

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Richter 34R-403**

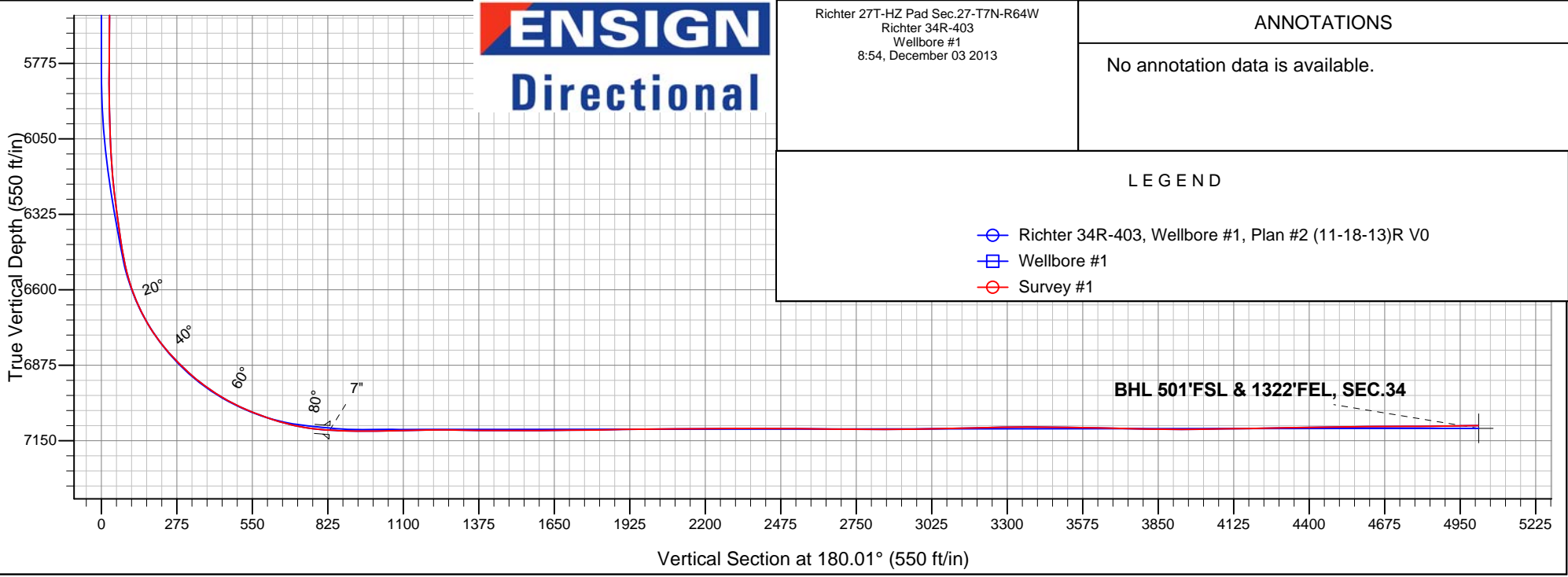
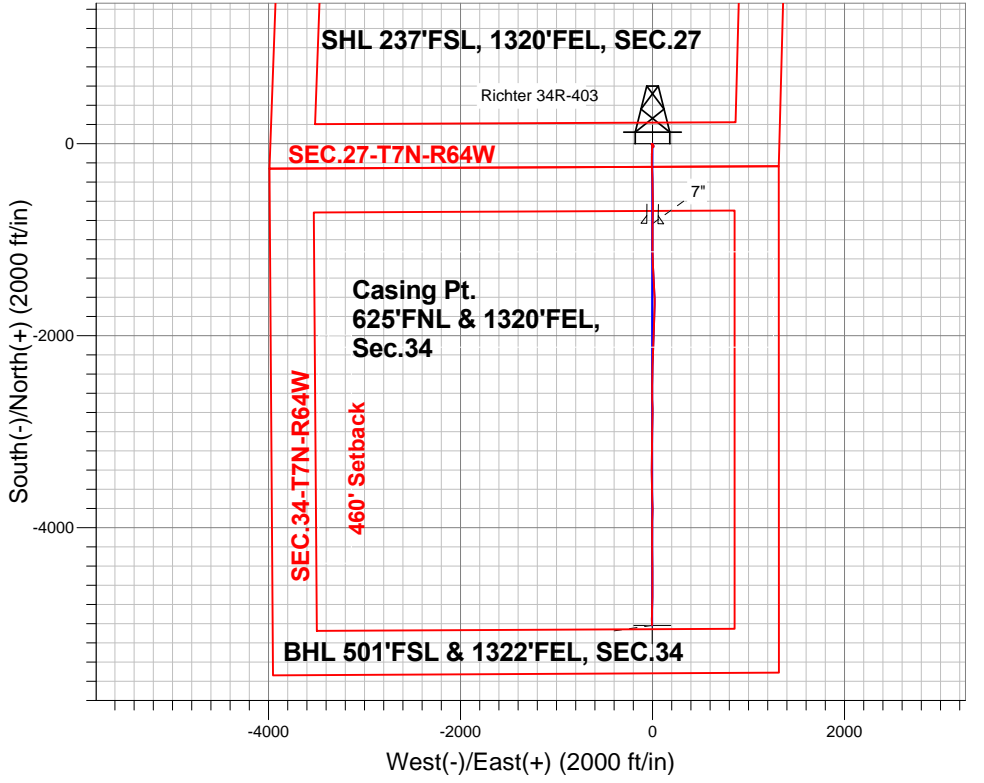
Surface Location: Richter 27T-HZ Pad Sec.27-T7N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4870.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1440180.36	3269189.75	40.537660	-104.531480	
		RKB - 13.5' WELL @ 4883.5ft (RKB - 13.5')				

FINAL SURVEY

Projected Bottom Hole Location
11729'MD 7094'TVD 5016'S & 5'W of SHL
90.7 degree Incl @ 179.7 degree AZM



Richter 27T-HZ Pad Sec.27-T7N-R64W
Richter 34R-403
Wellbore #1
8:54, December 03 2013

ANNOTATIONS

No annotation data is available.

LEGEND

- Richter 34R-403, Wellbore #1, Plan #2 (11-18-13)R V0
- Wellbore #1
- Survey #1



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.27-T7N-R64W

Richter 27T-HZ Pad Sec.27-T7N-R64W

Richter 34R-403

Wellbore #1

Survey: Survey #1

Standard Survey Report

03 December, 2013

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Richter 34R-403
Project:	SEC.27-T7N-R64W	TVD Reference:	WELL @ 4883.5ft (RKB - 13.5')
Site:	Richter 27T-HZ Pad Sec.27-T7N-R64W	MD Reference:	WELL @ 4883.5ft (RKB - 13.5')
Well:	Richter 34R-403	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.27-T7N-R64W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Richter 27T-HZ Pad Sec.27-T7N-R64W				
Site Position:		Northing:	1,440,175.74 ft	Latitude:	40.537650
From:	Lat/Long	Easting:	3,269,098.08 ft	Longitude:	-104.531810
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.63 °

Well	Richter 34R-403					
Well Position	+N-S	0.0 ft	Northing:	1,440,180.36 ft	Latitude:	40.537660
	+E-W	0.0 ft	Easting:	3,269,189.75 ft	Longitude:	-104.531480
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,870.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/30/2013	8.44	67.12	52,986

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	180.01	

Survey Program	Date	12/3/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
163.0	11,729.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.00	174.20	1.0	0.0	0.0	0.0	0.18	0.18	0.00	
SHL 237'FSL, 1320'FEL, SEC.27										
163.0	0.30	174.20	163.0	-0.4	0.0	0.4	0.18	0.18	0.00	
254.0	0.40	216.20	254.0	-0.9	-0.1	0.9	0.29	0.11	46.15	
345.0	0.20	282.80	345.0	-1.1	-0.5	1.1	0.41	-0.22	73.19	
436.0	0.30	262.10	436.0	-1.1	-0.9	1.1	0.15	0.11	-22.75	
527.0	0.50	264.00	527.0	-1.2	-1.5	1.2	0.22	0.22	2.09	
619.0	0.50	273.20	619.0	-1.2	-2.3	1.2	0.09	0.00	10.00	
710.0	1.00	270.70	710.0	-1.2	-3.5	1.2	0.55	0.55	-2.75	
801.0	1.10	233.60	801.0	-1.7	-5.0	1.7	0.74	0.11	-40.77	
883.0	1.30	229.60	882.9	-2.8	-6.3	2.8	0.26	0.24	-4.88	

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Site:	Richter 27T-HZ Pad Sec.27-T7N-R64W	MD Reference:	WELL @ 4883.5ft (RKB - 13.5')
Well:	Richter 34R-403	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
994.0	1.30	281.00	993.9	-3.4	-8.5	3.4	1.02	0.00	46.31
1,089.0	1.00	214.40	1,088.9	-3.8	-10.0	3.8	1.36	-0.32	-70.11
1,185.0	1.00	205.80	1,184.9	-5.3	-10.9	5.3	0.16	0.00	-8.96
1,280.0	1.10	130.40	1,279.9	-6.6	-10.5	6.6	1.35	0.11	-79.37
1,375.0	1.10	119.30	1,374.9	-7.7	-9.0	7.7	0.22	0.00	-11.68
1,470.0	1.00	129.70	1,469.8	-8.6	-7.6	8.6	0.23	-0.11	10.95
1,566.0	1.10	116.90	1,565.8	-9.6	-6.2	9.6	0.26	0.10	-13.33
1,661.0	1.10	101.40	1,660.8	-10.2	-4.4	10.2	0.31	0.00	-16.32
1,756.0	0.50	99.60	1,755.8	-10.4	-3.1	10.4	0.63	-0.63	-1.89
1,852.0	0.90	100.50	1,851.8	-10.6	-2.0	10.6	0.42	0.42	0.94
1,947.0	1.00	96.80	1,946.8	-10.9	-0.4	10.9	0.12	0.11	-3.89
2,042.0	0.40	105.30	2,041.8	-11.0	0.7	11.0	0.64	-0.63	8.95
2,138.0	0.90	110.70	2,137.8	-11.4	1.7	11.4	0.52	0.52	5.63
2,233.0	0.40	216.50	2,232.8	-11.9	2.2	11.9	1.14	-0.53	111.37
2,328.0	0.40	261.40	2,327.8	-12.2	1.7	12.2	0.32	0.00	47.26
2,423.0	0.20	250.10	2,422.8	-12.4	1.2	12.4	0.22	-0.21	-11.89
2,519.0	0.20	220.00	2,518.8	-12.5	1.0	12.5	0.11	0.00	-31.35
2,614.0	0.60	176.80	2,613.8	-13.2	0.9	13.2	0.50	0.42	-45.47
2,709.0	1.00	153.40	2,708.8	-14.4	1.3	14.4	0.54	0.42	-24.63
2,804.0	0.90	142.20	2,803.7	-15.7	2.1	15.7	0.22	-0.11	-11.79
2,899.0	0.20	90.50	2,898.7	-16.3	2.7	16.3	0.83	-0.74	-54.42
2,995.0	0.20	129.00	2,994.7	-16.4	3.0	16.4	0.14	0.00	40.10
3,090.0	0.20	338.20	3,089.7	-16.4	3.1	16.4	0.41	0.00	-158.74
3,185.0	0.40	35.10	3,184.7	-16.0	3.2	16.0	0.35	0.21	59.89
3,280.0	0.50	27.70	3,279.7	-15.3	3.6	15.3	0.12	0.11	-7.79
3,376.0	0.40	17.90	3,375.7	-14.6	3.9	14.6	0.13	-0.10	-10.21
3,471.0	0.50	48.50	3,470.7	-14.0	4.3	14.0	0.27	0.11	32.21
3,566.0	0.50	88.40	3,565.7	-13.8	5.1	13.8	0.36	0.00	42.00
3,661.0	0.40	85.90	3,660.7	-13.7	5.8	13.7	0.11	-0.11	-2.63
3,756.0	0.70	158.70	3,755.7	-14.2	6.3	14.2	0.73	0.32	76.63
3,852.0	0.60	139.90	3,851.7	-15.2	6.9	15.2	0.24	-0.10	-19.58
3,946.0	0.50	130.20	3,945.7	-15.8	7.5	15.8	0.15	-0.11	-10.32
4,042.0	0.70	154.70	4,041.7	-16.6	8.1	16.6	0.33	0.21	25.52
4,137.0	1.20	161.00	4,136.7	-18.1	8.6	18.1	0.54	0.53	6.63
4,232.0	1.20	167.70	4,231.7	-20.0	9.2	20.0	0.15	0.00	7.05
4,327.0	1.10	156.40	4,326.6	-21.8	9.8	21.8	0.26	-0.11	-11.89
4,423.0	0.90	164.10	4,422.6	-23.4	10.3	23.4	0.25	-0.21	8.02
4,518.0	1.10	196.80	4,517.6	-25.0	10.3	24.9	0.63	0.21	34.42
4,613.0	1.10	208.10	4,612.6	-26.6	9.6	26.6	0.23	0.00	11.89
4,708.0	0.90	184.20	4,707.6	-28.2	9.1	28.2	0.48	-0.21	-25.16
4,803.0	0.90	173.60	4,802.6	-29.7	9.1	29.7	0.18	0.00	-11.16
4,897.0	0.40	199.00	4,896.6	-30.7	9.1	30.7	0.60	-0.53	27.02
4,992.0	0.20	241.00	4,991.6	-31.1	8.9	31.1	0.30	-0.21	44.21
5,087.0	0.40	292.10	5,086.6	-31.1	8.4	31.1	0.33	0.21	53.79
5,182.0	0.40	255.60	5,181.6	-31.0	7.8	31.0	0.26	0.00	-38.42
5,277.0	0.40	261.20	5,276.6	-31.1	7.1	31.1	0.04	0.00	5.89
5,372.0	0.50	293.90	5,371.6	-31.0	6.4	31.0	0.29	0.11	34.42
5,467.0	0.70	314.60	5,466.6	-30.5	5.6	30.5	0.31	0.21	21.79
5,563.0	1.10	290.90	5,562.5	-29.7	4.3	29.7	0.56	0.42	-24.69
5,658.0	1.00	293.20	5,657.5	-29.1	2.7	29.1	0.11	-0.11	2.42
5,753.0	0.90	305.10	5,752.5	-28.3	1.4	28.3	0.23	-0.11	12.53
5,848.0	0.60	243.20	5,847.5	-28.1	0.3	28.1	0.86	-0.32	-65.16
5,944.0	1.30	215.30	5,943.5	-29.2	-0.8	29.2	0.85	0.73	-29.06
6,039.0	2.00	188.80	6,038.5	-31.7	-1.7	31.7	1.07	0.74	-27.89

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Site:	Richter 27T-HZ Pad Sec.27-T7N-R64W	MD Reference:	WELL @ 4883.5ft (RKB - 13.5')
Well:	Richter 34R-403	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,134.0	3.80	188.90	6,133.3	-36.5	-2.4	36.5	1.89	1.89	0.11
6,229.0	6.20	184.70	6,228.0	-44.7	-3.3	44.7	2.55	2.53	-4.42
6,325.0	7.70	183.70	6,323.3	-56.3	-4.1	56.3	1.57	1.56	-1.04
6,420.0	8.50	180.50	6,417.3	-69.7	-4.6	69.7	0.97	0.84	-3.37
6,467.0	9.80	182.10	6,463.7	-77.1	-4.8	77.1	2.82	2.77	3.40
6,515.0	12.70	182.40	6,510.8	-86.5	-5.2	86.5	6.04	6.04	0.63
6,562.0	15.60	181.10	6,556.3	-98.0	-5.5	98.0	6.21	6.17	-2.77
6,610.0	19.30	179.50	6,602.1	-112.4	-5.6	112.4	7.77	7.71	-3.33
6,657.0	23.30	180.70	6,645.9	-129.4	-5.6	129.4	8.56	8.51	2.55
6,706.0	27.30	181.10	6,690.2	-150.4	-5.9	150.4	8.17	8.16	0.82
6,753.0	31.00	181.20	6,731.2	-173.3	-6.4	173.3	7.87	7.87	0.21
6,801.0	35.20	180.00	6,771.4	-199.5	-6.7	199.5	8.86	8.75	-2.50
6,848.0	39.70	177.70	6,808.7	-228.0	-6.0	228.0	10.02	9.57	-4.89
6,896.0	43.20	177.20	6,844.7	-259.8	-4.6	259.8	7.32	7.29	-1.04
6,943.0	45.30	178.10	6,878.4	-292.5	-3.3	292.5	4.66	4.47	1.91
6,991.0	49.10	178.80	6,911.0	-327.7	-2.3	327.7	7.99	7.92	1.46
7,038.0	52.70	179.50	6,940.6	-364.2	-1.8	364.2	7.75	7.66	1.49
7,087.0	55.70	178.20	6,969.3	-403.9	-1.0	403.9	6.49	6.12	-2.65
7,134.0	59.80	177.50	6,994.4	-443.6	0.5	443.6	8.81	8.72	-1.49
7,182.0	63.40	178.40	7,017.2	-485.8	2.0	485.8	7.68	7.50	1.88
7,229.0	66.60	178.60	7,037.1	-528.4	3.1	528.4	6.82	6.81	0.43
7,277.0	69.10	179.30	7,055.1	-572.8	3.9	572.8	5.38	5.21	1.46
7,324.0	71.90	179.70	7,070.8	-617.1	4.3	617.1	6.01	5.96	0.85
7,372.0	74.30	180.90	7,084.8	-663.1	4.1	663.1	5.54	5.00	2.50
7,419.0	77.80	182.30	7,096.1	-708.6	2.8	708.6	7.99	7.45	2.98
7,467.0	82.00	180.90	7,104.5	-755.9	1.5	755.9	9.21	8.75	-2.92
7,504.0	85.50	181.10	7,108.6	-792.6	0.8	792.6	9.47	9.46	0.54
7,543.0	85.88	181.10	7,111.5	-831.5	0.1	831.5	0.98	0.98	0.00
7"									
7,555.0	86.00	181.10	7,112.3	-843.5	-0.1	843.5	0.98	0.98	0.00
7,573.0	87.70	180.40	7,113.3	-861.5	-0.4	861.5	10.21	9.44	-3.89
7,666.0	89.80	180.50	7,115.4	-954.4	-1.1	954.4	2.26	2.26	0.11
7,758.0	91.40	179.30	7,114.4	-1,046.4	-0.9	1,046.4	2.17	1.74	-1.30
7,849.0	91.40	178.20	7,112.2	-1,137.4	1.0	1,137.4	1.21	0.00	-1.21
7,945.0	90.40	178.80	7,110.7	-1,233.3	3.5	1,233.3	1.21	-1.04	0.63
8,040.0	88.60	176.10	7,111.5	-1,328.2	7.8	1,328.2	3.42	-1.89	-2.84
8,135.0	89.50	176.80	7,113.1	-1,423.0	13.7	1,423.0	1.20	0.95	0.74
8,230.0	90.50	177.90	7,113.1	-1,517.9	18.0	1,517.9	1.56	1.05	1.16
8,326.0	90.50	178.90	7,112.2	-1,613.9	20.7	1,613.9	1.04	0.00	1.04
8,421.0	90.00	181.40	7,111.8	-1,708.9	20.5	1,708.9	2.68	-0.53	2.63
8,516.0	90.90	182.30	7,111.1	-1,803.8	17.4	1,803.8	1.34	0.95	0.95
8,611.0	91.50	181.90	7,109.1	-1,898.7	13.9	1,898.7	0.76	0.63	-0.42
8,707.0	90.00	181.40	7,107.8	-1,994.7	11.2	1,994.7	1.65	-1.56	-0.52
8,802.0	90.40	181.60	7,107.5	-2,089.6	8.7	2,089.6	0.47	0.42	0.21
8,897.0	90.20	182.60	7,107.0	-2,184.6	5.2	2,184.6	1.07	-0.21	1.05
8,992.0	90.90	182.30	7,106.1	-2,279.5	1.1	2,279.5	0.80	0.74	-0.32
9,088.0	90.40	180.90	7,105.0	-2,375.4	-1.5	2,375.4	1.55	-0.52	-1.46
9,183.0	88.70	180.70	7,105.7	-2,470.4	-2.9	2,470.4	1.80	-1.79	-0.21
9,278.0	89.60	179.50	7,107.1	-2,565.4	-3.0	2,565.4	1.58	0.95	-1.26
9,373.0	89.80	178.90	7,107.6	-2,660.4	-1.7	2,660.4	0.67	0.21	-0.63
9,468.0	89.30	179.30	7,108.4	-2,755.4	-0.2	2,755.4	0.67	-0.53	0.42
9,564.0	90.00	180.50	7,109.0	-2,851.4	0.0	2,851.4	1.45	0.73	1.25
9,659.0	91.00	181.60	7,108.2	-2,946.3	-1.8	2,946.3	1.56	1.05	1.16

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
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9,754.0	91.40	180.90	7,106.2	-3,041.3	-3.9	3,041.3	0.85	0.42	-0.74
9,850.0	90.60	180.50	7,104.5	-3,137.3	-5.0	3,137.3	0.93	-0.83	-0.42
9,945.0	91.80	181.10	7,102.5	-3,232.3	-6.4	3,232.3	1.41	1.26	0.63
10,040.0	90.70	180.40	7,100.4	-3,327.2	-7.6	3,327.2	1.37	-1.16	-0.74
10,135.0	89.10	179.30	7,100.6	-3,422.2	-7.4	3,422.2	2.04	-1.68	-1.16
10,230.0	89.40	178.40	7,101.8	-3,517.2	-5.4	3,517.2	1.00	0.32	-0.95
10,326.0	88.90	179.50	7,103.3	-3,613.2	-3.7	3,613.2	1.26	-0.52	1.15
10,421.0	88.90	179.10	7,105.1	-3,708.1	-2.5	3,708.1	0.42	0.00	-0.42
10,517.0	88.40	179.70	7,107.3	-3,804.1	-1.5	3,804.1	0.81	-0.52	0.63
10,611.0	89.50	180.50	7,109.1	-3,898.1	-1.7	3,898.1	1.45	1.17	0.85
10,707.0	91.00	181.10	7,108.6	-3,994.1	-3.0	3,994.1	1.68	1.56	0.63
10,802.0	91.00	179.50	7,107.0	-4,089.0	-3.5	4,089.0	1.68	0.00	-1.68
10,897.0	90.70	180.20	7,105.6	-4,184.0	-3.3	4,184.0	0.80	-0.32	0.74
10,992.0	91.50	179.80	7,103.8	-4,279.0	-3.3	4,279.0	0.94	0.84	-0.42
11,087.0	90.80	179.80	7,101.8	-4,374.0	-2.9	4,374.0	0.74	-0.74	0.00
11,183.0	90.70	179.30	7,100.6	-4,470.0	-2.2	4,470.0	0.53	-0.10	-0.52
11,278.0	90.80	179.70	7,099.3	-4,565.0	-1.4	4,565.0	0.43	0.11	0.42
11,373.0	90.60	180.20	7,098.2	-4,660.0	-1.3	4,660.0	0.57	-0.21	0.53
11,468.0	89.60	180.90	7,098.0	-4,755.0	-2.2	4,755.0	1.28	-1.05	0.74
11,564.0	91.00	181.60	7,097.5	-4,850.9	-4.3	4,850.9	1.63	1.46	0.73
11,659.0	90.80	180.00	7,096.0	-4,945.9	-5.6	4,945.9	1.70	-0.21	-1.68
11,677.0	90.70	179.70	7,095.8	-4,963.9	-5.6	4,963.9	1.76	-0.56	-1.67
11,729.0	90.70	179.70	7,095.2	-5,015.9	-5.3	5,015.9	0.00	0.00	0.00
BHL 500'FSL & 1320'FEL, SEC.34									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,543.0	7,111.5	7"	7	7-1/2

Checked By: _____	Approved By: _____	Date: _____
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