

PETROLEUM DEVELOPMENT CORP DJ Basin

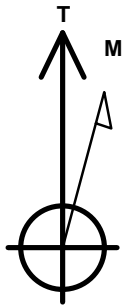
Well Name: **Niles Miller 20T-321**

Surface Location: Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4957.0

+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1318000.70 3197035.28 40.204157 -104.794569
Original Well Elev WELL @ 4970.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 379'FSL, 829'FEL	1.0	0.0	0.0	Point
BHL 500'FNL, 676'FEL	7264.0	4390.7	111.5	Point



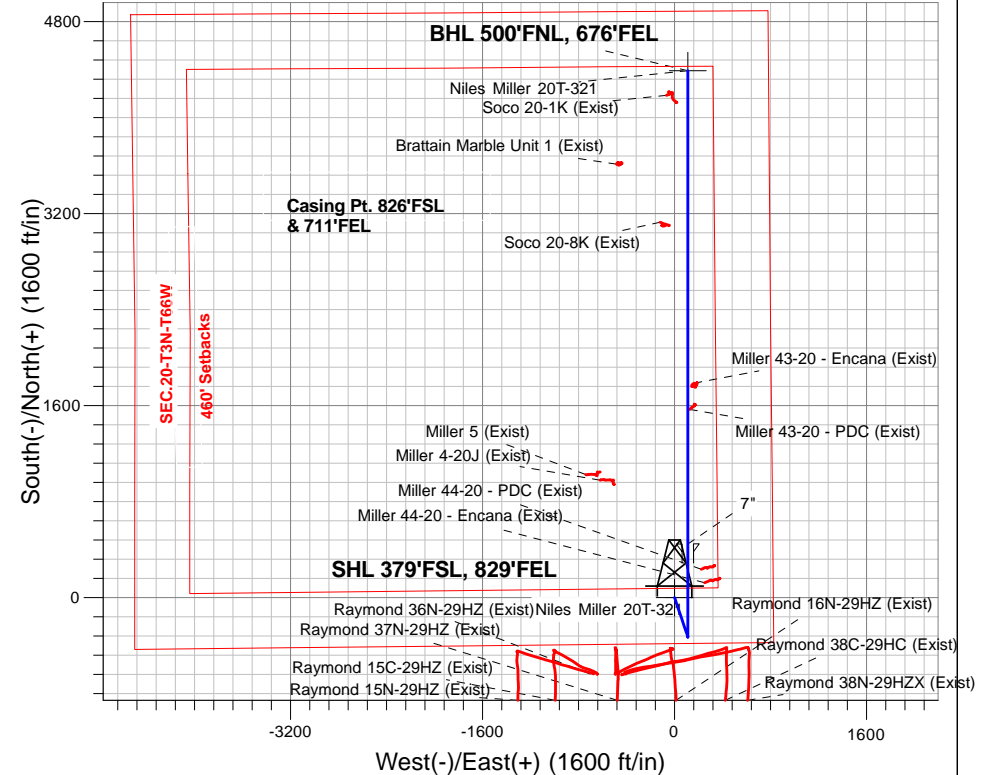
Azimuths to True North
Magnetic North: 8.26°

Magnetic Field
Strength: 52554.0snT
Dip Angle: 66.73°
Date: 12/3/2015
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1600.0	1600.0	KOP - Start Build 1.50
4894.8	4912.1	Start Drop -2.00
5200.0	5217.9	Start 1363.5 hold at 5217.9 MD
6563.5	6581.4	Start Build 7.50
7327.3	7793.6	Start 3944.0 hold at 7793.6 MD
7264.0	11737.7	TD at 11737.7

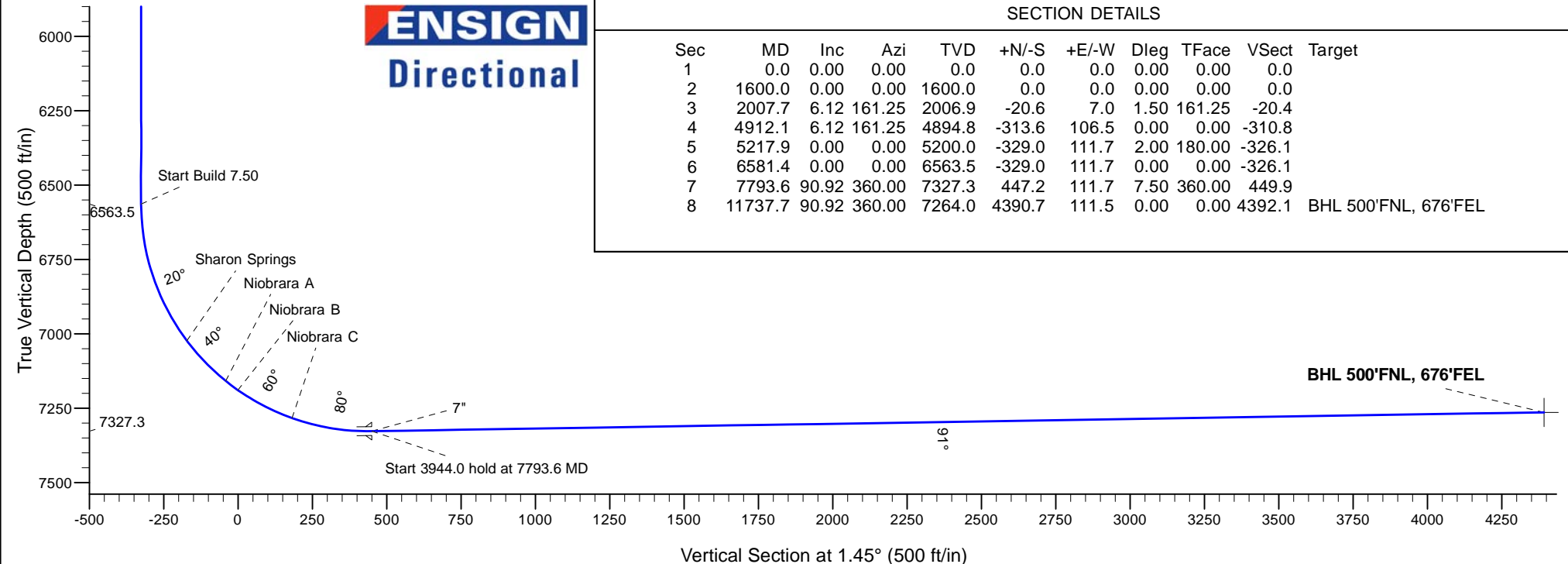
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
Niles Miller 20T-321
Plan #1 (12-01-15)
11:05, December 08 2015



ENSIGN
Directional

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1600.0	0.00	0.00	1600.0	0.0	0.0	0.00	0.00	0.0	
3	2007.7	6.12	161.25	2006.9	-20.6	7.0	1.50	161.25	-20.4	
4	4912.1	6.12	161.25	4894.8	-313.6	106.5	0.00	0.00	-310.8	
5	5217.9	0.00	0.00	5200.0	-329.0	111.7	2.00	180.00	-326.1	
6	6581.4	0.00	0.00	6563.5	-329.0	111.7	0.00	0.00	-326.1	
7	7793.6	90.92	360.00	7327.3	447.2	111.7	7.50	360.00	449.9	
8	11737.7	90.92	360.00	7264.0	4390.7	111.5	0.00	0.00	4392.1	BHL 500'FNL, 676'FEL





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.20-T3N-R66W

Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W

Niles Miller 20T-321

Wellbore #1

Plan: Plan #1 (12-01-15)

Standard Planning Report

08 December, 2015

Database:	US_EDM	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	North Reference:	True
Well:	Niles Miller 20T-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-01-15)		

Project	SEC.20-T3N-R66W, Weld County, Colorado		
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	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W				
Site Position:		Northing:	1,317,895.72 usft	Latitude:	40.203869
From:	Lat/Long	Easting:	3,197,037.36 usft	Longitude:	-104.794565
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.46

Well	Niles Miller 20T-321					
Well Position	+N/-S	105.0 ft	Northing:	1,318,000.70 usft	Latitude:	40.204158
	+E/-W	-1.2 ft	Easting:	3,197,035.28 usft	Longitude:	-104.794569
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,957.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/3/2015	8.26	66.73	52,554

Design	Plan #1 (12-01-15)			
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	1.45

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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,007.7	6.12	161.25	2,006.9	-20.6	7.0	1.50	1.50	0.00	161.25	
4,912.1	6.12	161.25	4,894.8	-313.6	106.5	0.00	0.00	0.00	0.00	
5,217.9	0.00	0.00	5,200.0	-329.0	111.7	2.00	-2.00	0.00	180.00	
6,581.4	0.00	0.00	6,563.5	-329.0	111.7	0.00	0.00	0.00	0.00	
7,793.6	90.92	360.00	7,327.3	447.2	111.7	7.50	7.50	0.00	360.00	
11,737.7	90.92	360.00	7,264.0	4,390.7	111.5	0.00	0.00	0.00	0.00	BHL 500'FNL, 676'FE

Database:	US_EDM	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	North Reference:	True
Well:	Niles Miller 20T-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-01-15)		

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 379'FSL, 829'FEL									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
1,700.0	1.50	161.25	1,700.0	-1.2	0.4	-1.2	1.50	1.50	0.00
1,800.0	3.00	161.25	1,799.9	-5.0	1.7	-4.9	1.50	1.50	0.00
1,900.0	4.50	161.25	1,899.7	-11.1	3.8	-11.1	1.50	1.50	0.00
2,000.0	6.00	161.25	1,999.3	-19.8	6.7	-19.6	1.50	1.50	0.00
2,007.7	6.12	161.25	2,006.9	-20.6	7.0	-20.4	1.50	1.50	0.00
2,100.0	6.12	161.25	2,098.7	-29.9	10.2	-29.6	0.00	0.00	0.00
2,200.0	6.12	161.25	2,198.1	-40.0	13.6	-39.6	0.00	0.00	0.00
2,300.0	6.12	161.25	2,297.6	-50.1	17.0	-49.6	0.00	0.00	0.00
2,400.0	6.12	161.25	2,397.0	-60.2	20.4	-59.6	0.00	0.00	0.00
2,500.0	6.12	161.25	2,496.4	-70.2	23.9	-69.6	0.00	0.00	0.00
2,600.0	6.12	161.25	2,595.9	-80.3	27.3	-79.6	0.00	0.00	0.00
2,700.0	6.12	161.25	2,695.3	-90.4	30.7	-89.6	0.00	0.00	0.00
2,800.0	6.12	161.25	2,794.7	-100.5	34.1	-99.6	0.00	0.00	0.00
2,900.0	6.12	161.25	2,894.1	-110.6	37.6	-109.6	0.00	0.00	0.00
3,000.0	6.12	161.25	2,993.6	-120.7	41.0	-119.6	0.00	0.00	0.00
3,100.0	6.12	161.25	3,093.0	-130.8	44.4	-129.6	0.00	0.00	0.00
3,200.0	6.12	161.25	3,192.4	-140.9	47.8	-139.6	0.00	0.00	0.00
3,300.0	6.12	161.25	3,291.9	-150.9	51.3	-149.6	0.00	0.00	0.00
3,400.0	6.12	161.25	3,391.3	-161.0	54.7	-159.6	0.00	0.00	0.00
3,500.0	6.12	161.25	3,490.7	-171.1	58.1	-169.6	0.00	0.00	0.00
3,600.0	6.12	161.25	3,590.2	-181.2	61.5	-179.6	0.00	0.00	0.00
3,700.0	6.12	161.25	3,689.6	-191.3	65.0	-189.6	0.00	0.00	0.00
3,800.0	6.12	161.25	3,789.0	-201.4	68.4	-199.6	0.00	0.00	0.00
3,900.0	6.12	161.25	3,888.5	-211.5	71.8	-209.6	0.00	0.00	0.00
3,943.8	6.12	161.25	3,932.0	-215.9	73.3	-214.0	0.00	0.00	0.00
Parkman									
4,000.0	6.12	161.25	3,987.9	-221.6	75.2	-219.6	0.00	0.00	0.00
4,100.0	6.12	161.25	4,087.3	-231.6	78.7	-229.6	0.00	0.00	0.00
4,200.0	6.12	161.25	4,186.8	-241.7	82.1	-239.6	0.00	0.00	0.00
4,300.0	6.12	161.25	4,286.2	-251.8	85.5	-249.6	0.00	0.00	0.00
4,400.0	6.12	161.25	4,385.6	-261.9	88.9	-259.6	0.00	0.00	0.00
4,401.4	6.12	161.25	4,387.0	-262.0	89.0	-259.7	0.00	0.00	0.00

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Project:	SEC.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	North Reference:	True
Well:	Niles Miller 20T-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-01-15)		

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)
Sussex									
4,500.0	6.12	161.25	4,485.0	-272.0	92.4	-269.6	0.00	0.00	0.00
4,600.0	6.12	161.25	4,584.5	-282.1	95.8	-279.6	0.00	0.00	0.00
4,700.0	6.12	161.25	4,683.9	-292.2	99.2	-289.6	0.00	0.00	0.00
4,800.0	6.12	161.25	4,783.3	-302.3	102.6	-299.6	0.00	0.00	0.00
4,900.0	6.12	161.25	4,882.8	-312.3	106.1	-309.5	0.00	0.00	0.00
4,912.1	6.12	161.25	4,894.8	-313.6	106.5	-310.8	0.00	0.00	0.00
Start Drop -2.00									
4,979.6	4.77	161.25	4,962.0	-319.6	108.5	-316.8	2.00	-2.00	0.00
Shannon									
5,000.0	4.36	161.25	4,982.3	-321.2	109.0	-318.3	2.00	-2.00	0.00
5,100.0	2.36	161.25	5,082.2	-326.7	110.9	-323.8	2.00	-2.00	0.00
5,200.0	0.36	161.25	5,182.1	-328.9	111.7	-326.0	2.00	-2.00	0.00
5,217.9	0.00	0.00	5,200.0	-329.0	111.7	-326.1	2.00	-2.00	0.00
Start 1363.5 hold at 5217.9 MD									
5,300.0	0.00	0.00	5,282.1	-329.0	111.7	-326.1	0.00	0.00	0.00
5,400.0	0.00	0.00	5,382.1	-329.0	111.7	-326.1	0.00	0.00	0.00
5,500.0	0.00	0.00	5,482.1	-329.0	111.7	-326.1	0.00	0.00	0.00
5,600.0	0.00	0.00	5,582.1	-329.0	111.7	-326.1	0.00	0.00	0.00
5,700.0	0.00	0.00	5,682.1	-329.0	111.7	-326.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,782.1	-329.0	111.7	-326.1	0.00	0.00	0.00
5,900.0	0.00	0.00	5,882.1	-329.0	111.7	-326.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,982.1	-329.0	111.7	-326.1	0.00	0.00	0.00
6,100.0	0.00	0.00	6,082.1	-329.0	111.7	-326.1	0.00	0.00	0.00
6,200.0	0.00	0.00	6,182.1	-329.0	111.7	-326.1	0.00	0.00	0.00
6,300.0	0.00	0.00	6,282.1	-329.0	111.7	-326.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,382.1	-329.0	111.7	-326.1	0.00	0.00	0.00
6,500.0	0.00	0.00	6,482.1	-329.0	111.7	-326.1	0.00	0.00	0.00
6,581.4	0.00	0.00	6,563.5	-329.0	111.7	-326.1	0.00	0.00	0.00
Start Build 7.50									
6,600.0	1.40	360.00	6,582.1	-328.8	111.7	-325.8	7.52	7.52	0.00
6,700.0	8.90	360.00	6,681.6	-319.8	111.7	-316.9	7.50	7.50	0.00
6,800.0	16.40	360.00	6,779.1	-297.9	111.7	-295.0	7.50	7.50	0.00
6,900.0	23.90	360.00	6,873.0	-263.5	111.7	-260.6	7.50	7.50	0.00
7,000.0	31.40	360.00	6,961.5	-217.1	111.7	-214.2	7.50	7.50	0.00
7,074.4	36.98	360.00	7,023.0	-175.3	111.7	-172.5	7.50	7.50	0.00
Sharon Springs									
7,100.0	38.90	360.00	7,043.2	-159.6	111.7	-156.7	7.50	7.50	0.00
7,200.0	46.40	360.00	7,116.7	-91.9	111.7	-89.0	7.50	7.50	0.00
7,262.7	51.10	360.00	7,158.0	-44.8	111.7	-42.0	7.50	7.50	0.00
Niobrara A									
7,300.0	53.90	360.00	7,180.7	-15.2	111.7	-12.4	7.50	7.50	0.00
7,314.2	54.97	360.00	7,189.0	-3.6	111.7	-0.8	7.50	7.50	0.00
Niobrara B									
7,400.0	61.40	360.00	7,234.2	69.2	111.7	72.0	7.50	7.50	0.00
7,500.0	68.90	360.00	7,276.2	159.9	111.7	162.7	7.50	7.50	0.00
7,519.6	70.36	360.00	7,283.0	178.2	111.7	181.0	7.50	7.50	0.00
Niobrara C									
7,600.0	76.40	360.00	7,306.0	255.3	111.7	258.0	7.50	7.50	0.00
7,700.0	83.90	360.00	7,323.1	353.7	111.7	356.5	7.50	7.50	0.00
7,793.6	90.92	360.00	7,327.3	447.2	111.7	449.9	7.50	7.50	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	North Reference:	True
Well:	Niles Miller 20T-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-01-15)		

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)
Start 3944.0 hold at 7793.6 MD - 7"									
7,800.0	90.92	360.00	7,327.2	453.6	111.7	456.3	0.04	0.04	0.00
7,900.0	90.92	360.00	7,325.6	553.6	111.7	556.2	0.00	0.00	0.00
8,000.0	90.92	360.00	7,324.0	653.6	111.7	656.2	0.00	0.00	0.00
8,100.0	90.92	360.00	7,322.4	753.5	111.7	756.1	0.00	0.00	0.00
8,200.0	90.92	360.00	7,320.8	853.5	111.7	856.1	0.00	0.00	0.00
8,300.0	90.92	360.00	7,319.2	953.5	111.6	956.0	0.00	0.00	0.00
8,400.0	90.92	360.00	7,317.6	1,053.5	111.6	1,056.0	0.00	0.00	0.00
8,500.0	90.92	360.00	7,316.0	1,153.5	111.6	1,156.0	0.00	0.00	0.00
8,600.0	90.92	360.00	7,314.4	1,253.5	111.6	1,255.9	0.00	0.00	0.00
8,700.0	90.92	360.00	7,312.8	1,353.5	111.6	1,355.9	0.00	0.00	0.00
8,800.0	90.92	360.00	7,311.2	1,453.5	111.6	1,455.8	0.00	0.00	0.00
8,900.0	90.92	360.00	7,309.6	1,553.4	111.6	1,555.8	0.00	0.00	0.00
9,000.0	90.92	360.00	7,308.0	1,653.4	111.6	1,655.7	0.00	0.00	0.00
9,100.0	90.92	360.00	7,306.4	1,753.4	111.6	1,755.7	0.00	0.00	0.00
9,200.0	90.92	360.00	7,304.7	1,853.4	111.6	1,855.6	0.00	0.00	0.00
9,300.0	90.92	360.00	7,303.1	1,953.4	111.6	1,955.6	0.00	0.00	0.00
9,400.0	90.92	360.00	7,301.5	2,053.4	111.6	2,055.5	0.00	0.00	0.00
9,500.0	90.92	360.00	7,299.9	2,153.4	111.6	2,155.5	0.00	0.00	0.00
9,600.0	90.92	360.00	7,298.3	2,253.3	111.6	2,255.5	0.00	0.00	0.00
9,700.0	90.92	360.00	7,296.7	2,353.3	111.6	2,355.4	0.00	0.00	0.00
9,800.0	90.92	360.00	7,295.1	2,453.3	111.6	2,455.4	0.00	0.00	0.00
9,900.0	90.92	360.00	7,293.5	2,553.3	111.6	2,555.3	0.00	0.00	0.00
10,000.0	90.92	360.00	7,291.9	2,653.3	111.6	2,655.3	0.00	0.00	0.00
10,100.0	90.92	360.00	7,290.3	2,753.3	111.6	2,755.2	0.00	0.00	0.00
10,200.0	90.92	360.00	7,288.7	2,853.3	111.5	2,855.2	0.00	0.00	0.00
10,300.0	90.92	360.00	7,287.1	2,953.3	111.5	2,955.1	0.00	0.00	0.00
10,400.0	90.92	360.00	7,285.5	3,053.2	111.5	3,055.1	0.00	0.00	0.00
10,500.0	90.92	360.00	7,283.9	3,153.2	111.5	3,155.0	0.00	0.00	0.00
10,600.0	90.92	360.00	7,282.3	3,253.2	111.5	3,255.0	0.00	0.00	0.00
10,700.0	90.92	360.00	7,280.7	3,353.2	111.5	3,355.0	0.00	0.00	0.00
10,800.0	90.92	360.00	7,279.1	3,453.2	111.5	3,454.9	0.00	0.00	0.00
10,900.0	90.92	360.00	7,277.4	3,553.2	111.5	3,554.9	0.00	0.00	0.00
11,000.0	90.92	360.00	7,275.8	3,653.2	111.5	3,654.8	0.00	0.00	0.00
11,100.0	90.92	360.00	7,274.2	3,753.2	111.5	3,754.8	0.00	0.00	0.00
11,200.0	90.92	360.00	7,272.6	3,853.1	111.5	3,854.7	0.00	0.00	0.00
11,300.0	90.92	360.00	7,271.0	3,953.1	111.5	3,954.7	0.00	0.00	0.00
11,400.0	90.92	360.00	7,269.4	4,053.1	111.5	4,054.6	0.00	0.00	0.00
11,500.0	90.92	360.00	7,267.8	4,153.1	111.5	4,154.6	0.00	0.00	0.00
11,600.0	90.92	360.00	7,266.2	4,253.1	111.5	4,254.5	0.00	0.00	0.00
11,700.0	90.92	360.00	7,264.6	4,353.1	111.5	4,354.5	0.00	0.00	0.00
11,737.7	90.92	360.00	7,264.0	4,390.7	111.5	4,392.1	0.00	0.00	0.00
TD at 11737.7 - BHL 500°FNL, 676°FEL									

Database:	US_EDM	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	North Reference:	True
Well:	Niles Miller 20T-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-01-15)		

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 379°FSL, 829°FEL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,318,000.71	3,197,035.28	40.204158	-104.794569
BHL 500°FNL, 676°FEL - plan hits target center - Point	0.00	0.00	7,264.0	4,390.7	111.5	1,322,391.98	3,197,111.81	40.216210	-104.794170

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,793.6	7,327.3	7"	7	8-3/4

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,943.8	3,932.0	Parkman		0.00	
4,401.4	4,387.0	Sussex		0.00	
4,979.6	4,962.0	Shannon		0.00	
7,074.4	7,023.0	Sharon Springs		0.00	
7,262.7	7,158.0	Niobrara A		0.00	
7,314.2	7,189.0	Niobrara B		0.00	
7,519.6	7,283.0	Niobrara C		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,600.0	1,600.0	0.0	0.0	KOP - Start Build 1.50
4,912.1	4,894.8	-20.6	7.0	Start Drop -2.00
5,217.9	5,200.0	-313.6	106.5	Start 1363.5 hold at 5217.9 MD
6,581.4	6,563.5	-329.0	111.7	Start Build 7.50
7,793.6	7,327.3	-329.0	111.7	Start 3944.0 hold at 7793.6 MD
11,737.7	7,264.0	447.2	111.7	TD at 11737.7

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.20-T3N-R66W

Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W

Niles Miller 20T-321

Wellbore #1

Plan #1 (12-01-15)

Anticollision Report

08 December, 2015

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (12-01-15)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 800.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	12/8/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,736.7	Plan #1 (12-01-15) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Existing Wells Sec.20-T3N-R66W						
Brattain Marble Unit 1 (Exist) - Wellbore #1 - Wellbore #1	10,969.2	7,217.6	587.8	502.0	6.850	CC, ES
Brattain Marble Unit 1 (Exist) - Wellbore #1 - Wellbore #1	11,000.0	7,216.8	588.6	502.2	6.814	SF
Miller 4-20J (Exist) - Wellbore #1 - Wellbore #1	8,329.0	7,303.2	722.1	680.8	17.473	CC, ES
Miller 4-20J (Exist) - Wellbore #1 - Wellbore #1	8,500.0	7,299.4	742.1	698.1	16.877	SF
Miller 43-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	9,118.9	7,305.7	33.5	-18.9	0.640	Level 1, CC, ES, SF
Miller 43-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	8,919.2	7,307.5	19.7	-29.8	0.398	Level 1, CC, ES, SF
Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	7,476.9	7,279.7	166.1	133.7	5.130	CC, ES, SF
Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	7,586.6	7,315.3	120.1	86.9	3.622	CC, ES, SF
Miller 5 (Exist) - Wellbore #1 - Wellbore #1						Out of range
Raymond 15C-29HZ (Exist) - Wellbore #1 - Wellbore #1						Out of range
Raymond 15N-29HZ (Exist) - Wellbore #1 - Wellbore #1						Out of range
Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1	5,167.7	5,145.4	159.7	135.8	6.688	CC
Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1	5,200.0	5,177.5	159.7	135.8	6.657	ES
Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,600.0	6,578.2	170.7	141.4	5.832	SF
Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1	4,019.3	3,977.6	603.7	585.3	32.688	CC
Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,217.8	6,172.2	604.4	576.5	21.714	ES
Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,700.0	6,654.0	609.2	579.6	20.562	SF
Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1	4,985.6	4,974.7	202.5	176.3	7.706	CC
Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1	5,000.0	4,988.9	202.6	176.3	7.691	ES, SF
Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1	4,349.3	4,338.3	281.3	257.5	11.817	CC, ES
Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1	4,700.0	4,687.1	290.4	265.2	11.516	SF
Soco 20-1K (Exist) - Wellbore #1 - Wellbore #1	11,536.8	7,235.7	172.7	74.8	1.764	CC, ES, SF
Soco 20-8K (Exist) - Wellbore #1 - Wellbore #1	10,464.5	7,243.4	204.6	126.1	2.608	CC, ES, SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W						
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	200.0	197.0	105.0	104.3	157.311	CC
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	300.0	296.6	105.2	104.1	95.239	ES
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	1,000.0	983.0	141.3	137.0	32.254	SF
Niles Miller 20Q-321 - Wellbore #1 - Plan #1 (12-01-15)	400.0	397.0	90.0	88.5	57.477	CC
Niles Miller 20Q-321 - Wellbore #1 - Plan #1 (12-01-15)	500.0	496.6	90.3	88.3	45.116	ES
Niles Miller 20Q-321 - Wellbore #1 - Plan #1 (12-01-15)	1,100.0	1,086.5	118.8	114.1	25.147	SF
Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)	1,000.0	998.0	45.0	40.7	10.540	CC, ES
Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)	11,737.7	11,637.7	340.9	171.1	2.007	SF
Niles Miller 20T-241 - Wellbore #1 - Plan #1 (12-01-15)	600.0	598.0	75.1	72.6	30.412	CC
Niles Miller 20T-241 - Wellbore #1 - Plan #1 (12-01-15)	700.0	697.5	75.4	72.5	25.997	ES
Niles Miller 20T-241 - Wellbore #1 - Plan #1 (12-01-15)	1,100.0	1,092.7	89.1	84.5	19.153	SF
Niles Miller 20T-301 - Wellbore #1 - Plan #1 (12-01-15)	800.0	798.0	60.1	56.7	17.836	CC, ES
Niles Miller 20T-301 - Wellbore #1 - Plan #1 (12-01-15)	11,737.7	11,762.2	661.9	487.3	3.789	SF
Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15)	1,400.0	1,399.0	15.1	9.0	2.486	CC, ES
Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15)	11,737.7	11,653.6	311.5	142.6	1.844	SF
Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)	1,200.0	1,199.0	30.1	24.9	5.822	CC, ES
Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)	11,737.7	11,901.0	600.9	432.6	3.571	SF

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Existing Wells Sec.20-T3N-R66W - Brattain Marble Unit 1 (Exist) - Wellbore #1 - Wellbore #1													
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
10,500.0	7,283.9	7,230.2	7,229.4	64.1	13.0	-89.91	3,622.0	-476.4	751.9	674.8	77.11	9.752	
10,600.0	7,282.3	7,227.5	7,226.7	66.0	13.0	-89.65	3,622.0	-476.3	694.0	615.0	78.96	8.789	
10,700.0	7,280.7	7,224.8	7,224.0	67.8	13.0	-89.39	3,622.0	-476.3	646.4	565.6	80.81	7.999	
10,800.0	7,279.1	7,222.1	7,221.4	69.7	13.0	-89.12	3,622.0	-476.2	611.6	528.9	82.67	7.398	
10,900.0	7,277.4	7,219.5	7,218.7	71.5	13.0	-88.86	3,622.1	-476.1	591.8	507.3	84.52	7.002	
10,969.2	7,276.3	7,217.6	7,216.8	72.8	13.0	-88.68	3,622.1	-476.1	587.8	502.0	85.81	6.850	CC, ES
11,000.0	7,275.8	7,216.8	7,216.0	73.4	13.0	-88.60	3,622.1	-476.1	588.6	502.2	86.38	6.814	SF
11,100.0	7,274.2	7,214.1	7,213.3	75.3	13.0	-88.34	3,622.1	-476.0	602.1	513.9	88.23	6.824	
11,200.0	7,272.6	7,211.4	7,210.7	77.2	13.0	-88.08	3,622.2	-476.0	631.4	541.3	90.09	7.009	
11,300.0	7,271.0	7,208.8	7,208.0	79.0	13.0	-87.82	3,622.2	-475.9	674.4	582.5	91.95	7.335	
11,400.0	7,269.4	7,206.1	7,205.4	80.9	13.0	-87.56	3,622.2	-475.8	728.7	634.9	93.80	7.768	
11,500.0	7,267.8	7,203.5	7,202.7	82.8	13.0	-87.31	3,622.2	-475.8	791.9	696.2	95.66	8.278	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 4-20J (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)			
8,000.0	7,324.0	7,310.2	7,307.9	21.3	15.5	-89.46	982.2	-610.5	793.5	756.8	36.71	21.614		
8,100.0	7,322.4	7,308.1	7,305.8	22.6	15.5	-89.29	982.2	-610.4	757.5	719.5	38.03	19.921		
8,200.0	7,320.8	7,305.9	7,303.7	24.0	15.5	-89.12	982.2	-610.4	733.5	694.1	39.42	18.606		
8,300.0	7,319.2	7,303.8	7,301.5	25.5	15.5	-88.95	982.2	-610.3	722.7	681.8	40.89	17.675		
8,329.0	7,318.7	7,303.2	7,300.9	25.9	15.5	-88.90	982.3	-610.3	722.1	680.8	41.33	17.473	CC, ES	
8,400.0	7,317.6	7,301.6	7,299.4	27.0	15.5	-88.78	982.3	-610.3	725.6	683.2	42.40	17.111		
8,500.0	7,316.0	7,299.4	7,297.2	28.6	15.5	-88.61	982.3	-610.3	742.1	698.1	43.97	16.877	SF	
8,600.0	7,314.4	7,297.2	7,295.0	30.2	15.5	-88.43	982.3	-610.2	771.3	725.7	45.57	16.923		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 43-20 - Encana (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		
8,400.0	7,317.6	7,280.3	7,278.9	27.0	13.4	51.43	1,771.0	144.5	719.2	686.6	32.62	22.047		
8,500.0	7,316.0	7,283.9	7,282.4	28.6	13.4	55.45	1,771.2	144.5	619.4	584.0	35.46	17.467		
8,600.0	7,314.4	7,287.4	7,285.9	30.2	13.4	59.88	1,771.4	144.6	519.7	481.2	38.43	13.524		
8,700.0	7,312.8	7,290.9	7,289.4	31.8	13.4	64.72	1,771.5	144.7	420.0	378.5	41.45	10.133		
8,800.0	7,311.2	7,294.4	7,292.9	33.5	13.4	69.94	1,771.7	144.8	320.5	276.0	44.43	7.212		
8,900.0	7,309.6	7,298.0	7,296.4	35.2	13.4	75.51	1,771.9	144.9	221.3	174.1	47.27	4.682		
9,000.0	7,308.0	7,301.5	7,300.0	36.9	13.4	81.36	1,772.1	145.0	123.5	73.6	49.83	2.478		
9,100.0	7,306.4	7,305.0	7,303.5	38.7	13.4	87.33	1,772.3	145.1	38.5	-13.5	52.00	0.740	Level 1	
9,118.9	7,306.0	7,305.7	7,304.1	39.0	13.4	88.45	1,772.3	145.1	33.5	-18.9	52.36	0.640	Level 1, CC, ES, SF	
9,200.0	7,304.7	7,308.5	7,306.9	40.4	13.4	93.24	1,772.4	145.2	87.7	34.0	53.71	1.633		
9,300.0	7,303.1	7,311.9	7,310.4	42.2	13.4	98.97	1,772.6	145.3	184.1	129.1	54.92	3.351		
9,400.0	7,301.5	7,315.2	7,313.7	44.0	13.4	104.41	1,772.8	145.4	282.9	227.2	55.69	5.080		
9,500.0	7,299.9	7,318.6	7,317.0	45.8	13.4	109.51	1,773.0	145.5	382.3	326.3	56.07	6.819		
9,600.0	7,298.3	7,321.8	7,320.3	47.6	13.4	114.21	1,773.1	145.5	482.0	425.8	56.14	8.586		
9,700.0	7,296.7	7,325.1	7,323.5	49.4	13.4	118.51	1,773.3	145.6	581.7	525.7	55.98	10.391		
9,800.0	7,295.1	7,328.3	7,326.7	51.2	13.4	122.41	1,773.4	145.7	681.5	625.8	55.69	12.239		
9,900.0	7,293.5	7,331.4	7,329.8	53.0	13.4	125.94	1,773.6	145.8	781.4	726.1	55.30	14.129		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 43-20 - PDC (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)			
8,200.0	7,320.8	7,333.5	7,332.7	24.0	14.1	144.11	1,572.1	130.8	719.0	695.3	23.69	30.348	0.398 Level 1, CC, ES, SF	
8,300.0	7,319.2	7,329.9	7,329.1	25.5	14.1	139.91	1,572.2	130.8	619.1	592.4	26.68	23.206		
8,400.0	7,317.6	7,326.3	7,325.5	27.0	14.1	134.88	1,572.2	130.9	519.2	489.1	30.10	17.247		
8,500.0	7,316.0	7,322.7	7,321.9	28.6	14.1	128.83	1,572.3	131.0	419.4	385.4	33.96	12.347		
8,600.0	7,314.4	7,319.0	7,318.2	30.2	14.1	121.62	1,572.4	131.1	319.6	281.4	38.16	8.376		
8,700.0	7,312.8	7,315.4	7,314.6	31.8	14.0	113.16	1,572.5	131.1	219.9	177.5	42.41	5.186		
8,800.0	7,311.2	7,311.8	7,311.0	33.5	14.0	103.57	1,572.5	131.2	120.7	74.5	46.25	2.610		
8,900.0	7,309.6	7,308.2	7,307.4	35.2	14.0	93.22	1,572.6	131.3	27.5	-21.6	49.12	0.559 Level 1		
8,919.2	7,309.3	7,307.5	7,306.7	35.5	14.0	91.20	1,572.6	131.3	19.7	-29.8	49.52	0.398 Level 1, CC, ES, SF		
9,000.0	7,308.0	7,304.5	7,303.7	36.9	14.0	82.75	1,572.7	131.4	83.1	32.5	50.60	1.643		
9,100.0	7,306.4	7,300.9	7,300.1	38.7	14.0	72.81	1,572.7	131.4	181.8	131.1	50.66	3.588		
9,200.0	7,304.7	7,297.3	7,296.5	40.4	14.0	63.89	1,572.8	131.5	281.3	231.7	49.64	5.668		
9,300.0	7,303.1	7,293.7	7,292.9	42.2	14.0	56.20	1,572.9	131.6	381.1	333.1	48.01	7.938		
9,400.0	7,301.5	7,290.0	7,289.2	44.0	14.0	49.72	1,573.0	131.7	480.9	434.7	46.17	10.416		
9,500.0	7,299.9	7,286.4	7,285.6	45.8	14.0	44.32	1,573.0	131.8	580.8	536.4	44.38	13.086		
9,600.0	7,298.3	7,282.8	7,282.0	47.6	14.0	39.82	1,573.1	131.8	680.7	637.9	42.78	15.912		
9,700.0	7,296.7	7,279.2	7,278.4	49.4	14.0	36.06	1,573.2	131.9	780.6	739.2	41.41	18.852		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - Encana (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	5.0	5.0	0.0	0.0	66.84	161.2	376.8	409.9	409.9	0.01	N/A		
100.0	100.0	105.6	105.6	0.1	0.1	66.82	161.3	376.7	409.8	409.5	0.25	1,608.772		
121.5	121.5	126.5	126.5	0.2	0.2	66.81	161.4	376.7	409.8	409.4	0.34	1,207.725		
200.0	200.0	203.1	203.1	0.3	0.3	66.80	161.5	376.8	410.0	409.3	0.65	632.046		
300.0	300.0	304.0	304.0	0.6	0.5	66.79	161.7	377.1	410.3	409.2	1.08	379.367		
400.0	400.0	406.0	406.0	0.8	0.7	66.84	161.4	377.2	410.3	408.8	1.47	279.514		
437.9	437.9	442.9	442.9	0.9	0.7	66.88	161.1	377.3	410.3	408.6	1.61	254.754		
500.0	500.0	503.7	503.7	1.0	0.8	66.91	160.9	377.5	410.4	408.5	1.84	222.528		
600.0	600.0	607.6	607.6	1.2	1.0	66.92	160.8	377.3	410.1	407.9	2.24	183.380		
700.0	700.0	705.7	705.7	1.5	1.1	66.91	160.7	376.9	409.8	407.1	2.61	157.139		
800.0	800.0	805.0	805.0	1.7	1.3	66.90	160.7	376.8	409.7	406.7	3.02	135.785		
800.5	800.5	805.5	805.5	1.7	1.3	66.90	160.7	376.8	409.7	406.7	3.02	135.686		
900.0	900.0	904.2	904.2	1.9	1.5	66.87	161.0	376.9	409.8	406.3	3.44	119.084		
1,000.0	1,000.0	1,006.6	1,006.6	2.1	1.7	66.80	161.4	376.5	409.7	405.8	3.88	105.523		
1,100.0	1,100.0	1,107.2	1,107.2	2.4	1.9	66.76	161.5	376.0	409.2	404.9	4.31	95.009		
1,200.0	1,200.0	1,205.7	1,205.7	2.6	2.1	66.81	161.0	375.8	408.9	404.2	4.69	87.222		
1,246.1	1,246.1	1,251.1	1,251.1	2.7	2.2	66.83	160.9	375.8	408.8	404.0	4.86	84.143		
1,300.0	1,300.0	1,304.4	1,304.4	2.8	2.2	66.83	160.8	375.9	408.9	403.8	5.06	80.811		
1,400.0	1,400.0	1,406.8	1,406.8	3.0	2.4	66.86	160.6	375.8	408.7	403.2	5.45	74.953		
1,500.0	1,500.0	1,505.4	1,505.4	3.3	2.6	66.86	160.5	375.6	408.4	402.6	5.86	69.665		
1,600.0	1,600.0	1,607.8	1,607.8	3.5	2.8	66.84	160.5	375.1	408.0	401.7	6.30	64.763		
1,700.0	1,700.0	1,707.8	1,707.8	3.7	3.0	-94.65	160.5	374.3	407.4	400.7	6.71	60.689		
1,752.0	1,752.0	1,758.4	1,758.4	3.8	3.1	-94.92	160.7	374.0	407.3	400.4	6.91	58.904		
1,800.0	1,799.9	1,805.3	1,805.2	3.9	3.2	-95.26	160.9	373.8	407.4	400.3	7.10	57.378		
1,900.0	1,899.7	1,907.1	1,907.1	4.0	3.5	-96.23	161.0	373.3	407.7	400.2	7.50	54.350		
2,007.7	2,006.9	2,013.4	2,013.4	4.2	3.7	-97.63	161.1	372.7	408.4	400.4	7.94	51.415		
2,100.0	2,098.7	2,104.0	2,104.0	4.4	3.9	-98.96	160.9	372.6	409.6	401.3	8.29	49.409		
2,200.0	2,198.1	2,206.5	2,206.5	4.6	4.0	-100.37	160.1	372.5	410.9	402.3	8.66	47.451		
2,300.0	2,297.6	2,305.3	2,305.2	4.9	4.2	-101.75	159.4	372.1	412.3	403.2	9.08	45.401		
2,400.0	2,397.0	2,404.6	2,404.5	5.1	4.4	-103.17	158.9	371.6	414.0	404.4	9.53	43.444		
2,500.0	2,496.4	2,505.4	2,505.4	5.4	4.6	-104.54	158.1	371.3	415.8	405.8	9.97	41.689		
2,600.0	2,595.9	2,609.5	2,609.5	5.6	4.8	-105.92	156.6	370.3	417.0	406.5	10.43	39.961		
2,700.0	2,695.3	2,707.8	2,707.7	5.9	5.1	-107.27	155.4	368.8	418.1	407.2	10.91	38.327		
2,800.0	2,794.7	2,807.0	2,806.9	6.1	5.3	-108.59	154.1	367.7	419.7	408.3	11.39	36.860		
2,900.0	2,894.1	2,908.3	2,908.2	6.4	5.5	-109.94	152.6	366.3	421.2	409.4	11.87	35.477		
3,000.0	2,993.6	3,004.7	3,004.6	6.6	5.8	-111.28	151.7	364.9	423.2	410.9	12.36	34.236		
3,100.0	3,093.0	3,106.5	3,106.3	6.9	6.0	-112.66	150.7	363.4	425.5	412.7	12.87	33.073		
3,200.0	3,192.4	3,204.9	3,204.7	7.2	6.3	-114.04	150.0	361.6	427.9	414.6	13.36	32.023		
3,300.0	3,291.9	3,302.1	3,302.0	7.5	6.5	-115.41	149.6	360.1	431.0	417.1	13.86	31.095		
3,400.0	3,391.3	3,403.7	3,403.5	7.7	6.8	-116.81	149.2	358.4	434.2	419.9	14.37	30.222		
3,500.0	3,490.7	3,500.8	3,500.6	8.0	7.0	-118.20	149.2	356.5	437.8	422.9	14.86	29.462		
3,600.0	3,590.2	3,599.5	3,599.3	8.3	7.2	-119.56	149.3	354.9	441.9	426.6	15.35	28.784		
3,700.0	3,689.6	3,700.0	3,699.8	8.6	7.5	-120.92	149.3	353.1	446.2	430.3	15.85	28.141		
3,800.0	3,789.0	3,797.0	3,796.7	8.9	7.7	-122.31	149.8	351.0	450.8	434.5	16.33	27.599		
3,900.0	3,888.5	3,893.8	3,893.5	9.2	7.9	-123.68	151.0	349.1	456.3	439.5	16.80	27.170		
4,000.0	3,987.9	3,996.5	3,996.2	9.4	8.2	-125.05	151.9	347.3	462.0	444.8	17.27	26.747		
4,100.0	4,087.3	4,094.2	4,093.9	9.7	8.4	-126.33	152.6	345.4	467.7	450.0	17.75	26.349		
4,200.0	4,186.8	4,198.0	4,197.6	10.0	8.6	-127.67	153.1	343.2	473.4	455.2	18.25	25.947		
4,300.0	4,286.2	4,305.6	4,305.2	10.3	8.9	-129.00	152.3	340.2	477.9	459.1	18.76	25.478		
4,400.0	4,385.6	4,404.5	4,404.1	10.6	9.2	-130.22	151.0	337.0	481.9	462.6	19.25	25.033		
4,500.0	4,485.0	4,504.5	4,504.0	10.9	9.4	-131.42	149.6	333.7	486.0	466.3	19.74	24.618		

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.20-T3N-R66W - Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
4,600.0	4,584.5	4,604.1	4,603.5	11.2	9.7	-132.56	148.0	330.7	490.3	470.1	20.23	24.234			
4,700.0	4,683.9	4,703.8	4,703.1	11.5	9.9	-133.67	146.3	327.8	494.7	474.0	20.72	23.878			
4,800.0	4,783.3	4,805.0	4,804.3	11.8	10.2	-134.80	144.5	324.6	499.1	477.9	21.21	23.534			
4,900.0	4,882.8	4,901.9	4,901.1	12.1	10.4	-135.80	142.6	322.0	503.8	482.1	21.68	23.234			
4,912.1	4,894.8	4,913.5	4,912.8	12.1	10.5	-135.91	142.4	321.8	504.4	482.7	21.74	23.201			
5,000.0	4,982.3	4,998.3	4,997.5	12.3	10.7	-136.68	141.0	320.1	508.2	486.1	22.15	22.941			
5,100.0	5,082.2	5,092.6	5,091.8	12.5	10.9	-137.28	140.3	318.4	511.0	488.4	22.59	22.624			
5,200.0	5,182.1	5,191.4	5,190.6	12.7	11.2	-137.62	140.1	316.9	512.0	489.0	23.01	22.247			
5,217.9	5,200.0	5,208.7	5,207.9	12.8	11.2	23.59	140.2	316.6	511.9	488.9	23.08	22.177			
5,268.3	5,250.4	5,256.2	5,255.4	12.8	11.3	23.52	140.3	316.0	511.8	488.5	23.27	21.992			
5,300.0	5,282.1	5,286.1	5,285.3	12.9	11.4	23.49	140.4	315.8	511.9	488.5	23.39	21.882			
5,400.0	5,382.1	5,385.1	5,384.3	13.1	11.5	23.42	141.2	315.3	512.4	488.6	23.75	21.577			
5,500.0	5,482.1	5,484.7	5,483.9	13.2	11.7	23.32	142.1	314.7	513.0	488.9	24.10	21.287			
5,600.0	5,582.1	5,583.5	5,582.6	13.4	11.9	23.23	143.0	314.3	513.7	489.3	24.45	21.014			
5,700.0	5,682.1	5,686.3	5,685.4	13.6	12.1	23.09	144.2	313.5	514.4	489.5	24.84	20.710			
5,800.0	5,782.1	5,788.4	5,787.5	13.8	12.3	22.95	144.8	312.3	514.5	489.2	25.26	20.368			
5,900.0	5,882.1	5,891.4	5,890.5	13.9	12.6	22.77	145.0	310.7	514.1	488.4	25.70	20.002			
6,000.0	5,982.1	5,988.2	5,987.3	14.1	12.8	22.62	145.2	309.3	513.7	487.6	26.13	19.657			
6,100.0	6,082.1	6,090.1	6,089.2	14.3	13.1	22.42	145.7	307.6	513.6	487.0	26.58	19.325			
6,200.0	6,182.1	6,192.6	6,191.7	14.5	13.3	22.23	145.8	305.7	512.9	485.9	27.03	18.978			
6,300.0	6,282.1	6,290.5	6,289.5	14.7	13.6	22.09	145.6	304.3	512.2	484.7	27.47	18.645			
6,400.0	6,382.1	6,391.3	6,390.4	14.8	13.8	21.93	145.6	302.8	511.7	483.7	27.92	18.324			
6,500.0	6,482.1	6,493.4	6,492.4	15.0	14.1	21.71	145.6	300.6	510.8	482.5	28.38	18.000			
6,581.4	6,563.5	6,578.1	6,577.1	15.2	14.3	21.52	145.1	298.7	509.7	481.0	28.75	17.728			
6,600.0	6,582.1	6,597.5	6,596.5	15.2	14.4	21.51	144.9	298.2	509.2	480.4	28.82	17.670			
6,650.0	6,632.0	6,647.0	6,646.0	15.3	14.5	21.63	144.4	297.1	505.6	476.7	28.91	17.491			
6,700.0	6,681.6	6,696.0	6,695.0	15.4	14.6	21.98	143.9	296.0	499.1	470.2	28.89	17.274			
6,750.0	6,730.8	6,747.2	6,746.2	15.4	14.7	22.58	143.4	294.9	489.5	460.7	28.78	17.009			
6,800.0	6,779.1	6,797.8	6,796.7	15.4	14.9	23.45	142.6	293.5	476.8	448.2	28.57	16.687			
6,850.0	6,826.6	6,844.5	6,843.4	15.4	15.0	24.61	141.9	292.2	461.1	432.8	28.27	16.309			
6,900.0	6,873.0	6,890.0	6,888.9	15.4	15.1	26.11	141.2	290.9	442.7	414.8	27.91	15.864			
6,950.0	6,918.0	6,934.9	6,933.7	15.4	15.2	28.06	140.5	289.6	421.8	394.3	27.51	15.332			
7,000.0	6,961.5	6,978.3	6,977.1	15.4	15.3	30.53	140.0	288.2	398.5	371.3	27.13	14.687			
7,050.0	7,003.3	7,019.9	7,018.7	15.4	15.4	33.64	139.4	286.7	372.9	346.1	26.83	13.901			
7,100.0	7,043.2	7,059.4	7,058.2	15.5	15.5	37.53	138.9	285.3	345.5	318.8	26.69	12.945			
7,150.0	7,081.0	7,096.8	7,095.5	15.5	15.6	42.40	138.4	284.0	316.6	289.7	26.83	11.800			
7,200.0	7,116.7	7,131.9	7,130.7	15.5	15.7	48.38	138.0	282.8	286.7	259.4	27.34	10.486			
7,250.0	7,150.0	7,164.7	7,163.4	15.6	15.8	55.55	137.5	281.7	256.6	228.4	28.26	9.082			
7,300.0	7,180.7	7,194.9	7,193.6	15.6	15.9	63.73	137.1	280.6	227.6	198.1	29.47	7.723			
7,350.0	7,208.8	7,222.5	7,221.2	15.8	16.0	72.48	136.8	279.6	201.2	170.5	30.70	6.555			
7,400.0	7,234.2	7,247.3	7,245.9	15.9	16.0	81.06	136.5	278.8	180.2	148.6	31.67	5.691			
7,450.0	7,256.7	7,269.2	7,267.8	16.2	16.1	88.69	136.2	278.0	167.9	135.7	32.22	5.212			
7,476.9	7,267.5	7,279.7	7,278.3	16.3	16.1	92.16	136.0	277.6	166.1	133.7	32.37	5.130 CC, ES, SF			
7,500.0	7,276.2	7,288.1	7,286.7	16.4	16.1	94.75	135.9	277.3	167.5	135.0	32.43	5.163			
7,550.0	7,292.7	7,303.9	7,302.5	16.7	16.2	98.92	135.7	276.8	179.9	147.4	32.52	5.533			
7,600.0	7,306.0	7,316.6	7,315.2	17.1	16.2	101.08	135.5	276.3	203.6	170.9	32.70	6.228			
7,650.0	7,316.2	7,326.1	7,324.7	17.5	16.2	101.15	135.4	276.0	235.6	202.5	33.09	7.120			
7,700.0	7,323.1	7,332.4	7,331.0	17.9	16.2	99.04	135.3	275.8	273.2	239.5	33.74	8.098			
7,750.0	7,326.8	7,335.4	7,334.0	18.4	16.3	94.62	135.3	275.7	314.5	279.9	34.52	9.110			
7,793.6	7,327.3	7,335.4	7,334.0	18.9	16.3	88.84	135.3	275.7	352.4	317.3	35.07	10.048			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1													
Survey Program: 100-NS-GYRO-MS												Offset Site Error:	0.0 ft
												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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,800.0	7,327.2	7,335.2	7,333.8	18.9	16.3	88.77	135.3	275.7	358.1	322.9	35.14	10.190	
7,900.0	7,325.6	7,332.3	7,330.9	20.0	16.2	87.76	135.3	275.8	449.3	413.0	36.23	12.402	
8,000.0	7,324.0	7,329.4	7,328.0	21.3	16.2	86.75	135.4	275.9	543.6	506.2	37.42	14.527	
8,100.0	7,322.4	7,326.5	7,325.1	22.6	16.2	85.75	135.4	276.0	639.6	600.9	38.69	16.530	
8,200.0	7,320.8	7,323.6	7,322.2	24.0	16.2	84.75	135.5	276.1	736.7	696.6	40.04	18.400	

Company:	PETROLEUM DEVELOPMENT CORP DJ	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	7.0	7.0	0.0	0.0	51.22	266.8	332.2	426.1	426.1	0.01	N/A		
100.0	100.0	107.2	107.2	0.1	0.1	51.20	267.0	332.0	426.0	425.8	0.26	1,654.410		
108.5	108.5	115.5	115.5	0.1	0.2	51.19	267.0	332.0	426.0	425.7	0.29	1,464.739		
200.0	200.0	205.2	205.2	0.3	0.3	51.19	267.1	332.1	426.2	425.6	0.65	652.720		
300.0	300.0	305.7	305.7	0.6	0.5	51.19	267.4	332.4	426.6	425.5	1.08	393.414		
400.0	400.0	408.9	408.9	0.8	0.7	51.24	267.0	332.5	426.5	425.0	1.47	289.641		
457.7	457.7	464.7	464.7	0.9	0.8	51.28	266.7	332.7	426.3	424.7	1.69	252.498		
500.0	500.0	506.1	506.1	1.0	0.8	51.31	266.6	332.8	426.4	424.6	1.85	230.745		
600.0	600.0	609.4	609.4	1.2	1.0	51.30	266.4	332.6	426.2	423.9	2.24	190.318		
700.0	700.0	707.6	707.6	1.5	1.2	51.28	266.4	332.2	425.8	423.2	2.61	163.075		
794.3	794.3	801.3	801.3	1.7	1.3	51.27	266.4	332.1	425.8	422.8	3.00	142.066		
800.0	800.0	806.9	806.9	1.7	1.3	51.27	266.4	332.1	425.8	422.7	3.02	140.935		
900.0	900.0	905.8	905.8	1.9	1.5	51.25	266.6	332.2	425.9	422.5	3.44	123.653		
1,000.0	1,000.0	1,008.0	1,008.0	2.1	1.7	51.17	267.1	331.8	426.0	422.1	3.89	109.640		
1,100.0	1,100.0	1,109.3	1,109.2	2.4	2.0	51.12	267.1	331.3	425.6	421.2	4.31	98.732		
1,200.0	1,200.0	1,208.2	1,208.2	2.6	2.1	51.15	266.7	331.1	425.1	420.5	4.69	90.624		
1,256.0	1,256.0	1,263.0	1,263.0	2.7	2.2	51.18	266.5	331.2	425.1	420.2	4.90	86.774		
1,300.0	1,300.0	1,306.4	1,306.4	2.8	2.3	51.18	266.5	331.2	425.1	420.0	5.06	83.968		
1,400.0	1,400.0	1,409.2	1,409.2	3.0	2.4	51.20	266.2	331.1	424.9	419.4	5.46	77.856		
1,500.0	1,500.0	1,507.1	1,507.1	3.3	2.6	51.19	266.1	330.9	424.6	418.8	5.87	72.385		
1,600.0	1,600.0	1,609.7	1,609.7	3.5	2.8	51.15	266.1	330.4	424.3	418.0	6.30	67.299		
1,665.5	1,665.5	1,675.0	1,675.0	3.6	3.0	-110.21	266.1	329.9	424.1	417.5	6.57	64.506		
1,700.0	1,700.0	1,709.2	1,709.2	3.7	3.0	-110.33	266.2	329.6	424.1	417.4	6.72	63.151		
1,800.0	1,799.9	1,806.6	1,806.6	3.9	3.3	-110.88	266.5	329.1	425.3	418.2	7.10	59.881		
1,900.0	1,899.7	1,909.1	1,909.0	4.0	3.5	-111.74	266.7	328.6	427.4	419.9	7.50	56.958		
2,007.7	2,006.9	2,015.0	2,015.0	4.2	3.7	-112.97	266.7	328.0	430.8	422.9	7.94	54.249		
2,100.0	2,098.7	2,106.8	2,106.7	4.4	3.9	-114.14	266.5	328.0	434.6	426.3	8.29	52.433		
2,200.0	2,198.1	2,209.3	2,209.3	4.6	4.0	-115.38	265.7	327.8	438.4	429.8	8.66	50.648		
2,300.0	2,297.6	2,307.5	2,307.5	4.9	4.2	-116.58	265.0	327.4	442.3	433.2	9.07	48.764		
2,400.0	2,397.0	2,406.9	2,406.9	5.1	4.4	-117.80	264.6	326.9	446.5	437.0	9.51	46.950		
2,500.0	2,496.4	2,508.7	2,508.7	5.4	4.6	-118.98	263.7	326.6	450.8	440.8	9.95	45.301		
2,600.0	2,595.9	2,612.4	2,612.4	5.6	4.9	-120.17	262.2	325.5	454.3	443.9	10.40	43.670		
2,700.0	2,695.3	2,710.2	2,710.2	5.9	5.1	-121.33	261.0	324.1	457.9	447.0	10.87	42.136		
2,800.0	2,794.7	2,810.3	2,810.2	6.1	5.3	-122.46	259.7	323.0	461.8	450.4	11.34	40.736		
2,900.0	2,894.1	2,910.8	2,910.6	6.4	5.5	-123.60	258.2	321.6	465.6	453.8	11.81	39.423		
3,000.0	2,993.6	3,007.0	3,006.8	6.6	5.8	-124.71	257.3	320.1	470.0	457.7	12.29	38.246		
3,100.0	3,093.0	3,109.0	3,108.9	6.9	6.0	-125.86	256.3	318.7	474.5	461.7	12.78	37.126		
3,200.0	3,192.4	3,206.2	3,206.1	7.2	6.3	-126.99	255.6	316.9	479.2	465.9	13.26	36.132		
3,300.0	3,291.9	3,304.0	3,303.9	7.5	6.5	-128.11	255.3	315.3	484.5	470.8	13.75	35.242		
3,400.0	3,391.3	3,405.1	3,405.0	7.7	6.8	-129.24	254.9	313.7	490.0	475.7	14.24	34.399		
3,500.0	3,490.7	3,501.6	3,501.4	8.0	7.0	-130.34	254.8	311.8	495.8	481.1	14.72	33.674		
3,600.0	3,590.2	3,601.0	3,600.8	8.3	7.2	-131.43	254.9	310.2	502.1	486.8	15.21	33.012		
3,700.0	3,689.6	3,700.0	3,699.8	8.6	7.5	-132.49	254.9	308.5	508.4	492.7	15.70	32.389		
3,800.0	3,789.0	3,796.9	3,796.6	8.9	7.7	-133.58	255.5	306.3	515.1	498.9	16.16	31.866		
3,900.0	3,888.5	3,893.8	3,893.5	9.2	7.9	-134.64	256.6	304.4	522.7	506.1	16.62	31.456		
4,000.0	3,987.9	3,997.1	3,996.8	9.4	8.2	-135.71	257.5	302.6	530.3	513.2	17.09	31.033		
4,100.0	4,087.3	4,094.4	4,094.1	9.7	8.4	-136.70	258.2	300.7	537.8	520.3	17.56	30.634		
4,200.0	4,186.8	4,198.9	4,198.6	10.0	8.6	-137.73	258.7	298.5	545.3	527.2	18.05	30.217		
4,300.0	4,286.2	4,307.8	4,307.4	10.3	8.9	-138.80	257.9	295.5	551.5	532.9	18.55	29.722		
4,400.0	4,385.6	4,406.3	4,405.8	10.6	9.2	-139.77	256.6	292.2	557.1	538.1	19.04	29.262		
4,500.0	4,485.0	4,506.8	4,506.3	10.9	9.4	-140.73	255.2	289.0	562.8	543.3	19.53	28.825		

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.20-T3N-R66W - Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
4,600.0	4,584.5	4,606.5	4,605.9	11.2	9.7	-141.64	253.6	286.0	568.6	548.6	20.01	28.416			
4,700.0	4,683.9	4,706.4	4,705.7	11.5	9.9	-142.51	251.9	283.1	574.5	554.0	20.50	28.031			
4,800.0	4,783.3	4,807.4	4,806.7	11.8	10.2	-143.40	250.1	279.8	580.3	559.3	20.98	27.659			
4,900.0	4,882.8	4,905.0	4,904.2	12.1	10.4	-144.19	248.2	277.3	586.3	564.8	21.45	27.326			
4,912.1	4,894.8	4,916.5	4,915.8	12.1	10.5	-144.28	248.0	277.1	587.0	565.5	21.51	27.289			
5,000.0	4,982.3	5,000.0	4,999.2	12.3	10.7	-144.88	246.7	275.4	591.8	569.8	21.93	26.989			
5,100.0	5,082.2	5,094.3	5,093.5	12.5	10.9	-145.37	245.9	273.7	595.3	573.0	22.37	26.617			
5,200.0	5,182.1	5,192.6	5,191.7	12.7	11.2	-145.65	245.8	272.1	596.7	573.9	22.80	26.177			
5,217.9	5,200.0	5,209.8	5,208.9	12.8	11.2	15.57	245.8	271.8	596.7	573.8	22.86	26.097			
5,252.6	5,234.8	5,242.6	5,241.8	12.8	11.3	15.52	245.9	271.4	596.6	573.6	23.00	25.946			
5,300.0	5,282.1	5,287.3	5,286.5	12.9	11.4	15.49	246.1	271.1	596.7	573.6	23.18	25.749			
5,400.0	5,382.1	5,385.7	5,384.9	13.1	11.5	15.43	246.8	270.6	597.4	573.8	23.53	25.384			
5,500.0	5,482.1	5,485.8	5,484.9	13.2	11.7	15.35	247.7	270.0	598.1	574.2	23.89	25.035			
5,600.0	5,582.1	5,583.8	5,582.9	13.4	11.9	15.29	248.7	269.6	598.9	574.7	24.24	24.707			
5,700.0	5,682.1	5,687.3	5,686.4	13.6	12.1	15.18	249.8	268.8	599.7	575.1	24.64	24.343			
5,800.0	5,782.1	5,789.1	5,788.2	13.8	12.3	15.06	250.4	267.6	600.0	575.0	25.06	23.940			
5,900.0	5,882.1	5,892.9	5,892.0	13.9	12.6	14.90	250.7	266.0	599.9	574.4	25.51	23.512			
5,976.3	5,958.5	5,966.3	5,965.5	14.1	12.7	14.81	250.7	264.9	599.6	573.8	25.84	23.203			
6,000.0	5,982.1	5,988.9	5,988.0	14.1	12.8	14.77	250.8	264.6	599.7	573.7	25.95	23.113			
6,100.0	6,082.1	6,090.9	6,090.0	14.3	13.1	14.60	251.4	262.9	599.8	573.4	26.39	22.725			
6,200.0	6,182.1	6,194.3	6,193.4	14.5	13.3	14.42	251.4	261.0	599.3	572.5	26.85	22.322			
6,300.0	6,282.1	6,291.8	6,290.9	14.7	13.6	14.30	251.2	259.6	598.8	571.5	27.30	21.938			
6,400.0	6,382.1	6,392.4	6,391.5	14.8	13.8	14.16	251.3	258.1	598.5	570.7	27.75	21.566			
6,500.0	6,482.1	6,494.6	6,493.6	15.0	14.1	13.96	251.2	255.9	597.9	569.7	28.21	21.194			
6,581.4	6,563.5	6,580.1	6,579.1	15.2	14.3	13.78	250.8	253.9	597.0	568.4	28.59	20.883			
6,600.0	6,582.1	6,599.7	6,598.7	15.2	14.4	13.76	250.6	253.5	596.5	567.9	28.65	20.819			
6,650.0	6,632.0	6,649.0	6,648.0	15.3	14.5	13.80	250.0	252.4	593.0	564.2	28.73	20.639			
6,700.0	6,681.6	6,698.1	6,697.0	15.4	14.6	13.97	249.6	251.3	586.3	557.6	28.69	20.435			
6,750.0	6,730.8	6,749.6	6,748.6	15.4	14.7	14.29	249.0	250.1	576.4	547.9	28.54	20.196			
6,800.0	6,779.1	6,800.0	6,798.9	15.4	14.9	14.76	248.2	248.8	563.2	535.0	28.27	19.921			
6,850.0	6,826.6	6,846.9	6,845.8	15.4	15.0	15.39	247.5	247.4	547.0	519.1	27.89	19.611			
6,900.0	6,873.0	6,892.3	6,891.2	15.4	15.1	16.22	246.8	246.1	527.8	500.4	27.41	19.260			
6,950.0	6,918.0	6,937.0	6,935.8	15.4	15.2	17.31	246.2	244.8	505.9	479.0	26.84	18.850			
7,000.0	6,961.5	6,980.2	6,979.1	15.4	15.3	18.69	245.6	243.4	481.2	455.0	26.20	18.365			
7,050.0	7,003.3	7,021.7	7,020.5	15.4	15.4	20.44	245.0	242.0	454.0	428.4	25.54	17.776			
7,100.0	7,043.2	7,061.2	7,060.0	15.5	15.5	22.69	244.5	240.6	424.3	399.4	24.90	17.042			
7,150.0	7,081.0	7,098.6	7,097.3	15.5	15.6	25.58	244.0	239.3	392.4	368.1	24.36	16.107			
7,200.0	7,116.7	7,133.8	7,132.5	15.5	15.7	29.32	243.6	238.0	358.6	334.5	24.06	14.902			
7,250.0	7,150.0	7,166.5	7,165.2	15.6	15.8	34.17	243.1	236.9	323.1	298.9	24.17	13.367			
7,300.0	7,180.7	7,196.7	7,195.4	15.6	15.9	40.42	242.8	235.8	286.4	261.5	24.88	11.508			
7,350.0	7,208.8	7,224.3	7,223.0	15.8	16.0	48.32	242.4	234.9	249.0	222.7	26.32	9.461			
7,400.0	7,234.2	7,249.1	7,247.7	15.9	16.0	57.81	242.1	234.0	211.9	183.5	28.33	7.478			
7,450.0	7,256.7	7,271.0	7,269.6	16.2	16.1	68.30	241.8	233.2	176.6	146.1	30.42	5.803			
7,500.0	7,276.2	7,289.9	7,288.5	16.4	16.1	78.57	241.5	232.6	146.0	114.0	32.01	4.560			
7,550.0	7,292.7	7,305.7	7,304.3	16.7	16.2	87.26	241.3	232.0	125.2	92.3	32.87	3.810			
7,586.6	7,302.7	7,315.3	7,313.9	17.0	16.2	92.07	241.2	231.7	120.1	86.9	33.16	3.622 CC, ES, SF			
7,600.0	7,306.0	7,318.4	7,317.0	17.1	16.2	93.45	241.2	231.6	120.8	87.6	33.22	3.636			
7,650.0	7,316.2	7,327.9	7,326.5	17.5	16.2	96.74	241.0	231.3	135.3	101.8	33.48	4.041			
7,700.0	7,323.1	7,334.2	7,332.8	17.9	16.3	97.02	241.0	231.0	164.2	130.3	33.90	4.844			
7,750.0	7,326.8	7,337.3	7,335.8	18.4	16.3	94.19	240.9	230.9	201.7	167.2	34.54	5.839			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design													Existing Wells Sec.20-T3N-R66W - Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor						
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
7,793.6	7,327.3	7,337.2	7,335.8	18.9	16.3	89.13	240.9	230.9	238.3	203.2	35.08	6.793					
7,800.0	7,327.2	7,337.0	7,335.6	18.9	16.3	89.04	240.9	230.9	243.8	208.7	35.14	6.938					
7,900.0	7,325.6	7,334.1	7,332.7	20.0	16.3	87.65	241.0	231.0	334.6	298.4	36.23	9.236					
8,000.0	7,324.0	7,331.2	7,329.8	21.3	16.2	86.26	241.0	231.1	429.5	392.1	37.41	11.482					
8,100.0	7,322.4	7,328.3	7,326.9	22.6	16.2	84.88	241.0	231.2	526.3	487.6	38.66	13.614					
8,200.0	7,320.8	7,325.4	7,324.0	24.0	16.2	83.51	241.1	231.3	624.0	584.1	39.96	15.616					
8,300.0	7,319.2	7,322.5	7,321.1	25.5	16.2	82.15	241.1	231.4	722.4	681.1	41.31	17.488					

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.20-T3N-R66W - Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		17-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	-143.75	-636.6	-466.7	790.7						
100.0	100.0	55.0	55.0	0.1	0.1	-143.75	-636.6	-466.7	789.4	789.2	0.22	3,657.775			
156.1	156.1	111.1	111.1	0.2	0.2	-143.75	-636.6	-466.8	789.4	788.9	0.47	1,693.054			
200.0	200.0	153.9	153.9	0.3	0.3	-143.74	-636.5	-466.9	789.4	788.7	0.66	1,201.820			
300.0	300.0	252.1	252.1	0.6	0.5	-143.72	-636.6	-467.3	789.7	788.6	1.09	726.623			
400.0	400.0	352.1	352.1	0.8	0.7	-143.70	-636.7	-467.7	790.0	788.5	1.51	521.649			
500.0	500.0	450.8	450.8	1.0	0.9	-143.67	-636.8	-468.3	790.5	788.5	1.94	406.541			
600.0	600.0	551.9	551.9	1.2	1.1	-143.62	-636.8	-469.2	791.0	788.7	2.38	332.199			
700.0	700.0	654.5	654.5	1.5	1.4	-143.54	-636.3	-470.2	791.1	788.3	2.82	280.060			
800.0	800.0	752.4	752.4	1.7	1.6	-143.45	-635.7	-471.3	791.4	788.1	3.26	243.025			
900.0	900.0	853.1	853.0	1.9	1.8	-143.37	-635.4	-472.4	791.7	788.0	3.69	214.550			
1,000.0	1,000.0	955.3	955.2	2.1	2.0	-143.28	-634.7	-473.4	791.8	787.7	4.13	191.829			
1,025.1	1,025.1	980.2	980.1	2.2	2.0	-143.26	-634.5	-473.6	791.8	787.5	4.23	186.966			
1,100.0	1,100.0	1,054.3	1,054.2	2.4	2.2	-143.22	-634.2	-474.1	791.8	787.3	4.56	173.831			
1,200.0	1,200.0	1,152.9	1,152.9	2.6	2.4	-143.18	-634.0	-474.6	792.0	787.0	4.99	158.821			
1,300.0	1,300.0	1,262.9	1,262.8	2.8	2.6	-143.13	-633.7	-475.2	792.2	786.7	5.44	145.530			
1,400.0	1,400.0	1,409.7	1,409.5	3.0	2.9	-143.16	-629.4	-471.5	788.3	782.3	5.98	131.886			
1,500.0	1,500.0	1,543.6	1,542.8	3.3	3.2	-143.39	-621.1	-461.4	778.7	772.2	6.49	119.974			
1,600.0	1,600.0	1,657.2	1,655.4	3.5	3.5	-143.77	-613.0	-449.1	766.5	759.5	6.96	110.127			
1,700.0	1,700.0	1,765.4	1,762.3	3.7	3.8	54.70	-605.3	-434.6	752.1	744.7	7.39	101.712			
1,800.0	1,799.9	1,880.1	1,875.2	3.9	4.1	54.45	-596.4	-416.3	734.2	726.4	7.83	93.732			
1,900.0	1,899.7	1,977.4	1,970.8	4.0	4.4	54.45	-588.2	-400.3	714.0	705.7	8.24	86.691			
2,007.7	2,006.9	2,089.2	2,080.7	4.2	4.7	54.61	-578.9	-381.5	690.5	681.8	8.70	79.385			
2,100.0	2,098.7	2,165.1	2,155.3	4.4	5.0	54.61	-572.6	-369.0	669.8	660.7	9.06	73.914			
2,200.0	2,198.1	2,261.4	2,250.2	4.6	5.3	54.63	-565.6	-354.0	648.7	639.2	9.50	68.308			
2,300.0	2,297.6	2,353.1	2,340.5	4.9	5.6	54.68	-559.1	-340.2	628.1	618.2	9.93	63.228			
2,400.0	2,397.0	2,445.6	2,432.0	5.1	5.9	54.79	-552.9	-327.4	608.4	598.1	10.38	58.630			
2,500.0	2,496.4	2,540.7	2,526.0	5.4	6.2	54.91	-546.8	-314.4	589.1	578.3	10.83	54.379			
2,600.0	2,595.9	2,628.2	2,612.6	5.6	6.4	54.99	-542.8	-303.0	571.7	560.4	11.28	50.678			
2,700.0	2,695.3	2,739.7	2,722.9	5.9	6.8	55.02	-537.5	-287.6	553.6	541.8	11.80	46.908			
2,800.0	2,794.7	2,850.2	2,831.8	6.1	7.2	54.95	-530.7	-270.1	533.2	520.9	12.32	43.266			
2,900.0	2,894.1	2,955.2	2,934.9	6.4	7.6	54.83	-522.8	-251.8	510.9	498.0	12.86	39.729			
3,000.0	2,993.6	3,044.3	3,022.5	6.6	7.9	54.73	-516.2	-236.6	488.8	475.5	13.34	36.634			
3,100.0	3,093.0	3,136.4	3,113.2	6.9	8.2	54.67	-510.4	-222.0	468.4	454.5	13.83	33.854			
3,200.0	3,192.4	3,234.4	3,209.9	7.2	8.5	54.80	-503.4	-207.8	448.0	433.6	14.33	31.257			
3,300.0	3,291.9	3,328.2	3,302.6	7.5	8.8	54.90	-497.7	-194.5	428.6	413.8	14.82	28.919			
3,400.0	3,391.3	3,427.6	3,400.9	7.7	9.2	55.12	-491.2	-181.1	409.4	394.0	15.32	26.713			
3,500.0	3,490.7	3,525.7	3,497.8	8.0	9.5	55.45	-484.3	-168.2	389.9	374.1	15.82	24.640			
3,600.0	3,590.2	3,629.6	3,600.4	8.3	9.9	55.54	-477.6	-152.8	369.9	353.5	16.37	22.602			
3,700.0	3,689.6	3,732.6	3,701.4	8.6	10.2	55.11	-471.3	-133.8	348.1	331.1	16.92	20.568			
3,800.0	3,789.0	3,828.2	3,795.1	8.9	10.6	54.63	-465.3	-115.9	325.9	308.5	17.47	18.659			
3,900.0	3,888.5	3,923.4	3,888.7	9.2	11.0	54.18	-459.5	-98.9	304.5	286.5	18.01	16.910			
4,000.0	3,987.9	4,021.6	3,985.2	9.4	11.3	53.85	-453.5	-82.4	283.6	265.1	18.55	15.288			
4,100.0	4,087.3	4,119.0	4,080.9	9.7	11.7	53.44	-447.2	-65.6	262.3	243.2	19.10	13.731			
4,200.0	4,186.8	4,214.3	4,174.9	10.0	12.0	53.19	-441.1	-50.4	241.7	222.1	19.63	12.310			
4,300.0	4,286.2	4,305.0	4,264.6	10.3	12.3	53.19	-436.2	-37.8	223.1	202.9	20.14	11.078			
4,400.0	4,385.6	4,398.0	4,356.9	10.6	12.6	53.59	-432.9	-27.7	207.6	187.0	20.62	10.067			
4,500.0	4,485.0	4,491.4	4,450.0	10.9	12.8	54.58	-430.6	-20.4	194.9	173.8	21.08	9.246			
4,600.0	4,584.5	4,586.3	4,544.8	11.2	13.0	56.29	-429.2	-16.0	184.8	163.3	21.51	8.593			
4,700.0	4,683.9	4,682.4	4,640.9	11.5	13.2	58.72	-428.4	-14.1	177.2	155.3	21.93	8.083			
4,800.0	4,783.3	4,781.1	4,739.6	11.8	13.3	61.70	-427.8	-13.5	171.0	148.7	22.34	7.653			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
	Sec.20-T3N-R66W		
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 17-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	
4,900.0	4,882.8	4,880.0	4,838.4	12.1	13.5	64.95	-427.3	-13.2	165.6	142.8	22.77	7.272		
4,912.1	4,894.8	4,891.9	4,850.4	12.1	13.5	65.36	-427.3	-13.2	165.0	142.2	22.83	7.229		
5,000.0	4,982.3	4,978.4	4,936.8	12.3	13.7	67.85	-427.2	-13.1	161.8	138.6	23.21	6.969		
5,100.0	5,082.2	5,078.1	5,036.6	12.5	13.8	69.70	-427.6	-13.3	160.0	136.4	23.61	6.777		
5,167.7	5,149.8	5,145.4	5,103.9	12.7	13.9	70.37	-427.7	-13.6	159.7	135.8	23.87	6.688	CC	
5,200.0	5,182.1	5,177.5	5,136.0	12.7	14.0	70.53	-427.8	-13.8	159.7	135.8	24.00	6.657	ES	
5,217.9	5,200.0	5,195.4	5,153.8	12.8	14.0	-128.20	-427.8	-13.9	159.9	135.8	24.07	6.642		
5,300.0	5,282.1	5,276.9	5,235.4	12.9	14.1	-128.16	-428.2	-14.5	160.6	136.2	24.37	6.587		
5,400.0	5,382.1	5,376.2	5,334.7	13.1	14.3	-128.09	-428.9	-15.8	162.0	137.2	24.74	6.547		
5,500.0	5,482.1	5,476.4	5,434.9	13.2	14.4	-127.96	-429.5	-17.1	163.4	138.3	25.11	6.508		
5,600.0	5,582.1	5,576.6	5,535.1	13.4	14.6	-127.77	-429.9	-18.5	164.7	139.2	25.48	6.466		
5,700.0	5,682.1	5,677.2	5,635.6	13.6	14.7	-127.56	-430.1	-19.7	165.8	140.0	25.84	6.416		
5,800.0	5,782.1	5,777.1	5,735.5	13.8	14.9	-127.36	-430.2	-20.8	166.7	140.5	26.22	6.361		
5,900.0	5,882.1	5,876.9	5,835.4	13.9	15.1	-127.12	-430.2	-22.0	167.7	141.2	26.59	6.309		
6,000.0	5,982.1	5,977.1	5,935.5	14.1	15.2	-126.77	-430.1	-23.5	168.8	141.8	26.97	6.260		
6,100.0	6,082.1	6,077.5	6,035.9	14.3	15.4	-126.36	-429.5	-24.9	169.6	142.3	27.34	6.203		
6,200.0	6,182.1	6,178.4	6,136.8	14.5	15.5	-125.87	-428.7	-26.1	170.1	142.4	27.72	6.137		
6,300.0	6,282.1	6,278.5	6,236.9	14.7	15.7	-125.24	-427.2	-27.4	170.3	142.2	28.10	6.059		
6,400.0	6,382.1	6,378.5	6,336.8	14.8	15.9	-124.44	-425.4	-28.8	170.4	141.9	28.48	5.983		
6,500.0	6,482.1	6,478.8	6,437.1	15.0	16.1	-123.57	-423.3	-30.4	170.6	141.7	28.87	5.909		
6,570.1	6,552.2	6,549.0	6,507.2	15.2	16.2	-122.89	-421.6	-31.5	170.5	141.4	29.14	5.851		
6,581.4	6,563.5	6,560.0	6,518.2	15.2	16.2	-122.78	-421.3	-31.7	170.5	141.3	29.18	5.843		
6,600.0	6,582.1	6,578.2	6,536.5	15.2	16.2	-122.65	-420.9	-32.0	170.7	141.4	29.26	5.832	SF	
6,650.0	6,632.0	6,626.7	6,585.0	15.3	16.3	-122.94	-420.2	-32.9	172.6	143.2	29.44	5.863		
6,700.0	6,681.6	6,670.9	6,629.1	15.4	16.4	-124.21	-420.9	-33.5	177.2	147.6	29.55	5.994		
6,750.0	6,730.8	6,710.6	6,668.6	15.4	16.4	-126.40	-424.5	-34.1	185.9	156.3	29.59	6.284		
6,800.0	6,779.1	6,743.0	6,700.6	15.4	16.5	-128.61	-429.7	-34.8	199.9	170.3	29.53	6.768		
6,850.0	6,826.6	6,786.3	6,742.8	15.4	16.5	-132.32	-439.1	-35.3	218.4	189.0	29.39	7.431		
6,900.0	6,873.0	6,822.0	6,777.4	15.4	16.5	-135.34	-448.3	-35.0	241.3	212.2	29.12	8.286		
6,950.0	6,918.0	6,853.8	6,807.8	15.4	16.6	-137.83	-457.7	-34.1	268.6	239.8	28.74	9.346		
7,000.0	6,961.5	6,881.6	6,834.0	15.4	16.6	-139.61	-466.7	-32.9	300.0	271.8	28.26	10.618		
7,050.0	7,003.3	6,905.4	6,856.2	15.4	16.6	-140.62	-475.1	-31.6	335.2	307.5	27.72	12.095		
7,100.0	7,043.2	6,925.3	6,874.7	15.5	16.6	-140.76	-482.6	-30.2	373.8	346.6	27.18	13.753		
7,150.0	7,081.0	6,957.0	6,903.6	15.5	16.7	-142.43	-495.2	-27.6	415.4	389.0	26.44	15.713		
7,200.0	7,116.7	6,957.0	6,903.6	15.5	16.7	-138.31	-495.2	-27.6	458.6	432.2	26.38	17.384		
7,250.0	7,150.0	6,957.0	6,903.6	15.6	16.7	-132.52	-495.2	-27.6	504.1	477.3	26.79	18.820		
7,300.0	7,180.7	6,970.0	6,915.3	15.6	16.7	-128.04	-500.8	-26.3	550.9	523.6	27.22	20.234		
7,350.0	7,208.8	6,973.9	6,918.7	15.8	16.7	-118.84	-502.5	-25.9	598.7	570.1	28.59	20.942		
7,400.0	7,234.2	6,975.7	6,920.3	15.9	16.7	-105.47	-503.3	-25.7	647.2	616.9	30.32	21.346		
7,450.0	7,256.7	6,975.8	6,920.4	16.2	16.7	-87.95	-503.3	-25.7	696.2	665.1	31.10	22.382		
7,500.0	7,276.2	6,974.3	6,919.1	16.4	16.7	-69.06	-502.7	-25.9	745.2	715.8	29.41	25.334		
7,550.0	7,292.7	6,971.5	6,916.6	16.7	16.7	-52.78	-501.4	-26.2	794.1	768.4	25.72	30.872		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 17-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)			
1,200.0	1,200.0	1,230.3	1,229.8	2.6	2.6	-141.72	-621.1	-490.1	794.8	789.6	5.16	153.891		
1,300.0	1,300.0	1,350.1	1,348.4	2.8	2.9	-140.89	-604.2	-491.2	784.3	778.6	5.69	137.947		
1,400.0	1,400.0	1,472.9	1,469.2	3.0	3.3	-139.80	-582.1	-492.0	770.8	764.6	6.26	123.128		
1,500.0	1,500.0	1,585.0	1,578.8	3.3	3.6	-138.68	-558.9	-491.3	754.5	747.7	6.81	110.827		
1,600.0	1,600.0	1,671.6	1,663.4	3.5	3.9	-137.74	-540.5	-491.1	738.4	731.1	7.31	101.056		
1,700.0	1,700.0	1,771.0	1,760.8	3.7	4.2	62.42	-520.4	-491.4	723.1	715.4	7.69	94.074		
1,800.0	1,799.9	1,866.8	1,854.6	3.9	4.6	63.95	-501.4	-490.8	706.5	698.4	8.14	86.771		
1,900.0	1,899.7	1,953.0	1,939.4	4.0	4.9	65.51	-485.7	-490.6	690.6	682.0	8.58	80.507		
2,007.7	2,006.9	2,052.1	2,037.2	4.2	5.2	67.42	-469.2	-489.6	673.6	664.5	9.08	74.184		
2,100.0	2,098.7	2,132.5	2,116.6	4.4	5.4	68.88	-457.0	-489.2	660.2	650.7	9.51	69.416		
2,200.0	2,198.1	2,220.4	2,203.6	4.6	5.7	70.53	-444.4	-489.6	647.6	637.6	10.00	64.788		
2,300.0	2,297.6	2,305.6	2,288.1	4.9	6.0	72.07	-434.0	-490.3	637.3	626.8	10.47	60.869		
2,400.0	2,397.0	2,390.9	2,373.1	5.1	6.2	73.45	-426.4	-491.1	629.5	618.5	10.94	57.559		
2,500.0	2,496.4	2,477.2	2,459.2	5.4	6.4	74.65	-421.6	-491.8	624.1	612.7	11.40	54.761		
2,600.0	2,595.9	2,567.2	2,549.2	5.6	6.6	75.72	-419.4	-492.8	620.8	609.0	11.84	52.424		
2,700.0	2,695.3	2,668.0	2,650.0	5.9	6.7	76.75	-419.0	-493.3	618.5	606.2	12.30	50.282		
2,800.0	2,794.7	2,768.2	2,750.2	6.1	6.9	77.84	-417.7	-493.8	615.9	603.1	12.77	48.236		
2,900.0	2,894.1	2,865.5	2,847.5	6.4	7.1	78.87	-416.8	-494.2	613.6	600.4	13.23	46.382		
3,000.0	2,993.6	2,962.4	2,944.4	6.6	7.3	79.82	-417.0	-494.5	612.0	598.3	13.69	44.711		
3,100.0	3,093.0	3,063.0	3,045.0	6.9	7.4	80.80	-417.4	-494.8	610.7	596.5	14.15	43.145		
3,200.0	3,192.4	3,166.6	3,148.6	7.2	7.6	81.70	-418.5	-494.2	609.0	594.4	14.62	41.653		
3,300.0	3,291.9	3,266.5	3,248.5	7.5	7.8	82.50	-420.1	-492.8	607.1	592.0	15.08	40.262		
3,400.0	3,391.3	3,357.4	3,339.4	7.7	7.9	83.23	-421.9	-492.1	605.9	590.3	15.52	39.035		
3,414.4	3,405.6	3,370.2	3,352.1	7.8	8.0	83.33	-422.2	-492.1	605.8	590.3	15.58	38.874		
3,500.0	3,490.7	3,448.9	3,430.8	8.0	8.1	83.98	-424.1	-492.8	606.4	590.4	15.97	37.969		
3,600.0	3,590.2	3,556.1	3,538.0	8.3	8.3	84.90	-426.5	-493.9	607.2	590.7	16.45	36.903		
3,700.0	3,689.6	3,663.1	3,645.0	8.6	8.5	85.83	-428.0	-493.5	606.5	589.6	16.94	35.808		
3,800.0	3,789.0	3,763.8	3,745.7	8.9	8.6	86.74	-428.8	-492.8	605.5	588.1	17.42	34.760		
3,900.0	3,888.5	3,864.4	3,846.3	9.2	8.8	87.71	-429.0	-492.1	604.4	586.5	17.90	33.766		
4,000.0	3,987.9	3,959.3	3,941.1	9.4	9.0	88.65	-429.1	-491.7	603.7	585.4	18.38	32.852		
4,019.3	4,007.1	3,977.6	3,959.4	9.5	9.0	88.83	-429.1	-491.7	603.7	585.3	18.47	32.688 CC		
4,100.0	4,087.3	4,058.9	4,040.8	9.7	9.2	89.63	-429.4	-491.8	603.8	584.9	18.87	32.003		
4,169.8	4,156.8	4,129.3	4,111.2	9.9	9.3	90.33	-429.6	-491.8	603.8	584.6	19.21	31.432		
4,200.0	4,186.8	4,159.1	4,141.0	10.0	9.4	90.62	-429.7	-491.7	603.8	584.4	19.36	31.194		
4,300.0	4,286.2	4,257.9	4,239.7	10.3	9.6	91.57	-430.1	-491.7	604.1	584.3	19.84	30.447		
4,400.0	4,385.6	4,357.7	4,339.6	10.6	9.8	92.51	-430.8	-491.4	604.4	584.0	20.33	29.730		
4,500.0	4,485.0	4,455.3	4,437.1	10.9	10.0	93.43	-431.5	-491.4	605.2	584.3	20.81	29.078		
4,600.0	4,584.5	4,554.4	4,536.2	11.2	10.1	94.33	-432.6	-491.5	606.2	584.9	21.30	28.466		
4,700.0	4,683.9	4,663.8	4,645.6	11.5	10.3	95.22	-434.6	-490.5	606.7	584.9	21.80	27.836		
4,755.1	4,738.7	4,717.3	4,699.1	11.7	10.4	95.63	-435.8	-489.6	606.6	584.6	22.06	27.503		
4,800.0	4,783.3	4,760.8	4,742.6	11.8	10.5	95.97	-436.7	-488.9	606.7	584.4	22.27	27.244		
4,900.0	4,882.8	4,859.6	4,841.4	12.1	10.7	96.75	-438.7	-487.8	607.2	584.4	22.75	26.692		
4,912.1	4,894.8	4,872.0	4,853.8	12.1	10.7	96.85	-438.9	-487.6	607.2	584.4	22.81	26.625		
5,000.0	4,982.3	4,962.2	4,943.9	12.3	10.9	97.51	-440.0	-486.5	607.3	584.1	23.20	26.177		
5,100.0	5,082.2	5,061.7	5,043.5	12.5	11.1	97.97	-440.5	-485.1	606.8	583.2	23.60	25.716		
5,200.0	5,182.1	5,158.2	5,140.0	12.7	11.3	98.11	-440.9	-484.0	606.2	582.2	23.97	25.293		
5,217.9	5,200.0	5,175.6	5,157.3	12.8	11.3	-100.65	-441.0	-483.9	606.1	582.0	24.03	25.219		
5,300.0	5,282.1	5,255.8	5,237.5	12.9	11.5	-100.68	-441.3	-483.5	605.8	581.4	24.34	24.889		
5,358.1	5,340.2	5,312.5	5,294.2	13.0	11.6	-100.72	-441.6	-483.4	605.7	581.1	24.55	24.672		
5,400.0	5,382.1	5,353.1	5,334.8	13.1	11.7	-100.74	-441.9	-483.4	605.7	581.0	24.70	24.521		
5,500.0	5,482.1	5,449.5	5,431.3	13.2	11.9	-100.75	-442.1	-483.9	606.3	581.2	25.07	24.185		

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft	
Survey Program: 17-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)		
5,600.0	5,582.1	5,550.9	5,532.7	13.4	12.1	-100.74	-442.1	-484.8	607.1	581.7	25.45	23.860	
5,700.0	5,682.1	5,660.4	5,642.1	13.6	12.3	-100.68	-441.5	-484.8	607.0	581.2	25.84	23.490	
5,800.0	5,782.1	5,757.2	5,738.9	13.8	12.5	-100.56	-440.0	-484.1	606.1	579.9	26.22	23.118	
5,858.1	5,840.2	5,812.5	5,794.2	13.9	12.6	-100.50	-439.4	-484.1	606.0	579.5	26.44	22.922	
5,900.0	5,882.1	5,853.0	5,834.7	13.9	12.7	-100.45	-438.9	-484.3	606.0	579.4	26.60	22.788	
6,000.0	5,982.1	5,960.3	5,942.0	14.1	12.9	-100.29	-437.2	-483.9	605.4	578.4	27.00	22.426	
6,100.0	6,082.1	6,057.6	6,039.2	14.3	13.1	-100.16	-435.6	-483.5	604.7	577.3	27.38	22.086	
6,200.0	6,182.1	6,155.0	6,136.7	14.5	13.3	-100.05	-434.5	-483.4	604.4	576.6	27.77	21.767	
6,217.8	6,199.9	6,172.2	6,153.9	14.5	13.4	-100.03	-434.3	-483.4	604.4	576.5	27.83	21.714 ES	
6,300.0	6,282.1	6,249.5	6,231.1	14.7	13.5	-99.97	-433.6	-483.8	604.7	576.5	28.15	21.484	
6,400.0	6,382.1	6,347.8	6,329.5	14.8	13.7	-99.91	-433.3	-485.0	605.7	577.2	28.53	21.229	
6,500.0	6,482.1	6,447.8	6,429.5	15.0	13.9	-99.86	-432.9	-486.1	606.8	577.9	28.92	20.981	
6,581.4	6,563.5	6,529.3	6,510.9	15.2	14.1	-99.82	-432.7	-487.1	607.7	578.5	29.24	20.785	
6,600.0	6,582.1	6,550.6	6,532.2	15.2	14.1	-99.83	-432.7	-487.3	607.9	578.6	29.32	20.737	
6,650.0	6,632.0	6,611.0	6,592.6	15.3	14.3	-100.28	-434.4	-486.9	608.4	578.9	29.51	20.616	
6,700.0	6,681.6	6,654.0	6,635.2	15.4	14.3	-101.20	-439.6	-485.6	609.2	579.6	29.63	20.562 SF	
6,750.0	6,730.8	6,689.1	6,669.6	15.4	14.4	-102.26	-446.7	-484.5	611.8	582.1	29.70	20.600	
6,800.0	6,779.1	6,722.5	6,701.9	15.4	14.4	-103.42	-455.3	-483.7	616.6	586.9	29.73	20.737	
6,850.0	6,826.6	6,754.9	6,732.6	15.4	14.4	-104.65	-465.4	-482.8	624.0	594.2	29.74	20.983	
6,900.0	6,873.0	6,786.0	6,761.7	15.4	14.5	-105.81	-476.3	-482.0	634.0	604.3	29.71	21.342	
6,950.0	6,918.0	6,813.3	6,786.9	15.4	14.5	-106.67	-486.7	-481.1	647.1	617.4	29.65	21.820	
7,000.0	6,961.5	6,836.3	6,808.0	15.4	14.5	-107.09	-496.0	-480.4	663.3	633.7	29.59	22.413	
7,050.0	7,003.3	6,855.4	6,825.3	15.4	14.5	-107.01	-504.1	-479.9	682.8	653.3	29.54	23.111	
7,100.0	7,043.2	6,872.3	6,840.4	15.5	14.5	-106.53	-511.5	-479.4	705.6	676.0	29.52	23.902	
7,150.0	7,081.0	6,887.7	6,854.1	15.5	14.5	-105.64	-518.5	-478.9	731.3	701.8	29.54	24.762	
7,200.0	7,116.7	6,899.4	6,864.5	15.5	14.6	-104.13	-524.0	-478.5	759.9	730.3	29.62	25.660	
7,250.0	7,150.0	6,910.0	6,873.8	15.6	14.6	-102.18	-529.1	-478.0	791.1	761.4	29.76	26.583	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.20-T3N-R66W - Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		17-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	-145.56	-635.9	-436.0	772.3						
100.0	100.0	55.3	55.3	0.1	0.1	-145.57	-635.9	-436.0	771.0	770.8	0.22	3,542.235			
200.0	200.0	153.4	153.4	0.3	0.3	-145.59	-636.3	-435.8	771.2	770.6	0.66	1,174.865			
300.0	300.0	251.6	251.6	0.6	0.5	-145.59	-636.7	-436.0	771.7	770.6	1.09	710.811			
400.0	400.0	350.8	350.8	0.8	0.7	-145.61	-637.3	-436.3	772.3	770.8	1.52	508.442			
500.0	500.0	450.7	450.7	1.0	0.9	-145.61	-637.9	-436.6	773.0	771.1	1.95	395.840			
600.0	600.0	549.8	549.8	1.2	1.1	-145.61	-638.5	-437.0	773.7	771.3	2.39	324.330			
700.0	700.0	648.6	648.6	1.5	1.4	-145.63	-639.3	-437.3	774.6	771.8	2.82	274.880			
800.0	800.0	748.6	748.6	1.7	1.6	-145.62	-640.1	-437.9	775.6	772.3	3.25	238.477			
900.0	900.0	847.7	847.7	1.9	1.8	-145.60	-640.8	-438.7	776.6	773.0	3.68	210.765			
1,000.0	1,000.0	950.4	950.4	2.1	2.0	-145.60	-641.5	-439.2	777.5	773.4	4.12	188.668			
1,100.0	1,100.0	1,052.3	1,052.3	2.4	2.2	-145.60	-642.1	-439.6	778.1	773.6	4.55	170.877			
1,200.0	1,200.0	1,181.0	1,180.9	2.6	2.5	-145.73	-641.5	-437.1	776.7	771.6	5.05	153.915			
1,300.0	1,300.0	1,302.4	1,302.1	2.8	2.7	-146.12	-639.8	-429.6	772.0	766.5	5.53	139.577			
1,400.0	1,400.0	1,420.5	1,419.6	3.0	3.0	-146.68	-636.9	-418.7	764.8	758.8	6.02	127.132			
1,500.0	1,500.0	1,538.5	1,536.7	3.3	3.3	-147.43	-632.9	-404.3	755.4	748.9	6.51	116.078			
1,600.0	1,600.0	1,644.7	1,641.7	3.5	3.5	-148.17	-627.9	-389.7	743.9	736.9	6.98	106.648			
1,700.0	1,700.0	1,748.9	1,744.8	3.7	3.8	50.02	-622.8	-374.7	731.4	723.9	7.46	98.066			
1,800.0	1,799.9	1,852.3	1,846.6	3.9	4.2	49.47	-618.0	-357.8	716.4	708.5	7.91	90.596			
1,900.0	1,899.7	1,952.1	1,944.8	4.0	4.5	49.01	-613.7	-340.3	699.6	691.2	8.35	83.751			
2,007.7	2,006.9	2,067.6	2,058.2	4.2	4.9	48.58	-608.3	-318.9	678.7	669.8	8.88	76.400			
2,100.0	2,098.7	2,157.5	2,146.1	4.4	5.2	48.04	-603.6	-301.2	659.1	649.8	9.34	70.545			
2,200.0	2,198.1	2,253.8	2,240.4	4.6	5.5	47.37	-599.3	-281.8	638.4	628.5	9.86	64.767			
2,300.0	2,297.6	2,354.3	2,338.6	4.9	5.9	46.59	-594.8	-261.2	617.5	607.1	10.40	59.351			
2,400.0	2,397.0	2,454.2	2,436.3	5.1	6.3	45.77	-589.7	-240.6	596.2	585.3	10.96	54.409			
2,500.0	2,496.4	2,547.9	2,528.0	5.4	6.7	45.05	-584.6	-222.1	575.2	563.7	11.48	50.087			
2,600.0	2,595.9	2,640.3	2,618.6	5.6	7.0	44.28	-580.5	-204.3	555.2	543.2	12.01	46.220			
2,700.0	2,695.3	2,738.9	2,715.3	5.9	7.4	43.40	-576.2	-185.4	535.6	523.0	12.58	42.568			
2,800.0	2,794.7	2,837.6	2,812.1	6.1	7.8	42.49	-571.8	-166.7	515.9	502.8	13.15	39.221			
2,900.0	2,894.1	2,935.9	2,908.4	6.4	8.2	41.48	-567.2	-147.7	496.2	482.4	13.75	36.090			
3,000.0	2,993.6	3,032.1	3,002.7	6.6	8.5	40.36	-563.0	-128.8	476.7	462.4	14.34	33.240			
3,100.0	3,093.0	3,124.0	3,092.9	6.9	8.9	39.35	-559.2	-112.0	458.2	443.3	14.90	30.757			
3,200.0	3,192.4	3,223.2	3,190.6	7.2	9.2	38.26	-555.4	-94.8	440.4	424.9	15.49	28.432			
3,300.0	3,291.9	3,324.0	3,289.7	7.5	9.6	37.12	-550.9	-77.5	422.3	406.2	16.09	26.245			
3,400.0	3,391.3	3,422.3	3,386.5	7.7	10.0	36.06	-545.8	-61.4	403.8	387.1	16.67	24.219			
3,500.0	3,490.7	3,519.8	3,482.7	8.0	10.3	34.98	-540.8	-46.1	385.8	368.5	17.25	22.367			
3,600.0	3,590.2	3,614.0	3,575.6	8.3	10.6	33.80	-536.3	-31.1	368.2	350.3	17.82	20.660			
3,700.0	3,689.6	3,707.0	3,667.4	8.6	11.0	32.49	-533.3	-16.4	352.2	333.8	18.39	19.146			
3,800.0	3,789.0	3,799.6	3,758.8	8.9	11.3	31.04	-531.7	-1.9	338.0	319.0	18.97	17.817			
3,900.0	3,888.5	3,901.1	3,859.1	9.2	11.6	29.25	-530.6	14.3	324.6	305.0	19.60	16.566			
4,000.0	3,987.9	4,004.9	3,961.0	9.4	12.0	26.72	-528.4	33.8	310.1	289.8	20.29	15.286			
4,100.0	4,087.3	4,105.8	4,059.7	9.7	12.5	23.72	-525.1	54.5	294.9	273.9	20.99	14.051			
4,200.0	4,186.8	4,204.8	4,156.3	10.0	12.9	20.31	-521.1	75.5	279.8	258.1	21.69	12.898			
4,300.0	4,286.2	4,302.9	4,252.0	10.3	13.3	16.48	-516.8	96.8	265.4	243.0	22.40	11.851			
4,400.0	4,385.6	4,403.3	4,349.9	10.6	13.8	12.15	-511.7	118.3	251.7	228.6	23.09	10.900			
4,500.0	4,485.0	4,501.1	4,445.4	10.9	14.2	7.62	-506.0	138.7	238.6	214.9	23.73	10.056			
4,600.0	4,584.5	4,598.8	4,540.9	11.2	14.6	2.71	-500.2	158.6	227.0	202.6	24.34	9.325			
4,700.0	4,683.9	4,695.6	4,635.5	11.5	15.0	-2.59	-494.4	178.2	217.2	192.3	24.91	8.719			
4,800.0	4,783.3	4,792.8	4,730.5	11.8	15.4	-8.27	-488.9	197.8	209.7	184.3	25.43	8.247			
4,900.0	4,882.8	4,890.6	4,826.2	12.1	15.8	-14.28	-483.4	217.3	204.5	178.5	25.91	7.892			
4,912.1	4,894.8	4,902.5	4,837.8	12.1	15.9	-15.02	-482.7	219.7	204.0	178.0	25.96	7.857			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:		0.0 ft
Survey Program: 17-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)				
4,985.6	4,968.0	4,974.7	4,908.5	12.3	16.2	-19.52	-478.5	233.9	202.5	176.3	26.28	7.706 CC			
5,000.0	4,982.3	4,988.9	4,922.4	12.3	16.2	-20.38	-477.7	236.7	202.6	176.3	26.34	7.691 ES, SF			
5,100.0	5,082.2	5,087.6	5,019.1	12.5	16.6	-26.14	-471.7	255.8	205.8	179.1	26.68	7.715			
5,200.0	5,182.1	5,187.0	5,116.6	12.7	17.0	-31.06	-465.8	273.9	213.3	186.3	26.95	7.915			
5,217.9	5,200.0	5,204.1	5,133.5	12.8	17.1	129.45	-464.9	276.9	215.1	188.1	26.99	7.968			
5,300.0	5,282.1	5,283.5	5,211.5	12.9	17.4	126.51	-461.5	290.7	224.3	197.1	27.25	8.233			
5,400.0	5,382.1	5,381.3	5,307.7	13.1	17.8	123.27	-457.8	308.0	236.8	209.2	27.54	8.596			
5,500.0	5,482.1	5,480.5	5,405.2	13.2	18.1	120.15	-453.4	325.9	249.8	222.0	27.84	8.974			
5,600.0	5,582.1	5,584.4	5,507.4	13.4	18.5	117.18	-448.1	343.7	262.5	234.4	28.14	9.330			
5,700.0	5,682.1	5,682.7	5,604.4	13.6	18.9	114.81	-443.2	358.9	274.4	245.9	28.44	9.647			
5,800.0	5,782.1	5,781.5	5,701.8	13.8	19.2	112.62	-438.5	374.5	287.0	258.3	28.75	9.985			
5,900.0	5,882.1	5,888.1	5,807.2	13.9	19.6	110.59	-433.4	389.7	298.5	269.4	29.07	10.270			
6,000.0	5,982.1	5,995.1	5,913.5	14.1	19.9	109.04	-429.0	401.6	307.7	278.3	29.40	10.466			
6,100.0	6,082.1	6,100.2	6,018.2	14.3	20.2	107.84	-425.2	410.8	314.8	285.1	29.74	10.586			
6,200.0	6,182.1	6,204.4	6,122.0	14.5	20.4	106.92	-422.1	417.9	320.5	290.4	30.08	10.656			
6,300.0	6,282.1	6,308.1	6,225.6	14.7	20.6	106.18	-419.5	423.5	324.8	294.4	30.43	10.677			
6,400.0	6,382.1	6,411.2	6,328.6	14.8	20.8	105.61	-417.3	427.8	328.3	297.5	30.78	10.667			
6,500.0	6,482.1	6,513.8	6,431.1	15.0	21.0	105.23	-415.9	430.8	330.7	299.6	31.13	10.623			
6,581.4	6,563.5	6,596.6	6,513.9	15.2	21.1	105.06	-415.4	432.5	332.3	300.9	31.43	10.573			
6,600.0	6,582.1	6,615.6	6,532.9	15.2	21.2	105.08	-415.4	432.8	332.6	301.2	31.48	10.567			
6,650.0	6,632.0	6,666.2	6,583.5	15.3	21.3	105.47	-415.8	433.5	334.1	302.5	31.63	10.564			
6,700.0	6,681.6	6,716.6	6,633.8	15.4	21.3	106.37	-416.2	434.0	336.5	304.7	31.78	10.587			
6,750.0	6,730.8	6,766.8	6,684.1	15.4	21.4	107.72	-416.7	434.4	339.7	307.8	31.92	10.643			
6,800.0	6,779.1	6,814.4	6,731.7	15.4	21.5	109.38	-417.3	434.6	344.2	312.2	32.02	10.750			
6,850.0	6,826.6	6,859.0	6,776.3	15.4	21.5	111.28	-418.6	434.7	350.7	318.6	32.07	10.934			
6,900.0	6,873.0	6,893.8	6,810.9	15.4	21.6	112.93	-421.0	434.9	360.0	327.9	32.01	11.246			
6,950.0	6,918.0	6,924.8	6,841.6	15.4	21.6	114.53	-425.3	435.0	373.1	341.3	31.87	11.710			
7,000.0	6,961.5	6,953.0	6,869.3	15.4	21.6	115.95	-430.8	435.0	390.5	358.9	31.63	12.345			
7,050.0	7,003.3	6,980.0	6,895.4	15.4	21.6	117.18	-437.5	434.7	412.1	380.8	31.32	13.157			
7,100.0	7,043.2	7,003.0	6,917.4	15.5	21.7	117.82	-444.2	434.2	437.8	406.8	30.97	14.134			
7,150.0	7,081.0	7,019.9	6,933.4	15.5	21.7	117.42	-449.5	433.7	467.4	436.8	30.65	15.250			
7,200.0	7,116.7	7,033.2	6,946.0	15.5	21.7	116.16	-454.0	433.4	500.7	470.3	30.42	16.457			
7,250.0	7,150.0	7,046.0	6,957.9	15.6	21.7	114.32	-458.6	433.1	537.1	506.8	30.32	17.713			
7,300.0	7,180.7	7,046.0	6,957.9	15.6	21.7	109.97	-458.6	433.1	576.1	545.5	30.58	18.837			
7,350.0	7,208.8	7,057.6	6,968.7	15.8	21.7	106.65	-463.0	432.9	617.1	586.3	30.86	19.997			
7,400.0	7,234.2	7,061.3	6,972.1	15.9	21.7	101.26	-464.4	432.8	659.9	628.4	31.43	20.993			
7,450.0	7,256.7	7,063.0	6,973.6	16.2	21.7	94.70	-465.1	432.8	703.8	671.8	32.07	21.947			
7,500.0	7,276.2	7,063.0	6,973.6	16.4	21.7	87.10	-465.1	432.8	748.7	716.1	32.55	23.003			
7,550.0	7,292.7	7,061.4	6,972.2	16.7	21.7	78.79	-464.4	432.8	794.1	761.5	32.61	24.353			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.20-T3N-R66W - Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		17-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	-147.52	-636.6	-405.3	755.8						
100.0	100.0	59.7	59.7	0.1	0.1	-147.51	-636.5	-405.3	754.6	754.4	0.23	3,323.727			
200.0	200.0	160.6	160.6	0.3	0.3	-147.44	-635.7	-405.9	754.2	753.5	0.67	1,118.766			
300.0	300.0	260.5	260.5	0.6	0.6	-147.32	-634.7	-407.1	754.0	752.9	1.11	678.120			
400.0	400.0	363.0	363.0	0.8	0.8	-147.21	-633.4	-408.1	753.5	751.9	1.55	484.633			
500.0	500.0	462.9	462.9	1.0	1.0	-147.06	-631.8	-409.3	752.8	750.8	2.00	376.731			
600.0	600.0	563.5	563.4	1.2	1.2	-146.90	-630.1	-410.8	752.1	749.7	2.44	308.349			
700.0	700.0	665.8	665.7	1.5	1.4	-146.76	-628.3	-411.8	751.3	748.4	2.88	261.167			
800.0	800.0	767.2	767.0	1.7	1.6	-146.63	-626.4	-412.6	750.1	746.8	3.32	226.253			
900.0	900.0	866.9	866.7	1.9	1.8	-146.50	-624.4	-413.4	748.9	745.2	3.75	199.628			
1,000.0	1,000.0	966.0	965.8	2.1	2.0	-146.36	-622.6	-414.2	747.8	743.6	4.18	178.731			
1,100.0	1,100.0	1,079.9	1,079.7	2.4	2.3	-146.26	-620.4	-414.3	746.4	741.7	4.65	160.663			
1,200.0	1,200.0	1,201.8	1,201.4	2.6	2.5	-146.51	-617.6	-408.6	741.8	736.7	5.12	144.756			
1,300.0	1,300.0	1,320.5	1,319.7	2.8	2.8	-147.01	-614.1	-398.6	734.7	729.1	5.60	131.148			
1,400.0	1,400.0	1,436.8	1,435.1	3.0	3.1	-147.75	-609.9	-384.8	725.2	719.1	6.08	119.278			
1,500.0	1,500.0	1,558.1	1,554.7	3.3	3.4	-148.83	-604.3	-365.6	712.9	706.3	6.58	108.321			
1,600.0	1,600.0	1,665.3	1,659.9	3.5	3.8	-149.97	-598.5	-345.9	698.7	691.6	7.06	98.939			
1,700.0	1,700.0	1,759.4	1,752.0	3.7	4.1	47.87	-593.7	-327.4	683.6	676.1	7.56	90.398			
1,800.0	1,799.9	1,864.5	1,854.6	3.9	4.5	46.81	-589.2	-305.1	666.9	658.9	8.05	82.818			
1,900.0	1,899.7	1,963.5	1,951.1	4.0	4.8	45.97	-583.9	-283.7	647.6	639.1	8.54	75.874			
2,007.7	2,006.9	2,058.5	2,043.9	4.2	5.2	45.27	-579.8	-263.4	626.2	617.1	9.02	69.394			
2,100.0	2,098.7	2,141.8	2,125.1	4.4	5.5	44.41	-577.6	-245.3	608.2	598.7	9.48	64.145			
2,200.0	2,198.1	2,243.5	2,224.5	4.6	5.9	43.31	-575.3	-223.7	589.5	579.5	10.04	58.727			
2,300.0	2,297.6	2,343.2	2,321.8	4.9	6.3	42.18	-572.0	-202.2	570.0	559.3	10.62	53.662			
2,400.0	2,397.0	2,438.5	2,414.8	5.1	6.7	41.01	-569.0	-181.7	550.8	539.6	11.20	49.194			
2,500.0	2,496.4	2,540.8	2,514.6	5.4	7.1	39.66	-565.9	-159.5	531.9	520.1	11.82	44.985			
2,600.0	2,595.9	2,653.0	2,623.2	5.6	7.6	37.72	-560.8	-131.6	510.8	498.2	12.56	40.654			
2,700.0	2,695.3	2,750.4	2,717.0	5.9	8.1	35.80	-555.3	-106.3	488.8	475.6	13.26	36.861			
2,800.0	2,794.7	2,840.3	2,803.6	6.1	8.6	33.79	-550.9	-82.5	468.0	454.1	13.95	33.560			
2,900.0	2,894.1	2,932.0	2,892.0	6.4	9.0	31.54	-547.8	-58.2	449.4	434.7	14.65	30.682			
3,000.0	2,993.6	3,026.2	2,983.3	6.6	9.4	29.26	-544.9	-34.9	432.1	416.8	15.32	28.198			
3,100.0	3,093.0	3,121.5	3,076.1	6.9	9.8	27.07	-542.1	-13.5	416.1	400.1	16.00	26.006			
3,200.0	3,192.4	3,220.7	3,173.0	7.2	10.2	24.85	-538.9	7.2	400.7	384.1	16.67	24.044			
3,300.0	3,291.9	3,320.0	3,270.2	7.5	10.6	22.54	-535.2	27.4	385.5	368.2	17.33	22.243			
3,400.0	3,391.3	3,416.4	3,364.6	7.7	11.0	20.24	-531.3	46.3	370.7	352.7	17.98	20.618			
3,500.0	3,490.7	3,512.6	3,459.1	8.0	11.4	17.94	-528.3	64.1	357.4	338.8	18.61	19.204			
3,600.0	3,590.2	3,613.9	3,558.7	8.3	11.8	15.35	-524.7	82.8	344.3	325.0	19.26	17.875			
3,700.0	3,689.6	3,715.0	3,657.5	8.6	12.2	12.25	-519.8	103.0	330.9	311.0	19.94	16.597			
3,800.0	3,789.0	3,809.3	3,749.6	8.9	12.6	8.99	-515.3	122.7	318.6	298.0	20.58	15.479			
3,900.0	3,888.5	3,908.4	3,846.5	9.2	13.1	5.39	-510.6	143.0	307.5	286.3	21.23	14.489			
4,000.0	3,987.9	4,005.9	3,941.5	9.4	13.5	1.25	-505.4	164.7	297.6	275.8	21.86	13.614			
4,100.0	4,087.3	4,101.6	4,034.6	9.7	13.9	-2.98	-500.3	185.7	289.3	266.9	22.46	12.882			
4,200.0	4,186.8	4,195.1	4,125.5	10.0	14.4	-7.44	-495.9	207.2	284.0	260.9	23.03	12.332			
4,300.0	4,286.2	4,290.7	4,218.1	10.3	14.8	-12.42	-491.6	230.9	281.6	258.1	23.56	11.953			
4,349.3	4,335.2	4,338.3	4,264.2	10.5	15.1	-14.87	-489.6	242.5	281.3	257.5	23.81	11.817 CC, ES			
4,400.0	4,385.6	4,387.0	4,311.4	10.6	15.3	-17.37	-487.6	254.3	281.6	257.6	24.04	11.713			
4,500.0	4,485.0	4,483.2	4,404.6	10.9	15.8	-22.24	-483.8	277.8	284.1	259.7	24.48	11.608			
4,600.0	4,584.5	4,588.7	4,507.5	11.2	16.3	-27.00	-480.3	300.8	287.3	262.4	24.87	11.550			
4,700.0	4,683.9	4,687.1	4,603.9	11.5	16.7	-31.10	-476.7	320.2	290.4	265.2	25.22	11.516 SF			
4,800.0	4,783.3	4,783.1	4,697.8	11.8	17.1	-35.16	-472.9	340.0	295.6	270.1	25.54	11.574			
4,900.0	4,882.8	4,881.4	4,793.9	12.1	17.5	-39.07	-469.4	360.1	302.3	276.4	25.85	11.693			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 17-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)			
4,912.1	4,894.8	4,893.3	4,805.6	12.1	17.5	-39.53	-469.0	362.5	303.2	277.3	25.89	11.710		
5,000.0	4,982.3	4,985.7	4,896.2	12.3	17.9	-42.83	-465.8	380.2	310.5	284.3	26.15	11.875		
5,100.0	5,082.2	5,082.0	4,990.9	12.5	18.3	-45.70	-462.2	397.5	320.8	294.4	26.40	12.155		
5,200.0	5,182.1	5,177.4	5,084.5	12.7	18.7	-48.10	-458.6	415.7	335.1	308.5	26.65	12.575		
5,217.9	5,200.0	5,194.3	5,101.0	12.8	18.8	112.76	-457.9	419.0	338.1	311.4	26.70	12.664		
5,300.0	5,282.1	5,273.2	5,178.2	12.9	19.1	111.26	-454.8	435.0	352.3	325.4	26.96	13.068		
5,400.0	5,382.1	5,374.0	5,277.0	13.1	19.5	109.56	-450.9	454.8	369.6	342.3	27.29	13.540		
5,500.0	5,482.1	5,474.0	5,374.9	13.2	19.9	107.89	-446.1	474.3	386.6	359.0	27.62	13.996		
5,600.0	5,582.1	5,574.2	5,473.2	13.4	20.3	106.39	-441.2	493.3	403.3	375.3	27.96	14.425		
5,700.0	5,682.1	5,674.3	5,571.5	13.6	20.7	105.10	-436.9	511.5	419.8	391.5	28.30	14.831		
5,800.0	5,782.1	5,770.9	5,666.4	13.8	21.1	103.99	-433.0	529.1	436.5	407.8	28.65	15.234		
5,900.0	5,882.1	5,882.0	5,775.9	13.9	21.5	102.89	-428.8	547.9	452.0	423.0	29.03	15.572		
6,000.0	5,982.1	5,987.0	5,879.7	14.1	21.9	102.01	-425.0	563.0	465.3	435.9	29.40	15.828		
6,100.0	6,082.1	6,092.0	5,983.6	14.3	22.2	101.18	-421.0	577.3	477.9	448.1	29.77	16.056		
6,200.0	6,182.1	6,201.6	6,092.4	14.5	22.5	100.43	-417.1	590.1	488.7	458.6	30.14	16.214		
6,300.0	6,282.1	6,314.4	6,204.8	14.7	22.8	100.02	-415.2	600.0	497.1	466.6	30.53	16.282		
6,400.0	6,382.1	6,431.1	6,321.2	14.8	23.0	99.79	-414.4	606.8	502.8	471.9	30.93	16.258		
6,500.0	6,482.1	6,542.4	6,432.5	15.0	23.2	99.74	-414.5	609.6	505.2	473.9	31.31	16.138		
6,581.4	6,563.5	6,625.4	6,515.5	15.2	23.3	99.77	-414.9	610.6	506.3	474.7	31.61	16.019		
6,600.0	6,582.1	6,643.5	6,533.6	15.2	23.4	99.79	-415.1	610.8	506.6	474.9	31.66	16.000		
6,650.0	6,632.0	6,684.0	6,574.0	15.3	23.4	100.02	-416.0	611.5	508.1	476.3	31.78	15.988		
6,700.0	6,681.6	6,722.8	6,612.7	15.4	23.5	100.57	-418.6	612.7	511.3	479.4	31.90	16.030		
6,750.0	6,730.8	6,758.0	6,647.7	15.4	23.5	101.28	-422.4	614.2	516.4	484.4	31.99	16.144		
6,800.0	6,779.1	6,790.0	6,679.3	15.4	23.6	102.08	-427.5	616.2	524.0	492.0	32.04	16.355		
6,850.0	6,826.6	6,821.3	6,709.8	15.4	23.6	102.98	-434.1	618.4	534.2	502.2	32.04	16.672		
6,900.0	6,873.0	6,851.8	6,739.1	15.4	23.7	103.91	-442.0	620.6	547.1	515.1	32.01	17.090		
6,950.0	6,918.0	6,884.9	6,770.5	15.4	23.7	105.06	-452.3	623.0	562.9	530.9	31.95	17.619		
7,000.0	6,961.5	6,932.4	6,814.6	15.4	23.7	107.45	-469.7	623.9	580.6	548.8	31.83	18.239		
7,050.0	7,003.3	6,957.3	6,837.2	15.4	23.7	107.99	-480.2	623.3	601.3	569.6	31.63	19.009		
7,100.0	7,043.2	6,972.3	6,850.6	15.5	23.7	107.41	-487.0	622.8	625.4	593.9	31.44	19.893		
7,150.0	7,081.0	6,983.6	6,860.6	15.5	23.7	106.14	-492.3	622.4	652.8	621.5	31.30	20.859		
7,200.0	7,116.7	6,992.2	6,868.2	15.5	23.7	104.23	-496.4	622.2	683.3	652.0	31.25	21.864		
7,250.0	7,150.0	7,003.0	6,877.5	15.6	23.7	102.13	-501.7	621.8	716.4	685.1	31.29	22.892		
7,300.0	7,180.7	7,003.0	6,877.5	15.6	23.7	98.43	-501.7	621.8	751.8	720.3	31.52	23.849		
7,350.0	7,208.8	7,003.0	6,877.5	15.8	23.7	94.27	-501.7	621.8	789.0	757.2	31.83	24.785		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.20-T3N-R66W - Soco 20-1K (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)				
10,800.0	7,279.1	7,253.8	7,250.9	69.7	14.5	-94.53	4,189.7	-61.6	756.5	672.6	83.94	9.012			
10,900.0	7,277.4	7,251.2	7,248.3	71.5	14.5	-93.67	4,189.7	-61.6	659.6	573.7	85.88	7.681			
11,000.0	7,275.8	7,248.6	7,245.8	73.4	14.5	-92.83	4,189.7	-61.5	563.7	475.9	87.80	6.420			
11,100.0	7,274.2	7,246.1	7,243.3	75.3	14.5	-92.00	4,189.7	-61.4	469.6	379.9	89.72	5.234			
11,200.0	7,272.6	7,243.6	7,240.8	77.2	14.5	-91.18	4,189.7	-61.4	378.4	286.8	91.61	4.130			
11,300.0	7,271.0	7,241.2	7,238.4	79.0	14.5	-90.38	4,189.8	-61.3	293.0	199.5	93.50	3.134			
11,400.0	7,269.4	7,238.8	7,236.0	80.9	14.5	-89.59	4,189.8	-61.3	220.3	124.9	95.37	2.310			
11,500.0	7,267.8	7,236.5	7,233.7	82.8	14.5	-88.82	4,189.8	-61.2	176.6	79.4	97.23	1.816			
11,536.8	7,267.2	7,235.7	7,232.8	83.5	14.5	-88.53	4,189.8	-61.2	172.7	74.8	97.91	1.764	CC, ES, SF		
11,600.0	7,266.2	7,234.2	7,231.4	84.7	14.5	-88.05	4,189.8	-61.1	183.9	84.8	99.07	1.856			
11,700.0	7,264.6	7,231.9	7,229.1	86.6	14.5	-87.30	4,189.8	-61.1	237.6	136.7	100.90	2.355			
11,737.7	7,264.0	7,231.1	7,228.3	87.1	14.5	-87.02	4,189.8	-61.1	264.9	163.4	101.45	2.611			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.20-T3N-R66W - Soco 20-8K (Exist) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft	
Survey Program:		100-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)				
9,700.0	7,296.7	7,244.6	7,243.5	49.4	15.1	-88.33	3,117.6	-93.0	791.4	727.0	64.40	12.288			
9,800.0	7,295.1	7,244.5	7,243.3	51.2	15.1	-88.28	3,117.6	-93.0	695.3	629.1	66.22	10.499			
9,900.0	7,293.5	7,244.3	7,243.1	53.0	15.1	-88.23	3,117.6	-92.9	600.4	532.4	68.05	8.824			
10,000.0	7,291.9	7,244.2	7,243.0	54.9	15.1	-88.19	3,117.6	-92.9	507.6	437.7	69.88	7.264			
10,100.0	7,290.3	7,244.0	7,242.8	56.7	15.1	-88.14	3,117.6	-92.9	418.0	346.3	71.71	5.829			
10,200.0	7,288.7	7,243.8	7,242.6	58.5	15.1	-88.10	3,117.6	-92.9	334.4	260.8	73.55	4.546			
10,300.0	7,287.1	7,243.7	7,242.5	60.4	15.1	-88.05	3,117.6	-92.9	262.5	187.1	75.40	3.482			
10,400.0	7,285.5	7,243.5	7,242.3	62.2	15.1	-88.01	3,117.6	-92.9	214.5	137.3	77.24	2.777			
10,464.5	7,284.4	7,243.4	7,242.2	63.4	15.1	-87.98	3,117.6	-92.9	204.6	126.1	78.44	2.608	CC, ES, SF		
10,500.0	7,283.9	7,243.3	7,242.2	64.1	15.1	-87.96	3,117.6	-92.9	207.6	128.5	79.10	2.625			
10,600.0	7,282.3	7,243.2	7,242.0	66.0	15.1	-87.91	3,117.6	-92.9	245.4	164.4	80.95	3.031			
10,700.0	7,280.7	7,243.0	7,241.8	67.8	15.1	-87.87	3,117.6	-92.9	311.9	229.1	82.81	3.767			
10,800.0	7,279.1	7,242.9	7,241.7	69.7	15.1	-87.82	3,117.6	-92.9	392.9	308.3	84.67	4.641			
10,900.0	7,277.4	7,242.7	7,241.5	71.5	15.1	-87.78	3,117.6	-92.9	481.1	394.6	86.54	5.560			
11,000.0	7,275.8	7,242.5	7,241.3	73.4	15.1	-87.73	3,117.6	-92.9	573.2	484.8	88.41	6.484			
11,100.0	7,274.2	7,242.4	7,241.2	75.3	15.1	-87.69	3,117.6	-92.9	667.6	577.3	90.27	7.395			
11,200.0	7,272.6	7,242.2	7,241.0	77.2	15.1	-87.64	3,117.6	-92.9	763.4	671.3	92.15	8.285			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)														Offset Well Error:	0.0 ft
Survey Program: 0-MWD															
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	179.32	-105.0	1.2	105.1						
100.0	100.0	97.0	97.0	0.1	0.1	179.32	-105.0	1.2	105.0	104.8	0.22	474.317			
200.0	200.0	197.0	197.0	0.3	0.3	179.32	-105.0	1.2	105.0	104.3	0.67	157.311 CC			
300.0	300.0	296.6	296.6	0.6	0.5	179.98	-105.2	0.0	105.2	104.1	1.10	95.239 ES			
400.0	400.0	396.1	396.0	0.8	0.8	-177.97	-105.7	-3.7	105.8	104.2	1.54	68.519			
500.0	500.0	495.4	495.1	1.0	1.0	-174.61	-106.6	-10.1	107.1	105.1	2.00	53.588			
600.0	600.0	594.2	593.5	1.2	1.2	-170.08	-107.9	-18.9	109.6	107.1	2.47	44.411			
700.0	700.0	692.5	691.1	1.5	1.5	-164.61	-109.5	-30.1	113.7	110.8	2.95	38.600			
800.0	800.0	790.1	787.8	1.7	1.8	-158.54	-111.4	-43.8	120.1	116.7	3.43	35.023			
900.0	900.0	887.0	883.3	1.9	2.2	-152.28	-113.7	-59.8	129.2	125.3	3.91	33.046			
1,000.0	1,000.0	983.0	977.5	2.1	2.6	-146.18	-116.3	-77.9	141.3	137.0	4.38	32.254 SF			
1,100.0	1,100.0	1,078.0	1,070.3	2.4	3.0	-140.51	-119.2	-98.2	156.7	151.9	4.85	32.336			
1,200.0	1,200.0	1,171.9	1,161.5	2.6	3.4	-135.44	-122.4	-120.5	175.4	170.1	5.31	33.055			
1,300.0	1,300.0	1,264.7	1,250.9	2.8	3.9	-131.01	-125.8	-144.7	197.2	191.5	5.76	34.224			
1,400.0	1,400.0	1,356.2	1,338.6	3.0	4.5	-127.20	-129.5	-170.7	222.1	215.9	6.22	35.693			
1,500.0	1,500.0	1,451.6	1,429.7	3.3	5.0	-123.89	-133.6	-198.8	248.8	242.1	6.69	37.187			
1,600.0	1,600.0	1,547.1	1,520.8	3.5	5.6	-121.22	-137.6	-226.9	276.1	268.9	7.16	38.548			
1,700.0	1,700.0	1,642.5	1,611.9	3.7	6.2	79.55	-141.6	-255.1	303.7	295.7	7.94	38.264			
1,800.0	1,799.9	1,737.6	1,702.7	3.9	6.8	81.61	-145.6	-283.1	331.3	323.0	8.36	39.638			
1,900.0	1,899.7	1,832.5	1,793.3	4.0	7.4	83.70	-149.6	-311.1	359.2	350.4	8.78	40.924			
2,007.7	2,006.9	1,934.3	1,890.5	4.2	8.0	85.96	-153.9	-341.1	389.6	380.4	9.23	42.218			
2,100.0	2,098.7	2,021.4	1,973.6	4.4	8.6	88.18	-157.5	-366.8	416.3	406.7	9.61	43.301			
2,200.0	2,198.1	2,115.7	2,063.7	4.6	9.2	90.28	-161.5	-394.6	445.7	435.7	10.05	44.356			
2,300.0	2,297.6	2,210.1	2,153.7	4.9	9.8	92.13	-165.5	-422.4	475.7	465.2	10.50	45.293			
2,400.0	2,397.0	2,304.4	2,243.8	5.1	10.4	93.76	-169.4	-450.3	506.0	495.0	10.97	46.123			
2,500.0	2,496.4	2,398.7	2,333.8	5.4	11.0	95.21	-173.4	-478.1	536.7	525.2	11.45	46.854			
2,600.0	2,595.9	2,493.1	2,423.9	5.6	11.6	96.50	-177.4	-505.9	567.7	555.7	11.95	47.499			
2,700.0	2,695.3	2,587.4	2,513.9	5.9	12.2	97.66	-181.4	-533.7	598.9	586.4	12.46	48.067			
2,800.0	2,794.7	2,681.7	2,604.0	6.1	12.7	98.71	-185.3	-561.5	630.3	617.3	12.98	48.569			
2,900.0	2,894.1	2,776.1	2,694.0	6.4	13.3	99.66	-189.3	-589.3	661.8	648.3	13.50	49.013			
3,000.0	2,993.6	2,870.4	2,784.1	6.6	13.9	100.52	-193.3	-617.1	693.6	679.5	14.04	49.406			
3,100.0	3,093.0	2,964.7	2,874.1	6.9	14.5	101.31	-197.2	-645.0	725.4	710.8	14.58	49.756			
3,200.0	3,192.4	3,059.1	2,964.2	7.2	15.1	102.03	-201.2	-672.8	757.4	742.3	15.13	50.068			
3,300.0	3,291.9	3,153.4	3,054.3	7.5	15.8	102.70	-205.2	-700.6	789.5	773.8	15.68	50.346			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	179.35	-90.0	1.0	90.1					
100.0	100.0	97.0	97.0	0.1	0.1	179.35	-90.0	1.0	90.0	89.8	0.22	406.705		
200.0	200.0	197.0	197.0	0.3	0.3	179.35	-90.0	1.0	90.0	89.4	0.67	134.887		
300.0	300.0	297.0	297.0	0.6	0.6	179.35	-90.0	1.0	90.0	88.9	1.12	80.607		
400.0	400.0	397.0	397.0	0.8	0.8	179.35	-90.0	1.0	90.0	88.5	1.57	57.477 CC		
500.0	500.0	496.6	496.6	1.0	1.0	-179.89	-90.3	-0.2	90.3	88.3	2.00	45.116 ES		
600.0	600.0	596.0	595.9	1.2	1.2	-177.54	-91.0	-3.9	91.1	88.7	2.43	37.468		
700.0	700.0	695.1	694.8	1.5	1.4	-173.71	-92.2	-10.2	92.8	89.9	2.87	32.290		
800.0	800.0	793.9	793.2	1.7	1.7	-168.63	-94.0	-18.9	95.9	92.6	3.33	28.805		
900.0	900.0	892.1	890.8	1.9	1.9	-162.65	-96.2	-30.0	100.9	97.1	3.79	26.608		
1,000.0	1,000.0	989.7	987.4	2.1	2.2	-156.21	-98.8	-43.6	108.4	104.2	4.26	25.451		
1,100.0	1,100.0	1,086.5	1,082.8	2.4	2.5	-149.78	-101.9	-59.4	118.8	114.1	4.72	25.147 SF		
1,200.0	1,200.0	1,182.5	1,177.0	2.6	2.9	-143.74	-105.5	-77.3	132.3	127.1	5.18	25.525		
1,300.0	1,300.0	1,277.4	1,269.7	2.8	3.3	-138.31	-109.4	-97.4	149.0	143.4	5.64	26.430		
1,400.0	1,400.0	1,371.3	1,360.8	3.0	3.7	-133.59	-113.7	-119.5	168.9	162.8	6.09	27.726		
1,500.0	1,500.0	1,467.8	1,454.3	3.3	4.2	-129.55	-118.5	-143.4	190.9	184.3	6.55	29.140		
1,600.0	1,600.0	1,564.6	1,547.9	3.5	4.7	-126.34	-123.2	-167.4	213.6	206.6	7.01	30.469		
1,700.0	1,700.0	1,661.3	1,641.5	3.7	5.2	74.97	-127.9	-191.4	236.5	228.8	7.67	30.842		
1,800.0	1,799.9	1,757.8	1,734.9	3.9	5.7	77.58	-132.6	-215.3	259.3	251.2	8.08	32.099		
1,900.0	1,899.7	1,854.2	1,828.1	4.0	6.2	80.23	-137.3	-239.2	282.3	273.8	8.49	33.258		
2,007.7	2,006.9	1,957.6	1,928.1	4.2	6.8	83.11	-142.3	-264.8	307.3	298.4	8.93	34.412		
2,100.0	2,098.7	2,046.1	2,013.7	4.4	7.2	85.74	-146.7	-286.8	329.4	320.1	9.32	35.357		
2,200.0	2,198.1	2,141.9	2,106.5	4.6	7.8	88.22	-151.3	-310.5	354.0	344.2	9.75	36.295		
2,300.0	2,297.6	2,237.8	2,199.2	4.9	8.3	90.38	-156.0	-334.3	379.1	368.9	10.21	37.143		
2,400.0	2,397.0	2,333.6	2,292.0	5.1	8.8	92.27	-160.7	-358.1	404.7	394.0	10.68	37.905		
2,500.0	2,496.4	2,429.5	2,384.7	5.4	9.3	93.94	-165.4	-381.8	430.6	419.5	11.16	38.586		
2,600.0	2,595.9	2,525.3	2,477.4	5.6	9.8	95.42	-170.0	-405.6	456.9	445.2	11.66	39.195		
2,700.0	2,695.3	2,621.2	2,570.2	5.9	10.3	96.74	-174.7	-429.3	483.4	471.2	12.16	39.739		
2,800.0	2,794.7	2,717.0	2,662.9	6.1	10.9	97.93	-179.4	-453.1	510.1	497.4	12.68	40.226		
2,900.0	2,894.1	2,812.8	2,755.6	6.4	11.4	99.00	-184.1	-476.9	537.0	523.8	13.21	40.662		
3,000.0	2,993.6	2,908.7	2,848.4	6.6	11.9	99.96	-188.7	-500.6	564.1	550.3	13.74	41.054		
3,100.0	3,093.0	3,004.5	2,941.1	6.9	12.4	100.84	-193.4	-524.4	591.3	577.0	14.28	41.407		
3,200.0	3,192.4	3,100.4	3,033.9	7.2	12.9	101.64	-198.1	-548.1	618.6	603.8	14.82	41.726		
3,300.0	3,291.9	3,196.2	3,126.6	7.5	13.5	102.38	-202.7	-571.9	646.0	630.6	15.38	42.015		
3,400.0	3,391.3	3,292.1	3,219.3	7.7	14.0	103.05	-207.4	-595.7	673.5	657.6	15.93	42.278		
3,500.0	3,490.7	3,387.9	3,312.1	8.0	14.5	103.67	-212.1	-619.4	701.1	684.6	16.49	42.517		
3,600.0	3,590.2	3,483.8	3,404.8	8.3	15.0	104.25	-216.8	-643.2	728.8	711.7	17.05	42.735		
3,700.0	3,689.6	3,579.6	3,497.6	8.6	15.6	104.78	-221.4	-666.9	756.5	738.9	17.62	42.936		
3,800.0	3,789.0	3,675.5	3,590.3	8.9	16.1	105.28	-226.1	-690.7	784.3	766.1	18.19	43.120		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)														Offset Well Error:	0.0 ft
Survey Program: 0-MWD															
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	179.36	-45.0	0.5	45.0						
100.0	100.0	98.0	98.0	0.1	0.1	179.36	-45.0	0.5	45.0	44.7	0.22	202.070			
200.0	200.0	198.0	198.0	0.3	0.3	179.36	-45.0	0.5	45.0	44.3	0.67	67.132			
300.0	300.0	298.0	298.0	0.6	0.6	179.36	-45.0	0.5	45.0	43.8	1.12	40.171			
400.0	400.0	398.0	398.0	0.8	0.8	179.36	-45.0	0.5	45.0	43.4	1.57	28.661			
500.0	500.0	498.0	498.0	1.0	1.0	179.36	-45.0	0.5	45.0	42.9	2.02	22.278			
600.0	600.0	598.0	598.0	1.2	1.2	179.36	-45.0	0.5	45.0	42.5	2.47	18.220			
700.0	700.0	698.0	698.0	1.5	1.5	179.36	-45.0	0.5	45.0	42.0	2.92	15.412			
800.0	800.0	798.0	798.0	1.7	1.7	179.36	-45.0	0.5	45.0	41.6	3.37	13.355			
900.0	900.0	898.0	898.0	1.9	1.9	179.36	-45.0	0.5	45.0	41.1	3.82	11.782			
1,000.0	1,000.0	998.0	998.0	2.1	2.1	179.36	-45.0	0.5	45.0	40.7	4.27	10.540 CC, ES			
1,100.0	1,100.0	1,097.1	1,097.1	2.4	2.3	-179.69	-45.9	-0.3	46.0	41.3	4.69	9.799			
1,200.0	1,200.0	1,196.0	1,195.9	2.6	2.5	-177.01	-49.0	-2.6	49.1	44.0	5.10	9.629			
1,300.0	1,300.0	1,294.7	1,294.4	2.8	2.7	-173.22	-54.0	-6.4	54.5	49.0	5.51	9.891			
1,400.0	1,400.0	1,393.0	1,392.3	3.0	2.9	-169.06	-61.0	-11.8	62.4	56.5	5.93	10.526			
1,500.0	1,500.0	1,490.9	1,489.5	3.3	3.1	-165.06	-70.0	-18.7	72.9	66.5	6.35	11.481			
1,600.0	1,600.0	1,589.9	1,587.7	3.5	3.4	-161.75	-80.0	-26.4	84.9	78.1	6.78	12.525			
1,700.0	1,700.0	1,689.1	1,686.2	3.7	3.6	39.89	-90.1	-34.1	96.1	88.9	7.19	13.358			
1,800.0	1,799.9	1,788.5	1,784.7	3.9	3.9	43.11	-100.2	-41.9	105.6	98.0	7.57	13.939			
1,900.0	1,899.7	1,887.9	1,883.3	4.0	4.2	46.73	-110.3	-49.6	113.6	105.6	7.96	14.262			
2,007.7	2,006.9	1,995.0	1,989.5	4.2	4.5	51.15	-121.2	-58.0	120.8	112.4	8.39	14.389			
2,100.0	2,098.7	2,086.7	2,080.5	4.4	4.8	55.06	-130.5	-65.1	126.7	118.0	8.78	14.431			
2,200.0	2,198.1	2,186.1	2,179.0	4.6	5.1	58.88	-140.6	-72.9	133.8	124.6	9.22	14.513			
2,300.0	2,297.6	2,285.5	2,277.6	4.9	5.4	62.31	-150.8	-80.6	141.4	131.7	9.67	14.619			
2,400.0	2,397.0	2,384.8	2,376.1	5.1	5.7	65.39	-160.9	-88.4	149.5	139.3	10.14	14.737			
2,500.0	2,496.4	2,484.2	2,474.7	5.4	6.0	68.14	-171.0	-96.1	157.9	147.3	10.63	14.861			
2,600.0	2,595.9	2,583.6	2,573.2	5.6	6.3	70.61	-181.1	-103.9	166.7	155.6	11.12	14.986			
2,700.0	2,695.3	2,682.9	2,671.8	5.9	6.6	72.83	-191.2	-111.6	175.7	164.1	11.63	15.109			
2,800.0	2,794.7	2,782.3	2,770.3	6.1	6.9	74.83	-201.3	-119.4	185.0	172.9	12.15	15.228			
2,900.0	2,894.1	2,881.7	2,868.9	6.4	7.3	76.64	-211.4	-127.1	194.5	181.8	12.68	15.342			
3,000.0	2,993.6	2,981.1	2,967.4	6.6	7.6	78.28	-221.5	-134.9	204.1	190.9	13.21	15.451			
3,100.0	3,093.0	3,080.4	3,066.0	6.9	7.9	79.78	-231.6	-142.6	214.0	200.2	13.76	15.555			
3,200.0	3,192.4	3,179.8	3,164.5	7.2	8.2	81.14	-241.7	-150.4	223.9	209.6	14.30	15.653			
3,300.0	3,291.9	3,279.2	3,263.1	7.5	8.5	82.38	-251.8	-158.1	234.0	219.1	14.86	15.747			
3,400.0	3,391.3	3,378.5	3,361.6	7.7	8.9	83.52	-261.9	-165.9	244.1	228.7	15.42	15.835			
3,500.0	3,490.7	3,477.9	3,460.2	8.0	9.2	84.57	-272.0	-173.6	254.4	238.4	15.98	15.919			
3,600.0	3,590.2	3,577.3	3,558.7	8.3	9.5	85.54	-282.1	-181.4	264.7	248.1	16.55	15.998			
3,700.0	3,689.6	3,676.6	3,657.3	8.6	9.8	86.43	-292.2	-189.2	275.1	258.0	17.11	16.073			
3,800.0	3,789.0	3,776.0	3,755.8	8.9	10.2	87.26	-302.3	-196.9	285.5	267.9	17.69	16.144			
3,900.0	3,888.5	3,875.5	3,856.4	9.2	10.5	88.06	-312.6	-204.8	296.0	277.7	18.26	16.208			
4,000.0	3,987.9	3,986.6	3,965.0	9.4	10.7	89.15	-321.3	-211.5	304.3	285.4	18.81	16.171			
4,100.0	4,087.3	4,095.9	4,074.1	9.7	11.0	90.62	-326.8	-215.7	309.5	290.1	19.36	15.983			
4,200.0	4,186.8	4,205.1	4,183.3	10.0	11.1	92.47	-328.9	-217.3	311.8	291.9	19.91	15.662			
4,300.0	4,286.2	4,306.0	4,284.2	10.3	11.3	94.44	-329.0	-217.3	312.5	292.1	20.45	15.285			
4,400.0	4,385.6	4,405.5	4,383.6	10.6	11.5	96.37	-329.0	-217.3	313.5	292.6	20.97	14.954			
4,500.0	4,485.0	4,504.9	4,483.0	10.9	11.6	98.28	-329.0	-217.3	314.9	293.4	21.48	14.657			
4,600.0	4,584.5	4,604.3	4,582.5	11.2	11.8	100.18	-329.0	-217.3	316.6	294.6	22.00	14.393			
4,700.0	4,683.9	4,703.8	4,681.9	11.5	11.9	102.06	-329.0	-217.3	318.7	296.2	22.51	14.159			
4,800.0	4,783.3	4,803.2	4,781.3	11.8	12.1	103.91	-329.0	-217.3	321.1	298.1	23.01	13.953			
4,900.0	4,882.8	4,902.6	4,880.8	12.1	12.3	105.73	-329.0	-217.3	323.8	300.3	23.51	13.773			
4,912.1	4,894.8	4,914.7	4,892.8	12.1	12.3	105.95	-329.0	-217.3	324.2	300.6	23.57	13.752			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)														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			
5,000.0	4,982.3	5,002.2	4,980.3	12.3	12.5	107.34	-329.0	-217.3	326.5	302.5	23.98	13.615			
5,100.0	5,082.2	5,102.0	5,080.2	12.5	12.6	108.35	-329.0	-217.3	328.3	303.9	24.38	13.464			
5,200.0	5,182.1	5,202.0	5,180.1	12.7	12.8	108.75	-329.0	-217.3	329.0	304.3	24.75	13.291			
5,217.9	5,200.0	5,219.8	5,198.0	12.8	12.8	-89.99	-329.0	-217.3	329.0	304.2	24.82	13.257			
5,300.0	5,282.1	5,302.0	5,280.1	12.9	13.0	-89.99	-329.0	-217.3	329.0	303.9	25.12	13.100			
5,400.0	5,382.1	5,402.0	5,380.1	13.1	13.1	-89.99	-329.0	-217.3	329.0	303.6	25.47	12.918			
5,500.0	5,482.1	5,502.0	5,480.1	13.2	13.3	-89.99	-329.0	-217.3	329.0	303.2	25.83	12.740			
5,600.0	5,582.1	5,602.0	5,580.1	13.4	13.5	-89.99	-329.0	-217.3	329.0	302.9	26.19	12.565			
5,700.0	5,682.1	5,702.0	5,680.1	13.6	13.7	-89.99	-329.0	-217.3	329.0	302.5	26.55	12.393			
5,800.0	5,782.1	5,802.0	5,780.1	13.8	13.9	-89.99	-329.0	-217.3	329.0	302.1	26.92	12.225			
5,900.0	5,882.1	5,902.0	5,880.1	13.9	14.0	-89.99	-329.0	-217.3	329.0	301.8	27.28	12.060			
6,000.0	5,982.1	6,002.0	5,980.1	14.1	14.2	-89.99	-329.0	-217.3	329.0	301.4	27.65	11.899			
6,100.0	6,082.1	6,102.0	6,080.1	14.3	14.4	-89.99	-329.0	-217.3	329.0	301.0	28.03	11.741			
6,200.0	6,182.1	6,202.0	6,180.1	14.5	14.6	-89.99	-329.0	-217.3	329.0	300.6	28.40	11.586			
6,300.0	6,282.1	6,302.0	6,280.1	14.7	14.8	-89.99	-329.0	-217.3	329.0	300.3	28.78	11.434			
6,400.0	6,382.1	6,402.0	6,380.1	14.8	15.0	-89.99	-329.0	-217.3	329.0	299.9	29.16	11.286			
6,462.5	6,444.6	6,464.5	6,442.6	15.0	15.1	-89.99	-329.0	-217.3	329.0	299.7	29.39	11.194			
6,500.0	6,482.1	6,502.0	6,480.1	15.0	15.2	-89.96	-328.8	-217.3	329.0	299.5	29.54	11.140			
6,581.4	6,563.5	6,582.8	6,560.7	15.2	15.3	-88.91	-322.7	-217.3	329.1	299.3	29.82	11.036			
6,600.0	6,582.1	6,601.1	6,578.8	15.2	15.3	-88.50	-320.2	-217.3	329.2	299.3	29.88	11.015			
6,650.0	6,632.0	6,650.0	6,626.9	15.3	15.4	-87.41	-311.3	-217.3	329.4	299.4	30.02	10.974			
6,700.0	6,681.6	6,698.4	6,673.8	15.4	15.4	-86.34	-299.4	-217.3	329.7	299.6	30.12	10.949			
6,750.0	6,730.8	6,746.5	6,719.6	15.4	15.4	-85.29	-284.7	-217.3	330.2	300.0	30.18	10.939			
6,800.0	6,779.1	6,794.2	6,764.0	15.4	15.4	-84.26	-267.3	-217.3	330.7	300.5	30.22	10.943			
6,850.0	6,826.6	6,841.6	6,807.0	15.4	15.5	-83.26	-247.3	-217.3	331.4	301.1	30.24	10.958			
6,900.0	6,873.0	6,888.7	6,848.4	15.4	15.5	-82.30	-224.9	-217.4	332.1	301.8	30.24	10.982			
6,950.0	6,918.0	6,935.5	6,888.1	15.4	15.5	-81.38	-200.1	-217.4	332.9	302.6	30.23	11.011			
7,000.0	6,961.5	6,982.0	6,925.9	15.4	15.5	-80.49	-173.1	-217.4	333.7	303.5	30.22	11.044			
7,050.0	7,003.3	7,028.3	6,961.8	15.4	15.5	-79.65	-144.0	-217.4	334.6	304.4	30.21	11.076			
7,100.0	7,043.2	7,074.3	6,995.8	15.5	15.5	-78.85	-112.9	-217.4	335.5	305.2	30.21	11.104			
7,150.0	7,081.0	7,120.0	7,027.6	15.5	15.5	-78.10	-80.1	-217.4	336.4	306.1	30.24	11.123			
7,200.0	7,116.7	7,165.6	7,057.3	15.5	15.5	-77.40	-45.5	-217.4	337.2	306.9	30.30	11.130			
7,250.0	7,150.0	7,210.9	7,084.8	15.6	15.5	-76.76	-9.5	-217.4	338.1	307.7	30.40	11.121			
7,300.0	7,180.7	7,256.1	7,110.0	15.6	15.5	-76.16	28.0	-217.4	339.0	308.4	30.56	11.092			
7,350.0	7,208.8	7,300.0	7,132.3	15.8	15.7	-75.64	65.8	-217.4	339.8	309.0	30.78	11.040			
7,400.0	7,234.2	7,346.0	7,153.2	15.9	15.9	-75.15	106.7	-217.4	340.5	309.4	31.07	10.958			
7,450.0	7,256.7	7,390.7	7,171.3	16.2	16.2	-74.72	147.7	-217.4	341.2	309.7	31.44	10.851			
7,500.0	7,276.2	7,435.3	7,186.8	16.4	16.5	-74.36	189.5	-217.4	341.8	309.9	31.90	10.715			
7,550.0	7,292.7	7,479.9	7,199.9	16.7	16.8	-74.05	232.1	-217.4	342.3	309.9	32.44	10.553			
7,600.0	7,306.0	7,524.3	7,210.5	17.1	17.2	-73.80	275.2	-217.4	342.7	309.7	33.06	10.366			
7,650.0	7,316.2	7,568.7	7,218.5	17.5	17.6	-73.61	318.9	-217.4	343.1	309.3	33.78	10.156			
7,700.0	7,323.1	7,613.1	7,223.9	17.9	18.0	-73.49	362.9	-217.4	343.3	308.7	34.57	9.929			
7,750.0	7,326.8	7,657.4	7,226.8	18.4	18.5	-73.42	407.1	-217.5	343.4	308.0	35.45	9.687			
7,793.6	7,327.3	7,696.1	7,227.3	18.9	18.9	-73.41	445.9	-217.5	343.4	307.1	36.28	9.466			
7,800.0	7,327.2	7,702.5	7,227.2	18.9	18.9	-73.41	452.2	-217.5	343.4	307.0	36.41	9.431			
7,900.0	7,325.6	7,802.5	7,225.9	20.0	20.1	-73.46	552.2	-217.5	343.4	304.7	38.61	8.892			
8,000.0	7,324.0	7,902.5	7,224.5	21.3	21.4	-73.50	652.2	-217.5	343.3	302.3	41.03	8.366			
8,100.0	7,322.4	8,002.5	7,223.2	22.6	22.7	-73.55	752.2	-217.5	343.2	299.6	43.63	7.866			
8,200.0	7,320.8	8,102.5	7,221.9	24.0	24.1	-73.59	852.2	-217.5	343.1	296.8	46.38	7.398			
8,300.0	7,319.2	8,202.5	7,220.6	25.5	25.6	-73.64	952.2	-217.5	343.1	293.8	49.26	6.965			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)														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			
8,400.0	7,317.6	8,302.5	7,219.2	27.0	27.2	-73.68	1,052.2	-217.6	343.0	290.8	52.24	6.565			
8,500.0	7,316.0	8,402.5	7,217.9	28.6	28.8	-73.73	1,152.2	-217.6	342.9	287.6	55.32	6.200			
8,600.0	7,314.4	8,502.5	7,216.6	30.2	30.4	-73.77	1,252.2	-217.6	342.9	284.4	58.47	5.864			
8,700.0	7,312.8	8,602.5	7,215.3	31.8	32.1	-73.82	1,352.1	-217.6	342.8	281.1	61.68	5.558			
8,800.0	7,311.2	8,702.5	7,213.9	33.5	33.7	-73.87	1,452.1	-217.6	342.7	277.8	64.95	5.277			
8,900.0	7,309.6	8,802.5	7,212.6	35.2	35.5	-73.91	1,552.1	-217.6	342.7	274.4	68.26	5.020			
9,000.0	7,308.0	8,902.5	7,211.3	36.9	37.2	-73.96	1,652.1	-217.6	342.6	271.0	71.62	4.784			
9,100.0	7,306.4	9,002.5	7,210.0	38.7	38.9	-74.00	1,752.1	-217.7	342.5	267.5	75.01	4.567			
9,200.0	7,304.7	9,102.5	7,208.6	40.4	40.7	-74.05	1,852.1	-217.7	342.5	264.0	78.43	4.367			
9,300.0	7,303.1	9,202.5	7,207.3	42.2	42.5	-74.09	1,952.1	-217.7	342.4	260.5	81.88	4.182			
9,400.0	7,301.5	9,302.5	7,206.0	44.0	44.3	-74.14	2,052.1	-217.7	342.3	257.0	85.35	4.011			
9,500.0	7,299.9	9,402.5	7,204.6	45.8	46.1	-74.18	2,152.1	-217.7	342.3	253.4	88.85	3.852			
9,600.0	7,298.3	9,502.5	7,203.3	47.6	47.9	-74.23	2,252.1	-217.7	342.2	249.8	92.36	3.705			
9,700.0	7,296.7	9,602.5	7,202.0	49.4	49.7	-74.27	2,352.1	-217.8	342.1	246.2	95.89	3.568			
9,800.0	7,295.1	9,702.5	7,200.7	51.2	51.5	-74.32	2,452.0	-217.8	342.1	242.6	99.44	3.440			
9,900.0	7,293.5	9,802.5	7,199.3	53.0	53.3	-74.37	2,552.0	-217.8	342.0	239.0	103.00	3.320			
10,000.0	7,291.9	9,902.5	7,198.0	54.9	55.2	-74.41	2,652.0	-217.8	341.9	235.4	106.58	3.208			
10,100.0	7,290.3	10,002.5	7,196.7	56.7	57.0	-74.46	2,752.0	-217.8	341.9	231.7	110.16	3.103			
10,200.0	7,288.7	10,102.5	7,195.4	58.5	58.8	-74.50	2,852.0	-217.8	341.8	228.1	113.76	3.005			
10,300.0	7,287.1	10,202.5	7,194.0	60.4	60.7	-74.55	2,952.0	-217.9	341.7	224.4	117.37	2.912			
10,400.0	7,285.5	10,302.5	7,192.7	62.2	62.5	-74.59	3,052.0	-217.9	341.7	220.7	120.98	2.824			
10,500.0	7,283.9	10,402.5	7,191.4	64.1	64.4	-74.64	3,152.0	-217.9	341.6	217.0	124.61	2.742			
10,600.0	7,282.3	10,502.5	7,190.1	66.0	66.3	-74.68	3,252.0	-217.9	341.6	213.3	128.24	2.663			
10,700.0	7,280.7	10,602.5	7,188.7	67.8	68.1	-74.73	3,352.0	-217.9	341.5	209.6	131.88	2.589			
10,800.0	7,279.1	10,702.5	7,187.4	69.7	70.0	-74.78	3,452.0	-217.9	341.4	205.9	135.52	2.519			
10,900.0	7,277.4	10,802.5	7,186.1	71.5	71.9	-74.82	3,551.9	-217.9	341.4	202.2	139.18	2.453			
11,000.0	7,275.8	10,902.5	7,184.8	73.4	73.7	-74.87	3,651.9	-218.0	341.3	198.5	142.84	2.389			
11,100.0	7,274.2	11,002.5	7,183.4	75.3	75.6	-74.91	3,751.9	-218.0	341.2	194.7	146.50	2.329			
11,200.0	7,272.6	11,102.5	7,182.1	77.2	77.5	-74.96	3,851.9	-218.0	341.2	191.0	150.17	2.272			
11,300.0	7,271.0	11,202.5	7,180.8	79.0	79.4	-75.00	3,951.9	-218.0	341.1	187.3	153.84	2.217			
11,400.0	7,269.4	11,302.5	7,179.4	80.9	81.3	-75.05	4,051.9	-218.0	341.1	183.5	157.52	2.165			
11,500.0	7,267.8	11,402.5	7,178.1	82.8	83.1	-75.10	4,151.9	-218.0	341.0	179.8	161.21	2.115			
11,600.0	7,266.2	11,502.5	7,176.8	84.7	85.0	-75.14	4,251.9	-218.1	340.9	176.0	164.90	2.068			
11,700.0	7,264.6	11,602.5	7,175.5	86.6	86.9	-75.19	4,351.9	-218.1	340.9	172.3	168.59	2.022			
11,730.9	7,264.1	11,633.4	7,175.1	87.0	87.5	-75.20	4,382.8	-218.1	340.9	171.2	169.62	2.010			
11,737.7	7,264.0	11,637.7	7,175.0	87.1	87.6	-75.20	4,387.1	-218.1	340.9	171.1	169.80	2.007 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-241 - Wellbore #1 - Plan #1 (12-01-15)														Offset Well Error:	0.0 ft
Survey Program: 0-MWD															
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	179.29	-75.0	0.9	75.1						
100.0	100.0	98.0	98.0	0.1	0.1	179.29	-75.0	0.9	75.1	74.8	0.22	337.290			
200.0	200.0	198.0	198.0	0.3	0.3	179.29	-75.0	0.9	75.1	74.4	0.67	112.055			
300.0	300.0	298.0	298.0	0.6	0.6	179.29	-75.0	0.9	75.1	73.9	1.12	67.053			
400.0	400.0	398.0	398.0	0.8	0.8	179.29	-75.0	0.9	75.1	73.5	1.57	47.840			
500.0	500.0	498.0	498.0	1.0	1.0	179.29	-75.0	0.9	75.1	73.0	2.02	37.185			
600.0	600.0	598.0	598.0	1.2	1.2	179.29	-75.0	0.9	75.1	72.6	2.47	30.412 CC			
700.0	700.0	697.5	697.5	1.5	1.4	-179.80	-75.4	-0.3	75.4	72.5	2.90	25.997 ES			
800.0	800.0	796.8	796.7	1.7	1.6	-177.05	-76.5	-3.9	76.6	73.2	3.32	23.030			
900.0	900.0	895.9	895.6	1.9	1.9	-172.66	-78.2	-10.1	78.9	75.1	3.76	20.987			
1,000.0	1,000.0	994.5	993.8	2.1	2.1	-167.00	-80.7	-18.6	82.9	78.7	4.20	19.723			
1,100.0	1,100.0	1,092.7	1,091.3	2.4	2.3	-160.58	-83.8	-29.6	89.1	84.5	4.65	19.153 SF			
1,200.0	1,200.0	1,190.2	1,187.8	2.6	2.6	-153.97	-87.6	-42.8	98.1	92.9	5.11	19.204			
1,300.0	1,300.0	1,286.9	1,283.2	2.8	2.9	-147.68	-92.1	-58.3	110.0	104.4	5.56	19.791			
1,400.0	1,400.0	1,382.7	1,377.3	3.0	3.3	-142.01	-97.2	-75.9	125.0	119.0	6.01	20.815			
1,500.0	1,500.0	1,479.9	1,472.3	3.3	3.7	-137.14	-102.8	-95.3	142.5	136.1	6.45	22.079			
1,600.0	1,600.0	1,577.7	1,567.9	3.5	4.1	-133.31	-108.4	-115.0	160.9	154.0	6.90	23.301			
1,700.0	1,700.0	1,675.5	1,663.5	3.7	4.5	68.61	-114.1	-134.7	179.3	171.9	7.46	24.030			
1,800.0	1,799.9	1,773.1	1,759.1	3.9	4.9	71.86	-119.7	-154.3	197.5	189.6	7.86	25.112			
1,900.0	1,899.7	1,870.7	1,854.4	4.0	5.3	75.17	-125.4	-173.9	215.6	207.3	8.27	26.081			
2,007.7	2,006.9	1,975.4	1,956.8	4.2	5.8	78.80	-131.4	-194.9	235.3	226.6	8.71	27.028			
2,100.0	2,098.7	2,065.1	2,044.5	4.4	6.2	81.96	-136.6	-213.0	252.8	243.7	9.09	27.797			
2,200.0	2,198.1	2,162.2	2,139.5	4.6	6.6	84.92	-142.2	-232.5	272.4	262.9	9.53	28.584			
2,300.0	2,297.6	2,259.3	2,234.5	4.9	7.1	87.49	-147.9	-252.0	292.7	282.7	9.98	29.313			
2,400.0	2,397.0	2,356.4	2,329.5	5.1	7.5	89.72	-153.5	-271.5	313.4	303.0	10.45	29.981			
2,500.0	2,496.4	2,453.6	2,424.4	5.4	7.9	91.68	-159.1	-291.1	334.6	323.7	10.94	30.590			
2,600.0	2,595.9	2,550.7	2,519.4	5.6	8.4	93.40	-164.7	-310.6	356.1	344.7	11.43	31.143			
2,700.0	2,695.3	2,647.8	2,614.4	5.9	8.8	94.93	-170.3	-330.1	377.9	365.9	11.94	31.644			
2,800.0	2,794.7	2,745.0	2,709.4	6.1	9.3	96.30	-175.9	-349.6	399.9	387.4	12.46	32.099			
2,900.0	2,894.1	2,842.1	2,804.3	6.4	9.7	97.52	-181.6	-369.2	422.1	409.1	12.98	32.513			
3,000.0	2,993.6	2,939.2	2,899.3	6.6	10.2	98.62	-187.2	-388.7	444.5	431.0	13.51	32.889			
3,100.0	3,093.0	3,036.3	2,994.3	6.9	10.6	99.61	-192.8	-408.2	467.0	452.9	14.05	33.232			
3,200.0	3,192.4	3,133.5	3,089.3	7.2	11.1	100.52	-198.4	-427.7	489.6	475.0	14.60	33.545			
3,300.0	3,291.9	3,230.6	3,184.3	7.5	11.5	101.34	-204.0	-447.3	512.3	497.2	15.14	33.833			
3,400.0	3,391.3	3,327.7	3,279.2	7.7	11.9	102.10	-209.7	-466.8	535.2	519.5	15.70	34.096			
3,500.0	3,490.7	3,424.8	3,374.2	8.0	12.4	102.79	-215.3	-486.3	558.1	541.8	16.25	34.339			
3,600.0	3,590.2	3,522.0	3,469.2	8.3	12.8	103.43	-220.9	-505.8	581.1	564.3	16.81	34.564			
3,700.0	3,689.6	3,619.1	3,564.2	8.6	13.3	104.02	-226.5	-525.4	604.1	586.7	17.37	34.771			
3,800.0	3,789.0	3,716.2	3,659.1	8.9	13.7	104.57	-232.1	-544.9	627.2	609.3	17.94	34.963			
3,900.0	3,888.5	3,813.3	3,754.1	9.2	14.2	105.07	-237.8	-564.4	650.4	631.9	18.51	35.142			
4,000.0	3,987.9	3,910.5	3,849.1	9.4	14.6	105.55	-243.4	-583.9	673.6	654.5	19.08	35.309			
4,100.0	4,087.3	4,007.6	3,944.1	9.7	15.1	105.99	-249.0	-603.5	696.8	677.2	19.65	35.464			
4,200.0	4,186.8	4,104.7	4,039.0	10.0	15.6	106.40	-254.6	-623.0	720.1	699.9	20.22	35.609			
4,300.0	4,286.2	4,201.8	4,134.0	10.3	16.0	106.79	-260.2	-642.5	743.4	722.6	20.80	35.745			
4,400.0	4,385.6	4,299.0	4,229.0	10.6	16.5	107.15	-265.9	-662.0	766.7	745.4	21.37	35.873			
4,500.0	4,485.0	4,396.1	4,324.0	10.9	16.9	107.50	-271.5	-681.6	790.1	768.1	21.95	35.993			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-301 - Wellbore #1 - Plan #1 (12-01-15)													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	179.40	-60.0	0.6	60.1						
100.0	100.0	98.0	98.0	0.1	0.1	179.40	-60.0	0.6	60.1	59.8	0.22	269.870			
200.0	200.0	198.0	198.0	0.3	0.3	179.40	-60.0	0.6	60.1	59.4	0.67	89.656			
300.0	300.0	298.0	298.0	0.6	0.6	179.40	-60.0	0.6	60.1	58.9	1.12	53.650			
400.0	400.0	398.0	398.0	0.8	0.8	179.40	-60.0	0.6	60.1	58.5	1.57	38.277			
500.0	500.0	498.0	498.0	1.0	1.0	179.40	-60.0	0.6	60.1	58.0	2.02	29.752			
600.0	600.0	598.0	598.0	1.2	1.2	179.40	-60.0	0.6	60.1	57.6	2.47	24.333			
700.0	700.0	698.0	698.0	1.5	1.5	179.40	-60.0	0.6	60.1	57.1	2.92	20.584			
800.0	800.0	798.0	798.0	1.7	1.7	179.40	-60.0	0.6	60.1	56.7	3.37	17.836 CC, ES			
900.0	900.0	897.3	897.3	1.9	1.9	-179.54	-60.6	-0.5	60.6	56.8	3.80	15.963			
1,000.0	1,000.0	996.5	996.4	2.1	2.1	-176.41	-62.3	-3.9	62.4	58.2	4.21	14.811			
1,100.0	1,100.0	1,095.4	1,095.1	2.4	2.3	-171.59	-65.1	-9.6	65.8	61.2	4.64	14.189			
1,200.0	1,200.0	1,193.9	1,193.2	2.6	2.5	-165.68	-69.0	-17.6	71.3	66.3	5.07	14.061			
1,300.0	1,300.0	1,291.9	1,290.6	2.8	2.7	-159.41	-73.9	-27.8	79.3	73.8	5.51	14.399			
1,400.0	1,400.0	1,389.3	1,386.9	3.0	3.0	-153.36	-80.0	-40.1	90.2	84.2	5.95	15.154			
1,500.0	1,500.0	1,487.0	1,483.4	3.3	3.3	-147.96	-87.0	-54.4	103.6	97.2	6.39	16.217			
1,600.0	1,600.0	1,585.6	1,580.6	3.5	3.6	-143.72	-94.1	-69.1	118.1	111.3	6.83	17.288			
1,700.0	1,700.0	1,684.2	1,677.9	3.7	4.0	58.65	-101.3	-83.8	132.4	125.0	7.31	18.107			
1,800.0	1,799.9	1,782.9	1,775.1	3.9	4.3	62.42	-108.5	-98.5	145.9	138.2	7.70	18.939			
1,900.0	1,899.7	1,881.4	1,872.3	4.0	4.6	66.36	-115.7	-113.2	158.9	150.8	8.10	19.622			
2,007.7	2,006.9	1,987.4	1,976.8	4.2	5.0	70.80	-123.4	-129.0	172.8	164.2	8.54	20.240			
2,100.0	2,098.7	2,078.1	2,066.2	4.4	5.4	74.59	-130.0	-142.5	185.1	176.1	8.92	20.736			
2,200.0	2,198.1	2,176.4	2,163.2	4.6	5.7	78.15	-137.2	-157.1	199.2	189.8	9.36	21.273			
2,300.0	2,297.6	2,274.6	2,260.1	4.9	6.1	81.25	-144.3	-171.8	214.0	204.1	9.82	21.791			
2,400.0	2,397.0	2,372.9	2,357.0	5.1	6.4	83.94	-151.5	-186.4	229.3	219.0	10.29	22.282			
2,500.0	2,496.4	2,471.2	2,453.9	5.4	6.8	86.29	-158.7	-201.0	245.0	234.2	10.77	22.742			
2,600.0	2,595.9	2,569.5	2,550.8	5.6	7.2	88.36	-165.8	-215.7	261.1	249.9	11.27	23.168			
2,700.0	2,695.3	2,667.7	2,647.8	5.9	7.6	90.18	-173.0	-230.3	277.5	265.8	11.78	23.562			
2,800.0	2,794.7	2,766.0	2,744.7	6.1	7.9	91.81	-180.1	-245.0	294.2	281.9	12.30	23.926			
2,900.0	2,894.1	2,864.3	2,841.6	6.4	8.3	93.25	-187.3	-259.6	311.0	298.2	12.82	24.261			
3,000.0	2,993.6	2,962.6	2,938.5	6.6	8.7	94.55	-194.4	-274.3	328.1	314.7	13.35	24.570			
3,100.0	3,093.0	3,060.9	3,035.4	6.9	9.1	95.73	-201.6	-288.9	345.2	331.4	13.89	24.855			
3,200.0	3,192.4	3,159.1	3,132.3	7.2	9.4	96.79	-208.8	-303.5	362.5	348.1	14.43	25.119			
3,300.0	3,291.9	3,257.4	3,229.3	7.5	9.8	97.75	-215.9	-318.2	380.0	365.0	14.98	25.363			
3,400.0	3,391.3	3,355.7	3,326.2	7.7	10.2	98.63	-223.1	-332.8	397.5	381.9	15.53	25.590			
3,500.0	3,490.7	3,454.0	3,423.1	8.0	10.6	99.44	-230.2	-347.5	415.1	399.0	16.09	25.800			
3,600.0	3,590.2	3,552.3	3,520.0	8.3	11.0	100.18	-237.4	-362.1	432.7	416.1	16.65	25.996			
3,700.0	3,689.6	3,650.5	3,616.9	8.6	11.3	100.86	-244.6	-376.7	450.5	433.3	17.21	26.178			
3,800.0	3,789.0	3,748.8	3,713.9	8.9	11.7	101.49	-251.7	-391.4	468.3	450.5	17.77	26.349			
3,900.0	3,888.5	3,847.1	3,810.8	9.2	12.1	102.08	-258.9	-406.0	486.1	467.8	18.34	26.508			
4,000.0	3,987.9	3,945.4	3,907.7	9.4	12.5	102.62	-266.0	-420.7	504.0	485.1	18.91	26.658			
4,100.0	4,087.3	4,043.6	4,004.6	9.7	12.9	103.12	-273.2	-435.3	521.9	502.4	19.48	26.798			
4,200.0	4,186.8	4,141.9	4,101.5	10.0	13.3	103.60	-280.4	-449.9	539.9	519.8	20.05	26.930			
4,300.0	4,286.2	4,240.2	4,198.4	10.3	13.6	104.04	-287.5	-464.6	557.9	537.3	20.62	27.054			
4,400.0	4,385.6	4,338.5	4,295.4	10.6	14.0	104.45	-294.7	-479.2	575.9	554.7	21.20	27.172			
4,500.0	4,485.0	4,436.8	4,392.3	10.9	14.4	104.84	-301.8	-493.9	594.0	572.2	21.77	27.283			
4,600.0	4,584.5	4,535.0	4,489.2	11.2	14.8	105.21	-309.0	-508.5	612.0	589.7	22.35	27.388			
4,700.0	4,683.9	4,649.0	4,601.7	11.5	15.2	105.65	-316.8	-524.6	629.4	606.4	22.93	27.449			
4,800.0	4,783.3	4,773.1	4,725.0	11.8	15.5	106.27	-323.2	-537.7	643.1	619.6	23.50	27.370			
4,900.0	4,882.8	4,898.1	4,849.6	12.1	15.7	107.07	-327.3	-546.0	653.0	628.9	24.06	27.143			
4,912.1	4,894.8	4,913.3	4,864.8	12.1	15.7	107.18	-327.6	-546.7	653.9	629.8	24.12	27.107			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-301 - Wellbore #1 - Plan #1 (12-01-15)													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		
5,000.0	4,982.3	5,023.7	4,975.2	12.3	15.9	107.99	-329.0	-549.4	658.6	634.0	24.59	26.782		
5,100.0	5,082.2	5,128.7	5,080.2	12.5	16.0	108.54	-329.0	-549.5	660.5	635.5	25.02	26.401		
5,200.0	5,182.1	5,228.7	5,180.1	12.7	16.2	108.75	-329.0	-549.5	661.2	635.8	25.39	26.040		
5,217.9	5,200.0	5,246.6	5,198.0	12.8	16.2	-90.00	-329.0	-549.5	661.3	635.8	25.46	25.974		
5,300.0	5,282.1	5,328.7	5,280.1	12.9	16.3	-90.00	-329.0	-549.5	661.3	635.5	25.75	25.684		
5,400.0	5,382.1	5,428.7	5,380.1	13.1	16.5	-90.00	-329.0	-549.5	661.3	635.2	26.09	25.346		
5,500.0	5,482.1	5,528.7	5,480.1	13.2	16.6	-90.00	-329.0	-549.5	661.3	634.8	26.44	25.014		
5,600.0	5,582.1	5,628.7	5,580.1	13.4	16.7	-90.00	-329.0	-549.5	661.3	634.5	26.78	24.688		
5,700.0	5,682.1	5,728.7	5,680.1	13.6	16.9	-90.00	-329.0	-549.5	661.3	634.1	27.14	24.367		
5,800.0	5,782.1	5,828.7	5,780.1	13.8	17.0	-90.00	-329.0	-549.5	661.3	633.8	27.49	24.053		
5,900.0	5,882.1	5,928.7	5,880.1	13.9	17.2	-90.00	-329.0	-549.5	661.3	633.4	27.85	23.744		
6,000.0	5,982.1	6,028.7	5,980.1	14.1	17.3	-90.00	-329.0	-549.5	661.3	633.0	28.21	23.440		
6,100.0	6,082.1	6,128.7	6,080.1	14.3	17.5	-90.00	-329.0	-549.5	661.3	632.7	28.57	23.142		
6,200.0	6,182.1	6,228.7	6,180.1	14.5	17.7	-90.00	-329.0	-549.5	661.3	632.3	28.94	22.850		
6,300.0	6,282.1	6,328.7	6,280.1	14.7	17.8	-90.00	-329.0	-549.5	661.3	632.0	29.31	22.564		
6,400.0	6,382.1	6,428.7	6,380.1	14.8	18.0	-90.00	-329.0	-549.5	661.3	631.6	29.68	22.282		
6,500.0	6,482.1	6,528.7	6,480.1	15.0	18.1	-90.00	-329.0	-549.5	661.3	631.2	30.05	22.006		
6,581.4	6,563.5	6,610.0	6,561.5	15.2	18.3	-90.00	-329.0	-549.5	661.3	630.9	30.35	21.786		
6,600.0	6,582.1	6,628.7	6,580.1	15.2	18.3	-90.01	-328.9	-549.5	661.3	630.8	30.42	21.738		
6,650.0	6,632.0	6,678.7	6,630.0	15.3	18.4	-90.02	-326.2	-549.5	661.3	630.7	30.57	21.628		
6,700.0	6,681.6	6,728.7	6,679.7	15.4	18.4	-90.03	-320.2	-549.5	661.3	630.6	30.70	21.541		
6,750.0	6,730.8	6,778.7	6,728.8	15.4	18.5	-90.04	-311.0	-549.5	661.3	630.5	30.79	21.478		
6,800.0	6,779.1	6,828.7	6,777.3	15.4	18.5	-90.05	-298.6	-549.6	661.3	630.4	30.85	21.435		
6,850.0	6,826.6	6,878.8	6,824.8	15.4	18.5	-90.06	-283.0	-549.6	661.3	630.4	30.89	21.407		
6,900.0	6,873.0	6,928.8	6,871.3	15.4	18.5	-90.08	-264.4	-549.6	661.3	630.4	30.91	21.391		
6,950.0	6,918.0	6,978.9	6,916.4	15.4	18.5	-90.09	-242.7	-549.6	661.3	630.3	30.93	21.381		
7,000.0	6,961.5	7,028.9	6,960.0	15.4	18.5	-90.10	-218.2	-549.6	661.3	630.3	30.94	21.371		
7,050.0	7,003.3	7,079.0	7,001.9	15.4	18.5	-90.11	-190.8	-549.6	661.3	630.3	30.97	21.354		
7,100.0	7,043.2	7,129.1	7,042.0	15.5	18.5	-90.12	-160.7	-549.6	661.3	630.3	31.01	21.324		
7,150.0	7,081.0	7,179.2	7,080.0	15.5	18.5	-90.13	-128.1	-549.6	661.3	630.2	31.09	21.273		
7,200.0	7,116.7	7,229.3	7,115.8	15.5	18.5	-90.13	-93.1	-549.6	661.3	630.1	31.20	21.194		
7,250.0	7,150.0	7,279.4	7,149.2	15.6	18.5	-90.14	-55.7	-549.6	661.3	629.9	31.37	21.081		
7,300.0	7,180.7	7,329.5	7,180.1	15.6	18.5	-90.15	-16.3	-549.6	661.3	629.7	31.60	20.928		
7,350.0	7,208.8	7,379.6	7,208.3	15.8	18.5	-90.16	25.1	-549.6	661.3	629.4	31.90	20.732		
7,400.0	7,234.2	7,429.7	7,233.8	15.9	18.6	-90.16	68.2	-549.6	661.3	629.0	32.27	20.491		
7,450.0	7,256.7	7,479.8	7,256.4	16.2	18.7	-90.17	112.9	-549.6	661.3	628.6	32.73	20.204		
7,500.0	7,276.2	7,530.0	7,276.0	16.4	18.8	-90.17	159.1	-549.6	661.3	628.0	33.28	19.873		
7,550.0	7,292.7	7,580.1	7,292.6	16.7	18.9	-90.18	206.4	-549.6	661.3	627.4	33.91	19.503		
7,600.0	7,306.0	7,630.2	7,306.0	17.1	19.1	-90.18	254.7	-549.7	661.3	626.7	34.63	19.098		
7,650.0	7,316.2	7,680.4	7,316.2	17.5	19.4	-90.18	303.7	-549.7	661.3	625.9	35.43	18.666		
7,700.0	7,323.1	7,730.5	7,323.2	17.9	19.8	-90.18	353.4	-549.7	661.4	625.0	36.31	18.214		
7,750.0	7,326.8	7,780.6	7,326.9	18.4	20.2	-90.18	403.4	-549.7	661.4	624.1	37.26	17.749		
7,793.6	7,327.3	7,824.4	7,327.5	18.9	20.6	-90.18	447.1	-549.7	661.4	623.2	38.14	17.338		
7,800.0	7,327.2	7,830.8	7,327.4	18.9	20.7	-90.19	453.5	-549.7	661.4	623.1	38.28	17.277		
7,900.0	7,325.6	7,930.8	7,325.8	20.0	21.7	-90.19	553.5	-549.7	661.4	620.9	40.52	16.322		
8,000.0	7,324.0	8,030.8	7,324.3	21.3	22.9	-90.20	653.5	-549.7	661.4	618.4	42.98	15.390		
8,100.0	7,322.4	8,130.8	7,322.8	22.6	24.2	-90.20	753.5	-549.7	661.4	615.8	45.62	14.497		
8,200.0	7,320.8	8,230.8	7,321.2	24.0	25.5	-90.21	853.4	-549.8	661.4	613.0	48.43	13.657		
8,300.0	7,319.2	8,330.8	7,319.7	25.5	26.9	-90.22	953.4	-549.8	661.4	610.1	51.37	12.876		
8,400.0	7,317.6	8,430.8	7,318.1	27.0	28.4	-90.22	1,053.4	-549.8	661.4	607.0	54.42	12.155		

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-301 - Wellbore #1 - Plan #1 (12-01-15)											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)				
8,500.0	7,316.0	8,530.8	7,316.6	28.6	30.0	-90.23	1,153.4	-549.8	661.5	603.9	57.56	11.491			
8,600.0	7,314.4	8,630.8	7,315.1	30.2	31.5	-90.23	1,253.4	-549.8	661.5	600.7	60.79	10.882			
8,700.0	7,312.8	8,730.8	7,313.5	31.8	33.1	-90.24	1,353.4	-549.9	661.5	597.4	64.08	10.323			
8,800.0	7,311.2	8,830.8	7,312.0	33.5	34.8	-90.25	1,453.4	-549.9	661.5	594.1	67.43	9.810			
8,900.0	7,309.6	8,930.8	7,310.5	35.2	36.4	-90.25	1,553.4	-549.9	661.5	590.7	70.83	9.340			
9,000.0	7,308.0	9,030.8	7,308.9	36.9	38.1	-90.26	1,653.3	-549.9	661.5	587.3	74.27	8.907			
9,100.0	7,306.4	9,130.8	7,307.4	38.7	39.8	-90.26	1,753.3	-549.9	661.5	583.8	77.75	8.509			
9,200.0	7,304.7	9,230.8	7,305.9	40.4	41.6	-90.27	1,853.3	-550.0	661.6	580.3	81.26	8.142			
9,300.0	7,303.1	9,330.8	7,304.3	42.2	43.3	-90.28	1,953.3	-550.0	661.6	576.8	84.79	7.802			
9,400.0	7,301.5	9,430.8	7,302.8	44.0	45.1	-90.28	2,053.3	-550.0	661.6	573.2	88.36	7.488			
9,500.0	7,299.9	9,530.8	7,301.3	45.8	46.8	-90.29	2,153.3	-550.0	661.6	569.7	91.94	7.196			
9,600.0	7,298.3	9,630.8	7,299.7	47.6	48.6	-90.29	2,253.3	-550.0	661.6	566.1	95.54	6.925			
9,700.0	7,296.7	9,730.8	7,298.2	49.4	50.4	-90.30	2,353.3	-550.0	661.6	562.5	99.17	6.672			
9,800.0	7,295.1	9,830.8	7,296.6	51.2	52.2	-90.31	2,453.3	-550.1	661.6	558.8	102.80	6.436			
9,900.0	7,293.5	9,930.8	7,295.1	53.0	54.0	-90.31	2,553.2	-550.1	661.7	555.2	106.45	6.215			
10,000.0	7,291.9	10,030.8	7,293.6	54.9	55.8	-90.32	2,653.2	-550.1	661.7	551.6	110.12	6.009			
10,100.0	7,290.3	10,130.8	7,292.0	56.7	57.7	-90.32	2,753.2	-550.1	661.7	547.9	113.79	5.815			
10,200.0	7,288.7	10,230.8	7,290.5	58.5	59.5	-90.33	2,853.2	-550.1	661.7	544.2	117.48	5.633			
10,300.0	7,287.1	10,330.8	7,289.0	60.4	61.3	-90.34	2,953.2	-550.2	661.7	540.5	121.17	5.461			
10,400.0	7,285.5	10,430.8	7,287.4	62.2	63.1	-90.34	3,053.2	-550.2	661.7	536.8	124.87	5.299			
10,500.0	7,283.9	10,530.8	7,285.9	64.1	65.0	-90.35	3,153.2	-550.2	661.7	533.2	128.58	5.146			
10,600.0	7,282.3	10,630.8	7,284.4	66.0	66.8	-90.35	3,253.2	-550.2	661.8	529.5	132.30	5.002			
10,700.0	7,280.7	10,730.8	7,282.8	67.8	68.7	-90.36	3,353.1	-550.2	661.8	525.7	136.02	4.865			
10,800.0	7,279.1	10,830.8	7,281.3	69.7	70.5	-90.37	3,453.1	-550.2	661.8	522.0	139.75	4.735			
10,900.0	7,277.4	10,930.8	7,279.8	71.5	72.4	-90.37	3,553.1	-550.3	661.8	518.3	143.49	4.612			
11,000.0	7,275.8	11,030.8	7,278.2	73.4	74.3	-90.38	3,653.1	-550.3	661.8	514.6	147.23	4.495			
11,100.0	7,274.2	11,130.8	7,276.7	75.3	76.1	-90.38	3,753.1	-550.3	661.8	510.8	150.97	4.384			
11,200.0	7,272.6	11,230.8	7,275.1	77.2	78.0	-90.39	3,853.1	-550.3	661.8	507.1	154.72	4.278			
11,300.0	7,271.0	11,330.8	7,273.6	79.0	79.9	-90.40	3,953.1	-550.3	661.8	503.4	158.48	4.176			
11,400.0	7,269.4	11,430.8	7,272.1	80.9	81.7	-90.40	4,053.1	-550.4	661.9	499.6	162.24	4.080			
11,500.0	7,267.8	11,530.8	7,270.5	82.8	83.6	-90.41	4,153.1	-550.4	661.9	495.9	166.00	3.987			
11,600.0	7,266.2	11,630.8	7,269.0	84.7	85.5	-90.41	4,253.0	-550.4	661.9	492.1	169.76	3.899			
11,700.0	7,264.6	11,730.8	7,267.5	86.6	87.3	-90.42	4,353.0	-550.4	661.9	488.4	173.53	3.814			
11,716.7	7,264.3	11,747.4	7,267.2	86.8	87.7	-90.42	4,369.7	-550.4	661.9	487.8	174.09	3.802			
11,737.7	7,264.0	11,762.2	7,267.0	87.1	87.9	-90.42	4,384.4	-550.4	661.9	487.3	174.69	3.789 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	179.00	-15.1	0.3	15.1	15.1	0.00	N/A		
100.0	100.0	99.0	99.0	0.1	0.1	179.00	-15.1	0.3	15.1	14.9	0.22	67.441		
200.0	200.0	199.0	199.0	0.3	0.3	179.00	-15.1	0.3	15.1	14.4	0.67	22.443		
300.0	300.0	299.0	299.0	0.6	0.6	179.00	-15.1	0.3	15.1	14.0	1.12	13.448		
400.0	400.0	399.0	399.0	0.8	0.8	179.00	-15.1	0.3	15.1	13.5	1.57	9.600		
500.0	500.0	499.0	499.0	1.0	1.0	179.00	-15.1	0.3	15.1	13.1	2.02	7.464		
600.0	600.0	599.0	599.0	1.2	1.2	179.00	-15.1	0.3	15.1	12.6	2.47	6.106		
700.0	700.0	699.0	699.0	1.5	1.5	179.00	-15.1	0.3	15.1	12.2	2.92	5.166		
800.0	800.0	799.0	799.0	1.7	1.7	179.00	-15.1	0.3	15.1	11.7	3.37	4.477		
900.0	900.0	899.0	899.0	1.9	1.9	179.00	-15.1	0.3	15.1	11.3	3.82	3.950		
1,000.0	1,000.0	999.0	999.0	2.1	2.1	179.00	-15.1	0.3	15.1	10.8	4.27	3.534		
1,100.0	1,100.0	1,099.0	1,099.0	2.4	2.4	179.00	-15.1	0.3	15.1	10.4	4.72	3.197		
1,200.0	1,200.0	1,199.0	1,199.0	2.6	2.6	179.00	-15.1	0.3	15.1	9.9	5.17	2.919		
1,300.0	1,300.0	1,299.0	1,299.0	2.8	2.8	179.00	-15.1	0.3	15.1	9.5	5.62	2.685		
1,400.0	1,400.0	1,399.0	1,399.0	3.0	3.0	179.00	-15.1	0.3	15.1	9.0	6.07	2.486 CC, ES		
1,500.0	1,500.0	1,498.7	1,498.7	3.3	3.2	175.40	-15.9	1.3	15.9	9.4	6.49	2.450		
1,600.0	1,600.0	1,598.3	1,598.2	3.5	3.4	166.56	-18.2	4.4	18.7	11.8	6.90	2.714		
1,700.0	1,700.0	1,697.7	1,697.4	3.7	3.6	-4.67	-22.1	9.5	22.8	15.5	7.29	3.131		
1,800.0	1,799.9	1,796.9	1,796.2	3.9	3.8	-14.62	-27.6	16.6	27.3	19.6	7.65	3.565		
1,900.0	1,899.7	1,895.9	1,894.5	4.0	4.0	-24.25	-34.6	25.8	32.4	24.4	8.01	4.048		
2,007.7	2,006.9	2,002.9	2,000.5	4.2	4.3	-33.92	-43.6	37.6	38.7	30.3	8.42	4.595		
2,100.0	2,098.7	2,094.9	2,091.6	4.4	4.5	-41.04	-51.5	47.9	43.9	35.1	8.80	4.994		
2,200.0	2,198.1	2,194.6	2,190.2	4.6	4.8	-46.98	-60.1	59.1	50.2	41.0	9.22	5.443		
2,300.0	2,297.6	2,294.3	2,288.9	4.9	5.1	-51.56	-68.6	70.2	56.9	47.2	9.67	5.882		
2,400.0	2,397.0	2,394.0	2,387.6	5.1	5.4	-55.16	-77.1	81.4	63.9	53.7	10.14	6.299		
2,500.0	2,496.4	2,493.6	2,486.3	5.4	5.7	-58.05	-85.7	92.6	71.0	60.4	10.62	6.688		
2,600.0	2,595.9	2,593.3	2,585.0	5.6	6.0	-60.40	-94.2	103.8	78.4	67.2	11.12	7.047		
2,700.0	2,695.3	2,693.0	2,683.7	5.9	6.3	-62.35	-102.8	114.9	85.8	74.2	11.63	7.377		
2,800.0	2,794.7	2,792.7	2,782.4	6.1	6.6	-63.99	-111.3	126.1	93.3	81.2	12.15	7.680		
2,900.0	2,894.1	2,892.4	2,881.1	6.4	6.9	-65.38	-119.9	137.3	100.9	88.2	12.68	7.956		
3,000.0	2,993.6	2,992.1	2,979.7	6.6	7.2	-66.57	-128.4	148.5	108.5	95.3	13.22	8.210		
3,100.0	3,093.0	3,091.7	3,078.4	6.9	7.6	-67.61	-137.0	159.6	116.2	102.4	13.76	8.442		
3,200.0	3,192.4	3,191.4	3,177.1	7.2	7.9	-68.52	-145.5	170.8	123.9	109.6	14.31	8.655		
3,300.0	3,291.9	3,291.1	3,275.8	7.5	8.2	-69.32	-154.1	182.0	131.6	116.8	14.87	8.851		
3,400.0	3,391.3	3,390.8	3,374.5	7.7	8.6	-70.04	-162.6	193.1	139.4	123.9	15.43	9.031		
3,500.0	3,490.7	3,490.5	3,473.2	8.0	8.9	-70.68	-171.2	204.3	147.2	131.2	16.00	9.197		
3,600.0	3,590.2	3,590.2	3,571.9	8.3	9.2	-71.25	-179.7	215.5	154.9	138.4	16.57	9.351		
3,700.0	3,689.6	3,689.9	3,670.6	8.6	9.6	-71.77	-188.2	226.7	162.7	145.6	17.14	9.494		
3,800.0	3,789.0	3,789.5	3,769.2	8.9	9.9	-72.24	-196.8	237.8	170.6	152.8	17.72	9.626		
3,900.0	3,888.5	3,889.2	3,867.9	9.2	10.2	-72.67	-205.3	249.0	178.4	160.1	18.30	9.749		
4,000.0	3,987.9	3,988.9	3,966.6	9.4	10.6	-73.07	-213.9	260.2	186.2	167.3	18.88	9.864		
4,100.0	4,087.3	4,088.6	4,065.3	9.7	10.9	-73.43	-222.4	271.4	194.1	174.6	19.46	9.970		
4,200.0	4,186.8	4,188.3	4,164.0	10.0	11.2	-73.76	-231.0	282.5	201.9	181.9	20.05	10.070		
4,300.0	4,286.2	4,288.0	4,262.7	10.3	11.6	-74.07	-239.5	293.7	209.8	189.1	20.64	10.164		
4,400.0	4,385.6	4,387.7	4,361.4	10.6	11.9	-74.36	-248.1	304.9	217.6	196.4	21.23	10.252		
4,500.0	4,485.0	4,487.3	4,460.0	10.9	12.3	-74.63	-256.6	316.1	225.5	203.7	21.82	10.335		
4,600.0	4,584.5	4,587.0	4,558.7	11.2	12.6	-74.88	-265.2	327.2	233.4	211.0	22.41	10.412		
4,700.0	4,683.9	4,686.7	4,657.4	11.5	13.0	-75.11	-273.7	338.4	241.3	218.3	23.01	10.486		
4,800.0	4,783.3	4,786.4	4,756.1	11.8	13.3	-75.33	-282.3	349.6	249.1	225.5	23.60	10.555		
4,900.0	4,882.8	4,886.1	4,854.8	12.1	13.6	-75.53	-290.8	360.8	257.0	232.8	24.20	10.620		
4,912.1	4,894.8	4,898.1	4,866.8	12.1	13.7	-75.56	-291.8	362.1	258.0	233.7	24.27	10.628		

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference															
Offset															
Semi Major Axis															
Distance															
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
5,000.0	4,982.3	4,985.7	4,953.5	12.3	14.0	-75.58	-299.3	371.9	265.2	240.5	24.75	10.717			
5,100.0	5,082.2	5,085.2	5,052.0	12.5	14.3	-74.97	-307.9	383.1	274.4	249.2	25.20	10.887			
5,200.0	5,182.1	5,189.0	5,154.8	12.7	14.7	-73.76	-316.4	394.2	284.0	258.5	25.57	11.108			
5,217.9	5,200.0	5,208.3	5,173.9	12.8	14.7	87.74	-317.8	396.0	285.6	260.0	25.63	11.145			
5,300.0	5,282.1	5,296.9	5,262.1	12.9	14.9	88.83	-323.1	402.9	291.9	266.0	25.88	11.279			
5,400.0	5,382.1	5,405.5	5,370.5	13.1	15.1	89.67	-327.3	408.5	297.0	270.8	26.20	11.335			
5,500.0	5,482.1	5,514.5	5,479.4	13.2	15.3	90.01	-329.0	410.7	299.0	272.5	26.54	11.269			
5,600.0	5,582.1	5,616.2	5,581.1	13.4	15.5	90.02	-329.1	410.8	299.1	272.2	26.89	11.123			
5,700.0	5,682.1	5,716.2	5,681.1	13.6	15.6	90.02	-329.1	410.8	299.1	271.9	27.24	10.981			
5,800.0	5,782.1	5,816.2	5,781.1	13.8	15.8	90.02	-329.1	410.8	299.1	271.5	27.59	10.841			
5,900.0	5,882.1	5,916.2	5,881.1	13.9	15.9	90.02	-329.1	410.8	299.1	271.1	27.94	10.703			
6,000.0	5,982.1	6,016.2	5,981.1	14.1	16.1	90.02	-329.1	410.8	299.1	270.8	28.30	10.568			
6,100.0	6,082.1	6,116.2	6,081.1	14.3	16.3	90.02	-329.1	410.8	299.1	270.4	28.66	10.435			
6,200.0	6,182.1	6,216.2	6,181.1	14.5	16.4	90.02	-329.1	410.8	299.1	270.1	29.02	10.305			
6,300.0	6,282.1	6,316.2	6,281.1	14.7	16.6	90.02	-329.1	410.8	299.1	269.7	29.39	10.177			
6,400.0	6,382.1	6,416.2	6,381.1	14.8	16.8	90.02	-329.1	410.8	299.1	269.3	29.76	10.051			
6,467.3	6,449.5	6,483.5	6,448.5	15.0	16.9	90.02	-329.1	410.8	299.1	269.1	30.00	9.968			
6,500.0	6,482.1	6,516.2	6,481.1	15.0	16.9	89.98	-328.9	410.8	299.1	269.0	30.12	9.928			
6,507.5	6,489.6	6,523.7	6,488.6	15.0	16.9	89.94	-328.7	410.8	299.1	268.9	30.15	9.919			
6,581.4	6,563.5	6,597.0	6,561.7	15.2	17.0	88.80	-322.7	410.8	299.2	268.7	30.46	9.820			
6,600.0	6,582.1	6,615.3	6,579.8	15.2	17.1	88.35	-320.2	410.8	299.2	268.7	30.54	9.796			
6,650.0	6,632.0	6,664.2	6,627.8	15.3	17.1	87.14	-311.2	410.8	299.5	268.7	30.74	9.743			
6,700.0	6,681.6	6,712.6	6,674.7	15.4	17.1	85.95	-299.3	410.8	299.8	269.0	30.89	9.707			
6,750.0	6,730.8	6,760.7	6,720.5	15.4	17.1	84.78	-284.5	410.8	300.3	269.3	31.01	9.687			
6,800.0	6,779.1	6,808.4	6,764.9	15.4	17.1	83.65	-267.1	410.8	301.0	269.9	31.09	9.681			
6,850.0	6,826.6	6,855.8	6,807.9	15.4	17.1	82.54	-247.0	410.8	301.7	270.5	31.14	9.689			
6,900.0	6,873.0	6,902.9	6,849.2	15.4	17.1	81.48	-224.5	410.8	302.5	271.3	31.16	9.707			
6,950.0	6,918.0	6,950.0	6,899.1	15.4	17.1	80.44	-199.5	410.8	303.3	272.2	31.16	9.735			
7,000.0	6,961.5	6,996.1	6,926.6	15.4	17.1	79.47	-172.7	410.8	304.3	273.1	31.14	9.769			
7,050.0	7,003.3	7,042.3	6,962.5	15.4	17.1	78.54	-143.6	410.8	305.2	274.1	31.12	9.807			
7,100.0	7,043.2	7,088.3	6,996.4	15.5	17.0	77.66	-112.5	410.8	306.2	275.1	31.10	9.845			
7,150.0	7,081.0	7,134.0	7,028.2	15.5	17.0	76.84	-79.7	410.8	307.2	276.1	31.10	9.878			
7,200.0	7,116.7	7,179.5	7,057.8	15.5	17.0	76.07	-45.1	410.8	308.2	277.1	31.12	9.904			
7,250.0	7,150.0	7,224.9	7,085.2	15.6	17.0	75.36	-9.0	410.8	309.2	278.0	31.17	9.918			
7,300.0	7,180.7	7,270.0	7,110.3	15.6	17.0	74.71	28.4	410.8	310.1	278.8	31.28	9.915			
7,350.0	7,208.8	7,315.0	7,133.1	15.8	16.9	74.12	67.2	410.8	311.0	279.5	31.44	9.892			
7,400.0	7,234.2	7,359.8	7,153.5	15.9	16.9	73.59	107.1	410.8	311.8	280.1	31.67	9.846			
7,450.0	7,256.7	7,404.5	7,171.5	16.2	17.0	73.13	148.0	410.7	312.6	280.6	31.99	9.771			
7,500.0	7,276.2	7,450.0	7,187.3	16.4	17.1	72.72	190.7	410.7	313.2	280.8	32.39	9.669			
7,550.0	7,292.7	7,493.5	7,200.1	16.7	17.3	72.39	232.3	410.7	313.8	280.9	32.89	9.541			
7,600.0	7,306.0	7,537.9	7,210.6	17.1	17.7	72.12	275.5	410.7	314.3	280.8	33.48	9.385			
7,650.0	7,316.2	7,582.3	7,218.6	17.5	18.1	71.91	319.1	410.7	314.6	280.4	34.17	9.206			
7,700.0	7,323.1	7,626.6	7,224.0	17.9	18.5	71.77	363.0	410.7	314.9	279.9	34.96	9.007			
7,750.0	7,326.8	7,670.9	7,226.9	18.4	18.9	71.69	407.2	410.7	315.0	279.2	35.83	8.791			
7,793.6	7,327.3	7,709.6	7,227.3	18.9	19.3	71.68	445.9	410.7	315.0	278.3	36.66	8.592			
7,800.0	7,327.2	7,716.0	7,227.2	18.9	19.4	71.68	452.3	410.7	315.0	278.2	36.79	8.561			
7,900.0	7,325.6	7,816.0	7,225.9	20.0	20.5	71.73	552.3	410.7	314.9	276.0	38.95	8.085			
8,000.0	7,324.0	7,916.0	7,224.6	21.3	21.7	71.78	652.3	410.7	314.8	273.5	41.31	7.620			
8,100.0	7,322.4	8,016.0	7,223.3	22.6	23.1	71.83	752.3	410.7	314.7	270.9	43.86	7.175			
8,200.0	7,320.8	8,116.0	7,221.9	24.0	24.4	71.88	852.3	410.7	314.6	268.1	46.56	6.757			

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15)											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)				
8,300.0	7,319.2	8,216.0	7,220.6	25.5	25.9	71.92	952.3	410.7	314.5	265.2	49.39	6.368			
8,400.0	7,317.6	8,316.0	7,219.3	27.0	27.4	71.97	1,052.2	410.7	314.4	262.1	52.33	6.009			
8,500.0	7,316.0	8,416.0	7,218.0	28.6	29.0	72.02	1,152.2	410.6	314.4	259.0	55.35	5.679			
8,600.0	7,314.4	8,516.0	7,216.6	30.2	30.6	72.07	1,252.2	410.6	314.3	255.8	58.46	5.376			
8,700.0	7,312.8	8,616.0	7,215.3	31.8	32.2	72.12	1,352.2	410.6	314.2	252.5	61.63	5.098			
8,800.0	7,311.2	8,716.0	7,214.0	33.5	33.9	72.17	1,452.2	410.6	314.1	249.2	64.85	4.843			
8,900.0	7,309.6	8,816.0	7,212.7	35.2	35.6	72.21	1,552.2	410.6	314.0	245.9	68.13	4.609			
9,000.0	7,308.0	8,916.0	7,211.3	36.9	37.3	72.26	1,652.2	410.6	313.9	242.5	71.44	4.394			
9,100.0	7,306.4	9,016.0	7,210.0	38.7	39.0	72.31	1,752.2	410.6	313.8	239.0	74.79	4.196			
9,200.0	7,304.7	9,116.0	7,208.7	40.4	40.7	72.36	1,852.2	410.6	313.7	235.5	78.18	4.013			
9,300.0	7,303.1	9,216.0	7,207.3	42.2	42.5	72.41	1,952.2	410.6	313.6	232.0	81.59	3.844			
9,400.0	7,301.5	9,316.0	7,206.0	44.0	44.3	72.45	2,052.2	410.5	313.5	228.5	85.03	3.687			
9,500.0	7,299.9	9,416.0	7,204.7	45.8	46.0	72.50	2,152.1	410.5	313.5	225.0	88.49	3.542			
9,600.0	7,298.3	9,516.0	7,203.4	47.6	47.8	72.55	2,252.1	410.5	313.4	221.4	91.98	3.407			
9,700.0	7,296.7	9,616.0	7,202.0	49.4	49.6	72.60	2,352.1	410.5	313.3	217.8	95.48	3.281			
9,800.0	7,295.1	9,716.0	7,200.7	51.2	51.4	72.65	2,452.1	410.5	313.2	214.2	98.99	3.164			
9,900.0	7,293.5	9,816.0	7,199.4	53.0	53.3	72.70	2,552.1	410.5	313.1	210.6	102.52	3.054			
10,000.0	7,291.9	9,916.0	7,198.1	54.9	55.1	72.75	2,652.1	410.5	313.0	206.9	106.07	2.951			
10,100.0	7,290.3	10,016.0	7,196.7	56.7	56.9	72.79	2,752.1	410.5	312.9	203.3	109.62	2.855			
10,200.0	7,288.7	10,116.0	7,195.4	58.5	58.7	72.84	2,852.1	410.5	312.8	199.6	113.19	2.764			
10,300.0	7,287.1	10,216.0	7,194.1	60.4	60.6	72.89	2,952.1	410.4	312.7	196.0	116.77	2.678			
10,400.0	7,285.5	10,316.0	7,192.8	62.2	62.4	72.94	3,052.1	410.4	312.7	192.3	120.36	2.598			
10,500.0	7,283.9	10,416.0	7,191.4	64.1	64.3	72.99	3,152.1	410.4	312.6	188.6	123.96	2.522			
10,600.0	7,282.3	10,516.0	7,190.1	66.0	66.1	73.04	3,252.0	410.4	312.5	184.9	127.56	2.450			
10,700.0	7,280.7	10,616.0	7,188.8	67.8	68.0	73.09	3,352.0	410.4	312.4	181.2	131.17	2.382			
10,800.0	7,279.1	10,716.0	7,187.5	69.7	69.9	73.13	3,452.0	410.4	312.3	177.5	134.80	2.317			
10,900.0	7,277.4	10,816.0	7,186.1	71.5	71.7	73.18	3,552.0	410.4	312.2	173.8	138.42	2.256			
11,000.0	7,275.8	10,916.0	7,184.8	73.4	73.6	73.23	3,652.0	410.4	312.1	170.1	142.06	2.197			
11,100.0	7,274.2	11,016.0	7,183.5	75.3	75.5	73.28	3,752.0	410.4	312.1	166.4	145.70	2.142			
11,200.0	7,272.6	11,116.0	7,182.1	77.2	77.3	73.33	3,852.0	410.4	312.0	162.6	149.34	2.089			
11,300.0	7,271.0	11,216.0	7,180.8	79.0	79.2	73.38	3,952.0	410.3	311.9	158.9	152.99	2.039			
11,400.0	7,269.4	11,316.0	7,179.5	80.9	81.1	73.43	4,052.0	410.3	311.8	155.1	156.65	1.990			
11,500.0	7,267.8	11,416.0	7,178.2	82.8	82.9	73.48	4,152.0	410.3	311.7	151.4	160.31	1.944			
11,600.0	7,266.2	11,516.0	7,176.8	84.7	84.8	73.53	4,251.9	410.3	311.6	147.7	163.98	1.900			
11,700.0	7,264.6	11,616.0	7,175.5	86.6	86.7	73.57	4,351.9	410.3	311.5	143.9	167.65	1.858			
11,737.7	7,264.0	11,653.6	7,175.0	87.1	87.4	73.59	4,389.6	410.3	311.5	142.6	168.89	1.844 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design													Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)		Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor					
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
0.0	0.0	0.0	0.0	0.0	0.0	179.31	-30.1	0.4	30.1								
100.0	100.0	99.0	99.0	0.1	0.1	179.31	-30.1	0.4	30.1	29.9	0.22	134.512					
200.0	200.0	199.0	199.0	0.3	0.3	179.31	-30.1	0.4	30.1	29.4	0.67	44.763					
300.0	300.0	299.0	299.0	0.6	0.6	179.31	-30.1	0.4	30.1	29.0	1.12	26.822					
400.0	400.0	399.0	399.0	0.8	0.8	179.31	-30.1	0.4	30.1	28.5	1.57	19.147					
500.0	500.0	499.0	499.0	1.0	1.0	179.31	-30.1	0.4	30.1	28.1	2.02	14.888					
600.0	600.0	599.0	599.0	1.2	1.2	179.31	-30.1	0.4	30.1	27.6	2.47	12.178					
700.0	700.0	699.0	699.0	1.5	1.5	179.31	-30.1	0.4	30.1	27.2	2.92	10.303					
800.0	800.0	799.0	799.0	1.7	1.7	179.31	-30.1	0.4	30.1	26.7	3.37	8.929					
900.0	900.0	899.0	899.0	1.9	1.9	179.31	-30.1	0.4	30.1	26.3	3.82	7.878					
1,000.0	1,000.0	999.0	999.0	2.1	2.1	179.31	-30.1	0.4	30.1	25.8	4.27	7.048					
1,100.0	1,100.0	1,099.0	1,099.0	2.4	2.4	179.31	-30.1	0.4	30.1	25.4	4.72	6.376					
1,200.0	1,200.0	1,199.0	1,199.0	2.6	2.6	179.31	-30.1	0.4	30.1	24.9	5.17	5.822 CC, ES					
1,300.0	1,300.0	1,298.7	1,298.6	2.8	2.8	177.14	-30.6	1.5	30.6	25.0	5.60	5.472					
1,400.0	1,400.0	1,398.2	1,398.1	3.0	3.0	171.02	-32.1	5.1	32.5	26.5	6.01	5.410					
1,500.0	1,500.0	1,497.4	1,497.1	3.3	3.2	162.43	-34.7	11.0	36.4	30.0	6.44	5.657					
1,600.0	1,600.0	1,596.3	1,595.6	3.5	3.4	153.34	-38.2	19.2	42.9	36.1	6.87	6.247					
1,700.0	1,700.0	1,694.7	1,693.3	3.7	3.6	-16.38	-42.8	29.7	51.2	43.9	7.27	7.040					
1,800.0	1,799.9	1,792.7	1,790.4	3.9	3.9	-24.34	-48.3	42.5	60.2	52.5	7.64	7.871					
1,900.0	1,899.7	1,890.3	1,886.5	4.0	4.2	-31.76	-54.8	57.4	70.2	62.2	8.02	8.756					
2,007.7	2,006.9	1,996.5	1,990.9	4.2	4.5	-39.13	-62.6	75.5	81.8	73.3	8.44	9.687					
2,100.0	2,098.7	2,087.9	2,080.7	4.4	4.8	-44.57	-69.4	91.1	91.6	82.8	8.82	10.385					
2,200.0	2,198.1	2,186.9	2,178.0	4.6	5.1	-49.26	-76.7	108.0	103.1	93.8	9.26	11.133					
2,300.0	2,297.6	2,285.9	2,275.3	4.9	5.5	-53.00	-84.0	124.9	115.1	105.4	9.71	11.847					
2,400.0	2,397.0	2,384.9	2,372.6	5.1	5.8	-56.02	-91.4	141.8	127.4	117.3	10.18	12.514					
2,500.0	2,496.4	2,484.0	2,469.9	5.4	6.2	-58.51	-98.7	158.6	140.1	129.4	10.67	13.129					
2,600.0	2,595.9	2,583.0	2,567.2	5.6	6.6	-60.58	-106.0	175.5	153.0	141.8	11.17	13.692					
2,700.0	2,695.3	2,682.0	2,664.5	5.9	7.0	-62.32	-113.3	192.4	166.0	154.4	11.69	14.205					
2,800.0	2,794.7	2,781.1	2,761.8	6.1	7.4	-63.82	-120.7	209.3	179.2	167.0	12.21	14.673					
2,900.0	2,894.1	2,880.1	2,859.1	6.4	7.8	-65.11	-128.0	226.2	192.5	179.8	12.75	15.099					
3,000.0	2,993.6	2,979.1	2,956.4	6.6	8.1	-66.23	-135.3	243.1	205.9	192.6	13.29	15.487					
3,100.0	3,093.0	3,078.1	3,053.7	6.9	8.5	-67.21	-142.6	260.0	219.3	205.5	13.84	15.841					
3,200.0	3,192.4	3,177.2	3,151.0	7.2	8.9	-68.08	-149.9	276.9	232.8	218.4	14.40	16.164					
3,300.0	3,291.9	3,276.2	3,248.3	7.5	9.3	-68.86	-157.3	293.8	246.3	231.4	14.96	16.461					
3,400.0	3,391.3	3,375.2	3,345.6	7.7	9.7	-69.55	-164.6	310.7	259.9	244.4	15.53	16.732					
3,500.0	3,490.7	3,474.2	3,442.9	8.0	10.1	-70.18	-171.9	327.6	273.5	257.4	16.11	16.982					
3,600.0	3,590.2	3,573.3	3,540.2	8.3	10.5	-70.74	-179.2	344.5	287.2	270.5	16.68	17.213					
3,700.0	3,689.6	3,672.3	3,637.5	8.6	11.0	-71.26	-186.6	361.4	300.8	283.6	17.26	17.425					
3,800.0	3,789.0	3,771.3	3,734.8	8.9	11.4	-71.73	-193.9	378.3	314.5	296.7	17.85	17.622					
3,900.0	3,888.5	3,870.4	3,832.1	9.2	11.8	-72.16	-201.2	395.2	328.2	309.8	18.43	17.805					
4,000.0	3,987.9	3,969.4	3,929.4	9.4	12.2	-72.56	-208.5	412.0	341.9	322.9	19.02	17.974					
4,100.0	4,087.3	4,068.4	4,026.7	9.7	12.6	-72.92	-215.8	428.9	355.7	336.1	19.62	18.132					
4,200.0	4,186.8	4,167.4	4,124.0	10.0	13.0	-73.26	-223.2	445.8	369.4	349.2	20.21	18.280					
4,300.0	4,286.2	4,266.5	4,221.3	10.3	13.4	-73.57	-230.5	462.7	383.2	362.4	20.81	18.417					
4,400.0	4,385.6	4,365.5	4,318.6	10.6	13.8	-73.87	-237.8	479.6	397.0	375.6	21.40	18.546					
4,500.0	4,485.0	4,464.5	4,415.9	10.9	14.2	-74.14	-245.1	496.5	410.7	388.7	22.00	18.667					
4,600.0	4,584.5	4,563.5	4,513.2	11.2	14.7	-74.39	-252.5	513.4	424.5	401.9	22.60	18.781					
4,700.0	4,683.9	4,662.6	4,610.5	11.5	15.1	-74.63	-259.8	530.3	438.3	415.1	23.21	18.888					
4,800.0	4,783.3	4,761.6	4,707.8	11.8	15.5	-74.86	-267.1	547.2	452.1	428.3	23.81	18.989					
4,900.0	4,882.8	4,860.6	4,805.1	12.1	15.9	-75.07	-274.4	564.1	465.9	441.5	24.42	19.084					
4,912.1	4,894.8	4,872.6	4,816.9	12.1	15.9	-75.09	-275.3	566.1	467.6	443.1	24.49	19.095					

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 Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,982.3	4,959.6	4,902.4	12.3	16.3	-75.36	-281.7	581.0	480.1	455.1	24.98	19.216			
5,100.0	5,082.2	5,058.4	4,999.4	12.5	16.7	-75.30	-289.1	597.8	495.1	469.7	25.47	19.443			
5,200.0	5,182.1	5,156.9	5,096.3	12.7	17.1	-74.90	-296.3	614.6	511.1	485.2	25.89	19.740			
5,217.9	5,200.0	5,174.5	5,113.5	12.8	17.2	86.45	-297.6	617.6	514.1	488.1	25.96	19.800			
5,300.0	5,282.1	5,255.2	5,192.8	12.9	17.5	87.20	-303.6	631.4	527.8	501.5	26.28	20.086			
5,400.0	5,382.1	5,358.1	5,293.9	13.1	18.0	88.10	-311.2	648.8	544.5	517.8	26.65	20.430			
5,500.0	5,482.1	5,477.9	5,412.2	13.2	18.3	88.92	-318.6	666.0	558.6	531.6	27.01	20.682			
5,600.0	5,582.1	5,599.0	5,532.5	13.4	18.6	89.51	-324.1	678.7	569.1	541.7	27.37	20.793			
5,700.0	5,682.1	5,721.1	5,654.3	13.6	18.8	89.86	-327.6	686.8	575.7	548.0	27.73	20.759			
5,800.0	5,782.1	5,843.7	5,776.8	13.8	19.0	90.00	-329.0	690.1	578.4	550.3	28.10	20.581			
5,900.0	5,882.1	5,948.0	5,881.1	13.9	19.2	90.01	-329.1	690.2	578.5	550.0	28.46	20.325			
6,000.0	5,982.1	6,048.0	5,981.1	14.1	19.3	90.01	-329.1	690.2	578.5	549.7	28.81	20.077			
6,100.0	6,082.1	6,148.0	6,081.1	14.3	19.5	90.01	-329.1	690.2	578.5	549.3	29.17	19.834			
6,200.0	6,182.1	6,248.0	6,181.1	14.5	19.6	90.01	-329.1	690.2	578.5	548.9	29.52	19.594			
6,300.0	6,282.1	6,348.0	6,281.1	14.7	19.7	90.01	-329.1	690.2	578.5	548.6	29.88	19.358			
6,400.0	6,382.1	6,448.0	6,381.1	14.8	19.9	90.01	-329.1	690.2	578.5	548.2	30.24	19.127			
6,500.0	6,482.1	6,548.0	6,481.1	15.0	20.0	90.01	-329.1	690.2	578.5	547.9	30.61	18.899			
6,581.4	6,563.5	6,629.3	6,562.5	15.2	20.1	90.01	-329.1	690.2	578.5	547.6	30.91	18.717			
6,581.4	6,563.5	6,629.3	6,562.5	15.2	20.1	90.01	-329.1	690.2	578.5	547.6	30.91	18.717			
6,600.0	6,582.1	6,648.0	6,581.1	15.2	20.2	90.03	-329.1	690.2	578.5	547.5	30.97	18.678			
6,650.0	6,632.0	6,697.9	6,631.0	15.3	20.2	90.31	-329.1	690.2	578.5	547.4	31.11	18.593			
6,700.0	6,681.6	6,747.5	6,680.7	15.4	20.3	90.91	-329.1	690.2	578.5	547.3	31.21	18.540			
6,750.0	6,730.8	6,797.8	6,730.9	15.4	20.4	91.65	-327.2	690.2	578.7	547.4	31.26	18.512			
6,800.0	6,779.1	6,848.6	6,781.5	15.4	20.4	92.38	-322.0	690.2	579.0	547.7	31.29	18.506			
6,850.0	6,826.6	6,900.0	6,832.0	15.4	20.5	93.11	-313.3	690.2	579.3	548.0	31.29	18.516			
6,900.0	6,873.0	6,951.8	6,882.4	15.4	20.5	93.82	-301.1	690.2	579.8	548.5	31.27	18.541			
6,950.0	6,918.0	7,004.2	6,932.4	15.4	20.5	94.52	-285.3	690.2	580.3	549.1	31.24	18.576			
7,000.0	6,961.5	7,057.2	6,981.7	15.4	20.5	95.21	-265.9	690.2	580.9	549.7	31.20	18.617			
7,050.0	7,003.3	7,110.7	7,030.0	15.4	20.5	95.87	-242.9	690.2	581.6	550.4	31.17	18.657			
7,100.0	7,043.2	7,164.8	7,077.0	15.5	20.5	96.51	-216.3	690.2	582.3	551.1	31.15	18.690			
7,150.0	7,081.0	7,219.4	7,122.5	15.5	20.5	97.13	-186.1	690.2	583.0	551.9	31.16	18.710			
7,200.0	7,116.7	7,274.5	7,166.1	15.5	20.5	97.71	-152.4	690.2	583.8	552.6	31.20	18.711			
7,250.0	7,150.0	7,330.1	7,207.5	15.6	20.5	98.25	-115.3	690.1	584.6	553.3	31.29	18.684			
7,300.0	7,180.7	7,386.2	7,246.5	15.6	20.4	98.77	-75.0	690.1	585.4	553.9	31.43	18.625			
7,350.0	7,208.8	7,442.8	7,282.7	15.8	20.4	99.24	-31.5	690.1	586.1	554.5	31.64	18.526			
7,400.0	7,234.2	7,499.9	7,315.8	15.9	20.4	99.66	15.0	690.1	586.8	554.9	31.92	18.384			
7,450.0	7,256.7	7,557.3	7,345.5	16.2	20.4	100.04	64.1	690.1	587.5	555.2	32.30	18.190			
7,500.0	7,276.2	7,615.1	7,371.6	16.4	20.5	100.37	115.6	690.1	588.1	555.3	32.75	17.956			
7,550.0	7,292.7	7,673.2	7,393.9	16.7	20.5	100.66	169.3	690.1	588.6	555.3	33.31	17.671			
7,600.0	7,306.0	7,731.5	7,412.0	17.1	20.6	100.89	224.7	690.1	589.0	555.1	33.96	17.344			
7,650.0	7,316.2	7,790.1	7,426.0	17.5	20.8	101.06	281.6	690.1	589.4	554.7	34.71	16.981			
7,700.0	7,323.1	7,848.8	7,435.5	17.9	21.0	101.18	339.5	690.1	589.6	554.1	35.55	16.587			
7,750.0	7,326.8	7,907.7	7,440.6	18.4	21.4	101.24	398.1	690.1	589.7	553.3	36.47	16.169			
7,793.6	7,327.3	7,957.3	7,441.5	18.9	21.7	101.26	447.7	690.1	589.8	552.4	37.33	15.798			
7,800.0	7,327.2	7,963.6	7,441.4	18.9	21.8	101.27	454.1	690.1	589.8	552.3	37.46	15.745			
7,900.0	7,325.6	8,063.6	7,441.1	20.0	22.7	101.38	554.1	690.1	590.0	550.4	39.58	14.906			
8,000.0	7,324.0	8,163.6	7,440.7	21.3	23.7	101.50	654.1	690.1	590.2	548.3	41.92	14.079			
8,100.0	7,322.4	8,263.6	7,440.3	22.6	24.9	101.62	754.1	690.0	590.5	546.0	44.46	13.282			
8,200.0	7,320.8	8,363.6	7,440.0	24.0	26.2	101.74	854.0	690.0	590.7	543.6	47.15	12.528			
8,300.0	7,319.2	8,463.6	7,439.6	25.5	27.6	101.85	954.0	690.0	591.0	541.0	49.98	11.824			

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

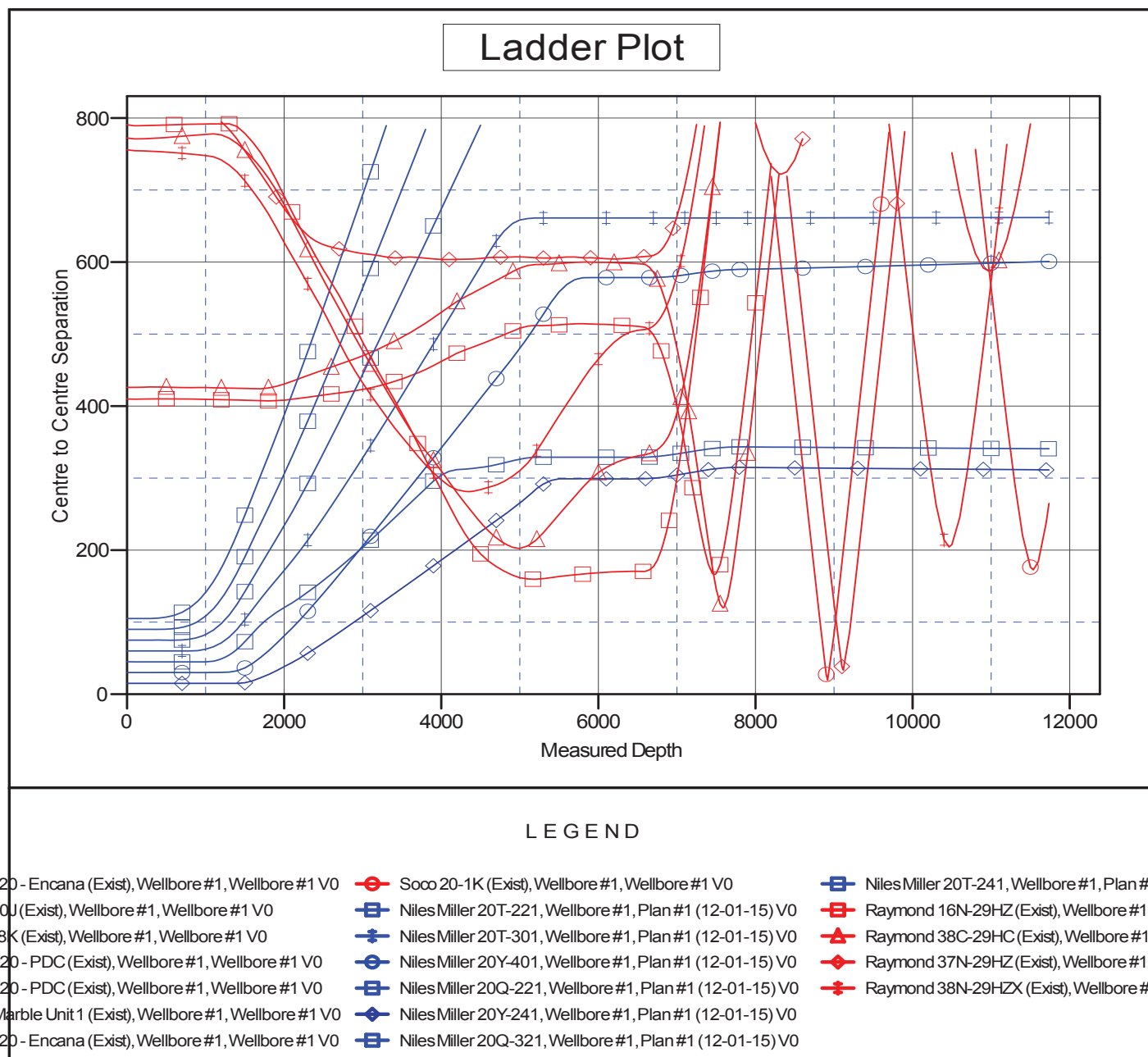
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Offset Design		Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)											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)				
8,400.0	7,317.6	8,563.6	7,439.2	27.0	29.0	101.97	1,054.0	690.0	591.2	538.3	52.92	11.172			
8,500.0	7,316.0	8,663.6	7,438.9	28.6	30.5	102.09	1,154.0	690.0	591.5	535.5	55.96	10.570			
8,600.0	7,314.4	8,763.6	7,438.5	30.2	32.0	102.21	1,254.0	690.0	591.7	532.7	59.07	10.018			
8,700.0	7,312.8	8,863.6	7,438.1	31.8	33.6	102.32	1,354.0	690.0	592.0	529.7	62.25	9.510			
8,800.0	7,311.2	8,963.6	7,437.8	33.5	35.2	102.44	1,454.0	689.9	592.2	526.8	65.48	9.044			
8,900.0	7,309.6	9,063.5	7,437.4	35.2	36.9	102.56	1,554.0	689.9	592.5	523.7	68.77	8.616			
9,000.0	7,308.0	9,163.5	7,437.0	36.9	38.5	102.68	1,654.0	689.9	592.8	520.7	72.09	8.222			
9,100.0	7,306.4	9,263.5	7,436.7	38.7	40.2	102.79	1,754.0	689.9	593.0	517.6	75.45	7.860			
9,200.0	7,304.7	9,363.5	7,436.3	40.4	41.9	102.91	1,854.0	689.9	593.3	514.5	78.84	7.526			
9,300.0	7,303.1	9,463.5	7,435.9	42.2	43.6	103.03	1,954.0	689.9	593.6	511.3	82.25	7.216			
9,400.0	7,301.5	9,563.5	7,435.6	44.0	45.3	103.14	2,053.9	689.9	593.8	508.2	85.69	6.930			
9,500.0	7,299.9	9,663.5	7,435.2	45.8	47.1	103.26	2,153.9	689.9	594.1	505.0	89.14	6.665			
9,600.0	7,298.3	9,763.5	7,434.8	47.6	48.9	103.38	2,253.9	689.8	594.4	501.8	92.62	6.418			
9,700.0	7,296.7	9,863.5	7,434.5	49.4	50.6	103.49	2,353.9	689.8	594.7	498.6	96.10	6.188			
9,800.0	7,295.1	9,963.5	7,434.1	51.2	52.4	103.61	2,453.9	689.8	595.0	495.4	99.60	5.973			
9,900.0	7,293.5	10,063.5	7,433.7	53.0	54.2	103.73	2,553.9	689.8	595.2	492.1	103.11	5.773			
10,000.0	7,291.9	10,163.5	7,433.4	54.9	56.0	103.84	2,653.9	689.8	595.5	488.9	106.63	5.585			
10,100.0	7,290.3	10,263.5	7,433.0	56.7	57.8	103.96	2,753.9	689.8	595.8	485.7	110.16	5.409			
10,200.0	7,288.7	10,363.4	7,432.6	58.5	59.6	104.07	2,853.9	689.8	596.1	482.4	113.69	5.243			
10,300.0	7,287.1	10,463.4	7,432.3	60.4	61.4	104.19	2,953.9	689.8	596.4	479.2	117.23	5.087			
10,400.0	7,285.5	10,563.4	7,431.9	62.2	63.3	104.30	3,053.9	689.7	596.7	475.9	120.78	4.940			
10,500.0	7,283.9	10,663.4	7,431.5	64.1	65.1	104.42	3,153.9	689.7	597.0	472.7	124.33	4.802			
10,600.0	7,282.3	10,763.4	7,431.2	66.0	66.9	104.53	3,253.8	689.7	597.3	469.4	127.88	4.671			
10,700.0	7,280.7	10,863.4	7,430.8	67.8	68.8	104.65	3,353.8	689.7	597.6	466.2	131.44	4.547			
10,800.0	7,279.1	10,963.4	7,430.4	69.7	70.6	104.76	3,453.8	689.7	597.9	462.9	135.00	4.429			
10,900.0	7,277.4	11,063.4	7,430.1	71.5	72.5	104.88	3,553.8	689.7	598.2	459.7	138.56	4.318			
11,000.0	7,275.8	11,163.4	7,429.7	73.4	74.3	104.99	3,653.8	689.7	598.5	456.4	142.12	4.211			
11,100.0	7,274.2	11,263.4	7,429.3	75.3	76.2	105.11	3,753.8	689.7	598.9	453.2	145.69	4.111			
11,200.0	7,272.6	11,363.4	7,429.0	77.2	78.0	105.22	3,853.8	689.6	599.2	449.9	149.25	4.015			
11,300.0	7,271.0	11,463.4	7,428.6	79.0	79.9	105.34	3,953.8	689.6	599.5	446.7	152.81	3.923			
11,400.0	7,269.4	11,563.4	7,428.2	80.9	81.7	105.45	4,053.8	689.6	599.8	443.4	156.38	3.836			
11,500.0	7,267.8	11,663.3	7,427.9	82.8	83.6	105.57	4,153.8	689.6	600.1	440.2	159.94	3.752			
11,600.0	7,266.2	11,763.3	7,427.5	84.7	85.5	105.68	4,253.8	689.6	600.5	437.0	163.51	3.672			
11,700.0	7,264.6	11,863.3	7,427.1	86.6	87.3	105.79	4,353.8	689.6	600.8	433.7	167.07	3.596			
11,737.7	7,264.0	11,901.0	7,427.0	87.1	88.1	105.84	4,391.4	689.6	600.9	432.6	168.27	3.571 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4970.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Niles Miller 20T-321
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.46°



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Niles Miller 20T-321
Project:	SEC.20-T3N-R66W	TVD Reference:	WELL @ 4970.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	MD Reference:	WELL @ 4970.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Niles Miller 20T-321	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 (12-01-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4970.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Niles Miller 20T-321
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.46°

