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OIL CON. DIV.
DIST. 3

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
Wt — Density Of Drill Fluid

LITHOLOGY MODIFIERS

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

Cgl
Ss
Siltst
Sh
Coal
Cmt
Salt
Anhy
Dol
Ls
Gneiss
Mica
Tuff
No Sample

OPERATOR BLACKWOOD AND NICHOLS

WELL NE Blanco Unit 499

FIELD Basin Fruitland Coal

LOCATION sec 20

CO. STATE Rio Arriba Co., New Mexico

ELEVATION KB 6356 ft. GL 6342' (ungrd)

SPUD DATE _____

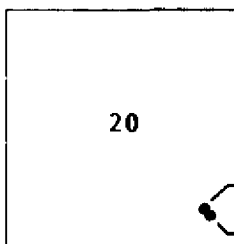
INTERVAL LOGGED 3021 - 3209 ft.

DATE LOGGED 5/28/90

LOGGING GEOLOGISTS Randy Laney, Mike Mixter

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 $\frac{C_3 + C_4}{C_1}$	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.

Sec 33-F 6 1/4"
3-22's

2.5 5 7.5 10

WOB 8-10
RPM 100
PP 1000

TD 3209 ft.

Porosity
CORE
DS
DST

DEPTH

LITHOLOGY
OBSERVED
%

7" casing set at 3021 ft.

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

total 152 units
C₁ 9,110 ppm

total 277 units
C₂ 20,480 ppm

total 188 units
C₁ 13,590 ppm

total 176 units
C₁ 12,720 ppm
C₂ 115 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

C₃ —

C₂ —

carbon dioxide

C₂ —

C₂ —

ONSET OF
FLARED GAS

3037-41
(1 can)

3051-52
(1 can)

3055-57
(1 can)

3067-68

3086-88

3157-70
(1 can)

3190-97
(1 can)

Visual
Show

Lithology
Interp

Lithology
Descriptions
and Remarks

Ss med brn, vf gr, sub
ang-sub rd, fr srt, dis-
agg, calc cmt, NS

Coal black & some brn
blk, sub blk-sub platy
30% vit, sli-mod carb,
some sec calc, tr pyr,
fair quality coal

Sh & Coal Sh is v dk
brn blk, sub platy-blky
res-occ sub vit, very
carb w/ grainy text,
intbnd w/ blk vit coal
as above

Siltst med brn-dk brn,
sub blk, firm, mod carb
w/ paper thin coaly
lam-occ lenses, mod sdy

Ss lt-med brn, some gy
-wh, vf gr, sub rd-sub
ang, poor-fair srt, occ
carb-coaly grains, very
calc cement, NS

Siltst med-dk brn, some
gy brn, blocky-sub blk,
non calc, mod-very carb
intbnd w/ dk brn to brn
blk, res & very carb
Sh

Ss lt-med brn, some
gy wh, pred vf gr, sub
ang-some sub rd, gen
fros qtz grs, mod-very
calc cement, disagg,
silty in part, NS

Coal black, pred sub
blocky, drilled up extr
emely fine gr, v little
vit, mod carb, no calc,
some resin, pr-fr qual.

T/ P.C. Tongue 3174'
Ss v lt gy wh S&P, vf
f gr, sub ang, fros &
clr qtz, sli calc, glauc
& carb grs, tr pale yel
flor, tr dd residue, NC

Coal blk, blocky to
sub blk, poor develop
conch frac, 40-50% vit,
some carb, no calc, some
resin, fair-good qual.
coal-best of well, the
two lower thick seams
had extraneous fibers-
source? (NEBU 303 is
80 ft. distant)

T/ Main P.C. 3207'
TD sample- Ss m gy
wh S&P, f-vf gr, sub ang
mod v srt, sli calc,

disagg, fros to clr qtz
grs, glauc & carb grs,
NF, NC