

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Becker Ranch 5R-243**

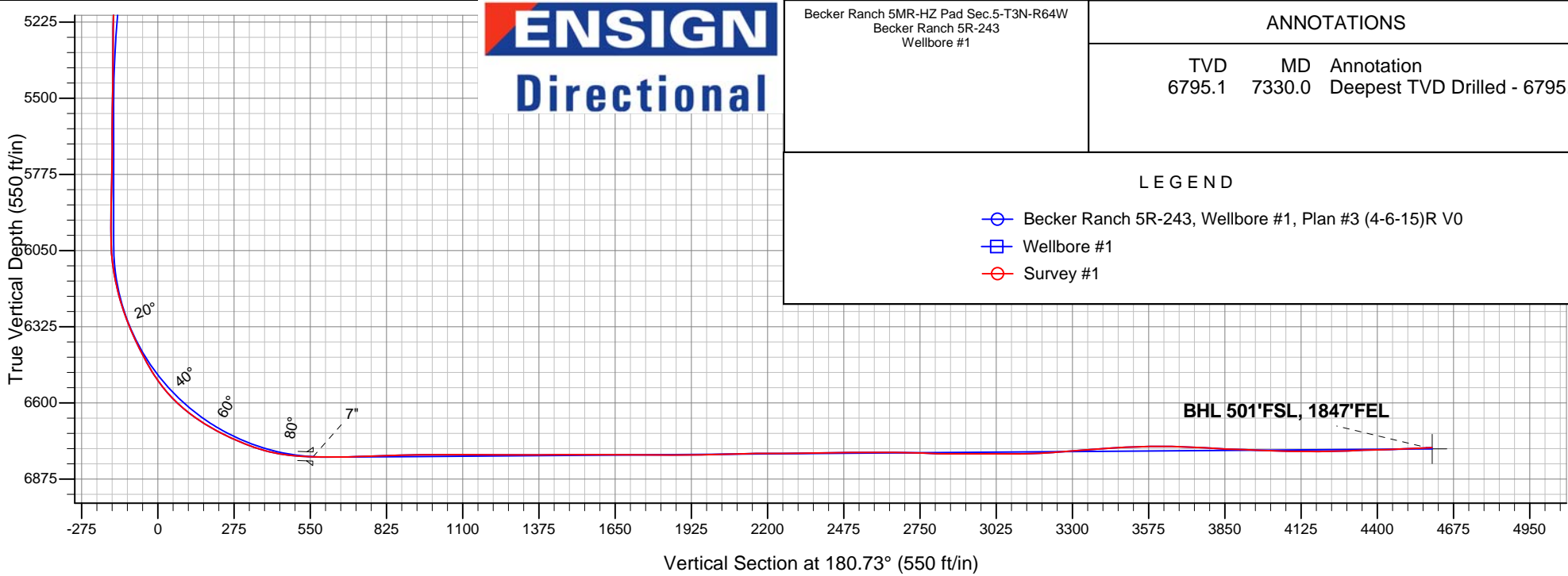
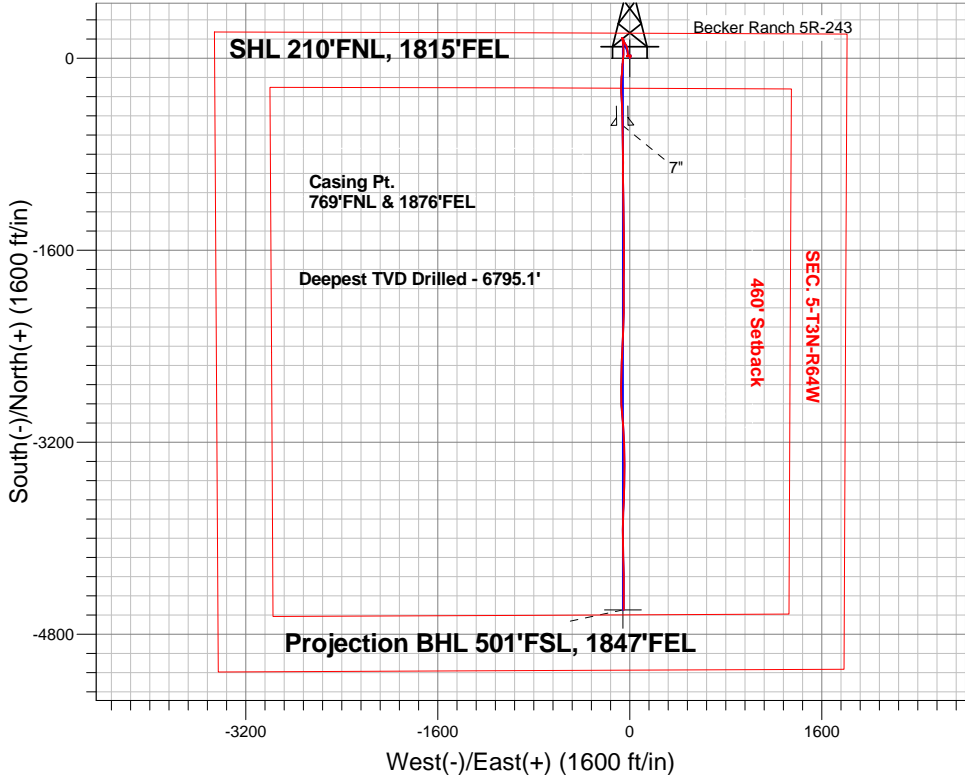
Surface Location: Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4781.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1339344.92	3259018.40	40.261180	-104.571870	
Ensign Rig #121 RKB - 13.5' WELL @ 4794 ft (Ensign Rig #121 RKB - 13')						

FINAL SURVEY

Projected Bottom Hole Location
11249'MD 6761'TVD 4597'S & 52'W of SHL
93.0 degree Incl @ 180.3 degree AZM



Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W Becker Ranch 5R-243 Wellbore #1	ANNOTATIONS		
	TVD	MD	Annotation
	6795.1	7330.0	Deepest TVD Drilled - 6795.1

LEGEND	
○	Becker Ranch 5R-243, Wellbore #1, Plan #3 (4-6-15)R V0
□	Wellbore #1
○	Survey #1



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.5-T3N-R64W

Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W

Becker Ranch 5R-243

Wellbore #1

Survey: Survey #1

Standard Survey Report

15 April, 2015

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5R-243
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4794.5ft (Ensign Rig #121 RKB - 13.5')
Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4794.5ft (Ensign Rig #121 RKB - 13.5')
Well:	Becker Ranch 5R-243	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.5-T3N-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	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W				
Site Position:		Northing:	1,339,344.02 ft	Latitude:	40.261180
From:	Lat/Long	Easting:	3,258,929.10 ft	Longitude:	-104.572190
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.60 °

Well	Becker Ranch 5R-243					
Well Position	+N-S	0.0 ft	Northing:	1,339,344.92 ft	Latitude:	40.261180
	+E-W	0.0 ft	Easting:	3,259,018.40 ft	Longitude:	-104.571870
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,781.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/5/2015	8.24	66.84	52,678

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	180.73	

Survey Program	Date	4/15/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
163.0	11,249.0	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	341.50	1.0	0.0	0.0	0.0	0.37	0.37	0.00	
SHL 210'FNL, 1815'FEL										
163.0	0.60	341.50	163.0	0.8	-0.3	-0.8	0.37	0.37	0.00	
257.0	0.70	359.80	257.0	1.9	-0.4	-1.8	0.24	0.11	19.47	
350.0	0.70	4.00	350.0	3.0	-0.4	-3.0	0.06	0.00	4.52	
443.0	0.80	357.70	443.0	4.2	-0.4	-4.2	0.14	0.11	-6.77	
537.0	0.60	3.90	537.0	5.3	-0.4	-5.3	0.23	-0.21	6.60	
630.0	0.70	10.50	630.0	6.4	-0.2	-6.4	0.13	0.11	7.10	
723.0	0.40	46.60	723.0	7.2	0.1	-7.2	0.48	-0.32	38.82	

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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)
817.0	0.60	56.80	817.0	7.7	0.8	-7.7	0.23	0.21	10.85
870.0	0.70	55.20	870.0	8.0	1.3	-8.0	0.19	0.19	-3.02
1,004.0	1.20	57.50	1,003.9	9.2	3.1	-9.3	0.37	0.37	1.72
1,191.0	0.80	32.90	1,190.9	11.4	5.5	-11.4	0.31	-0.21	-13.16
1,378.0	1.20	22.10	1,377.9	14.3	6.9	-14.4	0.24	0.21	-5.78
1,564.0	1.80	12.10	1,563.8	18.9	8.3	-19.0	0.35	0.32	-5.38
1,751.0	1.90	311.80	1,750.7	23.9	6.6	-24.0	0.99	0.05	-32.25
1,937.0	2.00	250.50	1,936.6	24.9	1.2	-24.9	1.07	0.05	-32.96
2,124.0	2.60	243.30	2,123.5	21.9	-5.7	-21.8	0.36	0.32	-3.85
2,310.0	1.40	252.10	2,309.4	19.3	-11.6	-19.1	0.66	-0.65	4.73
2,497.0	1.80	264.90	2,496.3	18.3	-16.7	-18.1	0.29	0.21	6.84
2,684.0	1.00	222.00	2,683.2	16.8	-20.7	-16.6	0.68	-0.43	-22.94
2,870.0	0.40	65.90	2,869.2	15.9	-21.2	-15.6	0.74	-0.32	-83.92
2,968.0	0.30	33.70	2,967.2	16.2	-20.7	-16.0	0.22	-0.10	-32.86
3,063.0	0.20	334.00	3,062.2	16.6	-20.7	-16.3	0.28	-0.11	-62.84
3,159.0	1.40	41.60	3,158.2	17.6	-20.0	-17.4	1.39	1.25	70.42
3,254.0	1.50	4.00	3,253.2	19.7	-19.1	-19.5	0.99	0.11	-39.58
3,350.0	3.70	13.20	3,349.1	24.0	-18.3	-23.8	2.33	2.29	9.58
3,445.0	3.10	11.40	3,443.9	29.5	-17.1	-29.3	0.64	-0.63	-1.89
3,541.0	4.00	355.10	3,539.7	35.4	-16.9	-35.2	1.40	0.94	-16.98
3,636.0	6.20	353.80	3,634.4	43.8	-17.7	-43.6	2.32	2.32	-1.37
3,731.0	6.10	354.70	3,728.8	53.9	-18.7	-53.7	0.15	-0.11	0.95
3,827.0	6.20	353.70	3,824.3	64.1	-19.8	-63.9	0.15	0.10	-1.04
3,922.0	6.20	356.30	3,918.7	74.4	-20.7	-74.1	0.30	0.00	2.74
4,018.0	6.70	343.80	4,014.1	84.9	-22.6	-84.6	1.55	0.52	-13.02
4,113.0	6.10	342.20	4,108.5	95.0	-25.7	-94.7	0.66	-0.63	-1.68
4,208.0	5.50	334.90	4,203.0	104.0	-29.1	-103.6	1.00	-0.63	-7.68
4,303.0	5.30	328.30	4,297.6	111.8	-33.4	-111.4	0.69	-0.21	-6.95
4,399.0	5.00	327.80	4,393.2	119.1	-37.9	-118.6	0.32	-0.31	-0.52
4,494.0	5.00	331.20	4,487.9	126.3	-42.1	-125.7	0.31	0.00	3.58
4,589.0	4.50	328.00	4,582.5	133.1	-46.1	-132.5	0.60	-0.53	-3.37
4,685.0	4.00	335.00	4,678.3	139.3	-49.5	-138.6	0.75	-0.52	7.29
4,780.0	3.80	345.20	4,773.0	145.3	-51.7	-144.7	0.76	-0.21	10.74
4,875.0	3.40	344.70	4,867.9	151.1	-53.3	-150.4	0.42	-0.42	-0.53
4,971.0	3.20	339.40	4,963.7	156.4	-55.0	-155.6	0.38	-0.21	-5.52
5,066.0	1.30	311.80	5,058.6	159.6	-56.7	-158.8	2.25	-2.00	-29.05
5,161.0	1.00	309.00	5,153.6	160.8	-58.1	-160.0	0.32	-0.32	-2.95
5,256.0	1.20	291.80	5,248.6	161.7	-59.7	-160.9	0.40	0.21	-18.11
5,351.0	1.00	291.60	5,343.6	162.4	-61.4	-161.6	0.21	-0.21	-0.21
5,447.0	0.80	327.50	5,439.6	163.2	-62.5	-162.4	0.61	-0.21	37.40
5,542.0	0.90	346.30	5,534.6	164.5	-63.1	-163.7	0.31	0.11	19.79
5,638.0	0.50	13.00	5,630.5	165.7	-63.2	-164.8	0.53	-0.42	27.81
5,733.0	0.40	328.00	5,725.5	166.3	-63.2	-165.5	0.38	-0.11	-47.37
5,828.0	1.00	359.50	5,820.5	167.5	-63.4	-166.6	0.73	0.63	33.16
5,924.0	1.50	359.30	5,916.5	169.5	-63.5	-168.7	0.52	0.52	-0.21
6,019.0	1.00	153.10	6,011.5	170.0	-63.1	-169.2	2.57	-0.53	161.90
6,115.0	8.10	169.30	6,107.1	162.6	-61.5	-161.8	7.44	7.40	16.88
6,210.0	14.40	173.70	6,200.3	144.3	-58.9	-143.5	6.69	6.63	4.63
6,306.0	20.60	171.90	6,291.8	115.7	-55.2	-115.0	6.48	6.46	-1.88
6,401.0	25.10	179.30	6,379.3	79.0	-52.6	-78.3	5.61	4.74	7.79
6,496.0	29.50	182.30	6,463.7	35.4	-53.3	-34.8	4.85	4.63	3.16

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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)
6,542.0	33.50	185.40	6,502.9	11.5	-55.0	-10.8	9.38	8.70	6.74
6,592.0	38.50	186.10	6,543.4	-17.8	-57.9	18.5	10.03	10.00	1.40
6,639.0	43.40	184.60	6,578.9	-48.4	-60.8	49.2	10.63	10.43	-3.19
6,686.0	48.20	183.50	6,611.6	-82.0	-63.1	82.8	10.35	10.21	-2.34
6,733.0	52.50	184.90	6,641.6	-118.1	-65.8	118.9	9.43	9.15	2.98
6,782.0	58.20	183.50	6,669.5	-158.3	-68.7	159.2	11.87	11.63	-2.86
6,829.0	60.80	183.30	6,693.3	-198.7	-71.1	199.6	5.54	5.53	-0.43
6,877.0	63.50	179.50	6,715.7	-241.1	-72.1	242.0	8.98	5.63	-7.92
6,924.0	66.30	178.10	6,735.7	-283.7	-71.3	284.6	6.54	5.96	-2.98
6,973.0	69.30	176.50	6,754.2	-329.0	-69.1	329.8	6.83	6.12	-3.27
7,020.0	73.80	177.20	6,769.1	-373.5	-66.7	374.3	9.68	9.57	1.49
7,068.0	78.60	177.90	6,780.5	-420.0	-64.7	420.8	10.10	10.00	1.46
7,115.0	82.70	178.40	6,788.1	-466.4	-63.2	467.2	8.79	8.72	1.06
7,163.0	87.00	178.80	6,792.4	-514.2	-62.0	514.9	9.00	8.96	0.83
7,208.0	88.13	178.88	6,794.4	-559.1	-61.1	559.8	2.52	2.51	0.18
7"									
7,330.0	91.20	179.10	6,795.1	-681.1	-59.0	681.8	2.52	2.51	0.18
Deepest TVD Drilled - 6795.1'									
7,425.0	92.30	179.30	6,792.2	-776.0	-57.6	776.7	1.18	1.16	0.21
7,520.0	91.60	180.20	6,788.9	-871.0	-57.2	871.6	1.20	-0.74	0.95
7,616.0	90.60	180.00	6,787.1	-966.9	-57.4	967.6	1.06	-1.04	-0.21
7,711.0	89.30	179.60	6,787.2	-1,061.9	-57.0	1,062.6	1.43	-1.37	-0.42
7,806.0	90.20	178.20	6,787.6	-1,156.9	-55.2	1,157.5	1.75	0.95	-1.47
7,902.0	89.90	178.80	6,787.5	-1,252.9	-52.7	1,253.5	0.70	-0.31	0.63
7,997.0	90.00	180.20	6,787.6	-1,347.9	-51.9	1,348.4	1.48	0.11	1.47
8,093.0	90.50	178.40	6,787.2	-1,443.9	-50.7	1,444.4	1.95	0.52	-1.88
8,188.0	89.60	180.00	6,787.1	-1,538.9	-49.4	1,539.4	1.93	-0.95	1.68
8,283.0	90.60	180.70	6,786.9	-1,633.9	-50.0	1,634.4	1.28	1.05	0.74
8,379.0	88.80	180.70	6,787.4	-1,729.8	-51.1	1,730.4	1.88	-1.88	0.00
8,474.0	90.00	180.20	6,788.4	-1,824.8	-51.9	1,825.3	1.37	1.26	-0.53
8,570.0	91.10	179.30	6,787.5	-1,920.8	-51.5	1,921.3	1.48	1.15	-0.94
8,665.0	91.10	180.20	6,785.7	-2,015.8	-51.0	2,016.3	0.95	0.00	0.95
8,761.0	91.50	181.20	6,783.5	-2,111.8	-52.2	2,112.3	1.12	0.42	1.04
8,856.0	89.60	181.70	6,782.6	-2,206.7	-54.6	2,207.2	2.07	-2.00	0.53
8,951.0	90.80	181.40	6,782.3	-2,301.7	-57.2	2,302.2	1.30	1.26	-0.32
9,047.0	91.10	182.60	6,780.7	-2,397.6	-60.5	2,398.2	1.29	0.31	1.25
9,142.0	90.20	182.40	6,779.6	-2,492.5	-64.7	2,493.1	0.97	-0.95	-0.21
9,238.0	90.70	182.30	6,778.8	-2,588.4	-68.6	2,589.1	0.53	0.52	-0.10
9,333.0	88.70	181.40	6,779.3	-2,683.4	-71.7	2,684.1	2.31	-2.11	-0.95
9,429.0	88.00	179.50	6,782.1	-2,779.3	-72.4	2,780.0	2.11	-0.73	-1.98
9,524.0	90.00	178.20	6,783.7	-2,874.3	-70.5	2,875.0	2.51	2.11	-1.37
9,619.0	89.70	174.70	6,784.0	-2,969.1	-64.7	2,969.7	3.70	-0.32	-3.68
9,715.0	90.00	175.60	6,784.2	-3,064.8	-56.5	3,065.2	0.99	0.31	0.94
9,810.0	91.90	177.20	6,782.7	-3,159.5	-50.6	3,159.9	2.61	2.00	1.68
9,905.0	94.80	177.90	6,777.1	-3,254.3	-46.5	3,254.6	3.14	3.05	0.74
10,000.0	94.40	180.00	6,769.5	-3,349.0	-44.8	3,349.3	2.24	-0.42	2.21
10,096.0	93.50	180.70	6,762.9	-3,444.7	-45.4	3,445.0	1.19	-0.94	0.73
10,191.0	91.80	181.40	6,758.5	-3,539.6	-47.1	3,539.9	1.93	-1.79	0.74
10,286.0	89.90	181.20	6,757.1	-3,634.6	-49.3	3,634.9	2.01	-2.00	-0.21
10,382.0	86.80	182.80	6,759.9	-3,730.5	-52.6	3,730.8	3.63	-3.23	1.67
10,477.0	87.00	182.30	6,765.0	-3,825.2	-56.8	3,825.6	0.57	0.21	-0.53
10,572.0	88.00	180.00	6,769.1	-3,920.1	-58.7	3,920.5	2.64	1.05	-2.42

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10,668.0	88.30	178.90	6,772.2	-4,016.0	-57.8	4,016.5	1.19	0.31	-1.15
10,763.0	88.30	179.10	6,775.1	-4,111.0	-56.2	4,111.4	0.21	0.00	0.21
10,858.0	91.60	177.90	6,775.1	-4,205.9	-53.7	4,206.3	3.70	3.47	-1.26
10,954.0	92.20	179.60	6,772.0	-4,301.9	-51.6	4,302.2	1.88	0.63	1.77
11,050.0	91.00	180.00	6,769.3	-4,397.8	-51.2	4,398.1	1.32	-1.25	0.42
11,145.0	92.60	180.00	6,766.3	-4,492.8	-51.2	4,493.1	1.68	1.68	0.00
11,194.0	93.00	180.30	6,763.9	-4,541.7	-51.4	4,542.0	1.02	0.82	0.61
11,249.0	93.00	180.30	6,761.0	-4,596.6	-51.7	4,596.9	0.00	0.00	0.00
BHL 500'FSL, 1854'FEL									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,208.0	6,794.4	7"	7	7-1/2

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
7,330.0	6,795.1	-681.1	-59.0	Deepest TVD Drilled - 6795.1'

Checked By: _____	Approved By: _____	Date: _____
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