

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Ottenhoff 29U-343**

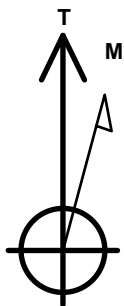
Surface Location: Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4662.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381166.55	3259764.52	40.375955	-104.567621	

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

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 560'FNL & 930'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2340'FNL & 300'FEL, Sec.32	6727.0	-7052.3	675.6	Point
LPL 819'FNL & 252'FEL, Sec.29	6772.0	-247.0	679.6	Point



Azimuths to True North
Magnetic North: 8.00°

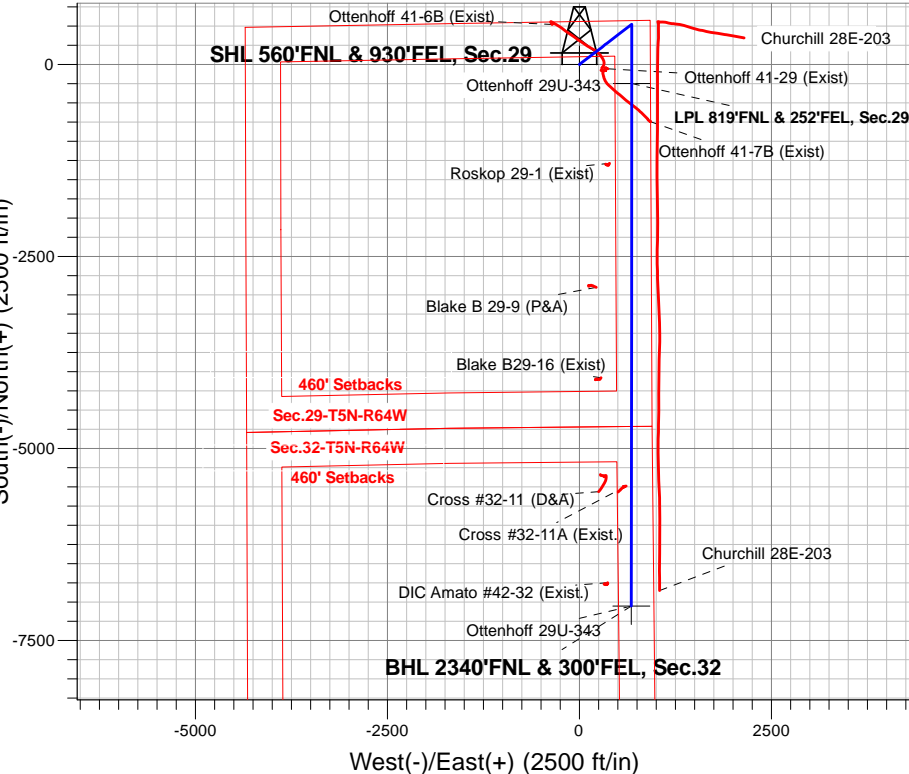
Magnetic Field
Strength: 52547.3snT
Dip Angle: 66.87°
Date: 1/30/2017
Model: IGRF2010

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29U-343
Plan #2 (1-25-17)
9:59, January 30 2017

ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP - Start Build 1.50
3434.1	3530.3	Start Drop -2.00
4200.0	4305.6	Start 1808.1 hold at 4305.6 MD
6008.1	6113.7	Start Build 7.50
6772.0	7318.7	Start 6805.4 hold at 7318.7 MD
6726.9	14124.2	TD at 14124.2

South(-)/North(+) (2500 ft/in)

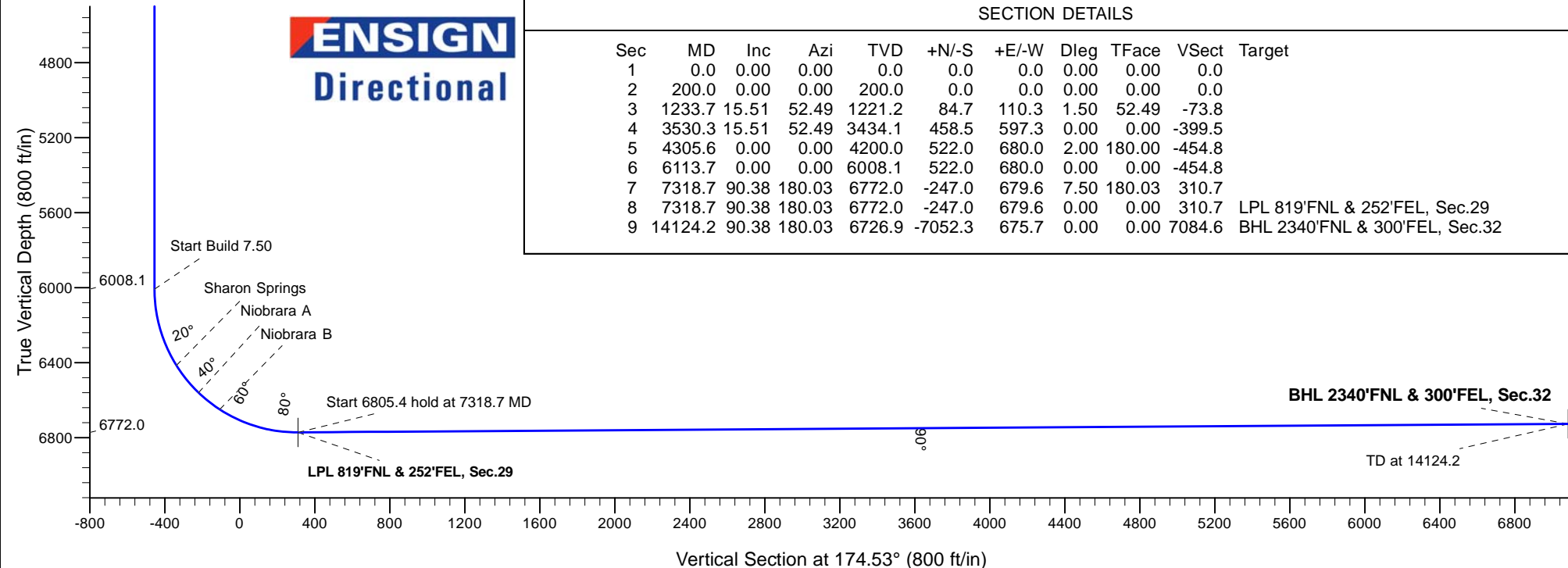


West(-)/East(+) (2500 ft/in)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	1233.7	15.51	52.49	1221.2	84.7	110.3	1.50	52.49	-73.8	
4	3530.3	15.51	52.49	3434.1	458.5	597.3	0.00	0.00	-399.5	
5	4305.6	0.00	0.00	4200.0	522.0	680.0	2.00	180.00	-454.8	
6	6113.7	0.00	0.00	6008.1	522.0	680.0	0.00	0.00	-454.8	
7	7318.7	90.38	180.03	6772.0	-247.0	679.6	7.50	180.03	310.7	
8	7318.7	90.38	180.03	6772.0	-247.0	679.6	0.00	0.00	310.7	LPL 819'FNL & 252'FEL, Sec.29
9	14124.2	90.38	180.03	6726.9	-7052.3	675.7	0.00	0.00	7084.6	BHL 2340'FNL & 300'FEL, Sec.32

ENSIGN
Directional



Vertical Section at 174.53° (800 ft/in)



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29U-343

Wellbore #1

Plan: Plan #2 (1-25-17)

Standard Planning Report

30 January, 2017

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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 29U-343					
Well Position	+N/-S	-0.4 ft	Northing:	1,381,166.55 usft	Latitude:	40.375955
	+E/-W	15.0 ft	Easting:	3,259,764.53 usft	Longitude:	-104.567621
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	1/30/2017	8.00	66.87	52,547

Design	Plan #2 (1-25-17)			
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	174.53

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,233.7	15.51	52.49	1,221.2	84.7	110.3	1.50	1.50	0.00	52.49	
3,530.3	15.51	52.49	3,434.1	458.5	597.3	0.00	0.00	0.00	0.00	
4,305.6	0.00	0.00	4,200.0	522.0	680.0	2.00	-2.00	0.00	180.00	
6,113.7	0.00	0.00	6,008.1	522.0	680.0	0.00	0.00	0.00	0.00	
7,318.7	90.38	180.03	6,772.0	-247.0	679.6	7.50	7.50	0.00	180.03	
7,318.7	90.38	180.03	6,772.0	-247.0	679.6	0.00	0.00	0.00	0.00	LPL 819'FNL & 252'FI
14,124.2	90.38	180.03	6,726.9	-7,052.3	675.7	0.00	0.00	0.00	0.00	BHL 2340'FNL & 300'

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
300.0	1.50	52.49	300.0	0.8	1.0	-0.7	1.50	1.50	0.00
400.0	3.00	52.49	399.9	3.2	4.2	-2.8	1.50	1.50	0.00
500.0	4.50	52.49	499.7	7.2	9.3	-6.2	1.50	1.50	0.00
600.0	6.00	52.49	599.3	12.7	16.6	-11.1	1.50	1.50	0.00
700.0	7.50	52.49	698.6	19.9	25.9	-17.3	1.50	1.50	0.00
800.0	9.00	52.49	797.5	28.6	37.3	-24.9	1.50	1.50	0.00
900.0	10.50	52.49	896.1	38.9	50.7	-33.9	1.50	1.50	0.00
1,000.0	12.00	52.49	994.2	50.8	66.2	-44.3	1.50	1.50	0.00
1,100.0	13.50	52.49	1,091.7	64.3	83.7	-56.0	1.50	1.50	0.00
1,200.0	15.00	52.49	1,188.6	79.3	103.2	-69.0	1.50	1.50	0.00
1,233.7	15.51	52.49	1,221.2	84.7	110.3	-73.8	1.50	1.50	0.00
1,300.0	15.51	52.49	1,285.0	95.4	124.3	-83.2	0.00	0.00	0.00
1,400.0	15.51	52.49	1,381.4	111.7	145.5	-97.3	0.00	0.00	0.00
1,500.0	15.51	52.49	1,477.7	128.0	166.7	-111.5	0.00	0.00	0.00
1,600.0	15.51	52.49	1,574.1	144.3	188.0	-125.7	0.00	0.00	0.00
1,700.0	15.51	52.49	1,670.5	160.6	209.2	-139.9	0.00	0.00	0.00
1,800.0	15.51	52.49	1,766.8	176.8	230.4	-154.1	0.00	0.00	0.00
1,900.0	15.51	52.49	1,863.2	193.1	251.6	-168.2	0.00	0.00	0.00
2,000.0	15.51	52.49	1,959.5	209.4	272.8	-182.4	0.00	0.00	0.00
2,100.0	15.51	52.49	2,055.9	225.7	294.0	-196.6	0.00	0.00	0.00
2,200.0	15.51	52.49	2,152.3	242.0	315.2	-210.8	0.00	0.00	0.00
2,300.0	15.51	52.49	2,248.6	258.2	336.4	-225.0	0.00	0.00	0.00
2,400.0	15.51	52.49	2,345.0	274.5	357.6	-239.2	0.00	0.00	0.00
2,500.0	15.51	52.49	2,441.3	290.8	378.8	-253.3	0.00	0.00	0.00
2,600.0	15.51	52.49	2,537.7	307.1	400.0	-267.5	0.00	0.00	0.00
2,700.0	15.51	52.49	2,634.1	323.3	421.2	-281.7	0.00	0.00	0.00
2,800.0	15.51	52.49	2,730.4	339.6	442.4	-295.9	0.00	0.00	0.00
2,900.0	15.51	52.49	2,826.8	355.9	463.6	-310.1	0.00	0.00	0.00
3,000.0	15.51	52.49	2,923.1	372.2	484.8	-324.2	0.00	0.00	0.00
3,100.0	15.51	52.49	3,019.5	388.5	506.0	-338.4	0.00	0.00	0.00
3,200.0	15.51	52.49	3,115.9	404.7	527.2	-352.6	0.00	0.00	0.00
3,300.0	15.51	52.49	3,212.2	421.0	548.5	-366.8	0.00	0.00	0.00
3,400.0	15.51	52.49	3,308.6	437.3	569.7	-381.0	0.00	0.00	0.00
3,500.0	15.51	52.49	3,404.9	453.6	590.9	-395.2	0.00	0.00	0.00
3,530.3	15.51	52.49	3,434.1	458.5	597.3	-399.5	0.00	0.00	0.00
Start Drop -2.00									
3,600.0	14.11	52.49	3,501.5	469.4	611.4	-408.9	2.00	-2.00	0.00
3,629.3	13.53	52.49	3,530.0	473.6	617.0	-412.6	2.00	-2.00	0.00
Parkman Sandstone									
3,700.0	12.11	52.49	3,598.9	483.2	629.4	-420.9	2.00	-2.00	0.00
3,800.0	10.11	52.49	3,697.0	494.9	644.7	-431.2	2.00	-2.00	0.00
3,900.0	8.11	52.49	3,795.8	504.5	657.3	-439.6	2.00	-2.00	0.00
4,000.0	6.11	52.49	3,895.0	512.1	667.1	-446.1	2.00	-2.00	0.00
4,100.0	4.11	52.49	3,994.6	517.5	674.2	-450.9	2.00	-2.00	0.00
4,200.0	2.11	52.49	4,094.4	520.8	678.5	-453.7	2.00	-2.00	0.00
4,300.0	0.11	52.49	4,194.4	522.0	680.0	-454.8	2.00	-2.00	0.00
4,305.6	0.00	0.00	4,200.0	522.0	680.0	-454.8	2.00	-2.00	-939.08
Start 1808.1 hold at 4305.6 MD - Sussex Sandstone									

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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 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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	0.00	0.00	4,294.4	522.0	680.0	-454.8	0.00	0.00	0.00
4,500.0	0.00	0.00	4,394.4	522.0	680.0	-454.8	0.00	0.00	0.00
4,600.0	0.00	0.00	4,494.4	522.0	680.0	-454.8	0.00	0.00	0.00
4,700.0	0.00	0.00	4,594.4	522.0	680.0	-454.8	0.00	0.00	0.00
4,800.0	0.00	0.00	4,694.4	522.0	680.0	-454.8	0.00	0.00	0.00
4,900.0	0.00	0.00	4,794.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,000.0	0.00	0.00	4,894.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,100.0	0.00	0.00	4,994.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,200.0	0.00	0.00	5,094.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,300.0	0.00	0.00	5,194.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,400.0	0.00	0.00	5,294.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,500.0	0.00	0.00	5,394.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,600.0	0.00	0.00	5,494.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,700.0	0.00	0.00	5,594.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,800.0	0.00	0.00	5,694.4	522.0	680.0	-454.8	0.00	0.00	0.00
5,900.0	0.00	0.00	5,794.4	522.0	680.0	-454.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,894.4	522.0	680.0	-454.8	0.00	0.00	0.00
6,100.0	0.00	0.00	5,994.4	522.0	680.0	-454.8	0.00	0.00	0.00
6,113.7	0.00	0.00	6,008.1	522.0	680.0	-454.8	0.00	0.00	0.00
Start Build 7.50									
6,200.0	6.47	180.03	6,094.2	517.1	680.0	-449.9	7.50	7.50	0.00
6,300.0	13.97	180.03	6,192.6	499.4	680.0	-432.3	7.50	7.50	0.00
6,400.0	21.47	180.03	6,287.8	469.0	680.0	-402.0	7.50	7.50	0.00
6,500.0	28.97	180.03	6,378.2	426.4	679.9	-359.6	7.50	7.50	0.00
6,542.8	32.18	180.03	6,415.0	404.6	679.9	-337.9	7.50	7.50	0.00
Sharon Springs									
6,600.0	36.47	180.03	6,462.2	372.4	679.9	-305.8	7.50	7.50	0.00
6,700.0	43.97	180.03	6,538.5	307.8	679.9	-241.6	7.50	7.50	0.00
6,730.4	46.26	180.03	6,560.0	286.3	679.9	-220.1	7.50	7.50	0.00
Niobrara A									
6,800.0	51.48	180.03	6,605.7	233.9	679.8	-168.0	7.50	7.50	0.00
6,875.9	57.17	180.03	6,650.0	172.3	679.8	-106.6	7.50	7.50	0.00
Niobrara B									
6,900.0	58.98	180.03	6,662.7	151.8	679.8	-86.3	7.50	7.50	0.00
7,000.0	66.48	180.03	6,708.5	63.0	679.7	2.1	7.50	7.50	0.00
7,074.9	72.09	180.03	6,735.0	-7.0	679.7	71.8	7.50	7.50	0.00
Niobrara C									
7,100.0	73.98	180.03	6,742.3	-31.0	679.7	95.7	7.50	7.50	0.00
7,200.0	81.48	180.03	6,763.6	-128.7	679.6	192.9	7.50	7.50	0.00
7,300.0	88.98	180.03	6,771.9	-228.3	679.6	292.0	7.50	7.50	0.00
7,318.7	90.38	180.03	6,772.0	-247.0	679.6	310.7	7.50	7.50	0.00
Start 6805.4 hold at 7318.7 MD									
7,400.0	90.38	180.03	6,771.5	-328.3	679.5	391.6	0.00	0.00	0.00
7,500.0	90.38	180.03	6,770.8	-428.3	679.5	491.1	0.00	0.00	0.00
7,600.0	90.38	180.03	6,770.1	-528.3	679.4	590.7	0.00	0.00	0.00
7,700.0	90.38	180.03	6,769.5	-628.3	679.3	690.2	0.00	0.00	0.00
7,800.0	90.38	180.03	6,768.8	-728.3	679.3	789.7	0.00	0.00	0.00
7,900.0	90.38	180.03	6,768.1	-828.3	679.2	889.3	0.00	0.00	0.00
8,000.0	90.38	180.03	6,767.5	-928.3	679.2	988.8	0.00	0.00	0.00
8,100.0	90.38	180.03	6,766.8	-1,028.2	679.1	1,088.3	0.00	0.00	0.00
8,200.0	90.38	180.03	6,766.2	-1,128.2	679.1	1,187.9	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 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,300.0	90.38	180.03	6,765.5	-1,228.2	679.0	1,287.4	0.00	0.00	0.00
8,400.0	90.38	180.03	6,764.8	-1,328.2	678.9	1,386.9	0.00	0.00	0.00
8,500.0	90.38	180.03	6,764.2	-1,428.2	678.9	1,486.5	0.00	0.00	0.00
8,600.0	90.38	180.03	6,763.5	-1,528.2	678.8	1,586.0	0.00	0.00	0.00
8,700.0	90.38	180.03	6,762.8	-1,628.2	678.8	1,685.6	0.00	0.00	0.00
8,800.0	90.38	180.03	6,762.2	-1,728.2	678.7	1,785.1	0.00	0.00	0.00
8,900.0	90.38	180.03	6,761.5	-1,828.2	678.7	1,884.6	0.00	0.00	0.00
9,000.0	90.38	180.03	6,760.8	-1,928.2	678.6	1,984.2	0.00	0.00	0.00
9,100.0	90.38	180.03	6,760.2	-2,028.2	678.6	2,083.7	0.00	0.00	0.00
9,200.0	90.38	180.03	6,759.5	-2,128.2	678.5	2,183.2	0.00	0.00	0.00
9,300.0	90.38	180.03	6,758.9	-2,228.2	678.4	2,282.8	0.00	0.00	0.00
9,400.0	90.38	180.03	6,758.2	-2,328.2	678.4	2,382.3	0.00	0.00	0.00
9,500.0	90.38	180.03	6,757.5	-2,428.2	678.3	2,481.8	0.00	0.00	0.00
9,600.0	90.38	180.03	6,756.9	-2,528.2	678.3	2,581.4	0.00	0.00	0.00
9,700.0	90.38	180.03	6,756.2	-2,628.2	678.2	2,680.9	0.00	0.00	0.00
9,800.0	90.38	180.03	6,755.5	-2,728.2	678.2	2,780.5	0.00	0.00	0.00
9,900.0	90.38	180.03	6,754.9	-2,828.2	678.1	2,880.0	0.00	0.00	0.00
10,000.0	90.38	180.03	6,754.2	-2,928.2	678.0	2,979.5	0.00	0.00	0.00
10,100.0	90.38	180.03	6,753.6	-3,028.2	678.0	3,079.1	0.00	0.00	0.00
10,200.0	90.38	180.03	6,752.9	-3,128.2	677.9	3,178.6	0.00	0.00	0.00
10,300.0	90.38	180.03	6,752.2	-3,228.2	677.9	3,278.1	0.00	0.00	0.00
10,400.0	90.38	180.03	6,751.6	-3,328.2	677.8	3,377.7	0.00	0.00	0.00
10,500.0	90.38	180.03	6,750.9	-3,428.2	677.8	3,477.2	0.00	0.00	0.00
10,600.0	90.38	180.03	6,750.2	-3,528.2	677.7	3,576.7	0.00	0.00	0.00
10,700.0	90.38	180.03	6,749.6	-3,628.2	677.6	3,676.3	0.00	0.00	0.00
10,800.0	90.38	180.03	6,748.9	-3,728.2	677.6	3,775.8	0.00	0.00	0.00
10,900.0	90.38	180.03	6,748.2	-3,828.2	677.5	3,875.4	0.00	0.00	0.00
11,000.0	90.38	180.03	6,747.6	-3,928.2	677.5	3,974.9	0.00	0.00	0.00
11,100.0	90.38	180.03	6,746.9	-4,028.2	677.4	4,074.4	0.00	0.00	0.00
11,200.0	90.38	180.03	6,746.3	-4,128.2	677.4	4,174.0	0.00	0.00	0.00
11,300.0	90.38	180.03	6,745.6	-4,228.2	677.3	4,273.5	0.00	0.00	0.00
11,400.0	90.38	180.03	6,744.9	-4,328.2	677.2	4,373.0	0.00	0.00	0.00
11,500.0	90.38	180.03	6,744.3	-4,428.2	677.2	4,472.6	0.00	0.00	0.00
11,600.0	90.38	180.03	6,743.6	-4,528.2	677.1	4,572.1	0.00	0.00	0.00
11,700.0	90.38	180.03	6,742.9	-4,628.2	677.1	4,671.6	0.00	0.00	0.00
11,800.0	90.38	180.03	6,742.3	-4,728.2	677.0	4,771.2	0.00	0.00	0.00
11,900.0	90.38	180.03	6,741.6	-4,828.2	677.0	4,870.7	0.00	0.00	0.00
12,000.0	90.38	180.03	6,741.0	-4,928.2	676.9	4,970.3	0.00	0.00	0.00
12,100.0	90.38	180.03	6,740.3	-5,028.2	676.8	5,069.8	0.00	0.00	0.00
12,200.0	90.38	180.03	6,739.6	-5,128.2	676.8	5,169.3	0.00	0.00	0.00
12,300.0	90.38	180.03	6,739.0	-5,228.2	676.7	5,268.9	0.00	0.00	0.00
12,400.0	90.38	180.03	6,738.3	-5,328.2	676.7	5,368.4	0.00	0.00	0.00
12,500.0	90.38	180.03	6,737.6	-5,428.2	676.6	5,467.9	0.00	0.00	0.00
12,600.0	90.38	180.03	6,737.0	-5,528.1	676.6	5,567.5	0.00	0.00	0.00
12,700.0	90.38	180.03	6,736.3	-5,628.1	676.5	5,667.0	0.00	0.00	0.00
12,800.0	90.38	180.03	6,735.6	-5,728.1	676.5	5,766.5	0.00	0.00	0.00
12,900.0	90.38	180.03	6,735.0	-5,828.1	676.4	5,866.1	0.00	0.00	0.00
13,000.0	90.38	180.03	6,734.3	-5,928.1	676.3	5,965.6	0.00	0.00	0.00
13,100.0	90.38	180.03	6,733.7	-6,028.1	676.3	6,065.2	0.00	0.00	0.00
13,200.0	90.38	180.03	6,733.0	-6,128.1	676.2	6,164.7	0.00	0.00	0.00
13,300.0	90.38	180.03	6,732.3	-6,228.1	676.2	6,264.2	0.00	0.00	0.00
13,400.0	90.38	180.03	6,731.7	-6,328.1	676.1	6,363.8	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,500.0	90.38	180.03	6,731.0	-6,428.1	676.1	6,463.3	0.00	0.00	0.00
13,600.0	90.38	180.03	6,730.3	-6,528.1	676.0	6,562.8	0.00	0.00	0.00
13,700.0	90.38	180.03	6,729.7	-6,628.1	675.9	6,662.4	0.00	0.00	0.00
13,800.0	90.38	180.03	6,729.0	-6,728.1	675.9	6,761.9	0.00	0.00	0.00
13,900.0	90.38	180.03	6,728.4	-6,828.1	675.8	6,861.5	0.00	0.00	0.00
14,000.0	90.38	180.03	6,727.7	-6,928.1	675.8	6,961.0	0.00	0.00	0.00
14,100.0	90.38	180.03	6,727.0	-7,028.1	675.7	7,060.5	0.00	0.00	0.00
14,124.2	90.38	180.03	6,726.9	-7,052.3	675.7	7,084.6	0.00	0.00	0.00
TD at 14124.2									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL 560'FNL & 930'FEL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,381,166.57	3,259,764.53	40.375955	-104.567621
BHL 2340'FNL & 300'FE - plan misses target center by 0.2ft at 14124.2ft MD (6726.9 TVD, -7052.3 N, 675.7 E) - Point	0.00	0.00	6,727.0	-7,052.3	675.6	1,374,122.06	3,260,514.18	40.356597	-104.565197
LPL 819'FNL & 252'FEL - plan hits target center - Point	0.00	0.00	6,772.0	-247.0	679.6	1,380,926.74	3,260,446.62	40.375277	-104.565182

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,629.3	3,530.0	Parkman Sandstone		0.00	
4,305.6	4,200.0	Sussex Sandstone		0.00	
6,542.8	6,415.0	Sharon Springs		0.00	
6,730.4	6,560.0	Niobrara A		0.00	
6,875.9	6,650.0	Niobrara B		0.00	
7,074.9	6,735.0	Niobrara C		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
200.0	200.0	0.0	0.0	KOP - Start Build 1.50
3,530.3	3,434.1	84.7	110.3	Start Drop -2.00
4,305.6	4,200.0	458.5	597.3	Start 1808.1 hold at 4305.6 MD
6,113.7	6,008.1	522.0	680.0	Start Build 7.50
7,318.7	6,772.0	522.0	680.0	Start 6805.4 hold at 7318.7 MD
14,124.2	6,726.9	-247.0	679.6	TD at 14124.2



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29U-343

Wellbore #1

Plan #2 (1-25-17)

Anticollision Report

30 January, 2017



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (1-25-17)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 800.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.45 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	1/30/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	14,123.8	Plan #2 (1-25-17) (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						
Churchill 28J-HZ Pad Sec.28-T5N-R64W						
Churchill 28E-203 - Wellbore #1 - Wellbore #1	6,935.4	6,952.3	338.6	298.6	8.472	CC
Churchill 28E-203 - Wellbore #1 - Wellbore #1	13,905.2	13,898.5	372.5	53.8	1.169	Level 2, ES, SF
Existing Wells Sec.29-T5N-R64W						
Cross #32-11 (D&A) - Wellbore #1 - Wellbore #1	12,502.4	6,714.2	346.6	200.5	2.372	CC, ES, SF
Cross #32-11A (Exist.) - Wellbore #1 - Wellbore #1	12,564.1	6,765.8	78.0	-72.8	0.517	Level 1, CC, ES, SF
DIC Amato #42-32 (Exist.) - Wellbore #1 - Wellbore #1	13,827.0	6,755.8	310.0	130.9	1.731	CC, ES, SF
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	1,339.8	1,292.3	249.2	240.3	28.093	CC
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	1,400.0	1,351.6	249.5	240.1	26.377	ES
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	7,150.0	6,738.4	320.3	282.3	8.440	SF
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	2,175.8	2,156.3	163.2	148.8	11.326	CC, ES
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	2,200.0	2,178.3	163.4	149.0	11.322	SF
Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1	7,817.7	6,851.6	244.2	193.8	4.840	CC, ES, SF
Roskop 29-1 (Exist) - Wellbore #1 - Wellbore #1	8,363.1	6,752.0	291.0	86.4	1.422	Level 3, CC, ES, SF
Existing Wells Sec.29-T5N-R64W (GRID)						
Blake B 29-9 (P&A) - Wellbore #1 - Wellbore #1	9,967.7	6,774.5	476.7	387.7	5.352	CC, ES
Blake B 29-9 (P&A) - Wellbore #1 - Wellbore #1	10,000.0	6,774.9	477.8	388.0	5.321	SF
Blake B29-16 (Exist) - Wellbore #1 - Wellbore #1	11,158.4	6,772.0	400.9	282.7	3.391	CC, ES
Blake B29-16 (Exist) - Wellbore #1 - Wellbore #1	11,200.0	6,770.9	403.1	283.9	3.382	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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 #2 (1-25-17)	166.3	167.3	150.2	149.5	233.444	CC
Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)	200.0	200.0	150.2	149.4	181.826	ES
Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	947.7	291.6	286.1	52.684	SF
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	200.0	202.0	120.1	119.3	144.427	CC, ES
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	988.7	196.5	191.1	36.334	SF
Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)	200.0	201.0	135.1	134.3	163.060	CC, ES
Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)	900.0	874.6	216.4	211.5	44.779	SF
Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)	200.0	201.0	90.0	89.2	108.596	CC, ES
Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)	900.0	897.1	145.7	140.9	30.191	SF
Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)	200.0	201.0	60.2	59.4	72.622	CC, ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)	800.0	798.5	101.4	97.2	23.933	SF
Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)	200.0	201.0	105.0	104.2	126.749	CC, ES
Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	995.2	178.3	172.9	32.908	SF
Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)	200.0	201.0	75.0	74.1	90.444	CC, ES
Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)	900.0	897.1	131.3	126.4	27.222	SF
Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)	200.0	201.0	30.1	29.3	36.311	CC, ES
Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)	14,124.2	14,062.6	463.0	124.7	1.369	Level 3, SF
Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)	200.0	200.0	45.1	44.3	54.651	CC, ES
Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)	14,124.2	14,137.8	693.4	359.8	2.078	SF
Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)	200.0	201.0	15.1	14.2	18.160	CC
Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)	14,124.2	14,020.5	231.8	-93.3	0.713	Level 1, ES, SF

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 44-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	
3,800.0	3,697.0	3,915.3	3,832.2	21.3	19.4	39.76	490.0	1,417.0	791.4	763.5	27.91	28.350	
3,900.0	3,795.8	4,000.0	3,914.8	21.7	19.9	39.59	495.4	1,399.0	758.1	729.6	28.56	26.541	
4,000.0	3,895.0	4,090.0	4,002.8	22.0	20.3	39.40	500.4	1,381.0	728.7	699.5	29.17	24.979	
4,100.0	3,994.6	4,201.8	4,111.9	22.2	20.9	39.04	507.2	1,357.6	700.8	671.0	29.79	23.522	
4,200.0	4,094.4	4,290.1	4,198.1	22.4	21.4	38.54	512.4	1,338.9	675.4	645.1	30.28	22.303	
4,305.6	4,200.0	4,394.2	4,299.7	22.6	22.0	90.44	517.2	1,316.7	651.4	620.6	30.77	21.170	
4,400.0	4,294.4	4,489.0	4,392.4	22.7	22.5	90.18	520.1	1,297.3	632.0	600.9	31.20	20.261	
4,500.0	4,394.4	4,589.7	4,490.4	22.8	23.1	89.90	523.0	1,274.5	609.3	577.6	31.66	19.245	
4,600.0	4,494.4	4,692.9	4,591.2	22.9	23.7	89.65	525.5	1,252.5	588.0	555.9	32.13	18.298	
4,700.0	4,594.4	4,787.4	4,683.0	23.1	24.2	89.39	527.9	1,230.4	564.7	532.1	32.59	17.328	
4,800.0	4,694.4	4,897.3	4,790.1	23.2	24.8	89.18	529.5	1,205.3	542.0	508.9	33.10	16.375	
4,900.0	4,794.4	5,000.5	4,889.8	23.4	25.5	88.63	534.0	1,179.1	516.6	483.1	33.59	15.379	
5,000.0	4,894.4	5,090.0	4,976.2	23.5	26.0	87.85	539.9	1,156.6	491.6	457.6	34.05	14.436	
5,100.0	4,994.4	5,175.0	5,058.7	23.7	26.5	87.15	544.7	1,136.8	468.6	434.1	34.50	13.581	
5,200.0	5,094.4	5,265.0	5,146.7	23.8	27.0	86.50	548.8	1,118.1	448.0	413.0	34.97	12.812	
5,300.0	5,194.4	5,349.7	5,229.9	24.0	27.5	86.08	550.9	1,102.5	429.8	394.4	35.41	12.138	
5,400.0	5,294.4	5,441.5	5,320.5	24.1	27.9	85.89	551.3	1,087.7	413.6	377.8	35.86	11.535	
5,500.0	5,394.4	5,536.0	5,414.0	24.3	28.2	85.78	551.1	1,073.9	399.1	362.8	36.31	10.992	
5,600.0	5,494.4	5,635.4	5,512.3	24.4	28.6	85.47	552.1	1,059.8	385.0	348.2	36.77	10.469	
5,700.0	5,594.4	5,728.7	5,604.8	24.6	29.0	85.21	552.8	1,047.0	371.4	334.1	37.23	9.976	
5,800.0	5,694.4	5,822.5	5,697.7	24.8	29.3	84.64	555.3	1,035.1	359.0	321.3	37.69	9.525	

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 44-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)			
5,900.0	5,794.4	5,907.7	5,782.5	24.9	29.6	84.21	557.2	1,027.0	349.7	311.6	38.12	9.173		
6,000.0	5,894.4	5,996.6	5,871.3	25.1	29.8	84.00	557.9	1,021.7	343.9	305.4	38.54	8.924		
6,100.0	5,994.4	6,084.3	5,958.9	25.3	30.0	83.95	558.0	1,019.7	341.6	302.7	38.94	8.773		
6,113.7	6,008.1	6,097.4	5,972.1	25.3	30.0	83.96	558.0	1,019.6	341.5	302.5	38.99	8.759		
6,130.2	6,024.6	6,113.3	5,987.9	25.3	30.0	-96.09	557.9	1,019.6	341.5	302.4	39.06	8.744		
6,150.0	6,044.4	6,131.9	6,006.6	25.3	30.0	-96.17	557.7	1,019.6	341.6	302.4	39.13	8.729		
6,200.0	6,094.2	6,179.0	6,053.7	25.4	30.1	-96.56	556.6	1,020.0	342.3	303.0	39.28	8.715		
6,250.0	6,143.7	6,227.4	6,101.9	25.4	30.1	-97.08	553.4	1,020.8	343.6	304.2	39.37	8.727		
6,300.0	6,192.6	6,270.9	6,144.9	25.4	30.1	-97.36	547.3	1,022.5	346.0	306.6	39.40	8.782		
6,350.0	6,240.7	6,323.8	6,196.2	25.3	30.1	-97.37	534.8	1,026.1	349.6	310.3	39.37	8.882		
6,400.0	6,287.8	6,401.9	6,269.4	25.2	30.1	-97.13	508.0	1,027.9	350.7	311.4	39.28	8.929		
6,450.0	6,333.7	6,452.2	6,314.5	25.2	30.1	-96.73	485.7	1,027.9	350.3	311.1	39.16	8.944		
6,459.2	6,341.9	6,460.9	6,322.1	25.1	30.1	-96.65	481.5	1,027.9	350.3	311.1	39.14	8.949		
6,500.0	6,378.2	6,501.8	6,357.2	25.0	30.1	-96.20	460.3	1,028.4	350.5	311.4	39.04	8.977		
6,550.0	6,421.1	6,562.1	6,406.8	24.9	30.1	-95.59	426.2	1,028.7	350.5	311.5	38.93	9.001		
6,600.0	6,462.2	6,615.4	6,448.3	24.8	30.2	-95.02	392.8	1,027.9	349.4	310.5	38.85	8.992		
6,650.0	6,501.4	6,664.2	6,483.0	24.6	30.2	-94.19	358.4	1,027.6	348.6	309.8	38.81	8.983		
6,700.0	6,538.5	6,725.1	6,521.5	24.5	30.2	-92.79	311.3	1,026.9	347.7	308.8	38.89	8.941		
6,750.0	6,573.3	6,785.6	6,556.1	24.3	30.3	-91.38	261.8	1,024.0	344.9	305.9	39.04	8.834		
6,800.0	6,605.7	6,833.7	6,579.2	24.2	30.5	-89.97	219.7	1,021.4	342.0	302.8	39.23	8.718		
6,850.0	6,635.6	6,877.5	6,596.7	24.0	30.6	-88.47	179.7	1,019.4	339.9	300.4	39.46	8.613		
6,900.0	6,662.7	6,921.6	6,611.6	23.9	30.7	-86.86	138.2	1,018.1	338.8	299.1	39.74	8.526		
6,935.4	6,680.3	6,952.3	6,620.1	23.8	30.8	-85.64	108.7	1,017.4	338.6	298.6	39.97	8.472 CC		
6,950.0	6,687.1	6,964.7	6,623.1	23.8	30.9	-85.14	96.7	1,017.2	338.6	298.6	40.05	8.454		
7,000.0	6,708.5	7,007.4	6,632.0	23.6	31.1	-83.41	54.9	1,016.8	339.4	299.0	40.39	8.404		
7,050.0	6,727.0	7,054.2	6,639.1	23.6	31.3	-81.56	8.6	1,016.8	340.9	300.1	40.77	8.362		
7,100.0	6,742.3	7,102.2	6,644.2	23.5	31.6	-79.83	-39.1	1,016.4	342.2	301.1	41.18	8.311		
7,150.0	6,754.6	7,151.7	6,647.7	23.5	31.9	-78.29	-88.5	1,015.8	343.4	301.7	41.65	8.243		
7,200.0	6,763.6	7,198.3	6,649.0	23.5	32.2	-77.04	-135.0	1,015.0	344.1	302.0	42.12	8.170		
7,250.0	6,769.4	7,242.7	6,650.3	23.6	32.5	-76.36	-179.4	1,014.8	345.0	302.3	42.67	8.084		
7,300.0	6,771.9	7,291.2	6,651.9	23.8	32.9	-76.21	-227.9	1,015.3	345.7	302.2	43.45	7.956		
7,318.7	6,772.0	7,310.6	6,652.2	23.9	33.1	-76.23	-247.3	1,015.3	345.7	301.9	43.79	7.894		
7,318.7	6,772.0	7,310.6	6,652.2	23.9	33.1	-76.23	-247.3	1,015.3	345.7	301.9	43.79	7.894		
7,400.0	6,771.5	7,393.8	6,651.0	24.4	33.9	-76.09	-330.4	1,014.6	345.3	299.7	45.59	7.573		
7,493.9	6,770.8	7,485.2	6,650.8	25.3	34.8	-76.14	-421.8	1,014.1	344.7	296.9	47.84	7.205		
7,500.0	6,770.8	7,490.9	6,650.8	25.4	34.8	-76.16	-427.5	1,014.1	344.7	296.7	47.98	7.184		
7,600.0	6,770.1	7,590.5	6,651.1	26.6	36.0	-76.34	-527.2	1,014.9	345.3	294.5	50.75	6.803		
7,666.4	6,769.7	7,657.5	6,649.7	27.5	36.8	-76.17	-594.1	1,014.6	345.2	292.5	52.72	6.549		
7,700.0	6,769.5	7,690.0	6,649.2	28.0	37.2	-76.13	-626.6	1,014.6	345.3	291.6	53.71	6.429		
7,800.0	6,768.8	7,788.9	6,649.1	29.5	38.5	-76.24	-725.5	1,015.3	345.9	289.1	56.83	6.087		
7,900.0	6,768.1	7,894.8	6,648.8	31.1	39.9	-76.31	-831.4	1,015.2	345.8	285.5	60.26	5.738		
8,000.0	6,767.5	7,993.0	6,648.4	32.8	41.4	-76.33	-929.6	1,014.5	345.1	281.4	63.74	5.414		
8,100.0	6,766.8	8,094.3	6,646.8	34.6	43.0	-76.14	-1,030.9	1,013.4	344.4	277.0	67.36	5.112		
8,200.0	6,766.2	8,195.0	6,645.3	36.5	44.6	-75.96	-1,131.6	1,012.3	343.5	272.5	70.99	4.839		
8,300.0	6,765.5	8,295.4	6,645.6	38.4	46.2	-76.07	-1,231.9	1,011.0	342.1	267.4	74.70	4.580		
8,400.0	6,764.8	8,392.8	6,645.3	40.3	47.9	-76.10	-1,329.3	1,010.4	341.4	262.9	78.48	4.350		
8,476.1	6,764.3	8,467.4	6,644.2	41.8	49.2	-75.99	-1,404.0	1,010.0	341.2	259.8	81.41	4.191		
8,500.0	6,764.2	8,490.3	6,644.1	42.3	49.6	-76.00	-1,426.8	1,010.0	341.2	258.9	82.34	4.144		
8,600.0	6,763.5	8,588.4	6,645.6	44.3	51.3	-76.39	-1,524.9	1,011.2	342.0	255.6	86.42	3.958		
8,700.0	6,762.8	8,687.9	6,646.9	46.4	53.1	-76.77	-1,624.4	1,012.5	342.9	252.3	90.59	3.785		

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		44-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)				
8,800.0	6,762.2	8,787.8	6,647.6	48.5	55.0	-77.05	-1,724.3	1,013.9	344.0	249.2	94.79	3.629			
8,900.0	6,761.5	8,888.1	6,646.7	50.5	56.9	-77.05	-1,824.6	1,014.9	345.0	246.1	98.89	3.489			
9,000.0	6,760.8	8,988.2	6,646.1	52.7	58.7	-77.09	-1,924.7	1,015.8	345.9	243.0	102.95	3.360			
9,100.0	6,760.2	9,088.2	6,645.5	54.8	60.5	-77.14	-2,024.6	1,016.7	346.9	239.8	107.10	3.239			
9,200.0	6,759.5	9,188.4	6,644.1	57.0	62.5	-77.05	-2,124.9	1,017.4	347.8	236.6	111.23	3.127			
9,300.0	6,758.9	9,296.1	6,643.4	59.1	64.4	-77.04	-2,232.5	1,017.1	347.6	232.1	115.45	3.010			
9,400.0	6,758.2	9,398.9	6,643.3	61.3	66.4	-77.08	-2,335.3	1,015.3	345.7	226.1	119.64	2.890			
9,500.0	6,757.5	9,498.0	6,644.3	63.5	68.3	-77.27	-2,434.4	1,013.4	343.6	219.7	123.87	2.774			
9,600.0	6,756.9	9,592.7	6,645.3	65.7	70.2	-77.51	-2,529.1	1,012.6	342.4	214.3	128.09	2.673			
9,620.1	6,756.7	9,611.6	6,645.3	66.2	70.5	-77.53	-2,548.0	1,012.6	342.4	213.5	128.93	2.656			
9,700.0	6,756.2	9,687.2	6,644.6	67.9	72.1	-77.52	-2,623.6	1,013.0	342.9	210.7	132.24	2.593			
9,800.0	6,755.5	9,784.3	6,644.1	70.1	74.0	-77.60	-2,720.6	1,014.8	344.8	208.3	136.51	2.526			
9,900.0	6,754.9	9,881.5	6,644.3	72.4	75.9	-77.82	-2,817.9	1,017.1	346.9	206.1	140.83	2.464			
10,000.0	6,754.2	9,973.7	6,644.8	74.6	77.8	-78.15	-2,910.0	1,021.2	351.1	206.0	145.13	2.419			
10,100.0	6,753.6	10,072.9	6,641.9	76.9	79.8	-77.96	-3,009.0	1,026.3	356.7	207.3	149.37	2.388			
10,200.0	6,752.9	10,174.2	6,641.0	79.1	81.8	-78.08	-3,110.2	1,031.1	361.4	207.6	153.77	2.350			
10,300.0	6,752.2	10,276.4	6,639.7	81.4	83.9	-78.16	-3,212.2	1,036.2	366.4	208.3	158.18	2.317			
10,400.0	6,751.6	10,380.3	6,641.8	83.6	86.0	-78.71	-3,316.0	1,040.4	370.0	207.1	162.84	2.272			
10,500.0	6,750.9	10,489.0	6,643.7	85.9	88.2	-79.20	-3,424.7	1,043.4	372.3	204.7	167.61	2.221			
10,600.0	6,750.2	10,587.0	6,643.1	88.2	90.2	-79.25	-3,522.6	1,044.5	373.4	201.5	171.97	2.171			
10,700.0	6,749.6	10,695.4	6,641.7	90.4	92.5	-79.16	-3,631.0	1,044.9	373.9	197.4	176.46	2.119			
10,800.0	6,748.9	10,805.5	6,640.6	92.7	94.7	-79.02	-3,741.0	1,042.1	371.5	190.6	180.92	2.053			
10,900.0	6,748.2	10,906.9	6,640.3	95.0	96.8	-78.96	-3,842.4	1,037.9	367.5	182.3	185.24	1.984			
11,000.0	6,747.6	10,999.5	6,640.7	97.3	98.7	-79.02	-3,935.0	1,035.0	364.3	174.8	189.48	1.923			
11,100.0	6,746.9	11,094.2	6,639.3	99.6	100.7	-78.88	-4,029.6	1,034.0	363.4	169.7	193.67	1.876			
11,174.8	6,746.4	11,167.3	6,638.0	101.3	102.3	-78.74	-4,102.7	1,033.6	363.2	166.4	196.84	1.845			
11,200.0	6,746.3	11,191.6	6,637.7	101.9	102.8	-78.71	-4,127.0	1,033.6	363.2	165.3	197.91	1.835			
11,300.0	6,745.6	11,291.9	6,636.5	104.1	104.9	-78.65	-4,227.3	1,033.8	363.6	161.3	202.26	1.798			
11,400.0	6,744.9	11,392.1	6,635.8	106.4	107.0	-78.63	-4,327.5	1,033.8	363.7	157.0	206.63	1.760			
11,500.0	6,744.3	11,497.4	6,635.5	108.7	109.2	-78.68	-4,432.8	1,033.1	363.1	151.9	211.14	1.719			
11,600.0	6,743.6	11,598.8	6,636.7	111.0	111.3	-78.94	-4,534.2	1,031.9	361.5	145.8	215.70	1.676			
11,700.0	6,742.9	11,700.0	6,637.7	113.3	113.4	-79.14	-4,635.4	1,030.1	359.5	139.2	220.25	1.632			
11,800.0	6,742.3	11,800.0	6,637.5	115.6	115.6	-79.17	-4,735.3	1,028.2	357.6	132.9	224.67	1.592			
11,900.0	6,741.6	11,901.4	6,637.2	117.9	117.7	-79.15	-4,836.7	1,025.7	355.2	126.1	229.09	1.551			
12,000.0	6,741.0	11,997.2	6,638.1	120.3	119.7	-79.34	-4,932.5	1,023.9	353.1	119.6	233.53	1.512			
12,100.0	6,740.3	12,093.0	6,640.6	122.6	121.8	-79.84	-5,028.3	1,023.9	352.6	114.4	238.20	1.480	Level 3		
12,111.2	6,740.2	12,103.9	6,640.9	122.8	122.0	-79.91	-5,039.1	1,023.9	352.5	113.8	238.73	1.477	Level 3		
12,200.0	6,739.6	12,187.9	6,642.8	124.9	123.8	-80.33	-5,123.1	1,024.8	353.1	110.3	242.84	1.454	Level 3		
12,300.0	6,739.0	12,287.7	6,643.5	127.2	126.0	-80.59	-5,222.9	1,026.7	354.7	107.3	247.46	1.434	Level 3		
12,400.0	6,738.3	12,383.2	6,643.2	129.5	128.0	-80.69	-5,318.4	1,028.5	356.7	104.8	251.88	1.416	Level 3		
12,500.0	6,737.6	12,475.9	6,641.5	131.8	130.0	-80.60	-5,411.0	1,031.7	360.3	104.2	256.14	1.407	Level 3		
12,600.0	6,737.0	12,575.6	6,638.9	134.1	132.1	-80.43	-5,510.5	1,036.3	365.2	104.7	260.48	1.402	Level 3		
12,700.0	6,736.3	12,677.2	6,637.6	136.4	134.3	-80.45	-5,612.1	1,041.0	369.9	104.9	264.97	1.396	Level 3		
12,800.0	6,735.6	12,787.2	6,637.2	138.8	136.6	-80.57	-5,722.0	1,043.8	372.4	102.7	269.70	1.381	Level 3		
12,900.0	6,735.0	12,888.6	6,636.2	141.1	138.8	-80.56	-5,823.4	1,045.3	374.0	99.8	274.17	1.364	Level 3		
13,000.0	6,734.3	12,990.2	6,635.2	143.4	141.0	-80.53	-5,925.0	1,046.0	374.8	96.1	278.63	1.345	Level 3		
13,100.0	6,733.7	13,094.2	6,634.6	145.7	143.2	-80.56	-6,029.0	1,046.5	375.3	92.1	283.18	1.325	Level 3		
13,200.0	6,733.0	13,195.2	6,634.3	148.0	145.3	-80.61	-6,130.0	1,045.9	374.7	87.0	287.68	1.303	Level 3		
13,300.0	6,732.3	13,297.9	6,633.8	150.4	147.5	-80.61	-6,232.7	1,045.0	373.8	81.6	292.20	1.279	Level 3		
13,400.0	6,731.7	13,396.3	6,633.0	152.7	149.7	-80.55	-6,331.1	1,043.9	372.8	76.3	296.58	1.257	Level 3		
13,500.0	6,731.0	13,499.4	6,632.3	155.0	151.9	-80.52	-6,434.2	1,042.3	371.4	70.3	301.06	1.234	Level 2		

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft
Survey Program: 44-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)			
13,600.0	6,730.3	13,594.7	6,632.1	157.3	153.9	-80.56	-6,529.4	1,041.2	370.2	64.8	305.44	1.212	Level 2	
13,615.7	6,730.2	13,608.8	6,632.0	157.7	154.2	-80.56	-6,543.6	1,041.1	370.2	64.1	306.11	1.209	Level 2	
13,700.0	6,729.7	13,688.4	6,631.0	159.7	156.0	-80.50	-6,623.1	1,041.8	370.9	61.2	309.72	1.198	Level 2	
13,800.0	6,729.0	13,789.8	6,628.8	162.0	158.1	-80.28	-6,724.5	1,042.6	372.0	58.0	314.05	1.185	Level 2	
13,900.0	6,728.4	13,893.3	6,627.1	164.3	160.4	-80.15	-6,828.0	1,042.9	372.5	54.1	318.46	1.170	Level 2	
13,905.2	6,728.3	13,898.5	6,627.1	164.4	160.5	-80.15	-6,833.2	1,042.9	372.5	53.8	318.69	1.169	Level 2, ES, SF	
14,000.0	6,727.7	13,915.0	6,626.9	166.7	160.8	-80.13	-6,849.7	1,042.8	380.7	59.4	321.21	1.185	Level 2	
14,100.0	6,727.0	13,915.0	6,626.9	169.0	160.8	-80.13	-6,849.7	1,042.8	413.0	89.5	323.52	1.276	Level 3	
14,124.2	6,726.9	13,915.0	6,626.9	169.4	160.8	-80.13	-6,849.7	1,042.8	424.0	100.0	323.97	1.309	Level 3	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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							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)			
11,800.0	6,742.3	6,571.8	6,567.8	115.6	16.8	59.66	-5,384.7	348.4	760.0	645.0	115.08	6.605		
11,900.0	6,741.6	6,585.0	6,580.4	117.9	16.9	61.37	-5,388.4	347.9	675.1	556.2	118.86	5.679		
12,000.0	6,741.0	6,603.1	6,597.7	120.3	16.9	63.81	-5,393.7	346.9	594.1	470.7	123.32	4.817		
12,100.0	6,740.3	6,622.2	6,615.8	122.6	16.9	66.48	-5,399.5	345.7	518.6	390.8	127.87	4.056		
12,200.0	6,739.6	6,647.0	6,639.3	124.9	17.0	70.11	-5,407.3	343.6	451.6	318.6	133.03	3.395		
12,300.0	6,739.0	6,663.6	6,654.8	127.2	17.0	72.60	-5,412.8	341.8	396.9	259.8	137.07	2.896		
12,400.0	6,738.3	6,687.6	6,677.2	129.5	17.1	76.29	-5,420.8	338.8	360.1	218.4	141.67	2.542		
12,500.0	6,737.6	6,713.4	6,701.2	131.8	17.1	80.29	-5,429.7	335.0	346.6	200.6	145.98	2.374		
12,502.4	6,737.6	6,714.2	6,701.9	131.9	17.1	80.41	-5,430.0	334.9	346.6	200.5	146.09	2.372 CC, ES, SF		
12,600.0	6,737.0	6,742.0	6,727.5	134.1	17.2	84.71	-5,440.0	330.5	358.5	208.7	149.86	2.392		
12,700.0	6,736.3	6,767.0	6,750.2	136.4	17.2	88.49	-5,449.3	325.8	393.8	240.8	152.95	2.575		
12,800.0	6,735.6	6,802.5	6,782.2	138.8	17.3	93.63	-5,462.7	317.9	446.8	291.4	155.41	2.875		
12,900.0	6,735.0	6,845.3	6,820.0	141.1	17.4	99.34	-5,480.0	307.9	510.9	354.2	156.62	3.262		
13,000.0	6,734.3	6,882.0	6,852.1	143.4	17.4	103.82	-5,495.1	298.8	582.4	425.3	157.11	3.707		
13,100.0	6,733.7	6,912.9	6,879.3	145.7	17.5	107.32	-5,507.7	291.1	659.2	501.8	157.37	4.189		
13,200.0	6,733.0	6,938.7	6,902.1	148.0	17.5	110.04	-5,517.7	284.4	740.1	582.4	157.68	4.693		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Cross #32- 11A (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 (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		
11,800.0	6,742.3	6,773.1	6,770.9	115.6	18.0	96.35	-5,492.2	598.7	768.0	635.4	132.64	5.790		
11,900.0	6,741.6	6,772.1	6,769.9	117.9	18.0	95.66	-5,492.2	598.7	668.6	533.6	135.05	4.951		
12,000.0	6,741.0	6,771.2	6,769.0	120.3	18.0	94.96	-5,492.2	598.7	569.4	432.0	137.45	4.143		
12,100.0	6,740.3	6,770.2	6,768.0	122.6	18.0	94.26	-5,492.2	598.7	470.6	330.7	139.84	3.365		
12,200.0	6,739.6	6,769.2	6,767.1	124.9	18.0	93.56	-5,492.2	598.7	372.3	230.1	142.21	2.618		
12,300.0	6,739.0	6,768.3	6,766.1	127.2	18.0	92.86	-5,492.2	598.7	275.4	130.8	144.57	1.905		
12,400.0	6,738.3	6,767.3	6,765.1	129.5	18.0	92.16	-5,492.2	598.6	181.7	34.8	146.92	1.237	Level 2	
12,500.0	6,737.6	6,766.4	6,764.2	131.8	18.0	91.46	-5,492.2	598.6	100.9	-48.3	149.25	0.676	Level 1	
12,564.1	6,737.2	6,765.8	6,763.6	133.3	18.0	91.01	-5,492.2	598.6	78.0	-72.8	150.73	0.517	Level 1, CC, ES, SF	
12,600.0	6,737.0	6,765.4	6,763.2	134.1	18.0	90.75	-5,492.2	598.6	85.8	-65.7	151.56	0.566	Level 1	
12,700.0	6,736.3	6,764.5	6,762.3	136.4	18.0	90.05	-5,492.2	598.6	156.7	2.8	153.86	1.018	Level 2	
12,800.0	6,735.6	6,763.5	6,761.3	138.8	18.0	89.35	-5,492.2	598.6	248.4	92.3	156.14	1.591		
12,900.0	6,735.0	6,762.6	6,760.4	141.1	18.0	88.65	-5,492.2	598.6	344.8	186.4	158.39	2.177		
13,000.0	6,734.3	6,761.6	6,759.4	143.4	18.0	87.95	-5,492.2	598.5	442.8	282.2	160.63	2.757		
13,100.0	6,733.7	6,760.6	6,758.5	145.7	18.0	87.25	-5,492.2	598.5	541.5	378.7	162.85	3.325		
13,200.0	6,733.0	6,759.7	6,757.5	148.0	18.0	86.55	-5,492.2	598.5	640.6	475.6	165.04	3.882		
13,300.0	6,732.3	6,758.7	6,756.6	150.4	18.0	85.86	-5,492.2	598.5	740.0	572.8	167.21	4.425		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - DIC Amato #42-32 (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)				
13,100.0	6,733.7	6,778.4	6,777.9	145.7	17.0	93.88	-6,754.4	365.7	790.1	628.0	162.06	4.875			
13,200.0	6,733.0	6,775.3	6,774.8	148.0	17.0	93.31	-6,754.5	365.7	699.2	534.8	164.44	4.252			
13,300.0	6,732.3	6,772.2	6,771.6	150.4	17.0	92.73	-6,754.6	365.8	611.2	444.4	166.81	3.664			
13,400.0	6,731.7	6,769.1	6,768.5	152.7	17.0	92.16	-6,754.6	365.8	527.5	358.4	169.17	3.119			
13,500.0	6,731.0	6,766.0	6,765.4	155.0	17.0	91.58	-6,754.7	365.8	450.5	279.0	171.51	2.627			
13,600.0	6,730.3	6,762.8	6,762.3	157.3	17.0	91.01	-6,754.8	365.8	384.2	210.4	173.84	2.210			
13,700.0	6,729.7	6,759.7	6,759.2	159.7	17.0	90.43	-6,754.9	365.8	335.0	158.9	176.16	1.902			
13,800.0	6,729.0	6,756.6	6,756.0	162.0	17.0	89.85	-6,755.0	365.8	311.2	132.7	178.46	1.744			
13,827.0	6,728.8	6,755.8	6,755.2	162.6	17.0	89.70	-6,755.0	365.8	310.0	130.9	179.08	1.731	CC, ES, SF		
13,900.0	6,728.4	6,753.5	6,752.9	164.3	17.0	89.28	-6,755.0	365.9	318.5	137.7	180.75	1.762			
14,000.0	6,727.7	6,750.4	6,749.8	166.7	17.0	88.70	-6,755.1	365.9	355.0	171.9	183.02	1.940			
14,100.0	6,727.0	6,747.2	6,746.7	169.0	17.0	88.12	-6,755.2	365.9	413.0	227.7	185.28	2.229			
14,124.2	6,726.9	6,746.5	6,745.9	169.4	17.0	87.99	-6,755.2	365.9	429.3	243.6	185.71	2.312			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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)				
0.0	0.0	0.0	0.0	0.0	0.0	105.31	-76.5	279.5	290.9						
100.0	100.0	75.1	75.1	0.1	0.1	105.33	-76.6	279.3	289.6	289.3	0.26	1,114.267			
186.1	186.1	160.1	160.1	0.4	0.3	105.38	-76.7	279.0	289.3	288.7	0.66	440.793			
200.0	200.0	173.7	173.7	0.4	0.3	105.38	-76.7	279.0	289.3	288.6	0.72	400.991			
300.0	300.0	273.3	273.3	0.7	0.5	53.11	-76.9	279.2	288.8	287.6	1.22	237.462			
400.0	399.9	371.0	371.0	1.0	0.8	53.81	-77.3	279.6	287.0	285.2	1.77	162.278			
500.0	499.7	469.7	469.7	1.3	1.1	55.03	-78.3	280.7	284.5	282.1	2.36	120.511			
600.0	599.3	568.1	568.1	1.6	1.4	56.70	-79.3	281.9	280.9	277.9	2.97	94.425			
700.0	698.6	666.8	666.7	1.9	1.7	58.86	-80.4	283.7	276.7	273.0	3.61	76.708			
800.0	797.5	764.7	764.6	2.3	2.0	61.34	-80.7	286.0	271.7	267.5	4.26	63.754			
900.0	896.1	862.8	862.7	2.7	2.3	64.39	-81.1	288.7	266.7	261.7	4.97	53.658			
1,000.0	994.2	962.2	962.0	3.2	2.6	68.12	-81.5	291.5	261.4	255.6	5.75	45.491			
1,100.0	1,091.7	1,059.9	1,059.7	3.7	2.9	72.49	-81.9	293.8	256.0	249.4	6.59	38.866			
1,200.0	1,188.6	1,157.4	1,157.1	4.3	3.2	77.59	-82.6	296.2	251.9	244.4	7.50	33.564			
1,233.7	1,221.2	1,190.4	1,190.1	4.5	3.3	79.49	-82.8	296.9	250.8	243.0	7.83	32.024			
1,300.0	1,285.0	1,254.1	1,253.9	5.0	3.6	83.20	-83.2	298.3	249.4	240.9	8.48	29.414			
1,339.8	1,323.3	1,292.3	1,292.0	5.2	3.7	85.43	-83.4	299.2	249.2	240.3	8.87	28.093 CC			
1,400.0	1,381.4	1,351.6	1,351.3	5.6	3.9	88.88	-83.8	300.6	249.5	240.1	9.46	26.377 ES			
1,500.0	1,477.7	1,448.7	1,448.4	6.3	4.2	94.54	-84.1	302.3	251.8	241.3	10.42	24.152			
1,600.0	1,574.1	1,544.8	1,544.5	6.9	4.5	99.98	-84.5	304.3	256.7	245.3	11.35	22.611			
1,700.0	1,670.5	1,642.0	1,641.7	7.6	4.8	105.23	-85.0	306.2	264.1	251.9	12.24	21.573			
1,800.0	1,766.8	1,739.8	1,739.5	8.3	5.1	110.17	-85.1	308.3	273.2	260.2	13.08	20.890			
1,900.0	1,863.2	1,836.7	1,836.3	8.9	5.4	114.67	-84.9	310.6	284.2	270.3	13.87	20.488			
2,000.0	1,959.5	1,933.4	1,933.0	9.6	5.7	118.84	-84.8	312.8	296.9	282.3	14.62	20.307			
2,100.0	2,055.9	2,031.3	2,030.9	10.3	6.0	122.66	-84.5	315.3	310.9	295.5	15.33	20.274			
2,200.0	2,152.3	2,128.8	2,128.3	10.9	6.3	126.17	-83.9	317.5	325.8	309.8	16.01	20.355			
2,300.0	2,248.6	2,225.4	2,224.9	11.6	6.6	129.30	-83.3	319.9	341.9	325.3	16.66	20.524			
2,400.0	2,345.0	2,322.5	2,321.9	12.3	6.9	132.13	-82.8	322.7	359.0	341.7	17.31	20.744			
2,500.0	2,441.3	2,419.0	2,418.4	13.0	7.2	134.66	-82.3	325.6	376.9	359.0	17.94	21.010			
2,600.0	2,537.7	2,516.7	2,516.0	13.7	7.5	137.04	-81.8	328.2	395.4	376.9	18.56	21.309			
2,700.0	2,634.1	2,612.9	2,612.2	14.3	7.8	139.18	-81.3	330.7	414.7	395.5	19.17	21.634			
2,800.0	2,730.4	2,710.1	2,709.4	15.0	8.1	141.20	-80.7	332.9	434.4	414.6	19.76	21.979			
2,900.0	2,826.8	2,803.6	2,802.9	15.7	8.4	143.07	-80.3	334.2	455.0	434.6	20.34	22.365			
3,000.0	2,923.1	2,899.0	2,898.3	16.4	8.7	144.84	-80.2	335.2	476.5	455.6	20.93	22.770			
3,100.0	3,019.5	2,997.5	2,996.8	17.1	9.0	146.55	-80.0	336.0	498.4	476.9	21.49	23.194			
3,200.0	3,115.9	3,095.1	3,094.4	17.7	9.3	148.11	-79.5	336.7	520.4	498.4	22.04	23.618			
3,300.0	3,212.2	3,192.2	3,191.5	18.4	9.5	149.54	-78.9	337.6	542.6	520.0	22.58	24.032			
3,400.0	3,308.6	3,286.9	3,286.2	19.1	9.8	150.85	-78.3	338.1	565.2	542.1	23.10	24.464			
3,500.0	3,404.9	3,386.2	3,385.5	19.8	10.0	152.13	-77.6	338.6	588.1	564.5	23.61	24.905			
3,530.3	3,434.1	3,415.0	3,414.2	20.0	10.1	152.49	-77.3	338.7	595.0	571.2	23.77	25.031			
3,600.0	3,501.5	3,478.0	3,477.3	20.4	10.3	153.34	-77.0	338.9	610.5	586.4	24.13	25.297			
3,700.0	3,598.9	3,571.2	3,570.5	20.9	10.5	154.38	-77.2	339.1	631.1	606.5	24.60	25.655			
3,800.0	3,697.0	3,666.7	3,666.0	21.3	10.7	155.20	-77.9	339.3	649.1	624.1	25.02	25.945			
3,900.0	3,795.8	3,763.2	3,762.5	21.7	10.9	155.82	-79.1	339.6	664.5	639.1	25.42	26.145			
4,000.0	3,895.0	3,861.6	3,860.9	22.0	11.1	156.26	-80.6	339.9	677.0	651.2	25.80	26.242			
4,100.0	3,994.6	3,978.0	3,977.2	22.2	11.3	156.61	-81.4	340.4	685.6	659.5	26.19	26.182			
4,200.0	4,094.4	4,092.1	4,091.3	22.4	11.6	156.92	-78.5	340.9	688.2	661.7	26.50	25.969			
4,305.6	4,200.0	4,207.2	4,206.3	22.6	11.7	-150.28	-72.8	340.4	685.7	658.9	26.73	25.650			
4,400.0	4,294.4	4,300.0	4,298.9	22.7	11.8	-149.95	-67.0	339.2	681.2	654.2	26.97	25.256			
4,500.0	4,394.4	4,396.0	4,394.7	22.8	11.9	-149.55	-61.0	337.2	676.8	649.6	27.22	24.866			
4,600.0	4,494.4	4,491.9	4,490.4	22.9	12.0	-149.15	-55.7	335.0	673.2	645.8	27.47	24.507			

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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)			
4,700.0	4,594.4	4,585.2	4,583.6	23.1	12.2	-148.85	-51.6	333.2	670.5	642.7	27.74	24.168		
4,800.0	4,694.4	4,683.0	4,681.3	23.2	12.3	-148.62	-48.5	332.0	668.4	640.4	28.04	23.834		
4,900.0	4,794.4	4,780.2	4,778.5	23.4	12.4	-148.45	-46.1	331.2	666.7	638.3	28.37	23.498		
5,000.0	4,894.4	4,876.2	4,874.5	23.5	12.6	-148.35	-44.5	330.9	665.5	636.7	28.74	23.150		
5,100.0	4,994.4	4,976.8	4,975.1	23.7	12.8	-148.33	-43.6	331.1	664.6	635.4	29.19	22.768		
5,200.0	5,094.4	5,075.8	5,074.1	23.8	13.1	-148.36	-42.9	331.9	663.6	633.9	29.68	22.358		
5,300.0	5,194.4	5,176.0	5,174.2	24.0	13.4	-148.49	-43.0	333.6	662.8	632.6	30.22	21.934		
5,400.0	5,294.4	5,277.1	5,275.4	24.1	13.7	-148.67	-43.3	335.9	661.8	631.0	30.77	21.508		
5,500.0	5,394.4	5,378.9	5,377.1	24.3	14.1	-148.82	-43.1	338.0	660.6	629.3	31.33	21.089		
5,600.0	5,494.4	5,473.2	5,471.4	24.4	14.3	-148.97	-43.2	340.0	659.6	627.8	31.85	20.709		
5,700.0	5,594.4	5,570.8	5,569.0	24.6	14.6	-149.17	-44.3	342.0	659.5	627.1	32.38	20.367		
5,800.0	5,694.4	5,670.7	5,668.9	24.8	14.9	-149.36	-45.4	344.0	659.4	626.5	32.91	20.035		
5,847.5	5,741.9	5,717.8	5,715.9	24.8	15.0	-149.47	-45.9	345.0	659.4	626.2	33.16	19.882		
5,900.0	5,794.4	5,769.1	5,767.2	24.9	15.2	-149.57	-46.6	346.0	659.4	626.0	33.44	19.721		
6,000.0	5,894.4	5,871.3	5,869.4	25.1	15.5	-149.76	-47.8	347.9	659.6	625.6	33.98	19.411		
6,100.0	5,994.4	5,970.8	5,968.8	25.3	15.8	-149.92	-48.6	349.6	659.3	624.8	34.52	19.103		
6,113.7	6,008.1	5,984.1	5,982.2	25.3	15.8	-149.95	-48.7	349.8	659.3	624.8	34.59	19.063		
6,150.0	6,044.4	6,020.3	6,018.3	25.3	15.9	30.03	-49.0	350.4	658.6	624.0	34.63	19.021		
6,200.0	6,094.2	6,070.7	6,068.8	25.4	16.1	30.27	-49.4	351.1	655.1	620.6	34.55	18.964		
6,250.0	6,143.7	6,121.0	6,119.1	25.4	16.2	30.78	-49.7	351.7	648.8	614.5	34.32	18.903		
6,300.0	6,192.6	6,170.9	6,169.0	25.4	16.4	31.57	-49.9	352.3	639.6	605.6	33.97	18.830		
6,350.0	6,240.7	6,218.8	6,216.9	25.3	16.5	32.64	-50.1	353.1	627.7	594.2	33.49	18.743		
6,400.0	6,287.8	6,264.1	6,262.1	25.2	16.6	34.00	-50.4	353.7	613.4	580.4	32.91	18.635		
6,450.0	6,333.7	6,308.8	6,306.9	25.2	16.8	35.72	-50.7	354.1	596.7	564.4	32.28	18.482		
6,500.0	6,378.2	6,354.7	6,352.7	25.0	16.9	37.90	-51.1	354.6	577.7	546.1	31.66	18.249		
6,550.0	6,421.1	6,398.9	6,396.9	24.9	17.0	40.54	-51.3	355.1	556.6	525.5	31.10	17.896		
6,600.0	6,462.2	6,439.7	6,437.7	24.8	17.2	43.63	-51.5	355.5	533.7	503.0	30.70	17.382		
6,650.0	6,501.4	6,478.8	6,476.8	24.6	17.3	47.23	-51.7	356.1	509.3	478.7	30.55	16.669		
6,700.0	6,538.5	6,515.9	6,513.9	24.5	17.4	51.37	-52.1	356.6	483.8	453.0	30.73	15.743		
6,750.0	6,573.3	6,550.9	6,548.9	24.3	17.5	56.05	-52.4	357.1	457.6	426.3	31.28	14.631		
6,800.0	6,605.7	6,583.6	6,581.6	24.2	17.6	61.18	-52.8	357.7	431.3	399.1	32.16	13.411		
6,850.0	6,635.6	6,614.0	6,611.9	24.0	17.7	66.62	-53.2	358.2	405.5	372.3	33.27	12.189		
6,900.0	6,662.7	6,641.7	6,639.7	23.9	17.8	72.14	-53.5	358.6	381.2	346.7	34.44	11.067		
6,950.0	6,687.1	6,666.6	6,664.6	23.8	17.8	77.48	-53.8	359.1	359.3	323.8	35.52	10.114		
7,000.0	6,708.5	6,688.7	6,686.7	23.6	17.9	82.35	-54.1	359.5	341.0	304.6	36.41	9.368		
7,050.0	6,727.0	6,708.1	6,706.1	23.6	17.9	86.56	-54.4	359.8	327.7	290.6	37.07	8.840		
7,100.0	6,742.3	6,724.9	6,722.8	23.5	18.0	89.95	-54.6	360.2	320.5	282.9	37.56	8.532		
7,126.6	6,749.2	6,732.5	6,730.4	23.5	18.0	91.33	-54.7	360.3	319.4	281.7	37.78	8.455		
7,150.0	6,754.6	6,738.4	6,736.4	23.5	18.0	92.31	-54.8	360.5	320.3	282.3	37.94	8.440 SF		
7,200.0	6,763.6	6,748.7	6,746.6	23.5	18.1	93.56	-54.9	360.7	327.5	289.2	38.30	8.550		
7,250.0	6,769.4	6,755.5	6,753.5	23.6	18.1	93.65	-55.0	360.9	341.9	303.2	38.67	8.842		
7,300.0	6,771.9	6,759.0	6,757.0	23.8	18.1	92.54	-55.1	361.0	362.8	323.7	39.05	9.290		
7,318.7	6,772.0	6,759.4	6,757.4	23.9	18.1	91.81	-55.1	361.0	372.1	332.9	39.19	9.495		
7,318.7	6,772.0	6,759.4	6,757.4	23.9	18.1	91.81	-55.1	361.0	372.1	332.9	39.19	9.495		
7,400.0	6,771.5	6,760.2	6,758.1	24.4	18.1	91.95	-55.1	361.0	419.8	379.8	39.99	10.496		
7,500.0	6,770.8	6,761.1	6,759.0	25.4	18.1	92.11	-55.1	361.0	490.7	449.6	41.17	11.921		
7,600.0	6,770.1	6,762.0	6,759.9	26.6	18.1	92.28	-55.1	361.1	570.5	528.0	42.51	13.420		
7,700.0	6,769.5	6,762.9	6,760.9	28.0	18.1	92.45	-55.2	361.1	655.8	611.8	44.00	14.904		
7,800.0	6,768.8	6,763.9	6,761.8	29.5	18.1	92.62	-55.2	361.1	744.7	699.1	45.61	16.329		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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	99.53	-49.2	292.8	297.1						
100.0	100.0	89.2	89.2	0.1	0.1	99.54	-49.2	292.8	296.9	296.6	0.28	1,049.203			
200.0	200.0	189.5	189.5	0.4	0.3	99.55	-49.3	292.7	296.8	296.0	0.72	411.436			
300.0	300.0	289.8	289.8	0.7	0.5	47.29	-49.3	292.4	295.7	294.5	1.16	255.629			
400.0	399.9	389.9	389.9	1.0	0.6	47.93	-49.5	292.1	292.7	291.1	1.60	183.436			
500.0	499.7	489.9	489.9	1.3	0.8	49.00	-49.7	291.6	288.0	285.9	2.05	140.652			
600.0	599.3	588.8	588.8	1.6	1.0	50.42	-49.4	291.4	281.7	279.2	2.55	110.569			
700.0	698.6	686.7	686.7	1.9	1.2	52.14	-48.4	291.6	274.3	271.3	3.04	90.276			
800.0	797.5	783.4	783.4	2.3	1.3	54.28	-47.1	292.7	266.4	262.9	3.52	75.748			
900.0	896.1	881.7	881.6	2.7	1.5	56.91	-45.4	294.7	258.1	254.0	4.09	63.089			
1,000.0	994.2	980.3	980.2	3.2	1.7	59.99	-42.7	297.1	249.1	244.3	4.74	52.500			
1,100.0	1,091.7	1,079.5	1,079.2	3.7	1.9	63.58	-38.8	299.8	239.4	233.9	5.52	43.400			
1,200.0	1,188.6	1,178.9	1,178.5	4.3	2.2	67.83	-33.8	302.5	229.1	222.8	6.38	35.895			
1,233.7	1,221.2	1,212.3	1,211.9	4.5	2.3	69.48	-32.0	303.4	225.6	218.9	6.70	33.678			
1,300.0	1,285.0	1,277.9	1,277.3	5.0	2.5	72.80	-28.4	304.8	218.9	211.6	7.34	29.839			
1,400.0	1,381.4	1,374.8	1,373.9	5.6	2.8	77.77	-22.1	307.6	210.2	201.9	8.32	25.266			
1,500.0	1,477.7	1,472.3	1,471.1	6.3	3.1	82.64	-14.7	311.9	203.6	194.3	9.32	21.849			
1,600.0	1,574.1	1,572.9	1,571.3	6.9	3.4	87.78	-6.3	316.4	198.1	187.7	10.33	19.171			
1,700.0	1,670.5	1,674.7	1,672.5	7.6	3.8	93.36	3.1	319.8	192.9	181.6	11.33	17.028			
1,800.0	1,766.8	1,780.9	1,778.1	8.3	4.1	99.76	15.4	320.8	186.4	174.1	12.28	15.175			
1,900.0	1,863.2	1,884.0	1,879.9	8.9	4.4	106.72	31.0	319.1	177.8	164.7	13.13	13.540			
2,000.0	1,959.5	1,983.6	1,978.1	9.6	4.8	114.73	46.6	314.8	170.7	156.9	13.81	12.357			
2,100.0	2,055.9	2,083.9	2,076.7	10.3	5.1	124.37	64.1	307.2	165.2	150.9	14.25	11.588			
2,175.8	2,129.0	2,156.3	2,147.3	10.8	5.3	132.27	77.8	299.7	163.2	148.8	14.41	11.326 CC, ES			
2,200.0	2,152.3	2,178.3	2,168.8	10.9	5.4	134.75	81.9	297.2	163.4	149.0	14.43	11.322 SF			
2,300.0	2,248.6	2,272.3	2,260.7	11.6	5.7	145.11	98.3	286.4	169.1	154.7	14.45	11.703			
2,400.0	2,345.0	2,365.4	2,351.6	12.3	6.0	154.72	115.1	275.1	180.4	166.0	14.46	12.478			
2,500.0	2,441.3	2,456.0	2,440.2	13.0	6.3	162.88	130.0	263.1	198.3	183.7	14.59	13.592			
2,600.0	2,537.7	2,545.4	2,527.4	13.7	6.6	169.83	144.1	249.7	221.7	206.8	14.87	14.907			
2,700.0	2,634.1	2,632.5	2,612.2	14.3	6.9	175.63	157.2	234.5	250.2	234.9	15.31	16.338			
2,800.0	2,730.4	2,718.5	2,695.5	15.0	7.1	-179.47	169.8	217.2	283.1	267.2	15.88	17.829			
2,900.0	2,826.8	2,806.3	2,780.0	15.7	7.4	-175.19	183.0	197.6	319.3	302.8	16.55	19.292			
3,000.0	2,923.1	2,898.2	2,868.9	16.4	7.7	-171.81	195.7	177.7	356.8	339.5	17.30	20.629			
3,100.0	3,019.5	2,983.9	2,951.7	17.1	8.0	-169.35	206.7	159.0	395.9	377.8	18.04	21.945			
3,200.0	3,115.9	3,075.3	3,040.1	17.7	8.3	-167.12	218.5	138.5	435.9	417.1	18.82	23.159			
3,300.0	3,212.2	3,172.6	3,134.3	18.4	8.7	-165.23	230.9	117.6	475.7	456.1	19.64	24.225			
3,400.0	3,308.6	3,276.8	3,235.8	19.1	9.0	-163.77	243.2	97.8	514.0	493.5	20.46	25.121			
3,500.0	3,404.9	3,380.5	3,337.7	19.8	9.4	-162.87	253.6	81.4	550.2	528.9	21.24	25.900			
3,530.3	3,434.1	3,411.0	3,367.7	20.0	9.5	-162.68	256.3	77.1	560.9	539.4	21.47	26.123			
3,600.0	3,501.5	3,477.1	3,433.0	20.4	9.7	-162.44	262.2	68.0	584.4	562.4	22.01	26.556			
3,700.0	3,598.9	3,564.0	3,518.3	20.9	10.0	-161.89	271.7	54.9	616.2	593.5	22.72	27.118			
3,800.0	3,697.0	3,648.0	3,600.4	21.3	10.3	-161.19	282.0	40.4	646.4	623.0	23.42	27.602			
3,900.0	3,795.8	3,732.0	3,682.2	21.7	10.6	-160.43	292.4	24.4	675.3	651.2	24.09	28.032			
4,000.0	3,895.0	3,819.3	3,766.8	22.0	10.9	-159.48	304.2	6.3	702.6	677.8	24.76	28.372			
4,100.0	3,994.6	3,909.7	3,853.7	22.2	11.3	-158.28	318.6	-14.0	728.0	702.5	25.45	28.603			
4,200.0	4,094.4	4,011.2	3,951.2	22.4	11.7	-156.85	335.5	-36.9	750.7	724.6	26.18	28.681			
4,305.6	4,200.0	4,122.0	4,058.1	22.6	12.1	-102.89	352.6	-60.4	770.7	743.8	26.90	28.648			
4,400.0	4,294.4	4,214.9	4,147.9	22.7	12.5	-101.57	366.5	-79.3	786.9	759.3	27.57	28.540			

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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	105.33	-85.6	312.3	324.0					
100.0	100.0	89.3	89.3	0.1	0.1	105.35	-85.7	312.3	323.8	323.6	0.26	1,239.859		
200.0	200.0	189.6	189.6	0.4	0.3	105.42	-86.0	312.0	323.7	323.0	0.68	479.510		
300.0	300.0	290.0	290.0	0.7	0.4	53.24	-86.6	311.6	322.6	321.5	1.09	296.067		
400.0	399.9	390.2	390.2	1.0	0.5	54.00	-87.4	311.0	320.0	318.4	1.51	211.855		
500.0	499.7	490.3	490.2	1.3	0.7	55.24	-88.4	310.3	315.7	313.8	1.96	161.111		
600.0	599.3	590.8	590.8	1.6	1.0	57.09	-90.2	309.0	310.0	307.4	2.55	121.544		
700.0	698.6	689.1	689.0	1.9	1.3	59.62	-92.9	307.1	303.0	299.8	3.15	96.052		
800.0	797.5	785.3	785.2	2.3	1.5	62.72	-96.2	305.7	296.0	292.2	3.78	78.219		
900.0	896.1	881.5	881.2	2.7	1.8	66.51	-100.4	304.5	289.6	285.1	4.47	64.790		
1,000.0	994.2	976.4	976.0	3.2	2.1	71.05	-105.8	303.4	284.3	279.1	5.21	54.589		
1,100.0	1,091.7	1,070.0	1,069.4	3.7	2.3	76.02	-111.3	303.2	281.2	275.2	6.00	46.870		
1,154.3	1,144.4	1,120.6	1,119.9	4.1	2.5	78.85	-114.3	303.5	280.8	274.3	6.46	43.447		
1,200.0	1,188.6	1,162.6	1,161.9	4.3	2.6	81.29	-116.9	304.1	281.2	274.3	6.85	41.028		
1,233.7	1,221.2	1,193.5	1,192.7	4.5	2.7	83.14	-119.0	304.5	282.0	274.8	7.15	39.425		
1,300.0	1,285.0	1,254.0	1,253.0	5.0	2.8	86.82	-123.5	305.7	285.0	277.3	7.75	36.795		
1,400.0	1,381.4	1,348.2	1,346.9	5.6	3.1	92.39	-131.1	307.8	293.0	284.3	8.66	33.835		
1,500.0	1,477.7	1,443.4	1,441.7	6.3	3.4	97.72	-138.9	309.9	303.9	294.3	9.55	31.830		
1,600.0	1,574.1	1,540.3	1,538.2	6.9	3.7	102.75	-146.6	311.9	317.1	306.7	10.38	30.542		
1,700.0	1,670.5	1,637.4	1,635.1	7.6	4.0	107.39	-153.8	313.7	332.2	321.0	11.18	29.716		
1,800.0	1,766.8	1,728.2	1,725.7	8.3	4.2	111.43	-160.6	314.9	349.1	337.2	11.94	29.243		
1,900.0	1,863.2	1,817.1	1,814.1	8.9	4.5	115.05	-169.1	316.5	370.0	357.3	12.68	29.169		
2,000.0	1,959.5	1,908.8	1,905.3	9.6	4.8	118.12	-178.3	320.1	393.0	379.6	13.42	29.283		
2,100.0	2,055.9	1,996.9	1,992.7	10.3	5.1	120.68	-188.3	324.3	418.3	404.2	14.15	29.573		
2,200.0	2,152.3	2,082.1	2,077.1	10.9	5.5	122.87	-199.4	328.7	446.2	431.4	14.87	30.011		
2,300.0	2,248.6	2,166.2	2,160.0	11.6	5.8	124.58	-212.4	334.8	477.0	461.4	15.60	30.569		
2,400.0	2,345.0	2,257.1	2,249.2	12.3	6.2	125.99	-227.4	343.3	509.2	492.9	16.36	31.126		
2,500.0	2,441.3	2,351.0	2,341.1	13.0	6.6	127.04	-243.3	354.2	542.1	524.9	17.15	31.615		
2,600.0	2,537.7	2,448.7	2,436.2	13.7	7.1	127.65	-259.6	368.9	574.7	556.7	17.99	31.951		
2,700.0	2,634.1	2,543.5	2,528.2	14.3	7.5	127.92	-275.1	385.6	606.9	588.1	18.87	32.167		
2,800.0	2,730.4	2,629.1	2,611.2	15.0	8.0	128.10	-289.8	401.2	640.0	620.2	19.75	32.402		
2,900.0	2,826.8	2,723.8	2,702.6	15.7	8.5	128.20	-306.7	419.3	673.6	652.9	20.69	32.551		
3,000.0	2,923.1	2,821.2	2,796.5	16.4	9.0	128.25	-323.8	438.4	707.1	685.4	21.65	32.661		
3,100.0	3,019.5	2,926.7	2,898.8	17.1	9.5	128.42	-341.1	457.7	739.3	716.7	22.62	32.691		
3,200.0	3,115.9	3,020.6	2,989.8	17.7	10.0	128.56	-356.1	474.9	771.2	747.7	23.56	32.730		
7,100.0	6,742.3	6,828.5	6,734.6	23.5	26.0	-51.50	-746.2	923.5	755.6	719.4	36.22	20.861		
7,150.0	6,754.6	6,841.0	6,747.1	23.5	26.0	-60.50	-746.1	923.5	709.8	670.6	39.23	18.095		
7,200.0	6,763.6	6,850.2	6,756.3	23.5	26.0	-70.22	-746.1	923.5	663.8	622.0	41.79	15.884		
7,250.0	6,769.4	6,855.9	6,762.0	23.6	26.0	-79.87	-746.1	923.5	617.9	574.6	43.34	14.258		
7,300.0	6,771.9	6,858.2	6,764.3	23.8	26.0	-88.63	-746.0	923.5	572.4	528.6	43.73	13.088		
7,318.7	6,772.0	6,858.2	6,764.3	23.9	26.0	-91.54	-746.0	923.5	555.5	511.8	43.64	12.728		
7,318.7	6,772.0	6,858.2	6,764.3	23.9	26.0	-91.54	-746.0	923.5	555.5	511.8	43.64	12.728		
7,400.0	6,771.5	6,857.1	6,763.2	24.4	26.0	-91.29	-746.0	923.5	483.8	439.3	44.46	10.881		
7,500.0	6,770.8	6,855.7	6,761.8	25.4	26.0	-90.97	-746.1	923.5	400.7	355.0	45.65	8.777		
7,600.0	6,770.1	6,854.4	6,760.5	26.6	26.0	-90.67	-746.1	923.5	327.1	280.1	47.01	6.958		
7,700.0	6,769.5	6,853.1	6,759.2	28.0	26.0	-90.36	-746.1	923.5	271.1	222.6	48.52	5.587		
7,800.0	6,768.8	6,851.9	6,758.0	29.5	26.0	-90.06	-746.1	923.5	244.8	194.7	50.15	4.883		
7,817.7	6,768.7	6,851.6	6,757.7	29.8	26.0	-90.01	-746.1	923.5	244.2	193.8	50.45	4.840 CC, ES, SF		
7,900.0	6,768.1	6,850.6	6,756.7	31.1	26.0	-89.77	-746.1	923.5	257.7	205.8	51.87	4.968		
8,000.0	6,767.5	6,849.3	6,755.4	32.8	26.0	-89.47	-746.1	923.5	304.7	251.1	53.69	5.677		
8,100.0	6,766.8	6,848.1	6,754.2	34.6	26.0	-89.18	-746.1	923.5	373.3	317.7	55.57	6.718		

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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					
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
8,200.0	6,766.2	6,846.9	6,753.0	36.5	26.0	-88.90	-746.1	923.5	453.6	396.1	57.50	7.889					
8,300.0	6,765.5	6,845.7	6,751.8	38.4	26.0	-88.61	-746.1	923.5	540.6	481.1	59.49	9.087					
8,400.0	6,764.8	6,844.5	6,750.6	40.3	26.0	-88.33	-746.1	923.5	631.4	569.9	61.52	10.264					
8,500.0	6,764.2	6,843.3	6,749.4	42.3	26.0	-88.05	-746.1	923.5	724.7	661.1	63.58	11.398					

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Roskop 29-1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-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)			
7,700.0	6,769.5	6,769.8	6,769.3	28.0	167.1	93.97	-1,290.8	388.1	723.9	531.1	192.84	3.754		
7,800.0	6,768.8	6,767.2	6,766.6	29.5	167.1	93.44	-1,290.9	388.1	633.7	439.2	194.43	3.259		
7,900.0	6,768.1	6,764.5	6,763.9	31.1	167.0	92.91	-1,291.0	388.1	546.8	350.7	196.11	2.788		
8,000.0	6,767.5	6,761.8	6,761.2	32.8	167.0	92.38	-1,291.0	388.1	465.2	267.4	197.85	2.351		
8,100.0	6,766.8	6,759.1	6,758.5	34.6	166.9	91.85	-1,291.1	388.0	392.2	192.6	199.66	1.965		
8,200.0	6,766.2	6,756.4	6,755.8	36.5	166.9	91.32	-1,291.1	388.0	333.6	132.1	201.50	1.655		
8,300.0	6,765.5	6,753.7	6,753.1	38.4	166.8	90.79	-1,291.2	388.0	297.8	94.4	203.39	1.464	Level 3	
8,363.1	6,765.1	6,752.0	6,751.4	39.6	166.8	90.46	-1,291.2	388.0	291.0	86.4	204.59	1.422	Level 3, CC, ES, SF	
8,400.0	6,764.8	6,751.0	6,750.4	40.3	166.8	90.26	-1,291.2	388.0	293.3	88.0	205.29	1.429	Level 3	
8,500.0	6,764.2	6,748.3	6,747.7	42.3	166.7	89.73	-1,291.3	388.0	321.6	114.3	207.22	1.552		
8,600.0	6,763.5	6,745.6	6,745.0	44.3	166.7	89.20	-1,291.3	387.9	375.2	166.0	209.17	1.794		
8,700.0	6,762.8	6,742.9	6,742.3	46.4	166.6	88.67	-1,291.4	387.9	445.1	233.9	211.12	2.108		
8,800.0	6,762.2	6,740.2	6,739.6	48.5	166.6	88.15	-1,291.4	387.9	524.8	311.7	213.08	2.463		
8,900.0	6,761.5	6,737.5	6,737.0	50.5	166.5	87.62	-1,291.5	387.9	610.5	395.5	215.05	2.839		
9,000.0	6,760.8	6,734.8	6,734.3	52.7	166.5	87.09	-1,291.6	387.9	700.0	483.0	217.01	3.226		
9,100.0	6,760.2	6,732.2	6,731.6	54.8	166.4	86.56	-1,291.6	387.8	792.0	573.0	218.97	3.617		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W (GRID) - Blake B 29-9 (P&A) - 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)			
9,400.0	6,758.2	6,766.5	6,764.8	61.3	16.1	91.73	-2,895.6	201.5	741.3	665.0	76.29	9.717	CC, ES	
9,500.0	6,757.5	6,767.9	6,766.2	63.5	16.1	91.90	-2,895.7	201.6	667.8	589.3	78.52	8.504		
9,600.0	6,756.9	6,769.3	6,767.6	65.7	16.1	92.07	-2,895.7	201.6	602.0	521.3	80.77	7.454		
9,700.0	6,756.2	6,770.7	6,769.0	67.9	16.1	92.24	-2,895.7	201.7	546.7	463.7	83.02	6.586		
9,800.0	6,755.5	6,772.1	6,770.4	70.1	16.1	92.41	-2,895.7	201.8	505.4	420.1	85.27	5.926		
9,900.0	6,754.9	6,773.5	6,771.9	72.4	16.1	92.58	-2,895.8	201.8	481.5	394.0	87.53	5.501		
9,967.7	6,754.4	6,774.5	6,772.8	73.9	16.1	92.69	-2,895.8	201.9	476.7	387.7	89.07	5.352		
10,000.0	6,754.2	6,774.9	6,773.3	74.6	16.1	92.74	-2,895.8	201.9	477.8	388.0	89.80	5.321		
10,100.0	6,753.6	6,776.3	6,774.7	76.9	16.1	92.91	-2,895.8	202.0	494.7	402.7	92.07	5.373		
10,200.0	6,752.9	6,777.8	6,776.1	79.1	16.2	93.08	-2,895.9	202.0	530.3	436.0	94.34	5.621		
10,300.0	6,752.2	6,779.2	6,777.5	81.4	16.2	93.25	-2,895.9	202.1	581.1	484.5	96.62	6.014		
10,400.0	6,751.6	6,780.6	6,778.9	83.6	16.2	93.42	-2,895.9	202.2	643.5	544.6	98.90	6.507	SF	
10,500.0	6,750.9	6,782.0	6,780.3	85.9	16.2	93.59	-2,895.9	202.2	714.5	613.3	101.18	7.062		
10,600.0	6,750.2	6,783.4	6,781.7	88.2	16.2	93.76	-2,896.0	202.3	791.8	688.4	103.46	7.653		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W (GRID) - Blake B29-16 (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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,500.0	6,750.9	6,788.9	6,788.0	85.9	18.1	93.21	-4,086.1	276.7	770.7	667.5	103.15	7.472		
10,600.0	6,750.2	6,786.3	6,785.4	88.2	18.1	92.84	-4,086.1	276.7	687.3	581.8	105.44	6.518		
10,700.0	6,749.6	6,783.7	6,782.8	90.4	18.1	92.47	-4,086.2	276.7	608.9	501.1	107.73	5.652		
10,800.0	6,748.9	6,781.2	6,780.3	92.7	18.1	92.11	-4,086.2	276.6	537.7	427.7	110.02	4.887		
10,900.0	6,748.2	6,778.6	6,777.7	95.0	18.1	91.74	-4,086.3	276.6	476.9	364.6	112.31	4.247		
11,000.0	6,747.6	6,776.0	6,775.1	97.3	18.1	91.37	-4,086.3	276.6	431.1	316.5	114.60	3.762		
11,100.0	6,746.9	6,773.5	6,772.6	99.6	18.1	91.00	-4,086.4	276.5	405.2	288.3	116.89	3.466		
11,158.4	6,746.5	6,772.0	6,771.1	100.9	18.1	90.79	-4,086.4	276.5	400.9	282.7	118.22	3.391 CC, ES		
11,200.0	6,746.3	6,770.9	6,770.0	101.9	18.1	90.64	-4,086.4	276.5	403.1	283.9	119.17	3.382 SF		
11,300.0	6,745.6	6,768.3	6,767.4	104.1	18.1	90.27	-4,086.4	276.4	425.2	303.7	121.46	3.501		
11,400.0	6,744.9	6,765.7	6,764.8	106.4	18.0	89.90	-4,086.5	276.4	468.1	344.3	123.74	3.783		
11,500.0	6,744.3	6,763.2	6,762.3	108.7	18.0	89.53	-4,086.5	276.4	526.7	400.6	126.02	4.179		
11,600.0	6,743.6	6,760.6	6,759.7	111.0	18.0	89.17	-4,086.6	276.3	596.3	468.0	128.30	4.648		
11,700.0	6,742.9	6,758.0	6,757.1	113.3	18.0	88.80	-4,086.6	276.3	673.7	543.1	130.58	5.159		
11,800.0	6,742.3	6,755.5	6,754.6	115.6	18.0	88.43	-4,086.7	276.3	756.4	623.5	132.85	5.694		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)											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	-89.31	1.8	-150.2	150.2	150.2	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-89.31	1.8	-150.2	150.2	149.9	0.28	540.065			
166.3	166.3	167.3	167.3	0.3	0.3	-89.31	1.8	-150.2	150.2	149.5	0.64	233.444	CC		
200.0	200.0	200.0	200.0	0.4	0.4	-89.31	1.8	-150.2	150.2	149.4	0.83	181.826	ES		
300.0	300.0	297.3	297.3	0.7	0.7	-141.93	2.2	-151.4	152.4	151.1	1.37	111.628			
400.0	399.9	393.3	393.3	1.0	0.9	-142.31	3.3	-154.8	159.2	157.2	1.92	82.986			
500.0	499.7	488.8	488.5	1.3	1.2	-142.87	5.2	-160.5	170.3	167.8	2.49	68.528			
600.0	599.3	583.4	582.7	1.6	1.5	-143.53	7.8	-168.4	185.9	182.9	3.07	60.647			
700.0	698.6	676.8	675.5	1.9	1.8	-144.22	11.1	-178.4	205.9	202.3	3.66	56.273			
800.0	797.5	768.8	766.7	2.3	2.2	-144.87	15.0	-190.4	230.3	226.0	4.27	53.952			
900.0	896.1	859.2	855.9	2.7	2.6	-145.45	19.5	-204.1	258.9	254.0	4.89	52.906			
1,000.0	994.2	947.7	942.9	3.2	3.0	-145.95	24.5	-219.5	291.6	286.1	5.54	52.684	SF		
1,100.0	1,091.7	1,034.2	1,027.5	3.7	3.4	-146.34	30.0	-236.4	328.5	322.3	6.20	53.006			
1,200.0	1,188.6	1,118.4	1,109.5	4.3	3.9	-146.65	36.0	-254.6	369.2	362.4	6.88	53.690			
1,233.7	1,221.2	1,146.2	1,136.6	4.5	4.0	-146.73	38.1	-261.0	383.9	376.7	7.11	53.975			
1,300.0	1,285.0	1,200.0	1,188.6	5.0	4.4	-147.09	42.3	-273.9	413.4	405.8	7.57	54.597			
1,400.0	1,381.4	1,280.8	1,266.4	5.6	4.9	-147.47	49.0	-294.5	459.4	451.1	8.28	55.467			
1,500.0	1,477.7	1,359.7	1,341.9	6.3	5.5	-147.68	56.1	-316.2	507.1	498.1	9.01	56.283			
1,600.0	1,574.1	1,437.0	1,415.5	6.9	6.0	-147.78	63.5	-338.9	556.4	546.6	9.74	57.112			
1,700.0	1,670.5	1,513.5	1,487.8	7.6	6.7	-147.79	71.3	-362.7	607.2	596.7	10.49	57.913			
1,800.0	1,766.8	1,599.2	1,568.5	8.3	7.4	-147.76	80.3	-390.0	658.7	647.5	11.27	58.428			
1,900.0	1,863.2	1,685.0	1,649.3	8.9	8.1	-147.74	89.2	-417.4	710.2	698.2	12.07	58.866			
2,000.0	1,959.5	1,770.7	1,730.0	9.6	8.8	-147.72	98.2	-444.7	761.8	748.9	12.86	59.218			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)											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	-89.31	1.4	-120.1	120.1	120.1	0.00	N/A			
100.0	100.0	102.0	102.0	0.1	0.1	-89.31	1.4	-120.1	120.1	119.8	0.28	427.618			
200.0	200.0	202.0	202.0	0.4	0.4	-89.31	1.4	-120.1	120.1	119.3	0.83	144.427	CC, ES		
300.0	300.0	302.0	302.0	0.7	0.7	-142.17	1.4	-120.1	121.1	119.7	1.38	87.530			
400.0	399.9	401.9	401.9	1.0	1.0	-143.25	1.4	-120.1	124.3	122.3	1.94	63.985			
500.0	499.7	501.7	501.7	1.3	1.2	-144.94	1.4	-120.1	129.6	127.0	2.51	51.655			
600.0	599.3	601.3	601.3	1.6	1.5	-147.07	1.4	-120.1	137.1	134.1	3.08	44.502			
700.0	698.6	700.6	700.6	1.9	1.8	-149.48	1.4	-120.1	147.2	143.5	3.66	40.180			
800.0	797.5	799.5	799.5	2.3	2.1	-152.00	1.4	-120.1	159.7	155.5	4.25	37.592			
900.0	896.1	894.6	894.6	2.7	2.3	-154.17	1.9	-121.1	175.9	171.0	4.83	36.439			
1,000.0	994.2	988.7	988.6	3.2	2.6	-155.81	3.4	-124.3	196.5	191.1	5.41	36.334	SF		
1,100.0	1,091.7	1,081.5	1,081.2	3.7	2.8	-156.95	5.8	-129.5	221.4	215.4	6.00	36.916			
1,200.0	1,188.6	1,172.8	1,172.2	4.3	3.1	-157.69	9.1	-136.6	250.6	244.0	6.60	37.962			
1,233.7	1,221.2	1,203.2	1,202.5	4.5	3.2	-157.86	10.4	-139.4	261.3	254.5	6.81	38.393			
1,300.0	1,285.0	1,262.6	1,261.4	5.0	3.4	-158.20	13.2	-145.5	283.2	276.0	7.21	39.277			
1,400.0	1,381.4	1,351.2	1,349.3	5.6	3.6	-158.40	18.1	-156.1	317.7	309.8	7.84	40.543			
1,500.0	1,477.7	1,438.8	1,435.8	6.3	4.0	-158.32	23.8	-168.4	353.7	345.3	8.48	41.722			
1,600.0	1,574.1	1,525.1	1,520.7	6.9	4.3	-158.05	30.3	-182.3	391.4	382.2	9.14	42.819			
1,700.0	1,670.5	1,610.2	1,604.1	7.6	4.7	-157.65	37.4	-197.8	430.6	420.8	9.82	43.841			
1,800.0	1,766.8	1,693.9	1,685.8	8.3	5.1	-157.15	45.2	-214.6	471.4	460.8	10.52	44.792			
1,900.0	1,863.2	1,776.3	1,765.7	8.9	5.5	-156.59	53.6	-232.7	513.7	502.4	11.24	45.687			
2,000.0	1,959.5	1,859.8	1,846.3	9.6	6.0	-155.97	62.8	-252.6	557.5	545.5	12.00	46.465			
2,100.0	2,055.9	1,949.3	1,932.5	10.3	6.5	-155.37	72.9	-274.3	601.7	588.9	12.78	47.090			
2,200.0	2,152.3	2,038.8	2,018.8	10.9	7.1	-154.86	83.0	-296.0	645.9	632.4	13.56	47.619			
2,300.0	2,248.6	2,128.4	2,105.0	11.6	7.6	-154.41	93.0	-317.8	690.2	675.9	14.36	48.065			
2,400.0	2,345.0	2,217.9	2,191.3	12.3	8.2	-154.01	103.1	-339.5	734.6	719.4	15.16	48.444			
2,500.0	2,441.3	2,307.4	2,277.6	13.0	8.8	-153.66	113.2	-361.3	778.9	763.0	15.97	48.769			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)										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	-89.38	1.5	-135.1	135.1	135.1	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.38	1.5	-135.1	135.1	134.9	0.28	485.951		
200.0	200.0	201.0	201.0	0.4	0.4	-89.38	1.5	-135.1	135.1	134.3	0.83	163.060	CC, ES	
300.0	300.0	301.0	301.0	0.7	0.7	-142.20	1.5	-135.1	136.2	134.8	1.38	98.597		
400.0	399.9	400.0	400.0	1.0	1.0	-143.15	1.5	-135.1	139.3	137.4	1.94	71.927		
500.0	499.7	497.3	497.3	1.3	1.2	-144.42	1.9	-136.3	145.8	143.3	2.49	58.513		
600.0	599.3	593.1	593.1	1.6	1.5	-145.68	3.2	-139.7	156.7	153.7	3.05	51.309		
700.0	698.6	688.2	687.9	1.9	1.7	-146.84	5.3	-145.3	172.2	168.6	3.63	47.401		
800.0	797.5	782.1	781.4	2.3	2.0	-147.84	8.3	-153.0	192.1	187.9	4.23	45.469		
900.0	896.1	874.6	873.4	2.7	2.3	-148.66	12.0	-162.6	216.4	211.5	4.83	44.779	SF	
1,000.0	994.2	965.6	963.5	3.2	2.7	-149.28	16.4	-174.2	244.9	239.4	5.45	44.891		
1,100.0	1,091.7	1,054.7	1,051.5	3.7	3.0	-149.74	21.5	-187.4	277.5	271.4	6.10	45.530		
1,200.0	1,188.6	1,141.8	1,137.2	4.3	3.4	-150.05	27.2	-202.2	314.2	307.5	6.76	46.512		
1,233.7	1,221.2	1,170.7	1,165.5	4.5	3.5	-150.13	29.2	-207.5	327.5	320.5	6.98	46.900		
1,300.0	1,285.0	1,227.0	1,220.5	5.0	3.8	-150.41	33.4	-218.4	354.4	347.0	7.43	47.696		
1,400.0	1,381.4	1,310.6	1,302.0	5.6	4.3	-150.65	40.1	-236.0	396.4	388.3	8.12	48.823		
1,500.0	1,477.7	1,392.8	1,381.7	6.3	4.7	-150.70	47.4	-254.9	440.1	431.3	8.83	49.866		
1,600.0	1,574.1	1,473.6	1,459.5	6.9	5.2	-150.63	55.1	-275.1	485.5	475.9	9.55	50.838		
1,700.0	1,670.5	1,561.1	1,543.5	7.6	5.8	-150.49	63.9	-297.9	531.8	521.5	10.32	51.544		
1,800.0	1,766.8	1,649.7	1,628.5	8.3	6.4	-150.38	72.8	-321.1	578.2	567.1	11.08	52.196		
1,900.0	1,863.2	1,738.3	1,713.6	8.9	7.0	-150.28	81.7	-344.2	624.6	612.7	11.85	52.694		
2,000.0	1,959.5	1,826.9	1,798.7	9.6	7.6	-150.19	90.5	-367.4	670.9	658.3	12.64	53.096		
2,100.0	2,055.9	1,915.5	1,883.7	10.3	8.3	-150.11	99.4	-390.6	717.3	703.9	13.43	53.426		
2,200.0	2,152.3	2,004.1	1,968.8	10.9	8.9	-150.05	108.3	-413.7	763.7	749.4	14.22	53.698		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)													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	1.1	-90.0	90.0	90.0	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-89.30	1.1	-90.0	90.0	89.7	0.28	323.639			
200.0	200.0	201.0	201.0	0.4	0.4	-89.30	1.1	-90.0	90.0	89.2	0.83	108.596	CC, ES		
300.0	300.0	301.0	301.0	0.7	0.7	-142.29	1.1	-90.0	91.0	89.7	1.38	65.914			
400.0	399.9	400.9	400.9	1.0	1.0	-143.73	1.1	-90.0	94.2	92.2	1.94	48.557			
500.0	499.7	500.7	500.7	1.3	1.2	-145.91	1.1	-90.0	99.5	97.0	2.51	39.716			
600.0	599.3	600.3	600.3	1.6	1.5	-148.59	1.1	-90.0	107.2	104.1	3.08	34.819			
700.0	698.6	699.6	699.6	1.9	1.8	-151.50	1.1	-90.0	117.4	113.8	3.66	32.093			
800.0	797.5	798.5	798.5	2.3	2.1	-154.42	1.1	-90.0	130.2	126.0	4.24	30.702			
900.0	896.1	897.1	897.1	2.7	2.3	-157.20	1.1	-90.0	145.7	140.9	4.83	30.191	SF		
1,000.0	994.2	995.2	995.2	3.2	2.6	-159.74	1.1	-90.0	163.9	158.5	5.41	30.292			
1,100.0	1,091.7	1,092.7	1,092.7	3.7	2.9	-162.01	1.1	-90.0	184.8	178.8	6.00	30.828			
1,200.0	1,188.6	1,189.6	1,189.6	4.3	3.1	-163.99	1.1	-90.0	208.4	201.9	6.58	31.683			
1,233.7	1,221.2	1,221.6	1,221.6	4.5	3.2	-164.58	1.1	-90.0	217.0	210.3	6.77	32.043			
1,300.0	1,285.0	1,283.7	1,283.7	5.0	3.4	-165.50	1.7	-90.7	234.6	227.4	7.15	32.790			
1,400.0	1,381.4	1,377.2	1,377.1	5.6	3.6	-166.28	3.7	-93.1	262.0	254.3	7.74	33.872			
1,500.0	1,477.7	1,470.1	1,469.9	6.3	3.9	-166.48	7.2	-97.3	290.5	282.2	8.33	34.882			
1,600.0	1,574.1	1,562.5	1,561.9	6.9	4.2	-166.27	12.1	-103.2	320.0	311.0	8.94	35.808			
1,700.0	1,670.5	1,654.1	1,653.1	7.6	4.4	-165.76	18.4	-110.7	350.5	340.9	9.56	36.652			
1,800.0	1,766.8	1,745.0	1,743.2	8.3	4.7	-165.01	26.0	-119.8	382.0	371.8	10.21	37.412			
1,900.0	1,863.2	1,835.0	1,832.1	8.9	5.0	-164.11	34.9	-130.4	414.7	403.8	10.89	38.092			
2,000.0	1,959.5	1,924.0	1,919.7	9.6	5.3	-163.10	45.0	-142.4	448.4	436.8	11.59	38.698			
2,100.0	2,055.9	2,015.2	2,009.1	10.3	5.7	-162.00	56.5	-156.2	483.2	470.9	12.33	39.198			
2,200.0	2,152.3	2,108.5	2,100.5	10.9	6.1	-161.01	68.4	-170.3	518.3	505.2	13.10	39.580			
2,300.0	2,248.6	2,201.8	2,192.0	11.6	6.5	-160.14	80.2	-184.5	553.5	539.6	13.87	39.897			
2,400.0	2,345.0	2,295.1	2,283.4	12.3	6.9	-159.37	92.1	-198.7	588.8	574.1	14.66	40.154			
2,500.0	2,441.3	2,388.4	2,374.9	13.0	7.4	-158.69	104.0	-212.9	624.1	608.6	15.46	40.367			
2,600.0	2,537.7	2,481.7	2,466.3	13.7	7.8	-158.09	115.9	-227.0	659.5	643.3	16.27	40.545			
2,700.0	2,634.1	2,575.0	2,557.8	14.3	8.3	-157.54	127.7	-241.2	695.0	677.9	17.08	40.694			
2,800.0	2,730.4	2,668.3	2,649.2	15.0	8.7	-157.05	139.6	-255.4	730.6	712.7	17.90	40.821			
2,900.0	2,826.8	2,761.6	2,740.7	15.7	9.2	-156.60	151.5	-269.6	766.1	747.4	18.72	40.929			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
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	-89.31	0.7	-60.2	60.2	60.2	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.31	0.7	-60.2	60.2	59.9	0.28	216.427		
200.0	200.0	201.0	201.0	0.4	0.4	-89.31	0.7	-60.2	60.2	59.4	0.83	72.622 CC, ES		
300.0	300.0	301.0	301.0	0.7	0.7	-142.54	0.7	-60.2	61.2	59.8	1.38	44.326		
400.0	399.9	400.9	400.9	1.0	1.0	-144.64	0.7	-60.2	64.4	62.4	1.94	33.190		
500.0	499.7	500.7	500.7	1.3	1.2	-147.70	0.7	-60.2	69.8	67.3	2.51	27.853		
600.0	599.3	600.3	600.3	1.6	1.5	-151.25	0.7	-60.2	77.7	74.6	3.08	25.231		
700.0	698.6	699.6	699.6	1.9	1.8	-154.85	0.7	-60.2	88.2	84.6	3.66	24.117		
800.0	797.5	798.5	798.5	2.3	2.1	-158.22	0.7	-60.2	101.4	97.2	4.24	23.933 SF		
900.0	896.1	897.1	897.1	2.7	2.3	-161.21	0.7	-60.2	117.3	112.5	4.82	24.359		
1,000.0	994.2	995.2	995.2	3.2	2.6	-163.77	0.7	-60.2	136.0	130.6	5.39	25.201		
1,100.0	1,091.7	1,092.7	1,092.7	3.7	2.9	-165.94	0.7	-60.2	157.3	151.3	5.97	26.335		
1,200.0	1,188.6	1,189.6	1,189.6	4.3	3.1	-167.75	0.7	-60.2	181.3	174.8	6.55	27.678		
1,233.7	1,221.2	1,222.2	1,222.2	4.5	3.2	-168.29	0.7	-60.2	190.0	183.3	6.75	28.167		
1,300.0	1,285.0	1,286.0	1,286.0	5.0	3.4	-169.28	0.7	-60.2	207.4	200.3	7.13	29.099		
1,400.0	1,381.4	1,382.4	1,382.4	5.6	3.7	-170.50	0.7	-60.2	233.8	226.0	7.71	30.324		
1,500.0	1,477.7	1,478.7	1,478.7	6.3	3.9	-171.47	0.7	-60.2	260.2	251.9	8.29	31.369		
1,600.0	1,574.1	1,575.1	1,575.1	6.9	4.2	-172.26	0.7	-60.2	286.7	277.8	8.88	32.270		
1,700.0	1,670.5	1,671.5	1,671.5	7.6	4.5	-172.92	0.7	-60.2	313.2	303.7	9.48	33.052		
1,800.0	1,766.8	1,767.8	1,767.8	8.3	4.7	-173.47	0.7	-60.2	339.8	329.7	10.07	33.737		
1,900.0	1,863.2	1,864.2	1,864.2	8.9	5.0	-173.95	0.7	-60.2	366.3	355.7	10.67	34.340		
2,000.0	1,959.5	1,960.5	1,960.5	9.6	5.3	-174.36	0.7	-60.2	392.9	381.7	11.27	34.874		
2,100.0	2,055.9	2,056.9	2,056.9	10.3	5.5	-174.66	1.2	-60.3	419.4	407.6	11.87	35.330		
2,200.0	2,152.3	2,153.2	2,153.2	10.9	5.8	-174.63	3.9	-61.1	445.3	432.9	12.48	35.671		
2,300.0	2,248.6	2,249.6	2,249.6	11.6	6.1	-174.29	9.1	-62.7	470.6	457.5	13.10	35.908		
2,400.0	2,345.0	2,346.0	2,346.0	12.3	6.4	-173.67	16.8	-65.1	495.2	481.4	13.74	36.045		
2,500.0	2,441.3	2,442.3	2,442.3	13.0	6.6	-172.83	27.0	-68.2	519.2	504.8	14.39	36.085		
2,600.0	2,537.7	2,538.7	2,538.7	13.7	6.9	-171.79	39.7	-72.0	542.8	527.7	15.06	36.030		
2,700.0	2,634.1	2,635.1	2,635.1	14.3	7.2	-170.66	54.0	-76.4	566.1	550.3	15.76	35.911		
2,800.0	2,730.4	2,731.4	2,731.4	15.0	7.6	-169.60	68.4	-80.7	589.5	573.0	16.48	35.774		
2,900.0	2,826.8	2,827.8	2,827.8	15.7	7.9	-168.63	82.7	-85.1	613.1	595.9	17.21	35.624		
3,000.0	2,923.1	2,924.1	2,924.1	16.4	8.2	-167.73	97.1	-89.4	636.9	619.0	17.96	35.465		
3,100.0	3,019.5	3,020.5	3,020.5	17.1	8.6	-166.90	111.4	-93.8	660.8	642.1	18.72	35.301		
3,200.0	3,115.9	3,116.9	3,116.9	17.7	8.9	-166.12	125.8	-98.1	684.9	665.4	19.49	35.134		
3,300.0	3,212.2	3,213.2	3,213.2	18.4	9.3	-165.39	140.1	-102.5	709.1	688.8	20.28	34.967		
3,400.0	3,308.6	3,309.6	3,309.6	19.1	9.6	-164.71	154.4	-106.8	733.3	712.2	21.07	34.802		
3,500.0	3,404.9	3,405.9	3,405.9	19.8	10.0	-164.08	168.8	-111.2	757.7	735.8	21.87	34.639		
3,530.3	3,434.1	3,435.1	3,435.1	20.0	10.1	-163.89	173.1	-112.5	765.1	742.9	22.12	34.591		
3,600.0	3,501.5	3,502.5	3,502.5	20.4	10.4	-163.56	183.2	-115.5	781.3	758.6	22.71	34.403		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)										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	-89.41	1.1	-105.0	105.0	105.0	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.41	1.1	-105.0	105.0	104.8	0.28	377.738		
200.0	200.0	201.0	201.0	0.4	0.4	-89.41	1.1	-105.0	105.0	104.2	0.83	126.749	CC, ES	
300.0	300.0	301.0	301.0	0.7	0.7	-142.32	1.1	-105.0	106.1	104.7	1.38	76.807		
400.0	399.9	400.9	400.9	1.0	1.0	-143.55	1.1	-105.0	109.2	107.3	1.94	56.316		
500.0	499.7	500.7	500.7	1.3	1.2	-145.45	1.1	-105.0	114.5	112.0	2.51	45.715		
600.0	599.3	600.3	600.3	1.6	1.5	-147.82	1.1	-105.0	122.2	119.1	3.08	39.682		
700.0	698.6	699.6	699.6	1.9	1.8	-150.45	1.1	-105.0	132.3	128.6	3.66	36.154		
800.0	797.5	798.5	798.5	2.3	2.1	-153.16	1.1	-105.0	145.0	140.7	4.24	34.160		
900.0	896.1	897.1	897.1	2.7	2.3	-155.79	1.1	-105.0	160.3	155.5	4.83	33.182		
1,000.0	994.2	995.2	995.2	3.2	2.6	-158.25	1.1	-105.0	178.3	172.9	5.42	32.908	SF	
1,100.0	1,091.7	1,089.7	1,089.6	3.7	2.9	-160.19	1.6	-105.9	199.8	193.8	6.00	33.306		
1,200.0	1,188.6	1,182.9	1,182.8	4.3	3.1	-161.45	3.4	-108.8	225.3	218.7	6.58	34.244		
1,233.7	1,221.2	1,214.0	1,213.9	4.5	3.2	-161.75	4.2	-110.2	234.8	228.0	6.78	34.647		
1,300.0	1,285.0	1,274.9	1,274.7	5.0	3.4	-162.24	6.2	-113.5	254.3	247.1	7.17	35.482		
1,400.0	1,381.4	1,366.1	1,365.6	5.6	3.6	-162.54	10.2	-120.0	284.8	277.1	7.77	36.680		
1,500.0	1,477.7	1,456.5	1,455.4	6.3	3.9	-162.47	15.2	-128.4	316.8	308.4	8.38	37.798		
1,600.0	1,574.1	1,545.9	1,544.1	6.9	4.2	-162.12	21.2	-138.4	350.1	341.1	9.02	38.834		
1,700.0	1,670.5	1,634.3	1,631.4	7.6	4.5	-161.57	28.3	-150.0	384.8	375.2	9.67	39.789		
1,800.0	1,766.8	1,721.6	1,717.3	8.3	4.8	-160.89	36.2	-163.2	421.0	410.6	10.35	40.668		
1,900.0	1,863.2	1,807.7	1,801.7	8.9	5.2	-160.12	45.1	-177.9	458.5	447.4	11.05	41.477		
2,000.0	1,959.5	1,892.7	1,884.6	9.6	5.6	-159.28	54.8	-193.9	497.4	485.7	11.78	42.218		
2,100.0	2,055.9	1,984.2	1,973.7	10.3	6.0	-158.42	65.8	-212.0	537.2	524.6	12.56	42.779		
2,200.0	2,152.3	2,075.7	2,062.7	10.9	6.5	-157.68	76.7	-230.1	576.9	563.6	13.34	43.262		
2,300.0	2,248.6	2,167.2	2,151.7	11.6	7.0	-157.04	87.7	-248.2	616.8	602.7	14.13	43.664		
2,400.0	2,345.0	2,258.8	2,240.7	12.3	7.4	-156.47	98.6	-266.3	656.7	641.8	14.93	44.002		
2,500.0	2,441.3	2,350.3	2,329.8	13.0	7.9	-155.97	109.5	-284.4	696.7	681.0	15.73	44.290		
2,600.0	2,537.7	2,441.8	2,418.8	13.7	8.5	-155.52	120.5	-302.5	736.7	720.2	16.54	44.536		
2,700.0	2,634.1	2,533.3	2,507.8	14.3	9.0	-155.11	131.4	-320.6	776.8	759.4	17.36	44.750		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)													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	-89.17	1.1	-74.9	75.0	75.0	0.00	N/A				
100.0	100.0	101.0	101.0	0.1	0.1	-89.17	1.1	-74.9	75.0	74.7	0.28	269.540				
200.0	200.0	201.0	201.0	0.4	0.4	-89.17	1.1	-74.9	75.0	74.1	0.83	90.444 CC, ES				
300.0	300.0	301.0	301.0	0.7	0.7	-142.26	1.1	-74.9	76.0	74.6	1.38	55.020				
400.0	399.9	400.9	400.9	1.0	1.0	-143.97	1.1	-74.9	79.1	77.2	1.94	40.799				
500.0	499.7	500.7	500.7	1.3	1.2	-146.54	1.1	-74.9	84.5	82.0	2.51	33.721				
600.0	599.3	600.3	600.3	1.6	1.5	-149.61	1.1	-74.9	92.3	89.2	3.08	29.966				
700.0	698.6	699.6	699.6	1.9	1.8	-152.85	1.1	-74.9	102.6	99.0	3.66	28.047				
800.0	797.5	798.5	798.5	2.3	2.1	-156.02	1.1	-74.9	115.6	111.3	4.24	27.261				
900.0	896.1	897.1	897.1	2.7	2.3	-158.93	1.1	-74.9	131.3	126.4	4.82	27.222 SF				
1,000.0	994.2	995.2	995.2	3.2	2.6	-161.52	1.1	-74.9	149.7	144.3	5.40	27.696				
1,100.0	1,091.7	1,092.7	1,092.7	3.7	2.9	-163.78	1.1	-74.9	170.8	164.8	5.98	28.536				
1,200.0	1,188.6	1,189.6	1,189.6	4.3	3.1	-165.71	1.1	-74.9	194.6	188.0	6.57	29.639				
1,233.7	1,221.2	1,222.2	1,222.2	4.5	3.2	-166.29	1.1	-74.9	203.2	196.4	6.76	30.057				
1,300.0	1,285.0	1,286.0	1,286.0	5.0	3.4	-167.38	1.1	-74.9	220.5	213.3	7.14	30.864				
1,400.0	1,381.4	1,382.4	1,382.4	5.6	3.7	-168.74	1.1	-74.9	246.7	239.0	7.73	31.930				
1,500.0	1,477.7	1,477.8	1,477.8	6.3	3.9	-169.65	1.7	-75.4	273.1	264.8	8.31	32.868				
1,600.0	1,574.1	1,573.0	1,572.9	6.9	4.2	-169.95	4.2	-77.3	300.0	291.1	8.90	33.702				
1,700.0	1,670.5	1,668.0	1,667.7	7.6	4.4	-169.77	8.6	-80.6	327.2	317.7	9.50	34.432				
1,800.0	1,766.8	1,762.6	1,762.0	8.3	4.7	-169.23	14.8	-85.3	354.9	344.7	10.12	35.058				
1,900.0	1,863.2	1,856.8	1,855.7	8.9	5.0	-168.41	22.9	-91.4	383.0	372.2	10.76	35.585				
2,000.0	1,959.5	1,950.5	1,948.6	9.6	5.3	-167.38	32.7	-98.8	411.6	400.2	11.43	36.016				
2,100.0	2,055.9	2,044.2	2,041.2	10.3	5.6	-166.19	44.3	-107.5	440.8	428.7	12.13	36.352				
2,200.0	2,152.3	2,139.3	2,135.1	10.9	5.9	-165.05	56.5	-116.7	470.4	457.5	12.85	36.599				
2,300.0	2,248.6	2,234.5	2,229.0	11.6	6.3	-164.06	68.7	-125.9	500.1	486.5	13.60	36.775				
2,400.0	2,345.0	2,329.6	2,322.9	12.3	6.6	-163.17	80.9	-135.1	529.9	515.5	14.35	36.914				
2,500.0	2,441.3	2,424.8	2,416.8	13.0	7.0	-162.37	93.1	-144.3	559.8	544.7	15.12	37.018				
2,600.0	2,537.7	2,519.9	2,510.7	13.7	7.4	-161.66	105.3	-153.5	589.8	573.9	15.90	37.093				
2,700.0	2,634.1	2,615.1	2,604.6	14.3	7.7	-161.02	117.5	-162.7	619.9	603.2	16.69	37.148				
2,800.0	2,730.4	2,710.2	2,698.5	15.0	8.1	-160.43	129.7	-171.9	650.0	632.5	17.48	37.187				
2,900.0	2,826.8	2,805.4	2,792.4	15.7	8.5	-159.90	141.9	-181.1	680.2	661.9	18.28	37.214				
3,000.0	2,923.1	2,900.5	2,886.4	16.4	8.9	-159.41	154.1	-190.3	710.5	691.4	19.08	37.230				
3,100.0	3,019.5	2,995.7	2,980.3	17.1	9.3	-158.96	166.3	-199.5	740.8	720.9	19.89	37.239				
3,200.0	3,115.9	3,090.8	3,074.2	17.7	9.7	-158.55	178.5	-208.7	771.1	750.4	20.70	37.242				

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)													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	-89.30	0.4	-30.1	30.1	30.1	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.30	0.4	-30.1	30.1	29.8	0.28	108.214		
200.0	200.0	201.0	201.0	0.4	0.4	-89.30	0.4	-30.1	30.1	29.3	0.83	36.311 CC, ES		
300.0	300.0	301.0	301.0	0.7	0.7	-143.27	0.4	-30.1	31.1	29.8	1.38	22.538		
400.0	399.9	400.9	400.9	1.0	1.0	-147.16	0.4	-30.1	34.4	32.4	1.94	17.703		
500.0	499.7	500.7	500.7	1.3	1.2	-152.20	0.4	-30.1	40.0	37.5	2.51	15.949		
600.0	599.3	600.3	600.3	1.6	1.5	-157.22	0.4	-30.1	48.3	45.2	3.08	15.674		
700.0	698.6	699.6	699.6	1.9	1.8	-161.56	0.4	-30.1	59.3	55.7	3.66	16.226		
800.0	797.5	798.5	798.5	2.3	2.1	-165.07	0.4	-30.1	73.1	68.9	4.23	17.278		
900.0	896.1	898.9	898.9	2.7	2.3	-167.33	1.5	-29.5	88.6	83.8	4.80	18.448		
1,000.0	994.2	999.6	999.5	3.2	2.6	-168.29	5.1	-27.8	104.7	99.3	5.37	19.482		
1,100.0	1,091.7	1,100.5	1,100.2	3.7	2.9	-168.46	11.0	-24.9	121.2	115.3	5.95	20.365		
1,200.0	1,188.6	1,201.8	1,201.0	4.3	3.2	-168.10	19.4	-20.9	138.3	131.7	6.55	21.112		
1,233.7	1,221.2	1,236.0	1,235.0	4.5	3.3	-167.89	22.7	-19.3	144.2	137.4	6.76	21.329		
1,300.0	1,285.0	1,303.3	1,301.9	5.0	3.5	-167.38	30.2	-15.7	155.3	148.1	7.17	21.647		
1,400.0	1,381.4	1,405.5	1,403.0	5.6	3.8	-166.24	43.5	-9.2	170.4	162.6	7.83	21.752		
1,500.0	1,477.7	1,508.1	1,504.1	6.3	4.2	-164.72	59.3	-1.6	183.6	175.0	8.54	21.495		
1,600.0	1,574.1	1,609.1	1,603.2	6.9	4.6	-162.96	76.9	6.9	195.2	185.9	9.30	20.994		
1,700.0	1,670.5	1,708.3	1,700.4	7.6	5.1	-161.37	94.5	15.5	206.7	196.6	10.09	20.493		
1,800.0	1,766.8	1,807.5	1,797.6	8.3	5.5	-159.94	112.2	24.0	218.3	207.4	10.90	20.023		
1,900.0	1,863.2	1,906.7	1,894.8	8.9	6.0	-158.66	129.8	32.5	230.1	218.4	11.75	19.586		
2,000.0	1,959.5	2,005.8	1,992.1	9.6	6.5	-157.50	147.4	41.0	242.0	229.4	12.61	19.182		
2,100.0	2,055.9	2,105.0	2,089.3	10.3	6.9	-156.45	165.0	49.5	253.9	240.4	13.50	18.811		
2,200.0	2,152.3	2,204.2	2,186.5	10.9	7.4	-155.50	182.6	58.0	266.0	251.6	14.40	18.469		
2,300.0	2,248.6	2,303.4	2,283.8	11.6	7.9	-154.63	200.2	66.6	278.1	262.8	15.32	18.156		
2,400.0	2,345.0	2,402.6	2,381.0	12.3	8.4	-153.83	217.8	75.1	290.3	274.0	16.24	17.868		
2,500.0	2,441.3	2,501.7	2,478.2	13.0	8.9	-153.09	235.5	83.6	302.5	285.3	17.18	17.604		
2,600.0	2,537.7	2,600.9	2,575.5	13.7	9.4	-152.41	253.1	92.1	314.7	296.6	18.13	17.361		
2,700.0	2,634.1	2,700.1	2,672.7	14.3	9.9	-151.79	270.7	100.6	327.0	308.0	19.08	17.137		
2,800.0	2,730.4	2,799.3	2,769.9	15.0	10.4	-151.21	288.3	109.2	339.4	319.3	20.05	16.930		
2,900.0	2,826.8	2,898.5	2,867.1	15.7	10.9	-150.67	305.9	117.7	351.8	330.7	21.01	16.739		
3,000.0	2,923.1	2,997.6	2,964.4	16.4	11.4	-150.16	323.5	126.2	364.2	342.2	21.99	16.562		
3,100.0	3,019.5	3,096.8	3,061.6	17.1	11.9	-149.69	341.1	134.7	376.6	353.6	22.97	16.397		
3,200.0	3,115.9	3,196.0	3,158.8	17.7	12.4	-149.25	358.7	143.2	389.0	365.1	23.95	16.244		
3,300.0	3,212.2	3,295.2	3,256.1	18.4	12.9	-148.84	376.4	151.8	401.5	376.6	24.94	16.102		
3,400.0	3,308.6	3,394.3	3,353.3	19.1	13.4	-148.45	394.0	160.3	414.0	388.1	25.92	15.969		
3,500.0	3,404.9	3,493.5	3,450.5	19.8	13.9	-148.08	411.6	168.8	426.5	399.6	26.92	15.845		
3,530.3	3,434.1	3,523.6	3,480.0	20.0	14.1	-147.98	416.9	171.4	430.3	403.1	27.22	15.808		
3,600.0	3,501.5	3,592.8	3,547.8	20.4	14.4	-147.77	429.2	177.3	438.3	410.4	27.92	15.702		
3,700.0	3,598.9	3,692.3	3,645.3	20.9	15.0	-147.25	446.9	185.9	447.4	418.5	28.89	15.485		
3,800.0	3,697.0	3,791.2	3,742.4	21.3	15.5	-146.49	464.4	194.4	453.6	423.7	29.87	15.185		
3,900.0	3,795.8	3,883.6	3,833.3	21.7	15.8	-145.76	479.3	201.5	457.9	427.2	30.67	14.927		
4,000.0	3,895.0	3,976.2	3,924.9	22.0	16.1	-145.11	491.6	207.5	461.0	429.6	31.38	14.689		
4,100.0	3,994.6	4,069.0	4,017.0	22.2	16.4	-144.56	501.2	212.1	462.8	430.8	31.99	14.468		
4,200.0	4,094.4	4,161.9	4,109.6	22.4	16.7	-144.09	508.1	215.5	463.4	430.9	32.49	14.261		
4,305.6	4,200.0	4,260.2	4,207.8	22.6	16.9	-91.19	512.4	217.6	462.6	429.7	32.91	14.056		
4,400.0	4,294.4	4,348.2	4,295.7	22.7	17.0	-91.02	513.8	218.2	461.9	428.6	33.26	13.886		
4,434.9	4,329.3	4,382.8	4,330.3	22.7	17.1	-91.02	513.8	218.2	461.9	428.5	33.38	13.837		
4,500.0	4,394.4	4,447.8	4,395.4	22.8	17.2	-91.02	513.8	218.2	461.9	428.3	33.61	13.743		
4,600.0	4,494.4	4,547.8	4,495.4	22.9	17.4	-91.02	513.8	218.2	461.9	427.9	33.97	13.598		
4,700.0	4,594.4	4,647.8	4,595.4	23.1	17.6	-91.02	513.8	218.2	461.9	427.5	34.33	13.453		

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)													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)			
4,800.0	4,694.4	4,747.8	4,695.4	23.2	17.8	-91.02	513.8	218.2	461.9	427.2	34.70	13.310		
4,900.0	4,794.4	4,847.8	4,795.4	23.4	17.9	-91.02	513.8	218.2	461.9	426.8	35.07	13.168		
5,000.0	4,894.4	4,947.8	4,895.4	23.5	18.1	-91.02	513.8	218.2	461.9	426.4	35.45	13.028		
5,100.0	4,994.4	5,047.8	4,995.4	23.7	18.3	-91.02	513.8	218.2	461.9	426.0	35.84	12.889		
5,200.0	5,094.4	5,147.8	5,095.4	23.8	18.5	-91.02	513.8	218.2	461.9	425.6	36.22	12.751		
5,300.0	5,194.4	5,247.8	5,195.4	24.0	18.7	-91.02	513.8	218.2	461.9	425.2	36.61	12.614		
5,400.0	5,294.4	5,347.8	5,295.4	24.1	18.9	-91.02	513.8	218.2	461.9	424.9	37.01	12.480		
5,500.0	5,394.4	5,447.8	5,395.4	24.3	19.1	-91.02	513.8	218.2	461.9	424.5	37.41	12.346		
5,600.0	5,494.4	5,547.8	5,495.4	24.4	19.3	-91.02	513.8	218.2	461.9	424.1	37.81	12.215		
5,700.0	5,594.4	5,647.8	5,595.4	24.6	19.5	-91.02	513.8	218.2	461.9	423.6	38.22	12.085		
5,800.0	5,694.4	5,747.8	5,695.4	24.8	19.7	-91.02	513.8	218.2	461.9	423.2	38.63	11.956		
5,900.0	5,794.4	5,847.8	5,795.4	24.9	19.9	-91.02	513.8	218.2	461.9	422.8	39.04	11.830		
6,000.0	5,894.4	5,947.8	5,895.4	25.1	20.1	-91.02	513.8	218.2	461.9	422.4	39.46	11.705		
6,100.0	5,994.4	6,047.8	5,995.4	25.3	20.4	-91.02	513.8	218.2	461.9	422.0	39.88	11.581		
6,103.9	5,998.3	6,051.7	5,999.3	25.3	20.4	-91.02	513.8	218.2	461.9	422.0	39.90	11.577		
6,113.7	6,008.1	6,061.5	6,009.1	25.3	20.4	-91.02	513.8	218.2	461.9	421.9	39.94	11.565		
6,150.0	6,044.4	6,097.4	6,045.0	25.3	20.4	88.94	512.9	218.2	461.9	421.8	40.06	11.529		
6,200.0	6,094.2	6,146.9	6,094.3	25.4	20.5	88.94	508.9	218.2	461.9	421.7	40.15	11.503		
6,250.0	6,143.7	6,196.3	6,143.2	25.4	20.5	88.95	501.8	218.2	461.9	421.7	40.17	11.497		
6,300.0	6,192.6	6,245.8	6,191.5	25.4	20.5	88.96	491.5	218.2	461.9	421.7	40.13	11.509		
6,350.0	6,240.7	6,295.2	6,239.1	25.3	20.4	88.97	478.1	218.2	461.9	421.8	40.03	11.538		
6,400.0	6,287.8	6,344.7	6,285.7	25.2	20.4	88.98	461.6	218.2	461.9	422.0	39.88	11.582		
6,450.0	6,333.7	6,394.1	6,331.2	25.2	20.3	89.01	442.2	218.2	461.9	422.2	39.68	11.639		
6,500.0	6,378.2	6,443.6	6,375.4	25.0	20.2	89.03	419.8	218.1	461.9	422.4	39.45	11.707		
6,550.0	6,421.1	6,493.1	6,418.0	24.9	20.0	89.06	394.6	218.1	461.9	422.7	39.20	11.783		
6,600.0	6,462.2	6,542.6	6,458.9	24.8	19.9	89.09	366.8	218.1	461.9	422.9	38.93	11.864		
6,650.0	6,501.4	6,592.2	6,497.9	24.6	19.7	89.13	336.3	218.1	461.9	423.2	38.66	11.946		
6,700.0	6,538.5	6,641.7	6,534.9	24.5	19.6	89.17	303.3	218.0	461.9	423.5	38.41	12.024		
6,750.0	6,573.3	6,691.3	6,569.6	24.3	19.5	89.21	268.0	218.0	461.9	423.7	38.19	12.094		
6,800.0	6,605.7	6,740.9	6,602.1	24.2	19.3	89.26	230.5	218.0	461.9	423.9	38.01	12.150		
6,850.0	6,635.6	6,790.5	6,632.0	24.0	19.2	89.31	190.9	218.0	461.9	424.0	37.90	12.188		
6,900.0	6,662.7	6,840.1	6,659.3	23.9	19.1	89.36	149.5	217.9	461.9	424.0	37.86	12.201		
6,950.0	6,687.1	6,889.8	6,683.9	23.8	19.0	89.42	106.3	217.9	461.9	424.0	37.90	12.187		
7,000.0	6,708.5	6,939.5	6,705.6	23.6	19.0	89.47	61.6	217.9	461.9	423.9	38.05	12.140		
7,050.0	6,727.0	6,989.2	6,724.4	23.6	19.0	89.53	15.6	217.8	461.9	423.6	38.30	12.060		
7,100.0	6,742.3	7,039.0	6,740.2	23.5	19.1	89.59	-31.6	217.8	461.9	423.2	38.67	11.946		
7,150.0	6,754.6	7,088.8	6,752.8	23.5	19.4	89.66	-79.8	217.7	461.9	422.8	39.15	11.797		
7,200.0	6,763.6	7,138.6	6,762.3	23.5	19.7	89.72	-128.7	217.7	461.9	422.2	39.76	11.618		
7,250.0	6,769.4	7,188.5	6,768.6	23.6	20.1	89.79	-178.1	217.7	461.9	421.5	40.48	11.411		
7,300.0	6,771.9	7,238.4	6,771.7	23.8	20.6	89.85	-227.9	217.6	461.9	420.6	41.32	11.181		
7,318.7	6,772.0	7,257.1	6,772.0	23.9	20.7	89.88	-246.6	217.6	462.0	420.3	41.65	11.091		
7,318.7	6,772.0	7,257.1	6,772.0	23.9	20.7	89.88	-246.6	217.6	462.0	420.3	41.65	11.091		
7,400.0	6,771.5	7,338.4	6,771.5	24.4	21.6	89.88	-327.9	217.6	462.0	418.7	43.23	10.687		
7,500.0	6,770.8	7,438.4	6,770.9	25.4	22.8	89.88	-427.9	217.5	462.0	416.4	45.60	10.131		
7,600.0	6,770.1	7,538.4	6,770.2	26.6	24.2	89.88	-527.9	217.4	462.0	413.7	48.32	9.562		
7,700.0	6,769.5	7,638.4	6,769.5	28.0	25.8	89.88	-627.9	217.3	462.0	410.7	51.32	9.003		
7,800.0	6,768.8	7,738.4	6,768.9	29.5	27.4	89.88	-727.9	217.3	462.0	407.5	54.56	8.468		
7,900.0	6,768.1	7,838.4	6,768.2	31.1	29.2	89.88	-827.9	217.2	462.0	404.0	58.01	7.965		
8,000.0	6,767.5	7,938.4	6,767.5	32.8	31.0	89.88	-927.9	217.1	462.1	400.4	61.62	7.499		
8,100.0	6,766.8	8,038.4	6,766.9	34.6	32.9	89.88	-1,027.9	217.0	462.1	396.7	65.37	7.069		

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

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
13,300.0	6,732.3	13,238.4	6,732.5	150.4	150.2	89.90	-6,227.8	213.3	462.9	163.0	299.94	1.543			
13,400.0	6,731.7	13,338.4	6,731.8	152.7	152.5	89.90	-6,327.8	213.2	462.9	158.3	304.61	1.520			
13,500.0	6,731.0	13,438.4	6,731.2	155.0	154.8	89.90	-6,427.8	213.1	462.9	153.7	309.27	1.497 Level 3			
13,600.0	6,730.3	13,538.4	6,730.5	157.3	157.2	89.90	-6,527.8	213.0	463.0	149.0	313.94	1.475 Level 3			
13,700.0	6,729.7	13,638.4	6,729.8	159.7	159.5	89.90	-6,627.8	213.0	463.0	144.4	318.61	1.453 Level 3			
13,800.0	6,729.0	13,738.4	6,729.2	162.0	161.8	89.90	-6,727.8	212.9	463.0	139.7	323.28	1.432 Level 3			
13,900.0	6,728.4	13,838.4	6,728.5	164.3	164.2	89.90	-6,827.8	212.8	463.0	135.1	327.95	1.412 Level 3			
14,000.0	6,727.7	13,938.4	6,727.9	166.7	166.5	89.90	-6,927.8	212.7	463.0	130.4	332.62	1.392 Level 3			
14,100.0	6,727.0	14,038.4	6,727.2	169.0	168.8	89.90	-7,027.8	212.7	463.0	125.8	337.29	1.373 Level 3			
14,124.2	6,726.9	14,062.6	6,727.0	169.4	169.4	89.90	-7,051.9	212.7	463.0	124.7	338.31	1.369 Level 3, SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-89.09	0.7	-45.1	45.1						
100.0	100.0	100.0	100.0	0.1	0.1	-89.09	0.7	-45.1	45.1	44.9	0.28	163.952			
200.0	200.0	200.0	200.0	0.4	0.4	-89.09	0.7	-45.1	45.1	44.3	0.83	54.651	CC, ES		
300.0	300.0	300.0	300.0	0.7	0.7	-142.57	0.7	-45.1	46.2	44.8	1.38	33.498			
400.0	399.9	399.9	399.9	1.0	1.0	-145.32	0.7	-45.1	49.4	47.4	1.94	25.473			
500.0	499.7	499.7	499.7	1.3	1.2	-149.16	0.7	-45.1	54.9	52.4	2.50	21.901			
600.0	599.3	599.3	599.3	1.6	1.5	-153.38	0.7	-45.1	62.9	59.8	3.08	20.434			
700.0	698.6	698.6	698.6	1.9	1.8	-157.42	0.7	-45.1	73.6	69.9	3.65	20.142			
800.0	797.5	797.5	797.5	2.3	2.1	-160.98	0.7	-45.1	87.0	82.8	4.23	20.572			
900.0	896.1	896.1	896.1	2.7	2.3	-163.97	0.7	-45.1	103.2	98.4	4.81	21.469			
1,000.0	994.2	994.2	994.2	3.2	2.6	-166.43	0.7	-45.1	122.1	116.7	5.38	22.681			
1,100.0	1,091.7	1,091.7	1,091.7	3.7	2.9	-168.43	0.7	-45.1	143.7	137.7	5.96	24.109			
1,200.0	1,188.6	1,188.6	1,188.6	4.3	3.1	-170.05	0.7	-45.1	167.9	161.3	6.53	25.690			
1,233.7	1,221.2	1,221.2	1,221.2	4.5	3.2	-170.52	0.7	-45.1	176.6	169.9	6.73	26.249			
1,300.0	1,285.0	1,285.0	1,285.0	5.0	3.4	-171.38	0.7	-45.1	194.1	187.0	7.11	27.304			
1,400.0	1,381.4	1,381.4	1,381.4	5.6	3.7	-172.42	0.7	-45.1	220.6	212.9	7.69	28.687			
1,500.0	1,477.7	1,477.7	1,477.7	6.3	3.9	-173.24	0.7	-45.1	247.2	238.9	8.28	29.865			
1,600.0	1,574.1	1,574.1	1,574.1	6.9	4.2	-173.90	0.7	-45.1	273.8	264.9	8.87	30.877			
1,700.0	1,670.5	1,670.5	1,670.5	7.6	4.5	-174.44	0.7	-45.1	300.4	290.9	9.46	31.755			
1,800.0	1,766.8	1,766.8	1,766.8	8.3	4.7	-174.89	0.7	-45.1	327.0	316.9	10.05	32.523			
1,900.0	1,863.2	1,863.2	1,863.2	8.9	5.0	-175.28	0.7	-45.1	353.6	343.0	10.65	33.199			
2,000.0	1,959.5	1,959.5	1,959.5	9.6	5.3	-175.61	0.7	-45.1	380.3	369.0	11.25	33.798			
2,100.0	2,055.9	2,055.9	2,055.9	10.3	5.5	-175.90	0.7	-45.1	406.9	395.1	11.85	34.333			
2,200.0	2,152.3	2,152.3	2,152.3	10.9	5.8	-176.15	0.7	-45.1	433.6	421.2	12.46	34.812			
2,300.0	2,248.6	2,248.6	2,248.6	11.6	6.1	-176.37	0.7	-45.1	460.3	447.2	13.06	35.245			
2,400.0	2,345.0	2,345.0	2,345.0	12.3	6.3	-176.57	0.7	-45.1	487.0	473.3	13.67	35.637			
2,500.0	2,441.3	2,441.3	2,441.3	13.0	6.6	-176.75	0.7	-45.1	513.7	499.4	14.27	35.993			
2,600.0	2,537.7	2,541.4	2,541.4	13.7	6.9	-176.90	0.9	-45.1	540.2	525.4	14.89	36.288			
2,700.0	2,634.1	2,648.1	2,648.0	14.3	7.2	-176.85	3.6	-44.9	565.4	549.9	15.52	36.430			
2,800.0	2,730.4	2,755.6	2,755.4	15.0	7.5	-176.57	9.2	-44.4	588.9	572.7	16.16	36.441			
2,900.0	2,826.8	2,863.9	2,863.3	15.7	7.8	-176.08	18.0	-43.6	610.6	593.8	16.81	36.327			
3,000.0	2,923.1	2,972.7	2,971.5	16.4	8.1	-175.41	29.8	-42.5	630.6	613.1	17.47	36.096			
3,100.0	3,019.5	3,081.9	3,079.6	17.1	8.4	-174.56	44.8	-41.1	649.0	630.8	18.15	35.752			
3,200.0	3,115.9	3,188.3	3,184.6	17.7	8.7	-173.58	62.2	-39.6	665.8	647.0	18.85	35.323			
3,300.0	3,212.2	3,286.4	3,281.2	18.4	9.0	-172.67	79.1	-38.0	682.4	662.8	19.55	34.913			
3,400.0	3,308.6	3,384.4	3,377.8	19.1	9.3	-171.80	96.0	-36.5	699.1	678.8	20.26	34.510			
3,500.0	3,404.9	3,482.5	3,474.3	19.8	9.7	-170.97	112.8	-35.0	716.0	695.0	20.99	34.118			
3,530.3	3,434.1	3,512.2	3,503.6	20.0	9.8	-170.72	117.9	-34.5	721.1	699.9	21.21	34.001			
3,600.0	3,501.5	3,580.6	3,571.0	20.4	10.0	-170.20	129.7	-33.4	732.2	710.4	21.76	33.644			
3,700.0	3,598.9	3,679.2	3,668.1	20.9	10.4	-169.43	146.6	-31.9	745.2	722.7	22.51	33.101			
3,800.0	3,697.0	3,778.1	3,765.5	21.3	10.8	-168.63	163.6	-30.4	755.1	731.8	23.25	32.482			
3,900.0	3,795.8	3,877.2	3,863.2	21.7	11.2	-167.79	180.7	-28.8	761.7	737.7	23.96	31.794			
4,000.0	3,895.0	3,976.4	3,960.9	22.0	11.6	-166.89	197.7	-27.3	765.0	740.4	24.64	31.045			
4,100.0	3,994.6	4,075.5	4,058.5	22.2	11.9	-165.93	214.8	-25.7	765.2	739.9	25.31	30.237			
4,200.0	4,094.4	4,174.5	4,156.0	22.4	12.3	-164.88	231.8	-24.2	762.2	736.3	25.95	29.374			
4,305.6	4,200.0	4,278.7	4,258.7	22.6	12.8	-111.18	249.7	-22.6	755.7	729.1	26.60	28.408			
4,400.0	4,294.4	4,371.7	4,350.2	22.7	13.2	-110.08	265.7	-21.1	748.6	721.3	27.29	27.435			
4,500.0	4,394.4	4,470.2	4,447.3	22.8	13.6	-108.89	282.7	-19.6	741.3	713.2	28.03	26.444			
4,600.0	4,494.4	4,568.7	4,544.3	22.9	14.0	-107.67	299.6	-18.0	734.3	705.5	28.79	25.504			
4,700.0	4,594.4	4,667.2	4,641.3	23.1	14.4	-106.44	316.5	-16.5	727.7	698.1	29.57	24.613			
4,800.0	4,694.4	4,765.7	4,738.3	23.2	14.8	-105.18	333.5	-15.0	721.4	691.1	30.35	23.768			

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)													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)			
4,900.0	4,794.4	4,864.2	4,835.3	23.4	15.2	-103.90	350.4	-13.4	715.5	684.4	31.15	22.969		
5,000.0	4,894.4	4,962.7	4,932.4	23.5	15.7	-102.60	367.3	-11.9	710.0	678.0	31.96	22.214		
5,100.0	4,994.4	5,061.2	5,029.4	23.7	16.1	-101.28	384.3	-10.4	704.8	672.0	32.78	21.501		
5,200.0	5,094.4	5,159.7	5,126.4	23.8	16.5	-99.95	401.2	-8.8	700.1	666.5	33.61	20.829		
5,300.0	5,194.4	5,258.2	5,223.4	24.0	17.0	-98.59	418.2	-7.3	695.7	661.2	34.45	20.196		
5,400.0	5,294.4	5,356.7	5,320.4	24.1	17.4	-97.22	435.1	-5.7	691.7	656.4	35.29	19.601		
5,500.0	5,394.4	5,455.2	5,417.5	24.3	17.8	-95.84	452.0	-4.2	688.2	652.0	36.14	19.042		
5,600.0	5,494.4	5,553.3	5,514.1	24.4	18.3	-94.45	468.9	-2.7	685.0	648.0	36.98	18.522		
5,700.0	5,594.4	5,648.6	5,608.2	24.6	18.6	-93.24	483.4	-1.4	682.6	644.9	37.71	18.102		
5,800.0	5,694.4	5,744.7	5,703.6	24.8	18.9	-92.28	494.9	-0.3	680.9	642.6	38.35	17.756		
5,900.0	5,794.4	5,841.4	5,800.0	24.9	19.2	-91.58	503.3	0.4	679.8	640.9	38.92	17.469		
6,000.0	5,894.4	5,938.7	5,897.1	25.1	19.4	-91.15	508.4	0.9	679.2	639.8	39.41	17.234		
6,100.0	5,994.4	6,036.1	5,994.5	25.3	19.6	-90.99	510.2	1.1	679.0	639.2	39.84	17.045		
6,107.7	6,002.1	6,043.7	6,002.1	25.3	19.6	-90.99	510.2	1.1	679.0	639.2	39.87	17.032		
6,113.7	6,008.1	6,049.7	6,008.1	25.3	19.6	-90.99	510.2	1.1	679.0	639.1	39.89	17.022		
6,150.0	6,044.4	6,086.0	6,044.4	25.3	19.7	89.05	510.2	1.1	679.0	639.0	40.04	16.959		
6,200.0	6,094.2	6,135.8	6,094.2	25.4	19.8	89.39	510.2	1.1	679.0	638.7	40.24	16.873		
6,250.0	6,143.7	6,185.2	6,143.6	25.4	19.9	89.88	508.9	1.1	678.9	638.5	40.40	16.806		
6,261.3	6,154.8	6,196.4	6,154.8	25.4	19.9	90.00	508.1	1.1	678.9	638.5	40.42	16.795		
6,300.0	6,192.6	6,235.0	6,193.1	25.4	19.9	90.38	504.3	1.1	678.9	638.5	40.49	16.769		
6,350.0	6,240.7	6,285.1	6,242.6	25.3	19.9	90.88	496.5	1.1	679.0	638.5	40.51	16.762		
6,400.0	6,287.8	6,335.6	6,291.9	25.2	19.9	91.38	485.3	1.0	679.1	638.7	40.47	16.783		
6,450.0	6,333.7	6,386.6	6,340.7	25.2	19.8	91.87	470.7	1.0	679.3	638.9	40.36	16.830		
6,500.0	6,378.2	6,437.9	6,388.8	25.0	19.8	92.36	452.8	1.0	679.5	639.3	40.21	16.901		
6,550.0	6,421.1	6,489.7	6,436.0	24.9	19.7	92.84	431.5	1.0	679.8	639.8	40.00	16.993		
6,600.0	6,462.2	6,541.9	6,482.0	24.8	19.5	93.30	406.8	1.0	680.1	640.3	39.77	17.102		
6,650.0	6,501.4	6,594.5	6,526.5	24.6	19.4	93.76	378.9	1.0	680.4	640.9	39.51	17.223		
6,700.0	6,538.5	6,647.5	6,569.4	24.5	19.3	94.19	347.6	1.0	680.8	641.6	39.24	17.351		
6,750.0	6,573.3	6,700.9	6,610.2	24.3	19.1	94.62	313.3	0.9	681.2	642.2	38.98	17.476		
6,800.0	6,605.7	6,754.7	6,648.9	24.2	19.0	95.02	275.8	0.9	681.6	642.8	38.74	17.592		
6,850.0	6,635.6	6,808.9	6,685.0	24.0	19.0	95.40	235.4	0.9	682.0	643.4	38.56	17.687		
6,900.0	6,662.7	6,863.5	6,718.4	23.9	18.9	95.75	192.3	0.9	682.4	644.0	38.44	17.752		
6,950.0	6,687.1	6,918.4	6,748.8	23.8	18.9	96.08	146.6	0.8	682.8	644.4	38.41	17.778		
7,000.0	6,708.5	6,973.7	6,776.1	23.6	18.9	96.38	98.5	0.8	683.2	644.7	38.48	17.754		
7,050.0	6,727.0	7,029.2	6,799.8	23.6	19.1	96.65	48.3	0.8	683.6	644.9	38.68	17.675		
7,100.0	6,742.3	7,085.1	6,820.0	23.5	19.2	96.89	-3.7	0.7	683.9	644.9	39.00	17.536		
7,150.0	6,754.6	7,141.1	6,836.4	23.5	19.5	97.10	-57.3	0.7	684.2	644.8	39.47	17.336		
7,200.0	6,763.6	7,197.4	6,848.8	23.5	19.8	97.28	-112.2	0.7	684.5	644.4	40.08	17.078		
7,250.0	6,769.4	7,253.9	6,857.2	23.6	20.3	97.41	-168.0	0.6	684.7	643.9	40.84	16.765		
7,300.0	6,771.9	7,310.4	6,861.4	23.8	20.7	97.52	-224.4	0.6	684.9	643.1	41.74	16.407		
7,318.7	6,772.0	7,331.6	6,862.0	23.9	20.9	97.55	-245.6	0.6	684.9	642.8	42.11	16.264		
7,318.7	6,772.0	7,331.6	6,862.0	23.9	20.9	97.55	-245.6	0.6	684.9	642.8	42.11	16.264		
7,400.0	6,771.5	7,413.8	6,862.0	24.4	21.7	97.59	-327.8	0.5	685.0	641.4	43.66	15.690		
7,500.0	6,770.8	7,513.8	6,862.0	25.4	22.9	97.65	-427.8	0.4	685.1	639.1	46.03	14.885		
7,600.0	6,770.1	7,613.8	6,862.0	26.6	24.3	97.70	-527.8	0.4	685.2	636.5	48.73	14.061		
7,700.0	6,769.5	7,713.8	6,862.0	28.0	25.8	97.76	-627.8	0.3	685.3	633.6	51.72	13.252		
7,800.0	6,768.8	7,813.8	6,862.0	29.5	27.5	97.81	-727.8	0.2	685.4	630.5	54.93	12.478		
7,900.0	6,768.1	7,913.8	6,862.0	31.1	29.2	97.87	-827.8	0.1	685.6	627.2	58.34	11.750		
8,000.0	6,767.5	8,013.8	6,862.0	32.8	31.0	97.92	-927.8	0.1	685.7	623.7	61.92	11.074		
8,100.0	6,766.8	8,113.8	6,862.0	34.6	32.9	97.98	-1,027.7	0.0	685.8	620.1	65.63	10.449		

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)													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			
8,200.0	6,766.2	8,213.8	6,862.0	36.5	34.8	98.03	-1,127.7	-0.1	685.9	616.4	69.45	9.875			
8,300.0	6,765.5	8,313.8	6,862.0	38.4	36.8	98.09	-1,227.7	-0.2	686.0	612.6	73.37	9.349			
8,400.0	6,764.8	8,413.8	6,862.0	40.3	38.9	98.14	-1,327.7	-0.2	686.1	608.7	77.37	8.867			
8,500.0	6,764.2	8,513.8	6,862.0	42.3	40.9	98.20	-1,427.7	-0.3	686.2	604.8	81.44	8.426			
8,600.0	6,763.5	8,613.8	6,862.0	44.3	43.0	98.25	-1,527.7	-0.4	686.3	600.8	85.57	8.020			
8,700.0	6,762.8	8,713.8	6,862.0	46.4	45.1	98.31	-1,627.7	-0.5	686.4	596.7	89.75	7.648			
8,800.0	6,762.2	8,813.8	6,862.0	48.5	47.3	98.36	-1,727.7	-0.5	686.5	592.6	93.97	7.306			
8,900.0	6,761.5	8,913.8	6,862.0	50.5	49.4	98.41	-1,827.7	-0.6	686.7	588.4	98.23	6.990			
9,000.0	6,760.8	9,013.8	6,862.0	52.7	51.6	98.47	-1,927.7	-0.7	686.8	584.2	102.53	6.698			
9,100.0	6,760.2	9,113.8	6,862.0	54.8	53.8	98.52	-2,027.7	-0.8	686.9	580.0	106.85	6.428			
9,200.0	6,759.5	9,213.8	6,862.0	57.0	56.0	98.58	-2,127.7	-0.8	687.0	575.8	111.20	6.178			
9,300.0	6,758.9	9,313.8	6,862.0	59.1	58.2	98.63	-2,227.7	-0.9	687.1	571.6	115.57	5.946			
9,400.0	6,758.2	9,413.8	6,862.0	61.3	60.5	98.69	-2,327.7	-1.0	687.2	567.3	119.96	5.729			
9,500.0	6,757.5	9,513.8	6,862.0	63.5	62.7	98.74	-2,427.7	-1.0	687.4	563.0	124.37	5.527			
9,600.0	6,756.9	9,613.7	6,862.0	65.7	64.9	98.80	-2,527.7	-1.1	687.5	558.7	128.79	5.338			
9,700.0	6,756.2	9,713.7	6,862.0	67.9	67.2	98.85	-2,627.7	-1.2	687.6	554.4	133.22	5.161			
9,800.0	6,755.5	9,813.7	6,862.0	70.1	69.5	98.90	-2,727.7	-1.3	687.7	550.0	137.67	4.995			
9,900.0	6,754.9	9,913.7	6,862.0	72.4	71.7	98.96	-2,827.7	-1.3	687.8	545.7	142.13	4.839			
10,000.0	6,754.2	10,013.7	6,862.0	74.6	74.0	99.01	-2,927.7	-1.4	688.0	541.3	146.60	4.693			
10,100.0	6,753.6	10,113.7	6,862.0	76.9	76.3	99.07	-3,027.7	-1.5	688.1	537.0	151.08	4.554			
10,200.0	6,752.9	10,213.7	6,862.0	79.1	78.5	99.12	-3,127.7	-1.6	688.2	532.6	155.57	4.424			
10,300.0	6,752.2	10,313.7	6,862.0	81.4	80.8	99.18	-3,227.7	-1.6	688.3	528.3	160.06	4.300			
10,400.0	6,751.6	10,413.7	6,862.0	83.6	83.1	99.23	-3,327.7	-1.7	688.4	523.9	164.56	4.183			
10,500.0	6,750.9	10,513.7	6,862.0	85.9	85.4	99.28	-3,427.7	-1.8	688.6	519.5	169.07	4.073			
10,600.0	6,750.2	10,613.7	6,862.0	88.2	87.7	99.34	-3,527.7	-1.9	688.7	515.1	173.58	3.967			
10,700.0	6,749.6	10,713.7	6,862.0	90.4	90.0	99.39	-3,627.7	-1.9	688.8	510.7	178.10	3.868			
10,800.0	6,748.9	10,813.7	6,862.0	92.7	92.3	99.45	-3,727.7	-2.0	688.9	506.3	182.62	3.773			
10,900.0	6,748.2	10,913.7	6,862.0	95.0	94.6	99.50	-3,827.7	-2.1	689.1	501.9	187.14	3.682			
11,000.0	6,747.6	11,013.7	6,862.0	97.3	96.9	99.56	-3,927.7	-2.2	689.2	497.5	191.67	3.596			
11,100.0	6,746.9	11,113.7	6,862.0	99.6	99.2	99.61	-4,027.7	-2.2	689.3	493.1	196.20	3.513			
11,200.0	6,746.3	11,213.7	6,862.0	101.9	101.5	99.66	-4,127.7	-2.3	689.4	488.7	200.74	3.435			
11,300.0	6,745.6	11,313.7	6,862.0	104.1	103.8	99.72	-4,227.7	-2.4	689.6	484.3	205.28	3.359			
11,400.0	6,744.9	11,413.7	6,862.0	106.4	106.1	99.77	-4,327.7	-2.4	689.7	479.9	209.81	3.287			
11,500.0	6,744.3	11,513.7	6,862.0	108.7	108.4	99.83	-4,427.7	-2.5	689.8	475.5	214.36	3.218			
11,600.0	6,743.6	11,613.7	6,862.0	111.0	110.8	99.88	-4,527.7	-2.6	690.0	471.1	218.90	3.152			
11,700.0	6,742.9	11,713.7	6,862.0	113.3	113.1	99.93	-4,627.7	-2.7	690.1	466.6	223.44	3.088			
11,800.0	6,742.3	11,813.7	6,862.0	115.6	115.4	99.99	-4,727.7	-2.7	690.2	462.2	227.99	3.027			
11,900.0	6,741.6	11,913.7	6,862.0	117.9	117.7	100.04	-4,827.7	-2.8	690.4	457.8	232.54	2.969			
12,000.0	6,741.0	12,013.7	6,862.0	120.3	120.0	100.10	-4,927.7	-2.9	690.5	453.4	237.09	2.912			
12,100.0	6,740.3	12,113.7	6,862.0	122.6	122.4	100.15	-5,027.7	-3.0	690.6	449.0	241.64	2.858			
12,200.0	6,739.6	12,213.7	6,862.0	124.9	124.7	100.20	-5,127.7	-3.0	690.8	444.6	246.19	2.806			
12,300.0	6,739.0	12,313.7	6,862.0	127.2	127.0	100.26	-5,227.7	-3.1	690.9	440.2	250.74	2.755			
12,400.0	6,738.3	12,413.7	6,862.0	129.5	129.3	100.31	-5,327.7	-3.2	691.0	435.7	255.29	2.707			
12,500.0	6,737.6	12,513.7	6,862.0	131.8	131.6	100.37	-5,427.7	-3.3	691.2	431.3	259.84	2.660			
12,600.0	6,737.0	12,613.7	6,862.0	134.1	134.0	100.42	-5,527.6	-3.3	691.3	426.9	264.39	2.615			
12,700.0	6,736.3	12,713.7	6,862.0	136.4	136.3	100.47	-5,627.6	-3.4	691.4	422.5	268.94	2.571			
12,800.0	6,735.6	12,813.7	6,862.0	138.8	138.6	100.53	-5,727.6	-3.5	691.6	418.1	273.50	2.529			
12,900.0	6,735.0	12,913.7	6,862.0	141.1	141.0	100.58	-5,827.6	-3.6	691.7	413.7	278.05	2.488			
13,000.0	6,734.3	13,013.7	6,862.0	143.4	143.3	100.63	-5,927.6	-3.6	691.8	409.2	282.60	2.448			
13,100.0	6,733.7	13,113.7	6,862.0	145.7	145.6	100.69	-6,027.6	-3.7	692.0	404.8	287.15	2.410			
13,200.0	6,733.0	13,213.7	6,862.0	148.0	148.0	100.74	-6,127.6	-3.8	692.1	400.4	291.70	2.373			

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)													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)			
13,300.0	6,732.3	13,313.7	6,862.0	150.4	150.3	100.80	-6,227.6	-3.8	692.3	396.0	296.25	2.337		
13,400.0	6,731.7	13,413.7	6,862.0	152.7	152.6	100.85	-6,327.6	-3.9	692.4	391.6	300.81	2.302		
13,500.0	6,731.0	13,513.7	6,862.0	155.0	154.9	100.90	-6,427.6	-4.0	692.6	387.2	305.36	2.268		
13,600.0	6,730.3	13,613.7	6,862.0	157.3	157.3	100.96	-6,527.6	-4.1	692.7	382.8	309.91	2.235		
13,700.0	6,729.7	13,713.7	6,862.0	159.7	159.6	101.01	-6,627.6	-4.1	692.8	378.4	314.46	2.203		
13,800.0	6,729.0	13,813.7	6,862.0	162.0	162.0	101.06	-6,727.6	-4.2	693.0	374.0	319.00	2.172		
13,900.0	6,728.4	13,913.7	6,862.0	164.3	164.3	101.12	-6,827.6	-4.3	693.1	369.6	323.55	2.142		
14,000.0	6,727.7	14,013.7	6,862.0	166.7	166.6	101.17	-6,927.6	-4.4	693.3	365.2	328.10	2.113		
14,100.0	6,727.0	14,113.6	6,862.0	169.0	169.0	101.22	-7,027.6	-4.4	693.4	360.8	332.65	2.085		
14,124.2	6,726.9	14,137.8	6,862.0	169.4	169.5	101.24	-7,051.8	-4.5	693.4	359.8	333.64	2.078 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)													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	-88.60	0.4	-15.0	15.1	15.0	0.00	9,294.501	CC	
100.0	100.0	101.0	101.0	0.1	0.1	-88.60	0.4	-15.0	15.1	14.8	0.28	54.119		
200.0	200.0	201.0	201.0	0.4	0.4	-88.60	0.4	-15.0	15.1	14.2	0.83	18.160		
300.0	300.0	301.0	301.0	0.7	0.7	-144.01	0.4	-15.0	16.1	14.7	1.38	11.647		
400.0	399.9	400.9	400.9	1.0	1.0	-150.81	0.4	-15.0	19.4	17.5	1.94	9.989		
500.0	499.7	501.2	501.2	1.3	1.2	-156.37	1.4	-14.1	24.2	21.7	2.50	9.663		
600.0	599.3	601.7	601.6	1.6	1.5	-159.24	4.3	-11.5	29.3	26.3	3.06	9.570		
700.0	698.6	702.3	702.0	1.9	1.8	-160.54	9.2	-7.0	34.7	31.0	3.63	9.543		
800.0	797.5	803.0	802.2	2.3	2.1	-160.88	16.0	-0.7	40.2	36.0	4.22	9.537		
900.0	896.1	903.8	902.4	2.7	2.4	-160.60	24.8	7.4	45.9	41.1	4.82	9.529		
1,000.0	994.2	1,004.8	1,002.2	3.2	2.8	-159.90	35.6	17.2	51.8	46.3	5.45	9.505		
1,100.0	1,091.7	1,105.8	1,101.8	3.7	3.2	-158.92	48.3	28.9	57.8	51.7	6.12	9.459		
1,200.0	1,188.6	1,207.0	1,201.0	4.3	3.7	-157.74	63.0	42.3	64.1	57.3	6.83	9.386		
1,233.7	1,221.2	1,241.0	1,234.3	4.5	3.9	-157.31	68.4	47.2	66.2	59.2	7.08	9.356		
1,300.0	1,285.0	1,307.2	1,298.8	5.0	4.2	-156.59	78.9	56.9	70.6	63.0	7.59	9.302		
1,400.0	1,381.4	1,406.9	1,396.2	5.6	4.7	-155.67	94.9	71.5	77.2	68.8	8.39	9.209		
1,500.0	1,477.7	1,506.7	1,493.6	6.3	5.2	-154.89	110.8	86.0	83.9	74.7	9.20	9.113		
1,600.0	1,574.1	1,606.5	1,591.0	6.9	5.8	-154.22	126.7	100.6	90.5	80.5	10.04	9.016		
1,700.0	1,670.5	1,706.3	1,688.4	7.6	6.3	-153.65	142.7	115.2	97.1	86.3	10.89	8.924		
1,800.0	1,766.8	1,806.0	1,785.9	8.3	6.8	-153.15	158.6	129.8	103.8	92.1	11.75	8.836		
1,900.0	1,863.2	1,905.8	1,883.3	8.9	7.4	-152.71	174.5	144.4	110.5	97.9	12.62	8.755		
2,000.0	1,959.5	2,005.6	1,980.7	9.6	7.9	-152.32	190.5	158.9	117.1	103.6	13.50	8.679		
2,100.0	2,055.9	2,105.4	2,078.1	10.3	8.5	-151.97	206.4	173.5	123.8	109.4	14.38	8.609		
2,200.0	2,152.3	2,205.1	2,175.5	10.9	9.0	-151.66	222.3	188.1	130.5	115.2	15.27	8.544		
2,300.0	2,248.6	2,304.9	2,272.9	11.6	9.6	-151.38	238.3	202.7	137.2	121.0	16.17	8.484		
2,400.0	2,345.0	2,404.7	2,370.3	12.3	10.2	-151.12	254.2	217.3	143.9	126.8	17.07	8.428		
2,500.0	2,441.3	2,504.4	2,467.7	13.0	10.7	-150.89	270.1	231.8	150.6	132.6	17.97	8.377		
2,600.0	2,537.7	2,604.2	2,565.1	13.7	11.3	-150.67	286.0	246.4	157.3	138.4	18.88	8.329		
2,700.0	2,634.1	2,704.0	2,662.5	14.3	11.8	-150.48	302.0	261.0	163.9	144.2	19.79	8.284		
2,800.0	2,730.4	2,803.8	2,759.9	15.0	12.4	-150.30	317.9	275.6	170.6	149.9	20.70	8.243		
2,900.0	2,826.8	2,903.5	2,857.4	15.7	13.0	-150.13	333.8	290.2	177.3	155.7	21.62	8.204		
3,000.0	2,923.1	3,003.3	2,954.8	16.4	13.5	-149.98	349.8	304.8	184.0	161.5	22.53	8.168		
3,100.0	3,019.5	3,103.1	3,052.2	17.1	14.1	-149.83	365.7	319.3	190.7	167.3	23.45	8.134		
3,200.0	3,115.9	3,202.9	3,149.6	17.7	14.6	-149.70	381.6	333.9	197.4	173.1	24.37	8.102		
3,300.0	3,212.2	3,302.6	3,247.0	18.4	15.2	-149.57	397.6	348.5	204.1	178.9	25.29	8.073		
3,400.0	3,308.6	3,402.4	3,344.4	19.1	15.8	-149.45	413.5	363.1	210.8	184.6	26.21	8.045		
3,500.0	3,404.9	3,502.2	3,441.8	19.8	16.3	-149.34	429.4	377.7	217.5	190.4	27.13	8.018		
3,530.3	3,434.1	3,532.4	3,471.3	20.0	16.5	-149.31	434.3	382.1	219.6	192.2	27.41	8.010		
3,600.0	3,501.5	3,602.0	3,539.3	20.4	16.9	-149.17	445.4	392.2	223.5	195.5	28.07	7.964		
3,700.0	3,598.9	3,701.9	3,636.8	20.9	17.5	-148.56	461.3	406.8	226.7	197.6	29.04	7.806		
3,800.0	3,697.0	3,800.0	3,732.7	21.3	18.0	-147.59	476.6	420.8	227.3	197.2	30.03	7.567		
3,900.0	3,795.8	3,893.2	3,824.3	21.7	18.4	-146.69	489.1	432.3	227.2	196.3	30.87	7.358		
4,000.0	3,895.0	3,987.7	3,917.7	22.0	18.7	-145.85	499.6	441.9	226.6	195.0	31.63	7.165		
4,100.0	3,994.6	4,082.3	4,011.7	22.2	19.0	-145.08	507.7	449.3	225.6	193.3	32.29	6.987		
4,200.0	4,094.4	4,177.0	4,106.0	22.4	19.2	-144.37	513.6	454.7	224.1	191.2	32.86	6.820		
4,305.6	4,200.0	4,277.1	4,206.0	22.6	19.4	-91.21	517.3	458.1	222.0	188.6	33.35	6.657		
4,400.0	4,294.4	4,366.8	4,295.6	22.7	19.6	-90.92	518.5	459.2	220.9	187.1	33.74	6.547		
4,434.9	4,329.3	4,401.5	4,330.3	22.7	19.6	-90.92	518.5	459.2	220.9	187.0	33.85	6.525		
4,500.0	4,394.4	4,466.5	4,395.4	22.8	19.7	-90.92	518.5	459.2	220.9	186.8	34.08	6.482		
4,600.0	4,494.4	4,566.5	4,495.4	22.9	19.9	-90.92	518.5	459.2	220.9	186.4	34.43	6.416		
4,700.0	4,594.4	4,666.5	4,595.4	23.1	20.0	-90.92	518.5	459.2	220.9	186.1	34.78	6.350		

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)													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		
4,800.0	4,694.4	4,766.5	4,695.4	23.2	20.2	-90.92	518.5	459.2	220.9	185.7	35.14	6.285		
4,900.0	4,794.4	4,866.5	4,795.4	23.4	20.4	-90.92	518.5	459.2	220.9	185.4	35.51	6.220		
5,000.0	4,894.4	4,966.5	4,895.4	23.5	20.5	-90.92	518.5	459.2	220.9	185.0	35.88	6.156		
5,100.0	4,994.4	5,066.5	4,995.4	23.7	20.7	-90.92	518.5	459.2	220.9	184.6	36.26	6.092		
5,200.0	5,094.4	5,166.5	5,095.4	23.8	20.9	-90.92	518.5	459.2	220.9	184.2	36.64	6.029		
5,300.0	5,194.4	5,266.5	5,195.4	24.0	21.0	-90.92	518.5	459.2	220.9	183.9	37.02	5.967		
5,400.0	5,294.4	5,366.5	5,295.4	24.1	21.2	-90.92	518.5	459.2	220.9	183.5	37.41	5.905		
5,500.0	5,394.4	5,466.5	5,395.4	24.3	21.4	-90.92	518.5	459.2	220.9	183.1	37.80	5.843		
5,600.0	5,494.4	5,566.5	5,495.4	24.4	21.6	-90.92	518.5	459.2	220.9	182.7	38.19	5.783		
5,700.0	5,594.4	5,666.5	5,595.4	24.6	21.8	-90.92	518.5	459.2	220.9	182.3	38.59	5.723		
5,800.0	5,694.4	5,766.5	5,695.4	24.8	21.9	-90.92	518.5	459.2	220.9	181.9	39.00	5.664		
5,900.0	5,794.4	5,866.5	5,795.4	24.9	22.1	-90.92	518.5	459.2	220.9	181.5	39.40	5.605		
6,000.0	5,894.4	5,966.5	5,895.4	25.1	22.3	-90.92	518.5	459.2	220.9	181.1	39.81	5.548		
6,040.6	5,935.0	6,007.2	5,936.0	25.2	22.4	-90.92	518.5	459.2	220.9	180.9	39.98	5.524		
6,100.0	5,994.4	6,066.2	5,995.0	25.3	22.5	-91.37	516.7	459.2	220.9	180.8	40.09	5.511		
6,113.7	6,008.1	6,079.7	6,008.5	25.3	22.5	-91.64	515.7	459.2	220.9	180.9	40.06	5.515		
6,150.0	6,044.4	6,115.5	6,044.1	25.3	22.5	87.52	511.8	459.2	221.1	181.1	39.96	5.532		
6,200.0	6,094.2	6,164.6	6,092.5	25.4	22.5	86.43	503.7	459.1	221.3	181.5	39.75	5.567		
6,250.0	6,143.7	6,213.4	6,140.0	25.4	22.5	85.37	492.6	459.1	221.6	182.1	39.48	5.613		
6,300.0	6,192.6	6,262.0	6,186.5	25.4	22.4	84.32	478.6	459.1	221.9	182.8	39.16	5.667		
6,350.0	6,240.7	6,310.3	6,231.8	25.3	22.3	83.31	461.8	459.1	222.4	183.6	38.81	5.730		
6,400.0	6,287.8	6,358.4	6,275.7	25.2	22.3	82.33	442.2	459.1	222.9	184.4	38.43	5.799		
6,450.0	6,333.7	6,406.3	6,318.2	25.2	22.1	81.38	420.1	459.1	223.4	185.4	38.04	5.873		
6,500.0	6,378.2	6,453.9	6,358.9	25.0	22.0	80.48	395.4	459.1	224.0	186.3	37.64	5.950		
6,550.0	6,421.1	6,501.4	6,397.9	24.9	21.9	79.62	368.3	459.0	224.6	187.3	37.24	6.030		
6,600.0	6,462.2	6,550.0	6,436.0	24.8	21.7	78.79	338.1	459.0	225.2	188.3	36.85	6.111		
6,650.0	6,501.4	6,595.8	6,470.1	24.6	21.6	78.05	307.6	459.0	225.8	189.3	36.49	6.187		
6,700.0	6,538.5	6,642.7	6,503.1	24.5	21.4	77.34	274.2	459.0	226.4	190.2	36.17	6.259		
6,750.0	6,573.3	6,689.5	6,533.8	24.3	21.3	76.68	238.9	459.0	227.0	191.1	35.89	6.325		
6,800.0	6,605.7	6,736.2	6,562.3	24.2	21.2	76.08	201.9	458.9	227.6	191.9	35.67	6.380		
6,850.0	6,635.6	6,782.7	6,588.4	24.0	21.0	75.53	163.4	458.9	228.1	192.6	35.51	6.424		
6,900.0	6,662.7	6,829.2	6,612.0	23.9	20.9	75.05	123.5	458.9	228.6	193.2	35.43	6.454		
6,950.0	6,687.1	6,875.5	6,633.2	23.8	20.8	74.62	82.2	458.8	229.1	193.7	35.43	6.467		
7,000.0	6,708.5	6,921.8	6,651.7	23.6	20.6	74.26	39.9	458.8	229.5	194.0	35.52	6.461		
7,050.0	6,727.0	6,967.9	6,667.7	23.6	20.5	73.95	-3.5	458.8	229.9	194.2	35.71	6.437		
7,100.0	6,742.3	7,014.0	6,681.0	23.5	20.5	73.71	-47.6	458.8	230.2	194.2	36.00	6.393		
7,150.0	6,754.6	7,060.1	6,691.5	23.5	20.5	73.53	-92.4	458.7	230.4	194.0	36.38	6.332		
7,200.0	6,763.6	7,106.2	6,699.4	23.5	20.6	73.41	-137.8	458.7	230.5	193.7	36.88	6.251		
7,250.0	6,769.4	7,152.2	6,704.5	23.6	20.8	73.35	-183.5	458.7	230.6	193.1	37.48	6.153		
7,300.0	6,771.9	7,200.0	6,706.9	23.8	21.2	73.36	-231.3	458.6	230.6	192.4	38.19	6.038		
7,308.6	6,772.0	7,206.1	6,707.0	23.8	21.3	73.36	-237.4	458.6	230.6	192.3	38.31	6.019		
7,318.7	6,772.0	7,215.4	6,707.0	23.9	21.4	73.37	-246.7	458.6	230.6	192.1	38.46	5.995		
7,318.7	6,772.0	7,215.4	6,707.0	23.9	21.4	73.37	-246.7	458.6	230.6	192.1	38.46	5.995		
7,336.9	6,771.9	7,233.3	6,706.9	24.0	21.5	73.37	-264.5	458.6	230.6	191.8	38.78	5.946		
7,400.0	6,771.5	7,296.4	6,706.5	24.4	22.2	73.38	-327.7	458.6	230.6	190.7	39.87	5.785		
7,500.0	6,770.8	7,396.4	6,705.8	25.4	23.4	73.38	-427.7	458.5	230.6	188.5	42.13	5.474		
7,600.0	6,770.1	7,496.4	6,705.2	26.6	24.8	73.38	-527.7	458.4	230.6	185.9	44.74	5.155		
7,700.0	6,769.5	7,596.4	6,704.5	28.0	26.3	73.38	-627.7	458.3	230.7	183.0	47.64	4.842		
7,800.0	6,768.8	7,696.4	6,703.8	29.5	27.9	73.38	-727.7	458.3	230.7	179.9	50.78	4.542		
7,900.0	6,768.1	7,796.4	6,703.2	31.1	29.6	73.39	-827.6	458.2	230.7	176.6	54.12	4.262		

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 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)										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)			
8,000.0	6,767.5	7,896.4	6,702.5	32.8	31.4	73.39	-927.6	458.1	230.7	173.1	57.63	4.004		
8,100.0	6,766.8	7,996.4	6,701.9	34.6	33.3	73.39	-1,027.6	458.0	230.7	169.5	61.26	3.766		
8,200.0	6,766.2	8,096.4	6,701.2	36.5	35.2	73.39	-1,127.6	457.9	230.7	165.7	65.02	3.549		
8,300.0	6,765.5	8,196.4	6,700.5	38.4	37.2	73.39	-1,227.6	457.9	230.8	161.9	68.86	3.351		
8,400.0	6,764.8	8,296.4	6,699.9	40.3	39.2	73.39	-1,327.6	457.8	230.8	158.0	72.79	3.171		
8,500.0	6,764.2	8,396.4	6,699.2	42.3	41.2	73.40	-1,427.6	457.7	230.8	154.0	76.78	3.006		
8,600.0	6,763.5	8,496.4	6,698.6	44.3	43.3	73.40	-1,527.6	457.6	230.8	150.0	80.83	2.856		
8,700.0	6,762.8	8,596.4	6,697.9	46.4	45.4	73.40	-1,627.6	457.6	230.8	145.9	84.93	2.718		
8,800.0	6,762.2	8,696.4	6,697.2	48.5	47.5	73.40	-1,727.6	457.5	230.9	141.8	89.07	2.592		
8,900.0	6,761.5	8,796.4	6,696.6	50.5	49.6	73.40	-1,827.6	457.4	230.9	137.6	93.25	2.476		
9,000.0	6,760.8	8,896.4	6,695.9	52.7	51.8	73.40	-1,927.6	457.3	230.9	133.4	97.46	2.369		
9,100.0	6,760.2	8,996.4	6,695.2	54.8	54.0	73.41	-2,027.6	457.3	230.9	129.2	101.69	2.271		
9,200.0	6,759.5	9,096.4	6,694.6	57.0	56.2	73.41	-2,127.6	457.2	230.9	125.0	105.96	2.179		
9,300.0	6,758.9	9,196.4	6,693.9	59.1	58.3	73.41	-2,227.6	457.1	230.9	120.7	110.24	2.095		
9,400.0	6,758.2	9,296.4	6,693.3	61.3	60.6	73.41	-2,327.6	457.0	231.0	116.4	114.55	2.016		
9,500.0	6,757.5	9,396.4	6,692.6	63.5	62.8	73.41	-2,427.6	457.0	231.0	112.1	118.87	1.943		
9,600.0	6,756.9	9,496.4	6,691.9	65.7	65.0	73.42	-2,527.6	456.9	231.0	107.8	123.20	1.875		
9,700.0	6,756.2	9,596.4	6,691.3	67.9	67.2	73.42	-2,627.6	456.8	231.0	103.5	127.55	1.811		
9,800.0	6,755.5	9,696.4	6,690.6	70.1	69.5	73.42	-2,727.6	456.7	231.0	99.1	131.92	1.751		
9,900.0	6,754.9	9,796.4	6,690.0	72.4	71.7	73.42	-2,827.6	456.7	231.0	94.8	136.29	1.695		
10,000.0	6,754.2	9,896.4	6,689.3	74.6	74.0	73.42	-2,927.6	456.6	231.1	90.4	140.68	1.643		
10,100.0	6,753.6	9,996.4	6,688.6	76.9	76.3	73.42	-3,027.6	456.5	231.1	86.0	145.07	1.593		
10,200.0	6,752.9	10,096.4	6,688.0	79.1	78.5	73.43	-3,127.6	456.4	231.1	81.6	149.47	1.546		
10,300.0	6,752.2	10,196.4	6,687.3	81.4	80.8	73.43	-3,227.6	456.4	231.1	77.2	153.88	1.502		
10,400.0	6,751.6	10,296.4	6,686.6	83.6	83.1	73.43	-3,327.6	456.3	231.1	72.8	158.30	1.460	Level 3	
10,500.0	6,750.9	10,396.4	6,686.0	85.9	85.4	73.43	-3,427.6	456.2	231.2	68.4	162.73	1.421	Level 3	
10,600.0	6,750.2	10,496.4	6,685.3	88.2	87.6	73.43	-3,527.6	456.1	231.2	64.0	167.16	1.383	Level 3	
10,700.0	6,749.6	10,596.4	6,684.7	90.4	89.9	73.44	-3,627.6	456.0	231.2	59.6	171.59	1.347	Level 3	
10,800.0	6,748.9	10,696.4	6,684.0	92.7	92.2	73.44	-3,727.6	456.0	231.2	55.2	176.03	1.313	Level 3	
10,900.0	6,748.2	10,796.4	6,683.3	95.0	94.5	73.44	-3,827.6	455.9	231.2	50.7	180.48	1.281	Level 3	
11,000.0	6,747.6	10,896.4	6,682.7	97.3	96.8	73.44	-3,927.6	455.8	231.2	46.3	184.93	1.250	Level 3	
11,100.0	6,746.9	10,996.4	6,682.0	99.6	99.1	73.44	-4,027.6	455.7	231.3	41.9	189.38	1.221	Level 2	
11,200.0	6,746.3	11,096.4	6,681.4	101.9	101.4	73.44	-4,127.6	455.7	231.3	37.4	193.84	1.193	Level 2	
11,300.0	6,745.6	11,196.4	6,680.7	104.1	103.7	73.45	-4,227.6	455.6	231.3	33.0	198.30	1.166	Level 2	
11,400.0	6,744.9	11,296.4	6,680.0	106.4	106.0	73.45	-4,327.6	455.5	231.3	28.5	202.77	1.141	Level 2	
11,500.0	6,744.3	11,396.4	6,679.4	108.7	108.3	73.45	-4,427.6	455.4	231.3	24.1	207.24	1.116	Level 2	
11,600.0	6,743.6	11,496.4	6,678.7	111.0	110.6	73.45	-4,527.6	455.4	231.4	19.6	211.71	1.093	Level 2	
11,700.0	6,742.9	11,596.4	6,678.1	113.3	112.9	73.45	-4,627.6	455.3	231.4	15.2	216.18	1.070	Level 2	
11,800.0	6,742.3	11,696.4	6,677.4	115.6	115.3	73.46	-4,727.6	455.2	231.4	10.7	220.66	1.049	Level 2	
11,900.0	6,741.6	11,796.4	6,676.7	117.9	117.6	73.46	-4,827.6	455.1	231.4	6.3	225.14	1.028	Level 2	
12,000.0	6,741.0	11,896.4	6,676.1	120.3	119.9	73.46	-4,927.6	455.1	231.4	1.8	229.62	1.008	Level 2	
12,100.0	6,740.3	11,996.4	6,675.4	122.6	122.2	73.46	-5,027.6	455.0	231.4	-2.7	234.11	0.989	Level 1	
12,200.0	6,739.6	12,096.4	6,674.7	124.9	124.5	73.46	-5,127.6	454.9	231.5	-7.1	238.59	0.970	Level 1	
12,300.0	6,739.0	12,196.4	6,674.1	127.2	126.8	73.46	-5,227.6	454.8	231.5	-11.6	243.08	0.952	Level 1	
12,400.0	6,738.3	12,296.4	6,673.4	129.5	129.2	73.47	-5,327.5	454.8	231.5	-16.1	247.57	0.935	Level 1	
12,500.0	6,737.6	12,396.4	6,672.8	131.8	131.5	73.47	-5,427.5	454.7	231.5	-20.6	252.06	0.918	Level 1	
12,600.0	6,737.0	12,496.4	6,672.1	134.1	133.8	73.47	-5,527.5	454.6	231.5	-25.0	256.56	0.902	Level 1	
12,700.0	6,736.3	12,596.4	6,671.4	136.4	136.1	73.47	-5,627.5	454.5	231.5	-29.5	261.05	0.887	Level 1	
12,800.0	6,735.6	12,696.4	6,670.8	138.8	138.5	73.47	-5,727.5	454.5	231.6	-34.0	265.55	0.872	Level 1	
12,900.0	6,735.0	12,796.4	6,670.1	141.1	140.8	73.47	-5,827.5	454.4	231.6	-38.5	270.05	0.858	Level 1	
13,000.0	6,734.3	12,896.4	6,669.5	143.4	143.1	73.48	-5,927.5	454.3	231.6	-42.9	274.55	0.844	Level 1	

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

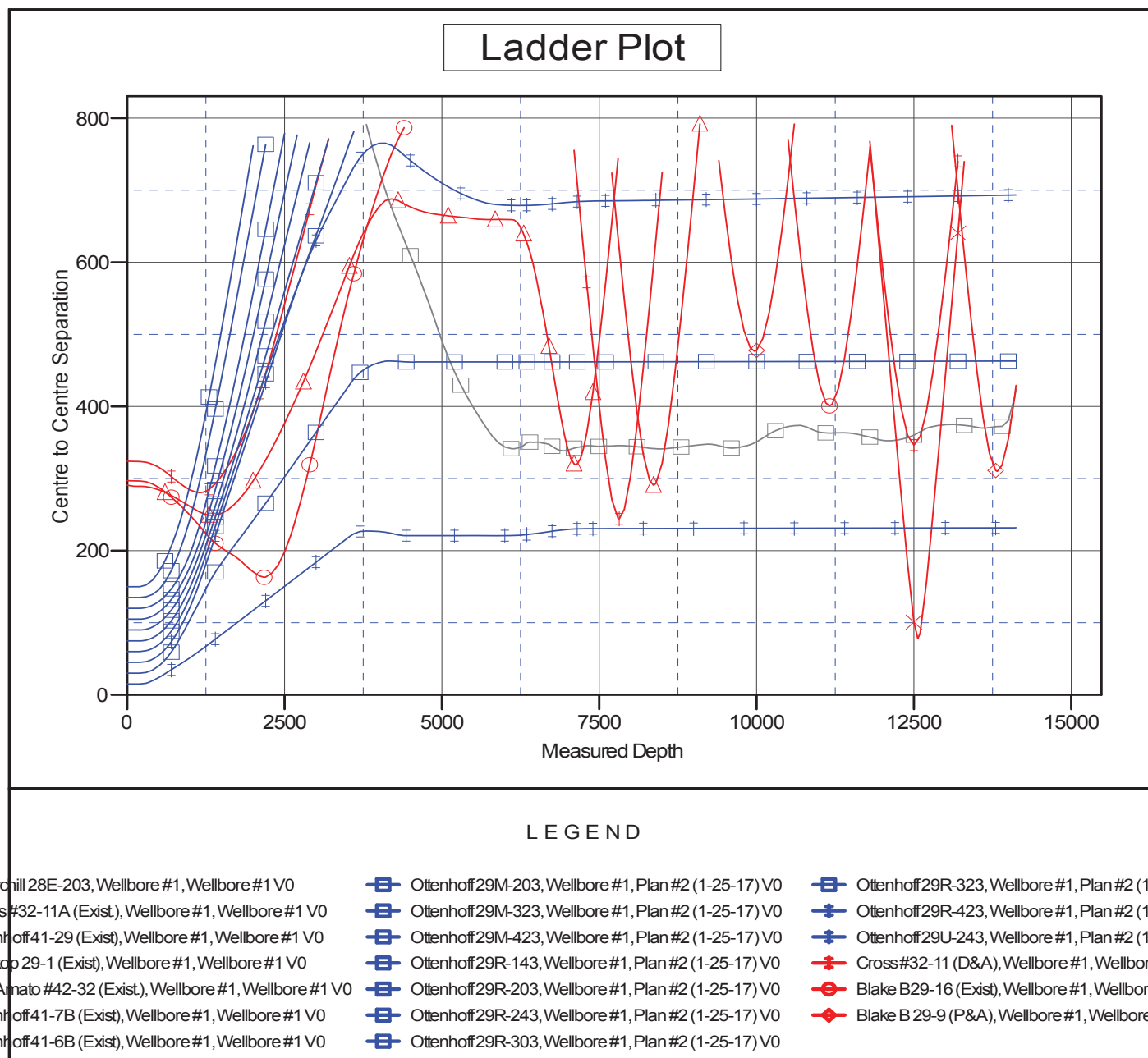
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)													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		
13,100.0	6,733.7	12,996.4	6,668.8	145.7	145.4	73.48	-6,027.5	454.2	231.6	-47.4	279.05	0.830	Level 1	
13,200.0	6,733.0	13,096.4	6,668.1	148.0	147.8	73.48	-6,127.5	454.2	231.6	-51.9	283.55	0.817	Level 1	
13,300.0	6,732.3	13,196.4	6,667.5	150.4	150.1	73.48	-6,227.5	454.1	231.7	-56.4	288.05	0.804	Level 1	
13,400.0	6,731.7	13,296.4	6,666.8	152.7	152.4	73.48	-6,327.5	454.0	231.7	-60.9	292.56	0.792	Level 1	
13,500.0	6,731.0	13,396.4	6,666.1	155.0	154.7	73.49	-6,427.5	453.9	231.7	-65.4	297.06	0.780	Level 1	
13,600.0	6,730.3	13,496.4	6,665.5	157.3	157.1	73.49	-6,527.5	453.8	231.7	-69.9	301.57	0.768	Level 1	
13,700.0	6,729.7	13,596.4	6,664.8	159.7	159.4	73.49	-6,627.5	453.8	231.7	-74.3	306.07	0.757	Level 1	
13,800.0	6,729.0	13,696.4	6,664.2	162.0	161.7	73.49	-6,727.5	453.7	231.7	-78.8	310.58	0.746	Level 1	
13,900.0	6,728.4	13,796.4	6,663.5	164.3	164.1	73.49	-6,827.5	453.6	231.8	-83.3	315.09	0.736	Level 1	
14,000.0	6,727.7	13,896.4	6,662.8	166.7	166.4	73.49	-6,927.5	453.5	231.8	-87.8	319.60	0.725	Level 1	
14,100.0	6,727.0	13,996.4	6,662.2	169.0	168.7	73.50	-7,027.5	453.5	231.8	-92.3	324.11	0.715	Level 1	
14,124.2	6,726.9	14,020.5	6,662.0	169.4	169.3	73.50	-7,051.7	453.4	231.8	-93.3	325.10	0.713	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
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 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	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

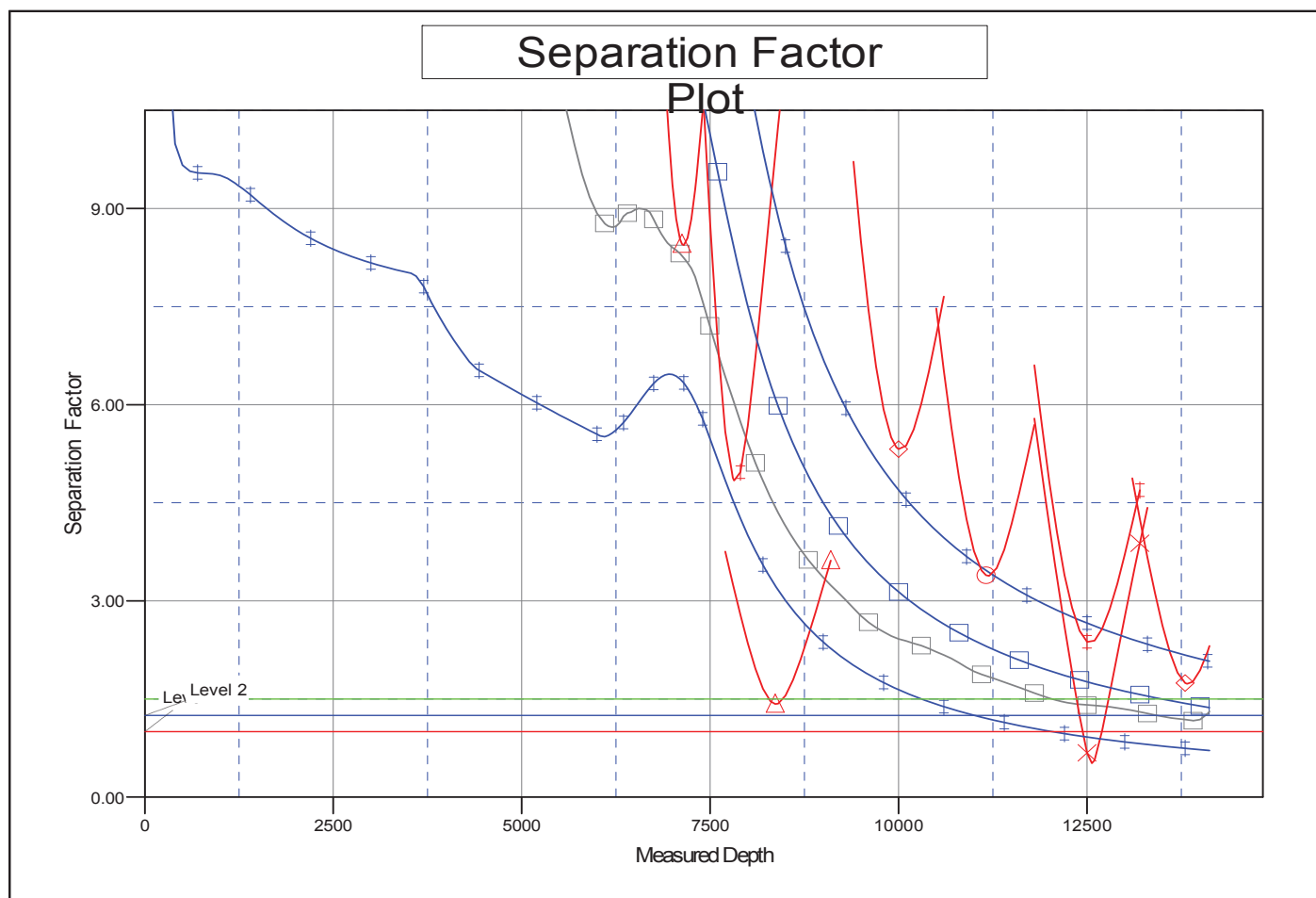
Coordinates are relative to: Ottenhoff 29U-343
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°



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Offset Depths are relative to Offset Datum
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Coordinates are relative to: Ottenhoff 29U-343
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°



LEGEND

Ironhill 28E-203, Wellbore #1, Wellbore #1 V0	Ottenhoff 29M-203, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff 29R-323, Wellbore #1, Plan #2 (1-25-17) V0
ss #32-11A (Exist), Wellbore #1, Wellbore #1 V0	Ottenhoff 29M-323, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff 29R-423, Wellbore #1, Plan #2 (1-25-17) V0
ntnoff 41-29 (Exist), Wellbore #1, Wellbore #1 V0	Ottenhoff 29M-423, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff 29U-243, Wellbore #1, Plan #2 (1-25-17) V0
kop 29-1 (Exist), Wellbore #1, Wellbore #1 V0	Ottenhoff 29R-143, Wellbore #1, Plan #2 (1-25-17) V0	Cross #32-11 (D&A), Wellbore #1, Wellbore #1 V0
Amato #42-32 (Exist), Wellbore #1, Wellbore #1 V0	Ottenhoff 29R-203, Wellbore #1, Plan #2 (1-25-17) V0	Blake B29-16 (Exist), Wellbore #1, Wellbore #1 V0
ntnoff 41-7B (Exist), Wellbore #1, Wellbore #1 V0	Ottenhoff 29R-243, Wellbore #1, Plan #2 (1-25-17) V0	Blake B 29-9 (P&A), Wellbore #1, Wellbore #1 V0
ntnoff 41-6B (Exist), Wellbore #1, Wellbore #1 V0	Ottenhoff 29R-303, Wellbore #1, Plan #2 (1-25-17) V0	