

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Otenhoff 29R-423**

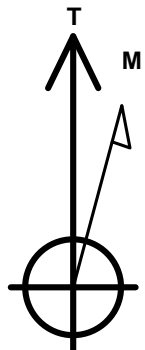
Surface Location: Otenhoff 5N64W29CR Pad Sec.29-T5N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4662.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381166.80	3259719.38	40.375957	-104.567783	

RKB - 23' WELL @ 4685.0ft (RKB - 23')

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 559'FNL & 975'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2636'FSL & 980'FEL, Sec.32	6862.0	-7361.2	43.5	Point



Azimuths to True North
Magnetic North: 8.12°

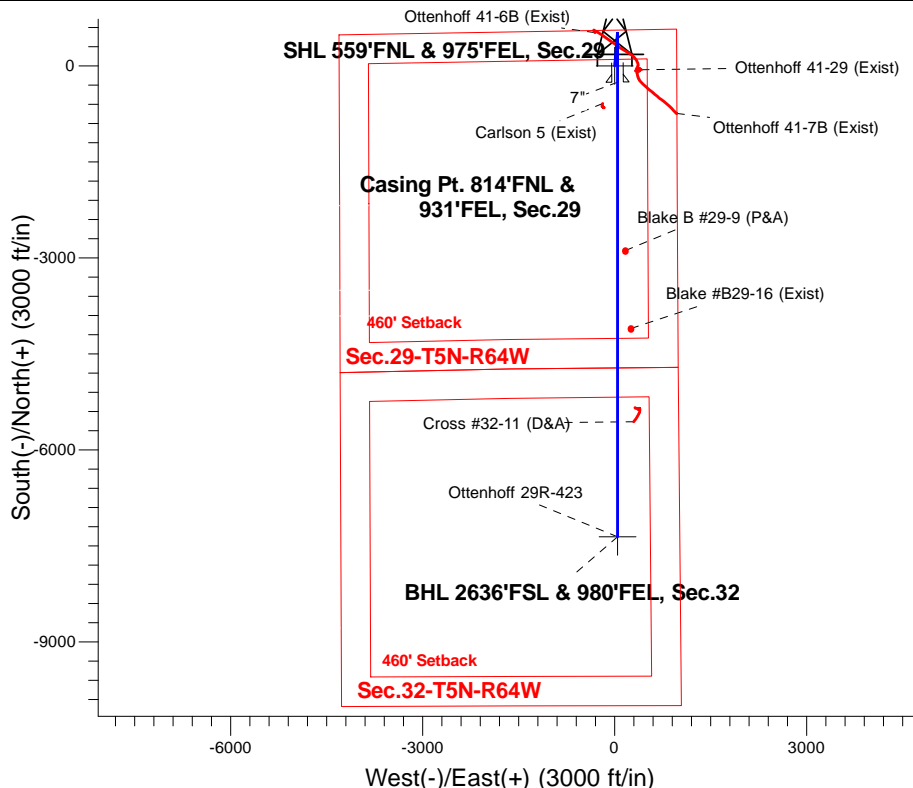
Magnetic Field
Strength: 52645.0snT
Dip Angle: 66.90°
Date: 2/26/2016
Model: IGRF2010

Otenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Otenhoff 29R-423
Plan #1 (3-15-16)
15:13, March 17 2016

ANNOTATIONS

TVD	MD	Annotation
2500.0	2500.0	KOP - Start Build 1.50
5506.2	5545.2	Start Drop -2.00
6098.0	6139.5	KOP #2 - Start Build 7.50
6862.0	7339.5	Start 7106.3 hold at 7339.5 MD
6862.0	14445.8	TD at 14445.8

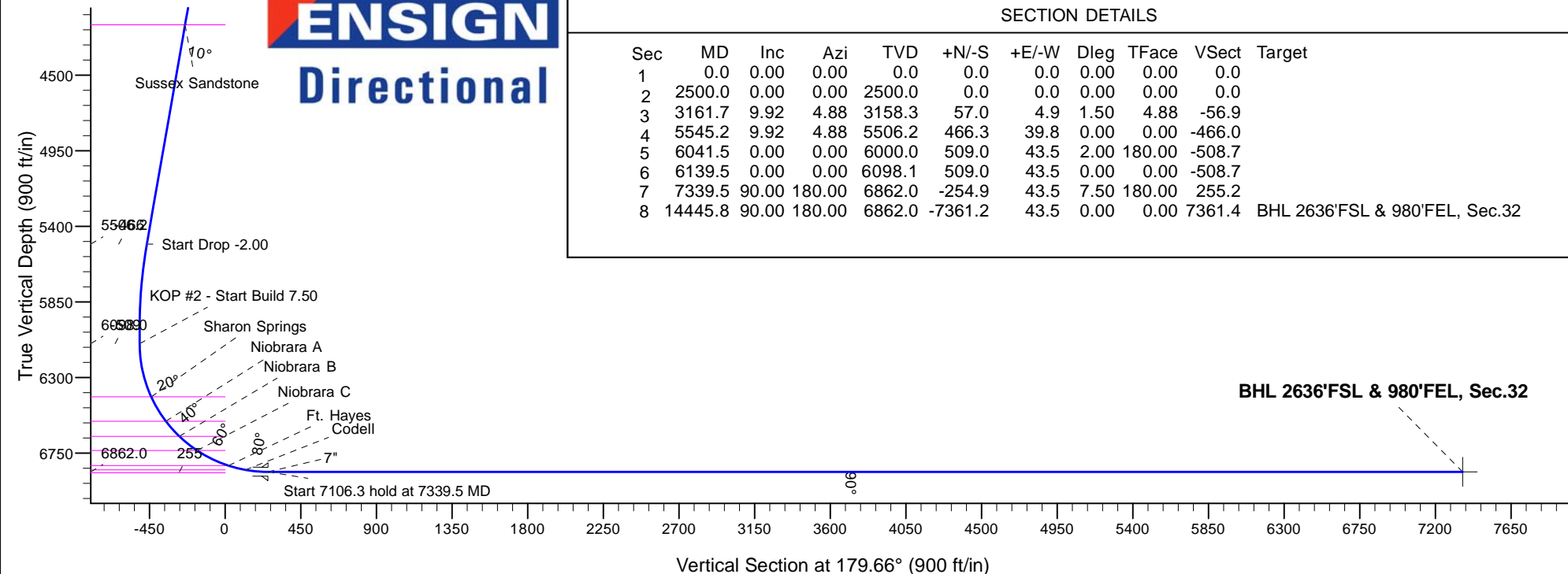
South(-)/North(+) (3000 ft/in)



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	2500.0	0.00	0.00	2500.0	0.0	0.0	0.00	0.00	0.0	
3	3161.7	9.92	4.88	3158.3	57.0	4.9	1.50	4.88	-56.9	
4	5545.2	9.92	4.88	5506.2	466.3	39.8	0.00	0.00	-466.0	
5	6041.5	0.00	0.00	6000.0	509.0	43.5	2.00	180.00	-508.7	
6	6139.5	0.00	0.00	6098.1	509.0	43.5	0.00	0.00	-508.7	
7	7339.5	90.00	180.00	6862.0	-254.9	43.5	7.50	180.00	255.2	
8	14445.8	90.00	180.00	6862.0	-7361.2	43.5	0.00	0.00	7361.4	BHL 2636'FSL & 980'FEL, Sec.32

ENSIGN
Directional





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29R-423

Wellbore #1

Plan: Plan #1 (3-15-16)

Standard Planning Report

17 March, 2016

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

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 29R-423					
Well Position	+N/-S	0.3 ft	Northing:	1,381,166.80 usft	Latitude:	40.375957
	+E/-W	-30.1 ft	Easting:	3,259,719.39 usft	Longitude:	-104.567783
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,662.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/26/2016	8.12	66.90	52,645

Design	Plan #1 (3-15-16)			
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	179.66

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	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,161.7	9.92	4.88	3,158.3	57.0	4.9	1.50	1.50	0.00	4.88	
5,545.2	9.92	4.88	5,506.2	466.3	39.8	0.00	0.00	0.00	0.00	
6,041.5	0.00	0.00	6,000.0	509.0	43.5	2.00	-2.00	0.00	180.00	
6,139.5	0.00	0.00	6,098.1	509.0	43.5	0.00	0.00	0.00	0.00	
7,339.5	90.00	180.00	6,862.0	-254.9	43.5	7.50	7.50	0.00	180.00	
14,445.8	90.00	180.00	6,862.0	-7,361.2	43.5	0.00	0.00	0.00	0.00	BHL 2636°FSL & 980°I

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

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 559'FNL & 975'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
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
2,600.0	1.50	4.88	2,600.0	1.3	0.1	-1.3	1.50	1.50	0.00
2,700.0	3.00	4.88	2,699.9	5.2	0.4	-5.2	1.50	1.50	0.00
2,800.0	4.50	4.88	2,799.7	11.7	1.0	-11.7	1.50	1.50	0.00
2,900.0	6.00	4.88	2,899.3	20.8	1.8	-20.8	1.50	1.50	0.00
3,000.0	7.50	4.88	2,998.6	32.6	2.8	-32.5	1.50	1.50	0.00
3,100.0	9.00	4.88	3,097.5	46.9	4.0	-46.8	1.50	1.50	0.00
3,161.7	9.92	4.88	3,158.3	57.0	4.9	-56.9	1.50	1.50	0.00
3,200.0	9.92	4.88	3,196.1	63.5	5.4	-63.5	0.00	0.00	0.00
3,300.0	9.92	4.88	3,294.6	80.7	6.9	-80.7	0.00	0.00	0.00
3,400.0	9.92	4.88	3,393.1	97.9	8.4	-97.8	0.00	0.00	0.00
3,500.0	9.92	4.88	3,491.6	115.1	9.8	-115.0	0.00	0.00	0.00
3,539.0	9.92	4.88	3,530.0	121.7	10.4	-121.7	0.00	0.00	0.00
Parkman Sandstone									
3,600.0	9.92	4.88	3,590.1	132.2	11.3	-132.2	0.00	0.00	0.00
3,700.0	9.92	4.88	3,688.6	149.4	12.8	-149.3	0.00	0.00	0.00
3,800.0	9.92	4.88	3,787.1	166.6	14.2	-166.5	0.00	0.00	0.00
3,900.0	9.92	4.88	3,885.6	183.8	15.7	-183.7	0.00	0.00	0.00
4,000.0	9.92	4.88	3,984.2	200.9	17.2	-200.8	0.00	0.00	0.00
4,100.0	9.92	4.88	4,082.7	218.1	18.6	-218.0	0.00	0.00	0.00
4,200.0	9.92	4.88	4,181.2	235.3	20.1	-235.1	0.00	0.00	0.00
4,219.1	9.92	4.88	4,200.0	238.6	20.4	-238.4	0.00	0.00	0.00
Sussex Sandstone									
4,300.0	9.92	4.88	4,279.7	252.4	21.6	-252.3	0.00	0.00	0.00

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Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

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	9.92	4.88	4,378.2	269.6	23.0	-269.5	0.00	0.00	0.00
4,500.0	9.92	4.88	4,476.7	286.8	24.5	-286.6	0.00	0.00	0.00
4,600.0	9.92	4.88	4,575.2	304.0	26.0	-303.8	0.00	0.00	0.00
4,700.0	9.92	4.88	4,673.7	321.1	27.4	-321.0	0.00	0.00	0.00
4,800.0	9.92	4.88	4,772.2	338.3	28.9	-338.1	0.00	0.00	0.00
4,900.0	9.92	4.88	4,870.7	355.5	30.4	-355.3	0.00	0.00	0.00
5,000.0	9.92	4.88	4,969.2	372.7	31.8	-372.5	0.00	0.00	0.00
5,100.0	9.92	4.88	5,067.7	389.8	33.3	-389.6	0.00	0.00	0.00
5,200.0	9.92	4.88	5,166.2	407.0	34.8	-406.8	0.00	0.00	0.00
5,300.0	9.92	4.88	5,264.7	424.2	36.2	-424.0	0.00	0.00	0.00
5,400.0	9.92	4.88	5,363.2	441.3	37.7	-441.1	0.00	0.00	0.00
5,500.0	9.92	4.88	5,461.7	458.5	39.2	-458.3	0.00	0.00	0.00
5,545.2	9.92	4.88	5,506.2	466.3	39.8	-466.0	0.00	0.00	0.00
Start Drop -2.00									
5,600.0	8.83	4.88	5,560.3	475.2	40.6	-474.9	2.00	-2.00	0.00
5,700.0	6.83	4.88	5,659.4	488.7	41.7	-488.5	2.00	-2.00	0.00
5,800.0	4.83	4.88	5,758.8	498.9	42.6	-498.6	2.00	-2.00	0.00
5,900.0	2.83	4.88	5,858.6	505.5	43.2	-505.3	2.00	-2.00	0.00
6,000.0	0.83	4.88	5,958.5	508.7	43.5	-508.4	2.00	-2.00	0.00
6,041.5	0.00	0.00	6,000.0	509.0	43.5	-508.7	2.00	-2.00	0.00
6,100.0	0.00	0.00	6,058.5	509.0	43.5	-508.7	0.00	0.00	0.00
6,139.5	0.00	0.00	6,098.0	509.0	43.5	-508.7	0.00	0.00	0.00
KOP #2 - Start Build 7.50									
6,200.0	4.54	180.00	6,158.5	506.6	43.5	-506.3	7.50	7.50	0.00
6,300.0	12.04	180.00	6,257.4	492.2	43.5	-491.9	7.50	7.50	0.00
6,400.0	19.54	180.00	6,353.5	465.0	43.5	-464.8	7.50	7.50	0.00
6,466.3	24.51	180.00	6,415.0	440.2	43.5	-439.9	7.50	7.50	0.00
Sharon Springs									
6,500.0	27.04	180.00	6,445.3	425.5	43.5	-425.2	7.50	7.50	0.00
6,600.0	34.54	180.00	6,531.2	374.4	43.5	-374.1	7.50	7.50	0.00
6,635.6	37.21	180.00	6,560.0	353.5	43.5	-353.2	7.50	7.50	0.00
Niobrara A									
6,700.0	42.04	180.00	6,609.6	312.4	43.5	-312.2	7.50	7.50	0.00
6,756.3	46.26	180.00	6,650.0	273.2	43.5	-273.0	7.50	7.50	0.00
Niobrara B									
6,800.0	49.54	180.00	6,679.3	240.8	43.5	-240.6	7.50	7.50	0.00
6,892.7	56.49	180.00	6,735.0	166.9	43.5	-166.6	7.50	7.50	0.00
Niobrara C									
6,900.0	57.04	180.00	6,739.0	160.7	43.5	-160.5	7.50	7.50	0.00
7,000.0	64.54	180.00	6,787.8	73.5	43.5	-73.2	7.50	7.50	0.00
7,100.0	72.04	180.00	6,824.8	-19.3	43.5	19.6	7.50	7.50	0.00
7,100.8	72.09	180.00	6,825.0	-20.1	43.5	20.3	7.50	7.50	0.00
Ft. Hayes									
7,200.0	79.54	180.00	6,849.3	-116.2	43.5	116.5	7.50	7.50	0.00
7,203.9	79.83	180.00	6,850.0	-120.1	43.5	120.3	7.50	7.50	0.00
Codell									
7,300.0	87.04	180.00	6,861.0	-215.5	43.5	215.7	7.50	7.50	0.00
7,339.5	90.00	180.00	6,862.0	-254.9	43.5	255.2	7.50	7.50	0.00
Start 7106.3 hold at 7339.5 MD - 7"									
7,400.0	90.00	180.00	6,862.0	-315.4	43.5	315.7	0.00	0.00	0.00
7,500.0	90.00	180.00	6,862.0	-415.4	43.5	415.7	0.00	0.00	0.00

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Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

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)
7,600.0	90.00	180.00	6,862.0	-515.4	43.5	515.7	0.00	0.00	0.00
7,700.0	90.00	180.00	6,862.0	-615.4	43.5	615.7	0.00	0.00	0.00
7,800.0	90.00	180.00	6,862.0	-715.4	43.5	715.7	0.00	0.00	0.00
7,900.0	90.00	180.00	6,862.0	-815.4	43.5	815.7	0.00	0.00	0.00
8,000.0	90.00	180.00	6,862.0	-915.4	43.5	915.7	0.00	0.00	0.00
8,100.0	90.00	180.00	6,862.0	-1,015.4	43.5	1,015.7	0.00	0.00	0.00
8,200.0	90.00	180.00	6,862.0	-1,115.4	43.5	1,115.7	0.00	0.00	0.00
8,300.0	90.00	180.00	6,862.0	-1,215.4	43.5	1,215.7	0.00	0.00	0.00
8,400.0	90.00	180.00	6,862.0	-1,315.4	43.5	1,315.7	0.00	0.00	0.00
8,500.0	90.00	180.00	6,862.0	-1,415.4	43.5	1,415.7	0.00	0.00	0.00
8,600.0	90.00	180.00	6,862.0	-1,515.4	43.5	1,515.7	0.00	0.00	0.00
8,700.0	90.00	180.00	6,862.0	-1,615.4	43.5	1,615.7	0.00	0.00	0.00
8,800.0	90.00	180.00	6,862.0	-1,715.4	43.5	1,715.7	0.00	0.00	0.00
8,900.0	90.00	180.00	6,862.0	-1,815.4	43.5	1,815.7	0.00	0.00	0.00
9,000.0	90.00	180.00	6,862.0	-1,915.4	43.5	1,915.7	0.00	0.00	0.00
9,100.0	90.00	180.00	6,862.0	-2,015.4	43.5	2,015.7	0.00	0.00	0.00
9,200.0	90.00	180.00	6,862.0	-2,115.4	43.5	2,115.7	0.00	0.00	0.00
9,300.0	90.00	180.00	6,862.0	-2,215.4	43.5	2,215.7	0.00	0.00	0.00
9,400.0	90.00	180.00	6,862.0	-2,315.4	43.5	2,315.7	0.00	0.00	0.00
9,500.0	90.00	180.00	6,862.0	-2,415.4	43.5	2,415.7	0.00	0.00	0.00
9,600.0	90.00	180.00	6,862.0	-2,515.4	43.5	2,515.6	0.00	0.00	0.00
9,700.0	90.00	180.00	6,862.0	-2,615.4	43.5	2,615.6	0.00	0.00	0.00
9,800.0	90.00	180.00	6,862.0	-2,715.4	43.5	2,715.6	0.00	0.00	0.00
9,900.0	90.00	180.00	6,862.0	-2,815.4	43.5	2,815.6	0.00	0.00	0.00
10,000.0	90.00	180.00	6,862.0	-2,915.4	43.5	2,915.6	0.00	0.00	0.00
10,100.0	90.00	180.00	6,862.0	-3,015.4	43.5	3,015.6	0.00	0.00	0.00
10,200.0	90.00	180.00	6,862.0	-3,115.4	43.5	3,115.6	0.00	0.00	0.00
10,300.0	90.00	180.00	6,862.0	-3,215.4	43.5	3,215.6	0.00	0.00	0.00
10,400.0	90.00	180.00	6,862.0	-3,315.4	43.5	3,315.6	0.00	0.00	0.00
10,500.0	90.00	180.00	6,862.0	-3,415.4	43.5	3,415.6	0.00	0.00	0.00
10,600.0	90.00	180.00	6,862.0	-3,515.4	43.5	3,515.6	0.00	0.00	0.00
10,700.0	90.00	180.00	6,862.0	-3,615.4	43.5	3,615.6	0.00	0.00	0.00
10,800.0	90.00	180.00	6,862.0	-3,715.4	43.5	3,715.6	0.00	0.00	0.00
10,900.0	90.00	180.00	6,862.0	-3,815.4	43.5	3,815.6	0.00	0.00	0.00
11,000.0	90.00	180.00	6,862.0	-3,915.4	43.5	3,915.6	0.00	0.00	0.00
11,100.0	90.00	180.00	6,862.0	-4,015.4	43.5	4,015.6	0.00	0.00	0.00
11,200.0	90.00	180.00	6,862.0	-4,115.4	43.5	4,115.6	0.00	0.00	0.00
11,300.0	90.00	180.00	6,862.0	-4,215.4	43.5	4,215.6	0.00	0.00	0.00
11,400.0	90.00	180.00	6,862.0	-4,315.4	43.5	4,315.6	0.00	0.00	0.00
11,500.0	90.00	180.00	6,862.0	-4,415.4	43.5	4,415.6	0.00	0.00	0.00
11,600.0	90.00	180.00	6,862.0	-4,515.4	43.5	4,515.6	0.00	0.00	0.00
11,700.0	90.00	180.00	6,862.0	-4,615.4	43.5	4,615.6	0.00	0.00	0.00
11,800.0	90.00	180.00	6,862.0	-4,715.4	43.5	4,715.6	0.00	0.00	0.00
11,900.0	90.00	180.00	6,862.0	-4,815.4	43.5	4,815.6	0.00	0.00	0.00
12,000.0	90.00	180.00	6,862.0	-4,915.4	43.5	4,915.6	0.00	0.00	0.00
12,100.0	90.00	180.00	6,862.0	-5,015.4	43.5	5,015.6	0.00	0.00	0.00
12,200.0	90.00	180.00	6,862.0	-5,115.4	43.5	5,115.6	0.00	0.00	0.00
12,300.0	90.00	180.00	6,862.0	-5,215.4	43.5	5,215.6	0.00	0.00	0.00
12,400.0	90.00	180.00	6,862.0	-5,315.4	43.5	5,315.6	0.00	0.00	0.00
12,500.0	90.00	180.00	6,862.0	-5,415.4	43.5	5,415.6	0.00	0.00	0.00
12,600.0	90.00	180.00	6,862.0	-5,515.4	43.5	5,515.6	0.00	0.00	0.00
12,700.0	90.00	180.00	6,862.0	-5,615.4	43.5	5,615.6	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

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)	
12,800.0	90.00	180.00	6,862.0	-5,715.4	43.5	5,715.6	0.00	0.00	0.00	
12,900.0	90.00	180.00	6,862.0	-5,815.4	43.5	5,815.6	0.00	0.00	0.00	
13,000.0	90.00	180.00	6,862.0	-5,915.4	43.5	5,915.6	0.00	0.00	0.00	
13,100.0	90.00	180.00	6,862.0	-6,015.4	43.5	6,015.6	0.00	0.00	0.00	
13,200.0	90.00	180.00	6,862.0	-6,115.4	43.5	6,115.6	0.00	0.00	0.00	
13,300.0	90.00	180.00	6,862.0	-6,215.4	43.5	6,215.6	0.00	0.00	0.00	
13,400.0	90.00	180.00	6,862.0	-6,315.4	43.5	6,315.6	0.00	0.00	0.00	
13,500.0	90.00	180.00	6,862.0	-6,415.4	43.5	6,415.6	0.00	0.00	0.00	
13,600.0	90.00	180.00	6,862.0	-6,515.4	43.5	6,515.6	0.00	0.00	0.00	
13,700.0	90.00	180.00	6,862.0	-6,615.4	43.5	6,615.6	0.00	0.00	0.00	
13,800.0	90.00	180.00	6,862.0	-6,715.4	43.5	6,715.6	0.00	0.00	0.00	
13,900.0	90.00	180.00	6,862.0	-6,815.4	43.5	6,815.6	0.00	0.00	0.00	
14,000.0	90.00	180.00	6,862.0	-6,915.4	43.5	6,915.6	0.00	0.00	0.00	
14,100.0	90.00	180.00	6,862.0	-7,015.4	43.5	7,015.6	0.00	0.00	0.00	
14,200.0	90.00	180.00	6,862.0	-7,115.4	43.5	7,115.6	0.00	0.00	0.00	
14,300.0	90.00	180.00	6,862.0	-7,215.4	43.5	7,215.6	0.00	0.00	0.00	
14,400.0	90.00	180.00	6,862.0	-7,315.4	43.5	7,315.6	0.00	0.00	0.00	
14,445.8	90.00	180.00	6,862.0	-7,361.2	43.5	7,361.4	0.00	0.00	0.00	
TD at 14445.8 - BHL 2636'FSL & 980'FEL, Sec.32										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
SHL 559'FNL & 975'FEL	0.00	0.00	1.0	0.0	0.0	1,381,166.82	3,259,719.39	40.375957	-104.567783	
- plan hits target center										
- Point										
BHL 2636'FSL & 980'FE	0.00	0.00	6,862.0	-7,361.2	43.5	1,373,806.76	3,259,840.24	40.355751	-104.567627	
- plan hits target center										
- Point										

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")		
7,339.5	6,862.0	7"	7	8-3/4		

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,539.0	3,530.0	Parkman Sandstone		0.00		
4,219.1	4,200.0	Sussex Sandstone		0.00		
6,466.3	6,415.0	Sharon Springs		0.00		
6,635.6	6,560.0	Niobrara A		0.00		
6,756.3	6,650.0	Niobrara B		0.00		
6,892.7	6,735.0	Niobrara C		0.00		
7,100.8	6,825.0	Ft. Hayes		0.00		
7,203.9	6,850.0	Codell		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,500.0	2,500.0	0.0	0.0	KOP - Start Build 1.50	
5,545.2	5,506.2	466.3	39.8	Start Drop -2.00	
6,139.5	6,098.0	509.0	43.5	KOP #2 - Start Build 7.50	
7,339.5	6,862.0	-254.9	43.5	Start 7106.3 hold at 7339.5 MD	
14,445.8	6,862.0	-7,361.2	43.5	TD at 14445.8	



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29R-423

Wellbore #1

Plan #1 (3-15-16)

Anticollision Report

17 March, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (3-15-16)		
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	14,445.6	Plan #1 (3-15-16) (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						
Existing Wells Sec.29-T5N-R64W						
Blake #B29-16 (Exist) - Wellbore #1 - Wellbore #1	11,189.2	6,881.0	210.9	-9.2	0.958	Level 1, CC, ES, SF
Blake B #29-9 (P&A) - Wellbore #1 - Wellbore #1	9,972.4	6,858.0	124.6	-72.4	0.633	Level 1, CC, ES, SF
Carlson 5 (Exist) - Wellbore #1 - Wellbore #1	7,686.3	6,851.3	236.3	203.0	7.084	CC, ES
Carlson 5 (Exist) - Wellbore #1 - Wellbore #1	7,700.0	6,850.8	236.7	203.2	7.060	SF
Cross #32-11 (D&A) - Wellbore #1 - Wellbore #1	12,627.9	7,007.8	279.4	159.8	2.336	CC, ES, SF
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	186.7	160.7	333.2	332.7	619.179	CC
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	300.0	273.2	333.5	332.5	335.103	ES
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	7,135.6	6,800.0	364.0	333.2	11.825	SF
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	3,975.4	3,984.7	135.8	118.0	7.636	CC
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	4,000.0	4,009.1	135.9	118.0	7.596	ES
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	4,100.0	4,108.0	138.0	119.6	7.522	SF
Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1	837.3	826.5	363.9	360.8	117.398	CC
Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1	900.0	888.4	364.0	360.6	107.534	ES
Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1	8,200.0	6,942.5	996.1	949.0	21.158	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

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						
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W						
Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)	166.3	167.3	105.0	104.5	200.016	CC
Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)	200.0	200.0	105.1	104.4	155.792	ES
Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)	1,000.0	970.0	183.7	179.4	42.768	SF
Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)	766.0	768.0	75.0	71.7	23.255	CC
Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)	800.0	802.0	75.0	71.6	22.203	ES
Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)	1,100.0	1,096.1	85.7	81.0	18.293	SF
Ottenhoff 29M-423 - Wellbore #1 - Plan #1 (3-14-16)	366.3	367.3	90.0	88.6	63.189	CC
Ottenhoff 29M-423 - Wellbore #1 - Plan #1 (3-14-16)	400.0	400.0	90.0	88.4	57.204	ES
Ottenhoff 29M-423 - Wellbore #1 - Plan #1 (3-14-16)	1,000.0	983.5	133.9	129.6	31.558	SF
Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)	1,166.3	1,167.3	44.9	39.8	8.935	CC
Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)	1,200.0	1,201.0	44.9	39.7	8.674	ES
Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)	14,445.8	14,243.0	726.8	451.9	2.644	SF
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	1,966.3	1,967.3	15.0	6.4	1.746	CC
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	2,100.0	2,100.9	15.5	6.3	1.681	ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	14,445.8	14,287.6	294.2	69.2	1.308	Level 3, SF
Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)	966.3	967.3	59.9	55.8	14.535	CC
Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)	1,000.0	1,001.0	59.9	55.6	14.020	ES
Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)	14,445.8	14,370.5	940.5	656.2	3.308	SF
Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)	1,366.3	1,367.3	29.8	23.9	5.037	CC
Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)	1,400.0	1,401.0	29.8	23.7	4.911	ES
Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)	14,445.8	14,377.5	465.1	182.6	1.646	SF
Ottenhoff 29R-323 - Wellbore #1 - Plan #1 (3-15-16)	766.3	767.3	15.0	11.8	4.670	CC
Ottenhoff 29R-323 - Wellbore #1 - Plan #1 (3-15-16)	14,445.8	14,363.3	256.2	3.6	1.014	Level 2, ES, SF
Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)	366.3	367.3	30.1	28.7	21.129	CC
Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)	400.0	401.0	30.1	28.5	19.100	ES
Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)	14,445.8	14,315.2	500.4	231.6	1.861	SF
Ottenhoff 29U-343 - Wellbore #1 - Plan #1 (3-15-16)	200.0	200.0	45.1	44.5	66.947	CC, ES
Ottenhoff 29U-343 - Wellbore #1 - Plan #1 (3-15-16)	14,445.8	14,411.8	693.3	409.3	2.441	SF

Offset Design													Existing Wells Sec.29-T5N-R64W - Blake #B29-16 (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error: 0.0 ft	
Survey Program: 7078-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)					
10,300.0	6,862.0	6,881.0	6,881.0	65.8	137.6	-90.00	-4,104.7	254.4	913.9	710.5	203.47	4.492				
10,400.0	6,862.0	6,881.0	6,881.0	67.7	137.6	-90.00	-4,104.7	254.4	816.9	611.6	205.33	3.979				
10,500.0	6,862.0	6,881.0	6,881.0	69.6	137.6	-90.00	-4,104.7	254.4	720.8	513.6	207.20	3.479				
10,600.0	6,862.0	6,881.0	6,881.0	71.5	137.6	-90.00	-4,104.7	254.4	625.9	416.8	209.07	2.993				
10,700.0	6,862.0	6,881.0	6,881.0	73.3	137.6	-90.00	-4,104.7	254.4	532.8	321.8	210.95	2.526				
10,800.0	6,862.0	6,881.0	6,881.0	75.2	137.6	-90.00	-4,104.7	254.4	442.7	229.9	212.83	2.080				
10,900.0	6,862.0	6,881.0	6,881.0	77.1	137.6	-90.00	-4,104.7	254.4	358.0	143.3	214.70	1.667				
11,000.0	6,862.0	6,881.0	6,881.0	79.0	137.6	-90.00	-4,104.7	254.4	283.4	66.8	216.59	1.308	Level 3			
11,100.0	6,862.0	6,881.0	6,881.0	80.9	137.6	-90.00	-4,104.7	254.4	229.0	10.6	218.47	1.048	Level 2			
11,189.2	6,862.0	6,881.0	6,881.0	82.5	137.6	-90.00	-4,104.7	254.4	210.9	-9.2	220.15	0.958	Level 1, CC, ES, SF			
11,200.0	6,862.0	6,881.0	6,881.0	82.7	137.6	-90.00	-4,104.7	254.4	211.2	-9.1	220.35	0.959	Level 1			
11,300.0	6,862.0	6,881.0	6,881.0	84.6	137.6	-90.00	-4,104.7	254.4	238.3	16.0	222.24	1.072	Level 2			
11,400.0	6,862.0	6,881.0	6,881.0	86.5	137.6	-90.00	-4,104.7	254.4	298.2	74.1	224.13	1.330	Level 3			
11,500.0	6,862.0	6,881.0	6,881.0	88.4	137.6	-90.00	-4,104.7	254.4	375.6	149.6	226.02	1.662				

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Blake #B29-16 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		7078-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	6,862.0	6,881.0	6,881.0	90.3	137.6	-90.00	-4,104.7	254.4	461.8	233.9	227.91	2.026			
11,700.0	6,862.0	6,881.0	6,881.0	92.2	137.6	-90.00	-4,104.7	254.4	552.6	322.8	229.80	2.405			
11,800.0	6,862.0	6,881.0	6,881.0	94.1	137.6	-90.00	-4,104.7	254.4	646.2	414.5	231.69	2.789			
11,900.0	6,862.0	6,881.0	6,881.0	96.0	137.6	-90.00	-4,104.7	254.4	741.4	507.8	233.58	3.174			
12,000.0	6,862.0	6,881.0	6,881.0	97.9	137.6	-90.00	-4,104.7	254.4	837.8	602.3	235.48	3.558			
12,100.0	6,862.0	6,881.0	6,881.0	99.8	137.6	-90.00	-4,104.7	254.4	934.9	697.5	237.38	3.938			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake B #29-9 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error:		0.0 ft
Survey Program: 7086-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)				
9,000.0	6,862.0	6,858.0	6,858.0	42.0	137.2	-90.00	-2,887.9	168.0	980.4	801.2	179.18	5.472			
9,100.0	6,862.0	6,858.0	6,858.0	43.8	137.2	-90.00	-2,887.9	168.0	881.3	700.3	180.97	4.870			
9,200.0	6,862.0	6,858.0	6,858.0	45.6	137.2	-90.00	-2,887.9	168.0	782.4	599.7	182.76	4.281			
9,300.0	6,862.0	6,858.0	6,858.0	47.4	137.2	-90.00	-2,887.9	168.0	683.9	499.3	184.57	3.705			
9,400.0	6,862.0	6,858.0	6,858.0	49.2	137.2	-90.00	-2,887.9	168.0	585.8	399.4	186.39	3.143			
9,500.0	6,862.0	6,858.0	6,858.0	51.1	137.2	-90.00	-2,887.9	168.0	488.6	300.4	188.21	2.596			
9,600.0	6,862.0	6,858.0	6,858.0	52.9	137.2	-90.00	-2,887.9	168.0	392.7	202.7	190.05	2.066			
9,700.0	6,862.0	6,858.0	6,858.0	54.7	137.2	-90.00	-2,887.9	168.0	299.6	107.7	191.88	1.561			
9,800.0	6,862.0	6,858.0	6,858.0	56.6	137.2	-90.00	-2,887.9	168.0	212.7	19.0	193.73	1.098	Level 2		
9,900.0	6,862.0	6,858.0	6,858.0	58.4	137.2	-90.00	-2,887.9	168.0	144.1	-51.5	195.57	0.737	Level 1		
9,972.4	6,862.0	6,858.0	6,858.0	59.8	137.2	-90.00	-2,887.9	168.0	124.6	-72.4	196.92	0.633	Level 1, CC, ES, SF		
10,000.0	6,862.0	6,858.0	6,858.0	60.3	137.2	-90.00	-2,887.9	168.0	127.6	-69.9	197.43	0.646	Level 1		
10,100.0	6,862.0	6,858.0	6,858.0	62.1	137.2	-90.00	-2,887.9	168.0	178.3	-21.0	199.28	0.895	Level 1		
10,200.0	6,862.0	6,858.0	6,858.0	64.0	137.2	-90.00	-2,887.9	168.0	259.4	58.3	201.14	1.290	Level 3		
10,300.0	6,862.0	6,858.0	6,858.0	65.8	137.2	-90.00	-2,887.9	168.0	350.4	147.4	203.01	1.726			
10,400.0	6,862.0	6,858.0	6,858.0	67.7	137.2	-90.00	-2,887.9	168.0	445.3	240.5	204.87	2.174			
10,500.0	6,862.0	6,858.0	6,858.0	69.6	137.2	-90.00	-2,887.9	168.0	542.1	335.3	206.74	2.622			
10,600.0	6,862.0	6,858.0	6,858.0	71.5	137.2	-90.00	-2,887.9	168.0	639.8	431.2	208.61	3.067			
10,700.0	6,862.0	6,858.0	6,858.0	73.3	137.2	-90.00	-2,887.9	168.0	738.1	527.6	210.49	3.507			
10,800.0	6,862.0	6,858.0	6,858.0	75.2	137.2	-90.00	-2,887.9	168.0	836.9	624.5	212.37	3.941			
10,900.0	6,862.0	6,858.0	6,858.0	77.1	137.2	-90.00	-2,887.9	168.0	935.9	721.6	214.24	4.368			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Carlson 5 (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	-165.51	-652.1	-168.6	673.7					
100.0	100.0	91.4	91.4	0.1	0.1	-165.51	-651.8	-168.4	673.2	673.0	0.23	2,877.566		
200.0	200.0	186.8	186.8	0.3	0.3	-165.51	-651.3	-168.3	672.7	672.0	0.65	1,034.688		
300.0	300.0	286.8	286.8	0.6	0.5	-165.52	-651.2	-168.2	672.6	671.6	1.04	646.268		
400.0	400.0	387.8	387.8	0.8	0.7	-165.56	-651.1	-167.7	672.4	670.9	1.46	459.501		
440.3	440.3	426.3	426.3	0.9	0.7	-165.56	-651.1	-167.6	672.3	670.7	1.62	415.269		
500.0	500.0	481.9	481.9	1.0	0.8	-165.56	-651.3	-167.7	672.5	670.7	1.84	365.658		
600.0	600.0	581.9	581.9	1.2	1.0	-165.57	-652.0	-167.7	673.2	671.0	2.20	305.985		
700.0	700.0	682.9	682.9	1.5	1.1	-165.60	-652.6	-167.5	673.7	671.2	2.59	260.594		
800.0	800.0	783.6	783.6	1.7	1.3	-165.60	-652.9	-167.7	674.1	671.2	2.99	225.363		
900.0	900.0	882.9	882.9	1.9	1.5	-165.61	-653.4	-167.6	674.5	671.1	3.43	196.908		
1,000.0	1,000.0	980.9	980.9	2.1	1.7	-165.64	-654.0	-167.5	675.1	671.3	3.87	174.279		
1,100.0	1,100.0	1,080.9	1,080.8	2.4	2.0	-165.67	-654.9	-167.3	675.9	671.6	4.34	155.919		
1,200.0	1,200.0	1,181.2	1,181.2	2.6	2.2	-165.70	-655.7	-167.2	676.7	671.9	4.80	140.870		
1,300.0	1,300.0	1,281.2	1,281.2	2.8	2.5	-165.72	-656.4	-167.1	677.4	672.1	5.28	128.391		
1,400.0	1,400.0	1,382.7	1,382.7	3.0	2.7	-165.75	-657.1	-166.9	678.0	672.2	5.75	117.844		
1,500.0	1,500.0	1,484.4	1,484.4	3.3	3.0	-165.78	-657.6	-166.6	678.3	672.1	6.23	108.824		
1,600.0	1,600.0	1,585.4	1,585.4	3.5	3.2	-165.76	-657.7	-166.8	678.5	671.9	6.65	102.043		
1,700.0	1,700.0	1,686.0	1,686.0	3.7	3.3	-165.69	-657.5	-166.7	678.6	671.6	6.99	97.018		
1,707.6	1,707.6	1,693.7	1,693.7	3.7	3.3	-165.68	-657.5	-167.8	678.6	671.5	7.02	96.665		
1,800.0	1,800.0	1,785.1	1,785.1	3.9	3.4	-165.63	-657.4	-168.5	678.6	671.3	7.35	92.310		
1,900.0	1,900.0	1,886.1	1,886.1	4.2	3.6	-165.59	-657.3	-168.8	678.7	671.0	7.72	87.895		
2,000.0	2,000.0	1,991.5	1,991.4	4.4	3.7	-165.56	-656.9	-169.2	678.3	670.2	8.07	84.057		
2,100.0	2,100.0	2,086.9	2,086.8	4.6	3.8	-165.49	-656.2	-169.8	677.8	669.4	8.42	80.508		
2,200.0	2,200.0	2,186.6	2,186.6	4.8	4.0	-165.40	-655.9	-170.9	677.7	668.9	8.81	76.947		
2,248.9	2,248.9	2,235.0	2,234.9	4.9	4.1	-165.35	-655.7	-171.4	677.7	668.7	9.01	75.247		
2,300.0	2,300.0	2,285.2	2,285.1	5.1	4.2	-165.32	-655.6	-171.8	677.8	668.5	9.22	73.541		
2,400.0	2,400.0	2,384.2	2,384.1	5.3	4.4	-165.28	-655.7	-172.2	678.0	668.3	9.65	70.231		
2,500.0	2,500.0	2,484.4	2,484.4	5.5	4.6	-165.28	-656.0	-172.4	678.2	668.1	10.11	67.082		
2,600.0	2,600.0	2,589.9	2,589.9	5.7	4.8	-170.15	-655.8	-172.6	679.4	668.9	10.52	64.564		
2,700.0	2,699.9	2,686.2	2,686.1	6.0	5.0	-170.18	-655.4	-172.7	682.9	672.0	10.90	62.642		
2,800.0	2,799.7	2,791.2	2,791.1	6.2	5.1	-170.26	-655.1	-172.6	689.1	677.8	11.28	61.079		
2,900.0	2,899.3	2,889.7	2,889.7	6.4	5.2	-170.36	-654.3	-172.6	697.3	685.7	11.60	60.128		
3,000.0	2,998.6	2,985.8	2,985.7	6.6	5.4	-170.45	-653.8	-172.9	708.5	696.6	11.94	59.341		
3,100.0	3,097.5	3,082.1	3,082.0	6.9	5.6	-170.56	-653.7	-173.4	722.7	710.4	12.32	58.651		
3,200.0	3,196.1	3,178.3	3,178.3	7.1	5.8	-170.73	-654.1	-173.5	739.6	726.9	12.72	58.137		
3,300.0	3,294.6	3,276.8	3,276.8	7.4	6.0	-170.98	-654.7	-173.3	757.2	744.0	13.13	57.651		
3,400.0	3,393.1	3,380.1	3,380.0	7.7	6.1	-171.23	-655.1	-172.8	774.4	760.9	13.52	57.300		
3,500.0	3,491.6	3,478.3	3,478.3	8.0	6.3	-171.44	-655.0	-172.4	791.3	777.4	13.87	57.045		
3,600.0	3,590.1	3,582.2	3,582.2	8.3	6.4	-171.66	-654.8	-172.0	808.1	793.8	14.24	56.752		
3,700.0	3,688.6	3,677.7	3,677.6	8.6	6.5	-171.84	-654.2	-171.7	824.5	809.9	14.59	56.498		
3,800.0	3,787.1	3,778.4	3,778.4	8.9	6.6	-172.02	-653.8	-171.4	841.2	826.2	14.96	56.226		
3,900.0	3,885.6	3,878.6	3,878.6	9.2	6.8	-172.22	-653.2	-170.7	857.5	842.2	15.34	55.911		
4,000.0	3,984.2	3,979.3	3,979.2	9.5	6.9	-172.35	-652.2	-170.9	873.7	858.0	15.73	55.548		
4,100.0	4,082.7	4,078.0	4,077.9	9.8	7.1	-172.41	-650.9	-172.0	889.7	873.6	16.14	55.138		
4,200.0	4,181.2	4,174.5	4,174.4	10.2	7.3	-172.39	-649.5	-174.3	905.9	889.3	16.56	54.716		
4,300.0	4,279.7	4,277.6	4,277.4	10.5	7.5	-172.35	-647.9	-176.9	922.1	905.1	16.99	54.256		
4,400.0	4,378.2	4,379.3	4,379.1	10.8	7.7	-172.29	-645.7	-179.9	937.7	920.3	17.44	53.782		
4,500.0	4,476.7	4,475.5	4,475.1	11.2	7.9	-172.17	-643.4	-183.7	953.3	935.4	17.87	53.341		
4,600.0	4,575.2	4,574.2	4,573.8	11.5	8.1	-172.09	-641.4	-187.0	969.1	950.8	18.32	52.912		
4,700.0	4,673.7	4,664.6	4,664.1	11.9	8.3	-172.10	-640.1	-188.6	985.2	966.5	18.75	52.554		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Carlson 5 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
6,700.0	6,609.6	6,629.0	6,628.0	15.6	12.1	19.78	-609.0	-194.9	952.3	932.2	20.13	47.299		
6,800.0	6,679.3	6,696.3	6,695.3	15.5	12.2	24.27	-606.8	-194.2	880.8	861.9	18.96	46.455		
6,900.0	6,739.0	6,753.4	6,752.3	15.4	12.3	31.07	-604.9	-193.7	802.0	783.3	18.74	42.795		
7,000.0	6,787.8	6,799.2	6,798.2	15.5	12.4	41.35	-603.4	-193.3	717.5	697.2	20.37	35.228		
7,100.0	6,824.8	6,833.1	6,832.0	15.8	12.5	55.99	-602.3	-193.0	629.5	605.5	23.95	26.280		
7,200.0	6,849.3	6,854.5	6,853.4	16.2	12.5	73.41	-601.6	-192.8	540.1	512.5	27.62	19.559		
7,300.0	6,861.0	6,862.9	6,861.8	16.9	12.6	88.75	-601.3	-192.7	452.7	423.3	29.40	15.396		
7,400.0	6,862.0	6,860.7	6,859.5	17.7	12.5	92.79	-601.4	-192.8	371.1	340.9	30.19	12.290		
7,500.0	6,862.0	6,857.4	6,856.3	18.7	12.5	92.00	-601.5	-192.8	300.8	269.7	31.18	9.649		
7,600.0	6,862.0	6,854.1	6,853.0	19.8	12.5	91.21	-601.6	-192.8	251.6	219.3	32.30	7.789		
7,686.3	6,862.0	6,851.3	6,850.2	20.8	12.5	90.52	-601.7	-192.8	236.3	203.0	33.36	7.084 CC, ES		
7,700.0	6,862.0	6,850.8	6,849.7	21.0	12.5	90.41	-601.7	-192.8	236.7	203.2	33.53	7.060 SF		
7,800.0	6,862.0	6,847.5	6,846.4	22.3	12.5	89.62	-601.8	-192.9	262.2	227.4	34.85	7.525		
7,900.0	6,862.0	6,844.3	6,843.1	23.8	12.5	88.82	-601.9	-192.9	318.6	282.3	36.25	8.789		
8,000.0	6,862.0	6,841.0	6,839.9	25.2	12.5	88.03	-602.0	-192.9	392.7	354.9	37.70	10.414		
8,100.0	6,862.0	6,837.7	6,836.6	26.8	12.5	87.24	-602.1	-193.0	476.3	437.1	39.21	12.147		
8,200.0	6,862.0	6,834.4	6,833.3	28.3	12.5	86.45	-602.3	-193.0	565.2	524.5	40.75	13.870		
8,300.0	6,862.0	6,831.1	6,830.0	30.0	12.5	85.66	-602.4	-193.0	657.4	615.0	42.33	15.530		
8,400.0	6,862.0	6,827.9	6,826.8	31.6	12.5	84.87	-602.5	-193.1	751.5	707.6	43.93	17.108		
8,500.0	6,862.0	6,824.6	6,823.5	33.3	12.5	84.08	-602.6	-193.1	846.9	801.4	45.54	18.597		
8,600.0	6,862.0	6,821.3	6,820.2	35.0	12.5	83.30	-602.7	-193.1	943.3	896.2	47.17	19.998		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Cross #32-11 (D&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 527-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
11,600.0	6,862.0	6,626.6	6,620.0	90.3	13.8	-52.74	-5,401.6	390.5	987.6	901.1	86.48	11.420		
11,700.0	6,862.0	6,653.1	6,645.0	92.2	13.9	-55.26	-5,410.1	388.1	898.5	808.2	90.34	9.946		
11,800.0	6,862.0	6,687.0	6,676.7	94.1	13.9	-58.67	-5,421.4	384.0	810.7	715.8	94.90	8.543		
11,900.0	6,862.0	6,718.5	6,705.9	96.0	14.0	-62.07	-5,432.2	379.4	724.5	625.2	99.29	7.297		
12,000.0	6,862.0	6,746.0	6,731.2	97.9	14.0	-65.25	-5,442.2	374.9	640.9	537.5	103.33	6.202		
12,100.0	6,862.0	6,794.1	6,774.6	99.8	14.1	-71.21	-5,460.1	364.9	559.5	450.7	108.83	5.141		
12,200.0	6,862.0	6,825.7	6,802.7	101.7	14.1	-75.50	-5,472.6	357.7	482.6	369.9	112.76	4.280		
12,300.0	6,862.0	6,868.9	6,840.7	103.6	14.2	-81.88	-5,490.5	347.2	412.1	295.2	116.82	3.527		
12,400.0	6,862.0	6,915.5	6,881.6	105.4	14.3	-89.54	-5,509.4	335.6	350.7	231.0	119.72	2.929		
12,500.0	6,862.0	6,960.4	6,921.4	107.3	14.3	-97.59	-5,526.6	323.8	303.9	183.2	120.70	2.518		
12,600.0	6,862.0	6,997.9	6,955.0	109.2	14.4	-104.71	-5,540.0	313.9	280.6	160.6	120.04	2.338		
12,627.9	6,862.0	7,007.8	6,963.8	109.8	14.4	-106.61	-5,543.4	311.2	279.4	159.8	119.61	2.336	CC, ES, SF	
12,700.0	6,862.0	7,032.0	6,985.7	111.1	14.5	-111.27	-5,551.6	304.7	287.5	169.4	118.10	2.434		
12,800.0	6,862.0	7,063.5	7,014.2	113.0	14.5	-117.25	-5,562.1	296.3	323.0	207.8	115.27	2.803		
12,900.0	6,862.0	7,065.0	7,015.5	115.0	14.5	-117.52	-5,562.6	295.9	380.7	263.9	116.75	3.261		
13,000.0	6,862.0	7,065.0	7,015.5	116.9	14.5	-117.52	-5,562.6	295.9	453.3	334.8	118.47	3.826		
13,100.0	6,862.0	7,065.0	7,015.5	118.8	14.5	-117.52	-5,562.6	295.9	534.9	414.7	120.19	4.450		
13,200.0	6,862.0	7,065.0	7,015.5	120.7	14.5	-117.52	-5,562.6	295.9	621.8	499.9	121.92	5.100		
13,300.0	6,862.0	7,065.0	7,015.5	122.6	14.5	-117.52	-5,562.6	295.9	712.2	588.6	123.64	5.760		
13,400.0	6,862.0	7,065.0	7,015.5	124.5	14.5	-117.52	-5,562.6	295.9	804.8	679.5	125.36	6.420		
13,500.0	6,862.0	7,065.0	7,015.5	126.4	14.5	-117.52	-5,562.6	295.9	899.1	772.0	127.08	7.075		
13,600.0	6,862.0	7,065.0	7,015.5	128.3	14.5	-117.52	-5,562.6	295.9	994.4	865.6	128.81	7.721		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	103.38	-77.2	324.6	334.7					
100.0	100.0	75.3	75.3	0.1	0.1	103.40	-77.3	324.4	333.5	333.3	0.21	1,570.067		
186.7	186.7	160.7	160.7	0.3	0.2	103.44	-77.5	324.1	333.2	332.7	0.54	619.179	CC	
200.0	200.0	173.6	173.6	0.3	0.3	103.44	-77.5	324.1	333.2	332.7	0.59	565.798		
300.0	300.0	273.2	273.2	0.6	0.4	103.45	-77.6	324.4	333.5	332.5	1.00	335.103	ES	
400.0	400.0	370.8	370.8	0.8	0.7	103.50	-78.0	324.8	334.0	332.6	1.45	231.011		
500.0	500.0	469.5	469.5	1.0	0.9	103.64	-79.0	325.8	335.3	333.4	1.92	174.572		
600.0	600.0	568.1	568.1	1.2	1.2	103.75	-80.1	327.1	336.8	334.4	2.40	140.362		
700.0	700.0	666.8	666.8	1.5	1.4	103.86	-81.1	328.8	338.8	335.9	2.87	117.992		
800.0	800.0	765.1	765.0	1.7	1.6	103.81	-81.4	331.1	341.1	337.8	3.33	102.320		
900.0	900.0	864.2	864.1	1.9	1.9	103.77	-81.8	333.9	343.9	340.1	3.80	90.448		
1,000.0	1,000.0	965.4	965.3	2.1	2.1	103.73	-82.3	336.7	346.7	342.4	4.28	80.973		
1,100.0	1,100.0	1,065.4	1,065.2	2.4	2.4	103.69	-82.6	339.1	349.1	344.4	4.76	73.319		
1,200.0	1,200.0	1,166.1	1,165.9	2.6	2.7	103.72	-83.4	341.5	351.6	346.4	5.25	66.995		
1,300.0	1,300.0	1,265.6	1,265.4	2.8	2.9	103.73	-84.0	343.7	353.9	348.2	5.73	61.720		
1,400.0	1,400.0	1,367.2	1,367.0	3.0	3.2	103.73	-84.6	346.0	356.3	350.1	6.22	57.241		
1,500.0	1,500.0	1,467.2	1,466.9	3.3	3.5	103.71	-84.9	347.8	358.1	351.4	6.71	53.372		
1,600.0	1,600.0	1,566.7	1,566.4	3.5	3.7	103.71	-85.4	349.9	360.2	353.0	7.20	50.059		
1,700.0	1,700.0	1,667.0	1,666.6	3.7	4.0	103.70	-85.8	351.9	362.3	354.6	7.68	47.165		
1,800.0	1,800.0	1,766.4	1,766.0	3.9	4.2	103.61	-85.7	354.0	364.3	356.2	8.16	44.659		
1,900.0	1,900.0	1,866.3	1,865.9	4.2	4.5	103.50	-85.5	356.4	366.6	358.0	8.64	42.449		
2,000.0	2,000.0	1,965.6	1,965.2	4.4	4.7	103.40	-85.4	358.7	368.8	359.7	9.11	40.474		
2,100.0	2,100.0	2,066.5	2,066.1	4.6	5.0	103.24	-85.0	361.2	371.2	361.6	9.59	38.711		
2,200.0	2,200.0	2,165.9	2,165.4	4.8	5.2	103.06	-84.3	363.5	373.3	363.2	10.06	37.112		
2,300.0	2,300.0	2,264.6	2,264.1	5.1	5.5	102.89	-83.8	366.2	375.8	365.2	10.53	35.686		
2,400.0	2,400.0	2,363.9	2,363.3	5.3	5.7	102.72	-83.3	369.1	378.5	367.5	11.01	34.388		
2,500.0	2,500.0	2,465.2	2,464.6	5.5	6.0	102.55	-82.8	372.0	381.2	369.7	11.49	33.182		
2,600.0	2,600.0	2,565.2	2,564.6	5.7	6.2	97.65	-82.2	374.5	383.8	371.8	11.97	32.069		
2,700.0	2,699.9	2,666.8	2,666.1	6.0	6.5	98.04	-81.7	377.1	386.7	374.2	12.44	31.070		
2,800.0	2,799.7	2,769.7	2,769.1	6.2	6.8	98.84	-81.1	379.0	389.2	376.3	12.93	30.111		
2,900.0	2,899.3	2,870.1	2,869.4	6.4	7.0	100.07	-80.9	380.0	391.7	378.3	13.41	29.214		
3,000.0	2,998.6	2,970.9	2,970.3	6.6	7.3	101.67	-80.9	380.9	394.8	380.9	13.89	28.431		
3,100.0	3,097.5	3,069.7	3,069.0	6.9	7.5	103.52	-80.4	381.6	398.5	384.2	14.35	27.765		
3,200.0	3,196.1	3,168.8	3,168.1	7.1	7.7	105.65	-79.8	382.5	403.4	388.6	14.82	27.214		
3,300.0	3,294.6	3,268.3	3,267.6	7.4	7.9	107.85	-79.1	383.2	408.8	393.5	15.30	26.723		
3,400.0	3,393.1	3,367.7	3,367.0	7.7	8.1	110.01	-78.5	383.6	414.6	398.9	15.76	26.303		
3,500.0	3,491.6	3,465.8	3,465.0	8.0	8.4	112.06	-77.7	384.0	420.9	404.7	16.24	25.918		
3,600.0	3,590.1	3,563.1	3,562.4	8.3	8.6	114.15	-77.8	384.3	428.1	411.4	16.72	25.601		
3,700.0	3,688.6	3,660.2	3,659.5	8.6	8.7	116.23	-78.6	384.5	436.1	418.9	17.17	25.393		
3,800.0	3,787.1	3,757.3	3,756.5	8.9	8.9	118.28	-79.7	384.8	445.0	427.3	17.61	25.265		
3,900.0	3,885.6	3,855.1	3,854.4	9.2	9.1	120.30	-81.2	385.1	454.6	436.6	18.05	25.183		
4,000.0	3,984.2	3,958.1	3,957.4	9.5	9.2	122.27	-82.2	385.4	464.6	446.1	18.50	25.109		
4,100.0	4,082.7	4,066.3	4,065.5	9.8	9.4	123.94	-80.1	386.0	473.3	454.3	18.94	24.982		
4,200.0	4,181.2	4,174.9	4,174.0	10.2	9.5	125.37	-75.4	385.8	480.2	460.9	19.36	24.807		
4,300.0	4,279.7	4,281.4	4,280.3	10.5	9.6	126.65	-69.0	384.7	485.7	465.9	19.75	24.585		
4,400.0	4,378.2	4,381.9	4,380.6	10.8	9.7	127.88	-62.6	382.7	490.4	470.3	20.13	24.358		
4,500.0	4,476.7	4,478.1	4,476.6	11.2	9.8	129.12	-57.1	380.4	495.6	475.1	20.50	24.174		
4,600.0	4,575.2	4,570.3	4,568.7	11.5	9.9	130.33	-52.9	378.6	502.1	481.2	20.87	24.057		
4,700.0	4,673.7	4,664.2	4,662.5	11.9	10.0	131.58	-49.8	377.4	510.2	488.9	21.25	24.014		
4,800.0	4,772.2	4,759.4	4,757.7	12.2	10.1	132.81	-47.3	376.5	519.3	497.6	21.63	24.008		
4,900.0	4,870.7	4,852.5	4,850.8	12.6	10.3	134.01	-45.5	376.0	529.4	507.4	22.03	24.030		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-29 (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)			
5,000.0	4,969.2	4,947.4	4,945.7	12.9	10.4	135.19	-44.6	376.2	541.0	518.5	22.47	24.075		
5,100.0	5,067.7	5,042.9	5,041.1	13.3	10.6	136.31	-43.8	376.7	553.1	530.2	22.94	24.107		
5,200.0	5,166.2	5,135.1	5,133.3	13.6	10.9	137.32	-43.6	377.9	566.4	543.0	23.43	24.174		
5,300.0	5,264.7	5,231.1	5,229.3	14.0	11.1	138.29	-43.9	380.0	580.9	556.9	23.94	24.265		
5,400.0	5,363.2	5,332.9	5,331.1	14.3	11.4	139.26	-44.0	382.2	595.2	570.7	24.46	24.333		
5,500.0	5,461.7	5,429.5	5,427.7	14.7	11.6	140.13	-43.8	384.2	609.4	584.5	24.97	24.408		
5,600.0	5,560.3	5,522.9	5,521.1	15.0	11.8	141.04	-44.5	386.2	624.2	598.8	25.47	24.513		
5,700.0	5,659.4	5,623.0	5,621.2	15.3	12.1	141.88	-45.5	388.1	636.9	610.9	25.93	24.561		
5,800.0	5,758.8	5,720.1	5,718.3	15.5	12.3	142.45	-46.7	390.2	647.0	620.7	26.37	24.540		
5,900.0	5,858.6	5,821.7	5,819.8	15.7	12.5	142.82	-48.0	392.1	654.5	627.7	26.79	24.434		
6,000.0	5,958.5	5,924.5	5,922.5	15.9	12.8	142.96	-48.9	393.9	658.7	631.5	27.19	24.224		
6,100.0	6,058.5	6,024.2	6,022.3	16.1	13.0	147.79	-49.8	395.6	660.6	633.0	27.60	23.935		
6,200.0	6,158.5	6,127.4	6,125.5	16.2	13.3	-32.45	-50.5	396.9	659.8	631.8	27.91	23.635		
6,300.0	6,257.4	6,225.6	6,223.7	16.2	13.5	-33.66	-50.9	398.3	648.8	620.9	27.88	23.270		
6,400.0	6,353.5	6,322.0	6,320.0	16.2	13.7	-36.03	-51.6	399.4	627.4	599.8	27.59	22.741		
6,500.0	6,445.3	6,415.1	6,413.1	16.0	14.0	-39.81	-52.1	400.4	596.2	569.0	27.20	21.917		
6,600.0	6,531.2	6,498.2	6,496.2	15.8	14.2	-45.09	-52.6	401.5	557.3	530.3	26.95	20.680		
6,700.0	6,609.6	6,575.4	6,573.4	15.6	14.3	-52.20	-53.4	402.7	512.8	485.7	27.12	18.909		
6,800.0	6,679.3	6,645.3	6,643.3	15.5	14.5	-61.07	-54.3	403.8	465.9	438.0	27.88	16.712		
6,900.0	6,739.0	6,705.6	6,703.5	15.4	14.6	-70.87	-55.1	404.9	421.1	392.1	28.98	14.529		
7,000.0	6,787.8	6,752.7	6,750.6	15.5	14.8	-79.73	-55.7	405.9	385.0	355.1	29.92	12.865		
7,100.0	6,824.8	6,789.0	6,786.9	15.8	14.8	-86.43	-56.3	407.0	365.6	335.0	30.57	11.958		
7,135.6	6,835.0	6,800.0	6,797.9	15.9	14.9	-88.20	-56.5	407.3	364.0	333.2	30.78	11.825 SF		
7,200.0	6,849.3	6,814.1	6,812.0	16.2	14.9	-89.96	-56.7	407.8	369.3	338.2	31.11	11.870		
7,300.0	6,861.0	6,827.0	6,824.9	16.9	14.9	-89.71	-56.9	408.2	397.8	366.0	31.79	12.514		
7,400.0	6,862.0	6,829.5	6,827.4	17.7	14.9	-88.65	-57.0	408.3	447.2	414.6	32.62	13.711		
7,500.0	6,862.0	6,831.0	6,828.9	18.7	15.0	-88.89	-57.0	408.4	511.5	477.9	33.60	15.226		
7,600.0	6,862.0	6,832.5	6,830.4	19.8	15.0	-89.13	-57.0	408.4	586.0	551.3	34.72	16.878		
7,700.0	6,862.0	6,834.0	6,831.9	21.0	15.0	-89.36	-57.0	408.5	667.1	631.2	35.95	18.555		
7,800.0	6,862.0	6,835.5	6,833.4	22.3	15.0	-89.59	-57.1	408.5	752.8	715.5	37.29	20.190		
7,900.0	6,862.0	6,837.0	6,834.9	23.8	15.0	-89.82	-57.1	408.6	841.7	803.0	38.70	21.749		
8,000.0	6,862.0	6,838.4	6,836.3	25.2	15.0	-90.05	-57.1	408.6	932.8	892.6	40.18	23.215		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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)			
0.0	0.0	0.0	0.0	0.0	0.0	98.40	-49.9	338.0	341.8					
100.0	100.0	89.3	89.3	0.1	0.1	98.40	-49.9	337.9	341.6	341.4	0.23	1,478.436		
200.0	200.0	189.6	189.6	0.3	0.3	98.42	-50.0	337.8	341.5	340.9	0.59	579.808		
300.0	300.0	289.9	289.9	0.6	0.4	98.44	-50.1	337.5	341.2	340.3	0.95	360.415		
400.0	400.0	390.2	390.2	0.8	0.5	98.47	-50.2	337.2	340.9	339.6	1.30	261.311		
500.0	500.0	490.5	490.5	1.0	0.7	98.51	-50.4	336.8	340.5	338.9	1.66	204.722		
600.0	600.0	589.4	589.4	1.2	0.8	98.47	-50.1	336.5	340.2	338.2	2.05	165.878		
639.0	639.0	628.0	628.0	1.3	0.9	98.41	-49.8	336.5	340.2	338.0	2.20	154.478		
700.0	700.0	687.4	687.4	1.5	1.0	98.29	-49.1	336.8	340.3	337.9	2.41	141.099		
800.0	800.0	784.1	784.1	1.7	1.1	98.05	-47.8	337.9	341.3	338.5	2.74	124.630		
900.0	900.0	882.6	882.5	1.9	1.2	97.73	-46.1	339.8	343.0	339.9	3.11	110.303		
1,000.0	1,000.0	981.6	981.5	2.1	1.4	97.22	-43.4	342.2	345.0	341.5	3.50	98.509		
1,100.0	1,100.0	1,081.2	1,081.0	2.4	1.6	96.52	-39.4	345.0	347.3	343.4	3.94	88.161		
1,200.0	1,200.0	1,182.3	1,181.9	2.6	1.8	95.64	-34.4	347.8	349.5	345.1	4.40	79.499		
1,300.0	1,300.0	1,283.5	1,282.9	2.8	2.1	94.69	-28.8	350.1	351.3	346.5	4.86	72.221		
1,400.0	1,400.0	1,378.4	1,377.5	3.0	2.3	93.66	-22.6	352.9	353.8	348.5	5.33	66.429		
1,500.0	1,500.0	1,473.9	1,472.7	3.3	2.5	92.46	-15.3	357.1	357.8	352.0	5.79	61.778		
1,600.0	1,600.0	1,577.0	1,575.4	3.5	2.8	91.05	-6.6	361.7	362.0	355.7	6.28	57.625		
1,700.0	1,700.0	1,682.6	1,680.4	3.7	3.1	89.50	3.2	365.2	365.3	358.5	6.78	53.850		
1,800.0	1,800.0	1,792.5	1,789.5	3.9	3.4	87.46	16.3	365.9	366.3	359.0	7.30	50.183		
1,900.0	1,900.0	1,900.3	1,896.0	4.2	3.7	84.85	32.8	363.7	365.2	357.4	7.81	46.769		
2,000.0	2,000.0	2,010.8	2,005.0	4.4	4.0	81.98	50.5	358.3	362.2	353.8	8.32	43.503		
2,100.0	2,100.0	2,121.4	2,113.3	4.6	4.2	78.57	70.5	348.6	356.5	347.7	8.84	40.325		
2,200.0	2,200.0	2,223.7	2,213.2	4.8	4.5	75.20	89.1	337.2	349.6	340.3	9.33	37.455		
2,300.0	2,300.0	2,322.4	2,309.6	5.1	4.8	71.86	106.7	325.5	343.2	333.4	9.82	34.945		
2,400.0	2,400.0	2,426.2	2,411.0	5.3	5.1	68.27	124.5	312.4	337.0	326.6	10.32	32.650		
2,500.0	2,500.0	2,532.4	2,514.8	5.5	5.3	64.55	141.3	297.0	329.9	319.1	10.82	30.478		
2,600.0	2,600.0	2,640.4	2,619.8	5.7	5.6	55.91	157.6	278.2	320.5	309.1	11.34	28.256		
2,700.0	2,699.9	2,745.3	2,721.4	6.0	5.9	52.16	173.1	256.5	307.9	296.0	11.84	26.002		
2,800.0	2,799.7	2,843.3	2,815.7	6.2	6.2	48.54	187.6	234.5	293.6	281.2	12.32	23.828		
2,900.0	2,899.3	2,943.1	2,912.3	6.4	6.4	45.25	200.8	213.2	278.7	265.9	12.80	21.767		
3,000.0	2,998.6	3,041.2	3,007.1	6.6	6.7	41.95	213.3	191.3	261.9	248.6	13.28	19.722		
3,100.0	3,097.5	3,136.9	3,099.7	6.9	7.0	38.66	225.7	170.2	244.5	230.7	13.75	17.785		
3,200.0	3,196.1	3,232.1	3,192.2	7.1	7.2	35.66	237.3	151.0	226.8	212.6	14.22	15.952		
3,300.0	3,294.6	3,329.0	3,287.0	7.4	7.5	32.89	248.0	134.3	210.3	195.6	14.71	14.293		
3,400.0	3,393.1	3,427.0	3,383.5	7.7	7.8	30.58	257.0	120.0	194.4	179.2	15.20	12.787		
3,500.0	3,491.6	3,523.5	3,478.6	8.0	8.0	27.99	266.2	106.4	179.4	163.7	15.69	11.433		
3,600.0	3,590.1	3,621.8	3,574.8	8.3	8.3	23.76	278.0	90.2	165.8	149.6	16.18	10.250		
3,700.0	3,688.6	3,721.3	3,671.8	8.6	8.6	17.93	290.3	71.7	152.8	136.2	16.64	9.185		
3,800.0	3,787.1	3,816.0	3,763.6	8.9	8.9	10.64	303.0	52.1	142.1	125.1	17.07	8.327		
3,900.0	3,885.6	3,910.7	3,854.6	9.2	9.2	1.56	318.1	30.9	136.7	119.2	17.47	7.822		
3,975.4	3,959.9	3,984.7	3,925.6	9.4	9.4	-5.96	330.5	14.1	135.8	118.0	17.78	7.636 CC		
4,000.0	3,984.2	4,009.1	3,949.1	9.5	9.5	-8.38	334.4	8.7	135.9	118.0	17.89	7.596 ES		
4,100.0	4,082.7	4,108.0	4,044.5	9.8	9.8	-17.76	349.8	-12.3	138.0	119.6	18.34	7.522 SF		
4,200.0	4,181.2	4,206.1	4,139.5	10.2	10.1	-26.38	364.5	-32.4	142.8	124.0	18.84	7.580		
4,300.0	4,279.7	4,308.3	4,238.7	10.5	10.5	-34.79	377.8	-52.8	148.8	129.4	19.41	7.667		
4,400.0	4,378.2	4,405.8	4,333.7	10.8	10.8	-42.13	389.4	-71.5	156.3	136.3	20.01	7.810		
4,500.0	4,476.7	4,502.6	4,427.9	11.2	11.1	-48.29	402.1	-89.6	166.6	145.9	20.65	8.067		
4,600.0	4,575.2	4,602.0	4,524.7	11.5	11.4	-53.74	415.3	-108.0	178.6	157.2	21.32	8.375		
4,700.0	4,673.7	4,701.8	4,622.2	11.9	11.7	-58.53	427.6	-125.2	190.5	168.5	22.01	8.655		
4,800.0	4,772.2	4,797.8	4,715.8	12.2	12.0	-62.55	439.9	-142.5	204.4	181.7	22.69	9.008		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
4,900.0	4,870.7	4,897.4	4,813.0	12.6	12.3	-66.13	452.8	-159.9	218.8	195.4	23.38	9.357		
5,000.0	4,969.2	4,993.5	4,906.8	12.9	12.6	-69.15	465.2	-176.9	234.0	210.0	24.06	9.726		
5,100.0	5,067.7	5,089.1	4,999.8	13.3	12.9	-71.80	478.0	-194.8	251.1	226.4	24.74	10.149		
5,200.0	5,166.2	5,189.7	5,097.7	13.6	13.2	-74.33	491.0	-213.9	268.7	243.3	25.44	10.564		
5,300.0	5,264.7	5,293.3	5,199.0	14.0	13.5	-76.83	502.8	-232.1	285.0	258.8	26.14	10.900		
5,400.0	5,363.2	5,397.4	5,301.3	14.3	13.8	-79.36	512.7	-249.0	299.8	272.9	26.85	11.165		
5,500.0	5,461.7	5,498.0	5,400.4	14.7	14.1	-81.76	520.9	-263.9	313.5	286.0	27.54	11.382		
5,600.0	5,560.3	5,597.2	5,498.2	15.0	14.4	-83.91	529.4	-278.3	327.5	299.3	28.20	11.611		
5,700.0	5,659.4	5,705.6	5,605.3	15.3	14.7	-85.64	538.2	-292.6	340.7	311.9	28.79	11.833		
5,800.0	5,758.8	5,815.3	5,714.2	15.5	15.0	-86.84	545.1	-303.9	351.2	321.9	29.34	11.969		
5,900.0	5,858.6	5,923.6	5,822.1	15.7	15.3	-87.56	549.9	-312.4	359.2	329.4	29.84	12.038		
6,000.0	5,958.5	6,030.2	5,928.4	15.9	15.5	-87.81	553.3	-318.5	365.1	334.9	30.28	12.059		
6,100.0	6,058.5	6,135.1	6,033.2	16.1	15.8	-82.81	555.2	-323.1	369.7	339.1	30.68	12.053		
6,200.0	6,158.5	6,240.9	6,138.9	16.2	16.0	97.45	555.8	-326.3	373.1	342.1	31.02	12.030		
6,300.0	6,257.4	6,344.7	6,242.8	16.2	16.1	99.27	555.0	-328.1	376.9	345.8	31.05	12.137		
6,400.0	6,353.5	6,446.1	6,344.1	16.2	16.2	102.65	553.1	-328.8	382.5	351.7	30.81	12.416		
6,500.0	6,445.3	6,543.2	6,441.1	16.0	16.2	107.12	550.6	-328.4	392.4	362.2	30.23	12.981		
6,600.0	6,531.2	6,633.0	6,530.9	15.8	16.2	111.89	547.8	-327.4	409.6	380.2	29.35	13.956		
6,700.0	6,609.6	6,715.7	6,613.6	15.6	16.2	116.30	544.9	-326.2	436.9	408.7	28.23	15.476		
6,800.0	6,679.3	6,791.9	6,689.7	15.5	16.2	119.89	541.7	-324.7	476.0	448.9	27.03	17.611		
6,900.0	6,739.0	6,858.9	6,756.6	15.4	16.2	122.07	538.7	-323.0	527.2	501.2	26.03	20.251		
7,000.0	6,787.8	6,916.6	6,814.2	15.5	16.2	122.51	535.7	-321.2	590.0	564.4	25.59	23.050		
7,100.0	6,824.8	6,963.4	6,860.9	15.8	16.2	120.65	533.0	-319.6	662.7	636.6	26.10	25.390		
7,200.0	6,849.3	6,997.7	6,895.1	16.2	16.2	115.61	530.8	-318.3	743.5	715.7	27.81	26.732		
7,300.0	6,861.0	7,018.5	6,915.8	16.9	16.2	106.12	529.5	-317.4	830.4	799.8	30.53	27.200		
7,400.0	6,862.0	7,027.6	6,924.9	17.7	16.2	101.59	528.8	-317.0	921.0	888.9	32.06	28.731		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 482-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	103.58	-86.3	357.5	367.9					
100.0	100.0	89.4	89.4	0.1	0.1	103.60	-86.4	357.4	367.7	367.5	0.21	1,718.714		
200.0	200.0	189.8	189.8	0.3	0.2	103.65	-86.8	357.2	367.5	367.0	0.55	665.130		
300.0	300.0	290.2	290.2	0.6	0.3	103.75	-87.3	356.7	367.3	366.4	0.89	412.092		
400.0	400.0	390.6	390.6	0.8	0.4	103.90	-88.1	356.2	366.9	365.7	1.23	298.311		
500.0	500.0	491.1	491.1	1.0	0.6	104.08	-89.2	355.4	366.4	364.8	1.58	231.994		
600.0	600.0	592.9	592.9	1.2	0.8	104.41	-91.0	354.1	365.6	363.5	2.04	179.368		
700.0	700.0	692.3	692.2	1.5	1.0	104.91	-93.7	352.2	364.5	362.0	2.49	146.487		
800.0	800.0	789.8	789.6	1.7	1.2	105.48	-97.1	350.7	363.9	361.0	2.93	124.181		
837.3	837.3	826.5	826.3	1.8	1.3	105.72	-98.6	350.3	363.9	360.8	3.10	117.398	CC	
900.0	900.0	888.4	888.1	1.9	1.5	106.19	-101.5	349.6	364.0	360.6	3.38	107.534	ES	
1,000.0	1,000.0	985.8	985.3	2.1	1.7	107.08	-107.0	348.4	364.5	360.7	3.84	95.038		
1,100.0	1,100.0	1,081.0	1,080.4	2.4	1.9	107.92	-112.7	348.3	366.2	361.9	4.28	85.605		
1,200.0	1,200.0	1,176.5	1,175.7	2.6	2.1	108.74	-118.5	349.4	369.2	364.5	4.73	78.132		
1,300.0	1,300.0	1,271.9	1,270.9	2.8	2.4	109.68	-125.6	351.2	373.4	368.3	5.17	72.164		
1,400.0	1,400.0	1,371.6	1,370.2	3.0	2.6	110.72	-133.7	353.4	378.4	372.7	5.65	66.910		
1,500.0	1,500.0	1,471.8	1,470.1	3.3	2.9	111.76	-141.9	355.6	383.3	377.2	6.12	62.611		
1,600.0	1,600.0	1,572.8	1,570.7	3.5	3.1	112.72	-149.8	357.7	388.2	381.6	6.58	59.024		
1,700.0	1,700.0	1,675.5	1,673.1	3.7	3.3	113.63	-157.2	359.4	392.6	385.6	7.02	55.936		
1,800.0	1,800.0	1,770.2	1,767.5	3.9	3.6	114.61	-165.2	360.7	397.3	389.8	7.47	53.164		
1,900.0	1,900.0	1,859.9	1,856.7	4.2	3.8	115.62	-174.1	363.1	403.9	396.0	7.92	50.978		
2,000.0	2,000.0	1,954.4	1,950.6	4.4	4.1	116.61	-184.0	367.3	412.7	404.3	8.39	49.187		
2,100.0	2,100.0	2,048.1	2,043.5	4.6	4.4	117.73	-195.5	372.0	422.7	413.8	8.87	47.648		
2,200.0	2,200.0	2,132.9	2,127.2	4.8	4.6	118.84	-207.7	377.2	435.1	425.7	9.34	46.595		
2,300.0	2,300.0	2,221.2	2,214.0	5.1	4.9	119.99	-222.1	384.8	450.6	440.8	9.81	45.918		
2,400.0	2,400.0	2,309.6	2,300.6	5.3	5.3	121.02	-237.0	394.2	468.4	458.1	10.28	45.548		
2,500.0	2,500.0	2,395.1	2,384.1	5.5	5.6	121.81	-251.4	405.4	488.5	477.7	10.73	45.504		
2,600.0	2,600.0	2,481.9	2,468.6	5.7	5.9	117.27	-265.8	419.7	511.7	500.6	11.10	46.094		
2,700.0	2,699.9	2,572.9	2,556.8	6.0	6.3	117.69	-280.7	436.2	537.7	526.1	11.54	46.586		
2,800.0	2,799.7	2,662.9	2,643.8	6.2	6.7	118.31	-296.5	452.6	565.7	553.7	11.97	47.238		
2,900.0	2,899.3	2,753.7	2,731.3	6.4	7.1	118.99	-312.7	470.4	596.2	583.8	12.40	48.071		
3,000.0	2,998.6	2,857.4	2,831.5	6.6	7.5	119.92	-330.7	490.4	627.7	614.9	12.83	48.907		
3,100.0	3,097.5	2,956.6	2,927.8	6.9	7.9	120.84	-346.6	508.3	659.0	645.7	13.25	49.716		
3,200.0	3,196.1	3,050.7	3,019.1	7.1	8.3	121.89	-361.5	525.5	691.9	678.2	13.68	50.596		
3,300.0	3,294.6	3,156.3	3,121.8	7.4	8.7	123.27	-377.6	544.2	724.5	710.4	14.12	51.308		
3,400.0	3,393.1	3,259.5	3,222.6	7.7	9.1	124.46	-391.8	561.4	755.7	741.1	14.56	51.889		
3,500.0	3,491.6	3,370.3	3,331.0	8.0	9.6	125.59	-405.7	578.9	785.8	770.8	15.03	52.287		
3,600.0	3,590.1	3,455.8	3,414.9	8.3	9.9	126.43	-416.3	591.8	815.4	799.9	15.47	52.719		
3,700.0	3,688.6	3,529.9	3,487.4	8.6	10.2	127.14	-426.7	603.6	846.9	831.0	15.90	53.261		
3,800.0	3,787.1	3,604.4	3,559.7	8.9	10.6	127.81	-438.4	616.8	880.9	864.5	16.34	53.897		
3,900.0	3,885.6	3,683.9	3,636.5	9.2	11.0	128.45	-451.5	632.2	916.7	899.9	16.80	54.554		
4,000.0	3,984.2	3,769.0	3,718.6	9.5	11.4	129.06	-465.9	649.7	953.6	936.4	17.28	55.195		
4,100.0	4,082.7	3,862.6	3,808.7	9.8	11.9	129.67	-481.7	669.2	991.0	973.2	17.77	55.770		
7,500.0	6,862.0	6,946.0	6,852.1	18.7	21.4	-90.07	-746.2	968.6	982.5	945.1	37.40	26.273		
7,600.0	6,862.0	6,945.5	6,851.6	19.8	21.4	-90.04	-746.2	968.6	983.5	945.0	38.51	24.758		
7,700.0	6,862.0	6,945.0	6,851.1	21.0	21.4	-90.01	-746.2	968.6	984.3	946.6	39.74	23.509		
7,800.0	6,862.0	6,944.5	6,850.6	22.3	21.4	-89.98	-746.2	968.6	985.7	946.6	41.07	22.536		
7,830.8	6,862.0	6,944.3	6,850.4	22.8	21.4	-89.97	-746.2	968.6	985.1	946.6	41.51	22.288		
7,900.0	6,862.0	6,944.0	6,850.1	23.8	21.4	-89.94	-746.2	968.6	984.7	946.6	42.49	21.836		
8,000.0	6,862.0	6,943.5	6,849.6	25.2	21.4	-89.91	-746.2	968.6	984.0	946.6	43.96	21.392		
8,100.0	6,862.0	6,943.0	6,849.1	26.8	21.4	-89.88	-746.2	968.6	983.5	946.6	45.50	21.177		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design												Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft	
Survey Program: 482-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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)				Separation Factor		
8,200.0	6,862.0	6,942.5	6,848.6	28.3	21.4	-89.85	-746.2	968.6	996.1	949.0	47.08				21.158 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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	1.0	1.0	0.0	0.0	-89.40	1.1	-105.0	105.0	105.0	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.40	1.1	-105.0	105.0	104.8	0.23	462.729		
166.3	166.3	167.3	167.3	0.3	0.3	-89.40	1.1	-105.0	105.0	104.5	0.53	200.016 CC		
200.0	200.0	200.0	200.0	0.3	0.3	-89.40	1.1	-105.0	105.1	104.4	0.67	155.792 ES		
300.0	300.0	298.4	298.4	0.6	0.6	-89.19	1.5	-106.2	106.3	105.2	1.11	95.433		
400.0	400.0	395.7	395.6	0.8	0.8	-88.58	2.7	-109.8	109.9	108.4	1.55	70.741		
500.0	500.0	492.8	492.5	1.0	1.0	-87.65	4.7	-115.6	116.1	114.1	2.00	58.006		
600.0	600.0	589.4	588.8	1.2	1.2	-86.52	7.5	-123.8	124.6	122.2	2.45	50.829		
700.0	700.0	685.6	684.3	1.5	1.5	-85.27	11.1	-134.2	135.7	132.8	2.91	46.670		
800.0	800.0	781.2	778.9	1.7	1.8	-84.00	15.4	-146.8	149.2	145.9	3.37	44.325		
900.0	900.0	876.0	872.5	1.9	2.2	-82.77	20.5	-161.5	165.2	161.4	3.83	43.150		
1,000.0	1,000.0	970.0	964.8	2.1	2.5	-81.63	26.2	-178.2	183.7	179.4	4.30	42.768 SF		
1,100.0	1,100.0	1,063.1	1,055.8	2.4	2.9	-80.59	32.6	-196.9	204.6	199.9	4.77	42.942		
1,200.0	1,200.0	1,155.1	1,145.2	2.6	3.3	-79.66	39.7	-217.4	227.9	222.7	5.24	43.518		
1,300.0	1,300.0	1,246.0	1,233.0	2.8	3.8	-78.83	47.3	-239.7	253.6	247.9	5.71	44.390		
1,400.0	1,400.0	1,335.8	1,319.1	3.0	4.3	-78.10	55.5	-263.6	281.5	275.3	6.19	45.483		
1,500.0	1,500.0	1,424.2	1,403.3	3.3	4.9	-77.46	64.3	-289.0	311.7	305.1	6.67	46.743		
1,600.0	1,600.0	1,511.3	1,485.7	3.5	5.4	-76.90	73.5	-315.8	344.2	337.0	7.15	48.114		
1,700.0	1,700.0	1,604.9	1,573.7	3.7	6.1	-76.38	83.8	-345.7	377.8	370.2	7.65	49.381		
1,800.0	1,800.0	1,699.0	1,662.3	3.9	6.7	-75.94	94.1	-375.8	411.5	403.4	8.15	50.491		
1,900.0	1,900.0	1,793.1	1,750.9	4.2	7.4	-75.57	104.4	-405.9	445.2	436.6	8.65	51.459		
2,000.0	2,000.0	1,887.2	1,839.4	4.4	8.0	-75.25	114.8	-436.0	479.0	469.8	9.16	52.311		
2,100.0	2,100.0	1,981.3	1,928.0	4.6	8.7	-74.98	125.1	-466.1	512.7	503.0	9.66	53.066		
2,200.0	2,200.0	2,075.4	2,016.6	4.8	9.3	-74.73	135.5	-496.2	546.4	536.3	10.17	53.739		
2,300.0	2,300.0	2,169.5	2,105.1	5.1	10.0	-74.52	145.8	-526.3	580.2	569.5	10.68	54.343		
2,400.0	2,400.0	2,263.6	2,193.7	5.3	10.7	-74.33	156.1	-556.4	614.0	602.8	11.19	54.887		
2,500.0	2,500.0	2,357.7	2,282.3	5.5	11.3	-74.16	166.5	-586.5	647.7	636.0	11.70	55.380		
2,600.0	2,600.0	2,451.9	2,370.9	5.7	12.0	-73.97	176.8	-616.6	681.2	669.1	12.11	56.258		
2,700.0	2,699.9	2,546.3	2,459.7	6.0	12.7	-73.84	187.2	-646.8	714.3	701.7	12.62	56.589		
2,800.0	2,799.7	2,640.7	2,548.6	6.2	13.4	-73.67	197.5	-677.0	746.8	733.7	13.14	56.842		
2,900.0	2,899.3	2,735.2	2,637.5	6.4	14.0	-73.50	207.9	-707.2	778.9	765.3	13.66	57.021		
3,000.0	2,998.6	2,829.6	2,726.4	6.6	14.7	-73.33	218.3	-737.4	810.6	796.4	14.19	57.125		
3,100.0	3,097.5	2,923.9	2,815.1	6.9	15.4	-73.16	228.7	-767.6	841.8	827.1	14.73	57.151		
3,200.0	3,196.1	3,018.1	2,903.8	7.1	16.1	-72.90	239.0	-797.7	872.8	857.5	15.29	57.103		
3,300.0	3,294.6	3,112.2	2,992.3	7.4	16.7	-72.82	249.3	-827.8	903.9	888.1	15.86	57.009		
3,400.0	3,393.1	3,206.3	3,080.9	7.7	17.4	-72.65	259.7	-857.9	935.2	918.8	16.44	56.875		
3,500.0	3,491.6	3,300.5	3,169.5	8.0	18.1	-71.70	270.0	-888.0	966.7	949.6	17.05	56.710		
3,600.0	3,590.1	3,394.6	3,258.1	8.3	18.8	-72.42	280.3	-918.1	998.3	980.6	17.66	56.520		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - 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	2.0	2.0	0.0	0.0	-89.44	0.7	-74.9	75.0	75.0	0.00	N/A			
100.0	100.0	102.0	102.0	0.1	0.1	-89.44	0.7	-74.9	75.0	74.7	0.23	326.931			
200.0	200.0	202.0	202.0	0.3	0.3	-89.44	0.7	-74.9	75.0	74.3	0.68	110.420			
300.0	300.0	302.0	302.0	0.6	0.6	-89.44	0.7	-74.9	75.0	73.8	1.13	66.428			
400.0	400.0	402.0	402.0	0.8	0.8	-89.44	0.7	-74.9	75.0	73.4	1.58	47.503			
500.0	500.0	502.0	502.0	1.0	1.0	-89.44	0.7	-74.9	75.0	72.9	2.03	36.970			
600.0	600.0	602.0	602.0	1.2	1.2	-89.44	0.7	-74.9	75.0	72.5	2.48	30.260			
700.0	700.0	702.0	702.0	1.5	1.5	-89.44	0.7	-74.9	75.0	72.0	2.93	25.612			
766.0	766.0	768.0	768.0	1.6	1.6	-89.44	0.7	-74.9	75.0	71.7	3.22	23.255	CC		
800.0	800.0	802.0	802.0	1.7	1.7	-89.44	0.7	-74.9	75.0	71.6	3.38	22.203	ES		
900.0	900.0	900.0	900.0	1.9	1.9	-89.03	1.3	-76.1	76.2	72.4	3.81	19.974			
1,000.0	1,000.0	998.3	998.2	2.1	2.1	-87.88	3.0	-79.6	79.7	75.5	4.25	18.772			
1,100.0	1,100.0	1,096.1	1,095.8	2.4	2.3	-86.19	5.7	-85.3	85.7	81.0	4.69	18.293	SF		
1,200.0	1,200.0	1,193.6	1,192.9	2.6	2.6	-84.19	9.5	-93.2	94.1	89.0	5.13	18.365			
1,300.0	1,300.0	1,290.5	1,289.2	2.8	2.8	-82.11	14.3	-103.3	105.1	99.5	5.57	18.864			
1,400.0	1,400.0	1,386.8	1,384.5	3.0	3.1	-80.10	20.2	-115.5	118.6	112.5	6.02	19.700			
1,500.0	1,500.0	1,482.4	1,478.8	3.3	3.4	-78.25	27.0	-129.8	134.6	128.1	6.47	20.803			
1,600.0	1,600.0	1,577.1	1,571.7	3.5	3.7	-76.61	34.8	-146.0	153.1	146.2	6.92	22.116			
1,700.0	1,700.0	1,670.8	1,663.3	3.7	4.1	-75.18	43.4	-164.1	174.1	166.7	7.38	23.596			
1,800.0	1,800.0	1,763.5	1,753.3	3.9	4.4	-73.94	52.9	-184.0	197.5	189.7	7.84	25.207			
1,900.0	1,900.0	1,855.6	1,842.2	4.2	4.9	-72.88	63.3	-205.7	223.3	215.0	8.30	26.913			
2,000.0	2,000.0	1,951.9	1,934.9	4.4	5.3	-71.97	74.6	-229.1	250.1	241.4	8.77	28.522			
2,100.0	2,100.0	2,048.2	2,027.6	4.6	5.8	-71.23	85.8	-252.6	277.0	267.7	9.24	29.970			
2,200.0	2,200.0	2,144.4	2,120.3	4.8	6.3	-70.63	97.1	-276.1	303.8	294.1	9.72	31.271			
2,300.0	2,300.0	2,240.7	2,213.0	5.1	6.8	-70.12	108.3	-299.6	330.7	320.6	10.19	32.446			
2,400.0	2,400.0	2,337.0	2,305.7	5.3	7.3	-69.69	119.6	-323.0	357.7	347.0	10.67	33.510			
2,500.0	2,500.0	2,433.3	2,398.4	5.5	7.9	-69.32	130.8	-346.5	384.6	373.5	11.16	34.478			
2,600.0	2,600.0	2,529.7	2,491.2	5.7	8.4	-73.66	142.1	-370.0	411.2	399.6	11.59	35.468			
2,700.0	2,699.9	2,626.2	2,584.1	6.0	8.9	-73.50	153.3	-393.6	437.1	425.0	12.08	36.184			
2,800.0	2,799.7	2,722.9	2,677.2	6.2	9.5	-73.64	164.6	-417.1	462.3	449.7	12.57	36.777			
2,900.0	2,899.3	2,819.7	2,770.4	6.4	10.0	-74.04	175.9	-440.7	486.8	473.8	13.07	37.256			
3,000.0	2,998.6	2,916.4	2,863.5	6.6	10.5	-74.66	187.2	-464.3	510.8	497.2	13.57	37.628			
3,100.0	3,097.5	3,013.0	2,956.5	6.9	11.1	-75.48	198.5	-487.9	534.2	520.1	14.10	37.897			
3,200.0	3,196.1	3,109.6	3,049.5	7.1	11.6	-76.58	209.8	-511.4	557.3	542.7	14.64	38.070			
3,300.0	3,294.6	3,206.0	3,142.4	7.4	12.2	-77.84	221.1	-535.0	580.6	565.4	15.20	38.190			
3,400.0	3,393.1	3,302.5	3,235.2	7.7	12.7	-79.00	232.3	-558.5	604.1	588.3	15.78	38.275			
3,500.0	3,491.6	3,399.0	3,328.1	8.0	13.2	-80.08	243.6	-582.0	627.8	611.5	16.38	38.331			
3,600.0	3,590.1	3,495.5	3,421.0	8.3	13.8	-81.08	254.9	-605.5	651.8	634.8	16.99	38.361			
3,700.0	3,688.6	3,592.0	3,513.9	8.6	14.3	-82.00	266.1	-629.1	675.9	658.3	17.61	38.370			
3,800.0	3,787.1	3,688.5	3,606.8	8.9	14.9	-82.87	277.4	-652.6	700.1	681.9	18.25	38.363			
3,900.0	3,885.6	3,784.9	3,699.7	9.2	15.4	-83.68	288.7	-676.1	724.5	705.6	18.90	38.341			
4,000.0	3,984.2	3,881.4	3,792.6	9.5	16.0	-84.43	299.9	-699.6	749.1	729.5	19.55	38.309			
4,100.0	4,082.7	3,977.9	3,885.5	9.8	16.5	-85.14	311.2	-723.2	773.7	753.5	20.22	38.267			
4,200.0	4,181.2	4,074.4	3,978.4	10.2	17.1	-85.80	322.5	-746.7	798.5	777.6	20.89	38.219			
4,300.0	4,279.7	4,170.9	4,071.2	10.5	17.6	-86.43	333.8	-770.2	823.3	801.7	21.57	38.165			
4,400.0	4,378.2	4,267.3	4,164.1	10.8	18.2	-87.02	345.0	-793.8	848.2	826.0	22.26	38.108			
4,500.0	4,476.7	4,363.8	4,257.0	11.2	18.7	-87.57	356.3	-817.3	873.2	850.3	22.95	38.047			
4,600.0	4,575.2	4,460.3	4,349.9	11.5	19.3	-88.09	367.6	-840.8	898.3	874.7	23.65	37.985			
4,700.0	4,673.7	4,556.8	4,442.8	11.9	19.8	-88.59	378.8	-864.3	923.5	899.1	24.35	37.921			
4,800.0	4,772.2	4,653.3	4,535.7	12.2	20.4	-89.06	390.1	-887.9	948.7	923.6	25.06	37.856			
4,900.0	4,870.7	4,749.8	4,628.6	12.6	20.9	-89.50	401.4	-911.4	974.0	948.2	25.77	37.791			

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design												Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - 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					
5,000.0	4,969.2	4,846.2	4,721.5	12.9	21.5	-89.93	412.6	-934.9	999.3	972.8	26.49	37.726					

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	1.0	1.0	0.0	0.0	-89.53	0.7	-90.0	90.0	90.0	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-89.53	0.7	-90.0	90.0	89.8	0.23	396.441			
200.0	200.0	201.0	201.0	0.3	0.3	-89.53	0.7	-90.0	90.0	89.3	0.68	133.025			
300.0	300.0	301.0	301.0	0.6	0.6	-89.53	0.7	-90.0	90.0	88.9	1.13	79.921			
366.3	366.3	367.3	367.3	0.7	0.7	-89.53	0.7	-90.0	90.0	88.6	1.42	63.189 CC			
400.0	400.0	400.0	400.0	0.8	0.8	-89.53	0.7	-90.0	90.0	88.4	1.57	57.204 ES			
500.0	500.0	498.8	498.8	1.0	1.0	-89.24	1.2	-91.2	91.2	89.2	2.01	45.321			
600.0	600.0	596.5	596.4	1.2	1.2	-88.42	2.6	-94.7	94.8	92.4	2.45	38.725			
700.0	700.0	694.0	693.7	1.5	1.4	-87.19	4.9	-100.5	100.9	98.0	2.89	34.899			
800.0	800.0	791.0	790.3	1.7	1.7	-85.70	8.2	-108.6	109.4	106.1	3.34	32.779			
900.0	900.0	887.6	886.3	1.9	1.9	-84.10	12.3	-118.8	120.4	116.6	3.79	31.782			
1,000.0	1,000.0	983.5	981.2	2.1	2.2	-82.51	17.3	-131.3	133.9	129.6	4.24	31.558 SF			
1,100.0	1,100.0	1,078.7	1,075.1	2.4	2.5	-81.01	23.1	-145.8	149.9	145.2	4.70	31.886			
1,200.0	1,200.0	1,173.1	1,167.8	2.6	2.9	-79.64	29.7	-162.4	168.4	163.2	5.16	32.616			
1,300.0	1,300.0	1,266.5	1,259.1	2.8	3.3	-78.41	37.1	-180.8	189.3	183.7	5.63	33.644			
1,400.0	1,400.0	1,358.8	1,348.8	3.0	3.7	-77.33	45.2	-201.1	212.7	206.6	6.09	34.895			
1,500.0	1,500.0	1,450.1	1,436.9	3.3	4.1	-76.39	54.0	-223.2	238.4	231.8	6.56	36.314			
1,600.0	1,600.0	1,543.3	1,526.4	3.5	4.6	-75.56	63.7	-247.4	266.1	259.1	7.04	37.776			
1,700.0	1,700.0	1,639.2	1,618.4	3.7	5.2	-74.85	73.8	-272.5	294.2	286.6	7.53	39.086			
1,800.0	1,800.0	1,735.2	1,710.5	3.9	5.7	-74.27	83.8	-297.7	322.3	314.2	8.01	40.228			
1,900.0	1,900.0	1,831.1	1,802.5	4.2	6.3	-73.78	93.9	-322.8	350.4	341.9	8.50	41.232			
2,000.0	2,000.0	1,927.0	1,894.5	4.4	6.8	-73.37	104.0	-348.0	378.5	369.5	8.99	42.120			
2,100.0	2,100.0	2,023.0	1,986.5	4.6	7.4	-73.01	114.0	-373.2	406.6	397.1	9.48	42.910			
2,200.0	2,200.0	2,118.9	2,078.6	4.8	7.9	-72.70	124.1	-398.3	434.8	424.8	9.97	43.618			
2,300.0	2,300.0	2,214.8	2,170.6	5.1	8.5	-72.42	134.1	-423.5	462.9	452.5	10.46	44.255			
2,400.0	2,400.0	2,310.8	2,262.6	5.3	9.1	-72.18	144.2	-448.6	491.1	480.2	10.95	44.831			
2,500.0	2,500.0	2,406.7	2,354.6	5.5	9.6	-71.96	154.3	-473.8	519.3	507.9	11.45	45.354			
2,600.0	2,600.0	2,502.7	2,446.8	5.7	10.2	-76.37	164.3	-498.9	547.2	535.3	11.88	46.074			
2,700.0	2,699.9	2,598.9	2,539.0	6.0	10.8	-76.17	174.4	-524.2	574.5	562.1	12.38	46.424			
2,800.0	2,799.7	2,695.1	2,631.4	6.2	11.3	-76.21	184.5	-549.4	601.2	588.3	12.88	46.690			
2,900.0	2,899.3	2,791.4	2,723.7	6.4	11.9	-76.46	194.6	-574.6	627.4	614.0	13.38	46.876			
3,000.0	2,998.6	2,887.7	2,816.0	6.6	12.5	-76.90	204.7	-599.9	653.1	639.2	13.90	46.984			
3,100.0	3,097.5	2,983.8	2,908.2	6.9	13.1	-77.50	214.8	-625.1	678.3	663.9	14.43	47.012			
3,200.0	3,196.1	3,079.7	3,000.3	7.1	13.6	-78.37	224.9	-650.2	703.3	688.3	14.98	46.963			
3,300.0	3,294.6	3,175.6	3,092.3	7.4	14.2	-79.44	234.9	-675.4	728.4	712.9	15.54	46.872			
3,400.0	3,393.1	3,271.5	3,184.3	7.7	14.8	-80.44	245.0	-700.5	753.8	737.7	16.12	46.753			
3,500.0	3,491.6	3,367.4	3,276.3	8.0	15.3	-81.37	255.1	-725.7	779.3	762.6	16.72	46.611			
3,600.0	3,590.1	3,463.4	3,368.3	8.3	15.9	-82.25	265.1	-750.8	805.1	787.7	17.33	46.452			
3,700.0	3,688.6	3,559.3	3,460.3	8.6	16.5	-83.07	275.2	-776.0	831.0	813.0	17.95	46.281			
3,800.0	3,787.1	3,655.2	3,552.3	8.9	17.1	-83.84	285.2	-801.1	857.0	838.4	18.59	46.101			
3,900.0	3,885.6	3,751.1	3,644.3	9.2	17.6	-84.57	295.3	-826.3	883.2	864.0	19.24	45.915			
4,000.0	3,984.2	3,847.0	3,736.3	9.5	18.2	-85.26	305.4	-851.4	909.5	889.6	19.89	45.725			
4,100.0	4,082.7	3,942.9	3,828.3	9.8	18.8	-85.90	315.4	-876.6	936.0	915.4	20.55	45.535			
4,200.0	4,181.2	4,038.8	3,920.3	10.2	19.4	-86.52	325.5	-901.7	962.5	941.3	21.23	45.344			
4,300.0	4,279.7	4,134.7	4,012.4	10.5	19.9	-87.10	335.5	-926.9	989.1	967.2	21.91	45.155			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	1.0	1.0	0.0	0.0	-89.52	0.4	-44.9	44.9	44.9	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.52	0.4	-44.9	44.9	44.6	0.23	197.607		
200.0	200.0	201.0	201.0	0.3	0.3	-89.52	0.4	-44.9	44.9	44.2	0.68	66.307		
300.0	300.0	301.0	301.0	0.6	0.6	-89.52	0.4	-44.9	44.9	43.7	1.13	39.837		
400.0	400.0	401.0	401.0	0.8	0.8	-89.52	0.4	-44.9	44.9	43.3	1.58	28.471		
500.0	500.0	501.0	501.0	1.0	1.0	-89.52	0.4	-44.9	44.9	42.8	2.03	22.151		
600.0	600.0	601.0	601.0	1.2	1.2	-89.52	0.4	-44.9	44.9	42.4	2.47	18.127		
700.0	700.0	701.0	701.0	1.5	1.5	-89.52	0.4	-44.9	44.9	41.9	2.92	15.341		
800.0	800.0	801.0	801.0	1.7	1.7	-89.52	0.4	-44.9	44.9	41.5	3.37	13.297		
900.0	900.0	901.0	901.0	1.9	1.9	-89.52	0.4	-44.9	44.9	41.0	3.82	11.733		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-89.52	0.4	-44.9	44.9	40.6	4.27	10.499		
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-89.52	0.4	-44.9	44.9	40.1	4.72	9.499		
1,166.3	1,166.3	1,167.3	1,167.3	2.5	2.5	-89.52	0.4	-44.9	44.9	39.8	5.02	8.935 CC		
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-89.52	0.4	-44.9	44.9	39.7	5.17	8.674 ES		
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-88.47	1.2	-45.9	45.9	40.3	5.61	8.173		
1,400.0	1,400.0	1,399.0	1,398.9	3.0	3.0	-85.62	3.7	-48.8	49.0	42.9	6.05	8.093		
1,500.0	1,500.0	1,497.7	1,497.4	3.3	3.2	-81.63	7.9	-53.7	54.4	47.9	6.49	8.374		
1,600.0	1,600.0	1,596.0	1,595.3	3.5	3.5	-77.25	13.7	-60.5	62.3	55.3	6.94	8.974		
1,700.0	1,700.0	1,693.8	1,692.4	3.7	3.7	-73.06	21.1	-69.1	72.8	65.4	7.38	9.855		
1,800.0	1,800.0	1,790.9	1,788.5	3.9	4.0	-69.36	30.0	-79.6	85.9	78.1	7.83	10.974		
1,900.0	1,900.0	1,887.2	1,883.5	4.2	4.2	-66.25	40.4	-91.8	101.8	93.5	8.28	12.293		
2,000.0	2,000.0	1,983.1	1,977.6	4.4	4.6	-63.69	52.3	-105.7	120.2	111.5	8.73	13.770		
2,100.0	2,100.0	2,081.0	2,073.6	4.6	4.9	-61.68	65.0	-120.7	139.8	130.6	9.19	15.216		
2,200.0	2,200.0	2,179.0	2,169.5	4.8	5.2	-60.16	77.8	-135.6	159.5	149.8	9.64	16.538		
2,300.0	2,300.0	2,277.0	2,265.5	5.1	5.6	-58.98	90.5	-150.6	179.2	169.1	10.10	17.745		
2,400.0	2,400.0	2,374.9	2,361.5	5.3	6.0	-58.03	103.3	-165.5	199.1	188.5	10.56	18.849		
2,500.0	2,500.0	2,472.9	2,457.5	5.5	6.3	-57.26	116.0	-180.5	218.9	207.9	11.02	19.861		
2,600.0	2,600.0	2,571.0	2,553.6	5.7	6.7	-61.52	128.8	-195.4	238.2	226.7	11.47	20.770		
2,700.0	2,699.9	2,669.3	2,649.9	6.0	7.1	-61.49	141.6	-210.5	256.3	244.4	11.94	21.472		
2,800.0	2,799.7	2,767.9	2,746.4	6.2	7.5	-61.94	154.4	-225.5	273.1	260.7	12.41	22.017		
2,900.0	2,899.3	2,866.5	2,843.1	6.4	7.9	-62.79	167.3	-240.5	288.9	276.0	12.88	22.421		
3,000.0	2,998.6	2,965.1	2,939.7	6.6	8.3	-63.98	180.1	-255.6	303.5	290.1	13.37	22.700		
3,100.0	3,097.5	3,063.8	3,036.3	6.9	8.7	-65.49	193.0	-270.7	317.3	303.4	13.87	22.866		
3,200.0	3,196.1	3,162.3	3,132.9	7.1	9.2	-67.32	205.8	-285.7	330.3	315.9	14.40	22.934		
3,300.0	3,294.6	3,260.8	3,229.4	7.4	9.6	-69.19	218.6	-300.7	343.6	328.6	14.96	22.974		
3,400.0	3,393.1	3,359.3	3,325.9	7.7	10.0	-70.91	231.4	-315.8	357.2	341.6	15.52	23.005		
3,500.0	3,491.6	3,457.8	3,422.4	8.0	10.4	-72.52	244.3	-330.8	371.0	354.9	16.11	23.029		
3,600.0	3,590.1	3,556.4	3,518.9	8.3	10.8	-74.00	257.1	-345.8	385.2	368.5	16.71	23.046		
3,700.0	3,688.6	3,654.9	3,615.4	8.6	11.2	-75.38	269.9	-360.9	399.6	382.2	17.33	23.057		
3,800.0	3,787.1	3,753.4	3,711.9	8.9	11.7	-76.67	282.7	-375.9	414.2	396.2	17.96	23.063		
3,900.0	3,885.6	3,851.9	3,808.4	9.2	12.1	-77.87	295.6	-391.0	428.9	410.3	18.60	23.064		
4,000.0	3,984.2	3,950.4	3,904.9	9.5	12.5	-78.99	308.4	-406.0	443.9	424.7	19.25	23.062		
4,100.0	4,082.7	4,048.9	4,001.4	9.8	12.9	-80.03	321.2	-421.0	459.0	439.1	19.91	23.057		
4,200.0	4,181.2	4,147.4	4,098.0	10.2	13.4	-81.01	334.1	-436.1	474.3	453.7	20.58	23.050		
4,300.0	4,279.7	4,245.9	4,194.5	10.5	13.8	-81.93	346.9	-451.1	489.7	468.4	21.25	23.041		
4,400.0	4,378.2	4,344.5	4,291.0	10.8	14.2	-82.79	359.7	-466.1	505.2	483.2	21.93	23.030		
4,500.0	4,476.7	4,443.0	4,387.5	11.2	14.6	-83.60	372.5	-481.2	520.8	498.1	22.62	23.019		
4,600.0	4,575.2	4,541.5	4,484.0	11.5	15.1	-84.37	385.4	-496.2	536.5	513.1	23.32	23.007		
4,700.0	4,673.7	4,640.0	4,580.5	11.9	15.5	-85.09	398.2	-511.3	552.3	528.2	24.02	22.995		
4,800.0	4,772.2	4,738.5	4,677.0	12.2	15.9	-85.77	411.0	-526.3	568.1	543.4	24.72	22.983		
4,900.0	4,870.7	4,837.0	4,773.5	12.6	16.4	-86.41	423.8	-541.3	584.1	558.6	25.43	22.971		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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					
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
5,000.0	4,969.2	4,935.5	4,870.0	12.9	16.8	-87.02	436.7	-556.4	600.1	573.9	26.14	22.959					
5,100.0	5,067.7	5,034.0	4,966.5	13.3	17.2	-87.60	449.5	-571.4	616.2	589.3	26.85	22.947					
5,200.0	5,166.2	5,132.6	5,063.1	13.6	17.6	-88.15	462.3	-586.4	632.3	604.7	27.57	22.935					
5,300.0	5,264.7	5,239.0	5,167.4	14.0	18.1	-88.73	476.0	-602.4	648.3	620.0	28.29	22.912					
5,400.0	5,363.2	5,360.3	5,287.1	14.3	18.4	-89.56	489.0	-617.7	661.6	632.6	29.03	22.792					
5,500.0	5,461.7	5,482.1	5,407.9	14.7	18.7	-90.61	498.7	-629.1	671.7	641.9	29.76	22.571					
5,600.0	5,560.3	5,604.0	5,529.4	15.0	19.0	-91.91	505.1	-636.6	678.6	648.1	30.46	22.278					
5,700.0	5,659.4	5,726.0	5,651.3	15.3	19.2	-93.14	508.1	-640.1	682.2	651.2	31.04	21.976					
5,800.0	5,758.8	5,834.6	5,759.8	15.5	19.3	-94.07	508.4	-640.4	683.1	651.6	31.54	21.660					
5,900.0	5,858.6	5,934.3	5,859.6	15.7	19.5	-94.64	508.4	-640.4	683.6	651.7	31.97	21.386					
6,000.0	5,958.5	6,033.7	5,958.7	15.9	19.5	-95.41	502.3	-640.4	683.9	651.6	32.30	21.172					
6,100.0	6,058.5	6,129.9	6,053.2	16.1	19.5	-92.07	484.3	-640.4	684.4	651.8	32.58	21.007					
6,200.0	6,158.5	6,221.1	6,140.0	16.2	19.4	85.69	456.4	-640.4	686.0	653.2	32.80	20.913					
6,300.0	6,257.4	6,309.3	6,220.1	16.2	19.3	83.43	419.8	-640.4	688.8	656.0	32.83	20.980					
6,400.0	6,353.5	6,395.0	6,293.5	16.2	19.2	81.29	375.5	-640.4	692.5	659.8	32.67	21.195					
6,500.0	6,445.3	6,478.8	6,359.9	16.0	19.0	79.31	324.6	-640.4	696.7	664.3	32.35	21.536					
6,600.0	6,531.2	6,560.8	6,419.2	15.8	18.8	77.50	268.1	-640.4	701.3	669.4	31.92	21.970					
6,700.0	6,609.6	6,641.4	6,471.3	15.6	18.6	75.89	206.6	-640.4	706.0	674.5	31.45	22.446					
6,800.0	6,679.3	6,720.7	6,515.9	15.5	18.4	74.49	141.0	-640.4	710.4	679.4	31.03	22.897					
6,900.0	6,739.0	6,800.0	6,553.5	15.4	18.3	73.30	71.2	-640.4	714.5	683.8	30.75	23.239					
7,000.0	6,787.8	6,876.8	6,582.8	15.5	18.1	72.36	0.3	-640.4	718.0	687.3	30.72	23.373					
7,100.0	6,824.8	6,950.0	6,604.0	15.8	18.0	71.68	-69.7	-640.4	720.8	689.7	31.01	23.245					
7,200.0	6,849.3	7,030.6	6,619.4	16.2	18.0	71.19	-148.8	-640.4	722.6	690.9	31.72	22.778					
7,300.0	6,861.0	7,107.0	6,626.3	16.9	18.2	70.97	-224.9	-640.4	723.5	690.6	32.81	22.047					
7,400.0	6,862.0	7,197.2	6,626.8	17.7	18.8	70.95	-315.1	-640.4	723.6	689.2	34.35	21.066					
7,500.0	6,862.0	7,297.2	6,626.7	18.7	19.7	70.94	-415.1	-640.4	723.6	687.4	36.23	19.970					
7,600.0	6,862.0	7,397.2	6,626.6	19.8	20.8	70.93	-515.1	-640.4	723.6	685.3	38.38	18.856					
7,700.0	6,862.0	7,497.2	6,626.4	21.0	22.0	70.92	-615.1	-640.4	723.7	683.0	40.74	17.766					
7,800.0	6,862.0	7,597.2	6,626.3	22.3	23.3	70.91	-715.1	-640.4	723.7	680.5	43.28	16.724					
7,900.0	6,862.0	7,697.2	6,626.1	23.8	24.7	70.90	-815.1	-640.5	723.8	677.8	45.97	15.746					
8,000.0	6,862.0	7,797.2	6,626.0	25.2	26.1	70.89	-915.1	-640.5	723.8	675.0	48.78	14.838					
8,100.0	6,862.0	7,897.2	6,625.9	26.8	27.6	70.88	-1,015.1	-640.5	723.9	672.2	51.70	14.000					
8,200.0	6,862.0	7,997.2	6,625.7	28.3	29.2	70.87	-1,115.1	-640.5	723.9	669.2	54.71	13.231					
8,300.0	6,862.0	8,097.2	6,625.6	30.0	30.8	70.86	-1,215.1	-640.5	724.0	666.2	57.80	12.526					
8,400.0	6,862.0	8,197.2	6,625.5	31.6	32.4	70.85	-1,315.1	-640.5	724.0	663.1	60.95	11.880					
8,500.0	6,862.0	8,297.2	6,625.3	33.3	34.1	70.84	-1,415.1	-640.5	724.1	659.9	64.15	11.287					
8,600.0	6,862.0	8,397.2	6,625.2	35.0	35.7	70.83	-1,515.1	-640.5	724.1	656.7	67.39	10.744					
8,700.0	6,862.0	8,497.2	6,625.0	36.7	37.4	70.81	-1,615.1	-640.5	724.1	653.5	70.68	10.245					
8,800.0	6,862.0	8,597.2	6,624.9	38.5	39.1	70.80	-1,715.1	-640.5	724.2	650.2	74.00	9.786					
8,900.0	6,862.0	8,697.2	6,624.8	40.2	40.9	70.79	-1,815.1	-640.5	724.2	646.9	77.35	9.363					
9,000.0	6,862.0	8,797.2	6,624.6	42.0	42.6	70.78	-1,915.1	-640.5	724.3	643.6	80.73	8.972					
9,100.0	6,862.0	8,897.2	6,624.5	43.8	44.4	70.77	-2,015.1	-640.5	724.3	640.2	84.13	8.610					
9,200.0	6,862.0	8,997.2	6,624.3	45.6	46.2	70.76	-2,115.1	-640.5	724.4	636.8	87.55	8.274					
9,300.0	6,862.0	9,097.2	6,624.2	47.4	48.0	70.75	-2,215.1	-640.5	724.4	633.4	90.98	7.962					
9,400.0	6,862.0	9,197.2	6,624.1	49.2	49.8	70.74	-2,315.1	-640.5	724.5	630.0	94.44	7.672					
9,500.0	6,862.0	9,297.2	6,623.9	51.1	51.6	70.73	-2,415.1	-640.5	724.5	626.6	97.90	7.400					
9,600.0	6,862.0	9,397.2	6,623.8	52.9	53.4	70.72	-2,515.1	-640.5	724.6	623.2	101.38	7.147					
9,700.0	6,862.0	9,497.2	6,623.6	54.7	55.2	70.71	-2,615.1	-640.5	724.6	619.7	104.87	6.909					
9,800.0	6,862.0	9,597.2	6,623.5	56.6	57.0	70.70	-2,715.1	-640.5	724.7	616.3	108.37	6.687					
9,900.0	6,862.0	9,697.2	6,623.4	58.4	58.9	70.69	-2,815.1	-640.5	724.7	612.8	111.88	6.477					

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

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Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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 (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	6,862.0	9,797.2	6,623.2	60.3	60.7	70.68	-2,915.1	-640.5	724.7	609.3	115.40	6.280			
10,100.0	6,862.0	9,897.2	6,623.1	62.1	62.5	70.67	-3,015.1	-640.5	724.8	605.9	118.93	6.094			
10,200.0	6,862.0	9,997.2	6,622.9	64.0	64.4	70.66	-3,115.1	-640.5	724.8	602.4	122.46	5.919			
10,300.0	6,862.0	10,097.2	6,622.8	65.8	66.2	70.65	-3,215.1	-640.5	724.9	598.9	126.00	5.753			
10,400.0	6,862.0	10,197.2	6,622.7	67.7	68.1	70.64	-3,315.1	-640.5	724.9	595.4	129.55	5.596			
10,500.0	6,862.0	10,297.2	6,622.5	69.6	69.9	70.63	-3,415.1	-640.5	725.0	591.9	133.10	5.447			
10,600.0	6,862.0	10,397.2	6,622.4	71.5	71.8	70.62	-3,515.1	-640.5	725.0	588.4	136.65	5.306			
10,700.0	6,862.0	10,497.2	6,622.2	73.3	73.7	70.61	-3,615.1	-640.5	725.1	584.9	140.21	5.171			
10,800.0	6,862.0	10,597.2	6,622.1	75.2	75.5	70.60	-3,715.1	-640.5	725.1	581.3	143.77	5.043			
10,900.0	6,862.0	10,697.2	6,622.0	77.1	77.4	70.59	-3,815.1	-640.5	725.2	577.8	147.34	4.922			
11,000.0	6,862.0	10,797.2	6,621.8	79.0	79.3	70.58	-3,915.1	-640.5	725.2	574.3	150.91	4.806			
11,100.0	6,862.0	10,897.2	6,621.7	80.9	81.1	70.57	-4,015.1	-640.5	725.3	570.8	154.48	4.695			
11,200.0	6,862.0	10,997.2	6,621.5	82.7	83.0	70.55	-4,115.1	-640.5	725.3	567.2	158.06	4.589			
11,300.0	6,862.0	11,097.2	6,621.4	84.6	84.9	70.54	-4,215.1	-640.5	725.4	563.7	161.64	4.487			
11,400.0	6,862.0	11,197.2	6,621.3	86.5	86.8	70.53	-4,315.1	-640.5	725.4	560.2	165.22	4.390			
11,500.0	6,862.0	11,297.2	6,621.1	88.4	88.7	70.52	-4,415.1	-640.5	725.4	556.6	168.81	4.298			
11,600.0	6,862.0	11,397.2	6,621.0	90.3	90.5	70.51	-4,515.1	-640.5	725.5	553.1	172.39	4.208			
11,700.0	6,862.0	11,497.2	6,620.8	92.2	92.4	70.50	-4,615.1	-640.5	725.5	549.6	175.98	4.123			
11,800.0	6,862.0	11,597.2	6,620.7	94.1	94.3	70.49	-4,715.1	-640.5	725.6	546.0	179.57	4.041			
11,900.0	6,862.0	11,697.2	6,620.6	96.0	96.2	70.48	-4,815.1	-640.5	725.6	542.5	183.16	3.962			
12,000.0	6,862.0	11,797.2	6,620.4	97.9	98.1	70.47	-4,915.1	-640.5	725.7	538.9	186.75	3.886			
12,100.0	6,862.0	11,897.2	6,620.3	99.8	100.0	70.46	-5,015.1	-640.5	725.7	535.4	190.35	3.813			
12,200.0	6,862.0	11,997.2	6,620.1	101.7	101.9	70.45	-5,115.1	-640.5	725.8	531.8	193.94	3.742			
12,300.0	6,862.0	12,097.2	6,620.0	103.6	103.8	70.44	-5,215.1	-640.5	725.8	528.3	197.54	3.674			
12,400.0	6,862.0	12,197.2	6,619.9	105.4	105.6	70.43	-5,315.1	-640.5	725.9	524.7	201.14	3.609			
12,500.0	6,862.0	12,297.2	6,619.7	107.3	107.5	70.42	-5,415.1	-640.5	725.9	521.2	204.74	3.546			
12,600.0	6,862.0	12,397.2	6,619.6	109.2	109.4	70.41	-5,515.1	-640.5	726.0	517.6	208.34	3.485			
12,700.0	6,862.0	12,497.2	6,619.4	111.1	111.3	70.40	-5,615.1	-640.5	726.0	514.1	211.94	3.426			
12,800.0	6,862.0	12,597.2	6,619.3	113.0	113.2	70.39	-5,715.1	-640.5	726.1	510.5	215.54	3.368			
12,900.0	6,862.0	12,697.2	6,619.2	115.0	115.1	70.38	-5,815.1	-640.5	726.1	507.0	219.15	3.313			
13,000.0	6,862.0	12,797.2	6,619.0	116.9	117.0	70.37	-5,915.1	-640.5	726.1	503.4	222.75	3.260			
13,100.0	6,862.0	12,897.2	6,618.9	118.8	118.9	70.36	-6,015.1	-640.5	726.2	499.8	226.35	3.208			
13,200.0	6,862.0	12,997.2	6,618.7	120.7	120.8	70.35	-6,115.1	-640.5	726.2	496.3	229.96	3.158			
13,300.0	6,862.0	13,097.2	6,618.6	122.6	122.7	70.34	-6,215.1	-640.5	726.3	492.7	233.57	3.110			
13,400.0	6,862.0	13,197.2	6,618.5	124.5	124.6	70.33	-6,315.1	-640.5	726.3	489.2	237.17	3.062			
13,500.0	6,862.0	13,297.2	6,618.3	126.4	126.5	70.32	-6,415.1	-640.5	726.4	485.6	240.78	3.017			
13,600.0	6,862.0	13,397.2	6,618.2	128.3	128.4	70.31	-6,515.1	-640.5	726.4	482.0	244.39	2.972			
13,700.0	6,862.0	13,497.2	6,618.0	130.2	130.3	70.30	-6,615.1	-640.5	726.5	478.5	247.99	2.929			
13,800.0	6,862.0	13,597.2	6,617.9	132.1	132.2	70.28	-6,715.1	-640.5	726.5	474.9	251.60	2.888			
13,900.0	6,862.0	13,697.2	6,617.8	134.0	134.1	70.27	-6,815.1	-640.5	726.6	471.4	255.21	2.847			
14,000.0	6,862.0	13,797.2	6,617.6	135.9	136.0	70.26	-6,915.1	-640.5	726.6	467.8	258.82	2.807			
14,100.0	6,862.0	13,897.2	6,617.5	137.8	137.9	70.25	-7,015.1	-640.5	726.7	464.2	262.43	2.769			
14,200.0	6,862.0	13,997.2	6,617.4	139.7	139.8	70.24	-7,115.1	-640.5	726.7	460.7	266.04	2.732			
14,300.0	6,862.0	14,097.2	6,617.2	141.6	141.7	70.23	-7,215.1	-640.5	726.8	457.1	269.65	2.695			
14,400.0	6,862.0	14,197.2	6,617.1	143.5	143.6	70.22	-7,315.1	-640.5	726.8	453.6	273.26	2.660			
14,445.8	6,862.0	14,243.0	6,617.0	144.4	144.5	70.22	-7,360.9	-640.5	726.8	451.9	274.91	2.644 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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			
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	1.0	1.0	0.0	0.0	-89.97	0.0	-15.0	15.0	15.0	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-89.97	0.0	-15.0	15.0	14.8	0.23	66.276			
200.0	200.0	201.0	201.0	0.3	0.3	-89.97	0.0	-15.0	15.0	14.4	0.68	22.239			
300.0	300.0	301.0	301.0	0.6	0.6	-89.97	0.0	-15.0	15.0	13.9	1.13	13.361			
400.0	400.0	401.0	401.0	0.8	0.8	-89.97	0.0	-15.0	15.0	13.5	1.58	9.549			
500.0	500.0	501.0	501.0	1.0	1.0	-89.97	0.0	-15.0	15.0	13.0	2.03	7.429			
600.0	600.0	601.0	601.0	1.2	1.2	-89.97	0.0	-15.0	15.0	12.6	2.47	6.080			
700.0	700.0	701.0	701.0	1.5	1.5	-89.97	0.0	-15.0	15.0	12.1	2.92	5.145			
800.0	800.0	801.0	801.0	1.7	1.7	-89.97	0.0	-15.0	15.0	11.7	3.37	4.460			
900.0	900.0	901.0	901.0	1.9	1.9	-89.97	0.0	-15.0	15.0	11.2	3.82	3.935			
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-89.97	0.0	-15.0	15.0	10.8	4.27	3.521			
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-89.97	0.0	-15.0	15.0	10.3	4.72	3.186			
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-89.97	0.0	-15.0	15.0	9.9	5.17	2.909			
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-89.97	0.0	-15.0	15.0	9.4	5.62	2.676			
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-89.97	0.0	-15.0	15.0	9.0	6.07	2.478			
1,500.0	1,500.0	1,501.0	1,501.0	3.3	3.3	-89.97	0.0	-15.0	15.0	8.5	6.52	2.307			
1,600.0	1,600.0	1,601.0	1,601.0	3.5	3.5	-89.97	0.0	-15.0	15.0	8.1	6.97	2.159			
1,700.0	1,700.0	1,701.0	1,701.0	3.7	3.7	-89.97	0.0	-15.0	15.0	7.6	7.42	2.028			
1,800.0	1,800.0	1,801.0	1,801.0	3.9	3.9	-89.97	0.0	-15.0	15.0	7.2	7.87	1.912			
1,900.0	1,900.0	1,901.0	1,901.0	4.2	4.2	-89.97	0.0	-15.0	15.0	6.7	8.32	1.809			
1,966.3	1,966.3	1,967.3	1,967.3	4.3	4.3	-89.97	0.0	-15.0	15.0	6.4	8.62	1.746 CC			
2,000.0	2,000.0	2,001.0	2,001.0	4.4	4.4	-89.97	0.0	-15.0	15.0	6.3	8.77	1.716			
2,100.0	2,100.0	2,100.9	2,100.8	4.6	4.6	-85.26	1.3	-15.4	15.5	6.3	9.22	1.681 ES			
2,200.0	2,200.0	2,200.6	2,200.5	4.8	4.8	-73.10	5.0	-16.6	17.3	7.7	9.66	1.795			
2,300.0	2,300.0	2,300.0	2,299.7	5.1	5.1	-58.67	11.3	-18.5	21.7	11.6	10.11	2.147			
2,400.0	2,400.0	2,399.1	2,398.4	5.3	5.3	-46.73	19.9	-21.2	29.2	18.6	10.56	2.764			
2,500.0	2,500.0	2,497.6	2,496.2	5.5	5.5	-38.42	30.9	-24.5	39.8	28.8	11.01	3.616			
2,600.0	2,600.0	2,595.6	2,593.2	5.7	5.8	-38.53	44.3	-28.7	52.3	40.9	11.45	4.569			
2,700.0	2,699.9	2,694.8	2,691.2	6.0	6.0	-36.62	59.1	-33.2	64.3	52.4	11.90	5.405			
2,800.0	2,799.7	2,794.3	2,789.5	6.2	6.3	-36.47	74.0	-37.8	74.2	61.9	12.34	6.014			
2,900.0	2,899.3	2,894.0	2,887.9	6.4	6.6	-37.44	88.9	-42.3	82.0	69.3	12.78	6.418			
3,000.0	2,998.6	2,993.8	2,986.5	6.6	6.9	-39.31	103.8	-46.9	87.9	74.6	13.23	6.640			
3,100.0	3,097.5	3,093.6	3,085.1	6.9	7.1	-42.03	118.7	-51.5	91.8	78.1	13.69	6.705			
3,200.0	3,196.1	3,193.4	3,183.7	7.1	7.5	-45.56	133.6	-56.1	94.2	80.1	14.18	6.644			
3,300.0	3,294.6	3,293.2	3,282.2	7.4	7.8	-49.14	148.6	-60.7	96.7	82.0	14.71	6.572			
3,400.0	3,393.1	3,393.0	3,380.8	7.7	8.1	-52.53	163.5	-65.3	99.5	84.2	15.26	6.520			
3,500.0	3,491.6	3,492.8	3,479.4	8.0	8.4	-55.73	178.4	-69.8	102.6	86.8	15.83	6.484			
3,600.0	3,590.1	3,592.6	3,577.9	8.3	8.7	-58.73	193.3	-74.4	106.1	89.6	16.42	6.461			
3,700.0	3,688.6	3,692.4	3,676.5	8.6	9.0	-61.54	208.2	-79.0	109.8	92.8	17.02	6.449			
3,800.0	3,787.1	3,792.2	3,775.0	8.9	9.4	-64.15	223.1	-83.6	113.7	96.1	17.64	6.445			
3,900.0	3,885.6	3,892.0	3,873.6	9.2	9.7	-66.59	238.0	-88.2	117.9	99.6	18.28	6.449			
4,000.0	3,984.2	3,991.7	3,972.2	9.5	10.0	-68.85	252.9	-92.7	122.3	103.3	18.93	6.458			
4,100.0	4,082.7	4,091.5	4,070.7	9.8	10.4	-70.96	267.9	-97.3	126.8	107.2	19.60	6.472			
4,200.0	4,181.2	4,191.3	4,169.3	10.2	10.7	-72.92	282.8	-101.9	131.5	111.3	20.27	6.490			
4,300.0	4,279.7	4,291.1	4,267.9	10.5	11.0	-74.74	297.7	-106.5	136.4	115.5	20.95	6.511			
4,400.0	4,378.2	4,390.9	4,366.4	10.8	11.4	-76.43	312.6	-111.1	141.4	119.7	21.64	6.534			
4,500.0	4,476.7	4,490.7	4,465.0	11.2	11.7	-78.01	327.5	-115.6	146.5	124.1	22.33	6.559			
4,600.0	4,575.2	4,590.5	4,563.6	11.5	12.0	-79.48	342.4	-120.2	151.7	128.7	23.03	6.586			
4,700.0	4,673.7	4,690.3	4,662.1	11.9	12.4	-80.85	357.3	-124.8	157.0	133.2	23.74	6.613			
4,800.0	4,772.2	4,790.1	4,760.7	12.2	12.7	-82.14	372.2	-129.4	162.4	137.9	24.45	6.642			
4,900.0	4,870.7	4,889.9	4,859.3	12.6	13.1	-83.34	387.1	-134.0	167.8	142.7	25.16	6.671			

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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)			
5,000.0	4,969.2	4,989.7	4,957.8	12.9	13.4	-84.46	402.1	-138.5	173.3	147.5	25.87	6.700		
5,100.0	5,067.7	5,089.5	5,056.4	13.3	13.8	-85.51	417.0	-143.1	178.9	152.3	26.59	6.730		
5,200.0	5,166.2	5,189.2	5,154.9	13.6	14.1	-86.50	431.9	-147.7	184.6	157.3	27.30	6.760		
5,300.0	5,264.7	5,289.0	5,253.5	14.0	14.5	-87.43	446.8	-152.3	190.3	162.2	28.02	6.789		
5,400.0	5,363.2	5,388.8	5,352.1	14.3	14.8	-88.31	461.7	-156.9	196.0	167.3	28.75	6.818		
5,500.0	5,461.7	5,488.9	5,450.9	14.7	15.2	-89.14	476.6	-161.5	201.8	172.3	29.47	6.848		
5,600.0	5,560.3	5,591.4	5,552.4	15.0	15.4	-90.40	489.9	-165.5	206.8	176.7	30.11	6.870		
5,700.0	5,659.4	5,693.8	5,654.4	15.3	15.7	-91.69	499.7	-168.5	210.7	180.0	30.64	6.875		
5,800.0	5,758.8	5,796.3	5,756.6	15.5	15.9	-92.87	506.0	-170.5	213.2	182.1	31.11	6.854		
5,900.0	5,858.6	5,898.6	5,858.9	15.7	16.1	-93.98	508.8	-171.3	214.6	183.0	31.52	6.808		
6,000.0	5,958.5	5,999.3	5,959.6	15.9	16.2	-94.85	508.8	-171.4	214.9	183.0	31.87	6.742		
6,100.0	6,058.5	6,098.4	6,058.2	16.1	16.3	-92.34	500.2	-171.4	215.1	182.9	32.13	6.693		
6,200.0	6,158.5	6,194.3	6,151.9	16.2	16.3	82.76	479.8	-171.4	216.7	184.4	32.27	6.714		
6,300.0	6,257.4	6,287.8	6,240.0	16.2	16.1	77.84	448.8	-171.4	220.0	187.9	32.12	6.848		
6,400.0	6,353.5	6,379.4	6,322.0	16.2	16.0	73.31	408.2	-171.4	224.6	192.9	31.71	7.085		
6,500.0	6,445.3	6,469.2	6,397.2	16.0	15.8	69.23	359.1	-171.4	230.2	199.2	31.05	7.414		
6,600.0	6,531.2	6,557.5	6,465.0	15.8	15.6	65.66	302.6	-171.4	236.3	206.1	30.20	7.825		
6,700.0	6,609.6	6,644.4	6,524.9	15.6	15.5	62.59	239.7	-171.4	242.5	213.3	29.24	8.294		
6,800.0	6,679.3	6,730.3	6,576.7	15.5	15.4	60.02	171.2	-171.4	248.5	220.2	28.28	8.787		
6,900.0	6,739.0	6,815.3	6,620.1	15.4	15.3	57.94	98.2	-171.4	253.9	226.4	27.45	9.250		
7,000.0	6,787.8	6,900.0	6,655.0	15.5	15.4	56.30	21.1	-171.4	258.5	231.6	26.89	9.612		
7,100.0	6,824.8	6,983.2	6,680.8	15.8	15.7	55.12	-58.0	-171.4	262.1	235.3	26.76	9.794		
7,200.0	6,849.3	7,066.5	6,697.9	16.2	16.2	54.35	-139.5	-171.4	264.5	237.3	27.14	9.745		
7,300.0	6,861.0	7,150.0	6,706.0	16.9	16.7	53.99	-222.5	-171.4	265.6	237.6	28.07	9.464		
7,400.0	6,862.0	7,241.9	6,706.3	17.7	17.5	53.90	-314.5	-171.4	266.0	236.5	29.50	9.015		
7,500.0	6,862.0	7,341.9	6,705.7	18.7	18.5	53.79	-414.4	-171.4	266.3	235.1	31.20	8.535		
7,600.0	6,862.0	7,441.9	6,705.0	19.8	19.7	53.68	-514.4	-171.4	266.7	233.6	33.12	8.052		
7,700.0	6,862.0	7,541.9	6,704.4	21.0	20.9	53.57	-614.4	-171.4	267.1	231.8	35.23	7.582		
7,800.0	6,862.0	7,641.9	6,703.8	22.3	22.2	53.46	-714.4	-171.4	267.4	230.0	37.48	7.136		
7,900.0	6,862.0	7,741.9	6,703.1	23.8	23.7	53.35	-814.4	-171.4	267.8	228.0	39.85	6.720		
8,000.0	6,862.0	7,841.9	6,702.5	25.2	25.2	53.25	-914.4	-171.4	268.2	225.9	42.33	6.336		
8,100.0	6,862.0	7,941.9	6,701.9	26.8	26.7	53.14	-1,014.4	-171.4	268.6	223.7	44.88	5.984		
8,200.0	6,862.0	8,041.9	6,701.3	28.3	28.3	53.03	-1,114.4	-171.4	268.9	221.4	47.50	5.662		
8,300.0	6,862.0	8,141.9	6,700.6	30.0	29.9	52.92	-1,214.4	-171.4	269.3	219.1	50.18	5.367		
8,400.0	6,862.0	8,241.9	6,700.0	31.6	31.6	52.82	-1,314.4	-171.4	269.7	216.8	52.91	5.098		
8,500.0	6,862.0	8,341.9	6,699.4	33.3	33.3	52.71	-1,414.4	-171.4	270.1	214.4	55.67	4.852		
8,600.0	6,862.0	8,441.9	6,698.7	35.0	35.0	52.61	-1,514.4	-171.4	270.5	212.0	58.46	4.627		
8,700.0	6,862.0	8,541.9	6,698.1	36.7	36.7	52.50	-1,614.4	-171.4	270.8	209.6	61.28	4.420		
8,800.0	6,862.0	8,641.9	6,697.5	38.5	38.4	52.39	-1,714.4	-171.4	271.2	207.1	64.12	4.230		
8,900.0	6,862.0	8,741.9	6,696.9	40.2	40.2	52.29	-1,814.4	-171.4	271.6	204.6	66.98	4.055		
9,000.0	6,862.0	8,841.9	6,696.2	42.0	42.0	52.19	-1,914.4	-171.4	272.0	202.1	69.85	3.894		
9,100.0	6,862.0	8,941.9	6,695.6	43.8	43.8	52.08	-2,014.4	-171.4	272.4	199.7	72.74	3.745		
9,200.0	6,862.0	9,041.9	6,695.0	45.6	45.6	51.98	-2,114.4	-171.4	272.8	197.1	75.63	3.607		
9,300.0	6,862.0	9,141.9	6,694.4	47.4	47.4	51.87	-2,214.4	-171.4	273.2	194.6	78.53	3.478		
9,400.0	6,862.0	9,241.9	6,693.7	49.2	49.2	51.77	-2,314.4	-171.4	273.5	192.1	81.44	3.359		
9,500.0	6,862.0	9,341.9	6,693.1	51.1	51.0	51.67	-2,414.4	-171.4	273.9	189.6	84.36	3.247		
9,600.0	6,862.0	9,441.9	6,692.5	52.9	52.9	51.56	-2,514.4	-171.4	274.3	187.1	87.27	3.143		
9,700.0	6,862.0	9,541.9	6,691.8	54.7	54.7	51.46	-2,614.4	-171.4	274.7	184.5	90.19	3.046		
9,800.0	6,862.0	9,641.9	6,691.2	56.6	56.5	51.36	-2,714.4	-171.4	275.1	182.0	93.12	2.954		
9,900.0	6,862.0	9,741.9	6,690.6	58.4	58.4	51.26	-2,814.4	-171.4	275.5	179.5	96.04	2.869		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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	6,862.0	9,841.9	6,690.0	60.3	60.2	51.15	-2,914.3	-171.4	275.9	176.9	98.96	2.788		
10,100.0	6,862.0	9,941.9	6,689.3	62.1	62.1	51.05	-3,014.3	-171.4	276.3	174.4	101.88	2.712		
10,200.0	6,862.0	10,041.9	6,688.7	64.0	64.0	50.95	-3,114.3	-171.4	276.7	171.9	104.81	2.640		
10,300.0	6,862.0	10,141.9	6,688.1	65.8	65.8	50.85	-3,214.3	-171.4	277.1	169.4	107.73	2.572		
10,400.0	6,862.0	10,241.9	6,687.4	67.7	67.7	50.75	-3,314.3	-171.4	277.5	166.8	110.65	2.508		
10,500.0	6,862.0	10,341.9	6,686.8	69.6	69.6	50.65	-3,414.3	-171.4	277.9	164.3	113.56	2.447		
10,600.0	6,862.0	10,441.9	6,686.2	71.5	71.4	50.55	-3,514.3	-171.4	278.3	161.8	116.48	2.389		
10,700.0	6,862.0	10,541.9	6,685.6	73.3	73.3	50.45	-3,614.3	-171.4	278.7	159.3	119.39	2.334		
10,800.0	6,862.0	10,641.9	6,684.9	75.2	75.2	50.35	-3,714.3	-171.4	279.1	156.8	122.29	2.282		
10,900.0	6,862.0	10,741.9	6,684.3	77.1	77.1	50.25	-3,814.3	-171.4	279.5	154.3	125.20	2.232		
11,000.0	6,862.0	10,841.9	6,683.7	79.0	79.0	50.15	-3,914.3	-171.4	279.9	151.8	128.10	2.185		
11,100.0	6,862.0	10,941.9	6,683.0	80.9	80.8	50.05	-4,014.3	-171.4	280.3	149.3	130.99	2.140		
11,200.0	6,862.0	11,041.9	6,682.4	82.7	82.7	49.96	-4,114.3	-171.4	280.7	146.8	133.89	2.096		
11,300.0	6,862.0	11,141.9	6,681.8	84.6	84.6	49.86	-4,214.3	-171.4	281.1	144.3	136.78	2.055		
11,400.0	6,862.0	11,241.9	6,681.2	86.5	86.5	49.76	-4,314.3	-171.4	281.5	141.8	139.66	2.016		
11,500.0	6,862.0	11,341.9	6,680.5	88.4	88.4	49.66	-4,414.3	-171.4	281.9	139.4	142.54	1.978		
11,600.0	6,862.0	11,441.9	6,679.9	90.3	90.3	49.57	-4,514.3	-171.4	282.3	136.9	145.41	1.941		
11,700.0	6,862.0	11,541.9	6,679.3	92.2	92.2	49.47	-4,614.3	-171.4	282.7	134.4	148.28	1.907		
11,800.0	6,862.0	11,641.8	6,678.6	94.1	94.1	49.37	-4,714.3	-171.4	283.1	132.0	151.15	1.873		
11,900.0	6,862.0	11,741.8	6,678.0	96.0	96.0	49.28	-4,814.3	-171.4	283.5	129.5	154.01	1.841		
12,000.0	6,862.0	11,841.8	6,677.4	97.9	97.9	49.18	-4,914.3	-171.4	283.9	127.1	156.86	1.810		
12,100.0	6,862.0	11,941.8	6,676.8	99.8	99.7	49.08	-5,014.3	-171.4	284.4	124.6	159.71	1.780		
12,200.0	6,862.0	12,041.8	6,676.1	101.7	101.6	48.99	-5,114.3	-171.4	284.8	122.2	162.56	1.752		
12,300.0	6,862.0	12,141.8	6,675.5	103.6	103.5	48.89	-5,214.3	-171.4	285.2	119.8	165.40	1.724		
12,400.0	6,862.0	12,241.8	6,674.9	105.4	105.4	48.80	-5,314.3	-171.4	285.6	117.4	168.23	1.698		
12,500.0	6,862.0	12,341.8	6,674.2	107.3	107.3	48.70	-5,414.2	-171.4	286.0	115.0	171.06	1.672		
12,600.0	6,862.0	12,441.8	6,673.6	109.2	109.2	48.61	-5,514.2	-171.4	286.4	112.5	173.89	1.647		
12,700.0	6,862.0	12,541.8	6,673.0	111.1	111.1	48.51	-5,614.2	-171.4	286.8	110.1	176.70	1.623		
12,800.0	6,862.0	12,641.8	6,672.4	113.0	113.0	48.42	-5,714.2	-171.4	287.3	107.7	179.52	1.600		
12,900.0	6,862.0	12,741.8	6,671.7	115.0	114.9	48.33	-5,814.2	-171.4	287.7	105.4	182.33	1.578		
13,000.0	6,862.0	12,841.8	6,671.1	116.9	116.8	48.23	-5,914.2	-171.4	288.1	103.0	185.13	1.556		
13,100.0	6,862.0	12,941.8	6,670.5	118.8	118.7	48.14	-6,014.2	-171.4	288.5	100.6	187.92	1.535		
13,200.0	6,862.0	13,041.8	6,669.8	120.7	120.7	48.05	-6,114.2	-171.4	288.9	98.2	190.71	1.515		
13,300.0	6,862.0	13,141.8	6,669.2	122.6	122.6	47.96	-6,214.2	-171.4	289.4	95.9	193.50	1.495 Level 3		
13,400.0	6,862.0	13,241.8	6,668.6	124.5	124.5	47.86	-6,314.2	-171.4	289.8	93.5	196.28	1.476 Level 3		
13,500.0	6,862.0	13,341.8	6,668.0	126.4	126.4	47.77	-6,414.2	-171.4	290.2	91.1	199.05	1.458 Level 3		
13,600.0	6,862.0	13,441.8	6,667.3	128.3	128.3	47.68	-6,514.2	-171.4	290.6	88.8	201.82	1.440 Level 3		
13,700.0	6,862.0	13,541.8	6,666.7	130.2	130.2	47.59	-6,614.2	-171.4	291.0	86.5	204.58	1.423 Level 3		
13,800.0	6,862.0	13,641.8	6,666.1	132.1	132.1	47.50	-6,714.2	-171.4	291.5	84.1	207.34	1.406 Level 3		
13,900.0	6,862.0	13,741.8	6,665.4	134.0	134.0	47.41	-6,814.2	-171.4	291.9	81.8	210.09	1.389 Level 3		
14,000.0	6,862.0	13,841.8	6,664.8	135.9	135.9	47.32	-6,914.2	-171.4	292.3	79.5	212.84	1.373 Level 3		
14,100.0	6,862.0	13,941.8	6,664.2	137.8	137.8	47.22	-7,014.2	-171.4	292.7	77.2	215.58	1.358 Level 3		
14,200.0	6,862.0	14,041.8	6,663.6	139.7	139.7	47.13	-7,114.2	-171.4	293.2	74.9	218.31	1.343 Level 3		
14,300.0	6,862.0	14,141.8	6,662.9	141.6	141.6	47.04	-7,214.2	-171.4	293.6	72.6	221.04	1.328 Level 3		
14,400.0	6,862.0	14,241.8	6,662.3	143.5	143.5	46.96	-7,314.2	-171.4	294.0	70.3	223.76	1.314 Level 3		
14,445.8	6,862.0	14,287.6	6,662.0	144.4	144.4	46.91	-7,360.0	-171.4	294.2	69.2	225.01	1.308 Level 3, SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	1.0	1.0	0.0	0.0	-89.65	0.4	-59.9	59.9	59.9	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.65	0.4	-59.9	59.9	59.7	0.23	263.881		
200.0	200.0	201.0	201.0	0.3	0.3	-89.65	0.4	-59.9	59.9	59.2	0.68	88.545		
300.0	300.0	301.0	301.0	0.6	0.6	-89.65	0.4	-59.9	59.9	58.8	1.13	53.198		
400.0	400.0	401.0	401.0	0.8	0.8	-89.65	0.4	-59.9	59.9	58.3	1.58	38.020		
500.0	500.0	501.0	501.0	1.0	1.0	-89.65	0.4	-59.9	59.9	57.9	2.03	29.580		
600.0	600.0	601.0	601.0	1.2	1.2	-89.65	0.4	-59.9	59.9	57.4	2.47	24.207		
700.0	700.0	701.0	701.0	1.5	1.5	-89.65	0.4	-59.9	59.9	57.0	2.92	20.486		
800.0	800.0	801.0	801.0	1.7	1.7	-89.65	0.4	-59.9	59.9	56.5	3.37	17.756		
900.0	900.0	901.0	901.0	1.9	1.9	-89.65	0.4	-59.9	59.9	56.1	3.82	15.668		
966.3	966.3	967.3	967.3	2.1	2.1	-89.65	0.4	-59.9	59.9	55.8	4.12	14.535 CC		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-89.65	0.4	-59.9	59.9	55.6	4.27	14.020 ES		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-89.01	1.1	-61.0	61.0	56.3	4.71	12.949		
1,200.0	1,200.0	1,198.2	1,198.1	2.6	2.6	-87.26	3.1	-64.3	64.4	59.3	5.15	12.511		
1,300.0	1,300.0	1,296.4	1,296.1	2.8	2.8	-84.73	6.4	-69.7	70.1	64.6	5.59	12.554		
1,400.0	1,400.0	1,394.3	1,393.6	3.0	3.0	-81.83	11.1	-77.2	78.3	72.3	6.03	12.993		
1,500.0	1,500.0	1,491.7	1,490.3	3.3	3.3	-78.91	17.0	-86.8	89.1	82.6	6.47	13.758		
1,600.0	1,600.0	1,588.4	1,586.0	3.5	3.5	-76.19	24.2	-98.4	102.4	95.5	6.92	14.794		
1,700.0	1,700.0	1,684.3	1,680.7	3.7	3.8	-73.77	32.6	-111.9	118.3	110.9	7.37	16.049		
1,800.0	1,800.0	1,779.4	1,774.0	3.9	4.1	-71.70	42.1	-127.3	136.7	128.9	7.82	17.483		
1,900.0	1,900.0	1,873.5	1,866.0	4.2	4.5	-69.94	52.7	-144.5	157.7	149.4	8.27	19.060		
2,000.0	2,000.0	1,969.7	1,959.5	4.4	4.8	-68.46	64.5	-163.5	180.6	171.8	8.73	20.673		
2,100.0	2,100.0	2,066.9	2,054.0	4.6	5.3	-67.30	76.5	-182.8	203.6	194.4	9.20	22.139		
2,200.0	2,200.0	2,164.2	2,148.5	4.8	5.7	-66.37	88.4	-202.1	226.7	217.1	9.66	23.467		
2,300.0	2,300.0	2,261.4	2,243.1	5.1	6.1	-65.61	100.4	-221.4	249.9	239.8	10.13	24.672		
2,400.0	2,400.0	2,358.6	2,337.6	5.3	6.5	-64.98	112.3	-240.7	273.1	262.5	10.60	25.769		
2,500.0	2,500.0	2,455.9	2,432.2	5.5	7.0	-64.45	124.3	-260.0	296.3	285.2	11.07	26.771		
2,600.0	2,600.0	2,553.2	2,526.9	5.7	7.4	-68.77	136.3	-279.3	319.1	307.6	11.51	27.720		
2,700.0	2,699.9	2,650.8	2,621.7	6.0	7.9	-68.68	148.3	-298.7	340.9	328.9	11.99	28.443		
2,800.0	2,799.7	2,748.5	2,716.7	6.2	8.4	-68.97	160.3	-318.1	361.9	349.4	12.47	29.028		
2,900.0	2,899.3	2,846.3	2,811.8	6.4	8.8	-69.59	172.3	-337.5	382.0	369.0	12.95	29.488		
3,000.0	2,998.6	2,944.1	2,906.9	6.6	9.3	-70.47	184.4	-356.9	401.3	387.8	13.45	29.833		
3,100.0	3,097.5	3,041.8	3,002.0	6.9	9.8	-71.60	196.4	-376.3	419.9	406.0	13.97	30.071		
3,200.0	3,196.1	3,139.5	3,096.9	7.1	10.2	-73.02	208.4	-395.7	438.1	423.6	14.50	30.212		
3,300.0	3,294.6	3,237.1	3,191.8	7.4	10.7	-74.54	220.4	-415.1	456.5	441.4	15.06	30.312		
3,400.0	3,393.1	3,334.7	3,286.7	7.7	11.2	-75.94	232.4	-434.5	475.1	459.5	15.64	30.389		
3,500.0	3,491.6	3,432.3	3,381.6	8.0	11.7	-77.23	244.4	-453.9	494.0	477.8	16.23	30.445		
3,600.0	3,590.1	3,529.9	3,476.5	8.3	12.1	-78.43	256.4	-473.3	513.2	496.3	16.83	30.485		
3,700.0	3,688.6	3,627.5	3,571.4	8.6	12.6	-79.54	268.4	-492.6	532.5	515.1	17.45	30.510		
3,800.0	3,787.1	3,725.1	3,666.3	8.9	13.1	-80.58	280.4	-512.0	552.0	533.9	18.09	30.522		
3,900.0	3,885.6	3,822.7	3,761.2	9.2	13.6	-81.55	292.4	-531.4	571.7	553.0	18.73	30.525		
4,000.0	3,984.2	3,920.3	3,856.1	9.5	14.1	-82.45	304.4	-550.8	591.5	572.2	19.38	30.519		
4,100.0	4,082.7	4,017.9	3,951.0	9.8	14.5	-83.29	316.4	-570.1	611.5	591.5	20.04	30.507		
4,200.0	4,181.2	4,115.5	4,045.9	10.2	15.0	-84.08	328.4	-589.5	631.6	610.9	20.71	30.489		
4,300.0	4,279.7	4,213.1	4,140.8	10.5	15.5	-84.82	340.4	-608.9	651.8	630.4	21.39	30.467		
4,400.0	4,378.2	4,310.7	4,235.7	10.8	16.0	-85.52	352.4	-628.3	672.1	650.0	22.08	30.442		
4,500.0	4,476.7	4,408.3	4,330.6	11.2	16.5	-86.18	364.4	-647.7	692.4	669.7	22.77	30.415		
4,600.0	4,575.2	4,505.9	4,425.5	11.5	17.0	-86.80	376.4	-667.0	712.9	689.4	23.46	30.385		
4,700.0	4,673.7	4,603.5	4,520.4	11.9	17.4	-87.38	388.4	-686.4	733.4	709.3	24.16	30.354		
4,800.0	4,772.2	4,701.1	4,615.3	12.2	17.9	-87.93	400.4	-705.8	754.0	729.2	24.87	30.323		
4,900.0	4,870.7	4,798.7	4,710.2	12.6	18.4	-88.46	412.4	-725.2	774.7	749.1	25.58	30.291		

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)				
5,000.0	4,969.2	4,896.3	4,805.1	12.9	18.9	-88.95	424.4	-744.6	795.4	769.2	26.29	30.258			
5,100.0	5,067.7	4,993.9	4,900.0	13.3	19.4	-89.43	436.4	-763.9	816.2	789.2	27.00	30.226			
5,200.0	5,166.2	5,091.5	4,994.9	13.6	19.9	-89.87	448.4	-783.3	837.1	809.3	27.72	30.194			
5,300.0	5,264.7	5,189.1	5,089.8	14.0	20.4	-90.30	460.4	-802.7	857.9	829.5	28.44	30.162			
5,400.0	5,363.2	5,306.9	5,204.6	14.3	20.9	-90.82	474.4	-825.3	878.2	849.0	29.22	30.055			
5,500.0	5,461.7	5,441.5	5,336.9	14.7	21.3	-91.56	487.5	-846.4	895.0	865.0	30.00	29.830			
5,600.0	5,560.3	5,577.2	5,471.3	15.0	21.7	-92.56	497.4	-862.4	907.7	876.9	30.77	29.504			
5,700.0	5,659.4	5,714.0	5,607.4	15.3	22.0	-93.51	504.0	-872.9	916.4	884.9	31.42	29.167			
5,800.0	5,758.8	5,851.3	5,744.6	15.5	22.2	-94.28	507.1	-878.0	920.8	888.8	31.98	28.792			
5,900.0	5,858.6	5,966.3	5,859.6	15.7	22.3	-94.76	507.4	-878.5	921.6	889.2	32.43	28.423			
6,000.0	5,958.5	6,066.2	5,959.5	15.9	22.4	-94.96	507.4	-878.5	921.9	889.1	32.79	28.117			
6,100.0	6,058.5	6,165.5	6,058.5	16.1	22.5	-90.50	501.0	-878.5	922.0	888.9	33.09	27.864			
6,200.0	6,158.5	6,262.0	6,153.2	16.2	22.5	88.48	482.6	-878.5	922.3	888.9	33.34	27.664			
6,300.0	6,257.4	6,356.4	6,242.8	16.2	22.4	87.43	453.2	-878.5	922.9	889.5	33.38	27.644			
6,400.0	6,353.5	6,450.0	6,327.5	16.2	22.3	86.41	413.3	-878.5	923.8	890.5	33.25	27.784			
6,500.0	6,445.3	6,539.9	6,403.6	16.0	22.1	85.48	365.5	-878.5	924.9	891.9	32.97	28.048			
6,600.0	6,531.2	6,629.5	6,473.3	15.8	22.0	84.62	309.4	-878.5	926.1	893.5	32.62	28.391			
6,700.0	6,609.6	6,717.8	6,535.2	15.6	21.8	83.84	246.5	-878.5	927.4	895.1	32.26	28.748			
6,800.0	6,679.3	6,805.1	6,588.8	15.5	21.6	83.16	177.6	-878.5	928.6	896.6	31.97	29.044			
6,900.0	6,739.0	6,891.5	6,633.8	15.4	21.4	82.58	103.9	-878.5	929.8	897.9	31.86	29.184			
7,000.0	6,787.8	6,977.3	6,669.9	15.5	21.3	82.11	26.1	-878.5	930.8	898.8	32.00	29.085			
7,100.0	6,824.8	7,062.5	6,697.0	15.8	21.2	81.77	-54.6	-878.5	931.6	899.1	32.46	28.698			
7,200.0	6,849.3	7,150.0	6,715.2	16.2	21.2	81.54	-140.1	-878.5	932.1	898.8	33.29	27.998			
7,300.0	6,861.0	7,232.1	6,723.4	16.9	21.3	81.44	-221.8	-878.5	932.3	897.9	34.46	27.055			
7,400.0	6,862.0	7,324.8	6,723.8	17.7	21.6	81.41	-314.5	-878.5	932.4	896.4	36.02	25.886			
7,500.0	6,862.0	7,424.8	6,723.1	18.7	22.1	81.37	-414.5	-878.5	932.5	894.6	37.92	24.591			
7,600.0	6,862.0	7,524.8	6,722.5	19.8	22.9	81.33	-514.5	-878.5	932.6	892.5	40.09	23.261			
7,700.0	6,862.0	7,624.8	6,721.8	21.0	23.9	81.29	-614.5	-878.5	932.7	890.2	42.49	21.949			
7,800.0	6,862.0	7,724.8	6,721.1	22.3	25.0	81.25	-714.5	-878.5	932.8	887.7	45.09	20.688			
7,900.0	6,862.0	7,824.8	6,720.5	23.8	26.3	81.21	-814.5	-878.5	932.9	885.0	47.84	19.499			
8,000.0	6,862.0	7,924.8	6,719.8	25.2	27.6	81.17	-914.5	-878.5	933.0	882.3	50.73	18.390			
8,100.0	6,862.0	8,024.8	6,719.1	26.8	29.0	81.13	-1,014.5	-878.5	933.1	879.4	53.73	17.365			
8,200.0	6,862.0	8,124.8	6,718.5	28.3	30.5	81.09	-1,114.5	-878.5	933.2	876.4	56.83	16.420			
8,300.0	6,862.0	8,224.8	6,717.8	30.0	32.0	81.05	-1,214.5	-878.5	933.3	873.3	60.01	15.553			
8,400.0	6,862.0	8,324.8	6,717.2	31.6	33.6	81.01	-1,314.5	-878.5	933.4	870.1	63.25	14.756			
8,500.0	6,862.0	8,424.8	6,716.5	33.3	35.2	80.97	-1,414.5	-878.5	933.5	867.0	66.56	14.026			
8,600.0	6,862.0	8,524.8	6,715.8	35.0	36.8	80.93	-1,514.5	-878.5	933.6	863.7	69.91	13.355			
8,700.0	6,862.0	8,624.8	6,715.2	36.7	38.4	80.89	-1,614.5	-878.5	933.7	860.4	73.30	12.738			
8,800.0	6,862.0	8,724.8	6,714.5	38.5	40.1	80.85	-1,714.4	-878.5	933.8	857.1	76.73	12.170			
8,900.0	6,862.0	8,824.8	6,713.8	40.2	41.8	80.81	-1,814.4	-878.5	933.9	853.7	80.20	11.645			
9,000.0	6,862.0	8,924.8	6,713.2	42.0	43.5	80.77	-1,914.4	-878.5	934.0	850.3	83.69	11.161			
9,100.0	6,862.0	9,024.8	6,712.5	43.8	45.3	80.73	-2,014.4	-878.5	934.1	846.9	87.20	10.712			
9,200.0	6,862.0	9,124.8	6,711.8	45.6	47.0	80.69	-2,114.4	-878.5	934.2	843.5	90.74	10.296			
9,300.0	6,862.0	9,224.8	6,711.2	47.4	48.8	80.65	-2,214.4	-878.5	934.4	840.1	94.30	9.909			
9,400.0	6,862.0	9,324.8	6,710.5	49.2	50.5	80.61	-2,314.4	-878.5	934.5	836.6	97.87	9.548			
9,500.0	6,862.0	9,424.8	6,709.9	51.1	52.3	80.57	-2,414.4	-878.5	934.6	833.1	101.46	9.212			
9,600.0	6,862.0	9,524.8	6,709.2	52.9	54.1	80.53	-2,514.4	-878.5	934.7	829.6	105.06	8.897			
9,700.0	6,862.0	9,624.8	6,708.5	54.7	55.9	80.49	-2,614.4	-878.5	934.8	826.1	108.67	8.602			
9,800.0	6,862.0	9,724.8	6,707.9	56.6	57.7	80.45	-2,714.4	-878.5	934.9	822.6	112.29	8.326			
9,900.0	6,862.0	9,824.8	6,707.2	58.4	59.5	80.41	-2,814.4	-878.5	935.0	819.1	115.93	8.066			

COMPASS 5000.1 Build 74

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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)				
10,000.0	6,862.0	9,924.8	6,706.5	60.3	61.3	80.37	-2,914.4	-878.5	935.1	815.6	119.57	7.821			
10,100.0	6,862.0	10,024.8	6,705.9	62.1	63.2	80.33	-3,014.4	-878.5	935.2	812.0	123.22	7.590			
10,200.0	6,862.0	10,124.8	6,705.2	64.0	65.0	80.29	-3,114.4	-878.5	935.3	808.5	126.87	7.372			
10,300.0	6,862.0	10,224.8	6,704.6	65.8	66.8	80.25	-3,214.4	-878.5	935.5	804.9	130.54	7.166			
10,400.0	6,862.0	10,324.8	6,703.9	67.7	68.7	80.21	-3,314.4	-878.5	935.6	801.4	134.20	6.971			
10,500.0	6,862.0	10,424.8	6,703.2	69.6	70.5	80.17	-3,414.4	-878.5	935.7	797.8	137.88	6.786			
10,600.0	6,862.0	10,524.8	6,702.6	71.5	72.3	80.13	-3,514.4	-878.5	935.8	794.2	141.56	6.611			
10,700.0	6,862.0	10,624.8	6,701.9	73.3	74.2	80.09	-3,614.4	-878.5	935.9	790.7	145.24	6.444			
10,800.0	6,862.0	10,724.8	6,701.2	75.2	76.0	80.05	-3,714.4	-878.5	936.0	787.1	148.93	6.285			
10,900.0	6,862.0	10,824.8	6,700.6	77.1	77.9	80.01	-3,814.4	-878.5	936.1	783.5	152.62	6.134			
11,000.0	6,862.0	10,924.8	6,699.9	79.0	79.8	79.97	-3,914.4	-878.5	936.3	779.9	156.31	5.990			
11,100.0	6,862.0	11,024.7	6,699.2	80.9	81.6	79.93	-4,014.3	-878.5	936.4	776.4	160.01	5.852			
11,200.0	6,862.0	11,124.7	6,698.6	82.7	83.5	79.89	-4,114.3	-878.5	936.5	772.8	163.71	5.721			
11,300.0	6,862.0	11,224.7	6,697.9	84.6	85.4	79.85	-4,214.3	-878.5	936.6	769.2	167.41	5.595			
11,400.0	6,862.0	11,324.7	6,697.3	86.5	87.2	79.81	-4,314.3	-878.5	936.7	765.6	171.11	5.474			
11,500.0	6,862.0	11,424.7	6,696.6	88.4	89.1	79.77	-4,414.3	-878.5	936.8	762.0	174.82	5.359			
11,600.0	6,862.0	11,524.7	6,695.9	90.3	91.0	79.73	-4,514.3	-878.5	937.0	758.4	178.53	5.248			
11,700.0	6,862.0	11,624.7	6,695.3	92.2	92.8	79.69	-4,614.3	-878.5	937.1	754.8	182.24	5.142			
11,800.0	6,862.0	11,724.7	6,694.6	94.1	94.7	79.65	-4,714.3	-878.5	937.2	751.3	185.95	5.040			
11,900.0	6,862.0	11,824.7	6,693.9	96.0	96.6	79.61	-4,814.3	-878.5	937.3	747.7	189.66	4.942			
12,000.0	6,862.0	11,924.7	6,693.3	97.9	98.5	79.57	-4,914.3	-878.5	937.4	744.1	193.37	4.848			
12,100.0	6,862.0	12,024.7	6,692.6	99.8	100.4	79.53	-5,014.3	-878.5	937.6	740.5	197.09	4.757			
12,200.0	6,862.0	12,124.7	6,692.0	101.7	102.2	79.49	-5,114.3	-878.5	937.7	736.9	200.80	4.670			
12,300.0	6,862.0	12,224.7	6,691.3	103.6	104.1	79.45	-5,214.3	-878.5	937.8	733.3	204.52	4.585			
12,400.0	6,862.0	12,324.7	6,690.6	105.4	106.0	79.41	-5,314.3	-878.5	937.9	729.7	208.24	4.504			
12,500.0	6,862.0	12,424.7	6,690.0	107.3	107.9	79.37	-5,414.3	-878.5	938.0	726.1	211.96	4.426			
12,600.0	6,862.0	12,524.7	6,689.3	109.2	109.8	79.33	-5,514.3	-878.5	938.2	722.5	215.68	4.350			
12,700.0	6,862.0	12,624.7	6,688.6	111.1	111.7	79.29	-5,614.3	-878.5	938.3	718.9	219.39	4.277			
12,800.0	6,862.0	12,724.7	6,688.0	113.0	113.6	79.25	-5,714.3	-878.5	938.4	715.3	223.11	4.206			
12,900.0	6,862.0	12,824.7	6,687.3	115.0	115.5	79.21	-5,814.3	-878.5	938.5	711.7	226.84	4.138			
13,000.0	6,862.0	12,924.7	6,686.6	116.9	117.3	79.17	-5,914.3	-878.5	938.7	708.1	230.56	4.071			
13,100.0	6,862.0	13,024.7	6,686.0	118.8	119.2	79.13	-6,014.3	-878.5	938.8	704.5	234.28	4.007			
13,200.0	6,862.0	13,124.7	6,685.3	120.7	121.1	79.09	-6,114.3	-878.5	938.9	700.9	238.00	3.945			
13,300.0	6,862.0	13,224.7	6,684.7	122.6	123.0	79.05	-6,214.3	-878.5	939.0	697.3	241.72	3.885			
13,400.0	6,862.0	13,324.7	6,684.0	124.5	124.9	79.01	-6,314.2	-878.5	939.2	693.7	245.44	3.826			
13,500.0	6,862.0	13,424.7	6,683.3	126.4	126.8	78.97	-6,414.2	-878.5	939.3	690.1	249.16	3.770			
13,600.0	6,862.0	13,524.7	6,682.7	128.3	128.7	78.93	-6,514.2	-878.5	939.4	686.5	252.88	3.715			
13,700.0	6,862.0	13,624.7	6,682.0	130.2	130.6	78.89	-6,614.2	-878.5	939.6	682.9	256.60	3.661			
13,800.0	6,862.0	13,724.7	6,681.3	132.1	132.5	78.85	-6,714.2	-878.5	939.7	679.4	260.32	3.610			
13,900.0	6,862.0	13,824.7	6,680.7	134.0	134.4	78.81	-6,814.2	-878.5	939.8	675.8	264.05	3.559			
14,000.0	6,862.0	13,924.7	6,680.0	135.9	136.3	78.77	-6,914.2	-878.5	939.9	672.2	267.77	3.510			
14,100.0	6,862.0	14,024.7	6,679.4	137.8	138.2	78.73	-7,014.2	-878.5	940.1	668.6	271.49	3.463			
14,200.0	6,862.0	14,124.7	6,678.7	139.7	140.1	78.69	-7,114.2	-878.5	940.2	665.0	275.21	3.416			
14,300.0	6,862.0	14,224.7	6,678.0	141.6	142.0	78.66	-7,214.2	-878.5	940.3	661.4	278.93	3.371			
14,400.0	6,862.0	14,324.7	6,677.4	143.5	143.9	78.62	-7,314.2	-878.5	940.5	657.8	282.65	3.327			
14,445.8	6,862.0	14,370.5	6,677.1	144.4	144.8	78.60	-7,360.0	-878.5	940.5	656.2	284.35	3.308 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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	1.0	1.0	0.0	0.0	-89.30	0.4	-29.8	29.8	29.8	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-89.30	0.4	-29.8	29.8	29.6	0.23	131.334			
200.0	200.0	201.0	201.0	0.3	0.3	-89.30	0.4	-29.8	29.8	29.1	0.68	44.069			
300.0	300.0	301.0	301.0	0.6	0.6	-89.30	0.4	-29.8	29.8	28.7	1.13	26.477			
400.0	400.0	401.0	401.0	0.8	0.8	-89.30	0.4	-29.8	29.8	28.2	1.58	18.923			
500.0	500.0	501.0	501.0	1.0	1.0	-89.30	0.4	-29.8	29.8	27.8	2.03	14.722			
600.0	600.0	601.0	601.0	1.2	1.2	-89.30	0.4	-29.8	29.8	27.3	2.47	12.048			
700.0	700.0	701.0	701.0	1.5	1.5	-89.30	0.4	-29.8	29.8	26.9	2.92	10.196			
800.0	800.0	801.0	801.0	1.7	1.7	-89.30	0.4	-29.8	29.8	26.4	3.37	8.837			
900.0	900.0	901.0	901.0	1.9	1.9	-89.30	0.4	-29.8	29.8	26.0	3.82	7.798			
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-89.30	0.4	-29.8	29.8	25.5	4.27	6.978			
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-89.30	0.4	-29.8	29.8	25.1	4.72	6.314			
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-89.30	0.4	-29.8	29.8	24.6	5.17	5.765			
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-89.30	0.4	-29.8	29.8	24.2	5.62	5.304			
1,366.3	1,366.3	1,367.3	1,367.3	3.0	3.0	-89.30	0.4	-29.8	29.8	23.9	5.92	5.037 CC			
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-89.30	0.4	-29.8	29.8	23.7	6.07	4.911 ES			
1,500.0	1,500.0	1,500.5	1,500.5	3.3	3.3	-87.34	1.4	-30.6	30.6	24.1	6.52	4.702			
1,600.0	1,600.0	1,600.0	1,599.9	3.5	3.5	-82.12	4.6	-32.9	33.3	26.3	6.96	4.782			
1,700.0	1,700.0	1,699.0	1,698.7	3.7	3.7	-75.19	9.7	-36.8	38.1	30.7	7.40	5.153			
1,800.0	1,800.0	1,797.7	1,796.9	3.9	3.9	-68.13	16.9	-42.2	45.6	37.8	7.85	5.816			
1,900.0	1,900.0	1,895.8	1,894.4	4.2	4.2	-61.97	26.1	-49.0	55.9	47.7	8.30	6.744			
2,000.0	2,000.0	1,993.3	1,991.0	4.4	4.4	-57.02	37.2	-57.3	69.1	60.3	8.74	7.901			
2,100.0	2,100.0	2,091.5	2,087.8	4.6	4.7	-53.26	49.9	-66.8	84.4	75.2	9.20	9.180			
2,200.0	2,200.0	2,190.2	2,185.2	4.8	5.0	-50.62	62.7	-76.4	100.1	90.5	9.65	10.377			
2,300.0	2,300.0	2,288.9	2,282.6	5.1	5.3	-48.70	75.6	-86.0	115.9	105.8	10.10	11.480			
2,400.0	2,400.0	2,387.5	2,379.9	5.3	5.6	-47.24	88.4	-95.6	131.9	121.3	10.55	12.496			
2,500.0	2,500.0	2,486.2	2,477.3	5.5	5.9	-46.10	101.2	-105.2	147.9	136.9	11.01	13.432			
2,600.0	2,600.0	2,585.0	2,574.8	5.7	6.2	-50.24	114.1	-114.8	163.1	151.6	11.46	14.234			
2,700.0	2,699.9	2,684.1	2,672.6	6.0	6.6	-50.27	127.0	-124.4	176.7	164.8	11.92	14.825			
2,800.0	2,799.7	2,783.3	2,770.5	6.2	6.9	-50.91	139.9	-134.1	188.6	176.2	12.38	15.239			
2,900.0	2,899.3	2,882.7	2,868.5	6.4	7.2	-52.06	152.8	-143.7	199.0	186.1	12.84	15.494			
3,000.0	2,998.6	2,982.1	2,966.6	6.6	7.6	-53.69	165.7	-153.4	207.9	194.5	13.31	15.612			
3,100.0	3,097.5	3,081.5	3,064.7	6.9	7.9	-55.75	178.7	-163.0	215.4	201.6	13.80	15.611			
3,200.0	3,196.1	3,180.8	3,162.7	7.1	8.3	-58.23	191.6	-172.7	222.0	207.7	14.32	15.510			
3,300.0	3,294.6	3,280.1	3,260.7	7.4	8.6	-60.72	204.5	-182.3	228.8	213.9	14.86	15.400			
3,400.0	3,393.1	3,379.4	3,358.6	7.7	9.0	-63.06	217.4	-192.0	236.0	220.6	15.42	15.306			
3,500.0	3,491.6	3,478.7	3,456.6	8.0	9.3	-65.26	230.3	-201.6	243.5	227.5	16.00	15.225			
3,600.0	3,590.1	3,578.0	3,554.6	8.3	9.7	-67.33	243.2	-211.3	251.4	234.8	16.59	15.154			
3,700.0	3,688.6	3,677.3	3,652.5	8.6	10.0	-69.27	256.1	-220.9	259.6	242.4	17.20	15.093			
3,800.0	3,787.1	3,776.5	3,750.5	8.9	10.4	-71.09	269.1	-230.6	268.1	250.2	17.82	15.040			
3,900.0	3,885.6	3,875.8	3,848.5	9.2	10.7	-72.80	282.0	-240.2	276.8	258.3	18.46	14.993			
4,000.0	3,984.2	3,975.1	3,946.5	9.5	11.1	-74.40	294.9	-249.9	285.7	266.6	19.11	14.954			
4,100.0	4,082.7	4,074.4	4,044.4	9.8	11.5	-75.91	307.8	-259.5	294.9	275.1	19.77	14.919			
4,200.0	4,181.2	4,173.7	4,142.4	10.2	11.8	-77.32	320.7	-269.2	304.3	283.8	20.43	14.890			
4,300.0	4,279.7	4,273.0	4,240.4	10.5	12.2	-78.65	333.6	-278.8	313.8	292.7	21.11	14.866			
4,400.0	4,378.2	4,372.3	4,338.3	10.8	12.6	-79.90	346.5	-288.5	323.5	301.7	21.79	14.845			
4,500.0	4,476.7	4,471.6	4,436.3	11.2	12.9	-81.08	359.5	-298.1	333.3	310.8	22.48	14.828			
4,600.0	4,575.2	4,570.8	4,534.3	11.5	13.3	-82.19	372.4	-307.8	343.3	320.1	23.17	14.815			
4,700.0	4,673.7	4,670.1	4,632.2	11.9	13.7	-83.24	385.3	-317.4	353.3	329.5	23.87	14.804			
4,800.0	4,772.2	4,769.4	4,730.2	12.2	14.0	-84.23	398.2	-327.1	363.5	339.0	24.57	14.796			
4,900.0	4,870.7	4,868.7	4,828.2	12.6	14.4	-85.17	411.1	-336.7	373.8	348.6	25.28	14.790			

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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)			
5,000.0	4,969.2	4,968.0	4,926.2	12.9	14.8	-86.05	424.0	-346.4	384.2	358.2	25.99	14.786		
5,100.0	5,067.7	5,067.3	5,024.1	13.3	15.1	-86.89	437.0	-356.0	394.7	368.0	26.70	14.785		
5,200.0	5,166.2	5,166.6	5,122.1	13.6	15.5	-87.69	449.9	-365.7	405.3	377.9	27.41	14.784		
5,300.0	5,264.7	5,265.9	5,220.1	14.0	15.9	-88.44	462.8	-375.3	415.9	387.8	28.13	14.786		
5,400.0	5,363.2	5,365.1	5,318.0	14.3	16.2	-89.16	475.7	-385.0	426.6	397.7	28.85	14.788		
5,500.0	5,461.7	5,473.6	5,425.3	14.7	16.5	-90.05	488.6	-394.7	436.5	406.9	29.55	14.773		
5,600.0	5,560.3	5,584.0	5,534.9	15.0	16.8	-91.32	498.5	-402.1	444.0	413.8	30.21	14.696		
5,700.0	5,659.4	5,694.4	5,645.1	15.3	17.0	-92.56	505.0	-406.9	449.2	418.4	30.77	14.597		
5,800.0	5,758.8	5,804.9	5,755.5	15.5	17.2	-93.65	508.1	-409.2	451.9	420.7	31.26	14.455		
5,900.0	5,858.6	5,909.0	5,859.6	15.7	17.4	-94.52	508.4	-409.4	452.6	420.9	31.69	14.284		
6,000.0	5,958.5	6,009.0	5,959.5	15.9	17.5	-94.92	508.4	-409.4	452.9	420.8	32.06	14.126		
6,100.0	6,058.5	6,108.9	6,059.5	16.1	17.7	-90.19	507.5	-409.4	452.9	420.5	32.39	13.984		
6,200.0	6,158.5	6,207.8	6,157.6	16.2	17.7	88.69	496.4	-409.4	453.0	420.4	32.63	13.881		
6,300.0	6,257.4	6,305.4	6,252.3	16.2	17.7	87.48	473.1	-409.4	453.3	420.7	32.66	13.878		
6,400.0	6,353.5	6,401.8	6,342.3	16.2	17.6	86.31	438.4	-409.4	453.8	421.3	32.50	13.964		
6,500.0	6,445.3	6,497.2	6,426.2	16.0	17.4	85.21	393.2	-409.4	454.5	422.3	32.19	14.119		
6,600.0	6,531.2	6,591.7	6,503.1	15.8	17.2	84.20	338.5	-409.4	455.2	423.4	31.79	14.319		
6,700.0	6,609.6	6,685.3	6,572.2	15.6	17.0	83.29	275.3	-409.4	456.0	424.6	31.39	14.528		
6,800.0	6,679.3	6,778.2	6,632.5	15.5	16.8	82.48	204.8	-409.4	456.8	425.8	31.07	14.703		
6,900.0	6,739.0	6,870.5	6,683.5	15.4	16.6	81.80	127.9	-409.4	457.6	426.6	30.93	14.793		
7,000.0	6,787.8	6,962.2	6,724.7	15.5	16.4	81.26	46.0	-409.4	458.2	427.2	31.06	14.752		
7,100.0	6,824.8	7,053.6	6,755.7	15.8	16.3	80.84	-40.0	-409.4	458.7	427.2	31.53	14.549		
7,200.0	6,849.3	7,144.8	6,776.2	16.2	16.4	80.58	-128.7	-409.4	459.1	426.7	32.38	14.179		
7,300.0	6,861.0	7,235.7	6,785.9	16.9	17.1	80.45	-219.1	-409.4	459.2	425.6	33.60	13.669		
7,400.0	6,862.0	7,331.8	6,786.5	17.7	17.9	80.42	-315.1	-409.4	459.3	424.1	35.20	13.048		
7,500.0	6,862.0	7,431.8	6,786.1	18.7	19.0	80.36	-415.1	-409.4	459.4	422.2	37.13	12.373		
7,600.0	6,862.0	7,531.8	6,785.7	19.8	20.1	80.31	-515.1	-409.4	459.4	420.1	39.32	11.684		
7,700.0	6,862.0	7,631.8	6,785.3	21.0	21.4	80.26	-615.1	-409.4	459.5	417.8	41.75	11.006		
7,800.0	6,862.0	7,731.8	6,784.9	22.3	22.7	80.21	-715.1	-409.4	459.6	415.2	44.37	10.359		
7,900.0	6,862.0	7,831.8	6,784.4	23.8	24.1	80.16	-815.1	-409.4	459.7	412.5	47.14	9.750		
8,000.0	6,862.0	7,931.8	6,784.0	25.2	25.6	80.11	-915.1	-409.4	459.7	409.7	50.05	9.185		
8,100.0	6,862.0	8,031.8	6,783.6	26.8	27.1	80.06	-1,015.1	-409.4	459.8	406.7	53.07	8.664		
8,200.0	6,862.0	8,131.8	6,783.2	28.3	28.7	80.00	-1,115.1	-409.4	459.9	403.7	56.18	8.186		
8,300.0	6,862.0	8,231.8	6,782.8	30.0	30.3	79.95	-1,215.1	-409.4	459.9	400.6	59.37	7.747		
8,400.0	6,862.0	8,331.8	6,782.3	31.6	31.9	79.90	-1,315.1	-409.4	460.0	397.4	62.62	7.346		
8,500.0	6,862.0	8,431.8	6,781.9	33.3	33.6	79.85	-1,415.1	-409.4	460.1	394.2	65.93	6.978		
8,600.0	6,862.0	8,531.8	6,781.5	35.0	35.3	79.80	-1,515.1	-409.4	460.2	390.9	69.29	6.641		
8,700.0	6,862.0	8,631.8	6,781.1	36.7	37.0	79.75	-1,615.1	-409.4	460.2	387.6	72.68	6.332		
8,800.0	6,862.0	8,731.8	6,780.7	38.5	38.8	79.70	-1,715.1	-409.4	460.3	384.2	76.12	6.047		
8,900.0	6,862.0	8,831.8	6,780.2	40.2	40.5	79.65	-1,815.1	-409.4	460.4	380.8	79.58	5.785		
9,000.0	6,862.0	8,931.8	6,779.8	42.0	42.3	79.59	-1,915.1	-409.4	460.5	377.4	83.07	5.543		
9,100.0	6,862.0	9,031.8	6,779.4	43.8	44.0	79.54	-2,015.1	-409.4	460.5	374.0	86.58	5.319		
9,200.0	6,862.0	9,131.8	6,779.0	45.6	45.8	79.49	-2,115.1	-409.4	460.6	370.5	90.11	5.111		
9,300.0	6,862.0	9,231.8	6,778.6	47.4	47.6	79.44	-2,215.1	-409.4	460.7	367.0	93.66	4.919		
9,400.0	6,862.0	9,331.8	6,778.2	49.2	49.4	79.39	-2,315.1	-409.4	460.8	363.5	97.23	4.739		
9,500.0	6,862.0	9,431.8	6,777.7	51.1	51.3	79.34	-2,415.1	-409.4	460.8	360.0	100.81	4.571		
9,600.0	6,862.0	9,531.8	6,777.3	52.9	53.1	79.29	-2,515.1	-409.4	460.9	356.5	104.40	4.415		
9,700.0	6,862.0	9,631.8	6,776.9	54.7	54.9	79.24	-2,615.1	-409.4	461.0	353.0	108.01	4.268		
9,800.0	6,862.0	9,731.8	6,776.5	56.6	56.7	79.18	-2,715.1	-409.4	461.1	349.5	111.62	4.131		
9,900.0	6,862.0	9,831.8	6,776.1	58.4	58.6	79.13	-2,815.1	-409.4	461.2	345.9	115.24	4.002		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	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	6,862.0	9,931.8	6,775.6	60.3	60.4	79.08	-2,915.1	-409.4	461.2	342.4	118.87	3.880			
10,100.0	6,862.0	10,031.7	6,775.2	62.1	62.3	79.03	-3,015.1	-409.4	461.3	338.8	122.51	3.766			
10,200.0	6,862.0	10,131.7	6,774.8	64.0	64.1	78.98	-3,115.1	-409.4	461.4	335.2	126.15	3.657			
10,300.0	6,862.0	10,231.7	6,774.4	65.8	66.0	78.93	-3,215.1	-409.4	461.5	331.7	129.80	3.555			
10,400.0	6,862.0	10,331.7	6,774.0	67.7	67.9	78.88	-3,315.1	-409.4	461.6	328.1	133.45	3.459			
10,500.0	6,862.0	10,431.7	6,773.5	69.6	69.7	78.83	-3,415.1	-409.4	461.6	324.5	137.11	3.367			
10,600.0	6,862.0	10,531.7	6,773.1	71.5	71.6	78.78	-3,515.1	-409.4	461.7	320.9	140.78	3.280			
10,700.0	6,862.0	10,631.7	6,772.7	73.3	73.5	78.72	-3,615.1	-409.4	461.8	317.4	144.44	3.197			
10,800.0	6,862.0	10,731.7	6,772.3	75.2	75.3	78.67	-3,715.1	-409.4	461.9	313.8	148.11	3.118			
10,900.0	6,862.0	10,831.7	6,771.9	77.1	77.2	78.62	-3,815.1	-409.4	462.0	310.2	151.78	3.044			
11,000.0	6,862.0	10,931.7	6,771.5	79.0	79.1	78.57	-3,915.1	-409.4	462.1	306.6	155.46	2.972			
11,100.0	6,862.0	11,031.7	6,771.0	80.9	81.0	78.52	-4,015.1	-409.4	462.1	303.0	159.14	2.904			
11,200.0	6,862.0	11,131.7	6,770.6	82.7	82.8	78.47	-4,115.0	-409.4	462.2	299.4	162.82	2.839			
11,300.0	6,862.0	11,231.7	6,770.2	84.6	84.7	78.42	-4,215.0	-409.4	462.3	295.8	166.50	2.777			
11,400.0	6,862.0	11,331.7	6,769.8	86.5	86.6	78.37	-4,315.0	-409.4	462.4	292.2	170.18	2.717			
11,500.0	6,862.0	11,431.7	6,769.4	88.4	88.5	78.32	-4,415.0	-409.4	462.5	288.6	173.87	2.660			
11,600.0	6,862.0	11,531.7	6,768.9	90.3	90.4	78.27	-4,515.0	-409.4	462.6	285.0	177.55	2.605			
11,700.0	6,862.0	11,631.7	6,768.5	92.2	92.3	78.22	-4,615.0	-409.4	462.6	281.4	181.24	2.553			
11,800.0	6,862.0	11,731.7	6,768.1	94.1	94.2	78.17	-4,715.0	-409.4	462.7	277.8	184.93	2.502			
11,900.0	6,862.0	11,831.7	6,767.7	96.0	96.0	78.11	-4,815.0	-409.4	462.8	274.2	188.62	2.454			
12,000.0	6,862.0	11,931.7	6,767.3	97.9	97.9	78.06	-4,915.0	-409.4	462.9	270.6	192.31	2.407			
12,100.0	6,862.0	12,031.7	6,766.8	99.8	99.8	78.01	-5,015.0	-409.4	463.0	267.0	196.00	2.362			
12,200.0	6,862.0	12,131.7	6,766.4	101.7	101.7	77.96	-5,115.0	-409.4	463.1	263.4	199.69	2.319			
12,300.0	6,862.0	12,231.7	6,766.0	103.6	103.6	77.91	-5,215.0	-409.4	463.2	259.8	203.38	2.277			
12,400.0	6,862.0	12,331.7	6,765.6	105.4	105.5	77.86	-5,315.0	-409.4	463.2	256.2	207.07	2.237			
12,500.0	6,862.0	12,431.7	6,765.2	107.3	107.4	77.81	-5,415.0	-409.4	463.3	252.6	210.77	2.198			
12,600.0	6,862.0	12,531.7	6,764.8	109.2	109.3	77.76	-5,515.0	-409.4	463.4	249.0	214.46	2.161			
12,700.0	6,862.0	12,631.7	6,764.3	111.1	111.2	77.71	-5,615.0	-409.4	463.5	245.4	218.15	2.125			
12,800.0	6,862.0	12,731.7	6,763.9	113.0	113.1	77.66	-5,715.0	-409.4	463.6	241.8	221.84	2.090			
12,900.0	6,862.0	12,831.7	6,763.5	115.0	115.0	77.61	-5,815.0	-409.4	463.7	238.2	225.54	2.056			
13,000.0	6,862.0	12,931.7	6,763.1	116.9	116.9	77.56	-5,915.0	-409.4	463.8	234.6	229.23	2.023			
13,100.0	6,862.0	13,031.7	6,762.7	118.8	118.8	77.51	-6,015.0	-409.4	463.9	231.0	232.92	1.992			
13,200.0	6,862.0	13,131.7	6,762.2	120.7	120.7	77.46	-6,115.0	-409.4	464.0	227.4	236.61	1.961			
13,300.0	6,862.0	13,231.7	6,761.8	122.6	122.6	77.41	-6,215.0	-409.4	464.1	223.8	240.30	1.931			
13,400.0	6,862.0	13,331.7	6,761.4	124.5	124.5	77.36	-6,315.0	-409.4	464.1	220.2	243.99	1.902			
13,500.0	6,862.0	13,431.7	6,761.0	126.4	126.4	77.31	-6,415.0	-409.4	464.2	216.6	247.68	1.874			
13,600.0	6,862.0	13,531.7	6,760.6	128.3	128.3	77.25	-6,515.0	-409.4	464.3	213.0	251.37	1.847			
13,700.0	6,862.0	13,631.7	6,760.1	130.2	130.2	77.20	-6,615.0	-409.4	464.4	209.4	255.06	1.821			
13,800.0	6,862.0	13,731.7	6,759.7	132.1	132.1	77.15	-6,715.0	-409.4	464.5	205.8	258.75	1.795			
13,900.0	6,862.0	13,831.7	6,759.3	134.0	134.0	77.10	-6,815.0	-409.4	464.6	202.2	262.44	1.770			
14,000.0	6,862.0	13,931.7	6,758.9	135.9	135.9	77.05	-6,915.0	-409.4	464.7	198.6	266.12	1.746			
14,100.0	6,862.0	14,031.7	6,758.5	137.8	137.8	77.00	-7,015.0	-409.4	464.8	195.0	269.81	1.723			
14,200.0	6,862.0	14,131.7	6,758.0	139.7	139.8	76.95	-7,115.0	-409.4	464.9	191.4	273.49	1.700			
14,300.0	6,862.0	14,231.7	6,757.6	141.6	141.7	76.90	-7,215.0	-409.4	465.0	187.8	277.18	1.678			
14,400.0	6,862.0	14,331.7	6,757.2	143.5	143.6	76.85	-7,315.0	-409.4	465.1	184.2	280.86	1.656			
14,445.8	6,862.0	14,377.5	6,757.0	144.4	144.4	76.83	-7,360.8	-409.4	465.1	182.6	282.55	1.646 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - 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	1.0	1.0	0.0	0.0	91.34	-0.4	15.0	15.0	15.0	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	91.34	-0.4	15.0	15.0	14.8	0.23	66.294			
200.0	200.0	201.0	201.0	0.3	0.3	91.34	-0.4	15.0	15.0	14.4	0.68	22.245			
300.0	300.0	301.0	301.0	0.6	0.6	91.34	-0.4	15.0	15.0	13.9	1.13	13.365			
400.0	400.0	401.0	401.0	0.8	0.8	91.34	-0.4	15.0	15.0	13.5	1.58	9.552			
500.0	500.0	501.0	501.0	1.0	1.0	91.34	-0.4	15.0	15.0	13.0	2.03	7.431			
600.0	600.0	601.0	601.0	1.2	1.2	91.34	-0.4	15.0	15.0	12.6	2.47	6.081			
700.0	700.0	701.0	701.0	1.5	1.5	91.34	-0.4	15.0	15.0	12.1	2.92	5.147			
766.3	766.3	767.3	767.3	1.6	1.6	91.34	-0.4	15.0	15.0	11.8	3.22	4.670 CC			
800.0	800.0	801.0	801.0	1.7	1.7	91.34	-0.4	15.0	15.0	11.7	3.37	4.461			
900.0	900.0	900.8	900.8	1.9	1.9	86.90	0.8	15.6	15.6	11.8	3.82	4.095			
1,000.0	1,000.0	1,000.5	1,000.4	2.1	2.1	75.80	4.4	17.3	17.9	13.6	4.27	4.191			
1,100.0	1,100.0	1,100.0	1,099.7	2.4	2.4	63.04	10.3	20.2	22.7	17.9	4.72	4.802			
1,200.0	1,200.0	1,198.9	1,198.2	2.6	2.6	52.64	18.4	24.1	30.4	25.3	5.17	5.887			
1,300.0	1,300.0	1,297.4	1,296.0	2.8	2.8	45.32	28.8	29.1	41.2	35.6	5.62	7.332			
1,400.0	1,400.0	1,395.2	1,392.8	3.0	3.1	40.38	41.3	35.2	54.9	48.8	6.08	9.030			
1,500.0	1,500.0	1,492.2	1,488.4	3.3	3.4	37.02	56.0	42.2	71.2	64.7	6.53	10.906			
1,600.0	1,600.0	1,589.2	1,583.6	3.5	3.7	34.68	72.6	50.3	90.0	83.0	6.99	12.877			
1,700.0	1,700.0	1,687.3	1,679.8	3.7	4.1	33.09	89.9	58.6	109.3	101.9	7.45	14.680			
1,800.0	1,800.0	1,785.4	1,776.0	3.9	4.4	31.98	107.1	66.9	128.7	120.8	7.91	16.277			
1,900.0	1,900.0	1,883.4	1,872.2	4.2	4.8	31.16	124.3	75.2	148.1	139.8	8.37	17.698			
2,000.0	2,000.0	1,981.5	1,968.4	4.4	5.2	30.54	141.6	83.5	167.6	158.7	8.83	18.968			
2,100.0	2,100.0	2,079.6	2,064.6	4.6	5.5	30.04	158.8	91.8	187.0	177.7	9.30	20.110			
2,200.0	2,200.0	2,177.7	2,160.8	4.8	5.9	29.63	176.0	100.1	206.5	196.7	9.77	21.140			
2,300.0	2,300.0	2,275.8	2,257.0	5.1	6.3	29.30	193.3	108.4	225.9	215.7	10.23	22.074			
2,400.0	2,400.0	2,373.8	2,353.2	5.3	6.7	29.02	210.5	116.7	245.4	234.7	10.70	22.924			
2,500.0	2,500.0	2,471.9	2,449.4	5.5	7.1	28.78	227.7	125.1	264.9	253.7	11.17	23.702			
2,600.0	2,600.0	2,570.2	2,545.8	5.7	7.5	23.68	245.0	133.4	283.2	271.5	11.65	24.302			
2,700.0	2,699.9	2,668.9	2,642.6	6.0	7.9	23.70	262.3	141.8	299.1	287.0	12.13	24.656			
2,800.0	2,799.7	2,768.0	2,739.8	6.2	8.3	23.92	279.7	150.2	312.7	300.1	12.61	24.800			
2,900.0	2,899.3	2,867.3	2,837.2	6.4	8.7	24.32	297.2	158.6	323.9	310.8	13.08	24.757			
3,000.0	2,998.6	2,966.9	2,934.9	6.6	9.1	24.89	314.7	167.0	332.8	319.2	13.56	24.546			
3,100.0	3,097.5	3,066.6	3,032.6	6.9	9.5	25.63	332.2	175.5	339.3	325.3	14.03	24.183			
3,200.0	3,196.1	3,166.3	3,130.4	7.1	10.0	26.54	349.7	183.9	343.8	329.3	14.52	23.678			
3,300.0	3,294.6	3,266.1	3,228.3	7.4	10.4	27.48	367.2	192.4	347.9	332.8	15.03	23.147			
3,400.0	3,393.1	3,365.8	3,326.1	7.7	10.8	28.41	384.7	200.8	352.1	336.5	15.55	22.646			
3,500.0	3,491.6	3,465.6	3,424.0	8.0	11.2	29.31	402.3	209.3	356.3	340.3	16.07	22.172			
3,600.0	3,590.1	3,565.3	3,521.8	8.3	11.6	30.19	419.8	217.7	360.7	344.1	16.60	21.723			
3,700.0	3,688.6	3,665.1	3,619.6	8.6	12.0	31.05	437.3	226.2	365.1	348.0	17.15	21.297			
3,800.0	3,787.1	3,764.8	3,717.5	8.9	12.4	31.88	454.8	234.6	369.7	352.0	17.69	20.892			
3,900.0	3,885.6	3,875.6	3,826.4	9.2	12.8	32.83	473.1	243.5	373.2	354.9	18.24	20.459			
4,000.0	3,984.2	3,989.9	3,939.5	9.5	13.1	33.95	488.1	250.7	373.0	354.2	18.78	19.857			
4,100.0	4,082.7	4,103.9	4,052.8	9.8	13.4	35.23	499.0	255.9	369.0	349.7	19.33	19.091			
4,200.0	4,181.2	4,217.2	4,165.9	10.2	13.6	36.73	505.8	259.2	361.4	341.6	19.88	18.178			
4,300.0	4,279.7	4,329.5	4,278.1	10.5	13.8	38.51	508.6	260.5	350.3	329.9	20.45	17.131			
4,400.0	4,378.2	4,430.6	4,379.2	10.8	14.0	40.37	508.6	260.6	337.0	316.0	21.02	16.031			
4,500.0	4,476.7	4,529.1	4,477.7	11.2	14.1	42.33	508.6	260.6	324.0	302.4	21.62	14.984			
4,600.0	4,575.2	4,627.6	4,576.2	11.5	14.2	44.45	508.6	260.6	311.4	289.1	22.25	13.997			
4,700.0	4,673.7	4,726.1	4,674.7	11.9	14.4	46.74	508.6	260.6	299.2	276.3	22.89	13.069			
4,800.0	4,772.2	4,824.6	4,773.2	12.2	14.5	49.22	508.6	260.6	287.6	264.0	23.57	12.200			
4,900.0	4,870.7	4,923.1	4,871.7	12.6	14.7	51.90	508.6	260.6	276.5	252.2	24.28	11.390			

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - 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							
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)			
5,000.0	4,969.2	5,021.6	4,970.2	12.9	14.9	54.79	508.6	260.6	266.1	241.1	25.01	10.640		
5,100.0	5,067.7	5,120.1	5,068.7	13.3	15.0	57.91	508.6	260.6	256.5	230.7	25.77	9.951		
5,200.0	5,166.2	5,218.6	5,167.2	13.6	15.2	61.25	508.6	260.6	247.6	221.1	26.56	9.323		
5,300.0	5,264.7	5,317.1	5,265.7	14.0	15.3	64.82	508.6	260.6	239.7	212.4	27.37	8.759		
5,400.0	5,363.2	5,415.6	5,364.2	14.3	15.5	68.61	508.6	260.6	232.8	204.6	28.19	8.259		
5,500.0	5,461.7	5,514.1	5,462.7	14.7	15.7	72.61	508.6	260.6	227.0	198.0	29.01	7.825		
5,600.0	5,560.3	5,612.7	5,561.3	15.0	15.8	76.62	508.6	260.6	222.5	192.7	29.79	7.469		
5,700.0	5,659.4	5,711.8	5,660.4	15.3	16.0	79.99	508.6	260.6	219.7	189.3	30.43	7.221		
5,800.0	5,758.8	5,811.3	5,759.8	15.5	16.2	82.57	508.6	260.6	218.2	187.2	30.98	7.044		
5,900.0	5,858.6	5,911.0	5,859.6	15.7	16.3	84.30	508.6	260.6	217.4	186.0	31.44	6.915		
6,000.0	5,958.5	6,011.0	5,959.5	15.9	16.5	85.13	508.6	260.6	217.1	185.3	31.83	6.822		
6,059.7	6,018.3	6,070.7	6,019.3	16.0	16.6	85.31	508.6	260.6	217.1	185.0	32.03	6.776		
6,100.0	6,058.5	6,110.9	6,059.4	16.1	16.6	90.56	506.9	260.6	217.1	185.0	32.16	6.750		
6,200.0	6,158.5	6,209.3	6,157.0	16.2	16.7	-86.61	493.9	260.6	217.5	185.0	32.45	6.702		
6,300.0	6,257.4	6,306.3	6,250.6	16.2	16.6	-83.61	469.0	260.6	218.5	186.0	32.50	6.723		
6,400.0	6,353.5	6,401.9	6,339.1	16.2	16.5	-80.76	433.0	260.6	220.0	187.7	32.30	6.810		
6,500.0	6,445.3	6,496.3	6,421.4	16.0	16.3	-78.11	386.9	260.6	221.9	190.0	31.91	6.955		
6,600.0	6,531.2	6,589.7	6,496.6	15.8	16.1	-75.71	331.7	260.6	224.1	192.7	31.36	7.146		
6,700.0	6,609.6	6,682.0	6,563.8	15.6	15.9	-73.57	268.4	260.6	226.4	195.7	30.74	7.364		
6,800.0	6,679.3	6,773.6	6,622.5	15.5	15.7	-71.73	198.2	260.6	228.7	198.5	30.16	7.582		
6,900.0	6,739.0	6,864.4	6,671.9	15.4	15.5	-70.20	122.0	260.6	230.8	201.1	29.73	7.764		
7,000.0	6,787.8	6,954.7	6,711.8	15.5	15.5	-68.97	41.1	260.6	232.6	203.1	29.56	7.869		
7,100.0	6,824.8	7,044.6	6,741.7	15.8	15.6	-68.06	-43.6	260.6	234.1	204.3	29.78	7.859		
7,200.0	6,849.3	7,134.1	6,761.4	16.2	16.1	-67.47	-130.9	260.6	235.1	204.6	30.45	7.718		
7,300.0	6,861.0	7,223.5	6,770.8	16.9	16.7	-67.20	-219.7	260.6	235.5	203.9	31.59	7.456		
7,400.0	6,862.0	7,318.7	6,771.3	17.7	17.5	-67.09	-314.9	260.6	235.7	202.6	33.13	7.114		
7,500.0	6,862.0	7,418.7	6,770.6	18.7	18.5	-66.95	-414.9	260.6	235.9	201.0	34.96	6.748		
7,600.0	6,862.0	7,518.7	6,770.0	19.8	19.6	-66.81	-514.9	260.6	236.2	199.1	37.05	6.375		
7,700.0	6,862.0	7,618.7	6,769.4	21.0	20.9	-66.67	-614.8	260.6	236.4	197.1	39.34	6.009		
7,800.0	6,862.0	7,718.7	6,768.7	22.3	22.2	-66.53	-714.8	260.6	236.7	194.9	41.81	5.661		
7,900.0	6,862.0	7,818.6	6,768.1	23.8	23.6	-66.39	-814.8	260.6	236.9	192.5	44.42	5.334		
8,000.0	6,862.0	7,918.6	6,767.5	25.2	25.1	-66.25	-914.8	260.6	237.2	190.0	47.15	5.031		
8,100.0	6,862.0	8,018.6	6,766.9	26.8	26.7	-66.12	-1,014.8	260.6	237.4	187.5	49.97	4.751		
8,200.0	6,862.0	8,118.6	6,766.2	28.3	28.2	-65.98	-1,114.8	260.6	237.7	184.8	52.88	4.495		
8,300.0	6,862.0	8,218.6	6,765.6	30.0	29.9	-65.84	-1,214.8	260.6	238.0	182.1	55.85	4.261		
8,400.0	6,862.0	8,318.6	6,765.0	31.6	31.5	-65.70	-1,314.8	260.6	238.2	179.3	58.88	4.046		
8,500.0	6,862.0	8,418.6	6,764.4	33.3	33.2	-65.56	-1,414.8	260.6	238.5	176.5	61.95	3.849		
8,600.0	6,862.0	8,518.6	6,763.7	35.0	34.9	-65.43	-1,514.8	260.6	238.7	173.7	65.06	3.669		
8,700.0	6,862.0	8,618.6	6,763.1	36.7	36.6	-65.29	-1,614.8	260.6	239.0	170.8	68.20	3.504		
8,800.0	6,862.0	8,718.6	6,762.5	38.5	38.4	-65.15	-1,714.8	260.6	239.3	167.9	71.37	3.352		
8,900.0	6,862.0	8,818.6	6,761.8	40.2	40.1	-65.02	-1,814.8	260.6	239.5	165.0	74.56	3.212		
9,000.0	6,862.0	8,918.6	6,761.2	42.0	41.9	-64.88	-1,914.8	260.6	239.8	162.0	77.77	3.083		
9,100.0	6,862.0	9,018.6	6,760.6	43.8	43.7	-64.74	-2,014.8	260.6	240.1	159.1	81.00	2.964		
9,200.0	6,862.0	9,118.6	6,760.0	45.6	45.5	-64.61	-2,114.8	260.6	240.3	156.1	84.24	2.853		
9,300.0	6,862.0	9,218.6	6,759.3	47.4	47.3	-64.47	-2,214.8	260.6	240.6	153.1	87.49	2.750		
9,400.0	6,862.0	9,318.6	6,758.7	49.2	49.1	-64.34	-2,314.8	260.6	240.9	150.1	90.75	2.654		
9,500.0	6,862.0	9,418.6	6,758.1	51.1	50.9	-64.20	-2,414.8	260.6	241.1	147.1	94.01	2.565		
9,600.0	6,862.0	9,518.6	6,757.4	52.9	52.8	-64.07	-2,514.8	260.6	241.4	144.1	97.28	2.482		
9,700.0	6,862.0	9,618.6	6,756.8	54.7	54.6	-63.94	-2,614.8	260.6	241.7	141.1	100.56	2.403		
9,800.0	6,862.0	9,718.6	6,756.2	56.6	56.4	-63.80	-2,714.8	260.6	242.0	138.1	103.84	2.330		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - 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		
9,900.0	6,862.0	9,818.6	6,755.6	58.4	58.3	-63.67	-2,814.8	260.6	242.2	135.1	107.12	2.261		
10,000.0	6,862.0	9,918.6	6,754.9	60.3	60.1	-63.54	-2,914.8	260.6	242.5	132.1	110.40	2.197		
10,100.0	6,862.0	10,018.6	6,754.3	62.1	62.0	-63.40	-3,014.8	260.6	242.8	129.1	113.69	2.136		
10,200.0	6,862.0	10,118.6	6,753.7	64.0	63.9	-63.27	-3,114.7	260.6	243.1	126.1	116.97	2.078		
10,300.0	6,862.0	10,218.6	6,753.0	65.8	65.7	-63.14	-3,214.7	260.6	243.4	123.1	120.26	2.024		
10,400.0	6,862.0	10,318.6	6,752.4	67.7	67.6	-63.01	-3,314.7	260.6	243.7	120.1	123.54	1.972		
10,500.0	6,862.0	10,418.6	6,751.8	69.6	69.4	-62.88	-3,414.7	260.6	243.9	117.1	126.82	1.924		
10,600.0	6,862.0	10,518.6	6,751.2	71.5	71.3	-62.74	-3,514.7	260.6	244.2	114.1	130.10	1.877		
10,700.0	6,862.0	10,618.6	6,750.5	73.3	73.2	-62.61	-3,614.7	260.6	244.5	111.1	133.37	1.833		
10,800.0	6,862.0	10,718.6	6,749.9	75.2	75.1	-62.48	-3,714.7	260.6	244.8	108.2	136.65	1.792		
10,900.0	6,862.0	10,818.6	6,749.3	77.1	76.9	-62.35	-3,814.7	260.6	245.1	105.2	139.92	1.752		
11,000.0	6,862.0	10,918.6	6,748.6	79.0	78.8	-62.22	-3,914.7	260.6	245.4	102.2	143.18	1.714		
11,100.0	6,862.0	11,018.6	6,748.0	80.9	80.7	-62.09	-4,014.7	260.6	245.7	99.2	146.45	1.678		
11,200.0	6,862.0	11,118.6	6,747.4	82.7	82.6	-61.96	-4,114.7	260.6	246.0	96.3	149.71	1.643		
11,300.0	6,862.0	11,218.6	6,746.8	84.6	84.5	-61.84	-4,214.7	260.6	246.3	93.3	152.96	1.610		
11,400.0	6,862.0	11,318.6	6,746.1	86.5	86.4	-61.71	-4,314.7	260.6	246.6	90.4	156.21	1.578		
11,500.0	6,862.0	11,418.6	6,745.5	88.4	88.3	-61.58	-4,414.7	260.6	246.9	87.4	159.46	1.548		
11,600.0	6,862.0	11,518.6	6,744.9	90.3	90.1	-61.45	-4,514.7	260.6	247.2	84.5	162.70	1.519		
11,700.0	6,862.0	11,618.6	6,744.2	92.2	92.0	-61.32	-4,614.7	260.6	247.5	81.5	165.94	1.491 Level 3		
11,800.0	6,862.0	11,718.6	6,743.6	94.1	93.9	-61.19	-4,714.7	260.6	247.8	78.6	169.17	1.465 Level 3		
11,900.0	6,862.0	11,818.6	6,743.0	96.0	95.8	-61.07	-4,814.7	260.6	248.1	75.7	172.40	1.439 Level 3		
12,000.0	6,862.0	11,918.6	6,742.4	97.9	97.7	-60.94	-4,914.7	260.6	248.4	72.8	175.62	1.414 Level 3		
12,100.0	6,862.0	12,018.6	6,741.7	99.8	99.6	-60.81	-5,014.7	260.6	248.7	69.8	178.84	1.391 Level 3		
12,200.0	6,862.0	12,118.6	6,741.1	101.7	101.5	-60.69	-5,114.7	260.6	249.0	66.9	182.05	1.368 Level 3		
12,300.0	6,862.0	12,218.6	6,740.5	103.6	103.4	-60.56	-5,214.7	260.6	249.3	64.0	185.25	1.346 Level 3		
12,400.0	6,862.0	12,318.6	6,739.8	105.4	105.3	-60.44	-5,314.7	260.6	249.6	61.2	188.45	1.325 Level 3		
12,500.0	6,862.0	12,418.6	6,739.2	107.3	107.2	-60.31	-5,414.7	260.6	249.9	58.3	191.65	1.304 Level 3		
12,600.0	6,862.0	12,518.6	6,738.6	109.2	109.1	-60.19	-5,514.7	260.6	250.2	55.4	194.84	1.284 Level 3		
12,700.0	6,862.0	12,618.6	6,738.0	111.1	111.0	-60.06	-5,614.7	260.6	250.5	52.5	198.02	1.265 Level 3		
12,800.0	6,862.0	12,718.6	6,737.3	113.0	112.9	-59.94	-5,714.6	260.6	250.9	49.7	201.19	1.247 Level 2		
12,900.0	6,862.0	12,818.6	6,736.7	115.0	114.8	-59.81	-5,814.6	260.6	251.2	46.8	204.37	1.229 Level 2		
13,000.0	6,862.0	12,918.6	6,736.1	116.9	116.7	-59.69	-5,914.6	260.6	251.5	44.0	207.53	1.212 Level 2		
13,100.0	6,862.0	13,018.6	6,735.4	118.8	118.6	-59.57	-6,014.6	260.6	251.8	41.1	210.69	1.195 Level 2		
13,200.0	6,862.0	13,118.6	6,734.8	120.7	120.5	-59.44	-6,114.6	260.6	252.1	38.3	213.84	1.179 Level 2		
13,300.0	6,862.0	13,218.6	6,734.2	122.6	122.4	-59.32	-6,214.6	260.6	252.4	35.5	216.99	1.163 Level 2		
13,400.0	6,862.0	13,318.6	6,733.6	124.5	124.3	-59.20	-6,314.6	260.6	252.8	32.6	220.13	1.148 Level 2		
13,500.0	6,862.0	13,418.6	6,732.9	126.4	126.2	-59.08	-6,414.6	260.6	253.1	29.8	223.26	1.134 Level 2		
13,600.0	6,862.0	13,518.6	6,732.3	128.3	128.1	-58.95	-6,514.6	260.6	253.4	27.0	226.39	1.119 Level 2		
13,700.0	6,862.0	13,618.6	6,731.7	130.2	130.0	-58.83	-6,614.6	260.6	253.7	24.2	229.51	1.106 Level 2		
13,800.0	6,862.0	13,718.6	6,731.1	132.1	131.9	-58.71	-6,714.6	260.6	254.1	21.4	232.62	1.092 Level 2		
13,900.0	6,862.0	13,818.6	6,730.4	134.0	133.8	-58.59	-6,814.6	260.6	254.4	18.7	235.73	1.079 Level 2		
14,000.0	6,862.0	13,918.6	6,729.8	135.9	135.7	-58.47	-6,914.6	260.6	254.7	15.9	238.83	1.067 Level 2		
14,100.0	6,862.0	14,018.6	6,729.2	137.8	137.7	-58.35	-7,014.6	260.6	255.0	13.1	241.93	1.054 Level 2		
14,200.0	6,862.0	14,118.6	6,728.5	139.7	139.6	-58.23	-7,114.6	260.6	255.4	10.4	245.02	1.042 Level 2		
14,300.0	6,862.0	14,218.6	6,727.9	141.6	141.5	-58.11	-7,214.6	260.6	255.7	7.6	248.10	1.031 Level 2		
14,400.0	6,862.0	14,318.6	6,727.3	143.5	143.4	-57.99	-7,314.6	260.6	256.0	4.9	251.17	1.019 Level 2		
14,445.8	6,862.0	14,363.3	6,727.0	144.4	144.2	-57.94	-7,359.4	260.6	256.2	3.6	252.57	1.014 Level 2, ES, SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - 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		
0.0	0.0	1.0	1.0	0.0	0.0	90.67	-0.4	30.1	30.1	30.1	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	90.67	-0.4	30.1	30.1	29.9	0.23	132.561		
200.0	200.0	201.0	201.0	0.3	0.3	90.67	-0.4	30.1	30.1	29.4	0.68	44.481		
300.0	300.0	301.0	301.0	0.6	0.6	90.67	-0.4	30.1	30.1	29.0	1.13	26.724		
366.3	366.3	367.3	367.3	0.7	0.7	90.67	-0.4	30.1	30.1	28.7	1.42	21.129 CC		
400.0	400.0	401.0	401.0	0.8	0.8	90.67	-0.4	30.1	30.1	28.5	1.58	19.100 ES		
500.0	500.0	500.4	500.4	1.0	1.0	88.86	0.6	31.0	31.0	29.0	2.02	15.343		
600.0	600.0	600.0	599.9	1.2	1.2	84.08	3.5	33.6	33.8	31.4	2.47	13.721		
700.0	700.0	698.8	698.5	1.5	1.5	77.79	8.2	38.0	39.0	36.1	2.92	13.367		
800.0	800.0	797.5	796.7	1.7	1.7	71.44	14.8	44.1	46.7	43.4	3.37	13.867		
900.0	900.0	895.6	894.2	1.9	2.0	65.89	23.2	51.9	57.3	53.4	3.83	14.962		
1,000.0	1,000.0	993.0	990.7	2.1	2.3	61.42	33.4	61.3	70.5	66.3	4.28	16.467		
1,100.0	1,100.0	1,089.7	1,086.0	2.4	2.6	57.94	45.2	72.3	86.6	81.8	4.74	18.248		
1,200.0	1,200.0	1,185.5	1,180.0	2.6	2.9	55.27	58.7	84.7	105.2	100.0	5.21	20.214		
1,300.0	1,300.0	1,282.2	1,274.5	2.8	3.3	53.20	73.8	98.6	126.0	120.3	5.67	22.215		
1,400.0	1,400.0	1,379.9	1,370.0	3.0	3.7	51.70	89.1	112.8	147.1	140.9	6.14	23.967		
1,500.0	1,500.0	1,477.6	1,465.4	3.3	4.1	50.57	104.4	127.0	168.2	161.6	6.60	25.475		
1,600.0	1,600.0	1,575.3	1,560.8	3.5	4.5	49.69	119.7	141.1	189.4	182.3	7.07	26.780		
1,700.0	1,700.0	1,673.0	1,656.3	3.7	5.0	48.99	135.0	155.3	210.6	203.1	7.54	27.920		
1,800.0	1,800.0	1,770.7	1,751.7	3.9	5.4	48.42	150.4	169.4	231.8	223.8	8.02	28.922		
1,900.0	1,900.0	1,868.4	1,847.2	4.2	5.8	47.94	165.7	183.6	253.1	244.6	8.49	29.809		
2,000.0	2,000.0	1,966.1	1,942.6	4.4	6.3	47.54	181.0	197.8	274.4	265.4	8.97	30.600		
2,100.0	2,100.0	2,063.8	2,038.0	4.6	6.7	47.19	196.3	211.9	295.7	286.2	9.44	31.308		
2,200.0	2,200.0	2,161.5	2,133.5	4.8	7.1	46.89	211.6	226.1	317.0	307.0	9.92	31.947		
2,300.0	2,300.0	2,259.2	2,228.9	5.1	7.6	46.63	226.9	240.3	338.3	327.9	10.40	32.524		
2,400.0	2,400.0	2,356.9	2,324.4	5.3	8.0	46.40	242.3	254.4	359.6	348.7	10.88	33.050		
2,500.0	2,500.0	2,454.6	2,419.8	5.5	8.5	46.20	257.6	268.6	380.9	369.5	11.36	33.529		
2,600.0	2,600.0	2,552.5	2,515.5	5.7	8.9	41.05	272.9	282.8	401.2	389.4	11.85	33.862		
2,700.0	2,699.9	2,650.7	2,611.5	6.0	9.4	41.06	288.3	297.0	419.7	407.3	12.34	34.003		
2,800.0	2,799.7	2,749.3	2,707.8	6.2	9.8	41.29	303.8	311.3	436.1	423.3	12.83	33.981		
2,900.0	2,899.3	2,848.2	2,804.3	6.4	10.3	41.74	319.3	325.6	450.7	437.4	13.33	33.815		
3,000.0	2,998.6	2,947.2	2,901.0	6.6	10.7	42.39	334.8	340.0	463.4	449.6	13.83	33.515		
3,100.0	3,097.5	3,046.2	2,997.8	6.9	11.2	43.23	350.3	354.4	474.3	460.0	14.33	33.093		
3,200.0	3,196.1	3,145.4	3,094.7	7.1	11.6	44.28	365.9	368.7	483.6	468.8	14.85	32.557		
3,300.0	3,294.6	3,244.5	3,191.5	7.4	12.1	45.38	381.4	383.1	492.7	477.3	15.39	32.009		
3,400.0	3,393.1	3,343.7	3,288.4	7.7	12.5	46.45	397.0	397.5	502.0	486.1	15.95	31.484		
3,500.0	3,491.6	3,442.8	3,385.2	8.0	13.0	47.47	412.5	411.8	511.5	495.0	16.51	30.981		
3,600.0	3,590.1	3,541.9	3,482.1	8.3	13.4	48.46	428.0	426.2	521.1	504.0	17.09	30.500		
3,700.0	3,688.6	3,641.1	3,578.9	8.6	13.9	49.42	443.6	440.6	530.9	513.2	17.67	30.040		
3,800.0	3,787.1	3,740.2	3,675.8	8.9	14.3	50.34	459.1	454.9	540.8	522.5	18.27	29.599		
3,900.0	3,885.6	3,859.1	3,792.3	9.2	14.8	51.45	476.4	470.9	549.3	530.4	18.90	29.064		
4,000.0	3,984.2	3,981.2	3,913.0	9.5	15.1	52.68	490.4	483.8	553.9	534.3	19.52	28.369		
4,100.0	4,082.7	4,103.4	4,034.3	9.8	15.4	54.05	500.6	493.3	554.5	534.4	20.15	27.518		
4,200.0	4,181.2	4,225.1	4,155.7	10.2	15.6	55.57	507.0	499.2	551.4	530.6	20.78	26.533		
4,300.0	4,279.7	4,345.9	4,276.4	10.5	15.8	57.27	509.6	501.6	544.6	523.2	21.42	25.425		
4,400.0	4,378.2	4,448.6	4,379.2	10.8	15.9	58.87	509.6	501.7	535.4	513.4	22.03	24.301		
4,500.0	4,476.7	4,547.1	4,477.7	11.2	16.1	60.45	509.6	501.7	526.6	504.0	22.66	23.242		
4,600.0	4,575.2	4,645.6	4,576.2	11.5	16.2	62.09	509.6	501.7	518.3	495.0	23.30	22.246		
4,700.0	4,673.7	4,744.1	4,674.7	11.9	16.3	63.78	509.6	501.7	510.3	486.4	23.95	21.309		
4,800.0	4,772.2	4,842.6	4,773.2	12.2	16.5	65.52	509.6	501.7	502.9	478.2	24.61	20.429		
4,900.0	4,870.7	4,941.1	4,871.7	12.6	16.6	67.31	509.6	501.7	495.9	470.6	25.29	19.607		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - 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							
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)			
5,000.0	4,969.2	5,039.6	4,970.2	12.9	16.7	69.15	509.6	501.7	489.4	463.4	25.98	18.839		
5,100.0	5,067.7	5,138.1	5,068.7	13.3	16.9	71.03	509.6	501.7	483.4	456.8	26.67	18.124		
5,200.0	5,166.2	5,236.6	5,167.2	13.6	17.0	72.96	509.6	501.7	478.0	450.7	27.38	17.460		
5,300.0	5,264.7	5,335.1	5,265.7	14.0	17.2	74.93	509.6	501.7	473.2	445.1	28.09	16.847		
5,400.0	5,363.2	5,433.6	5,364.2	14.3	17.3	76.93	509.6	501.7	469.0	440.2	28.80	16.282		
5,500.0	5,461.7	5,532.1	5,462.7	14.7	17.5	78.97	509.6	501.7	465.3	435.8	29.52	15.763		
5,600.0	5,560.3	5,630.7	5,561.3	15.0	17.6	80.95	509.6	501.7	462.4	432.2	30.20	15.311		
5,700.0	5,659.4	5,729.8	5,660.4	15.3	17.7	82.57	509.6	501.7	460.4	429.6	30.76	14.965		
5,800.0	5,758.8	5,829.3	5,759.8	15.5	17.9	83.79	509.6	501.7	459.2	427.9	31.27	14.685		
5,900.0	5,858.6	5,929.1	5,859.6	15.7	18.1	84.61	509.6	501.7	458.5	426.8	31.71	14.460		
6,000.0	5,958.5	6,029.0	5,959.6	15.9	18.2	85.02	509.5	501.7	458.2	426.1	32.08	14.283		
6,045.7	6,004.2	6,074.6	6,005.1	16.0	18.2	85.38	507.1	501.7	458.2	425.9	32.23	14.216		
6,100.0	6,058.5	6,128.2	6,058.3	16.1	18.3	91.02	500.8	501.7	458.3	425.9	32.40	14.145		
6,200.0	6,158.5	6,224.2	6,152.0	16.2	18.2	-86.66	480.4	501.7	459.0	426.3	32.68	14.045		
6,300.0	6,257.4	6,317.8	6,240.2	16.2	18.1	-84.30	449.3	501.7	460.5	427.8	32.74	14.066		
6,400.0	6,353.5	6,409.4	6,322.3	16.2	18.0	-82.06	408.7	501.7	462.8	430.2	32.59	14.201		
6,500.0	6,445.3	6,500.0	6,398.1	16.0	17.8	-79.96	359.1	501.7	465.5	433.2	32.25	14.433		
6,600.0	6,531.2	6,587.6	6,465.2	15.8	17.6	-78.08	303.0	501.7	468.5	436.7	31.79	14.738		
6,700.0	6,609.6	6,674.6	6,525.2	15.6	17.3	-76.38	240.0	501.7	471.7	440.4	31.28	15.081		
6,800.0	6,679.3	6,760.5	6,577.0	15.5	17.1	-74.90	171.5	501.7	474.8	444.0	30.80	15.414		
6,900.0	6,739.0	6,845.5	6,620.3	15.4	16.9	-73.66	98.4	501.7	477.6	447.2	30.48	15.671		
7,000.0	6,787.8	6,929.8	6,655.0	15.5	16.8	-72.66	21.7	501.7	480.1	449.7	30.42	15.782		
7,100.0	6,824.8	7,013.5	6,680.9	15.8	16.7	-71.91	-57.9	501.7	482.1	451.4	30.71	15.698		
7,200.0	6,849.3	7,100.0	6,698.4	16.2	16.8	-71.40	-142.6	501.7	483.4	452.0	31.44	15.377		
7,300.0	6,861.0	7,179.9	6,705.9	16.9	17.2	-71.18	-222.0	501.7	484.1	451.5	32.57	14.865		
7,400.0	6,862.0	7,272.3	6,706.3	17.7	18.0	-71.11	-314.5	501.7	484.3	450.1	34.11	14.195		
7,500.0	6,862.0	7,372.3	6,705.6	18.7	19.0	-71.04	-414.4	501.7	484.5	448.5	35.99	13.461		
7,600.0	6,862.0	7,472.3	6,705.0	19.8	20.1	-70.97	-514.4	501.7	484.7	446.5	38.12	12.715		
7,700.0	6,862.0	7,572.3	6,704.4	21.0	21.4	-70.90	-614.4	501.7	484.9	444.4	40.47	11.982		
7,800.0	6,862.0	7,672.3	6,703.7	22.3	22.7	-70.83	-714.4	501.7	485.1	442.1	42.99	11.282		
7,900.0	6,862.0	7,772.3	6,703.1	23.8	24.1	-70.76	-814.4	501.7	485.3	439.6	45.67	10.625		
8,000.0	6,862.0	7,872.3	6,702.5	25.2	25.6	-70.69	-914.4	501.7	485.5	437.0	48.48	10.015		
8,100.0	6,862.0	7,972.3	6,701.9	26.8	27.1	-70.62	-1,014.4	501.7	485.7	434.3	51.39	9.452		
8,200.0	6,862.0	8,072.3	6,701.2	28.3	28.6	-70.55	-1,114.4	501.7	485.9	431.5	54.38	8.935		
8,300.0	6,862.0	8,172.3	6,700.6	30.0	30.2	-70.48	-1,214.4	501.7	486.1	428.7	57.45	8.462		
8,400.0	6,862.0	8,272.3	6,700.0	31.6	31.9	-70.41	-1,314.4	501.7	486.3	425.7	60.58	8.028		
8,500.0	6,862.0	8,372.3	6,699.3	33.3	33.5	-70.34	-1,414.4	501.7	486.5	422.8	63.76	7.631		
8,600.0	6,862.0	8,472.2	6,698.7	35.0	35.2	-70.27	-1,514.4	501.7	486.7	419.8	66.98	7.267		
8,700.0	6,862.0	8,572.2	6,698.1	36.7	36.9	-70.20	-1,614.4	501.7	487.0	416.7	70.24	6.933		
8,800.0	6,862.0	8,672.2	6,697.5	38.5	38.6	-70.13	-1,714.4	501.7	487.2	413.6	73.54	6.625		
8,900.0	6,862.0	8,772.2	6,696.8	40.2	40.4	-70.07	-1,814.4	501.7	487.4	410.5	76.86	6.341		
9,000.0	6,862.0	8,872.2	6,696.2	42.0	42.1	-70.00	-1,914.4	501.7	487.6	407.4	80.20	6.080		
9,100.0	6,862.0	8,972.2	6,695.6	43.8	43.9	-69.93	-2,014.4	501.7	487.8	404.2	83.57	5.837		
9,200.0	6,862.0	9,072.2	6,694.9	45.6	45.7	-69.86	-2,114.4	501.7	488.0	401.1	86.95	5.613		
9,300.0	6,862.0	9,172.2	6,694.3	47.4	47.5	-69.79	-2,214.4	501.7	488.2	397.9	90.35	5.404		
9,400.0	6,862.0	9,272.2	6,693.7	49.2	49.3	-69.72	-2,314.4	501.7	488.5	394.7	93.76	5.210		
9,500.0	6,862.0	9,372.2	6,693.1	51.1	51.1	-69.65	-2,414.4	501.7	488.7	391.5	97.18	5.029		
9,600.0	6,862.0	9,472.2	6,692.4	52.9	52.9	-69.58	-2,514.4	501.7	488.9	388.3	100.62	4.859		
9,700.0	6,862.0	9,572.2	6,691.8	54.7	54.8	-69.51	-2,614.4	501.7	489.1	385.1	104.06	4.700		
9,800.0	6,862.0	9,672.2	6,691.2	56.6	56.6	-69.44	-2,714.4	501.7	489.3	381.8	107.51	4.552		

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - 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			
9,900.0	6,862.0	9,772.2	6,690.5	58.4	58.4	-69.37	-2,814.4	501.7	489.6	378.6	110.97	4.412			
10,000.0	6,862.0	9,872.2	6,689.9	60.3	60.3	-69.31	-2,914.3	501.7	489.8	375.4	114.43	4.280			
10,100.0	6,862.0	9,972.2	6,689.3	62.1	62.1	-69.24	-3,014.3	501.7	490.0	372.1	117.90	4.156			
10,200.0	6,862.0	10,072.2	6,688.7	64.0	64.0	-69.17	-3,114.3	501.7	490.2	368.9	121.37	4.039			
10,300.0	6,862.0	10,172.2	6,688.0	65.8	65.8	-69.10	-3,214.3	501.7	490.5	365.6	124.84	3.929			
10,400.0	6,862.0	10,272.2	6,687.4	67.7	67.7	-69.03	-3,314.3	501.7	490.7	362.4	128.32	3.824			
10,500.0	6,862.0	10,372.2	6,686.8	69.6	69.5	-68.96	-3,414.3	501.7	490.9	359.1	131.80	3.725			
10,600.0	6,862.0	10,472.2	6,686.1	71.5	71.4	-68.89	-3,514.3	501.7	491.1	355.8	135.29	3.630			
10,700.0	6,862.0	10,572.2	6,685.5	73.3	73.3	-68.83	-3,614.3	501.7	491.4	352.6	138.77	3.541			
10,800.0	6,862.0	10,672.2	6,684.9	75.2	75.1	-68.76	-3,714.3	501.7	491.6	349.3	142.26	3.456			
10,900.0	6,862.0	10,772.2	6,684.3	77.1	77.0	-68.69	-3,814.3	501.7	491.8	346.1	145.75	3.374			
11,000.0	6,862.0	10,872.2	6,683.6	79.0	78.9	-68.62	-3,914.3	501.7	492.0	342.8	149.24	3.297			
11,100.0	6,862.0	10,972.2	6,683.0	80.9	80.8	-68.55	-4,014.3	501.7	492.3	339.5	152.73	3.223			
11,200.0	6,862.0	11,072.2	6,682.4	82.7	82.7	-68.48	-4,114.3	501.7	492.5	336.3	156.22	3.153			
11,300.0	6,862.0	11,172.2	6,681.7	84.6	84.5	-68.42	-4,214.3	501.7	492.7	333.0	159.71	3.085			
11,400.0	6,862.0	11,272.2	6,681.1	86.5	86.4	-68.35	-4,314.3	501.7	493.0	329.8	163.20	3.021			
11,500.0	6,862.0	11,372.2	6,680.5	88.4	88.3	-68.28	-4,414.3	501.7	493.2	326.5	166.69	2.959			
11,600.0	6,862.0	11,472.2	6,679.9	90.3	90.2	-68.21	-4,514.3	501.7	493.4	323.3	170.18	2.899			
11,700.0	6,862.0	11,572.2	6,679.2	92.2	92.1	-68.15	-4,614.3	501.7	493.7	320.0	173.67	2.843			
11,800.0	6,862.0	11,672.2	6,678.6	94.1	94.0	-68.08	-4,714.3	501.7	493.9	316.7	177.16	2.788			
11,900.0	6,862.0	11,772.2	6,678.0	96.0	95.8	-68.01	-4,814.3	501.7	494.1	313.5	180.64	2.735			
12,000.0	6,862.0	11,872.2	6,677.3	97.9	97.7	-67.94	-4,914.3	501.7	494.4	310.2	184.13	2.685			
12,100.0	6,862.0	11,972.2	6,676.7	99.8	99.6	-67.88	-5,014.3	501.7	494.6	307.0	187.62	2.636			
12,200.0	6,862.0	12,072.2	6,676.1	101.7	101.5	-67.81	-5,114.3	501.7	494.8	303.7	191.10	2.589			
12,300.0	6,862.0	12,172.2	6,675.5	103.6	103.4	-67.74	-5,214.3	501.7	495.1	300.5	194.58	2.544			
12,400.0	6,862.0	12,272.2	6,674.8	105.4	105.3	-67.67	-5,314.3	501.7	495.3	297.3	198.06	2.501			
12,500.0	6,862.0	12,372.2	6,674.2	107.3	107.2	-67.61	-5,414.2	501.7	495.6	294.0	201.54	2.459			
12,600.0	6,862.0	12,472.2	6,673.6	109.2	109.1	-67.54	-5,514.2	501.7	495.8	290.8	205.02	2.418			
12,700.0	6,862.0	12,572.2	6,673.0	111.1	111.0	-67.47	-5,614.2	501.7	496.0	287.5	208.50	2.379			
12,800.0	6,862.0	12,672.2	6,672.3	113.0	112.9	-67.41	-5,714.2	501.7	496.3	284.3	211.97	2.341			
12,900.0	6,862.0	12,772.2	6,671.7	115.0	114.8	-67.34	-5,814.2	501.7	496.5	281.1	215.44	2.305			
13,000.0	6,862.0	12,872.2	6,671.1	116.9	116.7	-67.27	-5,914.2	501.7	496.8	277.9	218.91	2.269			
13,100.0	6,862.0	12,972.2	6,670.4	118.8	118.6	-67.20	-6,014.2	501.7	497.0	274.6	222.38	2.235			
13,200.0	6,862.0	13,072.2	6,669.8	120.7	120.5	-67.14	-6,114.2	501.7	497.3	271.4	225.85	2.202			
13,300.0	6,862.0	13,172.2	6,669.2	122.6	122.4	-67.07	-6,214.2	501.7	497.5	268.2	229.31	2.169			
13,400.0	6,862.0	13,272.2	6,668.6	124.5	124.3	-67.00	-6,314.2	501.7	497.7	265.0	232.78	2.138			
13,500.0	6,862.0	13,372.2	6,667.9	126.4	126.2	-66.94	-6,414.2	501.7	498.0	261.8	236.24	2.108			
13,600.0	6,862.0	13,472.2	6,667.3	128.3	128.1	-66.87	-6,514.2	501.7	498.2	258.5	239.70	2.079			
13,700.0	6,862.0	13,572.1	6,666.7	130.2	130.0	-66.81	-6,614.2	501.7	498.5	255.3	243.15	2.050			
13,800.0	6,862.0	13,672.1	6,666.0	132.1	131.9	-66.74	-6,714.2	501.7	498.7	252.1	246.60	2.022			
13,900.0	6,862.0	13,772.1	6,665.4	134.0	133.8	-66.67	-6,814.2	501.7	499.0	248.9	250.06	1.995			
14,000.0	6,862.0	13,872.1	6,664.8	135.9	135.7	-66.61	-6,914.2	501.7	499.2	245.7	253.50	1.969			
14,100.0	6,862.0	13,972.1	6,664.2	137.8	137.6	-66.54	-7,014.2	501.7	499.5	242.5	256.95	1.944			
14,200.0	6,862.0	14,072.1	6,663.5	139.7	139.5	-66.47	-7,114.2	501.7	499.7	239.3	260.39	1.919			
14,300.0	6,862.0	14,172.1	6,662.9	141.6	141.4	-66.41	-7,214.2	501.7	500.0	236.1	263.83	1.895			
14,400.0	6,862.0	14,272.1	6,662.3	143.5	143.3	-66.34	-7,314.2	501.7	500.2	233.0	267.27	1.872			
14,445.8	6,862.0	14,315.2	6,662.0	144.4	144.2	-66.31	-7,357.2	501.7	500.4	231.6	268.80	1.861 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - 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			
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.91	-0.7	45.1	45.1						
100.0	100.0	100.0	100.0	0.1	0.1	90.91	-0.7	45.1	45.1	44.9	0.22	200.842			
200.0	200.0	200.0	200.0	0.3	0.3	90.91	-0.7	45.1	45.1	44.5	0.67	66.947	CC, ES		
300.0	300.0	299.1	299.0	0.6	0.6	89.94	0.1	46.2	46.2	45.1	1.12	41.303			
400.0	400.0	398.0	397.9	0.8	0.8	87.25	2.4	49.2	49.3	47.8	1.57	31.524			
500.0	500.0	496.6	496.3	1.0	1.0	83.49	6.2	54.3	54.8	52.8	2.02	27.167			
600.0	600.0	594.9	594.2	1.2	1.3	79.37	11.5	61.4	62.8	60.3	2.47	25.373			
700.0	700.0	692.6	691.3	1.5	1.5	75.41	18.3	70.5	73.4	70.4	2.93	25.008			
800.0	800.0	789.7	787.4	1.7	1.8	71.93	26.6	81.5	86.6	83.2	3.39	25.511			
900.0	900.0	886.1	882.4	1.9	2.2	68.99	36.2	94.2	102.5	98.6	3.86	26.567			
1,000.0	1,000.0	981.5	976.1	2.1	2.5	66.57	47.2	108.8	121.0	116.7	4.32	27.986			
1,100.0	1,100.0	1,076.0	1,068.3	2.4	2.9	64.60	59.4	125.1	142.0	137.2	4.79	29.647			
1,200.0	1,200.0	1,169.4	1,159.0	2.6	3.4	63.01	72.8	142.9	165.6	160.3	5.26	31.471			
1,300.0	1,300.0	1,263.7	1,250.1	2.8	3.9	61.69	87.6	162.6	191.3	185.5	5.74	33.335			
1,400.0	1,400.0	1,360.1	1,343.1	3.0	4.4	60.65	102.9	182.9	217.4	211.2	6.21	34.987			
1,500.0	1,500.0	1,456.6	1,436.1	3.3	4.9	59.83	118.2	203.3	243.6	236.9	6.69	36.397			
1,600.0	1,600.0	1,553.0	1,529.2	3.5	5.4	59.17	133.4	223.6	269.9	262.7	7.18	37.609			
1,700.0	1,700.0	1,649.5	1,622.2	3.7	5.9	58.63	148.7	243.9	296.1	288.5	7.66	38.659			
1,800.0	1,800.0	1,746.0	1,715.2	3.9	6.4	58.17	164.0	264.3	322.4	314.3	8.15	39.577			
1,900.0	1,900.0	1,842.4	1,808.3	4.2	6.9	57.79	179.3	284.6	348.7	340.1	8.63	40.385			
2,000.0	2,000.0	1,938.9	1,901.3	4.4	7.5	57.45	194.6	305.0	375.0	365.9	9.12	41.102			
2,100.0	2,100.0	2,035.3	1,994.3	4.6	8.0	57.17	209.9	325.3	401.3	391.7	9.61	41.742			
2,200.0	2,200.0	2,131.8	2,087.4	4.8	8.5	56.91	225.2	345.7	427.7	417.6	10.11	42.316			
2,300.0	2,300.0	2,228.2	2,180.4	5.1	9.0	56.69	240.5	366.0	454.0	443.4	10.60	42.834			
2,400.0	2,400.0	2,324.7	2,273.5	5.3	9.6	56.49	255.8	386.4	480.3	469.2	11.09	43.303			
2,500.0	2,500.0	2,421.1	2,366.5	5.5	10.1	56.31	271.1	406.7	506.7	495.1	11.59	43.730			
2,600.0	2,600.0	2,517.8	2,459.7	5.7	10.6	51.07	286.4	427.1	532.2	520.2	12.09	44.027			
2,700.0	2,699.9	2,614.9	2,553.4	6.0	11.2	50.96	301.8	447.6	556.2	543.6	12.60	44.147			
2,800.0	2,799.7	2,712.3	2,647.3	6.2	11.7	51.06	317.3	468.1	578.6	565.5	13.11	44.129			
2,900.0	2,899.3	2,809.9	2,741.5	6.4	12.2	51.35	332.8	488.7	599.4	585.8	13.63	43.986			
3,000.0	2,998.6	2,907.8	2,835.9	6.6	12.8	51.81	348.3	509.3	618.7	604.5	14.15	43.725			
3,100.0	3,097.5	3,005.8	2,930.4	6.9	13.3	52.44	363.8	530.0	636.5	621.8	14.68	43.351			
3,200.0	3,196.1	3,103.8	3,025.0	7.1	13.8	53.28	379.4	550.7	653.0	637.7	15.23	42.878			
3,300.0	3,294.6	3,201.9	3,119.5	7.4	14.4	54.23	394.9	571.4	669.3	653.6	15.79	42.394			
3,400.0	3,393.1	3,299.9	3,214.1	7.7	14.9	55.14	410.5	592.1	685.9	669.5	16.36	41.918			
3,500.0	3,491.6	3,397.9	3,308.7	8.0	15.5	56.01	426.0	612.7	702.6	685.7	16.95	41.451			
3,600.0	3,590.1	3,496.0	3,403.2	8.3	16.0	56.83	441.6	633.4	719.5	701.9	17.55	40.996			
3,700.0	3,688.6	3,612.9	3,516.2	8.6	16.6	57.78	459.5	657.3	735.8	717.6	18.20	40.424			
3,800.0	3,787.1	3,745.1	3,645.3	8.9	17.1	58.88	476.7	680.2	748.2	729.3	18.86	39.660			
3,900.0	3,885.6	3,878.3	3,776.6	9.2	17.5	60.04	490.4	698.4	756.3	736.7	19.53	38.725			
4,000.0	3,984.2	4,011.9	3,909.1	9.5	17.8	61.29	500.4	711.7	760.0	739.8	20.19	37.641			
4,100.0	4,082.7	4,145.4	4,042.1	9.8	18.1	62.63	506.7	720.0	759.5	738.7	20.85	36.430			
4,200.0	4,181.2	4,278.1	4,174.8	10.2	18.3	64.10	509.2	723.4	754.8	733.3	21.50	35.100			
4,300.0	4,279.7	4,383.0	4,279.7	10.5	18.4	65.35	509.3	723.5	747.5	725.3	22.10	33.816			
4,400.0	4,378.2	4,481.5	4,378.2	10.8	18.5	66.55	509.3	723.5	740.3	717.6	22.70	32.610			
4,500.0	4,476.7	4,580.0	4,476.7	11.2	18.6	67.77	509.3	723.5	733.6	710.2	23.32	31.462			
4,600.0	4,575.2	4,678.5	4,575.2	11.5	18.7	69.01	509.3	723.5	727.1	703.2	23.94	30.375			
4,700.0	4,673.7	4,777.0	4,673.7	11.9	18.8	70.27	509.3	723.5	721.0	696.5	24.57	29.344			
4,800.0	4,772.2	4,875.5	4,772.2	12.2	18.9	71.55	509.3	723.5	715.3	690.1	25.22	28.369			
4,900.0	4,870.7	4,974.0	4,870.7	12.6	19.0	72.85	509.3	723.5	710.0	684.1	25.87	27.447			
5,000.0	4,969.2	5,072.5	4,969.2	12.9	19.2	74.17	509.3	723.5	705.0	678.5	26.53	26.577			

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - 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	5,067.7	5,171.0	5,067.7	13.3	19.3	75.51	509.3	723.5	700.5	673.3	27.19	25.757			
5,200.0	5,166.2	5,269.5	5,166.2	13.6	19.4	76.86	509.3	723.5	696.3	668.4	27.87	24.985			
5,300.0	5,264.7	5,368.0	5,264.7	14.0	19.5	78.23	509.3	723.5	692.5	664.0	28.55	24.259			
5,400.0	5,363.2	5,466.5	5,363.2	14.3	19.6	79.61	509.3	723.5	689.2	659.9	29.23	23.578			
5,500.0	5,461.7	5,565.0	5,461.7	14.7	19.8	81.01	509.3	723.5	686.2	656.3	29.92	22.938			
5,600.0	5,560.3	5,663.6	5,560.3	15.0	19.9	82.35	509.3	723.5	683.8	653.2	30.57	22.370			
5,700.0	5,659.4	5,762.7	5,659.4	15.3	20.0	83.44	509.3	723.5	682.1	651.0	31.11	21.925			
5,800.0	5,758.8	5,862.1	5,758.8	15.5	20.2	84.26	509.3	723.5	681.0	649.4	31.60	21.552			
5,900.0	5,858.6	5,961.9	5,858.6	15.7	20.3	84.81	509.3	723.5	680.3	648.3	32.02	21.245			
6,000.0	5,958.5	6,061.9	5,958.5	15.9	20.4	85.07	509.3	723.5	680.0	647.7	32.39	20.997			
6,062.1	6,020.6	6,123.9	6,020.6	16.0	20.5	85.13	509.2	723.5	680.0	647.4	32.59	20.864			
6,100.0	6,058.5	6,161.8	6,058.5	16.1	20.6	90.12	507.6	723.5	680.0	647.3	32.71	20.792			
6,200.0	6,158.5	6,260.4	6,156.1	16.2	20.6	-88.99	494.7	723.5	680.1	647.1	32.98	20.622			
6,300.0	6,257.4	6,357.5	6,249.9	16.2	20.5	-88.03	469.9	723.5	680.4	647.4	33.04	20.594			
6,400.0	6,353.5	6,453.2	6,338.6	16.2	20.4	-87.11	433.9	723.5	680.9	648.0	32.90	20.695			
6,500.0	6,445.3	6,547.8	6,421.0	16.0	20.2	-86.24	387.8	723.5	681.5	648.9	32.61	20.901			
6,600.0	6,531.2	6,641.2	6,496.3	15.8	20.0	-85.44	332.5	723.5	682.2	650.0	32.22	21.176			
6,700.0	6,609.6	6,733.7	6,563.7	15.6	19.8	-84.72	269.2	723.5	682.9	651.1	31.81	21.470			
6,800.0	6,679.3	6,825.4	6,622.4	15.5	19.6	-84.08	198.9	723.5	683.7	652.2	31.48	21.720			
6,900.0	6,739.0	6,916.4	6,671.9	15.4	19.4	-83.54	122.6	723.5	684.4	653.1	31.32	21.854			
7,000.0	6,787.8	7,006.8	6,711.8	15.5	19.2	-83.10	41.5	723.5	685.0	653.6	31.42	21.804			
7,100.0	6,824.8	7,096.8	6,741.8	15.8	19.2	-82.77	-43.2	723.5	685.5	653.6	31.85	21.519			
7,200.0	6,849.3	7,186.4	6,761.5	16.2	19.2	-82.54	-130.7	723.5	685.8	653.2	32.67	20.990			
7,300.0	6,861.0	7,275.9	6,770.8	16.9	19.4	-82.44	-219.6	723.5	686.0	652.1	33.87	20.256			
7,400.0	6,862.0	7,371.2	6,771.2	17.7	19.8	-82.40	-314.9	723.5	686.1	650.6	35.43	19.362			
7,500.0	6,862.0	7,471.2	6,770.6	18.7	20.6	-82.35	-414.9	723.5	686.1	648.8	37.33	18.380			
7,600.0	6,862.0	7,571.2	6,770.0	19.8	21.5	-82.29	-514.9	723.5	686.2	646.7	39.50	17.371			
7,700.0	6,862.0	7,671.2	6,769.4	21.0	22.6	-82.24	-614.9	723.5	686.3	644.4	41.91	16.375			
7,800.0	6,862.0	7,771.2	6,768.7	22.3	23.9	-82.19	-714.8	723.5	686.4	641.9	44.51	15.420			
7,900.0	6,862.0	7,871.2	6,768.1	23.8	25.2	-82.14	-814.8	723.5	686.5	639.2	47.28	14.520			
8,000.0	6,862.0	7,971.2	6,767.5	25.2	26.6	-82.09	-914.8	723.5	686.6	636.4	50.18	13.682			
8,100.0	6,862.0	8,071.2	6,766.8	26.8	28.0	-82.03	-1,014.8	723.5	686.7	633.5	53.20	12.908			
8,200.0	6,862.0	8,171.2	6,766.2	28.3	29.5	-81.98	-1,114.8	723.5	686.7	630.4	56.31	12.196			
8,300.0	6,862.0	8,271.2	6,765.6	30.0	31.1	-81.93	-1,214.8	723.5	686.8	627.3	59.50	11.543			
8,400.0	6,862.0	8,371.2	6,765.0	31.6	32.6	-81.88	-1,314.8	723.5	686.9	624.2	62.76	10.945			
8,500.0	6,862.0	8,471.2	6,764.3	33.3	34.3	-81.83	-1,414.8	723.5	687.0	620.9	66.07	10.397			
8,600.0	6,862.0	8,571.2	6,763.7	35.0	35.9	-81.77	-1,514.8	723.5	687.1	617.7	69.44	9.895			
8,700.0	6,862.0	8,671.1	6,763.1	36.7	37.6	-81.72	-1,614.8	723.5	687.2	614.3	72.85	9.433			
8,800.0	6,862.0	8,771.1	6,762.4	38.5	39.3	-81.67	-1,714.8	723.5	687.3	611.0	76.29	9.009			
8,900.0	6,862.0	8,871.1	6,761.8	40.2	41.0	-81.62	-1,814.8	723.5	687.4	607.6	79.77	8.617			
9,000.0	6,862.0	8,971.1	6,761.2	42.0	42.7	-81.57	-1,914.8	723.5	687.5	604.2	83.27	8.256			
9,100.0	6,862.0	9,071.1	6,760.6	43.8	44.4	-81.52	-2,014.8	723.5	687.6	600.8	86.80	7.921			
9,200.0	6,862.0	9,171.1	6,759.9	45.6	46.2	-81.46	-2,114.8	723.5	687.6	597.3	90.35	7.611			
9,300.0	6,862.0	9,271.1	6,759.3	47.4	48.0	-81.41	-2,214.8	723.5	687.7	593.8	93.91	7.323			
9,400.0	6,862.0	9,371.1	6,758.7	49.2	49.8	-81.36	-2,314.8	723.5	687.8	590.3	97.50	7.055			
9,500.0	6,862.0	9,471.1	6,758.0	51.1	51.5	-81.31	-2,414.8	723.5	687.9	586.8	101.09	6.805			
9,600.0	6,862.0	9,571.1	6,757.4	52.9	53.3	-81.26	-2,514.8	723.5	688.0	583.3	104.71	6.571			
9,700.0	6,862.0	9,671.1	6,756.8	54.7	55.2	-81.20	-2,614.8	723.5	688.1	579.8	108.33	6.352			
9,800.0	6,862.0	9,771.1	6,756.2	56.6	57.0	-81.15	-2,714.8	723.5	688.2	576.3	111.96	6.147			
9,900.0	6,862.0	9,871.1	6,755.5	58.4	58.8	-81.10	-2,814.8	723.5	688.3	572.7	115.60	5.954			

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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - 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	6,862.0	9,971.1	6,754.9	60.3	60.6	-81.05	-2,914.8	723.5	688.4	569.2	119.25	5.773			
10,100.0	6,862.0	10,071.1	6,754.3	62.1	62.4	-81.00	-3,014.8	723.5	688.5	565.6	122.91	5.602			
10,200.0	6,862.0	10,171.1	6,753.6	64.0	64.3	-80.95	-3,114.8	723.5	688.6	562.0	126.57	5.440			
10,300.0	6,862.0	10,271.1	6,753.0	65.8	66.1	-80.90	-3,214.7	723.5	688.7	558.5	130.24	5.288			
10,400.0	6,862.0	10,371.1	6,752.4	67.7	68.0	-80.84	-3,314.7	723.5	688.8	554.9	133.92	5.143			
10,500.0	6,862.0	10,471.1	6,751.8	69.6	69.8	-80.79	-3,414.7	723.5	688.9	551.3	137.60	5.007			
10,600.0	6,862.0	10,571.1	6,751.1	71.5	71.7	-80.74	-3,514.7	723.5	689.0	547.7	141.29	4.877			
10,700.0	6,862.0	10,671.1	6,750.5	73.3	73.5	-80.69	-3,614.7	723.5	689.1	544.1	144.98	4.753			
10,800.0	6,862.0	10,771.1	6,749.9	75.2	75.4	-80.64	-3,714.7	723.5	689.2	540.5	148.67	4.636			
10,900.0	6,862.0	10,871.1	6,749.2	77.1	77.2	-80.59	-3,814.7	723.5	689.3	537.0	152.36	4.524			
11,000.0	6,862.0	10,971.1	6,748.6	79.0	79.1	-80.53	-3,914.7	723.5	689.4	533.4	156.06	4.418			
11,100.0	6,862.0	11,071.1	6,748.0	80.9	81.0	-80.48	-4,014.7	723.5	689.5	529.8	159.77	4.316			
11,200.0	6,862.0	11,171.1	6,747.4	82.7	82.9	-80.43	-4,114.7	723.5	689.6	526.2	163.47	4.219			
11,300.0	6,862.0	11,271.1	6,746.7	84.6	84.7	-80.38	-4,214.7	723.5	689.7	522.6	167.18	4.126			
11,400.0	6,862.0	11,371.1	6,746.1	86.5	86.6	-80.33	-4,314.7	723.5	689.8	519.0	170.89	4.037			
11,500.0	6,862.0	11,471.1	6,745.5	88.4	88.5	-80.28	-4,414.7	723.5	689.9	515.3	174.60	3.952			
11,600.0	6,862.0	11,571.1	6,744.8	90.3	90.4	-80.23	-4,514.7	723.5	690.1	511.7	178.31	3.870			
11,700.0	6,862.0	11,671.1	6,744.2	92.2	92.2	-80.17	-4,614.7	723.5	690.2	508.1	182.02	3.792			
11,800.0	6,862.0	11,771.1	6,743.6	94.1	94.1	-80.12	-4,714.7	723.5	690.3	504.5	185.73	3.716			
11,900.0	6,862.0	11,871.1	6,743.0	96.0	96.0	-80.07	-4,814.7	723.5	690.4	500.9	189.45	3.644			
12,000.0	6,862.0	11,971.1	6,742.3	97.9	97.9	-80.02	-4,914.7	723.5	690.5	497.3	193.17	3.575			
12,100.0	6,862.0	12,071.1	6,741.7	99.8	99.8	-79.97	-5,014.7	723.5	690.6	493.7	196.88	3.508			
12,200.0	6,862.0	12,171.1	6,741.1	101.7	101.6	-79.92	-5,114.7	723.5	690.7	490.1	200.60	3.443			
12,300.0	6,862.0	12,271.1	6,740.5	103.6	103.5	-79.87	-5,214.7	723.5	690.8	486.5	204.32	3.381			
12,400.0	6,862.0	12,371.1	6,739.8	105.4	105.4	-79.81	-5,314.7	723.5	690.9	482.9	208.04	3.321			
12,500.0	6,862.0	12,471.1	6,739.2	107.3	107.3	-79.76	-5,414.7	723.5	691.0	479.3	211.76	3.263			
12,600.0	6,862.0	12,571.1	6,738.6	109.2	109.2	-79.71	-5,514.7	723.5	691.1	475.7	215.48	3.207			
12,700.0	6,862.0	12,671.1	6,737.9	111.1	111.1	-79.66	-5,614.7	723.5	691.3	472.1	219.20	3.154			
12,800.0	6,862.0	12,771.1	6,737.3	113.0	113.0	-79.61	-5,714.7	723.5	691.4	468.5	222.92	3.101			
12,900.0	6,862.0	12,871.1	6,736.7	115.0	114.9	-79.56	-5,814.6	723.5	691.5	464.8	226.64	3.051			
13,000.0	6,862.0	12,971.1	6,736.1	116.9	116.8	-79.51	-5,914.6	723.5	691.6	461.2	230.36	3.002			
13,100.0	6,862.0	13,071.1	6,735.4	118.8	118.7	-79.46	-6,014.6	723.5	691.7	457.6	234.08	2.955			
13,200.0	6,862.0	13,171.1	6,734.8	120.7	120.6	-79.40	-6,114.6	723.5	691.8	454.0	237.80	2.909			
13,300.0	6,862.0	13,271.1	6,734.2	122.6	122.5	-79.35	-6,214.6	723.5	691.9	450.4	241.52	2.865			
13,400.0	6,862.0	13,371.1	6,733.5	124.5	124.4	-79.30	-6,314.6	723.5	692.1	446.8	245.24	2.822			
13,500.0	6,862.0	13,471.1	6,732.9	126.4	126.3	-79.25	-6,414.6	723.5	692.2	443.2	248.96	2.780			
13,600.0	6,862.0	13,571.1	6,732.3	128.3	128.2	-79.20	-6,514.6	723.5	692.3	439.6	252.68	2.740			
13,700.0	6,862.0	13,671.0	6,731.7	130.2	130.1	-79.15	-6,614.6	723.5	692.4	436.0	256.40	2.701			
13,800.0	6,862.0	13,771.0	6,731.0	132.1	132.0	-79.10	-6,714.6	723.5	692.5	432.4	260.12	2.662			
13,900.0	6,862.0	13,871.0	6,730.4	134.0	133.9	-79.05	-6,814.6	723.5	692.7	428.8	263.84	2.625			
14,000.0	6,862.0	13,971.0	6,729.8	135.9	135.8	-79.00	-6,914.6	723.5	692.8	425.2	267.55	2.589			
14,100.0	6,862.0	14,071.0	6,729.1	137.8	137.7	-78.95	-7,014.6	723.5	692.9	421.6	271.27	2.554			
14,200.0	6,862.0	14,171.0	6,728.5	139.7	139.6	-78.89	-7,114.6	723.5	693.0	418.0	274.99	2.520			
14,300.0	6,862.0	14,271.0	6,727.9	141.6	141.5	-78.84	-7,214.6	723.5	693.1	414.4	278.70	2.487			
14,400.0	6,862.0	14,371.0	6,727.3	143.5	143.4	-78.79	-7,314.6	723.5	693.3	410.8	282.42	2.455			
14,417.3	6,862.0	14,388.3	6,727.1	143.9	143.7	-78.78	-7,331.8	723.5	693.3	410.2	283.06	2.449			
14,445.8	6,862.0	14,411.8	6,727.0	144.4	144.2	-78.77	-7,355.4	723.5	693.3	409.3	284.03	2.441 SF			

Reference Depths are relative to WELL @ 4685.0ft (RKB - 23')	Coordinates are relative to: Ottenhoff 29R-423
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 29R-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-423	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 (3-15-16)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4685.0ft (RKB - 23')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Ottenhoff 29R-423
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°

