

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

Well Name State Seventy Holes F-J-4HNB

Location NENW SEC. 4 T4N R62W

State COLORADO

County WELD

Country USA

Rig Number FRONTIER 4

API Number 05-123-39210-00

Field WATTENBERG

Region DJ BASIN

Spud Date 1/14/2015

Surface Coordinates 310' FNL x 1385' FWL (LAT: 40.34808, -104.33590)

Bottom Hole Coordinates 470' FSL x 1325' FWL (LAT: 40.33527, -104.33528) PROJECTED

Ground Elevation 4551'

K.B. Elevation 4573'

Logged Interval 5900'

Formation NIOBRARA, B-CHALK

Type of Drilling Fluid LSND, H2O

## Operator

Company Bonanza Creek Energy Inc.

Address 410 17th Street, Suite 1500  
Denver, CO 80202

## Geologist

Name Paul McKay

Company Bonanza Creek Energy Inc.

Address 410 17th Street, Suite 1500  
Denver, CO 80202

## Zone Color C

Oil  
Note  
Error

Condensate  
Core  
Water

## Rock Type

UNKNOWN  
ANHYDRITE  
BENTONITE  
BRECCIA  
CHALK  
CEMENT  
CHERT  
CLAY CHOKE SAND  
CLAYSTONE  
COAL  
CONGLOMERATE  
DOLOMITE  
DOLOMITIC LIMESTONE  
GRANITE  
GYPSUM  
IGNEOUS  
SIDERITE or LIMONITE  
LIMESTONE

Accessories

Fossils	
GASTROPOD	ARGILLITE GRAIN
INOCERAMUS	KAOLIN
ALGAE	B BENTONITE
AMPHIPORA	BITUMENOUS SUBSTANCE
BELEMNITE	BRECCIA FRAGMENTS
BIOCLASTIC	CALCAREOUS
BRACHIOPOD	PELLET
BRYOZOA	CARBONACEOUS FLAKES
CEPHALOPOD	PISOLUTE
CORAL	PLANT REMAINS
GRINOID	PLANT SPORES
ECHINOID	SCAPHOPOD
FISH	STROMATOPOROID
FORAMINIFERA	FERRUGINOUS PELLET
FOSSIL	FERRUGINOUS
ARGILLACEOUS	ANHYDRITIC
GLAUCONITE	GYPSIFEROUS
HEAVY MINERAL	TUFFACEOUS
ANHYDRITE STRINGER	M MARLSTONE
BENTONITE STRINGER	MICACEOUS
COAL STRINGER	MINERAL CRYSTALS
DOLOMITE STRINGER	NODULES
GYPSUM STRINGER	PHOSPHATE PELLETS
LIMESTONE STRINGER	P PYRITE
MARLSTONE (CALC) STRG	S SILT CAST
MARLSTONE (DOL) STRG	SANDY
SANDSTONE STRINGER	SILTY
SHALE STRINGER	SILTACEOUS
SILTSTONE STRINGER	STRINGER

Other Symbols

<b>Oil Show</b>	P PINPOINT	DST INTERVAL	WIRELINE TESTED - LEFT	E EARTHY
V VUGGY	FAULT	WIRELINE TESTED - RT	FINELYXLN	
<b>Engineering</b>	D DEAD	FORMATION TOP	DRILL STEM TEST	GS GRAINSTONE
EVEN	GAS SHOW	MN DEPTH	L LITHOGRAPHIC	MX MICROXLN
QUESTIONABLE	BIT			
SPOTTED STAINING	CONNECTION (UP)	MN DEPTH UP		MS MUDSTONE
<b>Porosity</b>	CONNECTION (DOWN)	MN DEPTH (DOWN)	A ANGULAR	PS PACKSTONE
CONNECTION GAS	NORMAL FAULT	R ROUNDED		WS WACKESTONE
E EARTHY	CONNECTION GAS (LEFT)	OVERTURNED STRATA	B SUBANG	
F FENESTRAL	TRIP GAS	REVERSE FAULT	R SUBRND	
F FRACTURE	TRIP GAS (LEFT)	CASING		<b>Sorting</b>
INTERCRYSTALLINE	DOWN TIME GAS	SIDEWALL CORE (LEFT)		M MODERATE
INTEROOLITIC	DOWN TIME GAS (LEFT)	SIDEWALL CORE (RIGHT)		P POOR
MOLDIC	CORE - LOST	SLIDE		W WELL
ORGANIC	CORE - RECOVERED	SURVEY		
				<b>Textures</b>
				BS BOUNDSTONE
				C CHALKY
				CX CRYPTOXLN

oding



es



ROP  
ROP —  
GAMMA —

Bit Data  
Bit #: 3  
Type: HE04JMRSV  
Size: 8.75  
Jets: 3x20  
S/N: 1395264

VIS: 38 WT: 9.1+

Total Gas & Chromatograph

GAS —  
C1 - - -  
C2 - - -  
C3 - - -  
C4 - - -

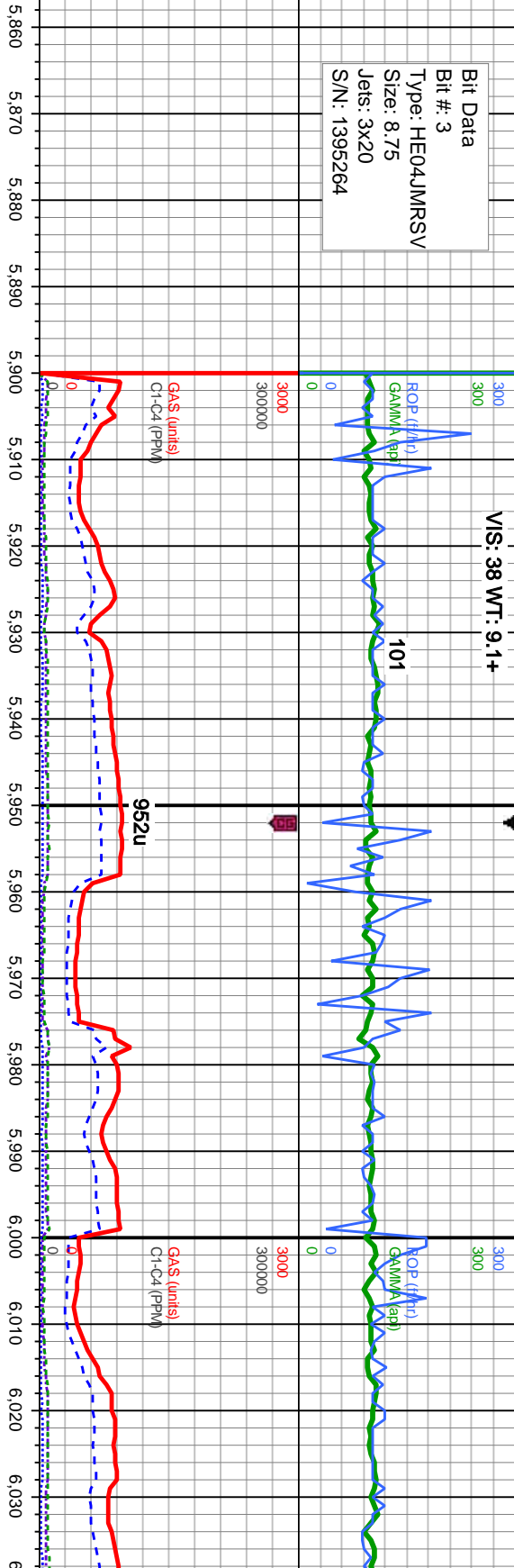
Depth Labels

% Lith

Well Bore  
TVD —

Oil Show

Images



COLUMBINE LOGGING INC.  
RIGGED UP ON 1/18/2015  
MANNED 2-PERSON LOGGING  
WITH BLOODHOUND GAS  
CHROMATOGRAPH UNIT #316  
BEGAN LOGGING ON  
1/18/2015 @ 13:19 MST

MD: 5,910'  
Inclination: 24.86°  
Azimuth: 178.43°  
VS: -216.81'  
TVD: 5,891.13'

MD: 5,957'  
Inclination: 29.8°  
Azimuth: 177°  
VS: -195.24'  
TVD: 5,932.87'

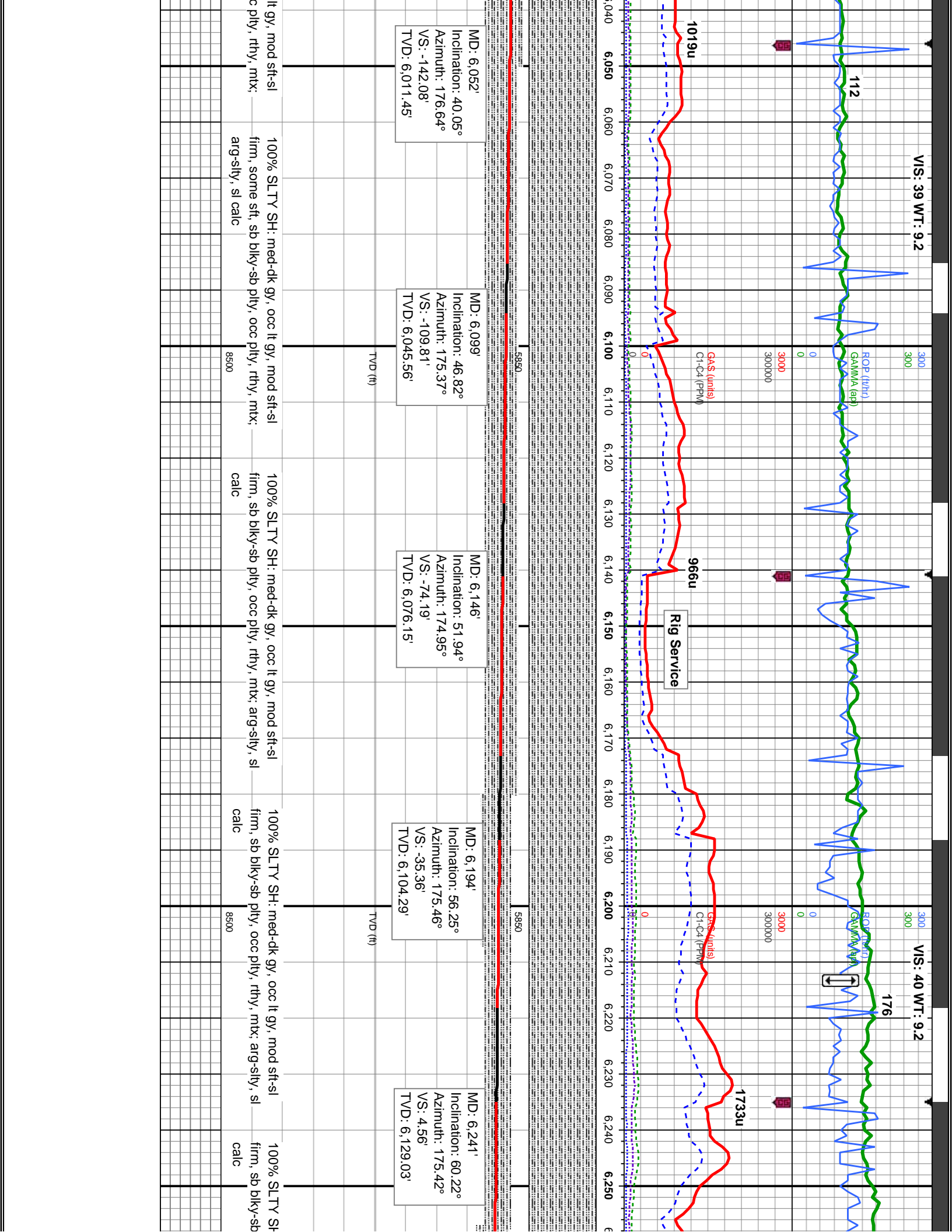
MD: 6,005'  
Inclination: 33.29°  
Azimuth: 178.14°  
VS: -170.13'  
TVD: 5,973.78'

100% SLTY SH: lt-med gy, some dk gy,  
mod sft - sl firm, sb blk-y-sb pily, occ pily,  
rthy, mtz; arg-sily, sl calc, occ shy ss

100% SLTY SH: lt-med gy, some dk gy,  
mod sft - sl firm, sb blk-y-sb pily, occ pily,  
rthy, mtz; arg-sily, sl calc, occ shy ss

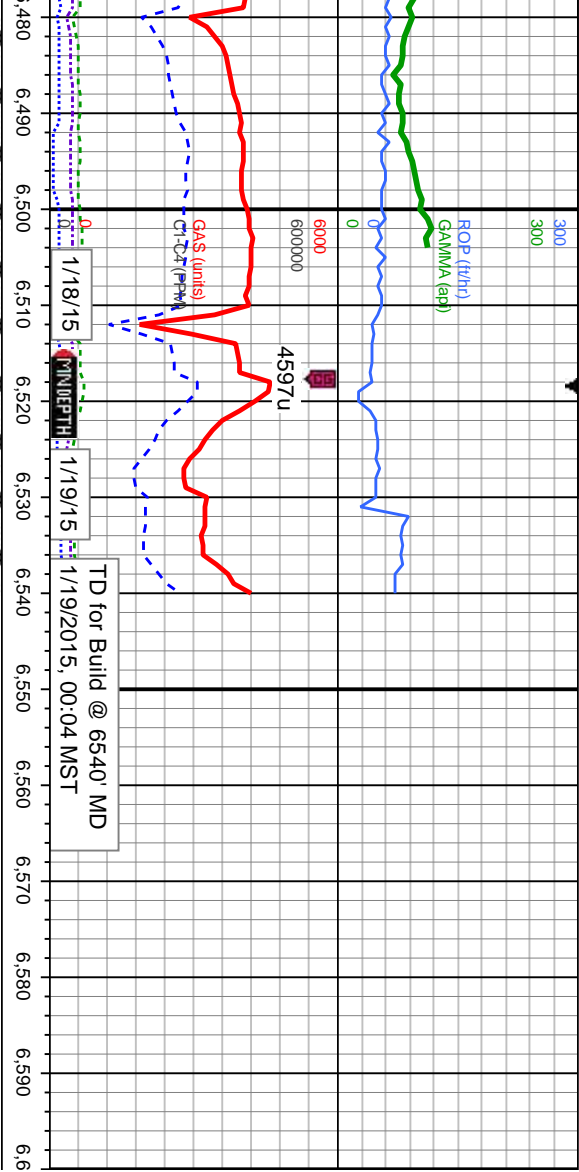
100% SLTY SH: med-dk gy, occ  
firm, some sft, sb blk-y-sb pily, occ  
arg-sily, sl calc, occ shy ss

EGMT  
F  
S









7'	MD: 6,498'	Projection to Bit
n: 80.41°	Inclination: 84.81°	MD: 6,540'
178.33°	Azimuth: 178.19°	Inclination: 89.62°
01'	VS: 245.83'	Azimuth: 176.44°
10.58'	TVD: 6,213.28'	VS: 287.76'
	TVD (ft)	TVD: 6,215.32'
75-80% CHK: lt-med gy, occ brn gy, mot, sb pty-bkly, sft-sl frm, rthy-sb wxy, imbd cal, 25-20%: MRLST: dk gy-bkly, sb pty-bkly, sl frm-mod hd, arg-sltly tex, mtx; calc, tr imbd cal, scatt foss, some uphole contaminants, g od; mod stmg bri wh bl, even thk bri yel amb ring, thn yel brn str		