BLANCO
Geological Services LLC

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

Well Name:	Muskateer 22-32		
Location:	SE/NW Sec 32 T31S R66W		
Licence Number:	05-071-08287-00	Region:	Purgatoire River
Spud Date:	11/09/05	Drilling Completed:	11/13/05
Surface Coordinates:	1550' FNL 2114' FWL		

Bottom Hole Coordinates:

Ground Elevation (ft):	7251'	K.B. Elevation (ft):	7255'
Logged Interval (ft):	790' To: 2330'	Total Depth (ft):	2330'
Formation:	Poison Canyon / Raton / Vermejo		
Type of Drilling Fluid:	Air/Mist		

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OPERATOR

Company: Pioneer Natural Resources USA Inc.
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Denver CO 80202

GEOLOGIST

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Company: BLANCO Geological Services LLC
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Rig

Pense #18

Comments

8 5/8" #24 Surface Casing set to 790'

ROCK TYPES

Anhy	Clyst	Gyp	Mrlst	Shgy
Bent	Coal	Igne	Salt	Sltst
Brec	Congl	Lmst	Shale	Ss
Cht	Dol	Meta	Shcol	Till

ACCESSORIES

MINERAL
- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Brecfrag
- Calc
- Carb
- Chtdk
- Chtlt
- Dol
- Feldspar
- Ferrpel
- Ferr
- Glau
- Gyp
- Hvymin
- Kaol
- Marl
- Minxl
- 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

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

OTHER SYMBOLS

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

SORTING
- Well
- Moderate
- Poor

ROUNDING
- Rounded
- Subrnd
- Subang
- Angular

OIL SHOWS
- Even
- Spotted
- Ques
- Dead

INTERVALS
- Core
- Core run
- Dst

- Srfcsg
- Cv-v
- Cv-c

EVENTS
- Rft
- Sidewall
- Srfcsg

Curve Track 1	Depth	Porosity	Lithology	Geological Descriptions	TG
ROP (min/ft)		24% 18% 12% 6%			TG (units)

0 ROP (min/ft) 1

0 TG 100

Muskateer 22-32

Pense Drilling Rig # 18

Tag Cement @ 720'

750

Blanco Geological Services LLC

Logging Unit Operational @ 08:06 11/10/05

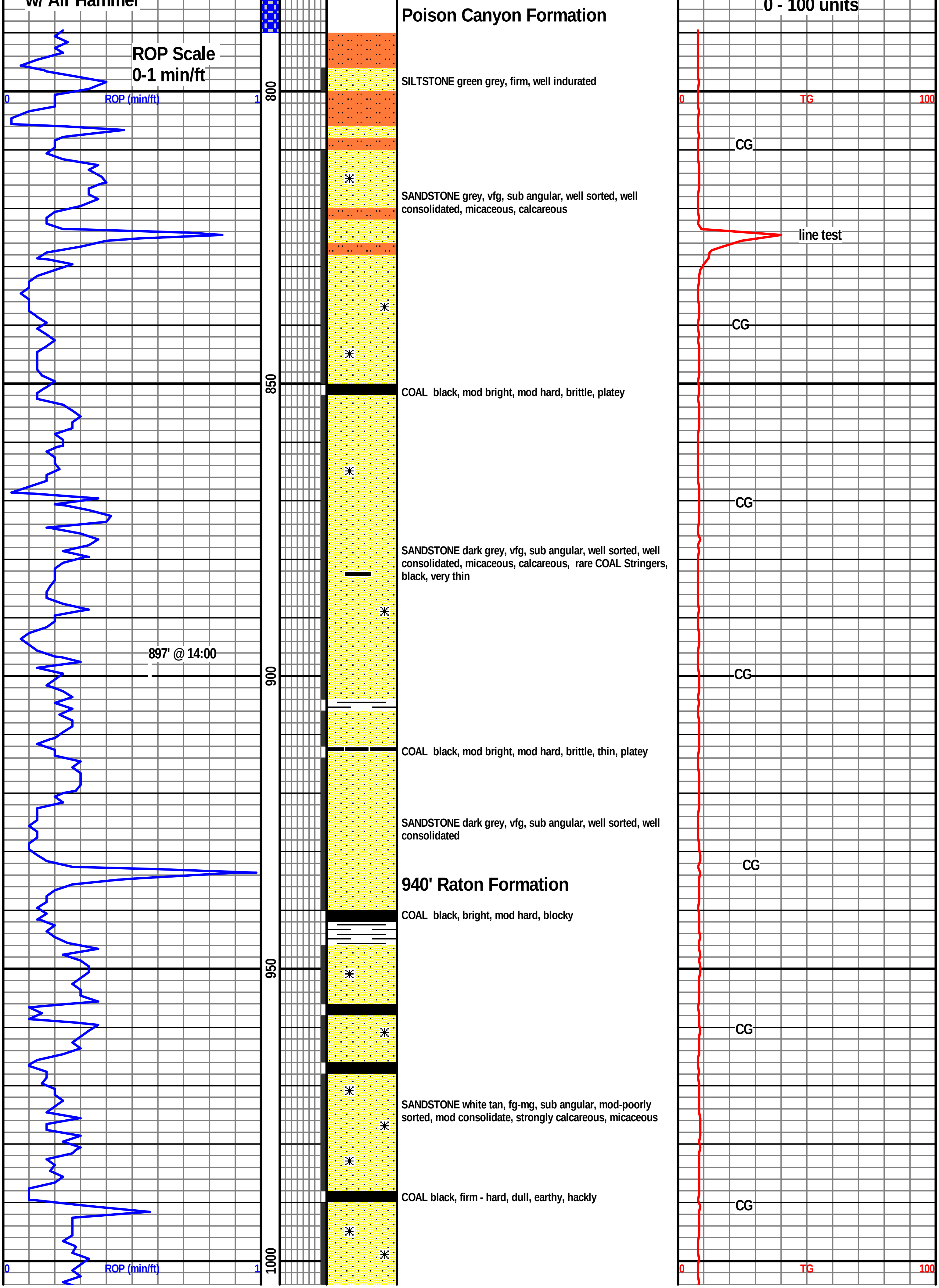
8 5/8" Surface Casing Set @ 790'

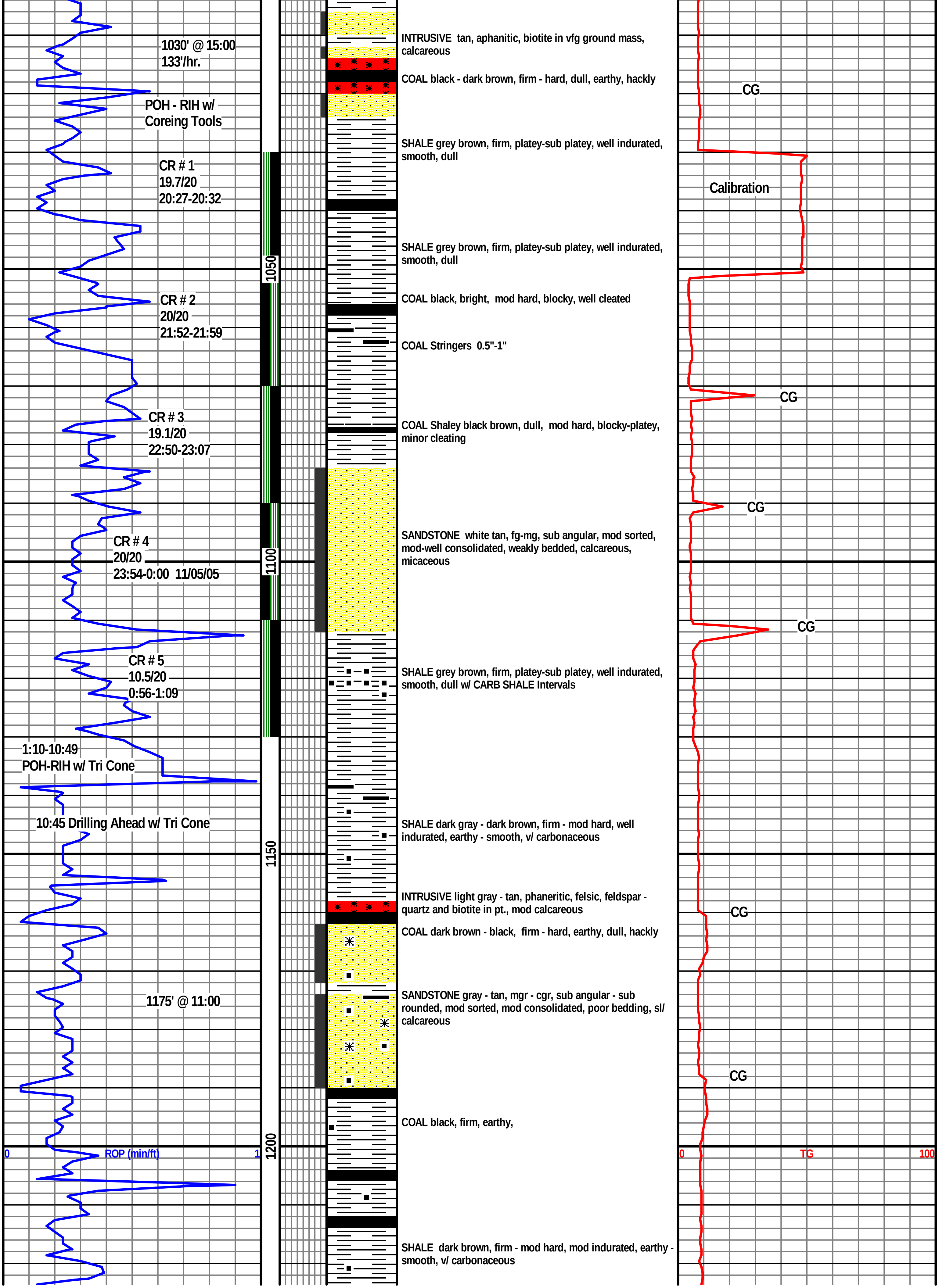
Began Sampling @ 790'

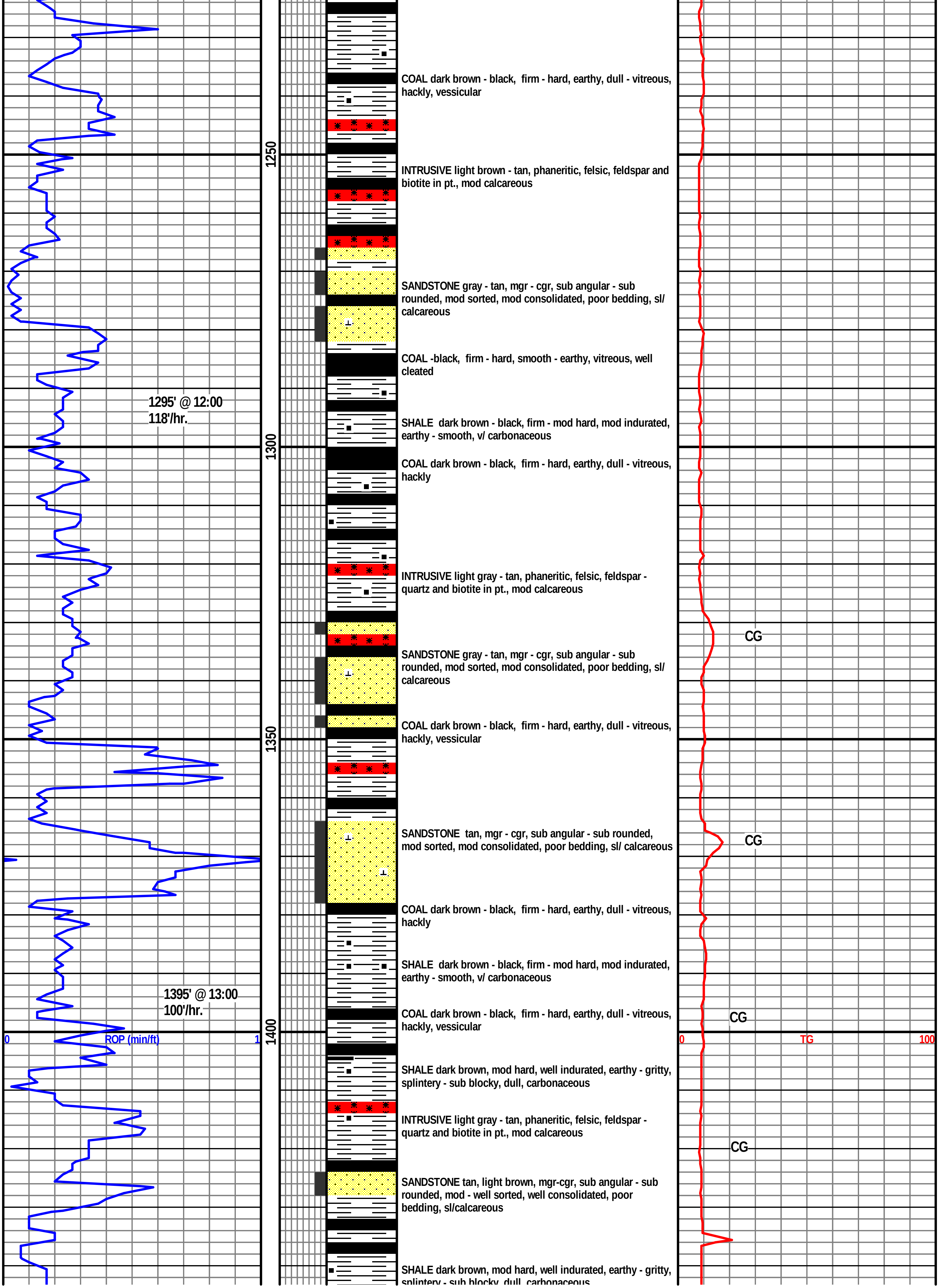
MSI Model TG Total Hydrocarbon CCD/TCD

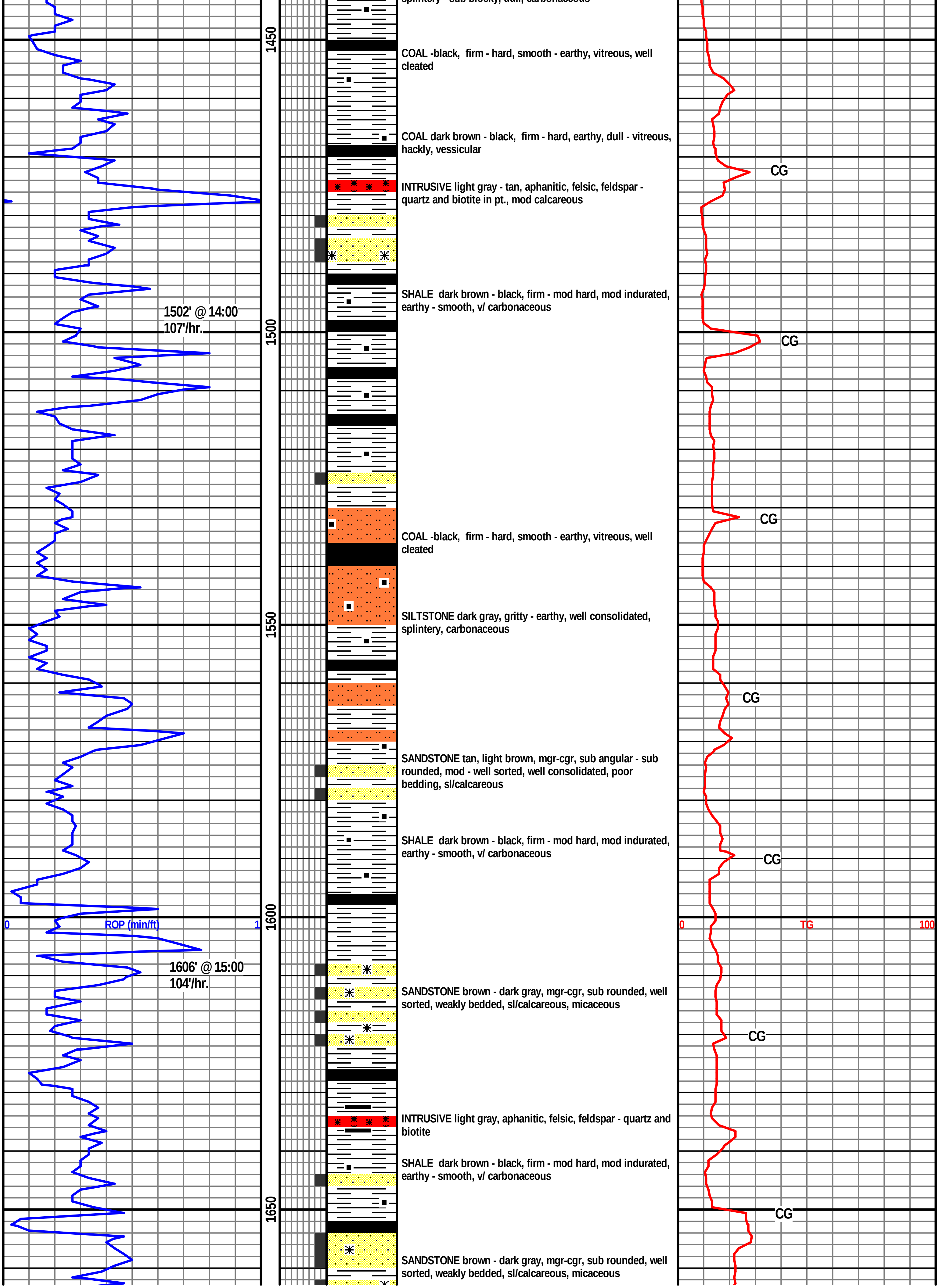
13:11 11/10/2005 Began Drilling Formation from 791' w/ Air Hammer

TG Scale

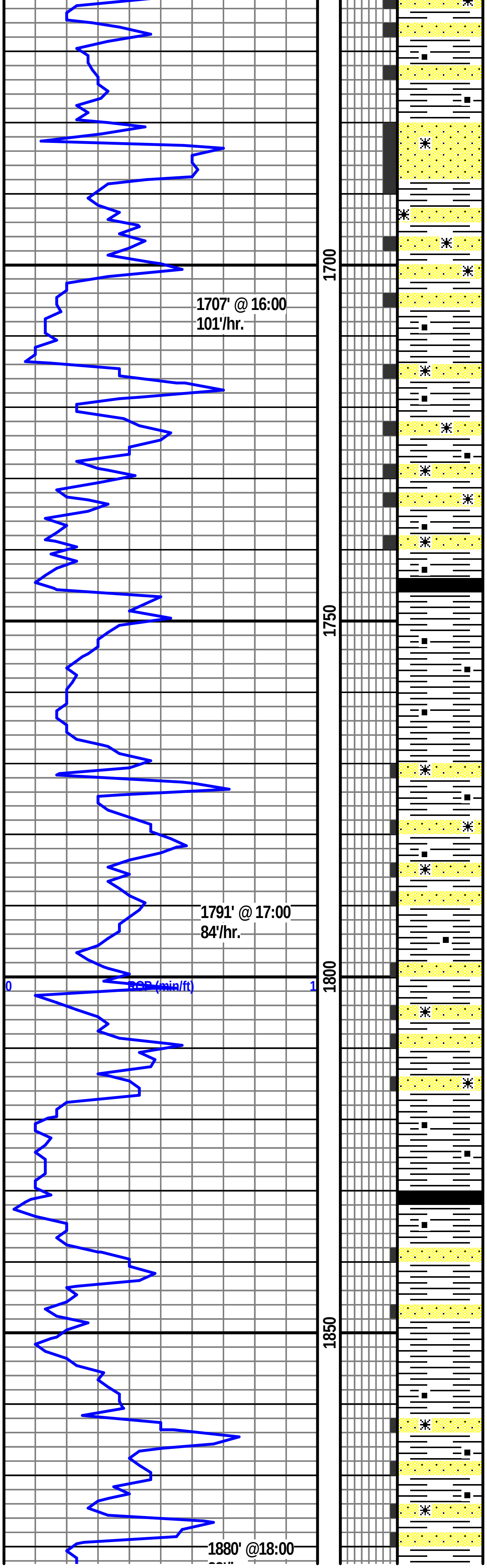

w/ Air Hammer
ROP Scale
0-1 min/ft
0 ROP (min/ft) 1
800
850
900
950
1000
897' @ 14:00
Poison Canyon Formation
SILTSTONE green grey, firm, well indurated
SANDSTONE grey, vfg, sub angular, well sorted, well consolidated, micaceous, calcareous
COAL black, mod bright, mod hard, brittle, platey
SANDSTONE dark grey, vfg, sub angular, well sorted, well consolidated, micaceous, calcareous, rare COAL Stringers, black, very thin
COAL black, mod bright, mod hard, brittle, thin, platey
SANDSTONE dark grey, vfg, sub angular, well sorted, well consolidated
940' Raton Formation
COAL black, bright, mod hard, blocky
SANDSTONE white tan, fg-mg, sub angular, mod-poorly sorted, mod consolidate, strongly calcareous, micaceous
COAL black, firm - hard, dull, earthy, hackly
0 - 100 units
0 TG 100
CG
line test
CG
CG
CG
CG
CG
CG
0 ROP (min/ft) 1
0 TG 100


1030' @ 15:00
133'/hr.
POH - RIH w/
Coreing Tools
CR # 1
19.7/20
20:27-20:32
CR # 2
20/20
21:52-21:59
CR # 3
19.1/20
22:50-23:07
CR # 4
20/20
23:54-0:00 11/05/05
CR # 5
10.5/20
0:56-1:09
1:10-10:49
POH-RIH w/ Tri Cone
10:45 Drilling Ahead w/ Tri Cone
1175' @ 11:00
0
ROP (min/ft)
1
1050
1100
1150
1200
INTRUSIVE tan, aphanitic, biotite in vfg ground mass, calcareous
COAL black - dark brown, firm - hard, dull, earthy, hackly
SHALE grey brown, firm, platey-sub platey, well indurated, smooth, dull
SHALE grey brown, firm, platey-sub platey, well indurated, smooth, dull
COAL black, bright, mod hard, blocky, well cleated
COAL Stringers 0.5"-1"
COAL Shaley black brown, dull, mod hard, blocky-platey, minor cleating
SANDSTONE white tan, fg-mg, sub angular, mod sorted, mod-well consolidated, weakly bedded, calcareous, micaceous
SHALE grey brown, firm, platey-sub platey, well indurated, smooth, dull w/ CARB SHALE Intervals
SHALE dark gray - dark brown, firm - mod hard, well indurated, earthy - smooth, v/ carbonaceous
INTRUSIVE light gray - tan, phaneritic, felsic, feldspar - quartz and biotite in pt., mod calcareous
COAL dark brown - black, firm - hard, earthy, dull, hackly
SANDSTONE gray - tan, mgr - cgr, sub angular - sub rounded, mod sorted, mod consolidated, poor bedding, sl/ calcareous
COAL black, firm, earthy,
SHALE dark brown, firm - mod hard, mod indurated, earthy - smooth, v/ carbonaceous
CG
Calibration
CG
CG
CG
CG
CG
0
TG
100


COAL dark brown - black, firm - hard, earthy, dull - vitreous, hackly, vessicular
1250
INTRUSIVE light brown - tan, phaneritic, felsic, feldspar and biotite in pt., mod calcareous
SANDSTONE gray - tan, mgr - cgr, sub angular - sub rounded, mod sorted, mod consolidated, poor bedding, sl/ calcareous
COAL -black, firm - hard, smooth - earthy, vitreous, well cleated
1295' @ 12:00
118'/hr.
SHALE dark brown - black, firm - mod hard, mod indurated, earthy - smooth, v/ carbonaceous
1300
COAL dark brown - black, firm - hard, earthy, dull - vitreous, hackly
INTRUSIVE light gray - tan, phaneritic, felsic, feldspar - quartz and biotite in pt., mod calcareous
CG
SANDSTONE gray - tan, mgr - cgr, sub angular - sub rounded, mod sorted, mod consolidated, poor bedding, sl/ calcareous
COAL dark brown - black, firm - hard, earthy, dull - vitreous, hackly, vessicular
1350
SANDSTONE tan, mgr - cgr, sub angular - sub rounded, mod sorted, mod consolidated, poor bedding, sl/ calcareous
CG
COAL dark brown - black, firm - hard, earthy, dull - vitreous, hackly
SHALE dark brown - black, firm - mod hard, mod indurated, earthy - smooth, v/ carbonaceous
1395' @ 13:00
100'/hr.
COAL dark brown - black, firm - hard, earthy, dull - vitreous, hackly, vessicular
CG
0
ROP (min/ft)
1
1400
0
TG
100
SHALE dark brown, mod hard, well indurated, earthy - gritty, splintery - sub blocky, dull, carbonaceous
INTRUSIVE light gray - tan, phaneritic, felsic, feldspar - quartz and biotite in pt., mod calcareous
CG
SANDSTONE tan, light brown, mgr-cgr, sub angular - sub rounded, mod - well sorted, well consolidated, poor bedding, sl/calcareous
SHALE dark brown, mod hard, well indurated, earthy - gritty, splintery - sub blocky, dull, carbonaceous



splintery - sub blocky, dull, carbonaceous
1450
COAL -black, firm - hard, smooth - earthy, vitreous, well cleated
COAL dark brown - black, firm - hard, earthy, dull - vitreous, hackly, vessicular
CG
INTRUSIVE light gray - tan, aphanitic, felsic, feldspar - quartz and biotite in pt., mod calcareous
SHALE dark brown - black, firm - mod hard, mod indurated, earthy - smooth, v/ carbonaceous
1502' @ 14:00
107'/hr.
1500
CG
CG
COAL -black, firm - hard, smooth - earthy, vitreous, well cleated
SILTSTONE dark gray, gritty - earthy, well consolidated, splintery, carbonaceous
1550
CG
SANDSTONE tan, light brown, mgr-cgr, sub angular - sub rounded, mod - well sorted, well consolidated, poor bedding, sl/calcareous
SHALE dark brown - black, firm - mod hard, mod indurated, earthy - smooth, v/ carbonaceous
CG
0
ROP (min/ft)
1
1600
0
TG
100
1606' @ 15:00
104'/hr.
SANDSTONE brown - dark gray, mgr-cgr, sub rounded, well sorted, weakly bedded, sl/calcareous, micaceous
CG
INTRUSIVE light gray, aphanitic, felsic, feldspar - quartz and biotite
SHALE dark brown - black, firm - mod hard, mod indurated, earthy - smooth, v/ carbonaceous
1650
CG
SANDSTONE brown - dark gray, mgr-cgr, sub rounded, well sorted, weakly bedded, sl/calcareous, micaceous



SHALE dark brown - black, mod hard, mod indurated, earthy - smooth, v/ carbonaceous

SANDSTONE white - light gray, mgr, sub rounded, mod - well sorted, weakly bedded, mod calcareous, micaceous, some quartz frags

SHALE black, mod hard, mod indurated, earthy - smooth, v/ carbonaceous

SANDSTONE gray, mgr-cgr, sub rounded, mod - well sorted, weakly bedded, mod calcareous, micaceous

COAL -black, firm - hard, smooth - earthy, dull,well cleated

SHALE black, mod hard, mod indurated, earthy - smooth, v/ carbonaceous

SANDSTONE dark gray, mgr, sub rounded, well sorted, weakly bedded, mod calcareous, micaceous

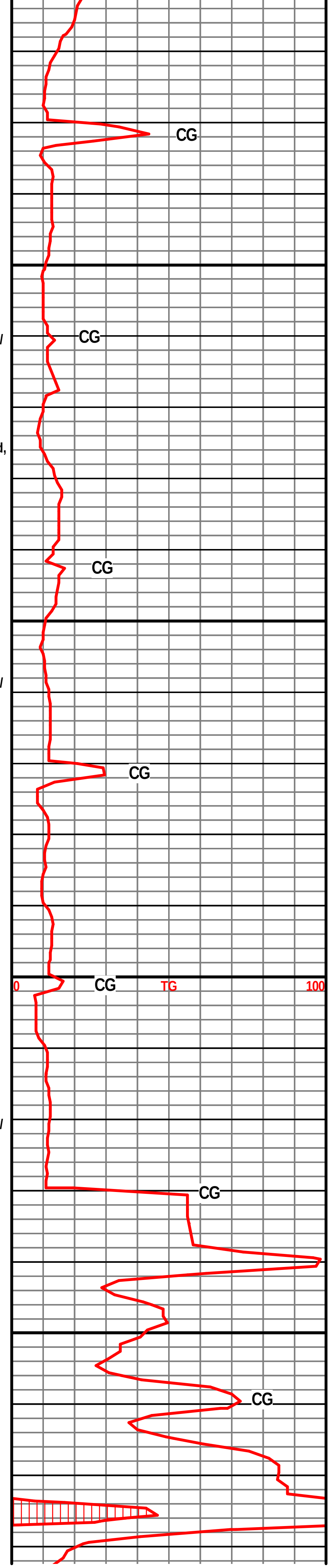
SANDSTONE gray, mgr, sub rounded, well sorted, weakly bedded, mod calcareous, micaceous

SHALE black, mod hard, mod indurated, earthy - smooth, v/ carbonaceous

COAL black, firm - hard, smooth - earthy, dull,well cleated

SHALE dark brown - black, mod hard, mod indurated, earthy - smooth, v/ carbonaceous

SANDSTONE gray, mgr, sub rounded, well sorted, weakly bedded, mod calcareous, micaceous



88'/hr.

1890' Basal Conglomerate

CG

1900

SANDSTONE white - clear, mgr - vcgr, sub rounded - sub angular, poorly sorted, unconsolidated, strongly calcareous, some quartz frags

COAL black, hard, vitreous, well cleated, conchoidal fracture

SANDSTONE white - clear, mgr - vcgr, sub rounded - sub angular, poorly sorted, unconsolidated, strongly calcareous, some quartz frags

CG

COAL black, hard, vitreous, well cleated, conchoidal fracture

1950

CG

1962' @ 19:00
82'/hr.

SANDSTONE white - clear, mgr - vcgr, sub rounded - sub angular, poorly sorted, unconsolidated, strongly calcareous, some quartz frags

POH-RIH w/ Core Tools
19:10 - 3:30 11/12/05

1980' Vermejo Formation

CG 6620 units

CR # 6
19.5/20
3:31-3:47

SHALE dark grey brown, mod hard, firm, mod-well indurated, dull, smooth, SANDSTONE Interbedded

SANDSTONE grey, fg, sub rounded - sub angular, mod-well sorted, well consolidated, calcareous

2000

0 ROP (min/ft) 1

SHALE dark grey, mod hard, firm, well indurated, dull, smooth, rare CaCO3 veinlets, SANDSTONE Interbedded, COAL Stringers 1/8"- 2" black, vitreous, hard, brittle, blocky, cleated, conchoidal fracture

0 CG 2936 units 100

CR # 7
20/20
5:10-5:15

SANDSTONE Stringers

CG 3357 units

COAL 2" black, mod bright, mod hard, brittle, blocky

CR # 8
19.5/20
6:25-6:33

SANDSTONE white grey, fg, sub rounded - sub angular, mod-well sorted, well consolidated, calcareous, SHALE Interbedded

CG 2635 units

2050

SANDSTONE white grey, fg, sub rounded - sub angular, mod-well sorted, well consolidated, calcareous, Interbedded dark organic fragments, COAL Stringers

CR # 9
19.5/20
7:25-7:51

CG 2249 units

CR # 10
20/20
9:17-9:25

SHALE dark grey, mod hard, firm, well indurated, dull, smooth, minor SANDSTONE Stringers

CG 2710 units

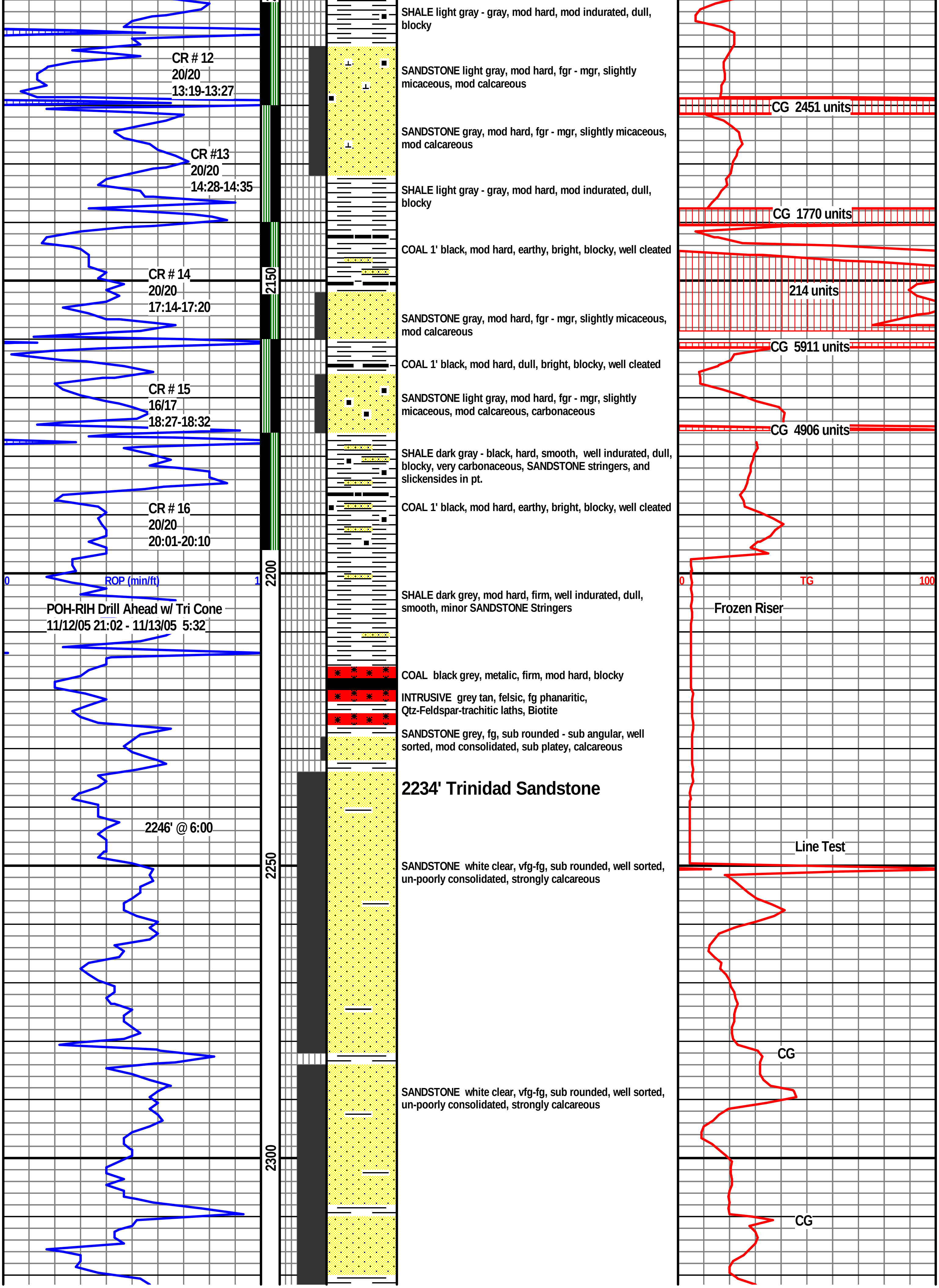
CR # 11
20/20
11:50-11:57

SHALE dark gray, firm - hard, mod indurated, dull, blocky, with SANDSTONE white - light gray with vertical calcite fractures

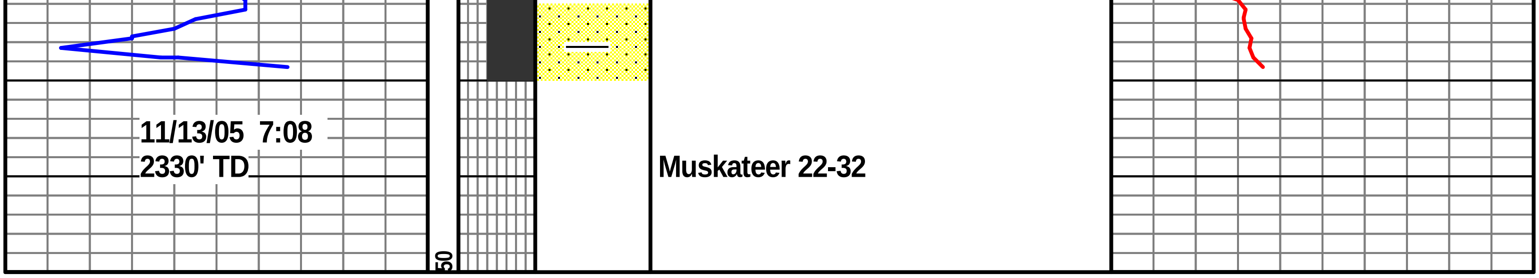
COAL black, mod hard, smooth - earthy, dull-mod bright, blocky

2100

CG 3957 units



SHALE light gray - gray, mod hard, mod indurated, dull, blocky
CR # 12
20/20
13:19-13:27
SANDSTONE light gray, mod hard, fgr - mgr, slightly micaceous, mod calcareous
CG 2451 units
SANDSTONE gray, mod hard, fgr - mgr, slightly micaceous, mod calcareous
CR #13
20/20
14:28-14:35
SHALE light gray - gray, mod hard, mod indurated, dull, blocky
CG 1770 units
COAL 1' black, mod hard, earthy, bright, blocky, well cleated
CR # 14
20/20
17:14-17:20
2150
214 units
SANDSTONE gray, mod hard, fgr - mgr, slightly micaceous, mod calcareous
CG 5911 units
COAL 1' black, mod hard, dull, bright, blocky, well cleated
CR # 15
16/17
18:27-18:32
SANDSTONE light gray, mod hard, fgr - mgr, slightly micaceous, mod calcareous, carbonaceous
CG 4906 units
SHALE dark gray - black, hard, smooth, well indurated, dull, blocky, very carbonaceous, SANDSTONE stringers, and slickensides in pt.
CR # 16
20/20
20:01-20:10
COAL 1' black, mod hard, earthy, bright, blocky, well cleated
2200
0
ROP (min/ft)
1
0
TG
100
POH-RIH Drill Ahead w/ Tri Cone
11/12/05 21:02 - 11/13/05 5:32
SHALE dark grey, mod hard, firm, well indurated, dull, smooth, minor SANDSTONE Stringers
Frozen Riser
COAL black grey, metalic, firm, mod hard, blocky
INTRUSIVE grey tan, felsic, fg phanaritic, Qtz-Feldspar-trachitic laths, Biotite
SANDSTONE grey, fg, sub rounded - sub angular, well sorted, mod consolidated, sub platey, calcareous
2234' Trinidad Sandstone
2246' @ 6:00
Line Test
2250
SANDSTONE white clear, vfg-fg, sub rounded, well sorted, un-poorly consolidated, strongly calcareous
CG
SANDSTONE white clear, vfg-fg, sub rounded, well sorted, un-poorly consolidated, strongly calcareous
2300
CG


11/13/05 7:08
2330' TD
50
Muskateer 22-32