

NOV 5 1989

BENCH MARK GEOLOGICAL SERVICES

HYDROCARBON WELL LOG

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
WI — Density Of Drill Fluid

LITHOLOGY MODIFIERS

// — Anhydritic
B — Bentonitic
J — Calcareous
■ — Carbonaceous. Coaly
L — Dolomitic
F — Fossiliferous
~ — Glauconitic
♦ — Oolitic
P — Pyritic
A — Siliceous

OPERATOR Blackwood and NicholsWELL NE Blanco Unit 417

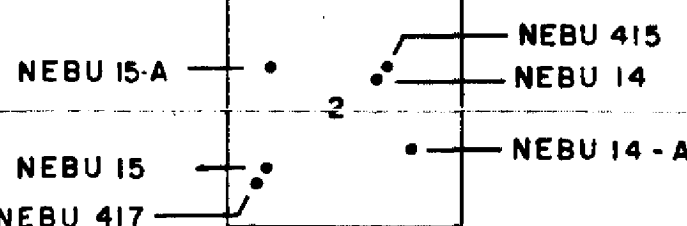
FIELD

LOCATION sec 2 T30N R7WCO/STATE Rio Arriba Co., New MexicoELEVATION KB 6348' GL 6333'

SPUD DATE

INTERVAL LOGGED 2901' - 3247'DATE LOGGED 11/6/89LOGGING GEOLOGISTS Randy Laney, Danny WyckoffINSTRUMENTATION FID chromatograph and total gas detector, Infrared CO₂ detector

WELL LOCATION



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

LEGEND—GAS CURVES

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

RATE OF PENETRATION

Min./Ft.

DEPTH

G F P

LITHOLOGY OBSERVED

CORE DEPTH

LITHOLOGY %

7" casing set at 2901 ft.

Drilling with fresh water.
5 foot sample interval.

Depth of Coal Intervals

100 units total gas = 1% methane
10 100 1000 units
100 1000 10,000 ppm

heavies - 100 1000 ppm
CO₂ 1000 10,000 ppm

Visual Show

G F P

Lithology Interp

G F P

Lithology Descriptions and Remarks

Siltst. m gy brn, sb
platy-sb blk, frm, gen
non carb, sli calc, occ
sdy in part

Sh. m-dk brn, gy blk,
pred sb platy, earthy-sb
res, frm, v carb w/ occ
coaly lam, silty ip

Coal. pred blk, sb blk
- blk, gen vit luster,
microlam w/ carb Sh,
grading to carb Sh

Sh. dk brn-bik brn, sb
platy, sb res-occ sb
vit, mod soft, v carb w/
coaly laminae and
lenses

Coal. v dark black brn
sb platy, gen sb vit,
v carb-grading to
coaly and carb Sh

Ss. gy wh sli S&P, f-
vr gr, smpl. disagg,
fair srt, sb ang, v calc
cmt w/ wh calc clvst,
vcl mntl flon, NC

Coal. black and brn
blk, sb platy-blocky,
10% vit luster-remain-
der sb vit to res, v
carb & occ argill. in
part, grading to carb
Sh, some amber resin

Ss. gy wh, gy brn, vf
gr, sb ang, p srt, disagg
mod-very calc, some wh
calc clvst, v siltv, NS

Sh. v dark brown, sb
platy, earthy-resinous,
siltv in part, v carb-
occ coaly laminae

Coal. black, good blo-
cky texture w/ conch
fracture, 50-60% vit
luster-remainder sb
vit, massive for most
part-some vf microlam,
gen clean coal w/
little carb material,
best coal seen in well

Coal. brn blk-blk, sb
biky, pred sb vit w/
very little vit, v carb
large amt free resin
& resin impregnated Ss
poor quality coal

Ss. m gy wh S&P, f gr,
sb ang-ang, mod sorting
med firm, calc and silt
cmt w/ lt brn argill
intgran material, glau-
conitic, NF, NC, Pictured
Cliffs tongue

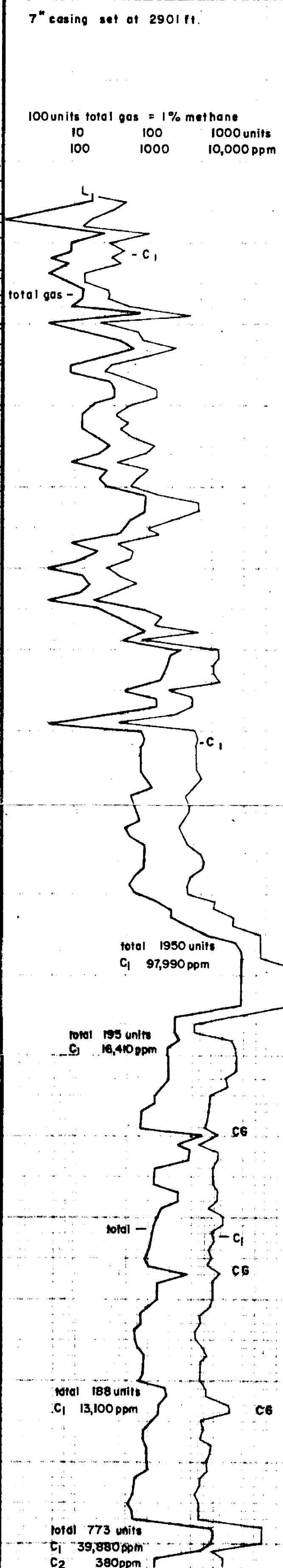
Ss. gy wh S&P, P.C. Ss
w/ less carb & coaly
fragments, better srt,
sb ang, glauconitic,
no intgran argill. mat-
erial, sli more calc,
smpl disagg, NS

Coal. pred blk, blk-
sb blk, 25% vit-remain-
der sb vit, some micro-
lam, fairly clean coal
only sli carb

Siltst. m brn, sb blk-
biky, frm, gen non carb-
occ coaly lam, sli calc
sandy ip, grading to
silty Sh

Coal. black, good blk
texture w/ conch frac,
massive w/ some micro-
lam, gen clean coal w/
little carb matter,
good quality coal

TD sample- drilled up
1' of main Pictured
Cliffs-m gy wh S&P, p
srt, carb & coaly grs,
glauconitic, fair amt
lt brn intgran argill
material, NF, NC

total 1950 units
C₁ 97,990 ppmtotal 195 units
C₁ 16,410 ppmtotal 188 units
C₁ 13,100 ppmtotal 773 units
C₁ 39,880 ppm
C₂ 380 ppm

23,750 ppm

carbon dioxide

3116-25

3089-3109

3196-97
3200-04

3227-28

3236-46

Carbon Dioxide 12,500 ppm