



# **SHELL E&P**

**MOFFAT COUNTY, CO**

**HERRING DRAW 5-33**

**HERRING DRAW 5-33**

**HERRING DRAW 5-33**

**Plan: PLAN 1**

## **Standard Planning Report**

**29 August, 2012**





Project: MOFFAT COUNTY, CO  
Site: HERRING DRAW 5-33  
Well: HERRING DRAW 5-33  
Wellbore: HERRING DRAW 5-33  
Design: PLAN 1  
Latitude: 40° 20' 44.760 N  
Longitude: 107° 30' 20.180 W  
GL: 6804.00  
KB: KB @ 6820.00ft (Original Well Elev)



#### WELLBORE TARGET DETAILS (LAT/LONG)

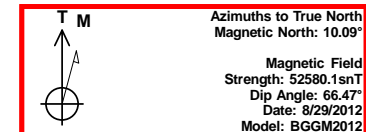
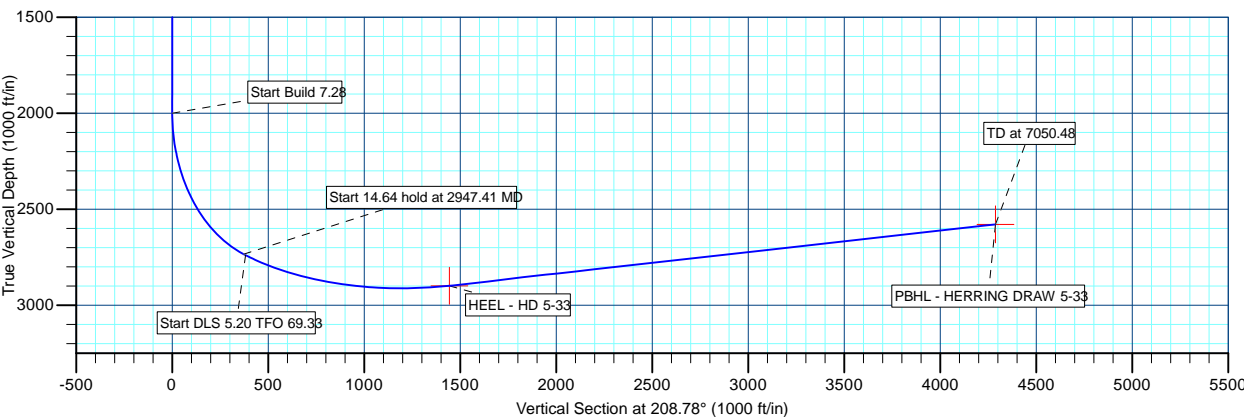
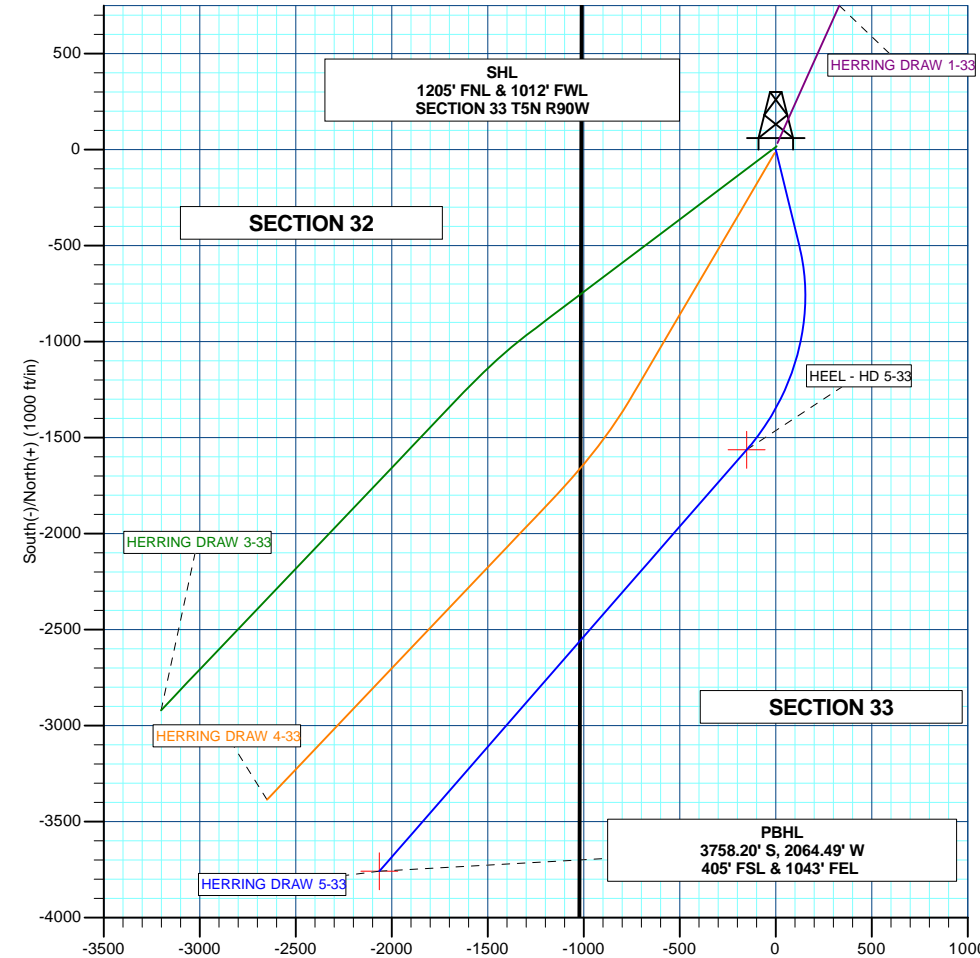
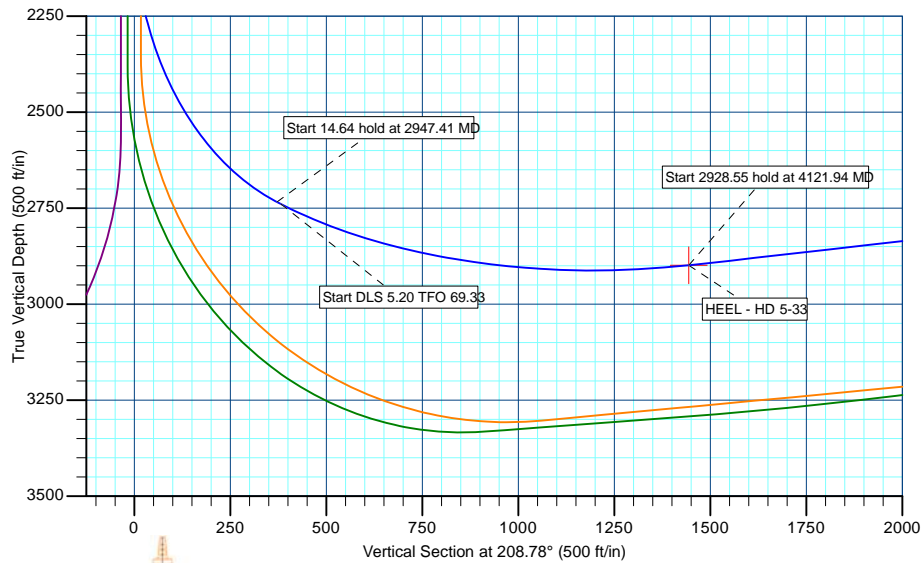
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
PBHL - HERRING DRAW 5-33	2579.00	-3758.20	-2064.49	40° 20' 7.620 N	107° 30' 46.840 W	Point
HEEL - HD 5-33	2899.00	-1563.79	-151.76	40° 20' 29.306 N	107° 30' 22.140 W	Point

#### WELL DETAILS: HERRING DRAW 5-33

+N/-S	+E/-W	Northing	Easting	Ground Level: 6804.00	Latitude	Longitude	Slot
0.00	0.00	1375125.13	2441018.89		40° 20' 44.760 N	107° 30' 20.180 W	

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	Start Build 7.28
2947.41	69.01	166.19	2734.39	-490.25	120.48	7.28	166.19	371.68	Start 14.64 hold at 2947.41 MD
2962.05	69.01	166.19	2739.63	-503.52	123.75	0.00	0.00	381.74	Start DLS 5.20 TFO 69.33
4121.94	96.27	221.08	2899.00	-1563.79	-151.76	5.20	69.33	1443.67	Start 2928.55 hold at 4121.94 MD
7050.48	96.27	221.08	2579.00	-3758.20	-2064.49	0.00	0.00	4287.92	TD at 7050.48



Plan: PLAN 1 (HERRING DRAW 5-33/HERRING DRAW 5-33)

Created By: MATT MAYDEW

Date: 15:59, August 29 2012



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Company:</b>	SHELL E&P	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Project:</b>	MOFFAT COUNTY, CO	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site:</b>	HERRING DRAW 5-33	<b>North Reference:</b>	True
<b>Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HERRING DRAW 5-33		
<b>Design:</b>	PLAN 1		

<b>Project</b>	MOFFAT COUNTY, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site	HERRING DRAW 5-33				
Site Position:		Northing:	1,375,125.13 usft	Latitude:	40° 20' 44.760 N
From:	Lat/Long	Easting:	2,441,018.89 usft	Longitude:	107° 30' 20.180 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16"	Grid Convergence:	-1.30 °

Well	HERRING DRAW 5-33					
Well Position	+N/-S	0.00 ft	Northing:	1,375,125.13 usft	Latitude:	40° 20' 44.760 N
	+E/-W	0.00 ft	Easting:	2,441,018.89 usft	Longitude:	107° 30' 20.180 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,804.00 ft

<b>Wellbore</b>	HERRING DRAW 5-33				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2012	8/29/2012	10.09	66.47	52,580

<b>Design</b>	PLAN 1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	208.78

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,947.41	69.01	166.19	2,734.39	-490.25	120.48	7.28	7.28	0.00	166.19	
2,962.05	69.01	166.19	2,739.63	-503.52	123.75	0.00	0.00	0.00	0.00	
4,121.94	96.27	221.08	2,899.00	-1,563.79	-151.76	5.20	2.35	4.73	69.33	HEEL - HD 5-33
7,050.48	96.27	221.08	2,579.00	-3,758.20	-2,064.49	0.00	0.00	0.00	0.00	PBHL - HERRING DF



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well HERRING DRAW 5-33
Company:	SHELL E&P	TVD Reference:	KB @ 6820.00ft (Original Well Elev)
Project:	MOFFAT COUNTY, CO	MD Reference:	KB @ 6820.00ft (Original Well Elev)
Site:	HERRING DRAW 5-33	North Reference:	True
Well:	HERRING DRAW 5-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	HERRING DRAW 5-33		
Design:	PLAN 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 7.28									
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,050.00	3.64	166.19	2,049.97	-1.54	0.38	1.17	7.28	7.28	0.00
2,100.00	7.28	166.19	2,099.73	-6.16	1.52	4.67	7.28	7.28	0.00
2,150.00	10.93	166.19	2,149.09	-13.85	3.40	10.50	7.28	7.28	0.00
2,200.00	14.57	166.19	2,197.85	-24.56	6.04	18.62	7.28	7.28	0.00
2,250.00	18.21	166.19	2,245.81	-38.26	9.40	29.00	7.28	7.28	0.00
2,300.00	21.85	166.19	2,292.78	-54.89	13.49	41.61	7.28	7.28	0.00
2,350.00	25.49	166.19	2,338.56	-74.38	18.28	56.39	7.28	7.28	0.00
2,400.00	29.14	166.19	2,382.98	-96.66	23.75	73.28	7.28	7.28	0.00
2,450.00	32.78	166.19	2,425.85	-121.63	29.89	92.21	7.28	7.28	0.00
2,500.00	36.42	166.19	2,467.00	-149.20	36.67	113.11	7.28	7.28	0.00
2,550.00	40.06	166.19	2,506.26	-179.25	44.05	135.89	7.28	7.28	0.00
2,600.00	43.71	166.19	2,543.48	-211.66	52.02	160.47	7.28	7.28	0.00
2,650.00	47.35	166.19	2,578.51	-246.30	60.53	186.73	7.28	7.28	0.00
2,700.00	50.99	166.19	2,611.19	-283.03	69.56	214.58	7.28	7.28	0.00
2,750.00	54.63	166.19	2,641.41	-321.71	79.06	243.90	7.28	7.28	0.00
2,800.00	58.27	166.19	2,669.04	-362.17	89.01	274.57	7.28	7.28	0.00
2,850.00	61.92	166.19	2,693.96	-404.25	99.35	306.48	7.28	7.28	0.00
2,900.00	65.56	166.19	2,716.08	-447.79	110.05	339.48	7.28	7.28	0.00
Start 14.64 hold at 2947.41 MD									
2,947.41	69.01	166.19	2,734.39	-490.25	120.48	371.68	7.28	7.28	0.00
Start DLS 5.20 TFO 69.33									
2,962.05	69.01	166.19	2,739.63	-503.52	123.75	381.74	0.00	0.00	0.00
3,000.00	69.72	168.16	2,753.01	-538.15	131.62	408.30	5.20	1.87	5.19
3,100.00	71.69	173.27	2,786.07	-631.26	146.82	482.58	5.20	1.97	5.10
3,200.00	73.79	178.25	2,815.76	-726.45	153.86	562.63	5.20	2.10	4.99
3,300.00	76.00	183.13	2,841.83	-822.95	152.68	647.78	5.20	2.21	4.88
3,400.00	78.31	187.91	2,864.06	-919.96	143.29	737.32	5.20	2.31	4.78
3,500.00	80.70	192.61	2,882.28	-1,016.68	125.76	830.53	5.20	2.39	4.70
3,600.00	83.15	197.25	2,896.34	-1,112.31	100.25	926.63	5.20	2.45	4.64
3,700.00	85.64	201.84	2,906.11	-1,206.06	66.96	1,024.83	5.20	2.49	4.59
3,800.00	88.16	206.40	2,911.51	-1,297.16	26.17	1,124.32	5.20	2.52	4.56



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Company:</b>	SHELL E&P	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Project:</b>	MOFFAT COUNTY, CO	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site:</b>	HERRING DRAW 5-33	<b>North Reference:</b>	True
<b>Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HERRING DRAW 5-33		
<b>Design:</b>	PLAN 1		

## Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,900.00	90.69	210.94	2,912.51	-1,384.87	-21.79	1,224.28	5.20	2.53	4.55
4,000.00	93.22	215.49	2,909.10	-1,468.45	-76.52	1,323.88	5.20	2.53	4.55
4,100.00	95.73	220.07	2,901.29	-1,547.22	-137.58	1,422.32	5.20	2.51	4.57
<b>Start 2928.55 hold at 4121.94 MD - HEEL - HD 5-33</b>									
4,121.94	96.27	221.08	2,899.00	-1,563.79	-151.76	1,443.67	5.20	2.49	4.60
4,200.00	96.27	221.08	2,890.47	-1,622.28	-202.75	1,519.49	0.00	0.00	0.00
4,300.00	96.27	221.08	2,879.54	-1,697.22	-268.06	1,616.61	0.00	0.00	0.00
4,400.00	96.27	221.08	2,868.62	-1,772.15	-333.38	1,713.73	0.00	0.00	0.00
4,500.00	96.27	221.08	2,857.69	-1,847.08	-398.69	1,810.85	0.00	0.00	0.00
4,600.00	96.27	221.08	2,846.76	-1,922.01	-464.00	1,907.98	0.00	0.00	0.00
4,700.00	96.27	221.08	2,835.84	-1,996.94	-529.32	2,005.10	0.00	0.00	0.00
4,800.00	96.27	221.08	2,824.91	-2,071.87	-594.63	2,102.22	0.00	0.00	0.00
4,900.00	96.27	221.08	2,813.98	-2,146.81	-659.94	2,199.34	0.00	0.00	0.00
5,000.00	96.27	221.08	2,803.05	-2,221.74	-725.26	2,296.46	0.00	0.00	0.00
5,100.00	96.27	221.08	2,792.13	-2,296.67	-790.57	2,393.58	0.00	0.00	0.00
5,200.00	96.27	221.08	2,781.20	-2,371.60	-855.88	2,490.70	0.00	0.00	0.00
5,300.00	96.27	221.08	2,770.27	-2,446.53	-921.20	2,587.82	0.00	0.00	0.00
5,400.00	96.27	221.08	2,759.35	-2,521.47	-986.51	2,684.95	0.00	0.00	0.00
5,500.00	96.27	221.08	2,748.42	-2,596.40	-1,051.82	2,782.07	0.00	0.00	0.00
5,600.00	96.27	221.08	2,737.49	-2,671.33	-1,117.13	2,879.19	0.00	0.00	0.00
5,700.00	96.27	221.08	2,726.57	-2,746.26	-1,182.45	2,976.31	0.00	0.00	0.00
5,800.00	96.27	221.08	2,715.64	-2,821.19	-1,247.76	3,073.43	0.00	0.00	0.00
5,900.00	96.27	221.08	2,704.71	-2,896.13	-1,313.07	3,170.55	0.00	0.00	0.00
6,000.00	96.27	221.08	2,693.79	-2,971.06	-1,378.39	3,267.67	0.00	0.00	0.00
6,100.00	96.27	221.08	2,682.86	-3,045.99	-1,443.70	3,364.79	0.00	0.00	0.00
6,200.00	96.27	221.08	2,671.93	-3,120.92	-1,509.01	3,461.92	0.00	0.00	0.00
6,300.00	96.27	221.08	2,661.00	-3,195.85	-1,574.33	3,559.04	0.00	0.00	0.00
6,400.00	96.27	221.08	2,650.08	-3,270.78	-1,639.64	3,656.16	0.00	0.00	0.00
6,500.00	96.27	221.08	2,639.15	-3,345.72	-1,704.95	3,753.28	0.00	0.00	0.00
6,600.00	96.27	221.08	2,628.22	-3,420.65	-1,770.27	3,850.40	0.00	0.00	0.00
6,700.00	96.27	221.08	2,617.30	-3,495.58	-1,835.58	3,947.52	0.00	0.00	0.00
6,800.00	96.27	221.08	2,606.37	-3,570.51	-1,900.89	4,044.64	0.00	0.00	0.00
6,900.00	96.27	221.08	2,595.44	-3,645.44	-1,966.21	4,141.77	0.00	0.00	0.00
7,000.00	96.27	221.08	2,584.52	-3,720.38	-2,031.52	4,238.89	0.00	0.00	0.00
<b>TD at 7050.48 - PBHL - HERRING DRAW 5-33</b>									
7,050.48	96.27	221.08	2,579.00	-3,758.20	-2,064.49	4,287.92	0.00	0.00	0.00

## Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL - HERRING DRA - plan hits target center - Point	0.00	0.00	2,579.00	-3,758.20	-2,064.49	1,371,414.58	2,438,869.94	40° 20' 7.620 N	107° 30' 46.840 W
HEEL - HD 5-33 - plan hits target center - Point	0.00	0.00	2,899.00	-1,563.79	-151.76	1,373,565.17	2,440,831.80	40° 20' 29.306 N	107° 30' 22.140 W



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well HERRING DRAW 5-33
Company:	SHELL E&P	TVD Reference:	KB @ 6820.00ft (Original Well Elev)
Project:	MOFFAT COUNTY, CO	MD Reference:	KB @ 6820.00ft (Original Well Elev)
Site:	HERRING DRAW 5-33	North Reference:	True
Well:	HERRING DRAW 5-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	HERRING DRAW 5-33		
Design:	PLAN 1		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
2,000.00	2,000.00	0.00	0.00	Start Build 7.28	
2,947.41	2,734.39	-490.25	120.48	Start 14.64 hold at 2947.41 MD	
2,962.05	2,739.63	-503.52	123.75	Start DLS 5.20 TFO 69.33	
4,121.94	2,899.00	-1,563.79	-151.76	Start 2928.55 hold at 4121.94 MD	
7,050.48	2,579.00	-3,758.20	-2,064.49	TD at 7050.48	



# **SHELL E&P**

**MOFFAT COUNTY, CO  
HERRING DRAW 5-33  
HERRING DRAW 5-33**

**HERRING DRAW 5-33  
PLAN 1**

## **Anticollision Report**

**29 August, 2012**



**Weatherford®**



<b>Company:</b>	SHELL E&P	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Project:</b>	MOFFAT COUNTY, CO	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Reference Site:</b>	HERRING DRAW 5-33	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HERRING DRAW 5-33	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PLAN 1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	PLAN 1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.00ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,611.13 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b> 8/29/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	7,050.48	PLAN 1 (HERRING DRAW 5-33)	MWD	MWD - Standard

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (ft)</b>	<b>Offset Measured Depth (ft)</b>	<b>Distance Between Centres (ft)</b>	<b>Distance Between Ellipses (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
HERRING DRAW 1-33						
HERRING DRAW 1-33 - HERRING DRAW 1-33 - PLAN	2,000.00	2,000.00	35.64	26.91	4.082	CC, ES, SF
HERRING DRAW 3-33						
HERRING DRAW 3-33 - HERRING DRAW 3-33 - PLAN	2,000.00	2,000.00	17.82	9.09	2.041	CC, ES, SF
HERRING DRAW 4-33						
HERRING DRAW 4-33 - HERRING DRAW 4-33 - PLAN	2,156.90	2,155.86	8.62	-0.75	0.920	Level 1, CC, ES, SF

<b>Offset Design</b>													<b>Offset Site Error:</b>	0.00 ft
HERRING DRAW 1-33 - HERRING DRAW 1-33 - HERRING DRAW 1-33 - PLAN 1													<b>Offset Well Error:</b>	0.00 ft
<b>Survey Program:</b> 0-MWD														
<b>Reference</b>	<b>Offset</b>	<b>Semi Major Axis</b>			<b>Distance</b>									
<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Reference (ft)</b>	<b>Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>Offset Wellbore Centre +E/-W (ft)</b>	<b>Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>	
0.00	0.00	0.00	0.00	0.00	0.00	15.11	34.41	9.29	35.64					
100.00	100.00	100.00	100.00	0.09	0.09	15.11	34.41	9.29	35.64	35.45	0.19	188.757		
200.00	200.00	200.00	200.00	0.32	0.32	15.11	34.41	9.29	35.64	35.00	0.64	55.829		
300.00	300.00	300.00	300.00	0.54	0.54	15.11	34.41	9.29	35.64	34.55	1.09	32.759		
400.00	400.00	400.00	400.00	0.77	0.77	15.11	34.41	9.29	35.64	34.10	1.54	23.181		
500.00	500.00	500.00	500.00	0.99	0.99	15.11	34.41	9.29	35.64	33.65	1.99	17.936		
600.00	600.00	600.00	600.00	1.22	1.22	15.11	34.41	9.29	35.64	33.20	2.44	14.627		
700.00	700.00	700.00	700.00	1.44	1.44	15.11	34.41	9.29	35.64	32.75	2.89	12.349		
800.00	800.00	800.00	800.00	1.67	1.67	15.11	34.41	9.29	35.64	32.30	3.34	10.684		
900.00	900.00	900.00	900.00	1.89	1.89	15.11	34.41	9.29	35.64	31.85	3.79	9.415		
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	15.11	34.41	9.29	35.64	31.40	4.23	8.416		
1,100.00	1,100.00	1,100.00	1,100.00	2.34	2.34	15.11	34.41	9.29	35.64	30.95	4.68	7.608		
1,200.00	1,200.00	1,200.00	1,200.00	2.57	2.57	15.11	34.41	9.29	35.64	30.50	5.13	6.942		
1,300.00	1,300.00	1,300.00	1,300.00	2.79	2.79	15.11	34.41	9.29	35.64	30.05	5.58	6.383		
1,400.00	1,400.00	1,400.00	1,400.00	3.02	3.02	15.11	34.41	9.29	35.64	29.61	6.03	5.907		
1,500.00	1,500.00	1,500.00	1,500.00	3.24	3.24	15.11	34.41	9.29	35.64	29.16	6.48	5.498		
1,600.00	1,600.00	1,600.00	1,600.00	3.47	3.47	15.11	34.41	9.29	35.64	28.71	6.93	5.141		
1,700.00	1,700.00	1,700.00	1,700.00	3.69	3.69	15.11	34.41	9.29	35.64	28.26	7.38	4.828		
1,800.00	1,800.00	1,800.00	1,800.00	3.92	3.92	15.11	34.41	9.29	35.64	27.81	7.83	4.551		
1,900.00	1,900.00	1,900.00	1,900.00	4.14	4.14	15.11	34.41	9.29	35.64	27.36	8.28	4.304		
2,000.00	2,000.00	2,000.00	2,000.00	4.36	4.36	15.11	34.41	9.29	35.64	26.91	8.73	4.082	CC, ES, SF	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation





Weatherford International Ltd.  
Anticollision Report



<b>Company:</b>	SHELL E&P	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Project:</b>	MOFFAT COUNTY, CO	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Reference Site:</b>	HERRING DRAW 5-33	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HERRING DRAW 5-33	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PLAN 1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		HERRING DRAW 1-33 - HERRING DRAW 1-33 - HERRING DRAW 1-33 - PLAN 1											Offset Site Error:		0.00 ft
Survey Program:		0-MWD											Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
2,100.00	2,099.73	2,099.73	2,099.73	4.55	4.59	-155.17	34.41	9.29	41.31	32.22	9.09	4.544			
2,200.00	2,197.85	2,197.85	2,197.85	4.75	4.81	-162.50	34.41	9.29	59.05	49.74	9.32	6.337			
2,300.00	2,292.78	2,292.78	2,292.78	4.98	5.02	-168.05	34.41	9.29	89.39	79.98	9.41	9.504			
2,400.00	2,382.98	2,382.98	2,382.98	5.36	5.23	-171.42	34.41	9.29	131.86	122.50	9.36	14.087			
2,500.00	2,467.00	2,467.00	2,467.00	5.94	5.41	-173.39	34.41	9.29	185.63	176.43	9.20	20.181			
2,600.00	2,543.48	2,543.48	2,543.48	6.76	5.59	-174.53	34.41	9.29	249.75	240.80	8.95	27.919			
2,700.00	2,611.19	2,600.00	2,599.99	7.84	5.71	-174.82	35.00	9.56	323.84	315.20	8.64	37.496			
2,800.00	2,669.04	2,642.48	2,642.40	9.16	5.81	-174.28	37.26	10.57	407.93	399.58	8.34	48.888			
2,900.00	2,716.08	2,671.68	2,671.47	10.68	5.88	-172.79	39.79	11.71	499.39	491.23	8.15	61.252			
3,000.00	2,753.01	2,690.84	2,690.48	12.32	5.92	-179.01	41.87	12.64	595.39	587.34	8.05	73.985			
3,100.00	2,786.07	2,700.00	2,699.56	13.88	5.94	158.04	42.99	13.14	692.79	682.19	10.60	65.352			
3,200.00	2,815.76	2,715.55	2,714.94	15.48	5.98	135.85	45.06	14.07	790.53	774.70	15.83	49.940			
3,300.00	2,841.83	2,722.42	2,721.74	17.10	5.99	116.28	46.05	14.52	888.07	867.57	20.50	43.316			
3,400.00	2,864.06	2,726.23	2,725.49	18.70	6.00	101.86	46.62	14.77	984.88	961.43	23.45	41.993			
3,500.00	2,882.28	2,727.38	2,726.62	20.29	6.01	91.71	46.79	14.85	1,080.51	1,055.30	25.20	42.872			
3,600.00	2,896.34	2,726.23	2,725.49	21.86	6.00	84.54	46.62	14.77	1,174.56	1,148.28	26.28	44.692			
3,700.00	2,906.11	2,723.13	2,722.43	23.41	6.00	79.40	46.15	14.56	1,266.69	1,239.72	26.98	46.954			
3,800.00	2,911.51	2,718.35	2,717.72	24.93	5.98	75.66	45.46	14.25	1,356.59	1,329.15	27.44	49.446			
3,900.00	2,912.51	2,700.00	2,699.56	26.43	5.94	72.06	42.99	13.14	1,444.07	1,416.49	27.57	52.371			
4,000.00	2,909.10	2,700.00	2,699.56	27.92	5.94	70.73	42.99	13.14	1,528.52	1,500.68	27.84	54.900			
4,100.00	2,901.29	2,700.00	2,699.56	29.38	5.94	69.93	42.99	13.14	1,610.02	1,581.99	28.03	57.436			



# Weatherford International Ltd.

## Anticollision Report



<b>Company:</b>	SHELL E&P	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Project:</b>	MOFFAT COUNTY, CO	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Reference Site:</b>	HERRING DRAW 5-33	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HERRING DRAW 5-33	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PLAN 1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design HERRING DRAW 3-33 - HERRING DRAW 3-33 - HERRING DRAW 3-33 - PLAN 1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	15.11	17.20	4.65	17.82					
100.00	100.00	100.00	100.00	0.09	0.09	15.11	17.20	4.65	17.82	17.63	0.19	94.378		
200.00	200.00	200.00	200.00	0.32	0.32	15.11	17.20	4.65	17.82	17.18	0.64	27.915		
300.00	300.00	300.00	300.00	0.54	0.54	15.11	17.20	4.65	17.82	16.73	1.09	16.380		
400.00	400.00	400.00	400.00	0.77	0.77	15.11	17.20	4.65	17.82	16.28	1.54	11.590		
500.00	500.00	500.00	500.00	0.99	0.99	15.11	17.20	4.65	17.82	15.83	1.99	8.968		
600.00	600.00	600.00	600.00	1.22	1.22	15.11	17.20	4.65	17.82	15.38	2.44	7.313		
700.00	700.00	700.00	700.00	1.44	1.44	15.11	17.20	4.65	17.82	14.93	2.89	6.174		
800.00	800.00	800.00	800.00	1.67	1.67	15.11	17.20	4.65	17.82	14.48	3.34	5.342		
900.00	900.00	900.00	900.00	1.89	1.89	15.11	17.20	4.65	17.82	14.03	3.79	4.708		
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	15.11	17.20	4.65	17.82	13.58	4.23	4.208		
1,100.00	1,100.00	1,100.00	1,100.00	2.34	2.34	15.11	17.20	4.65	17.82	13.13	4.68	3.804		
1,200.00	1,200.00	1,200.00	1,200.00	2.57	2.57	15.11	17.20	4.65	17.82	12.69	5.13	3.471		
1,300.00	1,300.00	1,300.00	1,300.00	2.79	2.79	15.11	17.20	4.65	17.82	12.24	5.58	3.192		
1,400.00	1,400.00	1,400.00	1,400.00	3.02	3.02	15.11	17.20	4.65	17.82	11.79	6.03	2.954		
1,500.00	1,500.00	1,500.00	1,500.00	3.24	3.24	15.11	17.20	4.65	17.82	11.34	6.48	2.749		
1,600.00	1,600.00	1,600.00	1,600.00	3.47	3.47	15.11	17.20	4.65	17.82	10.89	6.93	2.571		
1,700.00	1,700.00	1,700.00	1,700.00	3.69	3.69	15.11	17.20	4.65	17.82	10.44	7.38	2.414		
1,800.00	1,800.00	1,800.00	1,800.00	3.92	3.92	15.11	17.20	4.65	17.82	9.99	7.83	2.275		
1,900.00	1,900.00	1,900.00	1,900.00	4.14	4.14	15.11	17.20	4.65	17.82	9.54	8.28	2.152		
2,000.00	2,000.00	2,000.00	2,000.00	4.36	4.36	15.11	17.20	4.65	17.82	9.09	8.73	2.041 CC, ES, SF		
2,100.00	2,099.73	2,099.73	2,099.73	4.55	4.59	-158.40	17.20	4.65	23.58	14.49	9.09	2.594		
2,200.00	2,197.85	2,197.85	2,197.85	4.75	4.81	-167.72	17.20	4.65	41.79	32.48	9.31	4.490		
2,300.00	2,292.78	2,292.78	2,292.78	4.98	5.02	-172.66	17.20	4.65	72.63	63.24	9.39	7.737		
2,400.00	2,382.98	2,383.18	2,383.18	5.36	5.23	-175.11	17.20	4.64	115.45	106.11	9.34	12.363		
2,500.00	2,467.00	2,474.11	2,473.95	5.94	5.40	-178.22	14.39	0.92	167.59	158.46	9.13	18.347		
2,600.00	2,543.48	2,560.47	2,559.39	6.76	5.57	177.68	6.92	-8.98	227.48	218.62	8.86	25.675		
2,700.00	2,611.19	2,640.68	2,637.44	7.84	5.74	173.33	-4.16	-23.66	295.21	286.58	8.63	34.212		
2,800.00	2,669.04	2,713.52	2,706.75	9.16	5.94	168.79	-17.61	-41.48	370.36	361.76	8.60	43.074		
2,900.00	2,716.08	2,778.11	2,766.65	10.68	6.16	163.82	-32.17	-60.76	452.19	443.20	8.98	50.341		
3,000.00	2,753.01	2,835.54	2,818.42	12.32	6.40	156.24	-47.13	-80.59	538.90	528.37	10.52	51.202		
3,100.00	2,786.07	2,895.48	2,870.75	13.88	6.72	145.58	-64.72	-103.89	625.29	611.99	13.30	46.997		
3,200.00	2,815.76	2,960.70	2,925.49	15.48	7.14	137.09	-86.06	-132.17	709.90	693.77	16.12	44.028		
3,300.00	2,841.83	3,032.78	2,983.03	17.10	7.72	130.39	-112.21	-166.81	791.94	773.08	18.86	41.992		
3,400.00	2,864.06	3,113.58	3,043.42	18.70	8.51	125.16	-144.53	-209.62	870.64	849.11	21.53	40.436		
3,500.00	2,882.28	3,205.25	3,106.16	20.29	9.59	121.10	-184.76	-262.93	945.14	920.90	24.24	38.989		
3,600.00	2,896.34	3,310.11	3,169.70	21.86	11.08	117.97	-234.98	-329.46	1,014.43	987.30	27.14	37.381		
3,700.00	2,906.11	3,430.40	3,230.82	23.41	13.06	115.56	-297.34	-412.07	1,077.35	1,046.97	30.38	35.460		
3,800.00	2,911.51	3,567.57	3,284.01	24.93	15.63	113.64	-373.43	-512.89	1,132.52	1,098.40	34.13	33.186		
3,900.00	2,912.51	3,721.31	3,321.45	26.43	18.78	112.01	-463.16	-631.77	1,178.49	1,140.03	38.46	30.645		
4,000.00	2,909.10	3,888.41	3,334.50	27.92	22.41	110.49	-563.39	-764.57	1,213.87	1,170.57	43.31	28.029		
4,100.00	2,901.29	4,009.86	3,327.91	29.38	25.10	109.40	-636.44	-861.34	1,239.09	1,191.79	47.30	26.196		
4,200.00	2,890.47	4,107.61	3,321.28	30.84	27.29	109.17	-695.19	-939.18	1,259.93	1,208.94	50.99	24.710		
4,300.00	2,879.54	4,205.40	3,314.66	32.33	29.49	109.03	-753.97	-1,017.05	1,280.63	1,225.86	54.78	23.379		
4,400.00	2,868.62	4,303.19	3,308.03	33.89	31.72	108.90	-812.75	-1,094.92	1,301.34	1,242.71	58.63	22.197		
4,500.00	2,857.69	4,400.98	3,301.40	35.51	33.95	108.78	-871.53	-1,172.80	1,322.05	1,259.52	62.53	21.142		
4,600.00	2,846.76	4,498.77	3,294.77	37.19	36.20	108.65	-930.30	-1,250.67	1,342.77	1,276.29	66.48	20.199		
4,700.00	2,835.84	4,674.33	3,281.68	38.91	40.04	108.46	-1,039.35	-1,387.60	1,361.03	1,289.05	71.98	18.908		
4,800.00	2,824.91	4,863.69	3,264.54	40.68	44.03	108.29	-1,165.69	-1,527.57	1,372.89	1,295.19	77.70	17.669		
4,900.00	2,813.98	5,025.00	3,247.57	42.49	47.39	108.19	-1,279.93	-1,640.15	1,378.50	1,295.64	82.87	16.635		
5,000.00	2,803.05	5,124.91	3,236.62	44.34	49.54	108.13	-1,351.87	-1,708.61	1,382.62	1,295.74	86.88	15.914		
5,100.00	2,792.13	5,224.81	3,225.68	46.21	51.69	108.07	-1,423.80	-1,777.07	1,386.74	1,295.82	90.91	15.253		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



**Weatherford International Ltd.**  
Anticollision Report



<b>Company:</b>	SHELL E&P	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Project:</b>	MOFFAT COUNTY, CO	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Reference Site:</b>	HERRING DRAW 5-33	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HERRING DRAW 5-33	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PLAN 1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design HERRING DRAW 3-33 - HERRING DRAW 3-33 - HERRING DRAW 3-33 - PLAN 1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,200.00	2,781.20	5,324.72	3,214.73	48.11	53.85	108.02	-1,495.74	-1,845.53	1,390.86	1,295.89	94.97	14.646		
5,300.00	2,770.27	5,424.63	3,203.79	50.04	56.02	107.96	-1,567.67	-1,913.99	1,394.98	1,295.95	99.03	14.086		
5,400.00	2,759.35	5,524.53	3,192.84	51.98	58.18	107.90	-1,639.61	-1,982.45	1,399.10	1,295.99	103.11	13.569		
5,500.00	2,748.42	5,624.44	3,181.90	53.95	60.35	107.85	-1,711.54	-2,050.91	1,403.23	1,296.03	107.20	13.090		
5,600.00	2,737.49	5,724.34	3,170.95	55.93	62.52	107.79	-1,783.48	-2,119.36	1,407.35	1,296.05	111.30	12.645		
5,700.00	2,726.57	5,824.25	3,160.01	57.92	64.69	107.74	-1,855.41	-2,187.82	1,411.48	1,296.06	115.41	12.230		
5,800.00	2,715.64	5,924.15	3,149.06	59.93	66.87	107.68	-1,927.35	-2,256.28	1,415.60	1,296.07	119.53	11.843		
5,900.00	2,704.71	6,024.06	3,138.12	61.95	69.05	107.63	-1,999.28	-2,324.74	1,419.73	1,296.07	123.66	11.481		
6,000.00	2,693.79	6,123.96	3,127.17	63.98	71.23	107.57	-2,071.22	-2,393.20	1,423.86	1,296.07	127.80	11.142		
6,100.00	2,682.86	6,223.87	3,116.23	66.02	73.41	107.52	-2,143.15	-2,461.66	1,427.99	1,296.05	131.94	10.823		
6,200.00	2,671.93	6,323.78	3,105.28	68.07	75.59	107.47	-2,215.09	-2,530.12	1,432.13	1,296.04	136.09	10.523		
6,300.00	2,661.00	6,423.68	3,094.34	70.13	77.77	107.41	-2,287.02	-2,598.58	1,436.26	1,296.01	140.25	10.241		
6,400.00	2,650.08	6,523.59	3,083.39	72.19	79.96	107.36	-2,358.96	-2,667.04	1,440.39	1,295.99	144.41	9.974		
6,500.00	2,639.15	6,623.49	3,072.45	74.26	82.15	107.31	-2,430.89	-2,735.50	1,444.53	1,295.96	148.58	9.723		
6,600.00	2,628.22	6,723.40	3,061.50	76.34	84.33	107.25	-2,502.83	-2,803.96	1,448.67	1,295.92	152.75	9.484		
6,700.00	2,617.30	6,823.30	3,050.56	78.42	86.52	107.20	-2,574.76	-2,872.42	1,452.81	1,295.88	156.92	9.258		
6,800.00	2,606.37	6,923.21	3,039.61	80.51	88.71	107.15	-2,646.70	-2,940.88	1,456.95	1,295.84	161.11	9.043		
6,900.00	2,595.44	7,023.11	3,028.67	82.60	90.90	107.10	-2,718.63	-3,009.34	1,461.09	1,295.80	165.29	8.839		
7,000.00	2,584.52	7,123.02	3,017.72	84.69	93.09	107.05	-2,790.57	-3,077.79	1,465.23	1,295.75	169.48	8.645		
7,050.48	2,579.00	7,173.46	3,012.20	85.75	94.20	107.02	-2,826.88	-3,112.35	1,467.32	1,295.72	171.60	8.551		



# Weatherford International Ltd.

## Anticollision Report



<b>Company:</b>	SHELL E&P	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Project:</b>	MOFFAT COUNTY, CO	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Reference Site:</b>	HERRING DRAW 5-33	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HERRING DRAW 5-33	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PLAN 1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design HERRING DRAW 4-33 - HERRING DRAW 4-33 - HERRING DRAW 4-33 - PLAN 1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-164.89	-17.20	-4.65	17.82					
100.00	100.00	100.00	100.00	0.09	0.09	-164.89	-17.20	-4.65	17.82	17.63	0.19	94.378		
200.00	200.00	200.00	200.00	0.32	0.32	-164.89	-17.20	-4.65	17.82	17.18	0.64	27.915		
300.00	300.00	300.00	300.00	0.54	0.54	-164.89	-17.20	-4.65	17.82	16.73	1.09	16.380		
400.00	400.00	400.00	400.00	0.77	0.77	-164.89	-17.20	-4.65	17.82	16.28	1.54	11.590		
500.00	500.00	500.00	500.00	0.99	0.99	-164.89	-17.20	-4.65	17.82	15.83	1.99	8.968		
600.00	600.00	600.00	600.00	1.22	1.22	-164.89	-17.20	-4.65	17.82	15.38	2.44	7.313		
700.00	700.00	700.00	700.00	1.44	1.44	-164.89	-17.20	-4.65	17.82	14.93	2.89	6.174		
800.00	800.00	800.00	800.00	1.67	1.67	-164.89	-17.20	-4.65	17.82	14.48	3.34	5.342		
900.00	900.00	900.00	900.00	1.89	1.89	-164.89	-17.20	-4.65	17.82	14.03	3.79	4.708		
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	-164.89	-17.20	-4.65	17.82	13.58	4.23	4.208		
1,100.00	1,100.00	1,100.00	1,100.00	2.34	2.34	-164.89	-17.20	-4.65	17.82	13.13	4.68	3.804		
1,200.00	1,200.00	1,200.00	1,200.00	2.57	2.57	-164.89	-17.20	-4.65	17.82	12.69	5.13	3.471		
1,300.00	1,300.00	1,300.00	1,300.00	2.79	2.79	-164.89	-17.20	-4.65	17.82	12.24	5.58	3.192		
1,400.00	1,400.00	1,400.00	1,400.00	3.02	3.02	-164.89	-17.20	-4.65	17.82	11.79	6.03	2.954		
1,500.00	1,500.00	1,500.00	1,500.00	3.24	3.24	-164.89	-17.20	-4.65	17.82	11.34	6.48	2.749		
1,600.00	1,600.00	1,600.00	1,600.00	3.47	3.47	-164.89	-17.20	-4.65	17.82	10.89	6.93	2.571		
1,700.00	1,700.00	1,700.00	1,700.00	3.69	3.69	-164.89	-17.20	-4.65	17.82	10.44	7.38	2.414		
1,800.00	1,800.00	1,800.00	1,800.00	3.92	3.92	-164.89	-17.20	-4.65	17.82	9.99	7.83	2.275		
1,900.00	1,900.00	1,900.00	1,900.00	4.14	4.14	-164.89	-17.20	-4.65	17.82	9.54	8.28	2.152		
2,000.00	2,000.00	2,000.00	2,000.00	4.36	4.36	-164.89	-17.20	-4.65	17.82	9.09	8.73	2.041		
2,100.00	2,099.73	2,099.73	2,099.73	4.55	4.59	43.21	-17.20	-4.65	12.64	3.53	9.11	1.388 Level 3		
2,156.90	2,155.86	2,155.86	2,155.86	4.67	4.72	90.00	-17.20	-4.65	8.62	-0.75	9.37	0.920 Level 1, CC, ES, SF		
2,200.00	2,197.85	2,197.85	2,197.85	4.75	4.81	137.43	-17.20	-4.65	12.97	3.57	9.40	1.379 Level 3		
2,300.00	2,292.78	2,292.78	2,292.78	4.98	5.02	167.22	-17.20	-4.65	41.82	32.42	9.40	4.448		
2,400.00	2,382.98	2,384.78	2,384.77	5.36	5.22	173.06	-17.66	-4.92	84.06	74.72	9.34	9.003		
2,500.00	2,467.00	2,478.57	2,478.21	5.94	5.39	172.74	-24.33	-8.83	133.37	124.22	9.15	14.579		
2,600.00	2,543.48	2,572.02	2,570.10	6.76	5.57	170.24	-38.80	-17.33	188.14	179.20	8.95	21.025		
2,700.00	2,611.19	2,664.50	2,658.99	7.84	5.78	166.89	-60.67	-30.18	248.35	239.49	8.86	28.023		
2,800.00	2,669.04	2,755.49	2,743.67	9.16	6.05	163.06	-89.33	-47.01	313.87	304.81	9.06	34.658		
2,900.00	2,716.08	2,844.69	2,823.23	10.68	6.43	158.81	-124.03	-67.39	384.43	374.72	9.71	39.602		
3,000.00	2,753.01	2,933.62	2,898.47	12.32	6.94	153.07	-164.86	-91.37	458.52	447.21	11.31	40.538		
3,100.00	2,786.07	3,032.59	2,976.62	13.88	7.68	145.68	-217.15	-122.09	529.25	515.42	13.84	38.253		
3,200.00	2,815.76	3,145.11	3,057.29	15.48	8.76	139.84	-284.71	-161.77	594.22	577.60	16.62	35.753		
3,300.00	2,841.83	3,272.85	3,136.98	17.10	10.30	135.13	-370.69	-212.27	651.81	632.05	19.76	32.988		
3,400.00	2,864.06	3,416.34	3,209.73	18.70	12.36	131.18	-477.20	-274.83	700.25	676.89	23.36	29.981		
3,500.00	2,882.28	3,573.95	3,267.33	20.29	14.95	127.74	-603.53	-349.04	737.82	710.34	27.48	26.847		
3,600.00	2,896.34	3,741.25	3,301.25	21.86	17.95	124.55	-744.61	-431.91	763.12	731.03	32.09	23.781		
3,700.00	2,906.11	3,911.27	3,305.98	23.41	21.14	121.49	-890.96	-517.87	775.38	738.39	36.99	20.963		
3,800.00	2,911.51	4,022.19	3,296.18	24.93	23.25	119.66	-986.21	-573.82	777.59	736.97	40.61	19.146		
3,900.00	2,912.51	4,121.58	3,286.98	26.43	25.16	118.96	-1,071.55	-623.94	775.23	731.56	43.66	17.754		
4,000.00	2,909.10	4,221.25	3,277.75	27.92	27.09	119.22	-1,157.13	-674.21	768.15	721.80	46.35	16.574		
4,100.00	2,901.29	4,320.39	3,268.58	29.38	29.02	120.48	-1,242.24	-724.21	756.34	707.73	48.61	15.561		
4,200.00	2,890.47	4,400.00	3,261.20	30.84	30.54	121.36	-1,310.35	-764.75	742.02	690.96	51.06	14.533		
4,300.00	2,879.54	4,486.87	3,253.14	32.33	32.13	121.99	-1,383.43	-811.02	729.96	676.19	53.77	13.575		
4,400.00	2,868.62	4,568.51	3,245.54	33.89	33.66	122.50	-1,450.79	-856.51	720.43	663.94	56.49	12.753		
4,500.00	2,857.69	4,650.66	3,237.89	35.51	35.22	122.92	-1,517.22	-904.21	713.38	654.10	59.28	12.034		
4,600.00	2,846.76	4,733.18	3,230.20	37.19	36.81	123.25	-1,582.55	-954.04	708.80	646.65	62.15	11.404		
4,700.00	2,835.84	4,815.94	3,222.50	38.91	38.43	123.47	-1,646.60	-1,005.89	706.66	641.55	65.11	10.854		
4,737.86	2,831.70	4,847.32	3,219.58	39.58	39.05	123.53	-1,670.47	-1,026.02	706.49	640.24	66.25	10.664		
4,800.00	2,824.91	4,900.00	3,214.68	40.68	40.10	123.59	-1,710.07	-1,060.43	706.96	638.79	68.17	10.370		
4,900.00	2,813.98	4,981.65	3,207.11	42.49	41.74	123.60	-1,770.17	-1,115.17	709.67	638.38	71.29	9.955		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Weatherford International Ltd.  
Anticollision Report



<b>Company:</b>	SHELL E&P	<b>Local Co-ordinate Reference:</b>	Well HERRING DRAW 5-33
<b>Project:</b>	MOFFAT COUNTY, CO	<b>TVD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Reference Site:</b>	HERRING DRAW 5-33	<b>MD Reference:</b>	KB @ 6820.00ft (Original Well Elev)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HERRING DRAW 5-33	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HERRING DRAW 5-33	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PLAN 1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design HERRING DRAW 4-33 - HERRING DRAW 4-33 - HERRING DRAW 4-33 - PLAN 1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,000.00	2,803.05	5,077.78	3,198.21	44.34	43.71	123.53	-1,839.62	-1,181.04	714.07	639.31	74.76	9.552	
5,100.00	2,792.13	5,177.68	3,188.96	46.21	45.79	123.45	-1,911.76	-1,249.53	718.53	640.19	78.34	9.172	
5,200.00	2,781.20	5,277.58	3,179.71	48.11	47.90	123.38	-1,983.89	-1,318.02	722.98	641.04	81.95	8.822	
5,300.00	2,770.27	5,377.47	3,170.47	50.04	50.01	123.30	-2,056.02	-1,386.51	727.44	641.87	85.58	8.500	
5,400.00	2,759.35	5,477.37	3,161.22	51.98	52.12	123.23	-2,128.15	-1,455.00	731.90	642.68	89.22	8.203	
5,500.00	2,748.42	5,577.26	3,151.97	53.95	54.25	123.16	-2,200.28	-1,523.49	736.36	643.48	92.88	7.928	
5,600.00	2,737.49	5,677.16	3,142.73	55.93	56.38	123.09	-2,272.41	-1,591.98	740.83	644.27	96.56	7.672	
5,700.00	2,726.57	5,777.06	3,133.48	57.92	58.52	123.02	-2,344.54	-1,660.47	745.29	645.04	100.25	7.435	
5,800.00	2,715.64	5,876.95	3,124.23	59.93	60.66	122.95	-2,416.68	-1,728.96	749.75	645.81	103.95	7.213	
5,900.00	2,704.71	5,976.85	3,114.99	61.95	62.81	122.88	-2,488.81	-1,797.44	754.22	646.56	107.66	7.006	
6,000.00	2,693.79	6,076.75	3,105.74	63.98	64.96	122.81	-2,560.94	-1,865.93	758.69	647.30	111.38	6.812	
6,100.00	2,682.86	6,176.64	3,096.49	66.02	67.11	122.74	-2,633.07	-1,934.42	763.15	648.04	115.11	6.630	
6,200.00	2,671.93	6,276.54	3,087.24	68.07	69.27	122.68	-2,705.20	-2,002.91	767.62	648.77	118.86	6.458	
6,300.00	2,661.00	6,376.43	3,078.00	70.13	71.43	122.61	-2,777.33	-2,071.40	772.09	649.49	122.61	6.297	
6,400.00	2,650.08	6,476.33	3,068.75	72.19	73.60	122.55	-2,849.47	-2,139.89	776.56	650.20	126.36	6.145	
6,500.00	2,639.15	6,576.23	3,059.50	74.26	75.76	122.48	-2,921.60	-2,208.38	781.03	650.90	130.13	6.002	
6,600.00	2,628.22	6,676.12	3,050.26	76.34	77.93	122.42	-2,993.73	-2,276.87	785.51	651.60	133.90	5.866	
6,700.00	2,617.30	6,776.02	3,041.01	78.42	80.10	122.36	-3,065.86	-2,345.36	789.98	652.29	137.68	5.738	
6,800.00	2,606.37	6,875.91	3,031.76	80.51	82.28	122.30	-3,137.99	-2,413.85	794.45	652.98	141.47	5.616	
6,900.00	2,595.44	6,975.81	3,022.52	82.60	84.45	122.23	-3,210.12	-2,482.34	798.93	653.66	145.27	5.500	
7,000.00	2,584.52	7,075.71	3,013.27	84.69	86.63	122.17	-3,282.25	-2,550.83	803.41	654.34	149.07	5.390	
7,050.48	2,579.00	7,126.14	3,008.60	85.75	87.73	122.14	-3,318.67	-2,585.40	805.67	654.68	150.99	5.336	



Company:	SHELL E&P	Local Co-ordinate Reference:	Well HERRING DRAW 5-33
Project:	MOFFAT COUNTY, CO	TVD Reference:	KB @ 6820.00ft (Original Well Elev)
Reference Site:	HERRING DRAW 5-33	MD Reference:	KB @ 6820.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	HERRING DRAW 5-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	HERRING DRAW 5-33	Database:	EDM 5000.1 Single User Db
Reference Design:	PLAN 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 6820.00ft (Original Well Elev)

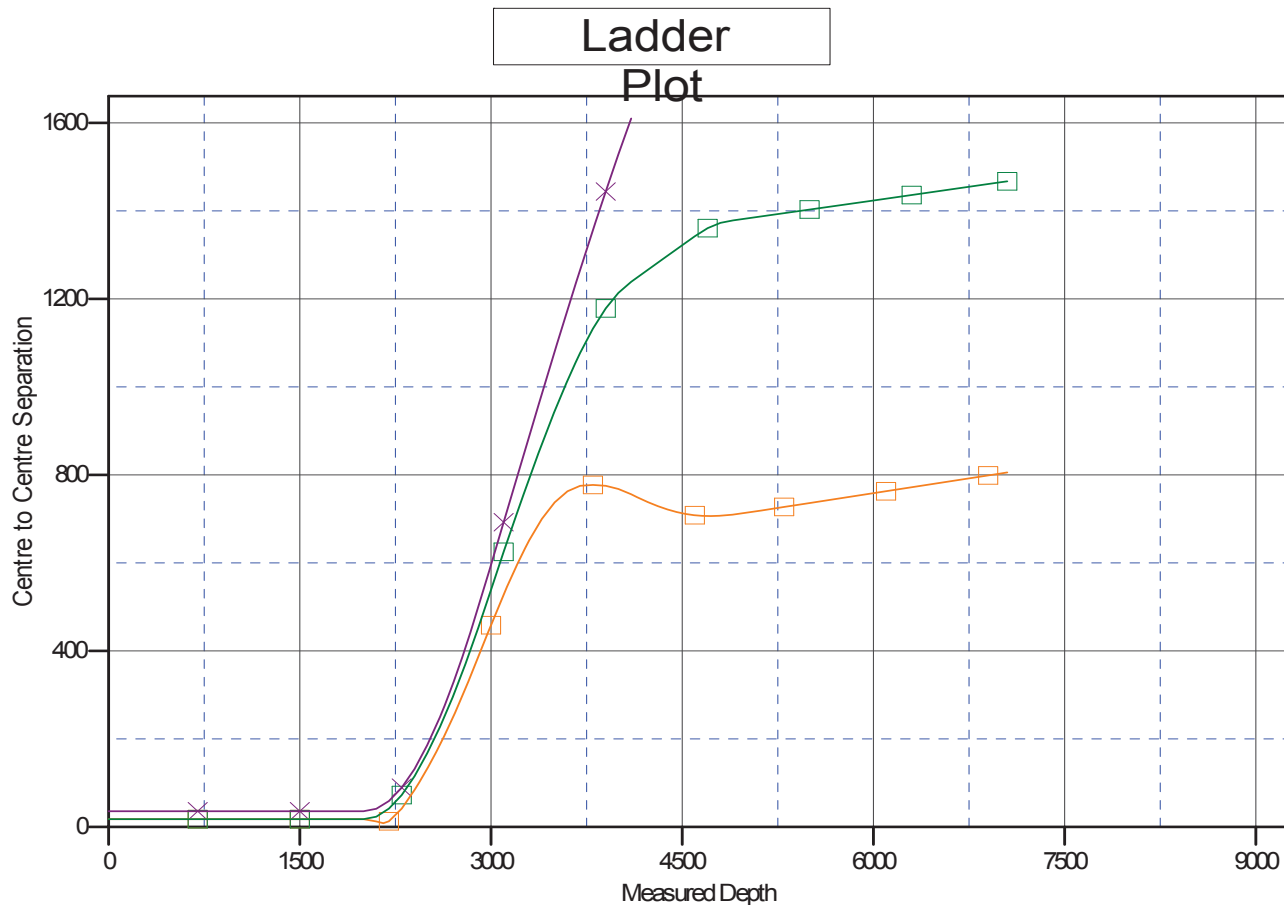
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: HERRING DRAW 5-33

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: -1.30°

**LEGEND**

3DRAW4-33,HERRINGDRAW4-33,PLAN 1 V0 HERRINGDRAW3-33,HERRINGDRAW3-33,PLAN 1 V0 HERRINGDRAW 1-33,HERRINGDRAW 1



Company:	SHELL E&P	Local Co-ordinate Reference:	Well HERRING DRAW 5-33
Project:	MOFFAT COUNTY, CO	TVD Reference:	KB @ 6820.00ft (Original Well Elev)
Reference Site:	HERRING DRAW 5-33	MD Reference:	KB @ 6820.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	HERRING DRAW 5-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	HERRING DRAW 5-33	Database:	EDM 5000.1 Single User Db
Reference Design:	PLAN 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 6820.00ft (Original Well Elev)

Offset Depths are relative to Offset Datum

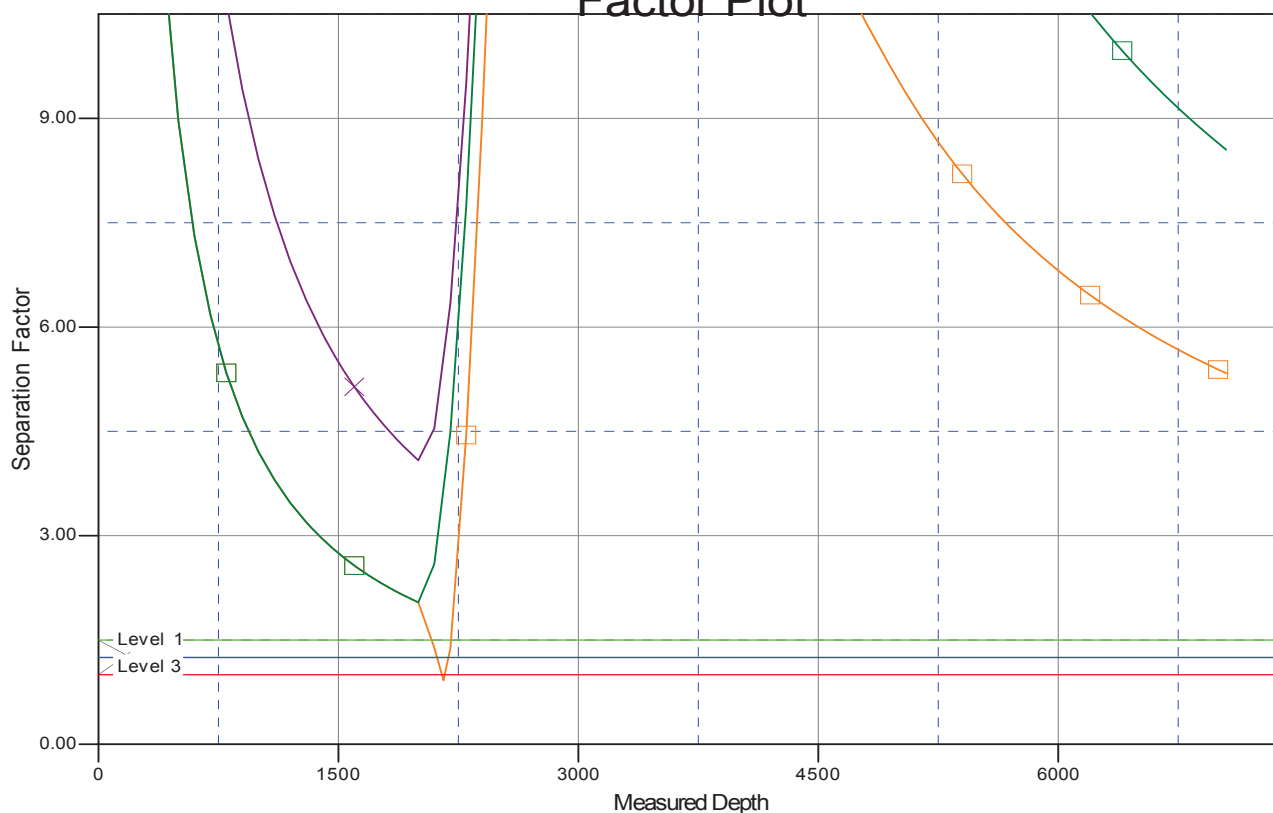
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: HERRING DRAW 5-33

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: -1.30°

## Separation Factor Plot



## LEGEND

3DRAW4-33,HERRINGDRAW4-33,PLAN1 V0 HERRINGDRAW3-33,HERRINGDRAW3-33,PLAN1 V0 HERRINGDRAW1-33,HERRINGDRAW1-33,PLAN1 V0