**Tecton Geologic**

| | |
|---|---|
| COMPANY | Calpine Corporation |
| WELL NAME | Prati 25 Redrill |
| FIELD | The Geysers |
| COUNTY | Sonoma |
| STATE | California |
| WELL HEAD COORDINATES | |
| 2208' N, 2707' W of SE corner of Sec 35, T12N, R9W<br>N: 428,760, E: 1,763,411 | |
| ELEVATION | 2347', GL |
| RIG - DAY RATE START DATE | 2/20/2010 |
| TD DATE | 5/1/2010 |
| TOTAL DEPTH | 10374' |
| TRUE VERTICAL DEPTH | 10189' |
| TD LOCATION | 910.8' North and 1519.2' West of Wellhead |
| DRILLING CONTRACTOR | Thermasource/Rig 108 |
| COMPANY REPRESENTATIVES | Steve Gamble<br>Jeff Potter |

## LOG INTERVAL

| | | | |
|---|---|---|---|
| DATE LOGGED | 3/3/10 | TO | 5/1/10 |
| DEPTH LOGGED | 2085' | TO | 10374' |
| MUD DRILLING | 2085' | TO | 5700' |
| AIR DRILLING | 5700' | TO | 10374' |
| LOG SCALE | 1:600 | | |
| UNIT NO. | T1 | | |

LOGGING GEOLOGISTS
Matt Dobbs (MD), Charley Wahl (CW)
Justin Everts (JE), Daniel Bida (DB)

## HOLE

| | | |
|---|---|---|
| 26" | TO | 282' |
| 20.5" | TO | 2085' |
| 14.75" | TO | 5700' |
| 10.625" | TO | 10374' |

## CASING

| | | | | |
|---|---|---|---|---|
| 22" | FROM | 0 | TO | 281' |
| 16" | FROM | 0 | TO | 2085' |
| 11.75" | FROM | 0 | TO | 5685' |

## LINER

| | | | | |
|---|---|---|---|---|
| 8.625" | FROM | 5516' | TO | 10360' |

## 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 | SFR | Steam Flow Rate |

## SYMBOLS

| | | | |
|---|---|---|---|
| ↯ | Wireline Log | ◢ | Casing Shoe |
| ◀ | Steam/Water Entry | ⧓ | Flow Test |
| ◂ | Deviation Survey | ▯ | Cored Interval No Recovery |

## REMARKS

All depths from kelly bushing
KB = 31'

## LITHOLOGY

| | | | |
|---|---|---|---|
| ▤ | Argillite | ⁚ | Siliceous Graywacke |
| ⊞ | Chert | ⟡ | Metamorphic Ultramafic |
| ▤ | Siltstone | − | Weak Foliation |
| ⫻ | Greenstone | = | Strong Foliation |
| ∫∫ | Serpentine | / | Marginal Alteration |
| ∫ | Blueschist | // | Pervasive Alteration |
| ✳ | Felsite | \ | Weakly Hornfelsic |
| ▤ | Clay | \\ | Strongly Hornfelsic |
| ⁚ | Lithic Graywacke | | |
| ^ | Argillaceous Graywacke | | |

## STEAM ENTRIES

| | Init | Sust |
|---|---|---|
| 6294' | 1# | 1# |
| 6330' | 4# | 4# |
| 7405' | 10# | 6# |
| 7590' | 4# | 4# |
| 7627' | 15# | 12# |
| 7636' | 4# | 2# |
| 8115' | 5# | 2# |
| 8455' | 2# | 1# |
| 8790' | 8# | 8# |
| 8854' | 2# | 1# |
| 8925' | 9# | 8# |

## WATER ENTRIES

6330-8900'
3 to 5 BPH

## LOST CIRCULATION ZONES

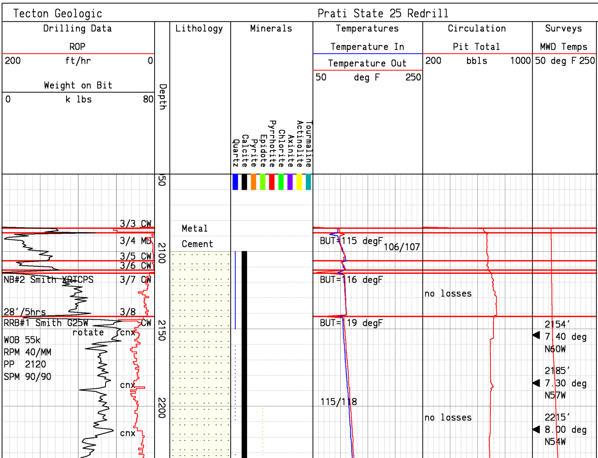
2447'
3025'

## SECONDARY MINERALS

Q = Quartz
C = Calcite
P = Pyrite
E = Epidote
R = Pyrrhotite
Ch = Chlorite
X = Axinite
A = Actinolite
T = Tourmaline

| | |
|---|---|
| Rare | << 1% |
| Trace | < 1% |
| Minor | 1% to 4% |
| Common | 4% to 7% |
| Abundant | 7% to 10% |
| | > 10% |

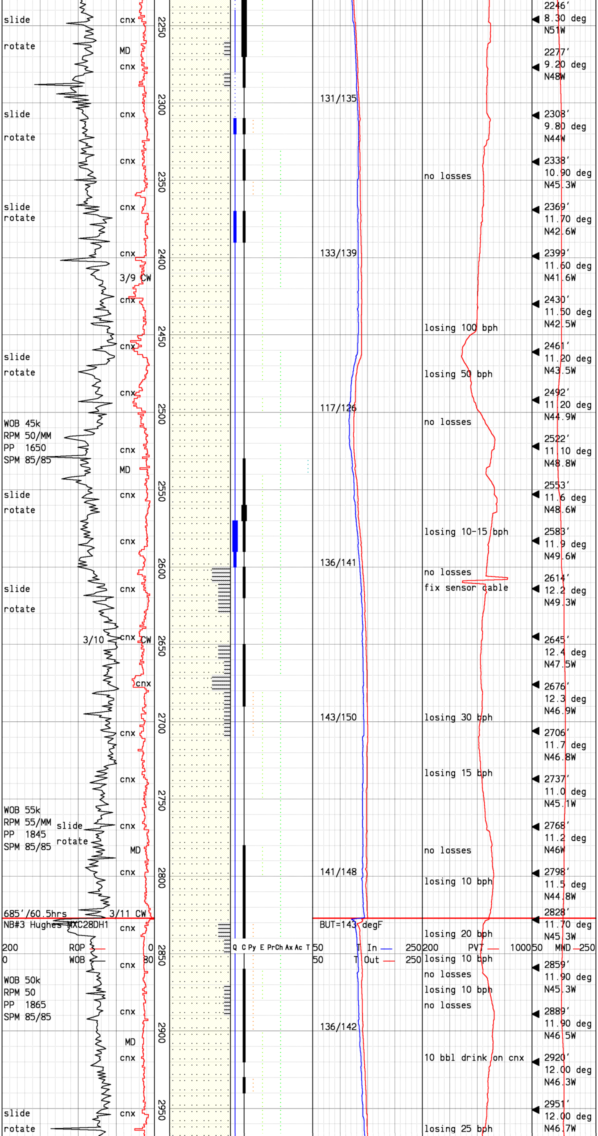
Tecton Geologic — Prati State 25 Redrill — Scale 1: 600



Descriptions

C/O cement plugs w/bit #1 down to 2132'. Set whipstock, mill window f/2085' t/2088', twist off. Fish tools, mill f/2088' t/2112'. Try to work through window w/bit, fail. Dress window t/2114'. M/U bit & watermelon mills, drill t/ 2142'. POOH, make up dir tools & 14.75" bit, RIH & drill ahead on 3/7/10. KOP from Prati 25 @ 2085'.

Siliceous Graywacke:med-dk gry, brn,com grn/gry,mod hd-hd,brit, v fn-fn gr,well def gr bndrs, well srtd,pred fresh app,loc wk fol,r-tr clr-wht qtz vng (com in brn grs),mnr-com vn & dissem calc,loc r pyr,r ylw-pistachio grn epid.



Siliceous Graywacke:lt-med gry, grn/gry,mod hd-hd,brit,v fn-fn gr,well def gr bndrs,well srtd, pred fresh app,loc wk fol,com wk chlor wash,r brn/bronze mica, loc r-tr arg clasts w/in,r qtz vng,tr-mnr calc vng,r ylw epid, loc intrbdd w/Argillite:gry-dk gry,loc brn,sft-mod hd,mass, laminated,tr calc vng,r dissem pyr.

Siliceous Graywacke:lt-med gry, blue/grn gry,loc brn gry,sft-hd, v fn-med gr,well def gr bndrs,r loc laminae,loc wk fol,tr wht-clr-smky/grn qtz clasts & vng, tr-mnr wht calc vns,r ylw & pistachio grn epid.

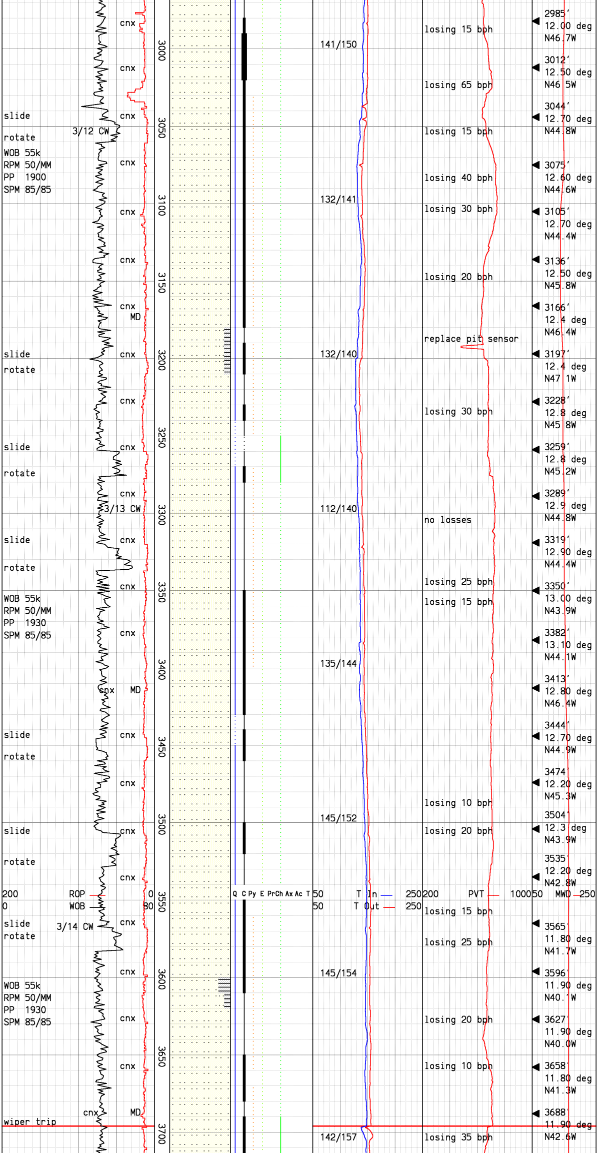
Begin losing 100 bbls/hr @ 2447'. Build volume and add LCM, drill ahead.

Siliceous Graywacke:lt-med gry, pred lt grn/gry,mod hd-hd,brit, v fn-med gr,well def gr bndrs, well srtd,loc wk fol,pred wk chlor wash,r brn/bronze mica, loc brick red fault gouge(?) w/ r tourm,tr qtz vng,t-mnr calc vng,r ylw epid,r chlor,w/loc tan Chert frags.

Siliceous Graywacke:lt-med gry, brn,pred lt grn/gry,mod hd-hd, brit,loc crumbly,v fn-med gr, mod well-well def gr bndrs,mod well-well srtd,loc wk fol,pred wk chlor wash,r brn/bronze mica, t-com wht qtz vng,t-com calc vng,r ylw epid,r chlor,intrbdd w/Argillite:brn/gry,brn,sft-mod hd,brit,com silty,com shard app,com fiss txt,r calc vng,w/ mnr-abun wht/lt brn clay cont frags of GW & Arg.

Siliceous Graywacke:lt-med gry, loc brn,pred lt grn/gry,mod hd-hd,brit,loc crumbly,v fn-med gr,pred mod well def gr bndrs, mod well-well srtd,loc wk fol, pred wk chlor wash,r brn/bronze mica,t wht qtz vng,t-mnr calc vng,r ylw epid,r chlor,loc intrbdd w/Argillite:brn/gry, brn,sft-mod hd,brit,com silty com shard app,com fiss txt,r qtz vng,r calc vng.

Siliceous Graywacke:lt-med gry, bl-grn/gry,mod hrd,v fn-med fn gr,well def gr bndrs,loc wk-str fol of dk mica,tr clr-wht qtz vng,wht-off wht dissem & vn calc,r bright dissem pyr,occ r ylw epid,r grn-brn chlor,loc intrbdd w/Siliceous Argillite: brn-dk brn,sft,v fn micaceous grs,thin lam,r wht qtz vng,r dissem & vn pyr.



Siliceous Graywacke:lt-med gry, tr brn,pred lt grn/gry,pred hd, brit,loc crumbly,fn-med gr, pred mod well def gr bndrs,mod well-well srtd,loc wk fol,pred wk chlor wash,r brn/bronze mica, t wht qtz vng,t-com calc vng,r disagg pyr,r ylw epid,r chlor.

Begin losing 65 bbls/hr @ 3025'.

Siliceous Graywacke:lt-med gry, grn blu gry,sft-hrd,brit brokn smpls,fn-med gr with distinct bndrs,loc fol of dk mica,pred wk chlor wash,r brn/bronze mica, loc r-tr arg clasts w/in,tr wht-clr qtz vng,mnr wht-pnk dissem-vng calc,r dissem pyr,r pistachio grn epid with loc vng, r tan-grn chlor,loc intrbdd w/ Argillite:brn/gry-brn,sft-mod hd,brit,loc silty,r qtz vng,tr calc vng,r dissem & vn pyr.

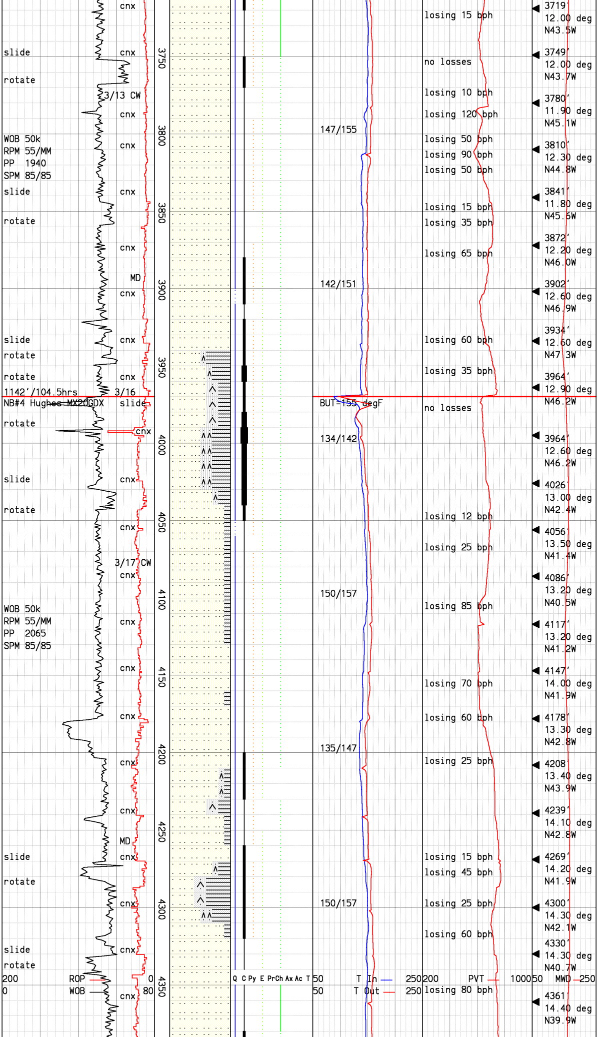
Siliceous Graywacke:dom lt grn, grn/gry,loc med gry,loc brn,mod hd-hrd,brit,v fn-med gr,pred mod well def gr bndrs,mod well-well srtd,loc wk fol,pred wk chlor wash,r brn/bronze mica, loc r-tr arg clasts w/in,r-tr qtz vng,tr-mnr calc vng,r dissem pyr,r pistachio grn epid, r-tr chlor.

Siliceous Graywacke:dom lt gry, occ bl-grn,loc brn,mod-hrd,v fn-med gr,well def gr bndrs,loc wk fol of dk micas,tr clr-wht qtz vng,tr-mnr wht-off wht dissem & vng calc,r bright ylw pyr,r ylw-grn epid,r chlor flecks w/r loc chlor wash,r tan mica grs.

Siliceous Graywacke:lt-med gry, lt grn,tr-com brn,mod hd-hd, brit,v fn-fn gr,mod well def gr bndrs,mod well srtd,loc wk fol,com-pred weak chlor wash,r brn/bronze mica,r lithics w/in, r-tr qtz vng,t-mnr calc vng,r canary ylw epid,r chlor.

Siliceous Graywacke:lt gry,lt brn/gry,mod hd,r friable,v fn-med gr,well srtd,well def gr bndrs,wk-str loc mica fol,tr wht qtz vng,tr-mnr wht dissem & vng calc,r ylw pyr,r ylw/grn epid,r grn chlor,loc intrbdd w/Siliceous Argillite:dk brn-brn,sft,v fn gr,laminated,r wht qtz,r wht calc vng,r ylw pyr.

Siliceous Graywacke:pred lt grn, loc med grn,com brn,mod hd-hd, pred brit,com crumbly,v fn-fn gr,mod well def gr bndrs,mod well-well srtd,loc wk fol,pred



wk chlor wash,r brn/bronze mica, loc r-tr arg clasts w/in,t qtz vng & rndd qtz frags,t-mnr calc vng,r dissem & disagg pyr,r ylw epid,r-tr chlor.

Begin losing 120 bbls/hr at 3780'.

Siliceous Graywacke:lt gry,bl-grn/gry,r brn,mod hd,v fn-med fn gr,r friable,well srtd,well def gr bndrs,loc wk-str fol of dk mica,tr clr-wht qtz vng,wht-off wht dissem & vng calc,r bright dissem pyr,r ylw epid,r grn-brn chlor.

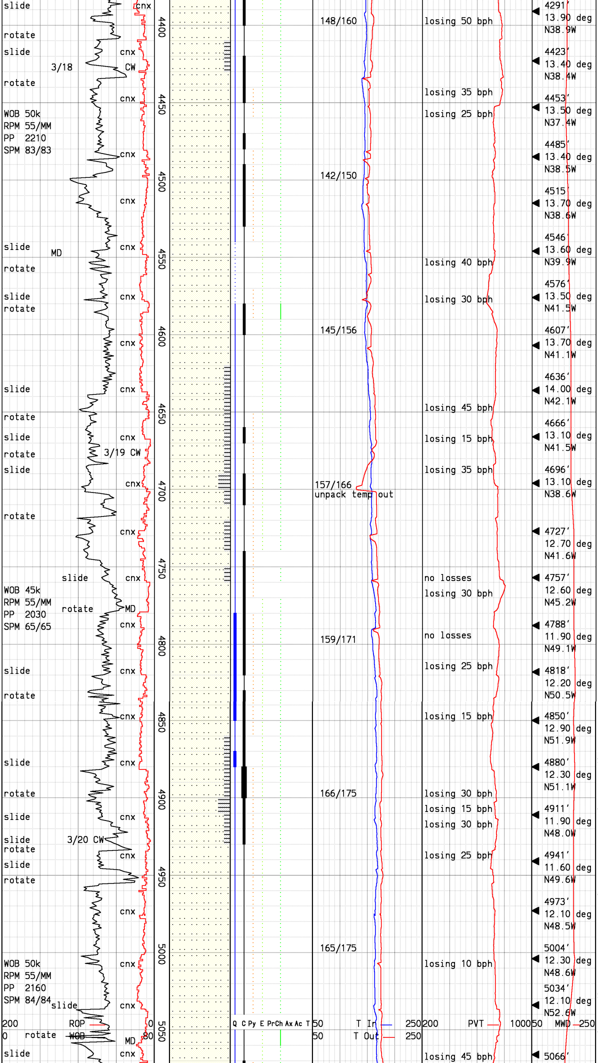
Siliceous Graywacke:lt gry-gry, lt brn/gry,lt grn,pred mod hd, loc v hd,brit,loc crumbly,v fn-fn gr,prly-mod well def gr bndrs,mod well-well srtd,loc wk fol,pred wk chlor wash,wk-mod rexln,loc str rexln,r lithics w/in,r-tr qtz vng,t-mnr calc vng,r disagg pyr,r ylw epid,r chlor,abun Argillaceous & sudden incr in Argillite at 3950'.

Drilling break of 61'/hr at 3991'.

Argillite:gry,brn/gry,brn,loc blk/silver,abun silty,sft,brit, com wk phyll sheen,loc str phyll sheen,mnr fiss txt,r-tr qtz vng, r-com calc vng & euh calc xtals, r dissem & vn pyr,w/r turq grn Chert,intrbdd w/Argillaceous Graywacke:pred brn/gry-brn,v fn-med gr,mod hd,brit,r-mnr dissem pyr,decr w/depth.

Siliceous Graywacke:lt gry,blu-grn/gry,mod hd-hd,fn-med gr,well srtd,well def gr bndrs,wk mica fol,occ friable,r loc rexln of felds,tr wht-clr qtz grs & wht qtz vng,tr-mnr wht dissem & vng calc,r bright ylw dissem & vng pyr,r loc ylw-grn epid,r dk grn chlor,r blu-brn Chert clasts, loc vitreous black organic material (Vitronite?),intrbdd w/Argillite:dk-med brn,sft-mod hd,v fn-fn gr,siliceous, shistose appr,r wht qtz vng,r wht calc vng,r pyr,r loc intrbdd Argillaceous Graywacke: lt brn-dk brn,mod hd,brit,v fn-med gr,mod well srtd,mod well def gr bndrs,wk fol,r biotite,r-tr qtz vng,tr-mnr calc vng,r-tr dissem pyr.

Argillite:med gry,brn/gry,brn, loc silver/blk,pred mass,com-abun silty,sft-mod hd,brit,com wk phyll sheen,loc str phyll sheen,r-tr qtz vng,r-tr calc vng,tr dissem pyr,intrbdd w/ Siliceous Graywacke,w/r Chert: lt gry,v hd,aph,r-tr qtz



microvng,r pyr microvng.

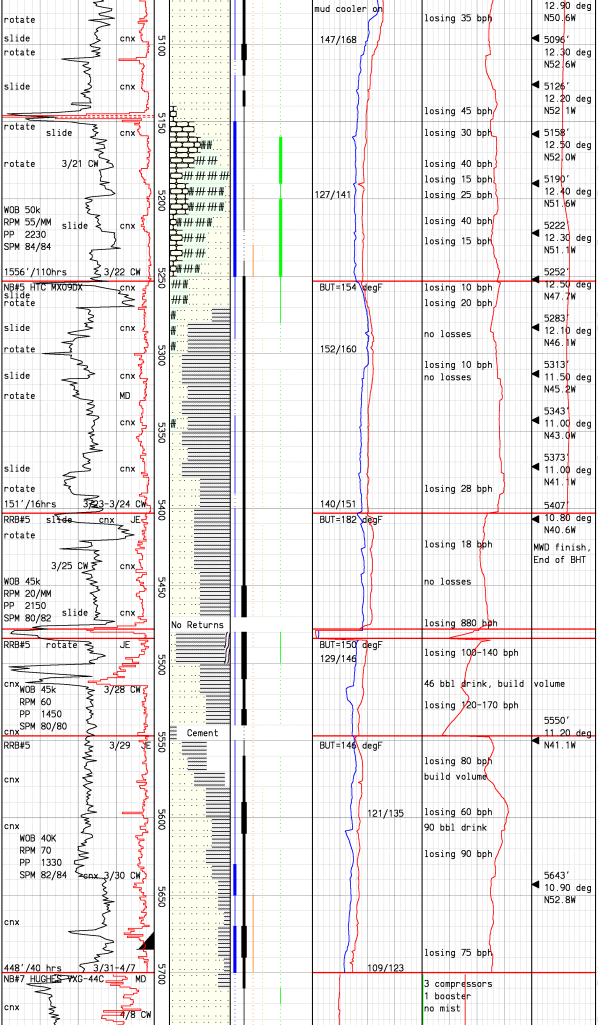
Siliceous Graywacke:lt-med gry blu-grn/gry,mod hd-hd,fn-med fn gr,well def gr bndrs,loc brite,tr clr-wht qtz grs,r-tr wht qtz vng,tr-mnr wht dissem & vng calc,r ylw pyr,r pistachio grn epid,r grn-tan chlor grs,r blk organic lithics,intrbdd w/Argillite:dk-med brn,sft, silty,v fn-fn gr,laminated,r wht-opaque qtz vng,r wht clac vng,r loc intrbdd Argillaceous Graywacke:dk brn,silty,r mica fol,r wht qtz vng,r ylw dissem pyr.

Siliceous Graywacke:lt gry-gry, lt brn/gry,lt grn,pred mod hd-hd,brit,loc crumbly,v fn-med gr,mod well def gr bndrs,mod well-well srtd,loc wk fol,pred wk chlor wash,r lithics w/in,tr qtz vng,t-mnr calc vng,r disagg pyr,r ylw epid,r chlor,loc intrbdd w/Argillite:gry,brn,loc blk/silver,sft,brit,com silty, mass,loc wk phyll sheen,occ str phyll sheen,loc fiss txt,r-tr qtz vng,r-tr calc vng.

Siliceous Graywacke:lt-dk gry, blu-grn/gry,mod hd-hd,brit,v fn-fn gr,mod well-well def gr bndrs,mod well-well srtd,loc fresh app,loc wk fol,tr-mnr wht-clr qtz vng & xtals,tr-mnr wht dissem & vng calc,r bright ylw vng & dissem pyr,r ylw/grn epid,r grn-tan chlor,loc-pred wk chlor wash,com intrbdd w/Argillite:gry,brn-dk brn,sft, com silty,laminated,loc wk phyll sheen,mnr fiss txt,tr-mnr qtz vng,tr-mnr wht calc vng,r bright ylw dissem & vng pyr.

Siliceous Graywacke:lt gry-gry, lt brn/gry,lt grn,pred mod hd-hd,brit,loc crumbly,v fn-med gr,mod well def gr bndrs,mod well-well srtd,loc wk fol,r lithics (Argillite & Chert) w/in,com-pred wk chlor wash,r bronze mica,r altd/str blchd appr,tr-mnr qtz vng,mnr-com calc vng,r dissem & Disagg pyr, r ylw epid,r chlor,loc intrbdd w/Argillite:gry,brn,com silty, com shard app,com wk phyll sheen,com fiss txt,r-tr qtz vng,r-mnr calc vng.

Siliceous Graywacke:lt-dk gry, grn/gry,mod hd-hd,loc friable, v fn-med gr,well def gr bndrs, well srtd,r siltyness,loc wk fol,r loc wk chlor wash,r tan-bronze mica,loc r lithics of



arg & rextln felds,r-tr wht qtz grs,r wht qtz vng,tr-com wht dissem & vng calc,r dissem & vng pyr,r ylw/grn epid,r-tr grn chlor,intrbdd w/Argillite:gry-dk gry,brn,sft,com silty, laminated,tr-mnr calc vng,r dissem pyr.

Drilling break of 477'/hr at 5148' corresponding with formation change.

Chert:wht,lt gry,lt grn,olive grn,tan,orng,turq,v hd,brit, mass,tr qtz microvng & euh qtz clusters,r calc vng,r dissem pyr,intrbdd w/Greenstone:dk-lt grn,spotted,pred mottled app, mod hd,v fn-fn gr,mass,fri-sft, tr wht & clr qtz vng,tr wht calc vng,r dull-bright ylw dissem & vng pyr,tr-mnr chlor fngrs,r brick rd sft fault gauge,intrbdd w/Siliceous Graywacke:lt-med gry,mod hd,fn-med gr,well def gr bnds,fr app.

Argillite:gry-dk gry,brn/gry-brn,sft,brit,mass,com-abun silty,tr-mnr wk phyll sheen,r-tr qtz vng,tr-mnr calc vng,r dissem pyr,intrbdd w/Siliceous Graywacke:lt gry-gry,lt grn,com lt brn,mod hd,brit,mnr crumbly, v fn-fn gr,mod well def gr bndrs,mod well-well srtd,tr qtz vng,mnr calc vng,r dissem pyr, r ylw epid,r chlorite,w/com frags of Chert & Greenstone.

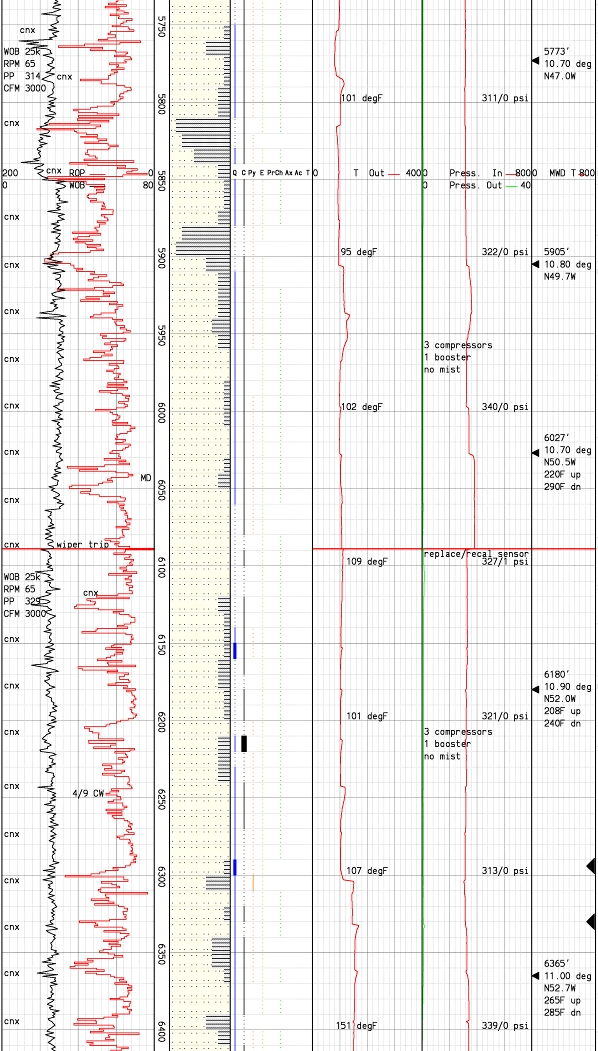
Drill t/5403',twist off @ mud motor,retrieve fish.RIH & tag tight spot @ 4948',ream t/5403' & drill ahead. Lose circulation @ 5474'.Drilling break of 79'hr @ 5478',POOH t/window, RIH & drill blind f/5478-5484',POOH & set cmt plug #1, Ream f/5525-5468' & c/o cmt t/5484'.Fracture zone f/5502-5515'.Drill t/5546', POOH & set cmt plug #2. C/o cmt t/5546' & drill ahead w/14.75" bit.

Drilling break of 42'/hr at 5597'.

Siliceous Graywacke:lt-dk gry, r wht,mod hd-hd,granular txt,wk fol,tr-mnr qtz vng,mnr-com calc vng;intrbdd w/Argillite:dk gry-blk,v fn gr,frm-mod hd,brit,wk-str phyll shn,wk lams,r-tr qtz vng,tr calc vng,r disem pyr;tr-10% Serpentine:lt-dk grn,sft, com flaky,waxy lustr,tr chlor.

Drill t/5700', POOH. Set 139 joints of 11 3/4", 54#, BUTT casing f/surface-5685' & cement in place. RIH & c/o cement with 10 5/8" bit.Drill ahead on air.

Siliceous Graywacke:lt-dk gry, mod hd-hd,fn-med gr,well def gr bndrs,wk-str dk mica fol,r loc shear in thin silty laminae,tr-mnr wht-clr xtln qtz vng,tr-com



wht calc vng & agg,r loc pyr,r ylw/grn epid,r chlor,intrbdd w/ Argillite:brn gry-blk,wk-str phyl shn,sft-mod hd,brit,v fn-fn gr,well srtd,laminated,r qtz vng,tr-com calc vng,r-tr dissem & vng pyr;r Serpentine frags.

Siliceous Graywacke:lt-dk gry, loc lt grn/gry,fn-med fn grs, mod-well srtd,sft-hd,mod well-well def gr bndrs,loc wk mica fol,r-tr wht qtz vng,r-tr wht dissem calc,r brt dissem & vng pyr,r ylw grn epid,r chlor grs & loc wash,r loc lithics of dk siltstone and chert,intrbdd w/ Argillite:brn,dk gry-blk,sft-mod hd,v fn-fn grs,thin laminae, r wht qtz vng,r-tr wht vng calc, r vng pyr.

Bottom hole temperatures taken by MRT w/survey tool and listed with survey data.

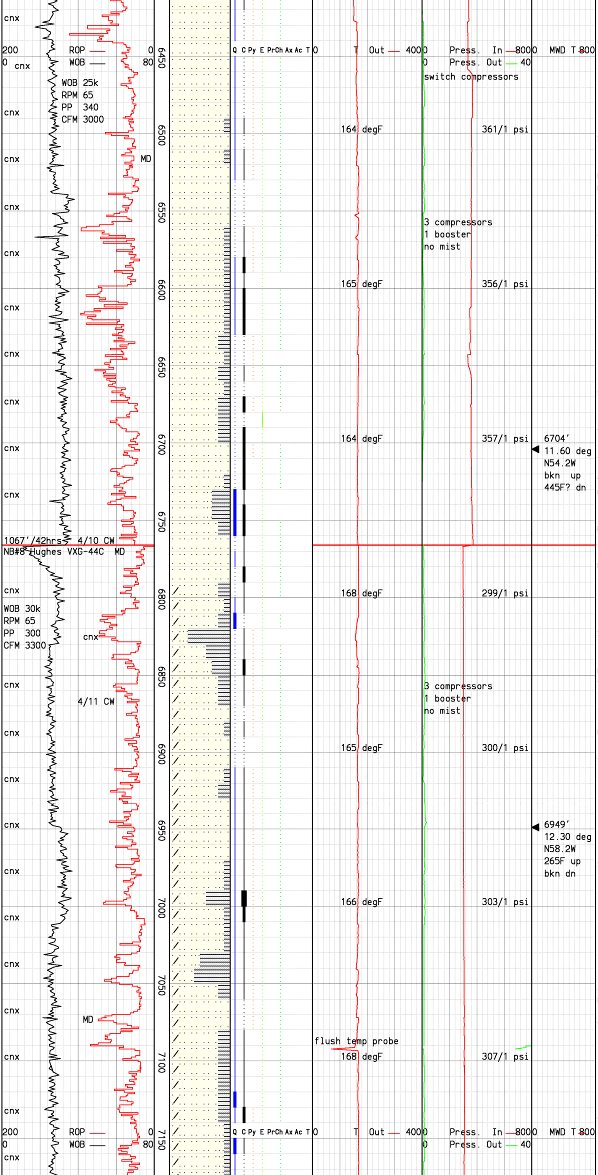
Siliceous Graywacke:lt-dk gry, loc lt grn/gry,loc lt ylw/brn, fn-med fn grs,mod-well srtd, hd-v hd,brit,mod well-well def gr bndrs,loc wk mica fol,r-tr wht qtz vng,r-tr wht dissem calc,r dissem & vng pyr,r ylw/grn epid,r chlor grs & loc wash, r loc lithics of dk Argillite and Chert,intrbdd w/Argillite: brn,dk gry-blk,sft-mod hd,v fn-fn gr,thin laminae,r wht qtz vng,r-tr wht vng calc,r dissem & vng pyr.

Siliceous Graywacke:lt-med gry, lt grn/gry,loc ylw/pea grn,hd-v hd,brit,v fn-med gr,prly-mod well def gr bndrs,mod well srtd, loc wk fol,loc abun Arg mtx,r qtz vng,r-tr dissem & vng calc, r epid,r chlor,intrbdd w/ Argillite:dk gry,brn,blk,sft-mod hd,mnr fiss txt,r dissem pyr.

Siliceous Graywacke:lt-med gry, loc ylw/pea grn,hd-v hd,brit, v fn-fn gr,indist-mod well def gr bndrs becoming less dist w/ depth,mod well srtd,com Arg mtx, loc red dissem sulfides,r-tr qtz vng,r-com dissem & vng calc, r dissem pyr,r epid,r chlor, intrbdd w/Argillite:dk gry,loc blk,mass,loc silty,sft-mod hd,r dissem pyr.

Possible entry at 6294',1 psi 45 degF init/stab incr, no noticeable flow from muffler. Possible entry at 6330',4 psi 15 degF init incr, 4 psi/8 deg F stab, no incr in flow from muffler. Well begins making 5 bph water.

Siliceous Graywacke:lt-dk gry, loc wht-grn gry,hd-v hd,r brit, v fn-med gr,well def gr bndrs, well srtd,wk-str fol micas,r loc thinly layrd,occ dk silty



txt,r-tr lithics,t-mnr wht qtz vng,r dissem pyr,r ylw-ylw grn epid,r loc chlor wash,intrbdd w/Argillite:brn-dk brn,dk gry, sft-mod hd,v fn gr,well srtd, lam,r phyll shn,r wht qtz vng, r-tr wht calc vng,r-tr bright ylw dissem & vng pyr.

Siliceous Graywacke:lt-dk gry, loc lt grn/gry,mod hd-v hd,brit, fn-med gr,prly-mod def gr bndrs, mod well srtd,loc wk-str dk mica fol,r loc thin silty lamin, r bronze mica,r Arg lithics w/ in,occ str fol & str chltzd grs, loc red dissem sulfides,tr-mnr wht-clr xtln qtz vng,r-tr wht vng & agg calc,r loc pyr,r ylw/ grn epid,r chlor,intrbdd w/Argillite:dk gry-blk,loc brn, sft-mod hd,brit,loc silty,well srtd,laminated,com mod str phyll sheen,r qtz vng,r calc vng,r-tr dissem & vng pyr.

Siliceous Graywacke:lt-dk gry, v lt grn,loc ylw/pea grn,hd-v hd,brit,v fn-med gr,prly-mod well def gr bndrs,mod well-well srtd,loc wk-str fol,com-abun Arg mtx,r bronze mica,loc abun red dissem sulfides,loc abun v wk chlor wash,r-mnr qtz vng,r-mnr dissem & vng calc,r dissem pyr,r ylw-pistach green epid,r chlor grs,intrbdd w/Argillite: med-dk gry,brn,sft-mod hd,loc silty,loc fiss txt,loc red dissem sulfides,r qtz vng,r-mnr calc vng,r dissem pyr.

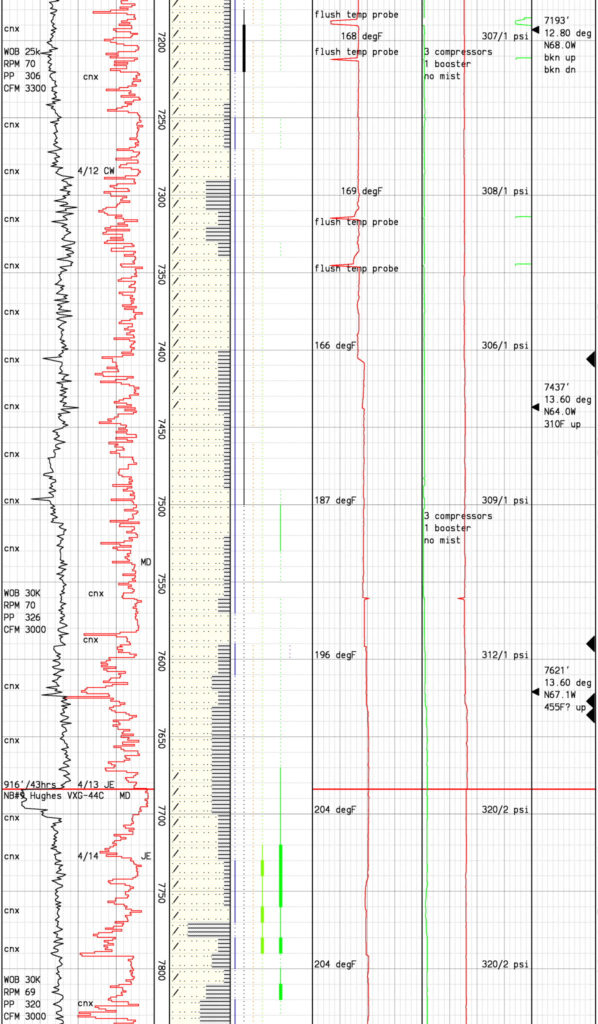
Siliceous Graywacke:lt-med gry, loc abun dk gry,loc ylw/pea grn, hd-v hd,brit,v fn-med gr,prly-mod well def gr bndrs,mod well-well srtd,loc wk-str fol,com-abun Arg mtx,r bronze mica,com v lt grn chlor wash,tr Arg lithics w/in,r-mnr qtz vng,r-mnr dissem & vng calc,r dissem pyr,r epid,r chlor,intrbdd w/ Argillite:gry-dk gry,sft-mod hd, brit,abun silty,loc fiss txt,r qtz vng,r-tr calc vng,r dissem pyr.

Well making 5 bph water.

Siliceous Graywacke:lt-dk gry, loc wht-grn/gry,hd-v hd,v well indur,r brit,v fn-med gr,prly def gr bndrs,r slight rexln,wk-str fol micas,r loc layrd,occ dk silty txt,r dk lithics,loc-pred wk-mod blchd app,r-tr wht qtz vng,r-mnr wht vng calc,r-tr dissem pyr,r ylw-ylw grn epid,r loc chlor wash,intrbdd w/ Argillite:brn-dk brn,dk gry,sft-mod hd,v fn gr,well srtd,lam,r phyll shn,r wht qtz vng,r-cmn wht calc vng,r-tr shiny ylw dissem & vng pyr.

Temp probe occasionally packing off. Flushing out via pressure hose.

Siliceous Graywacke:lt-dk gry, loc-pred wht/gry,com lt grn,hd-v hd,v fn-med gr,prly-mod def gr bndrs,fn-med gr,prly-well srtd,com wk-str fol,wk-mod



rexln,r bronze mica,r Arg lithics w/in,mnr-abun Arg mtx, tr-abun chlor wash,tr-abun mod blchd app,r dissem sulfides, loc pred mod blchd app,r-mnr qtz vng,tr-mnr dissem & vng calc,r pyr vng,r-tr canary ylw epid grs & vng,r chlor,intrbdd w/Argillite:med-dk gry,loc brn, sft-mod hd,brit,com silty,loc phyll sheen,com fiss txt,r-tr qtz vng,tr-mnr calc vng,r dissem & vng pyr,r epid vng.

Siliceous Graywacke:lt-dk gry, wht-grn/gry,hd-v hd,prly def gr bndrs,wk-str fol grs,rexln lithics,r-tr wht qtz vng,r vng calc,r dissem pyr,r ylw epid,r epid vng,r loc altrd chlor, intrbdd w/Argillite:brn-dk gry, mod hd,v fn gr,r wht qtz vng,r wht calc vng,r dissem & vng pyr.

Probable entry 7405-7408', 10 psi/28 degF init incr, 6 psi/ 20 degF psi stable increase.

Siliceous Graywacke:lt-dk gry, wht-grn/gry,hd-v hd,brit,prly-mod well def gr bndrs,loc wk-str fol grs,abun mod rexln,r bronze mica,r Arg lithics w/in, abun Arg mtx,loc chlor wash,r-tr qtz vng,r-tr dissem & vng calc,r dissem pyr,r-tr epid grs & vng,r-tr chlor,loc r pink axin frags,intrbdd w/Argillite: dk gry,sft-mod hd,brit,loc silty,loc fiss txt,loc phyll sheen,r-tr qtz vng,r-tr calc vng,r dissem pyr.

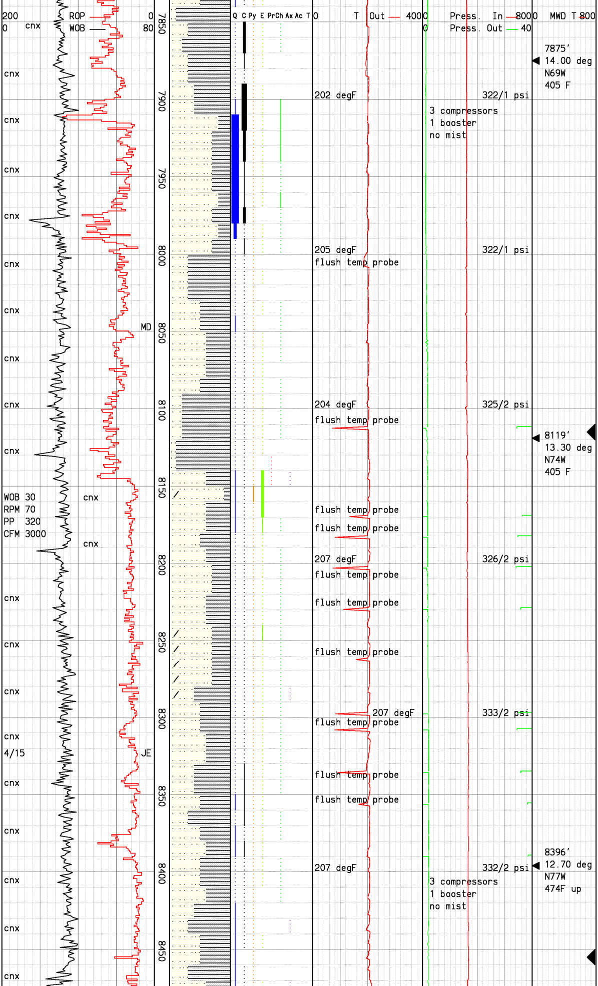
Well making 5 bph water.

Entry at 7590', 4 psi/7 degF init/stable increase. Entry at 7627', 15 psi/7 degF init incr, 12 psi/6 degF stable increase. Entry at 7636', 4 psi/3 degF init incr, 2 psi/ 2 degF stable increase.

Encounter tight spot at 7557' while RIH. Ream to bottom and drill ahead.

SFR = 39,600 lbs/hr (unrest)
H2S = 1044 ppm (air off)
NH3 = 550 ppm (air off)

Siliceous Graywacke:wht,lt gry, lt grn(chlortzd),salt & pepper, hd-v hd,occ britt,mod well-well def gr bndrs,loc wk fol grs, abun mod rexln,granular txt, mnr-abun blchd appr,occ mottld, incr propylitic altn f/7720'-7820',r-tr qtz vng,r loc calc vng,r dissem pyr,r-mnr epid agg & vng,r-mnr chlor stng,intrbdd w/Argillite:dk gry,blk,mod hd-v hd,britt,v fn gr,loc silty,loc fiss txt,dull-str phyll shn,r-tr qtz vng,r calc,r dissem pyr.



Well making 5 bph water.

Siliceous Graywacke:wht,lt gry,clr,salt & pepper,hd-v hd,occ britt,mod well-well def gr bndrs,loc wk fol grs,abun mod rexln,granular txt,com-abun blchd appr,mnr mottld,r-abun qtz vng & agg,r-com calc vng,r dissem pyr,r epid,r-tr chlor stng;intrbdd w/Argillite:dk gry,blk,mod hd-v hd,britt,v fn gr,loc silty,loc fiss txt,dull-str phyll shn,r-tr qtz vng,r calc,r loc pyr;absnt-mnr serpentine frags.

Temp probe occasionally packing off, likely due to inc in Argillite. Flushing out via pressure hose.

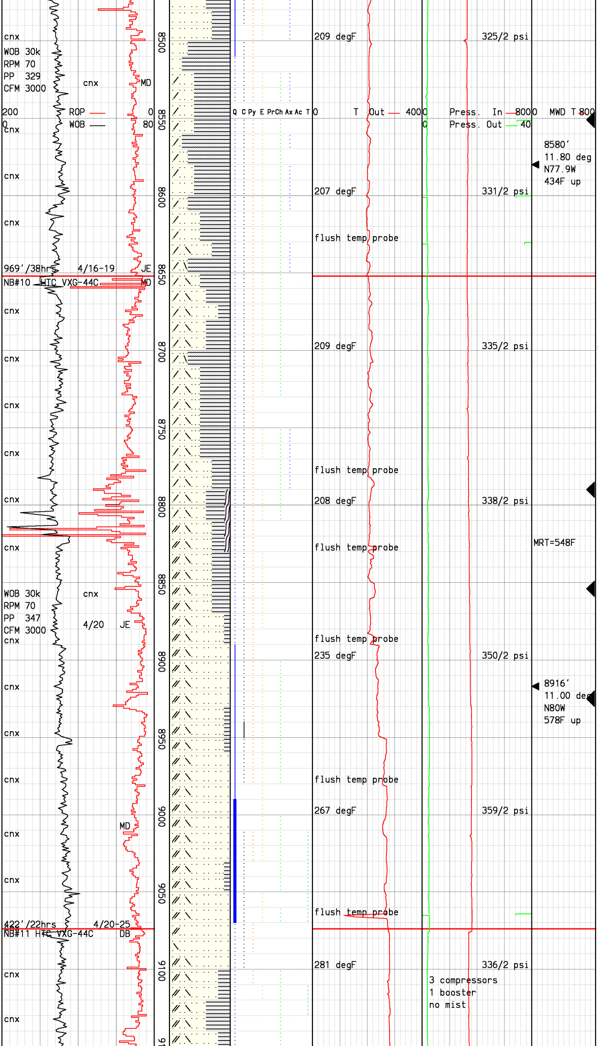
Argillite:lt-med gry,sft-mod hd,loc fri,silty-v fn grn,r dull phyll shn,r-tr qtz vng,loc-r dissem pyr,r pyr vng,loc-r dissem epid,intrbdd w/Siliceous Graywacke:wht,lt gry-grn,hd-v hd,prly-mod well def grn bndrs,salt & pepper appr,loc wk fol,loc blchd appr,loc-abun rexln,loc-r chlor wash,loc hornfelsic frag,r-tr qtz vng,r calc vng,r dissem pyr,r-tr agg & vng epid,r chlor.

Probable entry zone f/8115-8127'. 5 psi/3 degF init incr, 2 psi/2 degF stable incr.

Siliceous Graywacke:lt-md gry,lt grn,mod hd-v hd,v fn-fn gr,prly-mod def gr bndrs,mnr-pred blchd appr,pred v lt grn chlor wash,abun mod rexln,loc str rexln,r qtz vng,r calc vng,r dissem pyr,r-mnr epi grs/vng/stng,r chlor,r pink axinite frags,intrbdd w/Argillite:dk gry-blk,fri-mod hd,pred silty,com mod phyll sheen,loc str phyll sheen,r qtz vng,loc calc vng,r dissem pyr.

Siliceous Graywacke:lt-med gry,wht,mod hd-v hd,prly-mod def gr bndrs,pred blchd appr,occ lt grn chlor wash,abun mod rexln,loc str rexln,r-tr qtz vng,r-tr calc vng & agg,r dissem pyr,r epid grs & vng,r loc chlor;intrbdd w/Argillite:med-dk gry,blk,friable-mod hd,v fn-med gr,pred silty,com dull-mod phyll shn,mnr-abun str phyll shn,r qtz,r calc vng,r dissem pyr.

Minor entry at 8455', 2 psi initial increase and 1 psi stable increase with no change in temperature.



Siliceous Graywacke:lt-med gry, wht,loc altd oran,v hd,prly-mod def gr bndrs,pred blchd appr, abun mod rexln,mnr str rexln,r-tr qtz vng,r calc vng & agg,r dissem pyr,r loc epid grs,r loc axinite;intrbdd w/Argillite: As above w/decr phyll shn.

Probable entry at 8551', 9 psi initial increase and 6 psi stable increase with no change in temperature.

Draw works traction motor failed during bit run,replace with mud pump motor.

SFR = 40,800 lbs/hr (unrest)
H2S = 1155 ppm (air off)
NH3 = 500 ppm (air off)

Siliceous Graywacke:wht,lt-med gry,ylw,lt brn,mod hd-v hd,v fn-med gr,indist-prly def gr bndrs,mod-str rexln,com-abun str blchd app,abun-pred arg mtx,pred wk-mod blchd app,incr wk hornfelsic txt w/depth,r qtz vng,r calc vng,r dissem pyr, r ylw epid,r chlor,r pink bldd axinite grs & frags,intrbdd w/Argillite:dk gry,tan,sft-mod hd,dom silty,mod-str phyll sheen,r qtz vng,r calc vng,r dissem pyr.loc interbedded w/Serpentine:wht,v lt grn,sft, waxy appr,translucent.

Entry zone f/8790-8822', 8 psi/4 degF overall increase.

Failed survey at 8826'. Only MRT available.

Probable entry at 8854', 2 psi/2 degF init incr, 1 psi/2 degF stable increase.

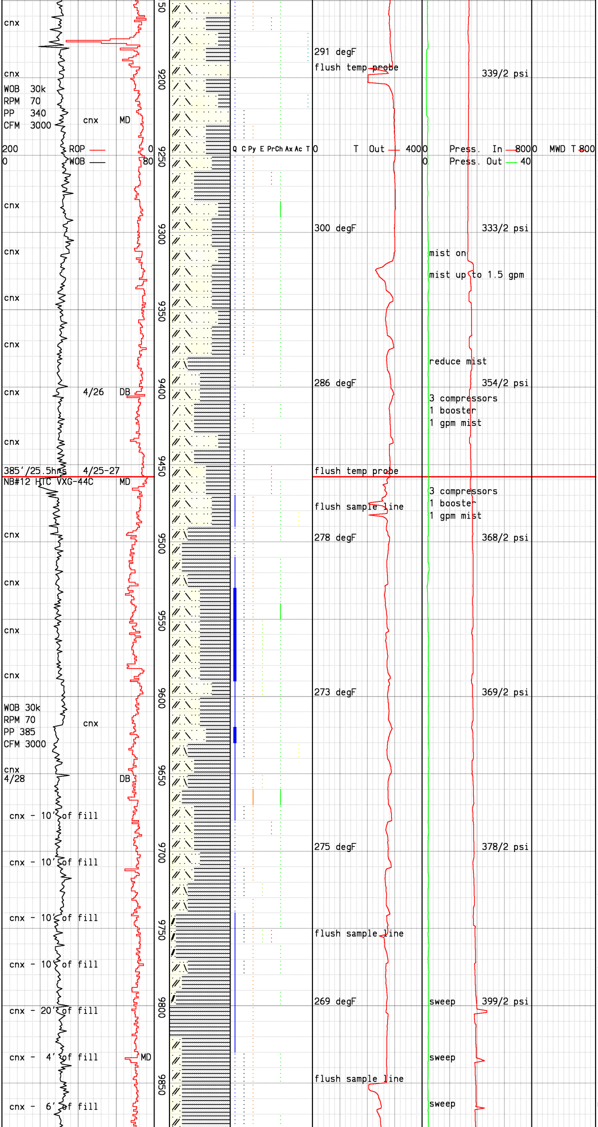
Well stop making water @ 8900'.

Entry Zone f/8925' t/8932', 9 psi/4 degF init incr, 8 psi/4 degF stable incr.Survey tool fail during cnx @ 8889' & 8950'.

Siliceous Graywacke:wht,buff, lt brn,lt gry,lt pink,hd-v hd, v fn-med gr,indist-prly def gr bndrs,abun str blchd appr, wk hornfelsic/granular txt, pred str rexln,incr altn w/ depth,tr-mnr qtz vng,r calc vng,r epid,r chlor,tr-mnr pink/grn tourm(?),w/mnr-abun Argillite:lt-dk gry,mod hd,loc silty,r dissem pyr;r Serp frags.

Drill t/9074',twist off,POOH. RIH,retrieve fish on second attempt after milling on box. M/U new bit & BHA, RIH & drill ahead.

SFR = 70,000 lbs/hr (unrest)
H2S = 1076 ppm (air off)
NH3 = 500 ppm (air off)



Possible entry: 9174'
Drilling break 111 ft/hr
9 degF overall temp incr,
no associated press incr.

Siliceous Graywacke:A/A,pred str rexln,loc abun grn chlor wash,r tourm,intrbdd w/ Argillite:A/A,com silty,loc str phyll sheen,w/r Chert:gry,v hd, r qtz microvng,w/r Serpentine: wht,v lt grn,waxy/soapy app,hd.

Siliceous Graywacke:A/A,r hexagonal blk biotite flakes, decr calc w/depth,intrbdd w/ Argillite:A/A,gry-dk gry,brn, loc blk.

SFR = 66,000 lbs/hr(unrest)
H2S = 1037 ppm (air off)
NH3 = 510 ppm (air off)

Possible steam entry at 9470'. 9 psi init incr, 7 psi stable incr, no temperature increase.

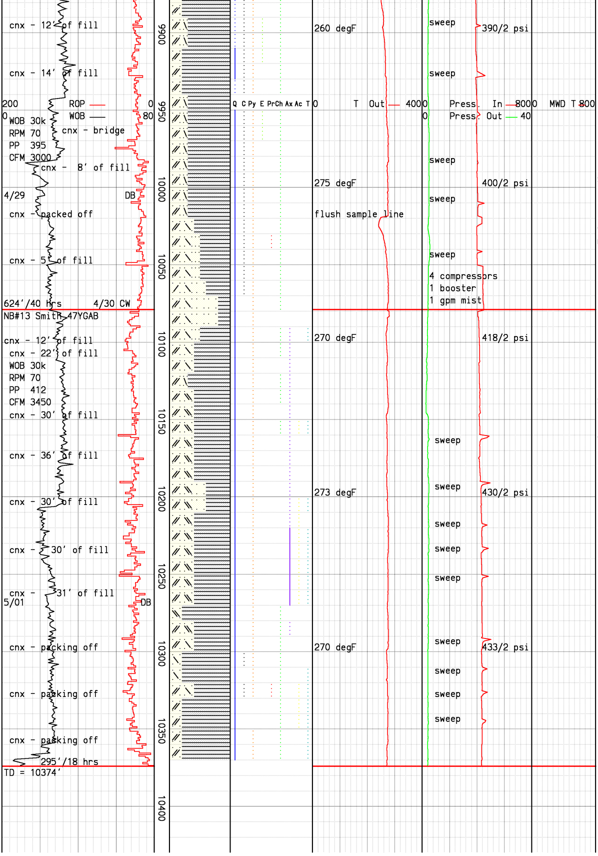
Small pressure fluctuations due to mist being turned off 5' prior to connections.

Siliceous Graywacke:lt brn,lt rust/brn,wht,indist gr bndrs,v hd,pred str siliceous,pred wk-mod hornfelsic,abun str blchd, incr homogeneous w/depth,loc wht & grn bladed actin(?),loc r epid,intrbdd w/Argillite:A/A, incr siliceous w/depth.

Begin encountering 10' of fill on connections at around 9680'. Pump 10 gal/20 bbls H2O soap & 1 gal/20 bbls H2O corrosion inhibitor starting at 9750'. Begin pumping 5 bbl sweeps 5' before cnx's starting @ 9800'.

Argillite:lt-dk gry,mod hd-hd, pred silty,occ phyllite sheen tr disagg qtz,r qtz vng,r disagg pyr,loc canary epid,loc disagg pyrr,r serp frags, intrbdd w/Siliceous Graywacke: A/A w/r chlor intrusions.

Argillite:A/A w/loc bronze mica flakes,intrbdd w/Siliceous Graywacke:A/A,loc chlor vng.



Decrease soap to 5 gal/20 bbls H2O at 9895'. More fill, increase soap back to 10 gal/20 bbls H2O at 9935'.

Encounter bridge 15' above KD at 9943' (cnx at 9958'). No fill below bridge.

10,020': Packed off, pressure incr to 740 psi. Work pipe, come free and drill ahead.

Siliceous Graywacke: A/A,loc lt brn,marg alt w/ dist grn bndrs,mod hornfelsic,r chlor inclns,r disagg pyrr,intrbdd w/Argillite:A/A,tr disagg milky qtz,loc clr qtz,loc lt brn qtz.

10,050': Air injection incr f/3000 t/3450 cfm.

SFR = 61,700 lbs/hr (unrest)
H2S = 1179 ppm (air off)
NH3 = 800 ppm (air off)

Siliceous Graywacke:lt-dk gry brn,orng-off wht,hd-v hd,v prly def gr bndrs almost mass,rexln wht-off wht felds,r loc rexln lithics,mod-str hornfelsic,loc dull lustr,tr wht-clr disagg & vng qtz,r disagg-vng pyr,r loc chlor,r-tr pnk-orng axin vng & druse,r grn bladed actin vng,r dk iridescent rods,r possible biotite, intrbdd w/Argillite:dk to blk,metallic lust,v fn gr,pr gr bndrs,r wht qtz micro vng,r disagg & vng ylw pyr,

Mixing soap: 10 gal/20 bbls
Injecting mist: 0.5 gal/min

SFR = 56,000 lbs/hr (unrest)
H2S = 1182 ppm (air off)
NH3 = 700 ppm (air off)

TD Prati State 25 Redrill on 5/1/2010, 10,374'.Run 132 joints of 8 5/8" 40# L-80 slotted and blank liner f/5516-10360'.