ROCKY MOUNTAIN GEO-ENGINEERING CORP.
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(970) 243-3044

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OPERATOR:	NW NATURAL GAS
WELL:	IW23a-22-65
LOCATION:	SECTION 22, T6N, R5W
COUNTY:	COLUMBIA
STATE:	OREGON
SPOT:	2281'N & 1924'E OF SW 1/4
ELEVATION:	GL 580.9' KB 596.9'
FIELD:	CALVIN CREEK GAS STORAGE FIELD

SPUD DATE:	9/19/97
TD DATE:	10/3/97
DATES LOGGED:	9/19/97 - 10/3/97
DEPTHS LOGGED:	20' - 2298'
LOGGERS:	ED PERRY, ERIC HELLER
DRILLING FLUID:	LOW SOLIDS POLYMER
DRILLING RIG:	TAYLOR RIG #4

LOG TYPE: MUD LOG

SCALE: 1:240 (5.0 INCH/100 FT)

REMARKS:

LITHOLOGIES

- ▨ SANDSTONE
- ▨ GRAY SHALE
- ▨ UNABLE TO INTERPRET
- ▨ DOLOMITE
- ▨ DOLOMITIC GRAINSTONE
- ▨ GRANITE
- ▨ LIME PACKSTONE
- ▨ DOLOMITIC LIMESTONE
- ▨ SHALY SANDSTONE
- ▨ SILTY SHALE
- ▨ DULL COAL
- ▨ ARGILLACEOUS DOLOMITE
- ▨ DOLOMITIC MUDSTONE
- ▨ GYPSUM
- ▨ LIME WACKESTONE
- ▨ MARL
- ▨ CLAYSTONE
- ▨ SILTSTONE
- ▨ INTERMEDIATE COAL
- ▨ CALCAREOUS DOLOMITE
- ▨ DOLOMITIC PACKSTONE
- ▨ LIME BOUNDSTONE
- ▨ TUFF
- ▨ DOLOMITIC MARL
- ▨ SHALE
- ▨ SHALY SILTSTONE
- ▨ NON COAL
- ▨ CRYSTALLINE DOLOMITE
- ▨ DOLOMITIC WACKESTONE
- ▨ LIME GRAINSTONE
- ▨ ARGILLACEOUS LIMESTONE
- ▨ METAMORPHIC
- ▨ WELDED TUFF
- ☒ NO SAMPLE
- ▨ CONGLOMERATE
- ▨ DOLOMITIC BOUNDSTONE
- ▨ GLACIAL TILL
- ▨ LIME MUDSTONE
- ▨ CRYSTALLINE LIMESTONE
- ▨ SALT

▨	ANHYDRITE
≋	BENTONITE
▩	BRECCIA
▤	BLACK SHALE
▦	CHALK
▤	COALY SHALE
▥	COLORED SHALE
△	CHERT
▲	DARK CHERT
▒	ALLUVIUM
▨	COLORED CLAYSTONE
■	COAL
▩	CARBONACEOUS SHALE
▧	VOLCANICS
■	BRIGHT COAL
▧	GRAY CLAYSTONE
▦	LIMESTONE

MODIFIERS

Ⅲ	AHYDRITE STRINGERS
⌓	ALGAE, LAMINATED
⌒	ALGAE, NON-DESCRIPT
⩚	ALGAE, OOTOID
⌒	ALGAE, SKELETAL
⌶	AMPHIPORA
//	ANHYDRITIC
▬	ARGILLACEOUS
/	ARGILLITE GRAIN
⊳	BELEMNITE
B	BENTONITE
⌒	BIOCLAST/FRAGMENTAL
♢	BRACHIOPOD
⟡	BRECCIA
ϒ	BRYOZOA
⊥	CALCAREOUS
■	CARBONACEOUS FLAKES
◣	CEMENTING BITUMENOUS
G	CEPHALOPOD
▲	CHERT, DARK
△	CHERT, LIGHT
⊠	CHERT, TRIPOLITIC
▬	COAL
↰	CORAL
⊙	CRINOID
✳	CRYSTALS
Ⅱ	DOLOMITE STRINGERS
∠	DOLOMITIC
♡	ECHINOID
+	FELDSPAR
⅃	FERRUGINOUS
●	FERRUGINOUS GRAINS
Ⅱ	FERRUGINOUS STRINGERS
∝	FISH REMAINS
∞	FORAMINIFERA
F	FOSSILS
≷	FRACTURES
△	GASTROPOD
∿	GLAUCONITE
\\	GYPSIFEROUS
Ⅲ	GYPSUM STRINGERS
◼	HEAVY/DARK MINERALS
Y	INTRACLASTS
K	KAOLIN
Ⅱ	LIMESTONE STRINGERS
L	LIMONITE
Π	MARLSTONE, CALCAREOUS
π	MARLSTONE, DOLOMITIC
◡	MICACEOUS
⊖	NODULES
ϕ	OOLITES
⊙	OSTRACOD
⦵	PEBBLES
▽	PELECYPOD
ø	PELLETS
●●	PHOSPHATE PELLETS
⊶	PISOLITE
◊	PLANT REMAINS
P	PYRITE
⊞	SALT CAST/INFILL
○	SAND GRAINS
⊡	SANDSTONE STRINGERS
▞	SANDY
♁	SCAPHOPOD
—	SHALE LAMINAE
Λ	SILICEOUS
⊡	SILTSTONE STRINGERS
▪▪	SILTY
⦚	SLICKENSLIDE
S	SPORES
Ⅲ	STROMATOPOROID
Ϻ	STYLOLITE
V	TUFFACEOUS

POROSITY/SORTING/ROUNDNESS SYMBOLS

X	INTERCRYSTALINE INTERGRANULAR
V	VUGGY
F	FRACTURE
ϕ	INTEROOLITIC
P	PINPOINT
ʃ	ORGANIC
O	MOLDIC
e	EARTHY
□	FENESTRAL
A	ANGULAR
a	SUBANGULAR
R	ROUNDED
r	SUBROUNDED
W	WELL
M	MEDIUM
P	POOR

ENGINEERING SYMBOLS

♣	BIT CHANGE
^	LOST CIRCULATION
◢	CASING
◣	CASING
◀	SIDEWALL CORE
▶	SIDEWALL CORE
▷	WIRELINE TEST
◁	WIRELINE TEST
↟	GAS TO SURFACE
▼	OIL TO SURFACE
▽	WATER TO SURFACE
●	EVEN STAINING
◑	SPOTTED STAINING
D	DEAD OIL
○	QUESTIONABLE
•	OIL SHOW
☼	GAS SHOW
✸	OIL AND GAS SHOW
CG	CONNECTION GAS
TG	TRIP GAS
⊘	MIDNIGHT DEPTH
⊘	MIDNIGHT DEPTH
▭	CONNECTION
–	OFF BOTTOM
⫽	NORMAL FAULT
⫽	REVERSE FAULT
↵	OVERTURNED STRATA

▨	CORE RECOVERED
▦	CORE LOST
☐	DST INTERVAL
▒	ROTATING
▥	SLIDING
▦	CANISTER

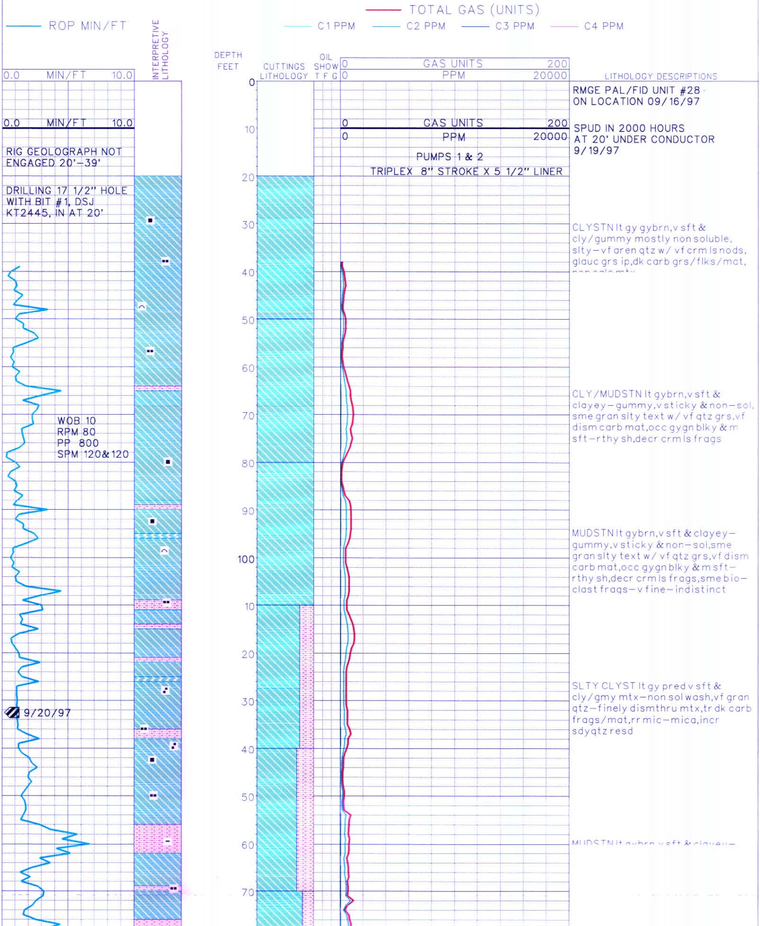
ABBREVIATIONS

CB – CORE BIT
CG – CONNECTION GAS
CO – CIRCULATE OUT
SPM – STROKES/MIN

DST – DRILL STEM TEST
DTG – DOWNTIME GAS
LAT – LOGGED AFTER TRIP
TG – TRIP GAS

NR – NO RETURNS
NS – NO SAMPLE
PP – PUMP PRESSURE
WOB – WEIGHT ON BIT

RPM – REVOLUTIONS/MIN
RR – RE-RUN
SLM – STEEL LINE MEASURE



RMGE PAL/FID UNIT #28
ON LOCATION 09/16/97

SPUD IN 2000 HOURS
AT 20' UNDER CONDUCTOR
9/19/97

RIG GEOLOGRAPH NOT
ENGAGED 20'–39'

PUMPS 1 & 2
TRIPLEX 8" STROKE X 5 1/2" LINER

DRILLING 17 1/2" HOLE
WITH BIT #1, DSJ
KT2445, IN AT 20'

CLYSTN lt gy gybrn,v sft & cly/gummy mostly non soluble, slty–vf aren qtz w/ vf crm ls nods, glauc grs ip,dk carb grs/flks/mat,

CLY/MUDSTN lt gybrn,v sft & clayey–gummy,v sticky & non–sol, sme gran slty text w/ vf qtz grs,vf dism carb mat,occ gygn blky & m sft–rthy sh,decr crm ls frags

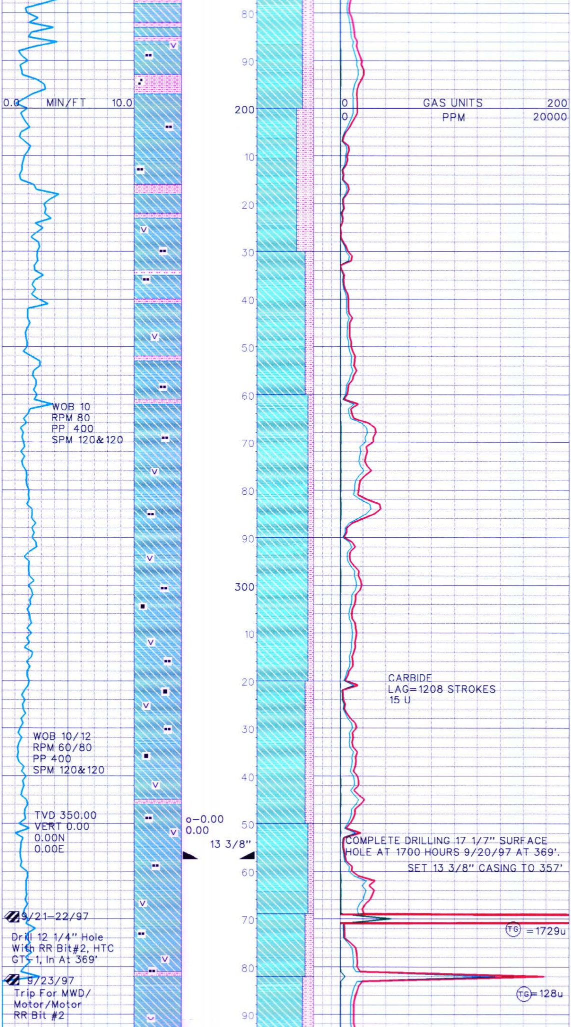
WOB 10
RPM 80
PP 800
SPM 120&120

MUDSTN lt gybrn,v sft & clayey–gummy,v sticky & non–sol,sme gran slty text w/ vf qtz grs,vf dism carb mat,occ gygn blky & m sft–rthy sh,decr crm ls frags,sme bio–clast frags–v fine–indistinct

SLTY CLYST lt gy pred v sft & cly/gmy mtx–non sol wash,vf gran qtz–finely dismthru mtx,tr dk carb frags/mat,rr mic–mica,incr sdyqtz resd

9/20/97

MUDSTN lt gybrn,v sft & clayey–



WOB 10
RPM 80
PP 400
SPM 120&120

CARBIDE
LAG=1208 STROKES
15 U

WOB 10/12
RPM 60/80
PP 400
SPM 120&120

TVD 350.00
VERT 0.00
0.00N
0.00E

o–0.00
0.00

13 3/8"

COMPLETE DRILLING 17 1/7" SURFACE
HOLE AT 1700 HOURS 9/20/97 AT 369'.
SET 13 3/8" CASING TO 357'

TG =1729u

9/21–22/97

Drill 12 1/4" Hole
With RR Bit#2, HTC
GT-1, In At 369'

9/23/97
Trip For MWD/
Motor/Motor
RR Bit #2

TG=128u

SLTYSH/CLAY lt gybrn,yel frags,vf gran & slty text in v sft & cly–gmy mtx,sme v fine qtz ss resd,pos yel tuffaceous mat,scat – abnt org/carb debris

MUDSTN/CLY lt gy v sft & cly/gmy mtx–non sol wash,vf gran qtz–finely dismthru mtx,scat – abnt dk carb–organic mat,dul yel tuffaceous frags ip

MUDSTN lt gybrn,v sft & clayey–gummy,v sticky & non–sol,sme gran slty text w/ vf qtz grs,vf dism carb mat,occ gygn blky & m sft–rthy sh,poss v sml dul yel tuffaceous mat

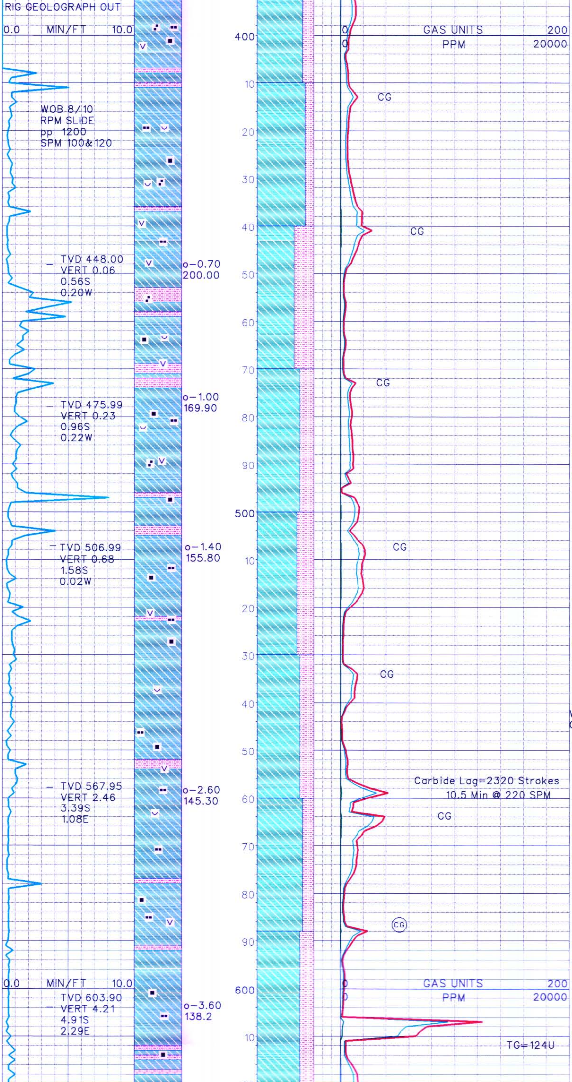
MUDSTN/CLY lt gy v sft & cly/gmy mtx–non sol wash,vf gran qtz–finely dismthru mtx,scat – abnt dk carb–organic mat,dul yel tuffaceous frags ip

MUDSTN lt gybrn,v sft & clayey–gummy,v sticky & non–sol,sme gran slty text w/ vf qtz grs,comm carb mat,tr gygn blky & m sft sh,sml dul yel tuffaceous mat

MUDSTN lt gybrn,v sft & clayey–gummy,v sticky & non–sol,sme gran slty text w/ vf qtz grs,comm–abnt carb mat,tr gygn blky & m sft sh,sml dul yel tuffaceous mat

MUDSTN lt gybrn,v sft & clayey–gummy,v sticky & non–sol,sme gran slty text w/ vf qtz grs,sme carb mat,tr gygn blky & m sft sh,sml dul yel tuffaceous mat

SLTY MUDSTN gy & lt gybrn,pred v sft & cly/gummy mtx–abmt washed from sample,slty/sdy gran



qtz resd,scat anhed ang qtz frags, vf sdy qtz slt ip,incr vf mica,sme dul yel tuff mat,tr felds,non-calc

CLY/MUDSTN lt gybrn,v sft & clayey-gummy,v sticky & non-sol, sme gran slty text w/ vf qtz grs,vf dism carb mat,occ gygn blky & m sft-rthy sh,decr crm ls frags,tuff mat ip

SLTY MUDSTN lt brn mot lt gybrn,v sft clayey-gummy w/ abnt smpl washed out,resd is pt vf sdy/slty qtz,scat-abnt biot incr dk org/lig mat,tuffaceous mat ip,rr micropyr, tr feld

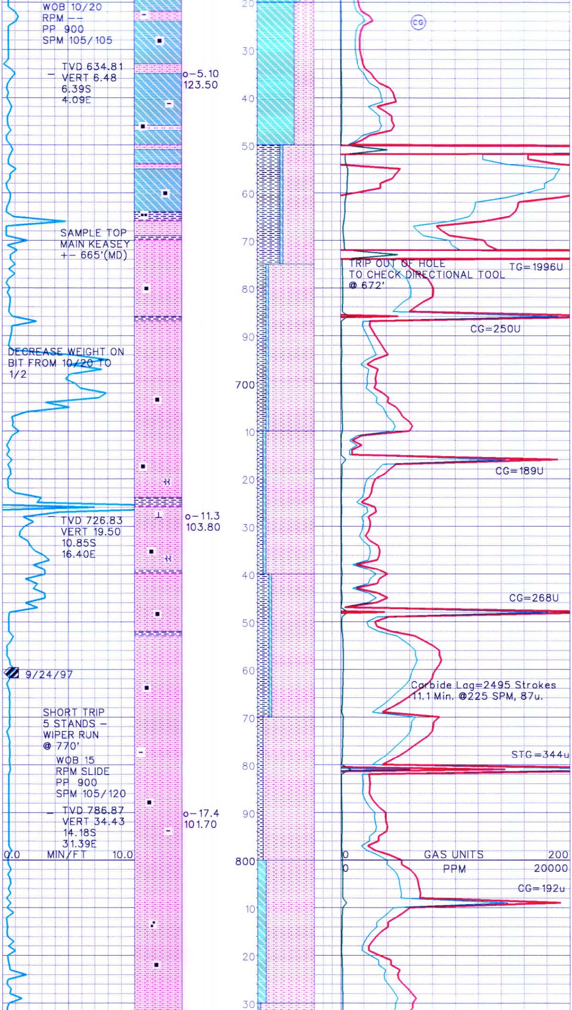
SLTY MUDSTN gy & lt gybrn,pred v sft & cly/gummy mtx-abmt washed from sample,slty/sdy gran qtz resd,scat anhed ang qtz frags, vf sdy qtz slt ip,incr vf mica,sme dul yel tuff mat,tr felds,non-calc

CLY/MUDSTN lt gybrn,v sft & clayey-gummy,v sticky & non-sol, sme gran slty text w/ vf qtz grs,vf dism carb mat,occ gygn blky & m sft-rthy sh,decr crm ls frags,tuff mat ip

Wt=8.9 Vis=43 Wl=4.8 pH=9.0
Cl=500 Ca=40 Sol=4.2 Ck=2/32

SLTY MUDSTN brn mot gy ip,pred cly mtx-v sft to clayey-gummy & abnt mat washed from sample,pred resd is vf sdy qtz sltst,abnt mica & sme dk carb mat in thn laminations,rr ang-glasy qtz,decr tuff incl,rr micropyr,rr sdy

SHSLTN ltbn mgy mot,cly to vf slt grns occ c slt grns,cly mtx,v fri to firm,subrnd,med srt,arg,lams in mtx,tr mica,non calc,rr sdy,tr tuff incl



CLY/SHSLSTN brn gy mot,cly to vf slt grns,vw srt,vf sft/fri occ frm,tr carb frags and lams,rr mica,non-vsl calc

SH dkbn blk,soft to mod firm,pred plty w/ blky,scat micropyr,tr mica, grd to sltstn

POSSIBLE SWAB GAS

Wt=8.9 Vis=40 Wl=6.4 pH=9.0
Cl=650 Ca=60 Sol=4.2 Ck=2/32

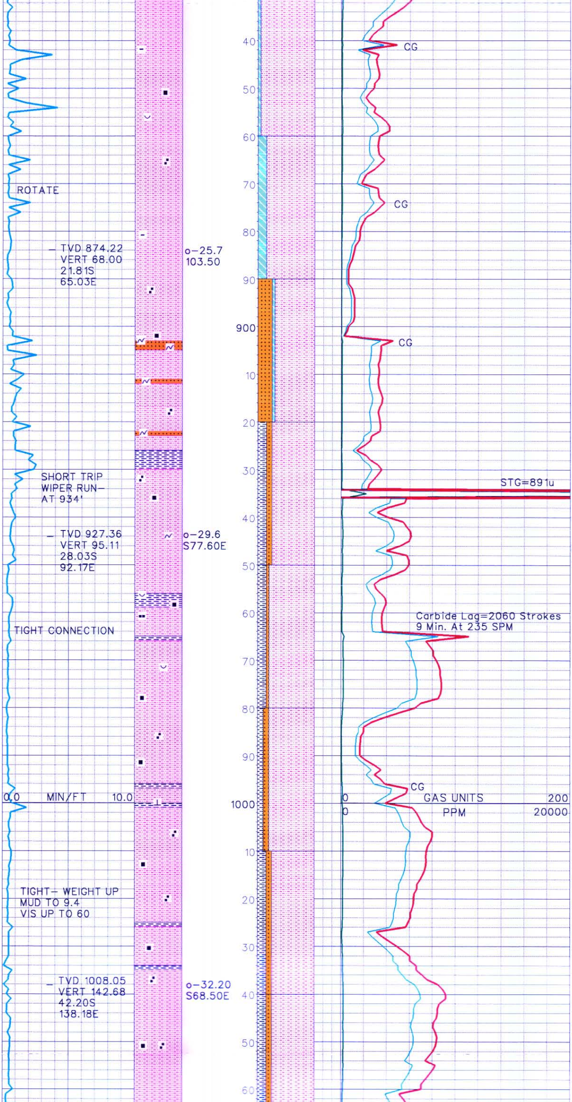
SHSLTSTN m-dkgy occ mbn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sndy,v sft sl frm ip,carb frgs and lams,rr micropyr

SHSLTSTN m-dkgy occ mbn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sndy,v sft sl frm ip,carb frgs and lams,rr micropyr,fracs infilled w/calcite,pred non-calc,v calc ip

SHSLTSTN evn dkgy,occ mot brn, pred slty qtz grns,sft-sl frm,carb frags and lams,tr mica,scat micropyr,pred non calc,occ sl-v calc

SHSLTSTN m-dkgy occ mbn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sndy,v sft sl frm ip,carb frgs and lams,rr micropyr,fracs infilled w/calcite,pred non-calc,v calc ip

SHSLTSTN m gy thru,blky,finely gran,scat vfine dism carb flks/lams, micmica ip,feld fld v thn fracs,sme sl calc incl,sl sdy ip,rr tuffaceous mat,grdg sh/mudstn ip



SHSLTSTN m−gy occ mbn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sdy,v sft sl frm ip,carb frgs and lams,fracs infilled w/calc,pred non−calc

SHSLTSTN m−gy occ mbn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sndy,v sft sl frm ip,carb frgs, rr micropyr,fracs infilled w/calcite, pred non−calc tr bf shaley ls,tr glauc grs

Wt=8.8 Vis=45 Wl=4.4 pH=9.0
Cl=850 Ca=100 Sol=3.4 Ck=2/32

GLAUC SS op & offwh vf−f ss w/ abnt glauc grs thru− sme c gr lse frags,ang qtz tt grain supported clstrs,sme dk org/lig mottled laminations,grading to aren sltst− sme m calc,sme chlorite,pos bas, volcaniclastics?

SLTST lt−incr dk gy,blky m frm incr calc ip,pt slate gy & org− nodules & frags,tr glauc f gr ss− carb grs ip,tr tan−crm micxl ls,rr glasy−ang qtz frags

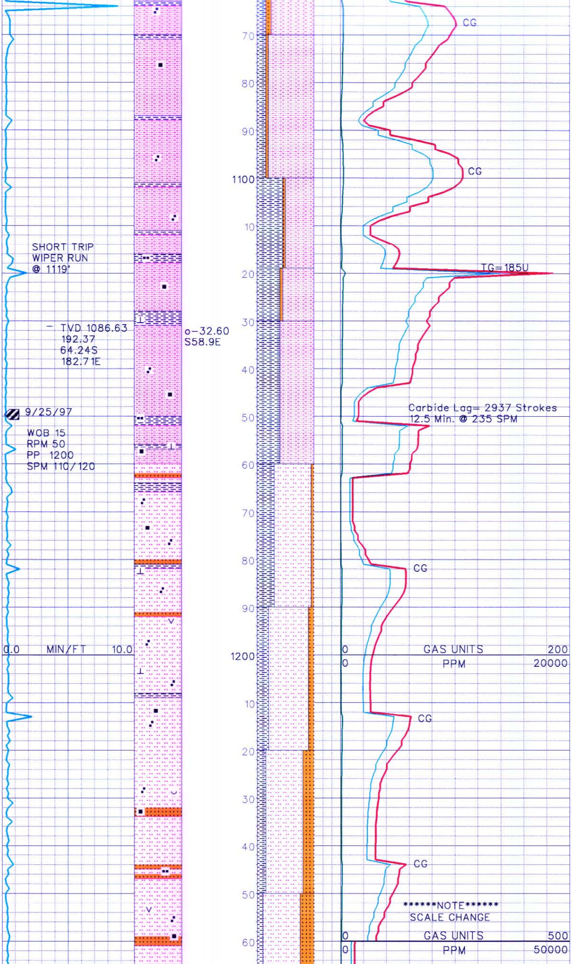
NOTE: INCREASING CAVINGS
APPROX. 1/4" DIAMETER

SHALE dk gy slate,sbblky−plty,dns m frm,carb lam ip blk−blky carb/coaly frags,evenly micmica, gran−slty ip,sbfis−thnly varved ip, sl calc ip

SHSLTSTN m−gy occ bn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sdy,v sft sl frm ip,carb frgs and lams,fracs infilled w/calc,pred sl−non calc

SHSLTSTN m−dk gy occ bn,mot ip, pred slty grns,occ cly,pred qtz grns, v sft−sl firm ip,grd to vf snd ip,scat carb frgs and lams,scat fracs infilled w/calc,pred non−calc,tr calc cem ip

SHSLTSTN m−dk gy occ bn,mot ip, pred slty grns,occ cly,pred qtz grns, v sft−sl firm ip,grd to vf snd ip,scat carb frgs and lams,scat fracs infilled w/calc,pred non−calc,tr calc cem ip



SHSLTSTN m–dk gy occ bn,mot ip, pred slty grns,occ cly,pred qtz grns, v sft–sl firm ip,grd to vf snd ip,scat carb frgs and lams,scat fracs infilled w/calc,pred non–calc,tr calc cem ip,scat ss frags–volcaniclastic?

SH dk gy–blk,occ dk bn,pred plty/blky,v sft,micmica,scat micpyr (rr lams?),tr carb frags occ lams,sl–non calc,grd to sltstn ip

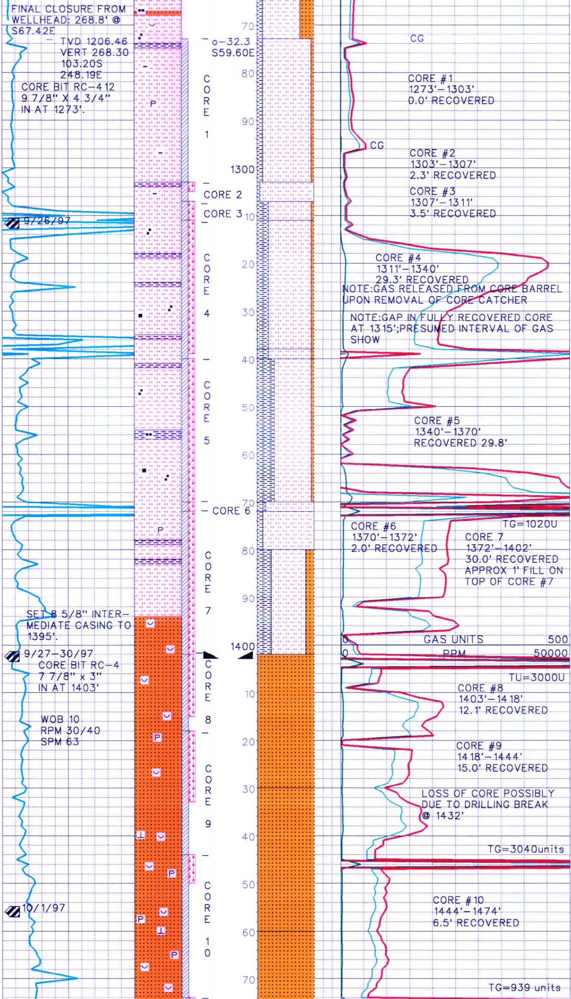
SHSLTSTN m–dk gy occ bn,mot ip, pred slty grns,occ cly,pred qtz grns, v sft–sl firm ip,grd to vf snd ip,scat carb frgs and lams,pred non–calc,tr calc cmt & frac fill ip

SDYSLTST gy mot op lt gy brn,vf aren ss– pred qtz,scat carb/lig nodules & lam,scat biot,sme tuffaceous mat,pred sltst,sme cly infill,sl calc

SHSLTSTN m–gy occ mbn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sndy,v sft sl frm ip,carb frgs, rr micropyr,fracs infilled w/calcite, pred non–calc tr bf shaley ls,tr glauc grs

SS op off wh s&p sme vcol grs,pred vf gr & grdg sltst,pt ang qtz grs mica & scat–abnt dk carb grs,sme vf tuff mat ip,occ glauc grs,sl calc, sme cly infil

SH dk gy–slate dk bn,pred plty/blky, v sft,micmica,scat micpyr (rr lams?),tr carb frags occ lams,sl–non calc,grd to sltstn ip,pt s&p w/ dk carb/lig grs



FINAL CLOSURE FROM WELLHEAD: 268.8' @ S67.42E

TVD 1206.46
VERT 268.30
103.20S
248.19E

o–32.3
S59.60E

CORE BIT RC–4 12
9 7/8" X 4 3/4"
IN AT 1273'.

Wt=9.5 Vis=87 Wl=4.6 pH=9.0
Cl=900 Ca=40 S0l=8 Ck=2/32

CORE #1
1273'–1303'
0.0' RECOVERED

SLTSTN m–dk gy,s&p ip,v sft–nonconsolidated,cly ip tr micmica, scat micpyr/ pyr clstrs,scat carb frags,sl calc,arg,grd to SH ip

CORE #2
1303'–1307'
2.3' RECOVERED

SHSLTSTN m–gy occ mbn,mot ip, pred slty grns occ cly,pred qtz grns, occ vf sndy,v sft sl frm ip,carb frgs, rr micropyr,fracs infilled w/calcite, pred non–calc tr bf shaley ls,occ op/wh f gr SS clstrs

CORE #3
1307'–1311'
3.5' RECOVERED

9/26/97

CORE #4
1311'–1340'
29.3' RECOVERED

NOTE:GAS RELEASED FROM CORE BARREL UPON REMOVAL OF CORE CATCHER

SH dkbn,soft to mod firm,pred plty w/ blky,scat micropyr,tr mica,grd to sltstnsl calc ip,dns–frm–sl carb ip

NOTE:GAP IN FULLY RECOVERED CORE AT 1315';PRESUMED INTERVAL OF GAS SHOW

Wt=9.5 Vis=53 Wl=5.6 pH=9.0
Cl=900 Ca=40 Sol=8 Ck=2/32

SHSLTSTN m–dk gy occ bn,mot ip, pred slty grns,occ cly,pred qtz grns, v sft–sl firm ip,grd to vf snd ip,scat carb frgs and lams,pred non–calc,tr calc cmt & frac fill ip

CORE #5
1340'–1370'
RECOVERED 29.8'

SH dkbrn,sft–m firm,pred blky plty ip,scat micromica,tr pyr,grd to sltst–sl calc ip,sme v finely sdy qtz

TG=1020U

CORE #6
1370'–1372'
2.0' RECOVERED

CORE 7
1372'–1402'
30.0' RECOVERED
APPROX 1' FILL ON TOP OF CORE #7

SET 8 5/8" INTERMEDIATE CASING TO 1395'.

SS op lt gy mot,pred f gr & w srt,ang sbang ip,sml clstrs w/ abnt biot/mics thru,sl slty mtx & sme arg infil,occ feld,good vis por

9/27–30/97
CORE BIT RC–4
7 7/8" x 3"
IN AT 1403'

TU=3000U

CORE #8
1403'–1418'
12.1' RECOVERED

WOB 10
RPM 30/40
SPM 63

CORE #9
1418'–1444'
15.0' RECOVERED

SS lt gy clr,vf–f gr,pred qtz gr, subrnd occ subang,rr xtl surf,w srt,v fri,abnt mica,pred musc,comm biot occ alt to chlor,rr gluac,tr micpyr, sme arg infill,sl calc,occ feld,mod vis por

LOSS OF CORE POSSIBLY DUE TO DRILLING BREAK @ 1432'

TG=3040units

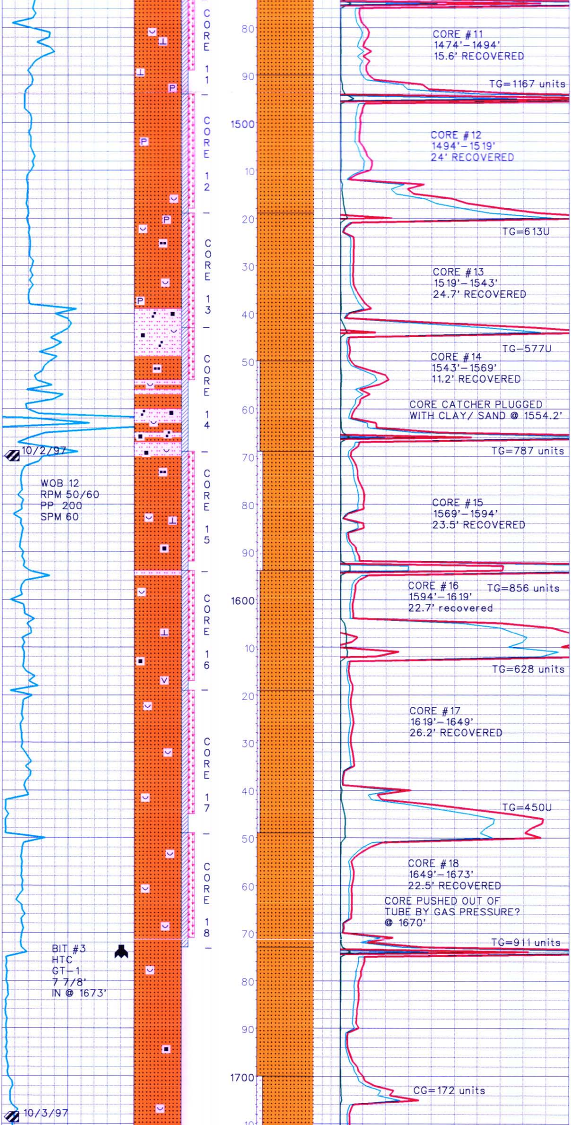
SS op trnsl lt gy lt gn tnt ip,f–occ vf gr,pred ang,m srt,abnt mica/biot flks & occ books,abnt pry clstrs & intgran micropyr,sme tuffaceous mat– gn&dk grs,slight arg content– pred grain supported,non–calc

10/1/97

CORE #10
1444'–1474'
6.5' RECOVERED

TG=939 units

Wt=8.45 Vis=37 Wl=14 pH=9.0
Cl=11.5K Ca=150 Sol=.2



Ck= Film

SS lt gy op trnsl glasy ip,f–occ m gr, m – w srt,ang thru,decr mica tr pr\yr & micropyr,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs

SS op lt brn lt gy lt gn tnt ip,f–occ vf gr,pred ang,m srt,abnt mica/biot flks & occ books,abnt pyr clstrs, sme tuffaceous mat– gn&dk grs, slight arg content– pt grain supported,incr m–v calc

SS op lt gy,vf–f gr,occ slty gr,v fri,v sft,pred qtz gr,ang–subang gr,w–m srt,abnt micaflks,pred musc occ biot tr chlor,comm–abnt micropyr, tr carb flks,arg infill ip,sl calc ip

SS/SLTSTN op lt gy,slty–vf gr,v sft occ sl frm,sub rnd,w srt,abnt mica lams,pred musc/biot occ chlor,abnt carb lams up to 1mm thick,occ fos plant,non calc,tr micropyr

SS op lt gy sme lt gn/oliv,pred f – occ vf gr,m–w srt,ang thru,wk calc cmt ip sl arg v fri sme grain supported,abnt mica/biot,sml pyr clstrs ip,sml gn tuff aphan grs/frags,occ grdg vf slty qtz

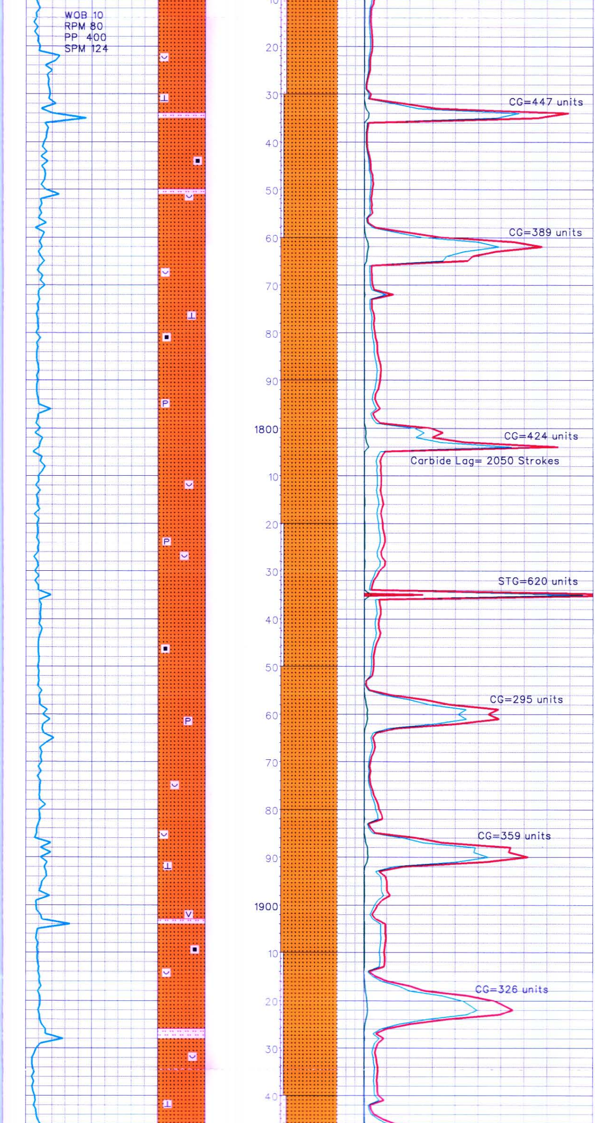
Wt=8.5 Vis=35 Wl=12.0 pH=7.0
Cl=10.9K Ca=100 Sol=.6
Ck=Film

SS lt gy op trnsl glasy ip,f–occ m gr, m – w srt,ang thru,decr mica tr pr\yr & micropyr,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs, NOTE: INCREASING METAL IN SAMPLES

SS lt gy op trnsl glasy ip,vf–f gr,m – w srt,ang thru,abnt mica occ lams up to 0.5mm thick pred biot,occ alt to chlor,tr pyr & micropyr,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs,non calc

SS lt gy op trnsl glasy ip,vf–f gr,w srt,ang thru,abnt mica occ,occ biot alt to chlor,tr pyr & micropyr,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs,non calc

SS lt gy op trnsl glasy ip,vf–f gr,w srt,ang thru,abnt mica occ,occ biot alt to chlor,tr pyr & micropyr,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs



SS op trnsl glassy lt gy ip,pred f gr & w srt,ang,lse grs w/ rr v fri sml clstrs,scat dk carb grs,sme gn tuff grs,sme metal in samp,mica ip
NOTE: poor samples over shaker, samples taken from desander

SS op trnsl lt gy,f-occ vf gr,pred ang,m srt,abnt mica/biot flks & occ books,abnt pyr clstrs,sme tuffaceous mat- gn&dk grs,slight arg content- pt grain supported,sl calc ip

SS op trnsl glassy lt gy ip,pred f gr & w srt,ang,lse grs w/ rr v fri sml clstrs,scat dk carb grs,sme gn tuff grs,sme metal in samp,mica

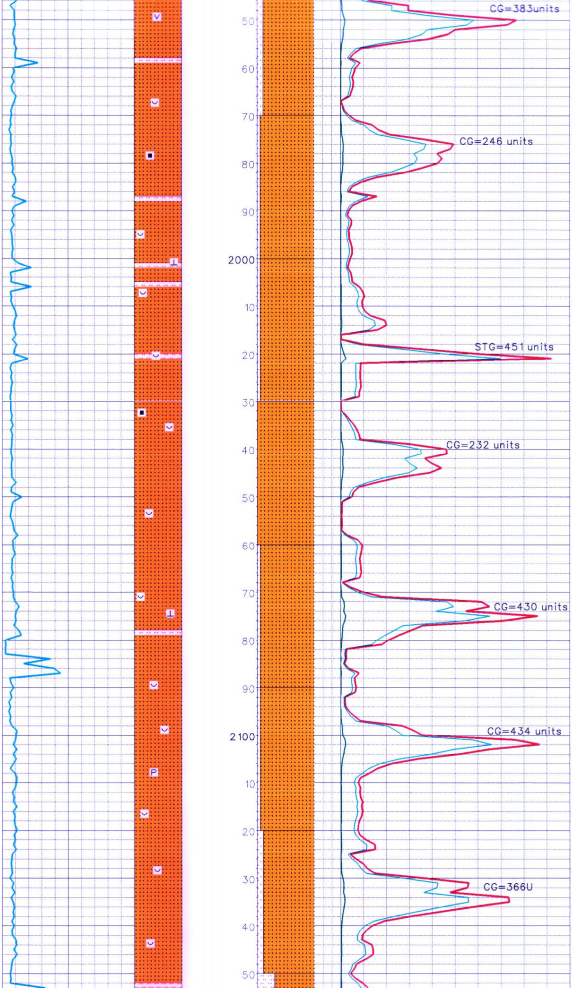
SS lt gy op trnsl glasy ip,vf-f gr,w srt,ang thru,abnt mica occ,occ biot alt to chlor,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs,non calc,incr pyr clstrs

SS op trnsl lt gy lt gn tnt ip,f-occ vf gr,pred ang,m srt,abnt mica/biot flks,abnt pyr & intgran micropyr, sme tuffaceous mat- gn&dk grs, slight arg content- pred grain supported,non-calc,lse grs & occ sml clstrs

SS op trnsl lt gy lt gn tnt ip,f-occ vf gr,pred ang,m srt,abnt mica/biot flks,abnt pyr,sme tuffaceous mat, slight arg content- pred grain supported,non-calc,lse grs thru, sme metal in sample

SS op ltbrn lt gy lt gn tnt ip,f-occ vf gr,pred ang,m srt,abnt mica/biot flks & occ books,abnt pyr,tr tuff, slight arg content- pt grain supported,v sl - non calc

SS lt gy op trnsl glasy ip,vf-f gr,w srt,ang thru,abnt mica occ,occ biot alt to chlor,tr pyr & micropyr,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs



SLTST lt gy op ip,pred vf sdy qtz, mostly washed from sample– lse grs thru

Wt=8.5 Vis=35 Wl=11.6 pH=7.0
Cl=10,750 Ck=Film

SS lt gy clr,vf–f gr,pred qtz gr, subrnd occ subang,rr xtl surf,w srt,v fri,abnt mica,pred musc,tr micpyr, sme arg infill,sl calc ip,sme s&p w/ carb grs/incl

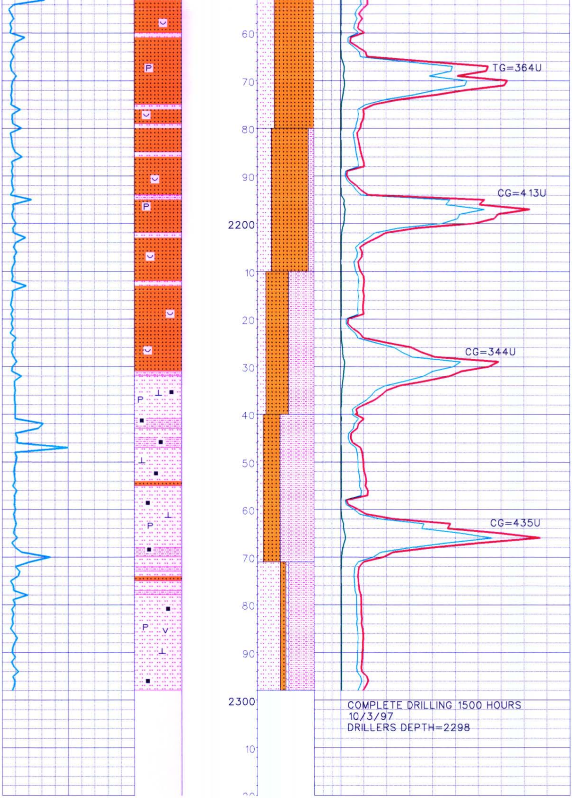
SS lt gy op trnsl glasy ip,vf–f gr,w srt,ang thru,abnt mica occ,occ biot alt to chlor,tr pyr & micropyr,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs

SS lt gy op trnsl ip,vf–f gr,w srt,ang thru,abnt mica occ,occ biot alt to chlor,pred lse grs sme sml clstrs w/ v wk grain support&fri thru,tr dk carb grs,non calc,pyr clstrs ip

SS op trnsl lt gy clr ip,vf–f– occ m gr ang thru & sl glasy ip,incr–abnt mica/biot & sme biot bks,tr–rr carb grs,v sl calc ip,lse grs & unconsol,rr gn tuff frags/grs

SS op lt gy trsnl/clr ip,vf–f gr,ang thru & sl glasy ip,incr–abnt mica/biot & sme biot bks,tr–rr carb grs,v sl calc ip,lse grs & unconsol,rr gn tuff frags/grs,tr feld

SS op lt gy trsnl/clr ip,vf–f gr,m–w srt,ang thru,abnt mica/biot & sme biot blks,rr carb grs,v sl calc ip,lse grs & unconsol,rr gn tuff frags/grs, tr feld



COMPLETE DRILLING 1500 HOURS
10/3/97
DRILLERS DEPTH=2298

SS op lt gy trsnl/clr ip,vf–f gr,m–w srt,ang thru,abnt mica/biot & sme biot blks,rr carb grs,scat micropyr/ clstrs,v sl calc ip,lse grs, rr gn tuff frags,tr feld

SLTSTN m–dk gy,pred slty gr,occ vf sndy,m–w srt,v sft,tr pyr clstrs/ micrpyr,comm–abnt carb flks/ lams,sl calc ip,shly ip,rr tuff frags, NOTE: ABNT DRILL SHAVINGS

SHSLTSTN m–dk gy,pred slty grns, m–w srt,pred plty,sme blky,v sft, comm pyr clstrs,abnt carb flks/ lams,pred sl calc,occ v calc

SHSLTSTN dk gy,occ m gy,pred slty grns,pred blky occ plty,v sft,w srt, comm–abnt pyr clstrs,abnt carb flks/ lams,scat lt grn trnsl tuff frags,pred sl calc,occ v calc,scat calcite frags

SHSLTSTN pred m gr,occ dk gy,blky–plty,v sft,w srt,comm pyr clstrs, abnt carb lams/ flks,pred sl calc, occ v calc,rr trnsl grn truff frags,rr calcite frags