

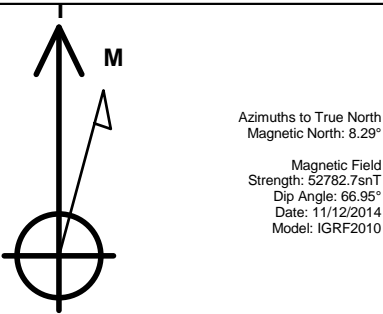
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Churchill 28J-343

Surface Location: Churchill 28J-HZ Pad Sec.28-T5N-R64W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4635.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1381537.70 3261964.79 40.376910 -104.559710  
Ensign Rig# 136 RKB - 12.5' WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')

WELLBORE TARGET DETAILS

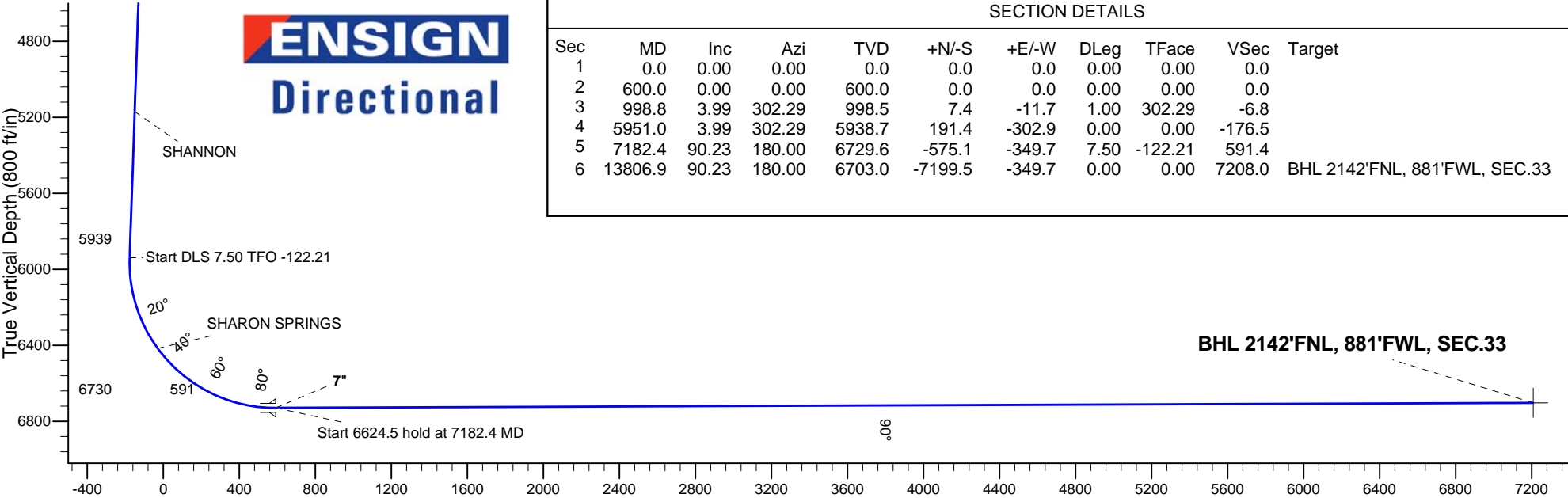
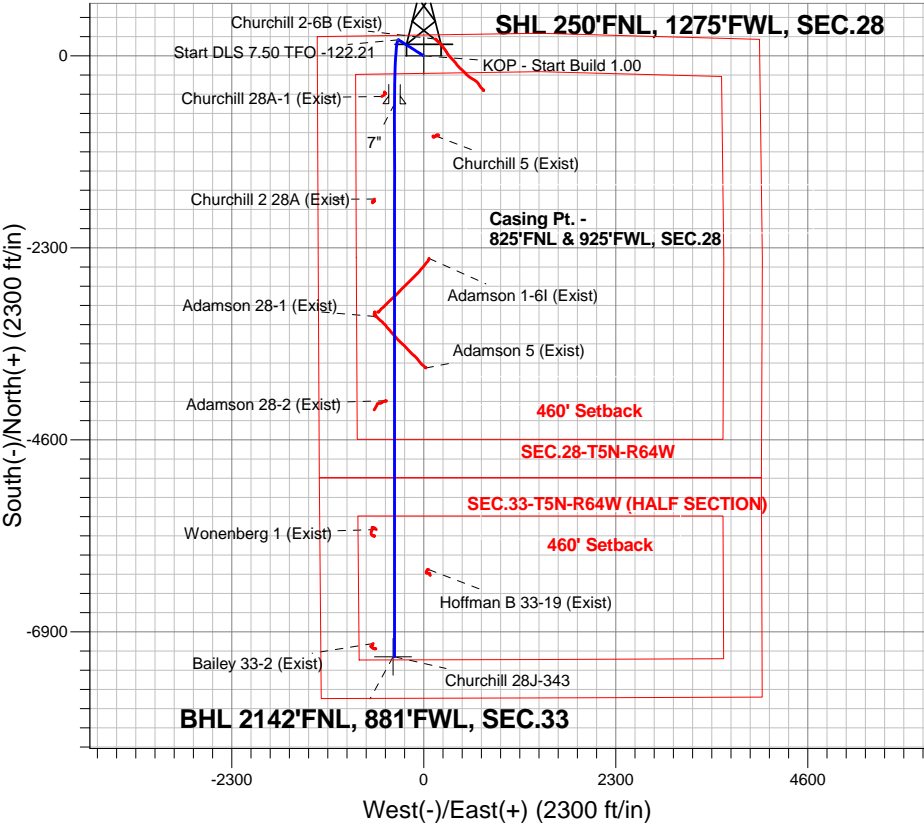
Name	TVD	+N/-S	+E/-W	Shape
SHL 250'FNL, 1275'FWL, SEC.28	1.0	0.0	0.0	Point
BHL 2142'FNL, 881'FWL, SEC.33	6703.0	-7198.7	-366.1	Point



ANNOTATIONS

TVD	MD	Annotation
600.0	600.0	KOP - Start Build 1.00
998.5	998.8	Start 4952.2 hold at 998.8 MD
5938.7	5951.0	Start DLS 7.50 TFO -122.21
6729.6	7182.4	Start 6624.5 hold at 7182.4 MD
6703.0	13806.9	TD at 13806.9

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



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	998.8	3.99	302.29	998.5	7.4	-11.7	1.00	302.29	-6.8	
4	5951.0	3.99	302.29	5938.7	191.4	-302.9	0.00	0.00	-176.5	
5	7182.4	90.23	180.00	6729.6	-575.1	-349.7	7.50	-122.21	591.4	
6	13806.9	90.23	180.00	6703.0	-7199.5	-349.7	0.00	0.00	7208.0	BHL 2142'FNL, 881'FWL, SEC.33

Vertical Section at 182.78° (800 ft/in)



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T5N-R64W**

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

**Churchill 28J-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 28J-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (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 28J-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:			1,381,533.43 ft			Latitude:			40.376900		
From:			Lat/Long			Easting:			3,261,903.54 ft			Longitude:			-104.559930		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.61 °		

Well	Churchill 28J-343					
Well Position	+N/-S	3.6 ft	Northing:	1,381,537.70 ft	Latitude:	40.376910
	+E/-W	61.3 ft	Easting:	3,261,964.79 ft	Longitude:	-104.559710
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,635.0 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	182.78

<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	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
998.8	3.99	302.29	998.5	7.4	-11.7	1.00	1.00	0.00	302.29	
5,951.0	3.99	302.29	5,938.7	191.4	-302.9	0.00	0.00	0.00	0.00	
7,182.4	90.23	180.00	6,729.6	-575.1	-349.7	7.50	7.00	-9.93	-122.21	
13,806.9	90.23	180.00	6,703.0	-7,199.5	-349.7	0.00	0.00	0.00	0.00	BHL 2142°FNL, 881

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (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 28J-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
<b>KOP - Start Build 1.00</b>									
700.0	1.00	302.29	700.0	0.5	-0.7	-0.4	1.00	1.00	0.00
800.0	2.00	302.29	800.0	1.9	-3.0	-1.7	1.00	1.00	0.00
900.0	3.00	302.29	899.9	4.2	-6.6	-3.9	1.00	1.00	0.00
998.8	3.99	302.29	998.5	7.4	-11.7	-6.8	1.00	1.00	0.00
<b>Start 4952.2 hold at 998.8 MD</b>									
1,000.0	3.99	302.29	999.7	7.5	-11.8	-6.9	0.00	0.00	0.00
1,100.0	3.99	302.29	1,099.4	11.2	-17.7	-10.3	0.00	0.00	0.00
1,200.0	3.99	302.29	1,199.2	14.9	-23.6	-13.7	0.00	0.00	0.00
1,300.0	3.99	302.29	1,298.9	18.6	-29.4	-17.1	0.00	0.00	0.00
1,400.0	3.99	302.29	1,398.7	22.3	-35.3	-20.6	0.00	0.00	0.00
1,500.0	3.99	302.29	1,498.5	26.0	-41.2	-24.0	0.00	0.00	0.00
1,600.0	3.99	302.29	1,598.2	29.7	-47.1	-27.4	0.00	0.00	0.00
1,700.0	3.99	302.29	1,698.0	33.5	-53.0	-30.9	0.00	0.00	0.00
1,800.0	3.99	302.29	1,797.7	37.2	-58.8	-34.3	0.00	0.00	0.00
1,900.0	3.99	302.29	1,897.5	40.9	-64.7	-37.7	0.00	0.00	0.00
2,000.0	3.99	302.29	1,997.3	44.6	-70.6	-41.1	0.00	0.00	0.00
2,100.0	3.99	302.29	2,097.0	48.3	-76.5	-44.6	0.00	0.00	0.00
2,200.0	3.99	302.29	2,196.8	52.0	-82.4	-48.0	0.00	0.00	0.00
2,300.0	3.99	302.29	2,296.5	55.7	-88.2	-51.4	0.00	0.00	0.00
2,400.0	3.99	302.29	2,396.3	59.5	-94.1	-54.8	0.00	0.00	0.00
2,500.0	3.99	302.29	2,496.0	63.2	-100.0	-58.3	0.00	0.00	0.00
2,600.0	3.99	302.29	2,595.8	66.9	-105.9	-61.7	0.00	0.00	0.00
2,700.0	3.99	302.29	2,695.6	70.6	-111.8	-65.1	0.00	0.00	0.00
2,800.0	3.99	302.29	2,795.3	74.3	-117.6	-68.5	0.00	0.00	0.00
2,900.0	3.99	302.29	2,895.1	78.0	-123.5	-72.0	0.00	0.00	0.00
3,000.0	3.99	302.29	2,994.8	81.8	-129.4	-75.4	0.00	0.00	0.00
3,100.0	3.99	302.29	3,094.6	85.5	-135.3	-78.8	0.00	0.00	0.00
3,200.0	3.99	302.29	3,194.3	89.2	-141.1	-82.2	0.00	0.00	0.00
3,300.0	3.99	302.29	3,294.1	92.9	-147.0	-85.7	0.00	0.00	0.00
3,400.0	3.99	302.29	3,393.9	96.6	-152.9	-89.1	0.00	0.00	0.00
3,500.0	3.99	302.29	3,493.6	100.3	-158.8	-92.5	0.00	0.00	0.00
3,556.5	3.99	302.29	3,550.0	102.4	-162.1	-94.4	0.00	0.00	0.00
<b>PARKMAN</b>									
3,600.0	3.99	302.29	3,593.4	104.0	-164.7	-95.9	0.00	0.00	0.00
3,700.0	3.99	302.29	3,693.1	107.8	-170.5	-99.4	0.00	0.00	0.00
3,800.0	3.99	302.29	3,792.9	111.5	-176.4	-102.8	0.00	0.00	0.00
3,900.0	3.99	302.29	3,892.7	115.2	-182.3	-106.2	0.00	0.00	0.00
4,000.0	3.99	302.29	3,992.4	118.9	-188.2	-109.6	0.00	0.00	0.00
4,100.0	3.99	302.29	4,092.2	122.6	-194.1	-113.1	0.00	0.00	0.00
4,173.0	3.99	302.29	4,165.0	125.3	-198.4	-115.6	0.00	0.00	0.00
<b>SUSSEX</b>									
4,200.0	3.99	302.29	4,191.9	126.3	-199.9	-116.5	0.00	0.00	0.00
4,300.0	3.99	302.29	4,291.7	130.0	-205.8	-119.9	0.00	0.00	0.00
4,400.0	3.99	302.29	4,391.4	133.8	-211.7	-123.3	0.00	0.00	0.00

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
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<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (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 28J-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	3.99	302.29	4,491.2	137.5	-217.6	-126.8	0.00	0.00	0.00
4,600.0	3.99	302.29	4,591.0	141.2	-223.5	-130.2	0.00	0.00	0.00
4,700.0	3.99	302.29	4,690.7	144.9	-229.3	-133.6	0.00	0.00	0.00
4,800.0	3.99	302.29	4,790.5	148.6	-235.2	-137.0	0.00	0.00	0.00
4,900.0	3.99	302.29	4,890.2	152.3	-241.1	-140.5	0.00	0.00	0.00
5,000.0	3.99	302.29	4,990.0	156.1	-247.0	-143.9	0.00	0.00	0.00
5,100.0	3.99	302.29	5,089.7	159.8	-252.9	-147.3	0.00	0.00	0.00
5,180.4	3.99	302.29	5,170.0	162.8	-257.6	-150.1	0.00	0.00	0.00
<b>SHANNON</b>									
5,200.0	3.99	302.29	5,189.5	163.5	-258.7	-150.7	0.00	0.00	0.00
5,300.0	3.99	302.29	5,289.3	167.2	-264.6	-154.2	0.00	0.00	0.00
5,400.0	3.99	302.29	5,389.0	170.9	-270.5	-157.6	0.00	0.00	0.00
5,500.0	3.99	302.29	5,488.8	174.6	-276.4	-161.0	0.00	0.00	0.00
5,600.0	3.99	302.29	5,588.5	178.3	-282.3	-164.4	0.00	0.00	0.00
5,700.0	3.99	302.29	5,688.3	182.1	-288.1	-167.9	0.00	0.00	0.00
5,800.0	3.99	302.29	5,788.1	185.8	-294.0	-171.3	0.00	0.00	0.00
5,900.0	3.99	302.29	5,887.8	189.5	-299.9	-174.7	0.00	0.00	0.00
5,951.0	3.99	302.29	5,938.7	191.4	-302.9	-176.5	0.00	0.00	0.00
<b>Start DLS 7.50 TFO -122.21</b>									
6,000.0	3.71	245.34	5,987.6	191.6	-305.8	-176.6	7.50	-0.56	-116.16
6,100.0	9.65	200.29	6,086.9	182.4	-311.6	-167.1	7.50	5.94	-45.05
6,200.0	16.88	191.22	6,184.2	160.3	-317.4	-144.7	7.50	7.23	-9.08
6,300.0	24.27	187.53	6,277.8	125.6	-322.9	-109.8	7.50	7.39	-3.69
6,400.0	31.71	185.49	6,366.0	79.0	-328.1	-63.0	7.50	7.44	-2.04
6,460.3	36.21	184.63	6,416.0	45.5	-331.1	-29.3	7.50	7.46	-1.42
<b>SHARON SPRINGS</b>									
6,500.0	39.17	184.16	6,447.4	21.3	-332.9	-5.1	7.50	7.47	-1.18
6,600.0	46.64	183.20	6,520.6	-46.6	-337.3	62.9	7.50	7.47	-0.96
6,700.0	54.12	182.46	6,584.3	-123.5	-341.0	139.9	7.50	7.48	-0.75
6,800.0	61.60	181.84	6,637.5	-208.1	-344.2	224.5	7.50	7.48	-0.62
6,900.0	69.09	181.30	6,679.2	-298.9	-346.7	315.3	7.50	7.48	-0.54
7,000.0	76.57	180.82	6,708.7	-394.3	-348.4	410.8	7.50	7.49	-0.48
7,100.0	84.06	180.37	6,725.5	-492.8	-349.4	509.2	7.50	7.49	-0.45
7,182.4	90.23	180.00	6,729.6	-575.1	-349.7	591.4	7.50	7.49	-0.44
<b>Start 6624.5 hold at 7182.4 MD - 7"</b>									
7,200.0	90.23	180.00	6,729.5	-592.7	-349.7	608.9	0.01	0.01	0.00
7,300.0	90.23	180.00	6,729.1	-692.7	-349.7	708.8	0.00	0.00	0.00
7,400.0	90.23	180.00	6,728.7	-792.7	-349.7	808.7	0.00	0.00	0.00
7,500.0	90.23	180.00	6,728.3	-892.7	-349.7	908.6	0.00	0.00	0.00
7,600.0	90.23	180.00	6,727.9	-992.7	-349.7	1,008.5	0.00	0.00	0.00
7,700.0	90.23	180.00	6,727.5	-1,092.7	-349.7	1,108.3	0.00	0.00	0.00
7,800.0	90.23	180.00	6,727.1	-1,192.7	-349.7	1,208.2	0.00	0.00	0.00
7,900.0	90.23	180.00	6,726.7	-1,292.7	-349.7	1,308.1	0.00	0.00	0.00
8,000.0	90.23	180.00	6,726.3	-1,392.7	-349.7	1,408.0	0.00	0.00	0.00
8,100.0	90.23	180.00	6,725.9	-1,492.7	-349.7	1,507.9	0.00	0.00	0.00
8,200.0	90.23	180.00	6,725.5	-1,592.7	-349.7	1,607.8	0.00	0.00	0.00
8,300.0	90.23	180.00	6,725.1	-1,692.7	-349.7	1,707.6	0.00	0.00	0.00
8,400.0	90.23	180.00	6,724.7	-1,792.7	-349.7	1,807.5	0.00	0.00	0.00
8,500.0	90.23	180.00	6,724.3	-1,892.7	-349.7	1,907.4	0.00	0.00	0.00
8,600.0	90.23	180.00	6,723.9	-1,992.7	-349.7	2,007.3	0.00	0.00	0.00
8,700.0	90.23	180.00	6,723.5	-2,092.7	-349.7	2,107.2	0.00	0.00	0.00

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (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 28J-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)
8,800.0	90.23	180.00	6,723.1	-2,192.7	-349.7	2,207.0	0.00	0.00	0.00
8,900.0	90.23	180.00	6,722.7	-2,292.7	-349.7	2,306.9	0.00	0.00	0.00
9,000.0	90.23	180.00	6,722.3	-2,392.7	-349.7	2,406.8	0.00	0.00	0.00
9,100.0	90.23	180.00	6,721.9	-2,492.7	-349.7	2,506.7	0.00	0.00	0.00
9,200.0	90.23	180.00	6,721.5	-2,592.7	-349.7	2,606.6	0.00	0.00	0.00
9,300.0	90.23	180.00	6,721.1	-2,692.7	-349.7	2,706.4	0.00	0.00	0.00
9,400.0	90.23	180.00	6,720.7	-2,792.7	-349.7	2,806.3	0.00	0.00	0.00
9,500.0	90.23	180.00	6,720.3	-2,892.7	-349.7	2,906.2	0.00	0.00	0.00
9,600.0	90.23	180.00	6,719.9	-2,992.7	-349.7	3,006.1	0.00	0.00	0.00
9,700.0	90.23	180.00	6,719.5	-3,092.7	-349.7	3,106.0	0.00	0.00	0.00
9,800.0	90.23	180.00	6,719.1	-3,192.7	-349.7	3,205.9	0.00	0.00	0.00
9,900.0	90.23	180.00	6,718.7	-3,292.7	-349.7	3,305.7	0.00	0.00	0.00
10,000.0	90.23	180.00	6,718.3	-3,392.6	-349.7	3,405.6	0.00	0.00	0.00
10,100.0	90.23	180.00	6,717.9	-3,492.6	-349.7	3,505.5	0.00	0.00	0.00
10,200.0	90.23	180.00	6,717.5	-3,592.6	-349.7	3,605.4	0.00	0.00	0.00
10,300.0	90.23	180.00	6,717.1	-3,692.6	-349.7	3,705.3	0.00	0.00	0.00
10,400.0	90.23	180.00	6,716.7	-3,792.6	-349.7	3,805.1	0.00	0.00	0.00
10,500.0	90.23	180.00	6,716.3	-3,892.6	-349.7	3,905.0	0.00	0.00	0.00
10,600.0	90.23	180.00	6,715.9	-3,992.6	-349.7	4,004.9	0.00	0.00	0.00
10,700.0	90.23	180.00	6,715.5	-4,092.6	-349.7	4,104.8	0.00	0.00	0.00
10,800.0	90.23	180.00	6,715.1	-4,192.6	-349.7	4,204.7	0.00	0.00	0.00
10,900.0	90.23	180.00	6,714.7	-4,292.6	-349.7	4,304.6	0.00	0.00	0.00
11,000.0	90.23	180.00	6,714.3	-4,392.6	-349.7	4,404.4	0.00	0.00	0.00
11,100.0	90.23	180.00	6,713.9	-4,492.6	-349.7	4,504.3	0.00	0.00	0.00
11,200.0	90.23	180.00	6,713.5	-4,592.6	-349.7	4,604.2	0.00	0.00	0.00
11,300.0	90.23	180.00	6,713.1	-4,692.6	-349.7	4,704.1	0.00	0.00	0.00
11,400.0	90.23	180.00	6,712.7	-4,792.6	-349.7	4,804.0	0.00	0.00	0.00
11,500.0	90.23	180.00	6,712.3	-4,892.6	-349.7	4,903.8	0.00	0.00	0.00
11,600.0	90.23	180.00	6,711.9	-4,992.6	-349.7	5,003.7	0.00	0.00	0.00
11,700.0	90.23	180.00	6,711.5	-5,092.6	-349.7	5,103.6	0.00	0.00	0.00
11,800.0	90.23	180.00	6,711.1	-5,192.6	-349.7	5,203.5	0.00	0.00	0.00
11,900.0	90.23	180.00	6,710.7	-5,292.6	-349.7	5,303.4	0.00	0.00	0.00
12,000.0	90.23	180.00	6,710.3	-5,392.6	-349.7	5,403.2	0.00	0.00	0.00
12,100.0	90.23	180.00	6,709.9	-5,492.6	-349.7	5,503.1	0.00	0.00	0.00
12,200.0	90.23	180.00	6,709.5	-5,592.6	-349.7	5,603.0	0.00	0.00	0.00
12,300.0	90.23	180.00	6,709.1	-5,692.6	-349.7	5,702.9	0.00	0.00	0.00
12,400.0	90.23	180.00	6,708.7	-5,792.6	-349.7	5,802.8	0.00	0.00	0.00
12,500.0	90.23	180.00	6,708.3	-5,892.6	-349.7	5,902.7	0.00	0.00	0.00
12,600.0	90.23	180.00	6,707.9	-5,992.6	-349.7	6,002.5	0.00	0.00	0.00
12,700.0	90.23	180.00	6,707.5	-6,092.6	-349.7	6,102.4	0.00	0.00	0.00
12,800.0	90.23	180.00	6,707.0	-6,192.6	-349.7	6,202.3	0.00	0.00	0.00
12,900.0	90.23	180.00	6,706.6	-6,292.6	-349.7	6,302.2	0.00	0.00	0.00
13,000.0	90.23	180.00	6,706.2	-6,392.6	-349.7	6,402.1	0.00	0.00	0.00
13,100.0	90.23	180.00	6,705.8	-6,492.6	-349.7	6,501.9	0.00	0.00	0.00
13,200.0	90.23	180.00	6,705.4	-6,592.6	-349.7	6,601.8	0.00	0.00	0.00
13,300.0	90.23	180.00	6,705.0	-6,692.6	-349.7	6,701.7	0.00	0.00	0.00
13,400.0	90.23	180.00	6,704.6	-6,792.6	-349.7	6,801.6	0.00	0.00	0.00
13,500.0	90.23	180.00	6,704.2	-6,892.6	-349.7	6,901.5	0.00	0.00	0.00
13,600.0	90.23	180.00	6,703.8	-6,992.6	-349.7	7,001.4	0.00	0.00	0.00
13,700.0	90.23	180.00	6,703.4	-7,092.6	-349.7	7,101.2	0.00	0.00	0.00
13,800.0	90.23	180.00	6,703.0	-7,192.6	-349.7	7,201.1	0.00	0.00	0.00
13,806.9	90.23	180.00	6,703.0	-7,199.5	-349.7	7,208.0	0.00	0.00	0.00

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Project:</b>	SEC.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (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 28J-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)
TD at 13806.9									

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude
BHL 2142'FNL, 881'F <sup>1</sup>	- plan misses by 16.4ft at 13806.1ft MD (6703.0 TVD, -7198.7 N, -349.7 E)	0.00	0.00	6,703.0	-7,198.7	-366.1	1,374,335.79	3,261,675.05	40.357150
	- Point								-104.561024
SHL 250'FNL, 1275'F <sup>1</sup>	- plan hits target	0.00	0.00	1.0	0.0	0.0	1,381,537.72	3,261,964.79	40.376910
	- Point								-104.559710

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,182.4	6,729.6	7"	7	7-1/2	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,556.5	3,550.0	PARKMAN			
4,173.0	4,165.0	SUSSEX			
5,180.4	5,170.0	SHANNON			
6,460.3	6,416.0	SHARON SPRINGS			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
600.0	600.0	0.0	0.0	KOP - Start Build 1.00
998.8	998.5	7.4	-11.7	Start 4952.2 hold at 998.8 MD
5,951.0	5,938.7	191.4	-302.9	Start DLS 7.50 TFO -122.21
7,182.4	6,729.6	-575.1	-349.7	Start 6624.5 hold at 7182.4 MD
13,806.9	6,703.0	-7,199.5	-349.7	TD at 13806.9



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T5N-R64W**

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

**Churchill 28J-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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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	13,806.1	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)	200.0	200.0	61.4	60.7	91.063	CC, ES
Churchill 28E-203 - Wellbore #1 - Plan #2 (11-12-14)	13,806.9	13,799.6	810.2	532.2	2.914	SF
Churchill 28E-423 - Wellbore #1 - Plan #2 (11-12-14)	400.0	400.0	30.9	29.3	19.616	CC, ES
Churchill 28E-423 - Wellbore #1 - Plan #2 (11-12-14)	13,806.9	13,912.5	486.1	213.5	1.783	SF
Churchill 28J-203 - Wellbore #1 - Plan #3 (11-12-14)	600.0	599.0	58.5	56.0	23.686	CC, ES
Churchill 28J-203 - Wellbore #1 - Plan #3 (11-12-14)	13,806.9	13,582.4	605.0	328.8	2.191	SF
Churchill 28J-423 - Wellbore #1 - Plan #3 (11-12-14)	600.0	598.0	89.2	86.7	36.126	CC, ES
Churchill 28J-423 - Wellbore #1 - Plan #3 (11-12-14)	13,806.9	13,893.3	796.8	520.1	2.879	SF
Churchill 28J-443 - Wellbore #1 - Plan #2 (11-12-14)	600.0	599.0	30.6	28.2	12.407	CC
Churchill 28J-443 - Wellbore #1 - Plan #2 (11-12-14)	13,806.9	13,876.2	209.5	-39.4	0.842	Level 1, ES, SF
Churchill 28M-343 - Wellbore #1 - Plan #3 (11-12-14)	600.0	598.0	119.8	117.3	48.545	CC, ES
Churchill 28M-343 - Wellbore #1 - Plan #3 (11-12-14)	1,400.0	1,386.5	168.9	163.0	28.329	SF
Churchill 28M-443 - Wellbore #1 - Plan #2 (11-12-14)	400.0	397.0	150.5	148.9	96.037	CC, ES
Churchill 28M-443 - Wellbore #1 - Plan #2 (11-12-14)	1,300.0	1,263.5	245.5	240.0	44.537	SF
<b>Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W</b>						
Adamson 1-6I (Exist) - Wellbore #1 - Wellbore #1	9,035.8	6,837.2	413.4	345.9	6.123	CC, ES
Adamson 1-6I (Exist) - Wellbore #1 - Wellbore #1	9,100.0	6,836.1	418.3	349.6	6.091	SF
Adamson 28-1 (Exist) - Wellbore #1 - Wellbore #1	9,728.3	6,744.5	226.7	151.6	3.016	CC, ES, SF
Adamson 28-2 (Exist) - Wellbore #1 - Wellbore #1	10,739.0	6,745.6	100.0	3.1	1.032	Level 2, CC, ES, SF
Adamson 5 (Exist) - Wellbore #1 - Wellbore #1	10,346.3	6,830.9	376.1	284.1	4.090	CC, ES
Adamson 5 (Exist) - Wellbore #1 - Wellbore #1	10,400.0	6,831.0	379.9	286.9	4.086	SF
Bailey 33-2 (Exist) - Wellbore #1 - Wellbore #1	13,650.8	6,774.5	259.4	110.0	1.736	CC, ES, SF
Churchill 2 28A (Exist) - Wellbore #1 - Wellbore #1	8,330.1	6,737.3	242.4	193.8	4.990	CC, ES, SF
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	5,699.6	5,777.6	451.7	424.5	16.623	CC
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	5,700.0	5,777.9	451.7	424.5	16.622	ES
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	6,200.0	6,249.2	468.0	438.6	15.912	SF
Churchill 28A-1 (Exist) - Wellbore #1 - Wellbore #1	7,086.9	6,720.6	139.6	110.2	4.747	CC, ES
Churchill 28A-1 (Exist) - Wellbore #1 - Wellbore #1	7,100.0	6,722.6	140.2	110.6	4.745	SF
Churchill 5 (Exist) - Wellbore #1 - Wellbore #1	7,561.4	6,735.2	498.7	462.9	13.942	CC, ES
Churchill 5 (Exist) - Wellbore #1 - Wellbore #1	7,700.0	6,738.1	517.6	479.7	13.655	SF
Hoffman B 33-19 (Exist) - Wellbore #1 - Wellbore #1	12,761.7	6,747.7	406.5	274.1	3.069	CC, ES
Hoffman B 33-19 (Exist) - Wellbore #1 - Wellbore #1	12,800.0	6,747.6	408.3	275.1	3.066	SF
Wonenberg 1 (Exist) - Wellbore #1 - Wellbore #1	12,279.3	6,769.4	221.8	99.4	1.812	CC, ES, SF

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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	0.0	0.0	0.0	0.0	-93.40	-3.6	-61.3	61.4				
100.0	100.0	100.0	100.0	0.1	0.1	-93.40	-3.6	-61.3	61.4	61.2	0.22	273.189	
200.0	200.0	200.0	200.0	0.3	0.3	-93.40	-3.6	-61.3	61.4	60.7	0.67	91.063 CC, ES	
300.0	300.0	298.4	298.4	0.6	0.6	-93.11	-3.4	-62.5	62.7	61.5	1.11	56.323	
400.0	400.0	396.8	396.7	0.8	0.8	-92.32	-2.7	-66.3	66.4	64.9	1.55	42.712	
500.0	500.0	494.8	494.5	1.0	1.0	-91.18	-1.5	-72.5	72.7	70.7	2.01	36.174	
600.0	600.0	592.5	591.8	1.2	1.3	-89.88	0.2	-81.1	81.5	79.0	2.48	32.891	
700.0	700.0	689.7	688.4	1.5	1.5	-31.09	2.3	-92.1	92.1	89.2	2.90	31.793	
800.0	800.0	786.6	784.3	1.7	1.8	-30.48	4.8	-105.4	103.7	100.4	3.34	31.048	
900.0	899.9	883.1	879.4	1.9	2.2	-30.22	7.9	-121.1	116.3	112.5	3.79	30.677	
1,000.0	999.7	982.0	976.8	2.1	2.6	-30.29	11.2	-138.6	128.9	124.6	4.25	30.290	
1,100.0	1,099.4	1,081.3	1,074.5	2.4	2.9	-30.57	14.6	-156.1	140.7	136.0	4.73	29.775	
1,200.0	1,199.2	1,180.6	1,172.2	2.6	3.3	-30.81	17.9	-173.6	152.5	147.3	5.20	29.326	
1,300.0	1,298.9	1,279.9	1,269.8	2.8	3.7	-31.01	21.3	-191.1	164.3	158.6	5.68	28.932	
1,400.0	1,398.7	1,379.2	1,367.5	3.1	4.1	-31.19	24.7	-208.7	176.1	170.0	6.16	28.593	
1,500.0	1,498.5	1,478.5	1,465.2	3.3	4.5	-31.35	28.1	-226.2	188.0	181.3	6.65	28.285	
1,600.0	1,598.2	1,577.8	1,562.9	3.6	4.9	-31.49	31.4	-243.7	199.8	192.7	7.13	28.014	
1,700.0	1,698.0	1,677.1	1,660.6	3.8	5.3	-31.61	34.8	-261.2	211.6	204.0	7.62	27.772	
1,800.0	1,797.7	1,776.4	1,758.3	4.1	5.7	-31.72	38.2	-278.8	223.4	215.3	8.11	27.555	
1,900.0	1,897.5	1,875.7	1,855.9	4.3	6.1	-31.81	41.5	-296.3	235.3	226.7	8.60	27.360	
2,000.0	1,997.3	1,975.0	1,953.6	4.6	6.5	-31.90	44.9	-313.8	247.1	238.0	9.09	27.183	
2,100.0	2,097.0	2,074.3	2,051.3	4.9	6.9	-31.98	48.3	-331.3	258.9	249.3	9.58	27.022	
2,200.0	2,196.8	2,173.6	2,149.0	5.1	7.4	-32.06	51.6	-348.8	270.7	260.7	10.07	26.875	
2,300.0	2,296.5	2,272.9	2,246.7	5.4	7.8	-32.12	55.0	-366.4	282.6	272.0	10.57	26.740	
2,400.0	2,396.3	2,372.2	2,344.3	5.6	8.2	-32.19	58.4	-383.9	294.4	283.3	11.06	26.616	
2,500.0	2,496.0	2,471.5	2,442.0	5.9	8.6	-32.24	61.7	-401.4	306.2	294.7	11.55	26.501	
2,600.0	2,595.8	2,570.8	2,539.7	6.1	9.0	-32.30	65.1	-418.9	318.0	306.0	12.05	26.395	
2,700.0	2,695.6	2,670.1	2,637.4	6.4	9.4	-32.34	68.5	-436.5	329.9	317.3	12.54	26.297	
2,800.0	2,795.3	2,769.4	2,735.1	6.6	9.8	-32.39	71.8	-454.0	341.7	328.7	13.04	26.206	
2,900.0	2,895.1	2,868.7	2,832.7	6.9	10.2	-32.43	75.2	-471.5	353.5	340.0	13.53	26.120	
3,000.0	2,994.8	2,968.0	2,930.4	7.2	10.6	-32.47	78.6	-489.0	365.4	351.3	14.03	26.041	
3,100.0	3,094.6	3,067.3	3,028.1	7.4	11.0	-32.51	81.9	-506.5	377.2	362.7	14.53	25.966	
3,200.0	3,194.3	3,166.6	3,125.8	7.7	11.4	-32.54	85.3	-524.1	389.0	374.0	15.02	25.896	
3,300.0	3,294.1	3,265.9	3,223.5	7.9	11.8	-32.58	88.7	-541.6	400.9	385.3	15.52	25.830	
3,400.0	3,393.9	3,365.2	3,321.2	8.2	12.3	-32.61	92.0	-559.1	412.7	396.7	16.02	25.768	
3,500.0	3,493.6	3,464.5	3,418.8	8.4	12.7	-32.64	95.4	-576.6	424.5	408.0	16.51	25.709	
3,600.0	3,593.4	3,563.8	3,516.5	8.7	13.1	-32.67	98.8	-594.2	436.3	419.3	17.01	25.654	
3,700.0	3,693.1	3,663.1	3,614.2	9.0	13.5	-32.69	102.1	-611.7	448.2	430.7	17.51	25.601	
3,800.0	3,792.9	3,762.4	3,711.9	9.2	13.9	-32.72	105.5	-629.2	460.0	442.0	18.00	25.552	
3,900.0	3,892.7	3,861.7	3,809.6	9.5	14.3	-32.74	108.9	-646.7	471.8	453.3	18.50	25.504	
4,000.0	3,992.4	3,961.0	3,907.2	9.7	14.7	-32.76	112.2	-664.2	483.7	464.7	19.00	25.459	
4,100.0	4,092.2	4,060.3	4,004.9	10.0	15.1	-32.79	115.6	-681.8	495.5	476.0	19.49	25.417	
4,200.0	4,191.9	4,159.6	4,102.6	10.2	15.5	-32.81	119.0	-699.3	507.3	487.3	19.99	25.376	
4,300.0	4,291.7	4,258.9	4,200.3	10.5	15.9	-32.83	122.4	-716.8	519.2	498.7	20.49	25.337	
4,400.0	4,391.4	4,358.2	4,298.0	10.8	16.3	-32.84	125.7	-734.3	531.0	510.0	20.99	25.300	
4,500.0	4,491.2	4,457.5	4,395.7	11.0	16.8	-32.86	129.1	-751.9	542.8	521.3	21.49	25.264	
4,600.0	4,591.0	4,556.8	4,493.3	11.3	17.2	-32.88	132.5	-769.4	554.6	532.7	21.98	25.230	
4,700.0	4,690.7	4,656.1	4,591.0	11.5	17.6	-32.90	135.8	-786.9	566.5	544.0	22.48	25.198	

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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									
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	
4,800.0	4,790.5	4,755.4	4,688.7	11.8	18.0	-32.91	139.2	-804.4	578.3	555.3	22.98	25.167		
4,900.0	4,890.2	4,854.7	4,786.4	12.1	18.4	-32.93	142.6	-821.9	590.1	566.7	23.48	25.137		
5,000.0	4,990.0	4,954.0	4,884.1	12.3	18.8	-32.94	145.9	-839.5	602.0	578.0	23.98	25.108		
5,100.0	5,089.7	5,053.3	4,981.7	12.6	19.2	-32.95	149.3	-857.0	613.8	589.3	24.47	25.080		
5,200.0	5,189.5	5,152.5	5,079.4	12.8	19.6	-32.97	152.7	-874.5	625.6	600.7	24.97	25.054		
5,300.0	5,289.3	5,251.8	5,177.1	13.1	20.0	-32.98	156.0	-892.0	637.5	612.0	25.47	25.028		
5,400.0	5,389.0	5,351.1	5,274.8	13.3	20.4	-32.99	159.4	-909.6	649.3	623.3	25.97	25.003		
5,500.0	5,488.8	5,450.4	5,372.5	13.6	20.8	-33.01	162.8	-927.1	661.1	634.7	26.47	24.979		
5,600.0	5,588.5	5,549.7	5,470.1	13.9	21.3	-33.02	166.1	-944.6	672.9	646.0	26.97	24.956		
5,700.0	5,688.3	5,649.0	5,567.8	14.1	21.7	-33.03	169.5	-962.1	684.8	657.3	27.46	24.934		
5,800.0	5,788.1	5,748.3	5,665.5	14.4	22.1	-33.04	172.9	-979.6	696.6	668.6	27.96	24.913		
5,900.0	5,887.8	5,847.6	5,763.2	14.6	22.5	-33.05	176.2	-997.2	708.4	680.0	28.46	24.892		
6,000.0	5,987.6	5,946.9	5,860.8	14.9	22.9	-33.07	179.6	-1,014.7	720.2	691.3	28.97	24.863		
6,100.0	6,086.9	6,045.0	5,957.3	15.0	23.2	-33.08	183.0	-1,032.0	731.9	702.6	29.35	24.937		
6,200.0	6,184.2	6,143.9	6,053.6	15.2	23.5	-33.09	186.3	-1,049.3	743.5	713.8	29.62	25.099		
6,300.0	6,277.8	6,243.9	6,148.3	15.3	23.8	-33.10	189.6	-1,066.3	754.6	724.8	29.82	25.309		
6,400.0	6,366.0	6,345.1	6,239.7	15.4	24.1	-33.11	192.9	-1,082.7	765.3	735.3	29.99	25.516		
6,500.0	6,447.4	6,447.4	6,326.1	15.5	24.3	-33.12	196.2	-1,098.2	775.2	745.0	30.22	25.652		
6,600.0	6,520.6	6,551.0	6,405.7	15.6	24.6	-33.13	199.5	-1,112.5	784.2	753.6	30.59	25.637		
6,700.0	6,584.3	6,655.8	6,476.7	15.8	24.9	-33.14	202.8	-1,125.3	792.1	760.9	31.19	25.395		
6,800.0	6,637.5	6,761.7	6,537.5	16.2	25.2	-33.15	206.1	-1,136.3	798.8	766.7	32.11	24.875		
6,900.0	6,679.2	6,868.7	6,586.3	16.8	25.6	-33.16	209.4	-1,145.1	804.1	770.7	33.41	24.071		
7,000.0	6,708.7	6,976.5	6,621.9	17.6	26.0	-33.17	212.7	-1,151.5	807.9	772.8	35.09	23.026		
7,100.0	6,725.5	7,085.0	6,643.3	18.6	26.6	-33.18	216.0	-1,155.4	810.2	773.1	37.14	21.817		
7,200.0	6,729.5	7,193.3	6,649.6	19.7	27.3	-33.19	219.3	-1,156.6	810.8	771.4	39.47	20.542		
7,300.0	6,729.1	7,293.3	6,649.3	20.9	28.1	-33.20	222.6	-1,156.6	810.8	768.9	41.89	19.357		
7,400.0	6,728.7	7,393.3	6,649.0	22.2	29.0	-33.21	225.9	-1,156.6	810.8	766.3	44.50	18.221		
7,500.0	6,728.3	7,493.3	6,648.7	23.6	30.0	-33.22	229.2	-1,156.6	810.8	763.5	47.28	17.150		
7,600.0	6,727.9	7,593.3	6,648.4	25.1	31.1	-33.23	232.5	-1,156.6	810.8	760.6	50.19	16.154		
7,700.0	6,727.5	7,693.3	6,648.1	26.6	32.3	-33.24	235.8	-1,156.6	810.8	757.6	53.22	15.234		
7,800.0	6,727.1	7,793.3	6,647.8	28.2	33.5	-33.25	239.1	-1,156.6	810.8	754.4	56.35	14.389		
7,900.0	6,726.7	7,893.3	6,647.5	29.8	34.9	-33.26	242.4	-1,156.6	810.8	751.2	59.56	13.614		
8,000.0	6,726.3	7,993.3	6,647.2	31.5	36.2	-33.27	245.7	-1,156.6	810.8	747.9	62.83	12.903		
8,100.0	6,725.9	8,093.3	6,646.9	33.1	37.7	-33.28	249.0	-1,156.6	810.8	744.6	66.17	12.253		
8,200.0	6,725.5	8,193.3	6,646.6	34.8	39.2	-33.29	252.3	-1,156.6	810.7	741.2	69.56	11.656		
8,300.0	6,725.1	8,293.3	6,646.3	36.6	40.7	-33.30	255.6	-1,156.6	810.7	737.7	72.99	11.108		
8,400.0	6,724.7	8,393.3	6,646.0	38.3	42.2	-33.31	258.9	-1,156.6	810.7	734.3	76.45	10.604		
8,500.0	6,724.3	8,493.3	6,645.7	40.1	43.8	-33.32	262.2	-1,156.6	810.7	730.8	79.95	10.140		
8,600.0	6,723.9	8,593.3	6,645.4	41.8	45.4	-33.33	265.5	-1,156.6	810.7	727.2	83.48	9.711		
8,700.0	6,723.5	8,693.3	6,645.1	43.6	47.1	-33.34	268.8	-1,156.6	810.7	723.7	87.04	9.315		
8,800.0	6,723.1	8,793.3	6,644.8	45.4	48.7	-33.35	272.1	-1,156.6	810.7	720.1	90.61	8.947		
8,900.0	6,722.7	8,893.3	6,644.5	47.2	50.4	-33.36	275.4	-1,156.6	810.7	716.5	94.21	8.605		
9,000.0	6,722.3	8,993.3	6,644.2	49.0	52.1	-33.37	278.7	-1,156.6	810.7	712.8	97.82	8.287		
9,100.0	6,721.9	9,093.3	6,643.9	50.9	53.8	-33.38	282.0	-1,156.6	810.7	709.2	101.45	7.991		
9,200.0	6,721.5	9,193.3	6,643.6	52.7	55.5	-33.39	285.3	-1,156.6	810.6	705.6	105.09	7.714		
9,300.0	6,721.1	9,293.3	6,643.3	54.5	57.3	-33.40	288.6	-1,156.6	810.6	701.9	108.75	7.454		
9,400.0	6,720.7	9,393.3	6,643.1	56.4	59.0	-33.41	291.9	-1,156.6	810.6	698.2	112.41	7.211		
9,500.0	6,720.3	9,493.3	6,642.8	58.2	60.8	-33.42	295.2	-1,156.6	810.6	694.5	116.09	6.982		
9,600.0	6,719.9	9,593.3	6,642.5	60.1	62.5	-33.43	298.5	-1,156.6	810.6	690.8	119.78	6.767		

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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									
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	6,719.5	9,693.3	6,642.2	61.9	64.3	84.53	-3,092.4	-1,156.6	810.6	687.1	123.47	6.565		
9,800.0	6,719.1	9,793.3	6,641.9	63.8	66.1	84.53	-3,192.4	-1,156.6	810.6	683.4	127.18	6.374		
9,900.0	6,718.7	9,893.3	6,641.6	65.6	67.9	84.54	-3,292.4	-1,156.6	810.6	679.7	130.89	6.193		
10,000.0	6,718.3	9,993.3	6,641.3	67.5	69.7	84.55	-3,392.4	-1,156.6	810.6	676.0	134.61	6.022		
10,100.0	6,717.9	10,093.3	6,641.0	69.4	71.5	84.56	-3,492.4	-1,156.6	810.6	672.2	138.33	5.860		
10,200.0	6,717.5	10,193.3	6,640.7	71.2	73.3	84.56	-3,592.4	-1,156.6	810.5	668.5	142.06	5.706		
10,300.0	6,717.1	10,293.3	6,640.4	73.1	75.1	84.57	-3,692.4	-1,156.6	810.5	664.7	145.79	5.560		
10,400.0	6,716.7	10,393.3	6,640.1	75.0	76.9	84.58	-3,792.4	-1,156.6	810.5	661.0	149.53	5.421		
10,500.0	6,716.3	10,493.3	6,639.8	76.9	78.8	84.58	-3,892.4	-1,156.6	810.5	657.2	153.27	5.288		
10,600.0	6,715.9	10,593.3	6,639.5	78.7	80.6	84.59	-3,992.4	-1,156.6	810.5	653.5	157.02	5.162		
10,700.0	6,715.5	10,693.3	6,639.2	80.6	82.4	84.60	-4,092.4	-1,156.6	810.5	649.7	160.77	5.041		
10,800.0	6,715.1	10,793.3	6,638.9	82.5	84.3	84.61	-4,192.4	-1,156.6	810.5	646.0	164.52	4.926		
10,900.0	6,714.7	10,893.3	6,638.6	84.4	86.1	84.61	-4,292.4	-1,156.6	810.5	642.2	168.28	4.816		
11,000.0	6,714.3	10,993.3	6,638.3	86.3	88.0	84.62	-4,392.4	-1,156.6	810.5	638.4	172.04	4.711		
11,100.0	6,713.9	11,093.3	6,638.0	88.2	89.8	84.63	-4,492.4	-1,156.6	810.5	634.6	175.81	4.610		
11,200.0	6,713.5	11,193.3	6,637.7	90.1	91.7	84.64	-4,592.4	-1,156.6	810.4	630.9	179.57	4.513		
11,300.0	6,713.1	11,293.3	6,637.4	91.9	93.5	84.64	-4,692.4	-1,156.6	810.4	627.1	183.34	4.420		
11,400.0	6,712.7	11,393.3	6,637.1	93.8	95.4	84.65	-4,792.4	-1,156.6	810.4	623.3	187.12	4.331		
11,500.0	6,712.3	11,493.3	6,636.8	95.7	97.2	84.66	-4,892.4	-1,156.6	810.4	619.5	190.89	4.245		
11,600.0	6,711.9	11,593.3	6,636.5	97.6	99.1	84.67	-4,992.4	-1,156.6	810.4	615.7	194.67	4.163		
11,700.0	6,711.5	11,693.3	6,636.2	99.5	101.0	84.67	-5,092.4	-1,156.6	810.4	612.0	198.44	4.084		
11,800.0	6,711.1	11,793.3	6,635.9	101.4	102.8	84.68	-5,192.4	-1,156.6	810.4	608.2	202.23	4.007		
11,900.0	6,710.7	11,893.3	6,635.6	103.3	104.7	84.69	-5,292.4	-1,156.6	810.4	604.4	206.01	3.934		
12,000.0	6,710.3	11,993.3	6,635.3	105.2	106.6	84.70	-5,392.4	-1,156.6	810.4	600.6	209.79	3.863		
12,100.0	6,709.9	12,093.3	6,635.0	107.1	108.4	84.70	-5,492.4	-1,156.6	810.4	596.8	213.58	3.794		
12,200.0	6,709.5	12,193.3	6,634.7	109.0	110.3	84.71	-5,592.4	-1,156.6	810.3	593.0	217.36	3.728		
12,300.0	6,709.1	12,293.3	6,634.4	110.9	112.2	84.72	-5,692.4	-1,156.6	810.3	589.2	221.15	3.664		
12,400.0	6,708.7	12,393.3	6,634.2	112.8	114.1	84.72	-5,792.4	-1,156.6	810.3	585.4	224.94	3.602		
12,500.0	6,708.3	12,493.3	6,633.9	114.7	115.9	84.73	-5,892.4	-1,156.6	810.3	581.6	228.73	3.543		
12,600.0	6,707.9	12,593.3	6,633.6	116.6	117.8	84.74	-5,992.4	-1,156.6	810.3	577.8	232.53	3.485		
12,700.0	6,707.5	12,693.3	6,633.3	118.5	119.7	84.75	-6,092.4	-1,156.6	810.3	574.0	236.32	3.429		
12,800.0	6,707.0	12,793.3	6,633.0	120.4	121.6	84.75	-6,192.4	-1,156.6	810.3	570.2	240.12	3.375		
12,900.0	6,706.6	12,893.3	6,632.7	122.3	123.5	84.76	-6,292.4	-1,156.6	810.3	566.4	243.91	3.322		
13,000.0	6,706.2	12,993.3	6,632.4	124.2	125.3	84.77	-6,392.4	-1,156.6	810.3	562.6	247.71	3.271		
13,100.0	6,705.8	13,093.3	6,632.1	126.1	127.2	84.78	-6,492.4	-1,156.6	810.3	558.8	251.51	3.222		
13,200.0	6,705.4	13,193.3	6,631.8	128.0	129.1	84.78	-6,592.4	-1,156.6	810.3	554.9	255.31	3.174		
13,300.0	6,705.0	13,293.3	6,631.5	129.9	131.0	84.79	-6,692.4	-1,156.6	810.2	551.1	259.11	3.127		
13,400.0	6,704.6	13,393.3	6,631.2	131.9	132.9	84.80	-6,792.4	-1,156.6	810.2	547.3	262.91	3.082		
13,500.0	6,704.2	13,493.3	6,630.9	133.8	134.8	84.81	-6,892.4	-1,156.6	810.2	543.5	266.71	3.038		
13,600.0	6,703.8	13,593.3	6,630.6	135.7	136.7	84.81	-6,992.4	-1,156.6	810.2	539.7	270.51	2.995		
13,700.0	6,703.4	13,693.3	6,630.3	137.6	138.6	84.82	-7,092.4	-1,156.6	810.2	535.9	274.32	2.954		
13,800.0	6,703.0	13,793.3	6,630.0	139.1	140.5	84.83	-7,192.4	-1,156.6	810.2	532.4	277.76	2.917		
13,806.3	6,703.0	13,799.6	6,630.0	139.2	140.6	84.83	-7,198.7	-1,156.6	810.2	532.2	277.98	2.915		
13,806.9	6,703.0	13,799.6	6,630.0	139.2	140.6	84.83	-7,198.7	-1,156.6	810.2	532.2	277.99	2.914 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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		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	-96.78	-3.6	-30.6	30.9	30.6	0.22	137.315			
100.0	100.0	100.0	100.0	0.1	0.1	-96.78	-3.6	-30.6	30.9	30.2	0.67	45.772			
200.0	200.0	200.0	200.0	0.3	0.3	-96.78	-3.6	-30.6	30.9	29.7	1.12	27.463			
300.0	300.0	300.0	300.0	0.6	0.6	-96.78	-3.6	-30.6	30.9	29.3	1.57	19.616 CC, ES			
400.0	400.0	400.0	400.0	0.8	0.8	-96.78	-3.6	-30.6	30.9	29.7	2.01	15.736			
500.0	500.0	499.5	499.5	1.0	1.0	-96.19	-3.4	-31.5	31.7	29.7	2.45	13.925			
600.0	600.0	598.9	598.9	1.2	1.2	-94.61	-2.7	-34.0	34.1	31.7	2.88	13.018			
700.0	700.0	698.3	698.1	1.5	1.4	-35.44	-1.6	-38.1	37.5	34.6	3.31	12.417			
800.0	800.0	797.6	797.2	1.7	1.7	-34.87	0.0	-44.0	41.1	37.8	3.75	11.993			
900.0	899.9	896.8	896.2	1.9	1.9	-34.98	2.0	-51.4	45.0	41.2	4.20	11.690			
1,000.0	999.7	995.9	994.8	2.1	2.2	-35.62	4.5	-60.5	49.1	44.9	4.65	11.624			
1,100.0	1,099.4	1,095.0	1,093.3	2.4	2.4	-36.11	7.4	-71.3	54.1	49.4	5.12	11.869			
1,200.0	1,199.2	1,193.9	1,191.4	2.6	2.7	-35.98	10.8	-83.6	60.7	55.6	5.58	12.172			
1,300.0	1,298.9	1,293.7	1,290.2	2.8	3.0	-35.71	14.3	-96.7	67.9	62.4	6.05	12.422			
1,400.0	1,398.7	1,393.4	1,389.0	3.1	3.3	-35.48	17.8	-109.7	75.2	69.1	6.52	12.631			
1,500.0	1,498.5	1,493.2	1,487.9	3.3	3.7	-35.30	21.4	-122.8	82.4	75.9	7.00	12.809			
1,600.0	1,598.2	1,592.9	1,586.7	3.6	4.0	-35.15	24.9	-135.8	89.7	82.7	7.48	12.960			
1,700.0	1,698.0	1,692.6	1,685.5	3.8	4.3	-35.02	28.5	-148.9	96.9	89.4	7.95	13.092			
1,800.0	1,797.7	1,792.4	1,784.3	4.1	4.6	-34.90	32.0	-162.0	104.1	96.2	8.43	13.207			
1,900.0	1,897.5	1,892.1	1,883.1	4.3	5.0	-34.81	35.6	-175.0	111.4	102.9	8.91	13.308			
2,000.0	1,997.3	1,991.8	1,981.9	4.6	5.3	-34.72	39.1	-188.1	118.6	109.7	9.39	13.397			
2,100.0	2,097.0	2,091.6	2,080.7	4.9	5.6	-34.64	42.7	-201.1	125.8	116.4	9.87	13.477			
2,200.0	2,196.8	2,191.3	2,179.6	5.1	6.0	-34.58	46.2	-214.2	133.1	123.2	10.36	13.549			
2,300.0	2,296.5	2,291.1	2,278.4	5.4	6.3	-34.52	49.8	-227.2	140.3	130.0	10.84	13.614			
2,400.0	2,396.3	2,390.8	2,377.2	5.6	6.6	-34.46	53.3	-240.3	147.5	136.7	11.32	13.673			
2,500.0	2,496.0	2,490.5	2,476.0	5.9	7.0	-34.41	56.9	-253.3	154.8	143.5	11.80	13.726			
2,600.0	2,595.8	2,590.3	2,574.8	6.1	7.3	-34.37	60.4	-266.4	162.0	150.2	12.29	13.775			
2,700.0	2,695.6	2,690.0	2,673.6	6.4	7.6	-34.32	64.0	-279.5	169.3	157.0	12.77	13.820			
2,800.0	2,795.3	2,789.7	2,772.5	6.6	8.0	-34.29	67.5	-292.5	176.5	163.7	13.26	13.862			
2,900.0	2,895.1	2,889.5	2,871.3	6.9	8.3	-34.25	71.1	-305.6	183.7	170.5	13.74	13.900			
3,000.0	2,994.8	2,989.2	2,970.1	7.2	8.7	-34.22	74.6	-318.6	191.0	177.2	14.22	13.935			
3,100.0	3,094.6	3,089.0	3,068.9	7.4	9.0	-34.19	78.2	-331.7	198.2	184.0	14.71	13.968			
3,200.0	3,194.3	3,188.7	3,167.7	7.7	9.3	-34.16	81.7	-344.7	205.5	190.7	15.19	13.999			
3,300.0	3,294.1	3,288.4	3,266.5	7.9	9.7	-34.13	85.3	-357.8	212.7	197.5	15.68	14.028			
3,400.0	3,393.9	3,388.2	3,365.4	8.2	10.0	-34.11	88.8	-370.8	219.9	204.3	16.16	14.054			
3,500.0	3,493.6	3,487.9	3,464.2	8.4	10.3	-34.09	92.4	-383.9	227.2	211.0	16.65	14.079			
3,600.0	3,593.4	3,587.6	3,563.0	8.7	10.7	-34.07	95.9	-397.0	234.4	217.8	17.13	14.103			
3,700.0	3,693.1	3,687.4	3,661.8	9.0	11.0	-34.05	99.4	-410.0	241.7	224.5	17.62	14.125			
3,800.0	3,792.9	3,787.1	3,760.6	9.2	11.4	-34.03	103.0	-423.1	248.9	231.3	18.11	14.146			
3,900.0	3,892.7	3,886.9	3,859.4	9.5	11.7	-34.01	106.5	-436.1	256.1	238.0	18.59	14.166			
4,000.0	3,992.4	3,986.6	3,958.2	9.7	12.0	-33.99	110.1	-449.2	263.4	244.8	19.08	14.184			
4,100.0	4,092.2	4,086.3	4,057.1	10.0	12.4	-33.98	113.6	-462.2	270.6	251.5	19.56	14.202			
4,200.0	4,191.9	4,186.1	4,155.9	10.2	12.7	-33.96	117.2	-475.3	277.8	258.3	20.05	14.219			
4,300.0	4,291.7	4,285.8	4,254.7	10.5	13.1	-33.95	120.7	-488.3	285.1	265.0	20.54	14.235			
4,400.0	4,391.4	4,385.5	4,353.5	10.8	13.4	-33.93	124.3	-501.4	292.3	271.8	21.02	14.250			
4,500.0	4,491.2	4,485.3	4,452.3	11.0	13.7	-33.92	127.8	-514.5	299.6	278.5	21.51	14.264			
4,600.0	4,591.0	4,585.0	4,551.1	11.3	14.1	-33.91	131.4	-527.5	306.8	285.3	21.99	14.278			
4,700.0	4,690.7	4,684.8	4,650.0	11.5	14.4	-33.90	134.9	-540.6	314.0	292.0	22.48	14.291			
4,800.0	4,790.5	4,784.5	4,748.8	11.8	14.8	-33.89	138.5	-553.6	321.3	298.8					

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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									
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	4,890.2	4,884.2	4,847.6	12.1	15.1	-33.87	142.0	-566.7	328.5	305.6	22.97	14.304		
5,000.0	4,990.0	4,984.0	4,946.4	12.3	15.4	-33.86	145.6	-579.7	335.8	312.3	23.45	14.316		
5,100.0	5,089.7	5,083.7	5,045.2	12.6	15.8	-33.85	149.1	-592.8	343.0	319.1	23.94	14.327		
5,200.0	5,189.5	5,183.4	5,144.0	12.8	16.1	-33.84	152.7	-605.8	350.2	325.8	24.43	14.338		
5,300.0	5,289.3	5,283.2	5,242.9	13.1	16.5	-33.84	156.2	-618.9	357.5	332.6	24.91	14.349		
5,400.0	5,389.0	5,382.9	5,341.7	13.3	16.8	-33.83	159.8	-632.0	364.7	339.3	25.40	14.359		
5,500.0	5,488.8	5,482.7	5,440.5	13.6	17.1	-33.82	163.3	-645.0	372.0	346.1	25.89	14.369		
5,600.0	5,588.5	5,582.4	5,539.3	13.9	17.5	-33.81	166.9	-658.1	379.2	352.8	26.37	14.378		
5,700.0	5,688.3	5,682.1	5,638.1	14.1	17.8	-33.80	170.4	-671.1	386.4	359.6	26.86	14.387		
5,800.0	5,788.1	5,781.9	5,736.9	14.4	18.2	-33.80	173.9	-684.2	393.7	366.3	27.35	14.396		
5,900.0	5,887.8	5,881.6	5,835.7	14.6	18.5	-33.79	177.5	-697.2	400.9	373.1	27.83	14.404		
6,000.0	5,987.6	5,981.3	5,934.5	14.9	18.8	23.01	181.0	-710.3	408.1	379.8	28.31	14.417		
6,100.0	6,086.9	6,080.2	6,032.5	15.0	19.2	69.06	184.4	-723.2	415.2	386.6	28.61	14.511		
6,200.0	6,184.2	6,179.8	6,131.1	15.2	19.4	79.72	179.6	-736.3	422.7	393.9	28.79	14.682		
6,300.0	6,277.8	6,281.8	6,230.5	15.3	19.7	84.92	161.4	-749.4	430.6	401.7	28.92	14.887		
6,400.0	6,366.0	6,366.4	6,329.0	15.4	19.9	88.36	128.9	-762.4	438.7	409.6	29.08	15.089		
6,500.0	6,447.4	6,493.6	6,424.4	15.5	20.1	90.97	82.0	-775.0	446.8	417.5	29.30	15.247		
6,600.0	6,520.6	6,603.5	6,514.5	15.6	20.3	93.06	20.3	-786.9	454.6	425.0	29.68	15.317		
6,700.0	6,584.3	6,716.1	6,596.7	15.8	20.5	94.76	-55.7	-797.8	461.9	431.6	30.27	15.262		
6,800.0	6,637.5	6,831.1	6,668.4	16.2	20.8	96.14	-145.0	-807.2	468.3	437.2	31.12	15.047		
6,900.0	6,679.2	6,948.4	6,726.9	16.8	21.2	97.23	-246.2	-814.9	473.6	441.3	32.30	14.666		
7,000.0	6,708.7	7,067.5	6,769.9	17.6	21.8	98.02	-357.1	-820.6	477.6	443.8	33.81	14.127		
7,100.0	6,725.5	7,188.0	6,795.5	18.6	22.6	98.54	-474.6	-824.0	480.1	444.4	35.64	13.469		
7,200.0	6,729.5	7,306.4	6,802.7	19.7	23.6	98.75	-592.6	-824.9	480.8	443.1	37.78	12.727		
7,300.0	6,729.1	7,406.4	6,802.7	20.9	24.5	98.80	-692.6	-824.9	480.9	440.7	40.18	11.969		
7,400.0	6,728.7	7,506.4	6,802.8	22.2	25.6	98.86	-792.6	-824.9	481.0	438.2	42.78	11.242		
7,500.0	6,728.3	7,606.4	6,802.8	23.6	26.8	98.91	-892.6	-824.9	481.0	435.5	45.55	10.560		
7,600.0	6,727.9	7,706.4	6,802.8	25.1	28.1	98.96	-992.6	-824.9	481.1	432.7	48.46	9.928		
7,700.0	6,727.5	7,806.4	6,802.9	26.6	29.4	99.01	-1,092.6	-824.9	481.2	429.7	51.48	9.347		
7,800.0	6,727.1	7,906.4	6,802.9	28.2	30.8	99.06	-1,192.6	-824.9	481.3	426.7	54.60	8.814		
7,900.0	6,726.7	8,006.4	6,802.9	29.8	32.3	99.11	-1,292.6	-824.9	481.3	423.5	57.80	8.328		
8,000.0	6,726.3	8,106.4	6,803.0	31.5	33.8	99.16	-1,392.6	-824.9	481.4	420.3	61.06	7.884		
8,100.0	6,725.9	8,206.4	6,803.0	33.1	35.4	99.22	-1,492.6	-824.9	481.5	417.1	64.38	7.478		
8,200.0	6,725.5	8,306.4	6,803.1	34.8	37.0	99.27	-1,592.6	-824.9	481.5	413.8	67.75	7.107		
8,300.0	6,725.1	8,406.4	6,803.1	36.6	38.6	99.32	-1,692.6	-824.9	481.6	410.4	71.17	6.767		
8,400.0	6,724.7	8,506.4	6,803.1	38.3	40.2	99.37	-1,792.6	-824.9	481.7	407.1	74.61	6.456		
8,500.0	6,724.3	8,606.4	6,803.2	40.1	41.9	99.42	-1,892.6	-824.9	481.7	403.7	78.09	6.169		
8,600.0	6,723.9	8,706.4	6,803.2	41.8	43.6	99.47	-1,992.6	-824.9	481.8	400.2	81.59	5.905		
8,700.0	6,723.5	8,806.4	6,803.2	43.6	45.3	99.52	-2,092.6	-824.9	481.9	396.8	85.12	5.661		
8,800.0	6,723.1	8,906.4	6,803.3	45.4	47.0	99.57	-2,192.6	-824.9	482.0	393.3	88.67	5.436		
8,900.0	6,722.7	9,006.4	6,803.3	47.2	48.8	99.62	-2,292.6	-824.9	482.0	389.8	92.23	5.226		
9,000.0	6,722.3	9,106.4	6,803.3	49.0	50.5	99.68	-2,392.6	-824.9	482.1	386.3	95.81	5.032		
9,100.0	6,721.9	9,206.4	6,803.4	50.9	52.3	99.73	-2,492.6	-824.9	482.2	382.8	99.41	4.850		
9,200.0	6,721.5	9,306.4	6,803.4	52.7	54.1	99.78	-2,592.6	-824.9	482.3	379.2	103.02	4.681		
9,300.0	6,721.1	9,406.4	6,803.4	54.5	55.8	99.83	-2,692.6	-824.9	482.3	375.7	106.63	4.523		
9,400.0	6,720.7	9,506.4	6,803.5	56.4	57.6	99.88	-2,792.6	-824.9	482.4	372.1	110.26	4.375		
9,500.0	6,720.3	9,606.4	6,803.5	58.2	59.4	99.93	-2,892.6	-824.9	482.5	368.6	113.90	4.236		
9,600.0	6,719.9	9,706.4	6,803.5	60.1	61.2	99.98	-2,992.6	-824.9	482.6	365.0	117.54	4.105		
9,700.0	6,719.5	9,806.4	6,803.6	61.9	63.1	100.03	-3,092.6	-824.9	482.6	361.4	121.19	3.982		

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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		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	6,719.1	9,906.4	6,803.6	63.8	64.9	100.08	-3,192.6	-824.9	482.7	357.9	124.85	3.866		
9,900.0	6,718.7	10,006.4	6,803.6	65.6	66.7	100.14	-3,292.6	-824.9	482.8	354.3	128.51	3.757		
10,000.0	6,718.3	10,106.4	6,803.7	67.5	68.5	100.19	-3,392.6	-824.9	482.9	350.7	132.18	3.653		
10,100.0	6,717.9	10,206.3	6,803.7	69.4	70.4	100.24	-3,492.6	-824.9	482.9	347.1	135.85	3.555		
10,200.0	6,717.5	10,306.3	6,803.8	71.2	72.2	100.29	-3,592.6	-824.9	483.0	343.5	139.53	3.462		
10,300.0	6,717.1	10,406.3	6,803.8	73.1	74.1	100.34	-3,692.6	-824.9	483.1	339.9	143.21	3.373		
10,400.0	6,716.7	10,506.3	6,803.8	75.0	75.9	100.39	-3,792.6	-824.9	483.2	336.3	146.89	3.289		
10,500.0	6,716.3	10,606.3	6,803.9	76.9	77.8	100.44	-3,892.6	-824.9	483.2	332.7	150.58	3.209		
10,600.0	6,715.9	10,706.3	6,803.9	78.7	79.6	100.49	-3,992.6	-824.9	483.3	329.1	154.27	3.133		
10,700.0	6,715.5	10,806.3	6,803.9	80.6	81.5	100.54	-4,092.6	-824.9	483.4	325.5	157.96	3.060		
10,800.0	6,715.1	10,906.3	6,804.0	82.5	83.3	100.59	-4,192.6	-824.9	483.5	321.8	161.65	2.991		
10,900.0	6,714.7	11,006.3	6,804.0	84.4	85.2	100.64	-4,292.6	-824.9	483.6	318.2	165.35	2.925		
11,000.0	6,714.3	11,106.3	6,804.0	86.3	87.1	100.69	-4,392.6	-824.9	483.6	314.6	169.04	2.861		
11,100.0	6,713.9	11,206.3	6,804.1	88.2	88.9	100.75	-4,492.6	-824.9	483.7	311.0	172.74	2.800		
11,200.0	6,713.5	11,306.3	6,804.1	90.1	90.8	100.80	-4,592.6	-824.9	483.8	307.4	176.44	2.742		
11,300.0	6,713.1	11,406.3	6,804.1	91.9	92.7	100.85	-4,692.6	-824.9	483.9	303.8	180.14	2.686		
11,400.0	6,712.7	11,506.3	6,804.2	93.8	94.6	100.90	-4,792.6	-824.9	484.0	300.1	183.84	2.633		
11,500.0	6,712.3	11,606.3	6,804.2	95.7	96.4	100.95	-4,892.6	-824.9	484.1	296.5	187.55	2.581		
11,600.0	6,711.9	11,706.3	6,804.2	97.6	98.3	101.00	-4,992.6	-824.9	484.1	292.9	191.25	2.531		
11,700.0	6,711.5	11,806.3	6,804.3	99.5	100.2	101.05	-5,092.6	-824.9	484.2	289.3	194.95	2.484		
11,800.0	6,711.1	11,906.3	6,804.3	101.4	102.1	101.10	-5,192.6	-824.9	484.3	285.6	198.66	2.438		
11,900.0	6,710.7	12,006.3	6,804.3	103.3	103.9	101.15	-5,292.6	-824.9	484.4	282.0	202.37	2.394		
12,000.0	6,710.3	12,106.3	6,804.4	105.2	105.8	101.20	-5,392.6	-824.9	484.5	278.4	206.07	2.351		
12,100.0	6,709.9	12,206.3	6,804.4	107.1	107.7	101.25	-5,492.6	-824.9	484.6	274.8	209.78	2.310		
12,200.0	6,709.5	12,306.3	6,804.5	109.0	109.6	101.30	-5,592.6	-824.9	484.6	271.2	213.48	2.270		
12,300.0	6,709.1	12,406.3	6,804.5	110.9	111.5	101.35	-5,692.6	-824.9	484.7	267.5	217.19	2.232		
12,400.0	6,708.7	12,506.3	6,804.5	112.8	113.4	101.40	-5,792.6	-824.9	484.8	263.9	220.89	2.195		
12,500.0	6,708.3	12,606.3	6,804.6	114.7	115.3	101.45	-5,892.6	-824.9	484.9	260.3	224.60	2.159		
12,600.0	6,707.9	12,706.3	6,804.6	116.6	117.2	101.51	-5,992.6	-824.9	485.0	256.7	228.31	2.124		
12,700.0	6,707.5	12,806.3	6,804.6	118.5	119.1	101.56	-6,092.6	-824.9	485.1	253.1	232.01	2.091		
12,800.0	6,707.0	12,906.3	6,804.7	120.4	120.9	101.61	-6,192.6	-824.9	485.2	249.5	235.72	2.058		
12,900.0	6,706.6	13,006.3	6,804.7	122.3	122.8	101.66	-6,292.6	-824.9	485.3	245.8	239.42	2.027		
13,000.0	6,706.2	13,106.3	6,804.7	124.2	124.7	101.71	-6,392.6	-824.9	485.3	242.2	243.13	1.996		
13,100.0	6,705.8	13,206.3	6,804.8	126.1	126.6	101.76	-6,492.6	-824.9	485.4	238.6	246.83	1.967		
13,200.0	6,705.4	13,306.3	6,804.8	128.0	128.5	101.81	-6,592.6	-824.9	485.5	235.0	250.54	1.938		
13,300.0	6,705.0	13,406.3	6,804.8	129.9	130.4	101.86	-6,692.6	-824.9	485.6	231.4	254.24	1.910		
13,400.0	6,704.6	13,506.3	6,804.9	131.9	132.3	101.91	-6,792.6	-824.9	485.7	227.8	257.94	1.883		
13,500.0	6,704.2	13,606.3	6,804.9	133.8	134.2	101.96	-6,892.6	-824.9	485.8	224.1	261.64	1.857		
13,600.0	6,703.8	13,706.3	6,804.9	135.7	136.1	102.01	-6,992.6	-824.9	485.9	220.5	265.35	1.831		
13,700.0	6,703.4	13,806.3	6,805.0	137.6	138.0	102.06	-7,092.6	-824.9	486.0	216.9	269.05	1.806		
13,800.0	6,703.0	13,906.3	6,805.0	139.1	139.9	102.11	-7,192.6	-824.9	486.1	213.7	272.39	1.784		
13,806.9	6,703.0	13,912.5	6,805.0	139.2	140.0	102.11	-7,198.7	-824.9	486.1	213.5	272.61	1.783 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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		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	90.00	0.0	58.5	58.5					
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	58.5	58.5	58.3	0.22	261.619		
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	58.5	58.5	57.8	0.67	87.061		
300.0	300.0	299.0	299.0	0.6	0.6	90.00	0.0	58.5	58.5	57.4	1.12	52.167		
400.0	400.0	399.0	399.0	0.8	0.8	90.00	0.0	58.5	58.5	56.9	1.57	37.241		
500.0	500.0	499.0	499.0	1.0	1.0	90.00	0.0	58.5	58.5	56.5	2.02	28.956		
600.0	600.0	599.0	599.0	1.2	1.2	90.00	0.0	58.5	58.5	56.0	2.47	23.686 CC, ES		
700.0	700.0	699.0	699.0	1.5	1.5	148.16	0.0	58.5	59.2	56.3	2.91	20.336		
800.0	800.0	799.0	799.0	1.7	1.7	149.44	0.0	58.5	61.5	58.1	3.35	18.339		
900.0	899.9	898.9	898.9	1.9	1.9	151.36	0.0	58.5	65.3	61.5	3.79	17.205		
1,000.0	999.7	998.7	998.7	2.1	2.1	153.71	0.0	58.5	70.7	66.5	4.24	16.685		
1,100.0	1,099.4	1,098.4	1,098.4	2.4	2.4	156.00	0.0	58.5	77.0	72.3	4.68	16.442		
1,200.0	1,199.2	1,198.2	1,198.2	2.6	2.6	157.95	0.0	58.5	83.4	78.3	5.13	16.258		
1,300.0	1,298.9	1,297.9	1,297.9	2.8	2.8	159.61	0.0	58.5	89.9	84.3	5.58	16.114		
1,400.0	1,398.7	1,397.7	1,397.7	3.1	3.0	161.05	0.0	58.5	96.4	90.4	6.03	16.001		
1,500.0	1,498.5	1,497.5	1,497.5	3.3	3.3	162.30	0.0	58.5	103.0	96.6	6.48	15.910		
1,600.0	1,598.2	1,597.2	1,597.2	3.6	3.5	163.41	0.0	58.5	109.7	102.8	6.93	15.837		
1,700.0	1,698.0	1,697.0	1,697.0	3.8	3.7	164.39	0.0	58.5	116.4	109.0	7.38	15.776		
1,800.0	1,797.7	1,796.7	1,796.7	4.1	3.9	165.26	0.0	58.5	123.1	115.3	7.83	15.725		
1,900.0	1,897.5	1,896.5	1,896.5	4.3	4.2	166.04	0.0	58.5	129.8	121.6	8.28	15.683		
2,000.0	1,997.3	1,996.3	1,996.3	4.6	4.4	166.74	0.0	58.5	136.6	127.9	8.73	15.646		
2,100.0	2,097.0	2,096.0	2,096.0	4.9	4.6	167.38	0.0	58.5	143.4	134.2	9.18	15.616		
2,200.0	2,196.8	2,195.8	2,195.8	5.1	4.8	167.96	0.0	58.5	150.2	140.5	9.63	15.589		
2,300.0	2,296.5	2,295.5	2,295.5	5.4	5.0	168.49	0.0	58.5	157.0	146.9	10.08	15.566		
2,400.0	2,396.3	2,395.3	2,395.3	5.6	5.3	168.97	0.0	58.5	163.8	153.3	10.54	15.546		
2,500.0	2,496.0	2,495.0	2,495.0	5.9	5.5	169.42	0.0	58.5	170.6	159.6	10.99	15.528		
2,600.0	2,595.8	2,594.8	2,594.8	6.1	5.7	169.83	0.0	58.5	177.5	166.0	11.44	15.512		
2,700.0	2,695.6	2,694.6	2,694.6	6.4	5.9	170.21	0.0	58.5	184.3	172.4	11.89	15.498		
2,800.0	2,795.3	2,794.3	2,794.3	6.6	6.2	170.57	0.0	58.5	191.2	178.8	12.35	15.486		
2,900.0	2,895.1	2,894.1	2,894.1	6.9	6.4	170.90	0.0	58.5	198.0	185.2	12.80	15.475		
3,000.0	2,994.8	2,993.8	2,993.8	7.2	6.6	171.21	0.0	58.5	204.9	191.7	13.25	15.465		
3,100.0	3,094.6	3,091.2	3,091.2	7.4	6.8	171.35	0.3	59.2	212.3	198.6	13.69	15.509		
3,200.0	3,194.3	3,188.3	3,188.3	7.7	7.0	171.17	1.2	61.4	220.9	206.8	14.12	15.642		
3,300.0	3,294.1	3,285.1	3,285.0	7.9	7.2	170.72	2.7	65.1	230.7	216.1	14.55	15.849		
3,400.0	3,393.9	3,382.8	3,382.6	8.2	7.4	170.04	4.7	70.2	241.5	226.5	14.99	16.114		
3,500.0	3,493.6	3,482.2	3,481.7	8.4	7.7	169.37	7.0	75.7	252.7	237.2	15.43	16.376		
3,600.0	3,593.4	3,581.5	3,580.9	8.7	7.9	168.75	9.2	81.2	263.8	247.9	15.87	16.623		
3,700.0	3,693.1	3,680.8	3,680.0	9.0	8.1	168.18	11.4	86.7	275.0	258.7	16.31	16.857		
3,800.0	3,792.9	3,780.2	3,779.2	9.2	8.3	167.66	13.6	92.2	286.2	269.4	16.76	17.079		
3,900.0	3,892.7	3,879.5	3,878.4	9.5	8.5	167.18	15.9	97.7	297.4	280.2	17.20	17.290		
4,000.0	3,992.4	3,978.9	3,977.5	9.7	8.8	166.73	18.1	103.2	308.7	291.0	17.65	17.490		
4,100.0	4,092.2	4,078.2	4,076.7	10.0	9.0	166.31	20.3	108.7	319.9	301.8	18.10	17.680		
4,200.0	4,191.9	4,177.5	4,175.8	10.2	9.2	165.92	22.5	114.2	331.2	312.7	18.54	17.861		
4,300.0	4,291.7	4,276.9	4,275.0	10.5	9.4	165.56	24.7	119.7	342.5	323.5	18.99	18.034		
4,400.0	4,391.4	4,376.2	4,374.2	10.8	9.7	165.22	27.0	125.2	353.8	334.4	19.44	18.198		
4,500.0	4,491.2	4,475.5	4,473.3	11.0	9.9	164.90	29.2	130.7	365.1	345.2	19.89	18.355		
4,600.0	4,591.0	4,574.9	4,572.5	11.3	10.1	164.60	31.4	136.2	376.5	356.1	20.34	18.505		
4,700.0	4,690.7	4,674.2	4,671.6	11.5	10.4	164.32	33.6	141.7	387.8	367.0	20.80	18.648		
4,800.0	4,790.5	4,773.6	4,770.8	11.8	10.6	164.05	35.9	147.2	399.1	377.9	21.25	18.785		

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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		
4,900.0	4,890.2	4,872.9	4,870.0	12.1	10.8	163.80	38.1	152.7	410.5	388.8	21.70	18.916		
5,000.0	4,990.0	4,972.2	4,969.1	12.3	11.0	163.57	40.3	158.2	421.9	399.7	22.15	19.042		
5,100.0	5,089.7	5,071.6	5,068.3	12.6	11.3	163.34	42.5	163.7	433.2	410.6	22.61	19.163		
5,200.0	5,189.5	5,170.9	5,167.4	12.8	11.5	163.13	44.8	169.2	444.6	421.5	23.06	19.279		
5,300.0	5,289.3	5,270.2	5,266.6	13.1	11.8	162.92	47.0	174.7	456.0	432.5	23.52	19.390		
5,400.0	5,389.0	5,369.6	5,365.8	13.3	12.0	162.73	49.2	180.2	467.4	443.4	23.97	19.497		
5,500.0	5,488.8	5,468.9	5,464.9	13.6	12.2	162.55	51.4	185.7	478.8	454.3	24.43	19.600		
5,600.0	5,588.5	5,568.3	5,564.1	13.9	12.5	162.37	53.7	191.2	490.1	465.3	24.88	19.699		
5,700.0	5,688.3	5,667.6	5,663.2	14.1	12.7	162.20	55.9	196.7	501.5	476.2	25.34	19.794		
5,800.0	5,788.1	5,766.9	5,762.4	14.4	12.9	162.04	58.1	202.2	512.9	487.2	25.79	19.886		
5,900.0	5,887.8	5,866.3	5,861.6	14.6	13.2	161.89	60.3	207.7	524.4	498.1	26.25	19.975		
6,000.0	5,987.6	5,950.0	5,945.1	14.9	13.3	-140.67	58.4	212.3	536.6	509.9	26.63	20.146		
6,100.0	6,086.9	6,036.2	6,030.4	15.0	13.5	-94.85	46.8	217.0	548.6	521.7	26.93	20.375		
6,200.0	6,184.2	6,120.3	6,111.7	15.2	13.7	-85.25	26.4	221.5	559.9	532.7	27.15	20.625		
6,300.0	6,277.8	6,204.3	6,190.3	15.3	13.8	-81.28	-2.8	225.9	570.2	542.9	27.33	20.864		
6,400.0	6,366.0	6,288.4	6,265.3	15.4	14.0	-79.19	-40.6	230.1	579.5	552.0	27.52	21.054		
6,500.0	6,447.4	6,372.8	6,336.0	15.5	14.2	-78.06	-86.6	234.0	587.6	559.8	27.79	21.141		
6,600.0	6,520.6	6,457.8	6,401.5	15.6	14.4	-77.53	-140.4	237.6	594.3	566.1	28.21	21.070		
6,700.0	6,584.3	6,543.3	6,461.1	15.8	14.8	-77.45	-201.6	241.0	599.8	570.9	28.85	20.790		
6,800.0	6,637.5	6,629.7	6,514.0	16.2	15.3	-77.74	-269.9	243.9	603.9	574.1	29.79	20.273		
6,900.0	6,679.2	6,717.1	6,559.2	16.8	15.9	-78.34	-344.5	246.4	606.6	575.5	31.06	19.531		
7,000.0	6,708.7	6,805.6	6,596.2	17.6	16.6	-79.23	-424.9	248.5	608.0	575.3	32.68	18.604		
7,100.0	6,725.5	6,895.5	6,623.9	18.6	17.5	-80.39	-510.3	250.0	608.1	573.4	34.64	17.554		
7,200.0	6,729.5	6,986.9	6,641.6	19.7	18.6	-81.77	-599.9	251.0	607.0	570.1	36.90	16.448		
7,300.0	6,729.1	7,080.5	6,648.5	20.9	19.8	-82.46	-693.2	251.4	606.4	567.0	39.37	15.399		
7,400.0	6,728.7	7,179.8	6,648.4	22.2	21.1	-82.48	-792.5	251.4	606.3	564.3	42.06	14.417		
7,500.0	6,728.3	7,279.8	6,648.2	23.6	22.5	-82.50	-892.5	251.4	606.3	561.4	44.90	13.502		
7,600.0	6,727.9	7,379.8	6,647.9	25.1	24.0	-82.52	-992.5	251.4	606.3	558.4	47.89	12.660		
7,700.0	6,727.5	7,479.8	6,647.7	26.6	25.5	-82.53	-1,092.5	251.4	606.3	555.3	50.98	11.892		
7,800.0	6,727.1	7,579.8	6,647.5	28.2	27.1	-82.55	-1,192.5	251.4	606.2	552.1	54.17	11.192		
7,900.0	6,726.7	7,679.8	6,647.3	29.8	28.8	-82.56	-1,292.5	251.4	606.2	548.8	57.43	10.555		
8,000.0	6,726.3	7,779.8	6,647.0	31.5	30.5	-82.58	-1,392.5	251.4	606.2	545.4	60.76	9.977		
8,100.0	6,725.9	7,879.8	6,646.8	33.1	32.1	-82.60	-1,492.5	251.4	606.2	542.0	64.14	9.450		
8,200.0	6,725.5	7,979.8	6,646.6	34.8	33.9	-82.61	-1,592.5	251.4	606.1	538.6	67.57	8.970		
8,300.0	6,725.1	8,079.8	6,646.4	36.6	35.6	-82.63	-1,692.5	251.4	606.1	535.1	71.04	8.532		
8,400.0	6,724.7	8,179.8	6,646.1	38.3	37.4	-82.65	-1,792.5	251.4	606.1	531.6	74.54	8.131		
8,500.0	6,724.3	8,279.8	6,645.9	40.1	39.1	-82.66	-1,892.5	251.4	606.1	528.0	78.07	7.763		
8,600.0	6,723.9	8,379.8	6,645.7	41.8	40.9	-82.68	-1,992.5	251.4	606.1	524.4	81.63	7.424		
8,700.0	6,723.5	8,479.8	6,645.5	43.6	42.7	-82.70	-2,092.5	251.4	606.0	520.8	85.21	7.112		
8,800.0	6,723.1	8,579.8	6,645.2	45.4	44.5	-82.71	-2,192.5	251.4	606.0	517.2	88.81	6.823		
8,900.0	6,722.7	8,679.8	6,645.0	47.2	46.4	-82.73	-2,292.5	251.4	606.0	513.6	92.43	6.556		
9,000.0	6,722.3	8,779.8	6,644.8	49.0	48.2	-82.74	-2,392.5	251.4	606.0	509.9	96.07	6.308		
9,100.0	6,721.9	8,879.8	6,644.5	50.9	50.0	-82.76	-2,492.5	251.4	605.9	506.2	99.72	6.077		
9,200.0	6,721.5	8,979.8	6,644.3	52.7	51.9	-82.78	-2,592.5	251.4	605.9	502.5	103.38	5.861		
9,300.0	6,721.1	9,079.8	6,644.1	54.5	53.7	-82.79	-2,692.5	251.4	605.9	498.8	107.05	5.660		
9,400.0	6,720.7	9,179.8	6,643.9	56.4	55.6	-82.81	-2,792.5	251.4	605.9	495.1	110.73	5.472		
9,500.0	6,720.3	9,279.8	6,643.6	58.2	57.4	-82.83	-2,892.5	251.4	605.9	491.4	114.42	5.295		
9,600.0	6,719.9	9,379.8	6,643.4	60.1	59.3	-82.84	-2,992.5	251.4	605.8	487.7	118.12	5.129		
9,700.0	6,719.5	9,479.8	6,643.2	61.9	61.1	-82.86	-3,092.5	251.4	605.8	484.0	121.83	4.973		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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	
9,800.0	6,719.1	9,579.8	6,643.0	63.8	63.0	-82.88	-3,192.5	251.4	605.8	480.2	125.54	4.825		
9,900.0	6,718.7	9,679.8	6,642.7	65.6	64.9	-82.89	-3,292.5	251.4	605.8	476.5	129.26	4.686		
10,000.0	6,718.3	9,779.8	6,642.5	67.5	66.7	-82.91	-3,392.5	251.4	605.7	472.8	132.99	4.555		
10,100.0	6,717.9	9,879.8	6,642.3	69.4	68.6	-82.92	-3,492.5	251.4	605.7	469.0	136.72	4.430		
10,200.0	6,717.5	9,979.8	6,642.0	71.2	70.5	-82.94	-3,592.5	251.4	605.7	465.2	140.46	4.312		
10,300.0	6,717.1	10,079.8	6,641.8	73.1	72.4	-82.96	-3,692.5	251.4	605.7	461.5	144.20	4.200		
10,400.0	6,716.7	10,179.8	6,641.6	75.0	74.3	-82.97	-3,792.5	251.4	605.7	457.7	147.94	4.094		
10,500.0	6,716.3	10,279.8	6,641.4	76.9	76.1	-82.99	-3,892.5	251.4	605.6	453.9	151.69	3.993		
10,600.0	6,715.9	10,379.8	6,641.1	78.7	78.0	-83.01	-3,992.5	251.4	605.6	450.2	155.45	3.896		
10,700.0	6,715.5	10,479.8	6,640.9	80.6	79.9	-83.02	-4,092.5	251.4	605.6	446.4	159.20	3.804		
10,800.0	6,715.1	10,579.8	6,640.7	82.5	81.8	-83.04	-4,192.5	251.4	605.6	442.6	162.96	3.716		
10,900.0	6,714.7	10,679.8	6,640.5	84.4	83.7	-83.06	-4,292.5	251.4	605.6	438.8	166.73	3.632		
11,000.0	6,714.3	10,779.8	6,640.2	86.3	85.6	-83.07	-4,392.5	251.4	605.5	435.0	170.49	3.552		
11,100.0	6,713.9	10,879.8	6,640.0	88.2	87.5	-83.09	-4,492.5	251.4	605.5	431.2	174.26	3.475		
11,200.0	6,713.5	10,979.8	6,639.8	90.1	89.4	-83.10	-4,592.5	251.4	605.5	427.5	178.03	3.401		
11,300.0	6,713.1	11,079.8	6,639.6	91.9	91.3	-83.12	-4,692.5	251.4	605.5	423.7	181.81	3.330		
11,400.0	6,712.7	11,179.8	6,639.3	93.8	93.2	-83.14	-4,792.5	251.4	605.4	419.9	185.58	3.262		
11,500.0	6,712.3	11,279.8	6,639.1	95.7	95.1	-83.15	-4,892.5	251.4	605.4	416.1	189.36	3.197		
11,600.0	6,711.9	11,379.8	6,638.9	97.6	97.0	-83.17	-4,992.5	251.4	605.4	412.3	193.14	3.135		
11,700.0	6,711.5	11,479.8	6,638.6	99.5	98.9	-83.19	-5,092.5	251.4	605.4	408.5	196.92	3.074		
11,800.0	6,711.1	11,579.8	6,638.4	101.4	100.8	-83.20	-5,192.5	251.4	605.4	404.7	200.70	3.016		
11,900.0	6,710.7	11,679.8	6,638.2	103.3	102.7	-83.22	-5,292.5	251.4	605.3	400.9	204.49	2.960		
12,000.0	6,710.3	11,779.8	6,638.0	105.2	104.6	-83.24	-5,392.5	251.4	605.3	397.0	208.28	2.906		
12,100.0	6,709.9	11,879.8	6,637.7	107.1	106.5	-83.25	-5,492.5	251.4	605.3	393.2	212.06	2.854		
12,200.0	6,709.5	11,979.8	6,637.5	109.0	108.4	-83.27	-5,592.5	251.4	605.3	389.4	215.85	2.804		
12,300.0	6,709.1	12,079.8	6,637.3	110.9	110.3	-83.29	-5,692.5	251.4	605.3	385.6	219.65	2.756		
12,400.0	6,708.7	12,179.8	6,637.1	112.8	112.2	-83.30	-5,792.5	251.4	605.2	381.8	223.44	2.709		
12,500.0	6,708.3	12,279.8	6,636.8	114.7	114.1	-83.32	-5,892.5	251.4	605.2	378.0	227.23	2.663		
12,600.0	6,707.9	12,379.8	6,636.6	116.6	116.0	-83.33	-5,992.5	251.4	605.2	374.2	231.03	2.620		
12,700.0	6,707.5	12,479.8	6,636.4	118.5	117.9	-83.35	-6,092.5	251.4	605.2	370.4	234.82	2.577		
12,800.0	6,707.0	12,579.8	6,636.1	120.4	119.8	-83.37	-6,192.5	251.4	605.2	366.5	238.62	2.536		
12,900.0	6,706.6	12,679.8	6,635.9	122.3	121.7	-83.38	-6,292.5	251.4	605.1	362.7	242.42	2.496		
13,000.0	6,706.2	12,779.8	6,635.7	124.2	123.6	-83.40	-6,392.5	251.4	605.1	358.9	246.22	2.458		
13,100.0	6,705.8	12,879.8	6,635.5	126.1	125.5	-83.42	-6,492.5	251.4	605.1	355.1	250.02	2.420		
13,200.0	6,705.4	12,979.8	6,635.2	128.0	127.4	-83.43	-6,592.5	251.4	605.1	351.3	253.82	2.384		
13,300.0	6,705.0	13,079.8	6,635.0	129.9	129.3	-83.45	-6,692.5	251.4	605.1	347.4	257.62	2.349		
13,400.0	6,704.6	13,179.8	6,634.8	131.9	131.2	-83.47	-6,792.5	251.4	605.0	343.6	261.43	2.314		
13,500.0	6,704.2	13,279.8	6,634.6	133.8	133.1	-83.48	-6,892.5	251.4	605.0	339.8	265.23	2.281		
13,600.0	6,703.8	13,379.8	6,634.3	135.7	135.0	-83.50	-6,992.5	251.4	605.0	336.0	269.04	2.249		
13,700.0	6,703.4	13,479.8	6,634.1	137.6	137.0	-83.51	-7,092.5	251.4	605.0	332.1	272.84	2.217		
13,800.0	6,703.0	13,579.8	6,633.9	139.1	138.6	-83.53	-7,192.5	251.4	605.0	329.0	276.00	2.192		
13,802.8	6,703.0	13,582.4	6,633.9	139.2	138.6	-83.53	-7,195.1	251.4	605.0	328.9	276.09	2.191		
13,806.9	6,703.0	13,582.4	6,633.9	139.2	138.6	-83.53	-7,195.1	251.4	605.0	328.8	276.15	2.191 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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		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	90.01	0.0	89.2	89.2						
100.0	100.0	98.0	98.0	0.1	0.1	90.01	0.0	89.2	89.2	88.9	0.22	400.668			
200.0	200.0	198.0	198.0	0.3	0.3	90.01	0.0	89.2	89.2	88.5	0.67	133.110			
300.0	300.0	298.0	298.0	0.6	0.6	90.01	0.0	89.2	89.2	88.0	1.12	79.652			
400.0	400.0	398.0	398.0	0.8	0.8	90.01	0.0	89.2	89.2	87.6	1.57	56.829			
500.0	500.0	498.0	498.0	1.0	1.0	90.01	0.0	89.2	89.2	87.1	2.02	44.172			
600.0	600.0	598.0	598.0	1.2	1.2	90.01	0.0	89.2	89.2	86.7	2.47	36.126 CC, ES			
700.0	700.0	698.0	698.0	1.5	1.5	148.01	0.0	89.2	89.9	87.0	2.91	30.879			
800.0	800.0	798.0	798.0	1.7	1.7	148.86	0.0	89.2	92.1	88.8	3.35	27.496			
900.0	899.9	897.9	897.9	1.9	1.9	150.19	0.0	89.2	95.9	92.1	3.79	25.285			
1,000.0	999.7	997.7	997.7	2.1	2.1	151.88	0.0	89.2	101.2	97.0	4.24	23.900			
1,100.0	1,099.4	1,097.4	1,097.4	2.4	2.4	153.63	0.0	89.2	107.4	102.7	4.68	22.945			
1,200.0	1,199.2	1,197.2	1,197.2	2.6	2.6	155.19	0.0	89.2	113.7	108.6	5.13	22.166			
1,300.0	1,298.9	1,296.9	1,296.9	2.8	2.8	156.58	0.0	89.2	120.0	114.5	5.58	21.521			
1,400.0	1,398.7	1,396.7	1,396.7	3.1	3.0	157.83	0.0	89.2	126.5	120.4	6.03	20.981			
1,500.0	1,498.5	1,496.5	1,496.5	3.3	3.3	158.96	0.0	89.2	132.9	126.5	6.48	20.522			
1,600.0	1,598.2	1,593.9	1,593.9	3.6	3.5	159.62	0.6	90.1	140.3	133.3	6.92	20.274			
1,700.0	1,698.0	1,690.9	1,690.9	3.8	3.7	159.51	2.7	93.1	149.3	142.0	7.35	20.303			
1,800.0	1,797.7	1,787.6	1,787.3	4.1	3.9	158.77	6.2	98.0	160.1	152.3	7.79	20.546			
1,900.0	1,897.5	1,886.0	1,885.4	4.3	4.1	157.67	10.7	104.6	172.3	164.1	8.24	20.911			
2,000.0	1,997.3	1,985.2	1,984.2	4.6	4.3	156.68	15.4	111.4	184.6	176.0	8.69	21.245			
2,100.0	2,097.0	2,084.3	2,083.1	4.9	4.6	155.81	20.1	118.1	197.0	187.9	9.14	21.544			
2,200.0	2,196.8	2,183.5	2,181.9	5.1	4.8	155.04	24.8	124.9	209.4	199.8	9.60	21.813			
2,300.0	2,296.5	2,282.7	2,280.8	5.4	5.0	154.37	29.5	131.6	221.9	211.8	10.06	22.056			
2,400.0	2,396.3	2,381.9	2,379.6	5.6	5.3	153.76	34.2	138.4	234.3	223.8	10.52	22.278			
2,500.0	2,496.0	2,481.1	2,478.5	5.9	5.5	153.21	38.8	145.1	246.8	235.8	10.98	22.479			
2,600.0	2,595.8	2,580.3	2,577.3	6.1	5.8	152.72	43.5	151.9	259.3	247.9	11.44	22.663			
2,700.0	2,695.6	2,679.5	2,676.2	6.4	6.0	152.27	48.2	158.6	271.9	260.0	11.91	22.832			
2,800.0	2,795.3	2,778.7	2,775.0	6.6	6.3	151.86	52.9	165.4	284.4	272.0	12.37	22.988			
2,900.0	2,895.1	2,877.9	2,873.9	6.9	6.5	151.49	57.6	172.1	297.0	284.1	12.84	23.131			
3,000.0	2,994.8	2,977.1	2,972.7	7.2	6.8	151.15	62.3	178.9	309.5	296.2	13.30	23.264			
3,100.0	3,094.6	3,076.3	3,071.6	7.4	7.0	150.83	66.9	185.6	322.1	308.3	13.77	23.388			
3,200.0	3,194.3	3,175.4	3,170.4	7.7	7.3	150.54	71.6	192.4	334.7	320.4	14.24	23.503			
3,300.0	3,294.1	3,274.6	3,269.3	7.9	7.6	150.27	76.3	199.1	347.3	332.6	14.71	23.610			
3,400.0	3,393.9	3,373.8	3,368.1	8.2	7.8	150.01	81.0	205.9	359.9	344.7	15.18	23.711			
3,500.0	3,493.6	3,473.0	3,467.0	8.4	8.1	149.78	85.7	212.6	372.5	356.8	15.65	23.805			
3,600.0	3,593.4	3,572.2	3,565.8	8.7	8.3	149.56	90.4	219.3	385.1	369.0	16.12	23.893			
3,700.0	3,693.1	3,671.4	3,664.7	9.0	8.6	149.35	95.1	226.1	397.7	381.1	16.59	23.976			
3,800.0	3,792.9	3,770.6	3,763.5	9.2	8.9	149.16	99.7	232.8	410.3	393.3	17.06	24.054			
3,900.0	3,892.7	3,869.8	3,862.4	9.5	9.1	148.98	104.4	239.6	423.0	405.4	17.53	24.128			
4,000.0	3,992.4	3,969.0	3,961.2	9.7	9.4	148.81	109.1	246.3	435.6	417.6	18.00	24.198			
4,100.0	4,092.2	4,068.2	4,060.1	10.0	9.6	148.64	113.8	253.1	448.2	429.8	18.47	24.264			
4,200.0	4,191.9	4,167.4	4,158.9	10.2	9.9	148.49	118.5	259.8	460.9	441.9	18.95	24.326			
4,300.0	4,291.7	4,266.5	4,257.8	10.5	10.2	148.35	123.2	266.6	473.5	454.1	19.42	24.386			
4,400.0	4,391.4	4,365.7	4,356.6	10.8	10.4	148.21	127.8	273.3	486.2	466.3	19.89	24.442			
4,500.0	4,491.2	4,464.9	4,455.5	11.0	10.7	148.08	132.5	280.1	498.8	478.5	20.36	24.496			
4,600.0	4,591.0	4,564.1	4,554.3	11.3	10.9	147.96	137.2	286.8	511.5	490.6	20.84	24.547			
4,700.0	4,690.7	4,663.3	4,653.2	11.5	11.2	147.84	141.9	293.6	524.1	502.8	21.31	24.596			
4,800.0	4,790.5	4,762.5	4,752.0	11.8	11.5	147.73	146.6	300.3	536.8	515.0	21.78	24.642			

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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)	Offset Measured Depth (ft)	Offset 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)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
4,900.0	4,890.2	4,861.7	4,850.9	12.1	11.7	147.62	151.3	307.1	549.4	527.2	22.26	24.687		
5,000.0	4,990.0	4,960.9	4,949.7	12.3	12.0	147.52	155.9	313.8	562.1	539.4	22.73	24.729		
5,100.0	5,089.7	5,060.1	5,048.6	12.6	12.3	147.42	160.6	320.5	574.7	551.5	23.20	24.770		
5,200.0	5,189.5	5,159.3	5,147.4	12.8	12.5	147.33	165.3	327.3	587.4	563.7	23.68	24.809		
5,300.0	5,289.3	5,258.5	5,246.3	13.1	12.8	147.24	170.0	334.0	600.1	575.9	24.15	24.846		
5,400.0	5,389.0	5,357.6	5,345.1	13.3	13.1	147.15	174.7	340.8	612.7	588.1	24.63	24.882		
5,500.0	5,488.8	5,456.8	5,444.0	13.6	13.3	147.07	179.4	347.5	625.4	600.3	25.10	24.917		
5,600.0	5,588.5	5,556.0	5,542.8	13.9	13.6	146.99	184.0	354.3	638.1	612.5	25.57	24.950		
5,700.0	5,688.3	5,655.2	5,641.7	14.1	13.9	146.91	188.7	361.0	650.7	624.7	26.05	24.982		
5,800.0	5,788.1	5,754.4	5,740.5	14.4	14.1	146.84	193.4	367.8	663.4	636.9	26.52	25.012		
5,900.0	5,887.8	5,853.6	5,839.4	14.6	14.4	146.77	198.1	374.5	676.1	649.1	27.00	25.042		
6,000.0	5,987.6	5,952.7	5,938.2	14.9	14.7	-156.12	202.8	381.3	688.8	661.3	27.45	25.088		
6,100.0	6,086.9	6,051.9	6,037.1	15.0	14.9	-111.39	206.8	388.0	701.7	673.9	27.82	25.224		
6,200.0	6,184.2	6,154.2	6,138.8	15.2	15.1	-102.85	200.4	395.0	714.8	686.7	28.06	25.474		
6,300.0	6,277.8	6,258.9	6,241.1	15.3	15.2	-99.68	179.8	401.9	727.7	699.5	28.22	25.787		
6,400.0	6,366.0	6,366.1	6,342.0	15.4	15.3	-98.12	144.5	408.8	740.2	711.8	28.35	26.107		
6,500.0	6,447.4	6,475.8	6,439.1	15.5	15.4	-97.26	94.0	415.5	751.9	723.4	28.53	26.356		
6,600.0	6,520.6	6,588.0	6,529.9	15.6	15.5	-96.72	28.5	421.7	762.7	733.9	28.85	26.436		
6,700.0	6,584.3	6,702.7	6,611.7	15.8	15.7	-96.37	-51.4	427.2	772.2	742.8	29.42	26.248		
6,800.0	6,637.5	6,819.4	6,681.9	16.2	16.0	-96.12	-144.4	432.0	780.2	749.8	30.34	25.712		
6,900.0	6,679.2	6,937.8	6,737.8	16.8	16.6	-95.91	-248.7	435.8	786.4	754.8	31.68	24.825		
7,000.0	6,708.7	7,057.5	6,777.3	17.6	17.5	-95.73	-361.5	438.5	790.8	757.3	33.46	23.637		
7,100.0	6,725.5	7,177.8	6,798.8	18.6	18.6	-95.55	-479.7	440.0	793.1	757.5	35.64	22.254		
7,200.0	6,729.5	7,290.9	6,802.7	19.7	19.9	-95.44	-592.6	440.3	793.5	755.5	38.06	20.850		
7,300.0	6,729.1	7,390.9	6,802.7	20.9	21.1	-95.47	-692.6	440.3	793.6	753.0	40.56	19.565		
7,400.0	6,728.7	7,490.9	6,802.8	22.2	22.4	-95.50	-792.6	440.3	793.6	750.4	43.25	18.348		
7,500.0	6,728.3	7,590.9	6,802.8	23.6	23.9	-95.53	-892.6	440.3	793.7	747.5	46.11	17.213		
7,600.0	6,727.9	7,690.9	6,802.9	25.1	25.3	-95.56	-992.6	440.3	793.7	744.6	49.09	16.167		
7,700.0	6,727.5	7,790.9	6,802.9	26.6	26.9	-95.59	-1,092.6	440.3	793.7	741.5	52.19	15.209		
7,800.0	6,727.1	7,890.9	6,802.9	28.2	28.4	-95.62	-1,192.6	440.3	793.8	738.4	55.37	14.335		
7,900.0	6,726.7	7,990.9	6,803.0	29.8	30.0	-95.66	-1,292.6	440.3	793.8	735.2	58.63	13.539		
8,000.0	6,726.3	8,090.9	6,803.0	31.5	31.7	-95.69	-1,392.6	440.3	793.9	731.9	61.96	12.813		
8,100.0	6,725.9	8,190.9	6,803.0	33.1	33.4	-95.72	-1,492.6	440.3	793.9	728.6	65.34	12.151		
8,200.0	6,725.5	8,290.9	6,803.1	34.8	35.1	-95.75	-1,592.6	440.3	794.0	725.2	68.76	11.546		
8,300.0	6,725.1	8,390.9	6,803.1	36.6	36.8	-95.78	-1,692.6	440.3	794.0	721.8	72.23	10.993		
8,400.0	6,724.7	8,490.9	6,803.1	38.3	38.5	-95.81	-1,792.6	440.3	794.0	718.3	75.73	10.485		
8,500.0	6,724.3	8,590.9	6,803.2	40.1	40.3	-95.84	-1,892.6	440.3	794.1	714.8	79.26	10.019		
8,600.0	6,723.9	8,690.9	6,803.2	41.8	42.1	-95.88	-1,992.6	440.3	794.1	711.3	82.81	9.590		
8,700.0	6,723.5	8,790.9	6,803.2	43.6	43.9	-95.91	-2,092.6	440.3	794.2	707.8	86.39	9.193		
8,800.0	6,723.1	8,890.9	6,803.3	45.4	45.7	-95.94	-2,192.6	440.3	794.2	704.2	89.98	8.826		
8,900.0	6,722.7	8,990.9	6,803.3	47.2	47.5	-95.97	-2,292.6	440.3	794.3	700.7	93.59	8.486		
9,000.0	6,722.3	9,090.9	6,803.3	49.0	49.3	-96.00	-2,392.6	440.3	794.3	697.1	97.22	8.170		
9,100.0	6,721.9	9,190.9	6,803.4	50.9	51.1	-96.03	-2,492.6	440.3	794.4	693.5	100.87	7.875		
9,200.0	6,721.5	9,290.9	6,803.4	52.7	52.9	-96.06	-2,592.6	440.3	794.4	689.9	104.52	7.601		
9,300.0	6,721.1	9,390.9	6,803.4	54.5	54.8	-96.09	-2,692.6	440.3	794.4	686.3	108.18	7.343		
9,400.0	6,720.7	9,490.9	6,803.5	56.4	56.6	-96.13	-2,792.6	440.3	794.5	682.6	111.86	7.103		
9,500.0	6,720.3	9,590.9	6,803.5	58.2	58.4	-96.16	-2,892.6	440.3	794.5	679.0	115.54	6.877		
9,600.0	6,719.9	9,690.9	6,803.6	60.1	60.3	-96.19	-2,992.6	440.3	794.6	675.4	119.23	6.664		
9,700.0	6,719.5	9,790.9	6,803.6	61.9	62.2	-96.22	-3,092.6	440.3	794.6	671.7	122.93	6.464		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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	6,719.1	9,890.9	6,803.6	63.8	64.0	-96.25	-3,192.6	440.3	794.7	668.0	126.64	6.275		
9,900.0	6,718.7	9,990.9	6,803.7	65.6	65.9	-96.28	-3,292.6	440.3	794.7	664.4	130.35	6.097		
10,000.0	6,718.3	10,090.9	6,803.7	67.5	67.7	-96.31	-3,392.6	440.3	794.8	660.7	134.07	5.928		
10,100.0	6,717.9	10,190.9	6,803.7	69.4	69.6	-96.34	-3,492.6	440.3	794.8	657.0	137.79	5.768		
10,200.0	6,717.5	10,290.9	6,803.8	71.2	71.5	-96.38	-3,592.6	440.3	794.9	653.4	141.52	5.617		
10,300.0	6,717.1	10,390.9	6,803.8	73.1	73.4	-96.41	-3,692.6	440.3	794.9	649.7	145.25	5.473		
10,400.0	6,716.7	10,490.9	6,803.8	75.0	75.2	-96.44	-3,792.6	440.3	795.0	646.0	148.98	5.336		
10,500.0	6,716.3	10,590.9	6,803.9	76.9	77.1	-96.47	-3,892.6	440.3	795.0	642.3	152.72	5.206		
10,600.0	6,715.9	10,690.9	6,803.9	78.7	79.0	-96.50	-3,992.6	440.3	795.1	638.6	156.46	5.082		
10,700.0	6,715.5	10,790.9	6,803.9	80.6	80.9	-96.53	-4,092.6	440.3	795.1	634.9	160.20	4.963		
10,800.0	6,715.1	10,890.9	6,804.0	82.5	82.8	-96.56	-4,192.6	440.3	795.2	631.2	163.95	4.850		
10,900.0	6,714.7	10,990.9	6,804.0	84.4	84.6	-96.59	-4,292.6	440.3	795.2	627.5	167.70	4.742		
11,000.0	6,714.3	11,090.9	6,804.0	86.3	86.5	-96.63	-4,392.6	440.3	795.3	623.8	171.45	4.639		
11,100.0	6,713.9	11,190.9	6,804.1	88.2	88.4	-96.66	-4,492.6	440.3	795.3	620.1	175.20	4.539		
11,200.0	6,713.5	11,290.9	6,804.1	90.1	90.3	-96.69	-4,592.6	440.3	795.4	616.4	178.96	4.445		
11,300.0	6,713.1	11,390.9	6,804.1	91.9	92.2	-96.72	-4,692.6	440.3	795.4	612.7	182.71	4.353		
11,400.0	6,712.7	11,490.9	6,804.2	93.8	94.1	-96.75	-4,792.6	440.3	795.5	609.0	186.47	4.266		
11,500.0	6,712.3	11,590.9	6,804.2	95.7	96.0	-96.78	-4,892.6	440.3	795.5	605.3	190.23	4.182		
11,600.0	6,711.9	11,690.9	6,804.2	97.6	97.9	-96.81	-4,992.6	440.3	795.6	601.6	193.99	4.101		
11,700.0	6,711.5	11,790.8	6,804.3	99.5	99.8	-96.84	-5,092.6	440.3	795.6	597.9	197.75	4.023		
11,800.0	6,711.1	11,890.8	6,804.3	101.4	101.7	-96.88	-5,192.6	440.3	795.7	594.2	201.52	3.948		
11,900.0	6,710.7	11,990.8	6,804.4	103.3	103.6	-96.91	-5,292.6	440.3	795.7	590.4	205.28	3.876		
12,000.0	6,710.3	12,090.8	6,804.4	105.2	105.5	-96.94	-5,392.6	440.3	795.8	586.7	209.05	3.807		
12,100.0	6,709.9	12,190.8	6,804.4	107.1	107.4	-96.97	-5,492.6	440.3	795.8	583.0	212.82	3.740		
12,200.0	6,709.5	12,290.8	6,804.5	109.0	109.3	-97.00	-5,592.6	440.3	795.9	579.3	216.58	3.675		
12,300.0	6,709.1	12,390.8	6,804.5	110.9	111.2	-97.03	-5,692.6	440.3	795.9	575.6	220.35	3.612		
12,400.0	6,708.7	12,490.8	6,804.5	112.8	113.1	-97.06	-5,792.6	440.3	796.0	571.9	224.12	3.552		
12,500.0	6,708.3	12,590.8	6,804.6	114.7	115.0	-97.09	-5,892.6	440.3	796.1	568.2	227.89	3.493		
12,600.0	6,707.9	12,690.8	6,804.6	116.6	116.9	-97.12	-5,992.6	440.3	796.1	564.4	231.66	3.437		
12,700.0	6,707.5	12,790.8	6,804.6	118.5	118.8	-97.16	-6,092.6	440.3	796.2	560.7	235.43	3.382		
12,800.0	6,707.0	12,890.8	6,804.7	120.4	120.7	-97.19	-6,192.6	440.3	796.2	557.0	239.20	3.329		
12,900.0	6,706.6	12,990.8	6,804.7	122.3	122.6	-97.22	-6,292.6	440.3	796.3	553.3	242.97	3.277		
13,000.0	6,706.2	13,090.8	6,804.7	124.2	124.5	-97.25	-6,392.6	440.3	796.3	549.6	246.75	3.227		
13,100.0	6,705.8	13,190.8	6,804.8	126.1	126.4	-97.28	-6,492.6	440.3	796.4	545.9	250.52	3.179		
13,200.0	6,705.4	13,290.8	6,804.8	128.0	128.3	-97.31	-6,592.6	440.3	796.4	542.1	254.29	3.132		
13,300.0	6,705.0	13,390.8	6,804.8	129.9	130.2	-97.34	-6,692.6	440.3	796.5	538.4	258.07	3.086		
13,400.0	6,704.6	13,490.8	6,804.9	131.9	132.1	-97.37	-6,792.6	440.3	796.5	534.7	261.84	3.042		
13,500.0	6,704.2	13,590.8	6,804.9	133.8	134.0	-97.41	-6,892.6	440.3	796.6	531.0	265.61	2.999		
13,600.0	6,703.8	13,690.8	6,804.9	135.7	135.9	-97.44	-6,992.6	440.3	796.7	527.3	269.39	2.957		
13,700.0	6,703.4	13,790.8	6,805.0	137.6	137.8	-97.47	-7,092.6	440.3	796.7	523.6	273.16	2.917		
13,800.0	6,703.0	13,890.8	6,805.0	139.1	139.7	-97.50	-7,192.6	440.3	796.8	520.2	276.57	2.881		
13,806.9	6,703.0	13,893.3	6,805.0	139.2	139.8	-97.50	-7,195.1	440.3	796.8	520.1	276.73	2.879 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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		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	90.01	0.0	30.6	30.7						
100.0	100.0	99.0	99.0	0.1	0.1	90.01	0.0	30.6	30.6	30.4	0.22	137.039			
200.0	200.0	199.0	199.0	0.3	0.3	90.01	0.0	30.6	30.6	30.0	0.67	45.604			
300.0	300.0	299.0	299.0	0.6	0.6	90.01	0.0	30.6	30.6	29.5	1.12	27.326			
400.0	400.0	399.0	399.0	0.8	0.8	90.01	0.0	30.6	30.6	29.1	1.57	19.507			
500.0	500.0	499.0	499.0	1.0	1.0	90.01	0.0	30.6	30.6	28.6	2.02	15.167			
600.0	600.0	599.0	599.0	1.2	1.2	90.01	0.0	30.6	30.6	28.2	2.47	12.407 CC			
700.0	700.0	699.0	699.0	1.5	1.5	148.57	0.0	30.6	31.4	28.5	2.91	10.774			
800.0	800.0	799.0	799.0	1.7	1.7	150.88	0.0	30.6	33.7	30.3	3.35	10.036			
900.0	899.9	899.3	899.3	1.9	1.9	153.22	0.6	30.1	36.9	33.1	3.79	9.731			
1,000.0	999.7	999.8	999.7	2.1	2.1	154.58	2.6	28.4	40.5	36.2	4.23	9.569			
1,100.0	1,099.4	1,100.2	1,100.1	2.4	2.4	154.68	5.9	25.5	43.5	38.8	4.67	9.313			
1,200.0	1,199.2	1,200.2	1,199.9	2.6	2.6	154.14	9.7	22.1	46.0	40.9	5.12	8.983			
1,300.0	1,298.9	1,300.2	1,299.8	2.8	2.8	153.66	13.6	18.7	48.4	42.9	5.57	8.701			
1,400.0	1,398.7	1,400.1	1,399.6	3.1	3.0	153.22	17.4	15.3	50.9	44.9	6.02	8.457			
1,500.0	1,498.5	1,500.1	1,499.4	3.3	3.3	152.82	21.3	12.0	53.4	46.9	6.48	8.245			
1,600.0	1,598.2	1,600.1	1,599.3	3.6	3.5	152.46	25.1	8.6	55.9	49.0	6.94	8.059			
1,700.0	1,698.0	1,700.0	1,699.1	3.8	3.7	152.13	29.0	5.2	58.4	51.0	7.40	7.895			
1,800.0	1,797.7	1,800.0	1,799.0	4.1	4.0	151.83	32.8	1.8	60.9	53.0	7.86	7.748			
1,900.0	1,897.5	1,900.0	1,898.8	4.3	4.2	151.55	36.7	-1.5	63.4	55.1	8.32	7.617			
2,000.0	1,997.3	1,999.9	1,998.6	4.6	4.5	151.29	40.5	-4.9	65.9	57.1	8.78	7.499			
2,100.0	2,097.0	2,099.9	2,098.5	4.9	4.7	151.05	44.4	-8.3	68.4	59.1	9.25	7.393			
2,200.0	2,196.8	2,199.9	2,198.3	5.1	4.9	150.83	48.2	-11.6	70.9	61.1	9.71	7.296			
2,300.0	2,296.5	2,299.9	2,298.1	5.4	5.2	150.62	52.0	-15.0	73.4	63.2	10.18	7.207			
2,400.0	2,396.3	2,399.8	2,398.0	5.6	5.4	150.42	55.9	-18.4	75.9	65.2	10.64	7.126			
2,500.0	2,496.0	2,499.8	2,497.8	5.9	5.6	150.24	59.7	-21.8	78.3	67.2	11.11	7.052			
2,600.0	2,595.8	2,599.8	2,597.7	6.1	5.9	150.07	63.6	-25.1	80.8	69.3	11.58	6.983			
2,700.0	2,695.6	2,699.7	2,697.5	6.4	6.1	149.91	67.4	-28.5	83.3	71.3	12.05	6.919			
2,800.0	2,795.3	2,799.7	2,797.3	6.6	6.4	149.76	71.3	-31.9	85.8	73.3	12.51	6.860			
2,900.0	2,895.1	2,899.7	2,897.2	6.9	6.6	149.62	75.1	-35.3	88.4	75.4	12.98	6.805			
3,000.0	2,994.8	2,999.6	2,997.0	7.2	6.9	149.48	79.0	-38.6	90.9	77.4	13.45	6.754			
3,100.0	3,094.6	3,099.6	3,096.8	7.4	7.1	149.36	82.8	-42.0	93.4	79.4	13.92	6.706			
3,200.0	3,194.3	3,199.6	3,196.7	7.7	7.3	149.23	86.7	-45.4	95.9	81.5	14.39	6.661			
3,300.0	3,294.1	3,299.5	3,296.5	7.9	7.6	149.12	90.5	-48.8	98.4	83.5	14.86	6.619			
3,400.0	3,393.9	3,399.5	3,396.4	8.2	7.8	149.01	94.3	-52.1	100.9	85.5	15.33	6.580			
3,500.0	3,493.6	3,499.5	3,496.2	8.4	8.1	148.91	98.2	-55.5	103.4	87.6	15.80	6.542			
3,600.0	3,593.4	3,599.4	3,596.0	8.7	8.3	148.81	102.0	-58.9	105.9	89.6	16.27	6.507			
3,700.0	3,693.1	3,699.4	3,695.9	9.0	8.5	148.71	105.9	-62.3	108.4	91.6	16.74	6.474			
3,800.0	3,792.9	3,799.4	3,795.7	9.2	8.8	148.62	109.7	-65.6	110.9	93.7	17.21	6.443			
3,900.0	3,892.7	3,899.3	3,895.5	9.5	9.0	148.54	113.6	-69.0	113.4	95.7	17.68	6.413			
4,000.0	3,992.4	3,999.3	3,995.4	9.7	9.3	148.46	117.4	-72.4	115.9	97.7	18.15	6.384			
4,100.0	4,092.2	4,099.3	4,095.2	10.0	9.5	148.38	121.3	-75.7	118.4	99.8	18.62	6.357			
4,200.0	4,191.9	4,199.3	4,195.1	10.2	9.7	148.30	125.1	-79.1	120.9	101.8	19.09	6.332			
4,300.0	4,291.7	4,299.2	4,294.9	10.5	10.0	148.23	129.0	-82.5	123.4	103.8	19.57	6.307			
4,400.0	4,391.4	4,399.2	4,394.7	10.8	10.2	148.16	132.8	-85.9	125.9	105.9	20.04	6.284			
4,500.0	4,491.2	4,499.2	4,494.6	11.0	10.5	148.09	136.6	-89.2	128.4	107.9	20.51	6.262			
4,600.0	4,591.0	4,599.1	4,594.4	11.3	10.7	148.03	140.5	-92.6	130.9	109.9	20.98	6.241			
4,700.0	4,690.7	4,699.1	4,694.2	11.5	11.0	147.97	144.3	-96.0	133.4	112.0	21.45	6.220			
4,800.0	4,790.5	4,799.1	4,794.1	11.8	11.2	147.91	148.2	-99.4	135.9	114.0	21.92	6.201			

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
4,900.0	4,890.2	4,899.0	4,893.9	12.1	11.4	147.85	152.0	-102.7	138.4	116.1	22.40	6.182		
5,000.0	4,990.0	4,999.0	4,993.8	12.3	11.7	147.80	155.9	-106.1	141.0	118.1	22.87	6.164		
5,100.0	5,089.7	5,099.0	5,093.6	12.6	11.9	147.74	159.7	-109.5	143.5	120.1	23.34	6.147		
5,200.0	5,189.5	5,198.9	5,193.4	12.8	12.2	147.69	163.6	-112.9	146.0	122.2	23.81	6.130		
5,300.0	5,289.3	5,298.9	5,293.3	13.1	12.4	147.64	167.4	-116.2	148.5	124.2	24.28	6.114		
5,400.0	5,389.0	5,398.9	5,393.1	13.3	12.6	147.59	171.3	-119.6	151.0	126.2	24.76	6.099		
5,500.0	5,488.8	5,498.8	5,492.9	13.6	12.9	147.55	175.1	-123.0	153.5	128.3	25.23	6.084		
5,600.0	5,588.5	5,598.8	5,592.8	13.9	13.1	147.50	178.9	-126.4	156.0	130.3	25.70	6.070		
5,700.0	5,688.3	5,698.8	5,692.6	14.1	13.4	147.46	182.8	-129.7	158.5	132.3	26.17	6.056		
5,800.0	5,788.1	5,798.7	5,792.5	14.4	13.6	147.41	186.6	-133.1	161.0	134.4	26.64	6.043		
5,900.0	5,887.8	5,898.7	5,892.3	14.6	13.9	147.37	190.5	-136.5	163.5	136.4	27.12	6.030		
6,000.0	5,987.6	5,998.7	5,992.1	14.9	14.1	-156.28	194.3	-139.8	166.0	138.5	27.59	6.019		
6,100.0	6,086.9	6,099.1	6,092.4	15.0	14.3	-114.17	193.7	-143.2	168.9	140.9	27.99	6.035		
6,200.0	6,184.2	6,200.8	6,193.0	15.2	14.4	-107.97	179.9	-146.6	172.1	143.9	28.24	6.095		
6,300.0	6,277.8	6,303.7	6,292.0	15.3	14.5	-106.96	152.5	-150.0	175.7	147.3	28.37	6.192		
6,400.0	6,366.0	6,407.7	6,387.5	15.4	14.6	-107.38	111.4	-153.2	179.3	150.9	28.40	6.313		
6,500.0	6,447.4	6,513.0	6,477.5	15.5	14.7	-108.28	57.1	-156.2	182.9	154.5	28.42	6.438		
6,600.0	6,520.6	6,619.3	6,560.0	15.6	14.8	-109.27	-9.8	-159.0	186.4	157.9	28.51	6.538		
6,700.0	6,584.3	6,726.6	6,633.1	15.8	15.0	-110.21	-88.3	-161.5	189.6	160.8	28.82	6.578		
6,800.0	6,637.5	6,834.8	6,694.8	16.2	15.4	-111.00	-176.9	-163.6	192.3	162.9	29.45	6.530		
6,900.0	6,679.2	6,943.7	6,743.8	16.8	16.1	-111.60	-274.0	-165.2	194.5	164.0	30.51	6.375		
7,000.0	6,708.7	7,053.0	6,778.5	17.6	16.9	-111.98	-377.6	-166.4	196.0	164.0	32.05	6.117		
7,100.0	6,725.5	7,162.7	6,798.2	18.6	18.0	-112.14	-485.4	-167.1	196.8	162.8	34.06	5.779		
7,200.0	6,729.5	7,270.1	6,802.7	19.7	19.2	-112.12	-592.6	-167.2	197.0	160.6	36.41	5.409		
7,300.0	6,729.1	7,370.1	6,802.7	20.9	20.5	-112.24	-692.6	-167.2	197.1	158.4	38.75	5.087		
7,400.0	6,728.7	7,470.1	6,802.8	22.2	21.8	-112.36	-792.6	-167.2	197.3	156.0	41.26	4.782		
7,500.0	6,728.3	7,570.1	6,802.8	23.6	23.3	-112.47	-892.6	-167.2	197.5	153.6	43.91	4.497		
7,600.0	6,727.9	7,670.1	6,802.8	25.1	24.7	-112.59	-992.6	-167.2	197.6	151.0	46.69	4.233		
7,700.0	6,727.5	7,770.1	6,802.9	26.6	26.3	-112.71	-1,092.6	-167.2	197.8	148.2	49.56	3.991		
7,800.0	6,727.1	7,870.1	6,802.9	28.2	27.9	-112.82	-1,192.6	-167.2	198.0	145.5	52.51	3.770		
7,900.0	6,726.7	7,970.1	6,803.0	29.8	29.5	-112.94	-1,292.6	-167.2	198.1	142.6	55.53	3.569		
8,000.0	6,726.3	8,070.1	6,803.0	31.5	31.2	-113.06	-1,392.6	-167.2	198.3	139.7	58.60	3.384		
8,100.0	6,725.9	8,170.1	6,803.0	33.1	32.9	-113.17	-1,492.6	-167.2	198.5	136.8	61.72	3.216		
8,200.0	6,725.5	8,270.1	6,803.1	34.8	34.6	-113.29	-1,592.6	-167.2	198.7	133.8	64.88	3.062		
8,300.0	6,725.1	8,370.1	6,803.1	36.6	36.3	-113.40	-1,692.6	-167.2	198.8	130.8	68.07	2.921		
8,400.0	6,724.7	8,470.1	6,803.1	38.3	38.1	-113.52	-1,792.6	-167.2	199.0	127.7	71.29	2.792		
8,500.0	6,724.3	8,570.1	6,803.2	40.1	39.8	-113.63	-1,892.6	-167.2	199.2	124.7	74.53	2.673		
8,600.0	6,723.9	8,670.1	6,803.2	41.8	41.6	-113.75	-1,992.6	-167.2	199.4	121.6	77.79	2.563		
8,700.0	6,723.5	8,770.1	6,803.2	43.6	43.4	-113.86	-2,092.6	-167.2	199.5	118.5	81.07	2.461		
8,800.0	6,723.1	8,870.1	6,803.3	45.4	45.2	-113.98	-2,192.6	-167.2	199.7	115.3	84.36	2.367		
8,900.0	6,722.7	8,970.1	6,803.3	47.2	47.0	-114.09	-2,292.6	-167.2	199.9	112.2	87.66	2.280		
9,000.0	6,722.3	9,070.1	6,803.3	49.0	48.9	-114.21	-2,392.6	-167.2	200.1	109.1	90.97	2.199		
9,100.0	6,721.9	9,170.1	6,803.4	50.9	50.7	-114.32	-2,492.6	-167.2	200.2	105.9	94.29	2.124		
9,200.0	6,721.5	9,270.1	6,803.4	52.7	52.5	-114.43	-2,592.6	-167.2	200.4	102.8	97.62	2.053		
9,300.0	6,721.1	9,370.0	6,803.4	54.5	54.4	-114.55	-2,692.6	-167.2	200.6	99.7	100.95	1.987		
9,400.0	6,720.7	9,470.0	6,803.5	56.4	56.2	-114.66	-2,792.6	-167.2	200.8	96.5	104.29	1.925		
9,500.0	6,720.3	9,570.0	6,803.5	58.2	58.1	-114.77	-2,892.6	-167.2	201.0	93.3	107.63	1.867		
9,600.0	6,719.9	9,670.0	6,803.5	60.1	59.9	-114.89	-2,992.6	-167.2	201.2	90.2	110.97	1.813		
9,700.0	6,719.5	9,770.0	6,803.6	61.9	61.8	-115.00	-3,092.6	-167.2	201.3	87.0	114.32	1.761		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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							
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	6,719.1	9,870.0	6,803.6	63.8	63.6	-115.11	-3,192.6	-167.2	201.5	83.9	117.66	1.713		
9,900.0	6,718.7	9,970.0	6,803.7	65.6	65.5	-115.22	-3,292.6	-167.2	201.7	80.7	121.01	1.667		
10,000.0	6,718.3	10,070.0	6,803.7	67.5	67.4	-115.34	-3,392.6	-167.2	201.9	77.5	124.35	1.624		
10,100.0	6,717.9	10,170.0	6,803.7	69.4	69.3	-115.45	-3,492.6	-167.2	202.1	74.4	127.70	1.582		
10,200.0	6,717.5	10,270.0	6,803.8	71.2	71.1	-115.56	-3,592.6	-167.2	202.3	71.2	131.04	1.544		
10,300.0	6,717.1	10,370.0	6,803.8	73.1	73.0	-115.67	-3,692.6	-167.2	202.5	68.1	134.38	1.507		
10,400.0	6,716.7	10,470.0	6,803.8	75.0	74.9	-115.78	-3,792.6	-167.2	202.6	64.9	137.73	1.471	Level 3	
10,500.0	6,716.3	10,570.0	6,803.9	76.9	76.8	-115.89	-3,892.6	-167.2	202.8	61.8	141.07	1.438	Level 3	
10,600.0	6,715.9	10,670.0	6,803.9	78.7	78.6	-116.00	-3,992.6	-167.2	203.0	58.6	144.40	1.406	Level 3	
10,700.0	6,715.5	10,770.0	6,803.9	80.6	80.5	-116.11	-4,092.6	-167.2	203.2	55.5	147.74	1.376	Level 3	
10,800.0	6,715.1	10,870.0	6,804.0	82.5	82.4	-116.22	-4,192.6	-167.2	203.4	52.3	151.07	1.346	Level 3	
10,900.0	6,714.7	10,970.0	6,804.0	84.4	84.3	-116.34	-4,292.6	-167.2	203.6	49.2	154.40	1.319	Level 3	
11,000.0	6,714.3	11,070.0	6,804.0	86.3	86.2	-116.45	-4,392.6	-167.2	203.8	46.1	157.73	1.292	Level 3	
11,100.0	6,713.9	11,170.0	6,804.1	88.2	88.1	-116.55	-4,492.6	-167.2	204.0	42.9	161.05	1.267	Level 3	
11,200.0	6,713.5	11,270.0	6,804.1	90.1	90.0	-116.66	-4,592.6	-167.2	204.2	39.8	164.37	1.242	Level 2	
11,300.0	6,713.1	11,370.0	6,804.1	91.9	91.9	-116.77	-4,692.6	-167.2	204.4	36.7	167.69	1.219	Level 2	
11,400.0	6,712.7	11,470.0	6,804.2	93.8	93.8	-116.88	-4,792.6	-167.2	204.6	33.6	171.00	1.196	Level 2	
11,500.0	6,712.3	11,570.0	6,804.2	95.7	95.7	-116.99	-4,892.6	-167.2	204.8	30.5	174.31	1.175	Level 2	
11,600.0	6,711.9	11,670.0	6,804.2	97.6	97.6	-117.10	-4,992.6	-167.2	205.0	27.4	177.61	1.154	Level 2	
11,700.0	6,711.5	11,770.0	6,804.3	99.5	99.5	-117.21	-5,092.6	-167.2	205.2	24.3	180.91	1.134	Level 2	
11,800.0	6,711.1	11,870.0	6,804.3	101.4	101.4	-117.32	-5,192.6	-167.2	205.4	21.2	184.21	1.115	Level 2	
11,900.0	6,710.7	11,970.0	6,804.3	103.3	103.3	-117.43	-5,292.6	-167.2	205.6	18.1	187.50	1.096	Level 2	
12,000.0	6,710.3	12,070.0	6,804.4	105.2	105.2	-117.53	-5,392.6	-167.2	205.8	15.0	190.79	1.079	Level 2	
12,100.0	6,709.9	12,170.0	6,804.4	107.1	107.1	-117.64	-5,492.6	-167.2	206.0	11.9	194.07	1.061	Level 2	
12,200.0	6,709.5	12,270.0	6,804.5	109.0	109.0	-117.75	-5,592.6	-167.2	206.2	8.8	197.35	1.045	Level 2	
12,300.0	6,709.1	12,370.0	6,804.5	110.9	110.9	-117.86	-5,692.6	-167.2	206.4	5.8	200.62	1.029	Level 2	
12,400.0	6,708.7	12,470.0	6,804.5	112.8	112.8	-117.96	-5,792.6	-167.2	206.6	2.7	203.89	1.013	Level 2	
12,500.0	6,708.3	12,570.0	6,804.6	114.7	114.7	-118.07	-5,892.6	-167.2	206.8	-0.4	207.16	0.998	Level 1	
12,600.0	6,707.9	12,670.0	6,804.6	116.6	116.6	-118.18	-5,992.6	-167.2	207.0	-3.4	210.41	0.984	Level 1	
12,700.0	6,707.5	12,770.0	6,804.6	118.5	118.5	-118.28	-6,092.6	-167.2	207.2	-6.5	213.67	0.970	Level 1	
12,800.0	6,707.0	12,870.0	6,804.7	120.4	120.4	-118.39	-6,192.6	-167.2	207.4	-9.5	216.92	0.956	Level 1	
12,900.0	6,706.6	12,970.0	6,804.7	122.3	122.3	-118.49	-6,292.6	-167.2	207.6	-12.5	220.16	0.943	Level 1	
13,000.0	6,706.2	13,070.0	6,804.7	124.2	124.2	-118.60	-6,392.6	-167.2	207.8	-15.6	223.40	0.930	Level 1	
13,100.0	6,705.8	13,170.0	6,804.8	126.1	126.1	-118.71	-6,492.6	-167.2	208.0	-18.6	226.64	0.918	Level 1	
13,200.0	6,705.4	13,270.0	6,804.8	128.0	128.0	-118.81	-6,592.6	-167.2	208.2	-21.6	229.87	0.906	Level 1	
13,300.0	6,705.0	13,370.0	6,804.8	129.9	129.9	-118.92	-6,692.6	-167.2	208.5	-24.6	233.09	0.894	Level 1	
13,400.0	6,704.6	13,470.0	6,804.9	131.9	131.8	-119.02	-6,792.6	-167.2	208.7	-27.6	236.31	0.883	Level 1	
13,500.0	6,704.2	13,570.0	6,804.9	133.8	133.7	-119.13	-6,892.6	-167.2	208.9	-30.6	239.53	0.872	Level 1	
13,600.0	6,703.8	13,670.0	6,804.9	135.7	135.6	-119.23	-6,992.6	-167.2	209.1	-33.6	242.73	0.861	Level 1	
13,700.0	6,703.4	13,770.0	6,805.0	137.6	137.5	-119.33	-7,092.6	-167.2	209.3	-36.6	245.94	0.851	Level 1	
13,800.0	6,703.0	13,870.0	6,805.0	139.1	139.5	-119.44	-7,192.6	-167.2	209.5	-39.3	248.79	0.842	Level 1	
13,806.9	6,703.0	13,876.2	6,805.0	139.2	139.6	-119.44	-7,198.7	-167.2	209.5	-39.4	248.97	0.842 Level 1, ES, SF		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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-343 - 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)	+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	90.00	0.0	119.8	119.8						
100.0	100.0	98.0	98.0	0.1	0.1	90.00	0.0	119.8	119.8	119.6	0.22	538.397			
200.0	200.0	198.0	198.0	0.3	0.3	90.00	0.0	119.8	119.8	119.1	0.67	178.867			
300.0	300.0	298.0	298.0	0.6	0.6	90.00	0.0	119.8	119.8	118.7	1.12	107.033			
400.0	400.0	398.0	398.0	0.8	0.8	90.00	0.0	119.8	119.8	118.2	1.57	76.364			
500.0	500.0	498.0	498.0	1.0	1.0	90.00	0.0	119.8	119.8	117.8	2.02	59.357			
600.0	600.0	598.0	598.0	1.2	1.2	90.00	0.0	119.8	119.8	117.3	2.47	48.545 CC, ES			
700.0	700.0	698.0	698.0	1.5	1.5	147.93	0.0	119.8	120.5	117.6	2.91	41.406			
800.0	800.0	798.0	798.0	1.7	1.7	148.57	0.0	119.8	122.8	119.4	3.35	36.641			
900.0	899.9	897.9	897.9	1.9	1.9	149.58	0.0	119.8	126.5	122.7	3.79	33.361			
1,000.0	999.7	997.7	997.7	2.1	2.1	150.90	0.0	119.8	131.8	127.6	4.24	31.119			
1,100.0	1,099.4	1,095.3	1,095.3	2.4	2.3	152.15	0.2	120.6	138.7	134.0	4.67	29.706			
1,200.0	1,199.2	1,192.7	1,192.6	2.6	2.5	153.04	0.9	122.9	147.2	142.1	5.10	28.877			
1,300.0	1,298.9	1,289.7	1,289.6	2.8	2.8	153.59	2.1	126.8	157.3	151.8	5.53	28.449			
1,400.0	1,398.7	1,386.5	1,386.2	3.1	3.0	153.86	3.8	132.3	168.9	163.0	5.96	28.329 SF			
1,500.0	1,498.5	1,482.9	1,482.4	3.3	3.2	153.88	5.9	139.3	182.1	175.7	6.40	28.454			
1,600.0	1,598.2	1,578.9	1,578.0	3.6	3.4	153.71	8.5	147.8	196.8	190.0	6.84	28.774			
1,700.0	1,698.0	1,674.5	1,672.9	3.8	3.7	153.40	11.5	157.7	213.1	205.8	7.28	29.252			
1,800.0	1,797.7	1,769.5	1,767.1	4.1	3.9	152.98	15.0	169.2	230.8	223.1	7.73	29.861			
1,900.0	1,897.5	1,863.9	1,860.6	4.3	4.2	152.48	18.9	182.0	250.1	241.9	8.18	30.577			
2,000.0	1,997.3	1,959.7	1,955.3	4.6	4.5	151.94	23.3	196.3	270.7	262.1	8.64	31.348			
2,100.0	2,097.0	2,057.5	2,051.8	4.9	4.8	151.45	27.8	211.2	291.6	282.5	9.10	32.048			
2,200.0	2,196.8	2,155.3	2,148.3	5.1	5.1	151.02	32.3	226.0	312.4	302.9	9.56	32.678			
2,300.0	2,296.5	2,253.0	2,244.9	5.4	5.4	150.65	36.8	240.8	333.3	323.3	10.03	33.241			
2,400.0	2,396.3	2,350.8	2,341.4	5.6	5.7	150.32	41.4	255.6	354.2	343.7	10.49	33.750			
2,500.0	2,496.0	2,448.6	2,438.0	5.9	6.1	150.03	45.9	270.5	375.1	364.1	10.96	34.210			
2,600.0	2,595.8	2,546.4	2,534.5	6.1	6.4	149.77	50.4	285.3	396.0	384.5	11.43	34.629			
2,700.0	2,695.6	2,644.1	2,631.0	6.4	6.7	149.53	54.9	300.1	416.9	405.0	11.91	35.012			
2,800.0	2,795.3	2,741.9	2,727.6	6.6	7.1	149.32	59.4	314.9	437.8	425.4	12.38	35.363			
2,900.0	2,895.1	2,839.7	2,824.1	6.9	7.4	149.13	63.9	329.8	458.7	445.9	12.85	35.685			
3,000.0	2,994.8	2,937.5	2,920.7	7.2	7.8	148.95	68.4	344.6	479.6	466.3	13.33	35.983			
3,100.0	3,094.6	3,035.2	3,017.2	7.4	8.1	148.79	73.0	359.4	500.6	486.8	13.81	36.258			
3,200.0	3,194.3	3,133.0	3,113.7	7.7	8.5	148.64	77.5	374.2	521.5	507.2	14.28	36.513			
3,300.0	3,294.1	3,230.8	3,210.3	7.9	8.8	148.50	82.0	389.1	542.4	527.7	14.76	36.750			
3,400.0	3,393.9	3,328.6	3,306.8	8.2	9.2	148.37	86.5	403.9	563.4	548.1	15.24	36.971			
3,500.0	3,493.6	3,426.4	3,403.4	8.4	9.5	148.26	91.0	418.7	584.3	568.6	15.72	37.178			
3,600.0	3,593.4	3,524.1	3,499.9	8.7	9.9	148.15	95.5	433.6	605.2	589.0	16.20	37.371			
3,700.0	3,693.1	3,621.9	3,596.4	9.0	10.2	148.04	100.0	448.4	626.2	609.5	16.67	37.553			
3,800.0	3,792.9	3,719.7	3,693.0	9.2	10.6	147.95	104.5	463.2	647.1	630.0	17.15	37.723			
3,900.0	3,892.7	3,817.5	3,789.5	9.5	10.9	147.86	109.1	478.0	668.1	650.4	17.63	37.883			
4,000.0	3,992.4	3,915.2	3,886.1	9.7	11.3	147.77	113.6	492.9	689.0	670.9	18.12	38.035			
4,100.0	4,092.2	4,013.0	3,982.6	10.0	11.6	147.69	118.1	507.7	710.0	691.4	18.60	38.177			
4,200.0	4,191.9	4,110.8	4,079.1	10.2	12.0	147.62	122.6	522.5	730.9	711.8	19.08	38.312			
4,300.0	4,291.7	4,208.6	4,175.7	10.5	12.4	147.55	127.1	537.3	751.9	732.3	19.56	38.440			
4,400.0	4,391.4	4,306.3	4,272.2	10.8	12.7	147.48	131.6	552.2	772.8	752.8	20.04	38.562			
4,500.0	4,491.2	4,404.1	4,368.8	11.0	13.1	147.42	136.1	567.0	793.8	773.2	20.52	38.677			
4,600.0	4,591.0	4,501.9	4,465.3	11.3	13.4	147.36	140.7	581.8	814.7	793.7	21.01	38.786			
4,700.0	4,690.7	4,599.7	4,561.9	11.5	13.8	147.30	145.2	596.6	835.7	814.2	21.49	38.890			
4,800.0	4,790.5	4,697.5	4,658.4	11.8	14.2	147.25	149.7	611.5	856.6	834.7	21.97	38.989			

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 28M-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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,890.2	4,795.2	4,754.9	12.1	14.5	147.20	154.2	626.3	877.6	855.1	22.45	39.084	
5,000.0	4,990.0	4,893.0	4,851.5	12.3	14.9	147.15	158.7	641.1	898.5	875.6	22.94	39.174	
5,100.0	5,089.7	4,990.8	4,948.0	12.6	15.2	147.10	163.2	655.9	919.5	896.1	23.42	39.261	
5,200.0	5,189.5	5,088.6	5,044.6	12.8	15.6	147.05	167.7	670.8	940.5	916.6	23.90	39.343	
5,300.0	5,289.3	5,186.3	5,141.1	13.1	16.0	147.01	172.3	685.6	961.4	937.0	24.39	39.422	
5,400.0	5,389.0	5,284.1	5,237.6	13.3	16.3	146.97	176.8	700.4	982.4	957.5	24.87	39.498	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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			
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	150.5	150.5						
100.0	100.0	97.0	97.0	0.1	0.1	90.01	0.0	150.5	150.5	150.2	0.22	679.552			
200.0	200.0	197.0	197.0	0.3	0.3	90.01	0.0	150.5	150.5	149.8	0.67	225.380			
300.0	300.0	297.0	297.0	0.6	0.6	90.01	0.0	150.5	150.5	149.3	1.12	134.684			
400.0	400.0	397.0	397.0	0.8	0.8	90.01	0.0	150.5	150.5	148.9	1.57	96.037 CC, ES			
500.0	500.0	494.6	494.6	1.0	1.0	89.93	0.2	151.2	151.2	149.2	2.00	75.554			
600.0	600.0	592.0	592.0	1.2	1.2	89.72	0.8	153.6	153.7	151.2	2.43	63.152			
700.0	700.0	689.3	689.2	1.5	1.4	147.22	1.8	157.5	158.5	155.6	2.86	55.326			
800.0	800.0	786.4	786.1	1.7	1.6	147.19	3.1	163.1	166.4	163.1	3.30	50.489			
900.0	899.9	882.9	882.4	1.9	1.9	147.32	4.9	170.2	177.4	173.7	3.73	47.539			
1,000.0	999.7	978.9	977.9	2.1	2.1	147.56	7.1	178.8	191.5	187.4	4.17	45.901			
1,100.0	1,099.4	1,074.3	1,072.8	2.4	2.4	147.85	9.6	188.9	207.9	203.3	4.62	45.055			
1,200.0	1,199.2	1,169.2	1,166.9	2.6	2.6	148.00	12.5	200.5	226.0	220.9	5.06	44.634			
1,300.0	1,298.9	1,263.5	1,260.3	2.8	2.9	148.03	15.7	213.5	245.5	240.0	5.51	44.537 SF			
1,400.0	1,398.7	1,357.2	1,352.8	3.1	3.2	147.97	19.3	227.9	266.7	260.7	5.97	44.689			
1,500.0	1,498.5	1,453.0	1,447.2	3.3	3.6	147.85	23.3	243.8	289.1	282.6	6.43	44.954			
1,600.0	1,598.2	1,550.5	1,543.1	3.6	3.9	147.74	27.3	260.1	311.6	304.7	6.89	45.189			
1,700.0	1,698.0	1,647.9	1,639.1	3.8	4.3	147.65	31.4	276.4	334.1	326.7	7.36	45.367			
1,800.0	1,797.7	1,745.3	1,735.1	4.1	4.7	147.57	35.5	292.7	356.6	348.7	7.83	45.517			
1,900.0	1,897.5	1,842.8	1,831.0	4.3	5.0	147.50	39.5	309.0	379.1	370.8	8.31	45.638			
2,000.0	1,997.3	1,940.2	1,927.0	4.6	5.4	147.43	43.6	325.3	401.6	392.8	8.78	45.737			
2,100.0	2,097.0	2,037.6	2,023.0	4.9	5.8	147.38	47.6	341.6	424.1	414.8	9.26	45.819			
2,200.0	2,196.8	2,135.1	2,119.0	5.1	6.1	147.33	51.7	357.9	446.6	436.9	9.73	45.888			
2,300.0	2,296.5	2,232.5	2,214.9	5.4	6.5	147.28	55.8	374.2	469.1	458.9	10.21	45.945			
2,400.0	2,396.3	2,329.9	2,310.9	5.6	6.9	147.24	59.8	390.6	491.6	480.9	10.69	45.993			
2,500.0	2,496.0	2,427.4	2,406.9	5.9	7.3	147.20	63.9	406.9	514.1	503.0	11.17	46.034			
2,600.0	2,595.8	2,524.8	2,502.9	6.1	7.6	147.17	68.0	423.2	536.6	525.0	11.65	46.069			
2,700.0	2,695.6	2,622.2	2,598.8	6.4	8.0	147.13	72.0	439.5	559.1	547.0	12.13	46.099			
2,800.0	2,795.3	2,719.7	2,694.8	6.6	8.4	147.10	76.1	455.8	581.7	569.0	12.61	46.125			
2,900.0	2,895.1	2,817.1	2,790.8	6.9	8.8	147.08	80.2	472.1	604.2	591.1	13.09	46.147			
3,000.0	2,994.8	2,914.5	2,886.7	7.2	9.2	147.05	84.2	488.4	626.7	613.1	13.57	46.166			
3,100.0	3,094.6	3,012.0	2,982.7	7.4	9.6	147.03	88.3	504.7	649.2	635.1	14.06	46.182			
3,200.0	3,194.3	3,109.4	3,078.7	7.7	9.9	147.01	92.4	521.0	671.7	657.2	14.54	46.196			
3,300.0	3,294.1	3,206.8	3,174.7	7.9	10.3	146.98	96.4	537.3	694.2	679.2	15.02	46.209			
3,400.0	3,393.9	3,304.3	3,270.6	8.2	10.7	146.96	100.5	553.6	716.7	701.2	15.51	46.219			
3,500.0	3,493.6	3,401.7	3,366.6	8.4	11.1	146.95	104.6	569.9	739.2	723.2	15.99	46.228			
3,600.0	3,593.4	3,499.1	3,462.6	8.7	11.5	146.93	108.6	586.3	761.7	745.3	16.47	46.236			
3,700.0	3,693.1	3,596.6	3,558.6	9.0	11.9	146.91	112.7	602.6	784.2	767.3	16.96	46.243			
3,800.0	3,792.9	3,694.0	3,654.5	9.2	12.2	146.90	116.8	618.9	806.7	789.3	17.44	46.249			
3,900.0	3,892.7	3,791.4	3,750.5	9.5	12.6	146.88	120.8	635.2	829.3	811.3	17.93	46.254			
4,000.0	3,992.4	3,888.9	3,846.5	9.7	13.0	146.87	124.9	651.5	851.8	833.4	18.41	46.258			
4,100.0	4,092.2	3,986.3	3,942.5	10.0	13.4	146.86	129.0	667.8	874.3	855.4	18.90	46.262			
4,200.0	4,191.9	4,083.7	4,038.4	10.2	13.8	146.84	133.0	684.1	896.8	877.4	19.38	46.265			
4,300.0	4,291.7	4,181.2	4,134.4	10.5	14.2	146.83	137.1	700.4	919.3	899.4	19.87	46.267			
4,400.0	4,391.4	4,278.6	4,230.4	10.8	14.5	146.82	141.2	716.7	941.8	921.5	20.36	46.269			
4,500.0	4,491.2	4,376.0	4,326.3	11.0	14.9	146.81	145.2	733.0	964.3	943.5	20.84	46.271			
4,600.0	4,591.0	4,473.5	4,422.3	11.3	15.3	146.80	149.3	749.3	986.8	965.5	21.33	46.272			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 - Adamson 1-6l (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 629-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
8,200.0	6,725.5	6,850.7	6,763.1	34.8	20.8	-92.14	-2,428.3	63.6	932.4	879.8	52.54	17.746		
8,300.0	6,725.1	6,849.1	6,761.6	36.6	20.8	-91.93	-2,428.4	63.6	843.9	789.6	54.28	15.546		
8,400.0	6,724.7	6,847.6	6,760.0	38.3	20.8	-91.71	-2,428.4	63.6	758.3	702.3	56.04	13.531		
8,500.0	6,724.3	6,846.0	6,758.4	40.1	20.8	-91.49	-2,428.4	63.6	676.7	618.9	57.82	11.704		
8,600.0	6,723.9	6,844.4	6,756.8	41.8	20.8	-91.27	-2,428.4	63.6	600.6	541.0	59.61	10.077		
8,700.0	6,723.5	6,842.8	6,755.2	43.6	20.8	-91.05	-2,428.4	63.6	532.6	471.2	61.40	8.673		
8,800.0	6,723.1	6,841.1	6,753.6	45.4	20.8	-90.82	-2,428.5	63.6	475.9	412.7	63.21	7.529		
8,900.0	6,722.7	6,839.5	6,751.9	47.2	20.8	-90.59	-2,428.5	63.7	435.1	370.1	65.03	6.691		
9,000.0	6,722.3	6,837.8	6,750.3	49.0	20.8	-90.36	-2,428.5	63.7	414.9	348.1	66.85	6.206		
9,035.8	6,722.2	6,837.2	6,749.7	49.7	20.8	-90.28	-2,428.5	63.7	413.4	345.9	67.51	6.123 CC, ES		
9,100.0	6,721.9	6,836.1	6,748.6	50.9	20.8	-90.13	-2,428.5	63.7	418.3	349.6	68.68	6.091 SF		
9,200.0	6,721.5	6,834.4	6,746.9	52.7	20.8	-89.89	-2,428.5	63.7	444.8	374.2	70.52	6.307		
9,300.0	6,721.1	6,832.7	6,745.2	54.5	20.7	-89.65	-2,428.6	63.7	490.5	418.2	72.36	6.779		
9,400.0	6,720.7	6,831.0	6,743.4	56.4	20.7	-89.41	-2,428.6	63.7	550.9	476.7	74.20	7.424		
9,500.0	6,720.3	6,829.2	6,741.7	58.2	20.7	-89.17	-2,428.6	63.7	621.5	545.4	76.05	8.172		
9,600.0	6,719.9	6,827.4	6,739.9	60.1	20.7	-88.93	-2,428.6	63.7	699.3	621.4	77.90	8.977		
9,700.0	6,719.5	6,825.7	6,738.1	61.9	20.7	-88.68	-2,428.7	63.7	782.2	702.5	79.75	9.808		
9,800.0	6,719.1	6,823.9	6,736.3	63.8	20.7	-88.43	-2,428.7	63.7	868.7	787.1	81.61	10.645		
9,900.0	6,718.7	6,822.0	6,734.5	65.6	20.7	-88.18	-2,428.7	63.7	957.8	874.4	83.46	11.476		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 - Adamson 28-1 (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							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
8,800.0	6,723.1	6,734.1	6,733.3	45.4	13.0	87.08	-3,120.8	-576.4	955.5	897.5	58.04	16.464		
8,900.0	6,722.7	6,735.2	6,734.4	47.2	13.0	87.36	-3,120.8	-576.4	858.7	798.8	59.86	14.345		
9,000.0	6,722.3	6,736.3	6,735.6	49.0	13.0	87.65	-3,120.8	-576.4	762.7	701.0	61.69	12.363		
9,100.0	6,721.9	6,737.5	6,736.7	50.9	13.0	87.93	-3,120.8	-576.4	667.9	604.4	63.53	10.513		
9,200.0	6,721.5	6,738.6	6,737.8	52.7	13.0	88.21	-3,120.8	-576.4	574.8	509.5	65.38	8.793		
9,300.0	6,721.1	6,739.7	6,738.9	54.5	13.0	88.50	-3,120.8	-576.4	484.6	417.3	67.23	7.208		
9,400.0	6,720.7	6,740.8	6,740.1	56.4	13.0	88.78	-3,120.9	-576.4	398.9	329.9	69.08	5.775		
9,500.0	6,720.3	6,742.0	6,741.2	58.2	13.0	89.07	-3,120.9	-576.4	321.7	250.8	70.94	4.536		
9,600.0	6,719.9	6,743.1	6,742.3	60.1	13.0	89.35	-3,120.9	-576.4	260.5	187.7	72.80	3.579		
9,700.0	6,719.5	6,744.2	6,743.4	61.9	13.0	89.64	-3,120.9	-576.4	228.5	153.8	74.66	3.061		
9,728.3	6,719.4	6,744.5	6,743.8	62.4	13.0	89.72	-3,120.9	-576.4	226.7	151.6	75.18	3.016 CC, ES, SF		
9,800.0	6,719.1	6,745.4	6,744.6	63.8	13.0	89.92	-3,120.9	-576.4	237.8	161.3	76.52	3.108		
9,900.0	6,718.7	6,746.5	6,745.7	65.6	13.0	90.21	-3,120.9	-576.5	284.4	206.0	78.39	3.629		
10,000.0	6,718.3	6,747.6	6,746.8	67.5	13.0	90.49	-3,121.0	-576.5	353.9	273.6	80.25	4.410		
10,100.0	6,717.9	6,748.7	6,748.0	69.4	13.0	90.78	-3,121.0	-576.5	435.4	353.3	82.12	5.302		
10,200.0	6,717.5	6,749.9	6,749.1	71.2	13.0	91.06	-3,121.0	-576.5	523.4	439.4	83.99	6.231		
10,300.0	6,717.1	6,751.0	6,750.2	73.1	13.0	91.34	-3,121.0	-576.5	615.0	529.2	85.86	7.163		
10,400.0	6,716.7	6,752.1	6,751.3	75.0	13.0	91.63	-3,121.0	-576.5	708.9	621.2	87.73	8.081		
10,500.0	6,716.3	6,753.2	6,752.5	76.9	13.0	91.91	-3,121.0	-576.5	804.3	714.7	89.60	8.977		
10,600.0	6,715.9	6,754.4	6,753.6	78.7	13.0	92.20	-3,121.1	-576.5	900.7	809.2	91.47	9.847		
10,700.0	6,715.5	6,755.5	6,754.7	80.6	13.0	92.48	-3,121.1	-576.5	997.8	904.4	93.33	10.691		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 - Adamson 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)	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)				
9,800.0	6,719.1	6,740.5	6,736.7	63.8	15.8	87.04	-4,131.6	-449.7	944.3	865.2	79.17	11.927		
9,900.0	6,718.7	6,741.1	6,737.2	65.6	15.8	87.35	-4,131.6	-449.7	845.0	763.9	81.06	10.424		
10,000.0	6,718.3	6,741.6	6,737.7	67.5	15.8	87.65	-4,131.6	-449.7	745.8	662.8	82.94	8.992		
10,100.0	6,717.9	6,742.1	6,738.3	69.4	15.8	87.96	-4,131.6	-449.7	646.8	562.0	84.82	7.625		
10,200.0	6,717.5	6,742.7	6,738.8	71.2	15.8	88.27	-4,131.6	-449.7	548.2	461.5	86.71	6.323		
10,300.0	6,717.1	6,743.2	6,739.3	73.1	15.8	88.58	-4,131.7	-449.7	450.3	361.7	88.60	5.082		
10,400.0	6,716.7	6,743.7	6,739.9	75.0	15.8	88.89	-4,131.7	-449.7	353.5	263.0	90.48	3.906		
10,500.0	6,716.3	6,744.3	6,740.4	76.9	15.8	89.20	-4,131.7	-449.7	259.1	166.7	92.37	2.805		
10,600.0	6,715.9	6,744.8	6,741.0	78.7	15.8	89.51	-4,131.7	-449.7	171.2	77.0	94.26	1.817		
10,700.0	6,715.5	6,745.4	6,741.5	80.6	15.8	89.82	-4,131.7	-449.7	107.3	11.2	96.14	1.116 Level 2		
10,739.0	6,715.3	6,745.6	6,741.7	81.4	15.8	89.94	-4,131.7	-449.7	100.0	3.1	96.88	1.032 Level 2, CC, ES, SF		
10,800.0	6,715.1	6,745.9	6,742.0	82.5	15.8	90.12	-4,131.7	-449.7	117.1	19.1	98.03	1.195 Level 2		
10,900.0	6,714.7	6,746.4	6,742.6	84.4	15.8	90.43	-4,131.7	-449.7	189.5	89.6	99.91	1.897		
11,000.0	6,714.3	6,747.0	6,743.1	86.3	15.8	90.74	-4,131.7	-449.7	279.5	177.7	101.79	2.745		
11,100.0	6,713.9	6,747.5	6,743.7	88.2	15.8	91.05	-4,131.7	-449.7	374.6	270.9	103.68	3.613		
11,200.0	6,713.5	6,748.1	6,744.2	90.1	15.8	91.36	-4,131.7	-449.7	471.7	366.1	105.55	4.469		
11,300.0	6,713.1	6,748.6	6,744.7	91.9	15.8	91.67	-4,131.7	-449.7	569.8	462.4	107.43	5.304		
11,400.0	6,712.7	6,749.1	6,745.3	93.8	15.8	91.98	-4,131.7	-449.7	668.5	559.2	109.31	6.116		
11,500.0	6,712.3	6,749.7	6,745.8	95.7	15.8	92.28	-4,131.7	-449.7	767.5	656.3	111.18	6.903		
11,600.0	6,711.9	6,750.2	6,746.3	97.6	15.8	92.59	-4,131.7	-449.7	866.7	753.7	113.05	7.667		
11,700.0	6,711.5	6,750.8	6,746.9	99.5	15.8	92.90	-4,131.7	-449.7	966.1	851.2	114.92	8.407		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 - Adamson 5 (Exist) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft	
Survey Program: 580-MWD										Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
9,500.0	6,720.3	6,830.0	6,742.7	58.2	20.9	-89.90	-3,739.0	26.4	926.1	850.0	76.12	12.166	
9,600.0	6,719.9	6,830.2	6,742.8	60.1	20.9	-89.91	-3,739.0	26.4	835.7	757.7	77.98	10.717	
9,700.0	6,719.5	6,830.3	6,742.9	61.9	20.9	-89.93	-3,739.0	26.4	747.8	667.9	79.84	9.366	
9,800.0	6,719.1	6,830.4	6,743.0	63.8	20.9	-89.95	-3,739.0	26.4	663.2	581.5	81.71	8.117	
9,900.0	6,718.7	6,830.5	6,743.2	65.6	20.9	-89.96	-3,739.0	26.4	583.6	500.1	83.58	6.983	
10,000.0	6,718.3	6,830.6	6,743.3	67.5	20.9	-89.98	-3,739.0	26.4	511.2	425.8	85.45	5.983	
10,100.0	6,717.9	6,830.7	6,743.4	69.4	20.9	-89.99	-3,739.0	26.4	449.5	362.2	87.32	5.148	
10,200.0	6,717.5	6,830.8	6,743.5	71.2	20.9	-90.01	-3,739.0	26.4	403.5	314.3	89.20	4.524	
10,300.0	6,717.1	6,830.9	6,743.6	73.1	20.9	-90.03	-3,739.0	26.4	378.9	287.8	91.08	4.160	
10,346.3	6,716.9	6,830.9	6,743.6	74.0	20.9	-90.03	-3,739.0	26.4	376.1	284.1	91.95	4.090 CC, ES	
10,400.0	6,716.7	6,831.0	6,743.7	75.0	20.9	-90.04	-3,739.0	26.4	379.9	286.9	92.96	4.086 SF	
10,500.0	6,716.3	6,831.1	6,743.8	76.9	20.9	-90.06	-3,739.0	26.4	406.2	311.4	94.84	4.283	
10,600.0	6,715.9	6,831.2	6,743.9	78.7	20.9	-90.07	-3,739.0	26.4	453.6	356.9	96.73	4.690	
10,700.0	6,715.5	6,831.3	6,744.0	80.6	20.9	-90.09	-3,739.0	26.4	516.2	417.6	98.61	5.235	
10,800.0	6,715.1	6,831.4	6,744.1	82.5	20.9	-90.10	-3,739.0	26.4	589.3	488.8	100.50	5.863	
10,900.0	6,714.7	6,831.5	6,744.2	84.4	20.9	-90.12	-3,739.0	26.4	669.3	566.9	102.39	6.537	
11,000.0	6,714.3	6,831.6	6,744.3	86.3	20.9	-90.13	-3,739.0	26.4	754.1	649.8	104.28	7.232	
11,100.0	6,713.9	6,831.7	6,744.4	88.2	20.9	-90.15	-3,739.0	26.4	842.3	736.1	106.18	7.933	
11,200.0	6,713.5	6,831.8	6,744.5	90.1	20.9	-90.16	-3,739.0	26.4	932.8	824.8	108.07	8.632	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 - Bailey 33-2 (Exist) - Wellbore #1 - Wellbore #1													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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
12,700.0	6,707.5	6,793.7	6,792.1	118.5	13.0	95.28	-7,043.1	-608.7	985.4	854.6	130.76	7.536		
12,800.0	6,707.0	6,791.9	6,790.2	120.4	13.0	94.86	-7,043.2	-608.7	889.3	756.6	132.74	6.700		
12,900.0	6,706.6	6,789.9	6,788.3	122.3	13.0	94.44	-7,043.2	-608.8	794.2	659.5	134.71	5.896		
13,000.0	6,706.2	6,788.0	6,786.3	124.2	13.0	94.02	-7,043.2	-608.8	700.5	563.8	136.68	5.125		
13,100.0	6,705.8	6,786.0	6,784.4	126.1	12.9	93.58	-7,043.3	-608.8	608.7	470.1	138.65	4.390		
13,200.0	6,705.4	6,784.0	6,782.3	128.0	12.9	93.14	-7,043.3	-608.9	520.0	379.4	140.62	3.698		
13,300.0	6,705.0	6,782.0	6,780.3	129.9	12.9	92.69	-7,043.3	-608.9	436.2	293.7	142.58	3.060		
13,400.0	6,704.6	6,779.9	6,778.2	131.9	12.9	92.23	-7,043.4	-609.0	360.8	216.2	144.53	2.496		
13,500.0	6,704.2	6,777.8	6,776.1	133.8	12.9	91.76	-7,043.4	-609.0	300.0	153.6	146.48	2.048		
13,600.0	6,703.8	6,775.6	6,773.9	135.7	12.9	91.28	-7,043.4	-609.0	264.3	115.9	148.42	1.781		
13,650.8	6,703.6	6,774.5	6,772.8	136.6	12.9	91.04	-7,043.5	-609.1	259.4	110.0	149.41	1.736 CC, ES, SF		
13,700.0	6,703.4	6,773.4	6,771.7	137.6	12.9	90.80	-7,043.5	-609.1	264.0	113.7	150.36	1.756		
13,800.0	6,703.0	6,771.2	6,769.5	139.1	12.9	90.30	-7,043.5	-609.1	299.2	147.3	151.92	1.970		
13,806.9	6,703.0	6,771.0	6,769.3	139.2	12.9	90.27	-7,043.5	-609.1	302.7	150.7	152.03	1.991		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 28A (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)					
7,400.0	6,728.7	6,772.0	6,771.4	22.2	12.0	98.66	-1,721.7	-591.7	960.6	927.5	33.08	29.036			
7,500.0	6,728.3	6,768.1	6,767.4	23.6	12.0	97.75	-1,721.8	-591.7	864.3	829.7	34.58	24.996			
7,600.0	6,727.9	6,764.2	6,763.6	25.1	12.0	96.84	-1,721.9	-591.8	768.9	732.7	36.13	21.278			
7,700.0	6,727.5	6,760.4	6,759.7	26.6	12.0	95.95	-1,722.1	-591.8	674.8	637.0	37.74	17.877			
7,800.0	6,727.1	6,756.6	6,755.9	28.2	12.0	95.06	-1,722.2	-591.9	582.6	543.2	39.40	14.788			
7,900.0	6,726.7	6,752.8	6,752.2	29.8	11.9	94.18	-1,722.3	-591.9	493.5	452.4	41.08	12.012			
8,000.0	6,726.3	6,749.2	6,748.5	31.5	11.9	93.31	-1,722.4	-592.0	409.4	366.6	42.80	9.566			
8,100.0	6,725.9	6,745.5	6,744.9	33.1	11.9	92.45	-1,722.5	-592.0	334.1	289.6	44.53	7.503			
8,200.0	6,725.5	6,741.9	6,741.3	34.8	11.9	91.60	-1,722.6	-592.0	275.1	228.8	46.28	5.943			
8,300.0	6,725.1	6,738.4	6,737.7	36.6	11.9	90.76	-1,722.8	-592.1	244.2	196.2	48.04	5.084			
8,330.1	6,725.0	6,737.3	6,736.7	37.1	11.9	90.51	-1,722.8	-592.1	242.4	193.8	48.58	4.990 CC, ES, SF			
8,400.0	6,724.7	6,734.8	6,734.2	38.3	11.9	89.93	-1,722.9	-592.1	252.2	202.4	49.81	5.064			
8,500.0	6,724.3	6,731.4	6,730.7	40.1	11.9	89.11	-1,723.0	-592.1	295.9	244.3	51.59	5.736			
8,600.0	6,723.9	6,728.0	6,727.3	41.8	11.9	88.31	-1,723.1	-592.2	362.6	309.3	53.37	6.795			
8,700.0	6,723.5	6,724.6	6,723.9	43.6	11.9	87.51	-1,723.2	-592.2	442.0	386.9	55.15	8.015			
8,800.0	6,723.1	6,721.2	6,720.6	45.4	11.9	86.72	-1,723.3	-592.2	528.5	471.5	56.93	9.282			
8,900.0	6,722.7	6,717.9	6,717.3	47.2	11.9	85.94	-1,723.4	-592.2	619.0	560.3	58.71	10.543			
9,000.0	6,722.3	6,714.7	6,714.0	49.0	11.9	85.18	-1,723.4	-592.2	712.0	651.5	60.49	11.772			
9,100.0	6,721.9	6,711.4	6,710.8	50.9	11.9	84.42	-1,723.5	-592.3	806.7	744.5	62.26	12.958			
9,200.0	6,721.5	6,708.3	6,707.6	52.7	11.9	83.68	-1,723.6	-592.3	902.5	838.5	64.02	14.098			
9,300.0	6,721.1	6,705.1	6,704.5	54.5	11.9	82.95	-1,723.7	-592.3	999.2	933.4	65.78	15.190			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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										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	120.21	-415.3	713.3	825.6						
100.0	100.0	80.8	80.8	0.1	0.1	120.21	-415.3	713.3	825.4	825.2	0.22	3,755.069			
200.0	200.0	179.9	179.9	0.3	0.2	120.20	-415.3	713.5	825.5	825.0	0.58	1,432.885			
300.0	300.0	278.9	278.9	0.6	0.4	120.19	-415.3	713.8	825.8	824.9	0.93	885.601			
400.0	400.0	378.0	378.0	0.8	0.5	120.18	-415.3	714.2	826.2	824.9	1.29	641.031			
500.0	500.0	477.1	477.1	1.0	0.6	120.15	-415.2	714.8	826.6	825.0	1.65	502.475			
600.0	600.0	576.2	576.2	1.2	0.8	120.13	-415.2	715.4	827.2	825.2	2.00	413.309			
700.0	700.0	675.3	675.3	1.5	0.9	177.82	-415.2	716.3	828.8	826.4	2.35	352.498			
800.0	800.0	774.3	774.3	1.7	1.0	177.79	-415.2	717.2	832.2	829.5	2.70	308.540			
900.0	899.9	887.7	887.7	1.9	1.2	177.76	-414.8	717.7	836.8	833.8	3.08	272.044			
1,000.0	999.7	1,002.5	1,002.5	2.1	1.3	177.73	-413.2	716.3	841.2	837.7	3.44	244.269			
1,100.0	1,099.4	1,112.4	1,112.2	2.4	1.5	177.61	-409.8	714.4	845.0	841.2	3.78	223.428			
1,200.0	1,199.2	1,221.2	1,221.0	2.6	1.6	177.49	-405.6	711.4	847.7	843.6	4.18	202.975			
1,300.0	1,298.9	1,338.4	1,338.0	2.8	1.8	177.42	-401.0	706.3	849.0	844.4	4.60	184.707			
1,400.0	1,398.7	1,446.3	1,445.5	3.1	2.0	177.31	-395.4	700.4	848.5	843.5	5.03	168.699			
1,500.0	1,498.5	1,541.1	1,540.1	3.3	2.2	177.18	-389.9	695.3	847.9	842.5	5.46	155.375			
1,508.6	1,507.0	1,548.5	1,547.4	3.4	2.3	177.17	-389.5	694.9	847.9	842.4	5.49	154.363			
1,600.0	1,598.2	1,630.7	1,629.5	3.6	2.5	177.06	-385.4	691.3	848.6	842.7	5.88	144.211			
1,700.0	1,698.0	1,744.1	1,742.6	3.8	2.7	176.90	-379.4	686.5	849.2	842.9	6.38	133.208			
1,800.0	1,797.7	1,862.9	1,860.8	4.1	3.0	176.68	-371.1	679.3	847.5	840.6	6.89	123.061			
1,900.0	1,897.5	2,002.4	1,999.1	4.3	3.4	176.13	-355.7	669.1	842.7	835.3	7.47	112.843			
2,000.0	1,997.3	2,132.4	2,126.7	4.6	3.7	175.31	-334.6	656.3	833.1	825.1	8.03	103.695			
2,100.0	2,097.0	2,251.4	2,243.2	4.9	4.1	174.68	-315.7	640.9	821.1	812.5	8.57	95.802			
2,200.0	2,196.8	2,364.8	2,353.9	5.1	4.4	174.35	-300.1	622.0	806.8	797.7	9.08	88.835			
2,300.0	2,296.5	2,462.9	2,449.6	5.4	4.7	174.26	-288.8	603.7	791.8	782.2	9.55	82.923			
2,400.0	2,396.3	2,562.5	2,546.9	5.6	4.9	174.20	-277.9	585.3	777.2	767.2	10.02	77.575			
2,500.0	2,496.0	2,670.7	2,652.3	5.9	5.3	174.14	-265.7	564.0	761.3	750.8	10.51	72.407			
2,600.0	2,595.8	2,766.0	2,745.0	6.1	5.5	173.94	-253.1	546.0	745.3	734.3	10.99	67.841			
2,700.0	2,695.6	2,864.4	2,840.8	6.4	5.8	173.60	-238.9	528.5	729.8	718.3	11.47	63.610			
2,800.0	2,795.3	2,963.7	2,937.3	6.6	6.1	173.07	-222.5	511.6	714.0	702.0	11.97	59.650			
2,900.0	2,895.1	3,054.7	3,025.6	6.9	6.4	172.41	-206.2	497.2	698.7	686.3	12.45	56.126			
3,000.0	2,994.8	3,144.1	3,112.7	7.2	6.7	171.83	-191.4	483.7	684.9	672.0	12.92	52.995			
3,100.0	3,094.6	3,237.7	3,204.4	7.4	7.0	171.41	-178.8	469.5	672.3	658.9	13.41	50.144			
3,200.0	3,194.3	3,333.8	3,298.6	7.7	7.3	170.94	-165.6	455.5	660.3	646.4	13.90	47.504			
3,300.0	3,294.1	3,429.7	3,392.6	7.9	7.6	170.50	-153.2	441.7	648.8	634.4	14.39	45.080			
3,400.0	3,393.9	3,527.5	3,488.7	8.2	7.9	170.06	-140.9	427.9	637.7	622.8	14.89	42.832			
3,500.0	3,493.6	3,631.4	3,590.6	8.4	8.2	169.45	-126.6	413.6	626.5	611.1	15.41	40.660			
3,600.0	3,593.4	3,751.9	3,707.9	8.7	8.6	168.31	-105.1	396.4	613.4	597.4	15.99	38.360			
3,700.0	3,693.1	3,856.0	3,808.3	9.0	8.9	166.99	-83.0	380.3	598.0	581.5	16.54	36.164			
3,800.0	3,792.9	3,958.4	3,907.1	9.2	9.3	165.77	-62.3	362.8	581.9	564.8	17.08	34.069			
3,900.0	3,892.7	4,050.1	3,995.8	9.5	9.6	164.82	-45.7	346.8	566.3	548.7	17.59	32.197			
4,000.0	3,992.4	4,137.5	4,080.8	9.7	9.8	163.94	-30.9	332.7	552.4	534.3	18.08	30.550			
4,100.0	4,092.2	4,224.0	4,165.3	10.0	10.1	163.08	-17.2	320.4	540.9	522.4	18.58	29.120			
4,200.0	4,191.9	4,320.8	4,260.1	10.2	10.4	162.15	-2.8	307.6	530.9	511.8	19.10	27.792			
4,300.0	4,291.7	4,416.2	4,353.8	10.5	10.7	161.21	11.2	295.5	521.5	501.9	19.63	26.572			
4,400.0	4,391.4	4,506.0	4,441.9	10.8	11.0	160.16	25.3	285.4	513.4	493.3	20.14	25.493			
4,500.0	4,491.2	4,602.3	4,536.3	11.0	11.3	158.87	41.3	276.0	506.8	486.1	20.69	24.501			
4,600.0	4,591.0	4,717.2	4,648.6	11.3	11.6	157.09	62.4	263.6	499.2	477.9	21.31	23.426			
4,700.0	4,690.7	4,822.7	4,751.5	11.5	12.0	155.52	81.1	249.6	489.6	467.7	21.91	22.351			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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)	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	4,790.5	4,918.3	4,844.7	11.8	12.3	154.01	98.3	236.5	479.9	457.5	22.47	21.355			
4,900.0	4,890.2	5,010.8	4,935.0	12.1	12.6	152.54	114.6	225.1	472.0	449.0	23.04	20.491			
5,000.0	4,990.0	5,105.1	5,027.6	12.3	12.9	151.39	127.9	213.9	465.1	441.5	23.58	19.722			
5,100.0	5,089.7	5,194.0	5,115.6	12.6	13.1	150.72	136.8	204.8	460.4	436.3	24.09	19.111			
5,200.0	5,189.5	5,285.5	5,206.5	12.8	13.4	150.20	144.4	197.2	457.8	433.2	24.60	18.612			
5,300.0	5,289.3	5,379.6	5,300.2	13.1	13.6	149.77	151.4	191.1	456.9	431.8	25.10	18.203			
5,400.0	5,389.0	5,486.3	5,406.3	13.3	13.9	149.20	159.9	183.9	455.9	430.2	25.65	17.775			
5,500.0	5,488.8	5,586.6	5,505.9	13.6	14.2	148.72	167.5	175.6	453.4	427.3	26.17	17.324			
5,600.0	5,588.5	5,681.4	5,600.3	13.9	14.5	148.46	173.1	169.2	452.5	425.8	26.67	16.965			
5,699.6	5,687.9	5,777.6	5,696.1	14.1	14.7	148.16	179.0	162.8	451.7	424.5	27.17	16.623 CC			
5,700.0	5,688.3	5,777.9	5,696.4	14.1	14.7	148.16	179.1	162.7	451.7	424.5	27.17	16.622 ES			
5,800.0	5,788.1	5,871.9	5,790.2	14.4	15.0	148.03	183.5	158.2	452.7	425.0	27.66	16.366			
5,900.0	5,887.8	5,969.2	5,887.4	14.6	15.2	147.98	187.5	153.9	454.1	426.0	28.14	16.135			
6,000.0	5,987.6	6,060.8	5,978.8	14.9	15.4	-155.03	189.3	151.0	456.8	428.3	28.58	15.986			
6,100.0	6,086.9	6,153.3	6,071.3	15.0	15.6	-111.28	192.1	149.9	461.7	432.7	28.99	15.926			
6,200.0	6,184.2	6,249.2	6,167.2	15.2	15.9	-104.94	195.4	149.3	468.0	438.6	29.41	15.912 SF			
6,300.0	6,277.8	6,342.8	6,260.7	15.3	16.1	-104.90	197.6	148.8	477.2	447.4	29.80	16.016			
6,400.0	6,366.0	6,437.0	6,354.9	15.4	16.3	-107.27	198.5	148.1	491.0	460.9	30.09	16.318			
6,500.0	6,447.4	6,523.2	6,441.1	15.5	16.5	-110.37	199.4	145.7	510.8	480.6	30.21	16.911			
6,600.0	6,520.6	6,593.6	6,511.4	15.6	16.7	-112.62	200.1	143.8	540.7	510.5	30.20	17.906			
6,700.0	6,584.3	6,655.5	6,573.3	15.8	16.8	-113.89	200.4	142.6	582.1	551.9	30.23	19.258			
6,800.0	6,637.5	6,709.1	6,626.9	16.2	16.9	-113.81	200.4	141.8	634.9	604.4	30.51	20.809			
6,900.0	6,679.2	6,752.2	6,670.0	16.8	17.0	-111.83	200.2	141.2	697.9	666.7	31.26	22.325			
7,000.0	6,708.7	6,782.3	6,700.1	17.6	17.0	-107.26	200.0	140.7	769.8	737.2	32.59	23.622			
7,100.0	6,725.5	6,799.0	6,716.8	18.6	17.0	-99.56	200.0	140.5	848.6	814.4	34.20	24.810			
7,200.0	6,729.5	6,803.3	6,721.1	19.7	17.0	-90.81	199.9	140.5	932.0	896.6	35.40	26.328			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 28A-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)	Reference	Offset	Semi Major Axis (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	3.7	3.7	0.0	0.0	-134.15		-451.7	-465.3	648.5					
100.0	100.0	108.0	108.0	0.1	0.2	-134.17		-451.6	-464.9	648.1	647.8	0.27	2,438.875		
200.0	200.0	204.7	204.7	0.3	0.4	-134.18		-451.3	-464.5	647.7	646.9	0.74	878.700		
300.0	300.0	303.6	303.6	0.6	0.6	-134.19		-451.4	-464.4	647.6	646.4	1.16	555.875		
400.0	400.0	405.4	405.4	0.8	0.8	-134.20		-451.3	-464.2	647.4	645.8	1.61	401.952		
500.0	500.0	505.6	505.6	1.0	1.1	-134.19		-451.1	-464.0	647.1	645.0	2.09	310.348		
600.0	600.0	603.5	603.5	1.2	1.3	-134.20		-451.0	-463.8	646.9	644.4	2.52	256.821		
700.0	700.0	703.1	703.1	1.5	1.5	-76.59		-451.2	-463.6	646.8	643.9	2.92	221.670		
800.0	800.0	806.2	806.2	1.7	1.7	-76.88		-451.5	-463.1	646.0	642.6	3.36	192.196		
900.0	899.9	903.7	903.7	1.9	1.9	-77.32		-451.9	-462.4	644.8	641.0	3.82	168.856		
1,000.0	999.7	1,002.4	1,002.4	2.1	2.1	-77.92		-452.4	-462.0	643.5	639.2	4.27	150.799		
1,100.0	1,099.4	1,105.2	1,105.2	2.4	2.4	-78.57		-452.5	-461.6	642.0	637.2	4.74	135.539		
1,200.0	1,199.2	1,202.6	1,202.6	2.6	2.5	-79.16		-452.4	-461.5	640.4	635.3	5.11	125.320		
1,300.0	1,298.9	1,304.9	1,304.8	2.8	2.6	-79.76		-452.0	-461.7	639.0	633.5	5.45	117.298		
1,400.0	1,398.7	1,406.2	1,406.2	3.1	2.8	-80.34		-451.3	-461.7	637.3	631.4	5.85	108.897		
1,500.0	1,498.5	1,506.7	1,506.7	3.3	3.0	-80.93		-450.5	-461.5	635.5	629.2	6.29	100.996		
1,600.0	1,598.2	1,606.3	1,606.3	3.6	3.2	-81.53		-449.9	-461.1	633.6	626.9	6.77	93.632		
1,700.0	1,698.0	1,704.0	1,704.0	3.8	3.4	-82.16		-449.6	-460.6	632.1	624.8	7.26	87.040		
1,800.0	1,797.7	1,801.7	1,801.7	4.1	3.7	-82.78		-449.5	-460.4	631.0	623.2	7.76	81.270		
1,900.0	1,897.5	1,904.4	1,904.4	4.3	3.9	-83.43		-449.3	-460.1	629.8	621.5	8.28	76.079		
2,000.0	1,997.3	2,000.8	2,000.7	4.6	4.2	-84.05		-449.2	-459.8	628.8	620.0	8.75	71.860		
2,100.0	2,097.0	2,101.0	2,101.0	4.9	4.4	-84.71		-449.3	-459.6	628.1	618.8	9.22	68.130		
2,200.0	2,196.8	2,200.0	2,200.0	5.1	4.5	-85.35		-449.5	-459.5	627.5	617.9	9.64	65.116		
2,300.0	2,296.5	2,299.4	2,299.4	5.4	4.6	-85.96		-449.5	-459.7	627.1	617.1	9.97	62.868		
2,400.0	2,396.3	2,399.3	2,399.3	5.6	4.7	-86.54		-449.2	-460.2	626.7	616.4	10.30	60.822		
2,500.0	2,496.0	2,498.0	2,498.0	5.9	4.8	-87.11		-449.0	-460.9	626.5	615.9	10.64	58.875		
2,600.0	2,595.8	2,599.5	2,599.5	6.1	4.9	-87.69		-448.6	-461.5	626.3	615.3	11.00	56.944		
2,700.0	2,695.6	2,699.7	2,699.6	6.4	5.0	-88.25		-448.1	-462.2	626.0	614.6	11.38	55.004		
2,800.0	2,795.3	2,799.3	2,799.3	6.6	5.1	-88.79		-447.5	-463.0	625.7	614.0	11.77	53.144		
2,900.0	2,895.1	2,898.4	2,898.4	6.9	5.3	-89.33		-446.9	-463.8	625.6	613.4	12.17	51.397		
3,000.0	2,994.8	2,999.5	2,999.5	7.2	5.4	-89.88		-446.3	-464.6	625.5	612.9	12.59	49.700		
3,100.0	3,094.6	3,099.8	3,099.7	7.4	5.6	-90.45		-445.7	-465.2	625.3	612.3	13.02	48.034		
3,177.8	3,172.2	3,176.4	3,176.4	7.6	5.7	-90.88		-445.2	-465.7	625.2	611.8	13.35	46.821		
3,200.0	3,194.3	3,198.3	3,198.2	7.7	5.8	-91.00		-445.1	-465.8	625.2	611.8	13.45	46.488		
3,300.0	3,294.1	3,295.4	3,295.3	7.9	5.9	-91.53		-444.7	-466.7	625.5	611.6	13.86	45.124		
3,400.0	3,393.9	3,394.8	3,394.8	8.2	6.1	-92.09		-444.7	-467.6	626.1	611.9	14.27	43.887		
3,500.0	3,493.6	3,495.5	3,495.4	8.4	6.2	-92.68		-444.7	-468.2	626.8	612.1	14.68	42.704		
3,600.0	3,593.4	3,595.9	3,595.8	8.7	6.4	-93.30		-444.8	-468.6	627.4	612.3	15.08	41.605		
3,700.0	3,693.1	3,696.3	3,696.2	9.0	6.5	-93.94		-444.9	-468.6	627.9	612.4	15.47	40.586		
3,800.0	3,792.9	3,798.8	3,798.8	9.2	6.7	-94.58		-444.8	-468.6	628.3	612.4	15.91	39.496		
3,900.0	3,892.7	3,897.3	3,897.3	9.5	6.9	-95.18		-444.4	-468.7	628.6	612.2	16.37	38.403		
4,000.0	3,992.4	4,000.2	4,000.1	9.7	7.1	-95.75		-443.6	-469.2	628.8	612.0	16.84	37.349		
4,100.0	4,092.2	4,103.0	4,102.9	10.0	7.3	-96.29		-442.3	-469.9	628.7	611.3	17.31	36.308		
4,200.0	4,191.9	4,204.8	4,204.7	10.2	7.6	-96.82		-440.5	-470.4	628.1	610.3	17.80	35.296		
4,300.0	4,291.7	4,307.1	4,307.0	10.5	7.8	-97.33		-438.3	-471.0	627.3	609.0	18.28	34.311		
4,400.0	4,391.4	4,406.0	4,405.8	10.8	8.0	-97.84		-436.2	-471.4	626.4	607.6	18.76	33.384		
4,500.0	4,491.2	4,505.5	4,505.3	11.0	8.2	-98.38		-434.2	-471.6	625.7	606.4	19.25	32.503		
4,591.0	4,582.0	4,594.9	4,594.7	11.3	8.4	-98.89		-432.7	-471.6	625.2	605.5	19.69	31.752		
4,600.0	4,591.0	4,600.0	4,599.8	11.3	8.5	-98.92		-432.6	-471.5	625.1	605.4	19.72	31.694		

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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 28A-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)	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	
4,700.0	4,690.7	4,695.1	4,694.9	11.5	8.6	-99.54	-432.0	-471.0	625.5	605.3	20.15	31.033		
4,800.0	4,790.5	4,782.0	4,781.8	11.8	8.7	-100.22	-433.3	-469.9	627.6	607.1	20.52	30.583		
4,900.0	4,890.2	4,878.4	4,878.1	12.1	8.8	-101.05	-436.4	-468.4	631.2	610.4	20.88	30.226		
5,000.0	4,990.0	4,977.1	4,976.8	12.3	9.0	-101.88	-439.6	-467.0	635.2	613.9	21.25	29.890		
5,100.0	5,089.7	5,078.4	5,078.0	12.6	9.1	-102.68	-442.7	-466.0	639.2	617.6	21.62	29.560		
5,200.0	5,189.5	5,183.1	5,182.6	12.8	9.2	-103.45	-445.2	-465.2	642.8	620.8	22.01	29.208		
5,300.0	5,289.3	5,283.5	5,283.0	13.1	9.3	-104.18	-447.1	-464.4	646.0	623.6	22.40	28.846		
5,400.0	5,389.0	5,392.3	5,391.9	13.3	9.5	-104.92	-448.3	-463.7	648.7	625.9	22.81	28.437		
5,500.0	5,488.8	5,482.8	5,482.4	13.6	9.6	-105.50	-449.1	-463.4	651.2	628.0	23.20	28.066		
5,600.0	5,588.5	5,580.4	5,580.0	13.9	9.8	-106.09	-450.9	-463.7	654.9	631.3	23.59	27.759		
5,700.0	5,688.3	5,684.8	5,684.3	14.1	9.9	-106.74	-452.5	-463.7	658.5	634.5	24.00	27.440		
5,800.0	5,788.1	5,783.7	5,783.2	14.4	10.1	-107.34	-453.7	-463.7	661.6	637.3	24.40	27.121		
5,900.0	5,887.8	5,880.9	5,880.4	14.6	10.2	-107.86	-455.0	-464.5	665.2	640.4	24.80	26.828		
6,000.0	5,987.6	5,977.8	5,977.3	14.9	10.4	-51.47	-456.5	-465.8	667.7	642.5	25.15	26.544		
6,100.0	6,086.9	6,075.2	6,074.6	15.0	10.5	-6.78	-458.5	-466.5	659.6	634.4	25.17	26.209		
6,200.0	6,184.2	6,173.7	6,173.1	15.2	10.7	2.38	-460.9	-466.6	639.0	614.2	24.81	25.761		
6,300.0	6,277.8	6,264.6	6,264.0	15.3	10.9	6.79	-463.0	-467.5	606.4	582.3	24.08	25.177		
6,400.0	6,366.0	6,349.2	6,348.5	15.4	11.0	10.34	-465.5	-469.1	562.8	539.8	23.05	24.417		
6,500.0	6,447.4	6,427.9	6,427.2	15.5	11.1	14.38	-468.2	-471.7	509.3	487.5	21.82	23.340		
6,600.0	6,520.6	6,500.0	6,499.1	15.6	11.3	19.96	-470.9	-475.4	446.9	426.2	20.66	21.627		
6,700.0	6,584.3	6,566.5	6,565.4	15.8	11.4	28.53	-473.6	-479.4	377.1	356.9	20.23	18.637		
6,800.0	6,637.5	6,623.1	6,621.9	16.2	11.5	41.62	-475.9	-482.8	302.1	280.5	21.61	13.984		
6,900.0	6,679.2	6,668.4	6,667.1	16.8	11.6	59.46	-477.7	-485.5	226.9	202.0	24.99	9.080		
7,000.0	6,708.7	6,701.8	6,700.4	17.6	11.6	77.08	-479.0	-487.5	163.3	135.3	28.04	5.824		
7,086.9	6,724.0	6,720.6	6,719.1	18.5	11.7	86.52	-479.8	-488.7	139.6	110.2	29.40	4.747 CC, ES		
7,100.0	6,725.5	6,722.6	6,721.1	18.6	11.7	87.29	-479.9	-488.8	140.2	110.6	29.54	4.745 SF		
7,200.0	6,729.5	6,730.6	6,729.1	19.7	11.7	88.21	-480.2	-489.3	179.3	148.6	30.69	5.842		
7,300.0	6,729.1	6,734.2	6,732.7	20.9	11.7	89.69	-480.3	-489.5	254.2	222.3	31.93	7.961		
7,400.0	6,728.7	6,737.9	6,736.3	22.2	11.7	91.17	-480.5	-489.7	342.2	308.9	33.25	10.290		
7,500.0	6,728.3	6,741.5	6,739.9	23.6	11.7	92.64	-480.6	-489.9	435.3	400.7	34.64	12.569		
7,600.0	6,727.9	6,745.1	6,743.5	25.1	11.7	94.10	-480.8	-490.1	531.0	494.9	36.06	14.723		
7,700.0	6,727.5	6,748.7	6,747.1	26.6	11.7	95.55	-480.9	-490.4	627.9	590.4	37.52	16.736		
7,800.0	6,727.1	6,752.3	6,750.7	28.2	11.7	96.99	-481.1	-490.6	725.7	686.7	39.00	18.609		
7,900.0	6,726.7	6,755.9	6,754.3	29.8	11.7	98.41	-481.2	-490.8	824.0	783.5	40.49	20.352		
8,000.0	6,726.3	6,759.5	6,757.9	31.5	11.7	99.82	-481.3	-491.0	922.6	880.7	41.98	21.979		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 5 (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)	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		
0.0	0.0	0.0	0.0	0.0	0.0	173.09	-965.4	117.0	972.5						
100.0	100.0	95.8	95.8	0.1	0.1	173.09	-965.2	117.0	972.3	972.0	0.24	4,057.890			
200.0	200.0	194.4	194.4	0.3	0.3	173.10	-964.9	116.8	971.9	971.2	0.69	1,414.806			
300.0	300.0	297.0	297.0	0.6	0.6	173.11	-964.5	116.5	971.5	970.3	1.16	840.786			
400.0	400.0	396.0	396.0	0.8	0.8	173.13	-964.0	116.1	971.0	969.3	1.62	599.043			
500.0	500.0	496.1	496.1	1.0	1.1	173.15	-963.6	115.7	970.5	968.4	2.09	463.822			
600.0	600.0	599.2	599.2	1.2	1.3	173.17	-963.0	115.3	969.9	967.3	2.58	375.937			
652.5	652.5	649.6	649.6	1.4	1.5	-129.11	-962.7	114.9	969.7	966.8	2.83	343.178			
700.0	700.0	695.1	695.1	1.5	1.6	-129.13	-962.5	114.8	969.8	966.8	3.05	318.186			
800.0	800.0	799.1	799.1	1.7	1.9	-129.22	-961.9	114.4	970.9	967.4	3.54	274.553			
900.0	899.9	895.8	895.8	1.9	2.1	-129.35	-961.4	113.6	973.1	969.1	4.00	243.427			
1,000.0	999.7	990.6	990.6	2.1	2.3	-129.55	-961.3	112.9	976.7	972.3	4.42	221.156			
1,100.0	1,099.4	1,088.5	1,088.4	2.4	2.4	-129.84	-961.5	112.6	981.4	976.6	4.79	204.893			
1,200.0	1,199.2	1,191.0	1,191.0	2.6	2.6	-130.13	-961.7	112.1	986.0	980.8	5.20	189.713			
1,300.0	1,298.9	1,287.0	1,287.0	2.8	2.7	-130.40	-961.9	111.8	990.6	985.0	5.57	177.936			
1,400.0	1,398.7	1,384.2	1,384.2	3.1	2.8	-130.69	-962.4	111.7	995.6	989.7	5.90	168.677			
6,700.0	6,584.3	6,570.9	6,569.0	15.8	11.6	-47.96	-950.1	153.3	963.2	940.2	22.97	41.931			
6,800.0	6,637.5	6,626.2	6,624.2	16.2	11.7	-56.03	-951.5	151.8	893.7	869.6	24.09	37.094			
6,900.0	6,679.2	6,670.2	6,668.1	16.8	11.7	-65.66	-952.6	150.6	821.3	795.5	25.89	31.725			
7,000.0	6,708.7	6,702.0	6,700.0	17.6	11.8	-75.77	-953.4	149.7	748.8	720.9	27.84	26.893			
7,100.0	6,725.5	6,721.3	6,719.2	18.6	11.8	-84.85	-953.8	149.2	679.1	649.6	29.49	23.026			
7,200.0	6,729.5	6,727.8	6,725.7	19.7	11.8	-90.70	-954.0	149.0	615.9	585.1	30.80	19.998			
7,300.0	6,729.1	6,729.8	6,727.8	20.9	11.8	-90.94	-954.0	149.0	563.1	531.0	32.05	17.565			
7,400.0	6,728.7	6,731.9	6,729.8	22.2	11.8	-91.18	-954.1	148.9	524.2	490.8	33.41	15.689			
7,500.0	6,728.3	6,734.0	6,731.9	23.6	11.8	-91.41	-954.1	148.8	502.5	467.6	34.85	14.420			
7,561.4	6,728.1	6,735.2	6,733.1	24.5	11.8	-91.56	-954.2	148.8	498.7	462.9	35.77	13.942 CC, ES			
7,600.0	6,727.9	6,736.0	6,733.9	25.1	11.8	-91.65	-954.2	148.8	500.2	463.8	36.35	13.761			
7,700.0	6,727.5	6,738.1	6,736.0	26.6	11.8	-91.89	-954.2	148.7	517.6	479.7	37.90	13.655 SF			
7,800.0	6,727.1	6,740.1	6,738.0	28.2	11.8	-92.12	-954.3	148.7	552.8	513.3	39.51	13.993			
7,900.0	6,726.7	6,742.2	6,740.1	29.8	11.8	-92.36	-954.3	148.6	602.7	561.6	41.15	14.649			
8,000.0	6,726.3	6,744.2	6,742.1	31.5	11.8	-92.59	-954.4	148.6	664.0	621.2	42.82	15.509			
8,100.0	6,725.9	6,746.3	6,744.2	33.1	11.8	-92.83	-954.4	148.5	733.9	689.4	44.51	16.488			
8,200.0	6,725.5	6,748.3	6,746.3	34.8	11.8	-93.07	-954.5	148.5	810.1	763.9	46.23	17.523			
8,300.0	6,725.1	6,750.4	6,748.3	36.6	11.8	-93.30	-954.5	148.4	891.0	843.1	47.97	18.575			
8,400.0	6,724.7	6,752.5	6,750.4	38.3	11.8	-93.54	-954.6	148.3	975.5	925.8	49.72	19.619			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 - Hoffman B 33-19 (Exist) - Wellbore #1 - Wellbor													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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
11,900.0	6,710.7	6,750.5	6,748.8	103.3	12.9	-89.73	-6,154.3	56.8	952.7	836.7	116.05	8.210		
12,000.0	6,710.3	6,750.2	6,748.5	105.2	12.9	-89.69	-6,154.3	56.8	863.3	745.4	117.95	7.320		
12,100.0	6,709.9	6,749.8	6,748.2	107.1	12.9	-89.64	-6,154.3	56.8	776.6	656.7	119.85	6.480		
12,200.0	6,709.5	6,749.5	6,747.8	109.0	12.9	-89.60	-6,154.3	56.8	693.3	571.6	121.75	5.695		
12,300.0	6,709.1	6,749.2	6,747.5	110.9	12.9	-89.55	-6,154.3	56.8	615.1	491.5	123.65	4.975		
12,400.0	6,708.7	6,748.9	6,747.2	112.8	12.9	-89.51	-6,154.3	56.8	544.1	418.5	125.55	4.334		
12,500.0	6,708.3	6,748.6	6,746.9	114.7	12.9	-89.46	-6,154.3	56.8	483.4	356.0	127.45	3.793		
12,600.0	6,707.9	6,748.2	6,746.6	116.6	12.9	-89.42	-6,154.3	56.8	437.5	308.1	129.35	3.382		
12,700.0	6,707.5	6,747.9	6,746.3	118.5	12.9	-89.37	-6,154.3	56.8	411.1	279.9	131.26	3.132		
12,761.7	6,707.2	6,747.7	6,746.1	119.7	12.9	-89.34	-6,154.3	56.8	406.5	274.1	132.43	3.069 CC, ES		
12,800.0	6,707.0	6,747.6	6,745.9	120.4	12.9	-89.33	-6,154.3	56.8	408.3	275.1	133.16	3.066 SF		
12,900.0	6,706.6	6,747.3	6,745.6	122.3	12.9	-89.28	-6,154.3	56.8	429.4	294.3	135.06	3.179		
13,000.0	6,706.2	6,747.0	6,745.3	124.2	12.9	-89.24	-6,154.3	56.7	471.2	334.2	136.97	3.440		
13,100.0	6,705.8	6,746.6	6,745.0	126.1	12.9	-89.19	-6,154.3	56.7	528.9	390.0	138.87	3.808		
13,200.0	6,705.4	6,746.3	6,744.7	128.0	12.9	-89.15	-6,154.3	56.7	597.8	457.0	140.78	4.246		
13,300.0	6,705.0	6,746.0	6,744.3	129.9	12.9	-89.10	-6,154.3	56.7	674.6	531.9	142.68	4.728		
13,400.0	6,704.6	6,745.7	6,744.0	131.9	12.9	-89.06	-6,154.3	56.7	756.8	612.2	144.59	5.234		
13,500.0	6,704.2	6,745.4	6,743.7	133.8	12.9	-89.01	-6,154.3	56.7	842.8	696.3	146.49	5.753		
13,600.0	6,703.8	6,745.0	6,743.4	135.7	12.9	-88.97	-6,154.3	56.7	931.7	783.3	148.40	6.278		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 1 (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							
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	6,712.7	6,750.7	6,746.9	93.8	12.0	86.47	-5,671.5	-571.8	906.6	801.0	105.60	8.585		
11,500.0	6,712.3	6,752.9	6,749.1	95.7	12.1	87.01	-5,671.5	-571.8	810.1	702.5	107.54	7.533		
11,600.0	6,711.9	6,755.0	6,751.2	97.6	12.1	87.56	-5,671.6	-571.7	714.4	605.0	109.47	6.526		
11,700.0	6,711.5	6,757.1	6,753.3	99.5	12.1	88.11	-5,671.6	-571.7	620.2	508.8	111.40	5.567		
11,800.0	6,711.1	6,759.2	6,755.4	101.4	12.1	88.66	-5,671.7	-571.6	528.0	414.7	113.31	4.660		
11,900.0	6,710.7	6,761.4	6,757.6	103.3	12.1	89.21	-5,671.8	-571.6	439.3	324.1	115.23	3.813		
12,000.0	6,710.3	6,763.5	6,759.7	105.2	12.1	89.75	-5,671.8	-571.5	356.6	239.5	117.13	3.044		
12,100.0	6,709.9	6,765.6	6,761.8	107.1	12.1	90.30	-5,671.9	-571.5	285.2	166.1	119.02	2.396		
12,200.0	6,709.5	6,767.7	6,763.9	109.0	12.1	90.85	-5,671.9	-571.4	235.5	114.6	120.91	1.948		
12,279.3	6,709.1	6,769.4	6,765.6	110.5	12.1	91.29	-5,672.0	-571.4	221.8	99.4	122.40	1.812 CC, ES, SF		
12,300.0	6,709.1	6,769.9	6,766.1	110.9	12.1	91.40	-5,672.0	-571.4	222.7	99.9	122.78	1.814		
12,400.0	6,708.7	6,772.0	6,768.2	112.8	12.1	91.95	-5,672.0	-571.3	252.5	127.8	124.65	2.025		
12,500.0	6,708.3	6,774.1	6,770.3	114.7	12.1	92.50	-5,672.1	-571.3	312.8	186.3	126.51	2.473		
12,600.0	6,707.9	6,776.3	6,772.5	116.6	12.1	93.05	-5,672.1	-571.3	389.8	261.5	128.35	3.037		
12,700.0	6,707.5	6,778.4	6,774.6	118.5	12.1	93.60	-5,672.2	-571.2	475.5	345.3	130.19	3.652		
12,800.0	6,707.0	6,780.5	6,776.7	120.4	12.1	94.15	-5,672.2	-571.2	565.8	433.8	132.01	4.286		
12,900.0	6,706.6	6,782.6	6,778.8	122.3	12.1	94.70	-5,672.3	-571.1	659.0	525.2	133.82	4.924		
13,000.0	6,706.2	6,784.8	6,781.0	124.2	12.1	95.24	-5,672.3	-571.1	753.9	618.3	135.62	5.559		
13,100.0	6,705.8	6,786.9	6,783.1	126.1	12.1	95.79	-5,672.4	-571.0	849.9	712.5	137.40	6.186		
13,200.0	6,705.4	6,789.0	6,785.2	128.0	12.1	96.34	-5,672.5	-571.0	946.8	807.6	139.18	6.803		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Churchill 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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

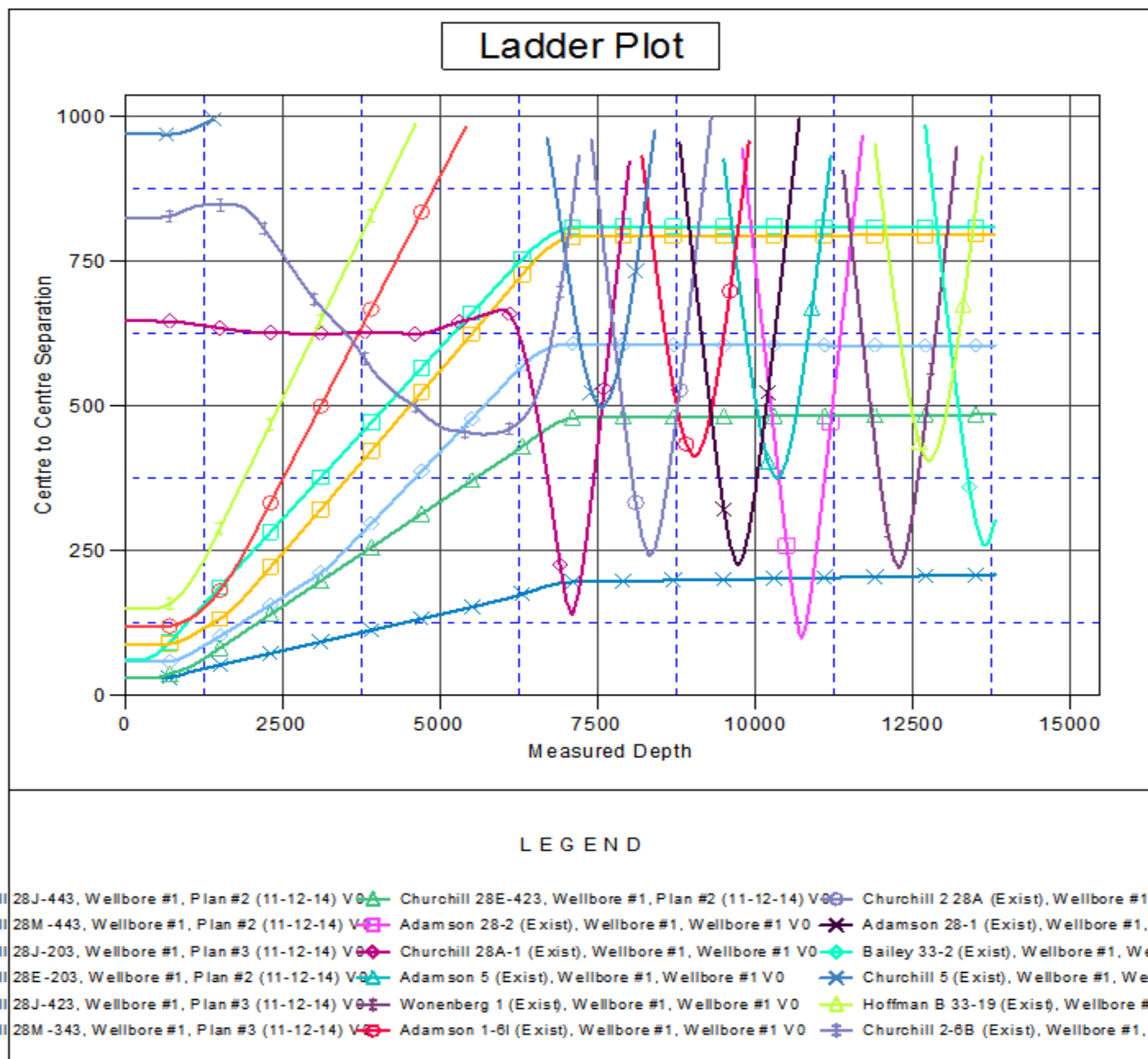
Reference Depths are relative to WELL @ 4647.5ft (Ensign Rig# 136 RCoordinates are relative to: Churchill 28J-343

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°



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 28J-343
<b>Project:</b>	SEC.28-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Reference Site:</b>	Churchill 28J-HZ Pad Sec.28-T5N-R64W	<b>MD Reference:</b>	WELL @ 4647.5ft (Ensign Rig# 136 RKB - 12.5')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Churchill 28J-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 @ 4647.5ft (Ensign Rig# 136 RCoordinates are relative to: Churchill 28J-343

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