TECTON GEOLOGIC

Santa Rosa, CA

COMPANY	Calpine Corporation
WELL	L'Esperance 1 RD
FIELD	Geysers
COUNTY/STATE	Lake County, California
WELL HEAD COORDINATES	
	982'S 2188'W of NE corner of Sec.6, T11N, R8W
ELEVATION	2827
SPUD DATE	1/16/84
TD DATE	
TOTAL DEPTH	
TRUE VERTICAL DEPTH	
TD LOCATION	
CONTRACTOR/RIG	Kenai Rig #3
COMPANY REPRESENTATIVE	Silva, Gamble

LOG INTERVAL

DATE LOGGED	11/14/08	TO	xx/xx/09
DEPTH LOGGED	6733	TO	xxxx
MUD DRILLING	6733	TO	7616
AIR DRILLING	7616	TO	xxxx
LOG SCALE	1:600	UNIT NO.	324

LOGGING GEOLOGISTS

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HOLE

10.775	TO	0
0	TO	0
0	TO	0
0	TO	0
0	TO	0

CASING

11.75	FROM	0	TO	6755
0	FROM	0	TO	0
0	FROM	0	TO	0
0	FROM	0	TO	0
0	FROM	0	TO	0
0	FROM	0	TO	0

ABBREVIATIONS

NB	New Bit	**BHT**	Bottom Hole Temp
RRB	Re-run Bit	**C**	Carbide Test
CB	Core Bit	**NR**	No Returns
WOB	Weight On Bit	**LAT**	Logged After Trip
SPM	Strokes per Minute	**CFM**	Cubic Feet per Min
PP	Pump Pressure	**BUT**	Bottoms Up Temp
RPM	Revolutions per Min		

SYMBOLS

- Wireline Log
- Casing Shoe
- Steam/Water Entry
- Flow Test
- Deviation Survey
- Cored Interval
- No Recovery

LITHOLOGY

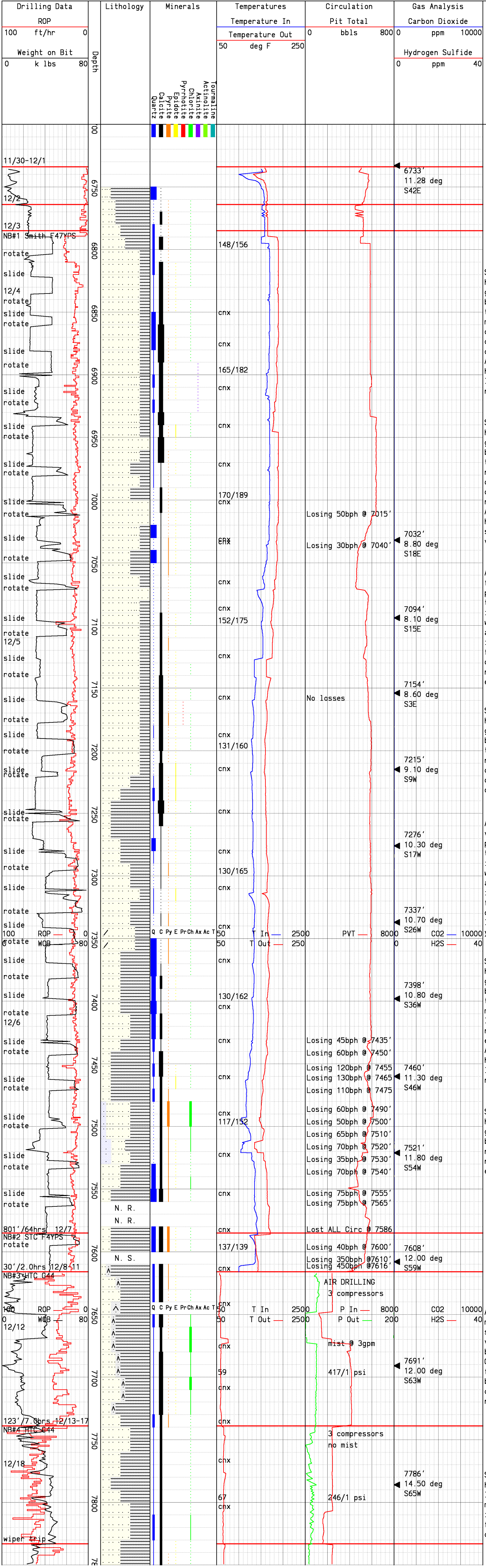
- Argillite
- Argillaceous Grywcke
- Chert
- Volcanic Graywacke
- Phyllite
- Siliceous Graywacke
- Greenstone
- Weak Foliation
- Serpentine
- Strong Foliation
- Blueschist
- Marginal Alteration
- Felsite
- Pervasive Alteration
- Rhyolite
- Weakly Hornfelsic
- Andesite
- Strongly Hornfelsic
- Lithic Graywacke

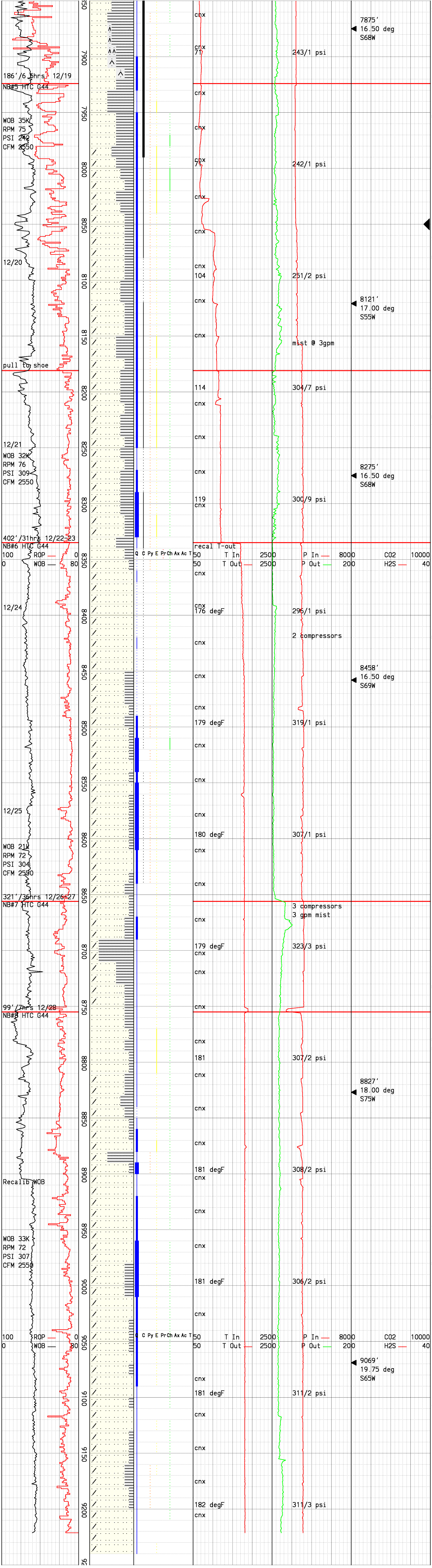
REMARKS

All depths from Kelly Bushing.
KB = 30'
cnx = connection
Workover Well
KOP = 6733'

SECONDARY MINERALS

Q = Quartz		Rare	<< 1%
C = Calcite		Trace	< 1%
P = Pyrite		Minor	1% to 4%
E = Epidote		Common	4% to 7%
R = Pyrrhotite		Abundant	7% to 10%
Ch = Chlorite			> 10%
X = Axinite			
A = Actinolite			
T = Tourmaline			


Drilling Data
ROP
100 ft/hr 0
Weight on Bit
0 k lbs 80
Depth
Lithology
Minerals
Quartz
Calcite
Pyrite
Epidote
Pyrrhotite
Chlorite
Axinite
Actinolite
Tourmaline
Temperatures
Temperature In
Temperature Out
50 deg F 250
Circulation
Pit Total
0 bbls 800
Gas Analysis
Carbon Dioxide
0 ppm 10000
Hydrogen Sulfide
0 ppm 40
Descriptions
11/30-12/1
12/2
12/3
NB#1 Smith F47YPS
rotate
slide
12/4
12/5
12/6
12/7
12/12
12/18
801'/64hrs
NB#2 STC F4YPS
30'/2.0hrs 12/8-11
NB#3 HTC G44
123'/7.0hrs 12/13-17
NB#4 HTC G44
wiper trip
ROP
WOB
Q C Py E PrCh Ax Ac T
T In
T Out
PVT
CO2
H2S
P In
P Out
N. R.
N. S.
148/156
165/182
170/189
152/175
131/160
130/165
130/162
117/152
137/139
59
67
cnx
Losing 50bph @ 7015'
Losing 30bph @ 7040'
No losses
Losing 45bph @ 7435'
Losing 60bph @ 7450'
Losing 120bph @ 7455
Losing 130bph @ 7465
Losing 110bph @ 7475
Losing 60bph @ 7490'
Losing 50bph @ 7500'
Losing 65bph @ 7510'
Losing 70bph @ 7520'
Losing 35bph @ 7530'
Losing 70bph @ 7540'
Losing 75bph @ 7555'
Losing 75bph @ 7565'
Lost ALL Circ @ 7586
Losing 40bph @ 7600'
Losing 350bph @7610'
Losing 450bph @7616'
AIR DRILLING
3 compressors
mist @ 3gpm
417/1 psi
3 compressors
no mist
246/1 psi
6733'
11.28 deg
S42E
7032'
8.80 deg
S18E
7094'
8.10 deg
S15E
7154'
8.60 deg
S3E
7215'
9.10 deg
S9W
7276'
10.30 deg
S17W
7337'
10.70 deg
S26W
7398'
10.80 deg
S36W
7460'
11.30 deg
S46W
7521'
11.80 deg
S54W
7608'
12.00 deg
S59W
7691'
12.00 deg
S63W
7786'
14.50 deg
S65W
Set cement plug and clean out to 6763' and set whipstock. MU 10.625" Mill and mill window in 11.75" casing from 6733-6739'. Twist off mill at 6739, retrieve fish. MU new mill and continue milling window from 6739-6785'. MU Mud Motor and MWD and drill ahead with 10.626" bit.
Silicic Graywacke:wht-lt gry, hd-v hd,occ blchd app,fn-med gr,mod srtd,pr-indist gr bndrs,pr relict txt,com succ txt,loc mod-str fol,loc wk-mod rexln,loc r qtz vng,loc r calc vng,loc r pyr vng,r clr qtz,r cubic pyr,r brn epi,r chlortzd grs,intrbdd w/ Argillite:med-dk gry,blk,frm-hd,wk fol,mass,com phyll shn, loc r calc vng,loc r qtz vng, r disem & vn pyr.
Silicic Graywacke:wht-med gry, hd-v hd,occ blchd app,fn-crs gr,mod srtd,pr-indist gr bndrs,pr relict txt,com succ txt,loc wk-str fol,loc wk-mod rexln,loc r-com qtz vng,loc r calc vng,loc r pyr vng,r clr qtz,r cubic pyr,r yel-brn epi, r chlortzd grs,intrbdd w/ Argillite:med-dk gry,blk,frm-hd,wk-mod fol,mass,com phyll shn,loc r calc vng,loc r qtz vng,r disem & vn pyr.
Argillite:dk gry-slvr,blk,sft-frm,wk-mod fol,mass,v abun phyll shn,loc r calc vng,loc tr qtz vng,r disem & vng pyr intrbdd w/Silicic Graywacke: wht-med gry,hd-v hd,occ blchd app,fn-crs gr,mod srtd,pr-indist gr bnds,loc wk-str fol,loc wk-mod rexln,loc r-abun qtz vng,c disem & vn calc,loc r pyr vng,r clr qtz,r-t yel epid,r chlortzd grs.
Silicic Graywacke:lt-med gry, hd-v hd,occ blchd app,fn-crs gr,pr srtd,pr-indist gr bndrs,pr relict txt,com succ txt,loc wk-mod fol,loc wk-mod rexln,loc r-com qtz vng,loc r calc vng,loc r pyr vng,r clr qtz,r cubic pyr,r yel epid,r chlortzd grs.
Argillite:dk gry-slvr,blk,sft-v hd,mod-str fol,mass,v abun phyll shn,loc r calc vng,loc tr qtz vng,r disem & vn pyr intrbdd w/Silicic Graywacke: wht-med gry,hd-v hd,occ blchd app,fn-crs gr,pr srtd,pr-indist gr bndrs,loc wk-str fol,loc wk-mod rexln,loc r-mnr qtz vng,com disem & vn calc, loc r pyr vng,r clr qtz,r-tr yel epid,r chlortzd grs.
Silicic Graywacke:wht-lt gry, hd-v hd,occ blchd app,fn-med gr,mod srtd,pr-indist gr bndrs,pr relict txt,com succ txt,loc mod-str fol,loc wk-mod rexln,loc r-abun qtz vng, loc r calc vng,loc r pyr vng, r clr qtz,r cubic pyr,r yel epid,r chlortzd grs,intrbdd w/ Argillite:med-dk gry,blk,frm-hd,wk fol,mass,com phyll shn, loc r calc vng,loc r qtz vng, r disem & vn pyr.
Silicic Graywacke:wht-med gry, hd-v hd,occ blchd app,fn-crs gr,mod srtd,pr-indist gr bnds,loc wk-str fol,loc wk-mod rexln,com disem & vn calc,loc r pyr vng,r clr qtz,r-tr yel epid,r chlortzd grs.
Losing total returns at 7586' during connection. Set cement plug #1, 200 linear ft. Drill to 7616' losing 40-450 bph.
Directionally with mud to 7616'. Change over to air and drill ahead with 10.626" bit.
Argillite:dk gry-blk,frm-hd, mod-str fol,mass,mnr phyll shn,loc tr qtz vng,tr disem & vn calc,r disem & vn pyr intr-bdd w/Silicic & Argillaceous Graywacke:med-dk gry,hd-v hd, fn-crs gr,pr srtd,pr-indist gr bndrs,loc wk-mod rexln,loc r-mnr qtz vng,com disem & vn calc,loc r disem pyr,tr-mnr disem chlor.
Drill to 7739', part drill pipe while pulling out of hole. Recover fish, drill ahead.
Silicic Graywacke:med-dk gry, hd-v hd,med-crs gr,mod srtd, loc wk-mod rexln,mnr qtz vng, mnr calc w/r microvng,r chlor, intrbdd w/Argillite:dk gry-blk, frm-hd,mod fol,mnr phyll shn,tr calc vng.


186'/6.5hrs 12/19
NB#5 HTC G44
WOB 35K
RPM 75
PSI 242
CFM 2550
12/20
pull to shoe
12/21
WOB 32K
RPM 76
PSI 309
CFM 2550
402'/31hrs 12/22-23
NB#6 HTC G44
100 ROP 0
0 WOB 80
12/24
12/25
WOB 21K
RPM 72
PSI 304
CFM 2550
321'/36hrs 12/26-27
NB#7 HTC G44
99'/7hrs 12/28
NB#8 HTC G44
Recalib WOB
WOB 33K
RPM 72
PSI 307
CFM 2550
7875'
16.50 deg
S68W
243/1 psi
242/1 psi
Steam entry at 8050'. Init 14# Press In & 35 degF Temp out incr. Stable at 12 # & 35 degF. No Press out change.
251/2 psi
8121'
17.00 deg
S55W
mist @ 3gpm
304/7 psi
8275'
16.50 deg
S68W
300/9 psi
recal T-out
T In 2500
T Out 2500
P In 8000
P Out 200
CO2 10000
H2S 40
296/1 psi
2 compressors
8458'
16.50 deg
S69W
319/1 psi
307/1 psi
3 compressors
3 gpm mist
323/3 psi
8827'
18.00 deg
S75W
308/2 psi
306/2 psi
9069'
19.75 deg
S65W
311/2 psi
311/3 psi
Silicic Graywacke:wht-lt gry, occ med gry,hd-v hd,sl-occ mod altrd,pred mod silic,sl-mod rexln,occ sl blchd appr,fn-med gr,mod-pr srtd,gd-pred fr dist gr bndrs,r qtz vng,mnr-loc com intrstit & wht calc vng/vn frags,loc r-r disem pyr,r disem/replcmt pale yel epid,loc r-r chlortzd grs,intrbdd w/med-occ dk gry Arg Graywacke:a/a & Argillite:dk gry-blk,pred hd, mass,loc wk phyll shn,r-tr wht calc vng,loc com sandy/silty.
Silicic Graywacke:wht,v lt gry, hd-v hd,sl-incr pred mod altrd, mod silic/rexln,sl-mod blchd appr,fn-crs gr,pr srtd,fr-pr dist gr bndrs,r-loc tr qtz vng, tr-mnr intrstit & wht vn calc, r disem pyr,r-tr disem/vn/agg/ replcmt pale yel epid,loc r-tr chlortzd grs/grndmass.intrbdd w/ Argillite:med-dk gry,blk,mod hd-loc hd,mass,wk phyll shn, loc wk fol,r clr/wht qtz vng, r-tr wht calc vng,loc com sandy.
Silicic Graywacke:wht-med gry, hd-v hd,loc sl blchd app,fn-crs gr,mod srtd,pr-absnt gr bndrs, marg altrn,com sucr txt,loc wk fol,loc wk-mod rexln, loc r-com qtz vng,r clr qtz, loc r calc vng,loc r pyr vng, r cubic pyr,r yel-brn epid,r chlortzd grs,intrbdd w/ Argillite:med-dk gry,blk,frm-hd,wk-mod fol,mass,com phyll shn,loc r calc vng,loc r qtz vng,r disem & vn pyr.
Silicic Graywacke:lt-drk gry, com blchd appr,hd-v hd,microxln-fn gr,mod-well srtd,dist-absnt gr bndrs, com sucr txt,loc wk fol,loc wk rexln,mod altrd,loc r-tr milky qtz vng,r clr qtz, loc r calc vng,r yel epid,r chlortzd grs,intrbdd w/ Argillite:med-dk gry,blk,frm-hd, mass,com phyll shn,loc r calc vn loc r qtz vng,r disem & vn pyr.
Silicic Graywacke:lt-med gry, com blchd appr,com chlortzd grs, hd-v hd,microxln-fn gr,mod-well srtd,dist-absnt gr bndrs,mod altrd,r-com milky qtz vng,r clr qtz,occ calc vng,r yel epid, intrbdd w/ Argillite:dk gry-blk, frm-hd,mass,com phyll shn,loc r qtz vng,r disem pyr.
Silicic Graywacke:lt gry, com blchd appr,com chlortzd grs, v hd,microxln-fn gr,mod-well srtd,dist-absnt gr bndrs,mod altrd,r-com milky qtz vng,r clr qtz,occ calc vng,r yel epid, intrbdd w/ Argillite:dk gry-blk, frm-hd,mass,com phyll shn,loc r disem pyr.
Silicic Graywacke:wht,lt-med gry,hd-v hd,pred mod altrd, mod rexln,sl-mod blchd appr,fn-crs gr,pr srtd,fr-pr dist gr bndrs,r-loc tr qtz vng,r-tr disem/vn/agg/replcmt pale yel epid,loc r-tr chlortzd grs/ grndmass.intrbdd w/Argillite: med-dk gry,blk,mod hd-loc hd, mass,wk phyll shn,loc wk fol, r clr/wht qtz vng,com silty.
Silicic Graywacke:wht-lt gry, com blchd appr,v hd,microxln-fn gr,pr-indist gr bndrs,mod altrd,str rexln, tr-com milky qtz vng,r clr qtz,r yel epid, r chlortzd grs, intrbdd w/ Argillite:dk gry-blk,frm-hd,com phyll shn,loc r disem pyr.
Silicic Graywacke:wht-lt gry, hd-v hd,occ blchd app,fn-med gr,mod srtd,pr-indist gr bndrs,loc wk-mod rexln,loc tr-mnr qtz vng,r clr qtz,loc r yel epid,r chlortzd grs,intrbdd w/ Argillite:med-dk gry,blk,frm-hd,mass,com phyll shn, r disem pyr.
Silicic Graywacke:lt-med gry, com blchd appr,v hd,microxln-fn gr,pr-indist gr bndrs,mod altrd,str rexln, tr milky qtz vng,r clr qtz,r yel epid, r chlortzd grs, intrbdd w/ Argillite:dk gry-blk,frm-hd,com phyll shn,loc r disem pyr.