

SOFTROCK GEOLOGICAL SERVICES

591 CR 233, Durango, CO (970) 247-7726

WELL INFORMATION

COMPANY: Phillips Petroleum Company

WELL NAME: San Juan 31 Fed 3 *1

LOCATION: Unit B, 878' FNL & 1328' FEL, Sec. 3, T31N-R9W

ELEVATION: GL: 6570', KB: 6587'

FIELD: Basin Fruitland Coal

INTERVAL LOGGED: 3163'- 3445'

DATE LOGGED: 4/20/98 - 4/21/98

CONTRACTOR: Big A *37

SPUD DATE:

WELLSITE GEOLOGISTS: Ron Horton, Peter Falk

GAS INSTRUMENTATION: FID Chromatograph and Total Gas Detector

SECTION 3

CONGL

SS

SLTST

SH

COAL

CHERT

SALT

ANHY

LS

DOL

IGNEOUS

BENTONITE

TUFF

HOLE SIZES - CASING DATA - MUD TYPES

HOLE SIZES: 12 1/4" to 320'
8 3/4" to 3163'
6 1/4" to 3445' (after drill out underreamed to 9 1/2")

CASING SIZES: 9 5/8" to 320'
7" to 3163'

MUD TYPES: water

ABBREVIATIONS

Ck - Filter Cake
CO - Circulate Out
CG - Connection Gas
DC - Depth Correction
DS - Directional Survey
DST - Drill Stem Test
DTG - Down Time Gas
LAT - Logged After Trip
NB - New Bit
OB - Old Bit
NR - No Returns
pH - pH of Mud
PP - Pump Pressure
RPM - Rotary Speed
SPM - Pump Strokes
TG - Trip Gas
Vis - Viscosity of Mud
WL - Water Loss of Mud
WOB - Weight on Bit
WT - Weight of Mud

LITHOLOGY MODIFIERS

A - Anhydritic
B - Bentonitic
C - Calcareous
CC - Carbonaceous / Coaly
D - Dolomitic
F - Fossiliferous
G - Glauconitic
O - Oolitic
P - Pyritic
S - Siliceous

SPECIAL SYMBOLS

- Core

- DST

- No Weight Taken

Company: Phillips Petroleum Company Well: San Juan 31 Fed 3 *1

DRILL RATE

ROP

Minutes Per Foot

FOROSITY

LITHOLOGY

DEPTH

* LITHOLOGY

SHOALS

TOTAL GAS UNITS

C1 - C4 PPM

DESCRIPTIONS / COMMENTS

1 UNIT GAS = 100 PPM Hydrocarbons

0 500 1000

0 1.0

0 2500 1000 1000 1000

METHANE ETHANE PROPANE BUTANE

VERTICAL SCALE: 5" = 100'

Bit: *3, HTC, 6 1/4", GT-1, in at 3163'

10 ft. sample interval
Drilling with water

131 Units
NOTE: initially samples were taken at the shaker. Mostly coal and carb shale the less dense material seen. for better samples used possum belly

186 Units

193 Units

Total Gas: 169 Units
C1: 16,593 ppm
C2: 251 ppm
C3: 58 ppm
C4: 53 ppm

163 Units

COAL: semi bright black satin (55%) and dull black to brown black (40%), minor amounts of bright black vitreous (5%), poorly cleated, rare conchoidal fractures

COAL: a combination of dull black (50%) and satin lustered coal (40%), minor amounts of bright black vitreous material (10%) as thin bands or lenses, platy to sub blocky, mostly sub platy to sub blocky, poor cleat development, occasional conchoidal fractures

SHALE: medium gray, platy to sub platy, earthy, mod calc, silty in part, moderately firm

COAL: primarily semi bright black satin (60%) banded with some bright black vitreous (20%) and dull black coal (20%), sub platy to blocky, mostly sub blocky, fair cleat development, occasional conchoidal fractures, fair quality coal

COAL: dull black to gray black coal, laminated with dark gray carb shale, trace bentonite

SHALE: medium gray to gray brown, platy to sub platy, earthy, moderately calcareous, silty, interbedded with light to medium gray brown siltstone and light gray to white very fine grained sandstone, shale is moderately firm

SANDSTONE: white, vf to fine grnd, sub ang, mod well srt'd, calcite cement, no cut or show

141 Units

179 Units

COAL: semi bright black satin (50%) and dull black (40%) with bright black vitreous bands (10%), rather poor cleat development, trace calcite seen on coal filling micro fracture

SILTSTONE: gray brown, arg in part, earthy, mod calc, grades to white vfg sandstone, mod firm

COAL: bright black vitreous (30%) to sub vitreous and satin (50%), some dull black (20%), sub blocky to blocky, good cleat development, common conchoidal fractures, occasional off white bentonite in the 3340' - 50' sample, good quality coal, best of well

183 Units

SANDSTONE: P. C. Tongue: white to light gray, some salt & pepper appearance, fine grained, sub ang to sub rnd, well sorted calcite cement, primarily unconsolidated quartz grains, occasional dark carbonaceous grains & material, trace glauconite grains, rare scattered yellow mineral fluorescence, no cut or show

SHALE: medium gray to gray brown, platy to sub platy, earthy, non to slightly calcareous, silty with siltstone interbeds, moderately firm

165 Units

86 Units

193 Units

Top Pictured Cliffs Se. @ 3444'

NOTE: After drill out 6 1/4" hole underreamed to 9 1/2"

Bit: *3 HTC, 6 1/4", GT-1, made 282' in 15.5 hours.

COAL INTERVALS:
3163 - 3165 2'
3182 - 3183 1'
3185 - 3188 3'
3191 - 3194 3'
3220 - 3228 8'
3227 - 3228 1'
3229 - 3232 2'
3247 - 3249 2'
3298 - 3300 2'
3303 - 3307 4'
3336 - 3346 10'
3428 - 3430 2'
3434 - 3436 2'
3440 - 3441 1'
TOTAL COAL: 41'

T.D. at 3445'