

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
 L — Calcareous
 C — Carbonaceous, Coaly
 D — Dolomitic
 F — Fossiliferous
 G — Glauconitic
 O — Oolitic
 P — Pyritic
 S — Siliceous

BENCH MARK

GEOLOGICAL SERVICES

HYDROCARBON

WELL LOG

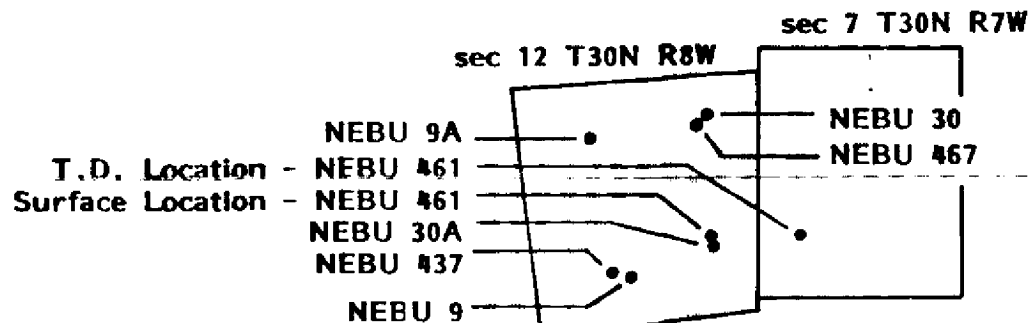
MAR 4 1991

OIL CON. DIV.,
DIST. 3OPERATOR BLACKWOOD AND NICHOLSWELL NE Blanco Unit 461FIELD Basin Fruitland CoalLOCATION sec 7 T30N R7W (TD location)CO./STATE San Juan Co., New MexicoELEVATION KB 6340 ft. GL 6326' (ungrd)

SPUD DATE

INTERVAL LOGGED 3039 - 3250 ft.DATE LOGGED 11/15 thru 11/16/90LOGGING GEOLOGISTS Randy Laney, Mike MixerINSTRUMENTATION FID Chromatograph and Total Gas Detector, Infrared CO₂ Detector

WELL LOCATION



LEGEND — GAS CURVES

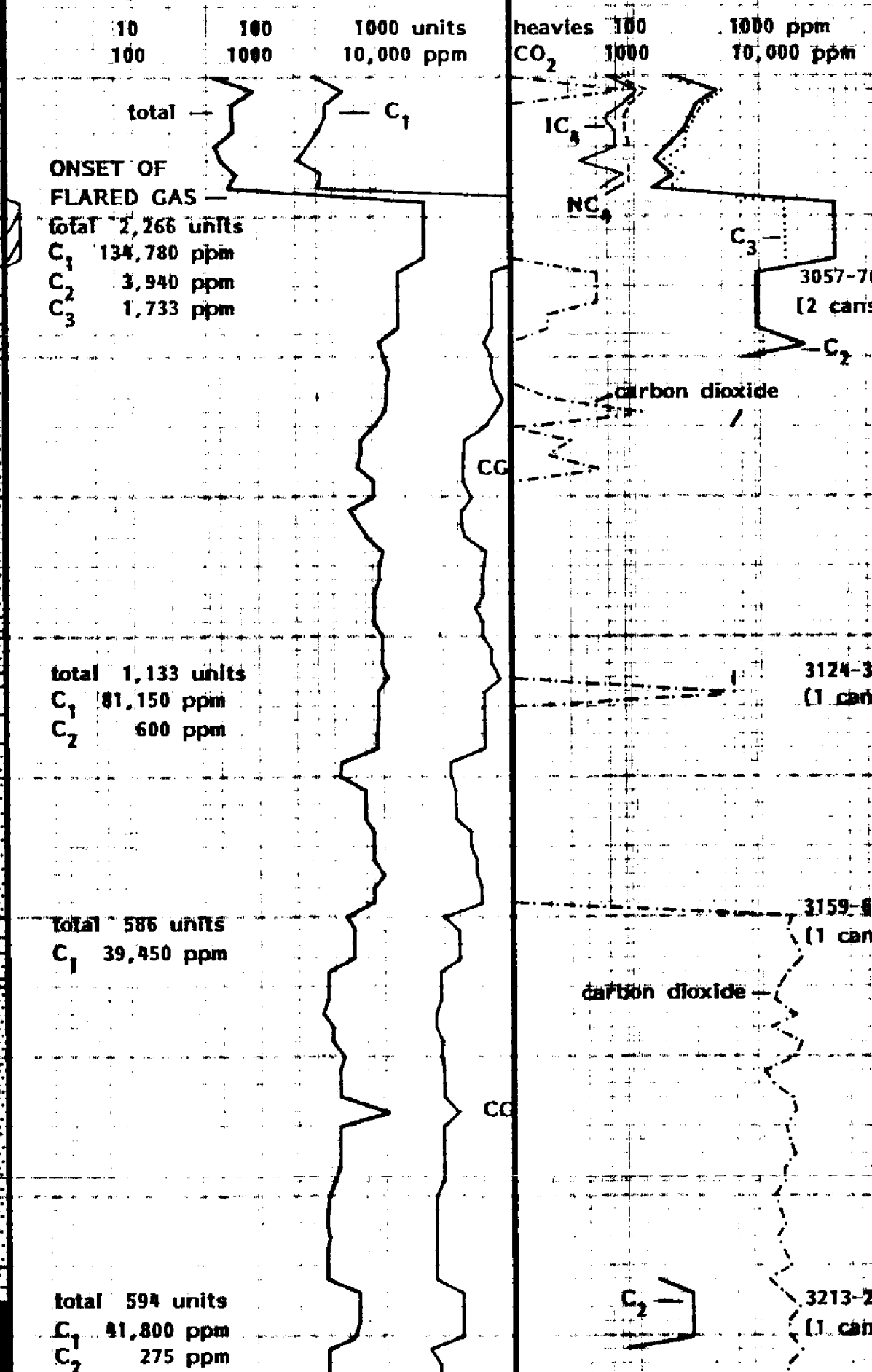
TOTAL GAS	T
METHANE	1
ETHANE	2
PROPANE	3
ISO & N-BUTANE	4
OIL INDICATOR $\frac{C_2 + C_3}{C_1}$	0

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

NOTE: The 9 7/8" topset portion of this well was directionally drilled reaching T.D. at a true vertical depth (TVD) of 3039 ft., measured depth (MD) = 3639 ft. at 0° deviation. All log depths are given as true vertical depths; measured depths from K.B. are given in parenthesis.

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



RATE OF PENETRATION

Min. Ft.

STC FDTL 6 3/4"
3-20's

2.5 5 7.5 10

WOB 8
RPM 100
PP 1200

(3700)

(3800)

circ. out

TD 3250 ft.

Visual Show	Lithology	Lithology
Log	Log	Log
Log	Log	Log

Siltst med gy, sub blk
 mod hd, sli calc, earthy
 non carb, w/ occ blk,
 vit coaly lenses, intbd
 w/ med gy, f gr Ss, NS
 Coal blk, sub blk to
 some blk w/ poorly
 developed conch frac,
 drilled up coarse gr,
 sub vit w/ 20-25% vit
 as finely striated to
 med banded, mod carb, no
 calc, rare resin, fair
 quality coal
 Ss med gy-brn gy, vf-f
 gr, sub ang-sub rd, poor
 srt, fros, mod fri (non
 disagg), mod calc, abnt
 silty-argill incl, NS
 Ss gen as above, vf gr
 sub ang, pr-fr srt, some
 carb grs, intbd w/ med-
 dk brn, sub blk Siltst
 & dk brn, plty, carb Sh
 Coal blk, sub blk to
 blk w/ better conch
 frac, 25-40% vit as med
 coarse bands, mod carb
 drilled up vf gr, dis-
 sem vf gr resin, no
 calc, mod good quality
 Siltst = dk gy brn, sub
 blk, hd, dissem carb gr
 intbd w/ = gy vf gr Ss
 Coal blk, fairly good
 blk text w/ good dev-
 elopment of cleats &
 conch frac, 40-50% vit
 as coarse banded to
 massive, some carb-less
 than above, no calc, no
 resin, drilled up as
 coarse gr, good quality
 Ss lt gy-cra, f gr, sub
 ang-sub rd, mod srt,
 fros, mod fri (non-dis-
 agg), mod calc cat, NS
 intbd w/ dk brn, carb
 Sh w/ some coaly lam
 Coal blk, good blk
 text w/ good cleat &
 conch frac development
 50-60% massive vit, v
 little carb, some amber
 resin, no calc, v good
 quality—best of well
 Sh dk gy-brn gybrn, sb
 plty, sub res, mod carb
 w/ f coaly lam, intbd
 w/ carb Siltst & coal
 T/ Main P.C. 3247'
 TD sample—Ss med gy
 S&P, f gr, sub rd, gen v
 srt, pred fros—some clt
 qtz grs, sli cat, disagg
 glauc & carb grs, NF, NC