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## MUDLOG TVD

<b>COMPANY</b>	ExxonMobil Production
<b>WELL</b>	PCU 297-11C6
<b>FIELD</b>	Piceance Creek Unit
<b>REGION</b>	Rocky Mountains
<b>COORDINATES</b>	39.896082 N 108.254572 W
<b>ELEVATION</b>	GL: 6965.3' KB: 6995.5'
<b>COUNTY, STATE</b>	Rio Blanco, CO
<b>API INDEX</b>	051031147200
<b>SPUD DATE</b>	02/12/2010
<b>CONTRACTOR</b>	HP Drilling
<b>CO. REP.</b>	M. Sadler / J. Wood
<b>RIG/TYPE</b>	#326/ Flex-Rig 4
<b>LOGGING UNIT</b>	#36
<b>GEOLOGISTS</b>	J. Kokes / D. Thibodeaux C. Record / J. Keevan
<b>ADD. PERSONS</b>	H. Strickland / J. Yeagar P. Strickland/ D. Lockhart
<b>CO. GEOLOGIST</b>	Chris Alba

### LOG INTERVAL

<b>DEPTHS:</b>	3824'	<b>TO</b>	12688'
<b>DATES:</b>	04/01/2010	<b>TO</b>	06/23/2010
<b>SCALE:</b>	1" = 100'		

### CASING DATA

16"	<b>AT</b>	150'
10 3/4"	<b>AT</b>	3809'
7"	<b>AT</b>	8665'

**AT**

### HOLE SIZE

14 3/4"	<b>TO</b>	3824'
9 7/8"	<b>TO</b>	8680'
6 1/8"	<b>TO</b>	12688'
	<b>TO</b>	

### MUD TYPES

WATER BASED SPUD MUD	<b>TO</b>	3824'
LSND	<b>TO</b>	12688'
	<b>TO</b>	
	<b>TO</b>	

### ABBREVIATIONS

<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm</i> MUD RESISTIVITY	<i>SG</i> SURVEY GAS
<i>PP</i> PUMP PRESSURE	<i>Rmf</i> FILTRATE RESISTIVITY	<i>WG</i> WIPER GAS
<i>SPM</i> STROKES/MIN	<i>PR</i> POOR RETURNS	<i>CG</i> CONNECTION GAS
<i>MW</i> MUD WEIGHT	<i>LAT</i> LOGGED AFTER TRIP	
<i>VIS</i> FUNNEL VISCOSITY	<i>LAS</i> LOGGED AFTER SURVEY	

	ALTERED ZONE
	ANDESITE
	ANHYDRITE
	BASALT
	BENTONITE
	BIOTITIZATION
	BRECCIA
	CALCARENITE
	CALCAREOUS TUFF
	CALCILUTITE
	CARBONATES
	CARBONACEOUS MAT
	CARBONACEOUS SH
	CEMENT CONTAM.
	CHALK
	CRYSTALLINE TUFF
	CHERT - ARGILL

	CHERT - GLASSY
	CHERT - PORCEL
	CHERT - TIGER STRIPE
	CHERT - UNDIFF
	CLAY
	CLAY-MUDSTONE
	CLYST-TUFFACEOUS
	CHLORITIZATION
	COAL
	CONGLOMERATE
	CONGL. SAND
	CONGL. SANDSTONE
	COQUINA
	DACITE
	DIATOMITE
	DIORITE
	DOLOSTONE

	FELSIC SILIC DIKE
	FOSSIL
	GABBRO
	GLASSY TUFF
	GRANITE
	GRANITE WASH
	GRANODIORITE
	GYPSUM
	HALITE
	HORNBL-QTZ-DIO
	IGNEOUS (ACIDIC)
	IGNEOUS (BASIC)
	INTRUSIVES
	KAOLINITIC
	LIMESTONE
	LITHIC TUFF
	MARL - DOLO

	MARL - CALC
	METAMORPHICS
	MUDSTONE
	OBSIDIAN
	PALEOSOL
	PHOSPHATE
	PORCELANITE
	PORCELANEOUS CLYST
	PYRITE
	PYROCLASTICS
	QUARTZ DIORITE
	QUARTZ LATITE
	QUARTZ MONZONITE
	RECRYSTALLIZED CALCITE
	RHYOLITE
	SALT
	SAND

	SANDSTONE
	SANDSTONE-TUFFACEOUS
	SERICITIZATION
	SERPENTINE
	SHALE
	SHALE TUFFACEOUS
	SHELL FRAGMENTS
	SIDERITE
	SILICIFICATION
	SILTSTONE
	SILTST-TUFFACEOUS
	TUFF
	VOLCANICLASTICS SEDS
	VOLCANICS

TVD Depth			Lithology	MGS			Interp. Lith			Remarks
<300	ROP ft/hr	>0		<0	Ttl Gas units	1K>	<10	Meth C-1 ppm	100K>	
<50	Avg WOB klbs	>0		<330	CO2 ppm	5K>	<10	Ethn C-2	100K>	
<1	Depth of Cut in/rev	>0		<0	Flare Ht. ft	100>	<10	Prop C-3	100K>	
								Butn C-4	100K>	
								Pent C-5	100K>	
<300	ROP	>0	3500 MD	<0	Ttl Gas	500>	<10	Meth C-1	100K>	
<50	Avg WOB	>0	3500 MD	<330	CO2	5K>	<10	Ethn C-2	100K>	
<1	Depth of Cut	>0	3500 MD	<0	Flare Ht.	100>	<10	Prop C-3	100K>	
								Butn C-4	100K>	
								Pent C-5	100K>	
			3600 MD							
			3600 MD							
			3700 MD							
			3700 MD							
			3800 MD							
			3800 MD							
			3900 MD							
			3900 MD							
			4000 MD							
			4000 MD							
			4100 MD							
			4100 MD							
			4200 MD							
			4200 MD							
			4300 MD							
			4300 MD							
			4400 MD							
			4400 MD							

ALL SAMPLE DEPTHS ARE REFERENCED TO RKB. ALL ROCK COLORS ARE REFERENCED TO THE GSA ROCK COLOR CHART. ROCK CONSTITUENTS ARE DESCRIBED WET AND LISTED IN ORDER OF MOST ABUNDANT TO LEAST ABUNDANT.

ALL CONNECTION GASES, TRIP GASES, AND DOWNTIME GASES ARE NOTED ON THE LOG. LARGE CONNECTION GASES WHICH APPEAR ON THE MUD LOG USUALLY REFLECT UP HOLE GAS INTERVALS BLEEDING GAS INTO THE BOREHOLE DURING CONNECTIONS.

GAS CHROMATOGRAPHY EQUIPMENT IS CALIBRATED TO A TEST GAS COMPOSED OF:  
METHANE = 10040 PPM  
METHANE = 10040 PPM  
ETHANE = 990 PPM  
PROPANE = 1000 PPM  
ISOBUTANE = 1010 PPM  
BUTANE = 1000 PPM  
ISOPENTANE = 1000 PPM  
PENTANE = 1000 PPM

WHEN THE MUD IS CIRCULATED THROUGH THE GAS BUSTER, THE INTERVAL IS MARKED IN THE MGS COLUMN; THE SIZE OF THE FLARES ARE NOTED AS WELL.

EVIDENCE OF FRACTURE FILL IS NOTED ON THE MUD LOG. KAOLIN PERCENTAGE IN SS INTERVALS IS ALSO NOTED ON THE MUD LOG.

1 UNIT OF GAS = 200 PPM OF METHANE

SET 10.7" CASING @ 3808

BEGAN LOGGING WELL PCU297-11C6 ON 04/01/2010 AT 22:30 HRS.

SANDSTONE=OFF WHITE ; FINE MEDIUM GRAIN;SUBROUNDED SUBANGULAR; MOD WELL SORTED; PREDOM QUARTZ GRAIN SUPPORTED; CLAY CALCITE CEMENT MATRIX; SLI REACTION TO HCL; MOD SPHERICITY; INTERBEDDED WITH BROWNISH RED SILTSTONES LIGHT MEDIUM GRAY SHALES LOW GAS READING; NO TRACE HYDROCARBONS

SILTSTONE=REDDISH BROWN; MOD HARD OCC SOFT; CRUMBLY DENSE TENACITY; BLOCKY IRREGULAR FRACTURE; MASSIVE CUTTINGS HABIT; DULL EARTHY OCC SPARKLING LUSTER; SMOOTH V GRITTY SANDY TEXTURE; MASSIVE STRUCTURE; INTERBEDDED WITH SHALES; LOW GAS; NO TRACE HYDROCARBONS

SHALE=LIGHT MEDIUM GRAY BROWNISH YELLOW; MOD FIRM; CRUMBLY DENSE TENACITY BLOCKY IRREGULAR FRACTURE; MASSIVE PLATY CUTTINGS HABIT; DULL EARTHY OCC WAXY LUSTER; SMOOTH CLAYEY SLI SILTY TEXTURE; MOD CALCAREOUS; INTERBEDDED BROWNISH RED SILTSTONES; LOW GAS

SILTSTONE=REDDISH BROWN; MOD HARD; DENSE TOUGH TENACITY; BLOCKY IRREGULAR FRACTURE; MASSIVE WEDGELIKE CUTTINGS DULL EARTHY OCC SPARKLING LUSTER; SMOOTH SANDY GRITTY TEXTURE; MASSIVE STRUCTURE INTERBEDDED MEDIUM LIGHT GRAY SHALES LOW GAS READINGS, NO TRACE HYDROCARBONS

SHALE=LIGHT MEDIUM GRAY YELLOW BROWN; MOD HARD FIRM; DENSE CRUMBLY TENACITY; BLOCKY IRREGULAR FRACTURE; PLATY CUTTING HABIT; DULL EARTHY WAXY LUSTER; SMOOTH SILTY CLAYEY TEXTURE;MOD CALCAREOUS; TRACE CHALCOPYRITE EMBEDDED; INTERBEDDED REDDISH BROWN SILTSTONES OCC SANDSTONES STRINGERS; LOW GAS; NO TRACE HYDROCARBON

SILTSTONE=REDDISH BROWN; MOD FIRM; DENSE TENACITY; BLOCKY IRREGULAR FRACTURE; MASSIVE CUTTINGS HABIT; DULL EARTHY LUSTER; SMOOTH SANDY GRITTY TEXTURE; MASSIVE STRUCTURE; INTERBEDDED W/ SHALE OCC SANDSTONES; LOW GAS

SANDSTONE=WHITE OFF WHITE BROWNISH GRAY; FINE MEDIUM GRAIN; SUBROUNDED SUBANGULAR MOD WELL SORTED; PREDOM GRAIN SUPPORTED; CALCITE CLAY CEMENT; MOO REACTION TO HCL; TR BLACK LITHICS CLASTS EMBEDDED;MOD SPHERICITY.

SILTSTONE = DARK YELLOWISH ORANGE TO





















