

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Ottenhoff 29M-323**

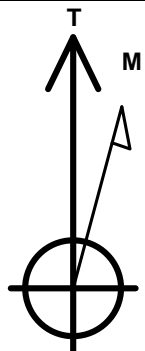
Surface Location: Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4664.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381166.74	3259644.43	40.375959	-104.568052	

RKB - 23' WELL @ 4687.0ft (RKB - 23')

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 557'FNL & 1050'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2628'FSL & 2157'FEL, Sec.32	6757.0	-7371.8	-1058.5	Point



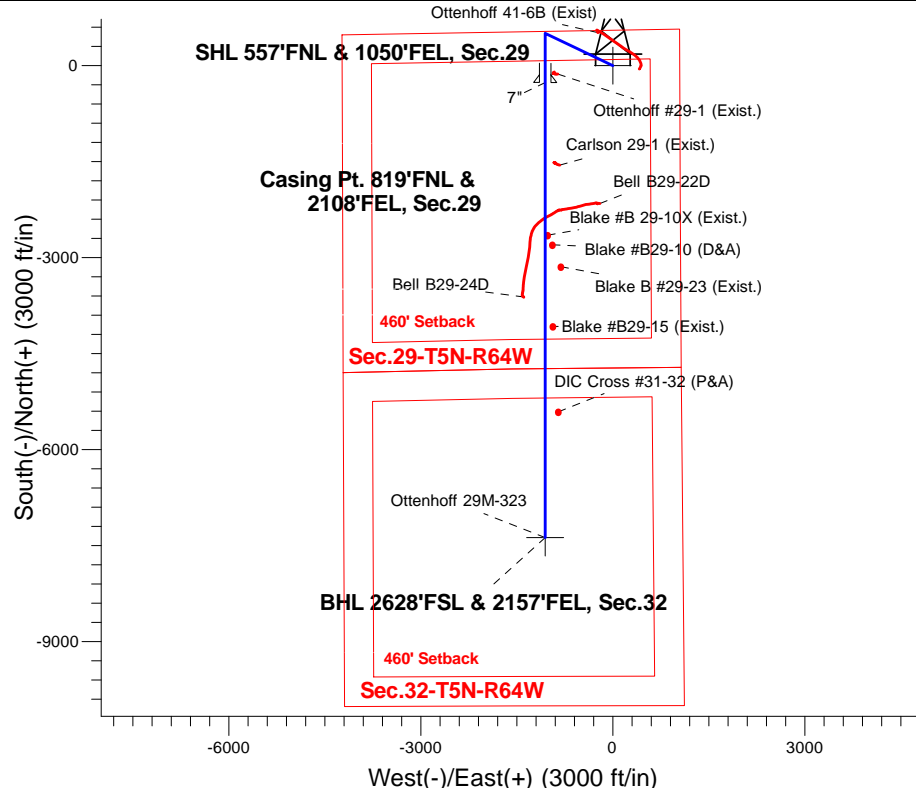
Azimuths to True North
Magnetic North: 8.12°

Magnetic Field
Strength: 52644.1snT
Dip Angle: 66.90°
Date: 2/29/2016
Model: IGRF2010

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29M-323
Plan #1 (3-14-16)
16:34, March 17 2016

ANNOTATIONS

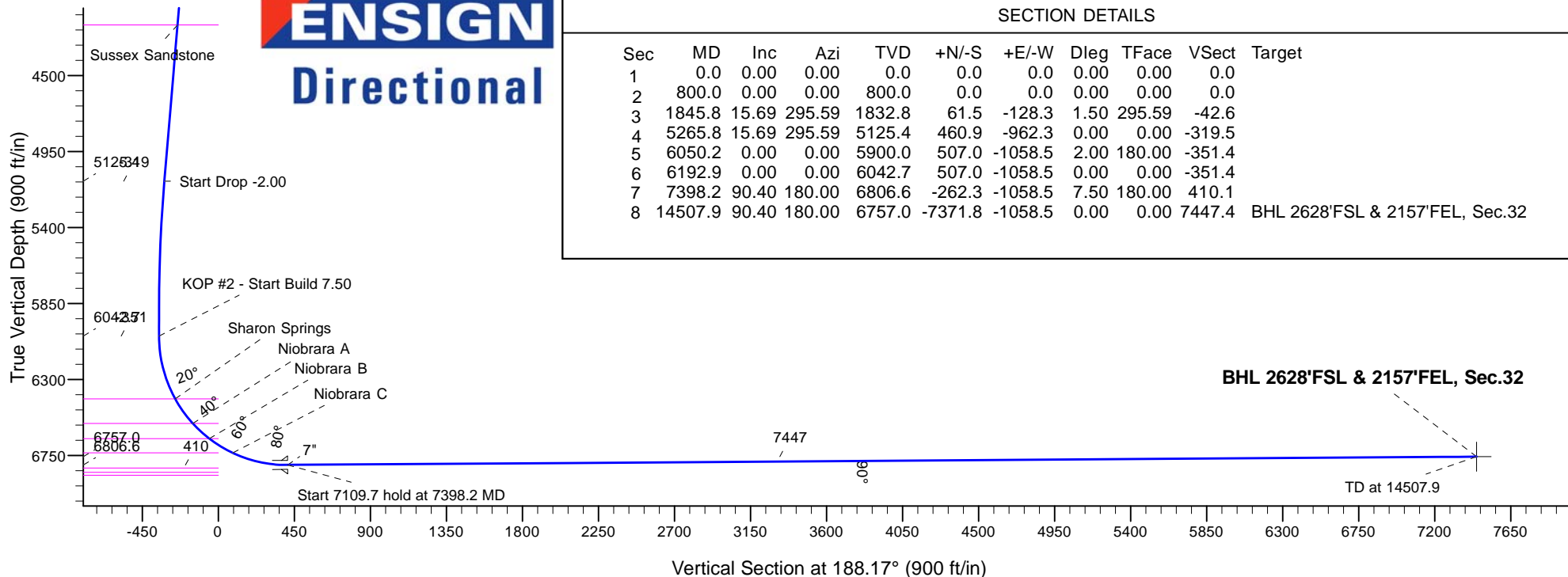
TVD	MD	Annotation
800.0	800.0	KOP - Start Build 1.50
5125.4	5265.8	Start Drop -2.00
6042.7	6192.9	KOP #2 - Start Build 7.50
6806.6	7398.2	Start 7109.7 hold at 7398.2 MD
6757.0	14507.9	TD at 14507.9



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	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1845.8	15.69	295.59	1832.8	61.5	-128.3	1.50	295.59	-42.6	
4	5265.8	15.69	295.59	5125.4	460.9	-962.3	0.00	0.00	-319.5	
5	6050.2	0.00	0.00	5900.0	507.0	-1058.5	2.00	180.00	-351.4	
6	6192.9	0.00	0.00	6042.7	507.0	-1058.5	0.00	0.00	-351.4	
7	7398.2	90.40	180.00	6806.6	-262.3	-1058.5	7.50	180.00	410.1	
8	14507.9	90.40	180.00	6757.0	-7371.8	-1058.5	0.00	0.00	7447.4	BHL 2628'FSL & 2157'FEL, Sec.32

ENSIGN
Directional





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29M-323

Wellbore #1

Plan: Plan #1 (3-14-16)

Standard Planning Report

17 March, 2016

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Project	SEC.29-T5N-R64W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W				
Site Position:		Northing:	1,381,166.77 usft	Latitude:	40.375956
From:	Lat/Long	Easting:	3,259,749.48 usft	Longitude:	-104.567675
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.60

Well	Ottenhoff 29M-323					
Well Position	+N/-S	1.1 ft	Northing:	1,381,166.74 usft	Latitude:	40.375959
	+E/-W	-105.0 ft	Easting:	3,259,644.44 usft	Longitude:	-104.568052
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,664.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/29/2016	8.12	66.90	52,644

Design	Plan #1 (3-14-16)			
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	188.17

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,845.8	15.69	295.59	1,832.8	61.5	-128.3	1.50	1.50	0.00	295.59	
5,265.8	15.69	295.59	5,125.4	460.9	-962.3	0.00	0.00	0.00	0.00	
6,050.2	0.00	0.00	5,900.0	507.0	-1,058.5	2.00	-2.00	0.00	180.00	
6,192.9	0.00	0.00	6,042.7	507.0	-1,058.5	0.00	0.00	0.00	0.00	
7,398.2	90.40	180.00	6,806.6	-262.3	-1,058.5	7.50	7.50	0.00	180.00	
14,507.9	90.40	180.00	6,757.0	-7,371.8	-1,058.5	0.00	0.00	0.00	0.00	BHL 2628'FSL & 2157

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Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 557°FNL & 1050°FEL, Sec.29									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
900.0	1.50	295.59	900.0	0.6	-1.2	-0.4	1.50	1.50	0.00
1,000.0	3.00	295.59	999.9	2.3	-4.7	-1.6	1.50	1.50	0.00
1,100.0	4.50	295.59	1,099.7	5.1	-10.6	-3.5	1.50	1.50	0.00
1,200.0	6.00	295.59	1,199.3	9.0	-18.9	-6.3	1.50	1.50	0.00
1,300.0	7.50	295.59	1,298.6	14.1	-29.5	-9.8	1.50	1.50	0.00
1,400.0	9.00	295.59	1,397.5	20.3	-42.4	-14.1	1.50	1.50	0.00
1,500.0	10.50	295.59	1,496.1	27.6	-57.7	-19.2	1.50	1.50	0.00
1,600.0	12.00	295.59	1,594.2	36.1	-75.3	-25.0	1.50	1.50	0.00
1,700.0	13.50	295.59	1,691.7	45.6	-95.2	-31.6	1.50	1.50	0.00
1,800.0	15.00	295.59	1,788.6	56.2	-117.4	-39.0	1.50	1.50	0.00
1,845.8	15.69	295.59	1,832.8	61.5	-128.3	-42.6	1.50	1.50	0.00
1,900.0	15.69	295.59	1,885.0	67.8	-141.5	-47.0	0.00	0.00	0.00
2,000.0	15.69	295.59	1,981.2	79.5	-165.9	-55.1	0.00	0.00	0.00
2,100.0	15.69	295.59	2,077.5	91.1	-190.3	-63.2	0.00	0.00	0.00
2,200.0	15.69	295.59	2,173.8	102.8	-214.7	-71.3	0.00	0.00	0.00
2,300.0	15.69	295.59	2,270.1	114.5	-239.1	-79.4	0.00	0.00	0.00
2,400.0	15.69	295.59	2,366.3	126.2	-263.5	-87.5	0.00	0.00	0.00
2,500.0	15.69	295.59	2,462.6	137.9	-287.8	-95.6	0.00	0.00	0.00
2,600.0	15.69	295.59	2,558.9	149.5	-312.2	-103.7	0.00	0.00	0.00
2,700.0	15.69	295.59	2,655.2	161.2	-336.6	-111.7	0.00	0.00	0.00
2,800.0	15.69	295.59	2,751.4	172.9	-361.0	-119.8	0.00	0.00	0.00
2,900.0	15.69	295.59	2,847.7	184.6	-385.4	-127.9	0.00	0.00	0.00
3,000.0	15.69	295.59	2,944.0	196.3	-409.8	-136.0	0.00	0.00	0.00
3,100.0	15.69	295.59	3,040.3	207.9	-434.2	-144.1	0.00	0.00	0.00
3,200.0	15.69	295.59	3,136.5	219.6	-458.5	-152.2	0.00	0.00	0.00
3,300.0	15.69	295.59	3,232.8	231.3	-482.9	-160.3	0.00	0.00	0.00
3,400.0	15.69	295.59	3,329.1	243.0	-507.3	-168.4	0.00	0.00	0.00
3,500.0	15.69	295.59	3,425.4	254.7	-531.7	-176.5	0.00	0.00	0.00
3,600.0	15.69	295.59	3,521.6	266.3	-556.1	-184.6	0.00	0.00	0.00
3,608.7	15.69	295.59	3,530.0	267.4	-558.2	-185.3	0.00	0.00	0.00
Parkman Sandstone									
3,700.0	15.69	295.59	3,617.9	278.0	-580.5	-192.7	0.00	0.00	0.00
3,800.0	15.69	295.59	3,714.2	289.7	-604.8	-200.8	0.00	0.00	0.00
3,900.0	15.69	295.59	3,810.5	301.4	-629.2	-208.9	0.00	0.00	0.00
4,000.0	15.69	295.59	3,906.7	313.1	-653.6	-217.0	0.00	0.00	0.00
4,100.0	15.69	295.59	4,003.0	324.7	-678.0	-225.1	0.00	0.00	0.00
4,200.0	15.69	295.59	4,099.3	336.4	-702.4	-233.2	0.00	0.00	0.00
4,300.0	15.69	295.59	4,195.6	348.1	-726.8	-241.3	0.00	0.00	0.00
4,304.6	15.69	295.59	4,200.0	348.6	-727.9	-241.6	0.00	0.00	0.00
Sussex Sandstone									

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Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,400.0	15.69	295.59	4,291.8	359.8	-751.2	-249.4	0.00	0.00	0.00
4,500.0	15.69	295.59	4,388.1	371.5	-775.5	-257.5	0.00	0.00	0.00
4,600.0	15.69	295.59	4,484.4	383.1	-799.9	-265.6	0.00	0.00	0.00
4,700.0	15.69	295.59	4,580.7	394.8	-824.3	-273.7	0.00	0.00	0.00
4,800.0	15.69	295.59	4,677.0	406.5	-848.7	-281.7	0.00	0.00	0.00
4,900.0	15.69	295.59	4,773.2	418.2	-873.1	-289.8	0.00	0.00	0.00
5,000.0	15.69	295.59	4,869.5	429.9	-897.5	-297.9	0.00	0.00	0.00
5,100.0	15.69	295.59	4,965.8	441.5	-921.9	-306.0	0.00	0.00	0.00
5,200.0	15.69	295.59	5,062.1	453.2	-946.2	-314.1	0.00	0.00	0.00
5,265.8	15.69	295.59	5,125.4	460.9	-962.3	-319.5	0.00	0.00	0.00
Start Drop -2.00									
5,300.0	15.00	295.59	5,158.4	464.8	-970.4	-322.2	2.00	-2.00	0.00
5,400.0	13.00	295.59	5,255.4	475.3	-992.3	-329.4	2.00	-2.00	0.00
5,500.0	11.00	295.59	5,353.2	484.3	-1,011.0	-335.6	2.00	-2.00	0.00
5,600.0	9.00	295.59	5,451.7	491.8	-1,026.7	-340.8	2.00	-2.00	0.00
5,700.0	7.00	295.59	5,550.7	497.8	-1,039.2	-345.0	2.00	-2.00	0.00
5,800.0	5.00	295.59	5,650.2	502.3	-1,048.7	-348.1	2.00	-2.00	0.00
5,900.0	3.00	295.59	5,749.9	505.3	-1,055.0	-350.2	2.00	-2.00	0.00
6,000.0	1.00	295.59	5,849.8	506.8	-1,058.1	-351.3	2.00	-2.00	0.00
6,050.2	0.00	0.00	5,900.0	507.0	-1,058.5	-351.4	2.00	-2.00	0.00
6,100.0	0.00	0.00	5,949.8	507.0	-1,058.5	-351.4	0.00	0.00	0.00
6,192.9	0.00	0.00	6,042.7	507.0	-1,058.5	-351.4	0.00	0.00	0.00
KOP #2 - Start Build 7.50									
6,200.0	0.53	180.00	6,049.8	507.0	-1,058.5	-351.4	7.53	7.53	0.00
6,300.0	8.03	180.00	6,149.5	499.5	-1,058.5	-344.0	7.50	7.50	0.00
6,400.0	15.53	180.00	6,247.3	479.1	-1,058.5	-323.8	7.50	7.50	0.00
6,500.0	23.03	180.00	6,341.6	446.1	-1,058.5	-291.1	7.50	7.50	0.00
6,581.7	29.17	180.00	6,415.0	410.1	-1,058.5	-255.5	7.50	7.50	0.00
Sharon Springs									
6,600.0	30.53	180.00	6,430.8	401.1	-1,058.5	-246.5	7.50	7.50	0.00
6,700.0	38.03	180.00	6,513.4	344.8	-1,058.5	-190.8	7.50	7.50	0.00
6,761.1	42.62	180.00	6,560.0	305.2	-1,058.5	-151.7	7.50	7.50	0.00
Niobrara A									
6,800.0	45.53	180.00	6,587.9	278.2	-1,058.5	-124.9	7.50	7.50	0.00
6,894.9	52.65	180.00	6,650.0	206.5	-1,058.5	-54.0	7.50	7.50	0.00
Niobrara B									
6,900.0	53.03	180.00	6,653.1	202.4	-1,058.5	-49.9	7.50	7.50	0.00
7,000.0	60.53	180.00	6,707.8	118.8	-1,058.5	32.8	7.50	7.50	0.00
7,059.4	64.99	180.00	6,735.0	66.1	-1,058.5	85.0	7.50	7.50	0.00
Niobrara C									
7,100.0	68.03	180.00	6,751.2	28.8	-1,058.5	121.9	7.50	7.50	0.00
7,200.0	75.53	180.00	6,782.4	-66.1	-1,058.5	215.9	7.50	7.50	0.00
7,300.0	83.03	180.00	6,801.0	-164.3	-1,058.5	313.1	7.50	7.50	0.00
7,398.2	90.40	180.00	6,806.6	-262.3	-1,058.5	410.1	7.50	7.50	0.00
Start 7109.7 hold at 7398.2 MD - 7"									
7,400.0	90.40	180.00	6,806.6	-264.1	-1,058.5	411.8	0.02	0.02	0.00
7,500.0	90.40	180.00	6,805.9	-364.1	-1,058.5	510.8	0.00	0.00	0.00
7,600.0	90.40	180.00	6,805.2	-464.1	-1,058.5	609.8	0.00	0.00	0.00
7,700.0	90.40	180.00	6,804.5	-564.1	-1,058.5	708.8	0.00	0.00	0.00
7,800.0	90.40	180.00	6,803.8	-664.1	-1,058.5	807.8	0.00	0.00	0.00
7,900.0	90.40	180.00	6,803.1	-764.1	-1,058.5	906.8	0.00	0.00	0.00

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Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,000.0	90.40	180.00	6,802.4	-864.1	-1,058.5	1,005.7	0.00	0.00	0.00
8,100.0	90.40	180.00	6,801.7	-964.1	-1,058.5	1,104.7	0.00	0.00	0.00
8,200.0	90.40	180.00	6,801.0	-1,064.1	-1,058.5	1,203.7	0.00	0.00	0.00
8,300.0	90.40	180.00	6,800.3	-1,164.1	-1,058.5	1,302.7	0.00	0.00	0.00
8,400.0	90.40	180.00	6,799.6	-1,264.0	-1,058.5	1,401.7	0.00	0.00	0.00
8,500.0	90.40	180.00	6,798.9	-1,364.0	-1,058.5	1,500.6	0.00	0.00	0.00
8,600.0	90.40	180.00	6,798.2	-1,464.0	-1,058.5	1,599.6	0.00	0.00	0.00
8,700.0	90.40	180.00	6,797.5	-1,564.0	-1,058.5	1,698.6	0.00	0.00	0.00
8,800.0	90.40	180.00	6,796.8	-1,664.0	-1,058.5	1,797.6	0.00	0.00	0.00
8,900.0	90.40	180.00	6,796.1	-1,764.0	-1,058.5	1,896.6	0.00	0.00	0.00
9,000.0	90.40	180.00	6,795.5	-1,864.0	-1,058.5	1,995.6	0.00	0.00	0.00
9,100.0	90.40	180.00	6,794.8	-1,964.0	-1,058.5	2,094.5	0.00	0.00	0.00
9,200.0	90.40	180.00	6,794.1	-2,064.0	-1,058.5	2,193.5	0.00	0.00	0.00
9,300.0	90.40	180.00	6,793.4	-2,164.0	-1,058.5	2,292.5	0.00	0.00	0.00
9,400.0	90.40	180.00	6,792.7	-2,264.0	-1,058.5	2,391.5	0.00	0.00	0.00
9,500.0	90.40	180.00	6,792.0	-2,364.0	-1,058.5	2,490.5	0.00	0.00	0.00
9,600.0	90.40	180.00	6,791.3	-2,464.0	-1,058.5	2,589.5	0.00	0.00	0.00
9,700.0	90.40	180.00	6,790.6	-2,564.0	-1,058.5	2,688.4	0.00	0.00	0.00
9,800.0	90.40	180.00	6,789.9	-2,664.0	-1,058.5	2,787.4	0.00	0.00	0.00
9,900.0	90.40	180.00	6,789.2	-2,764.0	-1,058.5	2,886.4	0.00	0.00	0.00
10,000.0	90.40	180.00	6,788.5	-2,864.0	-1,058.5	2,985.4	0.00	0.00	0.00
10,100.0	90.40	180.00	6,787.8	-2,964.0	-1,058.5	3,084.4	0.00	0.00	0.00
10,200.0	90.40	180.00	6,787.1	-3,064.0	-1,058.5	3,183.3	0.00	0.00	0.00
10,300.0	90.40	180.00	6,786.4	-3,164.0	-1,058.5	3,282.3	0.00	0.00	0.00
10,400.0	90.40	180.00	6,785.7	-3,264.0	-1,058.5	3,381.3	0.00	0.00	0.00
10,500.0	90.40	180.00	6,785.0	-3,364.0	-1,058.5	3,480.3	0.00	0.00	0.00
10,600.0	90.40	180.00	6,784.3	-3,464.0	-1,058.5	3,579.3	0.00	0.00	0.00
10,700.0	90.40	180.00	6,783.6	-3,564.0	-1,058.5	3,678.3	0.00	0.00	0.00
10,800.0	90.40	180.00	6,782.9	-3,664.0	-1,058.5	3,777.2	0.00	0.00	0.00
10,900.0	90.40	180.00	6,782.2	-3,764.0	-1,058.5	3,876.2	0.00	0.00	0.00
11,000.0	90.40	180.00	6,781.5	-3,864.0	-1,058.5	3,975.2	0.00	0.00	0.00
11,100.0	90.40	180.00	6,780.8	-3,964.0	-1,058.5	4,074.2	0.00	0.00	0.00
11,200.0	90.40	180.00	6,780.1	-4,064.0	-1,058.5	4,173.2	0.00	0.00	0.00
11,300.0	90.40	180.00	6,779.4	-4,164.0	-1,058.5	4,272.2	0.00	0.00	0.00
11,400.0	90.40	180.00	6,778.7	-4,264.0	-1,058.5	4,371.1	0.00	0.00	0.00
11,500.0	90.40	180.00	6,778.0	-4,364.0	-1,058.5	4,470.1	0.00	0.00	0.00
11,600.0	90.40	180.00	6,777.3	-4,464.0	-1,058.5	4,569.1	0.00	0.00	0.00
11,700.0	90.40	180.00	6,776.6	-4,564.0	-1,058.5	4,668.1	0.00	0.00	0.00
11,800.0	90.40	180.00	6,775.9	-4,664.0	-1,058.5	4,767.1	0.00	0.00	0.00
11,900.0	90.40	180.00	6,775.2	-4,764.0	-1,058.5	4,866.0	0.00	0.00	0.00
12,000.0	90.40	180.00	6,774.5	-4,864.0	-1,058.5	4,965.0	0.00	0.00	0.00
12,100.0	90.40	180.00	6,773.8	-4,964.0	-1,058.5	5,064.0	0.00	0.00	0.00
12,200.0	90.40	180.00	6,773.1	-5,064.0	-1,058.5	5,163.0	0.00	0.00	0.00
12,300.0	90.40	180.00	6,772.4	-5,164.0	-1,058.5	5,262.0	0.00	0.00	0.00
12,400.0	90.40	180.00	6,771.7	-5,264.0	-1,058.5	5,361.0	0.00	0.00	0.00
12,500.0	90.40	180.00	6,771.0	-5,364.0	-1,058.5	5,459.9	0.00	0.00	0.00
12,600.0	90.40	180.00	6,770.3	-5,463.9	-1,058.5	5,558.9	0.00	0.00	0.00
12,700.0	90.40	180.00	6,769.6	-5,563.9	-1,058.5	5,657.9	0.00	0.00	0.00
12,800.0	90.40	180.00	6,768.9	-5,663.9	-1,058.5	5,756.9	0.00	0.00	0.00
12,900.0	90.40	180.00	6,768.2	-5,763.9	-1,058.5	5,855.9	0.00	0.00	0.00
13,000.0	90.40	180.00	6,767.5	-5,863.9	-1,058.5	5,954.9	0.00	0.00	0.00
13,100.0	90.40	180.00	6,766.8	-5,963.9	-1,058.5	6,053.8	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,200.0	90.40	180.00	6,766.1	-6,063.9	-1,058.5	6,152.8	0.00	0.00	0.00	
13,300.0	90.40	180.00	6,765.4	-6,163.9	-1,058.5	6,251.8	0.00	0.00	0.00	
13,400.0	90.40	180.00	6,764.7	-6,263.9	-1,058.5	6,350.8	0.00	0.00	0.00	
13,500.0	90.40	180.00	6,764.0	-6,363.9	-1,058.5	6,449.8	0.00	0.00	0.00	
13,600.0	90.40	180.00	6,763.3	-6,463.9	-1,058.5	6,548.7	0.00	0.00	0.00	
13,700.0	90.40	180.00	6,762.6	-6,563.9	-1,058.5	6,647.7	0.00	0.00	0.00	
13,800.0	90.40	180.00	6,761.9	-6,663.9	-1,058.5	6,746.7	0.00	0.00	0.00	
13,900.0	90.40	180.00	6,761.2	-6,763.9	-1,058.5	6,845.7	0.00	0.00	0.00	
14,000.0	90.40	180.00	6,760.5	-6,863.9	-1,058.5	6,944.7	0.00	0.00	0.00	
14,100.0	90.40	180.00	6,759.8	-6,963.9	-1,058.5	7,043.7	0.00	0.00	0.00	
14,200.0	90.40	180.00	6,759.1	-7,063.9	-1,058.5	7,142.6	0.00	0.00	0.00	
14,300.0	90.40	180.00	6,758.5	-7,163.9	-1,058.5	7,241.6	0.00	0.00	0.00	
14,400.0	90.40	180.00	6,757.8	-7,263.9	-1,058.5	7,340.6	0.00	0.00	0.00	
14,500.0	90.40	180.00	6,757.1	-7,363.9	-1,058.5	7,439.6	0.00	0.00	0.00	
14,507.9	90.40	180.00	6,757.0	-7,371.8	-1,058.5	7,447.4	0.00	0.00	0.00	
TD at 14507.9 - BHL 2628'FSL & 2157'FEL, Sec.32										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SHL 557'FNL & 1050'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,381,166.76	3,259,644.44	40.375959	-104.568052	
BHL 2628'FSL & 2157'FI - plan hits target center - Point	0.00	0.00	6,757.0	-7,371.8	-1,058.5	1,373,784.57	3,258,663.49	40.355724	-104.571850	

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,398.2	6,806.6	7"	7	8-3/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,608.7	3,530.0	Parkman Sandstone		0.00		
4,304.6	4,200.0	Sussex Sandstone		0.00		
6,581.7	6,415.0	Sharon Springs		0.00		
6,761.1	6,560.0	Niobrara A		0.00		
6,894.9	6,650.0	Niobrara B		0.00		
7,059.4	6,735.0	Niobrara C		0.00		

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
800.0	800.0	0.0	0.0	KOP - Start Build 1.50
5,265.8	5,125.4	460.9	-962.3	Start Drop -2.00
6,192.9	6,042.7	507.0	-1,058.5	KOP #2 - Start Build 7.50
7,398.2	6,806.6	-262.3	-1,058.5	Start 7109.7 hold at 7398.2 MD
14,507.9	6,757.0	-7,371.8	-1,058.5	TD at 14507.9



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29M-323

Wellbore #1

Plan #1 (3-14-16)

Anticollision Report

17 March, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (3-14-16)		
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 1,000.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	3/17/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	14,507.9	Plan #1 (3-14-16) (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						
Bell Pad SEC.29-T5N-R64W						
Bell B29-22D - Bell B29-22D - Bell B29-22D	9,286.6	6,836.6	837.5	776.8	13.792	CC
Bell B29-22D - Bell B29-22D - Bell B29-22D	9,300.0	6,836.6	837.6	776.6	13.740	ES
Bell B29-22D - Bell B29-22D - Bell B29-22D	9,500.0	6,836.2	864.3	799.7	13.388	SF
Bell B29-24D - Bell B29-24D - Bell B29-24D	10,742.0	7,107.8	345.4	244.6	3.426	CC, ES, SF
Existing Wells Sec.29-T5N-R64W						
Blake #B 29-10X (Exist.) - Wellbore #1 - Wellbore #1	9,783.8	6,792.0	39.2	-152.2	0.205	Level 1, CC, ES, SF
Blake #B29-10 (D&A) - Wellbore #1 - Wellbore #1	9,935.0	6,790.9	113.1	-81.1	0.582	Level 1, CC, ES, SF
Blake #B29-15 (Exist.) - Wellbore #1 - Wellbore #1	11,208.2	6,797.0	118.6	-99.4	0.544	Level 1, CC, ES, SF
Blake B #29-23 (Exist.) - Wellbore #1 - Wellbore #1	10,275.6	6,796.5	244.6	44.0	1.219	Level 2, CC, ES, SF
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	8,686.3	6,782.1	215.5	166.4	4.391	CC, ES
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	8,700.0	6,782.3	215.9	166.6	4.379	SF
DIC Cross #31-32 (P&A) - Wellbore #1 - Wellbore #1	12,545.3	6,795.7	206.0	-37.1	0.847	Level 1, CC, ES, SF
Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1	7,264.1	6,783.7	188.5	157.7	6.127	CC, ES, SF
Ottenhoff 41-6B (Exist.) - Wellbore #1 - Wellbore #1	633.5	620.5	414.6	412.4	190.375	CC
Ottenhoff 41-6B (Exist.) - Wellbore #1 - Wellbore #1	700.0	685.0	414.7	412.3	172.115	ES
Ottenhoff 41-6B (Exist.) - Wellbore #1 - Wellbore #1	6,500.0	6,434.9	811.7	777.5	23.699	SF
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W						
Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)	200.0	199.0	30.1	29.4	44.778	CC, ES
Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)	14,507.9	14,417.9	451.8	164.7	1.574	SF
Ottenhoff 29M-423 - Wellbore #1 - Plan #1 (3-14-16)	400.0	399.0	15.0	13.5	9.576	CC
Ottenhoff 29M-423 - Wellbore #1 - Plan #1 (3-14-16)	14,507.9	14,616.5	252.1	-7.2	0.972	Level 1, ES, SF
Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)	800.0	799.0	30.1	26.7	8.932	CC, ES
Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)	14,507.9	14,249.2	512.3	233.7	1.839	SF
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	800.0	799.0	59.9	56.5	17.781	CC, ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	14,507.9	14,290.7	966.7	679.2	3.362	SF
Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)	800.0	799.0	15.0	11.7	4.467	CC
Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)	14,507.9	14,381.8	267.0	-9.6	0.965	Level 1, ES, SF
Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)	800.0	799.0	45.1	41.8	13.397	CC, ES
Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)	14,507.9	14,381.9	724.1	435.1	2.505	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 559- Bell Pad SEC.29-T5N-R64W - Bell B29-22D - Bell B29-22D - Bell B29-22D													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		
8,800.0	6,796.8	6,837.6	6,774.2	40.7	17.5	-87.93	-2,150.4	-221.6	968.6	916.4	52.19	18.558		
8,900.0	6,796.1	6,837.4	6,774.0	42.4	17.5	-87.92	-2,150.4	-221.6	922.4	868.5	53.92	17.108		
9,000.0	6,795.5	6,837.2	6,773.8	44.0	17.5	-87.90	-2,150.4	-221.6	885.2	829.5	55.66	15.904		
9,100.0	6,794.8	6,837.0	6,773.6	45.7	17.5	-87.89	-2,150.4	-221.6	858.0	800.6	57.41	14.945		
9,200.0	6,794.1	6,836.8	6,773.4	47.4	17.5	-87.88	-2,150.4	-221.6	842.0	782.8	59.18	14.227		
9,286.6	6,793.5	6,836.6	6,773.3	48.8	17.5	-87.87	-2,150.4	-221.6	837.5	776.8	60.73	13.792 CC		
9,300.0	6,793.4	6,836.6	6,773.2	49.1	17.5	-87.86	-2,150.4	-221.6	837.6	776.6	60.96	13.740 ES		
9,400.0	6,792.7	6,836.4	6,773.0	50.8	17.5	-87.85	-2,150.4	-221.6	845.1	782.4	62.75	13.467		
9,500.0	6,792.0	6,836.2	6,772.8	52.5	17.5	-87.84	-2,150.4	-221.6	864.3	799.7	64.56	13.388 SF		
9,600.0	6,791.3	6,836.0	6,772.6	54.3	17.5	-87.82	-2,150.4	-221.6	894.2	827.9	66.36	13.474		
9,700.0	6,790.6	6,835.8	6,772.4	56.0	17.5	-87.81	-2,150.4	-221.6	934.0	865.8	68.18	13.698		
9,800.0	6,789.9	6,835.6	6,772.2	57.8	17.5	-87.80	-2,150.4	-221.6	982.3	912.3	70.00	14.033		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 685- Bell Pad SEC.29-T5N-R64W - Bell B29-24D - Bell B29-24D - Bell B29-24D													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)			
9,900.0	6,789.2	7,099.9	6,793.6	59.6	29.2	89.88	-3,605.9	-1,404.1	910.0	824.7	85.35	10.663		
10,000.0	6,788.5	7,100.7	6,794.4	61.4	29.2	90.02	-3,605.9	-1,404.0	818.4	731.2	87.17	9.388		
10,100.0	6,787.8	7,101.6	6,795.3	63.2	29.2	90.17	-3,605.9	-1,404.0	729.0	640.0	89.00	8.191		
10,200.0	6,787.1	7,102.5	6,796.2	65.0	29.2	90.32	-3,605.9	-1,404.0	642.7	551.8	90.84	7.075		
10,300.0	6,786.4	7,103.4	6,797.1	66.8	29.2	90.47	-3,605.9	-1,404.0	560.9	468.3	92.67	6.053		
10,400.0	6,785.7	7,104.4	6,798.1	68.6	29.2	90.63	-3,606.0	-1,404.0	486.1	391.6	94.51	5.143		
10,500.0	6,785.0	7,105.4	6,799.0	70.4	29.2	90.79	-3,606.0	-1,403.9	421.8	325.4	96.36	4.377		
10,600.0	6,784.3	7,106.4	6,800.0	72.2	29.2	90.95	-3,606.0	-1,403.9	373.5	275.3	98.20	3.803		
10,700.0	6,783.6	7,107.4	6,801.1	74.0	29.2	91.13	-3,606.0	-1,403.9	348.0	247.9	100.05	3.478		
10,742.0	6,783.3	7,107.8	6,801.5	74.8	29.2	91.20	-3,606.0	-1,403.9	345.4	244.6	100.83	3.426	CC, ES, SF	
10,800.0	6,782.9	7,108.4	6,802.1	75.9	29.2	91.30	-3,606.0	-1,403.9	350.3	248.4	101.90	3.438		
10,900.0	6,782.2	7,109.5	6,803.2	77.7	29.2	91.48	-3,606.0	-1,403.9	379.9	276.1	103.75	3.662		
11,000.0	6,781.5	7,110.6	6,804.3	79.6	29.2	91.67	-3,606.1	-1,403.8	431.2	325.6	105.60	4.083		
11,100.0	6,780.8	7,111.8	6,805.5	81.4	29.2	91.86	-3,606.1	-1,403.8	497.5	390.1	107.45	4.630		
11,200.0	6,780.1	7,113.0	6,806.7	83.2	29.2	92.05	-3,606.1	-1,403.8	573.7	464.4	109.30	5.249		
11,300.0	6,779.4	7,114.2	6,807.9	85.1	29.2	92.25	-3,606.1	-1,403.8	656.3	545.1	111.15	5.904		
11,400.0	6,778.7	7,115.4	6,809.1	87.0	29.2	92.46	-3,606.1	-1,403.7	743.2	630.2	113.00	6.577		
11,500.0	6,778.0	7,116.7	6,810.4	88.8	29.2	92.68	-3,606.2	-1,403.7	833.0	718.1	114.85	7.253		
11,600.0	6,777.3	7,118.1	6,811.8	90.7	29.2	92.90	-3,606.2	-1,403.7	924.9	808.2	116.70	7.926		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake #B 29-10X (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7072-UNKNOWN													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	6,796.8	6,798.8	6,798.8	40.7	136.0	-99.93	-2,647.8	-1,019.3	984.5	812.3	172.25	5.716		
8,900.0	6,796.1	6,798.1	6,798.1	42.4	136.0	-98.94	-2,647.8	-1,019.3	884.6	710.3	174.33	5.074		
9,000.0	6,795.5	6,797.5	6,797.5	44.0	135.9	-97.94	-2,647.8	-1,019.3	784.7	608.3	176.40	4.448		
9,100.0	6,794.8	6,796.8	6,796.8	45.7	135.9	-96.94	-2,647.8	-1,019.3	684.9	506.4	178.44	3.838		
9,200.0	6,794.1	6,796.1	6,796.1	47.4	135.9	-95.93	-2,647.8	-1,019.3	585.1	404.6	180.45	3.242		
9,300.0	6,793.4	6,795.4	6,795.4	49.1	135.9	-94.92	-2,647.8	-1,019.3	485.3	302.9	182.43	2.660		
9,400.0	6,792.7	6,794.7	6,794.7	50.8	135.9	-93.91	-2,647.8	-1,019.3	385.7	201.4	184.37	2.092		
9,500.0	6,792.0	6,794.0	6,794.0	52.5	135.9	-92.89	-2,647.8	-1,019.3	286.4	100.2	186.27	1.538		
9,600.0	6,791.3	6,793.3	6,793.3	54.3	135.9	-91.87	-2,647.8	-1,019.3	187.9	-0.2	188.12	0.999	Level 1	
9,700.0	6,790.6	6,792.6	6,792.6	56.0	135.9	-90.85	-2,647.8	-1,019.3	92.5	-97.5	189.93	0.487	Level 1	
9,783.8	6,790.0	6,792.0	6,792.0	57.5	135.8	-90.00	-2,647.8	-1,019.3	39.2	-152.2	191.41	0.205	Level 1, CC, ES, SF	
9,800.0	6,789.9	6,791.9	6,791.9	57.8	135.8	-89.83	-2,647.8	-1,019.3	42.4	-149.2	191.69	0.221	Level 1	
9,900.0	6,789.2	6,791.2	6,791.2	59.6	135.8	-88.81	-2,647.8	-1,019.3	122.7	-70.7	193.40	0.634	Level 1	
10,000.0	6,788.5	6,790.5	6,790.5	61.4	135.8	-87.80	-2,647.8	-1,019.3	219.8	24.7	195.06	1.127	Level 2	
10,100.0	6,787.8	6,789.8	6,789.8	63.2	135.8	-86.78	-2,647.8	-1,019.3	318.7	122.0	196.66	1.620		
10,200.0	6,787.1	6,789.1	6,789.1	65.0	135.8	-85.76	-2,647.8	-1,019.3	418.1	219.9	198.21	2.109		
10,300.0	6,786.4	6,788.4	6,788.4	66.8	135.8	-84.75	-2,647.8	-1,019.3	517.7	318.0	199.71	2.592		
10,400.0	6,785.7	6,787.7	6,787.7	68.6	135.8	-83.74	-2,647.8	-1,019.3	617.5	416.3	201.14	3.070		
10,500.0	6,785.0	6,787.0	6,787.0	70.4	135.7	-82.73	-2,647.8	-1,019.3	717.3	514.8	202.52	3.542		
10,600.0	6,784.3	6,786.3	6,786.3	72.2	135.7	-81.73	-2,647.8	-1,019.3	817.2	613.3	203.83	4.009		
10,700.0	6,783.6	6,785.6	6,785.6	74.0	135.7	-80.74	-2,647.8	-1,019.3	917.1	712.0	205.09	4.471		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake #B29-10 (D&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7125-UNKNOWN													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)			
9,000.0	6,795.5	6,797.5	6,797.5	44.0	135.9	-93.30	-2,799.0	-945.5	941.7	764.3	177.42	5.308		
9,100.0	6,794.8	6,796.8	6,796.8	45.7	135.9	-92.95	-2,799.0	-945.5	842.6	663.4	179.19	4.702		
9,200.0	6,794.1	6,796.1	6,796.1	47.4	135.9	-92.60	-2,799.0	-945.5	743.6	562.6	180.97	4.109		
9,300.0	6,793.4	6,795.4	6,795.4	49.1	135.9	-92.25	-2,799.0	-945.5	644.9	462.2	182.75	3.529		
9,400.0	6,792.7	6,794.7	6,794.7	50.8	135.9	-91.89	-2,799.0	-945.5	546.8	362.2	184.54	2.963		
9,500.0	6,792.0	6,794.0	6,794.0	52.5	135.9	-91.54	-2,799.0	-945.5	449.4	263.1	186.34	2.412		
9,600.0	6,791.3	6,793.3	6,793.3	54.3	135.9	-91.18	-2,799.0	-945.5	353.5	165.4	188.13	1.879		
9,700.0	6,790.6	6,792.6	6,792.6	56.0	135.9	-90.83	-2,799.0	-945.5	260.7	70.8	189.93	1.373	Level 3	
9,800.0	6,789.9	6,791.9	6,791.9	57.8	135.8	-90.48	-2,799.0	-945.5	176.0	-15.7	191.73	0.918	Level 1	
9,900.0	6,789.2	6,791.2	6,791.2	59.6	135.8	-90.12	-2,799.0	-945.5	118.3	-75.2	193.53	0.611	Level 1	
9,935.0	6,788.9	6,790.9	6,790.9	60.2	135.8	-90.00	-2,799.0	-945.5	113.1	-81.1	194.16	0.582	Level 1, CC, ES, SF	
10,000.0	6,788.5	6,790.5	6,790.5	61.4	135.8	-89.77	-2,799.0	-945.5	130.4	-64.9	195.33	0.668	Level 1	
10,100.0	6,787.8	6,789.8	6,789.8	63.2	135.8	-89.42	-2,799.0	-945.5	200.0	2.9	197.12	1.015	Level 2	
10,200.0	6,787.1	6,789.1	6,789.1	65.0	135.8	-89.06	-2,799.0	-945.5	288.1	89.2	198.92	1.449	Level 3	
10,300.0	6,786.4	6,788.4	6,788.4	66.8	135.8	-88.71	-2,799.0	-945.5	382.1	181.4	200.71	1.904		
10,400.0	6,785.7	6,787.7	6,787.7	68.6	135.8	-88.36	-2,799.0	-945.5	478.6	276.1	202.50	2.363		
10,500.0	6,785.0	6,787.0	6,787.0	70.4	135.7	-88.00	-2,799.0	-945.5	576.2	371.9	204.28	2.821		
10,600.0	6,784.3	6,786.3	6,786.3	72.2	135.7	-87.65	-2,799.0	-945.5	674.6	468.5	206.06	3.274		
10,700.0	6,783.6	6,785.6	6,785.6	74.0	135.7	-87.30	-2,799.0	-945.5	773.3	565.5	207.83	3.721		
10,800.0	6,782.9	6,784.9	6,784.9	75.9	135.7	-86.94	-2,799.0	-945.5	872.4	662.8	209.60	4.162		
10,900.0	6,782.2	6,784.2	6,784.2	77.7	135.7	-86.59	-2,799.0	-945.5	971.6	760.3	211.36	4.597		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Blake #B29-15 (Exist.) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		7092-UNKNOWN											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
10,300.0	6,786.4	6,803.4	6,803.4	66.8	136.1	-93.06	-4,072.2	-939.9	915.9	714.9	201.07	4.555			
10,400.0	6,785.7	6,802.7	6,802.7	68.6	136.1	-92.72	-4,072.2	-939.9	816.9	613.9	202.94	4.025			
10,500.0	6,785.0	6,802.0	6,802.0	70.4	136.0	-92.39	-4,072.2	-939.9	718.1	513.3	204.81	3.506			
10,600.0	6,784.3	6,801.3	6,801.3	72.2	136.0	-92.05	-4,072.2	-939.9	619.7	413.0	206.68	2.998			
10,700.0	6,783.6	6,800.6	6,800.6	74.0	136.0	-91.71	-4,072.2	-939.9	521.9	313.3	208.54	2.503			
10,800.0	6,782.9	6,799.9	6,799.9	75.9	136.0	-91.38	-4,072.2	-939.9	425.1	214.7	210.41	2.020			
10,900.0	6,782.2	6,799.2	6,799.2	77.7	136.0	-91.04	-4,072.2	-939.9	330.3	118.0	212.26	1.556			
11,000.0	6,781.5	6,798.5	6,798.5	79.6	136.0	-90.70	-4,072.2	-939.9	239.6	25.5	214.12	1.119	Level 2		
11,100.0	6,780.8	6,797.8	6,797.8	81.4	136.0	-90.37	-4,072.2	-939.9	160.6	-55.4	215.97	0.743	Level 1		
11,200.0	6,780.1	6,797.1	6,797.1	83.2	135.9	-90.03	-4,072.2	-939.9	118.9	-99.0	217.81	0.546	Level 1		
11,208.2	6,780.0	6,797.0	6,797.0	83.4	135.9	-90.00	-4,072.2	-939.9	118.6	-99.4	217.97	0.544	Level 1, CC, ES, SF		
11,300.0	6,779.4	6,796.4	6,796.4	85.1	135.9	-89.69	-4,072.2	-939.9	149.9	-69.7	219.65	0.683	Level 1		
11,400.0	6,778.7	6,795.7	6,795.7	87.0	135.9	-89.35	-4,072.2	-939.9	225.4	4.0	221.49	1.018	Level 2		
11,500.0	6,778.0	6,795.0	6,795.0	88.8	135.9	-89.02	-4,072.2	-939.9	314.9	91.6	223.32	1.410	Level 3		
11,600.0	6,777.3	6,794.3	6,794.3	90.7	135.9	-88.68	-4,072.2	-939.9	409.3	184.2	225.14	1.818			
11,700.0	6,776.6	6,793.6	6,793.6	92.5	135.9	-88.34	-4,072.2	-939.9	505.8	278.9	226.96	2.229			
11,800.0	6,775.9	6,792.9	6,792.9	94.4	135.9	-88.00	-4,072.2	-939.9	603.5	374.7	228.77	2.638			
11,900.0	6,775.2	6,792.2	6,792.2	96.3	135.8	-87.67	-4,072.2	-939.9	701.8	471.2	230.58	3.044			
12,000.0	6,774.5	6,791.5	6,791.5	98.1	135.8	-87.33	-4,072.2	-939.9	800.6	568.2	232.38	3.445			
12,100.0	6,773.8	6,790.8	6,790.8	100.0	135.8	-86.99	-4,072.2	-939.9	899.6	665.4	234.17	3.842			
12,200.0	6,773.1	6,790.1	6,790.1	101.9	135.8	-86.66	-4,072.2	-939.9	998.8	762.8	235.95	4.233			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake B #29-23 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7595-UNKNOWN													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)			
9,400.0	6,792.7	6,802.7	6,802.7	50.8	136.1	-91.43	-3,139.6	-814.0	909.1	724.4	184.71	4.922		
9,500.0	6,792.0	6,802.0	6,802.0	52.5	136.0	-91.27	-3,139.6	-814.0	813.2	626.7	186.50	4.361		
9,600.0	6,791.3	6,801.3	6,801.3	54.3	136.0	-91.10	-3,139.6	-814.0	718.5	530.2	188.29	3.816		
9,700.0	6,790.6	6,800.6	6,800.6	56.0	136.0	-90.94	-3,139.6	-814.0	625.4	435.3	190.09	3.290		
9,800.0	6,789.9	6,799.9	6,799.9	57.8	136.0	-90.78	-3,139.6	-814.0	534.8	342.9	191.90	2.787		
9,900.0	6,789.2	6,799.2	6,799.2	59.6	136.0	-90.61	-3,139.6	-814.0	448.2	254.5	193.71	2.314		
10,000.0	6,788.5	6,798.5	6,798.5	61.4	136.0	-90.45	-3,139.6	-814.0	368.5	172.9	195.53	1.884		
10,100.0	6,787.8	6,797.8	6,797.8	63.2	136.0	-90.29	-3,139.6	-814.0	301.1	103.7	197.35	1.526		
10,200.0	6,787.1	6,797.1	6,797.1	65.0	135.9	-90.12	-3,139.6	-814.0	256.0	56.8	199.17	1.285	Level 3	
10,275.6	6,786.5	6,796.5	6,796.5	66.3	135.9	-90.00	-3,139.6	-814.0	244.6	44.0	200.55	1.219	Level 2, CC, ES, SF	
10,300.0	6,786.4	6,796.4	6,796.4	66.8	135.9	-89.96	-3,139.6	-814.0	245.8	44.8	201.00	1.223	Level 2	
10,400.0	6,785.7	6,795.7	6,795.7	68.6	135.9	-89.80	-3,139.6	-814.0	274.4	71.6	202.83	1.353	Level 3	
10,500.0	6,785.0	6,795.0	6,795.0	70.4	135.9	-89.63	-3,139.6	-814.0	331.9	127.3	204.66	1.622		
10,600.0	6,784.3	6,794.3	6,794.3	72.2	135.9	-89.47	-3,139.6	-814.0	406.3	199.8	206.49	1.967		
10,700.0	6,783.6	6,793.6	6,793.6	74.0	135.9	-89.31	-3,139.6	-814.0	489.8	281.5	208.32	2.351		
10,800.0	6,782.9	6,792.9	6,792.9	75.9	135.9	-89.14	-3,139.6	-814.0	578.6	368.5	210.16	2.753		
10,900.0	6,782.2	6,792.2	6,792.2	77.7	135.8	-88.98	-3,139.6	-814.0	670.6	458.6	211.99	3.163		
11,000.0	6,781.5	6,791.5	6,791.5	79.6	135.8	-88.82	-3,139.6	-814.0	764.6	550.7	213.83	3.575		
11,100.0	6,780.8	6,790.8	6,790.8	81.4	135.8	-88.65	-3,139.6	-814.0	859.9	644.2	215.67	3.987		
11,200.0	6,780.1	6,790.1	6,790.1	83.2	135.8	-88.49	-3,139.6	-814.0	956.2	738.7	217.51	4.396		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Carlson 29-1 (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							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
7,800.0	6,803.8	6,772.3	6,770.9	27.2	13.2	-84.22	-1,550.1	-843.9	912.0	876.8	35.21	25.899			
7,900.0	6,803.1	6,773.4	6,772.0	28.2	13.2	-84.52	-1,550.1	-843.9	815.2	778.7	36.55	22.302			
8,000.0	6,802.4	6,774.5	6,773.2	29.3	13.2	-84.81	-1,550.1	-843.8	719.3	681.3	37.97	18.941			
8,100.0	6,801.7	6,775.6	6,774.3	30.5	13.2	-85.11	-1,550.1	-843.7	624.6	585.1	39.46	15.828			
8,200.0	6,801.0	6,776.7	6,775.4	31.8	13.2	-85.40	-1,550.1	-843.7	531.8	490.8	41.00	12.971			
8,300.0	6,800.3	6,777.8	6,776.5	33.1	13.2	-85.70	-1,550.2	-843.6	442.3	399.7	42.59	10.384			
8,400.0	6,799.6	6,778.9	6,777.6	34.6	13.2	-85.99	-1,550.2	-843.6	358.3	314.1	44.22	8.102			
8,500.0	6,798.9	6,780.1	6,778.7	36.0	13.3	-86.29	-1,550.2	-843.5	284.8	238.9	45.89	6.207			
8,600.0	6,798.2	6,781.2	6,779.8	37.6	13.3	-86.58	-1,550.2	-843.4	232.1	184.5	47.58	4.878			
8,686.3	6,797.6	6,782.1	6,780.8	38.9	13.3	-86.84	-1,550.2	-843.4	215.5	166.4	49.06	4.391 CC, ES			
8,700.0	6,797.5	6,782.3	6,780.9	39.1	13.3	-86.88	-1,550.2	-843.4	215.9	166.6	49.30	4.379 SF			
8,800.0	6,796.8	6,783.4	6,782.0	40.7	13.3	-87.17	-1,550.3	-843.3	243.6	192.6	51.04	4.773			
8,900.0	6,796.1	6,784.5	6,783.1	42.4	13.3	-87.47	-1,550.3	-843.3	303.5	250.7	52.80	5.748			
9,000.0	6,795.5	6,785.6	6,784.2	44.0	13.3	-87.76	-1,550.3	-843.2	380.6	326.0	54.57	6.974			
9,100.0	6,794.8	6,786.7	6,785.3	45.7	13.3	-88.06	-1,550.3	-843.1	466.4	410.1	56.36	8.276			
9,200.0	6,794.1	6,787.8	6,786.5	47.4	13.3	-88.35	-1,550.3	-843.1	557.1	498.9	58.16	9.577			
9,300.0	6,793.4	6,788.9	6,787.6	49.1	13.3	-88.65	-1,550.4	-843.0	650.4	590.4	59.98	10.845			
9,400.0	6,792.7	6,790.0	6,788.7	50.8	13.3	-88.94	-1,550.4	-843.0	745.5	683.7	61.80	12.064			
9,500.0	6,792.0	6,791.2	6,789.8	52.5	13.3	-89.24	-1,550.4	-842.9	841.7	778.1	63.62	13.230			
9,600.0	6,791.3	6,792.3	6,790.9	54.3	13.3	-89.53	-1,550.4	-842.8	938.7	873.3	65.46	14.341			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - DIC Cross #31-32 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 7025-UNKNOWN													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
11,600.0	6,777.3	6,802.3	6,802.3	90.7	136.0	-91.83	-5,409.2	-852.5	967.5	742.0	225.45	4.291		
11,700.0	6,776.6	6,801.6	6,801.6	92.5	136.0	-91.64	-5,409.2	-852.5	870.0	642.7	227.33	3.827		
11,800.0	6,775.9	6,800.9	6,800.9	94.4	136.0	-91.45	-5,409.2	-852.5	773.2	544.0	229.21	3.374		
11,900.0	6,775.2	6,800.2	6,800.2	96.3	136.0	-91.25	-5,409.2	-852.5	677.4	446.3	231.08	2.931		
12,000.0	6,774.5	6,799.5	6,799.5	98.1	136.0	-91.06	-5,409.2	-852.5	582.9	349.9	232.96	2.502		
12,100.0	6,773.8	6,798.8	6,798.8	100.0	136.0	-90.86	-5,409.2	-852.5	490.6	255.8	234.84	2.089		
12,200.0	6,773.1	6,798.1	6,798.1	101.9	136.0	-90.67	-5,409.2	-852.5	402.1	165.4	236.71	1.699		
12,300.0	6,772.4	6,797.4	6,797.4	103.7	135.9	-90.48	-5,409.2	-852.5	320.3	81.8	238.59	1.343	Level 3	
12,400.0	6,771.7	6,796.7	6,796.7	105.6	135.9	-90.28	-5,409.2	-852.5	252.1	11.6	240.46	1.048	Level 2	
12,500.0	6,771.0	6,796.0	6,796.0	107.5	135.9	-90.09	-5,409.2	-852.5	211.0	-31.4	242.33	0.871	Level 1	
12,545.3	6,770.7	6,795.7	6,795.7	108.3	135.9	-90.00	-5,409.2	-852.5	206.0	-37.1	243.18	0.847	Level 1, CC, ES, SF	
12,600.0	6,770.3	6,795.3	6,795.3	109.4	135.9	-89.89	-5,409.2	-852.5	213.2	-31.0	244.20	0.873	Level 1	
12,700.0	6,769.6	6,794.6	6,794.6	111.2	135.9	-89.70	-5,409.2	-852.5	257.6	11.6	246.07	1.047	Level 2	
12,800.0	6,768.9	6,793.9	6,793.9	113.1	135.9	-89.51	-5,409.2	-852.5	327.6	79.7	247.94	1.321	Level 3	
12,900.0	6,768.2	6,793.2	6,793.2	115.0	135.9	-89.31	-5,409.2	-852.5	410.2	160.4	249.80	1.642		
13,000.0	6,767.5	6,792.5	6,792.5	116.9	135.9	-89.12	-5,409.2	-852.5	499.2	247.5	251.66	1.984		
13,100.0	6,766.8	6,791.8	6,791.8	118.8	135.8	-88.92	-5,409.2	-852.5	591.7	338.2	253.52	2.334		
13,200.0	6,766.1	6,791.1	6,791.1	120.7	135.8	-88.73	-5,409.2	-852.5	686.3	431.0	255.38	2.688		
13,300.0	6,765.4	6,790.4	6,790.4	122.5	135.8	-88.54	-5,409.2	-852.5	782.3	525.1	257.24	3.041		
13,400.0	6,764.7	6,789.7	6,789.7	124.4	135.8	-88.34	-5,409.2	-852.5	879.2	620.1	259.09	3.393		
13,500.0	6,764.0	6,789.0	6,789.0	126.3	135.8	-88.15	-5,409.2	-852.5	976.7	715.7	260.94	3.743		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff #29-1 (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							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-97.39	-120.9	-932.8	940.7						
100.0	100.0	90.1	90.1	0.1	0.1	-97.38	-120.8	-933.0	940.8	940.5	0.23	4,054.641			
200.0	200.0	194.2	194.2	0.3	0.4	-97.36	-120.5	-933.2	940.9	940.2	0.69	1,367.200			
229.8	229.8	222.8	222.8	0.4	0.4	-97.35	-120.4	-933.2	940.9	940.1	0.82	1,150.545			
300.0	300.0	288.9	288.9	0.6	0.6	-97.34	-120.2	-933.3	941.0	939.9	1.12	842.257			
400.0	400.0	388.2	388.2	0.8	0.8	-97.33	-120.2	-933.8	941.5	940.0	1.57	599.181			
500.0	500.0	494.7	494.6	1.0	1.0	-97.31	-119.8	-934.1	941.8	939.7	2.03	462.875			
531.0	531.0	524.0	524.0	1.1	1.1	-97.30	-119.6	-934.1	941.7	939.5	2.17	433.687			
600.0	600.0	587.7	587.7	1.2	1.2	-97.28	-119.3	-934.3	941.9	939.4	2.47	380.811			
700.0	700.0	693.5	693.5	1.5	1.5	-97.24	-118.8	-934.7	942.3	939.3	2.95	319.226			
719.9	719.9	713.1	713.0	1.5	1.5	-97.23	-118.6	-934.8	942.2	939.2	3.04	309.489			
800.0	800.0	788.1	788.1	1.7	1.7	-97.19	-118.0	-935.0	942.5	939.0	3.41	276.327			
900.0	900.0	893.7	893.7	1.9	2.0	-32.78	-117.0	-935.5	941.7	937.8	3.89	241.993			
1,000.0	999.9	987.4	987.4	2.1	2.2	-32.87	-116.3	-935.8	938.6	934.2	4.34	216.390			
1,100.0	1,099.7	1,088.5	1,088.5	2.3	2.5	-33.08	-115.5	-936.5	933.7	928.9	4.81	193.988			
1,200.0	1,199.3	1,191.0	1,190.9	2.6	2.7	-33.41	-114.8	-936.9	926.3	921.0	5.29	174.997			
1,300.0	1,298.6	1,300.0	1,300.0	2.8	3.0	-33.87	-113.5	-936.6	916.1	910.3	5.75	159.293			
1,400.0	1,397.5	1,394.5	1,394.4	3.1	3.2	-34.40	-112.5	-936.0	903.4	897.2	6.17	146.328			
1,500.0	1,496.1	1,496.0	1,495.9	3.4	3.4	-35.12	-111.8	-935.5	888.9	882.3	6.60	134.690			
1,600.0	1,594.2	1,595.3	1,595.3	3.8	3.5	-35.98	-111.2	-934.8	872.0	865.0	7.02	124.263			
1,700.0	1,691.7	1,693.9	1,693.9	4.2	3.7	-36.99	-110.5	-933.9	853.2	845.7	7.48	114.035			
1,800.0	1,788.6	1,790.6	1,790.5	4.6	3.8	-38.19	-110.2	-932.9	832.4	824.4	7.93	104.972			
1,900.0	1,885.0	1,884.7	1,884.6	5.1	4.0	-39.42	-110.1	-932.0	810.3	801.8	8.42	96.232			
2,000.0	1,981.2	1,981.6	1,981.5	5.6	4.1	-40.67	-110.0	-931.2	788.4	779.4	8.95	88.103			
2,100.0	2,077.5	2,079.1	2,079.0	6.1	4.3	-42.02	-110.3	-930.1	766.8	757.3	9.49	80.814			
2,200.0	2,173.8	2,170.5	2,170.4	6.6	4.4	-43.34	-110.3	-929.2	745.7	735.6	10.03	74.307			
2,300.0	2,270.1	2,269.0	2,268.9	7.1	4.5	-44.83	-110.4	-928.7	725.4	714.8	10.63	68.236			
2,400.0	2,366.3	2,363.8	2,363.8	7.7	4.7	-46.33	-110.2	-927.9	705.3	694.0	11.29	62.449			
2,500.0	2,462.6	2,457.1	2,457.0	8.2	4.9	-47.87	-109.9	-927.6	686.1	674.1	11.96	57.353			
2,600.0	2,558.9	2,552.8	2,552.7	8.8	5.0	-49.57	-110.1	-927.4	667.8	655.2	12.61	52.959			
2,700.0	2,655.2	2,650.2	2,650.1	9.3	5.1	-51.40	-110.5	-927.1	650.0	636.7	13.27	48.976			
2,800.0	2,751.4	2,748.8	2,748.7	9.9	5.3	-53.36	-110.7	-926.5	632.6	618.6	14.00	45.196			
2,900.0	2,847.7	2,846.3	2,846.2	10.4	5.5	-55.39	-110.6	-925.6	615.6	600.8	14.79	41.637			
3,000.0	2,944.0	2,940.5	2,940.4	11.0	5.7	-57.40	-110.1	-925.0	599.5	583.8	15.60	38.418			
3,100.0	3,040.3	3,035.5	3,035.4	11.6	5.9	-59.55	-110.0	-924.7	584.6	568.2	16.44	35.558			
3,200.0	3,136.5	3,134.0	3,133.9	12.1	6.2	-61.90	-109.9	-924.0	570.3	553.0	17.31	32.948			
3,300.0	3,232.8	3,230.7	3,230.6	12.7	6.4	-64.31	-109.6	-923.4	557.0	538.8	18.20	30.603			
3,400.0	3,329.1	3,329.3	3,329.1	13.3	6.6	-66.82	-108.6	-922.7	544.3	525.2	19.11	28.474			
3,500.0	3,425.4	3,425.7	3,425.5	13.8	6.9	-69.36	-107.4	-922.1	532.5	512.5	20.03	26.582			
3,600.0	3,521.6	3,523.0	3,522.9	14.4	7.1	-72.02	-106.0	-921.5	521.8	500.8	20.96	24.893			
3,700.0	3,617.9	3,621.2	3,621.0	15.0	7.4	-74.79	-104.3	-920.7	511.9	490.0	21.89	23.382			
3,800.0	3,714.2	3,718.5	3,718.4	15.5	7.6	-77.65	-102.5	-919.7	503.1	480.2	22.82	22.041			
3,900.0	3,810.5	3,814.4	3,814.2	16.1	7.8	-80.59	-100.9	-918.3	495.5	471.8	23.74	20.870			
4,000.0	3,906.7	3,909.4	3,909.1	16.7	8.1	-83.57	-99.3	-917.1	489.5	464.8	24.64	19.865			
4,100.0	4,003.0	4,001.5	4,001.2	17.2	8.3	-86.48	-98.1	-916.5	485.5	460.0	25.51	19.034			
4,200.0	4,099.3	4,095.1	4,094.9	17.8	8.6	-89.49	-97.5	-916.0	483.7	457.3	26.35	18.358			
4,251.9	4,149.3	4,145.1	4,144.8	18.1	8.7	-91.12	-97.4	-915.7	483.5	456.7	26.77	18.057			
4,300.0	4,195.6	4,191.5	4,191.3	18.4	8.8	-92.62	-97.2	-915.4	483.6	456.5	27.16	17.805			
4,400.0	4,291.8	4,285.5	4,285.3	18.9	9.0	-95.63	-96.9	-915.3	485.3	457.4	27.88	17.405			
4,500.0	4,388.1	4,379.2	4,379.0	19.5	9.1	-98.56	-97.0	-915.5	488.9	460.5	28.48	17.171			
4,600.0	4,484.4	4,473.2	4,473.0	20.1	9.1	-101.44	-97.5	-916.1	494.5	465.5	28.99	17.059			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff #29-1 (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							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
4,700.0	4,580.7	4,562.5	4,562.3	20.7	9.2	-104.12	-98.7	-916.7	502.2	472.7	29.47	17.042			
4,800.0	4,677.0	4,650.7	4,650.4	21.2	9.2	-106.75	-101.4	-916.9	512.9	482.9	29.93	17.137			
4,900.0	4,773.2	4,742.5	4,742.2	21.8	9.3	-109.40	-105.4	-917.1	526.0	495.7	30.36	17.328			
5,000.0	4,869.5	4,839.6	4,839.1	22.4	9.4	-112.09	-109.8	-917.1	540.6	509.8	30.75	17.579			
5,100.0	4,965.8	4,937.6	4,937.1	23.0	9.4	-114.66	-113.8	-917.3	555.8	524.6	31.12	17.858			
5,200.0	5,062.1	5,034.7	5,034.0	23.5	9.5	-117.09	-117.6	-917.2	571.9	540.4	31.48	18.169			
5,300.0	5,158.4	5,136.1	5,135.4	24.1	9.7	-119.64	-120.8	-916.5	588.3	556.5	31.79	18.508			
5,400.0	5,255.4	5,240.2	5,239.4	24.5	9.8	-122.09	-122.9	-915.2	603.2	571.2	31.99	18.856			
5,500.0	5,353.2	5,340.0	5,339.3	24.8	10.0	-124.08	-123.7	-913.8	615.7	583.5	32.22	19.112			
5,600.0	5,451.7	5,433.6	5,432.8	25.1	10.2	-125.71	-124.8	-911.4	627.3	594.9	32.44	19.336			
5,700.0	5,550.7	5,530.7	5,529.9	25.4	10.4	-127.16	-126.1	-907.8	637.7	605.1	32.66	19.528			
5,800.0	5,650.2	5,628.8	5,627.9	25.6	10.6	-128.32	-127.5	-904.1	646.4	613.5	32.87	19.667			
5,900.0	5,749.9	5,727.3	5,726.3	25.8	10.8	-129.12	-129.4	-901.2	653.3	620.2	33.08	19.746			
6,000.0	5,849.8	5,830.1	5,829.1	25.9	11.0	-129.61	-131.3	-898.6	657.9	624.5	33.31	19.747			
6,100.0	5,949.8	5,935.8	5,934.7	26.0	11.2	165.79	-132.6	-896.5	659.8	626.2	33.60	19.640			
6,200.0	6,049.8	6,039.8	6,038.7	26.2	11.5	-14.40	-132.8	-894.2	660.6	626.7	33.91	19.481			
6,300.0	6,149.5	6,140.6	6,139.5	26.2	11.7	-14.95	-132.7	-891.3	654.0	620.3	33.65	19.433			
6,400.0	6,247.3	6,240.7	6,239.5	26.2	11.9	-16.11	-132.2	-888.4	634.5	601.8	32.74	19.381			
6,500.0	6,341.6	6,335.1	6,333.9	26.1	12.2	-18.02	-131.4	-885.5	602.9	571.7	31.18	19.337			
6,600.0	6,430.8	6,422.6	6,421.3	26.0	12.4	-20.94	-130.8	-882.7	560.2	531.1	29.04	19.291			
6,700.0	6,513.4	6,502.4	6,501.0	25.8	12.6	-25.31	-130.5	-880.0	507.7	481.2	26.50	19.158			
6,800.0	6,587.9	6,576.7	6,575.3	25.6	12.8	-31.98	-130.3	-877.4	446.9	422.9	24.05	18.586			
6,900.0	6,653.1	6,641.7	6,640.3	25.5	12.9	-41.87	-130.2	-875.1	379.9	357.1	22.81	16.656			
7,000.0	6,707.8	6,696.2	6,694.8	25.3	13.0	-55.43	-130.1	-873.2	310.4	286.2	24.25	12.803			
7,100.0	6,751.2	6,739.4	6,737.9	25.1	13.2	-70.76	-130.0	-871.7	245.3	217.8	27.51	8.917			
7,200.0	6,782.4	6,770.5	6,769.0	25.1	13.2	-83.26	-130.0	-870.6	198.6	168.7	29.93	6.635			
7,264.1	6,795.8	6,783.7	6,782.2	25.0	13.3	-87.96	-129.9	-870.1	188.5	157.7	30.77	6.127 CC, ES, SF			
7,300.0	6,801.0	6,788.8	6,787.3	25.0	13.3	-89.25	-129.9	-869.9	191.8	160.7	31.06	6.175			
7,400.0	6,806.6	6,794.3	6,792.8	25.2	13.3	-87.63	-129.9	-869.7	231.7	200.1	31.59	7.334			
7,500.0	6,805.9	6,793.4	6,791.9	25.4	13.3	-87.37	-129.9	-869.8	300.8	268.4	32.38	9.292			
7,600.0	6,805.2	6,792.5	6,791.0	25.8	13.3	-87.10	-129.9	-869.8	383.8	350.5	33.31	11.522			
7,700.0	6,804.5	6,791.6	6,790.1	26.5	13.3	-86.83	-129.9	-869.8	473.4	439.0	34.38	13.772			
7,800.0	6,803.8	6,790.7	6,789.2	27.2	13.3	-86.56	-129.9	-869.9	566.5	531.0	35.55	15.936			
7,900.0	6,803.1	6,789.8	6,788.3	28.2	13.3	-86.30	-129.9	-869.9	661.6	624.8	36.82	17.970			
8,000.0	6,802.4	6,789.0	6,787.5	29.3	13.3	-86.03	-129.9	-869.9	758.0	719.8	38.17	19.861			
8,100.0	6,801.7	6,788.1	6,786.6	30.5	13.3	-85.76	-129.9	-870.0	855.2	815.6	39.58	21.608			
8,200.0	6,801.0	6,787.2	6,785.7	31.8	13.3	-85.49	-129.9	-870.0	953.0	911.9	41.05	23.218			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 488-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)			
0.0	0.0	0.0	0.0	0.0	0.0	96.99	-50.6	412.9	416.2					
100.0	100.0	87.3	87.3	0.1	0.1	96.99	-50.7	412.9	416.0	415.7	0.23	1,820.563		
200.0	200.0	187.7	187.7	0.3	0.2	97.00	-50.7	412.7	415.8	415.3	0.59	709.058		
300.0	300.0	288.1	288.1	0.6	0.4	97.02	-50.8	412.5	415.6	414.7	0.94	440.060		
400.0	400.0	388.5	388.5	0.8	0.5	97.04	-50.9	412.2	415.3	414.0	1.30	318.862		
500.0	500.0	488.0	488.0	1.0	0.6	97.08	-51.1	411.7	414.9	413.2	1.66	250.050		
600.0	600.0	587.5	587.5	1.2	0.8	97.05	-50.9	411.5	414.6	412.6	2.05	202.446		
633.5	633.5	620.5	620.5	1.3	0.9	97.01	-50.6	411.5	414.6	412.4	2.18	190.375 CC		
700.0	700.0	685.0	685.0	1.5	0.9	96.90	-49.8	411.7	414.7	412.3	2.41	172.115 ES		
800.0	800.0	781.0	781.0	1.7	1.0	96.71	-48.6	412.8	415.7	412.9	2.73	151.985		
900.0	900.0	879.0	878.9	1.9	1.2	160.91	-46.9	414.7	418.6	415.5	3.10	135.179		
1,000.0	999.9	977.5	977.4	2.1	1.4	160.65	-44.2	417.1	424.5	421.0	3.47	122.146		
1,100.0	1,099.7	1,076.8	1,076.5	2.3	1.6	160.34	-40.3	419.8	432.9	429.0	3.90	111.010		
1,200.0	1,199.3	1,177.6	1,177.2	2.6	1.8	160.00	-35.3	422.6	443.8	439.4	4.34	102.145		
1,300.0	1,298.6	1,278.9	1,278.3	2.8	2.0	159.72	-29.7	424.9	456.6	451.8	4.80	95.042		
1,400.0	1,397.5	1,371.5	1,370.7	3.1	2.3	159.44	-23.8	427.6	472.3	467.0	5.25	89.893		
1,500.0	1,496.1	1,463.3	1,462.1	3.4	2.5	159.13	-16.9	431.5	491.7	486.0	5.71	86.138		
1,600.0	1,594.2	1,566.0	1,564.4	3.8	2.8	158.80	-8.3	436.2	513.7	507.5	6.20	82.875		
1,700.0	1,691.7	1,671.3	1,669.2	4.2	3.1	158.51	1.3	439.8	536.9	530.2	6.70	80.084		
1,800.0	1,788.6	1,787.9	1,785.0	4.6	3.4	158.05	14.9	440.9	559.9	552.6	7.25	77.209		
1,900.0	1,885.0	1,901.5	1,897.2	5.1	3.7	157.41	32.3	438.6	581.8	573.9	7.82	74.369		
2,000.0	1,981.2	2,023.0	2,016.9	5.6	4.0	156.78	51.8	432.4	600.9	592.5	8.44	71.192		
2,100.0	2,077.5	2,145.1	2,136.4	6.1	4.3	155.93	74.3	421.0	615.7	606.7	9.08	67.833		
2,200.0	2,173.8	2,248.3	2,237.2	6.6	4.6	155.33	92.6	409.3	628.7	619.1	9.67	64.992		
2,300.0	2,270.1	2,352.2	2,338.7	7.1	4.9	154.72	111.3	396.8	641.1	630.8	10.29	62.334		
2,400.0	2,366.3	2,462.1	2,446.1	7.7	5.2	154.24	129.6	382.4	652.5	641.5	10.91	59.781		
2,500.0	2,462.6	2,582.4	2,563.5	8.2	5.5	153.85	148.2	363.6	661.4	649.9	11.57	57.165		
2,600.0	2,558.9	2,708.6	2,685.9	8.8	5.8	153.52	166.9	339.4	666.7	654.4	12.24	54.470		
2,700.0	2,655.2	2,816.5	2,789.9	9.3	6.1	153.22	183.0	315.4	668.8	656.0	12.87	51.981		
2,800.0	2,751.4	2,909.8	2,880.1	9.9	6.3	153.07	195.7	295.4	671.8	658.4	13.46	49.931		
2,900.0	2,847.7	3,017.3	2,984.0	10.4	6.6	152.98	209.5	271.6	674.2	660.1	14.08	47.886		
3,000.0	2,944.0	3,112.3	3,075.8	11.0	6.9	152.88	221.8	250.4	676.4	661.7	14.68	46.081		
3,100.0	3,040.3	3,198.6	3,159.6	11.6	7.1	152.83	232.6	232.4	680.0	664.7	15.26	44.574		
3,200.0	3,136.5	3,281.1	3,240.1	12.1	7.4	152.85	242.2	217.1	686.0	670.2	15.82	43.363		
3,300.0	3,232.8	3,363.7	3,321.1	12.7	7.6	152.98	250.6	204.0	694.6	678.2	16.38	42.415		
3,400.0	3,329.1	3,453.9	3,410.1	13.3	7.8	153.21	258.6	191.3	705.1	688.2	16.94	41.624		
3,500.0	3,425.4	3,575.2	3,529.3	13.8	8.2	153.33	271.6	173.1	714.6	697.0	17.60	40.603		
3,600.0	3,521.6	3,693.3	3,644.6	14.4	8.5	153.29	286.2	152.0	721.3	703.0	18.28	39.462		
3,700.0	3,617.9	3,812.5	3,760.2	15.0	8.9	153.17	301.7	127.8	725.5	706.5	18.97	38.243		
3,800.0	3,714.2	3,920.0	3,863.6	15.5	9.2	152.80	318.9	103.7	727.5	707.8	19.67	36.978		
3,900.0	3,810.5	4,014.0	3,953.8	16.1	9.5	152.45	334.5	82.6	729.5	709.2	20.35	35.855		
4,000.0	3,906.7	4,108.0	4,044.5	16.7	9.8	152.18	349.0	62.6	732.8	711.8	21.01	34.876		
4,100.0	4,003.0	4,202.0	4,135.4	17.2	10.1	151.95	363.1	43.4	736.9	715.2	21.67	33.998		
4,200.0	4,099.3	4,297.0	4,227.7	17.8	10.4	151.85	375.8	24.4	741.4	719.1	22.32	33.220		
4,300.0	4,195.6	4,391.0	4,319.2	18.4	10.7	151.85	386.9	6.2	746.6	723.7	22.94	32.544		
4,400.0	4,291.8	4,488.6	4,414.3	18.9	11.0	151.79	399.5	-12.1	752.4	728.8	23.59	31.892		
4,500.0	4,388.1	4,586.6	4,509.6	19.5	11.3	151.69	412.5	-30.2	758.5	734.2	24.25	31.275		
4,600.0	4,484.4	4,675.1	4,596.1	20.1	11.6	151.66	423.6	-45.7	765.5	740.6	24.87	30.776		
4,700.0	4,580.7	4,785.5	4,703.9	20.7	11.9	151.61	437.6	-65.3	772.3	746.7	25.56	30.213		
4,800.0	4,677.0	4,877.9	4,794.0	21.2	12.2	151.55	449.6	-81.6	779.2	753.0	26.20	29.738		
4,900.0	4,773.2	4,983.4	4,897.0	21.8	12.5	151.49	463.2	-100.1	786.3	759.4	26.88	29.248		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		488-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,869.5	5,091.9	5,002.6	22.4	12.9	151.39	477.6	-120.4	792.1	764.5	27.58	28.718			
5,100.0	4,965.8	5,186.7	5,094.9	23.0	13.2	151.32	489.9	-138.4	797.7	769.4	28.23	28.252			
5,200.0	5,062.1	5,276.0	5,182.1	23.5	13.5	151.36	500.3	-154.3	804.5	775.6	28.85	27.885			
5,300.0	5,158.4	5,366.2	5,270.6	24.1	13.7	151.52	509.2	-169.2	812.2	782.8	29.44	27.585			
5,400.0	5,255.4	5,457.2	5,360.3	24.5	14.0	151.74	516.9	-183.0	818.9	788.9	29.99	27.308			
5,500.0	5,353.2	5,554.5	5,456.1	24.8	14.3	151.84	525.0	-197.2	823.0	792.5	30.52	26.966			
5,600.0	5,451.7	5,645.9	5,546.2	25.1	14.5	151.79	532.8	-210.2	824.6	793.6	31.02	26.579			
5,700.0	5,550.7	5,727.0	5,626.6	25.4	14.8	151.71	539.0	-220.1	825.0	793.5	31.46	26.225			
5,800.0	5,650.2	5,806.0	5,705.0	25.6	15.0	151.61	543.8	-228.1	824.4	792.6	31.84	25.895			
5,900.0	5,749.9	5,901.0	5,799.5	25.8	15.2	151.48	548.3	-235.8	822.6	790.4	32.21	25.539			
6,000.0	5,849.8	5,982.7	5,881.0	25.9	15.4	151.32	551.3	-241.0	819.5	787.0	32.51	25.210			
6,100.0	5,949.8	6,074.7	5,972.8	26.0	15.7	86.72	553.6	-245.6	815.0	782.2	32.85	24.809			
6,200.0	6,049.8	6,165.5	6,063.6	26.2	15.8	-93.40	554.8	-249.2	811.2	777.9	33.23	24.414			
6,300.0	6,149.5	6,256.0	6,154.0	26.2	16.0	-94.07	555.0	-251.7	808.9	775.3	33.64	24.044			
6,352.9	6,201.6	6,304.2	6,202.3	26.2	16.1	-94.67	554.7	-252.6	808.6	774.8	33.81	23.914			
6,400.0	6,247.3	6,346.7	6,244.8	26.2	16.1	-95.34	554.3	-253.2	808.9	774.9	33.98	23.801			
6,500.0	6,341.6	6,434.9	6,332.9	26.1	16.2	-97.06	552.6	-253.8	811.7	777.5	34.25	23.699 SF			
6,600.0	6,430.8	6,518.9	6,416.9	26.0	16.2	-99.06	550.6	-253.7	818.6	784.3	34.36	23.825			
6,700.0	6,513.4	6,599.2	6,497.2	25.8	16.2	-101.11	548.2	-252.9	830.9	796.6	34.31	24.221			
6,800.0	6,587.9	6,674.6	6,572.5	25.6	16.2	-102.96	545.7	-251.9	849.9	815.8	34.07	24.941			
6,900.0	6,653.1	6,741.0	6,638.8	25.5	16.2	-104.16	543.1	-250.8	876.7	842.9	33.71	26.003			
7,000.0	6,707.8	6,797.0	6,694.8	25.3	16.2	-104.39	540.8	-249.6	912.3	879.0	33.36	27.345			
7,100.0	6,751.2	6,842.8	6,740.5	25.1	16.2	-103.39	538.7	-248.5	957.2	924.0	33.20	28.831			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-89.31	0.4	-30.1	30.1						
100.0	100.0	99.0	99.0	0.1	0.1	-89.31	0.4	-30.1	30.1	29.9	0.22	134.559			
200.0	200.0	199.0	199.0	0.3	0.3	-89.31	0.4	-30.1	30.1	29.4	0.67	44.778	CC, ES		
300.0	300.0	298.2	298.2	0.6	0.6	-88.58	0.8	-31.3	31.3	30.2	1.11	28.112			
400.0	400.0	397.3	397.3	0.8	0.8	-86.69	2.0	-34.9	35.0	33.5	1.56	22.451			
500.0	500.0	496.2	495.9	1.0	1.0	-84.29	4.1	-40.9	41.3	39.3	2.02	20.454			
600.0	600.0	594.6	593.9	1.2	1.3	-81.95	7.0	-49.4	50.1	47.6	2.49	20.111			
700.0	700.0	692.5	691.2	1.5	1.5	-79.93	10.7	-60.1	61.5	58.5	2.98	20.612			
800.0	800.0	789.8	787.5	1.7	1.9	-78.30	15.1	-73.1	75.5	72.0	3.50	21.558			
900.0	900.0	886.5	882.9	1.9	2.2	-12.74	20.4	-88.3	90.8	86.9	3.83	23.705			
1,000.0	999.9	982.9	977.4	2.1	2.6	-12.07	26.3	-105.7	106.0	101.7	4.28	24.769			
1,100.0	1,099.7	1,078.9	1,071.2	2.3	3.0	-11.70	33.1	-125.3	121.2	116.5	4.74	25.571			
1,200.0	1,199.3	1,174.5	1,164.0	2.6	3.4	-11.54	40.5	-147.0	136.3	131.1	5.21	26.171			
1,300.0	1,298.6	1,269.8	1,255.9	2.8	3.9	-11.51	48.7	-170.9	151.4	145.7	5.69	26.611			
1,400.0	1,397.5	1,364.7	1,346.8	3.1	4.5	-11.58	57.6	-196.7	166.4	160.2	6.18	26.934			
1,500.0	1,496.1	1,459.3	1,436.7	3.4	5.1	-11.73	67.2	-224.7	181.3	174.6	6.68	27.130			
1,600.0	1,594.2	1,555.5	1,527.2	3.8	5.7	-11.95	77.6	-255.0	195.9	188.7	7.20	27.194			
1,700.0	1,691.7	1,654.6	1,620.6	4.2	6.4	-12.28	88.5	-286.7	208.4	200.7	7.74	26.916			
1,800.0	1,788.6	1,754.1	1,714.2	4.6	7.1	-12.72	99.4	-318.5	218.4	210.1	8.30	26.321			
1,900.0	1,885.0	1,853.8	1,808.0	5.1	7.8	-13.28	110.4	-350.4	226.3	217.4	8.88	25.481			
2,000.0	1,981.2	1,953.5	1,901.8	5.6	8.5	-13.82	121.3	-382.3	233.9	224.4	9.49	24.661			
2,100.0	2,077.5	2,053.2	1,995.6	6.1	9.2	-14.33	132.3	-414.2	241.5	231.4	10.10	23.913			
2,200.0	2,173.8	2,152.9	2,089.5	6.6	9.9	-14.81	143.2	-446.0	249.2	238.5	10.73	23.230			
2,300.0	2,270.1	2,252.5	2,183.3	7.1	10.6	-15.26	154.2	-477.9	256.9	245.5	11.36	22.605			
2,400.0	2,366.3	2,352.2	2,277.1	7.7	11.3	-15.68	165.1	-509.8	264.6	252.5	12.01	22.031			
2,500.0	2,462.6	2,451.9	2,370.9	8.2	12.0	-16.08	176.1	-541.7	272.2	259.6	12.66	21.504			
2,600.0	2,558.9	2,551.6	2,464.7	8.8	12.7	-16.46	187.0	-573.5	280.0	266.6	13.32	21.017			
2,700.0	2,655.2	2,651.3	2,558.5	9.3	13.4	-16.82	198.0	-605.4	287.7	273.7	13.99	20.567			
2,800.0	2,751.4	2,751.0	2,652.4	9.9	14.2	-17.16	208.9	-637.3	295.4	280.7	14.66	20.150			
2,900.0	2,847.7	2,850.7	2,746.2	10.4	14.9	-17.48	219.9	-669.2	303.2	287.8	15.34	19.763			
3,000.0	2,944.0	2,950.3	2,840.0	11.0	15.6	-17.78	230.8	-701.1	310.9	294.9	16.02	19.403			
3,100.0	3,040.3	3,050.0	2,933.8	11.6	16.3	-18.07	241.8	-732.9	318.7	301.9	16.71	19.067			
3,200.0	3,136.5	3,149.7	3,027.6	12.1	17.0	-18.35	252.7	-764.8	326.4	309.0	17.41	18.754			
3,300.0	3,232.8	3,249.4	3,121.4	12.7	17.7	-18.62	263.7	-796.7	334.2	316.1	18.10	18.460			
3,400.0	3,329.1	3,349.1	3,215.2	13.3	18.4	-18.87	274.6	-828.6	342.0	323.2	18.81	18.185			
3,500.0	3,425.4	3,448.8	3,309.1	13.8	19.2	-19.11	285.6	-860.5	349.8	330.3	19.51	17.926			
3,600.0	3,521.6	3,548.5	3,402.9	14.4	19.9	-19.34	296.5	-892.3	357.6	337.3	20.22	17.683			
3,700.0	3,617.9	3,648.1	3,496.7	15.0	20.6	-19.56	307.5	-924.2	365.4	344.4	20.93	17.454			
3,800.0	3,714.2	3,747.8	3,590.5	15.5	21.3	-19.77	318.4	-956.1	373.2	351.5	21.65	17.237			
3,900.0	3,810.5	3,847.5	3,684.3	16.1	22.0	-19.97	329.4	-988.0	381.0	358.6	22.37	17.033			
4,000.0	3,906.7	3,947.2	3,778.1	16.7	22.7	-20.17	340.3	-1,019.8	388.8	365.7	23.09	16.839			
4,100.0	4,003.0	4,046.9	3,871.9	17.2	23.5	-20.35	351.3	-1,051.7	396.6	372.8	23.81	16.656			
4,200.0	4,099.3	4,146.6	3,965.8	17.8	24.2	-20.53	362.2	-1,083.6	404.4	379.9	24.54	16.482			
4,300.0	4,195.6	4,246.3	4,059.6	18.4	24.9	-20.71	373.2	-1,115.5	412.2	387.0	25.27	16.316			
4,400.0	4,291.8	4,345.9	4,153.4	18.9	25.6	-20.87	384.1	-1,147.4	420.1	394.1	26.00	16.159			
4,500.0	4,388.1	4,445.6	4,247.2	19.5	26.3	-21.03	395.1	-1,179.2	427.9	401.2	26.73	16.009			
4,600.0	4,484.4	4,545.3	4,341.0	20.1	27.0	-21.19	406.0	-1,211.1	435.7	408.3	27.46	15.866			
4,700.0	4,580.7	4,645.0	4,434.8	20.7	27.8	-21.34	416.9	-1,243.0	443.6	415.4	28.20	15.730			
4,800.0	4,677.0	4,744.7	4,528.6	21.2	28.5	-21.48	427.9	-1,274.9	451.4	422.5	28.94	15.600			
4,900.0	4,773.2	4,844.4	4,622.5	21.8	29.2	-21.62	438.8	-1,306.7	459.3	429.6	29.68	15.475			
5,000.0	4,869.5	4,944.1	4,716.3	22.4	29.9	-21.75	449.8	-1,338.6	467.1	436.7	30.42	15.356			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design				Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)										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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
5,100.0	4,965.8	5,059.6	4,825.6	23.0	30.6	-21.96	462.0	-1,374.0	473.6	442.4	31.20	15.179				
5,200.0	5,062.1	5,178.5	4,939.5	23.5	31.2	-22.32	473.0	-1,406.1	476.1	444.1	32.01	14.874				
5,300.0	5,158.4	5,297.4	5,054.8	24.1	31.7	-22.83	482.5	-1,433.7	474.8	442.0	32.83	14.462				
5,400.0	5,255.4	5,416.1	5,170.9	24.5	32.1	-23.35	490.4	-1,456.7	472.1	438.6	33.55	14.072				
5,500.0	5,353.2	5,534.6	5,287.8	24.8	32.4	-23.83	496.7	-1,475.1	468.7	434.5	34.19	13.708				
5,600.0	5,451.7	5,652.8	5,405.1	25.1	32.7	-24.30	501.4	-1,488.9	464.6	429.8	34.75	13.368				
5,700.0	5,550.7	5,770.7	5,522.7	25.4	32.9	-24.73	504.6	-1,498.1	459.7	424.5	35.24	13.047				
5,800.0	5,650.2	5,888.4	5,640.2	25.6	33.1	-25.15	506.2	-1,502.7	454.2	418.5	35.64	12.744				
5,900.0	5,749.9	5,997.1	5,748.9	25.8	33.2	-25.49	506.4	-1,503.3	448.4	412.4	35.94	12.475				
6,000.0	5,849.8	6,097.0	5,848.8	25.9	33.2	-25.65	506.4	-1,503.3	445.2	409.1	36.12	12.326				
6,066.6	5,916.4	6,163.4	5,915.2	26.0	33.3	-26.00	504.0	-1,503.3	444.5	408.2	36.36	12.226				
6,100.0	5,949.8	6,196.5	5,948.1	26.0	33.3	-90.82	500.6	-1,503.3	444.8	408.3	36.56	12.169				
6,200.0	6,049.8	6,292.9	6,042.7	26.2	33.3	86.89	482.9	-1,503.3	445.5	407.9	37.64	11.835				
6,300.0	6,149.5	6,385.7	6,131.1	26.2	33.2	83.98	454.6	-1,503.3	447.4	408.5	38.90	11.502				
6,400.0	6,247.3	6,476.2	6,213.3	26.2	33.2	81.22	417.0	-1,503.3	450.3	410.5	39.87	11.296				
6,500.0	6,341.6	6,564.6	6,288.8	26.1	33.0	78.64	371.0	-1,503.3	454.1	413.6	40.45	11.226				
6,600.0	6,430.8	6,650.0	6,356.2	26.0	32.9	76.31	318.7	-1,503.3	458.3	417.7	40.59	11.292				
6,700.0	6,513.4	6,736.4	6,418.0	25.8	32.8	74.16	258.4	-1,503.3	462.8	422.5	40.32	11.478				
6,800.0	6,587.9	6,820.3	6,471.2	25.6	32.7	72.31	193.5	-1,503.3	467.3	427.6	39.72	11.765				
6,900.0	6,653.1	6,900.0	6,514.8	25.5	32.6	70.77	126.9	-1,503.3	471.6	432.7	38.94	12.113				
7,000.0	6,707.8	6,985.1	6,553.4	25.3	32.4	69.44	51.1	-1,503.3	475.4	437.2	38.17	12.453				
7,100.0	6,751.2	7,066.4	6,582.3	25.1	32.4	68.43	-24.9	-1,503.3	478.5	440.8	37.66	12.705				
7,200.0	6,782.4	7,150.0	6,603.3	25.1	32.3	67.71	-105.8	-1,503.3	480.8	443.1	37.63	12.778				
7,300.0	6,801.0	7,227.7	6,614.9	25.0	32.3	67.31	-182.6	-1,503.3	482.1	443.9	38.22	12.615				
7,400.0	6,806.6	7,310.9	6,618.7	25.2	32.4	67.20	-265.6	-1,503.3	482.5	443.0	39.50	12.216				
7,500.0	6,805.9	7,410.9	6,619.5	25.4	32.5	67.37	-365.6	-1,503.3	481.9	440.8	41.15	11.712				
7,600.0	6,805.2	7,510.8	6,620.3	25.8	32.7	67.54	-465.6	-1,503.3	481.3	438.3	43.03	11.186				
7,700.0	6,804.5	7,610.8	6,621.1	26.5	33.1	67.71	-565.6	-1,503.3	480.7	435.6	45.13	10.653				
7,800.0	6,803.8	7,710.8	6,622.0	27.2	33.5	67.87	-665.5	-1,503.3	480.2	432.8	47.41	10.129				
7,900.0	6,803.1	7,810.8	6,622.8	28.2	34.1	68.04	-765.5	-1,503.3	479.6	429.8	49.85	9.622				
8,000.0	6,802.4	7,910.8	6,623.6	29.3	34.8	68.21	-865.5	-1,503.3	479.0	426.6	52.43	9.137				
8,100.0	6,801.7	8,010.8	6,624.4	30.5	35.6	68.38	-965.5	-1,503.3	478.5	423.4	55.13	8.680				
8,200.0	6,801.0	8,110.8	6,625.2	31.8	36.6	68.55	-1,065.5	-1,503.3	477.9	420.0	57.93	8.250				
8,300.0	6,800.3	8,210.8	6,626.1	33.1	37.6	68.72	-1,165.5	-1,503.3	477.4	416.5	60.83	7.848				
8,400.0	6,799.6	8,310.8	6,626.9	34.6	38.8	68.89	-1,265.5	-1,503.3	476.8	413.0	63.81	7.473				
8,500.0	6,798.9	8,410.7	6,627.7	36.0	40.0	69.06	-1,365.4	-1,503.3	476.3	409.4	66.85	7.124				
8,600.0	6,798.2	8,510.7	6,628.5	37.6	41.3	69.23	-1,465.4	-1,503.3	475.7	405.8	69.97	6.800				
8,700.0	6,797.5	8,610.7	6,629.3	39.1	42.7	69.40	-1,565.4	-1,503.3	475.2	402.1	73.13	6.498				
8,800.0	6,796.8	8,710.7	6,630.2	40.7	44.1	69.57	-1,665.4	-1,503.3	474.7	398.3	76.35	6.217				
8,900.0	6,796.1	8,810.7	6,631.0	42.4	45.5	69.74	-1,765.4	-1,503.3	474.1	394.5	79.61	5.956				
9,000.0	6,795.5	8,910.7	6,631.8	44.0	47.0	69.92	-1,865.4	-1,503.3	473.6	390.7	82.91	5.713				
9,100.0	6,794.8	9,010.7	6,632.6	45.7	48.6	70.09	-1,965.4	-1,503.3	473.1	386.9	86.24	5.486				
9,200.0	6,794.1	9,110.7	6,633.4	47.4	50.1	70.26	-2,065.3	-1,503.3	472.6	383.0	89.61	5.274				
9,300.0	6,793.4	9,210.7	6,634.3	49.1	51.7	70.43	-2,165.3	-1,503.3	472.1	379.1	93.01	5.075				
9,400.0	6,792.7	9,310.6	6,635.1	50.8	53.4	70.61	-2,265.3	-1,503.3	471.6	375.1	96.44	4.890				
9,500.0	6,792.0	9,410.6	6,635.9	52.5	55.0	70.78	-2,365.3	-1,503.3	471.1	371.2	99.89	4.716				
9,600.0	6,791.3	9,510.6	6,636.7	54.3	56.7	70.96	-2,465.3	-1,503.3	470.6	367.2	103.36	4.553				
9,700.0	6,790.6	9,610.6	6,637.5	56.0	58.3	71.13	-2,565.3	-1,503.3	470.1	363.2	106.86	4.399				
9,800.0	6,789.9	9,710.6	6,638.4	57.8	60.0	71.31	-2,665.2	-1,503.3	469.6	359.2	110.38	4.254				
9,900.0	6,789.2	9,810.6	6,639.2	59.6	61.7	71.48	-2,765.2	-1,503.3	469.1	355.2	113.91	4.118				

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)										Offset Site Error:		0.0 ft
Survey Program:		0-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)			
10,000.0	6,788.5	9,910.6	6,640.0	61.4	63.5	71.66	-2,865.2	-1,503.3	468.6	351.2	117.46	3.990		
10,100.0	6,787.8	10,010.6	6,640.8	63.2	65.2	71.84	-2,965.2	-1,503.3	468.1	347.1	121.03	3.868		
10,200.0	6,787.1	10,110.5	6,641.6	65.0	66.9	72.01	-3,065.2	-1,503.3	467.7	343.1	124.61	3.753		
10,300.0	6,786.4	10,210.5	6,642.5	66.8	68.7	72.19	-3,165.2	-1,503.3	467.2	339.0	128.21	3.644		
10,400.0	6,785.7	10,310.5	6,643.3	68.6	70.5	72.37	-3,265.2	-1,503.3	466.7	334.9	131.83	3.541		
10,500.0	6,785.0	10,410.5	6,644.1	70.4	72.2	72.54	-3,365.1	-1,503.3	466.3	330.8	135.45	3.442		
10,600.0	6,784.3	10,510.5	6,644.9	72.2	74.0	72.72	-3,465.1	-1,503.3	465.8	326.7	139.09	3.349		
10,700.0	6,783.6	10,610.5	6,645.7	74.0	75.8	72.90	-3,565.1	-1,503.3	465.4	322.6	142.74	3.260		
10,800.0	6,782.9	10,710.5	6,646.6	75.9	77.6	73.08	-3,665.1	-1,503.3	464.9	318.5	146.40	3.176		
10,900.0	6,782.2	10,810.5	6,647.4	77.7	79.4	73.26	-3,765.1	-1,503.3	464.5	314.4	150.07	3.095		
11,000.0	6,781.5	10,910.5	6,648.2	79.6	81.2	73.44	-3,865.1	-1,503.3	464.1	310.3	153.75	3.018		
11,100.0	6,780.8	11,010.4	6,649.0	81.4	83.0	73.62	-3,965.1	-1,503.3	463.6	306.2	157.44	2.945		
11,200.0	6,780.1	11,110.4	6,649.8	83.2	84.8	73.80	-4,065.0	-1,503.3	463.2	302.1	161.14	2.875		
11,300.0	6,779.4	11,210.4	6,650.7	85.1	86.6	73.98	-4,165.0	-1,503.3	462.8	297.9	164.85	2.807		
11,400.0	6,778.7	11,310.4	6,651.5	87.0	88.5	74.16	-4,265.0	-1,503.3	462.4	293.8	168.57	2.743		
11,500.0	6,778.0	11,410.4	6,652.3	88.8	90.3	74.34	-4,365.0	-1,503.3	462.0	289.7	172.30	2.681		
11,600.0	6,777.3	11,510.4	6,653.1	90.7	92.1	74.52	-4,465.0	-1,503.3	461.6	285.5	176.03	2.622		
11,700.0	6,776.6	11,610.4	6,653.9	92.5	94.0	74.70	-4,565.0	-1,503.3	461.1	281.4	179.77	2.565		
11,800.0	6,775.9	11,710.4	6,654.8	94.4	95.8	74.89	-4,665.0	-1,503.3	460.7	277.2	183.52	2.511		
11,900.0	6,775.2	11,810.4	6,655.6	96.3	97.6	75.07	-4,764.9	-1,503.3	460.4	273.1	187.28	2.458		
12,000.0	6,774.5	11,910.3	6,656.4	98.1	99.5	75.25	-4,864.9	-1,503.3	460.0	268.9	191.04	2.408		
12,100.0	6,773.8	12,010.3	6,657.2	100.0	101.3	75.43	-4,964.9	-1,503.3	459.6	264.8	194.81	2.359		
12,200.0	6,773.1	12,110.3	6,658.0	101.9	103.2	75.62	-5,064.9	-1,503.3	459.2	260.6	198.59	2.312		
12,300.0	6,772.4	12,210.3	6,658.9	103.7	105.0	75.80	-5,164.9	-1,503.3	458.8	256.5	202.37	2.267		
12,400.0	6,771.7	12,310.3	6,659.7	105.6	106.9	75.99	-5,264.9	-1,503.3	458.5	252.3	206.16	2.224		
12,500.0	6,771.0	12,410.3	6,660.5	107.5	108.7	76.17	-5,364.8	-1,503.3	458.1	248.1	209.95	2.182		
12,600.0	6,770.3	12,510.3	6,661.3	109.4	110.6	76.35	-5,464.8	-1,503.3	457.7	244.0	213.75	2.141		
12,700.0	6,769.6	12,610.3	6,662.1	111.2	112.5	76.54	-5,564.8	-1,503.3	457.4	239.8	217.56	2.102		
12,800.0	6,768.9	12,710.2	6,663.0	113.1	114.3	76.72	-5,664.8	-1,503.3	457.0	235.7	221.37	2.065		
12,900.0	6,768.2	12,810.2	6,663.8	115.0	116.2	76.91	-5,764.8	-1,503.3	456.7	231.5	225.18	2.028		
13,000.0	6,767.5	12,910.2	6,664.6	116.9	118.1	77.10	-5,864.8	-1,503.3	456.3	227.3	229.00	1.993		
13,100.0	6,766.8	13,010.2	6,665.4	118.8	119.9	77.28	-5,964.8	-1,503.3	456.0	223.2	232.83	1.959		
13,200.0	6,766.1	13,110.2	6,666.2	120.7	121.8	77.47	-6,064.7	-1,503.3	455.7	219.0	236.65	1.925		
13,300.0	6,765.4	13,210.2	6,667.1	122.5	123.7	77.65	-6,164.7	-1,503.3	455.3	214.9	240.49	1.893		
13,400.0	6,764.7	13,310.2	6,667.9	124.4	125.5	77.84	-6,264.7	-1,503.3	455.0	210.7	244.32	1.862		
13,500.0	6,764.0	13,410.2	6,668.7	126.3	127.4	78.03	-6,364.7	-1,503.3	454.7	206.5	248.16	1.832		
13,600.0	6,763.3	13,510.2	6,669.5	128.2	129.3	78.22	-6,464.7	-1,503.3	454.4	202.4	252.01	1.803		
13,700.0	6,762.6	13,610.1	6,670.3	130.1	131.2	78.40	-6,564.7	-1,503.3	454.1	198.2	255.85	1.775		
13,800.0	6,761.9	13,710.1	6,671.2	132.0	133.0	78.59	-6,664.7	-1,503.3	453.8	194.1	259.71	1.747		
13,900.0	6,761.2	13,810.1	6,672.0	133.9	134.9	78.78	-6,764.6	-1,503.3	453.5	189.9	263.56	1.721		
14,000.0	6,760.5	13,910.1	6,672.8	135.8	136.8	78.97	-6,864.6	-1,503.3	453.2	185.8	267.42	1.695		
14,100.0	6,759.8	14,010.1	6,673.6	137.7	138.7	79.16	-6,964.6	-1,503.3	452.9	181.6	271.28	1.670		
14,200.0	6,759.1	14,110.1	6,674.4	139.6	140.6	79.34	-7,064.6	-1,503.3	452.6	177.5	275.14	1.645		
14,300.0	6,758.5	14,210.1	6,675.3	141.5	142.4	79.53	-7,164.6	-1,503.3	452.3	173.3	279.01	1.621		
14,400.0	6,757.8	14,310.1	6,676.1	143.4	144.3	79.72	-7,264.6	-1,503.3	452.1	169.2	282.87	1.598		
14,500.0	6,757.1	14,410.1	6,676.9	145.3	146.2	79.91	-7,364.5	-1,503.3	451.8	165.1	286.75	1.576		
14,507.9	6,757.0	14,417.9	6,677.0	145.4	146.4	79.93	-7,372.4	-1,503.3	451.8	164.7	287.05	1.574 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	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	
0.0	0.0	0.0	0.0	0.0	0.0	-89.97	0.0	-15.0	15.1	15.1	0.00	N/A		
100.0	100.0	99.0	99.0	0.1	0.1	-89.97	0.0	-15.0	15.0	14.8	0.22	67.274		
200.0	200.0	199.0	199.0	0.3	0.3	-89.97	0.0	-15.0	15.0	14.4	0.67	22.388		
300.0	300.0	299.0	299.0	0.6	0.6	-89.97	0.0	-15.0	15.0	13.9	1.12	13.415		
400.0	400.0	399.0	399.0	0.8	0.8	-89.97	0.0	-15.0	15.0	13.5	1.57	9.576 CC		
500.0	500.0	498.6	498.6	1.0	1.0	-88.30	0.5	-16.2	16.2	14.2	2.01	8.068		
600.0	600.0	598.1	598.0	1.2	1.2	-84.48	1.9	-19.8	19.9	17.5	2.45	8.120		
700.0	700.0	697.3	697.0	1.5	1.4	-80.52	4.3	-25.8	26.2	23.3	2.91	9.019		
800.0	800.0	796.1	795.4	1.7	1.7	-77.39	7.6	-34.1	35.1	31.8	3.37	10.414		
900.0	900.0	894.6	893.2	1.9	2.0	-10.99	11.9	-44.7	45.4	41.6	3.79	11.979		
1,000.0	999.9	992.7	990.4	2.1	2.3	-9.91	17.1	-57.7	55.6	51.4	4.23	13.159		
1,100.0	1,099.7	1,090.7	1,086.9	2.3	2.6	-9.31	23.1	-72.9	65.9	61.2	4.67	14.092		
1,200.0	1,199.3	1,188.3	1,182.7	2.6	3.0	-9.01	30.1	-90.3	76.1	71.0	5.13	14.835		
1,300.0	1,298.6	1,285.7	1,277.8	2.8	3.4	-8.88	38.0	-110.0	86.3	80.7	5.59	15.426		
1,400.0	1,397.5	1,382.9	1,372.1	3.1	3.8	-8.88	46.7	-131.8	96.4	90.3	6.06	15.894		
1,500.0	1,496.1	1,479.9	1,465.5	3.4	4.3	-8.97	56.3	-155.8	106.4	99.9	6.55	16.260		
1,600.0	1,594.2	1,579.1	1,560.7	3.8	4.8	-9.17	66.7	-181.8	115.5	108.5	7.04	16.411		
1,700.0	1,691.7	1,678.8	1,656.4	4.2	5.4	-9.55	77.2	-208.0	122.0	114.5	7.55	16.163		
1,800.0	1,788.6	1,778.7	1,752.3	4.6	6.0	-10.10	87.7	-234.2	126.0	117.9	8.07	15.611		
1,900.0	1,885.0	1,878.7	1,848.2	5.1	6.5	-10.80	98.2	-260.4	127.8	119.2	8.62	14.827		
2,000.0	1,981.2	1,978.7	1,944.1	5.6	7.1	-11.52	108.6	-286.6	129.3	120.1	9.19	14.073		
2,100.0	2,077.5	2,078.7	2,040.0	6.1	7.7	-12.21	119.1	-312.8	130.9	121.1	9.77	13.392		
2,200.0	2,173.8	2,178.6	2,135.9	6.6	8.3	-12.89	129.6	-339.0	132.4	122.1	10.37	12.774		
2,300.0	2,270.1	2,278.6	2,231.8	7.1	8.9	-13.56	140.1	-365.2	134.0	123.1	10.97	12.213		
2,400.0	2,366.3	2,378.6	2,327.7	7.7	9.5	-14.20	150.6	-391.4	135.6	124.0	11.59	11.701		
2,500.0	2,462.6	2,478.6	2,423.6	8.2	10.1	-14.84	161.1	-417.7	137.3	125.0	12.22	11.232		
2,600.0	2,558.9	2,578.5	2,519.5	8.8	10.6	-15.45	171.6	-443.9	138.9	126.0	12.86	10.801		
2,700.0	2,655.2	2,678.5	2,615.4	9.3	11.2	-16.06	182.1	-470.1	140.5	127.0	13.51	10.404		
2,800.0	2,751.4	2,778.5	2,711.3	9.9	11.8	-16.65	192.5	-496.3	142.2	128.0	14.17	10.038		
2,900.0	2,847.7	2,878.5	2,807.2	10.4	12.4	-17.22	203.0	-522.5	143.9	129.1	14.84	9.699		
3,000.0	2,944.0	2,978.4	2,903.1	11.0	13.0	-17.79	213.5	-548.7	145.6	130.1	15.52	9.384		
3,100.0	3,040.3	3,078.4	2,999.0	11.6	13.6	-18.34	224.0	-574.9	147.3	131.1	16.20	9.090		
3,200.0	3,136.5	3,178.4	3,094.9	12.1	14.2	-18.87	234.5	-601.2	149.0	132.1	16.90	8.817		
3,300.0	3,232.8	3,278.4	3,190.8	12.7	14.8	-19.40	245.0	-627.4	150.8	133.2	17.61	8.562		
3,400.0	3,329.1	3,378.3	3,286.8	13.3	15.4	-19.91	255.5	-653.6	152.5	134.2	18.32	8.323		
3,500.0	3,425.4	3,478.3	3,382.7	13.8	16.0	-20.41	266.0	-679.8	154.3	135.2	19.05	8.099		
3,600.0	3,521.6	3,578.3	3,478.6	14.4	16.6	-20.90	276.4	-706.0	156.1	136.3	19.78	7.889		
3,700.0	3,617.9	3,678.3	3,574.5	15.0	17.2	-21.38	286.9	-732.2	157.8	137.3	20.52	7.691		
3,800.0	3,714.2	3,778.2	3,670.4	15.5	17.8	-21.84	297.4	-758.4	159.6	138.4	21.27	7.505		
3,900.0	3,810.5	3,878.2	3,766.3	16.1	18.4	-22.30	307.9	-784.6	161.4	139.4	22.03	7.329		
4,000.0	3,906.7	3,978.2	3,862.2	16.7	19.0	-22.75	318.4	-810.9	163.3	140.5	22.79	7.163		
4,100.0	4,003.0	4,078.2	3,958.1	17.2	19.6	-23.19	328.9	-837.1	165.1	141.5	23.56	7.006		
4,200.0	4,099.3	4,178.1	4,054.0	17.8	20.2	-23.61	339.4	-863.3	166.9	142.6	24.34	6.857		
4,300.0	4,195.6	4,278.1	4,149.9	18.4	20.8	-24.03	349.9	-889.5	168.8	143.6	25.13	6.716		
4,400.0	4,291.8	4,378.1	4,245.8	18.9	21.4	-24.44	360.3	-915.7	170.6	144.7	25.92	6.582		
4,500.0	4,388.1	4,478.1	4,341.7	19.5	22.0	-24.84	370.8	-941.9	172.5	145.8	26.72	6.455		
4,600.0	4,484.4	4,578.1	4,437.6	20.1	22.6	-25.23	381.3	-968.1	174.3	146.8	27.52	6.335		
4,700.0	4,580.7	4,678.0	4,533.5	20.7	23.2	-25.62	391.8	-994.4	176.2	147.9	28.33	6.219		
4,800.0	4,677.0	4,778.0	4,629.4	21.2	23.8	-25.99	402.3	-1,020.6	178.1	149.0	29.15	6.110		
4,900.0	4,773.2	4,878.0	4,725.3	21.8	24.4	-26.36	412.8	-1,046.8	180.0	150.0	29.97	6.005		
5,000.0	4,869.5	4,978.0	4,821.2	22.4	25.0	-26.72	423.3	-1,073.0	181.9	151.1	30.80	5.906		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #1 (3-14-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,100.0	4,965.8	5,077.9	4,917.2	23.0	25.6	-27.07	433.8	-1,099.2	183.8	152.2	31.63	5.810			
5,200.0	5,062.1	5,177.9	5,013.1	23.5	26.2	-27.42	444.2	-1,125.4	185.7	153.2	32.47	5.719			
5,300.0	5,158.4	5,277.9	5,109.0	24.1	26.8	-27.73	454.7	-1,151.6	187.8	154.5	33.30	5.640			
5,400.0	5,255.4	5,378.7	5,205.7	24.5	27.4	-27.70	465.3	-1,178.0	192.3	158.4	33.94	5.666			
5,500.0	5,353.2	5,485.2	5,308.5	24.8	27.9	-27.47	475.5	-1,203.7	197.7	163.3	34.42	5.745			
5,600.0	5,451.7	5,591.9	5,412.5	25.1	28.3	-27.21	484.4	-1,225.8	202.9	168.0	34.81	5.828			
5,700.0	5,550.7	5,698.8	5,517.6	25.4	28.6	-26.93	491.8	-1,244.3	207.7	172.6	35.12	5.913			
5,800.0	5,650.2	5,805.9	5,623.5	25.6	28.9	-26.63	497.8	-1,259.2	212.2	176.8	35.35	6.002			
5,900.0	5,749.9	5,913.2	5,730.1	25.8	29.2	-26.31	502.3	-1,270.5	216.4	180.9	35.49	6.095			
6,000.0	5,849.8	6,020.7	5,837.3	25.9	29.4	-25.97	505.3	-1,278.0	220.2	184.6	35.56	6.193			
6,100.0	5,949.8	6,128.4	5,944.8	26.0	29.5	-90.05	506.8	-1,281.8	223.3	187.7	35.66	6.263			
6,200.0	6,049.8	6,232.4	6,048.8	26.2	29.6	90.01	507.0	-1,282.3	223.8	187.9	35.94	6.227			
6,300.0	6,149.5	6,332.3	6,148.8	26.2	29.7	91.76	506.4	-1,282.3	223.9	188.4	35.51	6.305			
6,400.0	6,247.3	6,433.4	6,249.2	26.2	29.7	94.28	495.7	-1,282.3	224.4	189.7	34.68	6.471			
6,500.0	6,341.6	6,535.8	6,348.6	26.1	29.7	96.72	471.4	-1,282.3	225.4	191.6	33.80	6.667			
6,600.0	6,430.8	6,639.7	6,445.2	26.0	29.6	99.05	433.4	-1,282.3	226.6	193.7	32.96	6.877			
6,700.0	6,513.4	6,744.8	6,536.8	25.8	29.5	101.21	382.0	-1,282.3	228.2	196.0	32.19	7.089			
6,800.0	6,587.9	6,851.3	6,621.5	25.6	29.3	103.15	317.6	-1,282.3	229.9	198.3	31.55	7.286			
6,900.0	6,653.1	6,958.9	6,697.2	25.5	29.1	104.85	241.2	-1,282.3	231.6	200.5	31.08	7.451			
7,000.0	6,707.8	7,067.6	6,762.0	25.3	29.0	106.27	154.0	-1,282.3	233.2	202.3	30.82	7.565			
7,100.0	6,751.2	7,177.3	6,814.1	25.1	28.8	107.39	57.7	-1,282.3	234.5	203.7	30.84	7.606			
7,200.0	6,782.4	7,287.6	6,852.2	25.1	28.7	108.20	-45.8	-1,282.3	235.6	204.4	31.17	7.559			
7,300.0	6,801.0	7,398.4	6,875.0	25.0	28.7	108.68	-154.1	-1,282.3	236.2	204.4	31.84	7.419			
7,400.0	6,806.6	7,508.8	6,881.9	25.2	28.8	108.83	-264.2	-1,282.3	236.4	203.6	32.89	7.189			
7,500.0	6,805.9	7,608.8	6,881.8	25.4	29.0	108.96	-364.2	-1,282.3	236.6	202.3	34.34	6.891			
7,600.0	6,805.2	7,708.8	6,881.6	25.8	29.3	109.08	-464.2	-1,282.3	236.8	200.7	36.09	6.561			
7,700.0	6,804.5	7,808.8	6,881.5	26.5	29.8	109.21	-564.2	-1,282.3	237.0	198.9	38.11	6.218			
7,800.0	6,803.8	7,908.8	6,881.4	27.2	30.4	109.34	-664.2	-1,282.3	237.2	196.8	40.36	5.877			
7,900.0	6,803.1	8,008.8	6,881.2	28.2	31.1	109.47	-764.2	-1,282.3	237.4	194.6	42.79	5.548			
8,000.0	6,802.4	8,108.8	6,881.1	29.3	32.0	109.59	-864.2	-1,282.3	237.5	192.2	45.38	5.235			
8,100.0	6,801.7	8,208.8	6,880.9	30.5	33.0	109.72	-964.2	-1,282.3	237.7	189.6	48.09	4.943			
8,200.0	6,801.0	8,308.8	6,880.8	31.8	34.1	109.85	-1,064.2	-1,282.3	237.9	187.0	50.92	4.673			
8,300.0	6,800.3	8,408.8	6,880.7	33.1	35.3	109.97	-1,164.2	-1,282.3	238.1	184.3	53.83	4.423			
8,400.0	6,799.6	8,508.8	6,880.5	34.6	36.6	110.10	-1,264.2	-1,282.3	238.3	181.5	56.83	4.194			
8,500.0	6,798.9	8,608.8	6,880.4	36.0	38.0	110.22	-1,364.2	-1,282.3	238.5	178.6	59.88	3.983			
8,600.0	6,798.2	8,708.8	6,880.3	37.6	39.4	110.35	-1,464.2	-1,282.3	238.7	175.7	62.99	3.790			
8,700.0	6,797.5	8,808.8	6,880.1	39.1	40.9	110.48	-1,564.2	-1,282.3	238.9	172.7	66.14	3.612			
8,800.0	6,796.8	8,908.8	6,880.0	40.7	42.4	110.60	-1,664.2	-1,282.3	239.1	169.8	69.33	3.449			
8,900.0	6,796.1	9,008.8	6,879.8	42.4	43.9	110.73	-1,764.2	-1,282.3	239.3	166.7	72.55	3.298			
9,000.0	6,795.5	9,108.8	6,879.7	44.0	45.5	110.85	-1,864.2	-1,282.3	239.5	163.7	75.80	3.159			
9,100.0	6,794.8	9,208.8	6,879.6	45.7	47.1	110.98	-1,964.2	-1,282.3	239.7	160.6	79.07	3.031			
9,200.0	6,794.1	9,308.8	6,879.4	47.4	48.8	111.10	-2,064.2	-1,282.3	239.9	157.5	82.36	2.912			
9,300.0	6,793.4	9,408.8	6,879.3	49.1	50.4	111.22	-2,164.1	-1,282.3	240.1	154.4	85.67	2.802			
9,400.0	6,792.7	9,508.8	6,879.1	50.8	52.1	111.35	-2,264.1	-1,282.3	240.3	151.3	88.99	2.700			
9,500.0	6,792.0	9,608.8	6,879.0	52.5	53.8	111.47	-2,364.1	-1,282.3	240.5	148.2	92.33	2.605			
9,600.0	6,791.3	9,708.8	6,878.9	54.3	55.5	111.60	-2,464.1	-1,282.3	240.7	145.0	95.67	2.516			
9,700.0	6,790.6	9,808.8	6,878.7	56.0	57.2	111.72	-2,564.1	-1,282.3	240.9	141.9	99.03	2.433			
9,800.0	6,789.9	9,908.8	6,878.6	57.8	58.9	111.84	-2,664.1	-1,282.3	241.1	138.7	102.39	2.355			
9,900.0	6,789.2	10,008.8	6,878.4	59.6	60.7	111.97	-2,764.1	-1,282.3	241.3	135.6	105.76	2.282			
10,000.0	6,788.5	10,108.8	6,878.3	61.4	62.4	112.09	-2,864.1	-1,282.3	241.5	132.4	109.13	2.213			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #1 (3-14-16)													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				
10,100.0	6,787.8	10,208.7	6,878.2	63.2	64.2	112.21	-2,964.1	-1,282.3	241.7	129.2	112.50	2.149				
10,200.0	6,787.1	10,308.7	6,878.0	65.0	66.0	112.33	-3,064.1	-1,282.3	241.9	126.1	115.88	2.088				
10,300.0	6,786.4	10,408.7	6,877.9	66.8	67.7	112.46	-3,164.1	-1,282.3	242.2	122.9	119.26	2.031				
10,400.0	6,785.7	10,508.7	6,877.7	68.6	69.5	112.58	-3,264.1	-1,282.3	242.4	119.7	122.64	1.976				
10,500.0	6,785.0	10,608.7	6,877.6	70.4	71.3	112.70	-3,364.1	-1,282.3	242.6	116.6	126.03	1.925				
10,600.0	6,784.3	10,708.7	6,877.5	72.2	73.1	112.82	-3,464.1	-1,282.3	242.8	113.4	129.41	1.876				
10,700.0	6,783.6	10,808.7	6,877.3	74.0	74.9	112.94	-3,564.1	-1,282.3	243.0	110.2	132.79	1.830				
10,800.0	6,782.9	10,908.7	6,877.2	75.9	76.7	113.06	-3,664.1	-1,282.3	243.2	107.1	136.17	1.786				
10,900.0	6,782.2	11,008.7	6,877.0	77.7	78.6	113.19	-3,764.1	-1,282.3	243.5	103.9	139.56	1.745				
11,000.0	6,781.5	11,108.7	6,876.9	79.6	80.4	113.31	-3,864.1	-1,282.3	243.7	100.7	142.94	1.705				
11,100.0	6,780.8	11,208.7	6,876.8	81.4	82.2	113.43	-3,964.1	-1,282.3	243.9	97.6	146.32	1.667				
11,200.0	6,780.1	11,308.7	6,876.6	83.2	84.0	113.55	-4,064.1	-1,282.3	244.1	94.4	149.69	1.631				
11,300.0	6,779.4	11,408.7	6,876.5	85.1	85.9	113.67	-4,164.1	-1,282.3	244.3	91.3	153.07	1.596				
11,400.0	6,778.7	11,508.7	6,876.3	87.0	87.7	113.79	-4,264.1	-1,282.3	244.6	88.1	156.44	1.563				
11,500.0	6,778.0	11,608.7	6,876.2	88.8	89.5	113.91	-4,364.1	-1,282.3	244.8	85.0	159.81	1.532				
11,600.0	6,777.3	11,708.7	6,876.1	90.7	91.4	114.03	-4,464.1	-1,282.3	245.0	81.8	163.18	1.502				
11,700.0	6,776.6	11,808.7	6,875.9	92.5	93.2	114.14	-4,564.1	-1,282.3	245.3	78.7	166.54	1.473	Level 3			
11,800.0	6,775.9	11,908.7	6,875.8	94.4	95.1	114.26	-4,664.1	-1,282.3	245.5	75.6	169.90	1.445	Level 3			
11,900.0	6,775.2	12,008.7	6,875.6	96.3	96.9	114.38	-4,764.1	-1,282.3	245.7	72.5	173.26	1.418	Level 3			
12,000.0	6,774.5	12,108.7	6,875.5	98.1	98.8	114.50	-4,864.1	-1,282.3	245.9	69.3	176.61	1.393	Level 3			
12,100.0	6,773.8	12,208.7	6,875.4	100.0	100.7	114.62	-4,964.1	-1,282.3	246.2	66.2	179.96	1.368	Level 3			
12,200.0	6,773.1	12,308.7	6,875.2	101.9	102.5	114.74	-5,064.1	-1,282.3	246.4	63.1	183.31	1.344	Level 3			
12,300.0	6,772.4	12,408.7	6,875.1	103.7	104.4	114.86	-5,164.1	-1,282.3	246.6	60.0	186.65	1.321	Level 3			
12,400.0	6,771.7	12,508.7	6,874.9	105.6	106.2	114.97	-5,264.1	-1,282.3	246.9	56.9	189.99	1.299	Level 3			
12,500.0	6,771.0	12,608.7	6,874.8	107.5	108.1	115.09	-5,364.1	-1,282.3	247.1	53.8	193.32	1.278	Level 3			
12,600.0	6,770.3	12,708.7	6,874.7	109.4	110.0	115.21	-5,464.1	-1,282.3	247.4	50.7	196.65	1.258	Level 3			
12,700.0	6,769.6	12,808.7	6,874.5	111.2	111.8	115.32	-5,564.1	-1,282.3	247.6	47.6	199.98	1.238	Level 2			
12,800.0	6,768.9	12,908.7	6,874.4	113.1	113.7	115.44	-5,664.1	-1,282.3	247.8	44.5	203.30	1.219	Level 2			
12,900.0	6,768.2	13,008.7	6,874.2	115.0	115.6	115.56	-5,764.1	-1,282.3	248.1	41.5	206.61	1.201	Level 2			
13,000.0	6,767.5	13,108.7	6,874.1	116.9	117.5	115.67	-5,864.1	-1,282.3	248.3	38.4	209.93	1.183	Level 2			
13,100.0	6,766.8	13,208.7	6,874.0	118.8	119.3	115.79	-5,964.1	-1,282.3	248.6	35.3	213.23	1.166	Level 2			
13,200.0	6,766.1	13,308.7	6,873.8	120.7	121.2	115.91	-6,064.1	-1,282.3	248.8	32.3	216.53	1.149	Level 2			
13,300.0	6,765.4	13,408.7	6,873.7	122.5	123.1	116.02	-6,164.1	-1,282.3	249.0	29.2	219.83	1.133	Level 2			
13,400.0	6,764.7	13,508.7	6,873.5	124.4	125.0	116.14	-6,264.1	-1,282.3	249.3	26.2	223.12	1.117	Level 2			
13,500.0	6,764.0	13,608.7	6,873.4	126.3	126.8	116.25	-6,364.1	-1,282.3	249.5	23.1	226.41	1.102	Level 2			
13,600.0	6,763.3	13,708.7	6,873.3	128.2	128.7	116.37	-6,464.1	-1,282.3	249.8	20.1	229.69	1.087	Level 2			
13,700.0	6,762.6	13,808.7	6,873.1	130.1	130.6	116.48	-6,564.1	-1,282.3	250.0	17.1	232.97	1.073	Level 2			
13,800.0	6,761.9	13,908.7	6,873.0	132.0	132.5	116.60	-6,664.1	-1,282.3	250.3	14.0	236.24	1.059	Level 2			
13,900.0	6,761.2	14,008.7	6,872.9	133.9	134.4	116.71	-6,764.1	-1,282.3	250.5	11.0	239.51	1.046	Level 2			
14,000.0	6,760.5	14,108.7	6,872.7	135.8	136.3	116.82	-6,864.1	-1,282.3	250.8	8.0	242.77	1.033	Level 2			
14,100.0	6,759.8	14,208.7	6,872.6	137.7	138.2	116.94	-6,964.1	-1,282.3	251.0	5.0	246.02	1.020	Level 2			
14,200.0	6,759.1	14,308.7	6,872.4	139.6	140.0	117.05	-7,064.1	-1,282.3	251.3	2.0	249.27	1.008	Level 2			
14,300.0	6,758.5	14,408.7	6,872.3	141.5	141.9	117.16	-7,164.1	-1,282.3	251.5	-1.0	252.52	0.996	Level 1			
14,400.0	6,757.8	14,508.7	6,872.2	143.4	143.8	117.28	-7,264.1	-1,282.3	251.8	-4.0	255.76	0.985	Level 1			
14,500.0	6,757.1	14,608.7	6,872.0	145.3	145.7	117.39	-7,364.1	-1,282.3	252.1	-6.9	258.99	0.973	Level 1			
14,507.9	6,757.0	14,616.5	6,872.0	145.4	145.9	117.40	-7,371.9	-1,282.3	252.1	-7.2	259.25	0.972	Level 1, ES, SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)													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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.68	-0.4	30.1	30.1						
100.0	100.0	99.0	99.0	0.1	0.1	90.68	-0.4	30.1	30.1	29.9	0.22	134.558			
200.0	200.0	199.0	199.0	0.3	0.3	90.68	-0.4	30.1	30.1	29.4	0.67	44.778			
300.0	300.0	299.0	299.0	0.6	0.6	90.68	-0.4	30.1	30.1	29.0	1.12	26.831			
400.0	400.0	399.0	399.0	0.8	0.8	90.68	-0.4	30.1	30.1	28.5	1.57	19.154			
500.0	500.0	499.0	499.0	1.0	1.0	90.68	-0.4	30.1	30.1	28.1	2.02	14.893			
600.0	600.0	599.0	599.0	1.2	1.2	90.68	-0.4	30.1	30.1	27.6	2.47	12.183			
700.0	700.0	699.0	699.0	1.5	1.5	90.68	-0.4	30.1	30.1	27.2	2.92	10.307			
800.0	800.0	799.0	799.0	1.7	1.7	90.68	-0.4	30.1	30.1	26.7	3.37	8.932 CC, ES			
900.0	900.0	899.0	899.0	1.9	1.9	156.09	-0.4	30.1	31.3	27.5	3.81	8.207			
1,000.0	999.9	998.9	998.9	2.1	2.1	158.68	-0.4	30.1	34.9	30.7	4.25	8.215			
1,100.0	1,099.7	1,098.7	1,098.7	2.3	2.4	161.97	-0.4	30.1	41.1	36.4	4.69	8.759			
1,200.0	1,199.3	1,198.3	1,198.3	2.6	2.6	165.19	-0.4	30.1	49.9	44.7	5.13	9.720			
1,300.0	1,298.6	1,299.0	1,299.0	2.8	2.8	167.45	0.5	29.1	60.2	54.6	5.56	10.813			
1,400.0	1,397.5	1,399.9	1,399.9	3.1	3.0	168.50	3.0	26.1	70.7	64.8	5.99	11.802			
1,500.0	1,496.1	1,501.2	1,500.9	3.4	3.3	168.81	7.3	21.1	81.5	75.1	6.43	12.683			
1,600.0	1,594.2	1,602.6	1,601.9	3.8	3.5	168.63	13.4	14.0	92.5	85.6	6.87	13.468			
1,700.0	1,691.7	1,704.4	1,702.9	4.2	3.7	168.11	21.2	4.8	103.6	96.3	7.31	14.166			
1,800.0	1,788.6	1,806.3	1,803.8	4.6	4.0	167.36	30.8	-6.4	115.0	107.2	7.78	14.782			
1,900.0	1,885.0	1,908.5	1,904.5	5.1	4.3	166.40	42.2	-19.8	126.1	117.8	8.27	15.241			
2,000.0	1,981.2	2,009.9	2,003.9	5.6	4.6	165.14	55.0	-34.9	135.4	126.6	8.81	15.363			
2,100.0	2,077.5	2,109.5	2,101.4	6.1	5.0	163.96	68.0	-50.0	144.3	134.9	9.37	15.401			
2,200.0	2,173.8	2,209.0	2,199.0	6.6	5.3	162.92	81.0	-65.2	153.3	143.3	9.95	15.406			
2,300.0	2,270.1	2,308.6	2,296.5	7.1	5.7	162.00	93.9	-80.4	162.3	151.8	10.55	15.390			
2,400.0	2,366.3	2,408.2	2,394.1	7.7	6.1	161.17	106.9	-95.6	171.3	160.2	11.16	15.358			
2,500.0	2,462.6	2,507.7	2,491.6	8.2	6.5	160.42	119.8	-110.8	180.4	168.6	11.78	15.314			
2,600.0	2,558.9	2,607.3	2,589.1	8.8	6.9	159.75	132.8	-126.0	189.5	177.1	12.42	15.261			
2,700.0	2,655.2	2,706.8	2,686.7	9.3	7.3	159.14	145.8	-141.2	198.7	185.6	13.07	15.203			
2,800.0	2,751.4	2,806.4	2,784.2	9.9	7.7	158.58	158.7	-156.4	207.8	194.1	13.73	15.141			
2,900.0	2,847.7	2,906.0	2,881.7	10.4	8.1	158.07	171.7	-171.6	217.0	202.6	14.39	15.077			
3,000.0	2,944.0	3,005.5	2,979.3	11.0	8.5	157.60	184.7	-186.8	226.2	211.1	15.07	15.012			
3,100.0	3,040.3	3,105.1	3,076.8	11.6	8.9	157.16	197.6	-202.0	235.4	219.6	15.75	14.946			
3,200.0	3,136.5	3,204.7	3,174.3	12.1	9.3	156.76	210.6	-217.2	244.6	228.2	16.44	14.882			
3,300.0	3,232.8	3,304.2	3,271.9	12.7	9.8	156.39	223.5	-232.4	253.8	236.7	17.13	14.818			
3,400.0	3,329.1	3,403.8	3,369.4	13.3	10.2	156.05	236.5	-247.6	263.0	245.2	17.83	14.756			
3,500.0	3,425.4	3,503.3	3,467.0	13.8	10.6	155.72	249.5	-262.8	272.3	253.8	18.53	14.695			
3,600.0	3,521.6	3,602.9	3,564.5	14.4	11.0	155.42	262.4	-278.0	281.5	262.3	19.24	14.636			
3,700.0	3,617.9	3,702.5	3,662.0	15.0	11.4	155.14	275.4	-293.2	290.8	270.8	19.95	14.579			
3,800.0	3,714.2	3,802.0	3,759.6	15.5	11.9	154.88	288.4	-308.4	300.1	279.4	20.66	14.524			
3,900.0	3,810.5	3,901.6	3,857.1	16.1	12.3	154.63	301.3	-323.6	309.3	287.9	21.38	14.470			
4,000.0	3,906.7	4,001.1	3,954.6	16.7	12.7	154.40	314.3	-338.8	318.6	296.5	22.10	14.419			
4,100.0	4,003.0	4,100.7	4,052.2	17.2	13.2	154.17	327.2	-354.0	327.9	305.1	22.82	14.369			
4,200.0	4,099.3	4,200.3	4,149.7	17.8	13.6	153.97	340.2	-369.2	337.2	313.6	23.54	14.322			
4,300.0	4,195.6	4,299.8	4,247.2	18.4	14.0	153.77	353.2	-384.4	346.5	322.2	24.27	14.275			
4,400.0	4,291.8	4,399.4	4,344.8	18.9	14.5	153.58	366.1	-399.6	355.7	330.7	25.00	14.231			
4,500.0	4,388.1	4,498.9	4,442.3	19.5	14.9	153.40	379.1	-414.8	365.0	339.3	25.73	14.188			
4,600.0	4,484.4	4,598.5	4,539.9	20.1	15.3	153.24	392.0	-430.0	374.3	347.9	26.46	14.147			
4,700.0	4,580.7	4,698.1	4,637.4	20.7	15.7	153.07	405.0	-445.2	383.6	356.4	27.19	14.107			
4,800.0	4,677.0	4,797.6	4,734.9	21.2	16.2	152.92	418.0	-460.4	392.9	365.0	27.93	14.069			
4,900.0	4,773.2	4,897.2	4,832.5	21.8	16.6	152.78	430.9	-475.6	402.3	373.6	28.67	14.032			
5,000.0	4,869.5	4,996.7	4,930.0	22.4	17.1	152.64	443.9	-490.8	411.6	382.2	29.40	13.997			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,100.0	4,965.8	5,096.3	5,027.5	23.0	17.5	152.50	456.9	-506.0	420.9	390.7	30.14	13.963			
5,200.0	5,062.1	5,195.9	5,125.1	23.5	17.9	152.38	469.8	-521.2	430.2	399.3	30.88	13.930			
5,300.0	5,158.4	5,285.3	5,212.9	24.1	18.2	152.41	480.6	-533.8	440.5	409.0	31.50	13.985			
5,400.0	5,255.4	5,374.5	5,301.0	24.5	18.5	152.60	489.5	-544.3	450.7	418.6	32.02	14.075			
5,500.0	5,353.2	5,463.5	5,389.4	24.8	18.7	152.83	496.7	-552.6	460.0	427.6	32.46	14.171			
5,600.0	5,451.7	5,552.3	5,477.9	25.1	18.9	153.10	502.0	-558.9	468.6	435.8	32.83	14.275			
5,700.0	5,550.7	5,641.1	5,566.4	25.4	19.0	153.40	505.6	-563.1	476.5	443.4	33.12	14.386			
5,800.0	5,650.2	5,729.6	5,654.9	25.6	19.2	153.74	507.4	-565.2	483.5	450.2	33.33	14.505			
5,900.0	5,749.9	5,823.6	5,748.9	25.8	19.3	154.10	507.6	-565.5	489.5	456.0	33.49	14.614			
6,000.0	5,849.8	5,923.6	5,848.8	25.9	19.4	154.31	507.6	-565.5	492.6	459.0	33.67	14.632			
6,100.0	5,949.8	6,023.3	5,948.4	26.0	19.5	90.48	502.9	-565.5	493.0	459.3	33.70	14.630			
6,200.0	6,049.8	6,120.2	6,043.7	26.2	19.5	-87.55	486.0	-565.5	493.5	460.2	33.34	14.803			
6,300.0	6,149.5	6,213.6	6,132.9	26.2	19.5	-85.03	458.4	-565.5	495.0	462.3	32.68	15.144			
6,400.0	6,247.3	6,304.8	6,216.1	26.2	19.3	-82.61	421.1	-565.5	497.3	465.4	31.97	15.558			
6,500.0	6,341.6	6,393.9	6,292.6	26.1	19.2	-80.35	375.4	-565.5	500.4	469.1	31.25	16.012			
6,600.0	6,430.8	6,481.3	6,361.9	26.0	19.0	-78.27	322.2	-565.5	503.9	473.3	30.59	16.473			
6,700.0	6,513.4	6,567.2	6,423.6	25.8	18.8	-76.39	262.6	-565.5	507.6	477.6	30.02	16.909			
6,800.0	6,587.9	6,650.0	6,476.5	25.6	18.6	-74.76	198.9	-565.5	511.4	481.8	29.58	17.288			
6,900.0	6,653.1	6,735.4	6,523.4	25.5	18.4	-73.31	127.6	-565.5	515.0	485.7	29.30	17.574			
7,000.0	6,707.8	6,818.1	6,561.1	25.3	18.2	-72.15	54.0	-565.5	518.2	489.0	29.23	17.730			
7,100.0	6,751.2	6,900.0	6,590.2	25.1	18.1	-71.24	-22.4	-565.5	520.8	491.5	29.38	17.728			
7,200.0	6,782.4	6,981.7	6,611.1	25.1	18.0	-70.58	-101.4	-565.5	522.8	493.0	29.82	17.531			
7,300.0	6,801.0	7,062.9	6,623.3	25.0	18.1	-70.20	-181.7	-565.5	524.0	493.5	30.53	17.167			
7,400.0	6,806.6	7,145.2	6,626.9	25.2	18.4	-70.08	-263.8	-565.5	524.4	492.9	31.54	16.628			
7,500.0	6,805.9	7,245.2	6,626.8	25.4	19.2	-70.13	-363.8	-565.5	524.2	491.1	33.16	15.807			
7,600.0	6,805.2	7,345.2	6,626.6	25.8	20.2	-70.19	-463.8	-565.5	524.0	488.9	35.08	14.939			
7,700.0	6,804.5	7,445.2	6,626.5	26.5	21.4	-70.25	-563.8	-565.5	523.8	486.6	37.26	14.061			
7,800.0	6,803.8	7,545.2	6,626.4	27.2	22.6	-70.31	-663.8	-565.5	523.7	484.0	39.65	13.206			
7,900.0	6,803.1	7,645.2	6,626.2	28.2	24.0	-70.36	-763.8	-565.5	523.5	481.2	42.23	12.395			
8,000.0	6,802.4	7,745.2	6,626.1	29.3	25.4	-70.42	-863.8	-565.5	523.3	478.3	44.97	11.637			
8,100.0	6,801.7	7,845.2	6,625.9	30.5	26.9	-70.48	-963.8	-565.5	523.1	475.3	47.82	10.938			
8,200.0	6,801.0	7,945.2	6,625.8	31.8	28.4	-70.54	-1,063.8	-565.5	522.9	472.1	50.79	10.296			
8,300.0	6,800.3	8,045.2	6,625.7	33.1	30.0	-70.59	-1,163.8	-565.5	522.7	468.9	53.84	9.708			
8,400.0	6,799.6	8,145.2	6,625.5	34.6	31.6	-70.65	-1,263.8	-565.5	522.5	465.6	56.97	9.172			
8,500.0	6,798.9	8,245.2	6,625.4	36.0	33.2	-70.71	-1,363.8	-565.5	522.3	462.2	60.16	8.682			
8,600.0	6,798.2	8,345.2	6,625.2	37.6	34.9	-70.77	-1,463.8	-565.5	522.2	458.8	63.41	8.235			
8,700.0	6,797.5	8,445.2	6,625.1	39.1	36.5	-70.83	-1,563.8	-565.5	522.0	455.3	66.70	7.826			
8,800.0	6,796.8	8,545.2	6,625.0	40.7	38.3	-70.88	-1,663.8	-565.5	521.8	451.8	70.03	7.451			
8,900.0	6,796.1	8,645.2	6,624.8	42.4	40.0	-70.94	-1,763.8	-565.5	521.6	448.2	73.40	7.106			
9,000.0	6,795.5	8,745.2	6,624.7	44.0	41.7	-71.00	-1,863.8	-565.5	521.4	444.6	76.80	6.790			
9,100.0	6,794.8	8,845.2	6,624.5	45.7	43.5	-71.06	-1,963.8	-565.5	521.2	441.0	80.22	6.497			
9,200.0	6,794.1	8,945.2	6,624.4	47.4	45.3	-71.12	-2,063.8	-565.5	521.1	437.4	83.67	6.227			
9,300.0	6,793.4	9,045.2	6,624.3	49.1	47.0	-71.17	-2,163.8	-565.5	520.9	433.7	87.15	5.977			
9,400.0	6,792.7	9,145.2	6,624.1	50.8	48.8	-71.23	-2,263.8	-565.5	520.7	430.1	90.64	5.745			
9,500.0	6,792.0	9,245.2	6,624.0	52.5	50.6	-71.29	-2,363.8	-565.5	520.5	426.4	94.15	5.529			
9,600.0	6,791.3	9,345.2	6,623.8	54.3	52.4	-71.35	-2,463.8	-565.5	520.4	422.7	97.67	5.328			
9,700.0	6,790.6	9,445.2	6,623.7	56.0	54.2	-71.41	-2,563.8	-565.5	520.2	419.0	101.21	5.140			
9,800.0	6,789.9	9,545.2	6,623.6	57.8	56.1	-71.47	-2,663.8	-565.5	520.0	415.2	104.76	4.964			
9,900.0	6,789.2	9,645.2	6,623.4	59.6	57.9	-71.52	-2,763.8	-565.5	519.8	411.5	108.32	4.799			
10,000.0	6,788.5	9,745.2	6,623.3	61.4	59.7	-71.58	-2,863.8	-565.5	519.6	407.7	111.90	4.644			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)										Offset Site Error:		0.0 ft
Survey Program:		0-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)			
10,100.0	6,787.8	9,845.2	6,623.1	63.2	61.6	-71.64	-2,963.8	-565.5	519.5	404.0	115.48	4.498		
10,200.0	6,787.1	9,945.2	6,623.0	65.0	63.4	-71.70	-3,063.8	-565.5	519.3	400.2	119.08	4.361		
10,300.0	6,786.4	10,045.2	6,622.9	66.8	65.3	-71.76	-3,163.8	-565.5	519.1	396.4	122.68	4.231		
10,400.0	6,785.7	10,145.2	6,622.7	68.6	67.1	-71.82	-3,263.8	-565.5	518.9	392.6	126.29	4.109		
10,500.0	6,785.0	10,245.2	6,622.6	70.4	69.0	-71.87	-3,363.8	-565.5	518.8	388.9	129.91	3.993		
10,600.0	6,784.3	10,345.2	6,622.5	72.2	70.8	-71.93	-3,463.8	-565.5	518.6	385.1	133.54	3.883		
10,700.0	6,783.6	10,445.2	6,622.3	74.0	72.7	-71.99	-3,563.8	-565.5	518.4	381.2	137.17	3.779		
10,800.0	6,782.9	10,545.2	6,622.2	75.9	74.6	-72.05	-3,663.8	-565.5	518.2	377.4	140.81	3.680		
10,900.0	6,782.2	10,645.2	6,622.0	77.7	76.4	-72.11	-3,763.8	-565.5	518.1	373.6	144.46	3.586		
11,000.0	6,781.5	10,745.2	6,621.9	79.6	78.3	-72.17	-3,863.8	-565.5	517.9	369.8	148.11	3.497		
11,100.0	6,780.8	10,845.2	6,621.8	81.4	80.2	-72.23	-3,963.8	-565.5	517.7	366.0	151.77	3.411		
11,200.0	6,780.1	10,945.2	6,621.6	83.2	82.0	-72.29	-4,063.8	-565.5	517.6	362.1	155.43	3.330		
11,300.0	6,779.4	11,045.2	6,621.5	85.1	83.9	-72.34	-4,163.8	-565.5	517.4	358.3	159.10	3.252		
11,400.0	6,778.7	11,145.2	6,621.3	87.0	85.8	-72.40	-4,263.8	-565.5	517.2	354.5	162.77	3.178		
11,500.0	6,778.0	11,245.2	6,621.2	88.8	87.7	-72.46	-4,363.8	-565.5	517.1	350.6	166.45	3.106		
11,600.0	6,777.3	11,345.2	6,621.1	90.7	89.6	-72.52	-4,463.8	-565.5	516.9	346.8	170.13	3.038		
11,700.0	6,776.6	11,445.2	6,620.9	92.5	91.4	-72.58	-4,563.8	-565.5	516.7	342.9	173.81	2.973		
11,800.0	6,775.9	11,545.2	6,620.8	94.4	93.3	-72.64	-4,663.8	-565.5	516.6	339.1	177.50	2.910		
11,900.0	6,775.2	11,645.2	6,620.6	96.3	95.2	-72.70	-4,763.7	-565.5	516.4	335.2	181.20	2.850		
12,000.0	6,774.5	11,745.2	6,620.5	98.1	97.1	-72.76	-4,863.7	-565.5	516.2	331.3	184.89	2.792		
12,100.0	6,773.8	11,845.2	6,620.4	100.0	99.0	-72.82	-4,963.7	-565.5	516.1	327.5	188.60	2.736		
12,200.0	6,773.1	11,945.2	6,620.2	101.9	100.9	-72.88	-5,063.7	-565.5	515.9	323.6	192.30	2.683		
12,300.0	6,772.4	12,045.2	6,620.1	103.7	102.8	-72.94	-5,163.7	-565.5	515.7	319.7	196.01	2.631		
12,400.0	6,771.7	12,145.2	6,619.9	105.6	104.7	-73.00	-5,263.7	-565.5	515.6	315.8	199.72	2.581		
12,500.0	6,771.0	12,245.1	6,619.8	107.5	106.6	-73.05	-5,363.7	-565.5	515.4	312.0	203.44	2.533		
12,600.0	6,770.3	12,345.1	6,619.7	109.4	108.4	-73.11	-5,463.7	-565.5	515.2	308.1	207.15	2.487		
12,700.0	6,769.6	12,445.1	6,619.5	111.2	110.3	-73.17	-5,563.7	-565.5	515.1	304.2	210.88	2.443		
12,800.0	6,768.9	12,545.1	6,619.4	113.1	112.2	-73.23	-5,663.7	-565.5	514.9	300.3	214.60	2.399		
12,900.0	6,768.2	12,645.1	6,619.2	115.0	114.1	-73.29	-5,763.7	-565.5	514.8	296.4	218.33	2.358		
13,000.0	6,767.5	12,745.1	6,619.1	116.9	116.0	-73.35	-5,863.7	-565.5	514.6	292.5	222.06	2.317		
13,100.0	6,766.8	12,845.1	6,619.0	118.8	117.9	-73.41	-5,963.7	-565.5	514.4	288.6	225.79	2.278		
13,200.0	6,766.1	12,945.1	6,618.8	120.7	119.8	-73.47	-6,063.7	-565.5	514.3	284.8	229.53	2.241		
13,300.0	6,765.4	13,045.1	6,618.7	122.5	121.7	-73.53	-6,163.7	-565.5	514.1	280.9	233.27	2.204		
13,400.0	6,764.7	13,145.1	6,618.5	124.4	123.6	-73.59	-6,263.7	-565.5	514.0	277.0	237.01	2.169		
13,500.0	6,764.0	13,245.1	6,618.4	126.3	125.5	-73.65	-6,363.7	-565.5	513.8	273.1	240.75	2.134		
13,600.0	6,763.3	13,345.1	6,618.3	128.2	127.4	-73.71	-6,463.7	-565.5	513.6	269.1	244.50	2.101		
13,700.0	6,762.6	13,445.1	6,618.1	130.1	129.3	-73.77	-6,563.7	-565.5	513.5	265.2	248.25	2.068		
13,800.0	6,761.9	13,545.1	6,618.0	132.0	131.2	-73.83	-6,663.7	-565.5	513.3	261.3	252.00	2.037		
13,900.0	6,761.2	13,645.1	6,617.8	133.9	133.1	-73.89	-6,763.7	-565.5	513.2	257.4	255.75	2.007		
14,000.0	6,760.5	13,745.1	6,617.7	135.8	135.0	-73.95	-6,863.7	-565.5	513.0	253.5	259.51	1.977		
14,100.0	6,759.8	13,845.1	6,617.6	137.7	136.9	-74.01	-6,963.7	-565.5	512.9	249.6	263.27	1.948		
14,200.0	6,759.1	13,945.1	6,617.4	139.6	138.8	-74.07	-7,063.7	-565.5	512.7	245.7	267.03	1.920		
14,300.0	6,758.5	14,045.1	6,617.3	141.5	140.8	-74.13	-7,163.7	-565.5	512.6	241.8	270.79	1.893		
14,400.0	6,757.8	14,145.1	6,617.1	143.4	142.7	-74.19	-7,263.7	-565.5	512.4	237.9	274.56	1.866		
14,500.0	6,757.1	14,245.1	6,617.0	145.3	144.6	-74.25	-7,363.7	-565.5	512.3	233.9	278.33	1.841		
14,504.8	6,757.0	14,249.2	6,617.0	145.3	144.6	-74.25	-7,367.8	-565.5	512.3	233.8	278.49	1.839		
14,507.9	6,757.0	14,249.2	6,617.0	145.4	144.6	-74.25	-7,367.8	-565.5	512.3	233.7	278.55	1.839 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)													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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	90.69	-0.7	59.9	59.9					
100.0	100.0	99.0	99.0	0.1	0.1	90.69	-0.7	59.9	59.9	59.7	0.22	267.871		
200.0	200.0	199.0	199.0	0.3	0.3	90.69	-0.7	59.9	59.9	59.2	0.67	89.142		
300.0	300.0	299.0	299.0	0.6	0.6	90.69	-0.7	59.9	59.9	58.8	1.12	53.414		
400.0	400.0	399.0	399.0	0.8	0.8	90.69	-0.7	59.9	59.9	58.3	1.57	38.131		
500.0	500.0	499.0	499.0	1.0	1.0	90.69	-0.7	59.9	59.9	57.9	2.02	29.648		
600.0	600.0	599.0	599.0	1.2	1.2	90.69	-0.7	59.9	59.9	57.4	2.47	24.252		
700.0	700.0	699.0	699.0	1.5	1.5	90.69	-0.7	59.9	59.9	57.0	2.92	20.518		
800.0	800.0	799.0	799.0	1.7	1.7	90.69	-0.7	59.9	59.9	56.5	3.37	17.781	CC, ES	
900.0	900.0	899.0	899.0	1.9	1.9	155.61	-0.7	59.9	61.1	57.3	3.81	16.028		
1,000.0	999.9	998.9	998.9	2.1	2.1	157.02	-0.7	59.9	64.7	60.4	4.25	15.223		
1,100.0	1,099.7	1,098.7	1,098.7	2.3	2.4	159.06	-0.7	59.9	70.8	66.1	4.69	15.090		
1,200.0	1,199.3	1,198.3	1,198.3	2.6	2.6	161.37	-0.7	59.9	79.4	74.2	5.13	15.474		
1,300.0	1,298.6	1,297.6	1,297.6	2.8	2.8	163.70	-0.7	59.9	90.6	85.0	5.57	16.265		
1,400.0	1,397.5	1,396.5	1,396.5	3.1	3.0	165.86	-0.7	59.9	104.5	98.4	6.01	17.383		
1,500.0	1,496.1	1,495.1	1,495.1	3.4	3.2	167.76	-0.7	59.9	121.0	114.5	6.45	18.762		
1,600.0	1,594.2	1,593.2	1,593.2	3.8	3.5	169.40	-0.7	59.9	140.1	133.2	6.88	20.353		
1,700.0	1,691.7	1,690.7	1,690.7	4.2	3.7	170.78	-0.7	59.9	161.9	154.5	7.32	22.118		
1,800.0	1,788.6	1,787.6	1,787.6	4.6	3.9	171.94	-0.7	59.9	186.2	178.5	7.75	24.025		
1,900.0	1,885.0	1,884.0	1,884.0	5.1	4.1	172.93	-0.7	59.9	212.8	204.6	8.20	25.952		
2,000.0	1,981.2	1,980.2	1,980.2	5.6	4.3	173.73	-0.7	59.9	239.6	231.0	8.66	27.659		
2,100.0	2,077.5	2,079.9	2,079.9	6.1	4.6	174.23	0.1	59.7	266.1	256.9	9.14	29.111		
2,200.0	2,173.8	2,181.2	2,181.1	6.6	4.8	174.23	3.4	58.6	291.0	281.4	9.62	30.245		
2,300.0	2,270.1	2,283.3	2,283.0	7.1	5.0	173.82	9.3	56.8	314.3	304.2	10.11	31.091		
2,400.0	2,366.3	2,385.9	2,385.3	7.7	5.3	173.09	17.9	54.2	336.2	325.6	10.61	31.680		
2,500.0	2,462.6	2,489.1	2,487.8	8.2	5.5	172.07	29.2	50.7	356.5	345.4	11.13	32.038		
2,600.0	2,558.9	2,592.6	2,590.3	8.8	5.7	170.81	43.1	46.4	375.5	363.8	11.67	32.184		
2,700.0	2,655.2	2,691.0	2,687.4	9.3	6.0	169.54	57.8	41.9	393.8	381.6	12.22	32.236		
2,800.0	2,751.4	2,788.9	2,784.2	9.9	6.3	168.39	72.5	37.4	412.3	399.5	12.78	32.256		
2,900.0	2,847.7	2,886.9	2,880.9	10.4	6.5	167.34	87.1	32.9	430.9	417.5	13.36	32.248		
3,000.0	2,944.0	2,984.9	2,977.7	11.0	6.8	166.37	101.7	28.4	449.6	435.7	13.95	32.219		
3,100.0	3,040.3	3,082.8	3,074.4	11.6	7.1	165.48	116.4	23.9	468.5	453.9	14.56	32.173		
3,200.0	3,136.5	3,180.8	3,171.2	12.1	7.4	164.66	131.0	19.4	487.4	472.2	15.18	32.113		
3,300.0	3,232.8	3,278.7	3,267.9	12.7	7.7	163.91	145.7	14.9	506.5	490.7	15.81	32.043		
3,400.0	3,329.1	3,376.7	3,364.7	13.3	8.0	163.20	160.3	10.4	525.6	509.1	16.44	31.964		
3,500.0	3,425.4	3,474.6	3,461.4	13.8	8.3	162.55	174.9	5.9	544.8	527.7	17.09	31.880		
3,600.0	3,521.6	3,572.6	3,558.2	14.4	8.6	161.94	189.6	1.4	564.0	546.3	17.74	31.792		
3,700.0	3,617.9	3,670.6	3,654.9	15.0	9.0	161.37	204.2	-3.0	583.4	564.9	18.40	31.701		
3,800.0	3,714.2	3,768.5	3,751.7	15.5	9.3	160.83	218.8	-7.5	602.7	583.7	19.07	31.609		
3,900.0	3,810.5	3,866.5	3,848.4	16.1	9.6	160.33	233.5	-12.0	622.1	602.4	19.74	31.516		
4,000.0	3,906.7	3,964.4	3,945.2	16.7	9.9	159.86	248.1	-16.5	641.6	621.2	20.42	31.423		
4,100.0	4,003.0	4,062.4	4,041.9	17.2	10.3	159.42	262.8	-21.0	661.1	640.0	21.10	31.331		
4,200.0	4,099.3	4,160.3	4,138.7	17.8	10.6	159.00	277.4	-25.5	680.6	658.8	21.79	31.240		
4,300.0	4,195.6	4,258.3	4,235.4	18.4	10.9	158.61	292.0	-30.0	700.2	677.7	22.48	31.150		
4,400.0	4,291.8	4,356.2	4,332.2	18.9	11.2	158.24	306.7	-34.5	719.8	696.6	23.17	31.062		
4,500.0	4,388.1	4,454.2	4,428.9	19.5	11.6	157.89	321.3	-39.0	739.4	715.5	23.87	30.976		
4,600.0	4,484.4	4,552.2	4,525.7	20.1	11.9	157.55	336.0	-43.5	759.1	734.5	24.57	30.892		
4,700.0	4,580.7	4,650.1	4,622.4	20.7	12.3	157.23	350.6	-48.0	778.7	753.5	25.28	30.810		
4,800.0	4,677.0	4,748.1	4,719.2	21.2	12.6	156.93	365.2	-52.5	798.4	772.4	25.98	30.730		
4,900.0	4,773.2	4,846.0	4,816.0	21.8	12.9	156.64	379.9	-57.0	818.1	791.5	26.69	30.652		
5,000.0	4,869.5	4,944.0	4,912.7	22.4	13.3	156.37	394.5	-61.5	837.9	810.5	27.40	30.577		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-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)			
5,100.0	4,965.8	5,041.9	5,009.5	23.0	13.6	156.11	409.1	-66.0	857.6	829.5	28.12	30.503		
5,200.0	5,062.1	5,139.9	5,106.2	23.5	14.0	155.86	423.8	-70.5	877.4	848.6	28.83	30.432		
5,300.0	5,158.4	5,237.9	5,203.0	24.1	14.3	155.67	438.4	-75.0	897.0	867.4	29.57	30.338		
5,400.0	5,255.4	5,336.3	5,300.2	24.5	14.6	155.51	453.1	-79.5	914.2	883.9	30.30	30.170		
5,500.0	5,353.2	5,435.1	5,397.8	24.8	15.0	155.24	467.9	-84.0	928.2	897.2	31.01	29.929		
5,600.0	5,451.7	5,529.2	5,490.8	25.1	15.3	154.92	481.6	-88.2	939.4	907.7	31.65	29.682		
5,700.0	5,550.7	5,619.6	5,580.5	25.4	15.5	154.67	492.3	-91.5	948.2	916.1	32.16	29.487		
5,800.0	5,650.2	5,710.3	5,670.8	25.6	15.7	154.49	500.3	-94.0	954.9	922.4	32.59	29.305		
5,900.0	5,749.9	5,800.0	5,760.3	25.8	15.9	154.38	505.5	-95.6	959.4	926.5	32.93	29.137		
6,000.0	5,849.8	5,892.2	5,852.5	25.9	16.0	154.33	508.0	-96.4	961.8	928.6	33.19	28.978		
6,100.0	5,949.8	5,988.6	5,948.8	26.0	16.2	89.93	508.3	-96.5	962.1	928.6	33.44	28.767		
6,139.2	5,989.1	6,027.8	5,988.1	26.1	16.2	-90.00	506.9	-96.5	962.1	928.5	33.53	28.690		
6,200.0	6,049.8	6,088.1	6,048.0	26.2	16.3	-89.64	501.0	-96.5	962.1	928.5	33.59	28.640		
6,300.0	6,149.5	6,185.7	6,143.6	26.2	16.3	-88.89	481.4	-96.5	962.3	928.8	33.50	28.728		
6,400.0	6,247.3	6,281.8	6,234.4	26.2	16.1	-88.16	450.4	-96.5	962.6	929.3	33.22	28.972		
6,500.0	6,341.6	6,376.5	6,319.5	26.1	16.0	-87.47	408.9	-96.5	963.0	930.2	32.83	29.329		
6,600.0	6,430.8	6,470.0	6,397.8	26.0	15.8	-86.82	357.9	-96.5	963.6	931.2	32.39	29.746		
6,700.0	6,513.4	6,562.4	6,468.5	25.8	15.6	-86.23	298.5	-96.5	964.2	932.2	31.97	30.158		
6,800.0	6,587.9	6,653.8	6,530.9	25.6	15.4	-85.69	231.8	-96.5	964.8	933.2	31.64	30.490		
6,900.0	6,653.1	6,744.4	6,584.5	25.5	15.4	-85.23	158.8	-96.4	965.4	933.9	31.49	30.661		
7,000.0	6,707.8	6,834.3	6,628.7	25.3	15.4	-84.84	80.5	-96.4	966.0	934.4	31.57	30.601		
7,100.0	6,751.2	6,923.7	6,663.2	25.1	15.5	-84.53	-1.8	-96.4	966.5	934.5	31.93	30.267		
7,200.0	6,782.4	7,012.6	6,687.9	25.1	15.9	-84.31	-87.3	-96.4	966.8	934.2	32.60	29.655		
7,300.0	6,801.0	7,100.0	6,702.2	25.0	16.4	-84.17	-173.4	-96.4	967.1	933.5	33.58	28.803		
7,400.0	6,806.6	7,190.2	6,706.6	25.2	17.0	-84.12	-263.4	-96.4	967.2	932.3	34.87	27.739		
7,500.0	6,805.9	7,290.2	6,706.0	25.4	18.0	-84.13	-363.4	-96.4	967.1	930.6	36.58	26.437		
7,600.0	6,805.2	7,390.2	6,705.4	25.8	19.0	-84.13	-463.4	-96.4	967.1	928.5	38.60	25.058		
7,700.0	6,804.5	7,490.2	6,704.7	26.5	20.2	-84.14	-563.4	-96.4	967.1	926.3	40.87	23.665		
7,800.0	6,803.8	7,590.2	6,704.1	27.2	21.5	-84.14	-663.4	-96.4	967.1	923.8	43.36	22.306		
7,900.0	6,803.1	7,690.2	6,703.5	28.2	22.9	-84.14	-763.4	-96.4	967.1	921.1	46.03	21.010		
8,000.0	6,802.4	7,790.2	6,702.8	29.3	24.4	-84.15	-863.4	-96.4	967.1	918.3	48.86	19.795		
8,100.0	6,801.7	7,890.2	6,702.2	30.5	25.9	-84.15	-963.4	-96.4	967.1	915.3	51.81	18.666		
8,200.0	6,801.0	7,990.2	6,701.6	31.8	27.5	-84.16	-1,063.4	-96.4	967.1	912.2	54.87	17.624		
8,300.0	6,800.3	8,090.2	6,701.0	33.1	29.1	-84.16	-1,163.4	-96.4	967.1	909.1	58.03	16.667		
8,400.0	6,799.6	8,190.2	6,700.3	34.6	30.7	-84.17	-1,263.4	-96.4	967.1	905.8	61.25	15.788		
8,500.0	6,798.9	8,290.2	6,699.7	36.0	32.4	-84.17	-1,363.4	-96.4	967.1	902.5	64.55	14.982		
8,600.0	6,798.2	8,390.2	6,699.1	37.6	34.1	-84.17	-1,463.4	-96.4	967.1	899.2	67.90	14.243		
8,700.0	6,797.5	8,490.2	6,698.4	39.1	35.8	-84.18	-1,563.4	-96.4	967.1	895.8	71.29	13.564		
8,800.0	6,796.8	8,590.2	6,697.8	40.7	37.5	-84.18	-1,663.4	-96.4	967.1	892.3	74.73	12.940		
8,900.0	6,796.1	8,690.2	6,697.2	42.4	39.3	-84.19	-1,763.4	-96.4	967.0	888.8	78.21	12.365		
9,000.0	6,795.5	8,790.2	6,696.6	44.0	41.1	-84.19	-1,863.4	-96.4	967.0	885.3	81.71	11.835		
9,100.0	6,794.8	8,890.2	6,695.9	45.7	42.9	-84.19	-1,963.4	-96.4	967.0	881.8	85.24	11.344		
9,200.0	6,794.1	8,990.2	6,695.3	47.4	44.6	-84.20	-2,063.4	-96.4	967.0	878.2	88.80	10.890		
9,300.0	6,793.4	9,090.2	6,694.7	49.1	46.5	-84.20	-2,163.4	-96.4	967.0	874.6	92.38	10.468		
9,400.0	6,792.7	9,190.2	6,694.0	50.8	48.3	-84.21	-2,263.4	-96.4	967.0	871.0	95.98	10.076		
9,500.0	6,792.0	9,290.2	6,693.4	52.5	50.1	-84.21	-2,363.4	-96.4	967.0	867.4	99.59	9.710		
9,600.0	6,791.3	9,390.2	6,692.8	54.3	51.9	-84.21	-2,463.4	-96.4	967.0	863.8	103.22	9.368		
9,700.0	6,790.6	9,490.2	6,692.2	56.0	53.8	-84.22	-2,563.4	-96.4	967.0	860.1	106.86	9.049		
9,800.0	6,789.9	9,590.2	6,691.5	57.8	55.6	-84.22	-2,663.4	-96.4	967.0	856.5	110.52	8.750		
9,900.0	6,789.2	9,690.2	6,690.9	59.6	57.4	-84.23	-2,763.4	-96.4	967.0	852.8	114.18	8.469		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-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)			
10,000.0	6,788.5	9,790.2	6,690.3	61.4	59.3	-84.23	-2,863.4	-96.4	967.0	849.1	117.86	8.204		
10,100.0	6,787.8	9,890.2	6,689.6	63.2	61.1	-84.24	-2,963.4	-96.4	967.0	845.4	121.55	7.956		
10,200.0	6,787.1	9,990.2	6,689.0	65.0	63.0	-84.24	-3,063.4	-96.4	967.0	841.7	125.24	7.721		
10,300.0	6,786.4	10,090.2	6,688.4	66.8	64.9	-84.24	-3,163.4	-96.4	967.0	838.0	128.94	7.499		
10,400.0	6,785.7	10,190.2	6,687.8	68.6	66.7	-84.25	-3,263.4	-96.4	966.9	834.3	132.65	7.289		
10,500.0	6,785.0	10,290.2	6,687.1	70.4	68.6	-84.25	-3,363.4	-96.4	966.9	830.6	136.37	7.091		
10,600.0	6,784.3	10,390.2	6,686.5	72.2	70.5	-84.26	-3,463.4	-96.4	966.9	826.8	140.09	6.902		
10,700.0	6,783.6	10,490.2	6,685.9	74.0	72.3	-84.26	-3,563.4	-96.4	966.9	823.1	143.81	6.723		
10,800.0	6,782.9	10,590.2	6,685.3	75.9	74.2	-84.26	-3,663.4	-96.4	966.9	819.4	147.54	6.553		
10,900.0	6,782.2	10,690.2	6,684.6	77.7	76.1	-84.27	-3,763.4	-96.4	966.9	815.6	151.28	6.392		
11,000.0	6,781.5	10,790.2	6,684.0	79.6	78.0	-84.27	-3,863.4	-96.4	966.9	811.9	155.02	6.237		
11,100.0	6,780.8	10,890.2	6,683.4	81.4	79.9	-84.28	-3,963.4	-96.4	966.9	808.1	158.77	6.090		
11,200.0	6,780.1	10,990.2	6,682.7	83.2	81.7	-84.28	-4,063.4	-96.4	966.9	804.4	162.51	5.950		
11,300.0	6,779.4	11,090.2	6,682.1	85.1	83.6	-84.28	-4,163.4	-96.4	966.9	800.6	166.27	5.815		
11,400.0	6,778.7	11,190.2	6,681.5	87.0	85.5	-84.29	-4,263.4	-96.4	966.9	796.9	170.02	5.687		
11,500.0	6,778.0	11,290.2	6,680.9	88.8	87.4	-84.29	-4,363.4	-96.4	966.9	793.1	173.78	5.564		
11,600.0	6,777.3	11,390.2	6,680.2	90.7	89.3	-84.30	-4,463.4	-96.4	966.9	789.3	177.54	5.446		
11,700.0	6,776.6	11,490.2	6,679.6	92.5	91.2	-84.30	-4,563.4	-96.4	966.9	785.6	181.30	5.333		
11,800.0	6,775.9	11,590.2	6,679.0	94.4	93.1	-84.31	-4,663.4	-96.4	966.9	781.8	185.07	5.224		
11,900.0	6,775.2	11,690.2	6,678.3	96.3	95.0	-84.31	-4,763.4	-96.4	966.8	778.0	188.84	5.120		
12,000.0	6,774.5	11,790.2	6,677.7	98.1	96.9	-84.31	-4,863.4	-96.4	966.8	774.2	192.61	5.020		
12,100.0	6,773.8	11,890.2	6,677.1	100.0	98.8	-84.32	-4,963.4	-96.4	966.8	770.4	196.38	4.923		
12,200.0	6,773.1	11,990.2	6,676.5	101.9	100.7	-84.32	-5,063.4	-96.4	966.8	766.7	200.16	4.830		
12,300.0	6,772.4	12,090.2	6,675.8	103.7	102.6	-84.33	-5,163.4	-96.4	966.8	762.9	203.94	4.741		
12,400.0	6,771.7	12,190.2	6,675.2	105.6	104.5	-84.33	-5,263.3	-96.4	966.8	759.1	207.71	4.655		
12,500.0	6,771.0	12,290.2	6,674.6	107.5	106.4	-84.33	-5,363.3	-96.4	966.8	755.3	211.50	4.571		
12,600.0	6,770.3	12,390.2	6,673.9	109.4	108.3	-84.34	-5,463.3	-96.4	966.8	751.5	215.28	4.491		
12,700.0	6,769.6	12,490.2	6,673.3	111.2	110.2	-84.34	-5,563.3	-96.4	966.8	747.7	219.06	4.413		
12,800.0	6,768.9	12,590.2	6,672.7	113.1	112.1	-84.35	-5,663.3	-96.4	966.8	743.9	222.85	4.338		
12,900.0	6,768.2	12,690.2	6,672.1	115.0	114.0	-84.35	-5,763.3	-96.4	966.8	740.1	226.63	4.266		
13,000.0	6,767.5	12,790.2	6,671.4	116.9	115.9	-84.35	-5,863.3	-96.4	966.8	736.4	230.42	4.196		
13,100.0	6,766.8	12,890.2	6,670.8	118.8	117.8	-84.36	-5,963.3	-96.4	966.8	732.6	234.21	4.128		
13,200.0	6,766.1	12,990.2	6,670.2	120.7	119.7	-84.36	-6,063.3	-96.4	966.8	728.8	238.00	4.062		
13,300.0	6,765.4	13,090.2	6,669.5	122.5	121.6	-84.37	-6,163.3	-96.4	966.8	725.0	241.79	3.998		
13,400.0	6,764.7	13,190.2	6,668.9	124.4	123.5	-84.37	-6,263.3	-96.4	966.7	721.2	245.59	3.936		
13,500.0	6,764.0	13,290.2	6,668.3	126.3	125.4	-84.38	-6,363.3	-96.4	966.7	717.4	249.38	3.877		
13,600.0	6,763.3	13,390.2	6,667.7	128.2	127.3	-84.38	-6,463.3	-96.4	966.7	713.6	253.17	3.818		
13,700.0	6,762.6	13,490.2	6,667.0	130.1	129.2	-84.38	-6,563.3	-96.4	966.7	709.8	256.97	3.762		
13,800.0	6,761.9	13,590.2	6,666.4	132.0	131.1	-84.39	-6,663.3	-96.4	966.7	706.0	260.77	3.707		
13,900.0	6,761.2	13,690.2	6,665.8	133.9	133.0	-84.39	-6,763.3	-96.4	966.7	702.1	264.56	3.654		
14,000.0	6,760.5	13,790.2	6,665.1	135.8	134.9	-84.40	-6,863.3	-96.4	966.7	698.3	268.36	3.602		
14,100.0	6,759.8	13,890.2	6,664.5	137.7	136.8	-84.40	-6,963.3	-96.4	966.7	694.5	272.16	3.552		
14,200.0	6,759.1	13,990.2	6,663.9	139.6	138.7	-84.40	-7,063.3	-96.4	966.7	690.7	275.96	3.503		
14,300.0	6,758.5	14,090.2	6,663.3	141.5	140.6	-84.41	-7,163.3	-96.4	966.7	686.9	279.76	3.455		
14,400.0	6,757.8	14,190.2	6,662.6	143.4	142.5	-84.41	-7,263.3	-96.4	966.7	683.1	283.56	3.409		
14,500.0	6,757.1	14,290.2	6,662.0	145.3	144.5	-84.42	-7,363.3	-96.4	966.7	679.3	287.37	3.364		
14,500.5	6,757.1	14,290.7	6,662.0	145.3	144.5	-84.42	-7,363.8	-96.4	966.7	679.3	287.38	3.364		
14,507.9	6,757.0	14,290.7	6,662.0	145.4	144.5	-84.42	-7,363.8	-96.4	966.7	679.2	287.52	3.362 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	91.37	-0.4	15.0	15.1	15.1	0.00	N/A			
100.0	100.0	99.0	99.0	0.1	0.1	91.37	-0.4	15.0	15.0	14.8	0.22	67.294			
200.0	200.0	199.0	199.0	0.3	0.3	91.37	-0.4	15.0	15.0	14.4	0.67	22.394			
300.0	300.0	299.0	299.0	0.6	0.6	91.37	-0.4	15.0	15.0	13.9	1.12	13.418			
400.0	400.0	399.0	399.0	0.8	0.8	91.37	-0.4	15.0	15.0	13.5	1.57	9.579			
500.0	500.0	499.0	499.0	1.0	1.0	91.37	-0.4	15.0	15.0	13.0	2.02	7.448			
600.0	600.0	599.0	599.0	1.2	1.2	91.37	-0.4	15.0	15.0	12.6	2.47	6.093			
700.0	700.0	699.0	699.0	1.5	1.5	91.37	-0.4	15.0	15.0	12.1	2.92	5.155			
800.0	800.0	799.0	799.0	1.7	1.7	91.37	-0.4	15.0	15.0	11.7	3.37	4.467 CC			
900.0	900.0	899.0	899.0	1.9	1.9	157.66	-0.4	15.0	16.3	12.4	3.81	4.264			
1,000.0	999.9	998.9	998.9	2.1	2.1	161.94	-0.4	15.0	19.9	15.7	4.25	4.692			
1,100.0	1,099.7	1,099.3	1,099.3	2.3	2.4	165.37	0.3	13.9	25.0	20.4	4.68	5.346			
1,200.0	1,199.3	1,199.9	1,199.8	2.6	2.6	167.11	2.4	10.6	30.3	25.1	5.11	5.920			
1,300.0	1,298.6	1,300.5	1,300.2	2.8	2.8	167.89	5.9	5.0	35.5	30.0	5.54	6.416			
1,400.0	1,397.5	1,401.4	1,400.6	3.1	3.0	168.07	10.7	-2.9	40.9	34.9	5.97	6.845			
1,500.0	1,496.1	1,502.3	1,500.9	3.4	3.3	167.86	17.0	-13.0	46.3	39.9	6.42	7.217			
1,600.0	1,594.2	1,603.4	1,600.9	3.8	3.6	167.38	24.7	-25.4	51.8	44.9	6.87	7.537			
1,700.0	1,691.7	1,704.6	1,700.6	4.2	3.9	166.70	33.8	-40.0	57.3	49.9	7.33	7.812			
1,800.0	1,788.6	1,805.9	1,800.0	4.6	4.2	165.89	44.2	-57.0	62.8	55.0	7.81	8.042			
1,900.0	1,885.0	1,907.3	1,898.8	5.1	4.6	164.90	56.1	-76.1	68.1	59.7	8.33	8.170			
2,000.0	1,981.2	2,007.2	1,995.9	5.6	5.0	163.79	68.4	-96.0	72.5	63.7	8.89	8.160			
2,100.0	2,077.5	2,107.1	2,093.1	6.1	5.4	162.81	80.7	-115.8	77.0	67.6	9.47	8.136			
2,200.0	2,173.8	2,207.0	2,190.2	6.6	5.9	161.94	93.0	-135.6	81.5	71.5	10.06	8.102			
2,300.0	2,270.1	2,306.9	2,287.3	7.1	6.3	161.16	105.3	-155.5	86.1	75.4	10.68	8.061			
2,400.0	2,366.3	2,406.8	2,384.4	7.7	6.8	160.46	117.5	-175.3	90.6	79.3	11.30	8.016			
2,500.0	2,462.6	2,506.6	2,481.6	8.2	7.2	159.82	129.8	-195.1	95.2	83.2	11.94	7.968			
2,600.0	2,558.9	2,606.5	2,578.7	8.8	7.7	159.25	142.1	-215.0	99.7	87.1	12.59	7.919			
2,700.0	2,655.2	2,706.4	2,675.8	9.3	8.2	158.72	154.4	-234.8	104.3	91.1	13.26	7.869			
2,800.0	2,751.4	2,806.3	2,773.0	9.9	8.6	158.24	166.7	-254.6	108.9	95.0	13.93	7.819			
2,900.0	2,847.7	2,906.2	2,870.1	10.4	9.1	157.80	179.0	-274.5	113.5	98.9	14.60	7.771			
3,000.0	2,944.0	3,006.1	2,967.2	11.0	9.6	157.39	191.2	-294.3	118.1	102.8	15.29	7.723			
3,100.0	3,040.3	3,106.0	3,064.3	11.6	10.1	157.01	203.5	-314.1	122.7	106.7	15.98	7.677			
3,200.0	3,136.5	3,205.9	3,161.5	12.1	10.6	156.66	215.8	-334.0	127.3	110.6	16.68	7.632			
3,300.0	3,232.8	3,305.8	3,258.6	12.7	11.0	156.34	228.1	-353.8	131.9	114.5	17.38	7.589			
3,400.0	3,329.1	3,405.7	3,355.7	13.3	11.5	156.03	240.4	-373.6	136.5	118.4	18.09	7.548			
3,500.0	3,425.4	3,505.6	3,452.8	13.8	12.0	155.75	252.7	-393.5	141.1	122.3	18.80	7.508			
3,600.0	3,521.6	3,605.4	3,550.0	14.4	12.5	155.48	265.0	-413.3	145.8	126.2	19.51	7.470			
3,700.0	3,617.9	3,705.3	3,647.1	15.0	13.0	155.23	277.2	-433.1	150.4	130.1	20.23	7.433			
3,800.0	3,714.2	3,805.2	3,744.2	15.5	13.5	155.00	289.5	-453.0	155.0	134.1	20.95	7.398			
3,900.0	3,810.5	3,905.1	3,841.4	16.1	14.0	154.78	301.8	-472.8	159.6	138.0	21.68	7.364			
4,000.0	3,906.7	4,005.0	3,938.5	16.7	14.5	154.57	314.1	-492.6	164.3	141.9	22.40	7.332			
4,100.0	4,003.0	4,104.9	4,035.6	17.2	15.0	154.37	326.4	-512.5	168.9	145.8	23.13	7.301			
4,200.0	4,099.3	4,204.8	4,132.7	17.8	15.5	154.18	338.7	-532.3	173.5	149.7	23.87	7.271			
4,300.0	4,195.6	4,304.7	4,229.9	18.4	16.0	154.01	351.0	-552.2	178.2	153.6	24.60	7.243			
4,400.0	4,291.8	4,404.6	4,327.0	18.9	16.5	153.84	363.2	-572.0	182.8	157.5	25.34	7.216			
4,500.0	4,388.1	4,504.5	4,424.1	19.5	17.0	153.68	375.5	-591.8	187.5	161.4	26.07	7.190			
4,600.0	4,484.4	4,604.4	4,521.3	20.1	17.5	153.53	387.8	-611.7	192.1	165.3	26.81	7.165			
4,700.0	4,580.7	4,704.2	4,618.4	20.7	17.9	153.38	400.1	-631.5	196.7	169.2	27.55	7.140			
4,800.0	4,677.0	4,804.1	4,715.5	21.2	18.4	153.24	412.4	-651.3	201.4	173.1	28.29	7.117			
4,900.0	4,773.2	4,904.0	4,812.6	21.8	18.9	153.11	424.7	-671.2	206.0	177.0	29.04	7.095			
5,000.0	4,869.5	5,003.9	4,909.8	22.4	19.4	152.99	436.9	-691.0	210.7	180.9	29.78	7.074			

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

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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,100.0	4,965.8	5,103.8	5,006.9	23.0	19.9	152.87	449.2	-710.8	215.3	184.8	30.53	7.053			
5,200.0	5,062.1	5,203.7	5,104.0	23.5	20.4	152.75	461.5	-730.7	220.0	188.7	31.28	7.033			
5,300.0	5,158.4	5,300.0	5,197.8	24.1	20.9	152.75	472.9	-749.1	225.2	193.2	31.96	7.045			
5,400.0	5,255.4	5,392.8	5,288.8	24.5	21.2	152.90	482.4	-764.4	230.5	198.0	32.49	7.095			
5,500.0	5,353.2	5,486.3	5,381.1	24.8	21.5	153.08	490.4	-777.3	235.5	202.6	32.95	7.149			
5,600.0	5,451.7	5,579.7	5,473.7	25.1	21.7	153.30	496.8	-787.7	240.2	206.9	33.33	7.207			
5,700.0	5,550.7	5,672.9	5,566.5	25.4	21.9	153.55	501.6	-795.4	244.4	210.8	33.63	7.269			
5,800.0	5,650.2	5,766.1	5,659.5	25.6	22.1	153.83	504.8	-800.6	248.3	214.5	33.85	7.336			
5,900.0	5,749.9	5,859.1	5,752.5	25.8	22.2	154.14	506.4	-803.2	251.8	217.8	34.00	7.407			
6,000.0	5,849.8	5,955.5	5,848.8	25.9	22.3	154.44	506.6	-803.5	254.6	220.5	34.09	7.468			
6,100.0	5,949.8	6,055.5	5,948.8	26.0	22.4	90.08	506.6	-803.5	255.0	220.7	34.32	7.431			
6,127.7	5,977.5	6,083.2	5,976.5	26.1	22.5	-89.90	506.5	-803.5	255.0	220.6	34.39	7.415			
6,200.0	6,049.8	6,155.1	6,048.3	26.2	22.5	-88.85	501.8	-803.5	255.1	220.8	34.25	7.447			
6,300.0	6,149.5	6,253.3	6,144.8	26.2	22.5	-86.58	484.6	-803.5	255.5	221.8	33.66	7.590			
6,400.0	6,247.3	6,350.0	6,237.0	26.2	22.4	-84.39	455.7	-803.5	256.3	223.3	32.96	7.775			
6,500.0	6,341.6	6,446.0	6,324.3	26.1	22.3	-82.31	415.6	-803.5	257.3	225.1	32.22	7.986			
6,600.0	6,430.8	6,540.8	6,404.8	26.0	22.2	-80.39	365.7	-803.5	258.7	227.1	31.53	8.204			
6,700.0	6,513.4	6,634.7	6,477.8	25.8	22.0	-78.65	306.9	-803.5	260.1	229.2	30.92	8.412			
6,800.0	6,587.9	6,727.7	6,542.5	25.6	21.8	-77.11	240.1	-803.5	261.6	231.2	30.46	8.590			
6,900.0	6,653.1	6,820.1	6,598.3	25.5	21.6	-75.79	166.5	-803.5	263.1	232.9	30.17	8.720			
7,000.0	6,707.8	6,911.8	6,644.5	25.3	21.4	-74.69	87.3	-803.5	264.4	234.3	30.10	8.784			
7,100.0	6,751.2	7,003.2	6,680.7	25.1	21.3	-73.84	3.6	-803.5	265.5	235.2	30.29	8.767			
7,200.0	6,782.4	7,094.1	6,706.6	25.1	21.2	-73.24	-83.6	-803.5	266.3	235.6	30.76	8.658			
7,300.0	6,801.0	7,184.9	6,722.0	25.0	21.2	-72.89	-173.0	-803.5	266.8	235.3	31.53	8.463			
7,400.0	6,806.6	7,275.6	6,726.6	25.2	21.4	-72.78	-263.5	-803.5	267.0	234.4	32.59	8.192			
7,500.0	6,805.9	7,375.6	6,725.9	25.4	21.8	-72.78	-363.5	-803.5	267.0	232.8	34.18	7.811			
7,600.0	6,805.2	7,475.6	6,725.2	25.8	22.4	-72.78	-463.5	-803.5	267.0	230.9	36.06	7.403			
7,700.0	6,804.5	7,575.6	6,724.5	26.5	23.3	-72.78	-563.5	-803.5	267.0	228.8	38.21	6.986			
7,800.0	6,803.8	7,675.6	6,723.8	27.2	24.4	-72.78	-663.5	-803.5	267.0	226.4	40.59	6.578			
7,900.0	6,803.1	7,775.6	6,723.1	28.2	25.6	-72.78	-763.5	-803.5	267.0	223.8	43.15	6.188			
8,000.0	6,802.4	7,875.6	6,722.4	29.3	26.9	-72.78	-863.5	-803.5	267.0	221.1	45.86	5.822			
8,100.0	6,801.7	7,975.6	6,721.7	30.5	28.3	-72.78	-963.5	-803.5	267.0	218.3	48.70	5.482			
8,200.0	6,801.0	8,075.6	6,721.0	31.8	29.7	-72.78	-1,063.5	-803.5	267.0	215.3	51.65	5.169			
8,300.0	6,800.3	8,175.6	6,720.3	33.1	31.2	-72.78	-1,163.5	-803.5	267.0	212.3	54.69	4.881			
8,400.0	6,799.6	8,275.6	6,719.6	34.6	32.8	-72.78	-1,263.5	-803.5	267.0	209.2	57.81	4.618			
8,500.0	6,798.9	8,375.6	6,718.9	36.0	34.3	-72.78	-1,363.5	-803.5	267.0	206.0	60.99	4.377			
8,600.0	6,798.2	8,475.6	6,718.2	37.6	36.0	-72.78	-1,463.5	-803.5	267.0	202.7	64.23	4.156			
8,700.0	6,797.5	8,575.6	6,717.5	39.1	37.6	-72.78	-1,563.5	-803.5	267.0	199.5	67.51	3.954			
8,800.0	6,796.8	8,675.6	6,716.8	40.7	39.3	-72.78	-1,663.5	-803.5	267.0	196.1	70.84	3.769			
8,900.0	6,796.1	8,775.6	6,716.1	42.4	40.9	-72.78	-1,763.5	-803.5	267.0	192.8	74.20	3.598			
9,000.0	6,795.5	8,875.6	6,715.4	44.0	42.6	-72.78	-1,863.5	-803.5	267.0	189.4	77.59	3.441			
9,100.0	6,794.8	8,975.6	6,714.7	45.7	44.4	-72.78	-1,963.5	-803.5	267.0	186.0	81.00	3.296			
9,200.0	6,794.1	9,075.6	6,714.0	47.4	46.1	-72.78	-2,063.5	-803.5	267.0	182.5	84.44	3.162			
9,300.0	6,793.4	9,175.6	6,713.3	49.1	47.9	-72.78	-2,163.5	-803.5	267.0	179.1	87.90	3.037			
9,400.0	6,792.7	9,275.6	6,712.6	50.8	49.6	-72.78	-2,263.5	-803.5	267.0	175.6	91.38	2.921			
9,500.0	6,792.0	9,375.6	6,711.9	52.5	51.4	-72.78	-2,363.5	-803.5	267.0	172.1	94.88	2.814			
9,600.0	6,791.3	9,475.6	6,711.3	54.3	53.2	-72.78	-2,463.5	-803.5	267.0	168.6	98.39	2.713			
9,700.0	6,790.6	9,575.6	6,710.6	56.0	55.0	-72.78	-2,563.5	-803.5	267.0	165.1	101.91	2.620			
9,800.0	6,789.9	9,675.6	6,709.9	57.8	56.8	-72.78	-2,663.5	-803.5	267.0	161.5	105.44	2.532			
9,900.0	6,789.2	9,775.6	6,709.2	59.6	58.6	-72.78	-2,763.5	-803.5	267.0	158.0	108.99	2.450			

COMPASS 5000.1 Build 74

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-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)			
10,000.0	6,788.5	9,875.6	6,708.5	61.4	60.4	-72.78	-2,863.5	-803.5	267.0	154.4	112.54	2.372		
10,100.0	6,787.8	9,975.6	6,707.8	63.2	62.2	-72.78	-2,963.5	-803.5	267.0	150.9	116.11	2.299		
10,200.0	6,787.1	10,075.6	6,707.1	65.0	64.0	-72.78	-3,063.5	-803.5	267.0	147.3	119.68	2.231		
10,300.0	6,786.4	10,175.6	6,706.4	66.8	65.9	-72.78	-3,163.5	-803.5	267.0	143.7	123.25	2.166		
10,400.0	6,785.7	10,275.6	6,705.7	68.6	67.7	-72.78	-3,263.4	-803.5	267.0	140.1	126.84	2.105		
10,500.0	6,785.0	10,375.6	6,705.0	70.4	69.5	-72.78	-3,363.4	-803.5	267.0	136.5	130.43	2.047		
10,600.0	6,784.3	10,475.6	6,704.3	72.2	71.4	-72.78	-3,463.4	-803.5	267.0	132.9	134.03	1.992		
10,700.0	6,783.6	10,575.6	6,703.6	74.0	73.2	-72.78	-3,563.4	-803.5	267.0	129.3	137.63	1.940		
10,800.0	6,782.9	10,675.6	6,702.9	75.9	75.1	-72.78	-3,663.4	-803.5	267.0	125.7	141.24	1.890		
10,900.0	6,782.2	10,775.6	6,702.2	77.7	76.9	-72.78	-3,763.4	-803.5	267.0	122.1	144.85	1.843		
11,000.0	6,781.5	10,875.6	6,701.5	79.6	78.8	-72.78	-3,863.4	-803.5	267.0	118.5	148.46	1.798		
11,100.0	6,780.8	10,975.6	6,700.8	81.4	80.7	-72.78	-3,963.4	-803.5	267.0	114.9	152.08	1.755		
11,200.0	6,780.1	11,075.6	6,700.1	83.2	82.5	-72.78	-4,063.4	-803.5	267.0	111.3	155.70	1.715		
11,300.0	6,779.4	11,175.6	6,699.4	85.1	84.4	-72.78	-4,163.4	-803.5	267.0	107.6	159.33	1.676		
11,400.0	6,778.7	11,275.6	6,698.7	87.0	86.3	-72.78	-4,263.4	-803.5	267.0	104.0	162.96	1.638		
11,500.0	6,778.0	11,375.6	6,698.0	88.8	88.1	-72.78	-4,363.4	-803.5	267.0	100.4	166.59	1.603		
11,600.0	6,777.3	11,475.6	6,697.3	90.7	90.0	-72.78	-4,463.4	-803.5	267.0	96.8	170.22	1.568		
11,700.0	6,776.6	11,575.6	6,696.6	92.5	91.9	-72.78	-4,563.4	-803.5	267.0	93.1	173.86	1.536		
11,800.0	6,775.9	11,675.6	6,695.9	94.4	93.8	-72.78	-4,663.4	-803.5	267.0	89.5	177.50	1.504		
11,900.0	6,775.2	11,775.6	6,695.2	96.3	95.6	-72.78	-4,763.4	-803.5	267.0	85.8	181.14	1.474	Level 3	
12,000.0	6,774.5	11,875.6	6,694.5	98.1	97.5	-72.78	-4,863.4	-803.5	267.0	82.2	184.78	1.445	Level 3	
12,100.0	6,773.8	11,975.6	6,693.8	100.0	99.4	-72.78	-4,963.4	-803.5	267.0	78.5	188.43	1.417	Level 3	
12,200.0	6,773.1	12,075.6	6,693.1	101.9	101.3	-72.78	-5,063.4	-803.5	267.0	74.9	192.08	1.390	Level 3	
12,300.0	6,772.4	12,175.6	6,692.4	103.7	103.2	-72.78	-5,163.4	-803.5	267.0	71.2	195.72	1.364	Level 3	
12,400.0	6,771.7	12,275.6	6,691.7	105.6	105.0	-72.78	-5,263.4	-803.5	267.0	67.6	199.37	1.339	Level 3	
12,500.0	6,771.0	12,375.6	6,691.0	107.5	106.9	-72.78	-5,363.4	-803.5	267.0	63.9	203.03	1.315	Level 3	
12,600.0	6,770.3	12,475.6	6,690.3	109.4	108.8	-72.78	-5,463.4	-803.5	267.0	60.3	206.68	1.292	Level 3	
12,700.0	6,769.6	12,575.6	6,689.6	111.2	110.7	-72.78	-5,563.4	-803.5	267.0	56.6	210.34	1.269	Level 3	
12,800.0	6,768.9	12,675.6	6,688.9	113.1	112.6	-72.78	-5,663.4	-803.5	267.0	53.0	213.99	1.248	Level 2	
12,900.0	6,768.2	12,775.6	6,688.2	115.0	114.5	-72.78	-5,763.4	-803.5	267.0	49.3	217.65	1.227	Level 2	
13,000.0	6,767.5	12,875.6	6,687.5	116.9	116.4	-72.78	-5,863.4	-803.5	267.0	45.7	221.31	1.206	Level 2	
13,100.0	6,766.8	12,975.6	6,686.8	118.8	118.3	-72.78	-5,963.4	-803.5	267.0	42.0	224.97	1.187	Level 2	
13,200.0	6,766.1	13,075.6	6,686.1	120.7	120.2	-72.78	-6,063.4	-803.5	267.0	38.3	228.63	1.168	Level 2	
13,300.0	6,765.4	13,175.6	6,685.4	122.5	122.0	-72.78	-6,163.4	-803.5	267.0	34.7	232.29	1.149	Level 2	
13,400.0	6,764.7	13,275.6	6,684.7	124.4	123.9	-72.78	-6,263.4	-803.5	267.0	31.0	235.96	1.131	Level 2	
13,500.0	6,764.0	13,375.6	6,684.0	126.3	125.8	-72.78	-6,363.4	-803.5	267.0	27.4	239.62	1.114	Level 2	
13,600.0	6,763.3	13,475.6	6,683.3	128.2	127.7	-72.78	-6,463.4	-803.5	267.0	23.7	243.28	1.097	Level 2	
13,700.0	6,762.6	13,575.6	6,682.6	130.1	129.6	-72.78	-6,563.4	-803.5	267.0	20.0	246.95	1.081	Level 2	
13,800.0	6,761.9	13,675.6	6,681.9	132.0	131.5	-72.78	-6,663.4	-803.5	267.0	16.4	250.62	1.065	Level 2	
13,900.0	6,761.2	13,775.6	6,681.2	133.9	133.4	-72.78	-6,763.4	-803.5	267.0	12.7	254.28	1.050	Level 2	
14,000.0	6,760.5	13,875.6	6,680.5	135.8	135.3	-72.78	-6,863.4	-803.5	267.0	9.0	257.95	1.035	Level 2	
14,100.0	6,759.8	13,975.6	6,679.8	137.7	137.2	-72.78	-6,963.4	-803.5	267.0	5.4	261.62	1.020	Level 2	
14,200.0	6,759.1	14,075.6	6,679.1	139.6	139.1	-72.78	-7,063.4	-803.5	267.0	1.7	265.29	1.006	Level 2	
14,300.0	6,758.5	14,175.6	6,678.4	141.5	141.0	-72.79	-7,163.4	-803.5	267.0	-2.0	268.96	0.993	Level 1	
14,400.0	6,757.8	14,275.6	6,677.7	143.4	142.9	-72.79	-7,263.4	-803.5	267.0	-5.7	272.63	0.979	Level 1	
14,500.0	6,757.1	14,375.6	6,677.0	145.3	144.8	-72.79	-7,363.3	-803.5	267.0	-9.3	276.30	0.966	Level 1	
14,500.0	6,757.1	14,375.6	6,677.0	145.3	144.8	-72.79	-7,363.4	-803.5	267.0	-9.3	276.30	0.966	Level 1	
14,507.9	6,757.0	14,381.8	6,677.0	145.4	144.9	-72.79	-7,369.6	-803.5	267.0	-9.6	276.56	0.965	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.46	-0.4	45.1	45.1						
100.0	100.0	99.0	99.0	0.1	0.1	90.46	-0.4	45.1	45.1	44.9	0.22	201.830			
200.0	200.0	199.0	199.0	0.3	0.3	90.46	-0.4	45.1	45.1	44.5	0.67	67.165			
300.0	300.0	299.0	299.0	0.6	0.6	90.46	-0.4	45.1	45.1	44.0	1.12	40.245			
400.0	400.0	399.0	399.0	0.8	0.8	90.46	-0.4	45.1	45.1	43.6	1.57	28.730			
500.0	500.0	499.0	499.0	1.0	1.0	90.46	-0.4	45.1	45.1	43.1	2.02	22.338			
600.0	600.0	599.0	599.0	1.2	1.2	90.46	-0.4	45.1	45.1	42.7	2.47	18.273			
700.0	700.0	699.0	699.0	1.5	1.5	90.46	-0.4	45.1	45.1	42.2	2.92	15.460			
800.0	800.0	799.0	799.0	1.7	1.7	90.46	-0.4	45.1	45.1	41.8	3.37	13.397	CC, ES		
900.0	900.0	899.0	899.0	1.9	1.9	155.55	-0.4	45.1	46.3	42.5	3.81	12.153			
1,000.0	999.9	998.9	998.9	2.1	2.1	157.39	-0.4	45.1	49.9	45.7	4.25	11.748			
1,100.0	1,099.7	1,098.7	1,098.7	2.3	2.4	159.93	-0.4	45.1	56.0	51.3	4.69	11.947			
1,200.0	1,199.3	1,198.3	1,198.3	2.6	2.6	162.68	-0.4	45.1	64.7	59.6	5.13	12.612			
1,300.0	1,298.6	1,297.6	1,297.6	2.8	2.8	165.27	-0.4	45.1	76.0	70.4	5.57	13.646			
1,400.0	1,397.5	1,396.5	1,396.5	3.1	3.0	167.55	-0.4	45.1	90.0	84.0	6.01	14.973			
1,500.0	1,496.1	1,497.2	1,497.2	3.4	3.3	169.08	0.6	44.4	105.6	99.2	6.44	16.387			
1,600.0	1,594.2	1,598.2	1,598.2	3.8	3.5	169.66	3.8	42.1	121.8	114.9	6.88	17.709			
1,700.0	1,691.7	1,699.6	1,699.3	4.2	3.7	169.61	9.0	38.1	138.5	131.2	7.32	18.929			
1,800.0	1,788.6	1,801.2	1,800.4	4.6	3.9	169.12	16.5	32.5	155.6	147.9	7.76	20.051			
1,900.0	1,885.0	1,903.1	1,901.6	5.1	4.2	168.32	26.1	25.3	172.9	164.7	8.24	20.989			
2,000.0	1,981.2	2,005.5	2,003.0	5.6	4.5	167.17	38.0	16.5	188.4	179.7	8.75	21.532			
2,100.0	2,077.5	2,105.1	2,101.2	6.1	4.7	165.90	50.9	6.8	202.7	193.4	9.28	21.832			
2,200.0	2,173.8	2,204.0	2,198.8	6.6	5.0	164.80	63.8	-2.8	217.0	207.2	9.83	22.067			
2,300.0	2,270.1	2,302.9	2,296.4	7.1	5.3	163.83	76.6	-12.4	231.4	221.0	10.40	22.247			
2,400.0	2,366.3	2,401.7	2,394.0	7.7	5.6	162.98	89.5	-22.0	245.9	234.9	10.98	22.385			
2,500.0	2,462.6	2,500.6	2,491.5	8.2	6.0	162.22	102.4	-31.6	260.4	248.8	11.58	22.488			
2,600.0	2,558.9	2,599.5	2,589.1	8.8	6.3	161.54	115.2	-41.2	274.9	262.7	12.18	22.563			
2,700.0	2,655.2	2,698.4	2,686.7	9.3	6.6	160.93	128.1	-50.9	289.5	276.7	12.80	22.616			
2,800.0	2,751.4	2,797.3	2,784.3	9.9	6.9	160.38	141.0	-60.5	304.1	290.7	13.43	22.651			
2,900.0	2,847.7	2,896.2	2,881.8	10.4	7.3	159.88	153.8	-70.1	318.7	304.7	14.06	22.672			
3,000.0	2,944.0	2,995.1	2,979.4	11.0	7.6	159.42	166.7	-79.7	333.4	318.7	14.70	22.682			
3,100.0	3,040.3	3,094.0	3,077.0	11.6	8.0	159.01	179.5	-89.3	348.1	332.7	15.34	22.683			
3,200.0	3,136.5	3,192.8	3,174.6	12.1	8.3	158.62	192.4	-98.9	362.8	346.8	16.00	22.677			
3,300.0	3,232.8	3,291.7	3,272.1	12.7	8.7	158.27	205.3	-108.5	377.5	360.8	16.65	22.666			
3,400.0	3,329.1	3,390.6	3,369.7	13.3	9.0	157.94	218.1	-118.1	392.2	374.9	17.31	22.650			
3,500.0	3,425.4	3,489.5	3,467.3	13.8	9.4	157.63	231.0	-127.7	406.9	388.9	17.98	22.632			
3,600.0	3,521.6	3,588.4	3,564.9	14.4	9.7	157.35	243.9	-137.4	421.6	403.0	18.65	22.610			
3,700.0	3,617.9	3,687.3	3,662.4	15.0	10.1	157.09	256.7	-147.0	436.4	417.1	19.32	22.587			
3,800.0	3,714.2	3,786.2	3,760.0	15.5	10.4	156.84	269.6	-156.6	451.2	431.2	20.00	22.562			
3,900.0	3,810.5	3,885.0	3,857.6	16.1	10.8	156.61	282.4	-166.2	465.9	445.2	20.67	22.537			
4,000.0	3,906.7	3,983.9	3,955.2	16.7	11.1	156.39	295.3	-175.8	480.7	459.3	21.35	22.510			
4,100.0	4,003.0	4,082.8	4,052.7	17.2	11.5	156.19	308.2	-185.4	495.5	473.4	22.04	22.483			
4,200.0	4,099.3	4,181.7	4,150.3	17.8	11.9	156.00	321.0	-195.0	510.3	487.5	22.72	22.456			
4,300.0	4,195.6	4,280.6	4,247.9	18.4	12.2	155.81	333.9	-204.6	525.0	501.6	23.41	22.429			
4,400.0	4,291.8	4,379.5	4,345.5	18.9	12.6	155.64	346.8	-214.2	539.8	515.7	24.10	22.402			
4,500.0	4,388.1	4,478.4	4,443.0	19.5	12.9	155.48	359.6	-223.9	554.6	529.8	24.79	22.376			
4,600.0	4,484.4	4,577.3	4,540.6	20.1	13.3	155.33	372.5	-233.5	569.4	544.0	25.48	22.349			
4,700.0	4,580.7	4,676.1	4,638.2	20.7	13.7	155.18	385.3	-243.1	584.2	558.1	26.17	22.323			
4,800.0	4,677.0	4,775.0	4,735.8	21.2	14.0	155.04	398.2	-252.7	599.1	572.2	26.87	22.298			
4,900.0	4,773.2	4,873.9	4,833.3	21.8	14.4	154.91	411.1	-262.3	613.9	586.3	27.56	22.272			
5,000.0	4,869.5	4,972.8	4,930.9	22.4	14.8	154.78	423.9	-271.9	628.7	600.4	28.26	22.248			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,100.0	4,965.8	5,071.7	5,028.5	23.0	15.1	154.66	436.8	-281.5	643.5	614.5	28.96	22.223			
5,200.0	5,062.1	5,170.6	5,126.1	23.5	15.5	154.55	449.7	-291.1	658.3	628.7	29.65	22.199			
5,300.0	5,158.4	5,269.5	5,223.7	24.1	15.9	154.48	462.5	-300.8	673.0	642.6	30.37	22.161			
5,400.0	5,255.4	5,368.7	5,321.6	24.5	16.2	154.37	475.4	-310.4	685.2	654.1	31.08	22.049			
5,500.0	5,353.2	5,457.3	5,409.1	24.8	16.5	154.23	486.2	-318.4	694.9	663.3	31.66	21.948			
5,600.0	5,451.7	5,544.2	5,495.4	25.1	16.7	154.14	494.6	-324.7	703.4	671.2	32.16	21.873			
5,700.0	5,550.7	5,631.1	5,581.9	25.4	16.9	154.12	501.0	-329.5	710.5	677.9	32.57	21.813			
5,800.0	5,650.2	5,718.1	5,668.7	25.6	17.1	154.15	505.2	-332.7	716.3	683.4	32.91	21.766			
5,900.0	5,749.9	5,805.0	5,755.6	25.8	17.2	154.22	507.4	-334.3	720.8	687.6	33.16	21.732			
6,000.0	5,849.8	5,898.2	5,848.8	25.9	17.4	154.34	507.6	-334.5	723.7	690.3	33.36	21.691			
6,100.0	5,949.8	5,998.2	5,948.8	26.0	17.5	89.95	507.6	-334.5	724.1	690.4	33.63	21.532			
6,200.0	6,049.8	6,098.3	6,048.8	26.2	17.7	-90.02	507.2	-334.5	724.1	690.1	33.94	21.334			
6,209.0	6,058.9	6,107.3	6,057.9	26.2	17.7	-90.00	506.8	-334.5	724.1	690.1	33.95	21.327			
6,300.0	6,149.5	6,198.1	6,148.1	26.2	17.7	-89.82	497.3	-334.5	724.1	690.0	34.03	21.279			
6,400.0	6,247.3	6,297.6	6,245.0	26.2	17.7	-89.63	474.6	-334.5	724.1	690.2	33.91	21.352			
6,500.0	6,341.6	6,396.8	6,337.7	26.1	17.6	-89.45	439.7	-334.5	724.1	690.5	33.63	21.529			
6,600.0	6,430.8	6,495.8	6,425.0	26.0	17.4	-89.27	393.2	-334.5	724.1	690.9	33.25	21.777			
6,700.0	6,513.4	6,594.4	6,505.3	25.8	17.2	-89.11	336.0	-334.5	724.1	691.3	32.84	22.051			
6,800.0	6,587.9	6,692.8	6,577.4	25.6	17.0	-88.96	269.1	-334.5	724.2	691.7	32.48	22.294			
6,900.0	6,653.1	6,791.0	6,640.1	25.5	16.7	-88.83	193.7	-334.5	724.2	691.9	32.27	22.441			
7,000.0	6,707.8	6,889.0	6,692.6	25.3	16.5	-88.72	111.1	-334.5	724.2	692.0	32.29	22.429			
7,100.0	6,751.2	6,986.8	6,734.1	25.1	16.4	-88.63	22.5	-334.5	724.3	691.7	32.61	22.211			
7,200.0	6,782.4	7,084.6	6,763.8	25.1	16.2	-88.56	-70.5	-334.5	724.3	691.0	33.27	21.769			
7,300.0	6,801.0	7,182.2	6,781.5	25.0	16.6	-88.52	-166.5	-334.5	724.3	690.0	34.29	21.125			
7,400.0	6,806.6	7,279.9	6,786.7	25.2	17.4	-88.51	-264.0	-334.5	724.3	688.7	35.63	20.327			
7,500.0	6,805.9	7,379.9	6,786.3	25.4	18.4	-88.53	-364.0	-334.5	724.3	687.0	37.35	19.394			
7,600.0	6,805.2	7,479.9	6,785.9	25.8	19.5	-88.55	-464.0	-334.5	724.3	684.9	39.35	18.406			
7,700.0	6,804.5	7,579.9	6,785.5	26.5	20.7	-88.57	-564.0	-334.5	724.3	682.7	41.61	17.405			
7,800.0	6,803.8	7,679.9	6,785.1	27.2	22.0	-88.60	-664.0	-334.5	724.3	680.2	44.09	16.426			
7,900.0	6,803.1	7,779.9	6,784.7	28.2	23.4	-88.62	-764.0	-334.5	724.3	677.5	46.76	15.489			
8,000.0	6,802.4	7,879.9	6,784.2	29.3	24.8	-88.64	-864.0	-334.5	724.3	674.7	49.58	14.608			
8,100.0	6,801.7	7,979.9	6,783.8	30.5	26.3	-88.66	-964.0	-334.5	724.3	671.7	52.53	13.788			
8,200.0	6,801.0	8,079.9	6,783.4	31.8	27.9	-88.68	-1,064.0	-334.5	724.3	668.7	55.59	13.029			
8,300.0	6,800.3	8,179.9	6,783.0	33.1	29.5	-88.71	-1,164.0	-334.5	724.2	665.5	58.74	12.330			
8,400.0	6,799.6	8,279.9	6,782.6	34.6	31.1	-88.73	-1,264.0	-334.5	724.2	662.3	61.97	11.688			
8,500.0	6,798.9	8,379.9	6,782.1	36.0	32.7	-88.75	-1,364.0	-334.5	724.2	659.0	65.26	11.097			
8,600.0	6,798.2	8,479.9	6,781.7	37.6	34.4	-88.77	-1,464.0	-334.5	724.2	655.6	68.61	10.555			
8,700.0	6,797.5	8,579.9	6,781.3	39.1	36.1	-88.79	-1,564.0	-334.5	724.2	652.2	72.01	10.057			
8,800.0	6,796.8	8,679.9	6,780.9	40.7	37.8	-88.82	-1,664.0	-334.5	724.2	648.8	75.46	9.598			
8,900.0	6,796.1	8,779.9	6,780.5	42.4	39.6	-88.84	-1,764.0	-334.5	724.2	645.3	78.94	9.175			
9,000.0	6,795.5	8,879.9	6,780.0	44.0	41.3	-88.86	-1,864.0	-334.5	724.2	641.8	82.45	8.784			
9,100.0	6,794.8	8,979.9	6,779.6	45.7	43.1	-88.88	-1,964.0	-334.5	724.2	638.2	85.99	8.422			
9,200.0	6,794.1	9,079.9	6,779.2	47.4	44.9	-88.90	-2,064.0	-334.5	724.2	634.6	89.55	8.087			
9,300.0	6,793.4	9,179.9	6,778.8	49.1	46.7	-88.93	-2,164.0	-334.5	724.2	631.1	93.14	7.775			
9,400.0	6,792.7	9,279.9	6,778.4	50.8	48.5	-88.95	-2,264.0	-334.5	724.2	627.4	96.75	7.485			
9,500.0	6,792.0	9,379.9	6,778.0	52.5	50.3	-88.97	-2,364.0	-334.5	724.2	623.8	100.37	7.215			
9,600.0	6,791.3	9,479.9	6,777.5	54.3	52.1	-88.99	-2,464.0	-334.5	724.2	620.2	104.01	6.963			
9,700.0	6,790.6	9,579.9	6,777.1	56.0	54.0	-89.01	-2,564.0	-334.5	724.2	616.5	107.66	6.726			
9,800.0	6,789.9	9,679.9	6,776.7	57.8	55.8	-89.04	-2,664.0	-334.5	724.2	612.8	111.33	6.505			
9,900.0	6,789.2	9,779.9	6,776.3	59.6	57.6	-89.06	-2,764.0	-334.5	724.2	609.2	115.01	6.297			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)													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	6,788.5	9,879.9	6,775.9	61.4	59.5	-89.08	-2,864.0	-334.5	724.2	605.5	118.69	6.101		
10,100.0	6,787.8	9,979.9	6,775.4	63.2	61.3	-89.10	-2,964.0	-334.5	724.2	601.8	122.39	5.917		
10,200.0	6,787.1	10,079.9	6,775.0	65.0	63.2	-89.13	-3,064.0	-334.5	724.2	598.1	126.10	5.743		
10,300.0	6,786.4	10,179.9	6,774.6	66.8	65.0	-89.15	-3,164.0	-334.5	724.1	594.3	129.81	5.578		
10,400.0	6,785.7	10,279.9	6,774.2	68.6	66.9	-89.17	-3,264.0	-334.5	724.1	590.6	133.53	5.423		
10,500.0	6,785.0	10,379.9	6,773.8	70.4	68.8	-89.19	-3,364.0	-334.5	724.1	586.9	137.26	5.276		
10,600.0	6,784.3	10,479.9	6,773.3	72.2	70.6	-89.21	-3,464.0	-334.5	724.1	583.1	140.99	5.136		
10,700.0	6,783.6	10,579.9	6,772.9	74.0	72.5	-89.24	-3,564.0	-334.5	724.1	579.4	144.73	5.003		
10,800.0	6,782.9	10,679.9	6,772.5	75.9	74.4	-89.26	-3,664.0	-334.5	724.1	575.6	148.48	4.877		
10,900.0	6,782.2	10,779.9	6,772.1	77.7	76.2	-89.28	-3,763.9	-334.5	724.1	571.9	152.23	4.757		
11,000.0	6,781.5	10,879.9	6,771.7	79.6	78.1	-89.30	-3,863.9	-334.5	724.1	568.1	155.98	4.642		
11,100.0	6,780.8	10,979.9	6,771.3	81.4	80.0	-89.32	-3,963.9	-334.5	724.1	564.4	159.74	4.533		
11,200.0	6,780.1	11,079.9	6,770.8	83.2	81.9	-89.35	-4,063.9	-334.5	724.1	560.6	163.50	4.429		
11,300.0	6,779.4	11,179.9	6,770.4	85.1	83.7	-89.37	-4,163.9	-334.5	724.1	556.8	167.27	4.329		
11,400.0	6,778.7	11,279.9	6,770.0	87.0	85.6	-89.39	-4,263.9	-334.5	724.1	553.1	171.04	4.234		
11,500.0	6,778.0	11,379.9	6,769.6	88.8	87.5	-89.41	-4,363.9	-334.5	724.1	549.3	174.81	4.142		
11,600.0	6,777.3	11,479.9	6,769.2	90.7	89.4	-89.43	-4,463.9	-334.5	724.1	545.5	178.59	4.055		
11,700.0	6,776.6	11,579.9	6,768.7	92.5	91.3	-89.46	-4,563.9	-334.5	724.1	541.7	182.36	3.971		
11,800.0	6,775.9	11,679.9	6,768.3	94.4	93.2	-89.48	-4,663.9	-334.4	724.1	538.0	186.14	3.890		
11,900.0	6,775.2	11,779.9	6,767.9	96.3	95.1	-89.50	-4,763.9	-334.4	724.1	534.2	189.93	3.812		
12,000.0	6,774.5	11,879.9	6,767.5	98.1	97.0	-89.52	-4,863.9	-334.4	724.1	530.4	193.71	3.738		
12,100.0	6,773.8	11,979.9	6,767.1	100.0	98.9	-89.55	-4,963.9	-334.4	724.1	526.6	197.50	3.666		
12,200.0	6,773.1	12,079.9	6,766.6	101.9	100.7	-89.57	-5,063.9	-334.4	724.1	522.8	201.29	3.597		
12,300.0	6,772.4	12,179.9	6,766.2	103.7	102.6	-89.59	-5,163.9	-334.4	724.1	519.0	205.08	3.531		
12,400.0	6,771.7	12,279.9	6,765.8	105.6	104.5	-89.61	-5,263.9	-334.4	724.1	515.2	208.87	3.467		
12,500.0	6,771.0	12,379.9	6,765.4	107.5	106.4	-89.63	-5,363.9	-334.4	724.1	511.4	212.67	3.405		
12,600.0	6,770.3	12,479.9	6,765.0	109.4	108.3	-89.66	-5,463.9	-334.4	724.1	507.6	216.47	3.345		
12,700.0	6,769.6	12,579.9	6,764.5	111.2	110.2	-89.68	-5,563.9	-334.4	724.1	503.8	220.26	3.287		
12,800.0	6,768.9	12,679.9	6,764.1	113.1	112.1	-89.70	-5,663.9	-334.4	724.1	500.0	224.06	3.232		
12,900.0	6,768.2	12,779.9	6,763.7	115.0	114.0	-89.72	-5,763.9	-334.4	724.1	496.2	227.87	3.178		
13,000.0	6,767.5	12,879.9	6,763.3	116.9	115.9	-89.74	-5,863.9	-334.4	724.1	492.4	231.67	3.126		
13,100.0	6,766.8	12,979.9	6,762.9	118.8	117.8	-89.77	-5,963.9	-334.4	724.1	488.6	235.47	3.075		
13,200.0	6,766.1	13,079.9	6,762.5	120.7	119.7	-89.79	-6,063.9	-334.4	724.1	484.8	239.28	3.026		
13,300.0	6,765.4	13,179.9	6,762.0	122.5	121.6	-89.81	-6,163.9	-334.4	724.1	481.0	243.08	2.979		
13,400.0	6,764.7	13,279.9	6,761.6	124.4	123.5	-89.83	-6,263.9	-334.4	724.1	477.2	246.89	2.933		
13,500.0	6,764.0	13,379.9	6,761.2	126.3	125.4	-89.85	-6,363.9	-334.4	724.1	473.4	250.70	2.888		
13,600.0	6,763.3	13,479.9	6,760.8	128.2	127.3	-89.88	-6,463.9	-334.4	724.1	469.6	254.51	2.845		
13,700.0	6,762.6	13,579.9	6,760.4	130.1	129.2	-89.90	-6,563.9	-334.4	724.1	465.8	258.32	2.803		
13,800.0	6,761.9	13,679.9	6,759.9	132.0	131.1	-89.92	-6,663.9	-334.4	724.1	461.9	262.13	2.762		
13,900.0	6,761.2	13,779.9	6,759.5	133.9	133.0	-89.94	-6,763.9	-334.4	724.1	458.1	265.94	2.723		
13,988.8	6,760.6	13,868.7	6,759.1	135.6	134.7	-89.96	-6,852.8	-334.4	724.1	454.7	269.33	2.688		
14,000.0	6,760.5	13,879.9	6,759.1	135.8	135.0	-89.96	-6,863.9	-334.4	724.1	454.3	269.75	2.684		
14,100.0	6,759.8	13,979.9	6,758.7	137.7	136.9	-89.99	-6,963.9	-334.4	724.1	450.5	273.56	2.647		
14,200.0	6,759.1	14,079.9	6,758.3	139.6	138.8	-90.01	-7,063.9	-334.4	724.1	446.7	277.38	2.610		
14,300.0	6,758.5	14,179.9	6,757.8	141.5	140.7	-90.03	-7,163.9	-334.4	724.1	442.9	281.19	2.575		
14,400.0	6,757.8	14,279.9	6,757.4	143.4	142.6	-90.05	-7,263.9	-334.4	724.1	439.1	285.01	2.541		
14,500.0	6,757.1	14,379.9	6,757.0	145.3	144.5	-90.08	-7,363.9	-334.4	724.1	435.2	288.82	2.507		
14,507.9	6,757.0	14,381.9	6,757.0	145.4	144.5	-90.08	-7,366.0	-334.4	724.1	435.1	289.01	2.505 SF		

Reference Depths are relative to WELL @ 4687.0ft (RKB - 23')	Coordinates are relative to: Ottenhoff 29M-323
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: 0.60°



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-323
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4687.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4687.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4687.0ft (RKB - 23')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Ottenhoff 29M-323
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°

