

RECEIVED

MAR 02 1990
OIL CON. DIV
DIST. 3
HYDROCARBON
WELL LOG

BENCH MARK GEOLOGICAL SERVICES

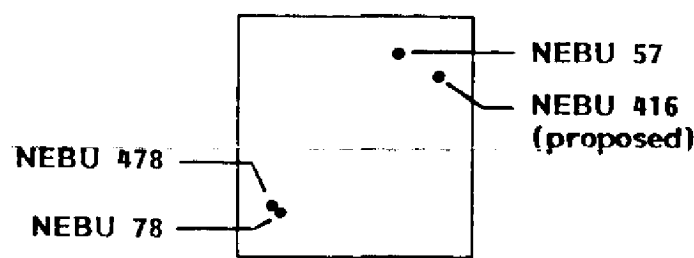
ABBREVIATIONS

CO — Circulate Out
CG — Connection Gas
CB — Core Bit
DC — Depth Correction
DS — Directional Survey
DST — Drill Stem Test
DTG — Down Time Gas
FC — Filter Cake
LAT — Logged After Trip
NB — New Bit
NDR — No Data Recorded
NR — No Returns
PP — Pump Pressure
RPM — Rotary Speed
SPM — Pump Strokes
TG — Trip Gas
TGR — Trip Gas Recycle
Vis — Viscosity
WL — Water Loss
WOB — Weight on Bit
WT — Density Of Drill Fluid

LITHOLOGY MODIFIERS

// — Anhydritic
B — Bentonitic
+ — Calcareous
■ — Carbonaceous, Coaly
- — Dolomitic
F — Fossiliferous
~ — Glauconitic
◇ — Oolitic
P — Pyritic
^ — Siliceous

OPERATOR — BLACKWOOD AND NICHOLS
WELL — NE BLANCO UNIT 478 FIELD — Basin Fruitland Coal
LOCATION — sec 21 T31N R7W CO./STATE — San Juan Co., New Mexico
ELEVATION KB 6422 est. GL 6408 (ungraded) SPUD DATE —
INTERVAL LOGGED — 2996 - 3321 ft. DATE LOGGED — 2/22 thru 2/23/90
LOGGING GEOLOGISTS — Randy Laney, Mike Mixer
INSTRUMENTATION — FID Chromatograph and Total Gas Detector, Infrared CO₂ Detector
WELL LOCATION



LEGEND—GAS CURVES

TOTAL GAS	1
METHANE	1
ETHANE	2
PROPANE	3
ISO & N-BUTANE	4
OIL INDICATOR	$\frac{C_2 + C_3}{C_1}$ 0

HYDROCARBON ANALYSIS

TOTAL GAS			Reported in Units	
10	100	1000	10	100
GAS CHROMATOGRAPHY			Reported in PPM	
100	1000	10000	100	1000
OIL INDICATOR			Dimension Less	
0.01	0.1	1.0	0.01	0.1

RATE OF PENETRATION

Min./Ft.

STC FDT 6 1/4"

2.5 5 7.5 10

WOB 12
RPM 90
PP 1000

DEPTH
CONC
CORR
CORR

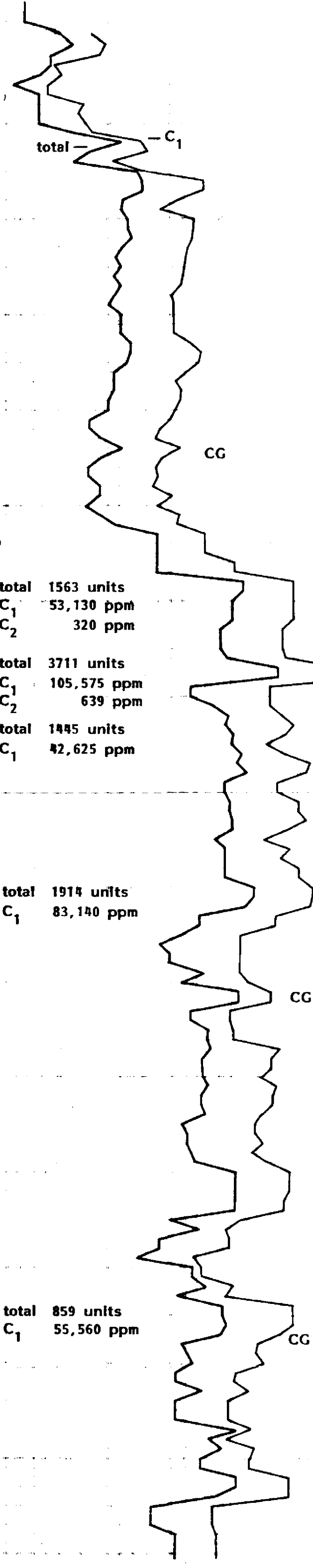
LITHOLOGY
OBSERVED
%

7" casing set at 2996 ft.

100 units Total Gas = 1% methane
10 100 1000 units
100 1000 10,000 ppm

5 ft. sample interval
Drilling with fresh water
Depth of Coal Intervals
(# of canistered samples)

heavies 100 1000 ppm
CO₂ 1000 10,000 ppm



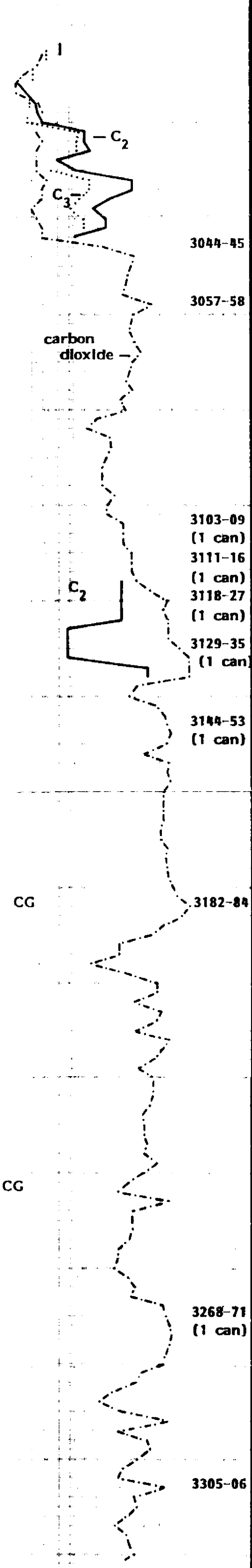
total 1563 units
C₁ 53,130 ppm
C₂ 320 ppm

total 3711 units
C₁ 105,575 ppm
C₂ 639 ppm

total 1445 units
C₁ 42,625 ppm

total 1914 units
C₁ 83,140 ppm

total 859 units
C₁ 55,560 ppm



Visual
Show
OFF

Lithology
Interp
OFF

Lithology
Descriptions
and Remarks

Ss m gy wh, crm, gen
vf gr, sb rd-sb ang,
mod srt, smpl disagg,
mod-v calc, NS

Sh dk brn, some brn
blk, sub platy, earthy-
resinous luster, frm,
mod carb, silty in part

Sh and Coal v dk brn-
brn blk, Sh is platy-
occ sub blocky, resinous
to silky luster,
v carb w/ coaly lam,
coal is blk, vit, very
thinly lam w/ Sh

Ss crm, lt gy wh, f-vf
gr, sub ang-sub rd, mod
srt, smpl disagg, v
calc cnt w/ wh clyst,
NS

Sh m brn, sub platy,
frm, earthy, mod sft,
gen sli carb, silty

Coal blk, v dk gy blk,
some brn blk, sub blk-
occ sub fis, resinous-
sub vit luster, 20% w/
microlam vit coal, mod
carb, fair quality coal

Coal blk, majority
blocky w/ conch frac,
massive to some finely
striated, 50-75% vit,
v little carb, much
better than above, very
good quality coal

Coal gen as above, blk
good blocky text w/
conch frac, 75% vit,
no resin

Ss gy wh, gen f gr,
mod frm, fair srt, calc
cnt, occ carb flakes,
some wh calc clyst, NS

Coal blk, blocky text
w/ conch frac, 75-80%
vit luster, some fine
striated, no carb mat

T/ P.C. Tongue 3190

Ss m gy wh S&P, pred
f-occ med gr, gen p
srt in upper part, sub
ang-sub rd, mod fri,
sli calc, glauc & carb
grs, tr intgran residue
NF, NC

Ss m gy brn, some gy
wh, gen finer gr than
above, p srt, mod fri,
sli-mod calc, becoming
much more carb & silty
glauc, coaly lam, NF, NC

Sltst m-dk brn, gy brn
blocky-sub blocky, mod
frm, v carb w/ occ coal
laminae, sli-mod calc,
mod-v sandy in part,
no glauc

Coal gen blk, pred
blocky w/ some conch
frac, 30-40% vit-some
microlam, abun. f gr
amber resin, good coal

Sh v dk blk brn, some
chocolate brn, sub blk
to sub platy, mod sft,
v carb w/ scattered
blk vit coaly lenses
and lam, grdg to shaley
coal in part

T/ Main P.C. 3310'

Ss m gy wh S&P, pred
f gr, mod w srt, mod
fri, sub rd-sub ang, sli
calc, glauc & carb grs,
tr dd intgran residue,
NF, NC

circulate out
co

co

T.D. 3321 ft. co
Note: drill rate for
last 10 ft. of well
averaged 1/2 min/ft