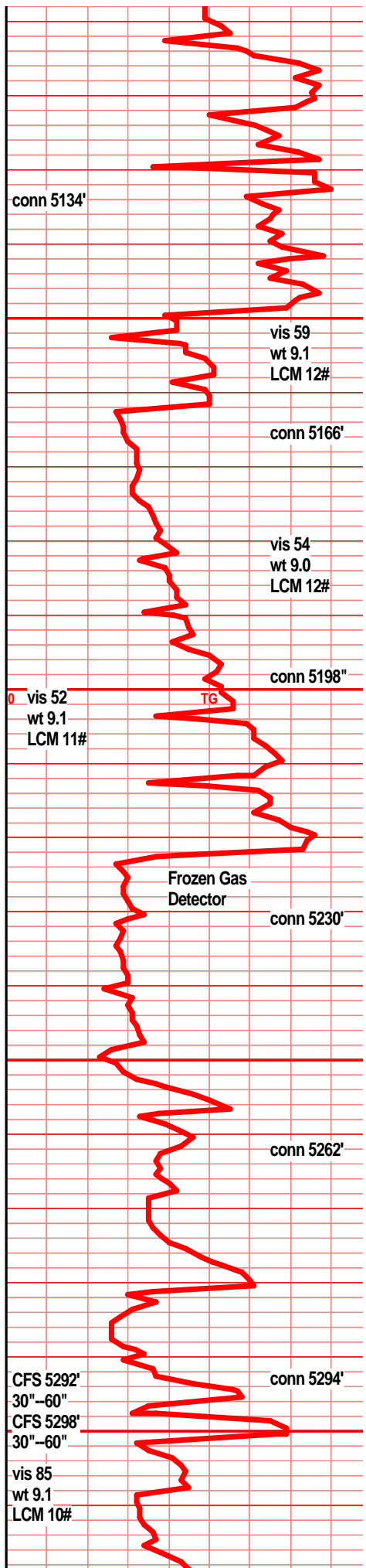
5290 SH- gry blk brn, slty sdy, vfn grn, gas bubs

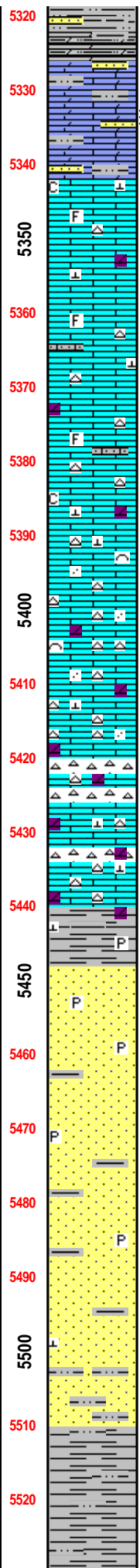
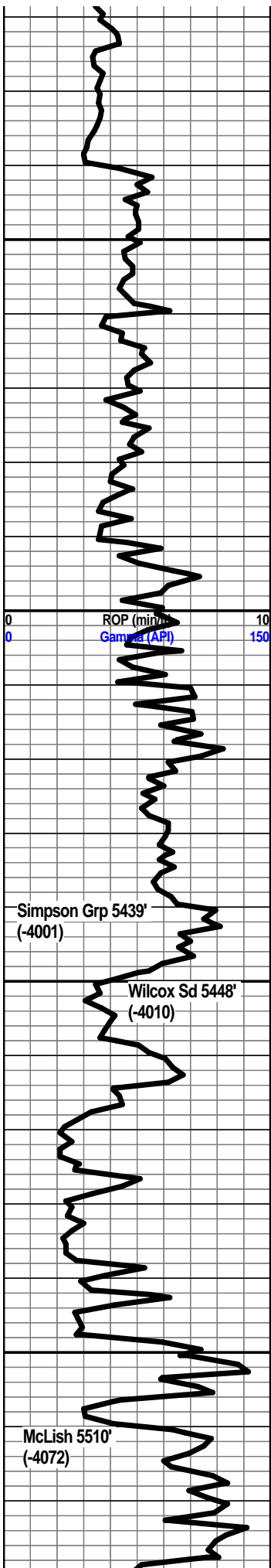
5300 SS- wht, few blk grns-lithics (~5%), med grn, trans qtz dom-wht overall color, sub round, fair interstitial por, cln slit and pepr look, hrd, subrnd grn & pcs, well silica cementatn, well sort, nso, sl odor

5310 SS- 60" few pcs w/ brn stn, pyr xln, vsso
 SS- wht, low blk lith grns, trans qtz, med grn, salt and pepper look, cln no stn, hrd, subrnd grns, well silica cementatn, nso

SH- gry brn, grys sft friable, slty, vis grn incl. brn pcs hrd crsr, sdy, gas bubs

SH- lt-drk gry brn, vfn grn, sl sdy, slty, vfn grn pyr xln, sl fissile, grny text, hrd, vry fnt lam seen, gas bubs





SH- lt gry , crsr, ltr, sdy, grty text, grn incl seen, no lam, sl interstitial por? dolo/sh- red/brn grny, sdy, vis incl, no lam, gas bubs- interstitial por

DOL/LS- gry brn, shly, sdy, vfn grn, grty text. gry sl vfn xln, hrd, dolomitic. brn pcs crsr, more clastic comp, hrd, gas bubs.

DOL/LS- gry dol, hrd xln, vfn grn, grty txt, sdy, blk grn inclu, sub ang. LS- tan wht, xln, vfn grn, calc, few chrts

LS- wht tan gry, vfn xln, vfn grn, chlky, tan brn opaqt chrt, fresh xln calc/chrt faces, calc foss

LS- wht tan, blk flaky grn/lith inclu, sdy pcs, low chrt-lt brn, trans/wht calc xln, few drk gry dolo pcs, grty xln text, calc foss, subang

LS- wht tan gry, vfn grn, xln-hrd, sdy pcs, clac xln, chrt xln & whl pcs-lt brn, blk/brn inc seen, calc foss, grty text, sub chlky-sft, subang

LS- wht tan lt gry, xln, vfn grn, calc xln, sdy, sl dolomitz, grty text, calc foss, sub chlky, incr chrt mtx- lt brn gry, shrp ang, blk grn inclu

LS- gry wht off wht, xln, fn grn, sdy, calc xln, chlky, grty text, friable to hrd xln, low foss- blk linear- curved frags, micro foss frags. CHRT- incr cont, lt brn gry, vfn grn, hrd, tite, drk grn inclu, shrp ang

LS- predom off wht gry, xln ls, sl dolomitization- gry, grty, xln, vfn grn, hrd, sub ang. CHRT- incr cont, lt brn, blk grn inclu, vfn xln, few fn foss frag, shrp ang, hrd

CHRT- gry brn, vfn xln, very hrd & tite, blk grn inclu, rare foss prsvd, shrp fresh faces. LS- gry, dec calc xln, low foss frag, grty text, sl dolomitization.

LS & CHRT- wht gry, calc xln, sl foss, blk grn/foss inclu in LS. CHRT- brn vfn grn, hrd tite, shrp ang, blk grn inclu, calc on chrt xln. sl dolo xln

SH- lt grn, vfn grn, sft waxy text, fissile splintery, very-vfn grn inclu, frac. few pcs sl xln- pyr xln, grty text, irreg fac, calc xln

SS- wht w/ blk grns (~5%), fn grn, qtrz dom, tans grns, wht as sst, mod silica cement, sub rnd grns, well sort, interstitial por, med hrdns, few pcs w/grn shly surface/intergrn cem-hrd well cem.

SS- wht gry, few lt grn suficially, fn-vfn grn, blk lithics, tans qtz pyr xln, grns, sub rnd, incr intergrn shl/clay cont-hrd, well cem, shl/clay & silica cem

SS- wht gry, blk grn/lith inclu, trans qtz grns, fn grn, pyr xln, sub round, mod silica cem, well sort, good por

SS- wht gry, sl incr blk incl cont, trans qtz dom, vfn-fn grn, low pyr xln, mod silica cem, sl hrd where clay/sh in cem matrix, sunrnd-subang, sl shly grn color to few pcs

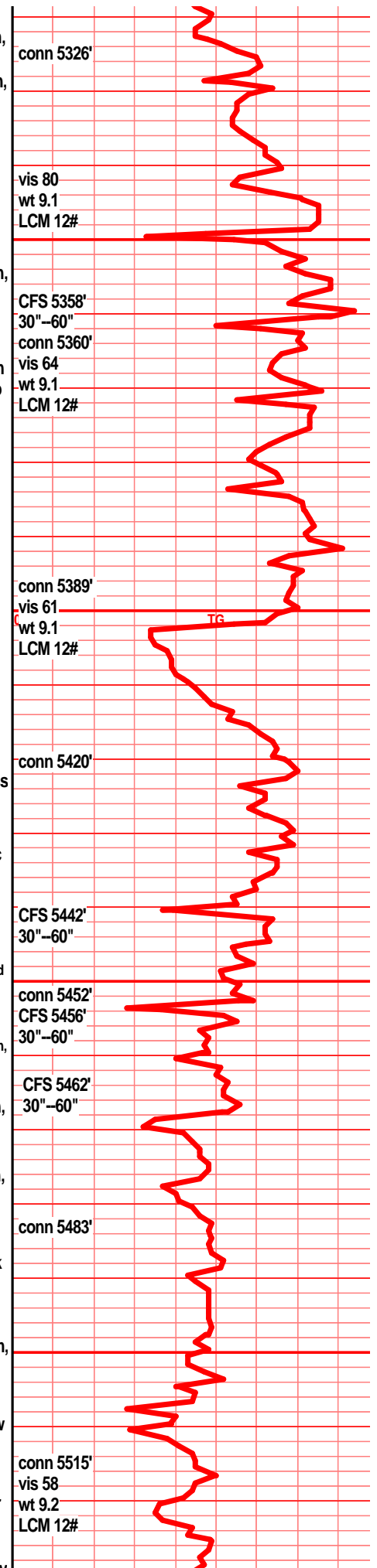
SS- wht gry, sl grn color, vfn-fn grn, trans wht qtz, incr blk grn/lithics, incr shly inter grn material, silica cement, well cement where shly cont, subang-subrnd, mod sort

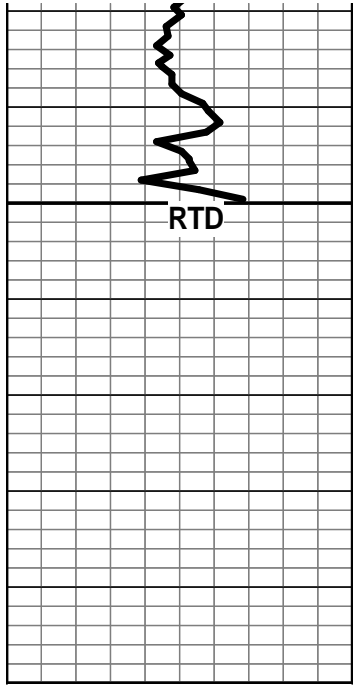
SS- wht-trans qtz rich, blk gr/liths, sl shl/clay inter grn cem, vfn-fine grn silica cem, mod sort, fair intergrb por, friable-non, fnr shlypcs titer/hrdr

SS- lowermost wht/trans grns, clnr, less blk brn (<5%), few gluac

SH- gry grn, vfn grn, soft waxy text, friable, sl slty sdy, pyr xln, fnt lam

SH- gry grn, vfn grn, fnt lam, gns sft friable, sl slty





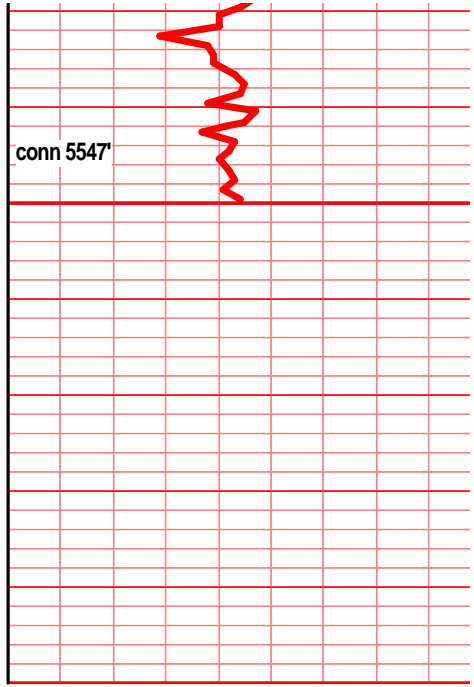
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SH- gry grn grn/blu, vfn grn, int lam. grys sil mat, or silty
sdy, waxy text. grn/blu pcs hrd, tite, shrp splintery fissile
frac.

SH- gry grn grn/blu teal, vfn grn, no slit sd, pyr xln, hrd tite,
fissile splintery frac, fnt lam, shrp edges

RTD: 5550



conn 5547