

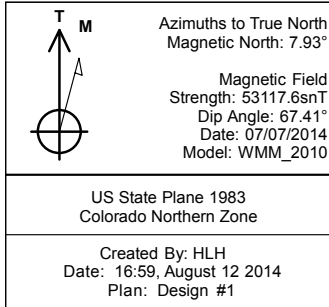


Company: Whiting Oil & Gas
Site: Horsetail 33M
Well: 2804
Project: Weld County, Colorado (NAD 83)
Rig: Pioneer 54



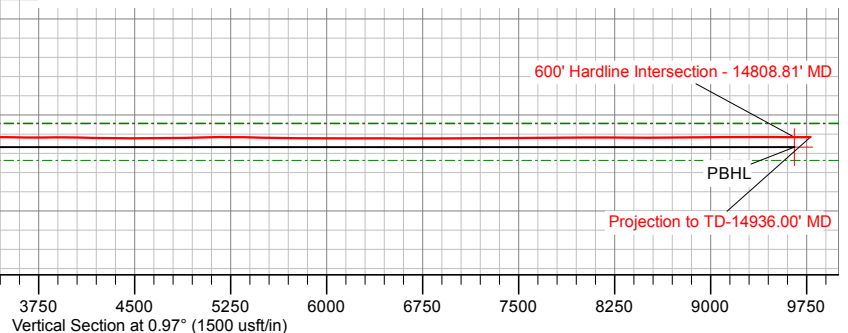
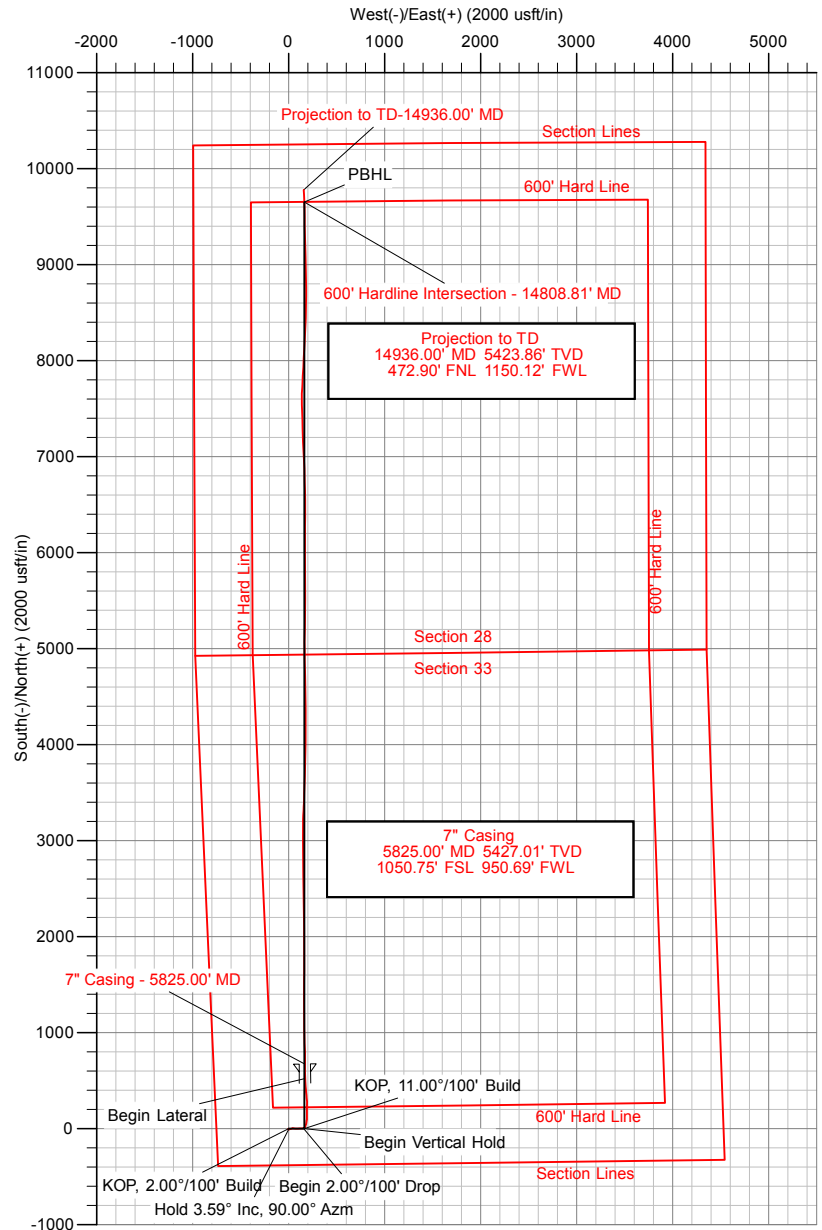
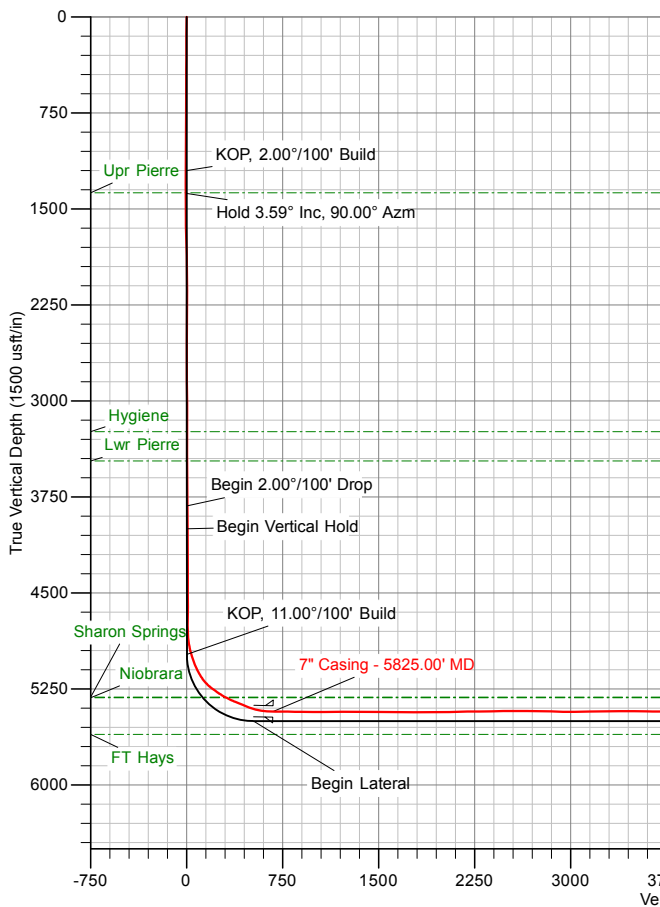
ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
1379.27	3.59	90.00	1379.16	0.00	5.61	0.10	5.61	Hold 3.59° Inc, 90.00° Azm
3825.75	3.59	90.00	3820.84	0.00	158.60	2.70	158.60	Begin 2.00°/100' Drop
4005.02	0.00	0.00	4000.00	0.00	164.21	2.79	164.21	Begin Vertical Hold
4986.15	0.00	0.00	4981.13	0.00	164.21	2.79	164.21	KOP, 11.00°/100' Build
5804.33	90.00	360.00	5502.00	520.87	164.21	523.59	685.08	Begin Lateral
14936.31	90.00	360.00	5502.00	9652.84	164.21	9654.24	9817.05	PBHL



SHL: 380' FSL & 750' FWL Sec. 33 - T10N - R57W

PBHL: 600' FNL & 1155' FWL Sec. 28 - T10N - R57W





Whiting Oil & Gas

Weld County, Colorado (NAD 83)

Horsetail 33M

2804

Wellbore #1

Survey: MS MWD

Standard Survey Report

12 August, 2014



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 2804
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4651.00usft (Pioneer 54)
Site:	Horsetail 33M	MD Reference:	WELL @ 4651.00usft (Pioneer 54)
Well:	2804	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

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	2804				
Well Position	+N/-S	0.00 usft	Northing:	1,535,004.33 usft	Latitude: 40° 47' 20.479 N
	+E/-W	0.00 usft	Easting:	3,481,296.93 usft	Longitude: 103° 45' 42.491 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 4,634.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	07/07/14	7.93	67.41	53,118

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00		0.97

Survey Program	Date	08/12/14			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
139.00	14,936.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	

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	
139.00	0.30	170.60	139.00	-0.36	0.06	-0.36	0.22	0.22	0.00	
229.00	0.30	174.70	229.00	-0.83	0.12	-0.82	0.02	0.00	4.56	
322.00	0.20	167.00	322.00	-1.23	0.18	-1.22	0.11	-0.11	-8.28	
413.00	0.20	200.60	413.00	-1.53	0.16	-1.53	0.13	0.00	36.92	
506.00	0.60	156.00	505.99	-2.13	0.30	-2.12	0.51	0.43	-47.96	
600.00	0.20	197.60	599.99	-2.73	0.45	-2.72	0.50	-0.43	44.26	
693.00	0.60	221.90	692.99	-3.25	0.08	-3.25	0.46	0.43	26.13	
786.00	0.20	134.50	785.99	-3.73	-0.13	-3.73	0.67	-0.43	-93.98	
879.00	0.60	176.30	878.99	-4.33	0.01	-4.33	0.51	0.43	44.95	
973.00	0.30	166.30	972.98	-5.06	0.10	-5.05	0.33	-0.32	-10.64	
1,066.00	0.40	173.10	1,065.98	-5.61	0.20	-5.61	0.12	0.11	7.31	
1,159.00	0.30	258.90	1,158.98	-5.98	0.00	-5.98	0.52	-0.11	92.26	
1,252.00	0.40	157.50	1,251.98	-6.33	-0.11	-6.33	0.59	0.11	-109.03	
1,345.00	1.00	120.90	1,344.97	-7.05	0.71	-7.03	0.77	0.65	-39.35	



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Site:	Horsetail 33M	MD Reference:	WELL @ 4651.00usft (Pioneer 54)
Well:	2804	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

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)
1,438.00	1.90	85.70	1,437.94	-7.35	2.94	-7.30	1.32	0.97	-37.85
1,532.00	3.70	75.00	1,531.83	-6.45	7.42	-6.32	1.99	1.91	-11.38
1,573.00	3.90	75.30	1,572.74	-5.75	10.05	-5.58	0.49	0.49	0.73
1,630.00	3.90	77.50	1,629.60	-4.84	13.82	-4.60	0.26	0.00	3.86
1,723.00	4.10	73.10	1,722.38	-3.19	20.09	-2.85	0.39	0.22	-4.73
1,816.00	3.90	68.80	1,815.15	-1.08	26.22	-0.63	0.39	-0.22	-4.62
1,909.00	3.90	67.40	1,907.94	1.28	32.09	1.82	0.10	0.00	-1.51
2,002.00	3.80	70.70	2,000.73	3.52	37.91	4.16	0.26	-0.11	3.55
2,096.00	2.00	85.10	2,094.60	4.68	42.49	5.40	2.05	-1.91	15.32
2,188.00	4.90	99.50	2,186.43	4.17	47.96	4.98	3.27	3.15	15.65
2,281.00	4.80	96.20	2,279.10	3.10	55.75	4.04	0.32	-0.11	-3.55
2,374.00	4.60	94.50	2,371.78	2.38	63.34	3.46	0.26	-0.22	-1.83
2,468.00	4.70	95.20	2,465.47	1.74	70.93	2.94	0.12	0.11	0.74
2,561.00	4.70	93.10	2,558.16	1.19	78.53	2.52	0.19	0.00	-2.26
2,655.00	4.80	91.00	2,651.84	0.91	86.31	2.37	0.21	0.11	-2.23
2,749.00	4.50	89.30	2,745.53	0.89	93.93	2.48	0.35	-0.32	-1.81
2,842.00	4.70	85.90	2,838.23	1.21	101.37	2.92	0.36	0.22	-3.66
2,935.00	4.70	81.50	2,930.92	2.04	108.94	3.88	0.39	0.00	-4.73
3,027.00	4.30	77.30	3,022.63	3.36	116.03	5.32	0.56	-0.43	-4.57
3,120.00	2.90	97.30	3,115.45	3.82	121.77	5.88	2.00	-1.51	21.51
3,214.00	2.90	93.70	3,209.33	3.37	126.50	5.51	0.19	0.00	-3.83
3,307.00	3.00	90.80	3,302.21	3.18	131.28	5.40	0.19	0.11	-3.12
3,400.00	2.80	89.90	3,395.09	3.15	135.99	5.45	0.22	-0.22	-0.97
3,494.00	2.70	89.70	3,488.98	3.17	140.50	5.55	0.11	-0.11	-0.21
3,588.00	2.20	84.10	3,582.89	3.36	144.51	5.81	0.59	-0.53	-5.96
3,681.00	1.70	82.20	3,675.84	3.74	147.65	6.23	0.54	-0.54	-2.04
3,774.00	1.60	74.10	3,768.80	4.28	150.26	6.82	0.27	-0.11	-8.71
3,867.00	1.50	80.90	3,861.77	4.83	152.71	7.41	0.22	-0.11	7.31
3,960.00	1.50	77.10	3,954.74	5.29	155.10	7.92	0.11	0.00	-4.09
4,054.00	1.30	79.00	4,048.71	5.77	157.35	8.43	0.22	-0.21	2.02
4,147.00	1.00	61.50	4,141.69	6.36	159.10	9.05	0.49	-0.32	-18.82
4,240.00	1.00	83.00	4,234.68	6.84	160.62	9.56	0.40	0.00	23.12
4,334.00	0.90	90.80	4,328.66	6.93	162.17	9.68	0.17	-0.11	8.30
4,427.00	0.80	91.90	4,421.65	6.90	163.55	9.67	0.11	-0.11	1.18
4,520.00	1.20	104.40	4,514.64	6.64	165.14	9.43	0.49	0.43	13.44
4,614.00	1.00	91.30	4,608.62	6.37	166.91	9.20	0.34	-0.21	-13.94
4,708.00	1.20	70.20	4,702.60	6.69	168.66	9.54	0.48	0.21	-22.45
4,802.00	1.20	66.10	4,796.58	7.42	170.49	10.31	0.09	0.00	-4.36
4,896.00	8.70	12.90	4,890.19	14.76	172.98	17.69	8.55	7.98	-56.60
4,990.00	16.80	18.00	4,981.79	34.65	178.77	37.67	8.69	8.62	5.43
5,082.00	23.10	11.80	5,068.24	64.99	186.58	68.14	7.21	6.85	-6.74
5,175.00	31.80	1.80	5,150.73	107.44	191.09	110.66	10.56	9.35	-10.75
5,269.00	47.00	358.60	5,223.16	166.92	191.03	170.13	16.31	16.17	-3.40
5,300.00	53.50	1.60	5,242.98	190.73	191.10	193.94	22.24	20.97	9.68



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 2804
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4651.00usft (Pioneer 54)
Site:	Horsetail 33M	MD Reference:	WELL @ 4651.00usft (Pioneer 54)
Well:	2804	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

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)	
5,331.00	54.80	2.20	5,261.13	215.85	191.93	219.06	4.48	4.19	1.94	
5,362.00	54.60	1.80	5,279.05	241.13	192.82	244.36	1.23	-0.65	-1.29	
5,393.00	57.80	358.10	5,296.30	266.88	192.78	270.11	14.31	10.32	-11.94	
5,424.00	61.80	355.80	5,311.89	293.63	191.34	296.82	14.41	12.90	-7.42	
5,455.00	64.10	354.70	5,325.98	321.14	189.05	324.29	8.06	7.42	-3.55	
5,486.00	65.50	354.50	5,339.18	349.06	186.41	352.17	4.55	4.52	-0.65	
5,517.00	67.30	355.60	5,351.59	377.36	183.96	380.42	6.65	5.81	3.55	
5,549.00	67.60	355.70	5,363.87	406.83	181.72	409.85	0.98	0.94	0.31	
5,580.00	67.40	355.40	5,375.73	435.38	179.50	438.36	1.10	-0.65	-0.97	
5,611.00	67.30	355.00	5,387.67	463.89	177.11	466.82	1.23	-0.32	-1.29	
5,642.00	71.50	355.80	5,398.57	492.81	174.78	495.70	13.76	13.55	2.58	
5,673.00	75.10	358.30	5,407.48	522.46	173.26	525.31	13.95	11.61	8.06	
5,704.00	76.40	357.90	5,415.11	552.49	172.27	555.32	4.38	4.19	-1.29	
5,735.00	80.30	358.60	5,421.37	582.83	171.34	585.64	12.77	12.58	2.26	
5,766.00	86.30	359.80	5,424.98	613.60	170.91	616.40	19.73	19.35	3.87	
5,788.00	88.20	0.10	5,426.04	635.57	170.89	638.37	8.74	8.64	1.36	
5,825.00	88.80	359.94	5,427.01	672.56	170.90	675.35	1.68	1.62	-0.44	
7" Casing - 5825.00' MD - 7 1/2"										
5,856.00	89.30	359.80	5,427.52	703.55	170.83	706.34	1.68	1.62	-0.44	
5,949.00	88.90	359.20	5,428.98	796.54	170.02	799.30	0.78	-0.43	-0.65	
6,043.00	90.10	358.20	5,429.80	890.51	167.89	893.22	1.66	1.28	-1.06	
6,136.00	89.30	357.60	5,430.29	983.44	164.48	986.09	1.08	-0.86	-0.65	
6,229.00	90.50	359.80	5,430.45	1,076.41	162.37	1,079.01	2.69	1.29	2.37	
6,323.00	90.20	359.60	5,429.88	1,170.41	161.88	1,172.98	0.38	-0.32	-0.21	
6,416.00	90.30	359.80	5,429.47	1,263.41	161.39	1,265.96	0.24	0.11	0.22	
6,509.00	90.20	359.90	5,429.07	1,356.40	161.15	1,358.94	0.15	-0.11	0.11	
6,602.00	89.80	359.90	5,429.07	1,449.40	160.99	1,451.92	0.43	-0.43	0.00	
6,695.00	89.10	1.00	5,429.96	1,542.39	161.72	1,544.91	1.40	-0.75	1.18	
6,788.00	88.30	0.50	5,432.07	1,635.36	162.93	1,637.89	1.01	-0.86	-0.54	
6,881.00	89.60	0.30	5,433.77	1,728.34	163.58	1,730.86	1.41	1.40	-0.22	
6,974.00	90.00	0.50	5,434.10	1,821.34	164.23	1,823.86	0.48	0.43	0.22	
7,067.00	91.70	359.70	5,432.72	1,914.32	164.40	1,916.83	2.02	1.83	-0.86	
7,160.00	91.20	359.30	5,430.37	2,007.29	163.58	2,009.77	0.69	-0.54	-0.43	
7,253.00	90.90	359.20	5,428.66	2,100.27	162.37	2,102.71	0.34	-0.32	-0.11	
7,346.00	90.50	359.00	5,427.53	2,193.25	160.91	2,195.66	0.48	-0.43	-0.22	
7,439.00	89.90	357.10	5,427.20	2,286.19	157.74	2,288.53	2.14	-0.65	-2.04	
7,533.00	91.80	0.40	5,425.81	2,380.14	155.69	2,382.43	4.05	2.02	3.51	
7,626.00	90.50	359.80	5,423.94	2,473.12	155.85	2,475.40	1.54	-1.40	-0.65	
7,719.00	90.20	359.60	5,423.37	2,566.11	155.37	2,568.38	0.39	-0.32	-0.22	
7,813.00	89.50	359.40	5,423.62	2,660.11	154.55	2,662.35	0.77	-0.74	-0.21	
7,906.00	89.00	359.20	5,424.84	2,753.09	153.41	2,755.30	0.58	-0.54	-0.22	
7,999.00	88.50	359.10	5,426.86	2,846.06	152.03	2,848.23	0.55	-0.54	-0.11	
8,092.00	89.00	359.40	5,428.89	2,939.03	150.81	2,941.16	0.63	0.54	0.32	



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Well:	2804	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

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)
8,185.00	90.60	359.90	5,429.22	3,032.03	150.25	3,034.13	1.80	1.72	0.54
8,278.00	90.50	359.90	5,428.32	3,125.02	150.08	3,127.11	0.11	-0.11	0.00
8,372.00	91.10	2.10	5,427.01	3,218.99	151.72	3,221.10	2.43	0.64	2.34
8,465.00	91.00	3.40	5,425.31	3,311.87	156.18	3,314.04	1.40	-0.11	1.40
8,558.00	89.80	1.90	5,424.66	3,404.76	160.48	3,406.99	2.07	-1.29	-1.61
8,651.00	89.50	2.00	5,425.23	3,497.71	163.65	3,499.97	0.34	-0.32	0.11
8,744.00	88.70	1.50	5,426.69	3,590.65	166.49	3,592.95	1.01	-0.86	-0.54
8,837.00	90.20	1.40	5,427.58	3,683.61	168.84	3,685.94	1.62	1.61	-0.11
8,930.00	90.40	2.60	5,427.09	3,776.55	172.09	3,778.93	1.31	0.22	1.29
9,023.00	90.10	1.00	5,426.69	3,869.50	175.01	3,871.91	1.75	-0.32	-1.72
9,116.00	89.70	1.00	5,426.85	3,962.49	176.63	3,964.91	0.43	-0.43	0.00
9,209.00	88.90	1.00	5,427.99	4,055.47	178.25	4,057.90	0.86	-0.86	0.00
9,302.00	88.70	0.60	5,429.93	4,148.44	179.55	4,150.88	0.48	-0.22	-0.43
9,395.00	89.60	359.10	5,431.31	4,241.42	179.31	4,243.85	1.88	0.97	-1.61
9,488.00	89.30	359.30	5,432.21	4,334.41	178.01	4,336.80	0.39	-0.32	0.22
9,580.00	90.10	359.20	5,432.69	4,426.40	176.81	4,428.76	0.88	0.87	-0.11
9,673.00	89.50	359.30	5,433.01	4,519.39	175.59	4,521.72	0.65	-0.65	0.11
9,765.00	89.80	359.30	5,433.57	4,611.38	174.46	4,613.67	0.33	0.33	0.00
9,858.00	89.60	358.70	5,434.06	4,704.37	172.84	4,706.62	0.68	-0.22	-0.65
9,950.00	92.10	359.40	5,432.70	4,796.34	171.32	4,798.55	2.82	2.72	0.76
10,043.00	92.00	358.60	5,429.37	4,889.26	169.69	4,891.43	0.87	-0.11	-0.86
10,135.00	91.30	359.30	5,426.72	4,981.21	168.01	4,983.34	1.08	-0.76	0.76
10,227.00	91.20	359.90	5,424.71	5,073.18	167.37	5,075.29	0.66	-0.11	0.65
10,320.00	90.00	1.80	5,423.74	5,166.16	168.75	5,168.28	2.42	-1.29	2.04
10,414.00	89.60	1.30	5,424.07	5,260.12	171.29	5,262.27	0.68	-0.43	-0.53
10,506.00	89.00	0.40	5,425.19	5,352.11	172.65	5,354.26	1.18	-0.65	-0.98
10,598.00	89.00	0.10	5,426.80	5,444.09	173.06	5,446.24	0.33	0.00	-0.33
10,690.00	88.90	359.90	5,428.48	5,536.08	173.06	5,538.21	0.24	-0.11	-0.22
10,783.00	88.30	359.60	5,430.76	5,629.05	172.65	5,631.16	0.72	-0.65	-0.32
10,875.00	88.90	359.80	5,433.00	5,721.02	172.17	5,723.11	0.69	0.65	0.22
10,968.00	90.00	359.90	5,433.90	5,814.01	171.92	5,816.09	1.19	1.18	0.11
11,059.00	89.60	359.30	5,434.21	5,905.01	171.29	5,907.06	0.79	-0.44	-0.66
11,152.00	90.50	0.50	5,434.13	5,998.01	171.13	6,000.04	1.61	0.97	1.29
11,245.00	90.20	359.70	5,433.56	6,091.00	171.29	6,093.03	0.92	-0.32	-0.86
11,337.00	90.10	359.10	5,433.32	6,183.00	170.33	6,184.99	0.66	-0.11	-0.65
11,430.00	89.90	1.40	5,433.32	6,275.99	170.73	6,277.98	2.48	-0.22	2.47
11,522.00	89.80	0.50	5,433.56	6,367.98	172.26	6,369.98	0.98	-0.11	-0.98
11,615.00	89.50	0.30	5,434.13	6,460.97	172.91	6,462.97	0.39	-0.32	-0.22
11,707.00	89.50	359.80	5,434.94	6,552.97	172.99	6,554.96	0.54	0.00	-0.54
11,800.00	89.60	358.60	5,435.67	6,645.95	171.69	6,647.91	1.29	0.11	-1.29
11,891.00	90.00	359.00	5,435.98	6,736.93	169.78	6,738.84	0.62	0.44	0.44
11,983.00	90.20	357.90	5,435.82	6,828.90	167.29	6,830.75	1.22	0.22	-1.20
12,075.00	90.50	357.50	5,435.26	6,920.82	163.60	6,922.60	0.54	0.33	-0.43
12,168.00	90.60	356.90	5,434.37	7,013.71	159.06	7,015.39	0.65	0.11	-0.65



Company:	Whiting Oil & Gas	Local Co-ordinate Reference:	Well 2804
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4651.00usft (Pioneer 54)
Site:	Horsetail 33M	MD Reference:	WELL @ 4651.00usft (Pioneer 54)
Well:	2804	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

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)
12,261.00	90.40	357.40	5,433.56	7,106.59	154.44	7,108.18	0.58	-0.22	0.54
12,354.00	90.60	356.70	5,432.75	7,199.46	149.65	7,200.96	0.78	0.22	-0.75
12,446.00	90.30	359.00	5,432.02	7,291.39	146.20	7,292.82	2.52	-0.33	2.50
12,538.00	90.10	358.60	5,431.70	7,383.37	144.27	7,384.75	0.49	-0.22	-0.43
12,631.00	90.00	357.70	5,431.62	7,476.32	141.27	7,477.64	0.97	-0.11	-0.97
12,723.00	90.50	359.20	5,431.22	7,568.28	138.78	7,569.54	1.72	0.54	1.63
12,813.00	91.60	2.00	5,429.57	7,658.25	139.72	7,659.52	3.34	1.22	3.11
12,905.00	90.10	3.80	5,428.20	7,750.11	144.38	7,751.45	2.55	-1.63	1.96
12,997.00	90.30	3.00	5,427.88	7,841.95	149.83	7,843.36	0.90	0.22	-0.87
13,089.00	90.60	3.30	5,427.16	7,933.81	154.89	7,935.29	0.46	0.33	0.33
13,181.00	89.40	2.70	5,427.16	8,025.68	159.70	8,027.23	1.46	-1.30	-0.65
13,274.00	89.70	3.40	5,427.89	8,118.54	164.65	8,120.17	0.82	0.32	0.75
13,366.00	90.00	2.70	5,428.13	8,210.41	169.55	8,212.11	0.83	0.33	-0.76
13,458.00	90.00	2.60	5,428.13	8,302.31	173.80	8,304.07	0.11	0.00	-0.11
13,551.00	89.80	2.00	5,428.29	8,395.24	177.53	8,397.04	0.68	-0.22	-0.65
13,643.00	89.80	1.30	5,428.62	8,487.20	180.18	8,489.03	0.76	0.00	-0.76
13,736.00	90.30	0.80	5,428.53	8,580.18	181.89	8,582.03	0.76	0.54	-0.54
13,828.00	90.70	1.10	5,427.73	8,672.17	183.41	8,674.03	0.54	0.43	0.33
13,921.00	90.30	358.90	5,426.92	8,765.16	183.41	8,767.01	2.40	-0.43	-2.37
14,013.00	90.80	359.10	5,426.04	8,857.14	181.80	8,858.95	0.59	0.54	0.22
14,105.00	90.00	358.70	5,425.39	8,949.12	180.04	8,950.88	0.97	-0.87	-0.43
14,197.00	89.80	357.90	5,425.55	9,041.08	177.31	9,042.78	0.90	-0.22	-0.87
14,289.00	91.50	359.10	5,424.51	9,133.04	174.90	9,134.69	2.26	1.85	1.30
14,381.00	89.90	359.00	5,423.39	9,225.01	173.38	9,226.63	1.74	-1.74	-0.11
14,473.00	90.30	358.50	5,423.23	9,316.99	171.37	9,318.56	0.70	0.43	-0.54
14,566.00	89.70	359.20	5,423.23	9,409.97	169.50	9,411.49	0.99	-0.65	0.75
14,659.00	89.60	359.30	5,423.79	9,502.96	168.29	9,504.45	0.15	-0.11	0.11
14,751.00	89.60	358.30	5,424.44	9,594.94	166.36	9,596.38	1.09	0.00	-1.09
14,808.81	89.72	358.18	5,424.78	9,652.72	164.58	9,654.12	0.30	0.22	-0.22
600' Hardline Intersection - 14808.81' MD									
14,844.00	89.80	358.10	5,424.92	9,687.89	163.44	9,689.27	0.30	0.22	-0.22
14,884.00	90.90	357.10	5,424.68	9,727.85	161.76	9,729.20	3.72	2.75	-2.50
14,936.00	90.90	357.10	5,423.86	9,779.78	159.13	9,781.07	0.00	0.00	0.00
Projection to TD-14936.00' MD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
600' Crossing Point - 14i	0.00	0.00	5,424.78	9,652.72	164.55	1,544,658.42	3,481,272.24	40° 48' 55.857 N	103° 45' 40.351 W
- hit/miss target									
- Shape									
- survey misses target center by 0.04usft at 14808.82usft MD (5424.78 TVD, 9652.72 N, 164.58 E)									
- Point									



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Site:	Horsetail 33M	MD Reference:	WELL @ 4651.00usft (Pioneer 54)
Well:	2804	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
5,825.00	5,427.01	7"		7	7-1/2

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
5,825.00	5,427.01	672.56	170.90	7" Casing - 5825.00' MD	
14,808.81	5,424.78	9,652.72	164.58	600' Hardline Intersection - 14808.81' MD	
14,936.00	5,423.86	9,779.78	159.13	Projection to TD-14936.00' MD	