

Elm Ridge Exploration Company.

La Plata County, Co (Nad 83)

Sec 7, T33N, R8W

IGW 122

DD

UWI:

WL:

Plan: #1

Standard Planning Report

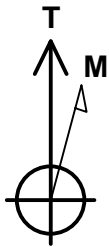
18 September, 2013



Elm Ridge Exploration Company.

Project: La Plata County, Co (Nad 83)
Site: Sec 7, T33N, R8W
Well: IGW 122
Wellbore: DD
Plan: #1

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone
Northing: 1171206.46
Easting: 2342817.95
Latitude: 37° 6' 54.288 N
Longitude: 107° 45' 14.184 W
Grid Convergence: 1.38° East
Ground Elevation: 6649.0
KB Elevation: Est RKB @ 6663.0usft (IGW 122)

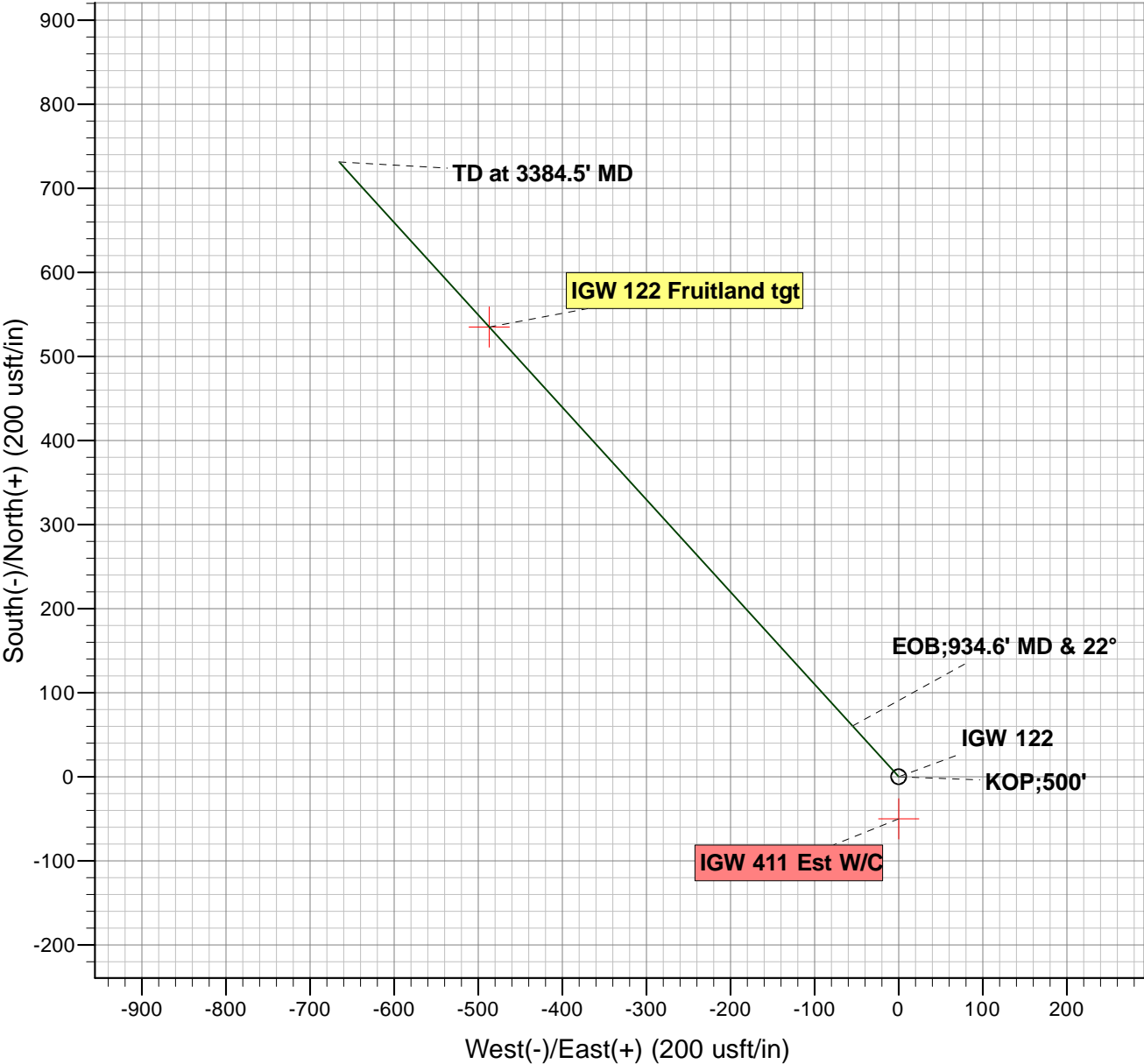
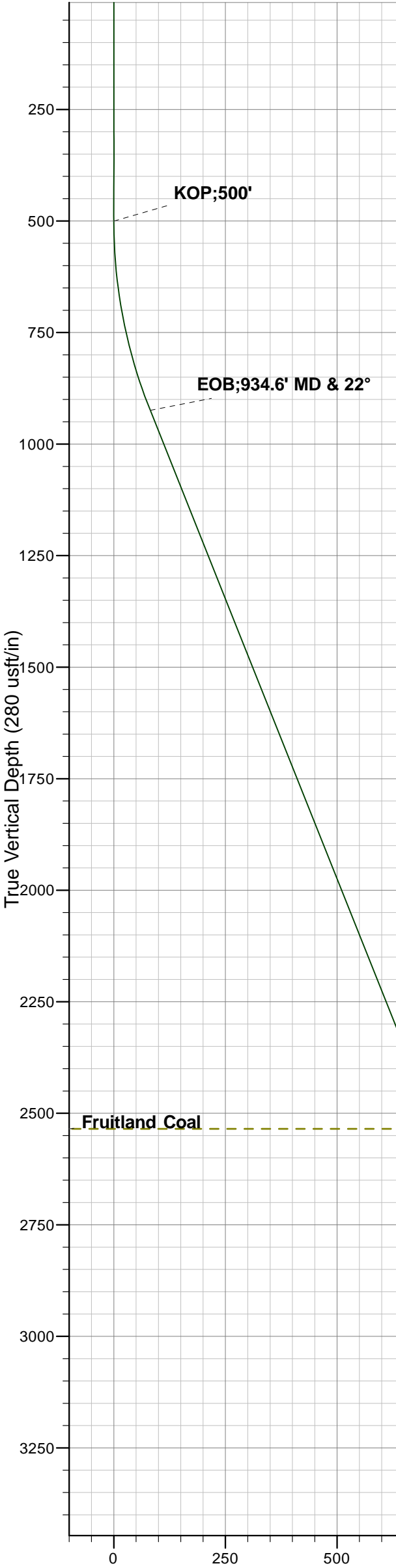


Azimuths to True North
Magnetic North: 9.66°

Magnetic Field
Strength: 50724.1snT
Dip Angle: 63.73°
Date: 9/18/2013
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	934.6	21.73	317.69	924.3	60.2	-54.8	5.00	317.69	81.4	
4	2668.6	21.73	317.69	2535.0	535.0	-487.0	0.00	0.00	723.5	IGW 122 Fruitland tgt
5	3384.5	21.73	317.69	3200.0	731.0	-665.4	0.00	0.00	988.5	



ANNOTATIONS

TVD	MD	Annotation
500.0	500.0	KOP;500'
924.3	934.6	EOB;934.6' MD & 22°
3200.0	3384.5	TD at 3384.5' MD

FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
2535.0	2668.6	Fruitland Coal



Mesa West Directional

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well IGW 122
Company:	Elm Ridge Exploration Company.	TVD Reference:	Est RKB @ 6663.0usft (IGW 122)
Project:	La Plata County, Co (Nad 83)	MD Reference:	Est RKB @ 6663.0usft (IGW 122)
Site:	Sec 7, T33N, R8W	North Reference:	True
Well:	IGW 122	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	#1		

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 7, T33N, R8W			
Site Position:		Northing:	1,171,206.46 usft	Latitude: 37° 6' 54.288 N
From:	Lat/Long	Easting:	2,342,817.96 usft	Longitude: 107° 45' 14.184 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.38 °

Well	IGW 122			
Well Position	+N/-S	0.0 usft	Northing:	1,171,206.46 usft
	+E/-W	0.0 usft	Easting:	2,342,817.96 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:		Ground Level: 6,649.0 usft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/18/2013	9.66	63.73	50,724

Design	#1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	317.69

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
934.6	21.73	317.69	924.3	60.2	-54.8	5.00	5.00	0.00	317.69	
2,668.6	21.73	317.69	2,535.0	535.0	-487.0	0.00	0.00	0.00	0.00	IGW 122 Fruitland tgt
3,384.5	21.73	317.69	3,200.0	731.0	-665.4	0.00	0.00	0.00	0.00	

Mesa West Directional

Planning Report



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Project:	La Plata County, Co (Nad 83)	MD Reference:	Est RKB @ 6663.0usft (IGW 122)
Site:	Sec 7, T33N, R8W	North Reference:	True
Well:	IGW 122	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	#1		

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)
0.0	0.00	0.00	0.0	-6,663.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP;500'										
500.0	0.00	0.00	500.0	-6,163.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	5.00	317.69	599.9	-6,063.1	3.2	-2.9	4.4	5.00	5.00	0.00
700.0	10.00	317.69	699.0	-5,964.0	12.9	-11.7	17.4	5.00	5.00	0.00
800.0	15.00	317.69	796.6	-5,866.4	28.9	-26.3	39.0	5.00	5.00	0.00
900.0	20.00	317.69	891.9	-5,771.1	51.1	-46.5	69.1	5.00	5.00	0.00
EOB;934.6' MD & 22°										
934.6	21.73	317.69	924.3	-5,738.7	60.2	-54.8	81.4	5.00	5.00	0.00
1,000.0	21.73	317.69	985.0	-5,678.0	78.1	-71.1	105.6	0.00	0.00	0.00
1,100.0	21.73	317.69	1,077.9	-5,585.1	105.5	-96.0	142.7	0.00	0.00	0.00
1,200.0	21.73	317.69	1,170.8	-5,492.2	132.9	-121.0	179.7	0.00	0.00	0.00
1,300.0	21.73	317.69	1,263.7	-5,399.3	160.3	-145.9	216.7	0.00	0.00	0.00
1,400.0	21.73	317.69	1,356.6	-5,306.4	187.6	-170.8	253.8	0.00	0.00	0.00
1,500.0	21.73	317.69	1,449.5	-5,213.5	215.0	-195.7	290.8	0.00	0.00	0.00
1,600.0	21.73	317.69	1,542.4	-5,120.6	242.4	-220.7	327.8	0.00	0.00	0.00
1,700.0	21.73	317.69	1,635.3	-5,027.7	269.8	-245.6	364.8	0.00	0.00	0.00
1,800.0	21.73	317.69	1,728.1	-4,934.9	297.2	-270.5	401.9	0.00	0.00	0.00
1,900.0	21.73	317.69	1,821.0	-4,842.0	324.6	-295.4	438.9	0.00	0.00	0.00
2,000.0	21.73	317.69	1,913.9	-4,749.1	351.9	-320.4	475.9	0.00	0.00	0.00
2,100.0	21.73	317.69	2,006.8	-4,656.2	379.3	-345.3	512.9	0.00	0.00	0.00
2,200.0	21.73	317.69	2,099.7	-4,563.3	406.7	-370.2	550.0	0.00	0.00	0.00
2,300.0	21.73	317.69	2,192.6	-4,470.4	434.1	-395.1	587.0	0.00	0.00	0.00
2,400.0	21.73	317.69	2,285.5	-4,377.5	461.5	-420.1	624.0	0.00	0.00	0.00
2,500.0	21.73	317.69	2,378.4	-4,284.6	488.8	-445.0	661.0	0.00	0.00	0.00
2,600.0	21.73	317.69	2,471.3	-4,191.7	516.2	-469.9	698.1	0.00	0.00	0.00
Fruitland Coal										
2,668.6	21.73	317.69	2,535.0	-4,128.0	535.0	-487.0	723.5	0.00	0.00	0.00
2,700.0	21.73	317.69	2,564.2	-4,098.8	543.6	-494.8	735.1	0.00	0.00	0.00
2,800.0	21.73	317.69	2,657.1	-4,005.9	571.0	-519.8	772.1	0.00	0.00	0.00
2,900.0	21.73	317.69	2,750.0	-3,913.0	598.4	-544.7	809.1	0.00	0.00	0.00
3,000.0	21.73	317.69	2,842.9	-3,820.1	625.7	-569.6	846.2	0.00	0.00	0.00
3,100.0	21.73	317.69	2,935.8	-3,727.2	653.1	-594.5	883.2	0.00	0.00	0.00
3,200.0	21.73	317.69	3,028.6	-3,634.4	680.5	-619.5	920.2	0.00	0.00	0.00
3,300.0	21.73	317.69	3,121.5	-3,541.5	707.9	-644.4	957.2	0.00	0.00	0.00
TD at 3384.5' MD										
3,384.5	21.73	317.69	3,200.0	-3,463.0	731.0	-665.4	988.5	0.00	0.00	0.00

Mesa West Directional

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Project:	La Plata County, Co (Nad 83)	MD Reference:	Est RKB @ 6663.0usft (IGW 122)
Site:	Sec 7, T33N, R8W	North Reference:	True
Well:	IGW 122	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	#1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
IGW 411 Est W/C	0.00	0.00	0.0	-50.0	0.0	1,171,156.47	2,342,816.75	37° 6' 53.794 N	107° 45' 14.184 W
- plan misses target center by 50.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Point									
IGW 122 Fruitland tgt	0.00	0.00	2,535.0	535.0	-487.0	1,171,753.05	2,342,344.01	37° 6' 59.577 N	107° 45' 20.196 W
- plan hits target center									
- Point									

Formations						
Measured Depth	Vertical Depth	Subsea Depth	Name	Lithology	Dip	Dip Direction
(usft)	(usft)	(usft)			(°)	(°)
2,668.6	2,535.0	4,128.0	Fruitland Coal		0.00	

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W	Comment	
(usft)	(usft)	(usft)	(usft)		
500.0	500.0	0.0	0.0	KOP;500'	
934.6	924.3	60.2	-54.8	EOB;934.6' MD & 22°	
3,384.5	3,200.0	535.0	-487.0	TD at 3384.5' MD	