

BENCH MARK
GEOLOGICAL SERVICES

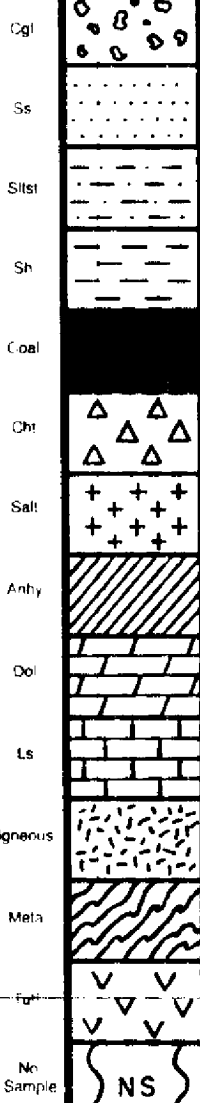
HYDROCARBON
WELL LOG

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
Wt -- Water Loss
WOB -- Weight on Bit
Wt -- Density Of Drill Fluid

LITHOLOGY MODIFIERS

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



OPERATOR Blackwood & Nichols

WELL NEBU 409

FIELD _____

LOCATION Sec. 10 T30N R7W

CO./STATE Rio Arriba Co., New Mexico

ELEVATION KB 6267 GL 6255

SPUD DATE 1/16/89

INTERVAL LOGGED 2880 - 3029

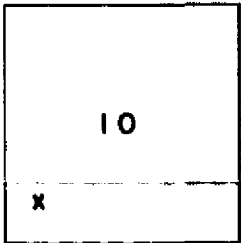
DATE LOGGED 1/22/89

LOGGING GEOLOGISTS Randy Laney, Dan Wyckoff

INSTRUMENTATION FID Chromatograph and total gas detector

WELL LOCATION

RECEIVED
JAN 30 1989
OIL CON. DIV.
DIST. 3



HYDROCARBON ANALYSIS

LEGEND - GAS CURVES

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

RATE OF PENETRATION

Min. Ft.

Porosity

Core

DEPTH

Core

LITHOLOGY

OBSERVED

%

Drilling with bit no. 2
HTC R-4

1 2 3 4

Depth corr. + 6'

WOB 20
RPM 65
PP 900
SPM 102

TD 6:30pm 1/22/89

7" casing set at 2880 feet.

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

No gas data due to malfunctioning
blooey line tap

blooey line flaring 20'-30'

5' samples caught 2880-TD

Drilling with fresh water

Depth of Coal breaks

2913-15

2930-34

2946-47

3011-13

3014.5-33

3034-36

3044-46

3052-62

3089-93

3113-24

Visual

Show

Lithology

Interp.

Lithology

Descriptions

and Remarks

Sh grey-dark grey, sub
waxy, platy-blocky, very
slightly calcareous

Sh becoming more car-
bonaceous and silty,
grading to siltstone

Coal generally black,
platy, gradational from
carbonaceous shale

Sh brown-black, platy,
firm, very carbonaceous
grading to argill. coal

Coal generally as
above, very carbonaceous

Sh brown-black, platy,
firm, very carbonaceous
interbedded with sub-
vitreous coal, some
calcite filled frac.

Ss cream, fine-medium
grain, poor sorting,
sub angular, arkosic,
very sli. calcar., arg.
cement, tight, no show,
some white claystone,
chocolate brown chert

Ss medium grey, very
fine grain, hard, fair
sorting, calcar. & sil.
cement, tight, generally
non carbon., no show

Coal black to brown-
black, sub blocky, sub
vit., vitreous, massive
texture w/ some finely
microlaminated, occas.
pyrite nodules, sub vit-
reous coal predomi-
nates in upper part,
becoming better vit-
reous coal to base

Coal predominately
black, some brown-black
blocky texture, mostly
vitreous, generally
less carbon. than above
vitreous coal more
common

Ss brown-grey, very
fine grain, grading to
siltstone, very argill.
calc. & sil. cement

Coal sub vitreous,
slightly more carbon.

Ss grey brown, some
S&P, medium grain, fair
sorting, argill. cement
carb. & green glauc.
grains, tight, no show

Coal black, blocky -
conch. frac., vitreous,
microlam., some carbon.
material, but best
overall coal seen in
well

trace Ss in last sam-
ple, grey-white, slight
S&P, fine grain, fair
sorting, sub angular,
medium friable, sli.
calcareous, no show