

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: Ottenhoff 29M-423

Surface Location: Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

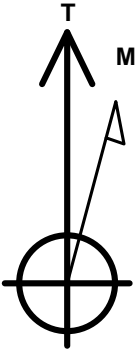
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone

Ground Elevation: 4663.0

+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1381166.59 3259629.39 40.375959 -104.568106
RKB - 23' WWWELL @ 4686.0ft (RKB - 23')

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 557'FNL & 1065'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2626'FSL & 2381'FEL, Sec.32	6872.0	-7374.0	-1267.3	Point



Azimuths to True North
Magnetic North: 8.12°

Magnetic Field
Strength: 52644.9snT
Dip Angle: 66.90°
Date: 2/26/2016
Model: IGRF2010

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29M-423
Plan #1 (3-14-16)
16:25, March 17 2016

ANNOTATIONS

TVD	MD	Annotation
400.0	400.0	KOP - Start Build 1.50
5191.0	5363.4	Start Drop -2.00
6117.9	6301.5	KOP #2 - Start Build 7.50
6881.9	7502.6	Start 7115.9 hold at 7502.6 MD
6872.0	14618.6	TD at 14618.6

SHL 557'FNL & 1065'FEL, Sec.29

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

Casing Pt. 815'FNL & 2332'FEL, Sec.29

460' Setback

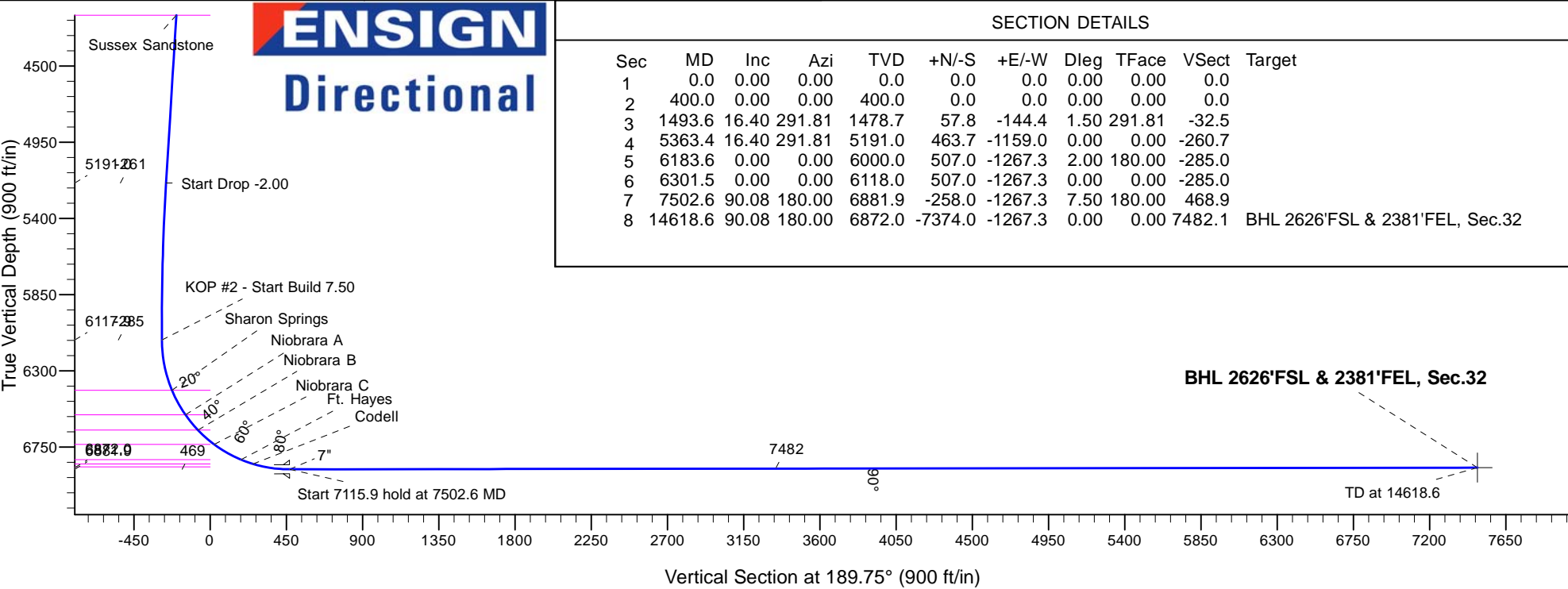
Sec.29-T5N-R64W

460' Setback

Sec.32-T5N-R64W

BHL 2626'FSL & 2381'FEL, Sec.32

West(-)/East(+) (3000 ft/in)



ENSIGN
Directional

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	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	1493.6	16.40	291.81	1478.7	57.8	-144.4	1.50	291.81	-32.5	
4	5363.4	16.40	291.81	5191.0	463.7	-1159.0	0.00	0.00	-260.7	
5	6183.6	0.00	0.00	6000.0	507.0	-1267.3	2.00	180.00	-285.0	
6	6301.5	0.00	0.00	6118.0	507.0	-1267.3	0.00	0.00	-285.0	
7	7502.6	90.08	180.00	6881.9	-258.0	-1267.3	7.50	180.00	468.9	
8	14618.6	90.08	180.00	6872.0	-7374.0	-1267.3	0.00	0.00	7482.1	BHL 2626'FSL & 2381'FEL, Sec.32

BHL 2626'FSL & 2381'FEL, Sec.32

Vertical Section at 189.75° (900 ft/in)



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29M-423

Wellbore #1

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

Standard Planning Report

17 March, 2016

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

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

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

Well	Ottenhoff 29M-423					
Well Position	+N/-S	1.1 ft	Northing:	1,381,166.59 usft	Latitude:	40.375959
	+E/-W	-120.1 ft	Easting:	3,259,629.39 usft	Longitude:	-104.568106
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,663.0 ft

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

Design	Plan #1 (3-14-16)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	189.75

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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,493.6	16.40	291.81	1,478.7	57.8	-144.4	1.50	1.50	0.00	291.81	
5,363.4	16.40	291.81	5,191.0	463.7	-1,159.0	0.00	0.00	0.00	0.00	
6,183.6	0.00	0.00	6,000.0	507.0	-1,267.3	2.00	-2.00	0.00	180.00	
6,301.5	0.00	0.00	6,118.0	507.0	-1,267.3	0.00	0.00	0.00	0.00	
7,502.6	90.08	180.00	6,881.9	-258.0	-1,267.3	7.50	7.50	0.00	180.00	
14,618.6	90.08	180.00	6,872.0	-7,374.0	-1,267.3	0.00	0.00	0.00	0.00	BHL 2626'FSL & 2381

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Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 557'FNL & 1065'FEL, Sec.29									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
500.0	1.50	291.81	500.0	0.5	-1.2	-0.3	1.50	1.50	0.00
600.0	3.00	291.81	599.9	1.9	-4.9	-1.1	1.50	1.50	0.00
700.0	4.50	291.81	699.7	4.4	-10.9	-2.5	1.50	1.50	0.00
800.0	6.00	291.81	799.3	7.8	-19.4	-4.4	1.50	1.50	0.00
900.0	7.50	291.81	898.6	12.1	-30.3	-6.8	1.50	1.50	0.00
1,000.0	9.00	291.81	997.5	17.5	-43.7	-9.8	1.50	1.50	0.00
1,100.0	10.50	291.81	1,096.1	23.8	-59.4	-13.4	1.50	1.50	0.00
1,200.0	12.00	291.81	1,194.2	31.0	-77.5	-17.4	1.50	1.50	0.00
1,300.0	13.50	291.81	1,291.7	39.2	-98.0	-22.0	1.50	1.50	0.00
1,400.0	15.00	291.81	1,388.6	48.3	-120.8	-27.2	1.50	1.50	0.00
1,493.6	16.40	291.81	1,478.7	57.8	-144.4	-32.5	1.50	1.50	0.00
1,500.0	16.40	291.81	1,484.9	58.4	-146.0	-32.8	0.00	0.00	0.00
1,600.0	16.40	291.81	1,580.8	68.9	-172.3	-38.7	0.00	0.00	0.00
1,700.0	16.40	291.81	1,676.7	79.4	-198.5	-44.6	0.00	0.00	0.00
1,800.0	16.40	291.81	1,772.6	89.9	-224.7	-50.5	0.00	0.00	0.00
1,900.0	16.40	291.81	1,868.6	100.4	-250.9	-56.4	0.00	0.00	0.00
2,000.0	16.40	291.81	1,964.5	110.9	-277.1	-62.3	0.00	0.00	0.00
2,100.0	16.40	291.81	2,060.4	121.4	-303.4	-68.2	0.00	0.00	0.00
2,200.0	16.40	291.81	2,156.4	131.9	-329.6	-74.1	0.00	0.00	0.00
2,300.0	16.40	291.81	2,252.3	142.3	-355.8	-80.0	0.00	0.00	0.00
2,400.0	16.40	291.81	2,348.2	152.8	-382.0	-85.9	0.00	0.00	0.00
2,500.0	16.40	291.81	2,444.2	163.3	-408.2	-91.8	0.00	0.00	0.00
2,600.0	16.40	291.81	2,540.1	173.8	-434.5	-97.7	0.00	0.00	0.00
2,700.0	16.40	291.81	2,636.0	184.3	-460.7	-103.6	0.00	0.00	0.00
2,800.0	16.40	291.81	2,731.9	194.8	-486.9	-109.5	0.00	0.00	0.00
2,900.0	16.40	291.81	2,827.9	205.3	-513.1	-115.4	0.00	0.00	0.00
3,000.0	16.40	291.81	2,923.8	215.8	-539.3	-121.3	0.00	0.00	0.00
3,100.0	16.40	291.81	3,019.7	226.3	-565.6	-127.2	0.00	0.00	0.00
3,200.0	16.40	291.81	3,115.7	236.8	-591.8	-133.1	0.00	0.00	0.00
3,300.0	16.40	291.81	3,211.6	247.2	-618.0	-139.0	0.00	0.00	0.00
3,400.0	16.40	291.81	3,307.5	257.7	-644.2	-144.9	0.00	0.00	0.00
3,500.0	16.40	291.81	3,403.5	268.2	-670.4	-150.8	0.00	0.00	0.00
3,600.0	16.40	291.81	3,499.4	278.7	-696.7	-156.7	0.00	0.00	0.00
3,631.9	16.40	291.81	3,530.0	282.1	-705.0	-158.6	0.00	0.00	0.00
Parkman Sandstone									
3,700.0	16.40	291.81	3,595.3	289.2	-722.9	-162.6	0.00	0.00	0.00
3,800.0	16.40	291.81	3,691.2	299.7	-749.1	-168.5	0.00	0.00	0.00
3,900.0	16.40	291.81	3,787.2	310.2	-775.3	-174.4	0.00	0.00	0.00
4,000.0	16.40	291.81	3,883.1	320.7	-801.5	-180.3	0.00	0.00	0.00
4,100.0	16.40	291.81	3,979.0	331.2	-827.8	-186.2	0.00	0.00	0.00
4,200.0	16.40	291.81	4,075.0	341.7	-854.0	-192.1	0.00	0.00	0.00
4,300.0	16.40	291.81	4,170.9	352.1	-880.2	-198.0	0.00	0.00	0.00
4,330.3	16.40	291.81	4,200.0	355.3	-888.1	-199.8	0.00	0.00	0.00
Sussex Sandstone									

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Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,400.0	16.40	291.81	4,266.8	362.6	-906.4	-203.9	0.00	0.00	0.00
4,500.0	16.40	291.81	4,362.7	373.1	-932.6	-209.8	0.00	0.00	0.00
4,600.0	16.40	291.81	4,458.7	383.6	-958.8	-215.7	0.00	0.00	0.00
4,700.0	16.40	291.81	4,554.6	394.1	-985.1	-221.6	0.00	0.00	0.00
4,800.0	16.40	291.81	4,650.5	404.6	-1,011.3	-227.5	0.00	0.00	0.00
4,900.0	16.40	291.81	4,746.5	415.1	-1,037.5	-233.4	0.00	0.00	0.00
5,000.0	16.40	291.81	4,842.4	425.6	-1,063.7	-239.3	0.00	0.00	0.00
5,100.0	16.40	291.81	4,938.3	436.1	-1,089.9	-245.1	0.00	0.00	0.00
5,200.0	16.40	291.81	5,034.3	446.5	-1,116.2	-251.0	0.00	0.00	0.00
5,300.0	16.40	291.81	5,130.2	457.0	-1,142.4	-256.9	0.00	0.00	0.00
5,363.4	16.40	291.81	5,191.0	463.7	-1,159.0	-260.7	0.00	0.00	0.00
Start Drop -2.00									
5,400.0	15.67	291.81	5,226.2	467.4	-1,168.4	-262.8	2.00	-2.00	0.00
5,500.0	13.67	291.81	5,322.9	476.9	-1,191.9	-268.1	2.00	-2.00	0.00
5,600.0	11.67	291.81	5,420.5	485.0	-1,212.3	-272.7	2.00	-2.00	0.00
5,700.0	9.67	291.81	5,518.7	491.9	-1,229.5	-276.5	2.00	-2.00	0.00
5,800.0	7.67	291.81	5,617.6	497.5	-1,243.5	-279.7	2.00	-2.00	0.00
5,900.0	5.67	291.81	5,716.9	501.8	-1,254.2	-282.1	2.00	-2.00	0.00
6,000.0	3.67	291.81	5,816.6	504.8	-1,261.8	-283.8	2.00	-2.00	0.00
6,100.0	1.67	291.81	5,916.5	506.5	-1,266.1	-284.8	2.00	-2.00	0.00
6,183.6	0.00	0.00	6,000.0	507.0	-1,267.3	-285.0	2.00	-2.00	0.00
6,200.0	0.00	0.00	6,016.4	507.0	-1,267.3	-285.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,116.4	507.0	-1,267.3	-285.0	0.00	0.00	0.00
6,301.5	0.00	0.00	6,117.9	507.0	-1,267.3	-285.0	0.00	0.00	0.00
KOP #2 - Start Build 7.50									
6,400.0	7.38	180.00	6,216.2	500.7	-1,267.3	-278.8	7.50	7.50	0.00
6,500.0	14.88	180.00	6,314.2	481.4	-1,267.3	-259.8	7.50	7.50	0.00
6,600.0	22.38	180.00	6,408.9	449.4	-1,267.3	-228.3	7.50	7.50	0.00
6,606.6	22.88	180.00	6,415.0	446.9	-1,267.3	-225.8	7.50	7.50	0.00
Sharon Springs									
6,700.0	29.88	180.00	6,498.6	405.4	-1,267.3	-184.9	7.50	7.50	0.00
6,772.9	35.35	180.00	6,560.0	366.1	-1,267.3	-146.2	7.50	7.50	0.00
Niobrara A									
6,800.0	37.38	180.00	6,581.8	350.1	-1,267.3	-130.4	7.50	7.50	0.00
6,890.1	44.14	180.00	6,650.0	291.3	-1,267.3	-72.5	7.50	7.50	0.00
Niobrara B									
6,900.0	44.88	180.00	6,657.1	284.3	-1,267.3	-65.6	7.50	7.50	0.00
7,000.0	52.38	180.00	6,723.1	209.3	-1,267.3	8.3	7.50	7.50	0.00
7,019.8	53.87	180.00	6,735.0	193.5	-1,267.3	23.9	7.50	7.50	0.00
Niobrara C									
7,100.0	59.88	180.00	6,778.8	126.4	-1,267.3	90.1	7.50	7.50	0.00
7,200.0	67.38	180.00	6,823.2	36.8	-1,267.3	178.3	7.50	7.50	0.00
7,204.7	67.74	180.00	6,825.0	32.5	-1,267.3	182.7	7.50	7.50	0.00
Ft. Hayes									
7,279.9	73.37	180.00	6,850.0	-38.4	-1,267.3	252.5	7.50	7.50	0.00
Codell									
7,300.0	74.88	180.00	6,855.5	-57.7	-1,267.3	271.5	7.50	7.50	0.00
7,350.2	78.63	180.00	6,867.0	-106.6	-1,267.3	319.7	7.47	7.47	0.00
Carlile									
7,400.0	82.38	180.00	6,875.2	-155.7	-1,267.3	368.1	7.53	7.53	0.00
7,500.0	89.88	180.00	6,881.9	-255.4	-1,267.3	466.4	7.50	7.50	0.00

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Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,502.6	90.08	180.00	6,881.9	-258.0	-1,267.3	468.9	7.50	7.50	0.00
Start 7115.9 hold at 7502.6 MD - 7"									
7,600.0	90.08	180.00	6,881.8	-355.4	-1,267.3	564.9	0.00	0.00	0.00
7,700.0	90.08	180.00	6,881.7	-455.4	-1,267.3	663.5	0.00	0.00	0.00
7,800.0	90.08	180.00	6,881.5	-555.4	-1,267.3	762.0	0.00	0.00	0.00
7,900.0	90.08	180.00	6,881.4	-655.4	-1,267.3	860.6	0.00	0.00	0.00
8,000.0	90.08	180.00	6,881.2	-755.4	-1,267.3	959.1	0.00	0.00	0.00
8,100.0	90.08	180.00	6,881.1	-855.4	-1,267.3	1,057.7	0.00	0.00	0.00
8,200.0	90.08	180.00	6,881.0	-955.4	-1,267.3	1,156.2	0.00	0.00	0.00
8,300.0	90.08	180.00	6,880.8	-1,055.4	-1,267.3	1,254.8	0.00	0.00	0.00
8,400.0	90.08	180.00	6,880.7	-1,155.4	-1,267.3	1,353.3	0.00	0.00	0.00
8,500.0	90.08	180.00	6,880.5	-1,255.4	-1,267.3	1,451.9	0.00	0.00	0.00
8,600.0	90.08	180.00	6,880.4	-1,355.4	-1,267.3	1,550.5	0.00	0.00	0.00
8,700.0	90.08	180.00	6,880.3	-1,455.4	-1,267.3	1,649.0	0.00	0.00	0.00
8,800.0	90.08	180.00	6,880.1	-1,555.4	-1,267.3	1,747.6	0.00	0.00	0.00
8,900.0	90.08	180.00	6,880.0	-1,655.4	-1,267.3	1,846.1	0.00	0.00	0.00
9,000.0	90.08	180.00	6,879.8	-1,755.4	-1,267.3	1,944.7	0.00	0.00	0.00
9,100.0	90.08	180.00	6,879.7	-1,855.4	-1,267.3	2,043.2	0.00	0.00	0.00
9,200.0	90.08	180.00	6,879.6	-1,955.4	-1,267.3	2,141.8	0.00	0.00	0.00
9,300.0	90.08	180.00	6,879.4	-2,055.4	-1,267.3	2,240.3	0.00	0.00	0.00
9,400.0	90.08	180.00	6,879.3	-2,155.4	-1,267.3	2,338.9	0.00	0.00	0.00
9,500.0	90.08	180.00	6,879.1	-2,255.4	-1,267.3	2,437.5	0.00	0.00	0.00
9,600.0	90.08	180.00	6,879.0	-2,355.4	-1,267.3	2,536.0	0.00	0.00	0.00
9,700.0	90.08	180.00	6,878.9	-2,455.4	-1,267.3	2,634.6	0.00	0.00	0.00
9,800.0	90.08	180.00	6,878.7	-2,555.4	-1,267.3	2,733.1	0.00	0.00	0.00
9,900.0	90.08	180.00	6,878.6	-2,655.4	-1,267.3	2,831.7	0.00	0.00	0.00
10,000.0	90.08	180.00	6,878.4	-2,755.4	-1,267.3	2,930.2	0.00	0.00	0.00
10,100.0	90.08	180.00	6,878.3	-2,855.4	-1,267.3	3,028.8	0.00	0.00	0.00
10,200.0	90.08	180.00	6,878.2	-2,955.4	-1,267.3	3,127.3	0.00	0.00	0.00
10,300.0	90.08	180.00	6,878.0	-3,055.4	-1,267.3	3,225.9	0.00	0.00	0.00
10,400.0	90.08	180.00	6,877.9	-3,155.4	-1,267.3	3,324.4	0.00	0.00	0.00
10,500.0	90.08	180.00	6,877.8	-3,255.4	-1,267.3	3,423.0	0.00	0.00	0.00
10,600.0	90.08	180.00	6,877.6	-3,355.4	-1,267.3	3,521.6	0.00	0.00	0.00
10,700.0	90.08	180.00	6,877.5	-3,455.4	-1,267.3	3,620.1	0.00	0.00	0.00
10,800.0	90.08	180.00	6,877.3	-3,555.4	-1,267.3	3,718.7	0.00	0.00	0.00
10,900.0	90.08	180.00	6,877.2	-3,655.4	-1,267.3	3,817.2	0.00	0.00	0.00
11,000.0	90.08	180.00	6,877.1	-3,755.4	-1,267.3	3,915.8	0.00	0.00	0.00
11,100.0	90.08	180.00	6,876.9	-3,855.4	-1,267.3	4,014.3	0.00	0.00	0.00
11,200.0	90.08	180.00	6,876.8	-3,955.4	-1,267.3	4,112.9	0.00	0.00	0.00
11,300.0	90.08	180.00	6,876.6	-4,055.4	-1,267.3	4,211.4	0.00	0.00	0.00
11,400.0	90.08	180.00	6,876.5	-4,155.4	-1,267.3	4,310.0	0.00	0.00	0.00
11,500.0	90.08	180.00	6,876.4	-4,255.4	-1,267.3	4,408.6	0.00	0.00	0.00
11,600.0	90.08	180.00	6,876.2	-4,355.4	-1,267.3	4,507.1	0.00	0.00	0.00
11,700.0	90.08	180.00	6,876.1	-4,455.4	-1,267.3	4,605.7	0.00	0.00	0.00
11,800.0	90.08	180.00	6,875.9	-4,555.4	-1,267.3	4,704.2	0.00	0.00	0.00
11,900.0	90.08	180.00	6,875.8	-4,655.4	-1,267.3	4,802.8	0.00	0.00	0.00
12,000.0	90.08	180.00	6,875.7	-4,755.4	-1,267.3	4,901.3	0.00	0.00	0.00
12,100.0	90.08	180.00	6,875.5	-4,855.4	-1,267.3	4,999.9	0.00	0.00	0.00
12,200.0	90.08	180.00	6,875.4	-4,955.4	-1,267.3	5,098.4	0.00	0.00	0.00
12,300.0	90.08	180.00	6,875.2	-5,055.4	-1,267.3	5,197.0	0.00	0.00	0.00
12,400.0	90.08	180.00	6,875.1	-5,155.4	-1,267.3	5,295.6	0.00	0.00	0.00
12,500.0	90.08	180.00	6,875.0	-5,255.4	-1,267.3	5,394.1	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,600.0	90.08	180.00	6,874.8	-5,355.4	-1,267.3	5,492.7	0.00	0.00	0.00	
12,700.0	90.08	180.00	6,874.7	-5,455.4	-1,267.3	5,591.2	0.00	0.00	0.00	
12,800.0	90.08	180.00	6,874.5	-5,555.4	-1,267.3	5,689.8	0.00	0.00	0.00	
12,900.0	90.08	180.00	6,874.4	-5,655.4	-1,267.3	5,788.3	0.00	0.00	0.00	
13,000.0	90.08	180.00	6,874.3	-5,755.4	-1,267.3	5,886.9	0.00	0.00	0.00	
13,100.0	90.08	180.00	6,874.1	-5,855.4	-1,267.3	5,985.4	0.00	0.00	0.00	
13,200.0	90.08	180.00	6,874.0	-5,955.4	-1,267.3	6,084.0	0.00	0.00	0.00	
13,300.0	90.08	180.00	6,873.8	-6,055.4	-1,267.3	6,182.5	0.00	0.00	0.00	
13,400.0	90.08	180.00	6,873.7	-6,155.4	-1,267.3	6,281.1	0.00	0.00	0.00	
13,500.0	90.08	180.00	6,873.6	-6,255.4	-1,267.3	6,379.7	0.00	0.00	0.00	
13,600.0	90.08	180.00	6,873.4	-6,355.4	-1,267.3	6,478.2	0.00	0.00	0.00	
13,700.0	90.08	180.00	6,873.3	-6,455.4	-1,267.3	6,576.8	0.00	0.00	0.00	
13,800.0	90.08	180.00	6,873.1	-6,555.4	-1,267.3	6,675.3	0.00	0.00	0.00	
13,900.0	90.08	180.00	6,873.0	-6,655.4	-1,267.3	6,773.9	0.00	0.00	0.00	
14,000.0	90.08	180.00	6,872.9	-6,755.4	-1,267.3	6,872.4	0.00	0.00	0.00	
14,100.0	90.08	180.00	6,872.7	-6,855.4	-1,267.3	6,971.0	0.00	0.00	0.00	
14,200.0	90.08	180.00	6,872.6	-6,955.4	-1,267.3	7,069.5	0.00	0.00	0.00	
14,300.0	90.08	180.00	6,872.4	-7,055.4	-1,267.3	7,168.1	0.00	0.00	0.00	
14,400.0	90.08	180.00	6,872.3	-7,155.4	-1,267.3	7,266.7	0.00	0.00	0.00	
14,500.0	90.08	180.00	6,872.2	-7,255.4	-1,267.3	7,365.2	0.00	0.00	0.00	
14,600.0	90.08	180.00	6,872.0	-7,355.4	-1,267.3	7,463.8	0.00	0.00	0.00	
14,618.6	90.08	180.00	6,872.0	-7,374.0	-1,267.3	7,482.1	0.00	0.00	0.00	
TD at 14618.6 - BHL 2626'FSL & 2381'FEL, Sec.32										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SHL 557'FNL & 1065'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,381,166.60	3,259,629.39	40.375959	-104.568106	
BHL 2626'FSL & 2381'FI - plan hits target center - Point	0.00	0.00	6,872.0	-7,374.0	-1,267.3	1,373,780.05	3,258,439.74	40.355718	-104.572653	

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (")	Hole Diameter (")
7,502.6	6,881.9	7"			7	8-3/4

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-14-16)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,631.9	3,530.0	Parkman Sandstone		0.00		
4,330.3	4,200.0	Sussex Sandstone		0.00		
6,606.6	6,415.0	Sharon Springs		0.00		
6,772.9	6,560.0	Niobrara A		0.00		
6,890.1	6,650.0	Niobrara B		0.00		
7,019.8	6,735.0	Niobrara C		0.00		
7,204.7	6,825.0	Ft. Hayes		0.00		
7,279.9	6,850.0	Codell		0.00		
7,350.2	6,867.0	Carlile		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
400.0	400.0	0.0	0.0	KOP - Start Build 1.50	
5,363.4	5,191.0	463.7	-1,159.0	Start Drop -2.00	
6,301.5	6,117.9	507.0	-1,267.3	KOP #2 - Start Build 7.50	
7,502.6	6,881.9	-258.0	-1,267.3	Start 7115.9 hold at 7502.6 MD	
14,618.6	6,872.0	-7,374.0	-1,267.3	TD at 14618.6	



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29M-423

Wellbore #1

Plan #1 (3-14-16)

Anticollision Report

17 March, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (3-14-16)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	3/17/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	14,618.6	Plan #1 (3-14-16) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Bell Pad SEC.29-T5N-R64W						
Bell B29-24D - Bell B29-24D - Bell B29-24D	10,852.7	7,198.9	119.4	18.3	1.181	Level 2, CC, ES, SF
Existing Wells Sec.29-T5N-R64W						
Blake #B 29-10X (Exist.) - Wellbore #1 - Wellbore #1	9,892.4	6,881.6	263.0	69.6	1.360	Level 3, CC
Blake #B 29-10X (Exist.) - Wellbore #1 - Wellbore #1	9,900.0	6,881.6	263.1	69.5	1.359	Level 3, ES, SF
Blake #B29-10 (D&A) - Wellbore #1 - Wellbore #1	10,043.6	6,881.4	336.8	140.6	1.717	CC, ES, SF
Blake #B29-15 (Exist.) - Wellbore #1 - Wellbore #1	11,316.8	6,894.6	342.4	122.3	1.556	CC, ES, SF
Blake B #29-23 (Exist.) - Wellbore #1 - Wellbore #1	10,384.2	6,888.9	468.4	265.7	2.312	CC
Blake B #29-23 (Exist.) - Wellbore #1 - Wellbore #1	10,400.0	6,888.9	468.6	265.7	2.310	ES, SF
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	8,796.2	6,853.1	443.5	393.9	8.941	CC
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	8,800.0	6,853.2	443.5	393.9	8.930	ES
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	8,900.0	6,854.9	455.5	404.1	8.865	SF
DIC Cross #31-32 (P&A) - Wellbore #1 - Wellbore #1	12,653.9	6,900.7	429.8	184.4	1.751	CC, ES, SF
Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1	7,371.3	6,851.9	414.8	383.1	13.088	CC, ES
Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1	7,400.0	6,856.2	415.8	383.9	13.040	SF
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W						
Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)	200.0	200.0	15.0	14.4	22.319	CC, ES
Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)	14,618.6	14,421.0	294.7	58.5	1.248	Level 2, SF
Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)	400.0	401.0	15.0	13.5	9.549	CC
Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)	14,618.6	14,507.9	252.1	-7.3	0.972	Level 1, ES, SF
Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)	400.0	400.0	45.1	43.6	28.689	CC, ES
Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)	14,618.6	14,249.2	760.9	487.5	2.784	SF
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	400.0	400.0	75.0	73.4	47.638	CC, ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	900.0	898.6	106.1	102.2	27.733	SF
Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)	400.0	400.0	30.1	28.5	19.127	CC, ES
Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)	14,618.6	14,381.8	517.0	247.9	1.921	SF
Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)	400.0	400.0	60.2	58.6	38.251	CC, ES
Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)	14,618.6	14,381.9	954.9	668.1	3.329	SF
Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)	400.0	399.0	90.0	88.4	57.283	CC, ES
Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)	1,000.0	996.5	134.9	130.6	31.517	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:		0.0 ft
Survey Program: 685- Bell Pad SEC.29-T5N-R64W - Bell B29-24D - Bell B29-24D - Bell B29-24D													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							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)				
9,900.0	6,878.6	7,175.1	6,868.8	58.8	29.3	80.30	-3,607.5	-1,387.3	959.9	876.2	83.64	11.476			
10,000.0	6,878.4	7,177.3	6,871.0	60.5	29.3	81.34	-3,607.5	-1,387.2	860.8	775.2	85.55	10.062			
10,100.0	6,878.3	7,179.6	6,873.3	62.3	29.3	82.42	-3,607.6	-1,387.2	761.9	674.4	87.45	8.713			
10,200.0	6,878.2	7,182.0	6,875.6	64.0	29.3	83.52	-3,607.7	-1,387.1	663.3	574.0	89.34	7.425			
10,300.0	6,878.0	7,184.4	6,878.1	65.8	29.3	84.66	-3,607.7	-1,387.0	565.3	474.1	91.21	6.198			
10,400.0	6,877.9	7,186.9	6,880.5	67.6	29.3	85.83	-3,607.8	-1,387.0	468.1	375.0	93.07	5.029			
10,500.0	6,877.8	7,189.4	6,883.1	69.4	29.3	87.03	-3,607.9	-1,386.9	372.3	277.4	94.91	3.923			
10,600.0	6,877.6	7,192.0	6,885.7	71.2	29.3	88.27	-3,607.9	-1,386.8	279.5	182.7	96.71	2.889			
10,700.0	6,877.5	7,194.7	6,888.3	73.0	29.3	89.55	-3,608.0	-1,386.8	193.8	95.4	98.49	1.968			
10,800.0	6,877.3	7,197.4	6,891.0	74.8	29.3	90.86	-3,608.1	-1,386.7	130.5	30.3	100.22	1.303	Level 3		
10,852.7	6,877.3	7,198.9	6,892.5	75.7	29.3	91.56	-3,608.1	-1,386.7	119.4	18.3	101.12	1.181	Level 2, CC, ES, SF		
10,900.0	6,877.2	7,200.2	6,893.8	76.6	29.3	92.20	-3,608.2	-1,386.6	128.4	26.5	101.91	1.260	Level 3		
11,000.0	6,877.1	7,203.1	6,896.7	78.4	29.3	93.58	-3,608.3	-1,386.5	189.6	86.0	103.54	1.831			
11,100.0	6,876.9	7,206.0	6,899.7	80.2	29.3	94.99	-3,608.4	-1,386.5	274.5	169.4	105.12	2.611			
11,200.0	6,876.8	7,209.1	6,902.7	82.0	29.3	96.44	-3,608.4	-1,386.4	367.1	260.5	106.63	3.443			
11,300.0	6,876.6	7,212.2	6,905.8	83.9	29.3	97.92	-3,608.5	-1,386.3	462.8	354.7	108.07	4.282			
11,400.0	6,876.5	7,215.4	6,909.0	85.7	29.3	99.43	-3,608.6	-1,386.2	559.9	450.5	109.43	5.117			
11,500.0	6,876.4	7,218.7	6,912.3	87.5	29.3	100.98	-3,608.7	-1,386.1	657.9	547.2	110.70	5.943			
11,600.0	6,876.2	7,222.1	6,915.7	89.4	29.3	102.55	-3,608.9	-1,386.0	756.4	644.5	111.88	6.761			
11,700.0	6,876.1	7,225.6	6,919.2	91.2	29.3	104.16	-3,609.0	-1,385.9	855.3	742.3	112.96	7.571			
11,800.0	6,875.9	7,229.2	6,922.8	93.1	29.3	105.79	-3,609.1	-1,385.8	954.3	840.4	113.93	8.376			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake #B 29-10X (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7072-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
9,000.0	6,879.8	6,882.8	6,882.8	43.8	137.7	-90.27	-2,647.8	-1,004.3	930.3	752.7	177.65	5.237		
9,100.0	6,879.7	6,882.7	6,882.7	45.4	137.7	-90.24	-2,647.8	-1,004.3	834.9	655.5	179.37	4.655		
9,200.0	6,879.6	6,882.6	6,882.6	47.0	137.7	-90.21	-2,647.8	-1,004.3	740.7	559.5	181.11	4.090		
9,300.0	6,879.4	6,882.4	6,882.4	48.6	137.6	-90.18	-2,647.8	-1,004.3	648.1	465.3	182.86	3.544		
9,400.0	6,879.3	6,882.3	6,882.3	50.3	137.6	-90.15	-2,647.8	-1,004.3	558.2	373.6	184.62	3.024		
9,500.0	6,879.1	6,882.1	6,882.1	51.9	137.6	-90.12	-2,647.8	-1,004.3	472.4	286.0	186.40	2.534		
9,600.0	6,879.0	6,882.0	6,882.0	53.6	137.6	-90.09	-2,647.8	-1,004.3	393.3	205.1	188.18	2.090		
9,700.0	6,878.9	6,881.9	6,881.9	55.3	137.6	-90.06	-2,647.8	-1,004.3	325.9	135.9	189.98	1.715		
9,800.0	6,878.7	6,881.7	6,881.7	57.0	137.6	-90.03	-2,647.8	-1,004.3	278.8	87.0	191.78	1.454	Level 3	
9,892.4	6,878.6	6,881.6	6,881.6	58.6	137.6	-90.00	-2,647.8	-1,004.3	263.0	69.6	193.45	1.360	Level 3, CC	
9,900.0	6,878.6	6,881.6	6,881.6	58.8	137.6	-90.00	-2,647.8	-1,004.3	263.1	69.5	193.59	1.359	Level 3, ES, SF	
10,000.0	6,878.4	6,881.4	6,881.4	60.5	137.6	-89.97	-2,647.8	-1,004.3	284.2	88.8	195.41	1.454	Level 3	
10,100.0	6,878.3	6,881.3	6,881.3	62.3	137.6	-89.94	-2,647.8	-1,004.3	335.1	137.8	197.23	1.699		
10,200.0	6,878.2	6,881.2	6,881.2	64.0	137.6	-89.91	-2,647.8	-1,004.3	404.7	205.7	199.06	2.033		
10,300.0	6,878.0	6,881.0	6,881.0	65.8	137.6	-89.88	-2,647.8	-1,004.3	485.1	284.2	200.89	2.415		
10,400.0	6,877.9	6,880.9	6,880.9	67.6	137.6	-89.85	-2,647.8	-1,004.3	571.7	369.0	202.73	2.820		
10,500.0	6,877.8	6,880.8	6,880.8	69.4	137.6	-89.82	-2,647.8	-1,004.3	662.1	457.5	204.57	3.236		
10,600.0	6,877.6	6,880.6	6,880.6	71.2	137.6	-89.78	-2,647.8	-1,004.3	754.9	548.5	206.42	3.657		
10,700.0	6,877.5	6,880.5	6,880.5	73.0	137.6	-89.75	-2,647.8	-1,004.3	849.4	641.1	208.27	4.078		
10,800.0	6,877.3	6,880.3	6,880.3	74.8	137.6	-89.72	-2,647.8	-1,004.3	945.0	734.8	210.12	4.497		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake #B29-10 (D&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7125-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
9,200.0	6,879.6	6,882.6	6,882.6	47.0	137.7	-90.20	-2,799.0	-930.4	908.3	727.2	181.11	5.015		
9,300.0	6,879.4	6,882.4	6,882.4	48.6	137.6	-90.18	-2,799.0	-930.4	816.3	633.5	182.86	4.464		
9,400.0	6,879.3	6,882.3	6,882.3	50.3	137.6	-90.15	-2,799.0	-930.4	726.4	541.8	184.62	3.934		
9,500.0	6,879.1	6,882.1	6,882.1	51.9	137.6	-90.13	-2,799.0	-930.4	639.5	453.1	186.40	3.431		
9,600.0	6,879.0	6,882.0	6,882.0	53.6	137.6	-90.11	-2,799.0	-930.4	557.0	368.8	188.19	2.960		
9,700.0	6,878.9	6,881.9	6,881.9	55.3	137.6	-90.08	-2,799.0	-930.4	481.2	291.2	189.98	2.533		
9,800.0	6,878.7	6,881.7	6,881.7	57.0	137.6	-90.06	-2,799.0	-930.4	415.7	223.9	191.78	2.167		
9,900.0	6,878.6	6,881.6	6,881.6	58.8	137.6	-90.03	-2,799.0	-930.4	366.2	172.6	193.59	1.891		
10,000.0	6,878.4	6,881.4	6,881.4	60.5	137.6	-90.01	-2,799.0	-930.4	339.7	144.2	195.41	1.738		
10,043.6	6,878.4	6,881.4	6,881.4	61.3	137.6	-90.00	-2,799.0	-930.4	336.8	140.6	196.21	1.717	CC, ES, SF	
10,100.0	6,878.3	6,881.3	6,881.3	62.3	137.6	-89.99	-2,799.0	-930.4	341.5	144.3	197.24	1.732		
10,200.0	6,878.2	6,881.2	6,881.2	64.0	137.6	-89.96	-2,799.0	-930.4	371.4	172.3	199.06	1.866		
10,300.0	6,878.0	6,881.0	6,881.0	65.8	137.6	-89.94	-2,799.0	-930.4	423.3	222.4	200.90	2.107		
10,400.0	6,877.9	6,880.9	6,880.9	67.6	137.6	-89.92	-2,799.0	-930.4	490.4	287.7	202.74	2.419		
10,500.0	6,877.8	6,880.8	6,880.8	69.4	137.6	-89.89	-2,799.0	-930.4	567.3	362.7	204.58	2.773		
10,600.0	6,877.6	6,880.6	6,880.6	71.2	137.6	-89.87	-2,799.0	-930.4	650.4	444.0	206.43	3.151		
10,700.0	6,877.5	6,880.5	6,880.5	73.0	137.6	-89.84	-2,799.0	-930.4	737.8	529.5	208.28	3.542		
10,800.0	6,877.3	6,880.3	6,880.3	74.8	137.6	-89.82	-2,799.0	-930.4	828.0	617.9	210.13	3.940		
10,900.0	6,877.2	6,880.2	6,880.2	76.6	137.6	-89.80	-2,799.0	-930.4	920.3	708.3	211.99	4.341		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake #B29-15 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7092-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
10,400.0	6,877.9	6,895.9	6,895.9	67.6	137.9	-90.21	-4,072.2	-924.9	978.7	775.6	203.06	4.820		
10,500.0	6,877.8	6,895.8	6,895.8	69.4	137.9	-90.19	-4,072.2	-924.9	885.7	680.8	204.90	4.322		
10,600.0	6,877.6	6,895.6	6,895.6	71.2	137.9	-90.17	-4,072.2	-924.9	794.4	587.7	206.75	3.842		
10,700.0	6,877.5	6,895.5	6,895.5	73.0	137.9	-90.14	-4,072.2	-924.9	705.5	496.9	208.60	3.382		
10,800.0	6,877.3	6,895.3	6,895.3	74.8	137.9	-90.12	-4,072.2	-924.9	620.0	409.5	210.46	2.946		
10,900.0	6,877.2	6,895.2	6,895.2	76.6	137.9	-90.10	-4,072.2	-924.9	539.4	327.1	212.31	2.541		
11,000.0	6,877.1	6,895.1	6,895.1	78.4	137.9	-90.07	-4,072.2	-924.9	466.5	252.3	214.17	2.178		
11,100.0	6,876.9	6,894.9	6,894.9	80.2	137.9	-90.05	-4,072.2	-924.9	405.3	189.2	216.04	1.876		
11,200.0	6,876.8	6,894.8	6,894.8	82.0	137.9	-90.03	-4,072.2	-924.9	361.8	143.9	217.90	1.660		
11,300.0	6,876.6	6,894.6	6,894.6	83.9	137.9	-90.00	-4,072.2	-924.9	342.8	123.0	219.77	1.560		
11,316.8	6,876.6	6,894.6	6,894.6	84.2	137.9	-90.00	-4,072.2	-924.9	342.4	122.3	220.09	1.556	CC, ES, SF	
11,400.0	6,876.5	6,894.5	6,894.5	85.7	137.9	-89.98	-4,072.2	-924.9	352.3	130.7	221.64	1.590		
11,500.0	6,876.4	6,894.4	6,894.4	87.5	137.9	-89.96	-4,072.2	-924.9	388.3	164.8	223.51	1.737		
11,600.0	6,876.2	6,894.2	6,894.2	89.4	137.9	-89.93	-4,072.2	-924.9	444.3	218.9	225.39	1.971		
11,700.0	6,876.1	6,894.1	6,894.1	91.2	137.9	-89.91	-4,072.2	-924.9	513.8	286.6	227.26	2.261		
11,800.0	6,875.9	6,893.9	6,893.9	93.1	137.9	-89.89	-4,072.2	-924.9	592.2	363.0	229.14	2.584		
11,900.0	6,875.8	6,893.8	6,893.8	94.9	137.9	-89.86	-4,072.2	-924.9	676.2	445.2	231.02	2.927		
12,000.0	6,875.7	6,893.7	6,893.7	96.8	137.9	-89.84	-4,072.2	-924.9	764.1	531.3	232.90	3.281		
12,100.0	6,875.5	6,893.5	6,893.5	98.6	137.9	-89.82	-4,072.2	-924.9	854.7	619.9	234.78	3.641		
12,200.0	6,875.4	6,893.4	6,893.4	100.5	137.9	-89.79	-4,072.2	-924.9	947.2	710.5	236.66	4.002		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake B #29-23 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7595-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
9,600.0	6,879.0	6,890.0	6,890.0	53.6	137.8	-90.13	-3,139.6	-798.9	913.4	725.1	188.35	4.850		
9,700.0	6,878.9	6,889.9	6,889.9	55.3	137.8	-90.12	-3,139.6	-798.9	829.2	639.0	190.14	4.361		
9,800.0	6,878.7	6,889.7	6,889.7	57.0	137.8	-90.10	-3,139.6	-798.9	748.8	556.8	191.95	3.901		
9,900.0	6,878.6	6,889.6	6,889.6	58.8	137.8	-90.08	-3,139.6	-798.9	673.7	479.9	193.76	3.477		
10,000.0	6,878.4	6,889.4	6,889.4	60.5	137.8	-90.07	-3,139.6	-798.9	605.8	410.2	195.58	3.097		
10,100.0	6,878.3	6,889.3	6,889.3	62.3	137.8	-90.05	-3,139.6	-798.9	547.9	350.4	197.40	2.775		
10,200.0	6,878.2	6,889.2	6,889.2	64.0	137.8	-90.03	-3,139.6	-798.9	503.3	304.1	199.23	2.526		
10,300.0	6,878.0	6,889.0	6,889.0	65.8	137.8	-90.01	-3,139.6	-798.9	475.9	274.8	201.07	2.367		
10,384.2	6,877.9	6,888.9	6,888.9	67.3	137.8	-90.00	-3,139.6	-798.9	468.4	265.7	202.61	2.312 CC		
10,400.0	6,877.9	6,888.9	6,888.9	67.6	137.8	-90.00	-3,139.6	-798.9	468.6	265.7	202.90	2.310 ES, SF		
10,500.0	6,877.8	6,888.8	6,888.8	69.4	137.8	-89.98	-3,139.6	-798.9	482.5	277.7	204.75	2.356		
10,600.0	6,877.6	6,888.6	6,888.6	71.2	137.8	-89.96	-3,139.6	-798.9	515.7	309.1	206.60	2.496		
10,700.0	6,877.5	6,888.5	6,888.5	73.0	137.8	-89.95	-3,139.6	-798.9	564.9	356.4	208.45	2.710		
10,800.0	6,877.3	6,888.3	6,888.3	74.8	137.8	-89.93	-3,139.6	-798.9	626.3	416.0	210.30	2.978		
10,900.0	6,877.2	6,888.2	6,888.2	76.6	137.8	-89.91	-3,139.6	-798.9	696.7	484.5	212.16	3.284		
11,000.0	6,877.1	6,888.1	6,888.1	78.4	137.8	-89.89	-3,139.6	-798.9	773.7	559.6	214.02	3.615		
11,100.0	6,876.9	6,887.9	6,887.9	80.2	137.8	-89.88	-3,139.6	-798.9	855.4	639.5	215.88	3.962		
11,200.0	6,876.8	6,887.8	6,887.8	82.0	137.8	-89.86	-3,139.6	-798.9	940.7	722.9	217.75	4.320		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							
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)			
7,900.0	6,881.4	6,838.2	6,836.7	30.3	13.4	-84.91	-1,551.3	-825.3	999.8	963.9	35.90	27.847		
8,000.0	6,881.2	6,839.9	6,838.4	31.1	13.4	-85.12	-1,551.3	-825.2	911.3	874.1	37.19	24.500		
8,100.0	6,881.1	6,841.5	6,840.1	31.9	13.4	-85.34	-1,551.3	-825.1	825.4	786.8	38.57	21.399		
8,200.0	6,881.0	6,843.2	6,841.7	32.9	13.4	-85.55	-1,551.3	-825.0	743.0	703.0	40.01	18.568		
8,300.0	6,880.8	6,844.9	6,843.4	34.0	13.4	-85.77	-1,551.4	-824.9	665.4	623.9	41.52	16.027		
8,400.0	6,880.7	6,846.5	6,845.1	35.2	13.4	-85.98	-1,551.4	-824.8	594.6	551.6	43.07	13.805		
8,500.0	6,880.5	6,848.2	6,846.7	36.5	13.4	-86.20	-1,551.4	-824.7	533.3	488.6	44.67	11.938		
8,600.0	6,880.4	6,849.9	6,848.4	37.9	13.4	-86.41	-1,551.5	-824.6	484.9	438.6	46.31	10.472		
8,700.0	6,880.3	6,851.5	6,850.1	39.3	13.4	-86.63	-1,551.5	-824.5	453.8	405.8	47.97	9.460		
8,796.2	6,880.1	6,853.1	6,851.7	40.7	13.4	-86.84	-1,551.5	-824.4	443.5	393.9	49.60	8.941 CC		
8,800.0	6,880.1	6,853.2	6,851.7	40.8	13.4	-86.84	-1,551.5	-824.4	443.5	393.9	49.67	8.930 ES		
8,900.0	6,880.0	6,854.9	6,853.4	42.3	13.4	-87.06	-1,551.6	-824.3	455.5	404.1	51.38	8.865 SF		
9,000.0	6,879.8	6,856.5	6,855.0	43.8	13.4	-87.28	-1,551.6	-824.2	488.1	435.0	53.12	9.188		
9,100.0	6,879.7	6,858.2	6,856.7	45.4	13.4	-87.49	-1,551.6	-824.1	537.6	482.7	54.88	9.796		
9,200.0	6,879.6	6,859.9	6,858.4	47.0	13.4	-87.71	-1,551.6	-824.1	599.8	543.1	56.65	10.588		
9,300.0	6,879.4	6,861.5	6,860.0	48.6	13.5	-87.92	-1,551.7	-824.0	671.2	612.8	58.44	11.486		
9,400.0	6,879.3	6,863.2	6,861.7	50.3	13.5	-88.14	-1,551.7	-823.9	749.2	688.9	60.23	12.438		
9,500.0	6,879.1	6,864.9	6,863.4	51.9	13.5	-88.35	-1,551.7	-823.8	831.8	769.8	62.04	13.408		
9,600.0	6,879.0	6,866.5	6,865.0	53.6	13.5	-88.57	-1,551.8	-823.7	918.0	854.1	63.86	14.375		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - DIC Cross #31-32 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7025-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
11,800.0	6,875.9	6,901.9	6,901.9	93.1	138.0	-90.16	-5,409.3	-837.4	955.9	726.6	229.32	4.169		
11,900.0	6,875.8	6,901.8	6,901.8	94.9	138.0	-90.14	-5,409.3	-837.4	867.8	636.6	231.20	3.753		
12,000.0	6,875.7	6,901.7	6,901.7	96.8	138.0	-90.12	-5,409.3	-837.4	782.5	549.4	233.08	3.357		
12,100.0	6,875.5	6,901.5	6,901.5	98.6	138.0	-90.10	-5,409.3	-837.4	701.1	466.1	234.96	2.984		
12,200.0	6,875.4	6,901.4	6,901.4	100.5	138.0	-90.08	-5,409.3	-837.4	625.1	388.3	236.84	2.639		
12,300.0	6,875.2	6,901.2	6,901.2	102.3	138.0	-90.07	-5,409.3	-837.4	556.8	318.0	238.73	2.332		
12,400.0	6,875.1	6,901.1	6,901.1	104.2	138.0	-90.05	-5,409.3	-837.4	499.2	258.6	240.61	2.075		
12,500.0	6,875.0	6,901.0	6,901.0	106.1	138.0	-90.03	-5,409.3	-837.4	456.5	214.0	242.50	1.883		
12,600.0	6,874.8	6,900.8	6,900.8	107.9	138.0	-90.01	-5,409.3	-837.4	433.2	188.8	244.39	1.773		
12,653.9	6,874.7	6,900.7	6,900.7	108.9	138.0	-90.00	-5,409.3	-837.4	429.8	184.4	245.41	1.751	CC, ES, SF	
12,700.0	6,874.7	6,900.7	6,900.7	109.8	138.0	-89.99	-5,409.3	-837.4	432.3	186.0	246.28	1.755		
12,800.0	6,874.5	6,900.5	6,900.5	111.7	138.0	-89.97	-5,409.3	-837.4	454.0	205.8	248.17	1.829		
12,900.0	6,874.4	6,900.4	6,900.4	113.5	138.0	-89.95	-5,409.3	-837.4	495.3	245.3	250.06	1.981		
13,000.0	6,874.3	6,900.3	6,900.3	115.4	138.0	-89.94	-5,409.3	-837.4	551.9	299.9	251.95	2.190		
13,100.0	6,874.1	6,900.1	6,900.1	117.3	138.0	-89.92	-5,409.3	-837.4	619.5	365.7	253.84	2.441		
13,200.0	6,874.0	6,900.0	6,900.0	119.2	138.0	-89.90	-5,409.3	-837.4	695.0	439.3	255.73	2.718		
13,300.0	6,873.8	6,899.8	6,899.8	121.0	138.0	-89.88	-5,409.3	-837.4	776.0	518.4	257.63	3.012		
13,400.0	6,873.7	6,899.7	6,899.7	122.9	138.0	-89.86	-5,409.3	-837.4	861.1	601.6	259.52	3.318		
13,500.0	6,873.6	6,899.6	6,899.6	124.8	138.0	-89.84	-5,409.3	-837.4	949.1	687.6	261.42	3.630		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	-97.51	-120.9	-917.8	925.7					
100.0	100.0	91.1	91.1	0.1	0.1	-97.50	-120.8	-917.9	925.9	925.6	0.23	3,967.283		
200.0	200.0	195.2	195.2	0.3	0.4	-97.48	-120.5	-918.1	926.0	925.3	0.69	1,340.837		
228.9	228.9	222.9	222.9	0.4	0.4	-97.47	-120.4	-918.1	926.0	925.1	0.82	1,134.826		
300.0	300.0	289.9	289.9	0.6	0.6	-97.46	-120.3	-918.3	926.1	925.0	1.12	827.308		
400.0	400.0	389.3	389.3	0.8	0.8	-97.45	-120.2	-918.8	926.6	925.1	1.57	588.748		
500.0	500.0	495.7	495.7	1.0	1.0	-29.28	-119.8	-919.1	925.7	923.7	2.03	455.882		
600.0	599.9	588.6	588.6	1.2	1.2	-29.38	-119.3	-919.3	922.4	920.0	2.46	374.831		
700.0	699.7	694.3	694.3	1.5	1.5	-29.60	-118.8	-919.7	917.1	914.1	2.94	312.394		
800.0	799.3	788.6	788.6	1.7	1.7	-29.87	-118.0	-920.0	909.3	905.9	3.40	267.737		
900.0	898.6	893.3	893.3	2.0	2.0	-30.28	-117.1	-920.4	899.4	895.5	3.89	231.143		
1,000.0	997.5	986.6	986.6	2.3	2.2	-30.76	-116.3	-920.7	887.2	882.8	4.37	203.120		
1,100.0	1,096.1	1,086.3	1,086.2	2.6	2.5	-31.39	-115.5	-921.4	873.2	868.3	4.88	178.905		
1,200.0	1,194.2	1,187.2	1,187.2	3.0	2.7	-32.16	-114.8	-921.8	856.8	851.4	5.41	158.333		
1,300.0	1,291.7	1,294.4	1,294.4	3.4	3.0	-33.12	-113.6	-921.6	837.7	831.7	5.94	141.088		
1,400.0	1,388.6	1,387.0	1,386.9	3.9	3.2	-34.14	-112.6	-921.0	816.2	809.7	6.45	126.626		
1,500.0	1,484.9	1,484.8	1,484.8	4.4	3.3	-35.39	-111.8	-920.6	793.0	786.1	6.98	113.641		
1,600.0	1,580.8	1,582.1	1,582.1	5.0	3.5	-36.59	-111.4	-919.8	769.0	761.5	7.54	102.055		
1,700.0	1,676.7	1,678.9	1,678.8	5.5	3.7	-37.84	-110.6	-919.0	745.2	737.1	8.13	91.627		
1,800.0	1,772.6	1,774.3	1,774.3	6.1	3.8	-39.17	-110.2	-918.0	721.7	712.9	8.72	82.743		
1,900.0	1,868.6	1,868.7	1,868.6	6.7	4.0	-40.61	-110.2	-917.1	698.7	689.3	9.33	74.904		
2,000.0	1,964.5	1,964.4	1,964.3	7.2	4.1	-42.15	-110.0	-916.3	676.3	666.3	9.96	67.901		
2,100.0	2,060.4	2,061.2	2,061.1	7.8	4.2	-43.85	-110.3	-915.2	654.3	643.7	10.61	61.667		
2,200.0	2,156.4	2,154.3	2,154.2	8.4	4.4	-45.57	-110.3	-914.3	632.9	621.6	11.27	56.158		
2,300.0	2,252.3	2,250.2	2,250.1	9.0	4.5	-47.44	-110.5	-913.8	612.6	600.6	11.97	51.171		
2,400.0	2,348.2	2,346.7	2,346.6	9.6	4.7	-49.43	-110.2	-913.0	592.6	579.8	12.75	46.493		
2,500.0	2,444.2	2,439.7	2,439.7	10.2	4.9	-51.45	-110.0	-912.6	573.7	560.1	13.54	42.353		
2,600.0	2,540.1	2,534.5	2,534.4	10.8	5.0	-53.66	-110.1	-912.4	555.9	541.6	14.33	38.802		
2,700.0	2,636.0	2,631.0	2,630.9	11.4	5.1	-56.08	-110.4	-912.1	539.1	524.0	15.12	35.669		
2,800.0	2,731.9	2,728.5	2,728.4	12.0	5.3	-58.67	-110.7	-911.6	523.1	507.2	15.97	32.767		
2,900.0	2,827.9	2,826.3	2,826.2	12.6	5.5	-61.42	-110.7	-910.7	507.9	491.0	16.88	30.080		
3,000.0	2,923.8	2,921.5	2,921.4	13.2	5.7	-64.19	-110.2	-910.0	493.7	475.8	17.84	27.674		
3,100.0	3,019.7	3,014.8	3,014.7	13.7	5.9	-67.04	-110.0	-909.7	481.2	462.4	18.80	25.601		
3,200.0	3,115.7	3,113.1	3,113.0	14.3	6.1	-70.21	-109.9	-909.2	470.0	450.2	19.78	23.763		
3,300.0	3,211.6	3,208.8	3,208.7	14.9	6.3	-73.44	-109.7	-908.5	460.2	439.4	20.77	22.161		
3,400.0	3,307.5	3,307.9	3,307.8	15.5	6.6	-76.85	-108.8	-907.8	451.6	429.8	21.76	20.749		
3,500.0	3,403.5	3,403.8	3,403.7	16.1	6.8	-80.23	-107.6	-907.2	444.3	421.5	22.73	19.543		
3,600.0	3,499.4	3,500.5	3,500.3	16.7	7.1	-83.73	-106.3	-906.6	438.6	414.9	23.68	18.521		
3,700.0	3,595.3	3,598.1	3,597.9	17.3	7.3	-87.33	-104.7	-905.9	434.5	409.9	24.60	17.661		
3,800.0	3,691.2	3,694.8	3,694.6	17.9	7.5	-90.98	-103.0	-904.9	431.9	406.4	25.47	16.953		
3,886.5	3,774.2	3,777.2	3,777.0	18.5	7.7	-94.13	-101.5	-903.8	431.1	404.9	26.19	16.462		
3,900.0	3,787.2	3,790.0	3,789.8	18.5	7.8	-94.63	-101.3	-903.6	431.1	404.8	26.29	16.396		
4,000.0	3,883.1	3,885.5	3,885.3	19.1	8.0	-98.29	-99.7	-902.4	432.4	405.3	27.06	15.981		
4,100.0	3,979.0	3,978.6	3,978.3	19.7	8.3	-101.77	-98.4	-901.5	435.9	408.1	27.76	15.701		
4,200.0	4,075.0	4,071.5	4,071.2	20.3	8.5	-105.16	-97.6	-901.1	441.8	413.4	28.40	15.556		
4,300.0	4,170.9	4,166.9	4,166.7	20.9	8.7	-108.55	-97.3	-900.5	449.9	420.9	28.99	15.522		
4,400.0	4,266.8	4,262.0	4,261.8	21.5	8.9	-111.78	-97.0	-900.2	459.7	430.2	29.48	15.591		
4,500.0	4,362.7	4,356.1	4,355.9	22.1	9.0	-114.78	-97.0	-900.4	471.2	441.3	29.86	15.781		
4,600.0	4,458.7	4,450.2	4,450.0	22.7	9.1	-117.61	-97.4	-900.9	484.5	454.3	30.14	16.072		
4,700.0	4,554.6	4,540.7	4,540.4	23.3	9.1	-120.16	-98.3	-901.5	499.5	469.1	30.40	16.429		
4,800.0	4,650.5	4,627.6	4,627.3	23.9	9.2	-122.48	-100.6	-901.8	517.2	486.6	30.66	16.869		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
4,900.0	4,746.5	4,717.5	4,717.1	24.5	9.3	-124.71	-104.3	-902.0	537.3	506.4	30.91	17.383		
5,000.0	4,842.4	4,812.6	4,812.2	25.1	9.3	-126.91	-108.7	-902.1	558.7	527.5	31.13	17.944		
5,100.0	4,938.3	4,911.8	4,911.3	25.7	9.4	-129.05	-112.8	-902.2	580.5	549.1	31.35	18.517		
5,200.0	5,034.3	5,006.5	5,005.9	26.3	9.5	-130.97	-116.5	-902.2	602.8	571.2	31.57	19.091		
5,300.0	5,130.2	5,105.5	5,104.8	26.9	9.6	-132.88	-119.9	-901.7	625.5	593.7	31.79	19.676		
5,400.0	5,226.2	5,206.9	5,206.1	27.5	9.8	-134.90	-122.4	-900.6	647.9	615.9	31.98	20.260		
5,500.0	5,322.9	5,309.8	5,309.0	27.9	10.0	-136.86	-123.5	-899.2	667.9	635.8	32.11	20.803		
5,600.0	5,420.5	5,400.0	5,399.2	28.3	10.1	-138.37	-124.4	-897.3	686.1	653.8	32.28	21.256		
5,700.0	5,518.7	5,492.2	5,491.4	28.6	10.3	-139.70	-125.6	-894.3	702.9	670.5	32.44	21.665		
5,800.0	5,617.6	5,590.0	5,589.1	28.9	10.5	-140.88	-127.0	-890.5	717.6	685.0	32.61	22.006		
5,900.0	5,716.9	5,689.0	5,688.0	29.1	10.7	-141.77	-128.6	-887.2	729.9	697.1	32.79	22.257		
6,000.0	5,816.6	5,790.8	5,789.8	29.3	10.9	-142.39	-130.6	-884.5	739.3	706.3	32.99	22.409		
6,100.0	5,916.5	5,896.9	5,895.8	29.5	11.1	-142.78	-132.2	-882.2	745.4	712.2	33.21	22.447		
6,200.0	6,016.4	6,002.5	6,001.4	29.6	11.4	-148.82	-132.8	-880.1	747.9	714.5	33.46	22.354		
6,300.0	6,116.4	6,100.5	6,099.4	29.7	11.6	-148.65	-132.8	-877.5	749.3	715.5	33.78	22.184		
6,400.0	6,216.2	6,203.8	6,202.7	29.7	11.8	-32.00	-132.4	-874.4	745.1	711.6	33.51	22.237		
6,500.0	6,314.2	6,302.5	6,301.3	29.7	12.1	-33.66	-131.7	-871.5	729.8	697.2	32.55	22.422		
6,600.0	6,408.9	6,395.5	6,394.2	29.6	12.3	-36.44	-131.0	-868.6	704.2	673.2	31.00	22.716		
6,700.0	6,498.6	6,481.6	6,480.3	29.5	12.5	-40.46	-130.5	-865.7	669.8	640.7	29.10	23.016		
6,800.0	6,581.8	6,563.9	6,562.5	29.4	12.7	-46.06	-130.4	-862.8	628.2	600.9	27.29	23.016		
6,900.0	6,657.1	6,639.0	6,637.6	29.2	12.9	-53.32	-130.2	-860.1	581.2	554.9	26.27	22.124		
7,000.0	6,723.1	6,704.9	6,703.4	29.1	13.1	-61.96	-130.1	-857.8	532.0	505.4	26.63	19.977		
7,100.0	6,778.8	6,760.4	6,758.9	28.9	13.2	-71.12	-130.0	-855.9	484.9	456.8	28.13	17.237		
7,200.0	6,823.2	6,804.5	6,803.0	28.8	13.3	-79.41	-129.9	-854.3	445.5	415.7	29.82	14.944		
7,300.0	6,855.5	6,836.7	6,835.1	28.7	13.4	-85.49	-129.9	-853.2	420.5	389.5	31.06	13.540		
7,371.3	6,870.9	6,851.9	6,850.3	28.7	13.4	-87.96	-129.8	-852.7	414.8	383.1	31.70	13.088 CC, ES		
7,400.0	6,875.2	6,856.2	6,854.6	28.7	13.4	-88.48	-129.8	-852.5	415.8	383.9	31.89	13.040 SF		
7,500.0	6,881.9	6,862.7	6,861.2	28.8	13.5	-88.00	-129.8	-852.3	433.8	401.3	32.46	13.363		
7,600.0	6,881.8	6,862.4	6,860.8	29.0	13.5	-87.89	-129.8	-852.3	472.5	439.3	33.22	14.226		
7,700.0	6,881.7	6,862.1	6,860.5	29.3	13.5	-87.85	-129.8	-852.3	527.6	493.5	34.13	15.459		
7,800.0	6,881.5	6,861.7	6,860.2	29.7	13.5	-87.80	-129.8	-852.3	594.6	559.4	35.18	16.903		
7,900.0	6,881.4	6,861.4	6,859.9	30.3	13.5	-87.76	-129.8	-852.4	669.8	633.5	36.33	18.436		
8,000.0	6,881.2	6,861.1	6,859.5	31.1	13.5	-87.71	-129.8	-852.4	750.8	713.2	37.59	19.977		
8,100.0	6,881.1	6,860.8	6,859.2	31.9	13.5	-87.67	-129.8	-852.4	836.0	797.1	38.92	21.479		
8,200.0	6,881.0	6,860.4	6,858.9	32.9	13.5	-87.62	-129.8	-852.4	924.1	883.8	40.33	22.916		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-88.64	0.4	-15.0	15.0	15.0	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	-88.64	0.4	-15.0	15.0	14.8	0.22	66.957		
200.0	200.0	200.0	200.0	0.3	0.3	-88.64	0.4	-15.0	15.0	14.4	0.67	22.319 CC, ES		
300.0	300.0	299.6	299.6	0.6	0.6	-87.26	0.8	-16.3	16.3	15.2	1.12	14.597		
400.0	400.0	399.1	399.0	0.8	0.8	-84.16	2.0	-20.0	20.1	18.5	1.56	12.846		
500.0	500.0	498.4	498.1	1.0	1.0	-13.42	4.1	-26.1	25.2	23.2	2.00	12.579		
600.0	599.9	597.5	596.8	1.2	1.3	-11.98	7.1	-34.6	30.3	27.9	2.45	12.399		
700.0	699.7	696.5	695.1	1.5	1.6	-11.16	10.8	-45.5	35.5	32.6	2.90	12.239		
800.0	799.3	795.4	793.0	1.7	1.9	-10.74	15.4	-58.8	40.6	37.3	3.36	12.090		
900.0	898.6	894.2	890.4	2.0	2.2	-10.57	20.8	-74.5	45.8	41.9	3.83	11.945		
1,000.0	997.5	992.8	987.1	2.3	2.6	-10.58	27.0	-92.6	50.9	46.6	4.31	11.800		
1,100.0	1,096.1	1,091.3	1,083.3	2.6	3.0	-10.72	34.0	-113.0	56.0	51.2	4.81	11.651		
1,200.0	1,194.2	1,189.7	1,178.7	3.0	3.5	-10.95	41.8	-135.6	61.1	55.8	5.32	11.494		
1,300.0	1,291.7	1,288.0	1,273.3	3.4	4.0	-11.26	50.3	-160.6	66.2	60.4	5.84	11.328		
1,400.0	1,388.6	1,386.1	1,367.1	3.9	4.6	-11.62	59.7	-187.8	71.2	64.9	6.39	11.158		
1,500.0	1,484.9	1,484.1	1,460.0	4.4	5.2	-12.04	69.8	-217.3	76.3	69.3	6.95	10.969		
1,600.0	1,580.8	1,583.2	1,553.4	5.0	5.9	-12.35	80.7	-248.8	82.2	74.6	7.56	10.876		
1,700.0	1,676.7	1,683.1	1,647.3	5.5	6.6	-12.61	91.6	-280.8	88.2	80.1	8.17	10.799		
1,800.0	1,772.6	1,782.9	1,741.3	6.1	7.3	-12.83	102.6	-312.7	94.3	85.5	8.79	10.721		
1,900.0	1,868.6	1,882.7	1,835.2	6.7	8.0	-13.03	113.5	-344.6	100.3	90.9	9.42	10.644		
2,000.0	1,964.5	1,982.5	1,929.1	7.2	8.7	-13.21	124.5	-376.5	106.4	96.3	10.06	10.571		
2,100.0	2,060.4	2,082.3	2,023.1	7.8	9.4	-13.36	135.5	-408.4	112.4	101.7	10.70	10.501		
2,200.0	2,156.4	2,182.1	2,117.0	8.4	10.1	-13.50	146.4	-440.4	118.5	107.1	11.35	10.435		
2,300.0	2,252.3	2,282.0	2,211.0	9.0	10.8	-13.63	157.4	-472.3	124.5	112.5	12.00	10.373		
2,400.0	2,348.2	2,381.8	2,304.9	9.6	11.5	-13.75	168.4	-504.2	130.6	117.9	12.66	10.315		
2,500.0	2,444.2	2,481.6	2,398.8	10.2	12.2	-13.85	179.3	-536.1	136.6	123.3	13.32	10.260		
2,600.0	2,540.1	2,581.4	2,492.8	10.8	12.9	-13.95	190.3	-568.0	142.7	128.7	13.98	10.208		
2,700.0	2,636.0	2,681.2	2,586.7	11.4	13.7	-14.04	201.3	-600.0	148.7	134.1	14.64	10.160		
2,800.0	2,731.9	2,781.0	2,680.6	12.0	14.4	-14.12	212.2	-631.9	154.8	139.5	15.30	10.114		
2,900.0	2,827.9	2,880.9	2,774.6	12.6	15.1	-14.19	223.2	-663.8	160.8	144.9	15.97	10.071		
3,000.0	2,923.8	2,980.7	2,868.5	13.2	15.8	-14.26	234.1	-695.7	166.9	150.2	16.64	10.031		
3,100.0	3,019.7	3,080.5	2,962.5	13.7	16.5	-14.33	245.1	-727.6	172.9	155.6	17.30	9.993		
3,200.0	3,115.7	3,180.3	3,056.4	14.3	17.2	-14.39	256.1	-759.6	179.0	161.0	17.97	9.958		
3,300.0	3,211.6	3,280.1	3,150.3	14.9	17.9	-14.44	267.0	-791.5	185.0	166.4	18.65	9.924		
3,400.0	3,307.5	3,379.9	3,244.3	15.5	18.7	-14.50	278.0	-823.4	191.1	171.8	19.32	9.892		
3,500.0	3,403.5	3,479.8	3,338.2	16.1	19.4	-14.55	289.0	-855.3	197.1	177.2	19.99	9.862		
3,600.0	3,499.4	3,579.6	3,432.1	16.7	20.1	-14.59	299.9	-887.2	203.2	182.5	20.66	9.833		
3,700.0	3,595.3	3,679.4	3,526.1	17.3	20.8	-14.64	310.9	-919.2	209.3	187.9	21.34	9.806		
3,800.0	3,691.2	3,779.2	3,620.0	17.9	21.5	-14.68	321.8	-951.1	215.3	193.3	22.01	9.781		
3,900.0	3,787.2	3,879.0	3,714.0	18.5	22.3	-14.72	332.8	-983.0	221.4	198.7	22.69	9.756		
4,000.0	3,883.1	3,978.8	3,807.9	19.1	23.0	-14.75	343.8	-1,014.9	227.4	204.1	23.37	9.733		
4,100.0	3,979.0	4,078.6	3,901.8	19.7	23.7	-14.79	354.7	-1,046.8	233.5	209.4	24.04	9.711		
4,200.0	4,075.0	4,178.5	3,995.8	20.3	24.4	-14.82	365.7	-1,078.8	239.5	214.8	24.72	9.690		
4,300.0	4,170.9	4,278.3	4,089.7	20.9	25.1	-14.85	376.7	-1,110.7	245.6	220.2	25.40	9.670		
4,400.0	4,266.8	4,378.1	4,183.6	21.5	25.8	-14.88	387.6	-1,142.6	251.6	225.6	26.08	9.650		
4,500.0	4,362.7	4,477.9	4,277.6	22.1	26.6	-14.91	398.6	-1,174.5	257.7	230.9	26.75	9.632		
4,600.0	4,458.7	4,577.7	4,371.5	22.7	27.3	-14.94	409.6	-1,206.4	263.8	236.3	27.43	9.614		
4,700.0	4,554.6	4,677.5	4,465.5	23.3	28.0	-14.97	420.5	-1,238.3	269.8	241.7	28.11	9.597		
4,800.0	4,650.5	4,777.4	4,559.4	23.9	28.7	-14.99	431.5	-1,270.3	275.9	247.1	28.79	9.581		
4,900.0	4,746.5	4,877.2	4,653.3	24.5	29.4	-15.02	442.4	-1,302.2	281.9	252.4	29.47	9.566		
5,000.0	4,842.4	4,978.8	4,749.0	25.1	30.2	-15.04	453.6	-1,334.6	287.9	257.8	30.15	9.548		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,100.0	4,938.3	5,089.7	4,854.3	25.7	30.8	-15.19	464.9	-1,367.5	291.4	260.6	30.86	9.446		
5,200.0	5,034.3	5,200.7	4,961.0	26.3	31.3	-15.51	474.9	-1,396.6	291.2	259.6	31.59	9.219		
5,300.0	5,130.2	5,311.5	5,068.6	26.9	31.7	-16.03	483.5	-1,421.6	287.2	254.8	32.36	8.875		
5,400.0	5,226.2	5,421.8	5,176.6	27.5	32.1	-16.74	490.7	-1,442.7	279.7	246.5	33.17	8.433		
5,500.0	5,322.9	5,531.6	5,284.9	27.9	32.4	-17.49	496.5	-1,459.7	271.2	237.3	33.90	7.999		
5,600.0	5,420.5	5,641.0	5,393.4	28.3	32.7	-18.26	501.0	-1,472.7	262.3	227.7	34.59	7.584		
5,700.0	5,518.7	5,750.0	5,501.9	28.6	32.9	-19.07	504.1	-1,481.8	253.2	218.0	35.23	7.187		
5,800.0	5,617.6	5,858.5	5,610.3	28.9	33.0	-19.91	505.9	-1,486.9	243.7	207.9	35.82	6.804		
5,900.0	5,716.9	5,965.1	5,716.9	29.1	33.1	-20.78	506.4	-1,488.3	234.1	197.7	36.38	6.435		
6,000.0	5,816.6	6,064.8	5,816.6	29.3	33.2	-21.46	506.4	-1,488.3	226.5	189.7	36.80	6.154		
6,100.0	5,916.5	6,164.5	5,916.2	29.5	33.3	-22.50	503.9	-1,488.3	222.2	184.8	37.33	5.952		
6,165.4	5,981.8	6,228.7	5,980.0	29.5	33.3	-24.66	496.0	-1,488.3	221.2	182.9	38.29	5.778		
6,200.0	6,016.4	6,262.2	6,012.8	29.6	33.3	-94.45	489.8	-1,488.3	221.7	182.7	39.01	5.683		
6,300.0	6,116.4	6,354.9	6,102.1	29.7	33.3	-100.72	465.2	-1,488.3	225.4	183.2	42.16	5.347		
6,400.0	6,216.2	6,442.7	6,183.4	29.7	33.2	71.88	432.0	-1,488.3	233.7	187.8	45.93	5.089		
6,500.0	6,314.2	6,527.9	6,258.1	29.7	33.1	65.30	391.1	-1,488.3	245.2	196.6	48.66	5.040		
6,600.0	6,408.9	6,610.8	6,326.0	29.6	33.0	59.65	343.6	-1,488.3	258.7	208.7	49.99	5.175		
6,700.0	6,498.6	6,691.7	6,386.9	29.5	32.9	54.89	290.4	-1,488.3	273.0	223.1	49.90	5.472		
6,800.0	6,581.8	6,771.1	6,440.9	29.4	32.7	50.96	232.3	-1,488.3	287.4	238.9	48.54	5.921		
6,900.0	6,657.1	6,850.0	6,488.3	29.2	32.6	47.75	169.2	-1,488.3	301.0	254.8	46.19	6.516		
7,000.0	6,723.1	6,926.0	6,527.5	29.1	32.5	45.24	104.2	-1,488.3	313.3	270.1	43.21	7.252		
7,100.0	6,778.8	7,000.0	6,559.3	28.9	32.4	43.30	37.4	-1,488.3	323.9	283.9	40.00	8.098		
7,200.0	6,823.2	7,077.4	6,585.6	28.8	32.4	41.81	-35.4	-1,488.3	332.5	295.4	37.05	8.974		
7,300.0	6,855.5	7,150.0	6,603.3	28.7	32.3	40.81	-105.8	-1,488.3	338.7	303.8	34.92	9.699		
7,400.0	6,875.2	7,226.8	6,614.8	28.7	32.3	40.20	-181.7	-1,488.3	342.5	308.4	34.15	10.029		
7,500.0	6,881.9	7,302.8	6,618.6	28.8	32.4	40.01	-257.6	-1,488.3	343.8	308.8	34.98	9.829		
7,600.0	6,881.8	7,402.8	6,619.4	29.0	32.5	40.11	-357.6	-1,488.3	343.1	306.6	36.50	9.400		
7,700.0	6,881.7	7,502.8	6,620.2	29.3	32.7	40.21	-457.5	-1,488.3	342.3	304.2	38.14	8.975		
7,800.0	6,881.5	7,602.8	6,621.1	29.7	33.1	40.32	-557.5	-1,488.3	341.6	301.7	39.91	8.558		
7,900.0	6,881.4	7,702.8	6,621.9	30.3	33.5	40.42	-657.5	-1,488.3	340.9	299.1	41.79	8.156		
8,000.0	6,881.2	7,802.8	6,622.7	31.1	34.1	40.53	-757.5	-1,488.3	340.1	296.4	43.77	7.771		
8,100.0	6,881.1	7,902.8	6,623.5	31.9	34.8	40.63	-857.5	-1,488.3	339.4	293.6	45.83	7.406		
8,200.0	6,881.0	8,002.8	6,624.3	32.9	35.6	40.74	-957.5	-1,488.3	338.7	290.7	47.97	7.060		
8,300.0	6,880.8	8,102.8	6,625.2	34.0	36.5	40.84	-1,057.5	-1,488.3	337.9	287.8	50.17	6.736		
8,400.0	6,880.7	8,202.8	6,626.0	35.2	37.5	40.95	-1,157.5	-1,488.3	337.2	284.8	52.44	6.431		
8,500.0	6,880.5	8,302.8	6,626.8	36.5	38.7	41.06	-1,257.5	-1,488.3	336.5	281.7	54.76	6.145		
8,600.0	6,880.4	8,402.8	6,627.6	37.9	39.9	41.16	-1,357.5	-1,488.3	335.8	278.6	57.13	5.877		
8,700.0	6,880.3	8,502.8	6,628.5	39.3	41.2	41.27	-1,457.5	-1,488.3	335.1	275.5	59.54	5.627		
8,800.0	6,880.1	8,602.8	6,629.3	40.8	42.5	41.38	-1,557.5	-1,488.3	334.3	272.3	62.00	5.393		
8,900.0	6,880.0	8,702.7	6,630.1	42.3	44.0	41.49	-1,657.4	-1,488.3	333.6	269.1	64.49	5.173		
9,000.0	6,879.8	8,802.7	6,630.9	43.8	45.4	41.60	-1,757.4	-1,488.3	332.9	265.9	67.01	4.968		
9,100.0	6,879.7	8,902.7	6,631.7	45.4	46.9	41.71	-1,857.4	-1,488.3	332.2	262.6	69.57	4.775		
9,200.0	6,879.6	9,002.7	6,632.6	47.0	48.4	41.82	-1,957.4	-1,488.3	331.5	259.3	72.16	4.594		
9,300.0	6,879.4	9,102.7	6,633.4	48.6	50.0	41.93	-2,057.4	-1,488.3	330.7	256.0	74.77	4.424		
9,400.0	6,879.3	9,202.7	6,634.2	50.3	51.6	42.04	-2,157.4	-1,488.3	330.0	252.6	77.41	4.264		
9,500.0	6,879.1	9,302.7	6,635.0	51.9	53.2	42.15	-2,257.4	-1,488.3	329.3	249.2	80.07	4.113		
9,600.0	6,879.0	9,402.7	6,635.8	53.6	54.9	42.27	-2,357.4	-1,488.3	328.6	245.9	82.75	3.971		
9,700.0	6,878.9	9,502.7	6,636.7	55.3	56.5	42.38	-2,457.4	-1,488.3	327.9	242.4	85.46	3.837		
9,800.0	6,878.7	9,602.7	6,637.5	57.0	58.2	42.49	-2,557.4	-1,488.3	327.2	239.0	88.19	3.710		
9,900.0	6,878.6	9,702.7	6,638.3	58.8	59.9	42.61	-2,657.4	-1,488.3	326.5	235.5	90.93	3.590		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
10,000.0	6,878.4	9,802.7	6,639.1	60.5	61.6	42.72	-2,757.4	-1,488.3	325.8	232.1	93.70	3.477			
10,100.0	6,878.3	9,902.7	6,639.9	62.3	63.3	42.84	-2,857.4	-1,488.3	325.1	228.6	96.48	3.369			
10,200.0	6,878.2	10,002.7	6,640.8	64.0	65.1	42.95	-2,957.3	-1,488.3	324.4	225.1	99.28	3.267			
10,300.0	6,878.0	10,102.7	6,641.6	65.8	66.8	43.07	-3,057.3	-1,488.3	323.7	221.6	102.10	3.170			
10,400.0	6,877.9	10,202.7	6,642.4	67.6	68.6	43.18	-3,157.3	-1,488.3	323.0	218.0	104.93	3.078			
10,500.0	6,877.8	10,302.7	6,643.2	69.4	70.3	43.30	-3,257.3	-1,488.3	322.3	214.5	107.78	2.990			
10,600.0	6,877.6	10,402.7	6,644.0	71.2	72.1	43.42	-3,357.3	-1,488.3	321.6	210.9	110.64	2.906			
10,700.0	6,877.5	10,502.7	6,644.9	73.0	73.9	43.53	-3,457.3	-1,488.3	320.9	207.4	113.52	2.827			
10,800.0	6,877.3	10,602.7	6,645.7	74.8	75.7	43.65	-3,557.3	-1,488.3	320.2	203.8	116.41	2.750			
10,900.0	6,877.2	10,702.7	6,646.5	76.6	77.5	43.77	-3,657.3	-1,488.3	319.5	200.2	119.32	2.678			
11,000.0	6,877.1	10,802.7	6,647.3	78.4	79.3	43.89	-3,757.3	-1,488.3	318.8	196.5	122.24	2.608			
11,100.0	6,876.9	10,902.6	6,648.1	80.2	81.1	44.01	-3,857.3	-1,488.3	318.1	192.9	125.18	2.541			
11,200.0	6,876.8	11,002.6	6,649.0	82.0	82.9	44.13	-3,957.3	-1,488.3	317.4	189.3	128.12	2.477			
11,300.0	6,876.6	11,102.6	6,649.8	83.9	84.7	44.25	-4,057.3	-1,488.3	316.7	185.6	131.09	2.416			
11,400.0	6,876.5	11,202.6	6,650.6	85.7	86.5	44.37	-4,157.2	-1,488.3	316.0	182.0	134.06	2.357			
11,500.0	6,876.4	11,302.6	6,651.4	87.5	88.3	44.50	-4,257.2	-1,488.3	315.3	178.3	137.05	2.301			
11,600.0	6,876.2	11,402.6	6,652.2	89.4	90.2	44.62	-4,357.2	-1,488.3	314.7	174.6	140.05	2.247			
11,700.0	6,876.1	11,502.6	6,653.1	91.2	92.0	44.74	-4,457.2	-1,488.3	314.0	170.9	143.06	2.195			
11,800.0	6,875.9	11,602.6	6,653.9	93.1	93.8	44.87	-4,557.2	-1,488.3	313.3	167.2	146.09	2.145			
11,900.0	6,875.8	11,702.6	6,654.7	94.9	95.7	44.99	-4,657.2	-1,488.3	312.6	163.5	149.12	2.096			
12,000.0	6,875.7	11,802.6	6,655.5	96.8	97.5	45.11	-4,757.2	-1,488.3	311.9	159.8	152.17	2.050			
12,100.0	6,875.5	11,902.6	6,656.3	98.6	99.3	45.24	-4,857.2	-1,488.3	311.3	156.0	155.24	2.005			
12,200.0	6,875.4	12,002.6	6,657.2	100.5	101.2	45.36	-4,957.2	-1,488.3	310.6	152.3	158.31	1.962			
12,300.0	6,875.2	12,102.6	6,658.0	102.3	103.0	45.49	-5,057.2	-1,488.3	309.9	148.5	161.40	1.920			
12,400.0	6,875.1	12,202.6	6,658.8	104.2	104.9	45.62	-5,157.2	-1,488.3	309.2	144.8	164.50	1.880			
12,500.0	6,875.0	12,302.6	6,659.6	106.1	106.7	45.75	-5,257.2	-1,488.3	308.6	141.0	167.61	1.841			
12,600.0	6,874.8	12,402.6	6,660.4	107.9	108.6	45.87	-5,357.2	-1,488.3	307.9	137.2	170.73	1.803			
12,700.0	6,874.7	12,502.6	6,661.3	109.8	110.5	46.00	-5,457.1	-1,488.3	307.2	133.4	173.86	1.767			
12,800.0	6,874.5	12,602.6	6,662.1	111.7	112.3	46.13	-5,557.1	-1,488.3	306.6	129.6	177.01	1.732			
12,900.0	6,874.4	12,702.6	6,662.9	113.5	114.2	46.26	-5,657.1	-1,488.3	305.9	125.7	180.17	1.698			
13,000.0	6,874.3	12,802.6	6,663.7	115.4	116.0	46.39	-5,757.1	-1,488.3	305.2	121.9	183.33	1.665			
13,100.0	6,874.1	12,902.6	6,664.5	117.3	117.9	46.52	-5,857.1	-1,488.3	304.6	118.1	186.52	1.633			
13,200.0	6,874.0	13,002.6	6,665.4	119.2	119.8	46.65	-5,957.1	-1,488.3	303.9	114.2	189.71	1.602			
13,300.0	6,873.8	13,102.5	6,666.2	121.0	121.6	46.78	-6,057.1	-1,488.3	303.3	110.4	192.91	1.572			
13,400.0	6,873.7	13,202.5	6,667.0	122.9	123.5	46.92	-6,157.1	-1,488.3	302.6	106.5	196.13	1.543			
13,500.0	6,873.6	13,302.5	6,667.8	124.8	125.4	47.05	-6,257.1	-1,488.3	302.0	102.6	199.35	1.515			
13,600.0	6,873.4	13,402.5	6,668.6	126.7	127.3	47.18	-6,357.1	-1,488.3	301.3	98.7	202.59	1.487 Level 3			
13,700.0	6,873.3	13,502.5	6,669.5	128.6	129.1	47.32	-6,457.1	-1,488.3	300.7	94.8	205.84	1.461 Level 3			
13,800.0	6,873.1	13,602.5	6,670.3	130.4	131.0	47.45	-6,557.1	-1,488.3	300.0	90.9	209.10	1.435 Level 3			
13,900.0	6,873.0	13,702.5	6,671.1	132.3	132.9	47.59	-6,657.0	-1,488.3	299.4	87.0	212.38	1.410 Level 3			
14,000.0	6,872.9	13,802.5	6,671.9	134.2	134.8	47.72	-6,757.0	-1,488.3	298.7	83.0	215.66	1.385 Level 3			
14,100.0	6,872.7	13,902.5	6,672.7	136.1	136.7	47.86	-6,857.0	-1,488.3	298.1	79.1	218.96	1.361 Level 3			
14,200.0	6,872.6	14,002.5	6,673.6	138.0	138.5	48.00	-6,957.0	-1,488.3	297.4	75.2	222.26	1.338 Level 3			
14,300.0	6,872.4	14,102.5	6,674.4	139.9	140.4	48.14	-7,057.0	-1,488.3	296.8	71.2	225.58	1.316 Level 3			
14,400.0	6,872.3	14,202.5	6,675.2	141.8	142.3	48.27	-7,157.0	-1,488.3	296.1	67.2	228.91	1.294 Level 3			
14,500.0	6,872.2	14,302.5	6,676.0	143.7	144.2	48.41	-7,257.0	-1,488.3	295.5	63.2	232.25	1.272 Level 3			
14,600.0	6,872.0	14,402.5	6,676.8	145.5	146.1	48.55	-7,357.0	-1,488.3	294.9	59.3	235.61	1.252 Level 3			
14,618.6	6,872.0	14,421.0	6,677.0	145.9	146.4	48.58	-7,375.5	-1,488.3	294.7	58.5	236.23	1.248 Level 2, SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	1.0	1.0	0.0	0.0	90.03	0.0	15.0	15.0	15.0	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	90.03	0.0	15.0	15.0	14.8	0.23	66.276		
200.0	200.0	201.0	201.0	0.3	0.3	90.03	0.0	15.0	15.0	14.4	0.68	22.239		
300.0	300.0	301.0	301.0	0.6	0.6	90.03	0.0	15.0	15.0	13.9	1.13	13.361		
400.0	400.0	401.0	401.0	0.8	0.8	90.03	0.0	15.0	15.0	13.5	1.58	9.549 CC		
500.0	500.0	501.0	501.0	1.0	1.0	159.93	0.0	15.0	16.3	14.2	2.02	8.050		
600.0	599.9	600.9	600.9	1.2	1.2	163.78	0.0	15.0	20.0	17.5	2.47	8.107		
700.0	699.7	700.7	700.7	1.5	1.5	167.73	0.0	15.0	26.3	23.4	2.92	9.028		
800.0	799.3	800.3	800.3	1.7	1.7	170.86	0.0	15.0	35.3	32.0	3.37	10.481		
900.0	898.6	900.8	900.8	2.0	1.9	172.83	0.6	13.8	45.7	41.9	3.82	11.970		
1,000.0	997.5	1,001.5	1,001.4	2.3	2.1	173.90	2.3	10.3	56.1	51.8	4.26	13.176		
1,100.0	1,096.1	1,102.6	1,102.3	2.6	2.3	174.47	5.2	4.2	66.5	61.8	4.70	14.140		
1,200.0	1,194.2	1,203.9	1,203.2	3.0	2.6	174.76	9.2	-4.2	76.9	71.7	5.15	14.916		
1,300.0	1,291.7	1,305.5	1,304.1	3.4	2.9	174.85	14.4	-15.1	87.3	81.7	5.62	15.542		
1,400.0	1,388.6	1,407.4	1,404.9	3.9	3.1	174.82	20.8	-28.4	97.6	91.5	6.09	16.044		
1,500.0	1,484.9	1,509.6	1,505.6	4.4	3.5	174.70	28.4	-44.2	108.0	101.4	6.57	16.438		
1,600.0	1,580.8	1,612.2	1,606.1	5.0	3.8	174.45	37.2	-62.5	116.8	109.7	7.08	16.494		
1,700.0	1,676.7	1,715.2	1,706.5	5.5	4.2	174.02	47.1	-83.4	123.0	115.3	7.61	16.154		
1,800.0	1,772.6	1,818.5	1,806.4	6.1	4.7	173.42	58.3	-106.7	126.5	118.3	8.16	15.506		
1,900.0	1,868.6	1,919.3	1,903.6	6.7	5.2	172.69	70.0	-131.2	128.1	119.4	8.72	14.691		
2,000.0	1,964.5	2,019.3	1,999.8	7.2	5.7	171.98	81.7	-155.6	129.6	120.3	9.29	13.951		
2,100.0	2,060.4	2,119.3	2,096.1	7.8	6.2	171.29	93.4	-180.0	131.2	121.3	9.88	13.281		
2,200.0	2,156.4	2,219.3	2,192.3	8.4	6.7	170.61	105.1	-204.3	132.8	122.3	10.47	12.675		
2,300.0	2,252.3	2,319.2	2,288.6	9.0	7.3	169.95	116.7	-228.7	134.4	123.3	11.08	12.122		
2,400.0	2,348.2	2,419.2	2,384.8	9.6	7.8	169.31	128.4	-253.1	136.0	124.3	11.70	11.618		
2,500.0	2,444.2	2,519.2	2,481.1	10.2	8.3	168.68	140.1	-277.5	137.6	125.3	12.33	11.156		
2,600.0	2,540.1	2,619.2	2,577.3	10.8	8.9	168.06	151.8	-301.9	139.2	126.3	12.97	10.732		
2,700.0	2,636.0	2,719.1	2,673.6	11.4	9.4	167.46	163.5	-326.2	140.9	127.3	13.62	10.340		
2,800.0	2,731.9	2,819.1	2,769.8	12.0	10.0	166.87	175.1	-350.6	142.6	128.3	14.29	9.979		
2,900.0	2,827.9	2,919.1	2,866.1	12.6	10.6	166.30	186.8	-375.0	144.2	129.3	14.96	9.644		
3,000.0	2,923.8	3,019.1	2,962.4	13.2	11.1	165.74	198.5	-399.4	145.9	130.3	15.64	9.332		
3,100.0	3,019.7	3,119.0	3,058.6	13.7	11.7	165.20	210.2	-423.7	147.7	131.3	16.33	9.043		
3,200.0	3,115.7	3,219.0	3,154.9	14.3	12.2	164.66	221.8	-448.1	149.4	132.4	17.03	8.773		
3,300.0	3,211.6	3,319.0	3,251.1	14.9	12.8	164.14	233.5	-472.5	151.1	133.4	17.74	8.520		
3,400.0	3,307.5	3,419.0	3,347.4	15.5	13.4	163.63	245.2	-496.9	152.9	134.4	18.45	8.284		
3,500.0	3,403.5	3,518.9	3,443.6	16.1	13.9	163.13	256.9	-521.3	154.6	135.5	19.18	8.063		
3,600.0	3,499.4	3,618.9	3,539.9	16.7	14.5	162.64	268.5	-545.6	156.4	136.5	19.91	7.854		
3,700.0	3,595.3	3,718.9	3,636.1	17.3	15.1	162.17	280.2	-570.0	158.2	137.5	20.66	7.659		
3,800.0	3,691.2	3,818.9	3,732.4	17.9	15.6	161.70	291.9	-594.4	160.0	138.6	21.41	7.474		
3,900.0	3,787.2	3,918.8	3,828.6	18.5	16.2	161.25	303.6	-618.8	161.8	139.6	22.17	7.300		
4,000.0	3,883.1	4,018.8	3,924.9	19.1	16.8	160.80	315.3	-643.2	163.6	140.7	22.93	7.136		
4,100.0	3,979.0	4,118.8	4,021.1	19.7	17.3	160.37	326.9	-667.5	165.5	141.7	23.70	6.980		
4,200.0	4,075.0	4,218.8	4,117.4	20.3	17.9	159.94	338.6	-691.9	167.3	142.8	24.48	6.833		
4,300.0	4,170.9	4,318.7	4,213.6	20.9	18.5	159.52	350.3	-716.3	169.1	143.9	25.27	6.693		
4,400.0	4,266.8	4,418.7	4,309.9	21.5	19.1	159.12	362.0	-740.7	171.0	144.9	26.06	6.560		
4,500.0	4,362.7	4,518.7	4,406.1	22.1	19.6	158.72	373.6	-765.1	172.9	146.0	26.86	6.434		
4,600.0	4,458.7	4,618.7	4,502.4	22.7	20.2	158.33	385.3	-789.4	174.7	147.1	27.67	6.315		
4,700.0	4,554.6	4,718.7	4,598.6	23.3	20.8	157.95	397.0	-813.8	176.6	148.1	28.48	6.201		
4,800.0	4,650.5	4,818.6	4,694.9	23.9	21.3	157.57	408.7	-838.2	178.5	149.2	29.30	6.092		
4,900.0	4,746.5	4,918.6	4,791.1	24.5	21.9	157.21	420.3	-862.6	180.4	150.3	30.12	5.988		
5,000.0	4,842.4	5,018.6	4,887.4	25.1	22.5	156.85	432.0	-887.0	182.3	151.3	30.95	5.889		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,100.0	4,938.3	5,118.6	4,983.6	25.7	23.1	156.50	443.7	-911.3	184.2	152.4	31.79	5.795		
5,200.0	5,034.3	5,218.5	5,079.9	26.3	23.6	156.15	455.4	-935.7	186.1	153.5	32.63	5.704		
5,300.0	5,130.2	5,315.6	5,173.5	26.9	24.1	155.89	466.5	-959.0	188.4	155.0	33.41	5.640		
5,400.0	5,226.2	5,409.9	5,265.1	27.5	24.5	156.01	476.2	-979.2	193.1	159.1	34.01	5.679		
5,500.0	5,322.9	5,504.1	5,357.2	27.9	24.8	156.26	484.6	-996.7	198.2	163.7	34.48	5.748		
5,600.0	5,420.5	5,600.0	5,451.7	28.3	25.1	156.53	491.7	-1,011.6	203.0	168.1	34.89	5.819		
5,700.0	5,518.7	5,692.0	5,542.8	28.6	25.4	156.81	497.3	-1,023.3	207.5	172.3	35.20	5.895		
5,800.0	5,617.6	5,785.8	5,636.0	28.9	25.6	157.10	501.7	-1,032.5	211.7	176.3	35.45	5.973		
5,900.0	5,716.9	5,879.5	5,729.4	29.1	25.8	157.41	504.8	-1,038.9	215.7	180.1	35.62	6.056		
6,000.0	5,816.6	5,973.0	5,822.9	29.3	25.9	157.74	506.5	-1,042.5	219.3	183.6	35.71	6.142		
6,100.0	5,916.5	6,067.6	5,917.5	29.5	26.0	158.07	507.0	-1,043.5	222.7	186.9	35.74	6.230		
6,200.0	6,016.4	6,167.6	6,017.4	29.6	26.1	90.00	507.0	-1,043.5	223.8	188.0	35.84	6.244		
6,241.1	6,057.5	6,208.7	6,058.5	29.6	26.2	90.04	506.8	-1,043.5	223.8	187.8	35.95	6.226		
6,300.0	6,116.4	6,267.4	6,117.1	29.7	26.2	90.93	503.4	-1,043.5	223.8	188.1	35.77	6.258		
6,400.0	6,216.2	6,365.8	6,214.1	29.7	26.2	-86.56	487.5	-1,043.5	224.2	189.2	34.99	6.408		
6,500.0	6,314.2	6,463.0	6,307.2	29.7	26.1	-84.14	459.7	-1,043.5	225.0	190.8	34.14	6.590		
6,600.0	6,408.9	6,559.1	6,395.1	29.6	26.0	-81.85	420.9	-1,043.5	226.1	192.8	33.31	6.788		
6,700.0	6,498.6	6,654.2	6,476.5	29.5	25.9	-79.72	371.9	-1,043.5	227.5	194.9	32.55	6.988		
6,800.0	6,581.8	6,748.4	6,550.5	29.4	25.7	-77.78	313.8	-1,043.5	229.0	197.1	31.91	7.177		
6,900.0	6,657.1	6,841.7	6,616.3	29.2	25.6	-76.07	247.6	-1,043.5	230.6	199.2	31.40	7.345		
7,000.0	6,723.1	6,934.4	6,673.2	29.1	25.4	-74.60	174.5	-1,043.5	232.2	201.1	31.05	7.478		
7,100.0	6,778.8	7,026.5	6,720.5	28.9	25.2	-73.38	95.5	-1,043.5	233.6	202.7	30.88	7.563		
7,200.0	6,823.2	7,118.2	6,757.8	28.8	25.1	-72.42	11.9	-1,043.5	234.8	203.8	30.95	7.586		
7,300.0	6,855.5	7,209.5	6,784.7	28.7	25.0	-71.73	-75.3	-1,043.5	235.7	204.4	31.27	7.537		
7,400.0	6,875.2	7,300.0	6,801.0	28.7	25.0	-71.32	-164.3	-1,043.5	236.2	204.4	31.87	7.412		
7,500.0	6,881.9	7,391.5	6,806.7	28.8	25.1	-71.18	-255.5	-1,043.5	236.4	203.7	32.79	7.211		
7,600.0	6,881.8	7,490.8	6,806.0	29.0	25.4	-71.06	-354.9	-1,043.5	236.6	202.4	34.21	6.917		
7,700.0	6,881.7	7,590.8	6,805.3	29.3	25.8	-70.93	-454.9	-1,043.5	236.8	200.9	35.94	6.588		
7,800.0	6,881.5	7,690.8	6,804.6	29.7	26.4	-70.80	-554.9	-1,043.5	237.0	199.0	37.95	6.245		
7,900.0	6,881.4	7,790.8	6,803.9	30.3	27.2	-70.67	-654.9	-1,043.5	237.2	197.0	40.17	5.903		
8,000.0	6,881.2	7,890.8	6,803.2	31.1	28.1	-70.55	-754.8	-1,043.5	237.3	194.8	42.59	5.572		
8,100.0	6,881.1	7,990.8	6,802.5	31.9	29.2	-70.42	-854.8	-1,043.5	237.5	192.4	45.17	5.258		
8,200.0	6,881.0	8,090.8	6,801.8	32.9	30.4	-70.29	-954.8	-1,043.5	237.7	189.8	47.88	4.965		
8,300.0	6,880.8	8,190.8	6,801.1	34.0	31.6	-70.17	-1,054.8	-1,043.5	237.9	187.2	50.70	4.692		
8,400.0	6,880.7	8,290.8	6,800.4	35.2	33.0	-70.04	-1,154.8	-1,043.5	238.1	184.5	53.61	4.441		
8,500.0	6,880.5	8,390.8	6,799.7	36.5	34.4	-69.91	-1,254.8	-1,043.5	238.3	181.7	56.60	4.210		
8,600.0	6,880.4	8,490.8	6,799.0	37.9	35.9	-69.79	-1,354.8	-1,043.5	238.5	178.8	59.65	3.998		
8,700.0	6,880.3	8,590.8	6,798.3	39.3	37.4	-69.66	-1,454.8	-1,043.5	238.7	175.9	62.76	3.803		
8,800.0	6,880.1	8,690.8	6,797.6	40.8	39.0	-69.54	-1,554.8	-1,043.5	238.9	173.0	65.91	3.624		
8,900.0	6,880.0	8,790.8	6,796.9	42.3	40.6	-69.41	-1,654.8	-1,043.5	239.1	170.0	69.09	3.460		
9,000.0	6,879.8	8,890.8	6,796.2	43.8	42.2	-69.29	-1,754.8	-1,043.5	239.3	167.0	72.31	3.309		
9,100.0	6,879.7	8,990.8	6,795.5	45.4	43.8	-69.16	-1,854.8	-1,043.5	239.5	163.9	75.56	3.169		
9,200.0	6,879.6	9,090.8	6,794.8	47.0	45.5	-69.04	-1,954.8	-1,043.5	239.7	160.8	78.83	3.040		
9,300.0	6,879.4	9,190.8	6,794.1	48.6	47.2	-68.91	-2,054.8	-1,043.5	239.9	157.7	82.12	2.921		
9,400.0	6,879.3	9,290.8	6,793.4	50.3	48.9	-68.79	-2,154.8	-1,043.5	240.1	154.6	85.43	2.810		
9,500.0	6,879.1	9,390.8	6,792.7	51.9	50.6	-68.66	-2,254.8	-1,043.5	240.3	151.5	88.75	2.707		
9,600.0	6,879.0	9,490.8	6,792.0	53.6	52.4	-68.54	-2,354.8	-1,043.5	240.5	148.4	92.09	2.611		
9,700.0	6,878.9	9,590.7	6,791.3	55.3	54.1	-68.41	-2,454.8	-1,043.5	240.7	145.2	95.43	2.522		
9,800.0	6,878.7	9,690.7	6,790.6	57.0	55.9	-68.29	-2,554.8	-1,043.5	240.9	142.1	98.79	2.438		
9,900.0	6,878.6	9,790.7	6,789.9	58.8	57.6	-68.17	-2,654.8	-1,043.5	241.1	138.9	102.15	2.360		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,000.0	6,878.4	9,890.7	6,789.2	60.5	59.4	-68.04	-2,754.8	-1,043.5	241.3	135.8	105.52	2.287		
10,100.0	6,878.3	9,990.7	6,788.5	62.3	61.2	-67.92	-2,854.8	-1,043.5	241.5	132.6	108.89	2.218		
10,200.0	6,878.2	10,090.7	6,787.8	64.0	63.0	-67.80	-2,954.8	-1,043.5	241.7	129.5	112.26	2.153		
10,300.0	6,878.0	10,190.7	6,787.1	65.8	64.8	-67.68	-3,054.8	-1,043.5	241.9	126.3	115.64	2.092		
10,400.0	6,877.9	10,290.7	6,786.4	67.6	66.6	-67.55	-3,154.8	-1,043.5	242.1	123.1	119.02	2.034		
10,500.0	6,877.8	10,390.7	6,785.7	69.4	68.4	-67.43	-3,254.7	-1,043.5	242.4	120.0	122.40	1.980		
10,600.0	6,877.6	10,490.7	6,785.0	71.2	70.2	-67.31	-3,354.7	-1,043.5	242.6	116.8	125.79	1.928		
10,700.0	6,877.5	10,590.7	6,784.3	73.0	72.0	-67.19	-3,454.7	-1,043.5	242.8	113.6	129.17	1.880		
10,800.0	6,877.3	10,690.7	6,783.6	74.8	73.9	-67.07	-3,554.7	-1,043.5	243.0	110.4	132.56	1.833		
10,900.0	6,877.2	10,790.7	6,783.0	76.6	75.7	-66.95	-3,654.7	-1,043.5	243.2	107.3	135.94	1.789		
11,000.0	6,877.1	10,890.7	6,782.3	78.4	77.5	-66.83	-3,754.7	-1,043.5	243.4	104.1	139.32	1.747		
11,100.0	6,876.9	10,990.7	6,781.6	80.2	79.4	-66.70	-3,854.7	-1,043.5	243.7	101.0	142.70	1.707		
11,200.0	6,876.8	11,090.7	6,780.9	82.0	81.2	-66.58	-3,954.7	-1,043.5	243.9	97.8	146.08	1.669		
11,300.0	6,876.6	11,190.7	6,780.2	83.9	83.1	-66.46	-4,054.7	-1,043.5	244.1	94.6	149.46	1.633		
11,400.0	6,876.5	11,290.7	6,779.5	85.7	84.9	-66.34	-4,154.7	-1,043.5	244.3	91.5	152.84	1.599		
11,500.0	6,876.4	11,390.7	6,778.8	87.5	86.8	-66.22	-4,254.7	-1,043.5	244.6	88.3	156.21	1.566		
11,600.0	6,876.2	11,490.7	6,778.1	89.4	88.6	-66.10	-4,354.7	-1,043.5	244.8	85.2	159.58	1.534		
11,700.0	6,876.1	11,590.7	6,777.4	91.2	90.5	-65.99	-4,454.7	-1,043.5	245.0	82.1	162.95	1.504		
11,800.0	6,875.9	11,690.7	6,776.7	93.1	92.4	-65.87	-4,554.7	-1,043.5	245.2	78.9	166.31	1.475 Level 3		
11,900.0	6,875.8	11,790.7	6,776.0	94.9	94.2	-65.75	-4,654.7	-1,043.5	245.5	75.8	169.67	1.447 Level 3		
12,000.0	6,875.7	11,890.7	6,775.3	96.8	96.1	-65.63	-4,754.7	-1,043.5	245.7	72.7	173.03	1.420 Level 3		
12,100.0	6,875.5	11,990.7	6,774.6	98.6	98.0	-65.51	-4,854.7	-1,043.5	245.9	69.5	176.39	1.394 Level 3		
12,200.0	6,875.4	12,090.7	6,773.9	100.5	99.8	-65.39	-4,954.7	-1,043.5	246.2	66.4	179.74	1.370 Level 3		
12,300.0	6,875.2	12,190.7	6,773.2	102.3	101.7	-65.27	-5,054.7	-1,043.5	246.4	63.3	183.08	1.346 Level 3		
12,400.0	6,875.1	12,290.7	6,772.5	104.2	103.6	-65.16	-5,154.7	-1,043.5	246.6	60.2	186.43	1.323 Level 3		
12,500.0	6,875.0	12,390.7	6,771.8	106.1	105.4	-65.04	-5,254.7	-1,043.5	246.9	57.1	189.76	1.301 Level 3		
12,600.0	6,874.8	12,490.7	6,771.1	107.9	107.3	-64.92	-5,354.7	-1,043.5	247.1	54.0	193.10	1.280 Level 3		
12,700.0	6,874.7	12,590.7	6,770.4	109.8	109.2	-64.80	-5,454.7	-1,043.5	247.3	50.9	196.43	1.259 Level 3		
12,800.0	6,874.5	12,690.7	6,769.7	111.7	111.1	-64.69	-5,554.7	-1,043.5	247.6	47.8	199.76	1.239 Level 2		
12,900.0	6,874.4	12,790.7	6,769.0	113.5	113.0	-64.57	-5,654.7	-1,043.5	247.8	44.7	203.08	1.220 Level 2		
13,000.0	6,874.3	12,890.7	6,768.3	115.4	114.8	-64.45	-5,754.6	-1,043.5	248.1	41.7	206.39	1.202 Level 2		
13,100.0	6,874.1	12,990.7	6,767.6	117.3	116.7	-64.34	-5,854.6	-1,043.5	248.3	38.6	209.71	1.184 Level 2		
13,200.0	6,874.0	13,090.7	6,766.9	119.2	118.6	-64.22	-5,954.6	-1,043.5	248.5	35.5	213.01	1.167 Level 2		
13,300.0	6,873.8	13,190.7	6,766.2	121.0	120.5	-64.11	-6,054.6	-1,043.5	248.8	32.5	216.32	1.150 Level 2		
13,400.0	6,873.7	13,290.7	6,765.5	122.9	122.4	-63.99	-6,154.6	-1,043.5	249.0	29.4	219.61	1.134 Level 2		
13,500.0	6,873.6	13,390.7	6,764.8	124.8	124.3	-63.87	-6,254.6	-1,043.5	249.3	26.4	222.91	1.118 Level 2		
13,600.0	6,873.4	13,490.7	6,764.1	126.7	126.1	-63.76	-6,354.6	-1,043.5	249.5	23.3	226.19	1.103 Level 2		
13,700.0	6,873.3	13,590.7	6,763.4	128.6	128.0	-63.64	-6,454.6	-1,043.5	249.8	20.3	229.48	1.088 Level 2		
13,800.0	6,873.1	13,690.7	6,762.7	130.4	129.9	-63.53	-6,554.6	-1,043.5	250.0	17.3	232.75	1.074 Level 2		
13,900.0	6,873.0	13,790.7	6,762.0	132.3	131.8	-63.41	-6,654.6	-1,043.5	250.3	14.2	236.03	1.060 Level 2		
14,000.0	6,872.9	13,890.7	6,761.3	134.2	133.7	-63.30	-6,754.6	-1,043.5	250.5	11.2	239.29	1.047 Level 2		
14,100.0	6,872.7	13,990.7	6,760.6	136.1	135.6	-63.19	-6,854.6	-1,043.5	250.8	8.2	242.56	1.034 Level 2		
14,200.0	6,872.6	14,090.7	6,759.9	138.0	137.5	-63.07	-6,954.6	-1,043.5	251.0	5.2	245.81	1.021 Level 2		
14,300.0	6,872.4	14,190.7	6,759.2	139.9	139.4	-62.96	-7,054.6	-1,043.5	251.3	2.2	249.06	1.009 Level 2		
14,400.0	6,872.3	14,290.7	6,758.5	141.8	141.3	-62.85	-7,154.6	-1,043.5	251.5	-0.8	252.31	0.997 Level 1		
14,500.0	6,872.2	14,390.7	6,757.8	143.7	143.2	-62.73	-7,254.6	-1,043.5	251.8	-3.8	255.55	0.985 Level 1		
14,600.0	6,872.0	14,490.7	6,757.1	145.5	145.1	-62.62	-7,354.6	-1,043.5	252.0	-6.8	258.79	0.974 Level 1		
14,618.6	6,872.0	14,507.9	6,757.0	145.9	145.4	-62.60	-7,371.8	-1,043.5	252.1	-7.3	259.37	0.972 Level 1, ES, SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth Depth (ft)	Vertical Depth Depth (ft)	Measured Depth Depth (ft)	Vertical Depth Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	90.46	-0.4	45.1	45.1						
100.0	100.0	100.0	100.0	0.1	0.1	90.46	-0.4	45.1	45.1	44.9	0.22	200.823			
200.0	200.0	200.0	200.0	0.3	0.3	90.46	-0.4	45.1	45.1	44.5	0.67	66.941			
300.0	300.0	300.0	300.0	0.6	0.6	90.46	-0.4	45.1	45.1	44.0	1.12	40.165			
400.0	400.0	400.0	400.0	0.8	0.8	90.46	-0.4	45.1	45.1	43.6	1.57	28.689	CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	159.24	-0.4	45.1	46.4	44.3	2.02	22.965			
600.0	599.9	599.9	599.9	1.2	1.2	160.81	-0.4	45.1	50.1	47.6	2.46	20.309			
700.0	699.7	699.7	699.7	1.5	1.5	162.98	-0.4	45.1	56.3	53.4	2.92	19.300			
800.0	799.3	799.3	799.3	1.7	1.7	165.30	-0.4	45.1	65.1	61.7	3.37	19.315			
900.0	898.6	898.6	898.6	2.0	1.9	167.50	-0.4	45.1	76.5	72.7	3.82	20.005			
1,000.0	997.5	997.5	997.5	2.3	2.1	169.42	-0.4	45.1	90.6	86.3	4.28	21.161			
1,100.0	1,096.1	1,096.1	1,096.1	2.6	2.4	171.04	-0.4	45.1	107.3	102.5	4.74	22.649			
1,200.0	1,194.2	1,194.2	1,194.2	3.0	2.6	172.38	-0.4	45.1	126.6	121.4	5.19	24.380			
1,300.0	1,291.7	1,295.0	1,295.0	3.4	2.8	173.31	0.4	44.2	147.5	141.8	5.65	26.114			
1,400.0	1,388.6	1,396.6	1,396.5	3.9	3.0	173.71	2.9	41.3	168.6	162.5	6.10	27.644			
1,500.0	1,484.9	1,498.6	1,498.3	4.4	3.2	173.76	7.2	36.3	189.8	183.3	6.56	28.956			
1,600.0	1,580.8	1,601.5	1,600.8	5.0	3.5	173.54	13.3	29.1	209.8	202.8	7.04	29.807			
1,700.0	1,676.7	1,705.3	1,703.8	5.5	3.7	173.06	21.3	19.7	227.4	219.9	7.54	30.163			
1,800.0	1,772.6	1,809.9	1,807.3	6.1	4.0	172.35	31.2	8.2	242.6	234.6	8.06	30.105			
1,900.0	1,868.6	1,915.2	1,911.0	6.7	4.3	171.44	43.0	-5.7	255.4	246.8	8.60	29.699			
2,000.0	1,964.5	2,017.9	2,011.7	7.2	4.7	170.38	56.1	-21.0	266.1	257.0	9.16	29.046			
2,100.0	2,060.4	2,117.2	2,109.0	7.8	5.0	169.39	69.0	-36.2	276.6	266.8	9.73	28.421			
2,200.0	2,156.4	2,216.6	2,206.4	8.4	5.4	168.48	81.9	-51.3	287.1	276.7	10.32	27.820			
2,300.0	2,252.3	2,315.9	2,303.7	9.0	5.7	167.64	94.9	-66.5	297.6	286.7	10.92	27.255			
2,400.0	2,348.2	2,415.3	2,401.0	9.6	6.1	166.85	107.8	-81.7	308.2	296.7	11.53	26.724			
2,500.0	2,444.2	2,514.6	2,498.3	10.2	6.5	166.11	120.7	-96.8	318.9	306.8	12.16	26.225			
2,600.0	2,540.1	2,614.0	2,595.7	10.8	6.9	165.42	133.7	-112.0	329.7	316.9	12.80	25.755			
2,700.0	2,636.0	2,713.3	2,693.0	11.4	7.3	164.78	146.6	-127.2	340.4	327.0	13.45	25.314			
2,800.0	2,731.9	2,812.7	2,790.3	12.0	7.7	164.17	159.5	-142.3	351.2	337.1	14.11	24.900			
2,900.0	2,827.9	2,912.0	2,887.6	12.6	8.1	163.60	172.5	-157.5	362.1	347.3	14.77	24.511			
3,000.0	2,923.8	3,011.3	2,985.0	13.2	8.5	163.06	185.4	-172.7	373.0	357.5	15.45	24.145			
3,100.0	3,019.7	3,110.7	3,082.3	13.7	8.9	162.56	198.3	-187.8	383.9	367.8	16.13	23.800			
3,200.0	3,115.7	3,210.0	3,179.6	14.3	9.4	162.08	211.3	-203.0	394.8	378.0	16.82	23.476			
3,300.0	3,211.6	3,309.4	3,277.0	14.9	9.8	161.63	224.2	-218.2	405.8	388.3	17.51	23.171			
3,400.0	3,307.5	3,408.7	3,374.3	15.5	10.2	161.20	237.1	-233.3	416.8	398.6	18.21	22.883			
3,500.0	3,403.5	3,508.1	3,471.6	16.1	10.6	160.79	250.1	-248.5	427.8	408.9	18.92	22.612			
3,600.0	3,499.4	3,607.4	3,568.9	16.7	11.0	160.41	263.0	-263.7	438.8	419.2	19.63	22.355			
3,700.0	3,595.3	3,706.8	3,666.3	17.3	11.5	160.04	275.9	-278.8	449.9	429.5	20.35	22.112			
3,800.0	3,691.2	3,806.1	3,763.6	17.9	11.9	159.69	288.9	-294.0	461.0	439.9	21.06	21.883			
3,900.0	3,787.2	3,905.5	3,860.9	18.5	12.3	159.36	301.8	-309.1	472.0	450.2	21.79	21.665			
4,000.0	3,883.1	4,004.8	3,958.2	19.1	12.7	159.04	314.7	-324.3	483.1	460.6	22.51	21.459			
4,100.0	3,979.0	4,104.2	4,055.6	19.7	13.2	158.74	327.7	-339.5	494.3	471.0	23.24	21.263			
4,200.0	4,075.0	4,203.5	4,152.9	20.3	13.6	158.45	340.6	-354.6	505.4	481.4	23.98	21.077			
4,300.0	4,170.9	4,302.9	4,250.2	20.9	14.0	158.17	353.6	-369.8	516.5	491.8	24.71	20.900			
4,400.0	4,266.8	4,402.2	4,347.6	21.5	14.5	157.90	366.5	-385.0	527.7	502.2	25.45	20.731			
4,500.0	4,362.7	4,501.6	4,444.9	22.1	14.9	157.65	379.4	-400.1	538.8	512.6	26.19	20.570			
4,600.0	4,458.7	4,600.9	4,542.2	22.7	15.3	157.40	392.4	-415.3	550.0	523.1	26.94	20.417			
4,700.0	4,554.6	4,700.2	4,639.5	23.3	15.8	157.17	405.3	-430.5	561.2	533.5	27.68	20.271			
4,800.0	4,650.5	4,799.6	4,736.9	23.9	16.2	156.94	418.2	-445.6	572.4	543.9	28.43	20.131			
4,900.0	4,746.5	4,898.9	4,834.2	24.5	16.6	156.72	431.2	-460.8	583.6	554.4	29.18	19.998			
5,000.0	4,842.4	4,998.3	4,931.5	25.1	17.1	156.52	444.1	-476.0	594.8	564.8	29.93	19.870			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)											Offset Site Error:		0.0 ft		
Survey Program:		0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
5,100.0	4,938.3	5,097.6	5,028.8	25.7	17.5	156.31	457.0	-491.1	606.0	575.3	30.69	19.748					
5,200.0	5,034.3	5,196.9	5,126.0	26.3	17.9	156.12	469.9	-506.3	617.2	585.8	31.44	19.631					
5,300.0	5,130.2	5,282.3	5,210.0	26.9	18.2	156.04	480.2	-518.3	629.6	597.5	32.06	19.638					
5,400.0	5,226.2	5,367.3	5,293.9	27.5	18.4	156.15	488.9	-528.4	643.9	611.3	32.62	19.739					
5,500.0	5,322.9	5,452.0	5,377.9	27.9	18.7	156.39	495.8	-536.6	657.9	624.8	33.10	19.876					
5,600.0	5,420.5	5,536.5	5,462.0	28.3	18.8	156.66	501.2	-542.9	670.8	637.3	33.50	20.024					
5,700.0	5,518.7	5,620.8	5,546.2	28.6	19.0	156.95	505.0	-547.3	682.8	649.0	33.83	20.184					
5,800.0	5,617.6	5,700.0	5,625.3	28.9	19.1	157.26	507.0	-549.7	693.9	659.8	34.08	20.359					
5,900.0	5,716.9	5,791.6	5,716.9	29.1	19.3	157.62	507.6	-550.5	703.8	669.6	34.27	20.539					
6,000.0	5,816.6	5,891.3	5,816.6	29.3	19.4	157.93	507.6	-550.5	711.4	676.9	34.45	20.652					
6,100.0	5,916.5	5,991.2	5,916.4	29.5	19.5	158.25	505.8	-550.5	715.7	681.1	34.54	20.719					
6,200.0	6,016.4	6,089.3	6,013.6	29.6	19.5	91.15	492.6	-550.5	717.0	682.7	34.28	20.914					
6,300.0	6,116.4	6,182.6	6,103.7	29.7	19.5	93.06	468.7	-550.5	717.9	684.1	33.84	21.217					
6,400.0	6,216.2	6,271.2	6,186.0	29.7	19.4	-84.58	436.0	-550.5	720.4	687.2	33.17	21.716					
6,500.0	6,314.2	6,357.1	6,261.6	29.7	19.2	-82.32	395.4	-550.5	723.9	691.4	32.47	22.294					
6,600.0	6,408.9	6,440.7	6,330.4	29.6	19.1	-80.21	347.9	-550.5	728.2	696.4	31.80	22.903					
6,700.0	6,498.6	6,522.3	6,392.2	29.5	18.9	-78.25	294.6	-550.5	733.1	701.9	31.19	23.503					
6,800.0	6,581.8	6,600.0	6,445.4	29.4	18.7	-76.52	238.1	-550.5	738.2	707.5	30.68	24.059					
6,900.0	6,657.1	6,681.1	6,494.5	29.2	18.5	-74.92	173.6	-550.5	743.3	713.0	30.29	24.543					
7,000.0	6,723.1	6,758.6	6,534.8	29.1	18.3	-73.57	107.4	-550.5	748.1	718.1	30.03	24.912					
7,100.0	6,778.8	6,835.3	6,567.9	28.9	18.2	-72.45	38.2	-550.5	752.4	722.4	29.95	25.122					
7,200.0	6,823.2	6,911.3	6,593.6	28.8	18.1	-71.57	-33.2	-550.5	755.9	725.9	30.07	25.137					
7,300.0	6,855.5	6,986.8	6,612.1	28.7	18.0	-70.94	-106.4	-550.5	758.6	728.1	30.44	24.920					
7,400.0	6,875.2	7,062.0	6,623.2	28.7	18.1	-70.55	-180.7	-550.5	760.2	729.2	31.06	24.478					
7,500.0	6,881.9	7,138.8	6,626.9	28.8	18.4	-70.42	-257.4	-550.5	760.8	728.9	31.96	23.803					
7,534.0	6,882.0	7,170.5	6,626.9	28.8	18.6	-70.41	-289.1	-550.5	760.9	728.4	32.45	23.445					
7,600.0	6,881.8	7,236.4	6,626.8	29.0	19.1	-70.42	-355.0	-550.5	760.8	727.3	33.49	22.717					
7,700.0	6,881.7	7,336.4	6,626.7	29.3	20.1	-70.42	-455.0	-550.5	760.8	725.5	35.33	21.533					
7,800.0	6,881.5	7,436.4	6,626.5	29.7	21.2	-70.42	-555.0	-550.5	760.8	723.4	37.44	20.320					
7,900.0	6,881.4	7,536.4	6,626.4	30.3	22.5	-70.42	-655.0	-550.5	760.8	721.0	39.77	19.129					
8,000.0	6,881.2	7,636.4	6,626.2	31.1	23.8	-70.42	-755.0	-550.5	760.8	718.5	42.29	17.989					
8,100.0	6,881.1	7,736.4	6,626.1	31.9	25.3	-70.42	-855.0	-550.5	760.8	715.9	44.97	16.919					
8,200.0	6,881.0	7,836.4	6,626.0	32.9	26.7	-70.42	-955.0	-550.5	760.8	713.1	47.77	15.926					
8,300.0	6,880.8	7,936.4	6,625.8	34.0	28.2	-70.42	-1,055.0	-550.5	760.8	710.1	50.68	15.011					
8,400.0	6,880.7	8,036.4	6,625.7	35.2	29.8	-70.42	-1,155.0	-550.5	760.8	707.1	53.69	14.171					
8,500.0	6,880.5	8,136.4	6,625.5	36.5	31.4	-70.42	-1,255.0	-550.5	760.8	704.1	56.77	13.403					
8,600.0	6,880.4	8,236.4	6,625.4	37.9	33.0	-70.42	-1,355.0	-550.5	760.8	700.9	59.91	12.699					
8,700.0	6,880.3	8,336.4	6,625.3	39.3	34.7	-70.42	-1,455.0	-550.5	760.8	697.7	63.11	12.056					
8,800.0	6,880.1	8,436.4	6,625.1	40.8	36.4	-70.42	-1,555.0	-550.5	760.8	694.5	66.35	11.466					
8,900.0	6,880.0	8,536.4	6,625.0	42.3	38.1	-70.42	-1,655.0	-550.5	760.8	691.2	69.64	10.925					
9,000.0	6,879.8	8,636.4	6,624.8	43.8	39.8	-70.42	-1,755.0	-550.5	760.8	687.9	72.96	10.428					
9,100.0	6,879.7	8,736.4	6,624.7	45.4	41.6	-70.42	-1,855.0	-550.5	760.8	684.5	76.31	9.970					
9,200.0	6,879.6	8,836.4	6,624.6	47.0	43.3	-70.42	-1,955.0	-550.5	760.8	681.1	79.69	9.548					
9,300.0	6,879.4	8,936.4	6,624.4	48.6	45.1	-70.42	-2,055.0	-550.5	760.8	677.7	83.09	9.157					
9,400.0	6,879.3	9,036.4	6,624.3	50.3	46.9	-70.42	-2,155.0	-550.5	760.8	674.3	86.51	8.795					
9,500.0	6,879.1	9,136.4	6,624.1	51.9	48.7	-70.42	-2,255.0	-550.4	760.8	670.9	89.94	8.459					
9,600.0	6,879.0	9,236.4	6,624.0	53.6	50.5	-70.42	-2,355.0	-550.4	760.8	667.4	93.40	8.146					
9,700.0	6,878.9	9,336.4	6,623.9	55.3	52.3	-70.42	-2,455.0	-550.4	760.8	664.0	96.87	7.854					
9,800.0	6,878.7	9,436.4	6,623.7	57.0	54.1	-70.42	-2,555.0	-550.4	760.8	660.5	100.35	7.582					
9,900.0	6,878.6	9,536.4	6,623.6	58.8	55.9	-70.42	-2,655.0	-550.4	760.8	657.0	103.85	7.327					

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design				Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #1 (3-14-16)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
10,000.0	6,878.4	9,636.4	6,623.4	60.5	57.7	-70.42	-2,755.0	-550.4	760.8	653.5	107.35	7.087				
10,100.0	6,878.3	9,736.4	6,623.3	62.3	59.6	-70.42	-2,855.0	-550.4	760.8	650.0	110.86	6.863				
10,200.0	6,878.2	9,836.4	6,623.2	64.0	61.4	-70.42	-2,955.0	-550.4	760.8	646.4	114.39	6.651				
10,300.0	6,878.0	9,936.4	6,623.0	65.8	63.3	-70.42	-3,055.0	-550.4	760.8	642.9	117.92	6.452				
10,400.0	6,877.9	10,036.4	6,622.9	67.6	65.1	-70.42	-3,155.0	-550.4	760.8	639.4	121.45	6.264				
10,500.0	6,877.8	10,136.4	6,622.7	69.4	67.0	-70.42	-3,255.0	-550.4	760.8	635.8	125.00	6.087				
10,600.0	6,877.6	10,236.4	6,622.6	71.2	68.8	-70.42	-3,355.0	-550.4	760.8	632.3	128.55	5.919				
10,700.0	6,877.5	10,336.4	6,622.5	73.0	70.7	-70.42	-3,455.0	-550.4	760.8	628.7	132.10	5.759				
10,800.0	6,877.3	10,436.4	6,622.3	74.8	72.5	-70.42	-3,555.0	-550.4	760.8	625.2	135.67	5.608				
10,900.0	6,877.2	10,536.4	6,622.2	76.6	74.4	-70.42	-3,655.0	-550.4	760.8	621.6	139.23	5.464				
11,000.0	6,877.1	10,636.4	6,622.0	78.4	76.3	-70.42	-3,755.0	-550.4	760.8	618.0	142.80	5.328				
11,100.0	6,876.9	10,736.4	6,621.9	80.2	78.1	-70.42	-3,855.0	-550.4	760.8	614.5	146.38	5.198				
11,200.0	6,876.8	10,836.4	6,621.8	82.0	80.0	-70.42	-3,955.0	-550.4	760.8	610.9	149.95	5.074				
11,300.0	6,876.6	10,936.4	6,621.6	83.9	81.9	-70.42	-4,055.0	-550.4	760.8	607.3	153.53	4.955				
11,400.0	6,876.5	11,036.4	6,621.5	85.7	83.8	-70.42	-4,155.0	-550.4	760.8	603.7	157.12	4.842				
11,500.0	6,876.4	11,136.4	6,621.3	87.5	85.6	-70.42	-4,255.0	-550.4	760.8	600.1	160.71	4.734				
11,600.0	6,876.2	11,236.4	6,621.2	89.4	87.5	-70.42	-4,355.0	-550.4	760.8	596.5	164.30	4.631				
11,700.0	6,876.1	11,336.4	6,621.1	91.2	89.4	-70.42	-4,455.0	-550.4	760.8	592.9	167.89	4.532				
11,800.0	6,875.9	11,436.4	6,620.9	93.1	91.3	-70.42	-4,555.0	-550.4	760.8	589.3	171.48	4.437				
11,900.0	6,875.8	11,536.4	6,620.8	94.9	93.2	-70.42	-4,655.0	-550.4	760.8	585.7	175.08	4.346				
12,000.0	6,875.7	11,636.4	6,620.6	96.8	95.0	-70.42	-4,755.0	-550.4	760.8	582.1	178.68	4.258				
12,100.0	6,875.5	11,736.4	6,620.5	98.6	96.9	-70.42	-4,855.0	-550.4	760.8	578.5	182.28	4.174				
12,200.0	6,875.4	11,836.4	6,620.4	100.5	98.8	-70.42	-4,955.0	-550.4	760.8	574.9	185.89	4.093				
12,300.0	6,875.2	11,936.4	6,620.2	102.3	100.7	-70.42	-5,055.0	-550.4	760.8	571.3	189.49	4.015				
12,400.0	6,875.1	12,036.4	6,620.1	104.2	102.6	-70.42	-5,155.0	-550.4	760.8	567.7	193.10	3.940				
12,500.0	6,875.0	12,136.4	6,619.9	106.1	104.5	-70.42	-5,255.0	-550.4	760.8	564.1	196.71	3.868				
12,600.0	6,874.8	12,236.4	6,619.8	107.9	106.4	-70.42	-5,355.0	-550.4	760.8	560.5	200.32	3.798				
12,700.0	6,874.7	12,336.4	6,619.7	109.8	108.3	-70.42	-5,455.0	-550.4	760.8	556.9	203.93	3.731				
12,800.0	6,874.5	12,436.4	6,619.5	111.7	110.2	-70.42	-5,555.0	-550.4	760.8	553.3	207.55	3.666				
12,900.0	6,874.4	12,536.4	6,619.4	113.5	112.1	-70.42	-5,655.0	-550.4	760.8	549.7	211.16	3.603				
13,000.0	6,874.3	12,636.4	6,619.3	115.4	114.0	-70.42	-5,755.0	-550.4	760.8	546.1	214.78	3.542				
13,100.0	6,874.1	12,736.4	6,619.1	117.3	115.9	-70.42	-5,855.0	-550.4	760.8	542.4	218.40	3.484				
13,200.0	6,874.0	12,836.4	6,619.0	119.2	117.8	-70.42	-5,955.0	-550.4	760.8	538.8	222.01	3.427				
13,300.0	6,873.8	12,936.4	6,618.8	121.0	119.7	-70.42	-6,055.0	-550.4	760.8	535.2	225.63	3.372				
13,400.0	6,873.7	13,036.4	6,618.7	122.9	121.6	-70.42	-6,155.0	-550.4	760.8	531.6	229.25	3.319				
13,500.0	6,873.6	13,136.4	6,618.6	124.8	123.5	-70.42	-6,255.0	-550.4	760.8	528.0	232.87	3.267				
13,600.0	6,873.4	13,236.4	6,618.4	126.7	125.4	-70.42	-6,355.0	-550.4	760.8	524.3	236.50	3.217				
13,700.0	6,873.3	13,336.4	6,618.3	128.6	127.3	-70.42	-6,455.0	-550.4	760.8	520.7	240.12	3.169				
13,800.0	6,873.1	13,436.4	6,618.1	130.4	129.2	-70.42	-6,555.0	-550.4	760.8	517.1	243.74	3.121				
13,900.0	6,873.0	13,536.4	6,618.0	132.3	131.1	-70.42	-6,655.0	-550.4	760.8	513.5	247.37	3.076				
14,000.0	6,872.9	13,636.4	6,617.9	134.2	133.0	-70.42	-6,755.0	-550.4	760.8	509.8	251.00	3.031				
14,100.0	6,872.7	13,736.4	6,617.7	136.1	134.9	-70.42	-6,855.0	-550.4	760.8	506.2	254.62	2.988				
14,200.0	6,872.6	13,836.4	6,617.6	138.0	136.8	-70.42	-6,955.0	-550.4	760.8	502.6	258.25	2.946				
14,300.0	6,872.4	13,936.4	6,617.4	139.9	138.7	-70.42	-7,055.0	-550.4	760.8	499.0	261.88	2.905				
14,400.0	6,872.3	14,036.4	6,617.3	141.8	140.6	-70.42	-7,155.0	-550.4	760.8	495.3	265.51	2.866				
14,500.0	6,872.2	14,136.4	6,617.2	143.7	142.5	-70.42	-7,255.0	-550.4	760.8	491.7	269.13	2.827				
14,600.0	6,872.0	14,236.4	6,617.0	145.5	144.4	-70.42	-7,355.0	-550.4	760.8	488.1	272.76	2.789				
14,604.0	6,872.0	14,240.4	6,617.0	145.6	144.5	-70.42	-7,359.0	-550.4	760.8	487.9	272.91	2.788				
14,618.6	6,872.0	14,249.2	6,617.0	145.9	144.6	-70.42	-7,367.8	-550.4	760.9	487.5	273.33	2.784 SF				

Company:	PETROLEUM DEVELOPMENT CORP DJ	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	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 #1 (3-14-16)													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	0.0	0.0	0.0	0.0	90.56	-0.7	74.9	75.0					
100.0	100.0	100.0	100.0	0.1	0.1	90.56	-0.7	74.9	75.0	74.7	0.22	333.469		
200.0	200.0	200.0	200.0	0.3	0.3	90.56	-0.7	74.9	75.0	74.3	0.67	111.156		
300.0	300.0	300.0	300.0	0.6	0.6	90.56	-0.7	74.9	75.0	73.8	1.12	66.694		
400.0	400.0	400.0	400.0	0.8	0.8	90.56	-0.7	74.9	75.0	73.4	1.57	47.638 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	159.10	-0.7	74.9	76.2	74.2	2.02	37.734		
600.0	599.9	599.9	599.9	1.2	1.2	160.09	-0.7	74.9	79.9	77.4	2.46	32.403		
700.0	699.7	699.7	699.7	1.5	1.5	161.54	-0.7	74.9	86.0	83.1	2.92	29.512		
800.0	799.3	799.3	799.3	1.7	1.7	163.26	-0.7	74.9	94.8	91.4	3.37	28.126		
900.0	898.6	898.6	898.6	2.0	1.9	165.04	-0.7	74.9	106.1	102.2	3.82	27.733 SF		
1,000.0	997.5	997.5	997.5	2.3	2.1	166.76	-0.7	74.9	120.0	115.7	4.28	28.027		
1,100.0	1,096.1	1,096.1	1,096.1	2.6	2.4	168.34	-0.7	74.9	136.5	131.8	4.74	28.817		
1,200.0	1,194.2	1,194.2	1,194.2	3.0	2.6	169.73	-0.7	74.9	155.7	150.5	5.20	29.970		
1,300.0	1,291.7	1,291.7	1,291.7	3.4	2.8	170.95	-0.7	74.9	177.5	171.8	5.65	31.398		
1,400.0	1,388.6	1,388.6	1,388.6	3.9	3.0	172.00	-0.7	74.9	201.8	195.7	6.11	33.036		
1,500.0	1,484.9	1,484.9	1,484.9	4.4	3.2	172.89	-0.7	74.9	228.8	222.2	6.57	34.832		
1,600.0	1,580.8	1,580.8	1,580.8	5.0	3.4	173.67	-0.7	74.9	256.8	249.8	7.04	36.480		
1,700.0	1,676.7	1,676.7	1,676.7	5.5	3.7	174.30	-0.7	74.9	284.9	277.4	7.52	37.902		
1,800.0	1,772.6	1,772.6	1,772.6	6.1	3.9	174.81	-0.7	74.9	313.1	305.1	8.00	39.138		
1,900.0	1,868.6	1,868.6	1,868.6	6.7	4.1	175.24	-0.7	74.9	341.2	332.7	8.48	40.221		
2,000.0	1,964.5	1,964.5	1,964.5	7.2	4.3	175.60	-0.7	74.9	369.4	360.4	8.97	41.177		
2,100.0	2,060.4	2,064.3	2,064.3	7.8	4.5	175.86	-0.2	74.8	397.2	387.8	9.47	41.964		
2,200.0	2,156.4	2,167.0	2,166.9	8.4	4.8	175.80	2.8	73.9	423.7	413.8	9.97	42.507		
2,300.0	2,252.3	2,270.5	2,270.3	9.0	5.0	175.44	8.4	72.1	448.8	438.3	10.48	42.831		
2,400.0	2,348.2	2,374.7	2,374.1	9.6	5.2	174.83	16.8	69.6	472.3	461.3	11.00	42.951		
2,500.0	2,444.2	2,479.3	2,478.0	10.2	5.5	173.99	28.0	66.1	494.5	482.9	11.53	42.884		
2,600.0	2,540.1	2,584.3	2,582.0	10.8	5.7	172.96	41.9	61.9	515.2	503.2	12.08	42.639		
2,700.0	2,636.0	2,682.9	2,679.4	11.4	6.0	171.90	56.6	57.3	535.3	522.6	12.64	42.335		
2,800.0	2,731.9	2,780.4	2,775.7	12.0	6.2	170.93	71.2	52.9	555.5	542.2	13.22	42.027		
2,900.0	2,827.9	2,877.9	2,872.1	12.6	6.5	170.03	85.8	48.4	575.8	562.0	13.80	41.709		
3,000.0	2,923.8	2,975.5	2,968.4	13.2	6.8	169.19	100.3	43.9	596.2	581.8	14.40	41.391		
3,100.0	3,019.7	3,073.0	3,064.7	13.7	7.1	168.40	114.9	39.4	616.8	601.8	15.02	41.075		
3,200.0	3,115.7	3,170.5	3,161.0	14.3	7.4	167.67	129.5	35.0	637.5	621.8	15.64	40.763		
3,300.0	3,211.6	3,268.0	3,257.3	14.9	7.7	166.98	144.1	30.5	658.2	641.9	16.27	40.456		
3,400.0	3,307.5	3,365.5	3,353.7	15.5	8.0	166.33	158.6	26.0	679.1	662.2	16.91	40.157		
3,500.0	3,403.5	3,463.1	3,450.0	16.1	8.3	165.72	173.2	21.5	700.0	682.4	17.56	39.865		
3,600.0	3,499.4	3,560.6	3,546.3	16.7	8.6	165.15	187.8	17.0	721.0	702.8	18.22	39.582		
3,700.0	3,595.3	3,658.1	3,642.6	17.3	8.9	164.61	202.3	12.6	742.1	723.2	18.88	39.308		
3,800.0	3,691.2	3,755.6	3,739.0	17.9	9.2	164.10	216.9	8.1	763.2	743.6	19.55	39.044		
3,900.0	3,787.2	3,853.1	3,835.3	18.5	9.6	163.61	231.5	3.6	784.4	764.1	20.22	38.789		
4,000.0	3,883.1	3,950.7	3,931.6	19.1	9.9	163.15	246.1	-0.9	805.6	784.7	20.90	38.543		
4,100.0	3,979.0	4,048.2	4,027.9	19.7	10.2	162.72	260.6	-5.3	826.9	805.3	21.59	38.306		
4,200.0	4,075.0	4,145.7	4,124.2	20.3	10.5	162.30	275.2	-9.8	848.2	825.9	22.27	38.079		
4,300.0	4,170.9	4,243.2	4,220.6	20.9	10.9	161.91	289.8	-14.3	869.6	846.6	22.97	37.860		
4,400.0	4,266.8	4,340.8	4,316.9	21.5	11.2	161.54	304.4	-18.8	891.0	867.3	23.66	37.650		
4,500.0	4,362.7	4,438.3	4,413.2	22.1	11.5	161.18	318.9	-23.2	912.4	888.0	24.36	37.448		
4,600.0	4,458.7	4,535.8	4,509.5	22.7	11.9	160.84	333.5	-27.7	933.9	908.8	25.07	37.253		
4,700.0	4,554.6	4,633.3	4,605.9	23.3	12.2	160.51	348.1	-32.2	955.4	929.6	25.77	37.067		
4,800.0	4,650.5	4,730.8	4,702.2	23.9	12.5	160.20	362.6	-36.7	976.9	950.4	26.48	36.887		
4,900.0	4,746.5	4,828.4	4,798.5	24.5	12.9	159.91	377.2	-41.1	998.4	971.2	27.19	36.715		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	90.70	-0.4	30.1	30.1						
100.0	100.0	100.0	100.0	0.1	0.1	90.70	-0.4	30.1	30.1	29.9	0.22	133.887			
200.0	200.0	200.0	200.0	0.3	0.3	90.70	-0.4	30.1	30.1	29.4	0.67	44.629			
300.0	300.0	300.0	300.0	0.6	0.6	90.70	-0.4	30.1	30.1	29.0	1.12	26.777			
400.0	400.0	400.0	400.0	0.8	0.8	90.70	-0.4	30.1	30.1	28.5	1.57	19.127 CC, ES			
500.0	500.0	500.0	500.0	1.0	1.0	159.75	-0.4	30.1	31.3	29.3	2.02	15.513			
600.0	599.9	599.9	599.9	1.2	1.2	161.96	-0.4	30.1	35.0	32.6	2.46	14.212			
700.0	699.7	699.7	699.7	1.5	1.5	164.74	-0.4	30.1	41.3	38.4	2.92	14.164			
800.0	799.3	799.3	799.3	1.7	1.7	167.46	-0.4	30.1	50.2	46.8	3.37	14.894			
900.0	898.6	898.6	898.6	2.0	1.9	169.80	-0.4	30.1	61.7	57.9	3.82	16.137			
1,000.0	997.5	997.5	997.5	2.3	2.1	171.69	-0.4	30.1	75.9	71.6	4.28	17.731			
1,100.0	1,096.1	1,098.4	1,098.3	2.6	2.4	172.97	0.3	29.0	91.5	86.8	4.73	19.344			
1,200.0	1,194.2	1,199.6	1,199.5	3.0	2.6	173.63	2.4	25.7	107.2	102.0	5.17	20.719			
1,300.0	1,291.7	1,301.3	1,301.0	3.4	2.8	173.90	5.9	20.0	122.9	117.3	5.62	21.861			
1,400.0	1,388.6	1,403.4	1,402.7	3.9	3.0	173.92	10.8	12.0	138.7	132.7	6.08	22.811			
1,500.0	1,484.9	1,506.0	1,504.5	4.4	3.3	173.75	17.3	1.6	154.6	148.0	6.55	23.592			
1,600.0	1,580.8	1,609.1	1,606.5	5.0	3.6	173.41	25.2	-11.1	169.0	161.9	7.05	23.966			
1,700.0	1,676.7	1,713.0	1,708.8	5.5	3.9	172.87	34.6	-26.3	180.8	173.2	7.57	23.892			
1,800.0	1,772.6	1,817.3	1,811.1	6.1	4.3	172.14	45.5	-44.0	190.0	181.9	8.10	23.449			
1,900.0	1,868.6	1,921.1	1,912.2	6.7	4.6	171.23	57.8	-63.8	196.8	188.1	8.66	22.717			
2,000.0	1,964.5	2,020.8	2,009.2	7.2	5.1	170.33	70.1	-83.6	202.8	193.5	9.23	21.972			
2,100.0	2,060.4	2,120.6	2,106.2	7.8	5.5	169.49	82.3	-103.4	208.8	199.0	9.81	21.279			
2,200.0	2,156.4	2,220.4	2,203.2	8.4	5.9	168.69	94.6	-123.2	214.8	204.4	10.41	20.641			
2,300.0	2,252.3	2,320.2	2,300.2	9.0	6.4	167.94	106.9	-143.1	220.9	209.9	11.02	20.051			
2,400.0	2,348.2	2,419.9	2,397.2	9.6	6.8	167.22	119.1	-162.9	227.1	215.4	11.64	19.505			
2,500.0	2,444.2	2,519.7	2,494.3	10.2	7.3	166.55	131.4	-182.7	233.2	221.0	12.28	19.000			
2,600.0	2,540.1	2,619.5	2,591.3	10.8	7.7	165.91	143.7	-202.5	239.4	226.5	12.92	18.531			
2,700.0	2,636.0	2,719.2	2,688.3	11.4	8.2	165.30	156.0	-222.3	245.7	232.1	13.58	18.095			
2,800.0	2,731.9	2,819.0	2,785.3	12.0	8.7	164.72	168.2	-242.1	251.9	237.7	14.24	17.690			
2,900.0	2,827.9	2,918.8	2,882.3	12.6	9.2	164.17	180.5	-261.9	258.2	243.3	14.92	17.312			
3,000.0	2,923.8	3,018.6	2,979.3	13.2	9.6	163.65	192.8	-281.7	264.5	248.9	15.60	16.959			
3,100.0	3,019.7	3,118.3	3,076.3	13.7	10.1	163.15	205.0	-301.5	270.8	254.6	16.29	16.629			
3,200.0	3,115.7	3,218.1	3,173.3	14.3	10.6	162.67	217.3	-321.4	277.2	260.2	16.98	16.320			
3,300.0	3,211.6	3,317.9	3,270.4	14.9	11.1	162.22	229.6	-341.2	283.5	265.9	17.69	16.030			
3,400.0	3,307.5	3,417.7	3,367.4	15.5	11.6	161.78	241.9	-361.0	289.9	271.5	18.40	15.758			
3,500.0	3,403.5	3,517.4	3,464.4	16.1	12.1	161.36	254.1	-380.8	296.3	277.2	19.11	15.502			
3,600.0	3,499.4	3,617.2	3,561.4	16.7	12.6	160.96	266.4	-400.6	302.7	282.9	19.84	15.261			
3,700.0	3,595.3	3,717.0	3,658.4	17.3	13.1	160.58	278.7	-420.4	309.2	288.6	20.56	15.034			
3,800.0	3,691.2	3,816.7	3,755.4	17.9	13.5	160.22	290.9	-440.2	315.6	294.3	21.30	14.820			
3,900.0	3,787.2	3,916.5	3,852.4	18.5	14.0	159.86	303.2	-460.0	322.0	300.0	22.03	14.617			
4,000.0	3,883.1	4,016.3	3,949.4	19.1	14.5	159.53	315.5	-479.8	328.5	305.7	22.77	14.425			
4,100.0	3,979.0	4,116.1	4,046.5	19.7	15.0	159.20	327.7	-499.7	335.0	311.5	23.52	14.244			
4,200.0	4,075.0	4,215.8	4,143.5	20.3	15.5	158.89	340.0	-519.5	341.5	317.2	24.27	14.071			
4,300.0	4,170.9	4,315.6	4,240.5	20.9	16.0	158.59	352.3	-539.3	347.9	322.9	25.02	13.908			
4,400.0	4,266.8	4,415.4	4,337.5	21.5	16.5	158.30	364.6	-559.1	354.4	328.7	25.77	13.752			
4,500.0	4,362.7	4,515.1	4,434.5	22.1	17.0	158.02	376.8	-578.9	361.0	334.4	26.53	13.604			
4,600.0	4,458.7	4,614.9	4,531.5	22.7	17.5	157.75	389.1	-598.7	367.5	340.2	27.30	13.463			
4,700.0	4,554.6	4,714.7	4,628.5	23.3	18.0	157.49	401.4	-618.5	374.0	345.9	28.06	13.329			
4,800.0	4,650.5	4,814.5	4,725.6	23.9	18.5	157.23	413.6	-638.3	380.5	351.7	28.83	13.200			
4,900.0	4,746.5	4,914.2	4,822.6	24.5	19.0	156.99	425.9	-658.1	387.1	357.5	29.60	13.078			
5,000.0	4,842.4	5,014.0	4,919.6	25.1	19.5	156.76	438.2	-678.0	393.6	363.3	30.37	12.961			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design				Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
5,100.0	4,938.3	5,113.8	5,016.6	25.7	20.0	156.53	450.5	-697.8	400.2	369.0	31.15	12.849				
5,200.0	5,034.3	5,213.6	5,113.6	26.3	20.5	156.31	462.7	-717.6	406.7	374.8	31.92	12.742				
5,300.0	5,130.2	5,300.0	5,197.8	26.9	20.9	156.19	472.9	-734.1	414.2	381.6	32.60	12.706				
5,400.0	5,226.2	5,393.2	5,289.3	27.5	21.2	156.30	482.5	-749.4	423.9	390.8	33.19	12.774				
5,500.0	5,322.9	5,481.7	5,376.5	27.9	21.4	156.52	490.1	-761.7	433.7	400.1	33.67	12.883				
5,600.0	5,420.5	5,569.9	5,464.0	28.3	21.7	156.76	496.2	-771.7	442.9	408.8	34.07	13.000				
5,700.0	5,518.7	5,658.0	5,551.6	28.6	21.9	157.02	501.0	-779.3	451.5	417.1	34.40	13.124				
5,800.0	5,617.6	5,745.9	5,639.3	28.9	22.0	157.31	504.3	-784.6	459.4	424.7	34.65	13.257				
5,900.0	5,716.9	5,833.6	5,727.0	29.1	22.2	157.61	506.1	-787.7	466.7	431.9	34.83	13.398				
6,000.0	5,816.6	5,923.3	5,816.6	29.3	22.3	157.93	506.6	-788.5	473.4	438.4	34.95	13.544				
6,100.0	5,916.5	6,023.1	5,916.5	29.5	22.4	158.18	506.6	-788.5	477.7	442.6	35.06	13.626				
6,200.0	6,016.4	6,123.0	6,016.3	29.6	22.5	90.27	504.7	-788.5	478.8	443.7	35.11	13.636				
6,300.0	6,116.4	6,221.0	6,113.4	29.7	22.5	91.84	491.6	-788.5	479.1	444.3	34.79	13.771				
6,400.0	6,216.2	6,315.9	6,205.0	29.7	22.5	-85.86	467.2	-788.5	480.1	446.0	34.10	14.077				
6,500.0	6,314.2	6,408.7	6,291.0	29.7	22.4	-83.66	432.5	-788.5	481.9	448.5	33.36	14.444				
6,600.0	6,408.9	6,500.0	6,370.9	29.6	22.2	-81.58	388.4	-788.5	484.2	451.5	32.62	14.841				
6,700.0	6,498.6	6,588.9	6,443.1	29.5	22.1	-79.67	336.7	-788.5	486.9	454.9	31.96	15.234				
6,800.0	6,581.8	6,676.7	6,508.0	29.4	21.9	-77.94	277.7	-788.5	489.8	458.4	31.40	15.600				
6,900.0	6,657.1	6,763.3	6,565.1	29.2	21.7	-76.40	212.5	-788.5	492.8	461.9	30.97	15.914				
7,000.0	6,723.1	6,850.0	6,614.4	29.1	21.5	-75.07	141.3	-788.5	495.7	465.0	30.69	16.152				
7,100.0	6,778.8	6,933.6	6,654.0	28.9	21.4	-73.99	67.7	-788.5	498.3	467.6	30.61	16.277				
7,200.0	6,823.2	7,017.7	6,685.6	28.8	21.3	-73.14	-10.2	-788.5	500.4	469.7	30.75	16.274				
7,300.0	6,855.5	7,100.0	6,707.9	28.7	21.2	-72.53	-89.3	-788.5	502.0	470.9	31.12	16.131				
7,400.0	6,875.2	7,184.6	6,721.9	28.7	21.2	-72.15	-172.8	-788.5	503.0	471.2	31.79	15.825				
7,500.0	6,881.9	7,267.8	6,726.6	28.8	21.4	-72.03	-255.7	-788.5	503.4	470.6	32.72	15.386				
7,500.1	6,881.9	7,267.8	6,726.6	28.8	21.4	-72.03	-255.8	-788.5	503.4	470.6	32.72	15.385				
7,600.0	6,881.8	7,366.4	6,726.0	29.0	21.7	-71.97	-354.3	-788.5	503.5	469.3	34.21	14.719				
7,700.0	6,881.7	7,466.4	6,725.3	29.3	22.4	-71.91	-454.3	-788.5	503.7	467.7	36.01	13.988				
7,800.0	6,881.5	7,566.4	6,724.6	29.7	23.2	-71.85	-554.3	-788.5	503.9	465.8	38.08	13.233				
7,900.0	6,881.4	7,666.4	6,723.9	30.3	24.3	-71.79	-654.3	-788.5	504.0	463.7	40.37	12.485				
8,000.0	6,881.2	7,766.4	6,723.2	31.1	25.5	-71.73	-754.3	-788.5	504.2	461.4	42.85	11.766				
8,100.0	6,881.1	7,866.4	6,722.5	31.9	26.8	-71.67	-854.3	-788.5	504.4	458.9	45.50	11.086				
8,200.0	6,881.0	7,966.4	6,721.8	32.9	28.2	-71.61	-954.3	-788.5	504.6	456.3	48.27	10.453				
8,300.0	6,880.8	8,066.4	6,721.1	34.0	29.6	-71.55	-1,054.3	-788.5	504.7	453.6	51.16	9.867				
8,400.0	6,880.7	8,166.4	6,720.4	35.2	31.1	-71.49	-1,154.3	-788.5	504.9	450.8	54.13	9.328				
8,500.0	6,880.5	8,266.4	6,719.7	36.5	32.6	-71.43	-1,254.3	-788.5	505.1	447.9	57.18	8.833				
8,600.0	6,880.4	8,366.4	6,719.0	37.9	34.2	-71.37	-1,354.3	-788.5	505.3	445.0	60.30	8.379				
8,700.0	6,880.3	8,466.4	6,718.3	39.3	35.8	-71.31	-1,454.3	-788.5	505.5	442.0	63.47	7.963				
8,800.0	6,880.1	8,566.4	6,717.6	40.8	37.4	-71.25	-1,554.3	-788.5	505.6	438.9	66.69	7.582				
8,900.0	6,880.0	8,666.4	6,716.9	42.3	39.1	-71.19	-1,654.3	-788.5	505.8	435.9	69.95	7.231				
9,000.0	6,879.8	8,766.3	6,716.2	43.8	40.8	-71.13	-1,754.3	-788.5	506.0	432.8	73.25	6.908				
9,100.0	6,879.7	8,866.3	6,715.5	45.4	42.5	-71.07	-1,854.3	-788.5	506.2	429.6	76.57	6.611				
9,200.0	6,879.6	8,966.3	6,714.8	47.0	44.2	-71.01	-1,954.2	-788.5	506.4	426.4	79.92	6.336				
9,300.0	6,879.4	9,066.3	6,714.1	48.6	45.9	-70.95	-2,054.2	-788.5	506.5	423.3	83.29	6.082				
9,400.0	6,879.3	9,166.3	6,713.4	50.3	47.7	-70.89	-2,154.2	-788.5	506.7	420.0	86.68	5.846				
9,500.0	6,879.1	9,266.3	6,712.7	51.9	49.5	-70.83	-2,254.2	-788.5	506.9	416.8	90.09	5.627				
9,600.0	6,879.0	9,366.3	6,712.0	53.6	51.2	-70.77	-2,354.2	-788.5	507.1	413.6	93.51	5.423				
9,700.0	6,878.9	9,466.3	6,711.3	55.3	53.0	-70.71	-2,454.2	-788.5	507.3	410.3	96.94	5.233				
9,800.0	6,878.7	9,566.3	6,710.6	57.0	54.8	-70.65	-2,554.2	-788.5	507.5	407.1	100.39	5.055				
9,900.0	6,878.6	9,666.3	6,709.9	58.8	56.6	-70.59	-2,654.2	-788.5	507.6	403.8	103.84	4.889				

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #1 (3-14-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
10,000.0	6,878.4	9,766.3	6,709.2	60.5	58.4	-70.53	-2,754.2	-788.5	507.8	400.5	107.31	4.732		
10,100.0	6,878.3	9,866.3	6,708.5	62.3	60.2	-70.48	-2,854.2	-788.5	508.0	397.2	110.78	4.586		
10,200.0	6,878.2	9,966.3	6,707.8	64.0	62.0	-70.42	-2,954.2	-788.5	508.2	393.9	114.26	4.448		
10,300.0	6,878.0	10,066.3	6,707.1	65.8	63.9	-70.36	-3,054.2	-788.5	508.4	390.7	117.74	4.318		
10,400.0	6,877.9	10,166.3	6,706.4	67.6	65.7	-70.30	-3,154.2	-788.5	508.6	387.3	121.24	4.195		
10,500.0	6,877.8	10,266.3	6,705.7	69.4	67.5	-70.24	-3,254.2	-788.5	508.8	384.0	124.73	4.079		
10,600.0	6,877.6	10,366.3	6,705.0	71.2	69.4	-70.18	-3,354.2	-788.5	509.0	380.7	128.23	3.969		
10,700.0	6,877.5	10,466.3	6,704.3	73.0	71.2	-70.12	-3,454.2	-788.5	509.2	377.4	131.73	3.865		
10,800.0	6,877.3	10,566.3	6,703.6	74.8	73.1	-70.06	-3,554.2	-788.5	509.3	374.1	135.24	3.766		
10,900.0	6,877.2	10,666.3	6,702.9	76.6	74.9	-70.00	-3,654.2	-788.5	509.5	370.8	138.74	3.672		
11,000.0	6,877.1	10,766.3	6,702.2	78.4	76.8	-69.94	-3,754.2	-788.5	509.7	367.5	142.25	3.583		
11,100.0	6,876.9	10,866.3	6,701.5	80.2	78.6	-69.88	-3,854.2	-788.5	509.9	364.1	145.77	3.498		
11,200.0	6,876.8	10,966.3	6,700.8	82.0	80.5	-69.83	-3,954.2	-788.5	510.1	360.8	149.28	3.417		
11,300.0	6,876.6	11,066.3	6,700.1	83.9	82.4	-69.77	-4,054.2	-788.5	510.3	357.5	152.80	3.340		
11,400.0	6,876.5	11,166.3	6,699.4	85.7	84.2	-69.71	-4,154.2	-788.5	510.5	354.2	156.31	3.266		
11,500.0	6,876.4	11,266.3	6,698.8	87.5	86.1	-69.65	-4,254.2	-788.5	510.7	350.9	159.83	3.195		
11,600.0	6,876.2	11,366.3	6,698.1	89.4	88.0	-69.59	-4,354.2	-788.5	510.9	347.5	163.35	3.128		
11,700.0	6,876.1	11,466.3	6,697.4	91.2	89.8	-69.53	-4,454.1	-788.5	511.1	344.2	166.86	3.063		
11,800.0	6,875.9	11,566.3	6,696.7	93.1	91.7	-69.47	-4,554.1	-788.5	511.3	340.9	170.38	3.001		
11,900.0	6,875.8	11,666.3	6,696.0	94.9	93.6	-69.41	-4,654.1	-788.5	511.5	337.6	173.90	2.941		
12,000.0	6,875.7	11,766.3	6,695.3	96.8	95.5	-69.36	-4,754.1	-788.5	511.7	334.3	177.42	2.884		
12,100.0	6,875.5	11,866.3	6,694.6	98.6	97.3	-69.30	-4,854.1	-788.5	511.9	330.9	180.93	2.829		
12,200.0	6,875.4	11,966.3	6,693.9	100.5	99.2	-69.24	-4,954.1	-788.5	512.1	327.6	184.45	2.776		
12,300.0	6,875.2	12,066.3	6,693.2	102.3	101.1	-69.18	-5,054.1	-788.5	512.3	324.3	187.97	2.725		
12,400.0	6,875.1	12,166.3	6,692.5	104.2	103.0	-69.12	-5,154.1	-788.5	512.5	321.0	191.48	2.676		
12,500.0	6,875.0	12,266.3	6,691.8	106.1	104.9	-69.06	-5,254.1	-788.5	512.7	317.7	195.00	2.629		
12,600.0	6,874.8	12,366.3	6,691.1	107.9	106.7	-69.01	-5,354.1	-788.5	512.9	314.3	198.51	2.583		
12,700.0	6,874.7	12,466.3	6,690.4	109.8	108.6	-68.95	-5,454.1	-788.5	513.1	311.0	202.03	2.540		
12,800.0	6,874.5	12,566.3	6,689.7	111.7	110.5	-68.89	-5,554.1	-788.5	513.3	307.7	205.54	2.497		
12,900.0	6,874.4	12,666.3	6,689.0	113.5	112.4	-68.83	-5,654.1	-788.5	513.5	304.4	209.05	2.456		
13,000.0	6,874.3	12,766.3	6,688.3	115.4	114.3	-68.77	-5,754.1	-788.5	513.7	301.1	212.56	2.417		
13,100.0	6,874.1	12,866.3	6,687.6	117.3	116.2	-68.71	-5,854.1	-788.5	513.9	297.8	216.07	2.378		
13,200.0	6,874.0	12,966.3	6,686.9	119.2	118.1	-68.66	-5,954.1	-788.5	514.1	294.5	219.58	2.341		
13,300.0	6,873.8	13,066.3	6,686.2	121.0	120.0	-68.60	-6,054.1	-788.5	514.3	291.2	223.09	2.305		
13,400.0	6,873.7	13,166.3	6,685.5	122.9	121.9	-68.54	-6,154.1	-788.5	514.5	287.9	226.59	2.271		
13,500.0	6,873.6	13,266.3	6,684.8	124.8	123.8	-68.48	-6,254.1	-788.5	514.7	284.6	230.09	2.237		
13,600.0	6,873.4	13,366.3	6,684.1	126.7	125.7	-68.42	-6,354.1	-788.5	514.9	281.3	233.60	2.204		
13,700.0	6,873.3	13,466.3	6,683.4	128.6	127.6	-68.37	-6,454.1	-788.5	515.1	278.0	237.10	2.173		
13,800.0	6,873.1	13,566.3	6,682.7	130.4	129.5	-68.31	-6,554.1	-788.5	515.3	274.7	240.60	2.142		
13,900.0	6,873.0	13,666.3	6,682.0	132.3	131.4	-68.25	-6,654.1	-788.5	515.5	271.4	244.09	2.112		
14,000.0	6,872.9	13,766.3	6,681.3	134.2	133.3	-68.19	-6,754.1	-788.5	515.7	268.1	247.59	2.083		
14,100.0	6,872.7	13,866.3	6,680.6	136.1	135.1	-68.14	-6,854.1	-788.5	515.9	264.8	251.08	2.055		
14,200.0	6,872.6	13,966.3	6,679.9	138.0	137.0	-68.08	-6,954.0	-788.5	516.1	261.6	254.57	2.027		
14,300.0	6,872.4	14,066.3	6,679.2	139.9	138.9	-68.02	-7,054.0	-788.5	516.3	258.3	258.06	2.001		
14,400.0	6,872.3	14,166.3	6,678.5	141.8	140.8	-67.96	-7,154.0	-788.5	516.5	255.0	261.55	1.975		
14,500.0	6,872.2	14,266.3	6,677.8	143.7	142.7	-67.91	-7,254.0	-788.5	516.8	251.7	265.04	1.950		
14,600.0	6,872.0	14,366.3	6,677.1	145.5	144.7	-67.85	-7,354.0	-788.5	517.0	248.4	268.52	1.925		
14,618.6	6,872.0	14,381.8	6,677.0	145.9	144.9	-67.84	-7,369.6	-788.5	517.0	247.9	269.12	1.921 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.35	-0.4	60.2	60.2					
100.0	100.0	100.0	100.0	0.1	0.1	90.35	-0.4	60.2	60.2	60.0	0.22	267.760		
200.0	200.0	200.0	200.0	0.3	0.3	90.35	-0.4	60.2	60.2	59.5	0.67	89.253		
300.0	300.0	300.0	300.0	0.6	0.6	90.35	-0.4	60.2	60.2	59.1	1.12	53.552		
400.0	400.0	400.0	400.0	0.8	0.8	90.35	-0.4	60.2	60.2	58.6	1.57	38.251	CC, ES	
500.0	500.0	500.0	500.0	1.0	1.0	158.99	-0.4	60.2	61.4	59.4	2.02	30.417		
600.0	599.9	599.9	599.9	1.2	1.2	160.21	-0.4	60.2	65.1	62.6	2.46	26.409		
700.0	699.7	699.7	699.7	1.5	1.5	161.96	-0.4	60.2	71.3	68.4	2.92	24.448		
800.0	799.3	799.3	799.3	1.7	1.7	163.95	-0.4	60.2	80.0	76.7	3.37	23.752		
900.0	898.6	898.6	898.6	2.0	1.9	165.95	-0.4	60.2	91.4	87.6	3.82	23.893		
1,000.0	997.5	997.5	997.5	2.3	2.1	167.80	-0.4	60.2	105.4	101.1	4.28	24.613		
1,100.0	1,096.1	1,096.1	1,096.1	2.6	2.4	169.43	-0.4	60.2	122.0	117.2	4.74	25.748		
1,200.0	1,194.2	1,194.2	1,194.2	3.0	2.6	170.84	-0.4	60.2	141.2	136.0	5.19	27.187		
1,300.0	1,291.7	1,291.7	1,291.7	3.4	2.8	172.02	-0.4	60.2	163.0	157.4	5.65	28.855		
1,400.0	1,388.6	1,388.6	1,388.6	3.9	3.0	173.02	-0.4	60.2	187.5	181.4	6.11	30.696		
1,500.0	1,484.9	1,488.8	1,488.8	4.4	3.2	173.72	0.5	59.6	213.7	207.1	6.57	32.532		
1,600.0	1,580.8	1,590.3	1,590.3	5.0	3.5	173.94	3.4	57.3	238.9	231.9	7.04	33.932		
1,700.0	1,676.7	1,693.0	1,692.7	5.5	3.7	173.74	8.6	53.5	262.2	254.6	7.53	34.824		
1,800.0	1,772.6	1,796.5	1,795.8	6.1	3.9	173.23	16.1	47.9	283.3	275.3	8.03	35.287		
1,900.0	1,868.6	1,900.9	1,899.5	6.7	4.2	172.44	25.9	40.6	302.4	293.9	8.55	35.380		
2,000.0	1,964.5	2,005.9	2,003.4	7.2	4.5	171.43	38.0	31.5	319.5	310.4	9.09	35.154		
2,100.0	2,060.4	2,105.6	2,101.7	7.8	4.7	170.36	51.0	21.8	335.3	325.6	9.64	34.782		
2,200.0	2,156.4	2,204.2	2,199.0	8.4	5.0	169.40	63.8	12.2	351.1	340.9	10.20	34.413		
2,300.0	2,252.3	2,302.7	2,296.3	9.0	5.3	168.52	76.6	2.6	367.1	356.3	10.78	34.045		
2,400.0	2,348.2	2,401.3	2,393.5	9.6	5.6	167.71	89.4	-6.9	383.1	371.7	11.37	33.685		
2,500.0	2,444.2	2,499.9	2,490.8	10.2	6.0	166.97	102.3	-16.5	399.2	387.2	11.98	33.335		
2,600.0	2,540.1	2,598.4	2,588.1	10.8	6.3	166.29	115.1	-26.1	415.3	402.8	12.59	32.996		
2,700.0	2,636.0	2,697.0	2,685.3	11.4	6.6	165.65	127.9	-35.7	431.6	418.3	13.21	32.670		
2,800.0	2,731.9	2,795.6	2,782.6	12.0	6.9	165.07	140.7	-45.3	447.8	434.0	13.84	32.357		
2,900.0	2,827.9	2,894.2	2,879.8	12.6	7.3	164.52	153.5	-54.8	464.1	449.6	14.48	32.057		
3,000.0	2,923.8	2,992.7	2,977.1	13.2	7.6	164.01	166.4	-64.4	480.4	465.3	15.12	31.771		
3,100.0	3,019.7	3,091.3	3,074.4	13.7	8.0	163.54	179.2	-74.0	496.8	481.0	15.77	31.499		
3,200.0	3,115.7	3,189.9	3,171.6	14.3	8.3	163.09	192.0	-83.6	513.2	496.8	16.43	31.239		
3,300.0	3,211.6	3,288.4	3,268.9	14.9	8.6	162.68	204.8	-93.2	529.7	512.6	17.09	30.991		
3,400.0	3,307.5	3,387.0	3,366.1	15.5	9.0	162.28	217.7	-102.7	546.1	528.4	17.76	30.755		
3,500.0	3,403.5	3,485.6	3,463.4	16.1	9.3	161.91	230.5	-112.3	562.6	544.2	18.43	30.531		
3,600.0	3,499.4	3,584.1	3,560.7	16.7	9.7	161.57	243.3	-121.9	579.1	560.0	19.10	30.317		
3,700.0	3,595.3	3,682.7	3,657.9	17.3	10.1	161.24	256.1	-131.5	595.6	575.8	19.78	30.113		
3,800.0	3,691.2	3,781.3	3,755.2	17.9	10.4	160.92	268.9	-141.1	612.2	591.7	20.46	29.919		
3,900.0	3,787.2	3,879.8	3,852.4	18.5	10.8	160.63	281.8	-150.6	628.7	607.6	21.14	29.734		
4,000.0	3,883.1	3,978.4	3,949.7	19.1	11.1	160.35	294.6	-160.2	645.3	623.5	21.83	29.557		
4,100.0	3,979.0	4,077.0	4,047.0	19.7	11.5	160.08	307.4	-169.8	661.9	639.4	22.52	29.389		
4,200.0	4,075.0	4,175.6	4,144.2	20.3	11.8	159.83	320.2	-179.4	678.5	655.3	23.21	29.228		
4,300.0	4,170.9	4,274.1	4,241.5	20.9	12.2	159.59	333.0	-189.0	695.1	671.2	23.91	29.074		
4,400.0	4,266.8	4,372.7	4,338.8	21.5	12.6	159.36	345.9	-198.5	711.7	687.1	24.60	28.927		
4,500.0	4,362.7	4,471.3	4,436.0	22.1	12.9	159.14	358.7	-208.1	728.3	703.0	25.30	28.787		
4,600.0	4,458.7	4,569.8	4,533.3	22.7	13.3	158.93	371.5	-217.7	745.0	719.0	26.00	28.652		
4,700.0	4,554.6	4,668.4	4,630.5	23.3	13.6	158.73	384.3	-227.3	761.6	734.9	26.70	28.523		
4,800.0	4,650.5	4,767.0	4,727.8	23.9	14.0	158.54	397.2	-236.9	778.3	750.9	27.41	28.400		
4,900.0	4,746.5	4,865.5	4,825.1	24.5	14.4	158.36	410.0	-246.4	795.0	766.9	28.11	28.281		
5,000.0	4,842.4	4,964.1	4,922.3	25.1	14.7	158.18	422.8	-256.0	811.7	782.8	28.82	28.167		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,100.0	4,938.3	5,062.7	5,019.6	25.7	15.1	158.01	435.6	-265.6	828.3	798.8	29.52	28.058		
5,200.0	5,034.3	5,161.3	5,116.8	26.3	15.5	157.85	448.4	-275.2	845.0	814.8	30.23	27.953		
5,300.0	5,130.2	5,259.8	5,214.1	26.9	15.8	157.69	461.3	-284.8	861.7	830.8	30.94	27.852		
5,400.0	5,226.2	5,358.4	5,311.4	27.5	16.2	157.58	474.1	-294.3	878.2	846.6	31.67	27.734		
5,500.0	5,322.9	5,445.6	5,397.6	27.9	16.5	157.54	484.9	-302.4	892.7	860.4	32.29	27.646		
5,600.0	5,420.5	5,529.2	5,480.4	28.3	16.7	157.54	493.3	-308.7	905.6	872.8	32.81	27.602		
5,700.0	5,518.7	5,612.7	5,563.6	28.6	16.9	157.59	499.8	-313.6	917.0	883.8	33.25	27.579		
5,800.0	5,617.6	5,700.0	5,650.7	28.9	17.0	157.68	504.5	-317.1	927.0	893.4	33.62	27.571		
5,900.0	5,716.9	5,779.8	5,730.4	29.1	17.2	157.81	506.9	-318.9	935.5	901.6	33.90	27.598		
6,000.0	5,816.6	5,866.0	5,816.6	29.3	17.3	157.98	507.6	-319.4	942.4	908.3	34.11	27.630		
6,100.0	5,916.5	5,965.9	5,916.5	29.5	17.5	158.12	507.6	-319.4	946.7	912.4	34.31	27.592		
6,200.0	6,016.4	6,065.9	6,016.4	29.6	17.6	89.96	507.6	-319.4	947.9	913.3	34.52	27.456		
6,237.7	6,054.2	6,103.6	6,054.2	29.6	17.7	90.00	507.0	-319.4	947.9	913.2	34.62	27.377		
6,300.0	6,116.4	6,165.5	6,115.8	29.7	17.7	90.31	501.9	-319.4	947.9	913.2	34.68	27.332		
6,400.0	6,216.2	6,263.3	6,211.9	29.7	17.7	-88.96	483.9	-319.4	948.0	913.4	34.56	27.427		
6,500.0	6,314.2	6,359.6	6,303.5	29.7	17.6	-88.25	454.2	-319.4	948.3	914.0	34.28	27.667		
6,600.0	6,408.9	6,454.6	6,389.5	29.6	17.5	-87.57	413.9	-319.4	948.7	914.8	33.87	28.007		
6,700.0	6,498.6	6,550.0	6,470.1	29.5	17.3	-86.92	363.0	-319.4	949.2	915.8	33.42	28.405		
6,800.0	6,581.8	6,641.2	6,540.6	29.4	17.1	-86.35	305.4	-319.4	949.8	916.8	32.99	28.788		
6,900.0	6,657.1	6,733.0	6,604.2	29.2	16.9	-85.82	239.3	-319.4	950.4	917.7	32.66	29.100		
7,000.0	6,723.1	6,823.9	6,659.0	29.1	16.7	-85.36	166.7	-319.4	951.0	918.5	32.49	29.269		
7,100.0	6,778.8	6,914.3	6,704.4	28.9	16.5	-84.98	88.7	-319.4	951.5	919.0	32.54	29.238		
7,200.0	6,823.2	7,004.0	6,740.2	28.8	16.3	-84.68	6.4	-319.4	952.0	919.1	32.86	28.967		
7,300.0	6,855.5	7,093.4	6,765.9	28.7	16.2	-84.45	-79.1	-319.4	952.3	918.8	33.48	28.441		
7,400.0	6,875.2	7,182.5	6,781.5	28.7	16.6	-84.32	-166.8	-319.4	952.5	918.1	34.40	27.687		
7,500.0	6,881.9	7,271.4	6,786.8	28.8	17.4	-84.27	-255.5	-319.4	952.6	917.0	35.60	26.760		
7,600.0	6,881.8	7,370.9	6,786.4	29.0	18.3	-84.25	-355.0	-319.4	952.6	915.4	37.23	25.589		
7,700.0	6,881.7	7,470.9	6,785.9	29.3	19.4	-84.23	-455.0	-319.4	952.7	913.5	39.15	24.331		
7,800.0	6,881.5	7,570.9	6,785.5	29.7	20.6	-84.22	-555.0	-319.4	952.7	911.4	41.34	23.044		
7,900.0	6,881.4	7,670.9	6,785.1	30.3	21.9	-84.20	-655.0	-319.4	952.7	909.0	43.76	21.773		
8,000.0	6,881.2	7,770.9	6,784.7	31.1	23.2	-84.18	-755.0	-319.4	952.8	906.4	46.36	20.551		
8,100.0	6,881.1	7,870.9	6,784.3	31.9	24.7	-84.17	-855.0	-319.4	952.8	903.7	49.12	19.396		
8,200.0	6,881.0	7,970.9	6,783.9	32.9	26.2	-84.15	-955.0	-319.4	952.8	900.8	52.02	18.317		
8,300.0	6,880.8	8,070.9	6,783.4	34.0	27.7	-84.13	-1,055.0	-319.4	952.8	897.8	55.03	17.316		
8,400.0	6,880.7	8,170.9	6,783.0	35.2	29.3	-84.12	-1,155.0	-319.4	952.9	894.7	58.13	16.392		
8,500.0	6,880.5	8,270.9	6,782.6	36.5	30.9	-84.10	-1,255.0	-319.4	952.9	891.6	61.32	15.541		
8,600.0	6,880.4	8,370.9	6,782.2	37.9	32.6	-84.08	-1,355.0	-319.4	952.9	888.4	64.57	14.758		
8,700.0	6,880.3	8,470.9	6,781.8	39.3	34.3	-84.07	-1,455.0	-319.4	953.0	885.1	67.88	14.039		
8,800.0	6,880.1	8,570.9	6,781.3	40.8	36.0	-84.05	-1,555.0	-319.4	953.0	881.7	71.24	13.376		
8,900.0	6,880.0	8,670.9	6,780.9	42.3	37.7	-84.03	-1,655.0	-319.4	953.0	878.4	74.65	12.766		
9,000.0	6,879.8	8,770.9	6,780.5	43.8	39.4	-84.02	-1,755.0	-319.4	953.1	875.0	78.10	12.204		
9,100.0	6,879.7	8,870.9	6,780.1	45.4	41.2	-84.00	-1,855.0	-319.4	953.1	871.5	81.57	11.684		
9,200.0	6,879.6	8,970.9	6,779.7	47.0	43.0	-83.98	-1,955.0	-319.4	953.1	868.0	85.08	11.202		
9,300.0	6,879.4	9,070.9	6,779.2	48.6	44.7	-83.97	-2,055.0	-319.4	953.1	864.5	88.61	10.756		
9,400.0	6,879.3	9,170.9	6,778.8	50.3	46.5	-83.95	-2,155.0	-319.4	953.2	861.0	92.17	10.342		
9,500.0	6,879.1	9,270.9	6,778.4	51.9	48.3	-83.93	-2,255.0	-319.4	953.2	857.5	95.74	9.956		
9,600.0	6,879.0	9,370.9	6,778.0	53.6	50.2	-83.92	-2,355.0	-319.4	953.2	853.9	99.34	9.596		
9,700.0	6,878.9	9,470.9	6,777.6	55.3	52.0	-83.90	-2,455.0	-319.4	953.3	850.3	102.95	9.260		
9,800.0	6,878.7	9,570.9	6,777.2	57.0	53.8	-83.88	-2,555.0	-319.4	953.3	846.7	106.57	8.945		
9,900.0	6,878.6	9,670.9	6,776.7	58.8	55.6	-83.87	-2,655.0	-319.4	953.3	843.1	110.21	8.650		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #1 (3-15-16)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
10,000.0	6,878.4	9,770.9	6,776.3	60.5	57.5	-83.85	-2,755.0	-319.4	953.3	839.5	113.85	8.373		
10,100.0	6,878.3	9,870.9	6,775.9	62.3	59.3	-83.83	-2,855.0	-319.4	953.4	835.9	117.51	8.113		
10,200.0	6,878.2	9,970.9	6,775.5	64.0	61.2	-83.82	-2,955.0	-319.4	953.4	832.2	121.18	7.868		
10,300.0	6,878.0	10,070.9	6,775.1	65.8	63.0	-83.80	-3,055.0	-319.4	953.4	828.6	124.86	7.636		
10,400.0	6,877.9	10,170.9	6,774.6	67.6	64.9	-83.78	-3,155.0	-319.4	953.5	824.9	128.54	7.418		
10,500.0	6,877.8	10,270.9	6,774.2	69.4	66.7	-83.77	-3,255.0	-319.4	953.5	821.3	132.23	7.211		
10,600.0	6,877.6	10,370.9	6,773.8	71.2	68.6	-83.75	-3,355.0	-319.4	953.5	817.6	135.93	7.015		
10,700.0	6,877.5	10,470.9	6,773.4	73.0	70.4	-83.73	-3,455.0	-319.4	953.6	813.9	139.64	6.829		
10,800.0	6,877.3	10,570.9	6,773.0	74.8	72.3	-83.72	-3,555.0	-319.4	953.6	810.2	143.35	6.652		
10,900.0	6,877.2	10,670.9	6,772.5	76.6	74.2	-83.70	-3,655.0	-319.4	953.6	806.6	147.06	6.484		
11,000.0	6,877.1	10,770.9	6,772.1	78.4	76.1	-83.68	-3,755.0	-319.4	953.7	802.9	150.78	6.325		
11,100.0	6,876.9	10,870.9	6,771.7	80.2	77.9	-83.67	-3,855.0	-319.4	953.7	799.2	154.51	6.172		
11,200.0	6,876.8	10,970.9	6,771.3	82.0	79.8	-83.65	-3,955.0	-319.4	953.7	795.5	158.24	6.027		
11,300.0	6,876.6	11,070.9	6,770.9	83.9	81.7	-83.63	-4,054.9	-319.4	953.7	791.8	161.97	5.888		
11,400.0	6,876.5	11,170.9	6,770.5	85.7	83.6	-83.62	-4,154.9	-319.4	953.8	788.1	165.70	5.756		
11,500.0	6,876.4	11,270.9	6,770.0	87.5	85.5	-83.60	-4,254.9	-319.4	953.8	784.4	169.44	5.629		
11,600.0	6,876.2	11,370.9	6,769.6	89.4	87.3	-83.58	-4,354.9	-319.4	953.8	780.7	173.19	5.508		
11,700.0	6,876.1	11,470.9	6,769.2	91.2	89.2	-83.57	-4,454.9	-319.4	953.9	776.9	176.93	5.391		
11,800.0	6,875.9	11,570.9	6,768.8	93.1	91.1	-83.55	-4,554.9	-319.4	953.9	773.2	180.68	5.280		
11,900.0	6,875.8	11,670.9	6,768.4	94.9	93.0	-83.53	-4,654.9	-319.4	953.9	769.5	184.43	5.172		
12,000.0	6,875.7	11,770.9	6,767.9	96.8	94.9	-83.52	-4,754.9	-319.4	954.0	765.8	188.18	5.069		
12,100.0	6,875.5	11,870.9	6,767.5	98.6	96.8	-83.50	-4,854.9	-319.4	954.0	762.1	191.94	4.970		
12,200.0	6,875.4	11,970.9	6,767.1	100.5	98.7	-83.48	-4,954.9	-319.4	954.0	758.3	195.69	4.875		
12,300.0	6,875.2	12,070.9	6,766.7	102.3	100.6	-83.47	-5,054.9	-319.4	954.1	754.6	199.45	4.783		
12,400.0	6,875.1	12,170.9	6,766.3	104.2	102.5	-83.45	-5,154.9	-319.4	954.1	750.9	203.21	4.695		
12,500.0	6,875.0	12,270.9	6,765.8	106.1	104.4	-83.43	-5,254.9	-319.4	954.1	747.2	206.97	4.610		
12,600.0	6,874.8	12,370.9	6,765.4	107.9	106.3	-83.42	-5,354.9	-319.4	954.2	743.4	210.74	4.528		
12,700.0	6,874.7	12,470.9	6,765.0	109.8	108.2	-83.40	-5,454.9	-319.4	954.2	739.7	214.50	4.448		
12,800.0	6,874.5	12,570.9	6,764.6	111.7	110.1	-83.38	-5,554.9	-319.4	954.2	736.0	218.27	4.372		
12,900.0	6,874.4	12,670.9	6,764.2	113.5	112.0	-83.37	-5,654.9	-319.4	954.3	732.2	222.04	4.298		
13,000.0	6,874.3	12,770.9	6,763.7	115.4	113.9	-83.35	-5,754.9	-319.4	954.3	728.5	225.81	4.226		
13,100.0	6,874.1	12,870.9	6,763.3	117.3	115.8	-83.33	-5,854.9	-319.4	954.3	724.7	229.58	4.157		
13,200.0	6,874.0	12,970.9	6,762.9	119.2	117.7	-83.32	-5,954.9	-319.4	954.4	721.0	233.35	4.090		
13,300.0	6,873.8	13,070.9	6,762.5	121.0	119.6	-83.30	-6,054.9	-319.4	954.4	717.3	237.12	4.025		
13,400.0	6,873.7	13,170.9	6,762.1	122.9	121.5	-83.28	-6,154.9	-319.4	954.4	713.5	240.89	3.962		
13,500.0	6,873.6	13,270.9	6,761.7	124.8	123.4	-83.27	-6,254.9	-319.4	954.5	709.8	244.67	3.901		
13,600.0	6,873.4	13,370.9	6,761.2	126.7	125.3	-83.25	-6,354.9	-319.4	954.5	706.0	248.44	3.842		
13,700.0	6,873.3	13,470.9	6,760.8	128.6	127.2	-83.23	-6,454.9	-319.4	954.5	702.3	252.22	3.785		
13,800.0	6,873.1	13,570.9	6,760.4	130.4	129.1	-83.22	-6,554.9	-319.4	954.6	698.6	255.99	3.729		
13,900.0	6,873.0	13,670.9	6,760.0	132.3	131.0	-83.20	-6,654.9	-319.4	954.6	694.8	259.77	3.675		
14,000.0	6,872.9	13,770.9	6,759.6	134.2	132.9	-83.18	-6,754.9	-319.4	954.6	691.1	263.55	3.622		
14,100.0	6,872.7	13,870.9	6,759.1	136.1	134.8	-83.17	-6,854.9	-319.4	954.7	687.3	267.33	3.571		
14,200.0	6,872.6	13,970.9	6,758.7	138.0	136.7	-83.15	-6,954.9	-319.4	954.7	683.6	271.11	3.521		
14,300.0	6,872.4	14,070.9	6,758.3	139.9	138.6	-83.13	-7,054.9	-319.4	954.7	679.8	274.89	3.473		
14,400.0	6,872.3	14,170.9	6,757.9	141.8	140.5	-83.12	-7,154.9	-319.4	954.8	676.1	278.67	3.426		
14,500.0	6,872.2	14,270.9	6,757.5	143.7	142.4	-83.10	-7,254.9	-319.4	954.8	672.3	282.45	3.380		
14,600.0	6,872.0	14,370.9	6,757.0	145.5	144.3	-83.08	-7,354.9	-319.4	954.8	668.6	286.23	3.336		
14,601.4	6,872.0	14,372.3	6,757.0	145.6	144.3	-83.08	-7,356.3	-319.4	954.8	668.5	286.28	3.335		
14,618.6	6,872.0	14,381.9	6,757.0	145.9	144.5	-83.08	-7,366.0	-319.4	954.9	668.1	286.79	3.329 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

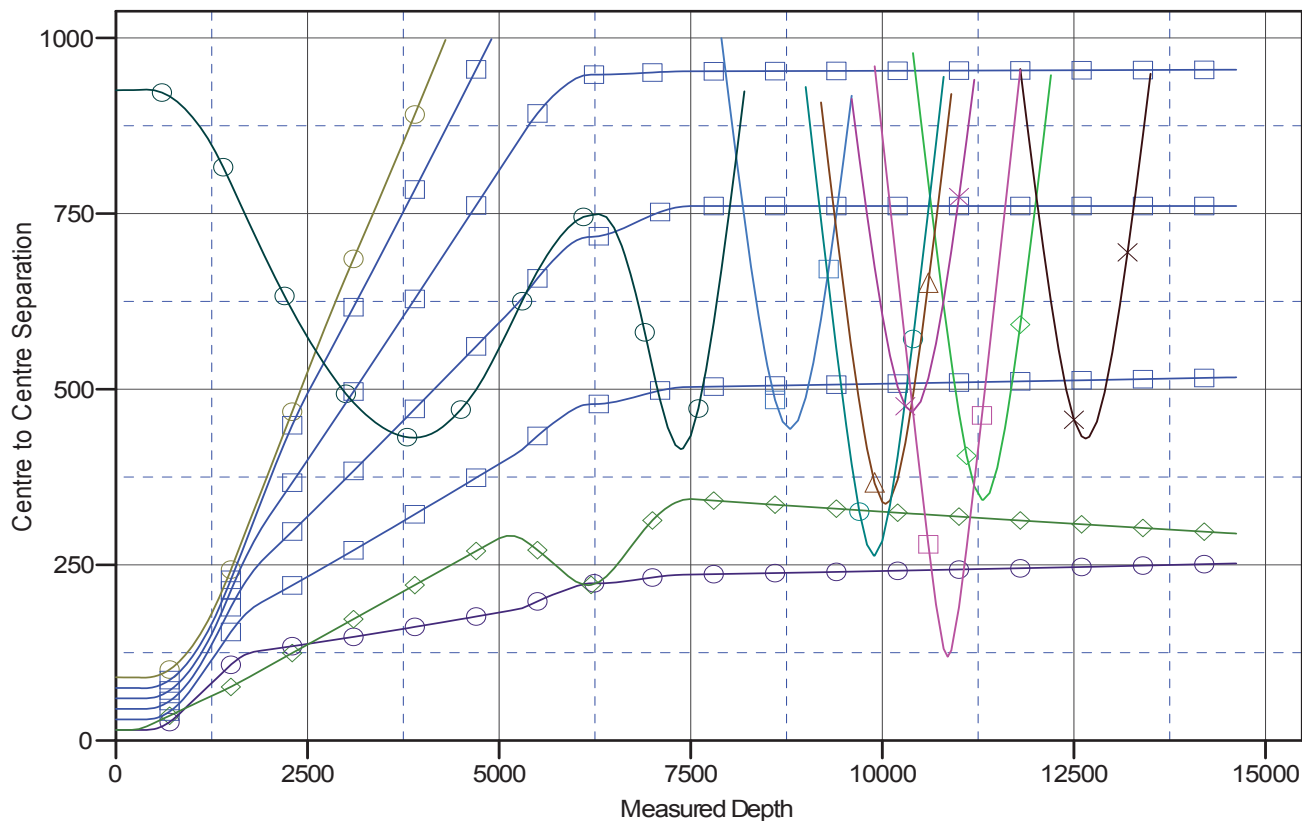
Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)													Offset Site Error:	0.0 ft
Survey Program:		0-MWD											Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	90.47	-0.7	90.0	90.0					
100.0	100.0	99.0	99.0	0.1	0.1	90.47	-0.7	90.0	90.0	89.8	0.22	402.414		
200.0	200.0	199.0	199.0	0.3	0.3	90.47	-0.7	90.0	90.0	89.3	0.67	133.915		
300.0	300.0	299.0	299.0	0.6	0.6	90.47	-0.7	90.0	90.0	88.9	1.12	80.242		
400.0	400.0	399.0	399.0	0.8	0.8	90.47	-0.7	90.0	90.0	88.4	1.57	57.283 CC, ES		
500.0	500.0	499.0	499.0	1.0	1.0	158.96	-0.7	90.0	91.2	89.2	2.02	45.236		
600.0	599.9	598.9	598.9	1.2	1.2	159.79	-0.7	90.0	94.9	92.4	2.46	38.541		
700.0	699.7	698.7	698.7	1.5	1.5	161.04	-0.7	90.0	101.1	98.1	2.91	34.692		
800.0	799.3	798.3	798.3	1.7	1.7	162.55	-0.7	90.0	109.8	106.4	3.37	32.598		
900.0	898.6	897.6	897.6	2.0	1.9	164.17	-0.7	90.0	121.0	117.2	3.82	31.657		
1,000.0	997.5	996.5	996.5	2.3	2.1	165.78	-0.7	90.0	134.9	130.6	4.28	31.517 SF		
1,100.0	1,096.1	1,095.1	1,095.1	2.6	2.3	167.30	-0.7	90.0	151.4	146.6	4.74	31.952		
1,200.0	1,194.2	1,193.2	1,193.2	3.0	2.6	168.68	-0.7	90.0	170.5	165.3	5.20	32.813		
1,300.0	1,291.7	1,290.7	1,290.7	3.4	2.8	169.92	-0.7	90.0	192.2	186.5	5.65	33.995		
1,400.0	1,388.6	1,387.6	1,387.6	3.9	3.0	171.00	-0.7	90.0	216.5	210.4	6.11	35.424		
1,500.0	1,484.9	1,483.9	1,483.9	4.4	3.2	171.94	-0.7	90.0	243.3	236.8	6.57	37.040		
1,600.0	1,580.8	1,579.8	1,579.8	5.0	3.4	172.78	-0.7	90.0	271.3	264.3	7.04	38.531		
1,700.0	1,676.7	1,675.7	1,675.7	5.5	3.7	173.46	-0.7	90.0	299.4	291.9	7.52	39.815		
1,800.0	1,772.6	1,771.6	1,771.6	6.1	3.9	174.02	-0.7	90.0	327.5	319.5	8.00	40.931		
1,900.0	1,868.6	1,867.6	1,867.6	6.7	4.1	174.49	-0.7	90.0	355.6	347.1	8.49	41.908		
2,000.0	1,964.5	1,963.5	1,963.5	7.2	4.3	174.90	-0.7	90.0	383.7	374.7	8.97	42.769		
2,100.0	2,060.4	2,059.4	2,059.4	7.8	4.5	175.25	-0.7	90.0	411.9	402.4	9.46	43.532		
2,200.0	2,156.4	2,155.4	2,155.4	8.4	4.7	175.55	-0.7	90.0	440.0	430.1	9.95	44.213		
2,300.0	2,252.3	2,251.3	2,251.3	9.0	4.9	175.82	-0.7	90.0	468.2	457.7	10.44	44.824		
2,400.0	2,348.2	2,347.2	2,347.2	9.6	5.2	176.06	-0.7	90.0	496.4	485.4	10.94	45.375		
2,500.0	2,444.2	2,443.2	2,443.2	10.2	5.4	176.27	-0.7	90.0	524.5	513.1	11.43	45.874		
2,600.0	2,540.1	2,540.5	2,540.5	10.8	5.6	176.44	-0.5	90.0	552.7	540.8	11.93	46.313		
2,700.0	2,636.0	2,640.0	2,640.0	11.4	5.8	176.38	1.8	90.2	580.3	567.9	12.44	46.657		
2,800.0	2,731.9	2,739.8	2,739.6	12.0	6.0	176.09	6.8	90.6	607.4	594.5	12.95	46.918		
2,900.0	2,827.9	2,839.7	2,839.3	12.6	6.3	175.58	14.3	91.3	634.0	620.5	13.46	47.096		
3,000.0	2,923.8	2,939.6	2,938.6	13.2	6.5	174.88	24.4	92.1	660.0	646.0	13.99	47.193		
3,100.0	3,019.7	3,039.3	3,037.5	13.7	6.7	174.02	37.1	93.2	685.7	671.1	14.53	47.204		
3,200.0	3,115.7	3,138.8	3,135.8	14.3	7.0	173.01	52.4	94.5	711.0	695.9	15.08	47.135		
3,300.0	3,211.6	3,235.5	3,231.1	14.9	7.2	171.96	68.9	95.9	736.2	720.5	15.66	47.008		
3,400.0	3,307.5	3,331.4	3,325.5	15.5	7.5	170.98	85.4	97.3	761.6	745.3	16.25	46.860		
3,500.0	3,403.5	3,427.3	3,420.0	16.1	7.8	170.07	101.8	98.8	787.2	770.3	16.86	46.693		
3,600.0	3,499.4	3,523.2	3,514.5	16.7	8.0	169.21	118.3	100.2	813.0	795.5	17.48	46.512		
3,700.0	3,595.3	3,619.1	3,609.0	17.3	8.3	168.40	134.8	101.6	838.9	820.8	18.11	46.320		
3,800.0	3,691.2	3,715.0	3,703.4	17.9	8.6	167.64	151.2	103.0	865.0	846.2	18.75	46.121		
3,900.0	3,787.2	3,810.9	3,797.9	18.5	8.9	166.93	167.7	104.4	891.2	871.8	19.41	45.919		
4,000.0	3,883.1	3,906.8	3,892.4	19.1	9.2	166.25	184.2	105.8	917.6	897.5	20.07	45.715		
4,100.0	3,979.0	4,002.8	3,986.9	19.7	9.5	165.62	200.7	107.2	944.1	923.3	20.74	45.511		
4,200.0	4,075.0	4,098.7	4,081.3	20.3	9.8	165.01	217.1	108.6	970.6	949.2	21.42	45.308		
4,300.0	4,170.9	4,194.6	4,175.8	20.9	10.1	164.44	233.6	110.0	997.3	975.2	22.11	45.108		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WWWELL @ 4686.0ft (RKB - 23')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

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

Ladder Plot



LEGEND

Ottenhoff 29R-143, Wellbore #1, Plan #1 (3-14-16) V0	Ottenhoff 29R-203, Wellbore #1, Plan #1 (3-14-16) V0	Ottenhoff #29-1 (Exist), Wellbore #1, Wellbore #1 V0
Ottenhoff 29M-323, Wellbore #1, Plan #1 (3-14-16) V0	Ottenhoff 29R-303, Wellbore #1, Plan #1 (3-15-16) V0	Blake #B29-10 (D&A), Wellbore #1, Wellbore #1 V0
Ottenhoff 29M-203, Wellbore #1, Plan #1 (3-14-16) V0	Blake #B29-15 (Exist), Wellbore #1, Wellbore #1 V0	Blake #B 29-10X (Exist), Wellbore #1, Wellbore #1 V0
Ottenhoff 29R-423, Wellbore #1, Plan #1 (3-15-16) V0	Carlson 29-1 (Exist), Wellbore #1, Wellbore #1 V0	Blake B #29-23 (Exist), Wellbore #1, Wellbore #1 V0
Ottenhoff 29R-243, Wellbore #1, Plan #1 (3-14-16) V0	DIC Cross #31-32 (P&A), Wellbore #1, Wellbore #1 V0	Bell B29-24D, Bell B29-24D, Bell B29-24D V0

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29M-423
Project:	SEC.29-T5N-R64W	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29M-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-14-16)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WWWELL @ 4686.0ft (RKB - 23')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

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

