

Elm Ridge Exploration Company.

La Plata County, Co (Nad 83)

Sec 11, T33N, R8W

IGE 134

DD

UWI:

WL:

Plan: #1

Standard Survey Report

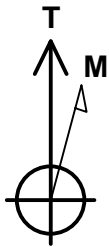
02 January, 2014



Elm Ridge Exploration Company.

Project: La Plata County, Co (Nad 83)
Site: Sec 11, T33N, R8W
Well: IGE 134
Wellbore: DD
Plan: #1

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone
Northing: 1170497.26
Easting: 2361451.27
Latitude: 37° 6' 51.660 N
Longitude: 107° 41' 24.000 W
Grid Convergence: 1.34° East
Ground Elevation: 6646.0
KB Elevation: Est RKB @ 6660.0usft (IGE 134)

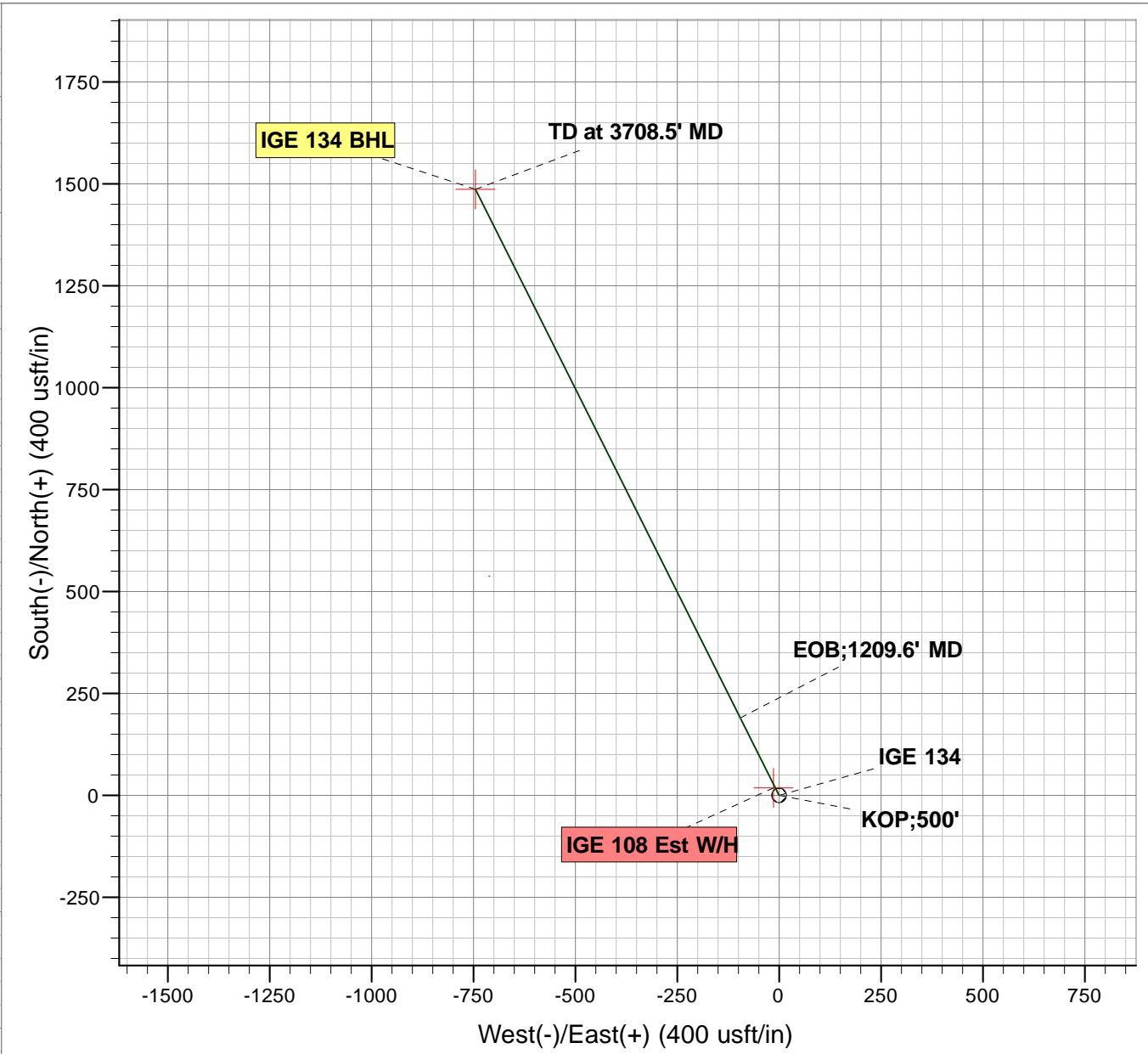
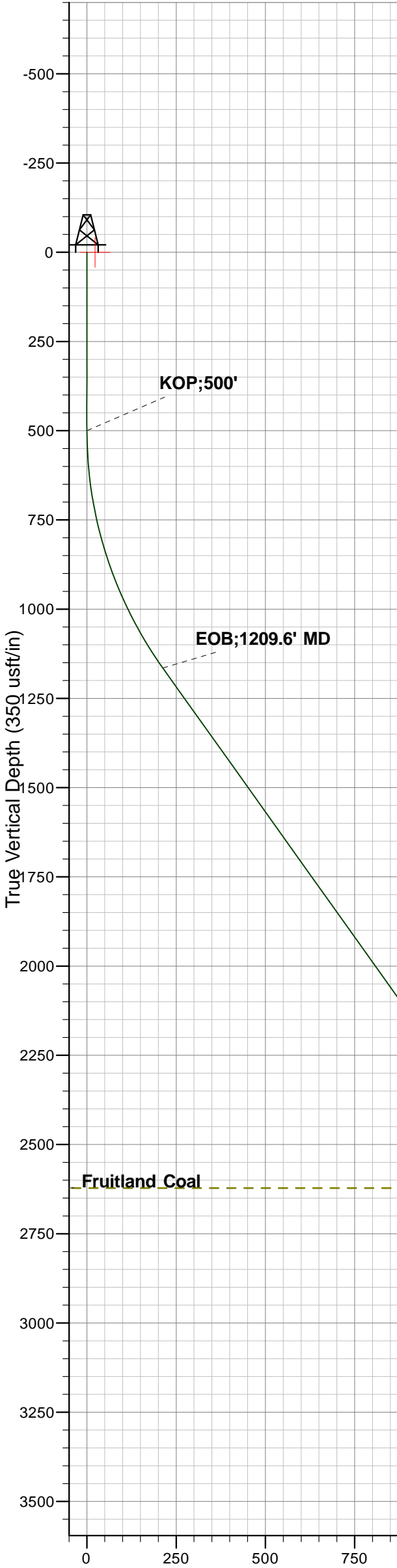


Azimuths to True North
Magnetic North: 9.63°

Magnetic Field
Strength: 50732.4snT
Dip Angle: 63.74°
Date: 9/17/2013
Model: IGRF2010

PLAN DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1209.6	35.48	333.39	1165.1	190.2	-95.3	5.00	333.39	212.8	
4	3708.5	35.48	333.39	3200.0	1487.0	-745.0	0.00	0.00	1663.2	IGE 134 BHL



ANNOTATIONS

TVD	MD	Annotation
500.0	500.0	KOP;500'
1165.1	1209.6	EOB;1209.6' MD
3200.0	3708.5	TD at 3708.5' MD

FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
2622.0	2998.7	Fruitland Coal



Mesa West Directional

Survey Report



Company:	Elm Ridge Exploration Company.	Local Co-ordinate Reference:	Well IGE 134
Project:	La Plata County, Co (Nad 83)	TVD Reference:	Est RKB @ 6660.0usft (IGE 134)
Site:	Sec 11, T33N, R8W	MD Reference:	Est RKB @ 6660.0usft (IGE 134)
Well:	IGE 134	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	#1	Database:	EDM 5000.1 Single User Db

Project	La Plata County, Co (Nad 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site	Sec 11, T33N, R8W		
Site Position:		Northing:	1,170,497.26 usft
From:	Lat/Long	Easting:	2,361,451.27 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	37° 6' 51.660 N
		Longitude:	107° 41' 24.000 W
		Grid Convergence:	-1.34 °

Well	IGE 134		
Well Position	+N/-S	0.0 usft	Northing: 1,170,497.26 usft
	+E/-W	0.0 usft	Easting: 2,361,451.27 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	37° 6' 51.660 N
		Longitude:	107° 41' 24.000 W
		Ground Level:	6,646.0 usft

Wellbore	DD		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	9/17/2013	9.63
			Dip Angle (°) 63.74
			Field Strength (nT) 50,732

Design	#1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°) 333.39

Survey Tool Program	Date	1/1/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	3,708.5 #1 (DD)		MWD	MWD - Standard

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
IGE 108 Est W/H										
0.0	0.00	0.00	0.0	-6,660.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP;500'										
500.0	0.00	0.00	500.0	-6,160.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	5.00	333.39	599.9	-6,060.1	3.9	-2.0	4.4	5.00	5.00	0.00
700.0	10.00	333.39	699.0	-5,961.0	15.6	-7.8	17.4	5.00	5.00	0.00
800.0	15.00	333.39	796.6	-5,863.4	34.9	-17.5	39.0	5.00	5.00	0.00
900.0	20.00	333.39	891.9	-5,768.1	61.8	-31.0	69.1	5.00	5.00	0.00
1,000.0	25.00	333.39	984.3	-5,675.7	96.0	-48.1	107.4	5.00	5.00	0.00
1,100.0	30.00	333.39	1,073.0	-5,587.0	137.3	-68.8	153.5	5.00	5.00	0.00

Mesa West Directional

Survey Report



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Project:	La Plata County, Co (Nad 83)	TVD Reference:	Est RKB @ 6660.0usft (IGE 134)
Site:	Sec 11, T33N, R8W	MD Reference:	Est RKB @ 6660.0usft (IGE 134)
Well:	IGE 134	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	#1	Database:	EDM 5000.1 Single User Db

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,200.0	35.00	333.39	1,157.3	-5,502.7	185.3	-92.8	207.2	5.00	5.00	0.00
EOB;1209.6' MD										
1,209.6	35.48	333.39	1,165.1	-5,494.9	190.2	-95.3	212.8	5.00	5.00	0.00
1,300.0	35.48	333.39	1,238.7	-5,421.3	237.1	-118.8	265.2	0.00	0.00	0.00
1,400.0	35.48	333.39	1,320.2	-5,339.8	289.0	-144.8	323.3	0.00	0.00	0.00
1,500.0	35.48	333.39	1,401.6	-5,258.4	340.9	-170.8	381.3	0.00	0.00	0.00
1,600.0	35.48	333.39	1,483.0	-5,177.0	392.8	-196.8	439.4	0.00	0.00	0.00
1,700.0	35.48	333.39	1,564.5	-5,095.5	444.7	-222.8	497.4	0.00	0.00	0.00
1,800.0	35.48	333.39	1,645.9	-5,014.1	496.6	-248.8	555.5	0.00	0.00	0.00
1,900.0	35.48	333.39	1,727.3	-4,932.7	548.5	-274.8	613.5	0.00	0.00	0.00
2,000.0	35.48	333.39	1,808.7	-4,851.3	600.4	-300.8	671.5	0.00	0.00	0.00
2,100.0	35.48	333.39	1,890.2	-4,769.8	652.3	-326.8	729.6	0.00	0.00	0.00
2,200.0	35.48	333.39	1,971.6	-4,688.4	704.2	-352.8	787.6	0.00	0.00	0.00
2,300.0	35.48	333.39	2,053.0	-4,607.0	756.1	-378.8	845.7	0.00	0.00	0.00
2,400.0	35.48	333.39	2,134.5	-4,525.5	808.0	-404.8	903.7	0.00	0.00	0.00
2,500.0	35.48	333.39	2,215.9	-4,444.1	859.9	-430.8	961.7	0.00	0.00	0.00
2,600.0	35.48	333.39	2,297.3	-4,362.7	911.8	-456.8	1,019.8	0.00	0.00	0.00
2,700.0	35.48	333.39	2,378.8	-4,281.2	963.7	-482.8	1,077.8	0.00	0.00	0.00
2,800.0	35.48	333.39	2,460.2	-4,199.8	1,015.6	-508.8	1,135.9	0.00	0.00	0.00
2,900.0	35.48	333.39	2,541.6	-4,118.4	1,067.5	-534.8	1,193.9	0.00	0.00	0.00
Fruitland Coal										
2,998.7	35.48	333.39	2,622.0	-4,038.0	1,118.7	-560.4	1,251.2	0.00	0.00	0.00
3,000.0	35.48	333.39	2,623.1	-4,036.9	1,119.3	-560.8	1,252.0	0.00	0.00	0.00
3,100.0	35.48	333.39	2,704.5	-3,955.5	1,171.2	-586.8	1,310.0	0.00	0.00	0.00
3,200.0	35.48	333.39	2,785.9	-3,874.1	1,223.1	-612.8	1,368.0	0.00	0.00	0.00
3,300.0	35.48	333.39	2,867.4	-3,792.6	1,275.0	-638.8	1,426.1	0.00	0.00	0.00
3,400.0	35.48	333.39	2,948.8	-3,711.2	1,326.9	-664.8	1,484.1	0.00	0.00	0.00
3,500.0	35.48	333.39	3,030.2	-3,629.8	1,378.8	-690.8	1,542.2	0.00	0.00	0.00
3,600.0	35.48	333.39	3,111.7	-3,548.3	1,430.7	-716.8	1,600.2	0.00	0.00	0.00
3,700.0	35.48	333.39	3,193.1	-3,466.9	1,482.6	-742.8	1,658.3	0.00	0.00	0.00
TD at 3708.5' MD - IGE 134 BHL										
3,708.5	35.48	333.39	3,200.0	-3,460.0	1,487.0	-745.0	1,663.2	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
IGE 108 Est W/H - plan misses target center by 23.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E) - Point	0.00	0.00	0.0	18.4	-13.8	1,170,515.95	2,361,437.86	37° 6' 51.842 N	107° 41' 24.171 W
IGE 134 BHL - plan hits target center - Point	0.00	0.00	3,200.0	1,487.0	-745.0	1,172,001.33	2,360,741.37	37° 7' 6.362 N	107° 41' 33.198 W

Mesa West Directional

Survey Report



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Project:	La Plata County, Co (Nad 83)	TVD Reference:	Est RKB @ 6660.0usft (IGE 134)
Site:	Sec 11, T33N, R8W	MD Reference:	Est RKB @ 6660.0usft (IGE 134)
Well:	IGE 134	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	#1	Database:	EDM 5000.1 Single User Db

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,998.7	2,622.0	Fruitland Coal		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500	500	0	0	KOP;500'
1210	1165	190	-95	EOB;1209.6' MD
3709	3200	1487	-745	TD at 3708.5' MD

Checked By: _____ Approved By: _____ Date: _____