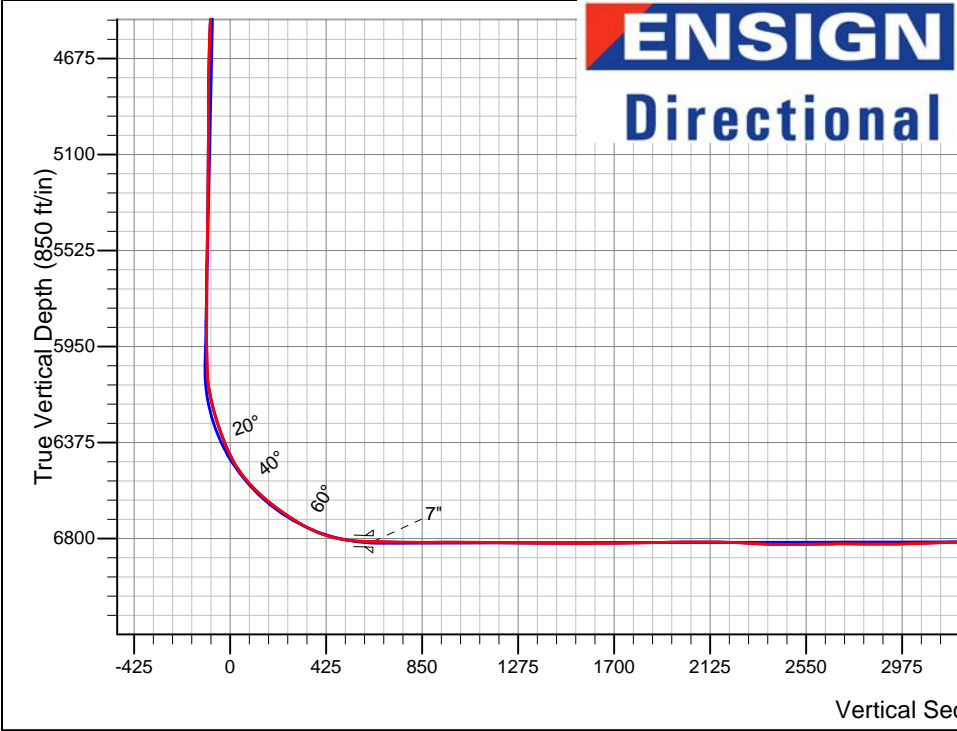
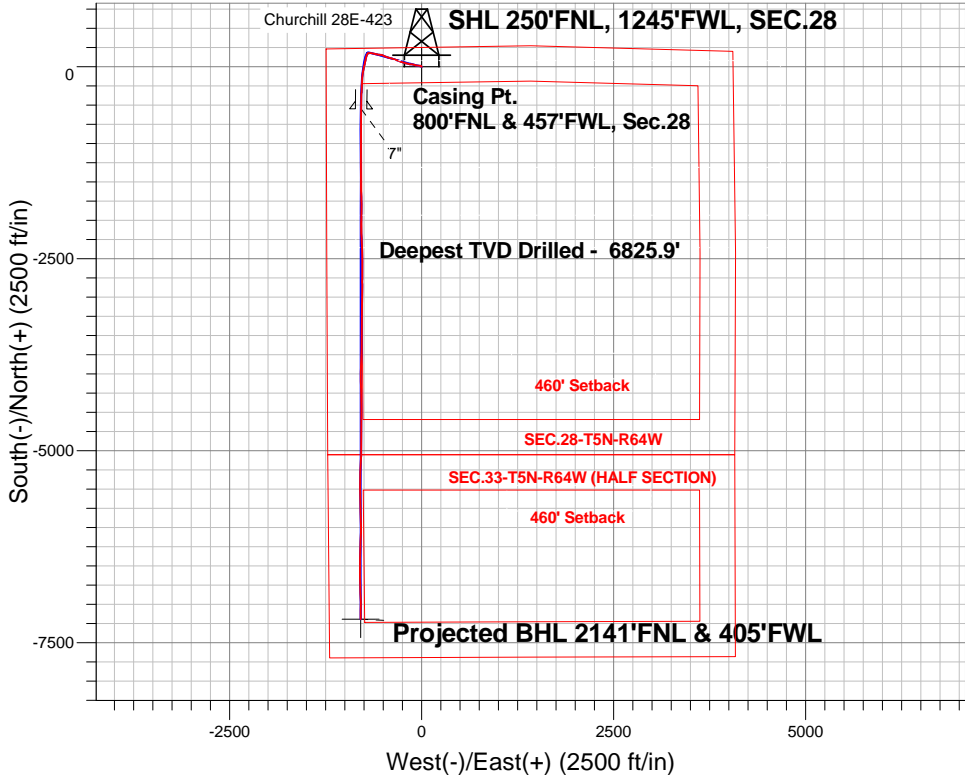


PETROLEUM DEVELOPMENT CORP Weld County CO

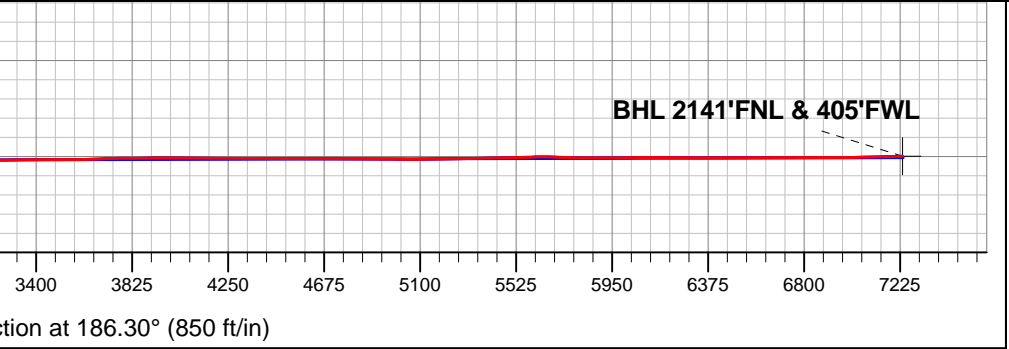
Well Name: Churchill 28E-423					
Surface Location: Churchill 28J-HZ Pad Sec.28-T5N-R64W					
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone					
Ground Elevation: 4635.0					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1381533.74	3261934.18	40.376900	-104.559820
Ensign Rig# 136 RKB - 13' WELL @ 4648ft (Ensign Rig# 136 RKB - 13')					
Slot					

FINAL SURVEY

Projected Bottom Hole Location
13920'MD 6798'TVD 7193'S & 794'W of SHL
91.7 degree Incl @ 180.3 degree AZM



Churchill 28J-HZ Pad Sec.28-T5N-R64W Churchill 28E-423 Wellbore #1	ANNOTATIONS		
	TVD 6825.9	MD 9104.0	Annotation Deepest TVD Drilled
LEGEND			
✕ Churchill 28E-423, Wellbore #1, Plan #3 (3-3-15)R V0			
□ Wellbore #1			
○ Survey #1			





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

Churchill 28J-HZ Pad Sec.28-T5N-R64W

Churchill 28E-423

Wellbore #1

Survey: Survey #1

Final Survey

16 March, 2015

Company:	PETROLEUM DEVELOPMENT CORP Weld Cou	Local Co-ordinate Reference:	Well Churchill 28E-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Well:	Churchill 28E-423	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	landmark

Project	SEC.28-T5N-R64W, Weld County, Colorado		
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	Churchill 28J-HZ Pad Sec.28-T5N-R64W				
Site Position:		Northing:	1,381,533.43ft	Latitude:	40.376900
From:	Lat/Long	Easting:	3,261,903.54ft	Longitude:	-104.559930
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.61 °

Well	Churchill 28E-423					
Well Position	+N/-S	0.0 ft	Northing:	1,381,533.74 ft	Latitude:	40.376900
	+E/-W	0.0 ft	Easting:	3,261,934.18 ft	Longitude:	-104.559820
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,635.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/27/2015	8.25	66.94	52,752

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	186.30	

Survey Program	Date	3/16/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
69.0	13,920.0	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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00
1.0	0.01	310.90	1.0	0.0	0.0	0.0	0.0	1.45
SHL 250'FNL, 1245'FWL, SEC.28								
69.0	1.00	310.90	69.0	0.4	-0.5	-0.3	1.45	
157.0	0.90	319.90	157.0	1.4	-1.5	-1.3	0.20	
252.0	0.90	338.50	252.0	2.7	-2.2	-2.4	0.31	
345.0	0.80	340.50	345.0	4.0	-2.7	-3.7	0.11	
439.0	0.90	347.90	439.0	5.3	-3.1	-5.0	0.16	
532.0	1.40	312.90	531.9	6.8	-4.1	-6.3	0.90	
626.0	2.20	296.90	625.9	8.4	-6.5	-7.6	1.00	
720.0	3.40	291.40	719.8	10.2	-10.7	-9.0	1.31	
813.0	5.80	278.80	812.5	12.0	-17.9	-9.9	2.78	

Company:	PETROLEUM DEVELOPMENT CORP Weld Cou	Local Co-ordinate Reference:	Well Churchill 28E-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Well:	Churchill 28E-423	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)	
880.0	6.20	277.20	879.1	12.9	-24.9	-10.1	0.65	
937.0	6.60	276.70	935.7	13.7	-31.2	-10.2	0.71	
1,032.0	6.20	277.00	1,030.2	15.0	-41.7	-10.3	0.42	
1,127.0	6.10	277.20	1,124.6	16.2	-51.8	-10.4	0.11	
1,223.0	5.90	278.20	1,220.1	17.6	-61.7	-10.7	0.24	
1,316.0	5.50	276.30	1,312.6	18.7	-70.9	-10.8	0.48	
1,413.0	6.00	281.90	1,409.1	20.3	-80.5	-11.3	0.77	
1,506.0	6.20	287.60	1,501.6	22.8	-90.0	-12.8	0.69	
1,600.0	7.70	289.10	1,594.9	26.4	-100.8	-15.2	1.61	
1,694.0	8.20	286.90	1,688.0	30.4	-113.2	-17.8	0.62	
1,787.0	6.90	270.20	1,780.2	32.4	-125.1	-18.4	2.73	
1,881.0	8.10	270.20	1,873.4	32.4	-137.4	-17.1	1.28	
1,975.0	8.70	276.00	1,966.4	33.2	-151.1	-16.4	1.10	
2,068.0	9.60	288.10	2,058.2	36.3	-165.4	-17.9	2.28	
2,162.0	8.80	290.40	2,151.0	41.3	-179.6	-21.3	0.94	
2,255.0	6.50	271.40	2,243.2	43.9	-191.6	-22.6	3.64	
2,349.0	9.40	285.10	2,336.3	46.0	-204.3	-23.3	3.66	
2,443.0	9.30	287.60	2,429.0	50.3	-219.0	-26.0	0.44	
2,536.0	8.30	277.90	2,521.0	53.5	-232.8	-27.6	1.92	
2,613.0	7.00	289.00	2,597.3	55.8	-242.7	-28.8	2.55	
2,703.0	7.20	288.40	2,686.6	59.4	-253.2	-31.2	0.24	
2,794.0	6.80	285.50	2,776.9	62.6	-263.9	-33.3	0.59	
2,884.0	5.70	292.80	2,866.4	65.7	-273.1	-35.4	1.51	
2,974.0	6.90	300.60	2,955.8	70.2	-281.9	-38.9	1.63	
3,065.0	8.40	297.80	3,046.0	76.1	-292.5	-43.6	1.70	
3,155.0	7.00	287.90	3,135.2	80.9	-303.5	-47.1	2.14	
3,246.0	5.80	281.10	3,225.6	83.5	-313.3	-48.6	1.56	
3,336.0	5.80	280.90	3,315.2	85.2	-322.2	-49.3	0.02	
3,427.0	7.00	292.00	3,405.6	88.1	-331.9	-51.2	1.89	
3,517.0	8.50	289.30	3,494.8	92.4	-343.2	-54.2	1.71	
3,607.0	7.90	285.60	3,583.9	96.3	-355.5	-56.7	0.89	
3,697.0	10.00	293.00	3,672.8	101.0	-368.6	-59.9	2.66	
3,787.0	10.30	289.10	3,761.4	106.7	-383.4	-63.9	0.83	
3,878.0	9.90	286.50	3,850.9	111.5	-398.6	-67.1	0.67	
3,968.0	8.60	281.20	3,939.8	115.0	-412.6	-69.1	1.73	
4,059.0	7.60	277.70	4,029.9	117.2	-425.3	-69.8	1.22	
4,150.0	8.20	284.60	4,120.0	119.6	-437.5	-70.9	1.23	
4,240.0	8.60	287.00	4,209.0	123.2	-450.2	-73.1	0.59	
4,331.0	8.70	296.90	4,299.0	128.3	-462.8	-76.7	1.64	
4,421.0	8.00	299.70	4,388.1	134.5	-474.3	-81.6	0.90	
4,512.0	7.70	296.20	4,478.2	140.3	-485.3	-86.2	0.62	
4,602.0	6.90	289.30	4,567.5	144.8	-495.8	-89.5	1.32	
4,692.0	6.30	294.80	4,656.9	148.6	-505.4	-92.3	0.97	
4,782.0	6.80	281.80	4,746.3	151.8	-515.1	-94.4	1.73	

Company:	PETROLEUM DEVELOPMENT CORP Weld Cou	Local Co-ordinate Reference:	Well Churchill 28E-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Well:	Churchill 28E-423	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)
4,873.0	8.60	280.90	4,836.5	154.2	-527.0	-95.4	1.98
4,963.0	8.30	277.70	4,925.5	156.3	-540.1	-96.1	0.62
5,054.0	7.30	276.10	5,015.7	157.8	-552.3	-96.3	1.12
5,144.0	8.40	273.50	5,104.8	158.8	-564.6	-95.9	1.28
5,235.0	8.50	282.80	5,194.8	160.7	-577.8	-96.3	1.50
5,325.0	7.70	277.00	5,283.9	162.9	-590.3	-97.2	1.27
5,415.0	7.50	290.60	5,373.1	165.7	-601.7	-98.7	2.01
5,506.0	6.40	283.30	5,463.5	169.0	-612.2	-100.8	1.55
5,597.0	7.60	282.80	5,553.8	171.5	-623.0	-102.1	1.32
5,687.0	6.60	277.90	5,643.1	173.5	-634.0	-102.9	1.30
5,777.0	7.60	278.10	5,732.4	175.1	-645.0	-103.2	1.11
5,868.0	8.70	278.20	5,822.5	176.9	-657.7	-103.7	1.21
5,958.0	7.60	274.00	5,911.6	178.3	-670.4	-103.6	1.39
6,003.0	7.40	270.00	5,956.2	178.5	-676.3	-103.2	1.24
6,048.0	7.50	271.40	6,000.8	178.6	-682.1	-102.6	0.46
6,093.0	8.60	264.90	6,045.4	178.3	-688.4	-101.7	3.17
6,139.0	9.50	246.80	6,090.8	176.5	-695.3	-99.2	6.46
6,184.0	11.30	223.80	6,135.1	171.9	-701.8	-93.8	9.97
6,230.0	13.50	209.30	6,180.0	163.9	-707.5	-85.3	8.25
6,275.0	15.80	200.60	6,223.6	153.6	-712.3	-74.5	7.06
6,320.0	17.50	197.90	6,266.7	141.4	-716.5	-62.0	4.15
6,365.0	19.30	195.30	6,309.4	127.8	-720.5	-48.0	4.40
6,410.0	20.80	194.10	6,351.6	112.9	-724.5	-32.7	3.46
6,455.0	22.20	192.50	6,393.5	96.9	-728.2	-16.4	3.37
6,501.0	26.90	191.40	6,435.3	78.2	-732.2	2.6	10.27
6,546.0	31.70	193.50	6,474.6	56.7	-737.0	24.5	10.91
6,591.0	36.20	193.50	6,511.9	32.2	-742.8	49.5	10.00
6,636.0	41.20	193.30	6,547.0	4.9	-749.3	77.4	11.11
6,681.0	45.30	192.10	6,579.8	-25.2	-756.1	108.0	9.29
6,727.0	48.50	189.50	6,611.2	-58.2	-762.4	141.5	8.09
6,772.0	50.80	187.40	6,640.3	-92.1	-767.4	175.7	6.23
6,817.0	53.30	185.40	6,668.0	-127.3	-771.3	211.2	6.57
6,862.0	56.30	183.70	6,694.0	-164.0	-774.3	248.0	7.35
6,907.0	58.00	182.30	6,718.4	-201.7	-776.2	285.7	4.59
6,953.0	60.90	181.70	6,741.7	-241.3	-777.6	325.2	6.40
6,998.0	64.50	183.20	6,762.4	-281.3	-779.3	365.1	8.53
7,043.0	70.30	183.70	6,779.7	-322.7	-781.8	406.6	12.93
7,088.0	75.70	182.60	6,792.8	-365.7	-784.2	449.5	12.23
7,134.0	80.10	181.40	6,802.5	-410.6	-785.8	494.4	9.90
7,179.0	84.10	180.50	6,808.6	-455.2	-786.5	538.7	9.11
7,224.0	87.70	180.70	6,811.9	-500.1	-787.0	583.4	8.01
7,274.0	88.44	180.90	6,813.5	-550.0	-787.7	633.1	1.54
7"							
7,298.0	88.80	181.00	6,814.1	-574.0	-788.1	657.0	1.54
7,392.0	89.20	180.30	6,815.8	-668.0	-789.1	750.5	0.86

Company:	PETROLEUM DEVELOPMENT CORP Weld Cou	Local Co-ordinate Reference:	Well Churchill 28E-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Well:	Churchill 28E-423	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)
7,485.0	89.40	179.10	6,816.9	-761.0	-788.6	842.9	1.31
7,579.0	91.30	179.80	6,816.3	-855.0	-787.7	936.2	2.15
7,673.0	89.50	180.50	6,815.7	-949.0	-788.0	1,029.7	2.05
7,766.0	89.40	180.20	6,816.6	-1,042.0	-788.5	1,122.2	0.34
7,860.0	89.30	180.50	6,817.6	-1,135.9	-789.1	1,215.7	0.34
7,953.0	89.10	180.50	6,818.9	-1,228.9	-789.9	1,308.2	0.22
8,047.0	90.00	181.00	6,819.7	-1,322.9	-791.2	1,401.7	1.10
8,141.0	88.90	179.50	6,820.6	-1,416.9	-791.6	1,495.2	1.98
8,234.0	90.90	179.60	6,820.7	-1,509.9	-790.8	1,587.6	2.15
8,328.0	89.90	177.70	6,820.1	-1,603.9	-788.6	1,680.7	2.28
8,421.0	90.80	177.50	6,819.5	-1,696.8	-784.7	1,772.6	0.99
8,515.0	91.80	180.30	6,817.4	-1,790.7	-782.9	1,865.8	3.16
8,609.0	90.80	180.70	6,815.2	-1,884.7	-783.8	1,959.3	1.15
8,702.0	89.60	180.70	6,814.9	-1,977.7	-784.9	2,051.9	1.29
8,796.0	89.20	180.20	6,815.9	-2,071.7	-785.6	2,145.4	0.68
8,889.0	88.50	179.10	6,817.8	-2,164.7	-785.1	2,237.7	1.40
8,983.0	86.40	176.30	6,821.9	-2,258.5	-781.3	2,330.6	3.72
9,104.0	89.90	177.00	6,825.9	-2,379.2	-774.2	2,449.8	2.95
Deepest TVD Drilled							
9,195.0	90.60	178.90	6,825.5	-2,470.1	-771.0	2,539.8	2.23
9,285.0	91.50	180.90	6,823.8	-2,560.1	-770.8	2,629.2	2.44
9,376.0	89.80	179.60	6,822.8	-2,651.1	-771.2	2,719.7	2.35
9,466.0	89.80	181.90	6,823.1	-2,741.1	-772.4	2,809.3	2.56
9,556.0	89.50	178.40	6,823.6	-2,831.1	-772.6	2,898.7	3.90
9,647.0	91.30	179.50	6,823.0	-2,922.0	-771.0	2,989.0	2.32
9,737.0	91.90	181.00	6,820.5	-3,012.0	-771.4	3,078.5	1.79
9,828.0	92.60	181.40	6,816.9	-3,102.9	-773.3	3,169.0	0.89
9,918.0	90.30	182.30	6,814.6	-3,192.8	-776.2	3,258.7	2.74
10,008.0	90.70	181.40	6,813.9	-3,282.8	-779.1	3,348.4	1.09
10,098.0	90.30	181.00	6,813.1	-3,372.8	-780.9	3,438.1	0.63
10,189.0	89.60	178.20	6,813.1	-3,463.7	-780.3	3,528.4	3.17
10,279.0	91.50	180.30	6,812.3	-3,553.7	-779.1	3,617.8	3.15
10,369.0	92.40	181.20	6,809.2	-3,643.7	-780.3	3,707.3	1.41
10,459.0	90.00	181.60	6,807.3	-3,733.6	-782.5	3,796.9	2.70
10,550.0	91.30	183.00	6,806.3	-3,824.5	-786.2	3,887.7	2.10
10,640.0	89.30	181.90	6,805.8	-3,914.4	-790.0	3,977.5	2.54
10,731.0	89.40	179.80	6,806.9	-4,005.4	-791.4	4,068.1	2.31
10,821.0	89.90	179.30	6,807.4	-4,095.4	-790.7	4,157.4	0.79
10,912.0	90.00	179.30	6,807.5	-4,186.4	-789.5	4,247.8	0.11
11,002.0	90.00	179.10	6,807.5	-4,276.4	-788.3	4,337.1	0.22
11,093.0	89.60	177.40	6,807.8	-4,367.3	-785.5	4,427.2	1.92
11,183.0	89.30	178.40	6,808.7	-4,457.3	-782.2	4,516.2	1.16
11,273.0	90.10	181.20	6,809.1	-4,547.3	-781.9	4,605.6	3.24
11,363.0	89.70	182.30	6,809.3	-4,637.2	-784.6	4,695.3	1.30

Company:	PETROLEUM DEVELOPMENT CORP Weld Cou	Local Co-ordinate Reference:	Well Churchill 28E-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648ft (Ensign Rig# 136 RKB - 13')
Well:	Churchill 28E-423	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)
11,454.0	89.70	180.70	6,809.8	-4,728.2	-787.0	4,786.0	1.76
11,545.0	89.60	178.60	6,810.3	-4,819.2	-786.5	4,876.4	2.31
11,635.0	89.60	178.80	6,811.0	-4,909.2	-784.4	4,965.6	0.22
11,725.0	88.80	180.30	6,812.2	-4,999.1	-783.7	5,054.9	1.89
11,816.0	91.80	185.10	6,811.7	-5,090.0	-788.0	5,145.7	6.22
11,906.0	91.50	183.30	6,809.2	-5,179.7	-794.6	5,235.6	2.03
11,997.0	90.70	180.50	6,807.4	-5,270.6	-797.6	5,326.3	3.20
12,087.0	90.70	179.50	6,806.3	-5,360.6	-797.6	5,415.8	1.11
12,178.0	91.70	181.70	6,804.4	-5,451.6	-798.6	5,506.3	2.66
12,268.0	91.60	181.00	6,801.8	-5,541.5	-800.7	5,595.9	0.79
12,358.0	88.10	178.40	6,802.0	-5,631.5	-800.2	5,685.3	4.84
12,449.0	88.50	177.50	6,804.7	-5,722.4	-797.0	5,775.3	1.08
12,539.0	90.10	178.40	6,805.8	-5,812.3	-793.7	5,864.3	2.04
12,630.0	90.00	177.00	6,805.8	-5,903.3	-790.1	5,954.3	1.54
12,720.0	91.20	181.90	6,804.8	-5,993.2	-789.2	6,043.6	5.60
12,811.0	89.40	179.50	6,804.3	-6,084.2	-790.3	6,134.2	3.30
12,901.0	90.20	184.60	6,804.7	-6,174.1	-793.5	6,223.9	5.74
12,991.0	89.30	182.60	6,805.1	-6,263.9	-799.2	6,313.8	2.44
13,082.0	89.90	180.90	6,805.7	-6,354.9	-802.0	6,404.5	1.98
13,172.0	89.80	180.30	6,805.9	-6,444.9	-802.9	6,494.1	0.68
13,263.0	90.70	179.60	6,805.5	-6,535.9	-802.8	6,584.5	1.25
13,353.0	91.10	179.10	6,804.1	-6,625.9	-801.8	6,673.8	0.71
13,443.0	89.30	178.60	6,803.8	-6,715.8	-800.0	6,763.1	2.08
13,534.0	90.00	179.10	6,804.4	-6,806.8	-798.2	6,853.3	0.95
13,625.0	89.70	176.50	6,804.6	-6,897.8	-794.7	6,943.3	2.88
13,715.0	91.80	180.50	6,803.4	-6,987.7	-792.3	7,032.4	5.02
13,806.0	91.20	180.90	6,801.0	-7,078.7	-793.5	7,123.0	0.79
13,867.0	91.70	180.30	6,799.5	-7,139.6	-794.1	7,183.7	1.28
13,920.0	91.70	180.30	6,797.9	-7,192.6	-794.4	7,236.3	0.00

BHL 2143'FNL, 405'FWL, SEC.33

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,274.0	6,813.5	7"	7	7-1/2	

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
9,104.0	6,825.9	-2,379.2	-774.2	Deepest TVD Drilled

Checked By: _____ Approved By: _____ Date: _____