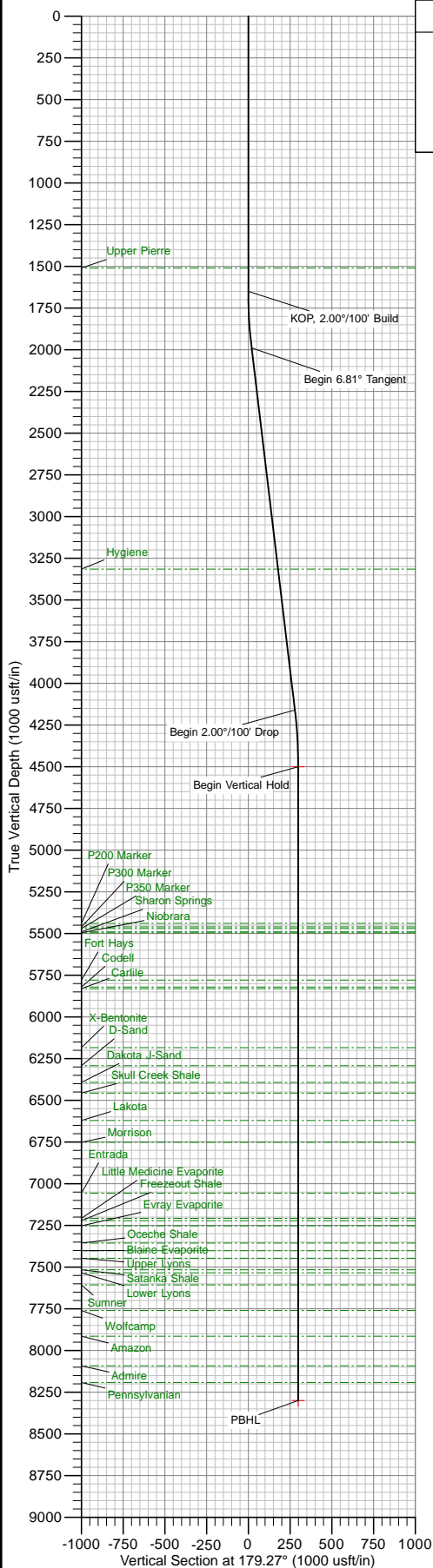
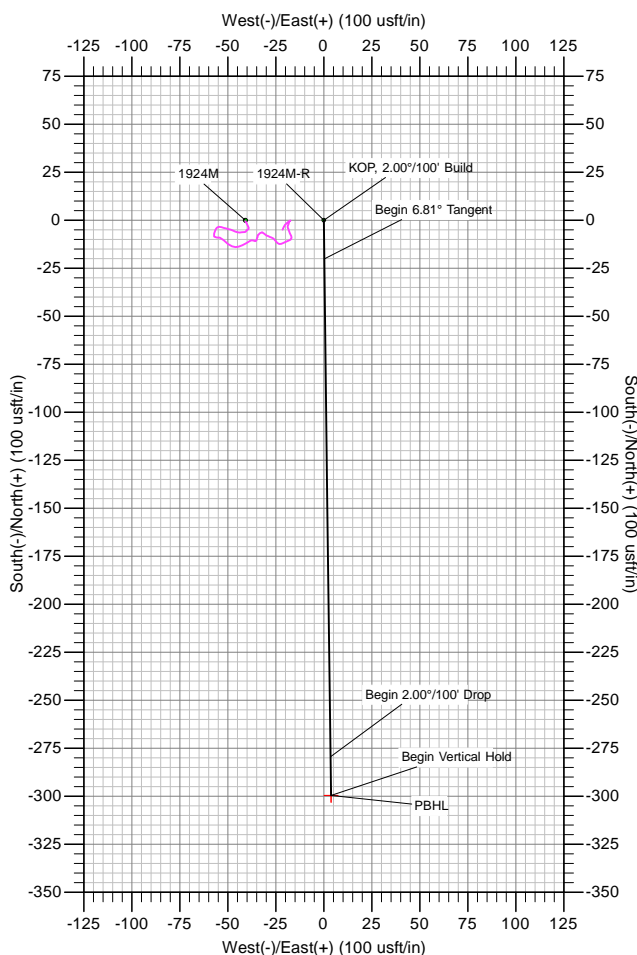




Company: Whiting Oil & Gas
Site: Horsetail 19N
Well: 1924M-R
Project: Weld County, Colorado (NAD 83)
Rig: Pioneer 54



ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation	
1650.00	0.00	0.00	1650.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build	
1990.38	6.81	179.27	1989.58	-20.20	0.26	20.20	20.20	Begin 6.81° Tangent	
4176.64	6.81	179.27	4160.42	-279.32	3.56	279.34	279.34	Begin 2.00°/100' Drop	
4517.01	0.00	0.00	4500.00	-299.52	3.81	299.54	299.54	Begin Vertical Hold	
8317.01	0.00	0.00	8300.00	-299.52	3.81	299.54	299.54	PBHL	

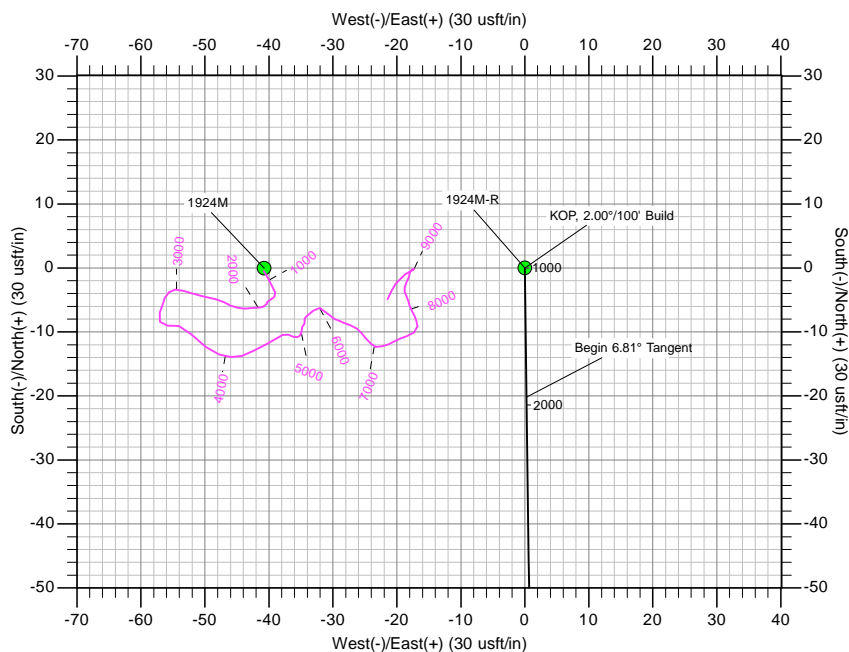


Azimuths to True North
Magnetic North: 7.92°

Magnetic Field
Strength: 53103.4snT
Dip Angle: 67.42°
Date: 10/1/2014
Model: WMM_2010

US State Plane 1983
Colorado Northern Zone

Created By: MEB
Date: 15:50, October 02 2014
Plan: Design #2





Whiting Oil & Gas

Weld County, Colorado (NAD 83)

Horsetail 19N

1924M-R

Wellbore #1

Plan: Design #2

Standard Planning Report

02 October, 2014



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1924M-R
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site:	Horsetail 19N	North Reference:	True
Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Project	Weld County, Colorado (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	1924M-R			
Well Position	+N/-S	1,932,283.63 usft	Northing:	1,545,700.17 usft
	+E/-W	3,272,806.43 usft	Easting:	3,472,145.28 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	
			Latitude:	40° 49' 7.900 N
			Longitude:	103° 47' 38.770 W
			Ground Level:	4,748.50 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	10/1/2014	7.92	67.42	53,103

Design	Design #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.27

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,650.00	0.00	0.00	1,650.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,990.38	6.81	179.27	1,989.58	-20.20	0.26	2.00	2.00	0.00	179.27	
4,176.64	6.81	179.27	4,160.42	-279.32	3.56	0.00	0.00	0.00	0.00	
4,517.01	0.00	0.00	4,500.00	-299.52	3.81	2.00	-2.00	0.00	180.00	Vertical v2 - Horsetail
8,317.01	0.00	0.00	8,300.00	-299.52	3.81	0.00	0.00	0.00	0.00	PBHL v2 - Horsetail



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1924M-R
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site:	Horsetail 19N	North Reference:	True
Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	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
1,510.00	0.00	0.00	1,510.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Pierre									
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,650.00	0.00	0.00	1,650.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 2.00°/100' Build									
1,700.00	1.00	179.27	1,700.00	-0.44	0.01	0.44	2.00	2.00	0.00
1,800.00	3.00	179.27	1,799.93	-3.93	0.05	3.93	2.00	2.00	0.00
1,900.00	5.00	179.27	1,899.68	-10.90	0.14	10.90	2.00	2.00	0.00
1,990.38	6.81	179.27	1,989.58	-20.20	0.26	20.20	2.00	2.00	0.00
Begin 6.81° Tangent									
2,000.00	6.81	179.27	1,999.13	-21.34	0.27	21.34	0.00	0.00	0.00
2,100.00	6.81	179.27	2,098.43	-33.19	0.42	33.19	0.00	0.00	0.00
2,200.00	6.81	179.27	2,197.72	-45.04	0.57	45.04	0.00	0.00	0.00
2,300.00	6.81	179.27	2,297.02	-56.89	0.72	56.90	0.00	0.00	0.00
2,400.00	6.81	179.27	2,396.31	-68.75	0.88	68.75	0.00	0.00	0.00
2,500.00	6.81	179.27	2,495.61	-80.60	1.03	80.60	0.00	0.00	0.00
2,600.00	6.81	179.27	2,594.90	-92.45	1.18	92.46	0.00	0.00	0.00
2,700.00	6.81	179.27	2,694.20	-104.30	1.33	104.31	0.00	0.00	0.00
2,800.00	6.81	179.27	2,793.49	-116.16	1.48	116.16	0.00	0.00	0.00
2,900.00	6.81	179.27	2,892.79	-128.01	1.63	128.02	0.00	0.00	0.00
3,000.00	6.81	179.27	2,992.08	-139.86	1.78	139.87	0.00	0.00	0.00
3,100.00	6.81	179.27	3,091.38	-151.71	1.93	151.73	0.00	0.00	0.00
3,200.00	6.81	179.27	3,190.67	-163.57	2.08	163.58	0.00	0.00	0.00
3,300.00	6.81	179.27	3,289.97	-175.42	2.23	175.43	0.00	0.00	0.00
3,325.21	6.81	179.27	3,315.00	-178.41	2.27	178.42	0.00	0.00	0.00
Hygiene									
3,400.00	6.81	179.27	3,389.26	-187.27	2.38	187.29	0.00	0.00	0.00
3,500.00	6.81	179.27	3,488.56	-199.12	2.54	199.14	0.00	0.00	0.00
3,600.00	6.81	179.27	3,587.85	-210.98	2.69	210.99	0.00	0.00	0.00
3,700.00	6.81	179.27	3,687.15	-222.83	2.84	222.85	0.00	0.00	0.00
3,800.00	6.81	179.27	3,786.44	-234.68	2.99	234.70	0.00	0.00	0.00
3,900.00	6.81	179.27	3,885.74	-246.53	3.14	246.55	0.00	0.00	0.00
4,000.00	6.81	179.27	3,985.03	-258.38	3.29	258.41	0.00	0.00	0.00
4,100.00	6.81	179.27	4,084.33	-270.24	3.44	270.26	0.00	0.00	0.00
4,176.64	6.81	179.27	4,160.42	-279.32	3.56	279.34	0.00	0.00	0.00
Begin 2.00°/100' Drop									
4,200.00	6.34	179.27	4,183.63	-282.00	3.59	282.02	2.00	-2.00	0.00
4,300.00	4.34	179.27	4,283.19	-291.30	3.71	291.32	2.00	-2.00	0.00



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1924M-R
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site:	Horsetail 19N	North Reference:	True
Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,400.00	2.34	179.27	4,383.02	-297.13	3.78	297.15	2.00	-2.00	0.00
4,500.00	0.34	179.27	4,482.99	-299.47	3.81	299.49	2.00	-2.00	0.00
4,517.01	0.00	0.00	4,500.00	-299.52	3.81	299.54	2.00	-2.00	0.00
Begin Vertical Hold									
4,600.00	0.00	0.00	4,582.99	-299.52	3.81	299.54	0.00	0.00	0.00
4,700.00	0.00	0.00	4,682.99	-299.52	3.81	299.54	0.00	0.00	0.00
4,800.00	0.00	0.00	4,782.99	-299.52	3.81	299.54	0.00	0.00	0.00
4,900.00	0.00	0.00	4,882.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,000.00	0.00	0.00	4,982.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,100.00	0.00	0.00	5,082.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,200.00	0.00	0.00	5,182.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,300.00	0.00	0.00	5,282.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,400.00	0.00	0.00	5,382.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,456.01	0.00	0.00	5,439.00	-299.52	3.81	299.54	0.00	0.00	0.00
P200 Marker									
5,477.01	0.00	0.00	5,460.00	-299.52	3.81	299.54	0.00	0.00	0.00
P300 Marker									
5,487.01	0.00	0.00	5,470.00	-299.52	3.81	299.54	0.00	0.00	0.00
P350 Marker									
5,500.00	0.00	0.00	5,482.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,507.01	0.00	0.00	5,490.00	-299.52	3.81	299.54	0.00	0.00	0.00
Sharon Springs									
5,513.01	0.00	0.00	5,496.00	-299.52	3.81	299.54	0.00	0.00	0.00
Niobrara									
5,600.00	0.00	0.00	5,582.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,700.00	0.00	0.00	5,682.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,796.01	0.00	0.00	5,779.00	-299.52	3.81	299.54	0.00	0.00	0.00
Fort Hays									
5,800.00	0.00	0.00	5,782.99	-299.52	3.81	299.54	0.00	0.00	0.00
5,838.01	0.00	0.00	5,821.00	-299.52	3.81	299.54	0.00	0.00	0.00
Codell									
5,848.01	0.00	0.00	5,831.00	-299.52	3.81	299.54	0.00	0.00	0.00
Carlile									
5,900.00	0.00	0.00	5,882.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,000.00	0.00	0.00	5,982.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,100.00	0.00	0.00	6,082.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,200.00	0.00	0.00	6,182.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,201.01	0.00	0.00	6,184.00	-299.52	3.81	299.54	0.00	0.00	0.00
X-Bentonite									
6,300.00	0.00	0.00	6,282.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,310.01	0.00	0.00	6,293.00	-299.52	3.81	299.54	0.00	0.00	0.00
D-Sand									
6,400.00	0.00	0.00	6,382.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,410.01	0.00	0.00	6,393.00	-299.52	3.81	299.54	0.00	0.00	0.00
Dakota J-Sand									
6,474.01	0.00	0.00	6,457.00	-299.52	3.81	299.54	0.00	0.00	0.00
Skull Creek Shale									
6,500.00	0.00	0.00	6,482.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,600.00	0.00	0.00	6,582.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,638.01	0.00	0.00	6,621.00	-299.52	3.81	299.54	0.00	0.00	0.00
Lakota									
6,700.00	0.00	0.00	6,682.99	-299.52	3.81	299.54	0.00	0.00	0.00



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Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site:	Horsetail 19N	North Reference:	True
Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,769.01	0.00	0.00	6,752.00	-299.52	3.81	299.54	0.00	0.00	0.00
Morrison									
6,800.00	0.00	0.00	6,782.99	-299.52	3.81	299.54	0.00	0.00	0.00
6,900.00	0.00	0.00	6,882.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,000.00	0.00	0.00	6,982.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,074.01	0.00	0.00	7,057.00	-299.52	3.81	299.54	0.00	0.00	0.00
Entrada									
7,100.00	0.00	0.00	7,082.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,200.00	0.00	0.00	7,182.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,225.01	0.00	0.00	7,208.00	-299.52	3.81	299.54	0.00	0.00	0.00
Little Medicine Evaporite									
7,239.01	0.00	0.00	7,222.00	-299.52	3.81	299.54	0.00	0.00	0.00
Freezeout Shale									
7,270.01	0.00	0.00	7,253.00	-299.52	3.81	299.54	0.00	0.00	0.00
Evray Evaporite									
7,300.00	0.00	0.00	7,282.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,373.01	0.00	0.00	7,356.00	-299.52	3.81	299.54	0.00	0.00	0.00
Oeche Shale									
7,400.00	0.00	0.00	7,382.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,419.01	0.00	0.00	7,402.00	-299.52	3.81	299.54	0.00	0.00	0.00
Blaine Evaporite									
7,464.01	0.00	0.00	7,447.00	-299.52	3.81	299.54	0.00	0.00	0.00
Upper Lyons									
7,500.00	0.00	0.00	7,482.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,533.01	0.00	0.00	7,516.00	-299.52	3.81	299.54	0.00	0.00	0.00
Satanka Shale									
7,551.01	0.00	0.00	7,534.00	-299.52	3.81	299.54	0.00	0.00	0.00
Lower Lyons									
7,600.00	0.00	0.00	7,582.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,624.01	0.00	0.00	7,607.00	-299.52	3.81	299.54	0.00	0.00	0.00
Sumner									
7,700.00	0.00	0.00	7,682.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,777.01	0.00	0.00	7,760.00	-299.52	3.81	299.54	0.00	0.00	0.00
Wolfcamp									
7,800.00	0.00	0.00	7,782.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,900.00	0.00	0.00	7,882.99	-299.52	3.81	299.54	0.00	0.00	0.00
7,931.01	0.00	0.00	7,914.00	-299.52	3.81	299.54	0.00	0.00	0.00
Amazon									
8,000.00	0.00	0.00	7,982.99	-299.52	3.81	299.54	0.00	0.00	0.00
8,100.00	0.00	0.00	8,082.99	-299.52	3.81	299.54	0.00	0.00	0.00
8,109.01	0.00	0.00	8,092.00	-299.52	3.81	299.54	0.00	0.00	0.00
Admire									
8,200.00	0.00	0.00	8,182.99	-299.52	3.81	299.54	0.00	0.00	0.00
8,210.01	0.00	0.00	8,193.00	-299.52	3.81	299.54	0.00	0.00	0.00
Pennsylvanian									
8,300.00	0.00	0.00	8,282.99	-299.52	3.81	299.54	0.00	0.00	0.00
8,317.01	0.00	0.00	8,300.00	-299.52	3.81	299.54	0.00	0.00	0.00
PBHL									



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1924M-R
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site:	Horsetail 19N	North Reference:	True
Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

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
Vertical v2 - Horsetail - plan hits target center - Point	0.00	0.00	4,500.00	-299.52	3.81	1,545,400.78	3,472,154.86	40° 49' 4.940 N	103° 47' 38.720 W
PBHL v2 - Horsetail 1 - plan hits target center - Point	0.00	0.00	8,300.00	-299.52	3.81	1,545,400.78	3,472,154.86	40° 49' 4.940 N	103° 47' 38.720 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,510.00	1,510.00	Upper Pierre		0.00	179.27
3,325.21	3,315.00	Hygiene		0.00	179.27
5,456.01	5,439.00	P200 Marker		0.00	179.27
5,477.01	5,460.00	P300 Marker		0.00	179.27
5,487.01	5,470.00	P350 Marker		0.00	179.27
5,507.01	5,490.00	Sharon Springs		0.00	179.27
5,513.01	5,496.00	Niobrara		0.00	179.27
5,796.01	5,779.00	Fort Hays		0.00	179.27
5,838.01	5,821.00	Codell		0.00	179.27
5,848.01	5,831.00	Carlile		0.00	179.27
6,201.01	6,184.00	X-Bentonite		0.00	179.27
6,310.01	6,293.00	D-Sand		0.00	179.27
6,410.01	6,393.00	Dakota J-Sand		0.00	179.27
6,474.01	6,457.00	Skull Creek Shale		0.00	179.27
6,638.01	6,621.00	Lakota		0.00	179.27
6,769.01	6,752.00	Morrison		0.00	179.27
7,074.01	7,057.00	Entrada		0.00	179.27
7,225.01	7,208.00	Little Medicine Evaporite		0.00	179.27
7,239.01	7,222.00	Freezeout Shale		0.00	179.27
7,270.01	7,253.00	Evray Evaporite		0.00	179.27
7,373.01	7,356.00	Oceche Shale		0.00	179.27
7,419.01	7,402.00	Blaine Evaporite		0.00	179.27
7,464.01	7,447.00	Upper Lyons		0.00	179.27
7,533.01	7,516.00	Satanka Shale		0.00	179.27
7,551.01	7,534.00	Lower Lyons		0.00	179.27
7,624.01	7,607.00	Sumner		0.00	179.27
7,777.01	7,760.00	Wolfcamp		0.00	179.27
7,931.01	7,914.00	Amazon		0.00	179.27
8,109.01	8,092.00	Admire		0.00	179.27
8,210.01	8,193.00	Pennsylvanian		0.00	179.27



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1924M-R
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site:	Horsetail 19N	North Reference:	True
Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,650.00	1,650.00	0.00	0.00	KOP, 2.00°/100' Build
1,990.38	1,989.58	-20.20	0.26	Begin 6.81° Tangent
4,176.64	4,160.42	-279.32	3.56	Begin 2.00°/100' Drop
4,517.01	4,500.00	-299.52	3.81	Begin Vertical Hold
8,317.01	8,300.00	-299.52	3.81	PBHL



Whiting Oil & Gas

Weld County, Colorado (NAD 83)

Horsetail 19N

1924M-R

Wellbore #1

Design #2

Anticollision Report

02 October, 2014



MS Energy Services

Anticollision Report



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 1924M-R
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Reference Site:	Horsetail 19N	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 CONROE DB
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Reference	Design #2
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD + Stations Interval 100.00usft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 10,000.00 u
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic
Casing Method:	Not applied

Survey Tool Program		Date	10/2/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	8,317.01	Design #2 (Wellbore #1)	MWD+IFR+MS	MWD + IFR + Multi Station	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Horsetail 19N						
1924M - Wellbore #1 - Surveys	1,445.34	1,443.35	39.20	33.52	6.899	CC
1924M - Wellbore #1 - Surveys	1,800.00	1,797.82	40.39	33.26	5.665	ES
1924M - Wellbore #1 - Surveys	1,900.00	1,897.42	41.25	33.74	5.493	SF
Horsetail 30F						
1948 - Wellbore #1 - Surveys	5,632.44	8,260.01	147.76	115.58	4.591	CC, ES, SF

Offset Design Horsetail 19N - 1924M - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 507-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-90.05	-0.04	-40.75	40.80					
100.00	100.00	98.00	98.00	0.09	0.11	-90.07	-0.05	-40.75	40.75	40.55	0.20	205.710		
200.00	200.00	198.00	198.00	0.32	0.22	-90.15	-0.10	-40.76	40.76	40.23	0.53	76.677		
300.00	300.00	297.99	297.99	0.54	0.32	-90.26	-0.19	-40.77	40.77	39.90	0.87	47.131		
400.00	400.00	397.99	397.99	0.77	0.43	-90.43	-0.31	-40.78	40.78	39.59	1.20	34.031		
500.00	500.00	497.99	497.99	0.99	0.54	-90.65	-0.46	-40.80	40.80	39.27	1.53	26.636		
600.00	600.00	598.02	598.02	1.22	0.75	-90.92	-0.65	-40.79	40.79	38.83	1.97	20.754		
700.00	700.00	698.05	698.05	1.44	0.97	-91.26	-0.89	-40.70	40.71	38.30	2.41	16.896		
800.00	800.00	798.08	798.08	1.66	1.19	-91.66	-1.18	-40.53	40.54	37.69	2.85	14.211		
900.00	900.00	898.11	898.11	1.89	1.41	-92.15	-1.51	-40.27	40.30	37.00	3.30	12.225		
1,000.00	1,000.00	998.13	998.13	2.11	1.62	-92.71	-1.89	-39.95	39.99	36.25	3.74	10.697		
1,100.00	1,100.00	1,098.11	1,098.10	2.34	1.84	-93.32	-2.30	-39.64	39.70	35.53	4.17	9.511		
1,200.00	1,200.00	1,198.08	1,198.08	2.56	2.05	-93.97	-2.74	-39.39	39.48	34.87	4.61	8.562		
1,300.00	1,300.00	1,298.06	1,298.05	2.79	2.26	-94.67	-3.20	-39.19	39.32	34.27	5.05	7.790		
1,400.00	1,400.00	1,398.03	1,398.03	3.01	2.47	-95.40	-3.69	-39.05	39.22	33.74	5.48	7.152		
1,445.34	1,445.34	1,443.35	1,443.34	3.12	2.57	-95.74	-3.92	-39.00	39.20	33.52	5.68	6.899 CC		
1,500.00	1,500.00	1,497.90	1,497.89	3.24	2.68	-96.22	-4.26	-39.04	39.28	33.36	5.92	6.635		
1,600.00	1,600.00	1,597.66	1,597.65	3.46	2.89	-97.08	-4.91	-39.54	39.84	33.50	6.35	6.277		
1,650.00	1,650.00	1,647.71	1,647.70	3.58	2.99	-97.23	-5.07	-39.98	40.31	33.75	6.56	6.144		
1,700.00	1,700.00	1,697.94	1,697.92	3.67	3.09	-96.81	-5.23	-40.20	40.49	33.74	6.76	5.992		
1,779.93	1,779.88	1,777.81	1,777.79	3.81	3.25	-93.66	-5.52	-40.26	40.38	33.32	7.06	5.723		

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



MS Energy Services

Anticollision Report



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 1924M-R
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Reference Site:	Horsetail 19N	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 CONROE DB
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 507-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
1,800.00	1,799.93	1,797.82	1,797.81	3.84	3.29	-92.37	-5.60	-40.31	40.39	33.26	7.13	5.665 ES		
1,900.00	1,899.68	1,897.42	1,897.40	4.02	3.50	-83.19	-6.01	-40.82	41.25	33.74	7.51	5.493 SF		
1,990.38	1,989.58	1,987.21	1,987.18	4.19	3.68	-71.45	-6.16	-41.58	44.13	36.28	7.85	5.624		
2,000.00	1,999.13	1,996.75	1,996.73	4.21	3.70	-70.11	-6.16	-41.67	44.61	36.72	7.88	5.658		
2,100.00	2,098.43	2,095.98	2,095.95	4.39	3.90	-58.08	-6.29	-42.77	50.88	42.62	8.26	6.157		
2,200.00	2,197.72	2,195.20	2,195.16	4.58	4.10	-49.03	-6.36	-43.97	59.00	50.35	8.65	6.821		
2,300.00	2,297.02	2,294.33	2,294.28	4.77	4.30	-42.12	-6.15	-45.16	68.41	59.38	9.03	7.575		
2,400.00	2,396.31	2,393.46	2,393.40	4.96	4.50	-36.88	-5.72	-46.41	78.80	69.38	9.42	8.363		
2,500.00	2,495.61	2,492.61	2,492.55	5.16	4.70	-32.79	-5.16	-47.57	89.74	79.92	9.82	9.138		
2,600.00	2,594.90	2,591.87	2,591.80	5.36	4.91	-29.78	-4.64	-49.07	101.18	90.95	10.23	9.894		
2,700.00	2,694.20	2,691.44	2,691.36	5.57	5.12	-27.41	-4.43	-50.45	112.50	101.87	10.64	10.578		
2,800.00	2,793.49	2,790.53	2,790.44	5.79	5.32	-25.32	-4.12	-51.53	123.95	112.91	11.04	11.224		
2,900.00	2,892.79	2,889.60	2,889.50	6.00	5.53	-23.67	-3.72	-52.86	135.72	124.26	11.46	11.847		
3,000.00	2,992.08	2,989.28	2,989.17	6.22	5.74	-22.34	-3.41	-54.30	147.53	135.65	11.87	12.425		
3,100.00	3,091.38	3,090.00	3,089.88	6.44	5.96	-21.17	-3.64	-55.43	158.80	146.50	12.29	12.916		
3,200.00	3,190.67	3,190.10	3,189.98	6.66	6.17	-20.13	-4.58	-56.18	169.33	156.62	12.72	13.316		
3,300.00	3,289.97	3,289.97	3,289.84	6.88	6.38	-19.13	-5.70	-56.62	179.65	166.51	13.14	13.675		
3,400.00	3,389.26	3,389.57	3,389.42	7.11	6.59	-18.25	-6.99	-57.06	189.84	176.28	13.56	14.001		
3,500.00	3,488.56	3,489.98	3,489.83	7.33	6.80	-17.34	-8.50	-56.99	199.72	185.74	13.98	14.285		
3,600.00	3,587.85	3,586.62	3,586.45	7.56	7.00	-16.11	-8.97	-55.64	210.26	195.87	14.39	14.610		
3,700.00	3,687.15	3,688.21	3,688.02	7.79	7.21	-14.83	-9.18	-53.73	221.03	206.21	14.82	14.919		
3,800.00	3,786.44	3,790.93	3,790.70	8.02	7.43	-13.68	-11.00	-51.46	230.30	215.06	15.25	15.105		
3,900.00	3,885.74	3,888.67	3,888.40	8.25	7.63	-12.60	-12.89	-49.07	239.46	223.79	15.66	15.289		
4,000.00	3,985.03	3,985.49	3,985.19	8.48	7.83	-11.62	-13.73	-47.04	249.79	233.72	16.07	15.541		
4,100.00	4,084.33	4,083.26	4,082.94	8.71	8.03	-10.74	-13.96	-45.18	260.85	244.36	16.49	15.822		
4,176.64	4,160.42	4,157.71	4,157.38	8.89	8.18	-10.13	-13.65	-43.89	269.88	253.07	16.80	16.060		
4,200.00	4,183.63	4,180.51	4,180.18	8.94	8.23	-9.94	-13.47	-43.47	272.62	255.72	16.91	16.124		
4,300.00	4,283.19	4,279.54	4,279.18	9.14	8.43	-9.17	-12.36	-41.33	282.56	265.22	17.34	16.294		
4,400.00	4,383.02	4,379.48	4,379.09	9.33	8.64	-8.61	-11.44	-39.49	288.95	271.19	17.76	16.266		
4,500.00	4,482.99	4,480.25	4,479.85	9.53	8.85	-8.27	-10.62	-38.19	291.88	273.71	18.17	16.060		
4,517.01	4,500.00	4,497.54	4,497.14	9.56	8.89	-8.23	-10.53	-37.99	291.99	273.75	18.24	16.006		
4,600.00	4,582.99	4,582.17	4,581.77	9.73	9.07	-8.05	-10.39	-37.10	292.01	273.41	18.60	15.703		
4,700.00	4,682.99	4,682.86	4,682.46	9.93	9.29	-7.91	-10.72	-36.29	291.57	272.56	19.02	15.334		
4,776.39	4,759.38	4,757.79	4,757.38	10.08	9.44	-7.80	-10.87	-35.75	291.34	272.01	19.33	15.072		
4,800.00	4,782.99	4,780.82	4,780.41	10.13	9.49	-7.77	-10.83	-35.60	291.36	271.94	19.43	14.999		
4,900.00	4,882.99	4,881.20	4,880.78	10.33	9.70	-7.69	-10.60	-35.20	291.54	271.70	19.84	14.694		
5,000.00	4,982.99	4,979.76	4,979.34	10.53	9.91	-7.63	-10.25	-34.96	291.86	271.61	20.25	14.410		
5,100.00	5,082.99	5,079.88	5,079.46	10.73	10.11	-7.61	-9.70	-34.90	292.40	271.73	20.67	14.147		
5,200.00	5,182.99	5,179.89	5,179.47	10.93	10.32	-7.56	-9.13	-34.73	292.93	271.85	21.09	13.892		
5,300.00	5,282.99	5,280.36	5,279.94	11.13	10.53	-7.49	-8.66	-34.41	293.36	271.85	21.51	13.641		
5,400.00	5,382.99	5,380.31	5,379.89	11.33	10.75	-7.49	-8.33	-34.45	293.70	271.77	21.93	13.394		
5,500.00	5,482.99	5,480.29	5,479.87	11.54	10.95	-7.46	-7.88	-34.37	294.13	271.78	22.35	13.163		
5,600.00	5,582.99	5,580.66	5,580.24	11.74	11.16	-7.41	-7.57	-34.14	294.41	271.64	22.77	12.932		
5,700.00	5,682.99	5,680.40	5,679.97	11.95	11.37	-7.32	-7.23	-33.74	294.69	271.51	23.18	12.712		
5,800.00	5,782.99	5,780.54	5,780.11	12.15	11.58	-7.22	-6.80	-33.24	295.05	271.45	23.60	12.501		
5,900.00	5,882.99	5,880.92	5,880.49	12.36	11.79	-7.11	-6.51	-32.75	295.28	271.25	24.03	12.290		
6,000.00	5,982.99	5,981.04	5,980.62	12.57	12.00	-6.99	-6.30	-32.15	295.41	270.97	24.45	12.083		
6,100.00	6,082.99	6,086.99	6,086.56	12.78	12.23	-6.80	-6.92	-31.07	294.72	269.83	24.89	11.843		
6,200.00	6,182.99	6,182.57	6,182.11	12.99	12.43	-6.56	-7.99	-29.73	293.45	268.16	25.30	11.600		
6,300.00	6,282.99	6,282.79	6,282.33	13.19	12.64	-6.41	-8.29	-28.91	293.06	267.34	25.72	11.393		
6,400.00	6,382.99	6,382.75	6,382.29	13.40	12.84	-6.27	-8.65	-28.12	292.61	266.47	26.15	11.192		
6,500.00	6,482.99	6,483.03	6,482.56	13.61	13.05	-6.07	-9.01	-27.09	292.15	265.58	26.57	10.996		

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



MS Energy Services

Anticollision Report



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 1924M-R
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Reference Site:	Horsetail 19N	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 CONROE DB
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design												Horsetail 19N - 1924M - Wellbore #1 - Surveys		Offset Site Error:		0.00 usft
Survey Program: 507-MWD												Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
6,600.00	6,582.99	6,583.83	6,583.35	13.83	13.27	-5.88	-9.64	-26.06	291.42	264.43	27.00	10.795				
6,700.00	6,682.99	6,683.45	6,682.97	14.04	13.48	-5.77	-10.32	-25.40	290.68	263.26	27.42	10.601				
6,800.00	6,782.99	6,783.27	6,782.78	14.25	13.68	-5.69	-10.90	-24.93	290.05	262.21	27.84	10.417				
6,900.00	6,882.99	6,883.65	6,883.16	14.46	13.89	-5.58	-11.52	-24.34	289.38	261.11	28.27	10.237				
7,000.00	6,982.99	6,982.98	6,982.49	14.67	14.10	-5.46	-12.20	-23.65	288.63	259.94	28.69	10.059				
7,096.22	7,079.20	7,077.70	7,077.20	14.88	14.30	-5.30	-12.33	-22.80	288.41	259.32	29.10	9.912				
7,100.00	7,082.99	7,081.44	7,080.94	14.89	14.31	-5.29	-12.33	-22.77	288.41	259.30	29.11	9.907				
7,200.00	7,182.99	7,180.84	7,180.33	15.10	14.51	-5.06	-12.07	-21.65	288.57	259.04	29.54	9.771				
7,300.00	7,282.99	7,280.05	7,279.54	15.31	14.72	-4.86	-11.65	-20.65	288.90	258.95	29.96	9.644				
7,400.00	7,382.99	7,380.63	7,380.12	15.53	14.93	-4.65	-11.08	-19.64	289.39	259.00	30.39	9.524				
7,500.00	7,482.99	7,480.43	7,479.91	15.74	15.14	-4.44	-10.72	-18.60	289.67	258.86	30.81	9.401				
7,600.00	7,582.99	7,579.55	7,579.02	15.95	15.34	-4.19	-10.11	-17.40	290.19	258.95	31.23	9.291				
7,700.00	7,682.99	7,678.05	7,677.51	16.17	15.55	-4.05	-9.15	-16.75	291.12	259.46	31.66	9.196				
7,800.00	7,782.99	7,779.53	7,778.99	16.38	15.76	-4.08	-8.20	-16.98	292.06	259.97	32.09	9.102				
7,900.00	7,882.99	7,879.06	7,878.51	16.60	15.97	-4.13	-7.46	-17.26	292.83	260.31	32.51	9.006				
8,000.00	7,982.99	7,978.82	7,978.27	16.81	16.18	-4.20	-6.59	-17.71	293.73	260.79	32.94	8.917				
8,100.00	8,082.99	8,079.05	8,078.49	17.03	16.39	-4.26	-5.74	-18.06	294.60	261.24	33.37	8.829				
8,200.00	8,182.99	8,179.21	8,178.65	17.25	16.59	-4.30	-4.91	-18.31	295.45	261.65	33.79	8.742				
8,300.00	8,282.99	8,279.40	8,278.83	17.46	16.80	-4.33	-4.21	-18.57	296.16	261.94	34.22	8.654				
8,317.01	8,300.00	8,296.33	8,295.77	17.50	16.84	-4.34	-4.09	-18.62	296.29	261.99	34.30	8.639				



MS Energy Services

Anticollision Report



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 1924M-R
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Reference Site:	Horsetail 19N	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 CONROE DB
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 207-MWD+IFR+MS												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	29.37	29.37	0.00	0.03	-170.40	-2,979.49	-503.68	3,021.76				
100.00	100.00	127.26	127.26	0.09	0.13	-170.40	-2,979.50	-503.94	3,021.82	3,021.59	0.22	N/A	
200.00	200.00	226.83	226.82	0.32	0.26	-170.39	-2,979.52	-504.54	3,021.94	3,021.36	0.57	5,263.458	
300.00	300.00	321.37	321.37	0.54	0.47	-170.37	-2,979.54	-505.44	3,022.11	3,021.11	1.01	3,001.715	
400.00	400.00	405.24	405.23	0.77	0.65	-170.35	-2,979.82	-506.48	3,022.65	3,021.24	1.42	2,135.204	
500.00	500.00	513.35	513.33	0.99	0.87	-170.34	-2,980.52	-507.24	3,023.42	3,021.56	1.86	1,626.163	
600.00	600.00	623.95	623.90	1.22	1.09	-170.38	-2,981.24	-505.10	3,023.73	3,021.44	2.30	1,316.338	
700.00	700.00	713.16	713.02	1.44	1.27	-170.46	-2,982.20	-501.21	3,024.07	3,021.37	2.70	1,118.522	
800.00	800.00	791.53	791.24	1.66	1.44	-170.55	-2,983.71	-496.61	3,025.00	3,021.91	3.09	977.766	
900.00	900.00	879.00	878.44	1.89	1.63	-170.68	-2,986.05	-490.13	3,026.44	3,022.94	3.51	862.935	
1,000.00	1,000.00	956.24	955.32	2.11	1.80	-170.82	-2,988.75	-483.18	3,028.48	3,024.58	3.90	776.169	
1,100.00	1,100.00	1,022.31	1,020.97	2.34	1.95	-170.95	-2,991.83	-476.39	3,031.49	3,027.21	4.27	709.146	
1,200.00	1,200.00	1,109.66	1,107.55	2.56	2.14	-171.16	-2,997.03	-466.14	3,035.54	3,030.84	4.70	646.401	
1,300.00	1,300.00	1,205.04	1,201.95	2.79	2.36	-171.41	-3,002.71	-453.67	3,039.49	3,034.35	5.14	591.870	
1,400.00	1,400.00	1,316.14	1,311.74	3.01	2.61	-171.71	-3,009.76	-438.29	3,043.81	3,038.19	5.61	542.432	
1,500.00	1,500.00	1,457.99	1,451.92	3.24	2.91	-172.12	-3,016.92	-417.79	3,046.71	3,040.57	6.14	496.274	
1,600.00	1,600.00	1,547.00	1,540.00	3.46	3.10	-172.35	-3,021.20	-405.71	3,049.65	3,043.09	6.55	465.493	
1,650.00	1,650.00	1,583.66	1,576.28	3.58	3.18	-172.45	-3,023.09	-400.77	3,051.31	3,044.56	6.75	452.268	
1,700.00	1,700.00	1,632.33	1,624.42	3.67	3.29	-172.58	-3,025.64	-394.10	3,052.59	3,045.64	6.95	439.006	
1,800.00	1,799.93	1,735.66	1,726.57	3.84	3.53	-172.85	-3,031.08	-379.51	3,052.60	3,045.25	7.35	415.130	
1,900.00	1,899.68	1,836.13	1,825.84	4.02	3.76	-173.12	-3,036.22	-364.91	3,049.03	3,041.29	7.74	393.762	
1,990.38	1,989.58	1,927.62	1,916.26	4.19	3.95	-173.35	-3,040.91	-351.73	3,042.90	3,034.82	8.09	376.278	
2,000.00	1,999.13	1,937.61	1,926.14	4.21	3.98	-173.38	-3,041.41	-350.32	3,042.10	3,033.97	8.13	374.381	
2,100.00	2,098.43	2,061.25	2,048.42	4.39	4.24	-173.69	-3,047.09	-332.99	3,033.34	3,024.77	8.57	353.871	
2,200.00	2,197.72	2,163.02	2,149.07	4.58	4.47	-173.94	-3,051.34	-318.52	3,024.21	3,015.22	8.99	336.557	
2,300.00	2,297.02	2,276.58	2,261.36	4.77	4.72	-174.23	-3,055.76	-302.22	3,014.84	3,005.42	9.43	319.783	
2,400.00	2,396.31	2,385.44	2,369.11	4.96	4.96	-174.50	-3,059.40	-287.08	3,005.03	2,995.16	9.86	304.756	
2,500.00	2,495.61	2,484.85	2,467.47	5.16	5.18	-174.75	-3,062.60	-273.08	2,995.14	2,984.85	10.28	291.270	
2,600.00	2,594.90	2,555.76	2,537.60	5.36	5.35	-174.92	-3,065.13	-262.87	2,985.66	2,975.01	10.64	280.479	
2,700.00	2,694.20	2,548.00	2,530.92	5.57	5.57	-175.02	-3,067.07	-252.07	2,975.22	2,965.12	11.00	269.541	
2,800.00	2,793.49	2,541.30	2,524.06	5.79	5.79	-175.08	-3,068.55	-242.55	2,965.18	2,955.75	11.36	258.348	
2,900.00	2,892.79	2,534.38	2,517.17	6.00	6.00	-175.12	-3,069.66	-233.12	2,955.03	2,945.66	11.72	247.151	
3,000.00	2,892.08	2,527.33	2,510.17	6.22	6.22	-175.15	-3,070.39	-223.69	2,945.03	2,935.66	12.08	235.954	
3,100.00	3,091.38	2,520.33	2,503.17	6.44	6.44	-175.17	-3,070.73	-214.26	2,935.03	2,925.66	12.44	224.757	
3,200.00	3,190.67	2,513.33	2,496.17	6.66	6.66	-175.18	-3,070.73	-204.83	2,925.03	2,915.66	12.80	213.560	
3,300.00	3,289.97	2,506.33	2,489.17	6.88	6.88	-175.17	-3,070.41	-195.40	2,915.03	2,905.66	13.16	202.363	
3,400.00	3,389.26	2,499.33	2,482.17	7.11	7.11	-175.14	-3,069.73	-185.97	2,905.03	2,895.66	13.52	191.166	
3,500.00	3,488.56	2,492.33	2,475.17	7.33	7.33	-175.09	-3,068.66	-176.54	2,895.03	2,885.66	13.88	180.000	
3,600.00	3,587.85	2,485.33	2,468.17	7.56	7.56	-175.02	-3,067.07	-167.11	2,885.03	2,875.66	14.24	168.793	
3,700.00	3,687.15	2,478.33	2,461.17	7.79	7.79	-174.92	-3,065.13	-157.68	2,875.03	2,865.66	14.60	157.586	
3,800.00	3,786.44	2,471.33	2,454.17	8.02	8.02	-174.79	-3,062.60	-148.25	2,865.03	2,855.66	14.96	146.379	
3,900.00	3,885.74	2,464.33	2,447.17	8.25	8.25	-174.63	-3,059.40	-138.82	2,855.03	2,845.66	15.32	135.172	
4,000.00	3,985.03	2,457.33	2,440.17	8.48	8.48	-174.45	-3,055.76	-129.39	2,845.03	2,835.66	15.68	123.965	
4,100.00	4,084.33	2,450.33	2,433.17	8.71	8.71	-174.25	-3,051.66	-119.96	2,835.03	2,825.66	16.04	112.758	
4,176.64	4,160.42	2,443.33	2,426.17	8.89	8.89	-174.03	-3,047.09	-110.53	2,825.03	2,815.66	16.40	101.551	
4,200.00	4,183.63	2,436.33	2,419.17	8.94	8.94	-173.79	-3,042.07	-101.10	2,815.03	2,805.66	16.76	90.344	
4,300.00	4,283.19	2,429.33	2,412.17	9.14	9.14	-173.53	-3,036.55	-91.67	2,805.03	2,795.66	17.12	79.137	
4,400.00	4,383.02	2,422.33	2,405.17	9.33	9.33	-173.25	-3,030.55	-82.24	2,795.03	2,785.66	17.48	67.930	
4,500.00	4,482.99	2,415.33	2,398.17	9.53	9.53	-172.95	-3,024.07	-72.81	2,785.03	2,775.66	17.84	56.723	
4,517.01	4,500.00	2,408.33	2,391.17	9.56	9.56	-172.63	-3,017.09	-63.38	2,775.03	2,765.66	18.20	45.516	
4,600.00	4,582.99	2,401.33	2,384.17	9.73	9.73	-172.29	-3,009.66	-53.95	2,765.03	2,755.66	18.56	34.309	
4,700.00	4,682.99	2,394.33	2,377.17	9.93	9.93	-171.93	-3,001.66	-44.52	2,755.03	2,745.66	18.92	23.102	

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



MS Energy Services

Anticollision Report



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 1924M-R
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Reference Site:	Horsetail 19N	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 CONROE DB
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

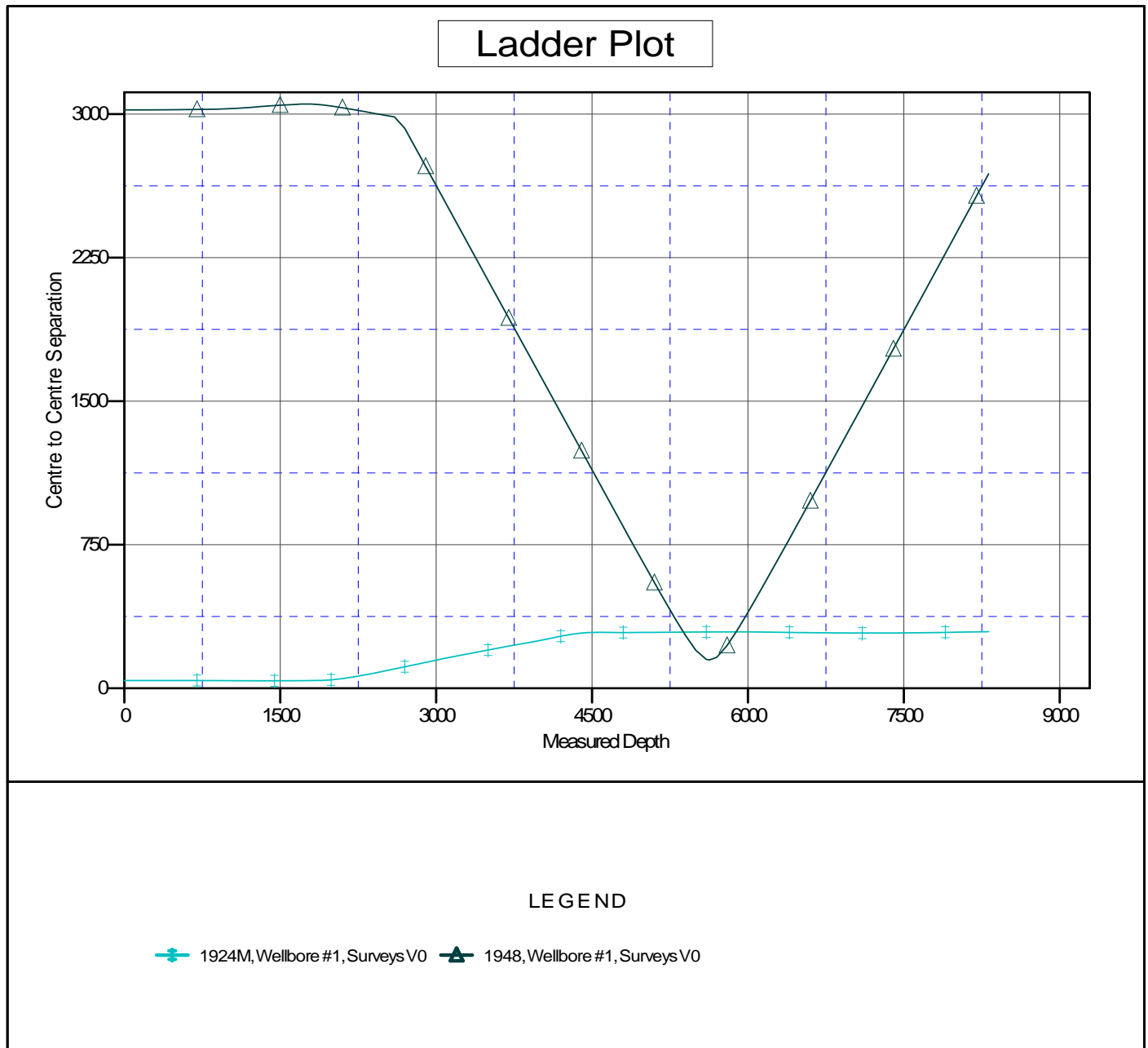
Offset Design												Horsetail 30F - 1948 - Wellbore #1 - Surveys		Offset Site Error:		0.00 usft
Survey Program: 207-MWD+IFR+MS												Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
4,800.00	4,782.99	8,262.09	5,645.42	10.13	20.42	-87.44	-292.92	-143.82	845.45	814.93	30.52	27.699				
4,900.00	4,882.99	8,261.88	5,645.42	10.33	20.42	-87.53	-293.14	-143.82	747.19	716.47	30.72	24.323				
5,000.00	4,982.99	8,261.66	5,645.42	10.53	20.42	-87.61	-293.36	-143.83	649.47	618.55	30.92	21.007				
5,100.00	5,082.99	8,261.43	5,645.42	10.73	20.42	-87.70	-293.59	-143.84	552.56	521.45	31.12	17.759				
5,200.00	5,182.99	8,261.18	5,645.42	10.93	20.42	-87.80	-293.83	-143.85	456.99	425.67	31.31	14.594				
5,300.00	5,282.99	8,260.93	5,645.42	11.13	20.42	-87.89	-294.09	-143.85	363.80	332.28	31.51	11.544				
5,400.00	5,382.99	8,260.67	5,645.42	11.33	20.42	-88.00	-294.35	-143.86	275.43	243.72	31.71	8.685				
5,500.00	5,482.99	8,260.39	5,645.42	11.54	20.42	-88.10	-294.62	-143.87	198.43	166.51	31.92	6.217				
5,600.00	5,582.99	8,260.11	5,645.42	11.74	20.41	-88.21	-294.91	-143.88	151.28	119.17	32.12	4.710				
5,632.44	5,615.43	8,260.01	5,645.43	11.81	20.41	-88.25	-295.01	-143.88	147.76	115.58	32.18	4.591 CC, ES, SF				
5,700.00	5,682.99	8,259.80	5,645.43	11.95	20.41	-88.33	-295.21	-143.89	162.48	130.16	32.32	5.027				
5,800.00	5,782.99	8,259.49	5,645.43	12.15	20.41	-88.45	-295.53	-143.90	223.41	190.89	32.52	6.870				
5,900.00	5,882.99	8,259.16	5,645.43	12.36	20.41	-88.58	-295.86	-143.91	305.65	272.93	32.72	9.340				
6,000.00	5,982.99	8,258.81	5,645.43	12.57	20.41	-88.72	-296.21	-143.92	396.15	363.22	32.93	12.031				
6,100.00	6,082.99	8,258.44	5,645.43	12.78	20.41	-88.86	-296.57	-143.93	490.35	457.22	33.13	14.801				
6,200.00	6,182.99	8,258.06	5,645.43	12.99	20.40	-89.01	-296.96	-143.94	586.48	553.14	33.33	17.594				
6,300.00	6,282.99	8,257.65	5,645.43	13.19	20.40	-89.17	-297.37	-143.95	683.72	650.18	33.54	20.386				
6,400.00	6,382.99	8,257.22	5,645.43	13.40	20.40	-89.33	-297.80	-143.97	781.65	747.91	33.74	23.165				
6,500.00	6,482.99	8,256.76	5,645.44	13.61	20.40	-89.51	-298.26	-143.98	880.05	846.10	33.95	25.925				
6,600.00	6,582.99	8,256.28	5,645.44	13.83	20.39	-89.70	-298.74	-144.00	978.77	944.62	34.15	28.661				
6,700.00	6,682.99	8,255.76	5,645.44	14.04	20.39	-89.90	-299.25	-144.01	1,077.73	1,043.38	34.35	31.372				
6,800.00	6,782.99	8,255.21	5,645.44	14.25	20.39	-90.11	-299.80	-144.03	1,176.87	1,142.31	34.56	34.056				
6,900.00	6,882.99	8,254.63	5,645.45	14.46	20.39	-90.34	-300.38	-144.05	1,276.14	1,241.38	34.76	36.712				
7,000.00	6,982.99	8,254.01	5,645.45	14.67	20.38	-90.58	-301.01	-144.07	1,375.51	1,340.55	34.96	39.342				
7,100.00	7,082.99	8,253.34	5,645.45	14.89	20.38	-90.84	-301.67	-144.09	1,474.97	1,439.81	35.17	41.944				
7,200.00	7,182.99	8,252.63	5,645.45	15.10	20.38	-91.11	-302.39	-144.11	1,574.50	1,539.13	35.37	44.519				
7,300.00	7,282.99	8,251.85	5,645.46	15.31	20.37	-91.41	-303.16	-144.14	1,674.08	1,638.52	35.57	47.068				
7,400.00	7,382.99	8,251.02	5,645.46	15.53	20.37	-91.73	-303.99	-144.16	1,773.71	1,737.95	35.77	49.590				
7,500.00	7,482.99	8,250.12	5,645.47	15.74	20.36	-92.08	-304.89	-144.19	1,873.38	1,837.42	35.97	52.088				
7,600.00	7,582.99	8,249.14	5,645.47	15.95	20.36	-92.46	-305.87	-144.23	1,973.09	1,936.92	36.16	54.562				
7,700.00	7,682.99	8,248.07	5,645.48	16.17	20.35	-92.87	-306.94	-144.26	2,072.82	2,036.46	36.36	57.013				
7,800.00	7,782.99	8,246.91	5,645.49	16.38	20.35	-93.32	-308.10	-144.30	2,172.57	2,136.02	36.55	59.442				
7,900.00	7,882.99	8,245.62	5,645.49	16.60	20.34	-93.81	-309.39	-144.34	2,272.35	2,235.61	36.74	61.851				
8,000.00	7,982.99	8,244.21	5,645.50	16.81	20.34	-94.35	-310.80	-144.39	2,372.14	2,335.22	36.93	64.242				
8,100.00	8,082.99	8,242.63	5,645.52	17.03	20.33	-94.96	-312.37	-144.44	2,471.95	2,434.85	37.11	66.617				
8,200.00	8,182.99	8,240.88	5,645.53	17.25	20.32	-95.63	-314.13	-144.51	2,571.78	2,534.50	37.28	68.979				
8,300.00	8,282.99	8,238.90	5,645.54	17.46	20.31	-96.38	-316.10	-144.57	2,671.62	2,634.16	37.45	71.331				
8,317.01	8,300.00	8,238.54	5,645.55	17.50	20.31	-96.51	-316.46	-144.59	2,688.61	2,651.12	37.48	71.730				

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



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 1924M-R
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4767.00usft (Pioneer 54)
Reference Site:	Horsetail 19N	MD Reference:	WELL @ 4767.00usft (Pioneer 54)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	1924M-R	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 CONROE DB
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4767.00usft (Pioneer 54) Coordinates are relative to: 1924M-R
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W Grid Convergence at Surface is: 1.10°

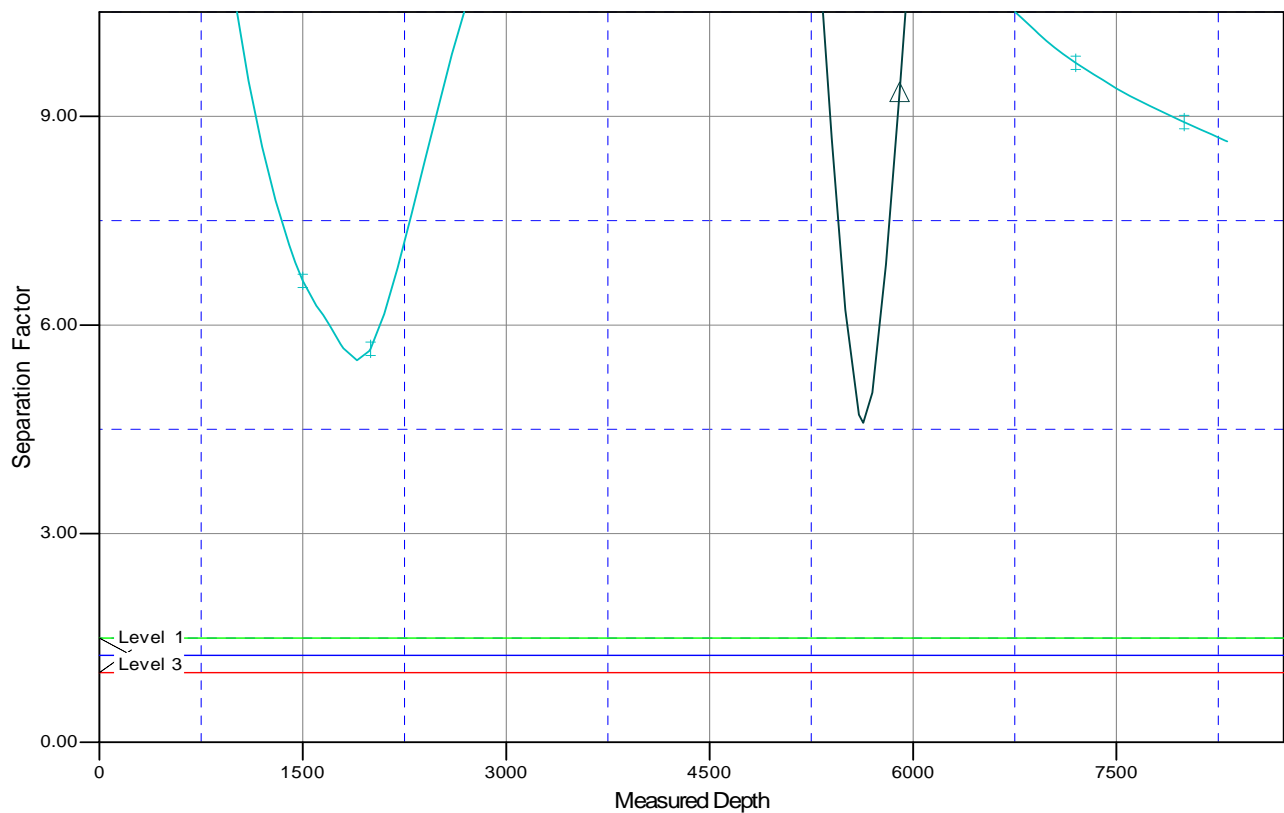




Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 1924M-R
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Central Meridian is 105° 30' 0.000 W Grid Convergence at Surface is: 1.10°

Separation Factor Plot



LEGEND

—+— 1924M, Wellbore #1, Surveys V0 —▲— 1948, Wellbore #1, Surveys V0