

Ray
4/9/86

Bechtel National, Inc.

Engineers—Constructors



Fifty Beale Street
San Francisco, California

Mail Address: P.O. Box 3965, San Francisco, CA 94119

Letter No. 16937-400-264

April 8, 1986

Mr. Ray Wallace
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Subject: Salton Sea Scientific Drilling Project
Mud Log for State 2-4, Bechtel Job 16937

Dear Mr. Wallace:

Per your request of C. A. Harper, please find attached a complete Mud Log for State 2-14. If you need additional information, phone Charlie at (415) 768-9918 or me at (415) 768-9232.

Very truly yours,

D. T. Rabb
Research and Development

DTR:fev

























EXLOG R.F. SMITH CORP. SMITH GEOTHERMAL DIVISION

GEOTHERMAL DATA LOG

COMPANY BECHTEL NATIONAL, INC.
 WELL STATE 2-14
 FIELD SALTON SEA
 COUNTY IMPERIAL STATE CALIFORNIA
 LOCATION SEC 14 T 11S R 13E
 ELEVATION -225.2 KB DF GL
 CONTRACTOR/RIG CLEVELAND DRILLING, INC./ #6
 SPUD DATE 10/24/85 TD DATE 3/17/86
 TD 10,564' TRUE VERT DEPTH _____
 BOTTOM HOLE LOCATION _____
 WELL STATUS _____
 COMPANY REPRESENTATIVE Gerald Reich

HOLE SIZE		CASING RECORD	
<u>40"</u>	to <u>150'</u>	<u>30"</u>	at <u>150'</u>
<u>17 1/2"</u>	to <u>3530'</u>	<u>13 3/8"</u>	at <u>3515'</u>
<u>12 1/2"</u>	to <u>6000'</u>	<u>9 5/8"</u>	at <u>6000'</u>
<u>8 1/2"</u>	to <u>10,475'</u>	<u>7"</u>	at <u>10,136'</u>
<u>6 1/8"</u>	to <u>10,564'</u>	_____	at _____
_____	to _____	_____	at _____

LITHOLOGY SYMBOLS

 Breccia	 Tuff and tuff-breccia	 Conglom.
 Graywacke	 Sandstone	 Siltstone
 Claystone	 Limestone	 Chert
 Argillite	 Dolomite	_____
 Solution Deposit	 Mineralized Zone	 Granitic Rock
 Intermed. Igneous	 Basic Igneous	 Peridotite
 Acidic Volcanic	 Intermed. Volcanic	 Basic Volcanic
 Porphyry	 Serpentine	 Schist Gneiss
 Clay	_____	_____

ENTRIES-WATER/STEAM

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

* = TESTED ZONES

LOG INTERVAL

DATE LOGGED 10/26/85 to 3/17/86
 DEPTH LOGGED 150' to 10,564'
 MUD DRILLING surface to 10,564'
 AIR DRILLING _____
 TEMPERATURE INSTRUMENT TYPE J-Thermocouple
 PRESSURE INSTRUMENT TYPE _____
 GAS TRAP-AGITATOR ELEC AIR
 LOG SCALE 1:600 UNIT NO. 335
 LOG PREPARED BY Ed Zifcheck, Frank Gonzales

LOST CIRCULATION ZONES

<u>6637'</u>	<u>8948'</u>
<u>8095'</u>	<u>9458'</u>
<u>8585'</u>	<u>10,475'</u>

MISC. REMARKS

Flow test at 6227'

SECONDARY MINERALS

Q = QUARTZ	s = sulfide	•
C = CALCITE	ch = chlorite	•
P = PYRITE	a = anhydrite	•
E = EPIDOTE	h = hematite	•

NO NEW BIT
 RRB RE-RUN BIT
 CB CORE BIT
 WOB WEIGHT ON BIT
 RPM REVS PER MINUTE
 SPM STROKES PER MINUTE
 CFM CUBIC FT PER MINUTE
 NR NO RETURNS
 Q CARBIDE TEST
 LAT LOGGED AFTER TRIP
 BHT BOTTOM HOLE TEMPERATURE
 TC TIME SINCE CIRCULATION
 CASING SHOE
 CORED INTERVAL
 NO RECOVERY

W MUD DENSITY
 V FUNNEL VISCOSITY
 PV PLASTIC VISCOSITY
 YP YIELD POINT
 F FILTRATE API
 FC FILTER CAKE
 SOL SOLIDS-%
 SD SAND CONTENT-%
 S SALINITY-PPM CI
 CA CALCIUM-PPM Ca
 MUD RESISTIVITY
 WIRELINE LOG RUN
 WATER/STEAM ENTRY
 ORIFICE/FLOW TEST

DRILL RATE
 ft/hr min/ft
 m/hr min/m
 ROCK DENSITY (g/cc) ---

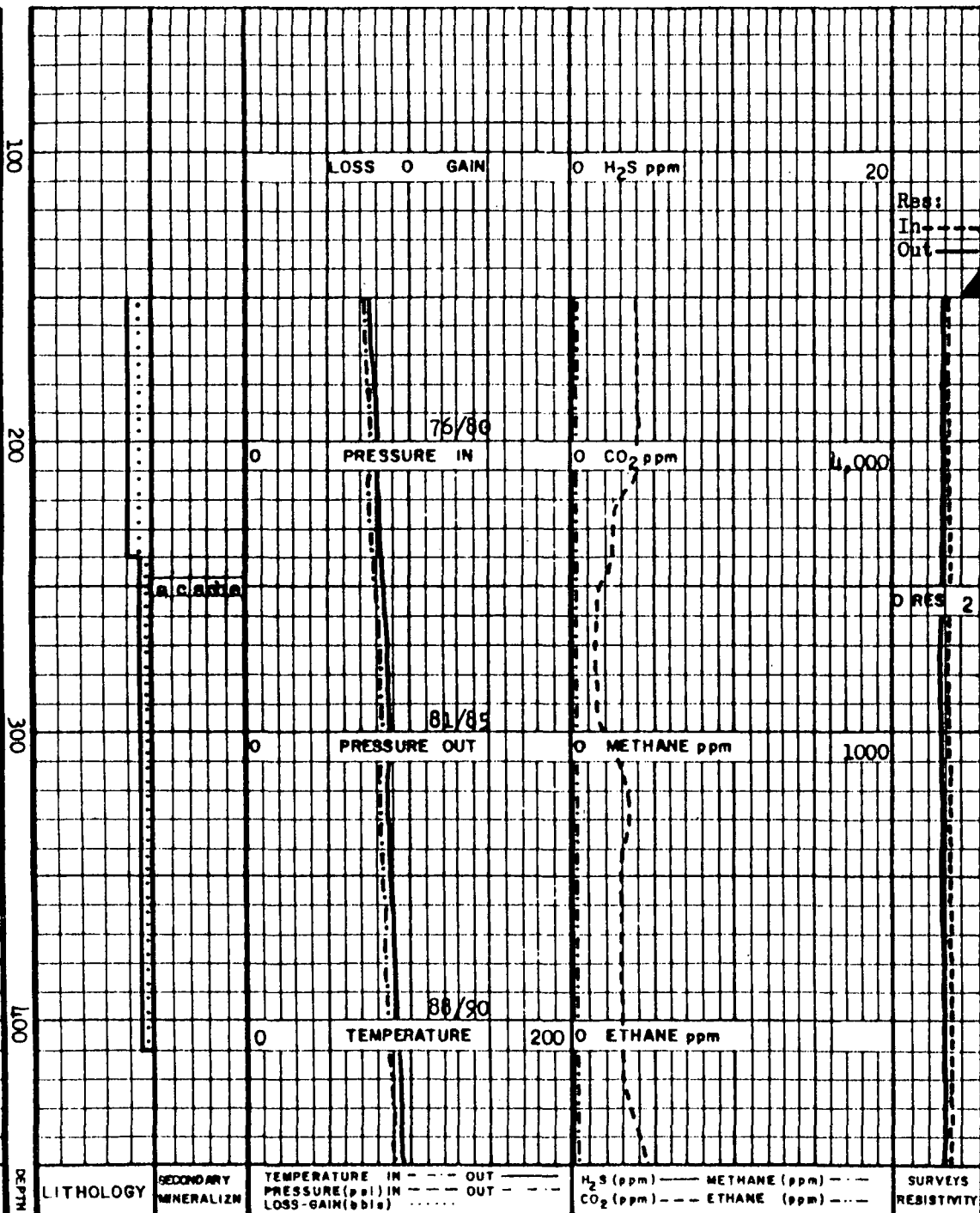
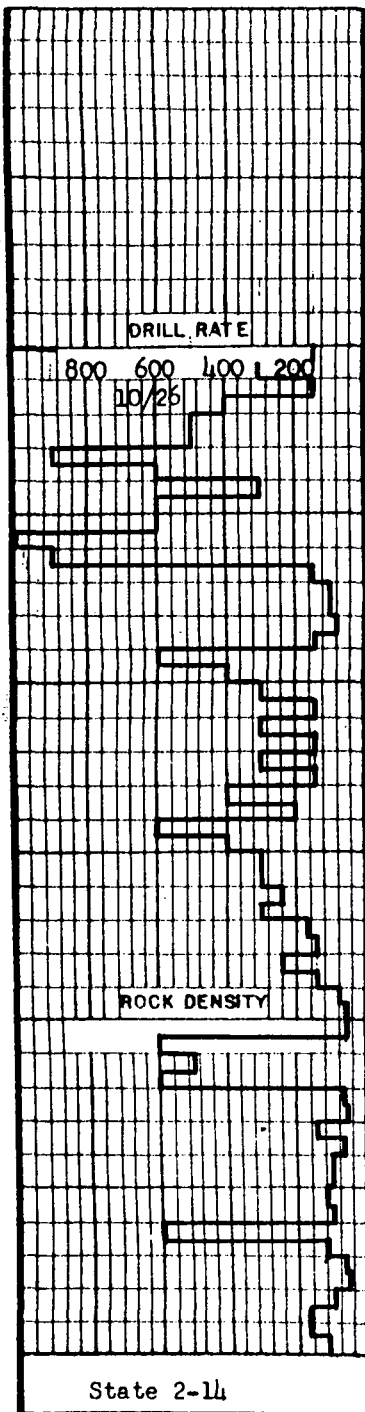
DEPTH
 LITHOLOGY
 MINERALIZATION

TEMPERATURE °C °F
 IN --- OUT ---
 PRESSURE KSC PSI
 IN --- OUT ---
 LOSS/GAIN
 BBLs

H₂S ppm _____
 CO₂ ppm _____
 METHANE ppm _____
 ETHANE ppm _____

SURVEYS
 RESISTIVITY Ω-M

LITHOLOGY DESCRIPTION
 AND REMARKS



Note: numbers in the secondary minerals column denote % of sample (i.e. 3=3%), "-" denotes less than 1%, "+" denotes more than 9%.

Note: opened 40" hole to 150', set 30" csg @ 150', begin logging @ 150' on 10/26/85, drlg 17 1/2" hole.

Clay: med-choc brn, v sft, v sol, stky w/fn gr interbdd slt/snd.

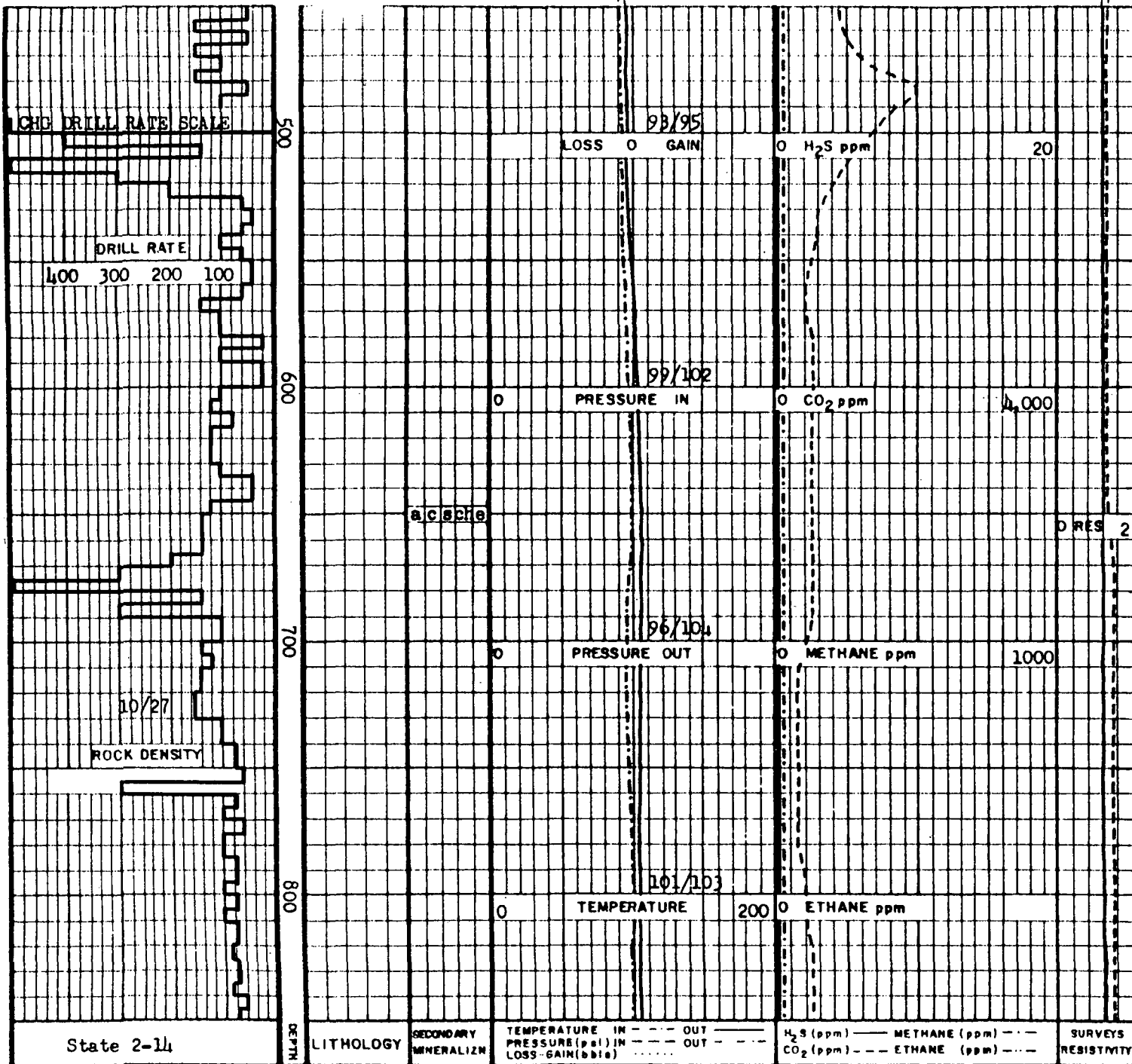
Sand: wht-clr, fn gr, mod-well srted, sbrd-sbang, scat slt, mnr-comm det biot & lithic frags, mnr coll pyr.

Clay: lt-med gry, v sft, v sol, sl calcic, cont stky w/abdt scat slt, mnr det lithic frags.

Clay: med gry, sol, stky, comm-abdt scat tan-wht slt & snd, approx 90% clay size particles.

Sand: wht, tan, buff, fn gr, sbrd-sbang, mod-well srted, cln qtz snd w/occ clr grs, mod amts of lithic frags, mnr coll pyr, tr-mnr det biot.

Clay: med gry, v sft, sol, stky w/interbdd slt & snd.



Clay; pred lt-med gry, mnr med brn, v sft, v sol, vis scat slt strgs, comm asstrd lithic frags.

Clay; grndng f/med gry to med-choc brn, incr v sft & stky appr, v sol, decr slt.

Clay; grndng f/med brn to gry, sft, v sol, uncon-sol, comm v fn gr dism slt w/approx 90% clay size slt.

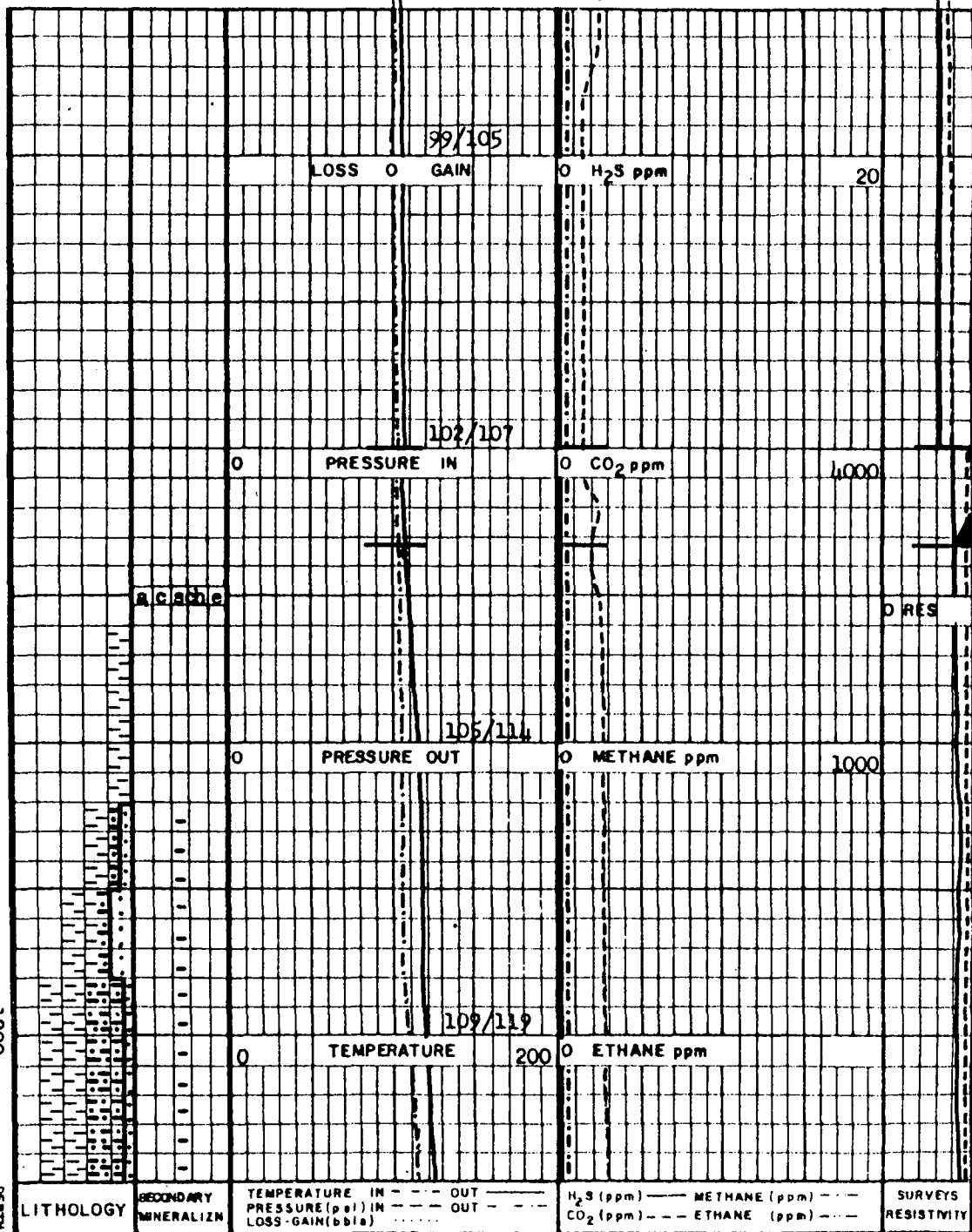
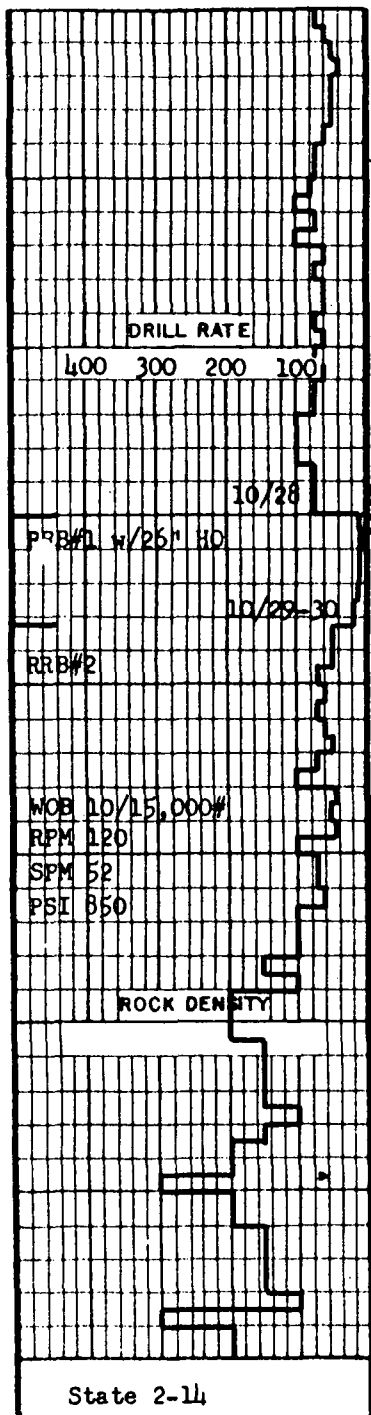
Clay; lt-med gry, sft, stky, v sol, comm inter-bdd clay size silts, sl calcic.

Clay; grndng f/gry to med brn, sft, interbdd w/clay size silts, sol, sl calcic.

Clay; med gry, sft, v sol, stky, sl calcic, inter-bdd w/v fn gr silts.

W 9.7 FV 54 PV 10
 YP 24 pH 8.1 F 18
 FC 2/32 CL⁻ 1450
 SD 1/2 SOL 10

Clay; med brn to med gry, sft, stky, sol, calcic, interbdd w/mnr slt & v fn gr snd, tr lith frag inc qtzite & alt volcanics.



Clay: lt gry, med brn, sft, stky, sol, calcic, w/ tr-mnr silt & v fn gr snd.

Clay: pred med brn, mnr lt gry, sft, stky, sol, calcic, interbdd w/lt gry snd.

Clay: lt gry, sft, stky, sol, calcic, loc slty, bcmg frm w/depth.

Clay: lt gry, sft-frm, stky, sol, calcic, interbdd w/mnr red brn cly.

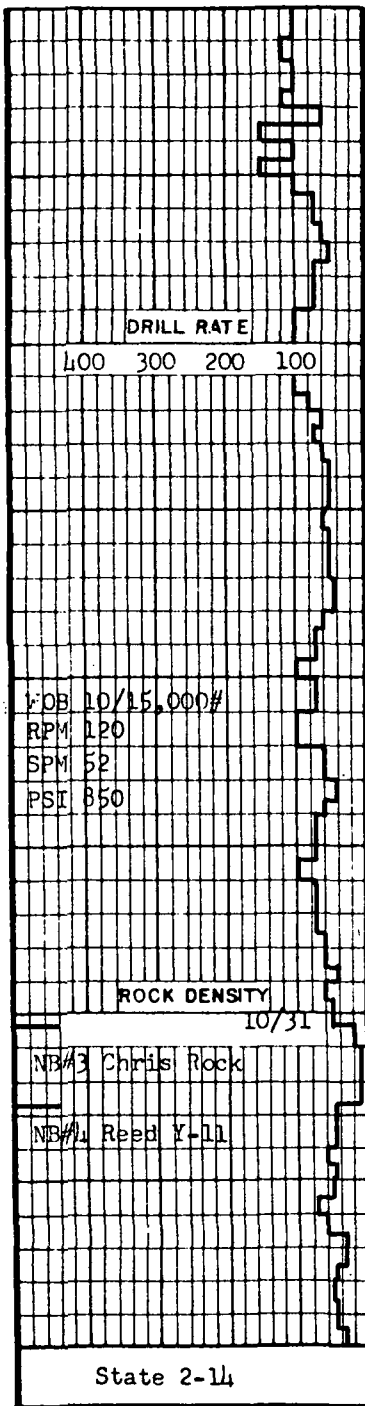
Note: open hole to 1032' w/26" HO, set 20" csg @ 1032', cont drlg 17 1/2" hole

Clay: lt-med gry, sft-frm, grndg into interbdd silt/snd, sol, sl calcic, tr v fn gr diam pyr.

Sandstone: wht-lt gry, frm-mod hd, calcic, v fn gr, tr v fn gr diam pyr, interbdd w/slty clay.

W 9.8 FV 40 PV 10
YP 14 pH 9.8 F 14
FC 2/32 Cl⁻ 1100
SD 1/4 SOL 11

Siltstone: lt-med gry, prly consol, calcic, tr v fn gr pyr, interbdd with cly/clystn.



Siltstone:lt-med gry,
prly consol,mod calcic,
tr disp pyr,interbdd w/
clay & snd.

Claystone:lt-med gry,
frm,sl calcic,interbdd
w/slty clay,incr indur,
tr v fn gr disp pyr.

Claystone:lt-med gry,
sft-frm,bcmg consol w/
depth,abdt interbdd
slt,tr disp pyr.

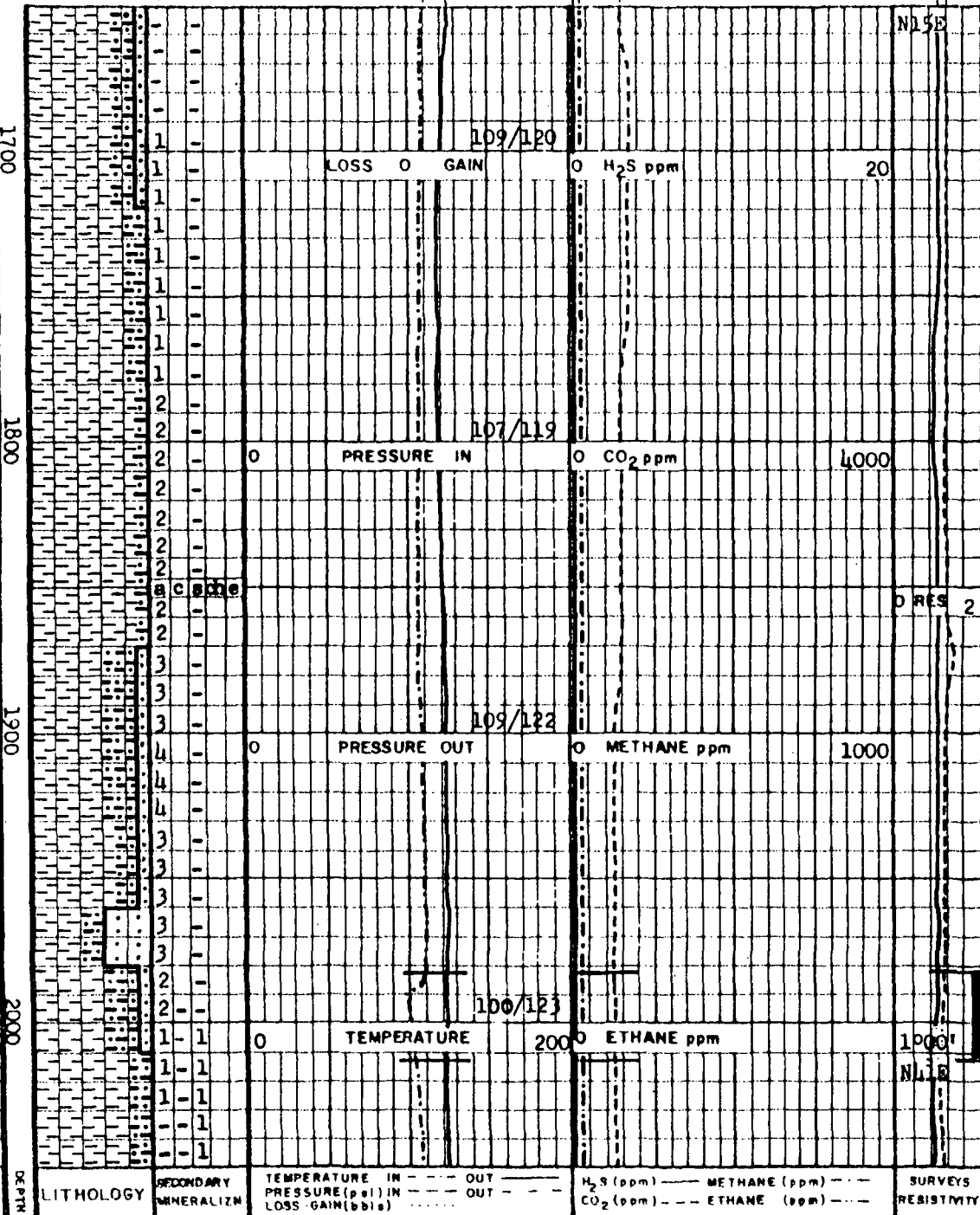
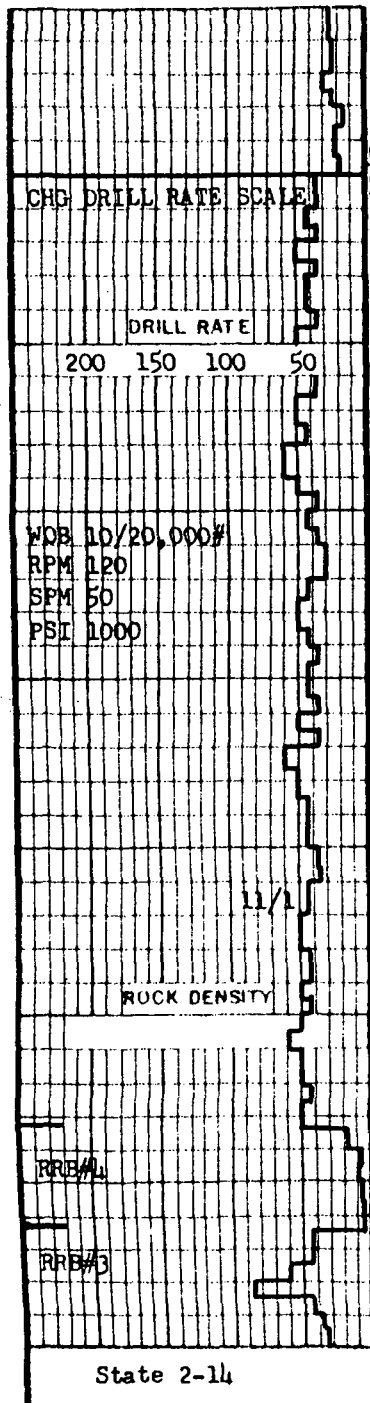
Sandstone:wht-lt gry,
v fn gr,mod hd,pred qtz
w/calcite cmt,prly
srtd,v porous,comm
interbdd slt,comm blk
carbonaceous frags,tr
disp pyr.

Note:130 bbl mud
loss f/1450-1480'.

W 9.8 FV 40 PV 10
YP 14 pH 9.8 F 14.0
FC 2/32 CL 2700
SD 1/4 SOL 11

Note:core f/1553'
to 1577.6',100%
recovery.

Claystone:lt-med gry,
sl-mod hd,loc slty,mod
calcic,tr disp pyr,r
anhydrite,interbdd w/
sltstn & v fn-fn gr
sndstn.



Sandstone: wht-lt gry, sl hd-hd, v fn-fn gr, silty, mod srtd, subang-subrnd, pred qtz, mnr fld, tr dism pyr, mod-abun calc cmt, poss anhydrite cmt, interbdd w/Claystone: lt-med gry, frm-hd, calcic, grdnl to sltstn, tr-mnr wht-lt gry anhydrite, tr dism pyr.

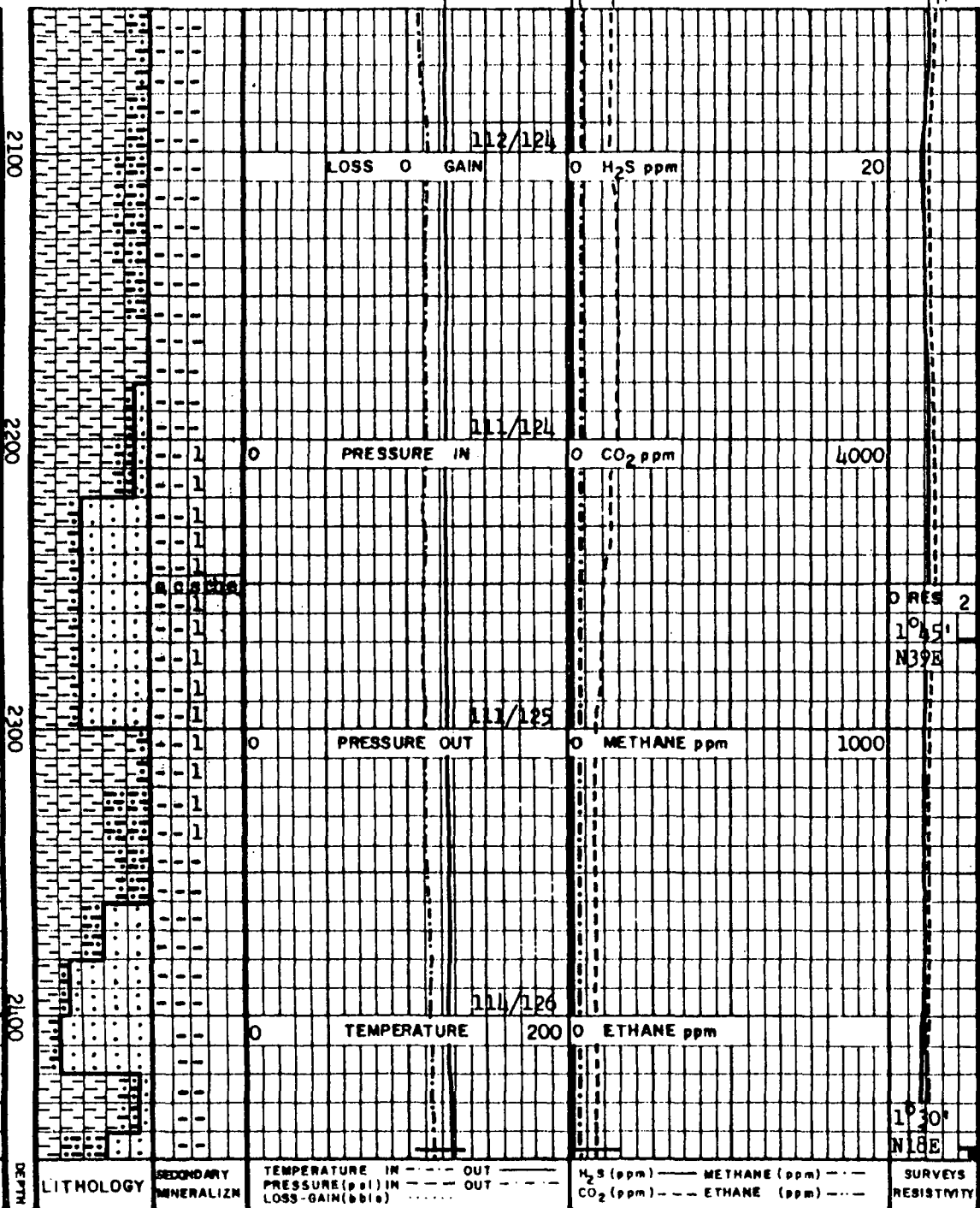
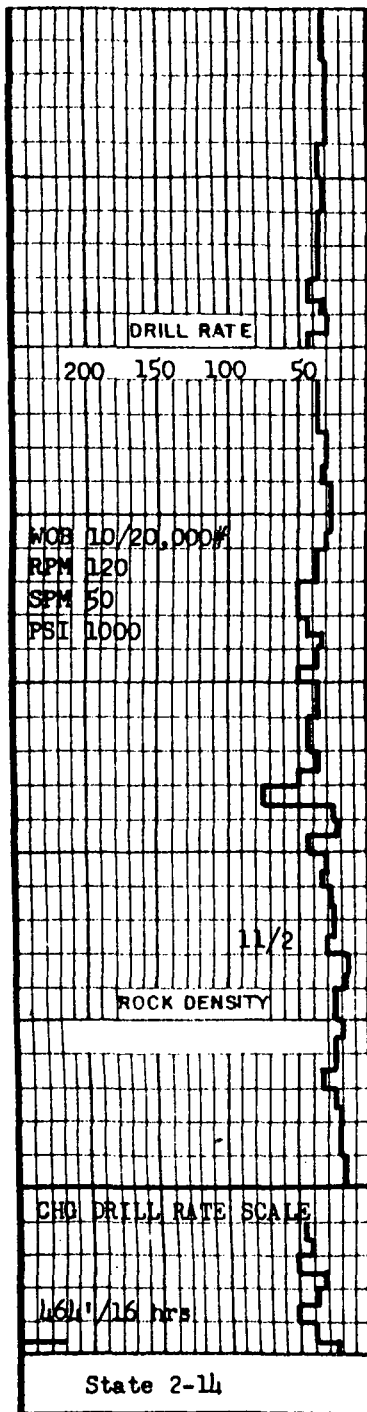
Claystone: lt-med gry, pred frm-sl hd, mnr hd-well cmt, calcic, loc grdnl to sltstn, inc anhydrite w/depth, tr dism pyr.

Claystone: pred lt-med gry, loc sl grnish cst, pred frm, loc hd, calcic, mnr-loc comm anhydrite, tr dism pyr.

Sandstone: wht-lt gry, v fn gr, sl hd, sbrnd-sbang, v slty, prly srtd, pred qtz, calcic cmt, tr dism pyr, mnr-comm anhyd.

Claystone: med gry, frm, loc slty, calcic, mnr-loc comm anhyd, tr dism pyr.

Note: core #2 f/1983 to 2012.2', 100% recovery.



Claystone:lt-med gry,
sft-frm,blky,loc slty,
calcic,comm spotted
appr(poss anhyd),tr
calc frac fill,tr dism
& vn pyr,r dk & clr
yllw sphalerite,r
galena.

W 9.6 FV 36 PV 7
YP 20 pH 9.6 F 20.2
FC 2/32 CL 2900
SD 1/4 SOL 9 1/2

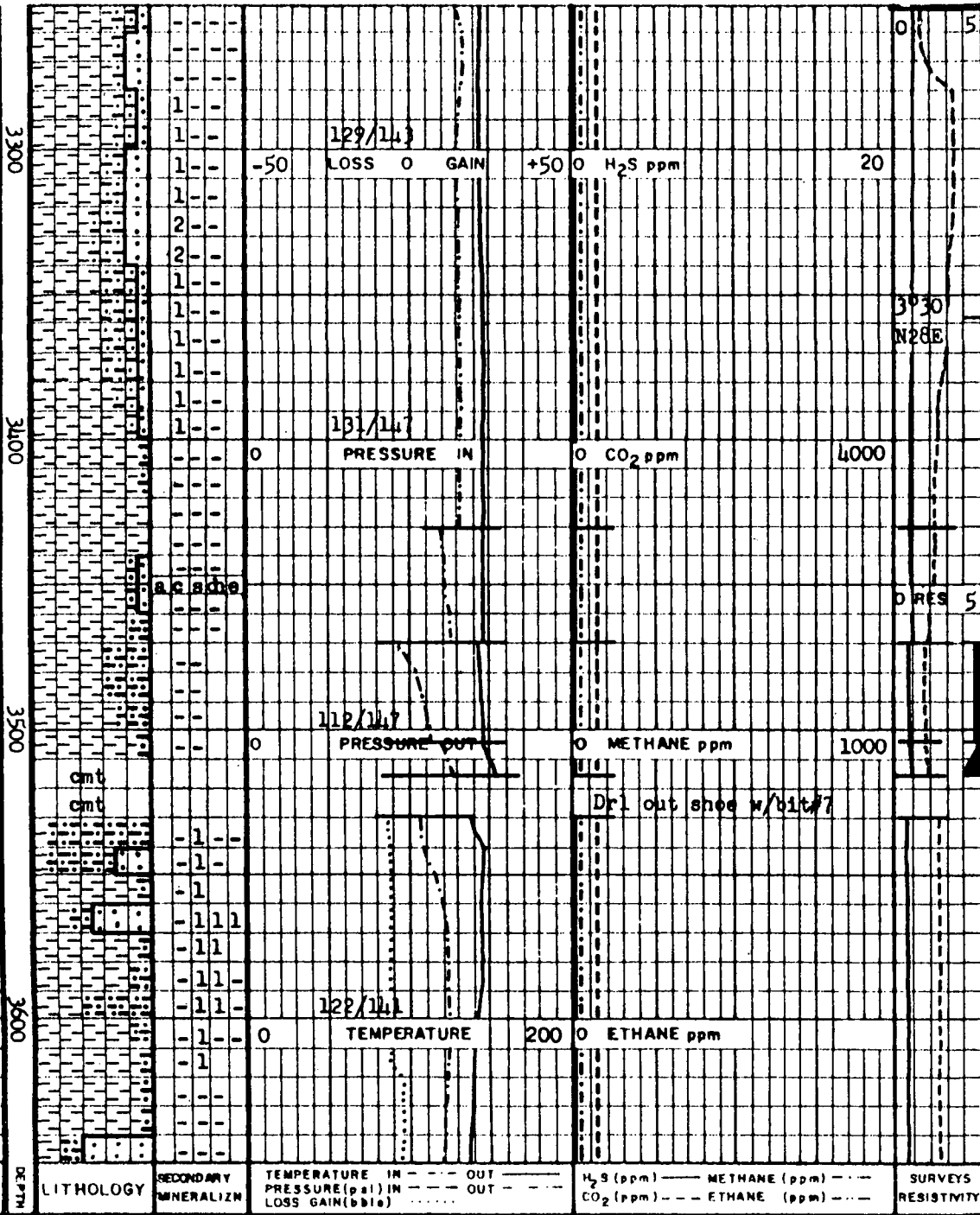
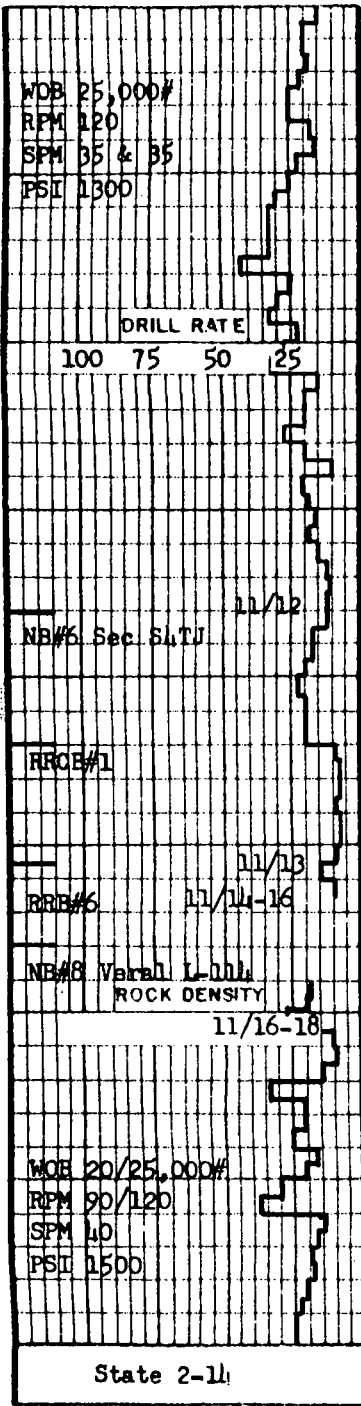
Claystone:lt-med gry,
sft-frm,blky,interbdd
w/sltst & ss,calcic,
spotted w/wht mnrl
(poss anhyd or calc),
r-tr anhyd,r-tr calc
vng,r-tr dism & vn pyr.

Sandstone:pred wht,mnr
lt gry,v fn gr,mod hd-
hd,prly srted,sbrnd-sb-
ang,slty,calcic,tr dism
pyr.

Siltstone:pred med gry,
mnr lt gry,mod hd,blky,
calcic,tr anhyd,tr clr
euhed calc frac fill,
tr dism pyr.

Sandstone:wht-lt gry,
v fn gr,mod hd,prly
srted,pred qtz w/mnr
felds,comm calc cmt,tr
dism & vn pyr.

RES 2
105'
N39E
130'
N18E



Note: resistivity scale change.

Claystone: pred lt-med gry, mnr wht, mod hd, blk, loc vis microlams, loc slty, calcic, comm wht spotted appr, tr-mnr calc vng, tr-mnr dism pyr.

W 9.3 FV 40 PV 9
YP 10 pH 10.6 F 12
FC 2/32 Cl 3100
SD 1/4 SOL 6 1/2

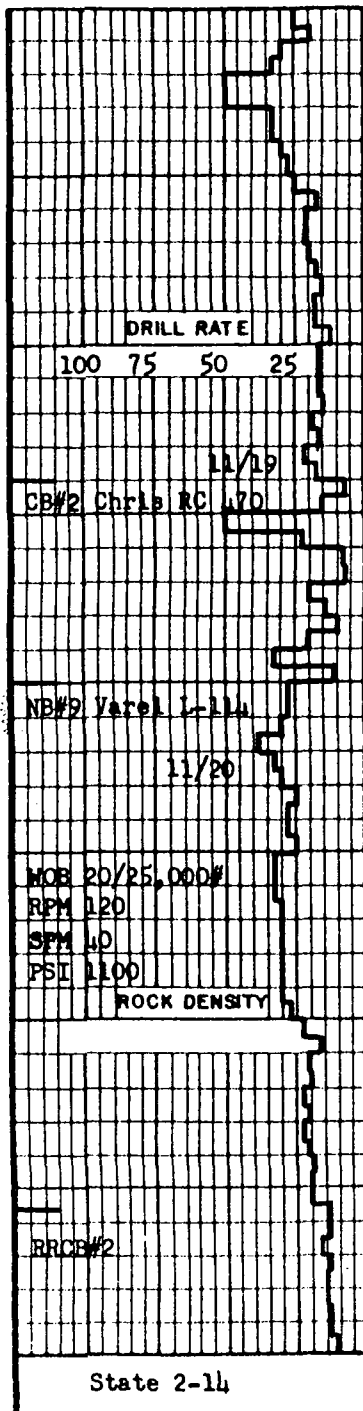
Claystone: lt-med gry, mod hd-hd, blk, loc interbdd w/lt gry-wht sltstn, calcic, spotted w/wht mnrl, tr calc vng, tr-mnr dism pyr.

Note: core #7 f/3470' to 3504', 97% recovery.

Note: set 13 3/8" @ 3515'. Drl out shoe to 3530'. PCH & run cnt bond log. Cont drlg 12 1/2" hole.

Siltstone: lt-med gry, lt grn, mod hd, calcic, loc grdntl to clystn, tr calc vng, tr-mnr dism pyr, tr chlor, tr epid.

Claystone: lt gry, lt grn, spotted w/wht min, tr calc, pyr, & epid.



Sandstone:wht,pred fn gr,loc mnr fn-med gr, mod hd,loc fria,prly srtd,abdt calc cmt,loc chlorite stn matrix, mnr calc vng,mnr-comm dism pyr,r-tr yllw epid

Siltstone:pred lt-med gry,mnr lt grn cast, mod hd,calcic,comm interbdd w/clystn,sl chlrtztn of matrix,tr vn calc,tr fn gr dism pyr,r epid.

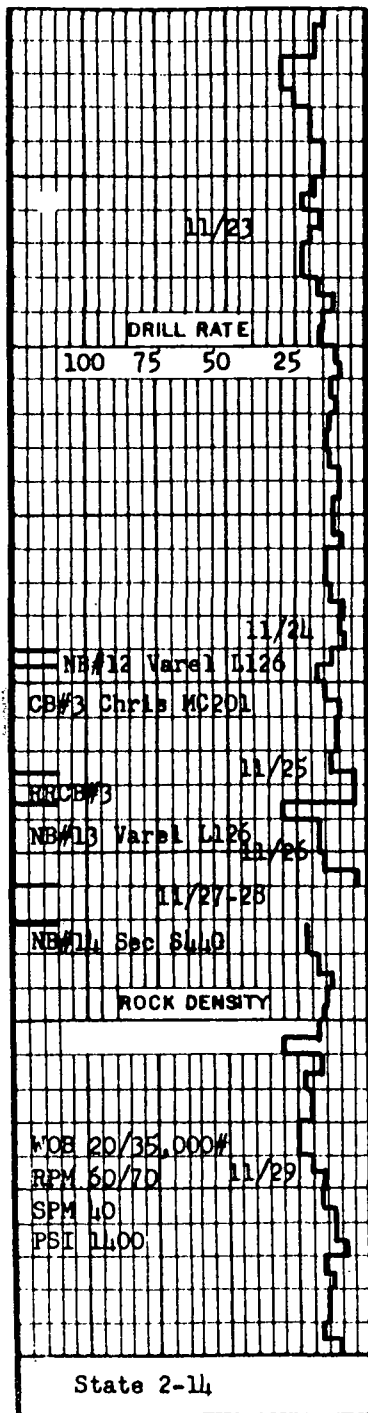
Note:core #8 f/3790' to 3846.6',94% recovery.

Siltstone:lt-med gry, lt grn,mod hd,calcic, sl chlortad,tr calc vng,tr dism pyr,r-loc tr epid.

Claystone:pred lt-med gry,lt grn,mnr dk gry, mod hd,calcic,loc slty spotted w/wht min(pos feldspar or anhydrite) comm wht-lt grn anhy-drite,sl chlortztn of matrix,tr calc vng,tr dism pyr & chalcopyr, loc tr epid.

W 9.2 FV 38 PV 12
YP 10 pH 10.1 F 17
FC 2/32 Cl⁻ 3500
SD 1/4 SOL 7

Note:core #9 f/4007' to 4069.9',100% recovery.



11-2							
11-4							
1114							
1114	111/140						
1114	-50	LOSS	0	GAIN	+50	H ₂ S ppm	20
1114							
1114							
11-4							
11-4							
11-4							
1115							
1115							
11-4							
11-4	109/138						
11-4	0	PRESSURE IN			0	CO ₂ ppm	4000
11-4							
11-4							
11-5							
11-8							
11-8							
11-6							
11-5							
11-6							
11-6	128/151						
11-6	0	PRESSURE OUT			0	METHANE ppm	1000
1-18							
1-18							
1-17							
1-28							
1-17							
1-17							
1-17							
1-17							
1-17	133/165						
1-17	0	TEMPERATURE			200	ETHANE ppm	
1-1+							
1-19							
1-18							
1-18							

Claystone:lt-med gry, lt grn,hd,calcic,loc grdnl to sltstn,spot w/wht min,comm epid vng,mnr calc vng,mnr dism sulfides,tr qtz vng,loc chlortzd mtx.

Siltstone:lt-med gry, lt grn,hd,silicified, sl calcic,comm -abun vn epid,mnr vn qtz & calc,mnr pyr,chalcopyr, sphal & gal.

Sandstone:lt gry,grn, yel,mod hd,silicified, sl calcic,v fn-fn gr, silty,comm-abun vn epid,mnr vn qtz & calc,mnr pyr & chalcopyr,tr spal,gal,pyrr.

Note:core #12,f/4643 to 4681.5',100% recovery.

Note:core #13,f/4681.5' to 4684,42% recovery.

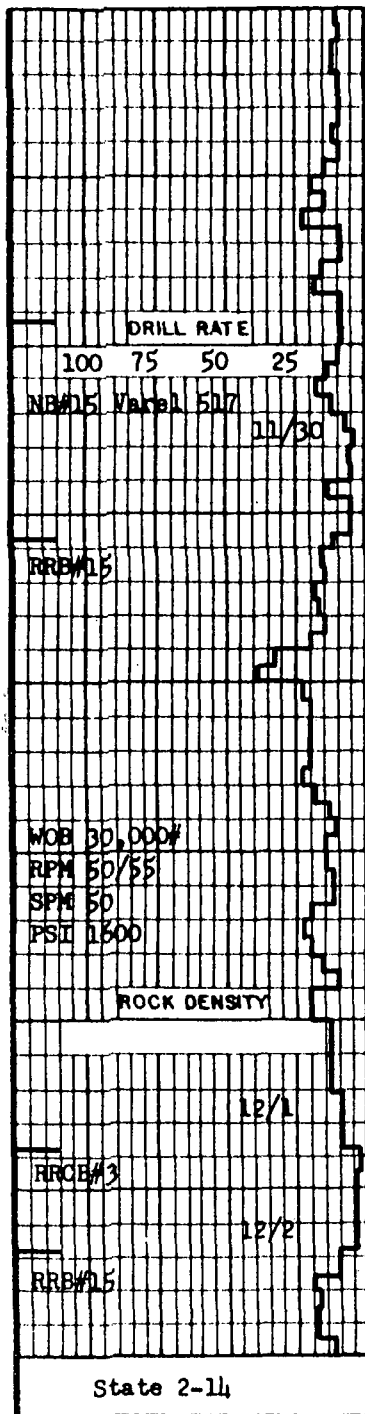
Note:lost 4 stab blds,POH @ 4710', mill & fish,recover core #14 w/junk basket, resume drlg @ 4722'.

Claystone:lt-med gry, lt-med grn,yel/grn,hd sl calcic,loc silty, spotted w/wht min,abun vn & matrix epid,tr calc,tr chlor,tr pyr & chalcopyr,tr hem.

State 2-14

LITHOLOGY SECONDARY MINERALIZM TEMPERATURE IN --- OUT --- PRESSURE (psf) IN --- OUT --- LOSS-GAIN(bbit) H₂S (ppm) --- METHANE (ppm) --- CO₂ (ppm) --- ETHANE (ppm) --- SURVEYS RESISTIVITY

REMARKS - LITHOLOGY EXLOG/SMITH PAGE 12



Note: decr in temp due to more efficient mud cooling.

Sandstone: wht w/comm-abdt yllw-grn cast, v fn-fn gr, hd, silicified, comm epidtzd matrix, tr-mnr qtz ovrgwrths, comm-abdt epid vng w/vis pris xls, tr pyr & chalcopyr, r-tr hem, r-tr vn calc.

Claystone: pred lt-med gry/grn, mnr dk gry, mod-v hd, sl calcic, loc silty, spotted w/wht mnr (poss anhyd), mnr vis microlams, loc chlortzd, grdtl to sltstn, mnr-comm vn epid, tr-mnr calc vng.

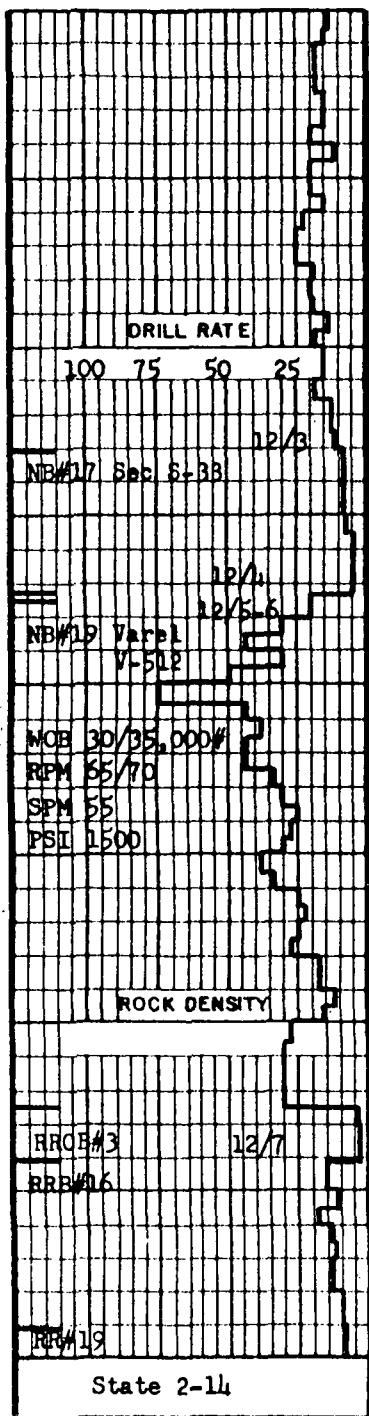
W 8.9 FV 42 PV 16
YP 12 pH 10.8 F 10
FC 2/32 C1 4200
SD nil SOL 6

Sandstone: wht w/yllw-grn cast, v fn gr, hd, epidtzd matrix, comm-abun epid vng, tr pyr & chalcopyr, r-tr hem, r-tr vn calc.

Claystone: med-dk gry, hd, spotted w/wht min, silty, tr calc & qtz vng, tr pyr & chalcopyr.

Note: core #15, f/5188' to 5218', 100% recovery.

State 2-14



DEPTH	LITHOLOGY	TEMPERATURE IN PRESSURE (psi) IN LOSS-GAIN (bbl/s)	TEMPERATURE OUT PRESSURE (psi) OUT	H ₂ S (ppm)	METHANE (ppm)	ETHANE (ppm)	SURVEYS RESISTIVITY	
1								
1								
1								
2								
2		129/160						
2		-50	LOSS 0 GAIN	+50	0	0	20	
2		2--1						
1		11-2					6915'	
1		1--2					N73E	
1		11-2					221'OF	
1		11-2						
1		11-1						
1		1-1-						
1		1-1-						
1		111-						
1		1111	0	PRESSURE IN	0	CO ₂ ppm	4000	
1		1111					7°30'	
1		1111					N75E	
1		1111					202'OF	
1		111-						
1		1217						
1		1217					0 RES 5	
1		1218					7°15'	
1		1219					N77E	
1		1218					256'OF	
1		1218	0	PRESSURE OUT	0	METHANE ppm	1000	
1		1218						
1		1318						
1		-217						
1		-216						
1		-216					7°30'	
1		1214					N76E	
1		1112					256'OF	
1		11--						
1		11--	0	TEMPERATURE	200	0	ETHANE ppm	
1		-1-1						
1		-1--						
1		-1--						
1		-1--						

Claystone: med-dk gry, hd, loc grdtl to sltstr calcic, mnr-comm calc vng, tr dism pyr & chalcopyr.

Claystone: med-dk gry, hd, loc silty, calcic, interbdd w/epidtzd ss, mnr vn calc, tr-mnr pyr & chalcopyr, r vn hem.

Claystone: lt-med gry, lt grn, spotted, calcic, hd, loc silty, tr calc vng, tr epid vng, tr dism pyr, tr chlor.

Note: ran NB#18 f/ 5422' to 5424', BHA parted, fish out BHA cont drlg.

Sandstone: wht, yel, yel-grn, hd, brit, v fn-fn gr, abun epid in mtx, comm vn epid w/euhed xls in frac & vug, mnr-comm qtz overgwths, tr calc vng, tr pyr, chalcopyr & spec hem.

Sandstone: wht, yel/grn, v fn-fn gr, comm epid-ztn of matrix w/loc vls euhed xls, loc silty, tr calc vng, mnr spec hem, tr-mnr pyr & chalcopyr vng.

Note: core #16 f/ 5574' to 5591.5', 100% recovery.

State 2-14

NB#20 Varel V-527
w/Turbodrill 12/20

NB#21 Varel V-527
w/Turbodrill 12/21

NB#22 Varel V-527
w/Turbodrill 12/22

DRILL RATE 12/22
100 75 50 25

NB#23 Varel V-527
w/Turbodrill

NB#25 Varel V-617
w/Turbodrill 12/23-1/2

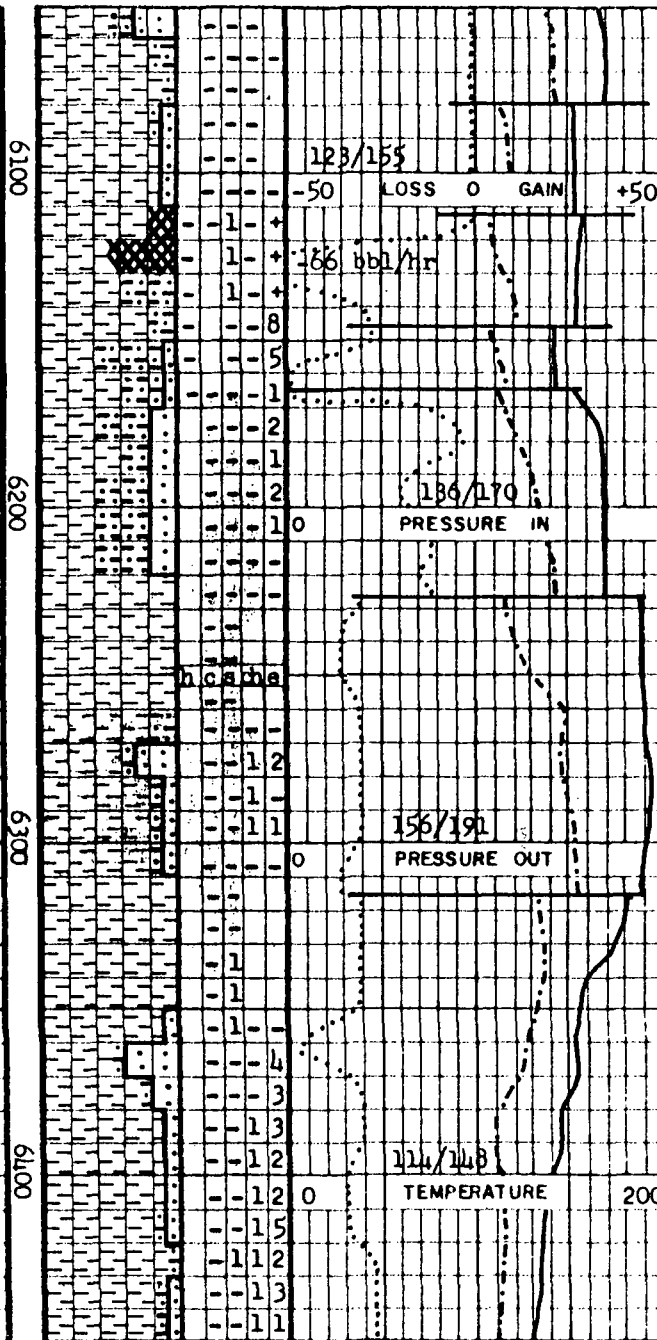
NB#27 Reed FP-51
w/Turbodrill

NB#28 ETC J22 1/3

ROCK DENSIT

WOB 25,000
RPM 80
SFM 47
PSI 1500

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Note: twist off in BHA @ 6043' while coring. Retrieve fish on 1st attempt. Cont drlg w/ turbodrill.

Note: twist off @ 6112' Retrieve fish 1st try. Ream out turbodrill run & drl ahead. Note: Change anhyd to hem in sec mnrl column @ 6100'.

Ream to 6166' w/NB#24

Ream to 6227' w/NB#26

Change Resistivity Scale

2 Coolers On

Note: lay down turbo-drill @ 6316'. Drl ahead.

Add LCM

Note: core #17 f/ 6026' to 6043', 100% recovery.

Claystone: lt-med gry, hd, silicified, loc slty, mnr dism pyr & chalco-pyr, assoc w/epidotized Mineralized Zone: f/6119 to 6133', fn granular epid, med grn, hd, britt, euhed-sbed epid xls, mnr dism pyr & chalco-pyr, mnr spec hem vng.

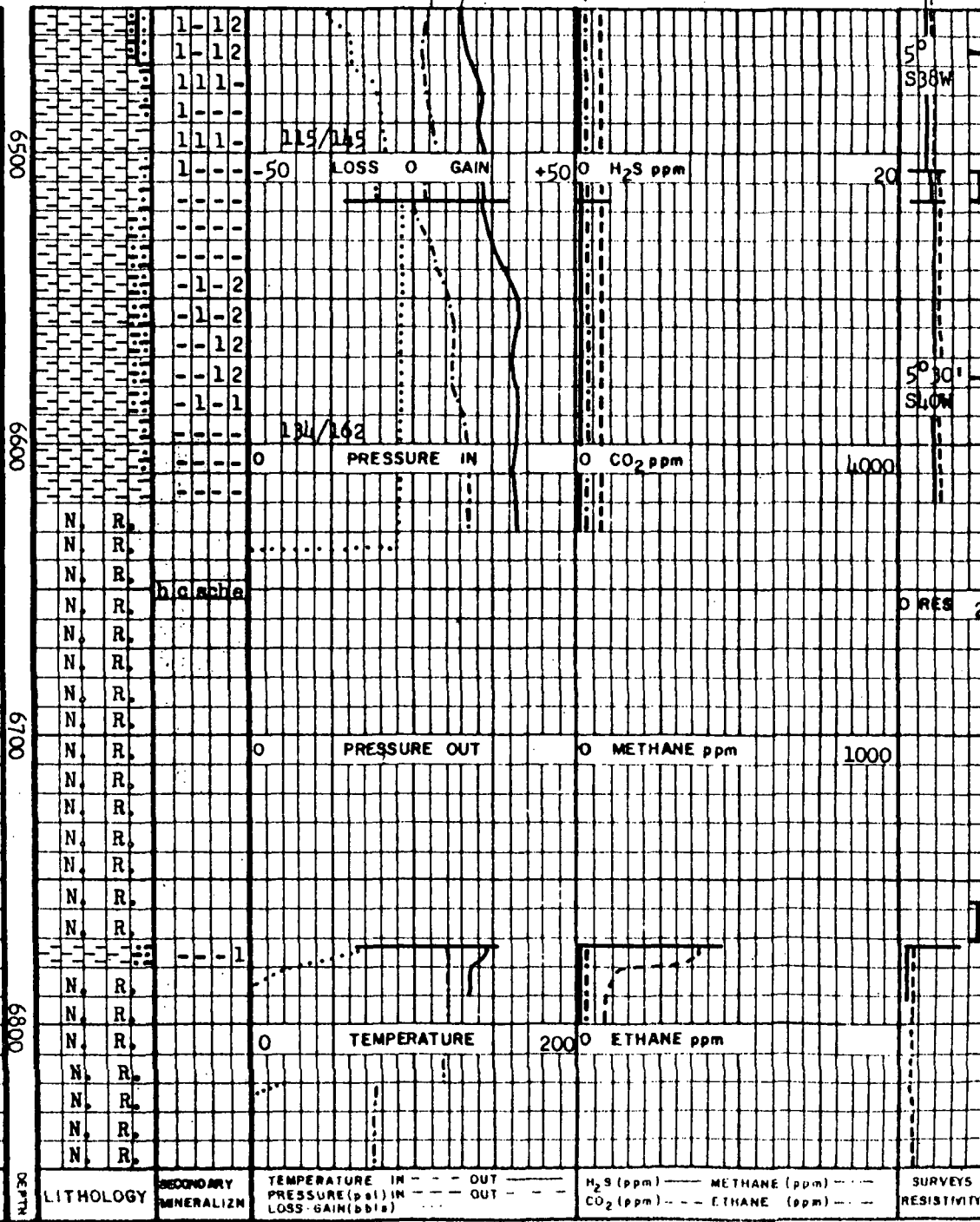
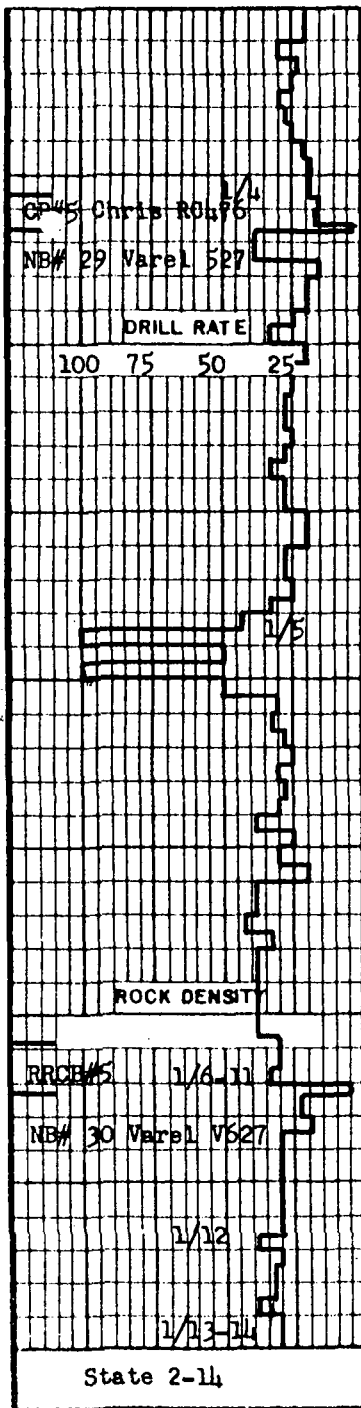
Sandstone: pred lt-med gry, mnr grn/yllw & wht, v fn gr, hd, mod-well srted, calcic, interbdd w/ siltstn & clystn, r-tr dism pyr.

Note: flow test @ 6227', max total flow = 475,000# est by Geothermex, temp = 450°F.

Claystone: pred lt-med gry, mnr dk gry, hd, calcic, tr calc vng, tr dism pyr, mn-abun sft lt gry altrd clay.

Sandstone: wht, yllw, hd, v fn-in gr, rexln, comm-abun yllw epid in mtx, comm epid vng, tr pyr.

Claystone: lt-med gry, lt-med grn, hd, calcic, loc sucrosic tex, tr calc vng, mn-abun sft, lt gry-lt grn altrd clay.



Claystone:lt-med grn, lt-dk gry,hd-v hd,loc sucrosic tex,calcic, tr epid vng,tr pyr,w/ sft altrd cly,

Note:core #18 f/ 6506' to 6517', 100% recovery.

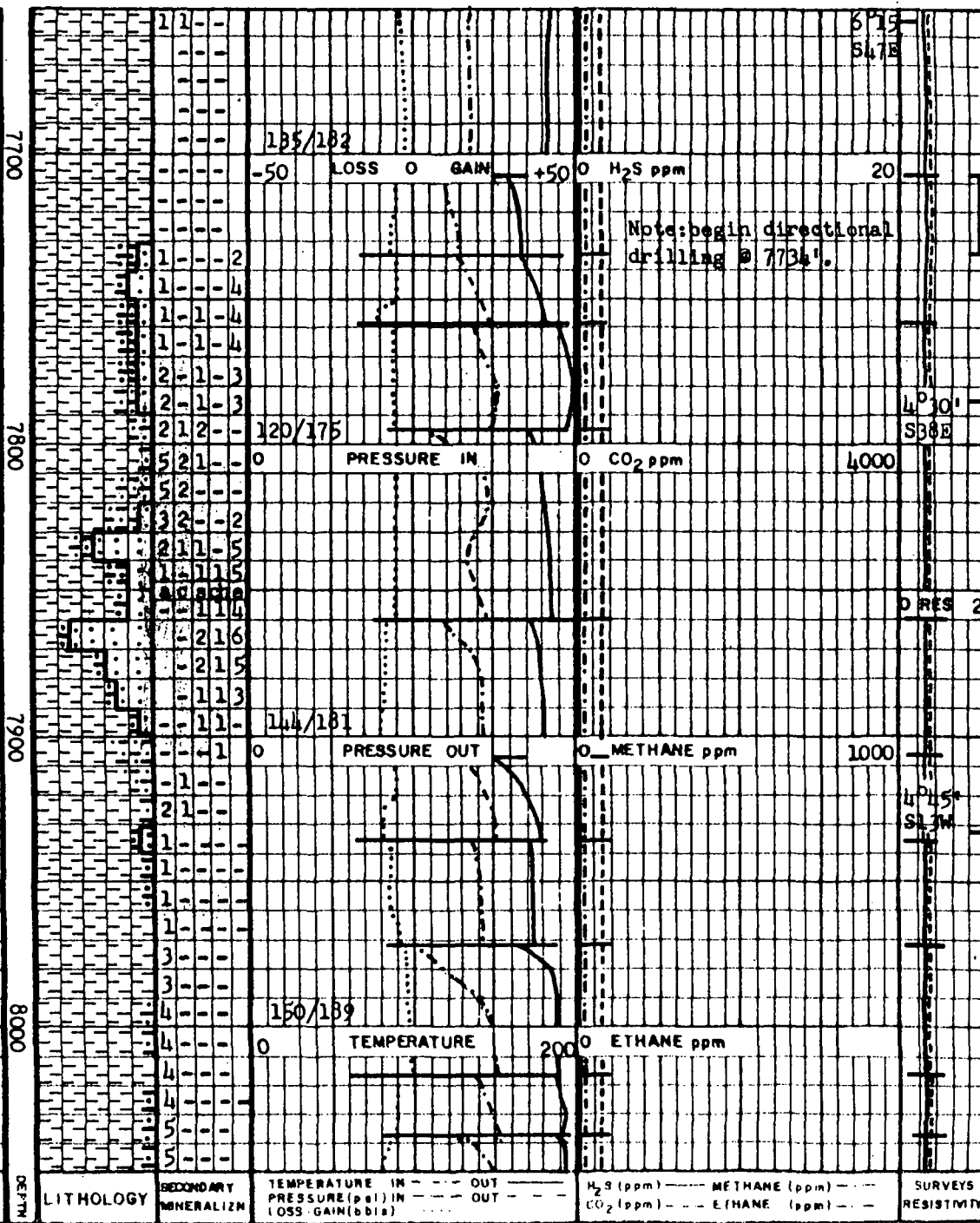
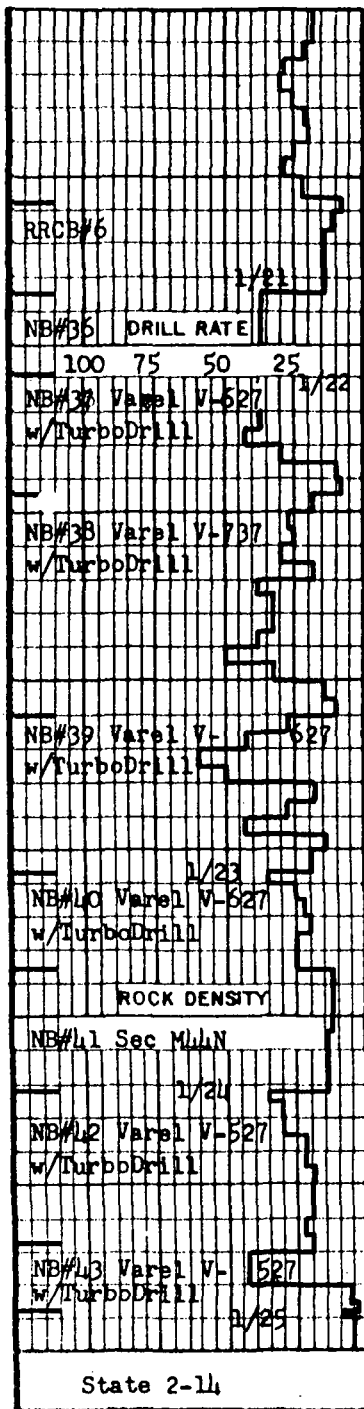
Claystone:pred lt-med grn & lt-med gry,hd-v hd,loc sucrosic tex, mnr-loc comm epid vng, tr pyr,loc comm-abun clay (poss kaolin).

Note:lost circulation @ 6637', spot LCM & drill ahead.

Note:drilling ahead without returns.

Note:core #19 f/ 6758' to 6771', 85% recovery.

Note:set cmt plug to 6771',drill ahead,lost circ @ 6803',spot LCM, drill ahead with no returns,set cmt plug to 6850'.



W 8.8 FV 40 PV 11
 YP 9 pH 8.8 F 30
 F/C 3/32 C1 6200
 SD 1/8 SOL 3

Note: core #24 f/
 7704' to 7734',
 100% recovery.

Sandstone: yel, hd, brit,
 fn gr, qtzitic, abun
 epid in mtx, mnr epid
 vng, tr-mnr dism pyr.

Claystone: pred med gry,
 mnr lt grn, hd, calcic,
 tr dism pyr, r epid vng.

Sandstone: wht, yel-grn,
 fn gr, hd, qtzitic, abun
 epid in mtx, mnr dism
 pyr, comm epid vng, w/
 Fibrous Mineral: f/7830'

mnr-loc abun, wht-lt
 blu-grn, sft, fibrous,
 silky luster, occ xls
 30 mm in length.

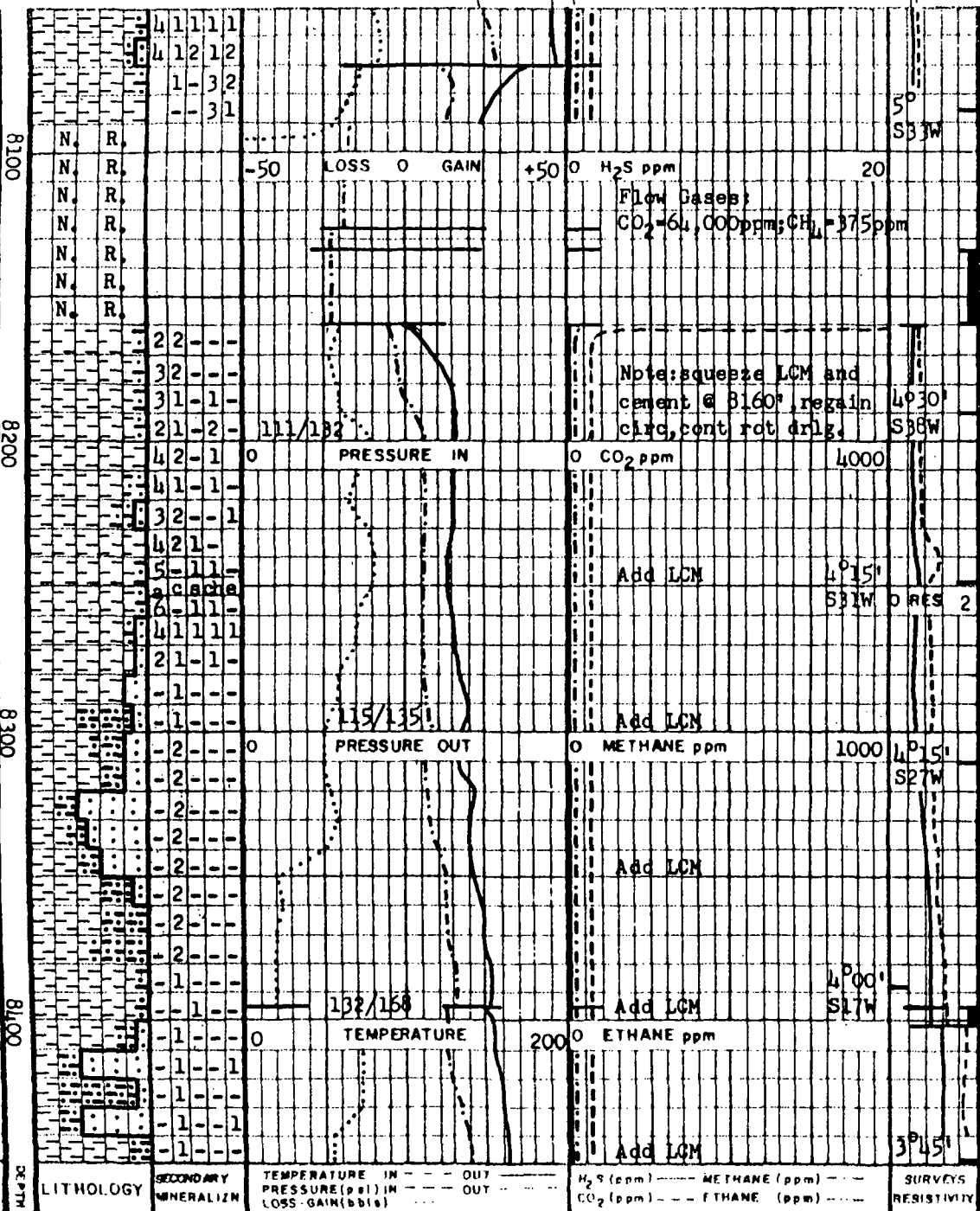
Claystone: lt-med gry/
 grn, mod hd, comm inter-
 bdd anhyd, slty, calcic,
 tr dism pyr.

Claystone: predlt-med
 gry, mnr lt grn, mod hd-
 hd, calcic, mnr anhyd,
 tr calc vng, tr epid
 vng, tr dism pyr.

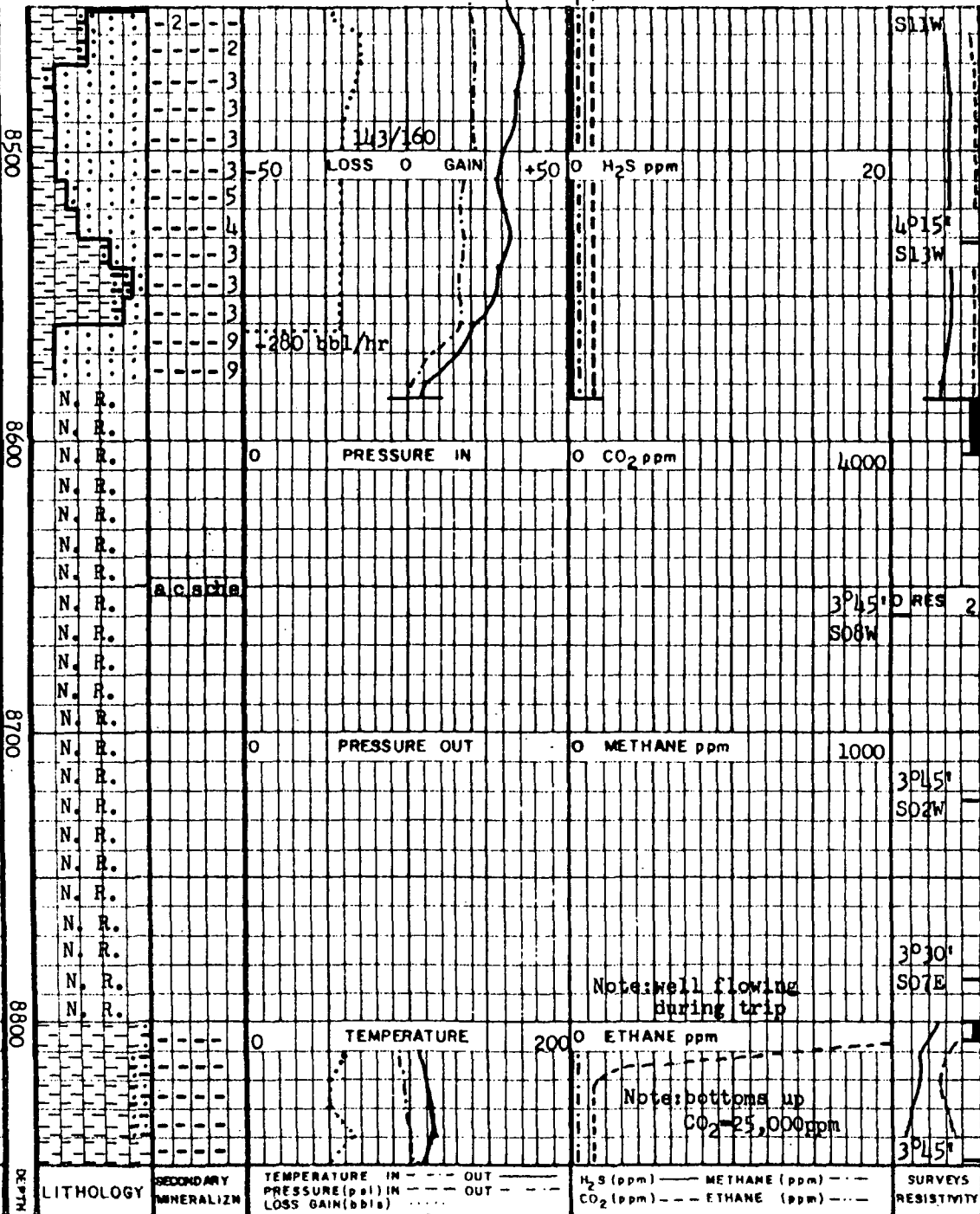
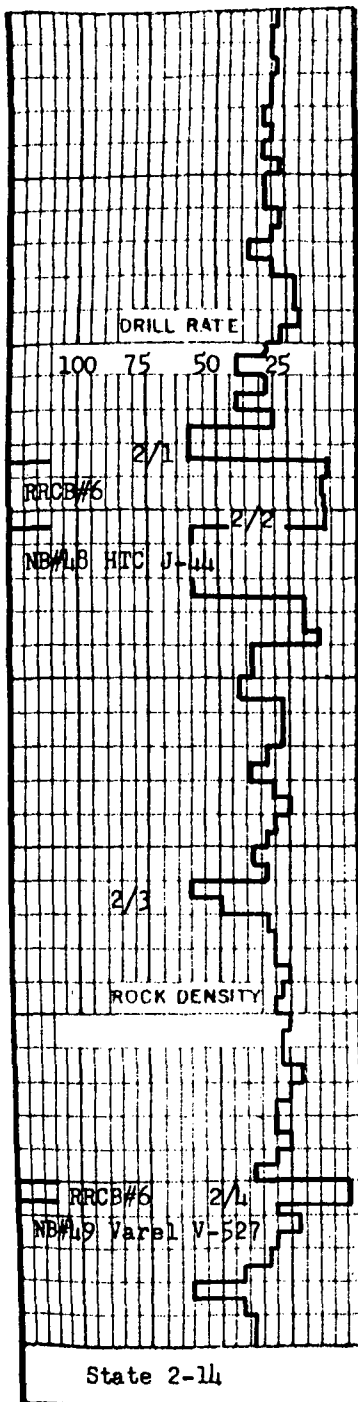
Claystone: med gry, dk
 gry/blk, mod hd, calcic,
 comm anhyd, tr dism pyr.

Claystone: lt-med gry,
 mod hd, calcic, comm-loc
 abdt anhyd, tr fn gr
 dism pyr.

RRB#34 w/TurboDrill
 RRB#41 1/26
 NB#45 Sec 8857 1/27
 RRCE#6 DRILL RATE
 100 75 50 25
 NB#46 Varel V-627 1/30
 WCB 25,000#
 RPM 80
 SPM 111
 PSI 1200
 RRCE#6 1/31
 NB#47 Varel 627
 State 2-14



Claystone:lt-pale grn, mod hd,non calcic,blchd appr,tr wht fib mnrl, tr epid vng,r clr calc vng.
 Note:lost circulation @ 8095'.Add LCM & drl ahead w/ partial returns & shaker off.Well flowing during and after trip @ 8126'.
 Note:core #25,f/ 8133' to 8160', 100% recovery.
 Claystone:lt-med gry/grn,sft-mod hd,loc slty,loc mnr micaceous appr,comm anhyd,mnr interbdd sndstn w/epid, tr calc,tr-mnr dism pyr,tr chlor.
 Claystone:pred a/a w/ highly altrd Claystone:wht-lt gry-lt grn,sft, pos kaolinized,loc streaky appr,sl calcic, tr pyr.
 Sandstone:wht-lt gry w/yel cast,sl hd,fn gr, rexln,qtz grs w/overgwths in kaolinized mtx,tr-mnr yel epid,tr pyr.
 Note:core #26,f/ 8395' to 8402',80-90% recovery.
 Sandstone:wht-lt gry, sl-mod hd,v fn-fn gr, rexln,kaolinized mtx, mnrl epid,tr pyr.



Sandstone: wht, yel, sl-mod hd, brit, v fn-fn gr, mod-hi altrd, rexln, abun qtz overgrwths, mnr-loc abun kaolin, comm epid, tr pyr.

Claystone: lt-med gry, lt-med grn, sl-v hd, sl-mod calcic, grdtal to siltstn, assoc w/sft wht kaolin.

Sandstone: pred a/a w/ altrd matrix, non calcic, abdt yllw epid, mnr kaolin, tr chlor.

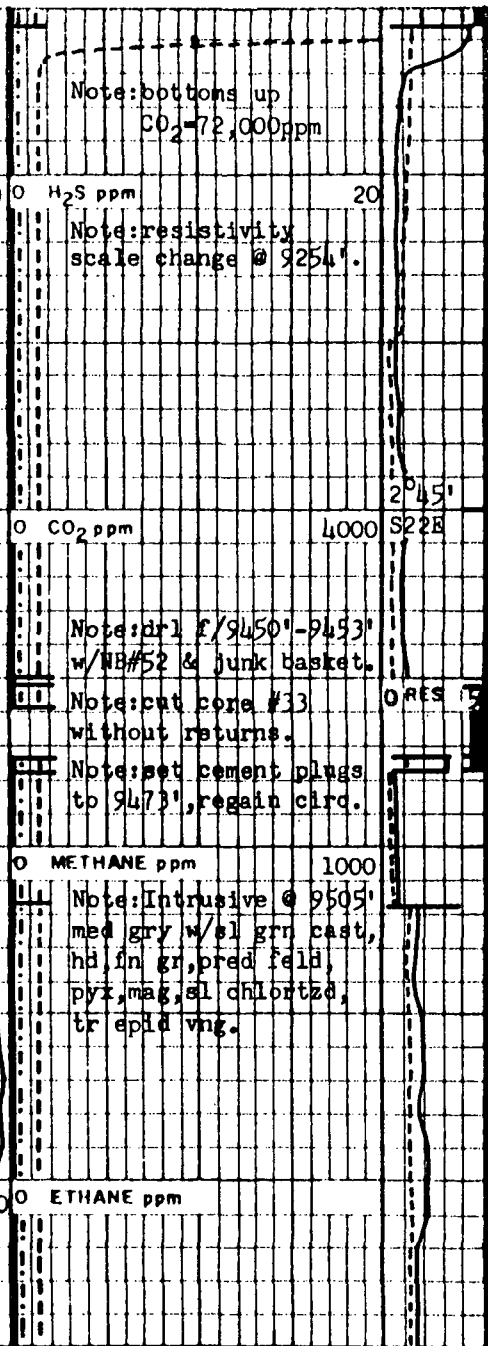
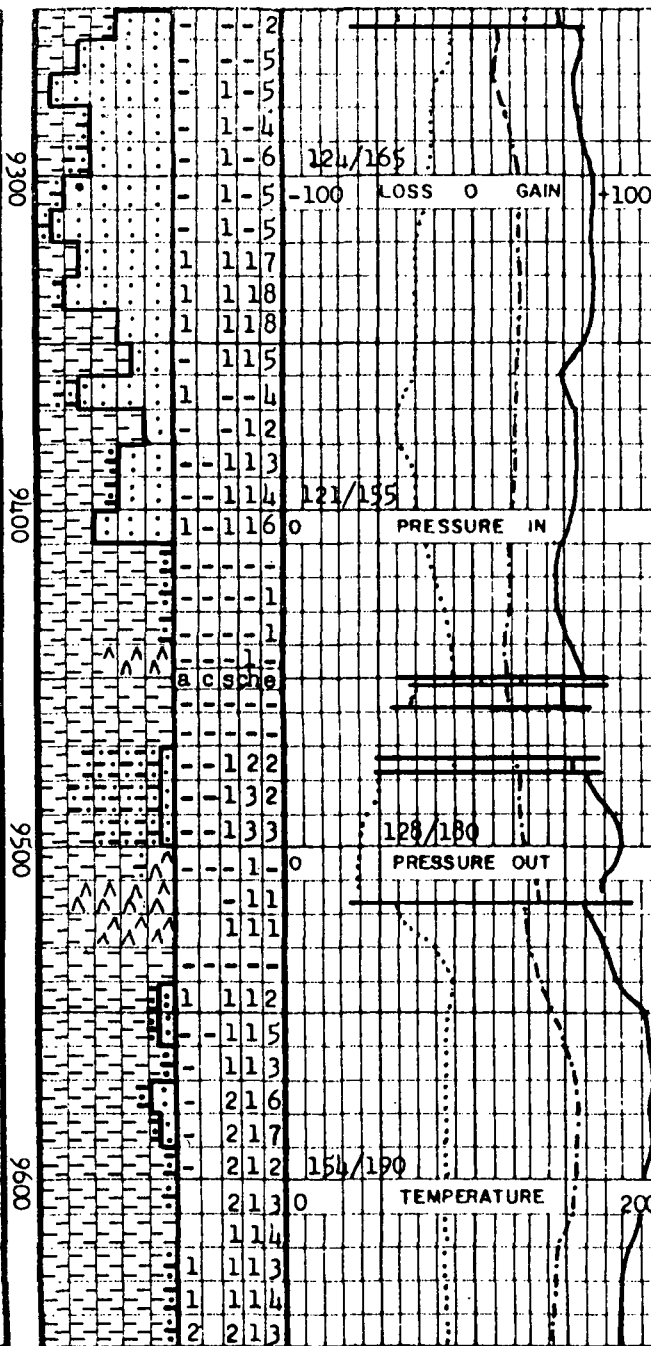
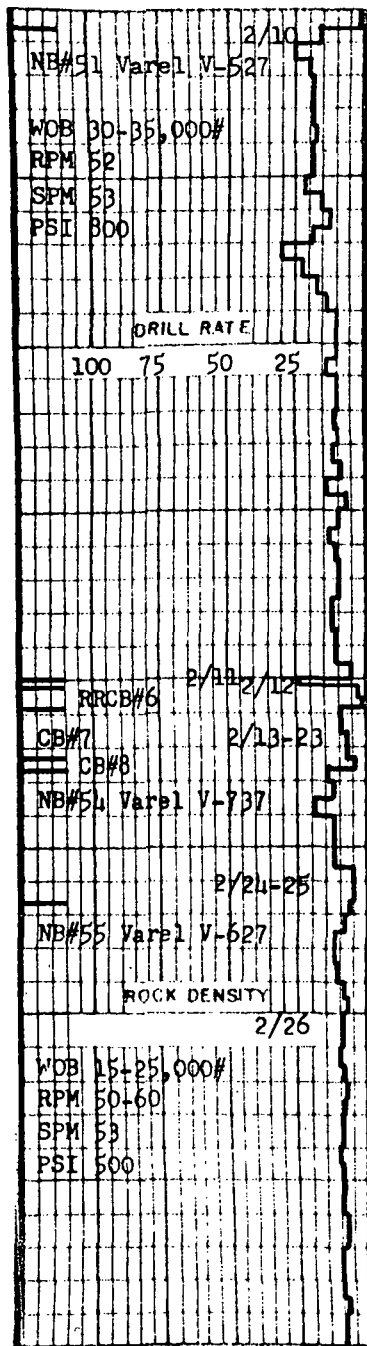
Note: core #27 f/ 8585' to 8604', 76% recovery.

Note: lost circ @ 8585', cut core #27 w/no returns, drlg to 8692' w/no returns, spot LCM & cement @ 8692', drlg to 8800' w/no returns, spot LCM & regain circ @ 8800'.

Note: core #28 f/ 8800' to 8807', 64% recovery.

Claystone: med gry, mod hd, calcic, loc grdtal to siltstn, tr anhyd, tr calc, tr diam pyr.

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Note: core #31 f/ 9248' to 9254', 58% recovery.

Note: well flowing during trip @ 9254'. Tout=202°F, gain 400 bbls.

Sandstone: wht-yel, v fn fn gr, hd, rexl n, comm epid in matrix, comm intstl wht mnrl, non calcic, comm epid vng, mnrl wht silky mnrl (occ fib), tr-mnr pyr.

Intrusive: @ 9445', med gry, hd, fn gr, pred feld & pyx or amph, tr v fn gr pyr or magnetite, tr-mnr chlor.

Note: core #32 f/ 9453' to 9458', 46% recovery.

Note: core #33 f/ 9458' to 9473', 33% recovery.

Note: core #34 f/ 9473' to 9477', 50% recovery.

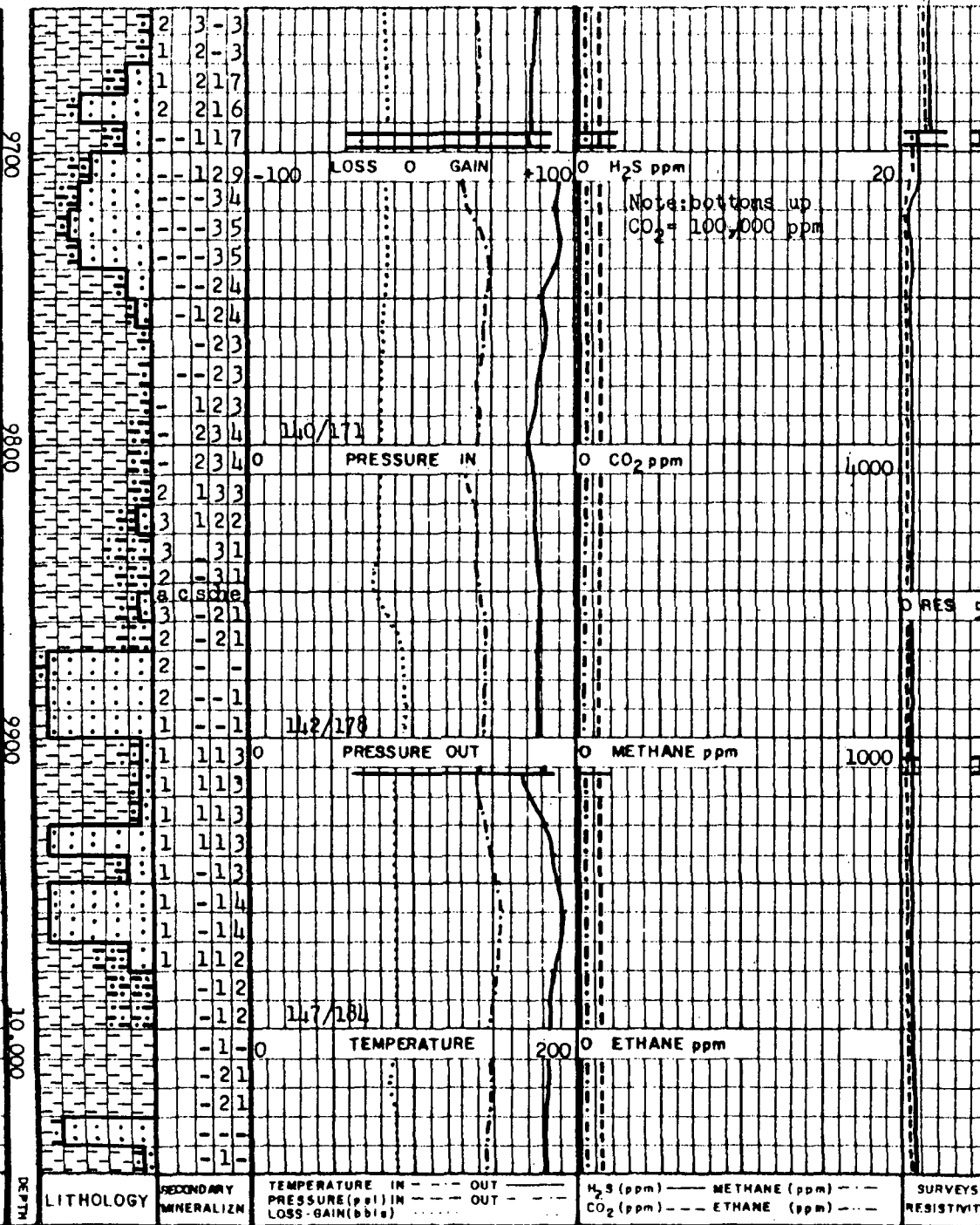
Claystone: med gry, med grn, hd-v hd, silicified, loc grdnl to sltstn, rexl n, comm epid vng, mnrl disp pyr, mnrl pyr blebs ringed w/epid, tr anhyd.

Claystone: lt-med gry, lt-med grn, v hd, rexl n, silicified, comm-abun epid vng, mnrl disp pyr, tr anhyd.

State 2-14

EXLOG / SMITH PAGE 24

2/27	
CB#9 Chris MC-201	2/28
RRB#56	3/1
DRILL RATE	
100	75 50 25
WOB 25,000#	
RPM 50	
SPM 40	
PSI 500	
3/2	
CB#10 Chris C-201	3/3
NB#57 Varel V-527	
ROCK DENSITY	
WOB 25,000#	
RPM 50	
SPM 40	
PSI 500	
3/4	
State 2-14	



Sandstone:lt yel-grn, lt gry-grn,hd,fn gr, loc qtzitic,loc comm detrital mica-chlortzd & bleached(red-brn),tr pyr, tr fib tremolite, comm-abun epid vng.

Note:core #35 f/ 9694' to 9698', 88% recovery.

Claystone:pred med-dk gry-grn,mnr lt gry-grn, hd-v hd,silicified, rexln,loc intbdd w/slt-stn,comm-abun epid vng, mnr dism pyr, tr chalco-pyr,loc r spec hem.

Claystone:pred a/a w/ interbdd med gry-grn micaceous sltstn.

Sandstone:pred wht,mnr yel,fn gr,hd,rexln,loc qtzitic w/comm qtz overgrwths,mnr anhyd, r pyr, tr epid vng,

Note:core #36 f/ 9907' to 9912', 13% recovery.

Sandstone:pred wht,mnr lt yel-grn,hd-v hd, silicic,rexln,qtzitic, comm epid, tr dism pyr, tr anhyd.

Siltstone:wht,hd,rexln, tr dism pyr,grdng to Claystone:med-dk gry-grn,v hd,silicified, rexln,r-tr dism pyr, r-tr epid vng.

