

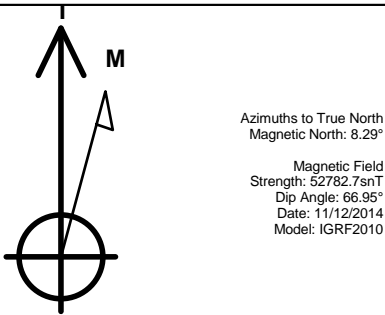
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Churchill 28M-343

Surface Location: Churchill 28J-HZ Pad Sec.28-T5N-R64W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4633.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1381538.98 3262084.58 40.376910 -104.559280  
Ensign Rig# 136 RKB - 12.5' WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')

WELLBORE TARGET DETAILS

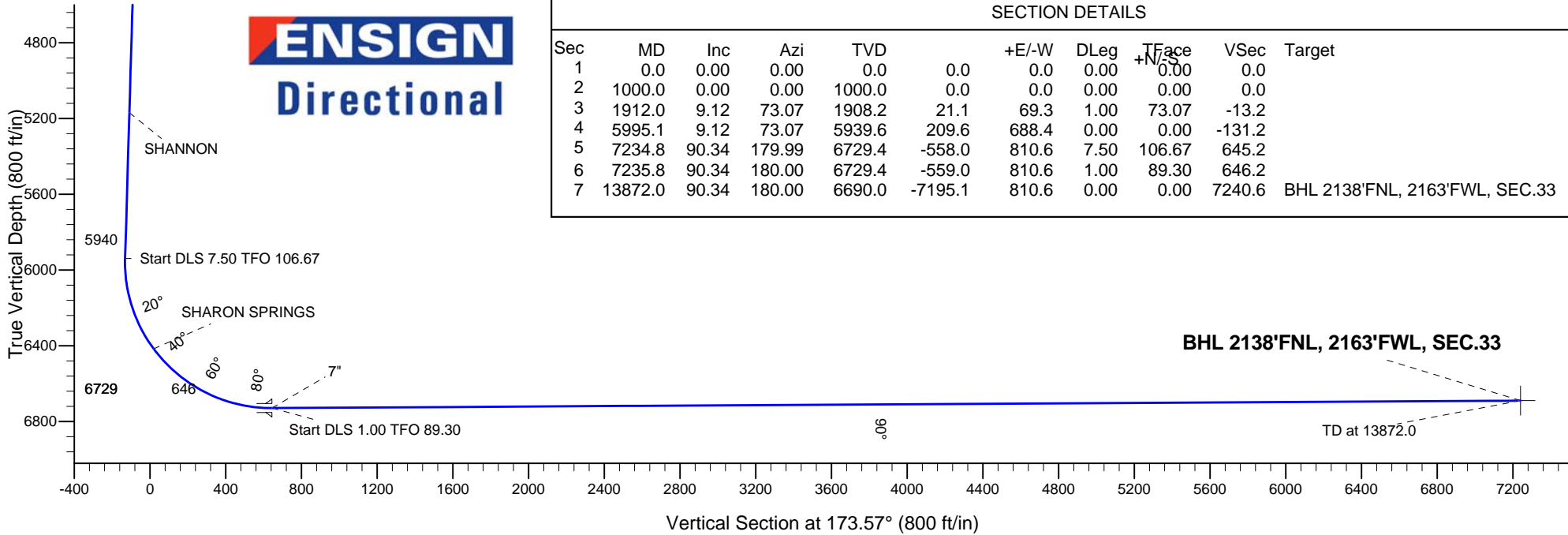
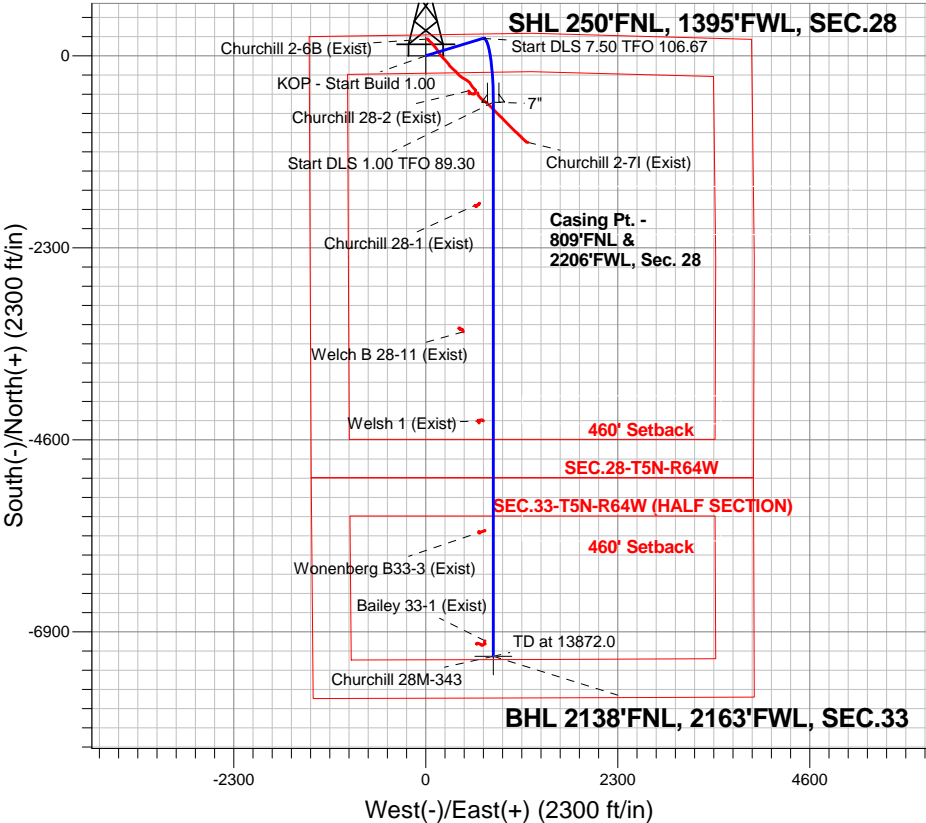
Name	TVD	+N/-S	+E/-W	Shape Point
SHL 250'FNL, 1395'FWL, SEC.28	1.0	0.0	0.0	Point
BHL 2138'FNL, 2163'FWL, SEC.33	6690.0	-7195.1	810.6	Point



ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP - Start Build 1.00
1908.2	1912.0	Start 4083.0 hold at 1912.0 MD
5939.6	5995.1	Start DLS 7.50 TFO 106.67
6729.4	7234.8	Start DLS 1.00 TFO 89.30
6729.4	7235.8	Start 6636.2 hold at 7235.8 MD
6690.0	13872.0	TD at 13872.0

Churchill 28J-HZ Pad Sec.28-T5N-R64W  
Churchill 28M-343  
Plan #3 (11-12-14)



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+E/-W	DLeg	TFace +N/-S	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.00	0.00	0.0	
3	1912.0	9.12	73.07	1908.2	21.1	69.3	73.07	-13.2	
4	5995.1	9.12	73.07	5939.6	209.6	688.4	0.00	-131.2	
5	7234.8	90.34	179.99	6729.4	-558.0	810.6	7.50	645.2	
6	7235.8	90.34	180.00	6729.4	-559.0	810.6	1.00	646.2	
7	13872.0	90.34	180.00	6690.0	-7195.1	810.6	0.00	7240.6	BHL 2138'FNL, 2163'FWL, SEC.33



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T5N-R64W**

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

**Churchill 28M-343**

**Wellbore #1**

**Plan: Plan #3 (11-12-14)**

## **Standard Planning Report**

**17 November, 2014**

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (11-12-14)		

<b>Project</b>	SEC.28-T5N-R64W, Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	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 28M-343					
Well Position	+N/-S	3.6 ft	Northing:	1,381,538.98 ft	Latitude:	40.376910
	+E/-W	181.1 ft	Easting:	3,262,084.58 ft	Longitude:	-104.559280
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,633.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	11/12/2014	8.29	66.95	52,783

<b>Design</b>	Plan #3 (11-12-14)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	173.57

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,912.0	9.12	73.07	1,908.2	21.1	69.3	1.00	1.00	0.00	73.07	
5,995.1	9.12	73.07	5,939.6	209.6	688.4	0.00	0.00	0.00	0.00	
7,234.8	90.34	179.99	6,729.4	-558.0	810.6	7.50	6.55	8.62	106.67	
7,235.8	90.34	180.00	6,729.4	-559.0	810.6	1.00	0.01	1.00	89.30	
13,872.0	90.34	180.00	6,690.0	-7,195.1	810.6	0.00	0.00	0.00	0.00	BHL 2138°FNL, 216

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (11-12-14)		

Planned 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
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP - Start Build 1.00</b>									
1,100.0	1.00	73.07	1,100.0	0.3	0.8	-0.2	1.00	1.00	0.00
1,200.0	2.00	73.07	1,200.0	1.0	3.3	-0.6	1.00	1.00	0.00
1,300.0	3.00	73.07	1,299.9	2.3	7.5	-1.4	1.00	1.00	0.00
1,400.0	4.00	73.07	1,399.7	4.1	13.4	-2.5	1.00	1.00	0.00
1,500.0	5.00	73.07	1,499.4	6.4	20.9	-4.0	1.00	1.00	0.00
1,600.0	6.00	73.07	1,598.9	9.1	30.0	-5.7	1.00	1.00	0.00
1,700.0	7.00	73.07	1,698.3	12.4	40.9	-7.8	1.00	1.00	0.00
1,800.0	8.00	73.07	1,797.4	16.2	53.3	-10.2	1.00	1.00	0.00
1,900.0	9.00	73.07	1,896.3	20.5	67.5	-12.9	1.00	1.00	0.00
1,912.0	9.12	73.07	1,908.2	21.1	69.3	-13.2	1.00	1.00	0.00
<b>Start 4083.0 hold at 1912.0 MD</b>									
2,000.0	9.12	73.07	1,995.0	25.2	82.6	-15.7	0.00	0.00	0.00
2,100.0	9.12	73.07	2,093.8	29.8	97.8	-18.6	0.00	0.00	0.00
2,200.0	9.12	73.07	2,192.5	34.4	113.0	-21.5	0.00	0.00	0.00
2,300.0	9.12	73.07	2,291.2	39.0	128.1	-24.4	0.00	0.00	0.00
2,400.0	9.12	73.07	2,390.0	43.6	143.3	-27.3	0.00	0.00	0.00
2,500.0	9.12	73.07	2,488.7	48.2	158.5	-30.2	0.00	0.00	0.00
2,600.0	9.12	73.07	2,587.5	52.9	173.6	-33.1	0.00	0.00	0.00
2,700.0	9.12	73.07	2,686.2	57.5	188.8	-36.0	0.00	0.00	0.00
2,800.0	9.12	73.07	2,784.9	62.1	203.9	-38.9	0.00	0.00	0.00
2,900.0	9.12	73.07	2,883.7	66.7	219.1	-41.8	0.00	0.00	0.00
3,000.0	9.12	73.07	2,982.4	71.3	234.3	-44.6	0.00	0.00	0.00
3,100.0	9.12	73.07	3,081.1	75.9	249.4	-47.5	0.00	0.00	0.00
3,200.0	9.12	73.07	3,179.9	80.6	264.6	-50.4	0.00	0.00	0.00
3,300.0	9.12	73.07	3,278.6	85.2	279.8	-53.3	0.00	0.00	0.00
3,400.0	9.12	73.07	3,377.3	89.8	294.9	-56.2	0.00	0.00	0.00
3,500.0	9.12	73.07	3,476.1	94.4	310.1	-59.1	0.00	0.00	0.00
3,574.9	9.12	73.07	3,550.0	97.9	321.4	-61.3	0.00	0.00	0.00
<b>PARKMAN</b>									
3,600.0	9.12	73.07	3,574.8	99.0	325.3	-62.0	0.00	0.00	0.00
3,700.0	9.12	73.07	3,673.5	103.6	340.4	-64.9	0.00	0.00	0.00
3,800.0	9.12	73.07	3,772.3	108.3	355.6	-67.8	0.00	0.00	0.00
3,900.0	9.12	73.07	3,871.0	112.9	370.7	-70.7	0.00	0.00	0.00
4,000.0	9.12	73.07	3,969.8	117.5	385.9	-73.5	0.00	0.00	0.00
4,100.0	9.12	73.07	4,068.5	122.1	401.1	-76.4	0.00	0.00	0.00
4,197.7	9.12	73.07	4,165.0	126.6	415.9	-79.3	0.00	0.00	0.00
<b>SUSSEX</b>									
4,200.0	9.12	73.07	4,167.2	126.7	416.2	-79.3	0.00	0.00	0.00
4,300.0	9.12	73.07	4,266.0	131.3	431.4	-82.2	0.00	0.00	0.00
4,400.0	9.12	73.07	4,364.7	136.0	446.6	-85.1	0.00	0.00	0.00

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (11-12-14)		

Planned 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)
4,500.0	9.12	73.07	4,463.4	140.6	461.7	-88.0	0.00	0.00	0.00
4,600.0	9.12	73.07	4,562.2	145.2	476.9	-90.9	0.00	0.00	0.00
4,700.0	9.12	73.07	4,660.9	149.8	492.1	-93.8	0.00	0.00	0.00
4,800.0	9.12	73.07	4,759.6	154.4	507.2	-96.7	0.00	0.00	0.00
4,900.0	9.12	73.07	4,858.4	159.0	522.4	-99.6	0.00	0.00	0.00
5,000.0	9.12	73.07	4,957.1	163.7	537.5	-102.4	0.00	0.00	0.00
5,100.0	9.12	73.07	5,055.9	168.3	552.7	-105.3	0.00	0.00	0.00
5,200.0	9.12	73.07	5,154.6	172.9	567.9	-108.2	0.00	0.00	0.00
5,215.6	9.12	73.07	5,170.0	173.6	570.2	-108.7	0.00	0.00	0.00
<b>SHANNON</b>									
5,300.0	9.12	73.07	5,253.3	177.5	583.0	-111.1	0.00	0.00	0.00
5,400.0	9.12	73.07	5,352.1	182.1	598.2	-114.0	0.00	0.00	0.00
5,500.0	9.12	73.07	5,450.8	186.7	613.4	-116.9	0.00	0.00	0.00
5,600.0	9.12	73.07	5,549.5	191.4	628.5	-119.8	0.00	0.00	0.00
5,700.0	9.12	73.07	5,648.3	196.0	643.7	-122.7	0.00	0.00	0.00
5,800.0	9.12	73.07	5,747.0	200.6	658.9	-125.6	0.00	0.00	0.00
5,900.0	9.12	73.07	5,845.7	205.2	674.0	-128.5	0.00	0.00	0.00
5,995.1	9.12	73.07	5,939.6	209.6	688.4	-131.2	0.00	0.00	0.00
<b>Start DLS 7.50 TFO 106.67</b>									
6,000.0	9.02	75.33	5,944.5	209.8	689.2	-131.3	7.50	-2.01	45.83
6,100.0	10.17	121.04	6,043.2	207.2	704.4	-127.1	7.50	1.15	45.71
6,200.0	15.40	146.04	6,140.8	191.6	719.4	-109.9	7.50	5.23	25.00
6,300.0	21.97	157.55	6,235.5	163.3	733.9	-80.1	7.50	6.57	11.51
6,400.0	28.97	163.83	6,325.7	122.7	747.8	-38.2	7.50	7.01	6.28
6,500.0	36.16	167.80	6,409.9	70.5	760.8	15.1	7.50	7.19	3.98
6,507.5	36.71	168.05	6,416.0	66.2	761.8	19.5	7.50	7.25	3.23
<b>SHARON SPRINGS</b>									
6,600.0	43.45	170.60	6,486.7	7.7	772.7	78.9	7.50	7.29	2.76
6,700.0	50.78	172.74	6,554.7	-64.8	783.2	152.1	7.50	7.34	2.13
6,800.0	58.15	174.46	6,612.8	-145.6	792.2	233.4	7.50	7.37	1.73
6,900.0	65.54	175.93	6,660.0	-233.4	799.6	321.4	7.50	7.39	1.47
7,000.0	72.94	177.24	6,695.4	-326.7	805.1	414.8	7.50	7.40	1.31
7,100.0	80.35	178.44	6,718.5	-423.8	808.8	511.7	7.50	7.41	1.21
7,200.0	87.76	179.59	6,728.8	-523.2	810.5	610.7	7.50	7.41	1.15
7,234.8	90.34	179.99	6,729.4	-558.0	810.6	645.2	7.50	7.41	1.14
<b>Start DLS 1.00 TFO 89.30 - 7"</b>									
7,235.8	90.34	180.00	6,729.4	-559.0	810.6	646.2	1.00	0.02	1.00
<b>Start 6636.2 hold at 7235.8 MD</b>									
7,300.0	90.34	180.00	6,729.0	-623.2	810.6	710.0	0.00	0.00	0.00
7,400.0	90.34	180.00	6,728.4	-723.2	810.6	809.4	0.00	0.00	0.00
7,500.0	90.34	180.00	6,727.8	-823.2	810.6	908.8	0.00	0.00	0.00
7,600.0	90.34	180.00	6,727.2	-923.2	810.6	1,008.1	0.00	0.00	0.00
7,700.0	90.34	180.00	6,726.6	-1,023.2	810.6	1,107.5	0.00	0.00	0.00
7,800.0	90.34	180.00	6,726.0	-1,123.2	810.6	1,206.9	0.00	0.00	0.00
7,900.0	90.34	180.00	6,725.5	-1,223.2	810.6	1,306.2	0.00	0.00	0.00
8,000.0	90.34	180.00	6,724.9	-1,323.2	810.6	1,405.6	0.00	0.00	0.00
8,100.0	90.34	180.00	6,724.3	-1,423.2	810.6	1,505.0	0.00	0.00	0.00
8,200.0	90.34	180.00	6,723.7	-1,523.2	810.6	1,604.4	0.00	0.00	0.00
8,300.0	90.34	180.00	6,723.1	-1,623.2	810.6	1,703.7	0.00	0.00	0.00
8,400.0	90.34	180.00	6,722.5	-1,723.2	810.6	1,803.1	0.00	0.00	0.00
8,500.0	90.34	180.00	6,721.9	-1,823.2	810.6	1,902.5	0.00	0.00	0.00

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (11-12-14)		

Planned 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)
8,600.0	90.34	180.00	6,721.3	-1,923.2	810.6	2,001.8	0.00	0.00	0.00
8,700.0	90.34	180.00	6,720.7	-2,023.2	810.6	2,101.2	0.00	0.00	0.00
8,800.0	90.34	180.00	6,720.1	-2,123.2	810.6	2,200.6	0.00	0.00	0.00
8,900.0	90.34	180.00	6,719.5	-2,223.2	810.6	2,299.9	0.00	0.00	0.00
9,000.0	90.34	180.00	6,718.9	-2,323.2	810.6	2,399.3	0.00	0.00	0.00
9,100.0	90.34	180.00	6,718.3	-2,423.2	810.6	2,498.7	0.00	0.00	0.00
9,200.0	90.34	180.00	6,717.7	-2,523.2	810.6	2,598.1	0.00	0.00	0.00
9,300.0	90.34	180.00	6,717.1	-2,623.2	810.6	2,697.4	0.00	0.00	0.00
9,400.0	90.34	180.00	6,716.5	-2,723.2	810.6	2,796.8	0.00	0.00	0.00
9,500.0	90.34	180.00	6,716.0	-2,823.2	810.6	2,896.2	0.00	0.00	0.00
9,600.0	90.34	180.00	6,715.4	-2,923.2	810.6	2,995.5	0.00	0.00	0.00
9,700.0	90.34	180.00	6,714.8	-3,023.2	810.6	3,094.9	0.00	0.00	0.00
9,800.0	90.34	180.00	6,714.2	-3,123.2	810.6	3,194.3	0.00	0.00	0.00
9,900.0	90.34	180.00	6,713.6	-3,223.2	810.6	3,293.6	0.00	0.00	0.00
10,000.0	90.34	180.00	6,713.0	-3,323.1	810.6	3,393.0	0.00	0.00	0.00
10,100.0	90.34	180.00	6,712.4	-3,423.1	810.6	3,492.4	0.00	0.00	0.00
10,200.0	90.34	180.00	6,711.8	-3,523.1	810.6	3,591.7	0.00	0.00	0.00
10,300.0	90.34	180.00	6,711.2	-3,623.1	810.6	3,691.1	0.00	0.00	0.00
10,400.0	90.34	180.00	6,710.6	-3,723.1	810.6	3,790.5	0.00	0.00	0.00
10,500.0	90.34	180.00	6,710.0	-3,823.1	810.6	3,889.9	0.00	0.00	0.00
10,600.0	90.34	180.00	6,709.4	-3,923.1	810.6	3,989.2	0.00	0.00	0.00
10,700.0	90.34	180.00	6,708.8	-4,023.1	810.6	4,088.6	0.00	0.00	0.00
10,800.0	90.34	180.00	6,708.2	-4,123.1	810.6	4,188.0	0.00	0.00	0.00
10,900.0	90.34	180.00	6,707.6	-4,223.1	810.6	4,287.3	0.00	0.00	0.00
11,000.0	90.34	180.00	6,707.0	-4,323.1	810.6	4,386.7	0.00	0.00	0.00
11,100.0	90.34	180.00	6,706.5	-4,423.1	810.6	4,486.1	0.00	0.00	0.00
11,200.0	90.34	180.00	6,705.9	-4,523.1	810.6	4,585.4	0.00	0.00	0.00
11,300.0	90.34	180.00	6,705.3	-4,623.1	810.6	4,684.8	0.00	0.00	0.00
11,400.0	90.34	180.00	6,704.7	-4,723.1	810.6	4,784.2	0.00	0.00	0.00
11,500.0	90.34	180.00	6,704.1	-4,823.1	810.6	4,883.6	0.00	0.00	0.00
11,600.0	90.34	180.00	6,703.5	-4,923.1	810.6	4,982.9	0.00	0.00	0.00
11,700.0	90.34	180.00	6,702.9	-5,023.1	810.6	5,082.3	0.00	0.00	0.00
11,800.0	90.34	180.00	6,702.3	-5,123.1	810.6	5,181.7	0.00	0.00	0.00
11,900.0	90.34	180.00	6,701.7	-5,223.1	810.6	5,281.0	0.00	0.00	0.00
12,000.0	90.34	180.00	6,701.1	-5,323.1	810.6	5,380.4	0.00	0.00	0.00
12,100.0	90.34	180.00	6,700.5	-5,423.1	810.6	5,479.8	0.00	0.00	0.00
12,200.0	90.34	180.00	6,699.9	-5,523.1	810.6	5,579.1	0.00	0.00	0.00
12,300.0	90.34	180.00	6,699.3	-5,623.1	810.6	5,678.5	0.00	0.00	0.00
12,400.0	90.34	180.00	6,698.7	-5,723.1	810.6	5,777.9	0.00	0.00	0.00
12,500.0	90.34	180.00	6,698.1	-5,823.1	810.6	5,877.2	0.00	0.00	0.00
12,600.0	90.34	180.00	6,697.6	-5,923.1	810.6	5,976.6	0.00	0.00	0.00
12,700.0	90.34	180.00	6,697.0	-6,023.1	810.6	6,076.0	0.00	0.00	0.00
12,800.0	90.34	180.00	6,696.4	-6,123.1	810.6	6,175.4	0.00	0.00	0.00
12,900.0	90.34	180.00	6,695.8	-6,223.1	810.6	6,274.7	0.00	0.00	0.00
13,000.0	90.34	180.00	6,695.2	-6,323.1	810.6	6,374.1	0.00	0.00	0.00
13,100.0	90.34	180.00	6,694.6	-6,423.1	810.6	6,473.5	0.00	0.00	0.00
13,200.0	90.34	180.00	6,694.0	-6,523.1	810.6	6,572.8	0.00	0.00	0.00
13,300.0	90.34	180.00	6,693.4	-6,623.1	810.6	6,672.2	0.00	0.00	0.00
13,400.0	90.34	180.00	6,692.8	-6,723.1	810.6	6,771.6	0.00	0.00	0.00
13,500.0	90.34	180.00	6,692.2	-6,823.1	810.6	6,870.9	0.00	0.00	0.00
13,600.0	90.34	180.00	6,691.6	-6,923.1	810.6	6,970.3	0.00	0.00	0.00
13,700.0	90.34	180.00	6,691.0	-7,023.1	810.6	7,069.7	0.00	0.00	0.00

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (11-12-14)		

#### Planned 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)
13,800.0	90.34	180.00	6,690.4	-7,123.1	810.6	7,169.1	0.00	0.00	0.00
13,872.0	90.34	180.00	6,690.0	-7,195.1	810.6	7,240.6	0.00	0.00	0.00
TD at 13872.0									

#### Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 250'FNL, 1395'F	0.00	0.00	1.0	0.0	0.0	1,381,538.99	3,262,084.58	40.376910	-104.559280
- plan hits target									
- Point									
BHL 2138'FNL, 2163'I	0.00	0.00	6,690.0	-7,195.1	810.6	1,374,353.19	3,262,971.43	40.357160	-104.556371
- plan hits target									
- Point									

#### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,234.8	6,729.4	7"	7	7-1/2

#### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,574.9	3,550.0	PARKMAN			
4,197.7	4,165.0	SUSSEX			
5,215.6	5,170.0	SHANNON			
6,507.5	6,416.0	SHARON SPRINGS			

#### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.0	1,000.0	0.0	0.0	KOP - Start Build 1.00
1,912.0	1,908.2	21.1	69.3	Start 4083.0 hold at 1912.0 MD
5,995.1	5,939.6	209.6	688.4	Start DLS 7.50 TFO 106.67
7,234.8	6,729.4	-558.0	810.6	Start DLS 1.00 TFO 89.30
7,235.8	6,729.4	-559.0	810.6	Start 6636.2 hold at 7235.8 MD
13,872.0	6,690.0	-7,195.1	810.6	TD at 13872.0



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T5N-R64W**

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

**Churchill 28M-343**

**Wellbore #1**

**Plan #3 (11-12-14)**

## **Anticollision Report**

**17 November, 2014**





<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #3 (11-12-14)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b> 11/17/2014			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	13,872.0	Plan #3 (11-12-14) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
Churchill 28J-HZ Pad Sec.28-T5N-R64W						
Churchill 28E-203 - Wellbore #1 - Plan #2 (11-12-14)	166.0	168.0	181.1	180.6	344.439	CC
Churchill 28E-203 - Wellbore #1 - Plan #2 (11-12-14)	200.0	200.0	181.1	180.5	268.648	ES
Churchill 28E-203 - Wellbore #1 - Plan #2 (11-12-14)	1,000.0	960.9	259.0	254.4	56.383	SF
Churchill 28E-423 - Wellbore #1 - Plan #2 (11-12-14)	366.0	368.0	150.5	149.1	105.615	CC
Churchill 28E-423 - Wellbore #1 - Plan #2 (11-12-14)	400.0	402.0	150.5	148.9	95.398	ES
Churchill 28E-423 - Wellbore #1 - Plan #2 (11-12-14)	1,300.0	1,275.5	223.9	218.4	40.575	SF
Churchill 28J-203 - Wellbore #1 - Plan #3 (11-12-14)	1,000.0	1,001.0	61.3	57.0	14.346	CC, ES
Churchill 28J-203 - Wellbore #1 - Plan #3 (11-12-14)	13,872.0	13,582.3	681.4	404.2	2.458	SF
Churchill 28J-343 - Wellbore #1 - Plan #3 (11-12-14)	566.0	568.0	119.8	117.5	51.551	CC
Churchill 28J-343 - Wellbore #1 - Plan #3 (11-12-14)	600.0	602.0	119.8	117.3	48.373	ES
Churchill 28J-343 - Wellbore #1 - Plan #3 (11-12-14)	1,400.0	1,392.4	169.3	163.3	28.365	SF
Churchill 28J-423 - Wellbore #1 - Plan #3 (11-12-14)	1,000.0	1,000.0	30.6	26.4	7.177	CC, ES
Churchill 28J-423 - Wellbore #1 - Plan #3 (11-12-14)	13,872.0	13,893.3	503.5	229.5	1.838	SF
Churchill 28J-443 - Wellbore #1 - Plan #2 (11-12-14)	766.3	767.3	89.2	85.9	27.668	CC
Churchill 28J-443 - Wellbore #1 - Plan #2 (11-12-14)	800.0	801.0	89.2	85.8	26.427	ES
Churchill 28J-443 - Wellbore #1 - Plan #2 (11-12-14)	1,300.0	1,297.2	109.2	103.6	19.655	SF
Churchill 28M-443 - Wellbore #1 - Plan #2 (11-12-14)	400.0	399.0	30.6	29.1	19.507	CC
Churchill 28M-443 - Wellbore #1 - Plan #2 (11-12-14)	13,872.0	13,970.5	251.7	1.4	1.005	Level 2, ES, SF
<b>Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W</b>						
Bailey 33-1 (Exist) - Wellbore #1 - Wellbore #1	13,691.0	6,737.6	103.6	-147.4	0.413	Level 1, CC, ES, SF
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	3,837.3	3,865.2	218.0	199.2	11.549	CC, ES
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	3,900.0	3,920.5	219.6	200.5	11.518	SF
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	7,715.0	6,769.6	409.5	366.0	9.410	CC, ES
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	7,800.0	6,769.7	418.2	373.4	9.329	SF
Churchill 28-1 (Exist) - Wellbore #1 - Wellbore #1	8,443.1	6,700.0	165.7	115.6	3.304	CC, ES, SF
Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,100.4	6,695.3	284.8	254.5	9.386	CC, ES, SF
Welch B 28-11 (Exist) - Wellbore #1 - Wellbore #1	9,981.9	6,710.9	361.5	283.3	4.619	CC, ES
Welch B 28-11 (Exist) - Wellbore #1 - Wellbore #1	10,000.0	6,710.9	362.0	283.4	4.605	SF
Welsh 1 (Exist) - Wellbore #1 - Wellbore #1	11,049.2	6,711.2	120.5	21.8	1.221	Level 2, CC, ES, SF
Wonenberg B33-3 (Exist) - Wellbore #1 - Wellbore #1	12,364.2	6,719.0	100.2	-23.0	0.814	Level 1, CC, ES, SF

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Plan #2 (11-12-14)													Offset Site Error: 0.0 ft
Survey Program: 0-MWD													Offset Well Error: 0.0 ft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.0	0.0	2.0	2.0	0.0	0.0	-91.15	-3.6	-181.1	181.1	181.1	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-91.15	-3.6	-181.1	181.1	180.9	0.23	790.093	
166.0	166.0	168.0	168.0	0.3	0.3	-91.15	-3.6	-181.1	181.1	180.6	0.53	344.439 CC	
200.0	200.0	200.0	200.0	0.3	0.3	-91.15	-3.6	-181.1	181.1	180.5	0.67	268.648 ES	
300.0	300.0	297.5	297.4	0.6	0.5	-91.07	-3.4	-182.3	182.4	181.3	1.11	164.356	
400.0	400.0	392.9	392.8	0.8	0.8	-90.84	-2.7	-185.9	186.1	184.6	1.54	120.487	
500.0	500.0	488.1	487.8	1.0	1.0	-90.47	-1.6	-191.8	192.3	190.3	1.99	96.408	
600.0	600.0	582.9	582.3	1.2	1.2	-90.01	0.0	-199.9	200.9	198.4	2.46	81.587	
700.0	700.0	677.3	676.0	1.5	1.5	-89.46	2.0	-210.3	212.0	209.0	2.95	71.780	
800.0	800.0	771.0	768.9	1.7	1.8	-88.87	4.4	-222.9	225.4	222.0	3.47	64.990	
900.0	900.0	864.1	860.8	1.9	2.1	-88.26	7.2	-237.7	241.3	237.3	4.01	60.155	
1,000.0	1,000.0	960.9	956.0	2.1	2.5	-87.64	10.5	-254.6	259.0	254.4	4.59	56.383 SF	
1,100.0	1,100.0	1,059.1	1,052.6	2.4	2.9	-160.15	13.8	-272.0	277.6	272.9	4.70	59.030	
1,200.0	1,200.0	1,157.0	1,148.9	2.6	3.2	-159.77	17.1	-289.3	297.8	292.7	5.15	57.851	
1,300.0	1,299.9	1,254.6	1,244.9	2.8	3.6	-159.54	20.5	-306.5	319.6	314.0	5.59	57.143	
1,400.0	1,399.7	1,351.8	1,340.5	3.0	4.0	-159.42	23.8	-323.6	343.0	337.0	6.04	56.783	
1,500.0	1,499.4	1,448.6	1,435.8	3.2	4.4	-159.40	27.0	-340.7	368.1	361.6	6.49	56.744	
1,600.0	1,598.9	1,545.0	1,530.6	3.5	4.8	-159.46	30.3	-357.7	394.6	387.7	6.93	56.933	
1,700.0	1,698.3	1,641.0	1,625.0	3.7	5.2	-159.58	33.6	-374.7	422.8	415.4	7.38	57.314	
1,800.0	1,797.4	1,736.4	1,718.9	4.0	5.6	-159.74	36.8	-391.5	452.5	444.7	7.82	57.855	
1,900.0	1,896.3	1,831.4	1,812.3	4.3	6.0	-159.94	40.0	-408.3	483.8	475.6	8.27	58.527	
2,000.0	1,995.0	1,926.0	1,905.4	4.6	6.3	-160.24	43.2	-424.9	516.1	507.4	8.73	59.112	
2,100.0	2,093.8	2,020.6	1,998.4	4.9	6.7	-160.52	46.4	-441.6	548.4	539.2	9.20	59.600	
2,200.0	2,192.5	2,115.2	2,091.5	5.2	7.1	-160.77	49.6	-458.3	580.7	571.0	9.67	60.023	
2,300.0	2,291.2	2,209.8	2,184.6	5.6	7.5	-161.00	52.9	-475.0	613.0	602.9	10.15	60.391	
2,400.0	2,390.0	2,304.4	2,277.6	5.9	7.9	-161.20	56.1	-491.7	645.3	634.7	10.63	60.715	
2,500.0	2,488.7	2,399.0	2,370.7	6.2	8.3	-161.38	59.3	-508.4	677.7	666.6	11.11	61.000	
2,600.0	2,587.5	2,493.6	2,463.8	6.6	8.7	-161.54	62.5	-525.1	710.0	698.4	11.59	61.252	
2,700.0	2,686.2	2,588.2	2,556.9	6.9	9.1	-161.69	65.7	-541.8	742.3	730.3	12.08	61.478	
2,800.0	2,784.9	2,682.9	2,649.9	7.3	9.4	-161.83	68.9	-558.5	774.7	762.1	12.56	61.680	
2,900.0	2,883.7	2,777.5	2,743.0	7.6	9.8	-161.96	72.1	-575.2	807.0	794.0	13.05	61.861	
3,000.0	2,982.4	2,872.1	2,836.1	8.0	10.2	-162.08	75.3	-591.9	839.4	825.9	13.53	62.025	
3,100.0	3,081.1	2,966.7	2,929.1	8.3	10.6	-162.18	78.5	-608.6	871.7	857.7	14.02	62.174	
3,200.0	3,179.9	3,061.3	3,022.2	8.7	11.0	-162.28	81.7	-625.3	904.1	889.6	14.51	62.309	
3,300.0	3,278.6	3,155.9	3,115.3	9.1	11.4	-162.38	84.9	-642.0	936.5	921.5	15.00	62.433	
3,400.0	3,377.3	3,250.5	3,208.3	9.4	11.8	-162.47	88.2	-658.7	968.8	953.3	15.49	62.546	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-423 - Wellbore #1 - Plan #2 (11-12-14)													Offset Site Error: 0.0 ft
Survey Program: 0-MWD													Offset Well Error: 0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	-91.39	-3.6	-150.5	150.5	150.5	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-91.39	-3.6	-150.5	150.5	150.3	0.23	656.445	
200.0	200.0	202.0	202.0	0.3	0.3	-91.39	-3.6	-150.5	150.5	149.8	0.68	221.713	
300.0	300.0	302.0	302.0	0.6	0.6	-91.39	-3.6	-150.5	150.5	149.4	1.13	133.381	
366.0	366.0	368.0	368.0	0.7	0.7	-91.39	-3.6	-150.5	150.5	149.1	1.42	105.615 CC	
400.0	400.0	402.0	402.0	0.8	0.8	-91.39	-3.6	-150.5	150.5	148.9	1.58	95.398 ES	
500.0	500.0	500.0	500.0	1.0	1.0	-91.29	-3.4	-151.3	151.3	149.3	2.01	75.157	
600.0	600.0	597.0	596.9	1.2	1.2	-91.03	-2.8	-153.7	153.8	151.4	2.45	62.911	
700.0	700.0	694.3	694.2	1.5	1.4	-90.60	-1.7	-157.7	157.9	155.1	2.89	54.736	
800.0	800.0	791.5	791.2	1.7	1.7	-90.05	-0.1	-163.4	163.7	160.4	3.34	49.088	
900.0	900.0	888.5	887.9	1.9	1.9	-89.39	1.8	-170.5	171.1	167.3	3.80	45.089	
1,000.0	1,000.0	985.2	984.2	2.1	2.1	-88.66	4.2	-179.3	180.2	175.9	4.27	42.218	
1,100.0	1,100.0	1,081.4	1,079.8	2.4	2.4	-161.01	7.0	-189.5	191.8	187.1	4.65	41.266	
1,200.0	1,200.0	1,177.1	1,174.7	2.6	2.7	-160.41	10.2	-201.2	206.6	201.5	5.08	40.673	
1,300.0	1,299.9	1,275.5	1,272.2	2.8	3.0	-159.97	13.7	-214.1	223.9	218.4	5.52	40.575 SF	
1,400.0	1,399.7	1,373.7	1,369.5	3.0	3.3	-159.72	17.1	-227.0	242.8	236.9	5.96	40.772	
1,500.0	1,499.4	1,471.5	1,466.4	3.2	3.6	-159.63	20.6	-239.8	263.3	257.0	6.39	41.189	
1,600.0	1,598.9	1,569.0	1,563.0	3.5	3.9	-159.66	24.1	-252.5	285.5	278.6	6.83	41.772	
1,700.0	1,698.3	1,666.2	1,659.3	3.7	4.2	-159.78	27.6	-265.2	309.2	301.9	7.27	42.513	
1,800.0	1,797.4	1,762.9	1,755.1	4.0	4.5	-159.97	31.0	-277.9	334.5	326.8	7.71	43.368	
1,900.0	1,896.3	1,859.2	1,850.5	4.3	4.9	-160.22	34.4	-290.5	361.4	353.3	8.16	44.321	
2,000.0	1,995.0	1,955.2	1,945.6	4.6	5.2	-160.55	37.8	-303.1	389.3	380.7	8.61	45.204	
2,100.0	2,093.8	2,051.2	2,040.7	4.9	5.5	-160.86	41.2	-315.6	417.2	408.2	9.08	45.971	
2,200.0	2,192.5	2,147.2	2,135.9	5.2	5.8	-161.12	44.7	-328.2	445.2	435.6	9.54	46.650	
2,300.0	2,291.2	2,243.2	2,231.0	5.6	6.1	-161.35	48.1	-340.8	473.1	463.1	10.01	47.253	
2,400.0	2,390.0	2,339.2	2,326.1	5.9	6.5	-161.56	51.5	-353.3	501.0	490.6	10.48	47.792	
2,500.0	2,488.7	2,435.2	2,421.2	6.2	6.8	-161.75	54.9	-365.9	529.0	518.0	10.96	48.277	
2,600.0	2,587.5	2,531.2	2,516.3	6.6	7.1	-161.91	58.3	-378.5	556.9	545.5	11.43	48.714	
2,700.0	2,686.2	2,627.2	2,611.4	6.9	7.4	-162.06	61.7	-391.0	584.9	573.0	11.91	49.111	
2,800.0	2,784.9	2,723.2	2,706.5	7.3	7.8	-162.20	65.2	-403.6	612.9	600.5	12.39	49.471	
2,900.0	2,883.7	2,819.2	2,801.7	7.6	8.1	-162.32	68.6	-416.2	640.8	627.9	12.87	49.801	
3,000.0	2,982.4	2,915.2	2,896.8	8.0	8.4	-162.44	72.0	-428.7	668.8	655.4	13.35	50.103	
3,100.0	3,081.1	3,011.2	2,991.9	8.3	8.7	-162.54	75.4	-441.3	696.7	682.9	13.83	50.381	
3,200.0	3,179.9	3,107.2	3,087.0	8.7	9.1	-162.64	78.8	-453.9	724.7	710.4	14.31	50.637	
3,300.0	3,278.6	3,203.2	3,182.1	9.1	9.4	-162.73	82.2	-466.4	752.7	737.9	14.79	50.874	
3,400.0	3,377.3	3,299.2	3,277.2	9.4	9.7	-162.82	85.6	-479.0	780.7	765.4	15.28	51.094	
3,500.0	3,476.1	3,395.2	3,372.4	9.8	10.0	-162.89	89.1	-491.6	808.6	792.9	15.76	51.298	
3,600.0	3,574.8	3,491.2	3,467.5	10.1	10.4	-162.97	92.5	-504.1	836.6	820.3	16.25	51.488	
3,700.0	3,673.5	3,587.2	3,562.6	10.5	10.7	-163.03	95.9	-516.7	864.6	847.8	16.73	51.666	
3,800.0	3,772.3	3,683.2	3,657.7	10.9	11.0	-163.10	99.3	-529.3	892.5	875.3	17.22	51.832	
3,900.0	3,871.0	3,779.2	3,752.8	11.2	11.3	-163.16	102.7	-541.8	920.5	902.8	17.71	51.987	
4,000.0	3,969.8	3,875.2	3,847.9	11.6	11.7	-163.21	106.1	-554.4	948.5	930.3	18.19	52.133	
4,100.0	4,068.5	3,971.3	3,943.0	12.0	12.0	-163.27	109.5	-567.0	976.5	957.8	18.68	52.271	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-203 - Wellbore #1 - Plan #3 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-61.3	61.3	61.3	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-61.3	61.3	61.1	0.23	270.009		
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-61.3	61.3	60.6	0.68	90.601		
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-61.3	61.3	60.2	1.13	54.433		
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-61.3	61.3	59.7	1.58	38.903		
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-61.3	61.3	59.3	2.03	30.267		
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-61.3	61.3	58.8	2.47	24.769		
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-61.3	61.3	58.4	2.92	20.962		
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-61.3	61.3	57.9	3.37	18.169		
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-61.3	61.3	57.5	3.82	16.032		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	0.0	-61.3	61.3	57.0	4.27	14.346 CC, ES		
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-163.30	0.0	-61.3	62.1	57.4	4.71	13.185		
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-163.96	0.0	-61.3	64.6	59.5	5.14	12.569		
1,300.0	1,299.9	1,300.9	1,300.9	2.8	2.8	-164.95	0.0	-61.3	68.8	63.3	5.58	12.348		
1,400.0	1,399.7	1,400.7	1,400.7	3.0	3.0	-166.15	0.0	-61.3	74.8	68.7	6.01	12.442		
1,500.0	1,499.4	1,500.4	1,500.4	3.2	3.3	-167.44	0.0	-61.3	82.4	76.0	6.44	12.791		
1,600.0	1,598.9	1,599.9	1,599.9	3.5	3.5	-168.72	0.0	-61.3	91.8	84.9	6.88	13.348		
1,700.0	1,698.3	1,699.3	1,699.3	3.7	3.7	-169.94	0.0	-61.3	102.9	95.6	7.31	14.079		
1,800.0	1,797.4	1,798.4	1,798.4	4.0	3.9	-171.04	0.0	-61.3	115.8	108.0	7.74	14.954		
1,900.0	1,896.3	1,897.3	1,897.3	4.3	4.2	-172.03	0.0	-61.3	130.4	122.2	8.18	15.951		
2,000.0	1,995.0	1,996.0	1,996.0	4.6	4.4	-172.89	0.0	-61.3	146.1	137.5	8.62	16.946		
2,100.0	2,093.8	2,094.8	2,094.8	4.9	4.6	-173.59	0.0	-61.3	161.9	152.8	9.07	17.838		
2,200.0	2,192.5	2,193.5	2,193.5	5.2	4.8	-174.16	0.0	-61.3	177.6	168.1	9.53	18.645		
2,300.0	2,291.2	2,292.2	2,292.2	5.6	5.0	-174.64	0.0	-61.3	193.4	183.4	9.98	19.376		
2,400.0	2,390.0	2,391.0	2,391.0	5.9	5.3	-175.04	0.0	-61.3	209.2	198.7	10.44	20.042		
2,500.0	2,488.7	2,489.7	2,489.7	6.2	5.5	-175.39	0.0	-61.3	225.0	214.1	10.89	20.650		
2,600.0	2,587.5	2,588.5	2,588.5	6.6	5.7	-175.69	0.0	-61.3	240.8	229.4	11.35	21.208		
2,700.0	2,686.2	2,687.2	2,687.2	6.9	5.9	-175.96	0.0	-61.3	256.6	244.8	11.81	21.721		
2,800.0	2,784.9	2,785.9	2,785.9	7.3	6.1	-176.19	0.0	-61.3	272.4	260.1	12.27	22.194		
2,900.0	2,883.7	2,884.7	2,884.7	7.6	6.4	-176.40	0.0	-61.3	288.2	275.5	12.74	22.632		
3,000.0	2,982.4	2,983.4	2,983.4	8.0	6.6	-176.59	0.0	-61.3	304.0	290.9	13.20	23.039		
3,100.0	3,081.1	3,086.9	3,086.9	8.3	6.8	-176.75	0.2	-60.7	319.3	305.6	13.66	23.368		
3,200.0	3,179.9	3,191.9	3,191.9	8.7	7.0	-176.85	1.2	-58.3	332.7	318.6	14.12	23.560		
3,300.0	3,278.6	3,297.4	3,297.3	9.1	7.3	-176.90	2.9	-54.1	344.3	329.8	14.58	23.613		
3,400.0	3,377.3	3,399.6	3,399.3	9.4	7.5	-176.90	5.1	-48.6	354.5	339.4	15.04	23.570		
3,500.0	3,476.1	3,499.1	3,498.6	9.8	7.7	-176.90	7.3	-43.1	364.4	348.9	15.49	23.523		
3,600.0	3,574.8	3,598.6	3,597.9	10.1	7.9	-176.90	9.6	-37.6	374.4	358.5	15.95	23.477		
3,700.0	3,673.5	3,698.1	3,697.3	10.5	8.1	-176.91	11.8	-32.1	384.4	368.0	16.40	23.431		
3,800.0	3,772.3	3,797.6	3,796.6	10.9	8.4	-176.91	14.0	-26.6	394.3	377.5	16.86	23.386		
3,900.0	3,871.0	3,897.1	3,895.9	11.2	8.6	-176.91	16.2	-21.1	404.3	387.0	17.32	23.342		
4,000.0	3,969.8	3,996.6	3,995.2	11.6	8.8	-176.91	18.5	-15.6	414.3	396.5	17.78	23.299		
4,100.0	4,068.5	4,096.1	4,094.6	12.0	9.0	-176.91	20.7	-10.1	424.2	406.0	18.24	23.257		
4,200.0	4,167.2	4,195.6	4,193.9	12.3	9.3	-176.91	22.9	-4.6	434.2	415.5	18.70	23.216		
4,300.0	4,266.0	4,295.1	4,293.2	12.7	9.5	-176.91	25.2	0.9	444.2	425.0	19.16	23.176		
4,400.0	4,364.7	4,394.6	4,392.5	13.1	9.7	-176.91	27.4	6.4	454.1	434.5	19.63	23.137		
4,500.0	4,463.4	4,494.1	4,491.9	13.4	9.9	-176.91	29.6	11.9	464.1	444.0	20.09	23.099		
4,600.0	4,562.2	4,593.6	4,591.2	13.8	10.2	-176.92	31.8	17.4	474.1	453.5	20.56	23.062		
4,700.0	4,660.9	4,693.1	4,690.5	14.2	10.4	-176.92	34.1	22.9	484.0	463.0	21.02	23.026		
4,800.0	4,759.6	4,792.6	4,789.8	14.5	10.6	-176.92	36.3	28.4	494.0	472.5	21.49	22.990		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-203 - Wellbore #1 - Plan #3 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
4,900.0	4,858.4	4,892.1	4,889.2	14.9	10.9	-176.92	38.5	34.0	504.0	482.0	21.95	22.956		
5,000.0	4,957.1	4,991.6	4,988.5	15.3	11.1	-176.92	40.7	39.5	513.9	491.5	22.42	22.923		
5,100.0	5,055.9	5,091.1	5,087.8	15.6	11.3	-176.92	43.0	45.0	523.9	501.0	22.89	22.890		
5,200.0	5,154.6	5,190.6	5,187.1	16.0	11.6	-176.92	45.2	50.5	533.8	510.5	23.35	22.859		
5,300.0	5,253.3	5,290.1	5,286.5	16.4	11.8	-176.92	47.4	56.0	543.8	520.0	23.82	22.828		
5,400.0	5,352.1	5,389.6	5,385.8	16.8	12.0	-176.92	49.7	61.5	553.8	529.5	24.29	22.798		
5,500.0	5,450.8	5,489.1	5,485.1	17.1	12.3	-176.92	51.9	67.0	563.7	539.0	24.76	22.769		
5,600.0	5,549.5	5,588.6	5,584.4	17.5	12.5	-176.92	54.1	72.5	573.7	548.5	25.23	22.740		
5,700.0	5,648.3	5,688.1	5,683.8	17.9	12.7	-176.92	56.3	78.0	583.7	558.0	25.70	22.712		
5,800.0	5,747.0	5,787.6	5,783.1	18.2	13.0	-176.92	58.6	83.5	593.6	567.5	26.17	22.685		
5,900.0	5,845.7	5,885.0	5,880.2	18.6	13.2	-176.93	60.7	88.9	603.6	577.0	26.63	22.666		
6,000.0	5,944.5	5,967.9	5,962.9	19.0	13.4	-179.74	56.8	93.5	615.3	588.2	27.03	22.762		
6,100.0	6,043.2	6,050.0	6,043.9	19.3	13.5	133.45	44.1	98.0	627.9	600.5	27.43	22.889		
6,200.0	6,140.8	6,130.3	6,121.3	19.5	13.7	107.61	23.4	102.3	639.9	612.1	27.81	23.009		
6,300.0	6,235.5	6,210.6	6,196.1	19.8	13.8	95.55	-5.4	106.4	651.0	622.9	28.17	23.109		
6,400.0	6,325.7	6,290.5	6,267.1	19.9	14.0	88.99	-41.6	110.4	661.0	632.5	28.53	23.165		
6,500.0	6,409.9	6,370.2	6,333.8	20.1	14.2	85.02	-85.0	114.1	669.7	640.7	28.93	23.149		
6,600.0	6,486.7	6,450.0	6,395.8	20.3	14.4	82.53	-135.2	117.5	676.8	647.5	29.39	23.031		
6,700.0	6,554.7	6,529.7	6,452.1	20.6	14.7	80.99	-191.4	120.6	682.5	652.5	29.97	22.769		
6,800.0	6,612.8	6,609.8	6,502.5	20.9	15.1	80.16	-253.6	123.4	686.5	655.8	30.72	22.347		
6,900.0	6,660.0	6,690.4	6,546.3	21.2	15.7	79.90	-321.1	125.9	689.0	657.3	31.68	21.745		
7,000.0	6,695.4	6,771.7	6,583.1	21.7	16.3	80.12	-393.5	127.9	689.8	657.0	32.89	20.972		
7,100.0	6,718.5	6,850.0	6,611.1	22.4	17.1	80.74	-466.6	129.5	689.2	654.9	34.31	20.085		
7,200.0	6,728.8	6,936.9	6,633.2	23.2	18.0	81.85	-550.6	130.7	687.1	651.0	36.09	19.037		
7,300.0	6,729.0	7,021.6	6,645.5	24.0	19.0	82.91	-634.3	131.4	684.5	646.3	38.19	17.922		
7,400.0	6,728.4	7,110.3	6,648.6	25.1	20.1	83.21	-723.0	131.6	683.8	643.2	40.62	16.835		
7,500.0	6,727.8	7,210.3	6,648.3	26.2	21.5	83.24	-823.0	131.6	683.8	640.4	43.33	15.780		
7,600.0	6,727.2	7,310.3	6,648.1	27.4	23.0	83.27	-923.0	131.6	683.7	637.5	46.20	14.798		
7,700.0	6,726.6	7,410.3	6,647.9	28.8	24.5	83.30	-1,023.0	131.6	683.7	634.5	49.20	13.895		
7,800.0	6,726.0	7,510.3	6,647.7	30.1	26.0	83.33	-1,123.0	131.6	683.6	631.3	52.31	13.068		
7,900.0	6,725.5	7,610.3	6,647.4	31.6	27.6	83.36	-1,223.0	131.6	683.6	628.1	55.51	12.315		
8,000.0	6,724.9	7,710.3	6,647.2	33.1	29.3	83.39	-1,323.0	131.6	683.5	624.8	58.78	11.628		
8,100.0	6,724.3	7,810.3	6,647.0	34.6	31.0	83.42	-1,423.0	131.6	683.5	621.4	62.12	11.003		
8,200.0	6,723.7	7,910.3	6,646.7	36.2	32.7	83.45	-1,523.0	131.6	683.5	617.9	65.51	10.433		
8,300.0	6,723.1	8,010.3	6,646.5	37.8	34.4	83.48	-1,623.0	131.6	683.4	614.5	68.94	9.913		
8,400.0	6,722.5	8,110.3	6,646.3	39.4	36.1	83.51	-1,723.0	131.6	683.4	611.0	72.42	9.436		
8,500.0	6,721.9	8,210.3	6,646.1	41.1	37.9	83.54	-1,823.0	131.6	683.3	607.4	75.93	9.000		
8,600.0	6,721.3	8,310.3	6,645.8	42.8	39.7	83.58	-1,923.0	131.6	683.3	603.8	79.47	8.599		
8,700.0	6,720.7	8,410.3	6,645.6	44.5	41.5	83.61	-2,023.0	131.6	683.2	600.2	83.03	8.229		
8,800.0	6,720.1	8,510.3	6,645.4	46.2	43.3	83.64	-2,123.0	131.6	683.2	596.6	86.62	7.888		
8,900.0	6,719.5	8,610.3	6,645.2	47.9	45.1	83.67	-2,223.0	131.6	683.2	592.9	90.22	7.572		
9,000.0	6,718.9	8,710.3	6,644.9	49.6	46.9	83.70	-2,323.0	131.6	683.1	589.3	93.85	7.279		
9,100.0	6,718.3	8,810.3	6,644.7	51.4	48.7	83.73	-2,423.0	131.6	683.1	585.6	97.49	7.007		
9,200.0	6,717.7	8,910.3	6,644.5	53.2	50.6	83.76	-2,523.0	131.6	683.0	581.9	101.14	6.753		
9,300.0	6,717.1	9,010.3	6,644.2	55.0	52.4	83.79	-2,623.0	131.6	683.0	578.2	104.81	6.517		
9,400.0	6,716.5	9,110.3	6,644.0	56.7	54.3	83.82	-2,723.0	131.6	683.0	574.5	108.49	6.295		
9,500.0	6,716.0	9,210.3	6,643.8	58.5	56.1	83.85	-2,823.0	131.6	682.9	570.7	112.18	6.088		
9,600.0	6,715.4	9,310.3	6,643.6	60.3	58.0	83.88	-2,923.0	131.6	682.9	567.0	115.87	5.893		
9,700.0	6,714.8	9,410.3	6,643.3	62.2	59.8	83.91	-3,023.0	131.6	682.8	563.3	119.58	5.710		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-203 - Wellbore #1 - Plan #3 (11-12-14)													Offset Site Error: 0.0 ft
Survey Program: 0-MWD													Offset Well Error: 0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
9,800.0	6,714.2	9,510.3	6,643.1	64.0	61.7	83.94	-3,123.0	131.6	682.8	559.5	123.30	5.538	
9,900.0	6,713.6	9,610.3	6,642.9	65.8	63.6	83.97	-3,223.0	131.6	682.8	555.8	127.02	5.375	
10,000.0	6,713.0	9,710.3	6,642.7	67.6	65.4	84.00	-3,323.0	131.6	682.7	552.0	130.75	5.222	
10,100.0	6,712.4	9,810.3	6,642.4	69.5	67.3	84.03	-3,423.0	131.6	682.7	548.2	134.48	5.077	
10,200.0	6,711.8	9,910.3	6,642.2	71.3	69.2	84.06	-3,523.0	131.6	682.7	544.4	138.22	4.939	
10,300.0	6,711.2	10,010.3	6,642.0	73.1	71.1	84.10	-3,623.0	131.6	682.6	540.7	141.97	4.808	
10,400.0	6,710.6	10,110.3	6,641.8	75.0	72.9	84.13	-3,723.0	131.6	682.6	536.9	145.72	4.684	
10,500.0	6,710.0	10,210.3	6,641.5	76.8	74.8	84.16	-3,823.0	131.6	682.5	533.1	149.47	4.566	
10,600.0	6,709.4	10,310.3	6,641.3	78.7	76.7	84.19	-3,923.0	131.6	682.5	529.3	153.23	4.454	
10,700.0	6,708.8	10,410.3	6,641.1	80.6	78.6	84.22	-4,023.0	131.6	682.5	525.5	156.99	4.347	
10,800.0	6,708.2	10,510.3	6,640.8	82.4	80.5	84.25	-4,123.0	131.6	682.4	521.7	160.76	4.245	
10,900.0	6,707.6	10,610.3	6,640.6	84.3	82.4	84.28	-4,223.0	131.6	682.4	517.9	164.53	4.148	
11,000.0	6,707.0	10,710.3	6,640.4	86.1	84.3	84.31	-4,323.0	131.6	682.4	514.1	168.30	4.054	
11,100.0	6,706.5	10,810.3	6,640.2	88.0	86.2	84.34	-4,423.0	131.6	682.3	510.2	172.08	3.965	
11,200.0	6,705.9	10,910.3	6,639.9	89.9	88.1	84.37	-4,523.0	131.6	682.3	506.4	175.85	3.880	
11,300.0	6,705.3	11,010.3	6,639.7	91.7	89.9	84.40	-4,623.0	131.6	682.3	502.6	179.63	3.798	
11,400.0	6,704.7	11,110.3	6,639.5	93.6	91.8	84.43	-4,723.0	131.6	682.2	498.8	183.42	3.719	
11,500.0	6,704.1	11,210.3	6,639.3	95.5	93.7	84.46	-4,823.0	131.6	682.2	495.0	187.20	3.644	
11,600.0	6,703.5	11,310.3	6,639.0	97.4	95.6	84.49	-4,923.0	131.6	682.1	491.2	190.99	3.572	
11,700.0	6,702.9	11,410.3	6,638.8	99.3	97.5	84.52	-5,023.0	131.6	682.1	487.3	194.78	3.502	
11,800.0	6,702.3	11,510.3	6,638.6	101.1	99.4	84.55	-5,123.0	131.6	682.1	483.5	198.58	3.435	
11,900.0	6,701.7	11,610.3	6,638.3	103.0	101.3	84.59	-5,223.0	131.6	682.0	479.7	202.37	3.370	
12,000.0	6,701.1	11,710.3	6,638.1	104.9	103.2	84.62	-5,323.0	131.6	682.0	475.8	206.17	3.308	
12,100.0	6,700.5	11,810.3	6,637.9	106.8	105.1	84.65	-5,423.0	131.6	682.0	472.0	209.96	3.248	
12,200.0	6,699.9	11,910.3	6,637.7	108.7	107.0	84.68	-5,523.0	131.6	681.9	468.2	213.76	3.190	
12,300.0	6,699.3	12,010.3	6,637.4	110.6	108.9	84.71	-5,623.0	131.6	681.9	464.3	217.56	3.134	
12,400.0	6,698.7	12,110.3	6,637.2	112.4	110.8	84.74	-5,723.0	131.6	681.9	460.5	221.37	3.080	
12,500.0	6,698.1	12,210.3	6,637.0	114.3	112.7	84.77	-5,823.0	131.6	681.8	456.7	225.17	3.028	
12,600.0	6,697.6	12,310.3	6,636.8	116.2	114.7	84.80	-5,923.0	131.6	681.8	452.8	228.98	2.978	
12,700.0	6,697.0	12,410.3	6,636.5	118.1	116.6	84.83	-6,023.0	131.6	681.8	449.0	232.78	2.929	
12,800.0	6,696.4	12,510.3	6,636.3	120.0	118.5	84.86	-6,123.0	131.6	681.7	445.1	236.59	2.881	
12,900.0	6,695.8	12,610.3	6,636.1	121.9	120.4	84.89	-6,223.0	131.6	681.7	441.3	240.40	2.836	
13,000.0	6,695.2	12,710.3	6,635.9	123.8	122.3	84.92	-6,323.0	131.6	681.7	437.5	244.21	2.791	
13,100.0	6,694.6	12,810.3	6,635.6	125.7	124.2	84.95	-6,423.0	131.6	681.6	433.6	248.02	2.748	
13,200.0	6,694.0	12,910.3	6,635.4	127.6	126.1	84.98	-6,523.0	131.6	681.6	429.8	251.84	2.707	
13,300.0	6,693.4	13,010.3	6,635.2	129.5	128.0	85.02	-6,623.0	131.6	681.6	425.9	255.65	2.666	
13,400.0	6,692.8	13,110.3	6,634.9	131.4	129.9	85.05	-6,723.0	131.6	681.5	422.1	259.47	2.627	
13,500.0	6,692.2	13,210.3	6,634.7	133.3	131.8	85.08	-6,823.0	131.6	681.5	418.2	263.28	2.589	
13,600.0	6,691.6	13,310.3	6,634.5	135.2	133.7	85.11	-6,923.0	131.6	681.5	414.4	267.10	2.551	
13,700.0	6,691.0	13,410.3	6,634.3	137.1	135.6	85.14	-7,023.0	131.6	681.4	410.5	270.92	2.515	
13,800.0	6,690.4	13,510.3	6,634.0	139.0	137.5	85.17	-7,123.0	131.6	681.4	406.7	274.70	2.481	
13,872.0	6,690.0	13,582.3	6,633.9	140.3	138.6	85.19	-7,195.0	131.6	681.4	404.2	277.19	2.458 SF	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-343 - Wellbore #1 - Plan #3 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	2.0	2.0	0.0	0.0	-90.00	0.0	-119.8	119.8	119.8	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-119.8	119.8	119.6	0.23	522.571		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-119.8	119.8	119.1	0.68	176.498		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-119.8	119.8	118.7	1.13	106.180		
400.0	400.0	402.0	402.0	0.8	0.8	-90.00	0.0	-119.8	119.8	118.2	1.58	75.929		
500.0	500.0	502.0	502.0	1.0	1.0	-90.00	0.0	-119.8	119.8	117.8	2.03	59.093		
566.0	566.0	568.0	568.0	1.2	1.2	-90.00	0.0	-119.8	119.8	117.5	2.32	51.551 CC		
600.0	600.0	602.0	602.0	1.2	1.2	-90.00	0.0	-119.8	119.8	117.3	2.48	48.373 ES		
700.0	700.0	700.0	700.0	1.5	1.5	-89.78	0.5	-120.5	120.6	117.6	2.92	41.344		
800.0	800.0	798.4	798.4	1.7	1.7	-89.14	1.8	-122.7	122.8	119.4	3.35	36.606		
900.0	900.0	896.5	896.4	1.9	1.9	-88.14	4.1	-126.3	126.5	122.7	3.80	33.314		
1,000.0	1,000.0	994.4	994.1	2.1	2.1	-86.84	7.2	-131.3	131.7	127.5	4.25	31.020		
1,100.0	1,100.0	1,094.0	1,093.5	2.4	2.3	-158.61	10.9	-137.1	138.6	134.0	4.67	29.674		
1,200.0	1,200.0	1,193.6	1,192.8	2.6	2.6	-157.69	14.6	-143.0	147.2	142.1	5.10	28.858		
1,300.0	1,299.9	1,293.1	1,292.1	2.8	2.8	-157.10	18.3	-148.8	157.5	151.9	5.53	28.451		
1,400.0	1,399.7	1,392.4	1,391.1	3.0	3.1	-156.81	22.0	-154.7	169.3	163.3	5.97	28.365 SF		
1,500.0	1,499.4	1,491.5	1,490.0	3.2	3.3	-156.77	25.7	-160.5	182.7	176.3	6.40	28.532		
1,600.0	1,598.9	1,590.3	1,588.6	3.5	3.6	-156.92	29.4	-166.3	197.8	190.9	6.84	28.903		
1,700.0	1,698.3	1,688.9	1,686.9	3.7	3.8	-157.22	33.0	-172.1	214.4	207.1	7.28	29.442		
1,800.0	1,797.4	1,787.2	1,785.0	4.0	4.1	-157.63	36.7	-177.9	232.6	224.9	7.72	30.121		
1,900.0	1,896.3	1,885.2	1,882.8	4.3	4.3	-158.11	40.3	-183.7	252.4	244.2	8.16	30.917		
2,000.0	1,995.0	1,983.0	1,980.3	4.6	4.6	-158.66	44.0	-189.4	273.2	264.6	8.62	31.692		
2,100.0	2,093.8	2,080.8	2,077.8	4.9	4.8	-159.14	47.6	-195.2	294.0	285.0	9.08	32.376		
2,200.0	2,192.5	2,178.6	2,175.4	5.2	5.1	-159.56	51.2	-200.9	314.9	305.3	9.55	32.985		
2,300.0	2,291.2	2,276.3	2,272.9	5.6	5.3	-159.93	54.9	-206.6	335.8	325.8	10.01	33.531		
2,400.0	2,390.0	2,374.1	2,370.5	5.9	5.6	-160.26	58.5	-212.4	356.6	346.2	10.48	34.023		
2,500.0	2,488.7	2,471.9	2,468.0	6.2	5.8	-160.54	62.1	-218.1	377.5	366.6	10.95	34.469		
2,600.0	2,587.5	2,569.7	2,565.5	6.6	6.1	-160.80	65.8	-223.9	398.4	387.0	11.43	34.874		
2,700.0	2,686.2	2,667.4	2,663.1	6.9	6.3	-161.03	69.4	-229.6	419.3	407.4	11.90	35.243		
2,800.0	2,784.9	2,765.2	2,760.6	7.3	6.6	-161.24	73.0	-235.4	440.3	427.9	12.37	35.582		
2,900.0	2,883.7	2,863.0	2,858.2	7.6	6.8	-161.44	76.7	-241.1	461.2	448.3	12.85	35.893		
3,000.0	2,982.4	2,960.8	2,955.7	8.0	7.1	-161.61	80.3	-246.9	482.1	468.8	13.33	36.180		
3,100.0	3,081.1	3,058.6	3,053.2	8.3	7.3	-161.77	83.9	-252.6	503.0	489.2	13.80	36.445		
3,200.0	3,179.9	3,156.3	3,150.8	8.7	7.6	-161.92	87.6	-258.4	524.0	509.7	14.28	36.691		
3,300.0	3,278.6	3,254.1	3,248.3	9.1	7.8	-162.05	91.2	-264.1	544.9	530.1	14.76	36.919		
3,400.0	3,377.3	3,351.9	3,345.9	9.4	8.1	-162.18	94.8	-269.9	565.8	550.6	15.24	37.132		
3,500.0	3,476.1	3,449.7	3,443.4	9.8	8.3	-162.30	98.5	-275.6	586.8	571.0	15.72	37.331		
3,600.0	3,574.8	3,547.4	3,540.9	10.1	8.6	-162.41	102.1	-281.4	607.7	591.5	16.20	37.517		
3,700.0	3,673.5	3,645.2	3,638.5	10.5	8.8	-162.51	105.7	-287.1	628.6	612.0	16.68	37.692		
3,800.0	3,772.3	3,743.0	3,736.0	10.9	9.1	-162.60	109.4	-292.9	649.6	632.4	17.16	37.855		
3,900.0	3,871.0	3,840.8	3,833.6	11.2	9.3	-162.69	113.0	-298.6	670.5	652.9	17.64	38.010		
4,000.0	3,969.8	3,938.5	3,931.1	11.6	9.6	-162.78	116.6	-304.4	691.5	673.4	18.12	38.155		
4,100.0	4,068.5	4,036.3	4,028.6	12.0	9.8	-162.85	120.3	-310.1	712.4	693.8	18.61	38.292		
4,200.0	4,167.2	4,134.1	4,126.2	12.3	10.1	-162.93	123.9	-315.9	733.4	714.3	19.09	38.422		
4,300.0	4,266.0	4,231.9	4,223.7	12.7	10.3	-163.00	127.5	-321.6	754.3	734.8	19.57	38.545		
4,400.0	4,364.7	4,329.7	4,321.3	13.1	10.6	-163.07	131.1	-327.4	775.3	755.2	20.05	38.661		
4,500.0	4,463.4	4,427.4	4,418.8	13.4	10.8	-163.13	134.8	-333.1	796.2	775.7	20.54	38.772		
4,600.0	4,562.2	4,525.2	4,516.3	13.8	11.1	-163.19	138.4	-338.9	817.2	796.2	21.02	38.877		
4,700.0	4,660.9	4,623.0	4,613.9	14.2	11.3	-163.24	142.0	-344.6	838.1	816.6	21.50	38.977		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-343 - Wellbore #1 - Plan #3 (11-12-14)												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,759.6	4,720.8	4,711.4	14.5	11.6	-163.30	145.7	-350.4	859.1	837.1	21.99	39.072	
4,900.0	4,858.4	4,818.5	4,809.0	14.9	11.8	-163.35	149.3	-356.1	880.1	857.6	22.47	39.163	
5,000.0	4,957.1	4,916.3	4,906.5	15.3	12.1	-163.40	152.9	-361.9	901.0	878.1	22.96	39.249	
5,100.0	5,055.9	5,014.1	5,004.0	15.6	12.3	-163.45	156.6	-367.6	922.0	898.5	23.44	39.332	
5,200.0	5,154.6	5,111.9	5,101.6	16.0	12.6	-163.49	160.2	-373.4	942.9	919.0	23.93	39.411	
5,300.0	5,253.3	5,209.6	5,199.1	16.4	12.9	-163.53	163.8	-379.1	963.9	939.5	24.41	39.487	
5,400.0	5,352.1	5,307.4	5,296.7	16.8	13.1	-163.57	167.5	-384.9	984.8	959.9	24.90	39.559	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-423 - Wellbore #1 - Plan #3 (11-12-14)														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	-90.02	0.0	-30.6	30.6						
100.0	100.0	100.0	100.0	0.1	0.1	-90.02	0.0	-30.6	30.6	30.4	0.22	136.355			
200.0	200.0	200.0	200.0	0.3	0.3	-90.02	0.0	-30.6	30.6	30.0	0.67	45.452			
300.0	300.0	300.0	300.0	0.6	0.6	-90.02	0.0	-30.6	30.6	29.5	1.12	27.271			
400.0	400.0	400.0	400.0	0.8	0.8	-90.02	0.0	-30.6	30.6	29.1	1.57	19.479			
500.0	500.0	500.0	500.0	1.0	1.0	-90.02	0.0	-30.6	30.6	28.6	2.02	15.151			
600.0	600.0	600.0	600.0	1.2	1.2	-90.02	0.0	-30.6	30.6	28.2	2.47	12.396			
700.0	700.0	700.0	700.0	1.5	1.5	-90.02	0.0	-30.6	30.6	27.7	2.92	10.489			
800.0	800.0	800.0	800.0	1.7	1.7	-90.02	0.0	-30.6	30.6	27.3	3.37	9.090			
900.0	900.0	900.0	900.0	1.9	1.9	-90.02	0.0	-30.6	30.6	26.8	3.82	8.021			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-90.02	0.0	-30.6	30.6	26.4	4.27	7.177 CC, ES			
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-163.54	0.0	-30.6	31.5	26.8	4.71	6.685			
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-164.79	0.0	-30.6	34.0	28.9	5.14	6.614			
1,300.0	1,299.9	1,299.9	1,299.9	2.8	2.8	-166.49	0.0	-30.6	38.2	32.7	5.57	6.860			
1,400.0	1,399.7	1,399.7	1,399.7	3.0	3.0	-168.33	0.0	-30.6	44.2	38.2	6.01	7.357			
1,500.0	1,499.4	1,499.4	1,499.4	3.2	3.3	-170.07	0.0	-30.6	51.9	45.5	6.44	8.059			
1,600.0	1,598.9	1,600.3	1,600.3	3.5	3.5	-171.06	0.7	-29.6	60.2	53.3	6.87	8.764			
1,700.0	1,698.3	1,701.5	1,701.5	3.7	3.7	-171.04	3.0	-26.3	67.9	60.6	7.29	9.307			
1,800.0	1,797.4	1,803.0	1,802.7	4.0	3.9	-170.30	6.8	-20.8	74.9	67.2	7.72	9.704			
1,900.0	1,896.3	1,903.0	1,902.3	4.3	4.1	-169.36	11.5	-14.0	82.2	74.1	8.15	10.088			
2,000.0	1,995.0	2,002.6	2,001.6	4.6	4.4	-168.72	16.3	-7.2	90.5	81.9	8.60	10.532			
2,100.0	2,093.8	2,102.2	2,100.9	4.9	4.6	-168.18	21.0	-0.4	98.9	89.8	9.05	10.926			
2,200.0	2,192.5	2,201.9	2,200.2	5.2	4.9	-167.73	25.7	6.3	107.3	97.8	9.51	11.278			
2,300.0	2,291.2	2,301.5	2,299.5	5.6	5.1	-167.35	30.4	13.1	115.6	105.7	9.98	11.592			
2,400.0	2,390.0	2,401.2	2,398.8	5.9	5.3	-167.02	35.1	19.9	124.0	113.6	10.44	11.876			
2,500.0	2,488.7	2,500.8	2,498.1	6.2	5.6	-166.73	39.8	26.7	132.4	121.5	10.91	12.131			
2,600.0	2,587.5	2,600.5	2,597.4	6.6	5.8	-166.47	44.5	33.4	140.8	129.4	11.39	12.363			
2,700.0	2,686.2	2,700.1	2,696.7	6.9	6.1	-166.24	49.2	40.2	149.2	137.3	11.86	12.574			
2,800.0	2,784.9	2,799.8	2,796.0	7.3	6.3	-166.04	53.9	47.0	157.5	145.2	12.34	12.766			
2,900.0	2,883.7	2,899.4	2,895.3	7.6	6.6	-165.86	58.6	53.8	165.9	153.1	12.82	12.943			
3,000.0	2,982.4	2,999.1	2,994.6	8.0	6.8	-165.69	63.3	60.6	174.3	161.0	13.30	13.105			
3,100.0	3,081.1	3,098.7	3,093.9	8.3	7.1	-165.54	68.0	67.3	182.7	168.9	13.79	13.254			
3,200.0	3,179.9	3,198.4	3,193.2	8.7	7.4	-165.41	72.7	74.1	191.1	176.8	14.27	13.391			
3,300.0	3,278.6	3,298.0	3,292.5	9.1	7.6	-165.28	77.4	80.9	199.5	184.8	14.76	13.519			
3,400.0	3,377.3	3,397.6	3,391.9	9.4	7.9	-165.17	82.1	87.7	207.9	192.7	15.25	13.637			
3,500.0	3,476.1	3,497.3	3,491.2	9.8	8.1	-165.06	86.8	94.4	216.3	200.6	15.73	13.748			
3,600.0	3,574.8	3,596.9	3,590.5	10.1	8.4	-164.96	91.5	101.2	224.7	208.5	16.22	13.850			
3,700.0	3,673.5	3,696.6	3,689.8	10.5	8.7	-164.87	96.2	108.0	233.1	216.4	16.71	13.946			
3,800.0	3,772.3	3,796.2	3,789.1	10.9	8.9	-164.79	100.9	114.8	241.5	224.3	17.21	14.036			
3,900.0	3,871.0	3,895.9	3,888.4	11.2	9.2	-164.71	105.7	121.6	249.9	232.2	17.70	14.121			
4,000.0	3,969.8	3,995.5	3,987.7	11.6	9.4	-164.64	110.4	128.3	258.3	240.1	18.19	14.200			
4,100.0	4,068.5	4,095.2	4,087.0	12.0	9.7	-164.57	115.1	135.1	266.7	248.0	18.68	14.274			
4,200.0	4,167.2	4,194.8	4,186.3	12.3	10.0	-164.50	119.8	141.9	275.1	255.9	19.18	14.345			
4,300.0	4,266.0	4,294.5	4,285.6	12.7	10.2	-164.44	124.5	148.7	283.5	263.8	19.67	14.411			
4,400.0	4,364.7	4,394.1	4,384.9	13.1	10.5	-164.38	129.2	155.4	291.9	271.7	20.17	14.474			
4,500.0	4,463.4	4,493.8	4,484.2	13.4	10.8	-164.33	133.9	162.2	300.3	279.6	20.66	14.533			
4,600.0	4,562.2	4,593.4	4,583.5	13.8	11.0	-164.28	138.6	169.0	308.7	287.5	21.16	14.590			
4,700.0	4,660.9	4,693.0	4,682.8	14.2	11.3	-164.23	143.3	175.8	317.1	295.4	21.65	14.643			
4,800.0	4,759.6	4,792.7	4,782.1	14.5	11.6	-164.18	148.0	182.6	325.5	303.3	22.15	14.694			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-423 - Wellbore #1 - Plan #3 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
4,900.0	4,858.4	4,892.3	4,881.4	14.9	11.8	-164.14	152.7	189.3	333.9	311.3	22.65	14.742		
5,000.0	4,957.1	4,992.0	4,980.7	15.3	12.1	-164.10	157.4	196.1	342.3	319.2	23.15	14.789		
5,100.0	5,055.9	5,091.6	5,080.0	15.6	12.4	-164.06	162.1	202.9	350.7	327.1	23.64	14.833		
5,200.0	5,154.6	5,191.3	5,179.3	16.0	12.6	-164.02	166.8	209.7	359.1	335.0	24.14	14.875		
5,300.0	5,253.3	5,290.9	5,278.6	16.4	12.9	-163.98	171.5	216.4	367.5	342.9	24.64	14.915		
5,400.0	5,352.1	5,390.6	5,377.9	16.8	13.1	-163.95	176.2	223.2	375.9	350.8	25.14	14.953		
5,500.0	5,450.8	5,490.2	5,477.2	17.1	13.4	-163.92	180.9	230.0	384.3	358.7	25.64	14.990		
5,600.0	5,549.5	5,589.9	5,576.5	17.5	13.7	-163.88	185.6	236.8	392.7	366.6	26.14	15.025		
5,700.0	5,648.3	5,689.5	5,675.8	17.9	13.9	-163.85	190.3	243.6	401.1	374.5	26.64	15.059		
5,800.0	5,747.0	5,789.2	5,775.1	18.2	14.2	-163.82	195.0	250.3	409.5	382.4	27.14	15.091		
5,900.0	5,845.7	5,888.8	5,874.4	18.6	14.5	-163.80	199.8	257.1	417.9	390.3	27.64	15.122		
6,000.0	5,944.5	5,988.4	5,973.8	19.0	14.7	-166.04	204.5	263.9	426.3	398.2	28.13	15.154		
6,100.0	6,043.2	6,087.7	6,072.8	19.3	15.0	-148.77	206.1	270.6	434.7	406.2	28.53	15.237		
6,200.0	6,140.8	6,187.4	6,171.6	19.5	15.1	124.36	195.4	277.4	443.0	414.2	28.81	15.379		
6,300.0	6,235.5	6,287.8	6,268.8	19.8	15.3	113.45	171.7	284.0	451.2	422.2	29.01	15.555		
6,400.0	6,325.7	6,388.9	6,362.8	19.9	15.4	107.79	135.1	290.4	459.1	429.9	29.17	15.736		
6,500.0	6,409.9	6,490.7	6,451.6	20.1	15.4	104.45	86.1	296.5	466.5	437.1	29.37	15.882		
6,600.0	6,486.7	6,593.1	6,533.8	20.3	15.5	102.31	25.2	302.1	473.3	443.6	29.68	15.944		
6,700.0	6,554.7	6,696.3	6,607.5	20.6	15.7	100.88	-46.6	307.1	479.3	449.2	30.20	15.874		
6,800.0	6,612.8	6,800.0	6,671.2	20.9	15.9	99.90	-128.3	311.5	484.6	453.6	30.99	15.637		
6,900.0	6,660.0	6,904.3	6,723.6	21.2	16.4	99.24	-218.3	315.1	488.9	456.8	32.12	15.221		
7,000.0	6,695.4	7,009.1	6,763.4	21.7	17.1	98.81	-315.1	317.8	492.2	458.6	33.61	14.643		
7,100.0	6,718.5	7,114.2	6,789.7	22.4	18.0	98.57	-416.8	319.6	494.4	459.0	35.45	13.945		
7,200.0	6,728.8	7,219.6	6,801.9	23.2	19.1	98.49	-521.3	320.4	495.5	457.9	37.60	13.180		
7,300.0	6,729.0	7,321.4	6,802.7	24.0	20.3	98.55	-623.2	320.5	495.7	455.8	39.89	12.426		
7,400.0	6,728.4	7,421.4	6,802.8	25.1	21.5	98.62	-723.2	320.5	495.8	453.3	42.42	11.686		
7,500.0	6,727.8	7,521.4	6,802.8	26.2	22.9	98.70	-823.2	320.5	495.8	450.7	45.13	10.986		
7,600.0	6,727.2	7,621.4	6,802.8	27.4	24.3	98.77	-923.2	320.5	495.9	448.0	47.99	10.334		
7,700.0	6,726.6	7,721.4	6,802.9	28.8	25.8	98.84	-1,023.2	320.5	496.0	445.1	50.97	9.731		
7,800.0	6,726.0	7,821.4	6,802.9	30.1	27.3	98.91	-1,123.2	320.5	496.1	442.1	54.06	9.178		
7,900.0	6,725.5	7,921.4	6,802.9	31.6	28.9	98.98	-1,223.2	320.5	496.2	439.0	57.22	8.672		
8,000.0	6,724.9	8,021.4	6,803.0	33.1	30.5	99.05	-1,323.2	320.5	496.3	435.9	60.46	8.209		
8,100.0	6,724.3	8,121.4	6,803.0	34.6	32.2	99.13	-1,423.2	320.5	496.4	432.7	63.76	7.786		
8,200.0	6,723.7	8,221.4	6,803.0	36.2	33.9	99.20	-1,523.2	320.5	496.5	429.4	67.11	7.398		
8,300.0	6,723.1	8,321.4	6,803.1	37.8	35.6	99.27	-1,623.2	320.5	496.6	426.1	70.51	7.044		
8,400.0	6,722.5	8,421.4	6,803.1	39.4	37.3	99.34	-1,723.1	320.5	496.7	422.8	73.94	6.718		
8,500.0	6,721.9	8,521.4	6,803.1	41.1	39.1	99.41	-1,823.1	320.5	496.8	419.4	77.40	6.419		
8,600.0	6,721.3	8,621.4	6,803.2	42.8	40.8	99.48	-1,923.1	320.5	496.9	416.0	80.90	6.143		
8,700.0	6,720.7	8,721.4	6,803.2	44.5	42.6	99.56	-2,023.1	320.5	497.0	412.6	84.41	5.888		
8,800.0	6,720.1	8,821.4	6,803.2	46.2	44.4	99.63	-2,123.1	320.5	497.1	409.2	87.95	5.653		
8,900.0	6,719.5	8,921.4	6,803.3	47.9	46.2	99.70	-2,223.1	320.5	497.3	405.7	91.51	5.434		
9,000.0	6,718.9	9,021.4	6,803.3	49.6	48.0	99.77	-2,323.1	320.5	497.4	402.3	95.08	5.231		
9,100.0	6,718.3	9,121.4	6,803.4	51.4	49.8	99.84	-2,423.1	320.5	497.5	398.8	98.66	5.042		
9,200.0	6,717.7	9,221.4	6,803.4	53.2	51.7	99.91	-2,523.1	320.5	497.6	395.3	102.26	4.866		
9,300.0	6,717.1	9,321.4	6,803.4	55.0	53.5	99.98	-2,623.1	320.5	497.7	391.8	105.87	4.701		
9,400.0	6,716.5	9,421.4	6,803.5	56.7	55.3	100.05	-2,723.1	320.5	497.8	388.3	109.49	4.546		
9,500.0	6,716.0	9,521.4	6,803.5	58.5	57.2	100.13	-2,823.1	320.5	497.9	384.8	113.12	4.401		
9,600.0	6,715.4	9,621.4	6,803.5	60.3	59.0	100.20	-2,923.1	320.5	498.0	381.3	116.76	4.265		
9,700.0	6,714.8	9,721.4	6,803.6	62.2	60.9	100.27	-3,023.1	320.5	498.1	377.7	120.40	4.137		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-423 - Wellbore #1 - Plan #3 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
9,800.0	6,714.2	9,821.4	6,803.6	64.0	62.7	100.34	-3,123.1	320.5	498.2	374.2	124.05	4.016		
9,900.0	6,713.6	9,921.4	6,803.6	65.8	64.6	100.41	-3,223.1	320.5	498.4	370.6	127.71	3.902		
10,000.0	6,713.0	10,021.4	6,803.7	67.6	66.4	100.48	-3,323.1	320.5	498.5	367.1	131.37	3.794		
10,100.0	6,712.4	10,121.4	6,803.7	69.5	68.3	100.55	-3,423.1	320.5	498.6	363.5	135.03	3.692		
10,200.0	6,711.8	10,221.4	6,803.7	71.3	70.2	100.62	-3,523.1	320.5	498.7	360.0	138.70	3.596		
10,300.0	6,711.2	10,321.4	6,803.8	73.1	72.0	100.69	-3,623.1	320.5	498.8	356.4	142.37	3.504		
10,400.0	6,710.6	10,421.4	6,803.8	75.0	73.9	100.77	-3,723.1	320.5	498.9	352.9	146.04	3.416		
10,500.0	6,710.0	10,521.4	6,803.8	76.8	75.8	100.84	-3,823.1	320.5	499.0	349.3	149.72	3.333		
10,600.0	6,709.4	10,621.4	6,803.9	78.7	77.7	100.91	-3,923.1	320.5	499.2	345.8	153.40	3.254		
10,700.0	6,708.8	10,721.4	6,803.9	80.6	79.6	100.98	-4,023.1	320.5	499.3	342.2	157.08	3.179		
10,800.0	6,708.2	10,821.3	6,803.9	82.4	81.4	101.05	-4,123.1	320.5	499.4	338.6	160.76	3.106		
10,900.0	6,707.6	10,921.3	6,804.0	84.3	83.3	101.12	-4,223.1	320.5	499.5	335.1	164.45	3.038		
11,000.0	6,707.0	11,021.3	6,804.0	86.1	85.2	101.19	-4,323.1	320.5	499.6	331.5	168.13	2.972		
11,100.0	6,706.5	11,121.3	6,804.0	88.0	87.1	101.26	-4,423.1	320.5	499.8	327.9	171.82	2.909		
11,200.0	6,705.9	11,221.3	6,804.1	89.9	89.0	101.33	-4,523.1	320.5	499.9	324.4	175.51	2.848		
11,300.0	6,705.3	11,321.3	6,804.1	91.7	90.9	101.40	-4,623.1	320.5	500.0	320.8	179.20	2.790		
11,400.0	6,704.7	11,421.3	6,804.2	93.6	92.8	101.47	-4,723.1	320.5	500.1	317.3	182.89	2.735		
11,500.0	6,704.1	11,521.3	6,804.2	95.5	94.7	101.54	-4,823.1	320.5	500.3	313.7	186.58	2.681		
11,600.0	6,703.5	11,621.3	6,804.2	97.4	96.6	101.61	-4,923.1	320.5	500.4	310.1	190.26	2.630		
11,700.0	6,702.9	11,721.3	6,804.3	99.3	98.5	101.68	-5,023.1	320.5	500.5	306.6	193.95	2.581		
11,800.0	6,702.3	11,821.3	6,804.3	101.1	100.3	101.75	-5,123.1	320.5	500.6	303.0	197.64	2.533		
11,900.0	6,701.7	11,921.3	6,804.3	103.0	102.2	101.83	-5,223.1	320.5	500.8	299.4	201.33	2.487		
12,000.0	6,701.1	12,021.3	6,804.4	104.9	104.1	101.90	-5,323.1	320.5	500.9	295.9	205.02	2.443		
12,100.0	6,700.5	12,121.3	6,804.4	106.8	106.0	101.97	-5,423.1	320.5	501.0	292.3	208.71	2.401		
12,200.0	6,699.9	12,221.3	6,804.4	108.7	107.9	102.04	-5,523.1	320.5	501.2	288.8	212.40	2.360		
12,300.0	6,699.3	12,321.3	6,804.5	110.6	109.8	102.11	-5,623.1	320.5	501.3	285.2	216.09	2.320		
12,400.0	6,698.7	12,421.3	6,804.5	112.4	111.7	102.18	-5,723.1	320.5	501.4	281.7	219.77	2.282		
12,500.0	6,698.1	12,521.3	6,804.5	114.3	113.6	102.25	-5,823.1	320.5	501.6	278.1	223.46	2.245		
12,600.0	6,697.6	12,621.3	6,804.6	116.2	115.5	102.32	-5,923.1	320.5	501.7	274.5	227.15	2.209		
12,700.0	6,697.0	12,721.3	6,804.6	118.1	117.4	102.39	-6,023.1	320.5	501.8	271.0	230.83	2.174		
12,800.0	6,696.4	12,821.3	6,804.6	120.0	119.3	102.46	-6,123.1	320.5	502.0	267.5	234.52	2.140		
12,900.0	6,695.8	12,921.3	6,804.7	121.9	121.3	102.53	-6,223.1	320.5	502.1	263.9	238.20	2.108		
13,000.0	6,695.2	13,021.3	6,804.7	123.8	123.2	102.60	-6,323.1	320.5	502.2	260.4	241.88	2.076		
13,100.0	6,694.6	13,121.3	6,804.7	125.7	125.1	102.67	-6,423.1	320.5	502.4	256.8	245.56	2.046		
13,200.0	6,694.0	13,221.3	6,804.8	127.6	127.0	102.74	-6,523.1	320.5	502.5	253.3	249.24	2.016		
13,300.0	6,693.4	13,321.3	6,804.8	129.5	128.9	102.81	-6,623.1	320.5	502.7	249.7	252.92	1.987		
13,400.0	6,692.8	13,421.3	6,804.9	131.4	130.8	102.88	-6,723.1	320.5	502.8	246.2	256.60	1.959		
13,500.0	6,692.2	13,521.3	6,804.9	133.3	132.7	102.95	-6,823.0	320.5	502.9	242.7	260.27	1.932		
13,600.0	6,691.6	13,621.3	6,804.9	135.2	134.6	103.02	-6,923.0	320.5	503.1	239.1	263.95	1.906		
13,700.0	6,691.0	13,721.3	6,805.0	137.1	136.5	103.09	-7,023.0	320.5	503.2	235.6	267.62	1.880		
13,800.0	6,690.4	13,821.3	6,805.0	139.0	138.4	103.16	-7,123.0	320.5	503.4	232.1	271.29	1.855		
13,872.0	6,690.0	13,893.3	6,805.0	140.3	139.8	103.21	-7,195.1	320.5	503.5	229.5	273.94	1.838 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-443 - Wellbore #1 - Plan #2 (11-12-14)														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-89.2	89.2	89.2	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-89.2	89.2	88.9	0.23	392.741			
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-89.2	89.2	88.5	0.68	131.783			
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-89.2	89.2	88.0	1.13	79.175			
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-89.2	89.2	87.6	1.58	56.586			
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-89.2	89.2	87.1	2.03	44.025			
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-89.2	89.2	86.7	2.47	36.028			
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-89.2	89.2	86.2	2.92	30.489			
766.3	766.3	767.3	767.3	1.6	1.6	-90.00	0.0	-89.2	89.2	85.9	3.22	27.668 CC			
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-89.2	89.2	85.8	3.37	26.427 ES			
900.0	900.0	900.0	900.0	1.9	1.9	-89.58	0.7	-89.7	89.7	85.9	3.82	23.505			
1,000.0	1,000.0	998.9	998.8	2.1	2.1	-88.38	2.6	-91.4	91.5	87.2	4.26	21.475			
1,100.0	1,100.0	1,097.7	1,097.6	2.4	2.3	-159.71	5.8	-94.3	95.3	90.6	4.69	20.311			
1,200.0	1,200.0	1,197.5	1,197.2	2.6	2.6	-158.14	9.6	-97.6	101.4	96.3	5.12	19.798			
1,300.0	1,299.9	1,297.2	1,296.8	2.8	2.8	-157.11	13.5	-101.0	109.2	103.6	5.55	19.655 SF			
1,400.0	1,399.7	1,396.7	1,396.2	3.0	3.0	-156.54	17.3	-104.3	118.5	112.5	5.99	19.797			
1,500.0	1,499.4	1,496.1	1,495.5	3.2	3.3	-156.35	21.1	-107.7	129.5	123.1	6.42	20.163			
1,600.0	1,598.9	1,595.3	1,594.5	3.5	3.5	-156.47	24.9	-111.0	142.1	135.2	6.86	20.708			
1,700.0	1,698.3	1,694.3	1,693.4	3.7	3.7	-156.81	28.8	-114.4	156.2	148.9	7.30	21.400			
1,800.0	1,797.4	1,793.0	1,792.0	4.0	4.0	-157.31	32.6	-117.7	172.0	164.2	7.74	22.215			
1,900.0	1,896.3	1,891.5	1,890.3	4.3	4.2	-157.91	36.3	-121.0	189.3	181.1	8.18	23.134			
2,000.0	1,995.0	1,989.8	1,988.5	4.6	4.4	-158.56	40.1	-124.4	207.7	199.0	8.64	24.035			
2,100.0	2,093.8	2,088.0	2,086.6	4.9	4.7	-159.12	43.9	-127.7	226.1	217.0	9.10	24.836			
2,200.0	2,192.5	2,186.3	2,184.8	5.2	4.9	-159.60	47.7	-131.0	244.5	234.9	9.57	25.555			
2,300.0	2,291.2	2,284.6	2,282.9	5.6	5.1	-160.01	51.5	-134.3	262.9	252.9	10.03	26.202			
2,400.0	2,390.0	2,382.9	2,381.0	5.9	5.4	-160.36	55.2	-137.6	281.3	270.8	10.50	26.787			
2,500.0	2,488.7	2,481.1	2,479.2	6.2	5.6	-160.67	59.0	-140.9	299.8	288.8	10.97	27.319			
2,600.0	2,587.5	2,579.4	2,577.3	6.6	5.8	-160.95	62.8	-144.3	318.2	306.8	11.44	27.805			
2,700.0	2,686.2	2,677.7	2,675.5	6.9	6.1	-161.19	66.6	-147.6	336.7	324.8	11.92	28.249			
2,800.0	2,784.9	2,776.0	2,773.6	7.3	6.3	-161.41	70.4	-150.9	355.1	342.8	12.39	28.658			
2,900.0	2,883.7	2,874.2	2,871.8	7.6	6.5	-161.61	74.1	-154.2	373.6	360.7	12.87	29.034			
3,000.0	2,982.4	2,972.5	2,969.9	8.0	6.8	-161.79	77.9	-157.5	392.1	378.7	13.34	29.382			
3,100.0	3,081.1	3,070.8	3,068.0	8.3	7.0	-161.95	81.7	-160.8	410.6	396.7	13.82	29.705			
3,200.0	3,179.9	3,169.0	3,166.2	8.7	7.3	-162.10	85.5	-164.2	429.0	414.7	14.30	30.004			
3,300.0	3,278.6	3,267.3	3,264.3	9.1	7.5	-162.24	89.3	-167.5	447.5	432.7	14.78	30.283			
3,400.0	3,377.3	3,365.6	3,362.5	9.4	7.7	-162.36	93.0	-170.8	466.0	450.7	15.26	30.544			
3,500.0	3,476.1	3,463.9	3,460.6	9.8	8.0	-162.48	96.8	-174.1	484.5	468.7	15.74	30.788			
3,600.0	3,574.8	3,562.1	3,558.8	10.1	8.2	-162.59	100.6	-177.4	503.0	486.8	16.22	31.016			
3,700.0	3,673.5	3,660.4	3,656.9	10.5	8.4	-162.69	104.4	-180.7	521.5	504.8	16.70	31.231			
3,800.0	3,772.3	3,758.7	3,755.1	10.9	8.7	-162.78	108.2	-184.1	539.9	522.8	17.18	31.433			
3,900.0	3,871.0	3,856.9	3,853.2	11.2	8.9	-162.87	111.9	-187.4	558.4	540.8	17.66	31.623			
4,000.0	3,969.8	3,955.2	3,951.3	11.6	9.2	-162.95	115.7	-190.7	576.9	558.8	18.14	31.803			
4,100.0	4,068.5	4,053.5	4,049.5	12.0	9.4	-163.03	119.5	-194.0	595.4	576.8	18.62	31.973			
4,200.0	4,167.2	4,151.8	4,147.6	12.3	9.6	-163.10	123.3	-197.3	613.9	594.8	19.10	32.134			
4,300.0	4,266.0	4,250.0	4,245.8	12.7	9.9	-163.17	127.1	-200.6	632.4	612.8	19.59	32.286			
4,400.0	4,364.7	4,348.3	4,343.9	13.1	10.1	-163.23	130.8	-204.0	650.9	630.8	20.07	32.431			
4,500.0	4,463.4	4,446.6	4,442.1	13.4	10.3	-163.29	134.6	-207.3	669.4	648.8	20.55	32.569			
4,600.0	4,562.2	4,544.9	4,540.2	13.8	10.6	-163.35	138.4	-210.6	687.9	666.9	21.04	32.700			
4,700.0	4,660.9	4,643.1	4,638.3	14.2	10.8	-163.40	142.2	-213.9	706.4	684.9	21.52	32.825			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-443 - Wellbore #1 - Plan #2 (11-12-14)												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,759.6	4,741.4	4,736.5	14.5	11.1	-163.45	146.0	-217.2	724.9	702.9	22.00	32.944	
4,900.0	4,858.4	4,839.7	4,834.6	14.9	11.3	-163.50	149.7	-220.5	743.4	720.9	22.49	33.057	
5,000.0	4,957.1	4,937.9	4,932.8	15.3	11.5	-163.55	153.5	-223.9	761.9	738.9	22.97	33.166	
5,100.0	5,055.9	5,036.2	5,030.9	15.6	11.8	-163.59	157.3	-227.2	780.4	756.9	23.46	33.270	
5,200.0	5,154.6	5,134.5	5,129.1	16.0	12.0	-163.63	161.1	-230.5	798.9	774.9	23.94	33.369	
5,300.0	5,253.3	5,232.8	5,227.2	16.4	12.2	-163.67	164.9	-233.8	817.4	793.0	24.43	33.464	
5,400.0	5,352.1	5,331.0	5,325.3	16.8	12.5	-163.71	168.6	-237.1	835.9	811.0	24.91	33.556	
5,500.0	5,450.8	5,429.3	5,423.5	17.1	12.7	-163.75	172.4	-240.4	854.4	829.0	25.40	33.644	
5,600.0	5,549.5	5,527.6	5,521.6	17.5	13.0	-163.78	176.2	-243.8	872.9	847.0	25.88	33.728	
5,700.0	5,648.3	5,625.8	5,619.8	17.9	13.2	-163.82	180.0	-247.1	891.4	865.0	26.37	33.809	
5,800.0	5,747.0	5,724.1	5,717.9	18.2	13.4	-163.85	183.8	-250.4	909.9	883.0	26.85	33.887	
5,900.0	5,845.7	5,822.4	5,816.1	18.6	13.7	-163.88	187.5	-253.7	928.4	901.1	27.34	33.962	
6,000.0	5,944.5	5,920.7	5,914.2	19.0	13.9	-166.22	191.3	-257.0	946.9	919.1	27.82	34.038	
6,100.0	6,043.2	6,018.6	6,012.0	19.3	14.1	147.65	195.1	-260.3	965.3	937.1	28.22	34.208	
6,200.0	6,140.8	6,115.4	6,108.6	19.5	14.3	122.60	192.4	-263.6	983.5	955.0	28.52	34.481	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-443 - Wellbore #1 - Plan #2 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.03	0.0	30.6	30.7					
100.0	100.0	99.0	99.0	0.1	0.1	90.03	0.0	30.6	30.6	30.4	0.22	137.039		
200.0	200.0	199.0	199.0	0.3	0.3	90.03	0.0	30.6	30.6	30.0	0.67	45.604		
300.0	300.0	299.0	299.0	0.6	0.6	90.03	0.0	30.6	30.6	29.5	1.12	27.326		
400.0	400.0	399.0	399.0	0.8	0.8	90.03	0.0	30.6	30.6	29.1	1.57	19.507 CC		
500.0	500.0	498.5	498.5	1.0	1.0	89.66	0.2	31.5	31.5	29.5	2.01	15.657		
600.0	600.0	597.9	597.9	1.2	1.2	88.63	0.8	34.0	34.0	31.5	2.45	13.893		
700.0	700.0	697.2	697.1	1.5	1.4	87.23	1.8	38.1	38.2	35.3	2.89	13.220		
800.0	800.0	796.3	796.0	1.7	1.7	85.71	3.3	43.9	44.2	40.8	3.34	13.209		
900.0	900.0	895.2	894.6	1.9	1.9	84.27	5.2	51.4	51.8	48.0	3.81	13.618		
1,000.0	1,000.0	993.8	992.7	2.1	2.2	83.01	7.4	60.5	61.3	57.0	4.28	14.303		
1,100.0	1,100.0	1,092.1	1,090.4	2.4	2.4	8.96	10.1	71.2	71.5	66.9	4.66	15.341		
1,200.0	1,200.0	1,190.3	1,187.8	2.6	2.7	8.29	13.1	83.4	81.8	76.7	5.09	16.053		
1,300.0	1,299.9	1,288.3	1,284.7	2.8	3.0	7.82	16.6	97.3	92.0	86.5	5.53	16.636		
1,400.0	1,399.7	1,386.1	1,381.2	3.0	3.3	7.50	20.5	112.8	102.3	96.3	5.98	17.116		
1,500.0	1,499.4	1,485.5	1,479.1	3.2	3.7	7.30	24.6	129.4	111.7	105.3	6.43	17.392		
1,600.0	1,598.9	1,585.2	1,577.3	3.5	4.1	7.24	28.8	146.1	119.5	112.6	6.88	17.374		
1,700.0	1,698.3	1,685.0	1,675.7	3.7	4.4	7.29	32.9	162.8	125.5	118.2	7.34	17.113		
1,800.0	1,797.4	1,784.9	1,774.1	4.0	4.8	7.44	37.1	179.5	129.8	122.0	7.80	16.651		
1,900.0	1,896.3	1,884.9	1,872.5	4.3	5.2	7.67	41.3	196.3	132.4	124.1	8.26	16.026		
2,000.0	1,995.0	1,984.9	1,971.0	4.6	5.6	7.97	45.4	213.0	133.9	125.2	8.74	15.321		
2,100.0	2,093.8	2,084.9	2,069.5	4.9	5.9	8.25	49.6	229.7	135.4	126.2	9.23	14.680		
2,200.0	2,192.5	2,184.8	2,168.0	5.2	6.3	8.54	53.8	246.5	136.9	127.2	9.71	14.099		
2,300.0	2,291.2	2,284.8	2,266.5	5.6	6.7	8.81	58.0	263.2	138.5	128.3	10.20	13.570		
2,400.0	2,390.0	2,384.8	2,365.0	5.9	7.1	9.08	62.1	279.9	140.0	129.3	10.70	13.086		
2,500.0	2,488.7	2,484.8	2,463.5	6.2	7.5	9.34	66.3	296.7	141.5	130.3	11.19	12.643		
2,600.0	2,587.5	2,584.8	2,562.0	6.6	7.9	9.60	70.5	313.4	143.0	131.3	11.69	12.236		
2,700.0	2,686.2	2,684.8	2,660.4	6.9	8.3	9.86	74.7	330.1	144.5	132.4	12.19	11.860		
2,800.0	2,784.9	2,784.8	2,758.9	7.3	8.7	10.10	78.8	346.9	146.1	133.4	12.69	11.512		
2,900.0	2,883.7	2,884.7	2,857.4	7.6	9.1	10.35	83.0	363.6	147.6	134.4	13.19	11.190		
3,000.0	2,982.4	2,984.7	2,955.9	8.0	9.4	10.58	87.2	380.3	149.1	135.4	13.69	10.889		
3,100.0	3,081.1	3,084.7	3,054.4	8.3	9.8	10.81	91.3	397.1	150.7	136.5	14.20	10.610		
3,200.0	3,179.9	3,184.7	3,152.9	8.7	10.2	11.04	95.5	413.8	152.2	137.5	14.71	10.349		
3,300.0	3,278.6	3,284.7	3,251.4	9.1	10.6	11.27	99.7	430.6	153.7	138.5	15.22	10.104		
3,400.0	3,377.3	3,384.7	3,349.9	9.4	11.0	11.48	103.9	447.3	155.3	139.6	15.73	9.874		
3,500.0	3,476.1	3,484.7	3,448.3	9.8	11.4	11.70	108.0	464.0	156.8	140.6	16.24	9.659		
3,600.0	3,574.8	3,584.6	3,546.8	10.1	11.8	11.91	112.2	480.8	158.4	141.6	16.75	9.456		
3,700.0	3,673.5	3,684.6	3,645.3	10.5	12.2	12.12	116.4	497.5	159.9	142.7	17.26	9.264		
3,800.0	3,772.3	3,784.6	3,743.8	10.9	12.6	12.32	120.5	514.2	161.5	143.7	17.78	9.083		
3,900.0	3,871.0	3,884.6	3,842.3	11.2	13.0	12.52	124.7	531.0	163.0	144.7	18.29	8.912		
4,000.0	3,969.8	3,984.6	3,940.8	11.6	13.4	12.71	128.9	547.7	164.6	145.8	18.81	8.750		
4,100.0	4,068.5	4,084.6	4,039.3	12.0	13.8	12.90	133.1	564.4	166.1	146.8	19.33	8.596		
4,200.0	4,167.2	4,184.6	4,137.8	12.3	14.2	13.09	137.2	581.2	167.7	147.9	19.85	8.450		
4,300.0	4,266.0	4,284.6	4,236.2	12.7	14.6	13.27	141.4	597.9	169.3	148.9	20.37	8.311		
4,400.0	4,364.7	4,384.5	4,334.7	13.1	15.0	13.45	145.6	614.6	170.8	149.9	20.89	8.178		
4,500.0	4,463.4	4,484.5	4,433.2	13.4	15.4	13.63	149.8	631.4	172.4	151.0	21.41	8.052		
4,600.0	4,562.2	4,584.5	4,531.7	13.8	15.8	13.81	153.9	648.1	174.0	152.0	21.93	7.931		
4,700.0	4,660.9	4,684.5	4,630.2	14.2	16.2	13.98	158.1	664.8	175.5	153.1	22.46	7.816		
4,800.0	4,759.6	4,784.5	4,728.7	14.5	16.5	14.14	162.3	681.6	177.1	154.1	22.98	7.706		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-443 - Wellbore #1 - Plan #2 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
4,900.0	4,858.4	4,884.5	4,827.2	14.9	16.9	14.31	166.4	698.3	178.7	155.2	23.51	7.601		
5,000.0	4,957.1	4,984.5	4,925.7	15.3	17.3	14.47	170.6	715.1	180.2	156.2	24.03	7.500		
5,100.0	5,055.9	5,084.4	5,024.1	15.6	17.7	14.63	174.8	731.8	181.8	157.3	24.56	7.403		
5,200.0	5,154.6	5,184.4	5,122.6	16.0	18.1	14.79	179.0	748.5	183.4	158.3	25.09	7.310		
5,300.0	5,253.3	5,284.4	5,221.1	16.4	18.5	14.94	183.1	765.3	185.0	159.3	25.62	7.221		
5,400.0	5,352.1	5,384.4	5,319.6	16.8	18.9	15.09	187.3	782.0	186.5	160.4	26.15	7.135		
5,500.0	5,450.8	5,484.4	5,418.1	17.1	19.3	15.24	191.5	798.7	188.1	161.4	26.68	7.052		
5,600.0	5,549.5	5,584.4	5,516.6	17.5	19.7	15.39	195.7	815.5	189.7	162.5	27.21	6.973		
5,700.0	5,648.3	5,684.4	5,615.1	17.9	20.1	15.53	199.8	832.2	191.3	163.5	27.74	6.896		
5,800.0	5,747.0	5,784.3	5,713.6	18.2	20.5	15.67	204.0	848.9	192.9	164.6	28.27	6.822		
5,900.0	5,845.7	5,884.3	5,812.0	18.6	20.9	15.81	208.2	865.7	194.4	165.6	28.80	6.751		
6,000.0	5,944.5	5,984.3	5,910.5	19.0	21.3	13.71	212.3	882.4	196.0	166.7	29.34	6.682		
6,100.0	6,043.2	6,084.0	6,008.7	19.3	21.7	-33.22	216.5	899.1	197.8	168.2	29.63	6.677		
6,200.0	6,140.8	6,185.0	6,108.2	19.5	22.0	-61.58	215.2	916.0	200.6	170.8	29.74	6.743		
6,300.0	6,235.5	6,288.2	6,208.8	19.8	22.3	-76.26	200.3	933.1	204.2	174.2	29.96	6.816		
6,400.0	6,325.7	6,393.4	6,308.3	19.9	22.6	-85.44	171.1	950.0	208.5	178.2	30.28	6.887		
6,500.0	6,409.9	6,500.7	6,404.8	20.1	22.8	-91.95	127.2	966.4	213.3	182.6	30.68	6.952		
6,600.0	6,486.7	6,610.1	6,495.9	20.3	23.1	-96.88	68.9	981.9	218.2	187.1	31.13	7.009		
6,700.0	6,554.7	6,721.4	6,579.3	20.6	23.3	-100.69	-3.3	996.0	223.0	191.4	31.59	7.059		
6,800.0	6,612.8	6,834.5	6,652.4	20.9	23.6	-103.62	-88.5	1,008.5	227.3	195.2	32.13	7.074		
6,900.0	6,660.0	6,949.0	6,713.1	21.2	24.0	-105.80	-185.0	1,018.8	230.9	198.2	32.73	7.055		
7,000.0	6,695.4	7,064.8	6,759.3	21.7	24.4	-107.30	-290.8	1,026.6	233.6	200.1	33.46	6.980		
7,100.0	6,718.5	7,181.4	6,789.4	22.4	25.1	-108.17	-403.2	1,031.7	235.1	200.8	34.37	6.840		
7,200.0	6,728.8	7,298.3	6,802.2	23.2	25.8	-108.43	-519.3	1,033.9	235.5	200.0	35.52	6.630		
7,245.9	6,730.1	7,348.1	6,802.7	23.5	26.2	-108.23	-569.1	1,034.0	235.0	198.6	36.41	6.455		
7,300.0	6,729.0	7,402.2	6,802.7	24.0	26.6	-108.49	-623.2	1,034.0	235.5	198.2	37.28	6.317		
7,400.0	6,728.4	7,502.2	6,802.8	25.1	27.6	-108.64	-723.2	1,034.0	235.7	196.1	39.59	5.954		
7,500.0	6,727.8	7,602.2	6,802.8	26.2	28.6	-108.78	-823.2	1,034.0	235.9	193.9	42.08	5.607		
7,600.0	6,727.2	7,702.2	6,802.8	27.4	29.7	-108.93	-923.2	1,034.0	236.1	191.4	44.72	5.280		
7,700.0	6,726.6	7,802.2	6,802.9	28.8	30.9	-109.07	-1,023.2	1,034.0	236.3	188.8	47.49	4.977		
7,800.0	6,726.0	7,902.2	6,802.9	30.1	32.2	-109.22	-1,123.2	1,034.0	236.5	186.2	50.36	4.697		
7,900.0	6,725.5	8,002.2	6,802.9	31.6	33.6	-109.36	-1,223.2	1,034.0	236.7	183.4	53.32	4.440		
8,000.0	6,724.9	8,102.2	6,803.0	33.1	35.0	-109.50	-1,323.2	1,034.0	237.0	180.6	56.35	4.205		
8,100.0	6,724.3	8,202.2	6,803.0	34.6	36.4	-109.65	-1,423.2	1,034.0	237.2	177.7	59.44	3.990		
8,200.0	6,723.7	8,302.2	6,803.0	36.2	37.9	-109.79	-1,523.2	1,034.0	237.4	174.8	62.58	3.793		
8,300.0	6,723.1	8,402.2	6,803.1	37.8	39.5	-109.93	-1,623.2	1,034.0	237.6	171.8	65.76	3.613		
8,400.0	6,722.5	8,502.2	6,803.1	39.4	41.0	-110.07	-1,723.1	1,034.0	237.8	168.8	68.98	3.447		
8,500.0	6,721.9	8,602.2	6,803.1	41.1	42.6	-110.22	-1,823.1	1,034.0	238.0	165.8	72.23	3.295		
8,600.0	6,721.3	8,702.2	6,803.2	42.8	44.3	-110.36	-1,923.1	1,034.0	238.2	162.7	75.50	3.156		
8,700.0	6,720.7	8,802.2	6,803.2	44.5	45.9	-110.50	-2,023.1	1,034.0	238.5	159.7	78.79	3.026		
8,800.0	6,720.1	8,902.2	6,803.3	46.2	47.6	-110.64	-2,123.1	1,034.0	238.7	156.6	82.10	2.907		
8,900.0	6,719.5	9,002.2	6,803.3	47.9	49.3	-110.78	-2,223.1	1,034.0	238.9	153.5	85.43	2.797		
9,000.0	6,718.9	9,102.2	6,803.3	49.6	51.0	-110.92	-2,323.1	1,034.0	239.1	150.4	88.76	2.694		
9,100.0	6,718.3	9,202.2	6,803.4	51.4	52.7	-111.06	-2,423.1	1,034.0	239.4	147.2	92.11	2.599		
9,200.0	6,717.7	9,302.2	6,803.4	53.2	54.4	-111.20	-2,523.1	1,034.0	239.6	144.1	95.47	2.510		
9,300.0	6,717.1	9,402.2	6,803.4	55.0	56.2	-111.34	-2,623.1	1,034.0	239.8	141.0	98.83	2.426		
9,400.0	6,716.5	9,502.2	6,803.5	56.7	57.9	-111.48	-2,723.1	1,034.0	240.0	137.8	102.20	2.349		
9,500.0	6,716.0	9,602.2	6,803.5	58.5	59.7	-111.62	-2,823.1	1,034.0	240.3	134.7	105.57	2.276		
9,600.0	6,715.4	9,702.2	6,803.5	60.3	61.5	-111.76	-2,923.1	1,034.0	240.5	131.6	108.95	2.207		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-443 - Wellbore #1 - Plan #2 (11-12-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
9,700.0	6,714.8	9,802.2	6,803.6	62.2	63.2	-111.90	-3,023.1	1,034.0	240.7	128.4	112.33	2.143		
9,800.0	6,714.2	9,902.2	6,803.6	64.0	65.0	-112.04	-3,123.1	1,034.0	241.0	125.3	115.71	2.083		
9,900.0	6,713.6	10,002.2	6,803.6	65.8	66.8	-112.18	-3,223.1	1,034.0	241.2	122.1	119.09	2.025		
10,000.0	6,713.0	10,102.2	6,803.7	67.6	68.6	-112.32	-3,323.1	1,034.0	241.4	119.0	122.47	1.971		
10,100.0	6,712.4	10,202.2	6,803.7	69.5	70.4	-112.45	-3,423.1	1,034.0	241.7	115.8	125.86	1.920		
10,200.0	6,711.8	10,302.2	6,803.7	71.3	72.3	-112.59	-3,523.1	1,034.0	241.9	112.7	129.24	1.872		
10,300.0	6,711.2	10,402.2	6,803.8	73.1	74.1	-112.73	-3,623.1	1,034.0	242.2	109.6	132.62	1.826		
10,400.0	6,710.6	10,502.2	6,803.8	75.0	75.9	-112.87	-3,723.1	1,034.0	242.4	106.4	136.00	1.782		
10,500.0	6,710.0	10,602.2	6,803.8	76.8	77.7	-113.00	-3,823.1	1,034.0	242.7	103.3	139.37	1.741		
10,600.0	6,709.4	10,702.2	6,803.9	78.7	79.6	-113.14	-3,923.1	1,034.0	242.9	100.2	142.75	1.702		
10,700.0	6,708.8	10,802.2	6,803.9	80.6	81.4	-113.28	-4,023.1	1,034.0	243.2	97.0	146.12	1.664		
10,800.0	6,708.2	10,902.2	6,803.9	82.4	83.3	-113.41	-4,123.1	1,034.0	243.4	93.9	149.49	1.628		
10,900.0	6,707.6	11,002.2	6,804.0	84.3	85.1	-113.55	-4,223.1	1,034.0	243.7	90.8	152.85	1.594		
11,000.0	6,707.0	11,102.2	6,804.0	86.1	87.0	-113.68	-4,323.1	1,034.0	243.9	87.7	156.21	1.561		
11,100.0	6,706.5	11,202.1	6,804.1	88.0	88.8	-113.82	-4,423.1	1,034.0	244.2	84.6	159.57	1.530		
11,200.0	6,705.9	11,302.1	6,804.1	89.9	90.7	-113.95	-4,523.1	1,034.0	244.4	81.5	162.93	1.500		
11,300.0	6,705.3	11,402.1	6,804.1	91.7	92.5	-114.09	-4,623.1	1,034.0	244.7	78.4	166.28	1.471 Level 3		
11,400.0	6,704.7	11,502.1	6,804.2	93.6	94.4	-114.22	-4,723.1	1,034.0	244.9	75.3	169.62	1.444 Level 3		
11,500.0	6,704.1	11,602.1	6,804.2	95.5	96.3	-114.36	-4,823.1	1,034.0	245.2	72.2	172.96	1.418 Level 3		
11,600.0	6,703.5	11,702.1	6,804.2	97.4	98.1	-114.49	-4,923.1	1,034.0	245.4	69.1	176.30	1.392 Level 3		
11,700.0	6,702.9	11,802.1	6,804.3	99.3	100.0	-114.62	-5,023.1	1,034.0	245.7	66.1	179.63	1.368 Level 3		
11,800.0	6,702.3	11,902.1	6,804.3	101.1	101.9	-114.76	-5,123.1	1,034.0	246.0	63.0	182.96	1.344 Level 3		
11,900.0	6,701.7	12,002.1	6,804.3	103.0	103.7	-114.89	-5,223.1	1,034.0	246.2	59.9	186.28	1.322 Level 3		
12,000.0	6,701.1	12,102.1	6,804.4	104.9	105.6	-115.02	-5,323.1	1,034.0	246.5	56.9	189.60	1.300 Level 3		
12,100.0	6,700.5	12,202.1	6,804.4	106.8	107.5	-115.15	-5,423.1	1,034.0	246.8	53.8	192.91	1.279 Level 3		
12,200.0	6,699.9	12,302.1	6,804.4	108.7	109.3	-115.28	-5,523.1	1,034.0	247.0	50.8	196.22	1.259 Level 3		
12,300.0	6,699.3	12,402.1	6,804.5	110.6	111.2	-115.42	-5,623.1	1,034.0	247.3	47.8	199.52	1.239 Level 2		
12,400.0	6,698.7	12,502.1	6,804.5	112.4	113.1	-115.55	-5,723.1	1,034.0	247.6	44.7	202.82	1.221 Level 2		
12,500.0	6,698.1	12,602.1	6,804.5	114.3	115.0	-115.68	-5,823.1	1,034.0	247.8	41.7	206.11	1.202 Level 2		
12,600.0	6,697.5	12,702.1	6,804.6	116.2	116.9	-115.81	-5,923.1	1,034.0	248.1	38.7	209.39	1.185 Level 2		
12,700.0	6,697.0	12,802.1	6,804.6	118.1	118.7	-115.94	-6,023.1	1,034.0	248.4	35.7	212.67	1.168 Level 2		
12,800.0	6,696.4	12,902.1	6,804.6	120.0	120.6	-116.07	-6,123.1	1,034.0	248.7	32.7	215.95	1.151 Level 2		
12,900.0	6,695.8	13,002.1	6,804.7	121.9	122.5	-116.20	-6,223.1	1,034.0	248.9	29.7	219.22	1.136 Level 2		
13,000.0	6,695.2	13,102.1	6,804.7	123.8	124.4	-116.33	-6,323.1	1,034.0	249.2	26.7	222.48	1.120 Level 2		
13,100.0	6,694.6	13,202.1	6,804.8	125.7	126.3	-116.46	-6,423.1	1,034.0	249.5	23.8	225.73	1.105 Level 2		
13,200.0	6,694.0	13,302.1	6,804.8	127.6	128.2	-116.59	-6,523.1	1,034.0	249.8	20.8	228.98	1.091 Level 2		
13,300.0	6,693.4	13,402.1	6,804.8	129.5	130.1	-116.72	-6,623.1	1,034.0	250.1	17.8	232.23	1.077 Level 2		
13,400.0	6,692.8	13,502.1	6,804.9	131.4	132.0	-116.85	-6,723.1	1,034.0	250.3	14.9	235.47	1.063 Level 2		
13,500.0	6,692.2	13,602.1	6,804.9	133.3	133.9	-116.97	-6,823.0	1,034.0	250.6	11.9	238.70	1.050 Level 2		
13,600.0	6,691.6	13,702.1	6,804.9	135.2	135.7	-117.10	-6,923.0	1,034.0	250.9	9.0	241.92	1.037 Level 2		
13,700.0	6,691.0	13,802.1	6,805.0	137.1	137.6	-117.23	-7,023.0	1,034.0	251.2	6.1	245.14	1.025 Level 2		
13,800.0	6,690.4	13,902.1	6,805.0	139.0	139.5	-117.36	-7,123.0	1,034.0	251.5	3.1	248.35	1.013 Level 2		
13,831.2	6,690.2	13,933.3	6,805.0	139.6	140.0	-117.40	-7,154.3	1,034.0	251.6	2.3	249.24	1.009 Level 2		
13,872.0	6,690.0	13,970.5	6,805.0	140.3	140.6	-117.44	-7,191.4	1,034.0	251.7	1.4	250.37	1.005 Level 2, ES, SF		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Bailey 33-1 (Exist) - Wellbore #1 - Wellbore #1													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 100-UNKNOWN													<b>Offset Well Error:</b>	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
12,700.0	6,697.0	6,769.6	6,766.7	118.1	116.1	108.34	-7,013.3	707.6	995.9	770.9	224.98	4.427		
12,800.0	6,696.4	6,766.4	6,763.4	120.0	116.0	106.67	-7,013.3	707.6	896.6	668.2	228.34	3.926		
12,900.0	6,695.8	6,763.1	6,760.2	121.9	115.9	104.98	-7,013.4	707.5	797.4	565.8	231.56	3.443		
13,000.0	6,695.2	6,759.8	6,756.9	123.8	115.8	103.28	-7,013.5	707.4	698.4	463.7	234.64	2.976		
13,100.0	6,694.6	6,756.6	6,753.7	125.7	115.7	101.55	-7,013.6	707.4	599.7	362.2	237.56	2.524		
13,200.0	6,694.0	6,753.3	6,750.4	127.6	115.6	99.81	-7,013.7	707.3	501.6	261.3	240.31	2.087		
13,300.0	6,693.4	6,750.1	6,747.2	129.5	115.5	98.06	-7,013.8	707.2	404.3	161.4	242.88	1.665		
13,400.0	6,692.8	6,746.9	6,744.0	131.4	115.4	96.30	-7,013.9	707.2	308.8	63.5	245.26	1.259	Level 3	
13,500.0	6,692.2	6,743.7	6,740.8	133.3	115.3	94.53	-7,013.9	707.1	217.2	-30.2	247.43	0.878	Level 1	
13,600.0	6,691.6	6,740.5	6,737.6	135.2	115.2	92.76	-7,014.0	707.0	137.9	-111.5	249.40	0.553	Level 1	
13,691.0	6,691.1	6,737.6	6,734.7	136.9	115.1	91.16	-7,014.1	707.0	103.6	-147.4	251.01	0.413	Level 1, CC, ES, SF	
13,700.0	6,691.0	6,737.3	6,734.4	137.1	115.1	91.00	-7,014.1	707.0	104.0	-147.1	251.16	0.414	Level 1	
13,800.0	6,690.4	6,734.1	6,731.2	139.0	115.0	89.24	-7,014.2	706.9	150.4	-102.3	252.70	0.595	Level 1	
13,872.0	6,690.0	6,731.8	6,728.9	140.3	114.9	87.97	-7,014.3	706.9	208.5	-45.2	253.67	0.822	Level 1	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 800-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	124.98	-415.3	593.5	724.5					
100.0	100.0	82.9	82.9	0.1	0.1	124.98	-415.3	593.5	724.4	724.2	0.22	3,254.506		
200.0	200.0	182.1	182.1	0.3	0.2	124.97	-415.3	593.7	724.5	723.9	0.58	1,251.169		
300.0	300.0	281.4	281.4	0.6	0.4	124.96	-415.3	594.0	724.8	723.8	0.94	774.675		
400.0	400.0	380.6	380.6	0.8	0.5	124.94	-415.3	594.4	725.1	723.8	1.29	561.202		
500.0	500.0	479.9	479.9	1.0	0.6	124.91	-415.3	595.0	725.6	723.9	1.65	440.118		
600.0	600.0	579.1	579.1	1.2	0.8	124.88	-415.2	595.7	726.1	724.1	2.01	362.143		
700.0	700.0	678.3	678.3	1.5	0.9	124.84	-415.2	596.5	726.8	724.4	2.36	307.754		
800.0	800.0	777.6	777.6	1.7	1.0	124.80	-415.2	597.4	727.5	724.8	2.72	267.671		
900.0	900.0	889.5	889.5	1.9	1.2	124.75	-414.8	597.9	727.7	724.6	3.10	234.469		
1,000.0	1,000.0	1,002.5	1,002.5	2.1	1.3	124.71	-413.2	596.5	725.9	722.4	3.48	208.822		
1,100.0	1,100.0	1,111.8	1,111.7	2.4	1.5	51.60	-409.8	594.6	722.1	718.3	3.81	189.553		
1,200.0	1,200.0	1,218.3	1,218.0	2.6	1.6	51.68	-405.7	591.7	716.1	711.9	4.19	171.106		
1,300.0	1,299.9	1,331.8	1,331.4	2.8	1.8	52.00	-401.3	586.9	707.7	703.1	4.58	154.374		
1,400.0	1,399.7	1,438.8	1,438.1	3.0	2.0	52.42	-395.8	581.0	696.5	691.5	5.00	139.184		
1,500.0	1,499.4	1,534.7	1,533.7	3.2	2.2	52.89	-390.2	575.8	684.0	678.5	5.43	126.063		
1,600.0	1,598.9	1,624.2	1,623.0	3.5	2.4	53.46	-385.7	571.8	671.6	665.8	5.85	114.799		
1,700.0	1,698.3	1,731.4	1,729.9	3.7	2.7	54.26	-380.1	567.3	658.5	652.1	6.33	103.961		
1,800.0	1,797.4	1,846.5	1,844.6	4.0	3.0	55.33	-372.5	560.5	642.2	635.3	6.86	93.674		
1,900.0	1,896.3	1,968.6	1,965.8	4.3	3.3	56.46	-360.1	552.1	622.2	614.8	7.42	83.833		
2,000.0	1,995.0	2,094.4	2,089.5	4.6	3.6	57.35	-340.9	540.7	596.7	588.7	8.02	74.383		
2,100.0	2,093.8	2,199.7	2,192.6	4.9	3.9	58.27	-323.7	528.3	568.8	560.3	8.58	66.305		
2,200.0	2,192.5	2,301.8	2,292.4	5.2	4.2	59.57	-308.3	513.2	539.6	530.5	9.13	59.089		
2,300.0	2,291.2	2,396.8	2,385.1	5.6	4.5	61.34	-296.2	496.3	510.0	500.3	9.67	52.715		
2,400.0	2,390.0	2,487.9	2,474.0	5.9	4.7	63.45	-286.1	479.2	481.3	471.1	10.22	47.093		
2,500.0	2,488.7	2,585.0	2,568.9	6.2	5.0	65.95	-275.5	461.2	453.6	442.8	10.80	42.007		
2,600.0	2,587.5	2,684.0	2,665.2	6.6	5.3	68.90	-264.0	441.6	425.6	414.2	11.40	37.318		
2,700.0	2,686.2	2,778.8	2,757.5	6.9	5.6	71.85	-251.3	423.8	397.9	385.9	12.02	33.108		
2,800.0	2,784.9	2,876.7	2,852.8	7.3	5.9	75.07	-237.0	406.6	371.0	358.3	12.66	29.305		
2,900.0	2,883.7	2,975.5	2,948.8	7.6	6.2	78.54	-220.5	389.8	343.9	330.6	13.32	25.820		
3,000.0	2,982.4	3,066.6	3,037.3	8.0	6.5	81.98	-204.1	375.5	317.6	303.7	13.97	22.745		
3,100.0	3,081.1	3,152.8	3,121.3	8.3	6.7	85.75	-190.1	362.6	294.7	280.0	14.61	20.171		
3,200.0	3,179.9	3,245.3	3,211.9	8.7	7.0	90.57	-177.8	348.5	275.9	260.6	15.28	18.056		
3,300.0	3,278.6	3,339.6	3,304.2	9.1	7.3	95.93	-164.9	334.9	259.5	243.5	15.96	16.260		
3,400.0	3,377.3	3,432.8	3,395.7	9.4	7.6	101.83	-152.8	321.5	246.5	229.9	16.61	14.839		
3,500.0	3,476.1	3,529.0	3,490.2	9.8	7.9	108.38	-140.7	307.9	237.1	219.9	17.24	13.752		
3,600.0	3,574.8	3,629.5	3,588.7	10.1	8.2	115.60	-126.9	294.1	230.0	212.2	17.83	12.902		
3,700.0	3,673.5	3,735.2	3,691.8	10.5	8.5	123.91	-108.5	279.1	223.6	205.2	18.35	12.186		
3,800.0	3,772.3	3,831.7	3,784.9	10.9	8.8	132.40	-88.2	264.3	218.6	199.8	18.75	11.656		
3,837.3	3,809.1	3,865.2	3,817.2	11.0	8.9	135.46	-81.0	259.0	218.0	199.2	18.88	11.549 CC, ES		
3,900.0	3,871.0	3,920.5	3,870.5	11.2	9.1	140.55	-69.7	249.7	219.6	200.5	19.07	11.518 SF		
4,000.0	3,969.8	4,010.3	3,957.2	11.6	9.4	148.46	-52.7	233.9	228.2	208.9	19.33	11.805		
4,100.0	4,068.5	4,105.2	4,049.4	12.0	9.7	155.77	-36.3	217.9	242.2	222.6	19.59	12.361		
4,200.0	4,167.2	4,202.6	4,144.4	12.3	10.0	161.97	-20.5	203.5	258.8	238.9	19.88	13.016		
4,300.0	4,266.0	4,298.0	4,237.8	12.7	10.3	166.95	-6.1	190.8	277.3	257.1	20.22	13.716		
4,400.0	4,364.7	4,395.3	4,333.2	13.1	10.6	171.28	8.1	178.3	297.5	276.9	20.59	14.448		
4,500.0	4,463.4	4,498.8	4,434.9	13.4	11.0	175.33	24.1	166.3	317.8	296.7	21.01	15.125		
4,600.0	4,562.2	4,598.9	4,533.0	13.8	11.3	178.86	40.7	156.5	337.3	315.8	21.45	15.723		
4,700.0	4,660.9	4,689.7	4,621.9	14.2	11.6	-178.06	57.1	147.0	358.0	336.1	21.90	16.350		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #														Offset Site Error:	0.0 ft
Survey Program: 800-NS-GYRO-MS														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis			Offset Wellbore Centre		Distance		Minimum	Separation	Warning		
Reference	Offset	Reference	Offset	Reference	Offset	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation (ft)	Factor			
4,800.0	4,759.6	4,776.3	4,706.2	14.5	11.8	-175.29	73.1	136.2	381.7	359.3	22.35	17.074			
4,900.0	4,858.4	4,870.8	4,798.3	14.9	12.1	-172.71	89.7	123.1	407.6	384.7	22.85	17.837			
5,000.0	4,957.1	4,972.9	4,897.9	15.3	12.5	-170.20	108.1	109.8	433.4	410.0	23.38	18.535			
5,100.0	5,055.9	5,066.8	4,989.9	15.6	12.7	-168.43	123.0	98.6	459.1	435.2	23.90	19.207			
5,200.0	5,154.6	5,173.3	5,095.1	16.0	13.1	-167.24	135.0	87.0	484.3	459.9	24.45	19.811			
5,300.0	5,253.3	5,280.3	5,201.3	16.4	13.4	-166.55	144.0	77.8	507.6	482.6	24.98	20.315			
5,400.0	5,352.1	5,384.4	5,304.9	16.8	13.6	-166.07	151.8	71.0	529.0	503.5	25.52	20.731			
5,500.0	5,450.8	5,475.6	5,395.7	17.1	13.9	-165.63	159.0	64.8	550.6	524.6	26.01	21.164			
5,600.0	5,549.5	5,568.1	5,487.6	17.5	14.1	-165.23	166.2	57.3	573.6	547.1	26.52	21.632			
5,700.0	5,648.3	5,675.0	5,594.0	17.9	14.4	-164.98	172.7	49.8	595.6	568.5	27.05	22.016			
5,800.0	5,747.0	5,776.8	5,695.4	18.2	14.7	-164.75	179.0	43.0	617.2	589.7	27.57	22.385			
5,900.0	5,845.7	5,882.9	5,801.1	18.6	15.0	-164.68	184.0	37.9	637.1	609.0	28.10	22.672			
6,000.0	5,944.5	5,986.0	5,904.1	19.0	15.2	-167.01	188.0	33.4	656.6	628.0	28.61	22.949			
6,100.0	6,043.2	6,102.2	6,020.2	19.3	15.5	147.06	190.4	30.5	674.1	645.0	29.09	23.174			
6,200.0	6,140.8	6,202.2	6,120.2	19.5	15.7	123.10	193.9	29.8	689.6	660.1	29.49	23.383			
6,300.0	6,235.5	6,296.7	6,214.6	19.8	16.0	113.42	196.7	29.3	705.5	675.6	29.82	23.658			
6,400.0	6,325.7	6,386.7	6,304.6	19.9	16.2	109.44	198.1	28.8	723.0	692.9	30.08	24.036			
6,500.0	6,409.9	6,456.8	6,374.8	20.1	16.3	107.33	198.7	27.8	744.4	714.1	30.27	24.588			
6,600.0	6,486.7	6,528.5	6,446.3	20.3	16.5	106.54	199.5	25.7	771.6	741.1	30.47	25.323			
6,700.0	6,554.7	6,601.5	6,519.4	20.6	16.7	106.43	200.2	23.8	804.5	773.8	30.72	26.192			
6,800.0	6,612.8	6,666.8	6,584.7	20.9	16.8	106.07	200.4	22.6	843.9	812.8	31.12	27.117			
6,900.0	6,660.0	6,715.7	6,633.6	21.2	16.9	104.52	200.3	21.9	890.5	858.7	31.85	27.963			
7,000.0	6,695.4	6,752.0	6,669.8	21.7	17.0	101.70	200.2	21.4	944.4	911.5	32.93	28.680			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1														Offset Site Error:	0.0 ft
Survey Program: 514-NS-GYRO-MS														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	125.46	-444.5	624.1	766.4						
100.0	100.0	82.4	82.4	0.1	0.1	125.46	-444.5	624.1	766.3	766.0	0.22	3,451.276			
200.0	200.0	181.1	181.1	0.3	0.2	125.48	-444.8	624.2	766.5	765.9	0.58	1,326.434			
300.0	300.0	279.9	279.9	0.6	0.4	125.50	-445.4	624.3	766.9	765.9	0.93	821.345			
400.0	400.0	378.6	378.6	0.8	0.5	125.55	-446.1	624.4	767.4	766.1	1.29	595.138			
500.0	500.0	477.3	477.3	1.0	0.6	125.60	-447.1	624.6	768.2	766.5	1.65	466.874			
600.0	600.0	573.1	573.1	1.2	0.8	125.68	-448.5	624.8	769.2	767.1	2.08	370.574			
700.0	700.0	671.0	670.9	1.5	1.1	125.84	-451.4	624.8	770.9	768.3	2.56	301.156			
800.0	800.0	760.2	760.0	1.7	1.3	126.05	-455.0	625.1	773.5	770.4	3.02	255.966			
900.0	900.0	852.2	851.9	1.9	1.6	126.28	-459.4	625.8	777.0	773.5	3.49	222.545			
1,000.0	1,000.0	942.0	941.6	2.1	1.8	126.51	-464.4	627.4	781.7	777.7	3.96	197.638			
1,100.0	1,100.0	1,032.0	1,031.4	2.4	2.1	53.68	-470.2	629.8	787.2	782.8	4.41	178.692			
1,200.0	1,200.0	1,122.2	1,121.3	2.6	2.3	54.00	-476.6	633.1	792.9	788.0	4.85	163.535			
1,300.0	1,299.9	1,218.4	1,217.1	2.8	2.5	54.39	-483.5	637.7	798.5	793.2	5.30	150.540			
1,400.0	1,399.7	1,315.5	1,313.9	3.0	2.8	54.80	-489.6	643.4	803.4	797.6	5.77	139.342			
1,500.0	1,499.4	1,409.2	1,407.1	3.2	3.0	55.30	-496.0	649.0	807.9	801.7	6.23	129.769			
1,600.0	1,598.9	1,501.9	1,499.4	3.5	3.3	55.93	-503.4	654.7	812.3	805.6	6.69	121.355			
1,700.0	1,698.3	1,590.5	1,587.5	3.7	3.5	56.58	-510.5	661.2	816.8	809.6	7.16	114.060			
1,800.0	1,797.4	1,676.1	1,672.4	4.0	3.8	57.21	-517.5	669.2	822.1	814.5	7.63	107.752			
1,900.0	1,896.3	1,768.0	1,763.4	4.3	4.0	57.90	-525.2	679.3	828.1	820.0	8.13	101.884			
2,000.0	1,995.0	1,868.7	1,863.1	4.6	4.3	58.80	-534.1	690.1	833.7	825.1	8.67	96.180			
2,100.0	2,093.8	1,966.8	1,960.3	4.9	4.5	59.64	-542.6	700.9	839.7	830.4	9.21	91.126			
2,200.0	2,192.5	2,067.0	2,059.5	5.2	4.8	60.47	-550.9	712.1	845.7	835.9	9.77	86.525			
2,300.0	2,291.2	2,169.0	2,160.5	5.6	5.1	61.29	-559.2	723.5	851.7	841.4	10.35	82.312			
2,400.0	2,390.0	2,264.2	2,254.8	5.9	5.3	62.10	-567.4	733.4	857.7	846.8	10.91	78.593			
2,500.0	2,488.7	2,352.9	2,342.7	6.2	5.6	62.84	-575.6	743.3	864.9	853.4	11.47	75.403			
2,600.0	2,587.5	2,440.5	2,429.2	6.6	5.8	63.61	-585.0	753.3	873.5	861.4	12.03	72.596			
2,700.0	2,686.2	2,527.4	2,514.8	6.9	6.1	64.37	-595.3	763.7	883.6	871.0	12.60	70.132			
2,800.0	2,784.9	2,611.1	2,597.0	7.3	6.3	65.07	-605.9	774.8	895.2	882.1	13.16	68.025			
2,900.0	2,883.7	2,690.0	2,674.4	7.6	6.6	65.73	-617.3	786.2	909.1	895.4	13.71	66.295			
3,000.0	2,982.4	2,794.6	2,776.6	8.0	6.9	66.55	-632.6	802.0	923.9	909.6	14.34	64.423			
3,100.0	3,081.1	2,898.8	2,878.7	8.3	7.2	67.33	-646.9	817.2	937.8	922.8	14.97	62.639			
3,200.0	3,179.9	2,986.8	2,964.8	8.7	7.5	68.02	-660.0	829.8	952.5	936.9	15.56	61.209			
3,300.0	3,278.6	3,088.3	3,064.0	9.1	7.8	68.87	-676.0	843.4	967.7	951.5	16.19	59.757			
3,400.0	3,377.3	3,194.8	3,168.4	9.4	8.1	69.63	-691.2	858.7	982.2	965.4	16.84	58.327			
3,500.0	3,476.1	3,309.5	3,280.9	9.8	8.5	70.44	-706.9	874.3	996.1	978.6	17.51	56.881			
6,800.0	6,612.8	6,642.9	6,573.4	20.9	17.9	-33.47	-1,036.9	1,216.9	987.5	960.3	27.20	36.304			
6,900.0	6,660.0	6,694.2	6,624.7	21.2	18.1	-44.92	-1,037.5	1,218.2	906.7	878.0	28.71	31.579			
7,000.0	6,695.4	6,732.0	6,662.6	21.7	18.1	-58.78	-1,037.9	1,219.1	823.1	791.1	32.00	25.721			
7,100.0	6,718.5	6,756.7	6,687.2	22.4	18.2	-73.15	-1,038.1	1,219.7	739.2	704.0	35.19	21.006			
7,200.0	6,728.8	6,768.1	6,698.6	23.2	18.2	-85.22	-1,038.2	1,220.0	658.1	621.2	36.82	17.874			
7,300.0	6,729.0	6,769.0	6,699.5	24.0	18.2	-88.53	-1,038.2	1,220.0	583.1	545.3	37.76	15.443			
7,400.0	6,728.4	6,769.1	6,699.7	25.1	18.2	-88.55	-1,038.2	1,220.0	516.7	477.7	39.02	13.243			
7,500.0	6,727.8	6,769.3	6,699.8	26.2	18.2	-88.57	-1,038.2	1,220.0	462.6	422.2	40.37	11.459			
7,600.0	6,727.2	6,769.4	6,699.9	27.4	18.2	-88.59	-1,038.2	1,220.0	425.4	383.6	41.79	10.178			
7,700.0	6,726.6	6,769.5	6,700.1	28.8	18.2	-88.60	-1,038.2	1,220.0	409.8	366.5	43.29	9.467			
7,715.0	6,726.5	6,769.6	6,700.1	29.0	18.2	-88.61	-1,038.2	1,220.0	409.5	366.0	43.52	9.410 CC, ES			
7,800.0	6,726.0	6,769.7	6,700.2	30.1	18.2	-88.62	-1,038.2	1,220.0	418.2	373.4	44.83	9.329 SF			
7,900.0	6,725.5	6,769.8	6,700.3	31.6	18.2	-88.64	-1,038.2	1,220.0	449.4	402.9	46.42	9.680			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft	
Survey Program: 514-NS-GYRO-MS										Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
8,000.0	6,724.9	6,769.9	6,700.5	33.1	18.2	-88.66	-1,038.2	1,220.0	498.9	450.9	48.05	10.383	
8,100.0	6,724.3	6,770.1	6,700.6	34.6	18.2	-88.68	-1,038.2	1,220.0	562.1	512.3	49.71	11.306	
8,200.0	6,723.7	6,770.2	6,700.7	36.2	18.2	-88.69	-1,038.2	1,220.0	634.7	583.3	51.40	12.349	
8,300.0	6,723.1	6,770.3	6,700.8	37.8	18.2	-88.71	-1,038.2	1,220.0	714.1	661.0	53.11	13.445	
8,400.0	6,722.5	6,770.4	6,701.0	39.4	18.2	-88.73	-1,038.2	1,220.0	798.0	743.2	54.84	14.551	
8,500.0	6,721.9	6,770.6	6,701.1	41.1	18.2	-88.75	-1,038.2	1,220.0	885.4	828.8	56.59	15.645	
8,600.0	6,721.3	6,770.7	6,701.2	42.8	18.2	-88.76	-1,038.2	1,220.0	975.1	916.8	58.36	16.709	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 28-1 (Exist) - Wellbore #1 - Wellbore #														Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Reference	Offset	Reference	Offset	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
7,500.0	6,727.8	6,700.0	6,699.1	26.2	13.3	80.41	-1,766.1	647.2	957.5	922.4	35.10	27.280			
7,600.0	6,727.2	6,700.0	6,699.1	27.4	13.3	80.41	-1,766.1	647.2	859.2	822.7	36.51	23.535			
7,700.0	6,726.6	6,700.0	6,699.1	28.8	13.3	80.41	-1,766.1	647.2	761.4	723.4	37.98	20.045			
7,800.0	6,726.0	6,700.0	6,699.1	30.1	13.3	80.41	-1,766.1	647.2	664.1	624.6	39.51	16.808			
7,900.0	6,725.5	6,700.0	6,699.1	31.6	13.3	80.41	-1,766.1	647.2	567.8	526.7	41.08	13.821			
8,000.0	6,724.9	6,700.0	6,699.1	33.1	13.3	80.41	-1,766.1	647.2	473.1	430.4	42.69	11.080			
8,100.0	6,724.3	6,700.0	6,699.1	34.6	13.3	80.41	-1,766.1	647.2	381.0	336.7	44.34	8.594			
8,200.0	6,723.7	6,700.0	6,699.1	36.2	13.3	80.41	-1,766.1	647.2	294.2	248.2	46.01	6.395			
8,300.0	6,723.1	6,700.0	6,699.1	37.8	13.3	80.41	-1,766.1	647.2	219.0	171.2	47.70	4.590			
8,400.0	6,722.5	6,700.0	6,699.1	39.4	13.3	80.41	-1,766.1	647.2	171.2	121.8	49.42	3.465			
8,443.1	6,722.2	6,700.0	6,699.1	40.1	13.3	80.41	-1,766.1	647.2	165.7	115.6	50.16	3.304 CC, ES, SF			
8,500.0	6,721.9	6,700.0	6,699.1	41.1	13.3	80.41	-1,766.1	647.2	175.2	124.1	51.15	3.426			
8,600.0	6,721.3	6,700.0	6,699.1	42.8	13.3	80.41	-1,766.1	647.2	228.2	175.3	52.89	4.314			
8,700.0	6,720.7	6,700.0	6,699.1	44.5	13.3	80.41	-1,766.1	647.2	305.7	251.1	54.65	5.594			
8,800.0	6,720.1	6,700.0	6,699.1	46.2	13.3	80.41	-1,766.1	647.2	393.5	337.1	56.43	6.974			
8,900.0	6,719.5	6,700.0	6,699.1	47.9	13.3	80.41	-1,766.1	647.2	486.0	427.8	58.21	8.350			
9,000.0	6,718.9	6,700.0	6,699.1	49.6	13.3	80.41	-1,766.1	647.2	581.0	521.0	60.00	9.684			
9,100.0	6,718.3	6,700.0	6,699.1	51.4	13.3	80.41	-1,766.1	647.2	677.5	615.7	61.80	10.963			
9,200.0	6,717.7	6,700.0	6,699.1	53.2	13.3	80.41	-1,766.1	647.2	774.8	711.2	63.60	12.182			
9,300.0	6,717.1	6,700.0	6,699.1	55.0	13.3	80.41	-1,766.1	647.2	872.8	807.4	65.42	13.342			
9,400.0	6,716.5	6,697.4	6,696.5	56.7	13.3	79.54	-1,766.2	647.1	971.1	904.1	67.03	14.488			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	126.83	-444.4	593.5	741.6					
100.0	100.0	82.7	82.7	0.1	0.1	126.81	-444.3	593.6	741.5	741.3	0.22	3,336.079		
200.0	200.0	184.0	184.0	0.3	0.3	126.78	-444.0	593.9	741.5	740.8	0.68	1,085.334		
300.0	300.0	283.6	283.6	0.6	0.6	126.77	-443.8	594.0	741.5	740.3	1.17	636.262		
313.3	313.3	296.8	296.8	0.6	0.6	126.77	-443.8	594.0	741.5	740.2	1.23	603.092		
400.0	400.0	382.6	382.6	0.8	0.8	126.77	-443.8	594.0	741.5	740.0	1.54	480.883		
500.0	500.0	482.0	482.0	1.0	0.8	126.80	-444.3	593.9	741.7	739.8	1.84	402.555		
600.0	600.0	580.3	580.2	1.2	1.0	126.85	-445.0	593.7	742.0	739.8	2.19	339.125		
700.0	700.0	679.3	679.3	1.5	1.1	126.93	-446.2	593.5	742.5	739.9	2.58	287.270		
800.0	800.0	780.3	780.3	1.7	1.3	127.04	-447.6	593.1	743.0	740.0	3.01	246.597		
900.0	900.0	882.5	882.4	1.9	1.5	127.18	-449.2	592.3	743.3	739.9	3.46	214.919		
1,000.0	1,000.0	984.0	983.9	2.1	1.8	127.32	-450.7	591.2	743.4	739.4	3.91	190.048		
1,100.0	1,100.0	1,085.9	1,085.8	2.4	2.0	54.46	-452.1	589.8	742.7	738.3	4.36	170.266		
1,200.0	1,200.0	1,188.1	1,188.0	2.6	2.2	54.80	-453.4	588.3	740.7	735.9	4.81	154.077		
1,300.0	1,299.9	1,288.9	1,288.8	2.8	2.5	55.26	-454.5	586.5	737.5	732.3	5.26	140.329		
1,400.0	1,399.7	1,390.6	1,390.5	3.0	2.7	55.86	-455.6	584.5	733.2	727.5	5.71	128.356		
1,500.0	1,499.4	1,492.0	1,491.8	3.2	3.0	56.58	-456.5	582.4	727.7	721.5	6.17	117.872		
1,600.0	1,598.9	1,594.3	1,594.1	3.5	3.2	57.45	-457.1	579.9	721.1	714.4	6.64	108.542		
1,700.0	1,698.3	1,695.9	1,695.7	3.7	3.4	58.47	-457.5	577.2	713.2	706.1	7.12	100.183		
1,800.0	1,797.4	1,795.7	1,795.4	4.0	3.7	59.63	-457.8	574.2	704.5	696.8	7.61	92.601		
1,900.0	1,896.3	1,894.2	1,893.8	4.3	3.9	60.93	-458.1	571.2	695.0	686.9	8.11	85.672		
2,000.0	1,995.0	1,993.6	1,993.2	4.6	4.1	62.27	-458.2	568.3	685.3	676.7	8.64	79.325		
2,100.0	2,093.8	2,093.0	2,092.6	4.9	4.4	63.62	-458.0	565.3	675.8	666.6	9.18	73.651		
2,200.0	2,192.5	2,191.3	2,190.9	5.2	4.6	64.99	-457.7	562.4	666.6	656.9	9.72	68.574		
2,300.0	2,291.2	2,291.3	2,290.8	5.6	4.8	66.41	-457.2	559.4	657.7	647.4	10.28	63.985		
2,400.0	2,390.0	2,391.1	2,390.6	5.9	5.1	67.85	-456.5	556.4	648.9	638.0	10.84	59.854		
2,500.0	2,488.7	2,490.3	2,489.7	6.2	5.3	69.32	-455.6	553.3	640.3	628.9	11.41	56.116		
2,600.0	2,587.5	2,589.4	2,588.7	6.6	5.5	70.83	-454.5	550.1	632.1	620.1	11.99	52.730		
2,700.0	2,686.2	2,687.5	2,686.8	6.9	5.8	72.34	-453.4	547.1	624.2	611.6	12.57	49.670		
2,800.0	2,784.9	2,784.0	2,783.2	7.3	6.0	73.86	-452.3	544.2	616.9	603.8	13.15	46.912		
2,900.0	2,883.7	2,880.3	2,879.5	7.6	6.2	75.39	-451.4	541.6	610.4	596.7	13.74	44.417		
3,000.0	2,982.4	2,978.4	2,977.6	8.0	6.5	76.98	-450.7	539.1	604.6	590.3	14.35	42.141		
3,100.0	3,081.1	3,073.7	3,072.8	8.3	6.7	78.54	-450.1	536.9	599.5	584.5	14.95	40.094		
3,200.0	3,179.9	3,170.9	3,170.1	8.7	6.9	80.14	-449.8	535.0	595.3	579.8	15.57	38.238		
3,300.0	3,278.6	3,267.7	3,266.8	9.1	7.2	81.75	-449.6	533.3	591.8	575.6	16.19	36.554		
3,400.0	3,377.3	3,365.0	3,364.1	9.4	7.4	83.41	-449.8	531.3	589.1	572.3	16.82	35.028		
3,500.0	3,476.1	3,461.7	3,460.7	9.8	7.7	85.13	-450.4	528.9	587.1	569.6	17.45	33.652		
3,600.0	3,574.8	3,559.0	3,558.1	10.1	8.0	86.87	-451.2	526.6	585.9	567.8	18.07	32.418		
3,700.0	3,673.5	3,657.0	3,656.0	10.5	8.2	88.59	-452.0	524.6	585.4	566.7	18.70	31.302		
3,731.6	3,704.7	3,687.8	3,686.8	10.6	8.3	89.13	-452.3	524.0	585.3	566.4	18.90	30.973		
3,800.0	3,772.3	3,754.8	3,753.8	10.9	8.5	90.30	-452.8	522.8	585.5	566.2	19.32	30.298		
3,900.0	3,871.0	3,853.8	3,852.8	11.2	8.7	92.00	-453.6	521.3	586.2	566.2	19.95	29.385		
4,000.0	3,969.8	3,953.0	3,952.0	11.6	9.0	93.66	-454.2	520.1	587.2	566.6	20.57	28.546		
4,100.0	4,068.5	4,051.8	4,050.8	12.0	9.2	95.29	-454.6	519.0	588.7	567.5	21.19	27.784		
4,200.0	4,167.2	4,150.5	4,149.4	12.3	9.5	96.85	-454.9	518.5	590.6	568.8	21.77	27.131		
4,300.0	4,266.0	4,249.6	4,248.5	12.7	9.6	98.36	-455.2	518.5	592.9	570.7	22.25	26.645		
4,400.0	4,364.7	4,349.6	4,348.5	13.1	9.6	99.85	-455.2	518.8	595.5	572.9	22.65	26.296		
4,500.0	4,463.4	4,450.0	4,448.9	13.4	9.6	101.30	-455.0	519.3	598.3	575.3	23.01	26.001		
4,600.0	4,562.2	4,550.9	4,549.8	13.8	9.7	102.72	-454.4	520.1	601.1	577.7	23.38	25.709		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #														Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
4,700.0	4,660.9	4,649.1	4,648.0	14.2	9.7	104.06	-453.6	521.1	604.1	580.3	23.76	25.427			
4,800.0	4,759.6	4,745.6	4,744.5	14.5	9.8	105.29	-453.1	522.9	607.8	583.6	24.13	25.186			
4,900.0	4,858.4	4,843.3	4,842.2	14.9	9.8	106.48	-453.0	525.2	612.0	587.5	24.50	24.976			
5,000.0	4,957.1	4,940.5	4,939.4	15.3	9.8	107.67	-453.0	527.1	616.8	591.9	24.88	24.785			
5,100.0	5,055.9	5,037.4	5,036.2	15.6	9.9	108.90	-453.4	528.4	622.2	596.9	25.28	24.615			
5,200.0	5,154.6	5,136.6	5,135.5	16.0	10.0	110.18	-454.0	529.3	628.1	602.4	25.68	24.459			
5,300.0	5,253.3	5,238.2	5,237.1	16.4	10.1	111.49	-454.2	529.9	634.0	607.9	26.07	24.314			
5,400.0	5,352.1	5,339.8	5,338.6	16.8	10.2	112.79	-454.0	530.4	639.7	613.3	26.46	24.181			
5,500.0	5,450.8	5,440.4	5,439.2	17.1	10.3	114.05	-453.4	531.0	645.4	618.6	26.84	24.047			
5,600.0	5,549.5	5,539.1	5,537.9	17.5	10.4	115.27	-452.7	531.6	651.4	624.1	27.23	23.922			
5,700.0	5,648.3	5,637.7	5,636.6	17.9	10.5	116.47	-452.1	532.1	657.6	630.0	27.62	23.807			
5,800.0	5,747.0	5,736.1	5,734.9	18.2	10.6	117.67	-451.4	532.3	664.2	636.1	28.03	23.692			
5,900.0	5,845.7	5,834.4	5,833.2	18.6	10.7	118.87	-450.8	532.2	671.1	642.7	28.46	23.581			
6,000.0	5,944.5	5,933.6	5,932.4	19.0	10.9	117.81	-450.1	532.2	678.4	649.5	28.90	23.475			
6,100.0	6,043.2	6,032.7	6,031.5	19.3	11.1	73.97	-449.4	532.1	678.9	649.7	29.16	23.281			
6,200.0	6,140.8	6,131.4	6,130.2	19.5	11.2	51.39	-448.7	532.2	667.1	638.1	29.00	23.008			
6,300.0	6,235.5	6,227.9	6,226.7	19.8	11.4	43.04	-447.7	532.4	643.4	614.9	28.44	22.622			
6,400.0	6,325.7	6,319.9	6,318.7	19.9	11.5	40.93	-446.4	532.6	608.5	580.9	27.61	22.044			
6,500.0	6,409.9	6,405.8	6,404.6	20.1	11.7	42.64	-444.5	532.1	563.7	537.0	26.69	21.123			
6,600.0	6,486.7	6,482.2	6,480.9	20.3	11.8	47.50	-442.1	530.7	510.8	484.8	26.02	19.636			
6,700.0	6,554.7	6,547.1	6,545.8	20.6	12.0	55.15	-439.4	528.7	453.0	427.0	26.00	17.424			
6,800.0	6,612.8	6,601.6	6,600.1	20.9	12.1	64.97	-437.2	527.1	394.2	367.4	26.82	14.696			
6,900.0	6,660.0	6,644.9	6,643.4	21.2	12.2	75.29	-435.5	525.8	340.3	312.2	28.12	12.103			
7,000.0	6,695.4	6,676.3	6,674.7	21.7	12.2	83.69	-434.2	524.8	300.3	270.9	29.33	10.238			
7,100.0	6,718.5	6,695.2	6,693.7	22.4	12.3	88.29	-433.4	524.2	284.8	254.5	30.34	9.387			
7,100.4	6,718.5	6,695.3	6,693.7	22.4	12.3	88.30	-433.4	524.2	284.8	254.5	30.35	9.386 CC, ES, SF			
7,200.0	6,728.8	6,701.5	6,699.9	23.2	12.3	88.23	-433.1	524.0	300.5	269.3	31.25	9.616			
7,300.0	6,729.0	6,697.6	6,696.0	24.0	12.3	86.48	-433.3	524.1	344.1	311.9	32.17	10.697			
7,400.0	6,728.4	6,692.9	6,691.3	25.1	12.3	85.55	-433.5	524.3	407.8	374.5	33.34	12.234			
7,500.0	6,727.8	6,688.2	6,686.7	26.2	12.3	84.62	-433.7	524.4	484.0	449.4	34.59	13.992			
7,600.0	6,727.2	6,683.5	6,682.0	27.4	12.3	83.69	-433.9	524.6	567.5	531.6	35.91	15.805			
7,700.0	6,726.6	6,678.9	6,677.3	28.8	12.3	82.76	-434.1	524.7	655.6	618.4	37.28	17.588			
7,800.0	6,726.0	6,674.2	6,672.7	30.1	12.2	81.84	-434.3	524.9	746.7	708.1	38.69	19.301			
7,900.0	6,725.5	6,669.5	6,668.0	31.6	12.2	80.92	-434.4	525.0	839.9	799.7	40.13	20.926			
8,000.0	6,724.9	6,664.8	6,663.3	33.1	12.2	80.01	-434.6	525.1	934.4	892.8	41.60	22.460			



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Welch B 28-11 (Exist) - Wellbore #1 - Wellbore														Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Reference	Offset	Reference	Offset	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
9,100.0	6,718.3	6,710.7	6,709.5	51.4	12.3	90.14	-3,305.1	449.1	953.2	891.2	61.97	15.381			
9,200.0	6,717.7	6,710.7	6,709.5	53.2	12.3	90.15	-3,305.1	449.1	861.5	797.7	63.80	13.503			
9,300.0	6,717.1	6,710.8	6,709.5	55.0	12.3	90.15	-3,305.1	449.1	771.8	706.2	65.63	11.760			
9,400.0	6,716.5	6,710.8	6,709.5	56.7	12.3	90.15	-3,305.1	449.1	685.1	617.6	67.47	10.154			
9,500.0	6,716.0	6,710.8	6,709.6	58.5	12.3	90.15	-3,305.1	449.1	602.5	533.1	69.31	8.692			
9,600.0	6,715.4	6,710.8	6,709.6	60.3	12.3	90.16	-3,305.1	449.1	525.9	454.7	71.16	7.390			
9,700.0	6,714.8	6,710.8	6,709.6	62.2	12.3	90.16	-3,305.1	449.1	458.5	385.4	73.02	6.279			
9,800.0	6,714.2	6,710.8	6,709.6	64.0	12.3	90.16	-3,305.1	449.1	404.7	329.8	74.88	5.405			
9,900.0	6,713.6	6,710.8	6,709.6	65.8	12.3	90.16	-3,305.1	449.1	370.7	294.0	76.74	4.831			
9,981.9	6,713.1	6,710.9	6,709.6	67.3	12.3	90.17	-3,305.1	449.1	361.5	283.3	78.27	4.619 CC, ES			
10,000.0	6,713.0	6,710.9	6,709.6	67.6	12.3	90.17	-3,305.1	449.1	362.0	283.4	78.60	4.605 SF			
10,100.0	6,712.4	6,710.9	6,709.7	69.5	12.3	90.17	-3,305.1	449.1	380.3	299.8	80.47	4.726			
10,200.0	6,711.8	6,710.9	6,709.7	71.3	12.3	90.17	-3,305.1	449.1	422.2	339.9	82.34	5.127			
10,300.0	6,711.2	6,710.9	6,709.7	73.1	12.3	90.17	-3,305.1	449.1	481.5	397.3	84.21	5.718			
10,400.0	6,710.6	6,710.9	6,709.7	75.0	12.3	90.18	-3,305.1	449.1	552.7	466.6	86.09	6.420			
10,500.0	6,710.0	6,710.9	6,709.7	76.8	12.3	90.18	-3,305.1	449.1	631.7	543.8	87.97	7.181			
10,600.0	6,709.4	6,711.0	6,709.7	78.7	12.3	90.18	-3,305.1	449.1	716.0	626.2	89.85	7.969			
10,700.0	6,708.8	6,711.0	6,709.7	80.6	12.3	90.18	-3,305.1	449.1	803.9	712.2	91.73	8.764			
10,800.0	6,708.2	6,711.0	6,709.8	82.4	12.3	90.19	-3,305.1	449.1	894.4	800.8	93.61	9.554			
10,900.0	6,707.6	6,711.0	6,709.8	84.3	12.3	90.19	-3,305.1	449.1	986.7	891.2	95.50	10.332			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Welsh 1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	6,712.4	6,708.7	6,707.5	69.5	12.6	89.16	-4,372.3	690.1	956.8	876.0	80.78	11.844	
10,200.0	6,711.8	6,709.0	6,707.8	71.3	12.6	89.29	-4,372.3	690.1	857.7	775.0	82.66	10.376	
10,300.0	6,711.2	6,709.3	6,708.0	73.1	12.6	89.41	-4,372.3	690.1	758.8	674.3	84.55	8.975	
10,400.0	6,710.6	6,709.5	6,708.3	75.0	12.6	89.54	-4,372.3	690.1	660.3	573.9	86.43	7.640	
10,500.0	6,710.0	6,709.8	6,708.5	76.8	12.6	89.66	-4,372.3	690.1	562.3	474.0	88.31	6.367	
10,600.0	6,709.4	6,710.0	6,708.8	78.7	12.6	89.79	-4,372.3	690.1	465.1	374.9	90.20	5.156	
10,700.0	6,708.8	6,710.3	6,709.1	80.6	12.6	89.91	-4,372.3	690.1	369.4	277.3	92.09	4.011	
10,800.0	6,708.2	6,710.6	6,709.3	82.4	12.6	90.04	-4,372.3	690.1	276.8	182.8	93.98	2.945	
10,900.0	6,707.6	6,710.8	6,709.6	84.3	12.6	90.16	-4,372.3	690.1	191.8	95.9	95.87	2.001	
11,000.0	6,707.0	6,711.1	6,709.9	86.1	12.6	90.28	-4,372.3	690.1	130.2	32.4	97.76	1.332 Level 3	
11,049.2	6,706.8	6,711.2	6,710.0	87.1	12.6	90.35	-4,372.3	690.1	120.5	21.8	98.70	1.221 Level 2, CC, ES, SF	
11,100.0	6,706.5	6,711.4	6,710.1	88.0	12.6	90.41	-4,372.3	690.1	130.8	31.1	99.66	1.312 Level 3	
11,200.0	6,705.9	6,711.6	6,710.4	89.9	12.6	90.53	-4,372.3	690.1	193.0	91.5	101.55	1.901	
11,300.0	6,705.3	6,711.9	6,710.6	91.7	12.6	90.66	-4,372.3	690.1	278.3	174.8	103.45	2.690	
11,400.0	6,704.7	6,712.1	6,710.9	93.6	12.6	90.78	-4,372.3	690.1	370.9	265.6	105.34	3.521	
11,500.0	6,704.1	6,712.4	6,711.2	95.5	12.6	90.91	-4,372.4	690.1	466.6	359.4	107.24	4.351	
11,600.0	6,703.5	6,712.7	6,711.4	97.4	12.6	91.03	-4,372.4	690.1	563.8	454.7	109.14	5.166	
11,700.0	6,702.9	6,712.9	6,711.7	99.3	12.6	91.16	-4,372.4	690.1	661.9	550.8	111.03	5.961	
11,800.0	6,702.3	6,713.2	6,712.0	101.1	12.6	91.28	-4,372.4	690.1	760.4	647.5	112.93	6.733	
11,900.0	6,701.7	6,713.5	6,712.2	103.0	12.6	91.41	-4,372.4	690.1	859.3	744.5	114.83	7.483	
12,000.0	6,701.1	6,713.7	6,712.5	104.9	12.6	91.53	-4,372.4	690.1	958.4	841.7	116.73	8.210	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Wonenberg B33-3 (Exist) - Wellbore #1 - Wellbo													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
11,400.0	6,704.7	6,720.0	6,718.2	93.6	12.3	90.41	-5,687.3	710.4	969.4	864.5	104.95	9.237		
11,500.0	6,704.1	6,719.9	6,718.1	95.5	12.3	90.35	-5,687.3	710.4	870.0	763.2	106.84	8.143		
11,600.0	6,703.5	6,719.8	6,718.0	97.4	12.3	90.29	-5,687.3	710.4	770.8	662.1	108.73	7.089		
11,700.0	6,702.9	6,719.7	6,717.8	99.3	12.3	90.22	-5,687.3	710.4	671.8	561.1	110.62	6.072		
11,800.0	6,702.3	6,719.6	6,717.7	101.1	12.3	90.16	-5,687.3	710.4	573.1	460.6	112.52	5.093		
11,900.0	6,701.7	6,719.5	6,717.6	103.0	12.3	90.10	-5,687.3	710.4	474.9	360.5	114.41	4.151		
12,000.0	6,701.1	6,719.4	6,717.5	104.9	12.3	90.04	-5,687.3	710.4	377.8	261.5	116.31	3.248		
12,100.0	6,700.5	6,719.3	6,717.4	106.8	12.3	89.97	-5,687.3	710.4	282.6	164.4	118.20	2.391		
12,200.0	6,699.9	6,719.2	6,717.3	108.7	12.3	89.91	-5,687.3	710.4	192.4	72.3	120.10	1.602		
12,300.0	6,699.3	6,719.0	6,717.2	110.6	12.3	89.85	-5,687.3	710.4	119.1	-2.9	122.00	0.976	Level 1	
12,364.2	6,699.0	6,719.0	6,717.1	111.8	12.3	89.81	-5,687.3	710.4	100.2	-23.0	123.22	0.814	Level 1, CC, ES, SF	
12,400.0	6,698.7	6,718.9	6,717.1	112.4	12.3	89.79	-5,687.3	710.4	106.4	-17.5	123.89	0.859	Level 1	
12,500.0	6,698.1	6,718.8	6,717.0	114.3	12.3	89.72	-5,687.3	710.4	168.8	43.0	125.79	1.342	Level 3	
12,600.0	6,697.6	6,718.7	6,716.9	116.2	12.3	89.66	-5,687.3	710.4	256.2	128.5	127.69	2.006		
12,700.0	6,697.0	6,718.6	6,716.7	118.1	12.3	89.60	-5,687.3	710.4	350.4	220.8	129.59	2.704		
12,800.0	6,696.4	6,718.5	6,716.6	120.0	12.3	89.54	-5,687.3	710.4	447.1	315.7	131.49	3.401		
12,900.0	6,695.8	6,718.4	6,716.5	121.9	12.3	89.47	-5,687.3	710.4	545.1	411.7	133.39	4.086		
13,000.0	6,695.2	6,718.3	6,716.4	123.8	12.3	89.41	-5,687.3	710.4	643.6	508.3	135.29	4.757		
13,100.0	6,694.6	6,718.2	6,716.3	125.7	12.3	89.35	-5,687.3	710.4	742.6	605.4	137.19	5.413		
13,200.0	6,694.0	6,718.1	6,716.2	127.6	12.3	89.29	-5,687.3	710.4	841.8	702.7	139.09	6.052		
13,300.0	6,693.4	6,717.9	6,716.1	129.5	12.3	89.22	-5,687.3	710.4	941.1	800.1	140.99	6.675		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

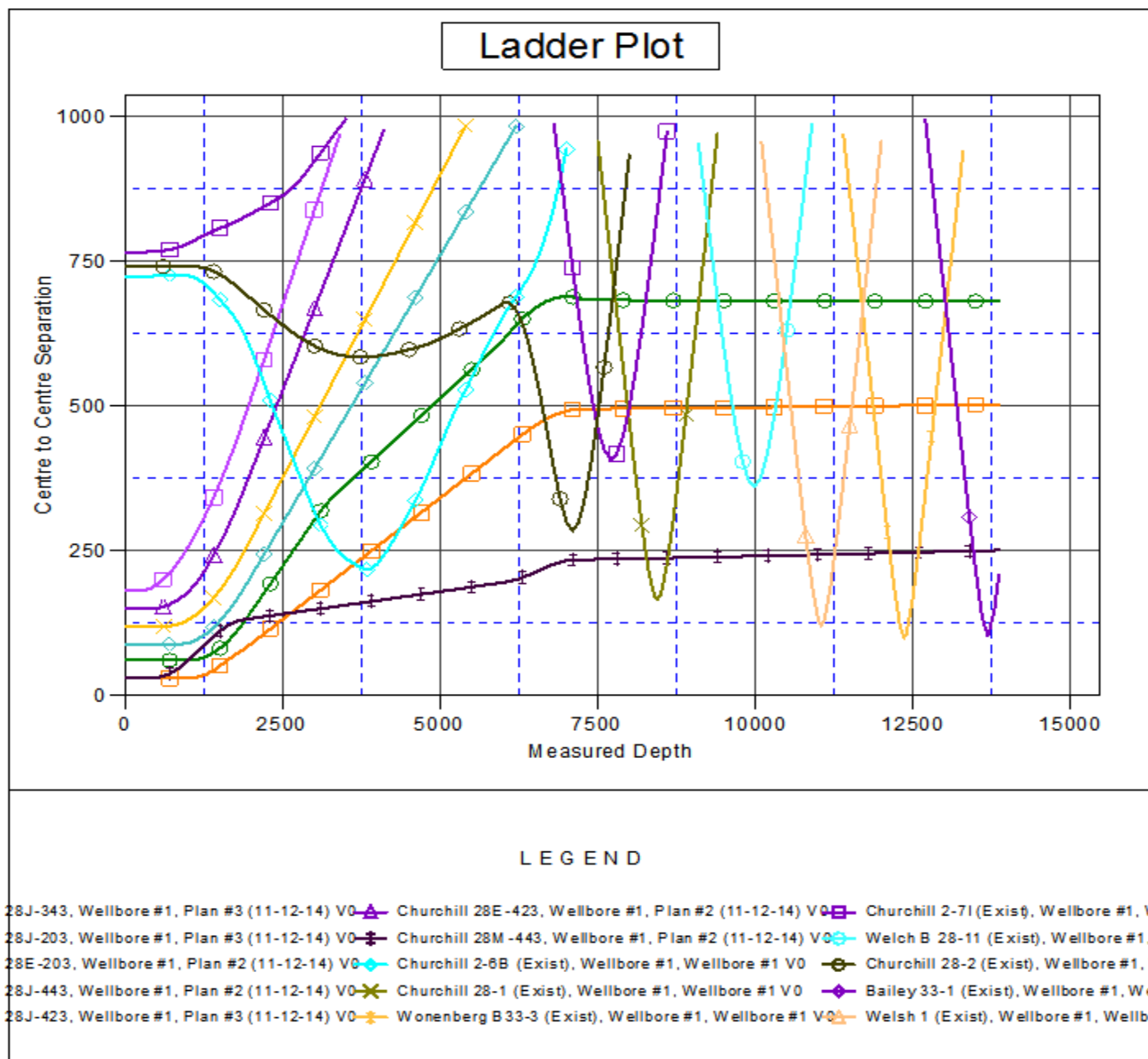
Reference Depths are relative to WELL @ 4645.5ft (Ensign Rig# 136 RCoordinates are relative to: Churchill 28M-343

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.61°



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28M-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4645.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28M-343	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #3 (11-12-14)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4645.5ft (Ensign Rig# 136 RCoordinates are relative to: Churchill 28M-343

Offset Depths are relative to Offset Datum

Coordinate System is US State Plane 1983, Colorado Northern Zone

Central Meridian is -105.500000 °

Grid Convergence at Surface is: 0.61°

