

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Bolton 7X-304**

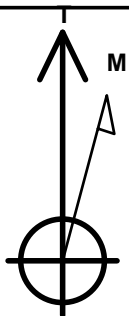
Surface Location: PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 5152.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1328450.81	3129212.27	40.234070	-105.037190	

Original Well Elev WELL @ 5167.0ft (Original Well Elev)

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 400'FSL & 211'FEL	1.0	0.0	0.0	Point
BHL 1206'FSL & 500'FWL	6990.0	743.6	-4475.5	Point

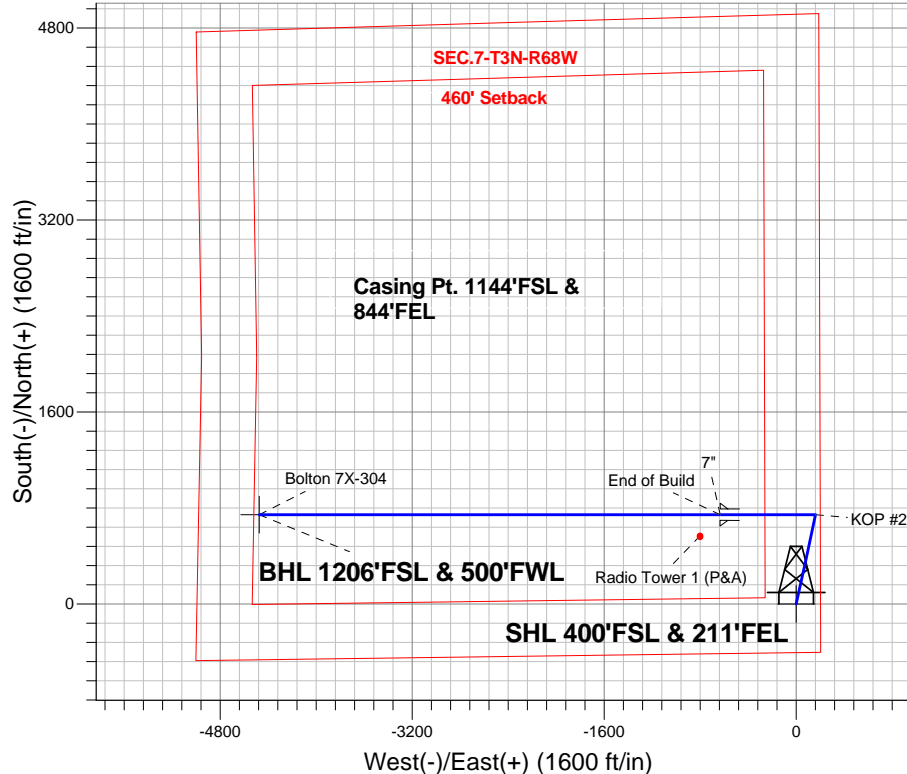


Azimuths to True North
Magnetic North: 8.58°
Magnetic Field
Strength: 52688.1srT
Dip Angle: 66.77°
Date: 7/15/2014
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP #1
6379.6	6433.7	KOP #2
7143.0	7664.1	End of Build

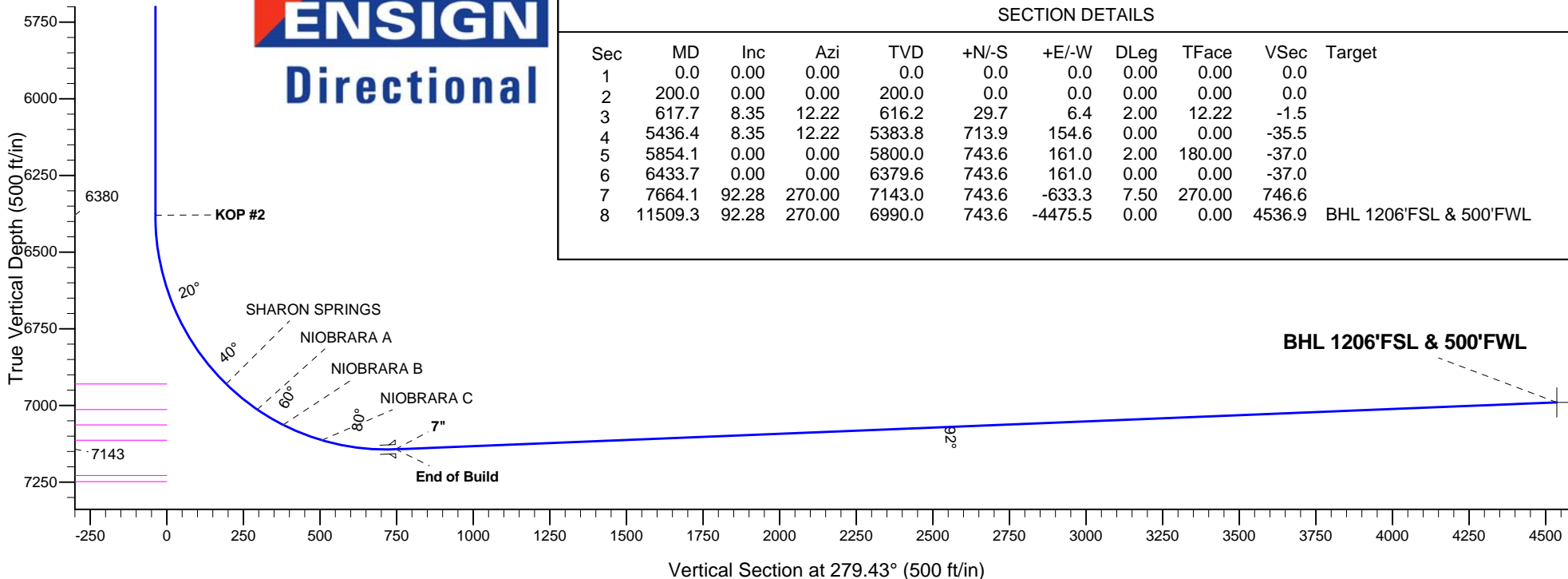
PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W
Bolton 7X-304
Plan #1 (7-15-14)



ENSIGN
Directional

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	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	617.7	8.35	12.22	616.2	29.7	6.4	2.00	12.22	-1.5	
4	5436.4	8.35	12.22	5383.8	713.9	154.6	0.00	0.00	-35.5	
5	5854.1	0.00	0.00	5800.0	743.6	161.0	2.00	180.00	-37.0	
6	6433.7	0.00	0.00	6379.6	743.6	161.0	0.00	0.00	-37.0	
7	7664.1	92.28	270.00	7143.0	743.6	-633.3	7.50	270.00	746.6	
8	11509.3	92.28	270.00	6990.0	743.6	-4475.5	0.00	0.00	4536.9	BHL 1206'FSL & 500'FWL





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.7-T3N-68W

PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W

Bolton 7X-304

Wellbore #1

Plan: Plan #1 (7-15-14)

Standard Planning Report

18 July, 2014

Database:	landmark	Local Co-ordinate Reference:	Well Bolton 7X-304
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Project:	SEC.7-T3N-68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	North Reference:	True
Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-15-14)		

Project	SEC.7-T3N-68W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W											
Site Position:						Northing:			1,328,450.81 ft			Latitude:			40.234070		
From:			Lat/Long			Easting:			3,129,212.27 ft			Longitude:			-105.037190		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.30 °		

Well	Bolton 7X-304					
Well Position	+N/-S	0.0 ft	Northing:	1,328,450.81 ft	Latitude:	40.234070
	+E/-W	0.0 ft	Easting:	3,129,212.27 ft	Longitude:	-105.037190
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,152.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/15/2014	8.58	66.77	52,688

Design	Plan #1 (7-15-14)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	279.43

Plan Sections										
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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
617.7	8.35	12.22	616.2	29.7	6.4	2.00	2.00	0.00	12.22	
5,436.4	8.35	12.22	5,383.8	713.9	154.6	0.00	0.00	0.00	0.00	
5,854.1	0.00	0.00	5,800.0	743.6	161.0	2.00	-2.00	0.00	180.00	
6,433.7	0.00	0.00	6,379.6	743.6	161.0	0.00	0.00	0.00	0.00	
7,664.1	92.28	270.00	7,143.0	743.6	-633.3	7.50	7.50	0.00	270.00	
11,509.3	92.28	270.00	6,990.0	743.6	-4,475.5	0.00	0.00	0.00	0.00	BHL 1206'FSL & 5C

Database:	landmark	Local Co-ordinate Reference:	Well Bolton 7X-304
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Project:	SEC.7-T3N-68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	North Reference:	True
Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-15-14)		

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
KOP #1									
300.0	2.00	12.22	300.0	1.7	0.4	-0.1	2.00	2.00	0.00
400.0	4.00	12.22	399.8	6.8	1.5	-0.3	2.00	2.00	0.00
500.0	6.00	12.22	499.5	15.3	3.3	-0.8	2.00	2.00	0.00
600.0	8.00	12.22	598.7	27.2	5.9	-1.4	2.00	2.00	0.00
617.7	8.35	12.22	616.2	29.7	6.4	-1.5	2.00	2.00	0.00
700.0	8.35	12.22	697.6	41.4	9.0	-2.1	0.00	0.00	0.00
800.0	8.35	12.22	796.6	55.6	12.0	-2.8	0.00	0.00	0.00
900.0	8.35	12.22	895.5	69.8	15.1	-3.5	0.00	0.00	0.00
1,000.0	8.35	12.22	994.5	84.0	18.2	-4.2	0.00	0.00	0.00
1,100.0	8.35	12.22	1,093.4	98.2	21.3	-4.9	0.00	0.00	0.00
1,200.0	8.35	12.22	1,192.3	112.4	24.3	-5.6	0.00	0.00	0.00
1,300.0	8.35	12.22	1,291.3	126.6	27.4	-6.3	0.00	0.00	0.00
1,400.0	8.35	12.22	1,390.2	140.8	30.5	-7.0	0.00	0.00	0.00
1,500.0	8.35	12.22	1,489.2	155.0	33.6	-7.7	0.00	0.00	0.00
1,600.0	8.35	12.22	1,588.1	169.2	36.6	-8.4	0.00	0.00	0.00
1,700.0	8.35	12.22	1,687.0	183.4	39.7	-9.1	0.00	0.00	0.00
1,800.0	8.35	12.22	1,786.0	197.6	42.8	-9.8	0.00	0.00	0.00
1,900.0	8.35	12.22	1,884.9	211.8	45.9	-10.5	0.00	0.00	0.00
2,000.0	8.35	12.22	1,983.9	226.0	48.9	-11.2	0.00	0.00	0.00
2,100.0	8.35	12.22	2,082.8	240.2	52.0	-11.9	0.00	0.00	0.00
2,200.0	8.35	12.22	2,181.7	254.4	55.1	-12.6	0.00	0.00	0.00
2,300.0	8.35	12.22	2,280.7	268.6	58.1	-13.3	0.00	0.00	0.00
2,400.0	8.35	12.22	2,379.6	282.8	61.2	-14.1	0.00	0.00	0.00
2,500.0	8.35	12.22	2,478.6	297.0	64.3	-14.8	0.00	0.00	0.00
2,600.0	8.35	12.22	2,577.5	311.2	67.4	-15.5	0.00	0.00	0.00
2,700.0	8.35	12.22	2,676.4	325.4	70.4	-16.2	0.00	0.00	0.00
2,800.0	8.35	12.22	2,775.4	339.6	73.5	-16.9	0.00	0.00	0.00
2,900.0	8.35	12.22	2,874.3	353.8	76.6	-17.6	0.00	0.00	0.00
3,000.0	8.35	12.22	2,973.2	368.0	79.7	-18.3	0.00	0.00	0.00
3,100.0	8.35	12.22	3,072.2	382.2	82.7	-19.0	0.00	0.00	0.00
3,200.0	8.35	12.22	3,171.1	396.3	85.8	-19.7	0.00	0.00	0.00
3,300.0	8.35	12.22	3,270.1	410.5	88.9	-20.4	0.00	0.00	0.00
3,400.0	8.35	12.22	3,369.0	424.7	92.0	-21.1	0.00	0.00	0.00
3,462.7	8.35	12.22	3,431.0	433.6	93.9	-21.5	0.00	0.00	0.00
PARKMAN									
3,500.0	8.35	12.22	3,467.9	438.9	95.0	-21.8	0.00	0.00	0.00
3,600.0	8.35	12.22	3,566.9	453.1	98.1	-22.5	0.00	0.00	0.00
3,700.0	8.35	12.22	3,665.8	467.3	101.2	-23.2	0.00	0.00	0.00
3,800.0	8.35	12.22	3,764.8	481.5	104.3	-23.9	0.00	0.00	0.00
3,886.2	8.35	12.22	3,850.0	493.8	106.9	-24.5	0.00	0.00	0.00
SUSSEX									
3,900.0	8.35	12.22	3,863.7	495.7	107.3	-24.6	0.00	0.00	0.00
4,000.0	8.35	12.22	3,962.6	509.9	110.4	-25.3	0.00	0.00	0.00
4,100.0	8.35	12.22	4,061.6	524.1	113.5	-26.0	0.00	0.00	0.00
4,200.0	8.35	12.22	4,160.5	538.3	116.6	-26.8	0.00	0.00	0.00
4,300.0	8.35	12.22	4,259.5	552.5	119.6	-27.5	0.00	0.00	0.00
4,400.0	8.35	12.22	4,358.4	566.7	122.7	-28.2	0.00	0.00	0.00
4,467.3	8.35	12.22	4,425.0	576.3	124.8	-28.6	0.00	0.00	0.00

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Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	North Reference:	True
Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-15-14)		

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)
SHANNON									
4,500.0	8.35	12.22	4,457.3	580.9	125.8	-28.9	0.00	0.00	0.00
4,600.0	8.35	12.22	4,556.3	595.1	128.9	-29.6	0.00	0.00	0.00
4,700.0	8.35	12.22	4,655.2	609.3	131.9	-30.3	0.00	0.00	0.00
4,800.0	8.35	12.22	4,754.2	623.5	135.0	-31.0	0.00	0.00	0.00
4,900.0	8.35	12.22	4,853.1	637.7	138.1	-31.7	0.00	0.00	0.00
5,000.0	8.35	12.22	4,952.0	651.9	141.2	-32.4	0.00	0.00	0.00
5,100.0	8.35	12.22	5,051.0	666.1	144.2	-33.1	0.00	0.00	0.00
5,200.0	8.35	12.22	5,149.9	680.3	147.3	-33.8	0.00	0.00	0.00
5,300.0	8.35	12.22	5,248.9	694.5	150.4	-34.5	0.00	0.00	0.00
5,400.0	8.35	12.22	5,347.8	708.7	153.4	-35.2	0.00	0.00	0.00
5,436.4	8.35	12.22	5,383.8	713.9	154.6	-35.5	0.00	0.00	0.00
5,500.0	7.08	12.22	5,446.8	722.2	156.4	-35.9	2.00	-2.00	0.00
5,600.0	5.08	12.22	5,546.3	732.6	158.6	-36.4	2.00	-2.00	0.00
5,700.0	3.08	12.22	5,646.0	739.5	160.1	-36.7	2.00	-2.00	0.00
5,800.0	1.08	12.22	5,745.9	743.1	160.9	-36.9	2.00	-2.00	0.00
5,854.1	0.00	0.00	5,800.0	743.6	161.0	-37.0	2.00	-2.00	0.00
5,900.0	0.00	0.00	5,845.9	743.6	161.0	-37.0	0.00	0.00	0.00
6,000.0	0.00	0.00	5,945.9	743.6	161.0	-37.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,045.9	743.6	161.0	-37.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,145.9	743.6	161.0	-37.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,245.9	743.6	161.0	-37.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,345.9	743.6	161.0	-37.0	0.00	0.00	0.00
6,433.7	0.00	0.00	6,379.6	743.6	161.0	-37.0	0.00	0.00	0.00
KOP #2									
6,500.0	4.97	270.00	6,445.8	743.6	158.1	-34.1	7.50	7.50	0.00
6,600.0	12.47	270.00	6,544.6	743.6	143.0	-19.2	7.50	7.50	0.00
6,700.0	19.97	270.00	6,640.6	743.6	115.1	8.4	7.50	7.50	0.00
6,800.0	27.47	270.00	6,732.1	743.6	74.9	48.0	7.50	7.50	0.00
6,900.0	34.97	270.00	6,817.5	743.6	23.1	99.1	7.50	7.50	0.00
7,000.0	42.47	270.00	6,895.5	743.6	-39.5	160.8	7.50	7.50	0.00
7,048.2	46.09	270.00	6,930.0	743.6	-73.1	194.0	7.50	7.50	0.00
SHARON SPRINGS									
7,100.0	49.97	270.00	6,964.6	743.6	-111.6	232.0	7.50	7.50	0.00
7,180.4	56.00	270.00	7,013.0	743.6	-175.8	295.3	7.50	7.50	0.00
NIORARA A									
7,200.0	57.47	270.00	7,023.7	743.6	-192.2	311.4	7.50	7.50	0.00
7,279.7	63.45	270.00	7,063.0	743.6	-261.4	379.8	7.50	7.50	0.00
NIORARA B									
7,300.0	64.97	270.00	7,071.8	743.6	-279.7	397.8	7.50	7.50	0.00
7,400.0	72.47	270.00	7,108.1	743.6	-372.9	489.7	7.50	7.50	0.00
7,416.8	73.73	270.00	7,113.0	743.6	-389.0	505.6	7.50	7.50	0.00
NIORARA C									
7,500.0	79.97	270.00	7,131.9	743.6	-469.9	585.4	7.50	7.50	0.00
7,600.0	87.47	270.00	7,142.8	743.6	-569.2	683.4	7.50	7.50	0.00
7,664.1	92.28	270.00	7,143.0	743.6	-633.3	746.6	7.50	7.50	0.00
End of Build - 7"									
7,700.0	92.28	270.00	7,141.5	743.6	-669.2	782.0	0.00	0.00	0.00
7,800.0	92.28	270.00	7,137.6	743.6	-769.1	880.6	0.00	0.00	0.00
7,900.0	92.28	270.00	7,133.6	743.6	-869.0	979.2	0.00	0.00	0.00
8,000.0	92.28	270.00	7,129.6	743.6	-969.0	1,077.7	0.00	0.00	0.00

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Project:	SEC.7-T3N-68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	North Reference:	True
Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-15-14)		

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)
8,100.0	92.28	270.00	7,125.6	743.6	-1,068.9	1,176.3	0.00	0.00	0.00
8,200.0	92.28	270.00	7,121.7	743.6	-1,168.8	1,274.9	0.00	0.00	0.00
8,300.0	92.28	270.00	7,117.7	743.6	-1,268.7	1,373.4	0.00	0.00	0.00
8,400.0	92.28	270.00	7,113.7	743.6	-1,368.6	1,472.0	0.00	0.00	0.00
8,500.0	92.28	270.00	7,109.7	743.6	-1,468.6	1,570.6	0.00	0.00	0.00
8,600.0	92.28	270.00	7,105.7	743.6	-1,568.5	1,669.1	0.00	0.00	0.00
8,700.0	92.28	270.00	7,101.8	743.6	-1,668.4	1,767.7	0.00	0.00	0.00
8,800.0	92.28	270.00	7,097.8	743.6	-1,768.3	1,866.3	0.00	0.00	0.00
8,900.0	92.28	270.00	7,093.8	743.6	-1,868.2	1,964.9	0.00	0.00	0.00
9,000.0	92.28	270.00	7,089.8	743.6	-1,968.2	2,063.4	0.00	0.00	0.00
9,100.0	92.28	270.00	7,085.9	743.6	-2,068.1	2,162.0	0.00	0.00	0.00
9,200.0	92.28	270.00	7,081.9	743.6	-2,168.0	2,260.6	0.00	0.00	0.00
9,300.0	92.28	270.00	7,077.9	743.6	-2,267.9	2,359.1	0.00	0.00	0.00
9,400.0	92.28	270.00	7,073.9	743.6	-2,367.9	2,457.7	0.00	0.00	0.00
9,500.0	92.28	270.00	7,069.9	743.6	-2,467.8	2,556.3	0.00	0.00	0.00
9,600.0	92.28	270.00	7,066.0	743.6	-2,567.7	2,654.8	0.00	0.00	0.00
9,700.0	92.28	270.00	7,062.0	743.6	-2,667.6	2,753.4	0.00	0.00	0.00
9,800.0	92.28	270.00	7,058.0	743.6	-2,767.5	2,852.0	0.00	0.00	0.00
9,900.0	92.28	270.00	7,054.0	743.6	-2,867.5	2,950.6	0.00	0.00	0.00
10,000.0	92.28	270.00	7,050.0	743.6	-2,967.4	3,049.1	0.00	0.00	0.00
10,100.0	92.28	270.00	7,046.1	743.6	-3,067.3	3,147.7	0.00	0.00	0.00
10,200.0	92.28	270.00	7,042.1	743.6	-3,167.2	3,246.3	0.00	0.00	0.00
10,300.0	92.28	270.00	7,038.1	743.6	-3,267.1	3,344.8	0.00	0.00	0.00
10,400.0	92.28	270.00	7,034.1	743.6	-3,367.1	3,443.4	0.00	0.00	0.00
10,500.0	92.28	270.00	7,030.2	743.6	-3,467.0	3,542.0	0.00	0.00	0.00
10,600.0	92.28	270.00	7,026.2	743.6	-3,566.9	3,640.5	0.00	0.00	0.00
10,700.0	92.28	270.00	7,022.2	743.6	-3,666.8	3,739.1	0.00	0.00	0.00
10,800.0	92.28	270.00	7,018.2	743.6	-3,766.7	3,837.7	0.00	0.00	0.00
10,900.0	92.28	270.00	7,014.2	743.6	-3,866.7	3,936.2	0.00	0.00	0.00
11,000.0	92.28	270.00	7,010.3	743.6	-3,966.6	4,034.8	0.00	0.00	0.00
11,100.0	92.28	270.00	7,006.3	743.6	-4,066.5	4,133.4	0.00	0.00	0.00
11,200.0	92.28	270.00	7,002.3	743.6	-4,166.4	4,232.0	0.00	0.00	0.00
11,300.0	92.28	270.00	6,998.3	743.6	-4,266.3	4,330.5	0.00	0.00	0.00
11,400.0	92.28	270.00	6,994.3	743.6	-4,366.3	4,429.1	0.00	0.00	0.00
11,500.0	92.28	270.00	6,990.4	743.6	-4,466.2	4,527.7	0.00	0.00	0.00
11,509.3	92.28	270.00	6,990.0	743.6	-4,475.5	4,536.9	0.00	0.00	0.00

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,664.1	7,143.0	7"	7	7-1/2	

Database:	landmark	Local Co-ordinate Reference:	Well Bolton 7X-304
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Project:	SEC.7-T3N-68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	North Reference:	True
Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-15-14)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,462.7	3,431.0	PARKMAN		0.00		
3,886.2	3,850.0	SUSSEX		0.00		
4,467.3	4,425.0	SHANNON		0.00		
7,048.2	6,930.0	SHARON SPRINGS		0.00		
7,180.4	7,013.0	NIOBRARA A		0.00		
7,279.7	7,063.0	NIOBRARA B		0.00		
7,416.8	7,113.0	NIOBRARA C		0.00		
	7,228.0	FT HAYS		0.00		
	7,248.0	CODELL		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
200.0	200.0	0.0	0.0	KOP #1	
6,433.7	6,379.6	743.6	161.0	KOP #2	
7,664.1	7,143.0	743.6	-633.3	End of Build	



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.7-T3N-68W

PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W

Bolton 7X-304

Wellbore #1

Plan #1 (7-15-14)

Anticollision Report

18 July, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (7-15-14)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 7/17/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,509.3	Plan #1 (7-15-14) (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
Offset Well - Wellbore - Design						
Existings Sec.7-T3N-R68W						
Billings 22-18 (Exist.) - Wellbore #1 - Wellbore #1						Out of range
Radio Tower 1 (P&A) - Wellbore #1 - Wellbore #1	7,832.2	7,123.3	175.3	4.5	1.027	Level 2, CC, ES, SF
PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W						
Bolton 7X-434 - Wellbore #1 - Plan #1 (7-15-14)	200.0	199.0	32.8	32.1	48.805	CC, ES
Bolton 7X-434 - Wellbore #1 - Plan #1 (7-15-14)	11,509.3	11,579.2	363.9	130.5	1.559	SF
Bolton 7Y-214 - Wellbore #1 - Plan #1 (7-16-14)	200.0	199.0	61.9	61.3	92.153	CC, ES
Bolton 7Y-214 - Wellbore #1 - Plan #1 (7-16-14)	11,509.3	11,423.8	664.0	412.7	2.642	SF
Bolton 7Y-404 - Wellbore #1 - Plan #1 (7-16-14)	200.0	199.0	91.1	90.4	135.519	CC, ES
Bolton 7Y-404 - Wellbore #1 - Plan #1 (7-16-14)	10,400.0	10,449.6	999.8	809.2	5.244	SF

Offset Design												Offset Site Error: 0.0 ft		
Existings Sec.7-T3N-R68W - Radio Tower 1 (P&A) - Wellbore #1 - Wellbore #1												Offset Well Error: 0.0 ft		
Survey Program: 7850-UNKNOWN														
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	
0.0	0.0	0.0	0.0	0.0	0.0	-54.65	568.3	-801.3	982.5					
100.0	100.0	87.0	87.0	0.1	1.7	-54.65	568.3	-801.3	982.4	980.5	1.85	530.277		
200.0	200.0	187.0	187.0	0.3	3.7	-54.65	568.3	-801.3	982.4	978.3	4.08	240.936		
300.0	300.0	287.0	287.0	0.6	5.7	-66.98	568.3	-801.3	981.7	975.4	6.30	155.795		
400.0	399.8	386.8	386.8	0.8	7.7	-67.30	568.3	-801.3	979.7	971.1	8.53	114.895		
500.0	499.5	486.5	486.5	1.0	9.7	-67.83	568.3	-801.3	976.3	965.6	10.76	90.726		
600.0	598.7	585.7	585.7	1.3	11.7	-68.57	568.3	-801.3	971.8	958.8	13.01	74.672		
700.0	697.6	684.6	684.6	1.6	13.7	-69.38	568.3	-801.3	966.5	951.2	15.29	63.195		
800.0	796.6	783.6	783.6	2.0	15.7	-70.19	568.3	-801.3	961.5	943.9	17.59	54.663		
900.0	895.5	882.5	882.5	2.3	17.7	-71.00	568.3	-801.3	956.6	936.7	19.89	48.090		
1,000.0	994.5	981.5	981.5	2.6	19.6	-71.81	568.3	-801.3	951.9	929.7	22.20	42.879		
1,100.0	1,093.4	1,080.4	1,080.4	3.0	21.6	-72.64	568.3	-801.3	947.4	922.9	24.51	38.651		
1,200.0	1,192.3	1,179.3	1,179.3	3.3	23.6	-73.48	568.3	-801.3	943.2	916.3	26.83	35.155		
1,300.0	1,291.3	1,278.3	1,278.3	3.6	25.6	-74.32	568.3	-801.3	939.1	909.9	29.15	32.219		
1,400.0	1,390.2	1,377.2	1,377.2	4.0	27.5	-75.17	568.3	-801.3	935.2	903.8	31.47	29.720		
1,500.0	1,489.2	1,476.2	1,476.2	4.3	29.5	-76.02	568.3	-801.3	931.6	897.8	33.79	27.569		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0ft
Survey Program: 7850-UNKNOWN													Offset Well Error:	0.0ft
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	
1,600.0	1,588.1	1,575.1	1,575.1	4.7	31.5	-76.88	568.3	-801.3	928.1	892.0	36.12	25.699		
1,700.0	1,687.0	1,674.0	1,674.0	5.0	33.5	-77.75	568.3	-801.3	924.9	886.5	38.44	24.060		
1,800.0	1,786.0	1,773.0	1,773.0	5.4	35.5	-78.62	568.3	-801.3	921.9	881.1	40.77	22.613		
1,900.0	1,884.9	1,871.9	1,871.9	5.7	37.4	-79.50	568.3	-801.3	919.1	876.0	43.10	21.327		
2,000.0	1,983.9	1,970.9	1,970.9	6.1	39.4	-80.39	568.3	-801.3	916.6	871.1	45.43	20.177		
2,100.0	2,082.8	2,069.8	2,069.8	6.4	41.4	-81.27	568.3	-801.3	914.2	866.5	47.76	19.144		
2,200.0	2,181.7	2,168.7	2,168.7	6.7	43.4	-82.17	568.3	-801.3	912.1	862.0	50.09	18.211		
2,300.0	2,280.7	2,267.7	2,267.7	7.1	45.4	-83.06	568.3	-801.3	910.2	857.8	52.42	17.365		
2,400.0	2,379.6	2,366.6	2,366.6	7.4	47.3	-83.96	568.3	-801.3	908.6	853.8	54.75	16.596		
2,500.0	2,478.6	2,465.6	2,465.6	7.8	49.3	-84.87	568.3	-801.3	907.1	850.1	57.08	15.893		
2,600.0	2,577.5	2,564.5	2,564.5	8.1	51.3	-85.77	568.3	-801.3	905.9	846.5	59.41	15.250		
2,700.0	2,676.4	2,663.4	2,663.4	8.5	53.3	-86.68	568.3	-801.3	905.0	843.2	61.74	14.659		
2,800.0	2,775.4	2,762.4	2,762.4	8.8	55.2	-87.59	568.3	-801.3	904.2	840.2	64.06	14.114		
2,900.0	2,874.3	2,861.3	2,861.3	9.2	57.2	-88.50	568.3	-801.3	903.7	837.3	66.39	13.612		
3,000.0	2,973.2	2,960.2	2,960.2	9.5	59.2	-89.41	568.3	-801.3	903.5	834.7	68.72	13.147		
3,064.7	3,037.3	3,024.3	3,024.3	9.7	60.5	-90.00	568.3	-801.3	903.4	833.2	70.22	12.865		
3,100.0	3,072.2	3,059.2	3,059.2	9.9	61.2	-90.32	568.3	-801.3	903.4	832.4	71.04	12.717		
3,200.0	3,171.1	3,158.1	3,158.1	10.2	63.2	-91.23	568.3	-801.3	903.6	830.3	73.37	12.317		
3,300.0	3,270.1	3,257.1	3,257.1	10.6	65.1	-92.14	568.3	-801.3	904.1	828.4	75.69	11.944		
3,400.0	3,369.0	3,356.0	3,356.0	10.9	67.1	-93.05	568.3	-801.3	904.7	826.7	78.01	11.598		
3,500.0	3,467.9	3,454.9	3,454.9	11.2	69.1	-93.96	568.3	-801.3	905.6	825.3	80.33	11.274		
3,600.0	3,566.9	3,553.9	3,553.9	11.6	71.1	-94.87	568.3	-801.3	906.8	824.1	82.65	10.972		
3,700.0	3,665.8	3,652.8	3,652.8	11.9	73.1	-95.77	568.3	-801.3	908.1	823.2	84.96	10.689		
3,800.0	3,764.8	3,751.8	3,751.8	12.3	75.0	-96.67	568.3	-801.3	909.7	822.4	87.27	10.424		
3,900.0	3,863.7	3,850.7	3,850.7	12.6	77.0	-97.57	568.3	-801.3	911.5	821.9	89.58	10.175		
4,000.0	3,962.6	3,949.6	3,949.6	13.0	79.0	-98.46	568.3	-801.3	913.6	821.7	91.89	9.942		
4,100.0	4,061.6	4,048.6	4,048.6	13.3	81.0	-99.35	568.3	-801.3	915.9	821.7	94.19	9.723		
4,200.0	4,160.5	4,147.5	4,147.5	13.7	83.0	-100.24	568.3	-801.3	918.3	821.9	96.49	9.517		
4,300.0	4,259.5	4,246.5	4,246.5	14.0	84.9	-101.12	568.3	-801.3	921.1	822.3	98.79	9.323		
4,400.0	4,358.4	4,345.4	4,345.4	14.4	86.9	-101.99	568.3	-801.3	924.0	822.9	101.09	9.140		
4,500.0	4,457.3	4,444.3	4,444.3	14.7	88.9	-102.86	568.3	-801.3	927.2	823.8	103.38	8.968		
4,600.0	4,556.3	4,543.3	4,543.3	15.1	90.9	-103.73	568.3	-801.3	930.5	824.9	105.67	8.806		
4,700.0	4,655.2	4,642.2	4,642.2	15.4	92.8	-104.58	568.3	-801.3	934.1	826.2	107.96	8.653		
4,800.0	4,754.2	4,741.2	4,741.2	15.8	94.8	-105.43	568.3	-801.3	937.9	827.7	110.24	8.508		
4,900.0	4,853.1	4,840.1	4,840.1	16.1	96.8	-106.28	568.3	-801.3	941.9	829.4	112.52	8.371		
5,000.0	4,952.0	4,939.0	4,939.0	16.4	98.8	-107.11	568.3	-801.3	946.2	831.3	114.80	8.242		
5,100.0	5,051.0	5,038.0	5,038.0	16.8	100.8	-107.94	568.3	-801.3	950.6	833.5	117.08	8.119		
5,200.0	5,149.9	5,136.9	5,136.9	17.1	102.7	-108.76	568.3	-801.3	955.2	835.8	119.35	8.003		
5,300.0	5,248.9	5,235.9	5,235.9	17.5	104.7	-109.58	568.3	-801.3	960.0	838.4	121.62	7.894		
5,400.0	5,347.8	5,334.8	5,334.8	17.8	106.7	-110.38	568.3	-801.3	965.0	841.1	123.88	7.790		
5,500.0	5,446.8	5,433.8	5,433.8	18.2	108.7	-111.20	568.3	-801.3	970.0	843.8	126.16	7.689		
5,600.0	5,546.3	5,533.3	5,533.3	18.4	110.7	-111.85	568.3	-801.3	973.9	845.5	128.39	7.586		
5,700.0	5,646.0	5,633.0	5,633.0	18.6	112.7	-112.29	568.3	-801.3	976.5	846.0	130.59	7.478		
5,800.0	5,745.9	5,732.9	5,732.9	18.7	114.7	-112.51	568.3	-801.3	977.9	845.2	132.75	7.367		
5,900.0	5,845.9	5,832.9	5,832.9	18.9	116.7	-100.32	568.3	-801.3	978.1	846.7	131.40	7.444		
6,000.0	5,945.9	5,932.9	5,932.9	19.0	118.7	-100.32	568.3	-801.3	978.1	844.5	133.59	7.322		
6,100.0	6,045.9	6,032.9	6,032.9	19.2	120.7	-100.32	568.3	-801.3	978.1	842.3	135.79	7.203		
6,200.0	6,145.9	6,132.9	6,132.9	19.3	122.7	-100.32	568.3	-801.3	978.1	840.1	137.98	7.089		
6,300.0	6,245.9	6,232.9	6,232.9	19.5	124.7	-100.32	568.3	-801.3	978.1	838.0	140.18	6.978		
6,400.0	6,345.9	6,332.9	6,332.9	19.6	126.7	-100.32	568.3	-801.3	978.1	835.8	142.37	6.870		
6,500.0	6,445.8	6,432.8	6,432.8	19.8	128.7	-10.39	568.3	-801.3	975.3	828.1	147.24	6.624		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													Existings Sec.7-T3N-R68W - Radio Tower 1 (P&A) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft
Survey Program: 7850-UNKNOWN													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					
6,600.0	6,544.6	6,531.6	6,531.6	19.9	130.6	-10.76	568.3	-801.3	960.4	813.9	146.45	6.558					
6,700.0	6,640.6	6,627.6	6,627.6	20.0	132.6	-11.50	568.3	-801.3	933.0	789.8	143.18	6.516					
6,800.0	6,732.1	6,719.1	6,719.1	20.0	134.4	-12.71	568.3	-801.3	893.5	756.0	137.50	6.498					
6,900.0	6,817.5	6,804.5	6,804.5	20.1	136.1	-14.54	568.3	-801.3	842.8	713.0	129.73	6.496					
7,000.0	6,895.5	6,882.5	6,882.5	20.2	137.6	-17.32	568.3	-801.3	781.7	661.1	120.64	6.480					
7,100.0	6,964.6	6,951.6	6,951.6	20.3	139.0	-21.56	568.3	-801.3	711.6	599.7	111.95	6.357					
7,200.0	7,023.7	7,010.7	7,010.7	20.6	140.2	-28.15	568.3	-801.3	633.9	526.4	107.48	5.897					
7,300.0	7,071.8	7,058.8	7,058.8	21.1	141.2	-38.46	568.3	-801.3	550.2	436.5	113.69	4.840					
7,400.0	7,108.1	7,095.1	7,095.1	21.9	141.9	-53.64	568.3	-801.3	462.9	329.2	133.69	3.462					
7,500.0	7,131.9	7,118.9	7,118.9	23.2	142.4	-71.78	568.3	-801.3	374.9	219.1	155.73	2.407					
7,600.0	7,142.8	7,129.8	7,129.8	24.8	142.6	-86.66	568.3	-801.3	290.8	125.2	165.62	1.756					
7,700.0	7,141.5	7,128.5	7,128.5	26.6	142.6	-91.72	568.3	-801.3	219.5	51.5	167.98	1.307 Level 3					
7,800.0	7,137.6	7,124.6	7,124.6	28.6	142.5	-90.42	568.3	-801.3	178.2	8.1	170.05	1.048 Level 2					
7,832.2	7,136.3	7,123.3	7,123.3	29.3	142.5	-90.00	568.3	-801.3	175.3	4.5	170.74	1.027 Level 2, CC, ES, SF					
7,900.0	7,133.6	7,120.6	7,120.6	30.8	142.4	-89.12	568.3	-801.3	187.9	15.7	172.15	1.091 Level 2					
8,000.0	7,129.6	7,116.6	7,116.6	33.1	142.3	-87.82	568.3	-801.3	242.5	68.3	174.25	1.392 Level 3					
8,100.0	7,125.6	7,112.6	7,112.6	35.4	142.3	-86.52	568.3	-801.3	319.9	143.5	176.32	1.814					
8,200.0	7,121.7	7,108.7	7,108.7	37.8	142.2	-85.23	568.3	-801.3	407.2	228.8	178.36	2.283					
8,300.0	7,117.7	7,104.7	7,104.7	40.2	142.1	-83.94	568.3	-801.3	499.2	318.8	180.35	2.768					
8,400.0	7,113.7	7,100.7	7,100.7	42.7	142.0	-82.66	568.3	-801.3	593.8	411.5	182.29	3.258					
8,500.0	7,109.7	7,096.7	7,096.7	45.3	141.9	-81.39	568.3	-801.3	689.9	505.7	184.15	3.746					
8,600.0	7,105.7	7,092.7	7,092.7	47.8	141.9	-80.12	568.3	-801.3	787.0	601.0	185.94	4.232					
8,700.0	7,101.8	7,088.8	7,088.8	50.4	141.8	-78.86	568.3	-801.3	884.6	697.0	187.66	4.714					
8,800.0	7,097.8	7,084.8	7,084.8	53.0	141.7	-77.62	568.3	-801.3	982.8	793.5	189.29	5.192					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													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	-180.00	-32.8	0.0	32.8					
100.0	100.0	99.0	99.0	0.1	0.1	-180.00	-32.8	0.0	32.8	32.6	0.22	146.660		
200.0	200.0	199.0	199.0	0.3	0.3	-180.00	-32.8	0.0	32.8	32.1	0.67	48.805 CC, ES		
300.0	300.0	299.0	299.0	0.6	0.6	168.39	-32.8	0.0	34.5	33.4	1.13	30.563		
400.0	399.8	398.8	398.8	0.8	0.8	169.89	-32.8	0.0	39.6	38.1	1.59	24.927		
500.0	499.5	498.5	498.5	1.0	1.0	171.68	-32.8	0.0	48.3	46.2	2.05	23.510		
600.0	598.7	597.7	597.7	1.3	1.2	173.33	-32.8	0.0	60.3	57.8	2.51	23.995		
700.0	697.6	696.6	696.6	1.6	1.5	174.61	-32.8	0.0	74.7	71.8	2.97	25.177		
800.0	796.6	795.6	795.6	2.0	1.7	175.49	-32.8	0.0	89.2	85.8	3.42	26.054		
900.0	895.5	894.5	894.5	2.3	1.9	176.12	-32.8	0.0	103.7	99.8	3.88	26.709		
1,000.0	994.5	993.5	993.5	2.6	2.1	176.60	-32.8	0.0	118.2	113.9	4.34	27.216		
1,100.0	1,093.4	1,092.4	1,092.4	3.0	2.3	176.97	-32.8	0.0	132.7	127.9	4.80	27.620		
1,200.0	1,192.3	1,191.3	1,191.3	3.3	2.6	177.27	-32.8	0.0	147.2	141.9	5.27	27.948		
1,300.0	1,291.3	1,290.6	1,290.6	3.6	2.8	177.42	-31.3	0.5	160.2	154.5	5.74	27.924		
1,400.0	1,390.2	1,401.1	1,400.9	4.0	3.0	177.33	-26.2	2.4	169.7	163.5	6.21	27.317		
1,500.0	1,489.2	1,507.2	1,506.6	4.3	3.3	177.01	-17.3	5.6	175.5	168.8	6.69	26.226		
1,600.0	1,588.1	1,612.5	1,611.1	4.7	3.5	176.49	-5.0	10.1	177.8	170.6	7.18	24.766		
1,700.0	1,687.0	1,712.5	1,710.1	5.0	3.8	175.92	8.0	14.8	178.8	171.1	7.66	23.348		
1,800.0	1,786.0	1,812.5	1,809.2	5.4	4.1	175.35	20.9	19.4	179.8	171.7	8.14	22.091		
1,900.0	1,884.9	1,912.5	1,908.2	5.7	4.3	174.79	33.9	24.1	180.9	172.2	8.63	20.967		
2,000.0	1,983.9	2,012.5	2,007.2	6.1	4.6	174.24	46.8	28.8	181.9	172.8	9.11	19.962		
2,100.0	2,082.8	2,112.4	2,106.3	6.4	4.9	173.70	59.7	33.5	183.0	173.4	9.61	19.052		
2,200.0	2,181.7	2,212.4	2,205.3	6.7	5.2	173.16	72.7	38.2	184.1	174.0	10.10	18.229		
2,300.0	2,280.7	2,312.4	2,304.3	7.1	5.5	172.63	85.6	42.9	185.2	174.6	10.60	17.479		
2,400.0	2,379.6	2,412.4	2,403.3	7.4	5.8	172.10	98.6	47.5	186.3	175.2	11.10	16.794		
2,500.0	2,478.6	2,512.3	2,502.4	7.8	6.1	171.58	111.5	52.2	187.5	175.9	11.60	16.165		
2,600.0	2,577.5	2,612.3	2,601.4	8.1	6.4	171.07	124.5	56.9	188.6	176.5	12.10	15.587		
2,700.0	2,676.4	2,712.3	2,700.4	8.5	6.8	170.56	137.4	61.6	189.8	177.2	12.61	15.053		
2,800.0	2,775.4	2,812.3	2,799.4	8.8	7.1	170.06	150.3	66.3	191.0	177.9	13.12	14.559		
2,900.0	2,874.3	2,912.3	2,898.5	9.2	7.4	169.57	163.3	71.0	192.2	178.6	13.63	14.101		
3,000.0	2,973.2	3,012.2	2,997.5	9.5	7.7	169.08	176.2	75.7	193.4	179.3	14.14	13.674		
3,100.0	3,072.2	3,112.2	3,096.5	9.9	8.0	168.60	189.2	80.3	194.6	180.0	14.66	13.276		
3,200.0	3,171.1	3,212.2	3,195.6	10.2	8.4	168.12	202.1	85.0	195.9	180.7	15.18	12.904		
3,300.0	3,270.1	3,312.2	3,294.6	10.6	8.7	167.65	215.1	89.7	197.1	181.4	15.70	12.555		
3,400.0	3,369.0	3,412.2	3,393.6	10.9	9.0	167.19	228.0	94.4	198.4	182.2	16.23	12.228		
3,500.0	3,467.9	3,512.1	3,492.6	11.2	9.3	166.73	240.9	99.1	199.7	182.9	16.75	11.920		
3,600.0	3,566.9	3,612.1	3,591.7	11.6	9.7	166.28	253.9	103.8	201.0	183.7	17.28	11.631		
3,700.0	3,665.8	3,712.1	3,690.7	11.9	10.0	165.83	266.8	108.4	202.3	184.5	17.81	11.357		
3,800.0	3,764.8	3,812.1	3,789.7	12.3	10.3	165.39	279.8	113.1	203.6	185.3	18.35	11.099		
3,900.0	3,863.7	3,912.1	3,888.7	12.6	10.6	164.95	292.7	117.8	204.9	186.1	18.88	10.855		
4,000.0	3,962.6	4,012.0	3,987.8	13.0	11.0	164.53	305.7	122.5	206.3	186.9	19.42	10.623		
4,100.0	4,061.6	4,112.0	4,086.8	13.3	11.3	164.10	318.6	127.2	207.6	187.7	19.96	10.403		
4,200.0	4,160.5	4,212.0	4,185.8	13.7	11.6	163.68	331.5	131.9	209.0	188.5	20.50	10.195		
4,300.0	4,259.5	4,312.0	4,284.8	14.0	12.0	163.27	344.5	136.5	210.4	189.3	21.05	9.996		
4,400.0	4,358.4	4,412.0	4,383.9	14.4	12.3	162.86	357.4	141.2	211.8	190.2	21.59	9.807		
4,500.0	4,457.3	4,511.9	4,482.9	14.7	12.6	162.46	370.4	145.9	213.2	191.0	22.14	9.627		
4,600.0	4,556.3	4,611.9	4,581.9	15.1	13.0	162.07	383.3	150.6	214.6	191.9	22.69	9.455		
4,700.0	4,655.2	4,707.0	4,676.3	15.4	13.2	161.79	394.8	154.8	216.9	193.7	23.20	9.348		
4,800.0	4,754.2	4,800.0	4,768.8	15.8	13.4	161.87	403.3	157.8	222.0	198.3	23.63	9.395		
4,900.0	4,853.1	4,893.5	4,862.1	16.1	13.6	162.28	408.9	159.9	230.0	206.0	24.02	9.577		
5,000.0	4,952.0	4,986.0	4,954.5	16.4	13.8	162.95	411.7	160.9	241.0	216.7	24.38	9.888		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design		PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W - Bolton 7X-434 - Wellbore #1 - Plan #1 (7-15-14)										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)								
5,100.0	5,051.0	5,081.4	5,050.0	16.8	13.9	163.84	412.1	161.0	254.6	229.9	24.73	10.297				
5,200.0	5,149.9	5,180.4	5,148.9	17.1	14.1	164.70	412.1	161.0	268.6	243.5	25.11	10.697				
5,300.0	5,248.9	5,279.3	5,247.9	17.5	14.3	165.48	412.1	161.0	282.6	257.1	25.51	11.081				
5,400.0	5,347.8	5,378.3	5,346.8	17.8	14.5	166.18	412.1	161.0	296.7	270.8	25.91	11.451				
5,500.0	5,446.8	5,477.3	5,445.8	18.2	14.6	166.83	412.1	161.0	310.2	283.9	26.31	11.788				
5,600.0	5,546.3	5,576.7	5,545.3	18.4	14.8	167.31	412.1	161.0	320.5	293.9	26.67	12.019				
5,700.0	5,646.0	5,676.5	5,645.0	18.6	15.0	167.61	412.1	161.0	327.5	300.5	27.00	12.128				
5,800.0	5,745.9	5,776.4	5,744.9	18.7	15.2	167.76	412.1	161.0	331.0	303.7	27.31	12.120				
5,900.0	5,845.9	5,876.4	5,844.9	18.9	15.3	-180.00	412.1	161.0	331.5	297.7	33.77	9.816				
6,000.0	5,945.9	5,976.4	5,944.9	19.0	15.5	-180.00	412.1	161.0	331.5	297.4	34.11	9.720				
6,100.0	6,045.9	6,076.4	6,044.9	19.2	15.7	-180.00	412.1	161.0	331.5	297.1	34.45	9.625				
6,200.0	6,145.9	6,176.4	6,144.9	19.3	15.9	-180.00	412.1	161.0	331.5	296.7	34.78	9.531				
6,300.0	6,245.9	6,276.4	6,244.9	19.5	16.1	-180.00	412.1	161.0	331.5	296.4	35.13	9.438				
6,400.0	6,345.9	6,376.4	6,344.9	19.6	16.3	-180.00	412.1	161.0	331.5	296.1	35.47	9.346				
6,444.6	6,390.5	6,420.9	6,389.5	19.7	16.4	-90.15	412.1	161.0	331.5	301.6	29.91	11.084				
6,500.0	6,445.8	6,476.3	6,444.8	19.8	16.5	-90.49	412.1	161.0	331.5	301.4	30.15	10.996				
6,600.0	6,544.6	6,576.6	6,545.0	19.9	16.6	-92.47	412.1	157.3	331.8	301.2	30.62	10.836				
6,700.0	6,640.6	6,678.6	6,645.6	20.0	16.8	-94.50	412.1	140.6	332.6	301.5	31.03	10.719				
6,800.0	6,732.1	6,782.3	6,744.6	20.0	16.9	-96.45	412.1	110.1	333.7	302.3	31.37	10.635				
6,900.0	6,817.5	6,887.7	6,840.0	20.1	17.0	-98.29	412.1	65.6	335.1	303.3	31.72	10.564				
7,000.0	6,895.5	6,994.7	6,929.7	20.2	17.0	-99.98	412.1	7.4	336.7	304.5	32.17	10.465				
7,100.0	6,964.6	7,103.3	7,011.6	20.3	17.2	-101.50	412.1	-63.8	338.4	305.5	32.90	10.283				
7,200.0	7,023.7	7,213.3	7,083.3	20.6	17.5	-102.80	412.1	-147.1	340.0	305.9	34.12	9.965				
7,300.0	7,071.8	7,324.6	7,143.0	21.1	18.3	-103.86	412.1	-240.9	341.5	305.5	35.99	9.489				
7,400.0	7,108.1	7,436.9	7,188.8	21.9	19.6	-104.67	412.1	-343.4	342.7	304.1	38.60	8.878				
7,500.0	7,131.9	7,549.9	7,219.2	23.2	21.4	-105.19	412.1	-452.1	343.5	301.6	41.95	8.190				
7,600.0	7,142.8	7,663.4	7,233.3	24.8	23.5	-105.44	412.1	-564.7	343.9	298.0	45.92	7.490				
7,700.0	7,141.5	7,770.3	7,232.8	26.6	25.6	-105.55	412.1	-671.5	344.1	294.0	50.08	6.871				
7,800.0	7,137.6	7,870.3	7,230.3	28.6	27.7	-105.79	412.1	-771.4	344.5	290.3	54.18	6.359				
7,900.0	7,133.6	7,970.3	7,227.9	30.8	30.0	-106.03	412.1	-871.4	344.9	286.5	58.48	5.899				
8,000.0	7,129.6	8,070.3	7,225.4	33.1	32.3	-106.28	412.1	-971.3	345.4	282.4	62.93	5.488				
8,100.0	7,125.6	8,170.2	7,222.9	35.4	34.7	-106.52	412.1	-1,071.3	345.8	278.3	67.50	5.123				
8,200.0	7,121.7	8,270.2	7,220.5	37.8	37.2	-106.76	412.1	-1,171.3	346.2	274.1	72.17	4.798				
8,300.0	7,117.7	8,370.2	7,218.0	40.2	39.7	-107.00	412.1	-1,271.2	346.7	269.8	76.91	4.507				
8,400.0	7,113.7	8,470.2	7,215.5	42.7	42.2	-107.24	412.1	-1,371.2	347.1	265.4	81.71	4.248				
8,500.0	7,109.7	8,570.2	7,213.1	45.3	44.8	-107.48	412.1	-1,471.1	347.6	261.0	86.56	4.015				
8,600.0	7,105.7	8,670.2	7,210.6	47.8	47.4	-107.72	412.1	-1,571.1	348.0	256.6	91.44	3.806				
8,700.0	7,101.8	8,770.2	7,208.2	50.4	50.0	-107.95	412.1	-1,671.1	348.5	252.1	96.35	3.617				
8,800.0	7,097.8	8,870.2	7,205.7	53.0	52.7	-108.19	412.1	-1,771.0	349.0	247.7	101.29	3.445				
8,900.0	7,093.8	8,970.1	7,203.2	55.7	55.3	-108.43	412.1	-1,871.0	349.4	243.2	106.24	3.289				
9,000.0	7,089.8	9,070.1	7,200.8	58.3	58.0	-108.66	412.1	-1,970.9	349.9	238.7	111.20	3.147				
9,100.0	7,085.9	9,170.1	7,198.3	61.0	60.7	-108.90	412.1	-2,070.9	350.4	234.2	116.17	3.016				
9,200.0	7,081.9	9,270.1	7,195.9	63.7	63.4	-109.13	412.1	-2,170.8	350.9	229.8	121.14	2.897				
9,300.0	7,077.9	9,370.1	7,193.4	66.3	66.1	-109.37	412.1	-2,270.8	351.4	225.3	126.12	2.786				
9,400.0	7,073.9	9,470.1	7,190.9	69.0	68.8	-109.60	412.1	-2,370.8	351.9	220.8	131.10	2.684				
9,500.0	7,069.9	9,570.1	7,188.5	71.7	71.5	-109.83	412.1	-2,470.7	352.4	216.3	136.08	2.590				
9,600.0	7,066.0	9,670.1	7,186.0	74.4	74.2	-110.07	412.1	-2,570.7	352.9	211.9	141.05	2.502				
9,700.0	7,062.0	9,770.1	7,183.6	77.2	76.9	-110.30	412.1	-2,670.6	353.5	207.4	146.02	2.421				
9,800.0	7,058.0	9,870.0	7,181.1	79.9	79.7	-110.53	412.1	-2,770.6	354.0	203.0	150.99	2.345				
9,900.0	7,054.0	9,970.0	7,178.6	82.6	82.4	-110.76	412.1	-2,870.5	354.5	198.6	155.94	2.273				

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W - Bolton 7X-434 - Wellbore #1 - Plan #1 (7-15-14)													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		
10,000.0	7,050.0	10,070.0	7,176.2	85.3	85.2	-110.99	412.1	-2,970.5	355.1	194.2	160.89	2.207		
10,100.0	7,046.1	10,170.0	7,173.7	88.1	87.9	-111.21	412.1	-3,070.5	355.6	189.8	165.83	2.145		
10,200.0	7,042.1	10,270.0	7,171.3	90.8	90.7	-111.44	412.1	-3,170.4	356.2	185.4	170.76	2.086		
10,300.0	7,038.1	10,370.0	7,168.8	93.6	93.4	-111.67	412.1	-3,270.4	356.7	181.1	175.68	2.031		
10,400.0	7,034.1	10,470.0	7,166.3	96.3	96.2	-111.89	412.1	-3,370.3	357.3	176.7	180.58	1.979		
10,500.0	7,030.2	10,570.0	7,163.9	99.1	98.9	-112.12	412.1	-3,470.3	357.9	172.4	185.48	1.929		
10,600.0	7,026.2	10,670.0	7,161.4	101.8	101.7	-112.35	412.1	-3,570.3	358.4	168.1	190.36	1.883		
10,700.0	7,022.2	10,769.9	7,159.0	104.6	104.5	-112.57	412.1	-3,670.2	359.0	163.8	195.23	1.839		
10,800.0	7,018.2	10,869.9	7,156.5	107.3	107.2	-112.79	412.1	-3,770.2	359.6	159.5	200.09	1.797		
10,900.0	7,014.2	10,969.9	7,154.0	110.1	110.0	-113.02	412.1	-3,870.1	360.2	155.3	204.93	1.758		
11,000.0	7,010.3	11,069.9	7,151.6	112.8	112.8	-113.24	412.1	-3,970.1	360.8	151.0	209.76	1.720		
11,100.0	7,006.3	11,169.9	7,149.1	115.6	115.5	-113.46	412.1	-4,070.0	361.4	146.8	214.58	1.684		
11,200.0	7,002.3	11,269.9	7,146.7	118.4	118.3	-113.68	412.1	-4,170.0	362.0	142.6	219.38	1.650		
11,300.0	6,998.3	11,369.9	7,144.2	121.1	121.1	-113.90	412.1	-4,270.0	362.6	138.4	224.16	1.618		
11,400.0	6,994.3	11,469.9	7,141.7	123.9	123.9	-114.12	412.1	-4,369.9	363.2	134.3	228.93	1.587		
11,500.0	6,990.4	11,569.8	7,139.3	126.7	126.0	-114.34	412.1	-4,469.9	363.8	130.8	233.05	1.561		
11,509.3	6,990.0	11,579.2	7,139.0	126.9	126.1	-114.36	412.1	-4,479.2	363.9	130.5	233.41	1.559 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
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	-180.00	-61.9	0.0	61.9					
100.0	100.0	99.0	99.0	0.1	0.1	-180.00	-61.9	0.0	61.9	61.7	0.22	276.919		
200.0	200.0	199.0	199.0	0.3	0.3	-180.00	-61.9	0.0	61.9	61.3	0.67	92.153 CC, ES		
300.0	300.0	299.0	299.0	0.6	0.6	168.11	-61.9	0.0	63.6	62.5	1.13	56.364		
400.0	399.8	398.8	398.8	0.8	0.8	168.99	-61.9	0.0	68.8	67.2	1.59	43.237		
500.0	499.5	498.5	498.5	1.0	1.0	170.19	-61.9	0.0	77.3	75.3	2.05	37.683		
600.0	598.7	597.7	597.7	1.3	1.2	171.49	-61.9	0.0	89.4	86.9	2.52	35.536		
700.0	697.6	696.6	696.6	1.6	1.5	172.66	-61.9	0.0	103.7	100.7	2.97	34.927		
800.0	796.6	795.6	795.6	2.0	1.7	173.56	-61.9	0.0	118.1	114.7	3.43	34.487		
900.0	895.5	894.5	894.5	2.3	1.9	174.27	-61.9	0.0	132.6	128.7	3.88	34.133		
1,000.0	994.5	993.5	993.5	2.6	2.1	174.83	-61.9	0.0	147.0	142.7	4.35	33.843		
1,100.0	1,093.4	1,092.4	1,092.4	3.0	2.3	175.30	-61.9	0.0	161.5	156.7	4.81	33.602		
1,200.0	1,192.3	1,191.3	1,191.3	3.3	2.6	175.68	-61.9	0.0	176.0	170.7	5.27	33.399		
1,300.0	1,291.3	1,290.3	1,290.3	3.6	2.8	176.01	-61.9	0.0	190.5	184.8	5.73	33.226		
1,400.0	1,390.2	1,389.2	1,389.2	4.0	3.0	176.30	-61.9	0.0	205.0	198.8	6.20	33.077		
1,500.0	1,489.2	1,488.2	1,488.2	4.3	3.2	176.54	-61.9	0.0	219.5	212.8	6.66	32.946		
1,600.0	1,588.1	1,587.1	1,587.1	4.7	3.5	176.75	-61.9	0.0	234.0	226.9	7.13	32.832		
1,700.0	1,687.0	1,686.0	1,686.0	5.0	3.7	176.94	-61.9	0.0	248.5	240.9	7.59	32.730		
1,800.0	1,786.0	1,785.0	1,785.0	5.4	3.9	177.11	-61.9	0.0	263.0	255.0	8.06	32.640		
1,900.0	1,884.9	1,883.9	1,883.9	5.7	4.1	177.26	-61.9	0.0	277.5	269.0	8.52	32.558		
2,000.0	1,983.9	1,982.9	1,982.9	6.1	4.3	177.40	-61.9	0.0	292.0	283.0	8.99	32.485		
2,100.0	2,082.8	2,081.8	2,081.8	6.4	4.6	177.52	-61.9	0.0	306.5	297.1	9.46	32.418		
2,200.0	2,181.7	2,180.7	2,180.7	6.7	4.8	177.64	-61.9	0.0	321.1	311.1	9.92	32.358		
2,300.0	2,280.7	2,279.7	2,279.7	7.1	5.0	177.74	-61.9	0.0	335.6	325.2	10.39	32.302		
2,400.0	2,379.6	2,378.6	2,378.6	7.4	5.2	177.83	-61.9	0.0	350.1	339.2	10.86	32.251		
2,500.0	2,478.6	2,477.6	2,477.6	7.8	5.5	177.92	-61.9	0.0	364.6	353.3	11.32	32.204		
2,600.0	2,577.5	2,585.4	2,585.4	8.1	5.7	177.89	-61.1	0.9	378.2	366.4	11.80	32.041		
2,700.0	2,676.4	2,696.6	2,696.4	8.5	5.9	177.48	-57.4	5.0	388.9	376.6	12.29	31.640		
2,800.0	2,775.4	2,808.2	2,807.6	8.8	6.2	176.71	-50.8	12.3	396.5	383.7	12.79	31.013		
2,900.0	2,874.3	2,912.9	2,911.6	9.2	6.4	175.71	-42.4	21.6	401.7	388.5	13.28	30.261		
3,000.0	2,973.2	3,012.6	3,010.5	9.5	6.7	174.74	-34.1	30.7	406.8	393.0	13.76	29.559		
3,100.0	3,072.2	3,112.2	3,109.3	9.9	6.9	173.81	-25.8	39.8	412.0	397.7	14.25	28.901		
3,200.0	3,171.1	3,211.9	3,208.2	10.2	7.2	172.89	-17.5	49.0	417.2	402.5	14.75	28.282		
3,300.0	3,270.1	3,311.5	3,307.1	10.6	7.4	172.00	-9.2	58.1	422.6	407.3	15.26	27.699		
3,400.0	3,369.0	3,411.1	3,406.0	10.9	7.7	171.13	-0.9	67.2	428.1	412.3	15.77	27.150		
3,500.0	3,467.9	3,510.8	3,504.8	11.2	7.9	170.29	7.4	76.3	433.7	417.4	16.28	26.632		
3,600.0	3,566.9	3,610.4	3,603.7	11.6	8.2	169.46	15.6	85.5	439.3	422.5	16.81	26.142		
3,700.0	3,665.8	3,710.1	3,702.6	11.9	8.5	168.66	23.9	94.6	445.1	427.7	17.33	25.679		
3,800.0	3,764.8	3,809.7	3,801.5	12.3	8.7	167.88	32.2	103.7	450.9	433.0	17.86	25.241		
3,900.0	3,863.7	3,909.3	3,900.3	12.6	9.0	167.11	40.5	112.8	456.8	438.4	18.40	24.826		
4,000.0	3,962.6	4,009.0	3,999.2	13.0	9.3	166.37	48.8	122.0	462.8	443.9	18.94	24.432		
4,100.0	4,061.6	4,108.6	4,098.1	13.3	9.6	165.64	57.1	131.1	468.9	449.4	19.49	24.059		
4,200.0	4,160.5	4,208.3	4,197.0	13.7	9.9	164.94	65.3	140.2	475.1	455.0	20.04	23.705		
4,300.0	4,259.5	4,300.0	4,288.0	14.0	10.1	164.33	72.8	148.4	481.5	461.0	20.56	23.425		
4,400.0	4,358.4	4,393.1	4,380.8	14.4	10.3	163.97	78.6	154.8	489.8	468.8	21.02	23.306		
4,500.0	4,457.3	4,482.9	4,470.4	14.7	10.5	163.89	82.2	158.8	500.0	478.5	21.45	23.313		
4,600.0	4,556.3	4,572.4	4,559.8	15.1	10.7	164.07	84.0	160.8	512.1	490.3	21.85	23.433		
4,700.0	4,655.2	4,666.8	4,654.2	15.4	10.8	164.46	84.2	161.0	525.9	503.7	22.26	23.623		
4,800.0	4,754.2	4,765.7	4,753.2	15.8	11.0	164.87	84.2	161.0	539.9	517.2	22.70	23.787		
4,900.0	4,853.1	4,864.7	4,852.1	16.1	11.2	165.26	84.2	161.0	554.0	530.8	23.14	23.938		
5,000.0	4,952.0	4,963.6	4,951.0	16.4	11.4	165.63	84.2	161.0	568.1	544.5	23.59	24.083		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
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		
5,100.0	5,051.0	5,062.6	5,050.0	16.8	11.7	165.99	84.2	161.0	582.2	558.1	24.03	24.222		
5,200.0	5,149.9	5,161.5	5,148.9	17.1	11.9	166.33	84.2	161.0	596.3	571.8	24.48	24.356		
5,300.0	5,248.9	5,260.4	5,247.9	17.5	12.1	166.65	84.2	161.0	610.4	585.5	24.93	24.485		
5,400.0	5,347.8	5,359.4	5,346.8	17.8	12.3	166.96	84.2	161.0	624.6	599.2	25.38	24.609		
5,500.0	5,446.8	5,458.4	5,445.8	18.2	12.5	167.27	84.2	161.0	638.0	612.2	25.83	24.701		
5,600.0	5,546.3	5,557.8	5,545.3	18.4	12.7	167.52	84.2	161.0	648.4	622.1	26.23	24.717		
5,700.0	5,646.0	5,657.6	5,645.0	18.6	12.9	167.69	84.2	161.0	655.3	628.7	26.61	24.632		
5,800.0	5,745.9	5,757.5	5,744.9	18.7	13.1	167.77	84.2	161.0	658.9	631.9	26.95	24.450		
5,900.0	5,845.9	5,857.5	5,844.9	18.9	13.3	-180.00	84.2	161.0	659.4	627.7	31.68	20.814		
6,000.0	5,945.9	5,957.5	5,944.9	19.0	13.6	-180.00	84.2	161.0	659.4	627.3	32.05	20.576		
6,100.0	6,045.9	6,057.5	6,044.9	19.2	13.8	-180.00	84.2	161.0	659.4	627.0	32.41	20.343		
6,200.0	6,145.9	6,157.5	6,144.9	19.3	14.0	-180.00	84.2	161.0	659.4	626.6	32.78	20.113		
6,300.0	6,245.9	6,257.5	6,244.9	19.5	14.2	-180.00	84.2	161.0	659.4	626.2	33.15	19.888		
6,365.4	6,311.4	6,322.9	6,310.4	19.6	14.3	-180.00	84.2	161.0	659.4	626.0	33.40	19.743		
6,400.0	6,345.9	6,357.5	6,344.9	19.6	14.4	-180.00	84.2	161.0	659.4	625.9	33.53	19.668		
6,500.0	6,445.8	6,457.1	6,444.2	19.8	14.6	-89.60	84.2	153.6	659.4	629.7	29.74	22.171		
6,600.0	6,544.6	6,556.1	6,541.0	19.9	14.7	-89.15	84.2	133.5	659.5	629.4	30.01	21.976		
6,700.0	6,640.6	6,654.3	6,633.8	20.0	14.8	-88.71	84.2	101.3	659.5	629.3	30.26	21.798		
6,800.0	6,732.1	6,752.0	6,721.2	20.0	14.9	-88.29	84.2	57.8	659.7	629.1	30.56	21.589		
6,900.0	6,817.5	6,849.1	6,801.9	20.1	15.1	-87.91	84.2	3.9	659.8	628.8	31.00	21.285		
7,000.0	6,895.5	6,945.7	6,874.7	20.2	15.5	-87.56	84.2	-59.5	660.0	628.3	31.71	20.815		
7,100.0	6,964.6	7,041.9	6,938.7	20.3	16.1	-87.25	84.2	-131.2	660.1	627.3	32.80	20.123		
7,200.0	7,023.7	7,137.7	6,992.9	20.6	17.0	-86.99	84.2	-210.0	660.3	625.9	34.40	19.194		
7,300.0	7,071.8	7,233.1	7,036.8	21.1	18.1	-86.77	84.2	-294.8	660.4	623.9	36.56	18.065		
7,400.0	7,108.1	7,328.4	7,069.7	21.9	19.5	-86.61	84.2	-384.1	660.5	621.3	39.27	16.819		
7,500.0	7,131.9	7,423.4	7,091.2	23.2	21.1	-86.51	84.2	-476.6	660.6	618.1	42.49	15.547		
7,600.0	7,142.8	7,518.4	7,101.1	24.8	22.9	-86.46	84.2	-571.0	660.6	614.5	46.10	14.330		
7,700.0	7,141.5	7,614.6	7,099.5	26.6	24.9	-86.43	84.2	-667.2	660.7	610.6	50.04	13.202		
7,800.0	7,137.6	7,714.6	7,094.5	28.6	27.1	-86.35	84.2	-767.0	660.7	606.4	54.34	12.160		
7,900.0	7,133.6	7,814.6	7,089.6	30.8	29.4	-86.26	84.2	-866.9	660.8	601.9	58.85	11.229		
8,000.0	7,129.6	7,914.6	7,084.6	33.1	31.7	-86.18	84.2	-966.8	660.9	597.3	63.53	10.402		
8,100.0	7,125.6	8,014.6	7,079.7	35.4	34.2	-86.09	84.2	-1,066.7	660.9	592.6	68.35	9.670		
8,200.0	7,121.7	8,114.6	7,074.7	37.8	36.7	-86.01	84.2	-1,166.5	661.0	587.7	73.27	9.021		
8,300.0	7,117.7	8,214.6	7,069.8	40.2	39.2	-85.93	84.2	-1,266.4	661.1	582.8	78.28	8.445		
8,400.0	7,113.7	8,314.6	7,064.8	42.7	41.8	-85.84	84.2	-1,366.3	661.1	577.8	83.36	7.930		
8,500.0	7,109.7	8,414.6	7,059.8	45.3	44.3	-85.76	84.2	-1,466.1	661.2	572.7	88.51	7.471		
8,600.0	7,105.7	8,514.6	7,054.9	47.8	47.0	-85.67	84.2	-1,566.0	661.3	567.6	93.70	7.058		
8,700.0	7,101.8	8,614.6	7,049.9	50.4	49.6	-85.59	84.2	-1,665.9	661.3	562.4	98.93	6.685		
8,800.0	7,097.8	8,714.6	7,045.0	53.0	52.3	-85.50	84.2	-1,765.8	661.4	557.2	104.19	6.348		
8,900.0	7,093.8	8,814.6	7,040.0	55.7	54.9	-85.42	84.2	-1,865.6	661.5	552.0	109.49	6.042		
9,000.0	7,089.8	8,914.6	7,035.1	58.3	57.6	-85.33	84.2	-1,965.5	661.6	546.8	114.81	5.762		
9,100.0	7,085.9	9,014.6	7,030.1	61.0	60.3	-85.25	84.2	-2,065.4	661.7	541.5	120.15	5.507		
9,200.0	7,081.9	9,114.6	7,025.2	63.7	63.0	-85.17	84.2	-2,165.2	661.7	536.2	125.51	5.272		
9,300.0	7,077.9	9,214.6	7,020.2	66.3	65.7	-85.08	84.2	-2,265.1	661.8	530.9	130.88	5.057		
9,400.0	7,073.9	9,314.6	7,015.3	69.0	68.4	-85.00	84.2	-2,365.0	661.9	525.6	136.27	4.857		
9,500.0	7,069.9	9,414.6	7,010.3	71.7	71.1	-84.91	84.2	-2,464.9	662.0	520.3	141.68	4.673		
9,600.0	7,066.0	9,514.5	7,005.3	74.4	73.9	-84.83	84.2	-2,564.7	662.1	515.0	147.09	4.501		
9,700.0	7,062.0	9,614.5	7,000.4	77.2	76.6	-84.74	84.2	-2,664.6	662.2	509.7	152.51	4.342		
9,800.0	7,058.0	9,714.5	6,995.4	79.9	79.3	-84.66	84.2	-2,764.5	662.3	504.3	157.94	4.193		
9,900.0	7,054.0	9,814.5	6,990.5	82.6	82.1	-84.58	84.2	-2,864.4	662.3	499.0	163.37	4.054		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													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	
10,000.0	7,050.0	9,914.5	6,985.5	85.3	84.8	-84.49	84.2	-2,964.2	662.4	493.6	168.82	3.924		
10,100.0	7,046.1	10,014.5	6,980.6	88.1	87.6	-84.41	84.2	-3,064.1	662.5	488.3	174.26	3.802		
10,200.0	7,042.1	10,114.5	6,975.6	90.8	90.3	-84.32	84.2	-3,164.0	662.6	482.9	179.72	3.687		
10,300.0	7,038.1	10,214.5	6,970.7	93.6	93.1	-84.24	84.2	-3,263.8	662.7	477.6	185.17	3.579		
10,400.0	7,034.1	10,314.5	6,965.7	96.3	95.9	-84.16	84.2	-3,363.7	662.8	472.2	190.63	3.477		
10,500.0	7,030.2	10,414.5	6,960.8	99.1	98.6	-84.07	84.2	-3,463.6	662.9	466.8	196.09	3.381		
10,600.0	7,026.2	10,514.5	6,955.8	101.8	101.4	-83.99	84.2	-3,563.5	663.0	461.5	201.56	3.290		
10,700.0	7,022.2	10,614.5	6,950.9	104.6	104.1	-83.90	84.2	-3,663.3	663.1	456.1	207.03	3.203		
10,800.0	7,018.2	10,714.5	6,945.9	107.3	106.9	-83.82	84.2	-3,763.2	663.2	450.7	212.50	3.121		
10,900.0	7,014.2	10,814.5	6,940.9	110.1	109.7	-83.74	84.2	-3,863.1	663.3	445.4	217.97	3.043		
11,000.0	7,010.3	10,914.5	6,936.0	112.8	112.5	-83.65	84.2	-3,963.0	663.5	440.0	223.44	2.969		
11,100.0	7,006.3	11,014.5	6,931.0	115.6	115.2	-83.57	84.2	-4,062.8	663.6	434.7	228.91	2.899		
11,200.0	7,002.3	11,114.5	6,926.1	118.4	118.0	-83.48	84.2	-4,162.7	663.7	429.3	234.38	2.832		
11,300.0	6,998.3	11,214.5	6,921.1	121.1	120.8	-83.40	84.2	-4,262.6	663.8	423.9	239.86	2.767		
11,400.0	6,994.3	11,314.5	6,916.2	123.9	123.6	-83.32	84.2	-4,362.4	663.9	418.6	245.33	2.706		
11,500.0	6,990.4	11,414.5	6,911.2	126.7	126.3	-83.23	84.2	-4,462.3	664.0	413.2	250.81	2.648		
11,509.3	6,990.0	11,423.8	6,910.8	126.9	126.6	-83.22	84.2	-4,471.6	664.0	412.7	251.32	2.642 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													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	180.00	-91.1	0.0	91.1					
100.0	100.0	99.0	99.0	0.1	0.1	180.00	-91.1	0.0	91.1	90.9	0.22	407.233		
200.0	200.0	199.0	199.0	0.3	0.3	180.00	-91.1	0.0	91.1	90.4	0.67	135.519 CC, ES		
300.0	300.0	299.0	299.0	0.6	0.6	168.00	-91.1	0.0	92.8	91.7	1.13	82.178		
400.0	399.8	398.8	398.8	0.8	0.8	168.62	-91.1	0.0	97.9	96.3	1.59	61.559		
500.0	499.5	498.5	498.5	1.0	1.0	169.51	-91.1	0.0	106.5	104.4	2.05	51.873		
600.0	598.7	597.7	597.7	1.3	1.2	170.55	-91.1	0.0	118.5	116.0	2.52	47.100		
700.0	697.6	696.6	696.6	1.6	1.5	171.57	-91.1	0.0	132.8	129.8	2.97	44.702		
800.0	796.6	795.6	795.6	2.0	1.7	172.39	-91.1	0.0	147.2	143.7	3.43	42.944		
900.0	895.5	894.5	894.5	2.3	1.9	173.08	-91.1	0.0	161.6	157.7	3.89	41.578		
1,000.0	994.5	993.5	993.5	2.6	2.1	173.65	-91.1	0.0	176.0	171.7	4.35	40.489		
1,100.0	1,093.4	1,092.4	1,092.4	3.0	2.3	174.13	-91.1	0.0	190.5	185.6	4.81	39.602		
1,200.0	1,192.3	1,191.3	1,191.3	3.3	2.6	174.55	-91.1	0.0	204.9	199.6	5.27	38.867		
1,300.0	1,291.3	1,290.3	1,290.3	3.6	2.8	174.91	-91.1	0.0	219.4	213.6	5.74	38.247		
1,400.0	1,390.2	1,389.2	1,389.2	4.0	3.0	175.22	-91.1	0.0	233.9	227.7	6.20	37.717		
1,500.0	1,489.2	1,488.2	1,488.2	4.3	3.2	175.50	-91.1	0.0	248.3	241.7	6.66	37.260		
1,600.0	1,588.1	1,587.1	1,587.1	4.7	3.5	175.75	-91.1	0.0	262.8	255.7	7.13	36.862		
1,700.0	1,687.0	1,681.4	1,681.4	5.0	3.6	175.77	-91.9	0.8	278.0	270.5	7.57	36.737		
1,800.0	1,786.0	1,774.4	1,774.3	5.4	3.8	175.30	-94.8	3.8	295.1	287.1	7.99	36.930		
1,900.0	1,884.9	1,866.5	1,866.2	5.7	4.0	174.45	-99.7	8.9	314.2	305.7	8.42	37.315		
2,000.0	1,983.9	1,961.5	1,960.6	6.1	4.2	173.31	-106.6	16.0	334.9	326.0	8.86	37.791		
2,100.0	2,082.8	2,059.0	2,057.6	6.4	4.4	172.24	-113.8	23.4	355.9	346.6	9.32	38.203		
2,200.0	2,181.7	2,156.6	2,154.6	6.7	4.6	171.29	-121.0	30.9	377.1	367.3	9.78	38.564		
2,300.0	2,280.7	2,254.2	2,251.6	7.1	4.8	170.44	-128.3	38.3	398.3	388.1	10.25	38.879		
2,400.0	2,379.6	2,351.7	2,348.6	7.4	5.1	169.68	-135.5	45.8	419.6	408.9	10.72	39.155		
2,500.0	2,478.6	2,449.3	2,445.6	7.8	5.3	168.99	-142.7	53.3	441.0	429.8	11.19	39.394		
2,600.0	2,577.5	2,546.8	2,542.6	8.1	5.6	168.37	-150.0	60.7	462.4	450.8	11.68	39.608		
2,700.0	2,676.4	2,644.4	2,639.6	8.5	5.8	167.80	-157.2	68.2	483.9	471.8	12.16	39.799		
2,800.0	2,775.4	2,741.9	2,736.6	8.8	6.1	167.28	-164.5	75.6	505.4	492.8	12.65	39.969		
2,900.0	2,874.3	2,839.5	2,833.6	9.2	6.3	166.80	-171.7	83.1	527.0	513.9	13.13	40.122		
3,000.0	2,973.2	2,937.1	2,930.6	9.5	6.6	166.35	-178.9	90.5	548.6	535.0	13.63	40.260		
3,100.0	3,072.2	3,034.6	3,027.6	9.9	6.9	165.95	-186.2	98.0	570.2	556.1	14.12	40.385		
3,200.0	3,171.1	3,132.2	3,124.6	10.2	7.1	165.57	-193.4	105.5	591.8	577.2	14.61	40.499		
3,300.0	3,270.1	3,229.7	3,221.6	10.6	7.4	165.22	-200.6	112.9	613.5	598.4	15.11	40.603		
3,400.0	3,369.0	3,327.3	3,318.6	10.9	7.7	164.89	-207.9	120.4	635.2	619.6	15.61	40.698		
3,500.0	3,467.9	3,424.8	3,415.6	11.2	8.0	164.58	-215.1	127.8	656.9	640.8	16.11	40.785		
3,600.0	3,566.9	3,522.4	3,512.6	11.6	8.2	164.30	-222.4	135.3	678.6	662.0	16.61	40.865		
3,700.0	3,665.8	3,620.0	3,609.6	11.9	8.5	164.03	-229.6	142.8	700.4	683.3	17.11	40.939		
3,800.0	3,764.8	3,720.3	3,709.4	12.3	8.8	163.77	-237.0	150.4	722.1	704.5	17.61	40.998		
3,900.0	3,863.7	3,841.2	3,829.9	12.6	9.1	163.64	-243.8	157.4	741.9	723.8	18.14	40.910		
4,000.0	3,962.6	3,963.7	3,952.3	13.0	9.3	163.79	-247.0	160.7	758.7	740.1	18.63	40.723		
4,100.0	4,061.6	4,072.0	4,060.6	13.3	9.5	164.10	-247.3	161.0	772.9	753.8	19.09	40.493		
4,200.0	4,160.5	4,170.9	4,159.5	13.7	9.7	164.39	-247.3	161.0	786.9	767.4	19.53	40.288		
4,300.0	4,259.5	4,269.9	4,258.5	14.0	9.9	164.67	-247.3	161.0	800.9	780.9	19.98	40.090		
4,400.0	4,358.4	4,368.8	4,357.4	14.4	10.1	164.94	-247.3	161.0	814.9	794.5	20.42	39.899		
4,500.0	4,457.3	4,467.7	4,456.3	14.7	10.3	165.20	-247.3	161.0	829.0	808.1	20.87	39.716		
4,600.0	4,556.3	4,566.7	4,555.3	15.1	10.5	165.45	-247.3	161.0	843.0	821.7	21.32	39.541		
4,700.0	4,655.2	4,665.6	4,654.2	15.4	10.7	165.69	-247.3	161.0	857.1	835.4	21.77	39.372		
4,800.0	4,754.2	4,764.6	4,753.2	15.8	10.9	165.93	-247.3	161.0	871.2	849.0	22.22	39.209		
4,900.0	4,853.1	4,863.5	4,852.1	16.1	11.0	166.16	-247.3	161.0	885.3	862.7	22.67	39.053		
5,000.0	4,952.0	4,962.4	4,951.0	16.4	11.2	166.38	-247.3	161.0	899.4	876.3	23.12	38.902		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design													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		
5,100.0	5,051.0	5,061.4	5,050.0	16.8	11.4	166.59	-247.3	161.0	913.6	890.0	23.57	38.757		
5,200.0	5,149.9	5,160.3	5,148.9	17.1	11.6	166.80	-247.3	161.0	927.7	903.7	24.02	38.617		
5,300.0	5,248.9	5,259.3	5,247.9	17.5	11.8	167.00	-247.3	161.0	941.9	917.4	24.48	38.482		
5,400.0	5,347.8	5,358.2	5,346.8	17.8	12.0	167.20	-247.3	161.0	956.0	931.1	24.93	38.351		
5,500.0	5,446.8	5,457.2	5,445.8	18.2	12.2	167.42	-247.3	161.0	969.5	944.2	25.39	38.180		
5,600.0	5,546.3	5,556.7	5,545.3	18.4	12.4	167.60	-247.3	161.0	979.9	954.1	25.81	37.959		
5,700.0	5,646.0	5,656.4	5,645.0	18.6	12.6	167.71	-247.3	161.0	986.8	960.6	26.20	37.661		
5,800.0	5,745.9	5,756.3	5,744.9	18.7	12.8	167.77	-247.3	161.0	990.4	963.8	26.56	37.289		
5,900.0	5,845.9	5,856.3	5,844.9	18.9	13.1	-180.00	-247.3	161.0	990.9	959.5	31.38	31.581		
6,000.0	5,945.9	5,956.3	5,944.9	19.0	13.3	-180.00	-247.3	161.0	990.9	959.2	31.74	31.224		
6,100.0	6,045.9	6,056.3	6,044.9	19.2	13.5	-180.00	-247.3	161.0	990.9	958.8	32.10	30.873		
6,200.0	6,145.9	6,156.3	6,144.9	19.3	13.7	-180.00	-247.3	161.0	990.9	958.4	32.46	30.528		
6,300.0	6,245.9	6,256.3	6,244.9	19.5	13.9	-180.00	-247.3	161.0	990.9	958.1	32.82	30.189		
6,400.0	6,345.9	6,356.3	6,344.9	19.6	14.1	-180.00	-247.3	161.0	990.9	957.7	33.19	29.856		
6,444.6	6,390.5	6,400.9	6,389.5	19.7	14.2	-90.05	-247.3	161.0	990.9	961.7	29.17	33.971		
6,500.0	6,445.8	6,456.2	6,444.8	19.8	14.3	-90.17	-247.3	161.0	990.9	961.5	29.39	33.714		
6,600.0	6,544.6	6,556.6	6,545.0	19.9	14.5	-90.83	-247.3	157.3	991.0	961.3	29.74	33.319		
6,700.0	6,640.6	6,658.6	6,645.6	20.0	14.6	-91.50	-247.3	140.5	991.2	961.2	30.04	32.997		
6,800.0	6,732.1	6,762.3	6,744.6	20.0	14.8	-92.16	-247.3	109.9	991.6	961.3	30.33	32.695		
6,900.0	6,817.5	6,867.6	6,840.0	20.1	14.9	-92.78	-247.3	65.4	992.1	961.4	30.69	32.325		
7,000.0	6,895.5	6,974.6	6,929.6	20.2	15.0	-93.36	-247.3	7.2	992.6	961.4	31.25	31.761		
7,100.0	6,964.6	7,083.1	7,011.4	20.3	15.4	-93.88	-247.3	-64.0	993.2	961.0	32.17	30.869		
7,200.0	7,023.7	7,193.1	7,083.1	20.6	16.1	-94.33	-247.3	-147.3	993.7	960.1	33.62	29.556		
7,300.0	7,071.8	7,304.4	7,142.8	21.1	17.2	-94.70	-247.3	-241.1	994.3	958.5	35.74	27.822		
7,400.0	7,108.1	7,416.6	7,188.5	21.9	18.7	-94.99	-247.3	-343.5	994.7	956.1	38.57	25.789		
7,500.0	7,131.9	7,529.6	7,218.9	23.2	20.5	-95.17	-247.3	-452.2	994.9	952.9	42.06	23.656		
7,600.0	7,142.8	7,643.1	7,232.9	24.8	22.7	-95.26	-247.3	-564.7	995.1	949.0	46.07	21.599		
7,700.0	7,141.5	7,749.9	7,232.5	26.6	24.9	-95.30	-247.3	-671.4	995.1	944.9	50.30	19.785		
7,800.0	7,137.6	7,849.9	7,230.0	28.6	27.1	-95.39	-247.3	-771.4	995.3	940.7	54.60	18.228		
7,900.0	7,133.6	7,949.8	7,227.6	30.8	29.4	-95.48	-247.3	-877.4	995.4	936.3	59.12	16.838		
8,000.0	7,129.6	8,049.8	7,225.1	33.1	31.8	-95.56	-247.3	-971.3	995.6	931.8	63.80	15.604		
8,100.0	7,125.6	8,149.8	7,222.7	35.4	34.2	-95.65	-247.3	-1,071.3	995.7	927.1	68.62	14.510		
8,200.0	7,121.7	8,249.8	7,220.2	37.8	36.7	-95.74	-247.3	-1,171.2	995.9	922.3	73.55	13.541		
8,300.0	7,117.7	8,349.8	7,217.8	40.2	39.3	-95.83	-247.3	-1,271.2	996.0	917.5	78.56	12.680		
8,400.0	7,113.7	8,449.8	7,215.4	42.7	41.8	-95.92	-247.3	-1,371.2	996.2	912.6	83.63	11.911		
8,500.0	7,109.7	8,549.8	7,212.9	45.3	44.4	-96.00	-247.3	-1,471.1	996.4	907.6	88.77	11.224		
8,600.0	7,105.7	8,649.8	7,210.5	47.8	47.0	-96.09	-247.3	-1,571.1	996.5	902.6	93.96	10.606		
8,700.0	7,101.8	8,749.8	7,208.0	50.4	49.7	-96.18	-247.3	-1,671.0	996.7	897.5	99.18	10.049		
8,800.0	7,097.8	8,849.7	7,205.6	53.0	52.3	-96.27	-247.3	-1,771.0	996.9	892.4	104.44	9.545		
8,900.0	7,093.8	8,949.7	7,203.1	55.7	55.0	-96.35	-247.3	-1,870.9	997.0	887.3	109.73	9.086		
9,000.0	7,089.8	9,049.7	7,200.7	58.3	57.7	-96.44	-247.3	-1,970.9	997.2	882.2	115.04	8.668		
9,100.0	7,085.9	9,149.7	7,198.3	61.0	60.4	-96.53	-247.3	-2,070.9	997.4	877.0	120.37	8.286		
9,200.0	7,081.9	9,249.7	7,195.8	63.7	63.1	-96.62	-247.3	-2,170.8	997.5	871.8	125.72	7.935		
9,300.0	7,077.9	9,349.7	7,193.4	66.3	65.8	-96.71	-247.3	-2,270.8	997.7	866.6	131.09	7.611		
9,400.0	7,073.9	9,449.7	7,190.9	69.0	68.5	-96.79	-247.3	-2,370.7	997.9	861.4	136.46	7.313		
9,500.0	7,069.9	9,549.7	7,188.5	71.7	71.3	-96.88	-247.3	-2,470.7	998.1	856.2	141.85	7.036		
9,600.0	7,066.0	9,649.6	7,186.0	74.4	74.0	-96.97	-247.3	-2,570.7	998.3	851.0	147.25	6.779		
9,700.0	7,062.0	9,749.6	7,183.6	77.2	76.7	-97.06	-247.3	-2,670.6	998.5	845.8	152.66	6.540		
9,800.0	7,058.0	9,849.6	7,181.2	79.9	79.5	-97.14	-247.3	-2,770.6	998.6	840.6	158.08	6.317		
9,900.0	7,054.0	9,949.6	7,178.7	82.6	82.2	-97.23	-247.3	-2,870.5	998.8	835.3	163.50	6.109		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Offset Design											PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W - Bolton 7Y-404 - Wellbore #1 - Plan #1 (7-16-14)			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				
10,000.0	7,050.0	10,049.6	7,176.3	85.3	85.0	-97.32	-247.3	-2,970.5	999.0	830.1	168.93	5.914				
10,100.0	7,046.1	10,149.6	7,173.8	88.1	87.7	-97.40	-247.3	-3,070.4	999.2	824.9	174.36	5.731				
10,200.0	7,042.1	10,249.6	7,171.4	90.8	90.5	-97.49	-247.3	-3,170.4	999.4	819.6	179.80	5.559				
10,300.0	7,038.1	10,349.6	7,168.9	93.6	93.3	-97.58	-247.3	-3,270.4	999.6	814.4	185.24	5.397				
10,400.0	7,034.1	10,449.6	7,166.5	96.3	96.0	-97.67	-247.3	-3,370.3	999.8	809.2	190.68	5.244 SF				

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
Reference Design:	Plan #1 (7-15-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5167.0ft (Original Well Elev) Coordinates are relative to: Bolton 7X-304
 Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
 Central Meridian is -105.500000 ° Grid Convergence at Surface is: 0.30°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bolton 7X-304
Project:	SEC.7-T3N-68W	TVD Reference:	WELL @ 5167.0ft (Original Well Elev)
Reference Site:	PDC Bolton 3N68W7Y-MLVT Pad Sec.7-T3N-R68W	MD Reference:	WELL @ 5167.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bolton 7X-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	landmark
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Reference Depths are relative to WELL @ 5167.0ft (Original Well Elev)Coordinates are relative to: Bolton 7X-304
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinate System is US State Plane 1983, Colorado Northern Zone
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