WHITING PETROLEUM CORPORATION

Project: Weld County, CO
Site: Horsetail #30F
Well: 3108
Wellbore: OH
Design: OH

Azimuths to True North
Magnetic North: 8.01°

Magnetic Field
Strength: 53054.6snT
Dip Angle: 67.42°
Date: 4/30/2014
Model: BGGM2013

PROJECT DETAILS: Weld County, CO

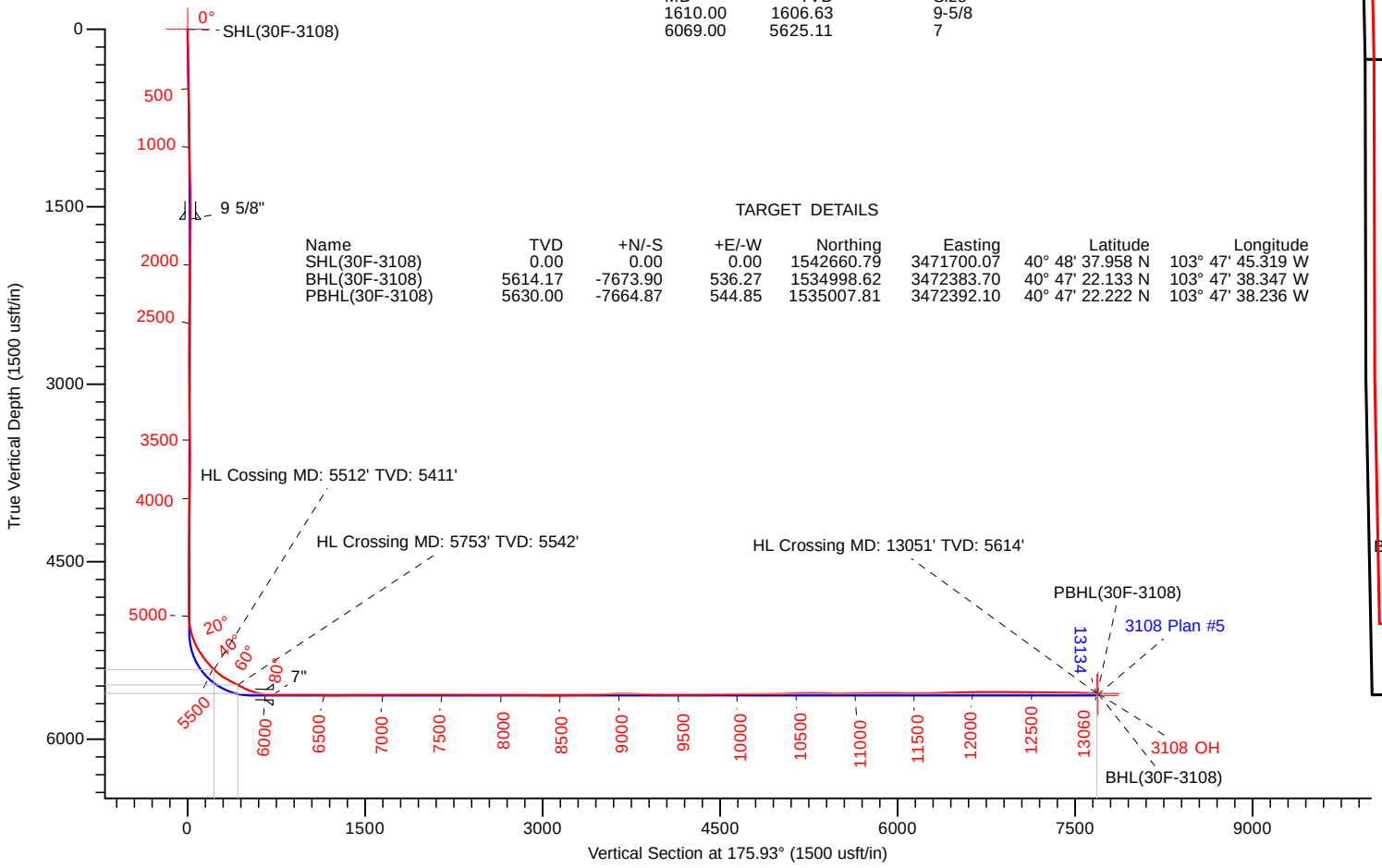
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone

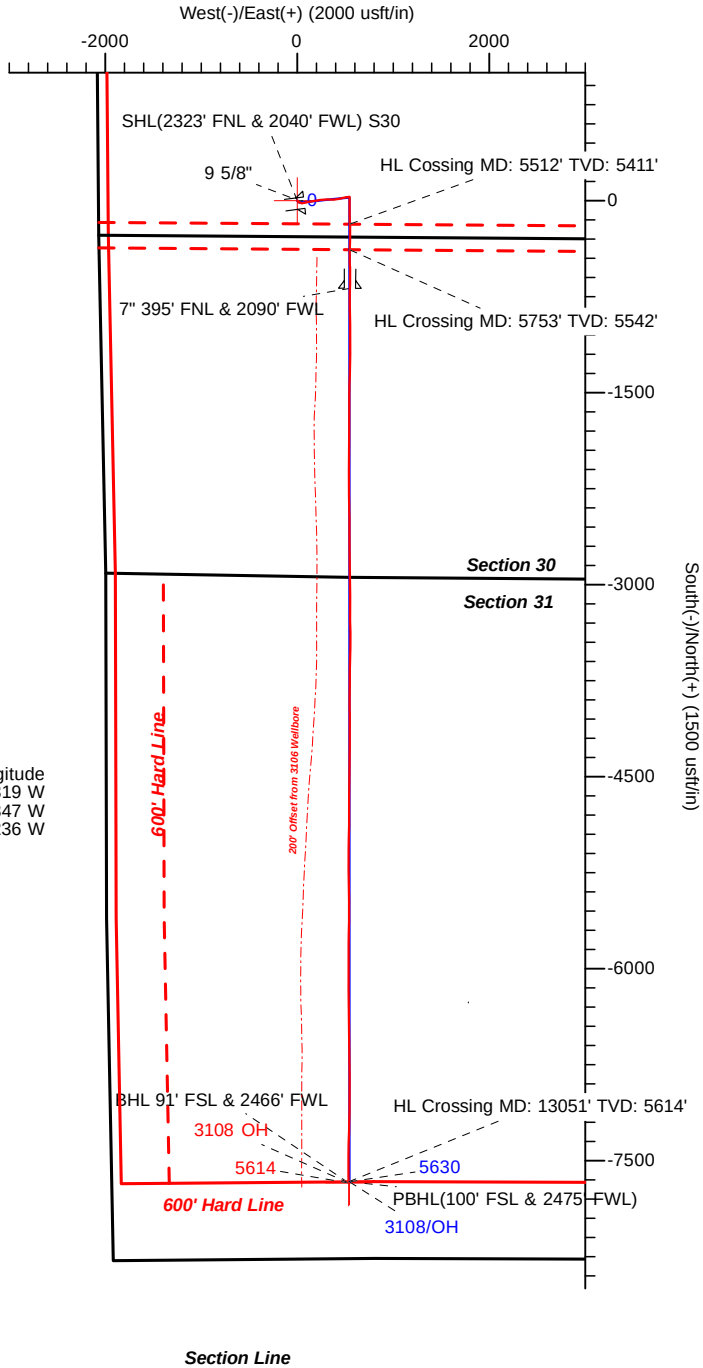
ACTUAL CASING DETAILS

MD	TVD	Size
1610.00	1606.63	9-5/8
6069.00	5625.11	7

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL(30F-3108)	0.00	0.00	0.00	1542660.79	3471700.07	40° 48' 37.958 N	103° 47' 45.319 W
BHL(30F-3108)	5614.17	-7673.90	536.27	1534998.62	3472383.70	40° 47' 22.133 N	103° 47' 38.347 W
PBHL(30F-3108)	5630.00	-7664.87	544.85	1535007.81	3472392.10	40° 47' 22.222 N	103° 47' 38.236 W





LEAM DRILLING SYSTEMS LLC
2010 East Davis, Conroe, Texas 77301
Phone: 936/756-7577, Fax: 936/756-7595

Design: OH (3108/OH)
Horsetail #30F
Created By: Michelle Walther Date: 10:46, December 22 2014

Approved: _____ Date: _____

LEAM Drilling Systems LLC

Survey Report

Company:	WHITING PETROLEUM CORPORATION	**Local Co-ordinate Reference:**	Well 3108
Project:	Weld County, CO	**TVD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Site:	Horsetail #30F	**MD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Well:	3108	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User Db

Project Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site Horsetail #30F

Site Position:		**Northing:**	1,542,711.44 usft	**Latitude:**	40° 48' 38.459 N
From:	Lat/Long	**Easting:**	3,471,699.09 usft	**Longitude:**	103° 47' 45.319 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	1.10 °

Well 3108

Well Position	**+N/-S**	0.00 usft	**Northing:**	1,542,660.80 usft	**Latitude:**	40° 48' 37.958 N
	+E/-W	0.00 usft	**Easting:**	3,471,700.06 usft	**Longitude:**	103° 47' 45.319 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	4,780.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	4/30/2014	8.01	67.42	53,055

Design OH

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	175.93

Survey Program **Date** 8/20/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
140.00	13,009.00	Survey #1 (OH)	MWD+IFR1+MS_PES	Fixed:v2:Eagleford, crustal dec + 3-axis corr.
13,060.00	13,060.00	Survey #2 (OH)	Project	Projection

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
140.00	1.17	107.81	139.99	-0.44	1.36	0.53	0.84	0.84	0.00
170.00	1.15	107.21	169.98	-0.62	1.94	0.76	0.08	-0.07	-2.00
263.00	2.16	102.53	262.94	-1.28	4.54	1.60	1.09	1.09	-5.03
355.00	2.08	128.28	354.88	-2.69	7.55	3.22	1.03	-0.09	27.99
448.00	1.51	157.37	447.84	-4.86	9.34	5.51	1.14	-0.61	31.28
539.00	1.20	161.05	538.81	-6.87	10.11	7.57	0.35	-0.34	4.04
631.00	1.20	95.85	630.80	-7.88	11.38	8.67	1.41	0.00	-70.87
722.00	2.02	134.02	721.76	-9.09	13.49	10.03	1.44	0.90	41.95
814.00	1.49	138.46	813.72	-11.11	15.44	12.18	0.59	-0.58	4.83

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Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User 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)
905.00	1.16	108.91	904.70	-12.30	17.10	13.48	0.82	-0.36	-32.47
997.00	1.68	104.82	996.67	-12.95	19.29	14.28	0.58	0.57	-4.45
1,089.00	2.80	98.77	1,088.60	-13.63	22.81	15.22	1.24	1.22	-6.58
1,180.00	3.82	106.92	1,179.44	-14.85	27.91	16.80	1.23	1.12	8.96
1,272.00	5.19	108.76	1,271.16	-17.08	34.78	19.51	1.50	1.49	2.00
1,364.00	6.05	97.55	1,362.72	-19.06	43.53	22.10	1.51	0.93	-12.18
1,456.00	7.13	88.51	1,454.11	-19.55	54.04	23.33	1.62	1.17	-9.83
1,548.00	8.60	79.98	1,545.25	-18.20	66.52	22.88	2.04	1.60	-9.27
1,579.00	8.00	83.15	1,575.92	-17.54	70.95	22.53	2.43	-1.94	10.23
1,610.00	7.79	82.83	1,606.63	-17.02	75.17	22.32	0.68	-0.67	-1.02
9 5/8"									
1,678.00	7.34	82.08	1,674.03	-15.85	84.05	21.77	0.68	-0.67	-1.11
1,708.00	7.38	78.86	1,703.79	-15.21	87.84	21.41	1.38	0.13	-10.73
1,799.00	8.88	72.69	1,793.87	-11.99	100.28	19.08	1.90	1.65	-6.78
1,891.00	8.79	82.17	1,884.79	-8.92	114.02	16.99	1.58	-0.10	10.30
1,982.00	7.95	83.55	1,974.82	-7.27	127.17	16.28	0.95	-0.92	1.52
2,074.00	8.66	87.93	2,065.85	-6.30	140.41	16.25	1.03	0.77	4.76
2,166.00	8.22	85.74	2,156.85	-5.57	153.89	16.47	0.59	-0.48	-2.38
2,258.00	8.04	80.10	2,247.93	-3.97	166.79	15.80	0.89	-0.20	-6.13
2,350.00	9.71	80.77	2,338.83	-1.62	180.78	14.45	1.82	1.82	0.73
2,441.00	10.00	86.27	2,428.49	0.13	196.24	13.80	1.08	0.32	6.04
2,534.00	10.06	80.75	2,520.07	1.96	212.32	13.12	1.04	0.06	-5.94
2,627.00	11.12	86.40	2,611.48	3.83	229.29	12.46	1.59	1.14	6.08
2,719.00	10.81	82.32	2,701.81	5.54	246.69	11.99	0.91	-0.34	-4.43
2,811.00	10.58	87.90	2,792.21	7.00	263.68	11.73	1.15	-0.25	6.07
2,902.00	9.71	89.24	2,881.79	7.41	279.70	12.47	0.99	-0.96	1.47
2,993.00	7.87	86.36	2,971.71	7.90	293.60	12.95	2.08	-2.02	-3.16
3,085.00	7.21	80.32	3,062.92	9.27	305.57	12.44	1.12	-0.72	-6.57
3,177.00	8.00	91.53	3,154.11	10.07	317.67	12.50	1.82	0.86	12.18
3,269.00	8.79	95.17	3,245.13	9.27	331.07	14.25	1.03	0.86	3.96
3,361.00	8.75	88.32	3,336.06	8.84	345.06	15.67	1.14	-0.04	-7.45
3,454.00	9.82	89.69	3,427.84	9.09	360.06	16.49	1.17	1.15	1.47
3,546.00	10.11	89.81	3,518.45	9.16	375.98	17.55	0.32	0.32	0.13
3,638.00	9.49	89.97	3,609.10	9.19	391.64	18.63	0.67	-0.67	0.17
3,730.00	8.64	77.20	3,699.96	10.73	405.97	18.11	2.37	-0.92	-13.88
3,823.00	8.48	88.48	3,791.93	12.46	419.64	17.36	1.81	-0.17	12.13
3,915.00	8.44	82.55	3,882.94	13.51	433.11	17.26	0.95	-0.04	-6.45
4,006.00	8.16	81.34	3,972.98	15.35	446.12	16.35	0.36	-0.31	-1.33
4,098.00	7.96	78.51	4,064.07	17.60	458.81	15.01	0.48	-0.22	-3.08
4,190.00	8.88	78.19	4,155.08	20.32	472.01	13.23	1.00	1.00	-0.35
4,282.00	8.31	82.44	4,246.05	22.65	485.55	11.87	0.93	-0.62	4.62
4,373.00	7.80	81.19	4,336.15	24.46	498.17	10.96	0.59	-0.56	-1.37
4,466.00	6.73	80.15	4,428.40	26.36	509.78	9.89	1.16	-1.15	-1.12

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Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User 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)
4,559.00	7.02	89.95	4,520.74	27.30	520.83	9.74	1.30	0.31	10.54
4,651.00	5.93	85.11	4,612.15	27.71	531.19	10.06	1.32	-1.18	-5.26
4,743.00	3.78	79.24	4,703.81	28.68	538.90	9.64	2.40	-2.34	-6.38
4,835.00	2.90	92.19	4,795.66	29.16	544.21	9.54	1.25	-0.96	14.08
4,926.00	0.96	141.14	4,886.61	28.48	546.99	10.42	2.62	-2.13	53.79
5,017.00	0.81	196.28	4,977.60	27.26	547.28	11.65	0.91	-0.16	60.59
5,109.00	11.81	182.00	5,068.90	17.20	546.77	21.65	11.99	11.96	-15.52
5,201.00	21.04	179.52	5,157.05	-8.78	546.58	47.55	10.06	10.03	-2.70
5,293.00	30.33	181.24	5,239.87	-48.60	546.22	87.25	10.13	10.10	1.87
5,385.00	37.27	177.89	5,316.28	-99.73	546.74	138.29	7.81	7.54	-3.64
5,477.00	42.63	177.46	5,386.79	-158.74	549.15	197.31	5.83	5.83	-0.47
5,512.00	46.12	178.21	5,411.80	-183.19	550.07	221.77	10.09	9.98	2.13
HL Cossing MD: 5512' TVD: 5411'									
5,569.00	51.82	179.25	5,449.20	-226.16	551.00	264.70	10.09	10.00	1.83
5,661.00	62.24	181.26	5,499.20	-303.23	550.58	341.55	11.47	11.33	2.18
5,691.00	62.11	180.74	5,513.20	-329.76	550.12	367.97	1.59	-0.43	-1.73
5,722.00	62.02	181.19	5,527.73	-357.15	549.66	395.26	1.31	-0.29	1.45
5,753.00	61.71	180.96	5,542.34	-384.48	549.14	422.48	1.20	-1.00	-0.74
HL Crossing MD: 5753' TVD: 5542'									
5,783.00	62.11	180.34	5,556.47	-410.94	548.84	448.86	2.26	1.33	-2.07
5,814.00	64.04	179.31	5,570.51	-438.58	548.93	476.43	6.89	6.23	-3.32
5,844.00	67.16	179.07	5,582.90	-465.89	549.32	503.71	10.43	10.40	-0.80
5,875.00	71.30	179.03	5,593.89	-494.87	549.80	532.64	13.36	13.35	-0.13
5,906.00	73.85	179.09	5,603.17	-524.44	550.28	562.17	8.23	8.23	0.19
5,936.00	75.43	179.58	5,611.12	-553.37	550.62	591.05	5.50	5.27	1.63
5,967.00	80.18	180.03	5,617.67	-583.66	550.72	621.27	15.39	15.32	1.45
5,997.00	85.14	180.26	5,621.50	-613.40	550.65	650.94	16.55	16.53	0.77
6,028.00	86.99	180.18	5,623.62	-644.33	550.53	681.78	5.97	5.97	-0.26
6,035.00	87.47	180.42	5,623.96	-651.32	550.49	688.75	7.66	6.86	3.43
6,069.00	88.65	180.43	5,625.12	-685.30	550.24	722.62	3.46	3.46	0.03
7"									
6,105.00	89.89	180.44	5,625.58	-721.29	549.96	758.51	3.46	3.46	0.03
6,194.00	90.64	179.85	5,625.16	-810.29	549.74	847.26	1.07	0.84	-0.66
6,284.00	90.90	179.48	5,623.95	-900.28	550.27	937.07	0.50	0.29	-0.41
6,374.00	88.97	179.18	5,624.06	-990.27	551.32	1,026.90	2.17	-2.14	-0.33
6,463.00	88.84	178.97	5,625.76	-1,079.24	552.75	1,115.75	0.28	-0.15	-0.24
6,553.00	88.22	180.17	5,628.07	-1,169.21	553.43	1,205.54	1.50	-0.69	1.33
6,642.00	89.98	181.58	5,629.46	-1,258.18	552.07	1,294.19	2.53	1.98	1.58
6,732.00	91.82	182.53	5,628.05	-1,348.11	548.84	1,383.66	2.30	2.04	1.06
6,822.00	90.51	182.84	5,626.22	-1,437.99	544.63	1,473.02	1.50	-1.46	0.34
6,911.00	90.95	180.16	5,625.09	-1,526.94	542.30	1,561.58	3.05	0.49	-3.01
7,001.00	91.25	179.61	5,623.36	-1,616.92	542.48	1,651.35	0.70	0.33	-0.61
7,090.00	90.29	180.60	5,622.16	-1,705.91	542.32	1,740.10	1.55	-1.08	1.11
7,180.00	89.45	179.60	5,622.37	-1,795.91	542.16	1,829.86	1.45	-0.93	-1.11

LEAM Drilling Systems LLC

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7,269.00	88.75	180.93	5,623.76	-1,884.90	541.75	1,918.59	1.69	-0.79	1.49
7,357.00	90.55	180.71	5,624.30	-1,972.88	540.49	2,006.27	2.06	2.05	-0.25
7,441.00	90.24	180.29	5,623.72	-2,056.88	539.76	2,090.00	0.62	-0.37	-0.50
7,529.00	90.02	179.69	5,623.52	-2,144.88	539.77	2,177.78	0.73	-0.25	-0.68
7,616.00	89.76	179.42	5,623.69	-2,231.87	540.45	2,264.60	0.43	-0.30	-0.31
7,706.00	89.49	179.43	5,624.28	-2,321.87	541.35	2,354.43	0.30	-0.30	0.01
7,793.00	88.75	178.45	5,625.62	-2,408.84	542.96	2,441.30	1.41	-0.85	-1.13
7,879.00	90.29	179.93	5,626.34	-2,494.82	544.18	2,527.15	2.48	1.79	1.72
7,971.00	90.25	179.81	5,625.90	-2,586.82	544.38	2,618.94	0.14	-0.04	-0.13
8,063.00	89.98	179.15	5,625.72	-2,678.82	545.22	2,710.76	0.78	-0.29	-0.72
8,156.00	89.27	178.24	5,626.33	-2,771.79	547.34	2,803.65	1.24	-0.76	-0.98
8,248.00	89.67	179.50	5,627.18	-2,863.77	549.15	2,895.52	1.44	0.43	1.37
8,340.00	89.27	179.36	5,628.03	-2,955.76	550.07	2,987.34	0.46	-0.43	-0.15
8,432.00	89.19	180.07	5,629.27	-3,047.75	550.52	3,079.13	0.78	-0.09	0.77
8,523.00	91.03	180.28	5,629.09	-3,138.74	550.25	3,169.88	2.04	2.02	0.23
8,614.00	90.46	179.60	5,627.91	-3,229.73	550.34	3,260.65	0.98	-0.63	-0.75
8,706.00	89.58	177.23	5,627.87	-3,321.69	552.89	3,352.56	2.75	-0.96	-2.58
8,797.00	93.24	179.70	5,625.64	-3,412.61	555.32	3,443.42	4.85	4.02	2.71
8,889.00	92.58	181.37	5,620.96	-3,504.48	554.47	3,535.00	1.95	-0.72	1.82
8,981.00	91.96	181.94	5,617.32	-3,596.37	551.81	3,626.47	0.92	-0.67	0.62
9,073.00	88.88	180.81	5,616.65	-3,688.33	549.60	3,718.04	3.57	-3.35	-1.23
9,165.00	88.13	180.55	5,619.05	-3,780.29	548.51	3,809.69	0.86	-0.82	-0.28
9,256.00	87.87	180.89	5,622.22	-3,871.23	547.37	3,900.32	0.47	-0.29	0.37
9,349.00	88.71	178.72	5,625.00	-3,964.18	547.69	3,993.05	2.50	0.90	-2.33
9,442.00	90.07	179.80	5,625.99	-4,057.16	548.89	4,085.89	1.87	1.46	1.16
9,534.00	89.76	179.28	5,626.12	-4,149.16	549.63	4,177.71	0.66	-0.34	-0.57
9,626.00	91.34	181.31	5,625.24	-4,241.15	549.15	4,269.43	2.80	1.72	2.21
9,717.00	91.87	181.30	5,622.69	-4,332.09	547.08	4,359.99	0.58	0.58	-0.01
9,808.00	89.89	181.13	5,621.30	-4,423.05	545.15	4,450.59	2.18	-2.18	-0.19
9,900.00	89.23	180.23	5,622.00	-4,515.04	544.06	4,542.27	1.21	-0.72	-0.98
9,992.00	90.77	181.20	5,622.00	-4,607.03	542.91	4,633.94	1.98	1.67	1.05
10,084.00	91.30	180.92	5,620.34	-4,699.00	541.21	4,725.56	0.65	0.58	-0.30
10,176.00	90.55	180.24	5,618.85	-4,790.98	540.28	4,817.24	1.10	-0.82	-0.74
10,268.00	89.19	179.40	5,619.06	-4,882.98	540.57	4,909.03	1.74	-1.48	-0.91
10,361.00	92.00	181.62	5,618.10	-4,975.95	539.74	5,001.71	3.85	3.02	2.39
10,453.00	92.40	181.63	5,614.57	-5,067.85	537.13	5,093.19	0.43	0.43	0.01
10,545.00	90.59	179.88	5,612.17	-5,159.80	535.92	5,184.83	2.74	-1.97	-1.90
10,637.00	89.76	178.94	5,611.88	-5,251.79	536.87	5,276.65	1.36	-0.90	-1.02
10,729.00	88.88	177.91	5,612.98	-5,343.75	539.40	5,368.56	1.47	-0.96	-1.12
10,821.00	88.53	179.14	5,615.06	-5,435.70	541.77	5,460.44	1.39	-0.38	1.34
10,913.00	91.22	181.42	5,615.26	-5,527.68	541.32	5,552.16	3.83	2.92	2.48
11,005.00	91.09	181.10	5,613.40	-5,619.64	539.29	5,643.74	0.38	-0.14	-0.35
11,097.00	90.29	180.33	5,612.29	-5,711.62	538.14	5,735.41	1.21	-0.87	-0.84

Company:	WHITING PETROLEUM CORPORATION	**Local Co-ordinate Reference:**	Well 3108
Project:	Weld County, CO	**TVD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Site:	Horsetail #30F	**MD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Well:	3108	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User 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)
11,188.00	90.46	180.25	5,611.70	-5,802.62	537.68	5,826.15	0.21	0.19	-0.09
11,280.00	89.85	179.82	5,611.45	-5,894.62	537.63	5,917.91	0.81	-0.66	-0.47
11,373.00	89.49	179.75	5,611.99	-5,987.62	537.98	6,010.70	0.39	-0.39	-0.08
11,465.00	88.97	179.61	5,613.22	-6,079.61	538.49	6,102.49	0.59	-0.57	-0.15
11,558.00	89.96	180.48	5,614.09	-6,172.60	538.42	6,195.25	1.42	1.06	0.94
11,650.00	91.78	180.23	5,612.69	-6,264.58	537.85	6,286.96	2.00	1.98	-0.27
11,741.00	92.53	179.58	5,609.27	-6,355.52	538.00	6,377.67	1.09	0.82	-0.71
11,832.00	91.22	179.26	5,606.29	-6,446.46	538.92	6,468.46	1.48	-1.44	-0.35
11,923.00	91.17	178.40	5,604.40	-6,537.42	540.78	6,559.32	0.95	-0.05	-0.95
12,016.00	91.08	177.70	5,602.57	-6,630.35	543.94	6,652.24	0.76	-0.10	-0.75
12,108.00	90.59	180.23	5,601.23	-6,722.32	545.60	6,744.09	2.80	-0.53	2.75
12,200.00	88.79	177.67	5,601.73	-6,814.29	547.29	6,835.95	3.40	-1.96	-2.78
12,291.00	89.55	180.42	5,603.05	-6,905.26	548.80	6,926.80	3.13	0.84	3.02
12,384.00	89.80	181.45	5,603.57	-6,998.24	547.29	7,019.44	1.14	0.27	1.11
12,476.00	89.67	182.14	5,604.00	-7,090.20	544.40	7,110.95	0.76	-0.14	0.75
12,567.00	89.45	181.62	5,604.70	-7,181.14	541.42	7,201.46	0.62	-0.24	-0.57
12,659.00	89.27	181.52	5,605.72	-7,273.10	538.90	7,293.01	0.22	-0.20	-0.11
12,751.00	90.43	181.91	5,605.97	-7,365.06	536.15	7,384.54	1.33	1.26	0.42
12,843.00	88.58	179.85	5,606.76	-7,457.04	534.73	7,476.18	3.01	-2.01	-2.24
12,935.00	88.15	179.57	5,609.39	-7,549.00	535.20	7,567.95	0.56	-0.47	-0.30
13,009.00	87.66	179.48	5,612.09	-7,622.95	535.81	7,641.75	0.67	-0.66	-0.12
13,051.00	87.66	179.48	5,613.81	-7,664.91	536.19	7,683.64	0.00	0.00	0.00
HL Crossing MD: 13051' TVD: 5614'									
13,060.00	87.66	179.48	5,614.17	-7,673.90	536.27	7,692.61	0.00	0.00	0.00

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,610.00	1,606.63	9 5/8"	9-5/8	12-1/4
6,069.00	5,625.12	7"	7	7-1/2

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
5,512.00	5,411.80	-183.19	550.07	HL Cossing MD: 5512' TVD: 5411'
5,753.00	5,542.34	-384.48	549.14	HL Crossing MD: 5753' TVD: 5542'
13,051.00	5,613.81	-7,664.91	536.19	HL Crossing MD: 13051' TVD: 5614'

WHITING PETROLEUM CORPORATION

Weld County, CO
Horsetail #30F
3108

OH

Design: OH

Survey Report - Geographic

20 August, 2014

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	WHITING PETROLEUM CORPORATION	**Local Co-ordinate Reference:**	Well 3108
Project:	Weld County, CO	**TVD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Site:	Horsetail #30F	**MD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Well:	3108	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User Db

Project Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site Horsetail #30F

Site Position:		**Northing:**	1,542,711.44 usft	**Latitude:**	40° 48' 38.459 N
From:	Lat/Long	**Easting:**	3,471,699.09 usft	**Longitude:**	103° 47' 45.319 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	1.10 °

Well 3108

Well Position	**+N/-S**	0.00 usft	**Northing:**	1,542,660.80 usft	**Latitude:**	40° 48' 37.958 N
	+E/-W	0.00 usft	**Easting:**	3,471,700.06 usft	**Longitude:**	103° 47' 45.319 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	4,780.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	4/30/2014	8.01	67.42	53,055

Design OH

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	175.93

Survey Program **Date** 8/20/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
140.00	13,009.00	Survey #1 (OH)	MWD+IFR1+MS_PES	Fixed:v2:Eagleford, crustal dec + 3-axis corr.
13,060.00	13,060.00	Survey #2 (OH)	Project	Projection

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	1,542,660.80	3,471,700.06	40° 48' 37.958 N	103° 47' 45.319 W
140.00	1.17	107.81	139.99	-0.44	1.36	1,542,660.39	3,471,701.43	40° 48' 37.954 N	103° 47' 45.302 W
170.00	1.15	107.21	169.98	-0.62	1.94	1,542,660.21	3,471,702.02	40° 48' 37.952 N	103° 47' 45.294 W
263.00	2.16	102.53	262.94	-1.28	4.54	1,542,659.61	3,471,704.63	40° 48' 37.946 N	103° 47' 45.260 W
355.00	2.08	128.28	354.88	-2.69	7.55	1,542,658.26	3,471,707.66	40° 48' 37.932 N	103° 47' 45.221 W
448.00	1.51	157.37	447.84	-4.86	9.34	1,542,656.11	3,471,709.50	40° 48' 37.910 N	103° 47' 45.198 W
539.00	1.20	161.05	538.81	-6.87	10.11	1,542,654.12	3,471,710.31	40° 48' 37.890 N	103° 47' 45.188 W
631.00	1.20	95.85	630.80	-7.88	11.38	1,542,653.14	3,471,711.60	40° 48' 37.880 N	103° 47' 45.171 W
722.00	2.02	134.02	721.76	-9.09	13.49	1,542,651.97	3,471,713.72	40° 48' 37.868 N	103° 47' 45.144 W
814.00	1.49	138.46	813.72	-11.11	15.44	1,542,649.98	3,471,715.72	40° 48' 37.848 N	103° 47' 45.118 W
905.00	1.16	108.91	904.70	-12.30	17.10	1,542,648.83	3,471,717.40	40° 48' 37.837 N	103° 47' 45.097 W

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	WHITING PETROLEUM CORPORATION	**Local Co-ordinate Reference:**	Well 3108
Project:	Weld County, CO	**TVD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Site:	Horsetail #30F	**MD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Well:	3108	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
997.00	1.68	104.82	996.67	-12.95	19.29	1,542,648.23	3,471,719.60	40° 48' 37.830 N	103° 47' 45.068 W
1,089.00	2.80	98.77	1,088.60	-13.63	22.81	1,542,647.61	3,471,723.13	40° 48' 37.824 N	103° 47' 45.023 W
1,180.00	3.82	106.92	1,179.44	-14.85	27.91	1,542,646.48	3,471,728.25	40° 48' 37.812 N	103° 47' 44.956 W
1,272.00	5.19	108.76	1,271.16	-17.08	34.78	1,542,644.38	3,471,735.17	40° 48' 37.789 N	103° 47' 44.867 W
1,364.00	6.05	97.55	1,362.72	-19.06	43.53	1,542,642.58	3,471,743.95	40° 48' 37.770 N	103° 47' 44.753 W
1,456.00	7.13	88.51	1,454.11	-19.55	54.04	1,542,642.29	3,471,754.47	40° 48' 37.765 N	103° 47' 44.616 W
1,548.00	8.60	79.98	1,545.25	-18.20	66.52	1,542,643.88	3,471,766.93	40° 48' 37.778 N	103° 47' 44.454 W
1,579.00	8.00	83.15	1,575.92	-17.54	70.95	1,542,644.62	3,471,771.34	40° 48' 37.785 N	103° 47' 44.397 W
1,610.00	7.79	82.83	1,606.63	-17.02	75.17	1,542,645.22	3,471,775.55	40° 48' 37.790 N	103° 47' 44.342 W
9 5/8"									
1,678.00	7.34	82.08	1,674.03	-15.85	84.05	1,542,646.57	3,471,784.40	40° 48' 37.802 N	103° 47' 44.226 W
1,708.00	7.38	78.86	1,703.79	-15.21	87.84	1,542,647.28	3,471,788.18	40° 48' 37.808 N	103° 47' 44.177 W
1,799.00	8.88	72.69	1,793.87	-11.99	100.28	1,542,650.73	3,471,800.56	40° 48' 37.840 N	103° 47' 44.015 W
1,891.00	8.79	82.17	1,884.79	-8.92	114.02	1,542,654.07	3,471,814.24	40° 48' 37.870 N	103° 47' 43.836 W
1,982.00	7.95	83.55	1,974.82	-7.27	127.17	1,542,655.97	3,471,827.35	40° 48' 37.886 N	103° 47' 43.665 W
2,074.00	8.66	87.93	2,065.85	-6.30	140.41	1,542,657.19	3,471,840.57	40° 48' 37.896 N	103° 47' 43.493 W
2,166.00	8.22	85.74	2,156.85	-5.57	153.89	1,542,658.19	3,471,854.03	40° 48' 37.903 N	103° 47' 43.318 W
2,258.00	8.04	80.10	2,247.93	-3.97	166.79	1,542,660.03	3,471,866.90	40° 48' 37.919 N	103° 47' 43.150 W
2,350.00	9.71	80.77	2,338.83	-1.62	180.78	1,542,662.65	3,471,880.85	40° 48' 37.942 N	103° 47' 42.968 W
2,441.00	10.00	86.27	2,428.49	0.13	196.24	1,542,664.69	3,471,896.27	40° 48' 37.960 N	103° 47' 42.767 W
2,534.00	10.06	80.75	2,520.07	1.96	212.32	1,542,666.83	3,471,912.31	40° 48' 37.978 N	103° 47' 42.558 W
2,627.00	11.12	86.40	2,611.48	3.83	229.29	1,542,669.03	3,471,929.24	40° 48' 37.996 N	103° 47' 42.337 W
2,719.00	10.81	82.32	2,701.81	5.54	246.69	1,542,671.07	3,471,946.60	40° 48' 38.013 N	103° 47' 42.111 W
2,811.00	10.58	87.90	2,792.21	7.00	263.68	1,542,672.86	3,471,963.56	40° 48' 38.027 N	103° 47' 41.890 W
2,902.00	9.71	89.24	2,881.79	7.41	279.70	1,542,673.58	3,471,979.58	40° 48' 38.031 N	103° 47' 41.682 W
2,993.00	7.87	86.36	2,971.71	7.90	293.60	1,542,674.34	3,471,993.46	40° 48' 38.036 N	103° 47' 41.501 W
3,085.00	7.21	80.32	3,062.92	9.27	305.57	1,542,675.94	3,472,005.40	40° 48' 38.050 N	103° 47' 41.345 W
3,177.00	8.00	91.53	3,154.11	10.07	317.67	1,542,676.97	3,472,017.48	40° 48' 38.058 N	103° 47' 41.188 W
3,269.00	8.79	95.17	3,245.13	9.27	331.07	1,542,676.43	3,472,030.89	40° 48' 38.050 N	103° 47' 41.014 W
3,361.00	8.75	88.32	3,336.06	8.84	345.06	1,542,676.27	3,472,044.89	40° 48' 38.046 N	103° 47' 40.832 W
3,454.00	9.82	89.69	3,427.84	9.09	360.06	1,542,676.81	3,472,059.89	40° 48' 38.048 N	103° 47' 40.637 W
3,546.00	10.11	89.81	3,518.45	9.16	375.98	1,542,677.18	3,472,075.80	40° 48' 38.049 N	103° 47' 40.430 W
3,638.00	9.49	89.97	3,609.10	9.19	391.64	1,542,677.51	3,472,091.46	40° 48' 38.049 N	103° 47' 40.226 W
3,730.00	8.64	77.20	3,699.96	10.73	405.97	1,542,679.32	3,472,105.75	40° 48' 38.064 N	103° 47' 40.040 W
3,823.00	8.48	88.48	3,791.93	12.46	419.64	1,542,681.31	3,472,119.38	40° 48' 38.081 N	103° 47' 39.862 W
3,915.00	8.44	82.55	3,882.94	13.51	433.11	1,542,682.63	3,472,132.84	40° 48' 38.092 N	103° 47' 39.687 W
4,006.00	8.16	81.34	3,972.98	15.35	446.12	1,542,684.72	3,472,145.80	40° 48' 38.110 N	103° 47' 39.518 W
4,098.00	7.96	78.51	4,064.07	17.60	458.81	1,542,687.21	3,472,158.46	40° 48' 38.132 N	103° 47' 39.352 W
4,190.00	8.88	78.19	4,155.08	20.32	472.01	1,542,690.19	3,472,171.60	40° 48' 38.159 N	103° 47' 39.181 W
4,282.00	8.31	82.44	4,246.05	22.65	485.55	1,542,692.78	3,472,185.09	40° 48' 38.182 N	103° 47' 39.005 W
4,373.00	7.80	81.19	4,336.15	24.46	498.17	1,542,694.83	3,472,197.67	40° 48' 38.200 N	103° 47' 38.841 W
4,466.00	6.73	80.15	4,428.40	26.36	509.78	1,542,696.95	3,472,209.24	40° 48' 38.219 N	103° 47' 38.690 W
4,559.00	7.02	89.95	4,520.74	27.30	520.83	1,542,698.10	3,472,220.27	40° 48' 38.228 N	103° 47' 38.546 W
4,651.00	5.93	85.11	4,612.15	27.71	531.19	1,542,698.71	3,472,230.62	40° 48' 38.232 N	103° 47' 38.411 W
4,743.00	3.78	79.24	4,703.81	28.68	538.90	1,542,699.83	3,472,238.32	40° 48' 38.242 N	103° 47' 38.311 W
4,835.00	2.90	92.19	4,795.66	29.16	544.21	1,542,700.41	3,472,243.61	40° 48' 38.246 N	103° 47' 38.242 W
4,926.00	0.96	141.14	4,886.61	28.48	546.99	1,542,699.78	3,472,246.40	40° 48' 38.240 N	103° 47' 38.206 W
5,017.00	0.81	196.28	4,977.60	27.26	547.28	1,542,698.57	3,472,246.72	40° 48' 38.228 N	103° 47' 38.202 W
5,109.00	11.81	182.00	5,068.90	17.20	546.77	1,542,688.50	3,472,246.40	40° 48' 38.128 N	103° 47' 38.209 W
5,201.00	21.04	179.52	5,157.05	-8.78	546.58	1,542,662.52	3,472,246.71	40° 48' 37.871 N	103° 47' 38.211 W
5,293.00	30.33	181.24	5,239.87	-48.60	546.22	1,542,622.70	3,472,247.11	40° 48' 37.478 N	103° 47' 38.216 W
5,385.00	37.27	177.89	5,316.28	-99.73	546.74	1,542,571.59	3,472,248.62	40° 48' 36.973 N	103° 47' 38.209 W
5,477.00	42.63	177.46	5,386.79	-158.74	549.15	1,542,512.64	3,472,252.16	40° 48' 36.390 N	103° 47' 38.178 W
5,512.00	46.12	178.21	5,411.80	-183.19	550.07	1,542,488.21	3,472,253.55	40° 48' 36.148 N	103° 47' 38.166 W
HL Cossing MD: 5512' TVD: 5411'									

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	WHITING PETROLEUM CORPORATION	**Local Co-ordinate Reference:**	Well 3108
Project:	Weld County, CO	**TVD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Site:	Horsetail #30F	**MD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Well:	3108	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,569.00	51.82	179.25	5,449.20	-226.16	551.00	1,542,445.26	3,472,255.31	40° 48' 35.724 N	103° 47' 38.154 W
5,661.00	62.24	181.26	5,499.20	-303.23	550.58	1,542,368.20	3,472,256.37	40° 48' 34.962 N	103° 47' 38.159 W
5,691.00	62.11	180.74	5,513.20	-329.76	550.12	1,542,341.67	3,472,256.42	40° 48' 34.700 N	103° 47' 38.165 W
5,722.00	62.02	181.19	5,527.73	-357.15	549.66	1,542,314.28	3,472,256.48	40° 48' 34.429 N	103° 47' 38.171 W
5,753.00	61.71	180.96	5,542.34	-384.48	549.14	1,542,286.94	3,472,256.50	40° 48' 34.159 N	103° 47' 38.178 W
HL Crossing MD: 5753' TVD: 5542'									
5,783.00	62.11	180.34	5,556.47	-410.94	548.84	1,542,260.48	3,472,256.70	40° 48' 33.898 N	103° 47' 38.182 W
5,814.00	64.04	179.31	5,570.51	-438.58	548.93	1,542,232.85	3,472,257.32	40° 48' 33.625 N	103° 47' 38.181 W
5,844.00	67.16	179.07	5,582.90	-465.89	549.32	1,542,205.55	3,472,258.23	40° 48' 33.355 N	103° 47' 38.176 W
5,875.00	71.30	179.03	5,593.89	-494.87	549.80	1,542,176.58	3,472,259.27	40° 48' 33.068 N	103° 47' 38.169 W
5,906.00	73.85	179.09	5,603.17	-524.44	550.28	1,542,147.03	3,472,260.32	40° 48' 32.776 N	103° 47' 38.163 W
5,936.00	75.43	179.58	5,611.12	-553.37	550.62	1,542,118.11	3,472,261.22	40° 48' 32.490 N	103° 47' 38.159 W
5,967.00	80.18	180.03	5,617.67	-583.66	550.72	1,542,087.83	3,472,261.90	40° 48' 32.191 N	103° 47' 38.157 W
5,997.00	85.14	180.26	5,621.50	-613.40	550.65	1,542,058.09	3,472,262.40	40° 48' 31.897 N	103° 47' 38.158 W
6,028.00	86.99	180.18	5,623.62	-644.33	550.53	1,542,027.17	3,472,262.87	40° 48' 31.592 N	103° 47' 38.160 W
6,035.00	87.47	180.42	5,623.96	-651.32	550.49	1,542,020.18	3,472,262.97	40° 48' 31.523 N	103° 47' 38.160 W
6,069.00	88.65	180.43	5,625.12	-685.30	550.24	1,541,986.20	3,472,263.37	40° 48' 31.187 N	103° 47' 38.164 W
7"									
6,105.00	89.89	180.44	5,625.58	-721.29	549.96	1,541,950.21	3,472,263.79	40° 48' 30.831 N	103° 47' 38.167 W
6,194.00	90.64	179.85	5,625.16	-810.29	549.74	1,541,861.22	3,472,265.27	40° 48' 29.952 N	103° 47' 38.170 W
6,284.00	90.90	179.48	5,623.95	-900.28	550.27	1,541,771.26	3,472,267.53	40° 48' 29.063 N	103° 47' 38.163 W
6,374.00	88.97	179.18	5,624.06	-990.27	551.32	1,541,681.30	3,472,270.31	40° 48' 28.173 N	103° 47' 38.150 W
6,463.00	88.84	178.97	5,625.76	-1,079.24	552.75	1,541,592.38	3,472,273.46	40° 48' 27.294 N	103° 47' 38.131 W
6,553.00	88.22	180.17	5,628.07	-1,169.21	553.43	1,541,502.44	3,472,275.86	40° 48' 26.405 N	103° 47' 38.122 W
6,642.00	89.98	181.58	5,629.46	-1,258.18	552.07	1,541,413.46	3,472,276.21	40° 48' 25.526 N	103° 47' 38.140 W
6,732.00	91.82	182.53	5,628.05	-1,348.11	548.84	1,541,323.49	3,472,274.71	40° 48' 24.638 N	103° 47' 38.182 W
6,822.00	90.51	182.84	5,626.22	-1,437.99	544.63	1,541,233.54	3,472,272.23	40° 48' 23.750 N	103° 47' 38.237 W
6,911.00	90.95	180.16	5,625.09	-1,526.94	542.30	1,541,144.56	3,472,271.61	40° 48' 22.871 N	103° 47' 38.267 W
7,001.00	91.25	179.61	5,623.36	-1,616.92	542.48	1,541,054.60	3,472,273.52	40° 48' 21.982 N	103° 47' 38.265 W
7,090.00	90.29	180.60	5,622.16	-1,705.91	542.32	1,540,965.62	3,472,275.06	40° 48' 21.102 N	103° 47' 38.267 W
7,180.00	89.45	179.60	5,622.37	-1,795.91	542.16	1,540,875.64	3,472,276.64	40° 48' 20.213 N	103° 47' 38.269 W
7,269.00	88.75	180.93	5,623.76	-1,884.90	541.75	1,540,786.66	3,472,277.93	40° 48' 19.334 N	103° 47' 38.274 W
7,357.00	90.55	180.71	5,624.30	-1,972.88	540.49	1,540,698.66	3,472,278.37	40° 48' 18.464 N	103° 47' 38.291 W
7,441.00	90.24	180.29	5,623.72	-2,056.88	539.76	1,540,614.67	3,472,279.25	40° 48' 17.634 N	103° 47' 38.300 W
7,529.00	90.02	179.69	5,623.52	-2,144.88	539.77	1,540,526.69	3,472,280.95	40° 48' 16.765 N	103° 47' 38.300 W
7,616.00	89.76	179.42	5,623.69	-2,231.87	540.45	1,540,439.72	3,472,283.30	40° 48' 15.905 N	103° 47' 38.291 W
7,706.00	89.49	179.43	5,624.28	-2,321.87	541.35	1,540,349.76	3,472,285.93	40° 48' 15.016 N	103° 47' 38.280 W
7,793.00	88.75	178.45	5,625.62	-2,408.84	542.96	1,540,262.84	3,472,289.21	40° 48' 14.157 N	103° 47' 38.259 W
7,879.00	90.29	179.93	5,626.34	-2,494.82	544.18	1,540,176.89	3,472,292.08	40° 48' 13.307 N	103° 47' 38.243 W
7,971.00	90.25	179.81	5,625.90	-2,586.82	544.38	1,540,084.91	3,472,294.06	40° 48' 12.398 N	103° 47' 38.240 W
8,063.00	89.98	179.15	5,625.72	-2,678.82	545.22	1,539,992.95	3,472,296.66	40° 48' 11.489 N	103° 47' 38.230 W
8,156.00	89.27	178.24	5,626.33	-2,771.79	547.34	1,539,900.04	3,472,300.56	40° 48' 10.570 N	103° 47' 38.202 W
8,248.00	89.67	179.50	5,627.18	-2,863.77	549.15	1,539,808.11	3,472,304.14	40° 48' 9.662 N	103° 47' 38.179 W
8,340.00	89.27	179.36	5,628.03	-2,955.76	550.07	1,539,716.16	3,472,306.83	40° 48' 8.753 N	103° 47' 38.167 W
8,432.00	89.19	180.07	5,629.27	-3,047.75	550.52	1,539,624.19	3,472,309.05	40° 48' 7.844 N	103° 47' 38.161 W
8,523.00	91.03	180.28	5,629.09	-3,138.74	550.25	1,539,533.21	3,472,310.52	40° 48' 6.945 N	103° 47' 38.164 W
8,614.00	90.46	179.60	5,627.91	-3,229.73	550.34	1,539,442.23	3,472,312.37	40° 48' 6.045 N	103° 47' 38.163 W
8,706.00	89.58	177.23	5,627.87	-3,321.69	552.89	1,539,350.34	3,472,316.68	40° 48' 5.137 N	103° 47' 38.130 W
8,797.00	93.24	179.70	5,625.64	-3,412.61	555.32	1,539,259.49	3,472,320.86	40° 48' 4.238 N	103° 47' 38.098 W
8,889.00	92.58	181.37	5,620.96	-3,504.48	554.47	1,539,167.62	3,472,321.77	40° 48' 3.331 N	103° 47' 38.110 W
8,981.00	91.96	181.94	5,617.32	-3,596.37	551.81	1,539,075.69	3,472,320.88	40° 48' 2.423 N	103° 47' 38.144 W
9,073.00	88.88	180.81	5,616.65	-3,688.33	549.60	1,538,983.71	3,472,320.44	40° 48' 1.514 N	103° 47' 38.173 W
9,165.00	88.13	180.55	5,619.05	-3,780.29	548.51	1,538,891.74	3,472,321.12	40° 48' 0.605 N	103° 47' 38.187 W
9,256.00	87.87	180.89	5,622.22	-3,871.23	547.37	1,538,800.80	3,472,321.72	40° 47' 59.707 N	103° 47' 38.202 W
9,349.00	88.71	178.72	5,625.00	-3,964.18	547.69	1,538,707.87	3,472,323.82	40° 47' 58.788 N	103° 47' 38.198 W

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	WHITING PETROLEUM CORPORATION	**Local Co-ordinate Reference:**	Well 3108
Project:	Weld County, CO	**TVD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Site:	Horsetail #30F	**MD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Well:	3108	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,442.00	90.07	179.80	5,625.99	-4,057.16	548.89	1,538,614.93	3,472,326.81	40° 47' 57.870 N	103° 47' 38.182 W
9,534.00	89.76	179.28	5,626.12	-4,149.16	549.63	1,538,522.97	3,472,329.32	40° 47' 56.961 N	103° 47' 38.173 W
9,626.00	91.34	181.31	5,625.24	-4,241.15	549.15	1,538,430.99	3,472,330.61	40° 47' 56.052 N	103° 47' 38.179 W
9,717.00	91.87	181.30	5,622.69	-4,332.09	547.08	1,538,340.02	3,472,330.29	40° 47' 55.153 N	103° 47' 38.206 W
9,808.00	89.89	181.13	5,621.30	-4,423.05	545.15	1,538,249.04	3,472,330.11	40° 47' 54.254 N	103° 47' 38.231 W
9,900.00	89.23	180.23	5,622.00	-4,515.04	544.06	1,538,157.04	3,472,330.78	40° 47' 53.345 N	103° 47' 38.245 W
9,992.00	90.77	181.20	5,622.00	-4,607.03	542.91	1,538,065.05	3,472,331.40	40° 47' 52.436 N	103° 47' 38.260 W
10,084.00	91.30	180.92	5,620.34	-4,699.00	541.21	1,537,973.07	3,472,331.47	40° 47' 51.528 N	103° 47' 38.282 W
10,176.00	90.55	180.24	5,618.85	-4,790.98	540.28	1,537,881.08	3,472,332.31	40° 47' 50.619 N	103° 47' 38.294 W
10,268.00	89.19	179.40	5,619.06	-4,882.98	540.57	1,537,789.11	3,472,334.36	40° 47' 49.710 N	103° 47' 38.291 W
10,361.00	92.00	181.62	5,618.10	-4,975.95	539.74	1,537,696.13	3,472,335.32	40° 47' 48.791 N	103° 47' 38.301 W
10,453.00	92.40	181.63	5,614.57	-5,067.85	537.13	1,537,604.21	3,472,334.48	40° 47' 47.883 N	103° 47' 38.335 W
10,545.00	90.59	179.88	5,612.17	-5,159.80	535.92	1,537,512.25	3,472,335.04	40° 47' 46.975 N	103° 47' 38.351 W
10,637.00	89.76	178.94	5,611.88	-5,251.79	536.87	1,537,420.29	3,472,337.75	40° 47' 46.066 N	103° 47' 38.339 W
10,729.00	88.88	177.91	5,612.98	-5,343.75	539.40	1,537,328.40	3,472,342.05	40° 47' 45.157 N	103° 47' 38.306 W
10,821.00	88.53	179.14	5,615.06	-5,435.70	541.77	1,537,236.52	3,472,346.18	40° 47' 44.248 N	103° 47' 38.275 W
10,913.00	91.22	181.42	5,615.26	-5,527.68	541.32	1,537,144.54	3,472,347.50	40° 47' 43.340 N	103° 47' 38.281 W
11,005.00	91.09	181.10	5,613.40	-5,619.64	539.29	1,537,052.56	3,472,347.25	40° 47' 42.431 N	103° 47' 38.307 W
11,097.00	90.29	180.33	5,612.29	-5,711.62	538.14	1,536,960.57	3,472,347.86	40° 47' 41.522 N	103° 47' 38.322 W
11,188.00	90.46	180.25	5,611.70	-5,802.62	537.68	1,536,869.58	3,472,349.15	40° 47' 40.623 N	103° 47' 38.328 W
11,280.00	89.85	179.82	5,611.45	-5,894.62	537.63	1,536,777.60	3,472,350.86	40° 47' 39.714 N	103° 47' 38.329 W
11,373.00	89.49	179.75	5,611.99	-5,987.62	537.98	1,536,684.62	3,472,353.00	40° 47' 38.795 N	103° 47' 38.325 W
11,465.00	88.97	179.61	5,613.22	-6,079.61	538.49	1,536,592.66	3,472,355.28	40° 47' 37.886 N	103° 47' 38.318 W
11,558.00	89.96	180.48	5,614.09	-6,172.60	538.42	1,536,499.68	3,472,357.00	40° 47' 36.967 N	103° 47' 38.319 W
11,650.00	91.78	180.23	5,612.69	-6,264.58	537.85	1,536,407.71	3,472,358.19	40° 47' 36.058 N	103° 47' 38.326 W
11,741.00	92.53	179.58	5,609.27	-6,355.52	538.00	1,536,316.79	3,472,360.09	40° 47' 35.160 N	103° 47' 38.325 W
11,832.00	91.22	179.26	5,606.29	-6,446.46	538.92	1,536,225.88	3,472,362.76	40° 47' 34.261 N	103° 47' 38.313 W
11,923.00	91.17	178.40	5,604.40	-6,537.42	540.78	1,536,134.97	3,472,366.36	40° 47' 33.362 N	103° 47' 38.288 W
12,016.00	91.08	177.70	5,602.57	-6,630.35	543.94	1,536,042.12	3,472,371.31	40° 47' 32.444 N	103° 47' 38.247 W
12,108.00	90.59	180.23	5,601.23	-6,722.32	545.60	1,535,950.20	3,472,374.74	40° 47' 31.535 N	103° 47' 38.226 W
12,200.00	88.79	177.67	5,601.73	-6,814.29	547.29	1,535,858.28	3,472,378.19	40° 47' 30.627 N	103° 47' 38.204 W
12,291.00	89.55	180.42	5,603.05	-6,905.26	548.80	1,535,767.36	3,472,381.46	40° 47' 29.728 N	103° 47' 38.184 W
12,384.00	89.80	181.45	5,603.57	-6,998.24	547.29	1,535,674.36	3,472,381.73	40° 47' 28.809 N	103° 47' 38.204 W
12,476.00	89.67	182.14	5,604.00	-7,090.20	544.40	1,535,582.37	3,472,380.61	40° 47' 27.900 N	103° 47' 38.241 W
12,567.00	89.45	181.62	5,604.70	-7,181.14	541.42	1,535,491.38	3,472,379.38	40° 47' 27.002 N	103° 47' 38.280 W
12,659.00	89.27	181.52	5,605.72	-7,273.10	538.90	1,535,399.39	3,472,378.62	40° 47' 26.093 N	103° 47' 38.313 W
12,751.00	90.43	181.91	5,605.97	-7,365.06	536.15	1,535,307.40	3,472,377.64	40° 47' 25.184 N	103° 47' 38.349 W
12,843.00	88.58	179.85	5,606.76	-7,457.04	534.73	1,535,215.41	3,472,377.99	40° 47' 24.276 N	103° 47' 38.367 W
12,935.00	88.15	179.57	5,609.39	-7,549.00	535.20	1,535,123.48	3,472,380.23	40° 47' 23.367 N	103° 47' 38.361 W
13,009.00	87.66	179.48	5,612.09	-7,622.95	535.81	1,535,049.55	3,472,382.26	40° 47' 22.636 N	103° 47' 38.353 W
13,051.00	87.66	179.48	5,613.81	-7,664.91	536.19	1,535,007.61	3,472,383.45	40° 47' 22.222 N	103° 47' 38.348 W
HL Crossing MD: 13051' TVD: 5614'									
13,060.00	87.66	179.48	5,614.17	-7,673.90	536.27	1,534,998.62	3,472,383.70	40° 47' 22.133 N	103° 47' 38.347 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,610.00	1,606.63	9 5/8"	9-5/8	12-1/4
6,069.00	5,625.12	7"	7	7-1/2

Company:	WHITING PETROLEUM CORPORATION	**Local Co-ordinate Reference:**	Well 3108
Project:	Weld County, CO	**TVD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Site:	Horsetail #30F	**MD Reference:**	GE 4780' + GE 17' @ 4797.00usft (Xtreme 18)
Well:	3108	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Multi User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
5,512.00	5,411.80	-183.19	550.07	HL Cossing MD: 5512' TVD: 5411'
5,753.00	5,542.34	-384.48	549.14	HL Crossing MD: 5753' TVD: 5542'
13,051.00	5,613.81	-7,664.91	536.19	HL Crossing MD: 13051' TVD: 5614'