PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Niles Miller 20Y-241**

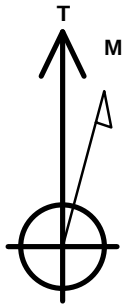
Surface Location: Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4956.0

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1317985.62	3197035.66	40.204116	-104.794568	

Original Well Elev WELL @ 4969.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 364'FSL, 829'FEL	1.0	0.0	0.0	Point
BHL 500'FNL, 378'FEL	7175.0	4405.8	410.0	Point



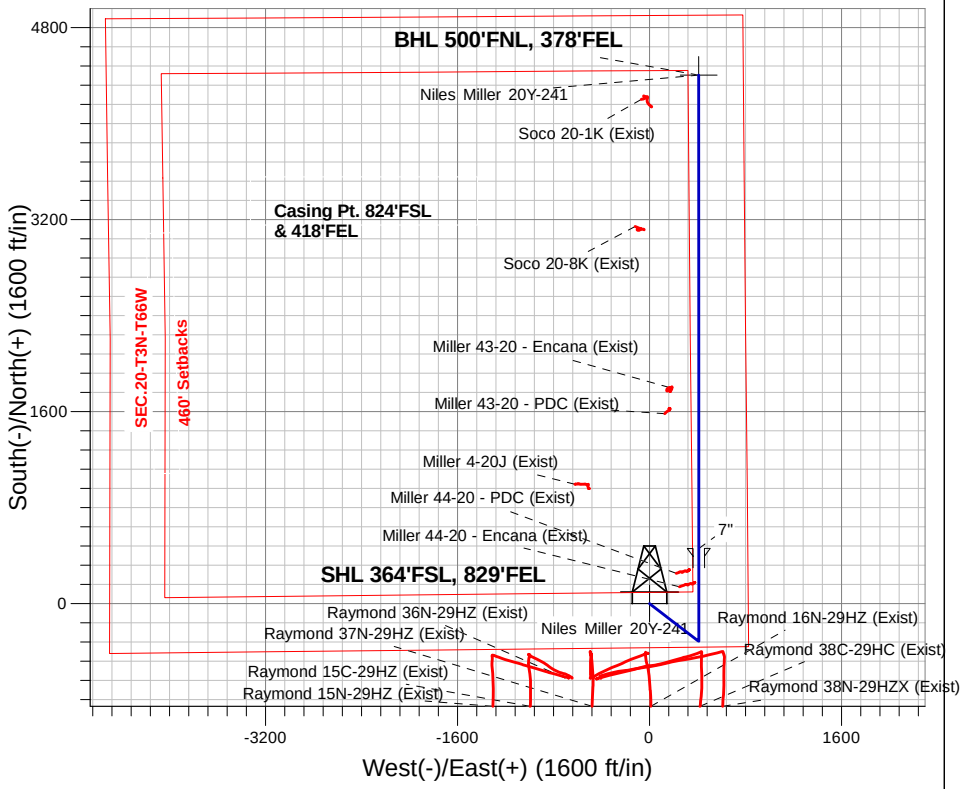
Azimuths to True North
Magnetic North: 8.26°

Magnetic Field
Strength: 52552.5snT
Dip Angle: 66.73°
Date: 12/8/2015
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1400.0	1400.0	KOP - Start Build 1.50
5095.7	5129.4	Start Drop -2.00
5500.0	5535.1	Start 963.5 hold at 5535.1 MD
6463.5	6498.5	Start Build 7.50
7227.3	7708.7	Start 3946.1 hold at 7708.7 MD
7175.0	11654.7	TD at 11654.7

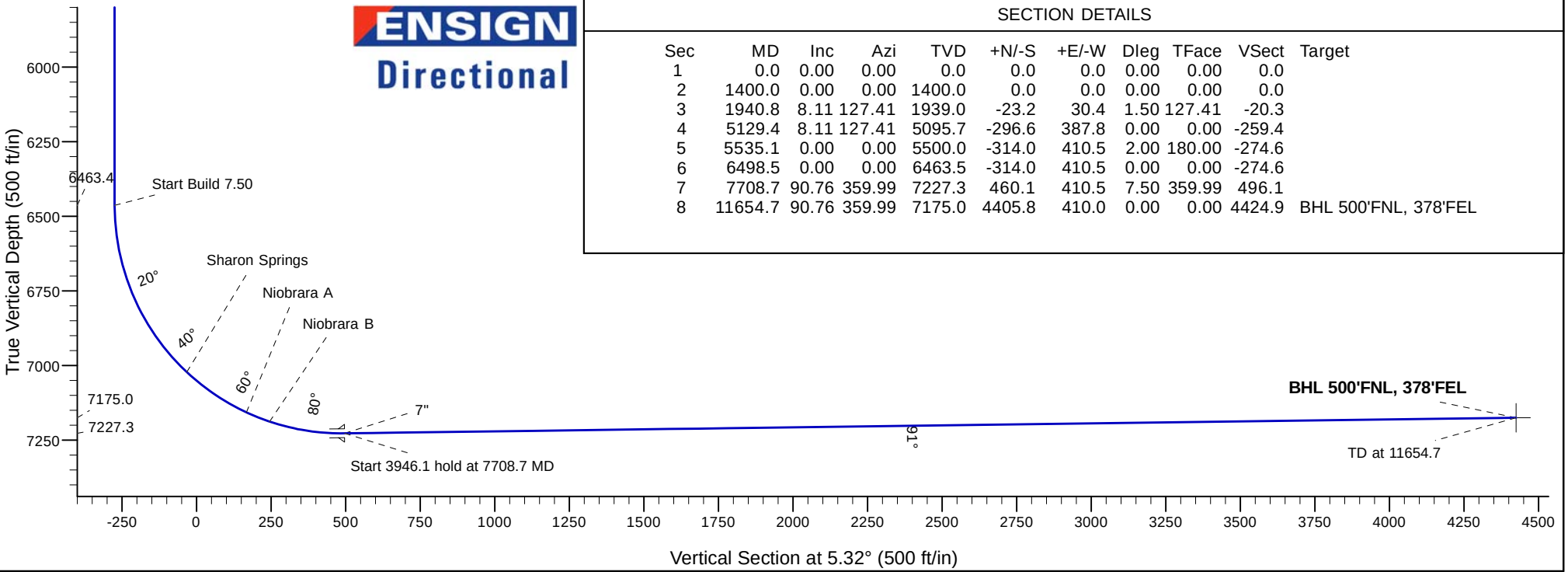
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
Niles Miller 20Y-241
Plan #1 (12-01-15)
10:36, December 08 2015



ENSIGN Directional

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1400.0	0.00	0.00	1400.0	0.0	0.0	0.00	0.00	0.0	
3	1940.8	8.11	127.41	1939.0	-23.2	30.4	1.50	127.41	-20.3	
4	5129.4	8.11	127.41	5095.7	-296.6	387.8	0.00	0.00	-259.4	
5	5535.1	0.00	0.00	5500.0	-314.0	410.5	2.00	180.00	-274.6	
6	6498.5	0.00	0.00	6463.5	-314.0	410.5	0.00	0.00	-274.6	
7	7708.7	90.76	359.99	7227.3	460.1	410.5	7.50	359.99	496.1	
8	11654.7	90.76	359.99	7175.0	4405.8	410.0	0.00	0.00	4424.9	BHL 500'FNL, 378'FEL



ENSIGN Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.20-T3N-R66W
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
Niles Miller 20Y-241

Wellbore #1

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

Standard Planning Report

08 December, 2015

PDC ENERGY
Growing E&P Value

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20Y-241	**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 20Y-241

Well Position	**+N/-S**	89.9 ft	**Northing:**	1,317,985.62 usft	**Latitude:**	40.204116
	+E/-W	-1.0 ft	**Easting:**	3,197,035.66 usft	**Longitude:**	-104.794568
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	4,956.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/8/2015	8.26	66.73	52,553

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	5.32

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	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,940.8	8.11	127.41	1,939.0	-23.2	30.4	1.50	1.50	0.00	127.41	
5,129.4	8.11	127.41	5,095.7	-296.6	387.8	0.00	0.00	0.00	0.00	
5,535.1	0.00	0.00	5,500.0	-314.0	410.5	2.00	-2.00	0.00	180.00	
6,498.5	0.00	0.00	6,463.5	-314.0	410.5	0.00	0.00	0.00	0.00	
7,708.7	90.76	359.99	7,227.3	460.1	410.5	7.50	7.50	0.00	359.99	
11,654.7	90.76	359.99	7,175.0	4,405.8	410.0	0.00	0.00	0.00	0.00	BHL 500'FNL, 378'FE

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20Y-241	**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 364'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
KOP - Start Build 1.50									
1,500.0	1.50	127.41	1,500.0	-0.8	1.0	-0.7	1.50	1.50	0.00
1,600.0	3.00	127.41	1,599.9	-3.2	4.2	-2.8	1.50	1.50	0.00
1,700.0	4.50	127.41	1,699.7	-7.2	9.4	-6.3	1.50	1.50	0.00
1,800.0	6.00	127.41	1,799.3	-12.7	16.6	-11.1	1.50	1.50	0.00
1,900.0	7.50	127.41	1,898.6	-19.9	26.0	-17.4	1.50	1.50	0.00
1,940.8	8.11	127.41	1,939.0	-23.2	30.4	-20.3	1.50	1.50	0.00
2,000.0	8.11	127.41	1,997.6	-28.3	37.0	-24.7	0.00	0.00	0.00
2,100.0	8.11	127.41	2,096.6	-36.9	48.2	-32.2	0.00	0.00	0.00
2,200.0	8.11	127.41	2,195.6	-45.4	59.4	-39.7	0.00	0.00	0.00
2,300.0	8.11	127.41	2,294.6	-54.0	70.6	-47.2	0.00	0.00	0.00
2,400.0	8.11	127.41	2,393.6	-62.6	81.8	-54.7	0.00	0.00	0.00
2,500.0	8.11	127.41	2,492.6	-71.2	93.0	-62.2	0.00	0.00	0.00
2,600.0	8.11	127.41	2,591.6	-79.7	104.2	-69.7	0.00	0.00	0.00
2,700.0	8.11	127.41	2,690.6	-88.3	115.5	-77.2	0.00	0.00	0.00
2,800.0	8.11	127.41	2,789.6	-96.9	126.7	-84.7	0.00	0.00	0.00
2,900.0	8.11	127.41	2,888.6	-105.5	137.9	-92.2	0.00	0.00	0.00
3,000.0	8.11	127.41	2,987.6	-114.0	149.1	-99.7	0.00	0.00	0.00
3,100.0	8.11	127.41	3,086.6	-122.6	160.3	-107.2	0.00	0.00	0.00
3,200.0	8.11	127.41	3,185.6	-131.2	171.5	-114.7	0.00	0.00	0.00
3,300.0	8.11	127.41	3,284.6	-139.7	182.7	-122.2	0.00	0.00	0.00
3,400.0	8.11	127.41	3,383.6	-148.3	193.9	-129.7	0.00	0.00	0.00
3,500.0	8.11	127.41	3,482.6	-156.9	205.1	-137.2	0.00	0.00	0.00
3,600.0	8.11	127.41	3,581.6	-165.5	216.3	-144.7	0.00	0.00	0.00
3,700.0	8.11	127.41	3,680.6	-174.0	227.5	-152.2	0.00	0.00	0.00
3,800.0	8.11	127.41	3,779.6	-182.6	238.8	-159.7	0.00	0.00	0.00
3,900.0	8.11	127.41	3,878.6	-191.2	250.0	-167.2	0.00	0.00	0.00
3,952.9	8.11	127.41	3,931.0	-195.7	255.9	-171.2	0.00	0.00	0.00
Parkman									
4,000.0	8.11	127.41	3,977.6	-199.8	261.2	-174.7	0.00	0.00	0.00
4,100.0	8.11	127.41	4,076.6	-208.3	272.4	-182.2	0.00	0.00	0.00
4,200.0	8.11	127.41	4,175.6	-216.9	283.6	-189.7	0.00	0.00	0.00
4,300.0	8.11	127.41	4,274.6	-225.5	294.8	-197.2	0.00	0.00	0.00
4,400.0	8.11	127.41	4,373.6	-234.0	306.0	-204.7	0.00	0.00	0.00
4,412.5	8.11	127.41	4,386.0	-235.1	307.4	-205.6	0.00	0.00	0.00

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Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20Y-241	**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	8.11	127.41	4,472.6	-242.6	317.2	-212.2	0.00	0.00	0.00
4,600.0	8.11	127.41	4,571.6	-251.2	328.4	-219.7	0.00	0.00	0.00
4,700.0	8.11	127.41	4,670.6	-259.8	339.6	-227.2	0.00	0.00	0.00
4,800.0	8.11	127.41	4,769.6	-268.3	350.8	-234.7	0.00	0.00	0.00
4,900.0	8.11	127.41	4,868.6	-276.9	362.0	-242.2	0.00	0.00	0.00
4,993.4	8.11	127.41	4,961.0	-284.9	372.5	-249.2	0.00	0.00	0.00
Shannon									
5,000.0	8.11	127.41	4,967.6	-285.5	373.3	-249.7	0.00	0.00	0.00
5,100.0	8.11	127.41	5,066.6	-294.1	384.5	-257.2	0.00	0.00	0.00
5,129.4	8.11	127.41	5,095.7	-296.6	387.8	-259.4	0.00	0.00	0.00
Start Drop -2.00									
5,200.0	6.70	127.41	5,165.7	-302.1	395.0	-264.2	2.00	-2.00	0.00
5,300.0	4.70	127.41	5,265.2	-308.1	402.9	-269.5	2.00	-2.00	0.00
5,400.0	2.70	127.41	5,365.0	-312.1	408.0	-272.9	2.00	-2.00	0.00
5,500.0	0.70	127.41	5,464.9	-313.9	410.4	-274.5	2.00	-2.00	0.00
5,535.1	0.00	0.00	5,500.0	-314.0	410.5	-274.6	2.00	-2.00	0.00
Start 963.5 hold at 5535.1 MD									
5,600.0	0.00	0.00	5,564.9	-314.0	410.5	-274.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,664.9	-314.0	410.5	-274.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,764.9	-314.0	410.5	-274.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,864.9	-314.0	410.5	-274.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,964.9	-314.0	410.5	-274.6	0.00	0.00	0.00
6,100.0	0.00	0.00	6,064.9	-314.0	410.5	-274.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,164.9	-314.0	410.5	-274.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,264.9	-314.0	410.5	-274.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,364.9	-314.0	410.5	-274.6	0.00	0.00	0.00
6,498.5	0.00	0.00	6,463.4	-314.0	410.5	-274.6	0.00	0.00	0.00
Start Build 7.50									
6,500.0	0.11	359.99	6,464.9	-314.0	410.5	-274.6	7.35	7.35	0.00
6,600.0	7.61	359.99	6,564.6	-307.3	410.5	-267.9	7.50	7.50	0.00
6,700.0	15.11	359.99	6,662.6	-287.6	410.5	-248.3	7.50	7.50	0.00
6,800.0	22.61	359.99	6,757.2	-255.3	410.5	-216.1	7.50	7.50	0.00
6,900.0	30.11	359.99	6,846.7	-210.9	410.5	-172.0	7.50	7.50	0.00
7,000.0	37.61	359.99	6,929.7	-155.2	410.5	-116.5	7.50	7.50	0.00
7,100.0	45.11	359.99	7,004.7	-89.2	410.5	-50.8	7.50	7.50	0.00
7,124.9	46.98	359.99	7,022.0	-71.3	410.5	-32.9	7.50	7.50	0.00
Sharon Springs									
7,200.0	52.61	359.99	7,070.4	-13.9	410.5	24.2	7.50	7.50	0.00
7,300.0	60.11	359.99	7,125.8	69.2	410.5	107.0	7.50	7.50	0.00
7,368.0	65.21	359.99	7,157.0	129.6	410.5	167.1	7.50	7.50	0.00
Niobrara A									
7,400.0	67.61	359.99	7,169.8	159.0	410.5	196.3	7.50	7.50	0.00
7,452.1	71.52	359.99	7,188.0	207.7	410.5	244.9	7.50	7.50	0.00
Niobrara B									
7,500.0	75.11	359.99	7,201.8	253.6	410.5	290.6	7.50	7.50	0.00
7,600.0	82.61	359.99	7,221.1	351.7	410.5	388.2	7.50	7.50	0.00
7,700.0	90.11	359.99	7,227.4	451.4	410.5	487.5	7.50	7.50	0.00
7,708.7	90.76	359.99	7,227.3	460.1	410.5	496.2	7.47	7.47	0.00
Start 3946.1 hold at 7708.7 MD - 7"									
7,800.0	90.76	359.99	7,226.1	551.4	410.4	587.1	0.00	0.00	0.00

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Well:	Niles Miller 20Y-241	**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)
7,900.0	90.76	359.99	7,224.8	651.4	410.4	686.6	0.00	0.00	0.00
8,000.0	90.76	359.99	7,223.5	751.4	410.4	786.2	0.00	0.00	0.00
8,100.0	90.76	359.99	7,222.2	851.4	410.4	885.7	0.00	0.00	0.00
8,200.0	90.76	359.99	7,220.8	951.4	410.4	985.3	0.00	0.00	0.00
8,300.0	90.76	359.99	7,219.5	1,051.4	410.4	1,084.9	0.00	0.00	0.00
8,400.0	90.76	359.99	7,218.2	1,151.4	410.4	1,184.4	0.00	0.00	0.00
8,500.0	90.76	359.99	7,216.8	1,251.3	410.4	1,284.0	0.00	0.00	0.00
8,600.0	90.76	359.99	7,215.5	1,351.3	410.4	1,383.5	0.00	0.00	0.00
8,700.0	90.76	359.99	7,214.2	1,451.3	410.3	1,483.1	0.00	0.00	0.00
8,800.0	90.76	359.99	7,212.9	1,551.3	410.3	1,582.7	0.00	0.00	0.00
8,900.0	90.76	359.99	7,211.5	1,651.3	410.3	1,682.2	0.00	0.00	0.00
9,000.0	90.76	359.99	7,210.2	1,751.3	410.3	1,781.8	0.00	0.00	0.00
9,100.0	90.76	359.99	7,208.9	1,851.3	410.3	1,881.3	0.00	0.00	0.00
9,200.0	90.76	359.99	7,207.6	1,951.3	410.3	1,980.9	0.00	0.00	0.00
9,300.0	90.76	359.99	7,206.2	2,051.3	410.3	2,080.5	0.00	0.00	0.00
9,400.0	90.76	359.99	7,204.9	2,151.3	410.3	2,180.0	0.00	0.00	0.00
9,500.0	90.76	359.99	7,203.6	2,251.3	410.3	2,279.6	0.00	0.00	0.00
9,600.0	90.76	359.99	7,202.3	2,351.2	410.3	2,379.1	0.00	0.00	0.00
9,700.0	90.76	359.99	7,200.9	2,451.2	410.2	2,478.7	0.00	0.00	0.00
9,800.0	90.76	359.99	7,199.6	2,551.2	410.2	2,578.3	0.00	0.00	0.00
9,900.0	90.76	359.99	7,198.3	2,651.2	410.2	2,677.8	0.00	0.00	0.00
10,000.0	90.76	359.99	7,196.9	2,751.2	410.2	2,777.4	0.00	0.00	0.00
10,100.0	90.76	359.99	7,195.6	2,851.2	410.2	2,876.9	0.00	0.00	0.00
10,200.0	90.76	359.99	7,194.3	2,951.2	410.2	2,976.5	0.00	0.00	0.00
10,300.0	90.76	359.99	7,193.0	3,051.2	410.2	3,076.1	0.00	0.00	0.00
10,400.0	90.76	359.99	7,191.6	3,151.2	410.2	3,175.6	0.00	0.00	0.00
10,500.0	90.76	359.99	7,190.3	3,251.2	410.2	3,275.2	0.00	0.00	0.00
10,600.0	90.76	359.99	7,189.0	3,351.2	410.1	3,374.7	0.00	0.00	0.00
10,700.0	90.76	359.99	7,187.7	3,451.1	410.1	3,474.3	0.00	0.00	0.00
10,800.0	90.76	359.99	7,186.3	3,551.1	410.1	3,573.9	0.00	0.00	0.00
10,900.0	90.76	359.99	7,185.0	3,651.1	410.1	3,673.4	0.00	0.00	0.00
11,000.0	90.76	359.99	7,183.7	3,751.1	410.1	3,773.0	0.00	0.00	0.00
11,100.0	90.76	359.99	7,182.4	3,851.1	410.1	3,872.5	0.00	0.00	0.00
11,200.0	90.76	359.99	7,181.0	3,951.1	410.1	3,972.1	0.00	0.00	0.00
11,300.0	90.76	359.99	7,179.7	4,051.1	410.1	4,071.7	0.00	0.00	0.00
11,400.0	90.76	359.99	7,178.4	4,151.1	410.1	4,171.2	0.00	0.00	0.00
11,500.0	90.76	359.99	7,177.1	4,251.1	410.0	4,270.8	0.00	0.00	0.00
11,600.0	90.76	359.99	7,175.7	4,351.1	410.0	4,370.3	0.00	0.00	0.00
11,654.7	90.76	359.99	7,175.0	4,405.8	410.0	4,424.8	0.00	0.00	0.00
TD at 11654.7 - BHL 500'FNL, 378'FEL									

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20Y-241	**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 364'FSL, 829'FEL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,317,985.63	3,197,035.66	40.204116	-104.794568
BHL 500'FNL, 378'FEL - plan hits target center - Point	0.00	0.00	7,175.0	4,405.8	410.0	1,322,394.36	3,197,410.62	40.216210	-104.793100

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,708.7	7,227.3	7"	7	8-3/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,952.9	3,931.0	Parkman		0.00	
4,412.5	4,386.0	Sussex		0.00	
4,993.4	4,961.0	Shannon		0.00	
7,124.9	7,022.0	Sharon Springs		0.00	
7,368.0	7,157.0	Niobrara A		0.00	
7,452.1	7,188.0	Niobrara B		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,400.0	1,400.0	0.0	0.0	KOP - Start Build 1.50
5,129.4	5,095.7	-23.2	30.4	Start Drop -2.00
5,535.1	5,500.0	-296.6	387.8	Start 963.5 hold at 5535.1 MD
6,498.5	6,463.5	-314.0	410.5	Start Build 7.50
7,708.7	7,227.3	-314.0	410.5	Start 3946.1 hold at 7708.7 MD
11,654.7	7,175.0	460.1	410.5	TD at 11654.7

ENSIGN Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.20-T3N-R66W
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
Niles Miller 20Y-241

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

Anticollision Report

08 December, 2015

PDC ENERGY
Growing E&P Value

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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	11,654.7	Plan #1 (12-01-15) (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Existing Wells Sec.20-T3N-R66W						
Miller 4-20J (Exist) - Wellbore #1 - Wellbore #1						Out of range
Miller 43-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	9,031.4	7,214.3	267.3	215.1	5.119	CC, ES, SF
Miller 43-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	8,838.6	7,205.3	277.2	227.9	5.621	CC, ES, SF
Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	7,391.0	7,169.1	129.3	97.2	4.022	CC, ES
Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	7,400.0	7,172.5	129.6	97.4	4.018	SF
Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	7,502.6	7,205.6	175.3	142.4	5.321	CC, ES, SF
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	4,503.1	4,496.4	380.2	358.3	17.351	CC, ES
Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,600.0	6,557.3	453.4	423.2	15.042	SF
Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1	2,316.1	2,315.5	670.5	659.7	61.998	CC, ES
Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1	4,100.0	4,049.0	791.7	772.3	40.807	SF
Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1	6,503.1	6,508.2	89.1	52.8	2.456	CC, ES, SF
Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1	5,400.0	5,417.0	133.7	101.6	4.164	SF
Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1	5,410.4	5,427.3	133.7	101.6	4.165	CC, ES
Soco 20-1K (Exist) - Wellbore #1 - Wellbore #1	11,454.5	7,134.7	468.8	371.2	4.802	CC, ES
Soco 20-1K (Exist) - Wellbore #1 - Wellbore #1	11,500.0	7,133.9	471.0	372.6	4.783	SF
Soco 20-8K (Exist) - Wellbore #1 - Wellbore #1	10,380.3	7,141.4	500.1	421.9	6.398	CC, ES
Soco 20-8K (Exist) - Wellbore #1 - Wellbore #1	10,400.0	7,141.4	500.4	421.9	6.373	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W						
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	200.0	198.0	89.9	89.3	134.266	CC
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	300.0	297.7	90.1	89.0	81.407	ES
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	1,000.0	984.3	129.5	125.2	30.056	SF
Niles Miller 20Q-321 - Wellbore #1 - Plan #1 (12-01-15)	400.0	398.0	75.0	73.4	47.781	CC
Niles Miller 20Q-321 - Wellbore #1 - Plan #1 (12-01-15)	500.0	497.6	75.2	73.2	37.542	ES
Niles Miller 20Q-321 - Wellbore #1 - Plan #1 (12-01-15)	1,000.0	991.1	95.1	90.9	22.553	SF
Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)	1,000.0	999.0	29.9	25.6	7.001	CC, ES
Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)	11,654.7	11,637.7	628.4	453.6	3.595	SF
Niles Miller 20T-241 - Wellbore #1 - Plan #1 (12-01-15)	600.0	599.0	60.0	57.5	24.278	CC
Niles Miller 20T-241 - Wellbore #1 - Plan #1 (12-01-15)	700.0	698.6	60.3	57.4	20.786	ES
Niles Miller 20T-241 - Wellbore #1 - Plan #1 (12-01-15)	1,100.0	1,094.2	75.3	70.7	16.251	SF
Niles Miller 20T-301 - Wellbore #1 - Plan #1 (12-01-15)	800.0	799.0	45.0	41.6	13.347	CC, ES
Niles Miller 20T-301 - Wellbore #1 - Plan #1 (12-01-15)	1,100.0	1,096.9	51.1	46.4	11.012	SF
Niles Miller 20T-321 - Wellbore #1 - Plan #1 (12-01-15)	1,400.0	1,401.0	15.1	9.0	2.484	CC, ES
Niles Miller 20T-321 - Wellbore #1 - Plan #1 (12-01-15)	11,654.7	11,737.7	311.5	142.6	1.844	SF
Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)	1,200.0	1,200.0	15.0	9.8	2.902	CC, ES
Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)	1,300.0	1,299.8	15.6	10.0	2.781	SF

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 43-20 - 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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,300.0	7,219.5	7,186.6	7,185.3	27.2	13.2	-84.76	1,781.3	142.8	778.2	738.5	39.71	19.596	
8,400.0	7,218.2	7,190.1	7,188.7	28.7	13.2	-85.49	1,781.4	142.8	685.2	643.8	41.33	16.578	
8,500.0	7,216.8	7,193.6	7,192.2	30.3	13.3	-86.24	1,781.6	142.9	594.4	551.4	42.99	13.827	
8,600.0	7,215.5	7,197.2	7,195.8	31.9	13.3	-87.01	1,781.8	142.9	507.2	462.5	44.68	11.351	
8,700.0	7,214.2	7,201.0	7,199.6	33.6	13.3	-87.81	1,782.0	142.9	425.5	379.1	46.40	9.170	
8,800.0	7,212.9	7,205.0	7,203.6	35.3	13.3	-88.67	1,782.2	143.0	353.4	305.2	48.14	7.341	
8,900.0	7,211.5	7,209.0	7,207.6	37.0	13.3	-89.53	1,782.4	143.0	297.8	247.9	49.89	5.968	
9,000.0	7,210.2	7,213.0	7,211.6	38.7	13.3	-90.39	1,782.6	143.1	269.1	217.4	51.66	5.209	
9,031.4	7,209.8	7,214.3	7,212.9	39.3	13.3	-90.66	1,782.7	143.1	267.3	215.1	52.21	5.119	CC, ES, SF
9,100.0	7,208.9	7,217.0	7,215.6	40.4	13.3	-91.25	1,782.8	143.1	275.9	222.5	53.42	5.165	
9,200.0	7,207.6	7,221.0	7,219.6	42.2	13.3	-92.11	1,783.0	143.1	315.9	260.8	55.19	5.724	
9,300.0	7,206.2	7,225.0	7,223.6	44.0	13.3	-92.97	1,783.2	143.2	378.8	321.8	56.96	6.650	
9,400.0	7,204.9	7,229.0	7,227.6	45.8	13.3	-93.82	1,783.4	143.3	455.1	396.4	58.73	7.749	
9,500.0	7,203.6	7,233.0	7,231.6	47.5	13.3	-94.68	1,783.6	143.3	539.2	478.7	60.49	8.913	
9,600.0	7,202.3	7,237.0	7,235.6	49.3	13.3	-95.53	1,783.9	143.4	627.9	565.7	62.25	10.087	
9,700.0	7,200.9	7,241.1	7,239.6	51.2	13.3	-96.38	1,784.1	143.4	719.6	655.6	64.00	11.244	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,100.0	7,222.2	7,230.0	7,229.2	24.2	13.8	-93.89	1,589.3	132.7	788.5	750.8	37.66	20.937	
8,200.0	7,220.8	7,226.7	7,225.9	25.7	13.8	-93.20	1,589.3	132.7	695.8	656.7	39.11	17.791	
8,300.0	7,219.5	7,223.3	7,222.5	27.2	13.8	-92.51	1,589.4	132.8	605.4	564.8	40.61	14.907	
8,400.0	7,218.2	7,220.0	7,219.2	28.7	13.8	-91.83	1,589.5	132.9	518.6	476.4	42.16	12.300	
8,500.0	7,216.8	7,216.6	7,215.9	30.3	13.8	-91.14	1,589.5	133.0	437.4	393.7	43.75	9.998	
8,600.0	7,215.5	7,213.3	7,212.5	31.9	13.8	-90.44	1,589.6	133.0	365.6	320.3	45.37	8.059	
8,700.0	7,214.2	7,209.9	7,209.2	33.6	13.8	-89.75	1,589.7	133.1	309.9	262.9	47.01	6.591	
8,800.0	7,212.9	7,206.6	7,205.8	35.3	13.8	-89.06	1,589.7	133.2	279.9	231.2	48.67	5.750	
8,838.6	7,212.4	7,205.3	7,204.5	35.9	13.8	-88.80	1,589.8	133.2	277.2	227.9	49.32	5.621	CC, ES, SF
8,900.0	7,211.5	7,203.2	7,202.5	37.0	13.8	-88.37	1,589.8	133.2	283.9	233.6	50.35	5.639	
9,000.0	7,210.2	7,199.9	7,199.1	38.7	13.8	-87.68	1,589.9	133.3	320.7	268.7	52.04	6.164	
9,100.0	7,208.9	7,196.5	7,195.8	40.4	13.8	-86.99	1,589.9	133.4	380.9	327.2	53.74	7.089	
9,200.0	7,207.6	7,193.2	7,192.4	42.2	13.8	-86.30	1,590.0	133.4	455.3	399.9	55.44	8.213	
9,300.0	7,206.2	7,189.8	7,189.1	44.0	13.7	-85.61	1,590.1	133.5	538.1	480.9	57.15	9.416	
9,400.0	7,204.9	7,186.5	7,185.7	45.8	13.7	-84.92	1,590.1	133.6	625.9	567.0	58.86	10.634	
9,500.0	7,203.6	7,183.2	7,182.4	47.5	13.7	-84.23	1,590.2	133.7	716.8	656.3	60.56	11.836	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	6.0	6.0	0.0	0.0	64.92	176.3	376.6	415.8	415.8	0.01	N/A	
100.0	100.0	106.5	106.5	0.1	0.1	64.89	176.4	376.4	415.7	415.5	0.26	1,621.674	
119.4	119.4	125.4	125.4	0.2	0.2	64.88	176.4	376.4	415.7	415.4	0.33	1,249.804	
200.0	200.0	204.1	204.1	0.3	0.3	64.88	176.6	376.6	415.9	415.2	0.65	639.173	
300.0	300.0	305.0	305.0	0.6	0.5	64.86	176.8	376.8	416.3	415.2	1.08	384.316	
400.0	400.0	407.1	407.1	0.8	0.7	64.91	176.5	377.0	416.2	414.7	1.47	283.218	
440.2	440.2	446.2	446.2	0.9	0.7	64.95	176.2	377.0	416.2	414.5	1.62	256.799	
500.0	500.0	504.8	504.8	1.0	0.8	64.99	176.0	377.2	416.3	414.4	1.85	225.521	
600.0	600.0	608.6	608.6	1.2	1.0	64.99	175.9	377.0	416.0	413.8	2.24	185.896	
700.0	700.0	706.7	706.7	1.5	1.1	64.98	175.8	376.7	415.7	413.1	2.61	159.292	
798.8	798.8	804.8	804.8	1.7	1.3	64.97	175.8	376.6	415.6	412.6	3.01	137.889	
800.0	800.0	806.0	806.0	1.7	1.3	64.97	175.8	376.6	415.6	412.6	3.02	137.654	
900.0	900.0	905.1	905.1	1.9	1.5	64.94	176.1	376.6	415.7	412.3	3.44	120.733	
1,000.0	1,000.0	1,007.6	1,007.6	2.1	1.7	64.87	176.5	376.3	415.6	411.7	3.88	106.998	
1,100.0	1,100.0	1,108.2	1,108.2	2.4	1.9	64.83	176.5	375.7	415.1	410.8	4.31	96.352	
1,200.0	1,200.0	1,206.7	1,206.7	2.6	2.1	64.88	176.1	375.5	414.8	410.1	4.69	88.457	
1,247.1	1,247.1	1,253.1	1,253.1	2.7	2.2	64.90	175.9	375.6	414.7	409.9	4.86	85.271	
1,300.0	1,300.0	1,305.4	1,305.4	2.8	2.3	64.90	175.9	375.6	414.8	409.7	5.06	81.956	
1,400.0	1,400.0	1,407.8	1,407.8	3.0	2.4	64.93	175.7	375.6	414.6	409.1	5.45	76.010	
1,500.0	1,500.0	1,506.4	1,506.4	3.2	2.6	-62.65	175.6	375.3	413.8	407.9	5.84	70.829	
1,600.0	1,599.9	1,608.7	1,608.7	3.4	2.8	-63.20	175.6	374.9	411.6	405.3	6.24	65.984	
1,700.0	1,699.7	1,708.4	1,708.4	3.6	3.0	-64.12	175.6	374.1	408.0	401.3	6.64	61.402	
1,800.0	1,799.3	1,805.5	1,805.4	3.8	3.2	-65.40	176.0	373.5	403.7	396.7	7.06	57.188	
1,900.0	1,898.6	1,906.9	1,906.9	4.0	3.5	-67.07	176.1	373.1	398.6	391.1	7.50	53.169	
1,940.8	1,939.0	1,947.0	1,947.0	4.1	3.6	-67.84	176.1	372.8	396.2	388.6	7.68	51.574	
2,000.0	1,997.6	2,005.0	2,005.0	4.3	3.7	-68.98	176.1	372.5	392.9	384.9	7.96	49.374	
2,100.0	2,096.6	2,103.1	2,103.1	4.6	3.9	-70.89	176.0	372.4	387.8	379.4	8.39	46.242	
2,200.0	2,195.6	2,205.0	2,205.0	4.8	4.0	-72.83	175.2	372.3	382.8	374.0	8.81	43.453	
2,300.0	2,294.6	2,303.1	2,303.1	5.1	4.2	-74.79	174.5	371.8	378.1	368.8	9.29	40.711	
2,400.0	2,393.6	2,401.9	2,401.9	5.4	4.4	-76.84	174.0	371.4	373.9	364.2	9.80	38.177	
2,500.0	2,492.6	2,502.4	2,502.4	5.7	4.6	-78.92	173.2	371.0	370.1	359.8	10.30	35.927	
2,600.0	2,591.6	2,605.4	2,605.4	6.0	4.8	-81.08	171.8	370.1	366.0	355.2	10.83	33.807	
2,700.0	2,690.6	2,703.0	2,702.9	6.3	5.1	-83.25	170.5	368.6	362.1	350.8	11.37	31.857	
2,800.0	2,789.6	2,802.1	2,802.0	6.6	5.3	-85.46	169.2	367.5	359.0	347.1	11.91	30.134	
2,900.0	2,888.6	2,902.3	2,902.2	6.9	5.5	-87.73	167.8	366.2	356.1	343.7	12.47	28.569	
3,000.0	2,987.6	2,998.4	2,998.3	7.3	5.8	-90.00	166.8	364.7	354.1	341.1	13.02	27.193	
3,100.0	3,086.6	3,099.4	3,099.3	7.6	6.0	-92.41	165.9	363.3	352.8	339.2	13.59	25.958	
3,200.0	3,185.6	3,196.6	3,196.5	7.9	6.2	-94.79	165.1	361.6	352.0	337.9	14.15	24.878	
3,219.6	3,205.0	3,215.8	3,215.6	8.0	6.3	-95.28	165.0	361.2	352.0	337.7	14.26	24.685	
3,300.0	3,284.6	3,294.2	3,294.1	8.2	6.5	-97.22	164.7	359.9	352.3	337.6	14.71	23.953	
3,400.0	3,383.6	3,394.2	3,394.0	8.6	6.7	-99.68	164.3	358.3	353.3	338.0	15.27	23.134	
3,500.0	3,482.6	3,491.0	3,490.8	8.9	7.0	-102.11	164.2	356.4	355.0	339.2	15.82	22.446	
3,600.0	3,581.6	3,589.9	3,589.6	9.2	7.2	-104.55	164.4	354.8	357.7	341.4	16.36	21.868	
3,700.0	3,680.6	3,689.2	3,689.0	9.6	7.5	-106.94	164.4	353.1	361.0	344.1	16.90	21.359	
3,800.0	3,779.6	3,785.1	3,784.9	9.9	7.7	-109.31	164.8	351.0	365.1	347.7	17.41	20.965	
3,900.0	3,878.6	3,882.2	3,882.0	10.3	7.9	-111.65	165.9	349.0	370.6	352.7	17.91	20.692	
4,000.0	3,977.6	3,983.2	3,982.9	10.6	8.1	-113.97	166.9	347.3	376.6	358.2	18.41	20.460	
4,100.0	4,076.6	4,081.1	4,080.8	10.9	8.4	-116.16	167.5	345.4	382.9	364.0	18.90	20.255	
4,200.0	4,175.6	4,182.5	4,182.2	11.3	8.6	-118.36	168.2	343.3	389.7	370.3	19.40	20.082	
4,300.0	4,274.6	4,287.5	4,287.1	11.6	8.9	-120.63	167.6	340.5	395.8	375.9	19.91	19.879	
4,400.0	4,373.6	4,386.0	4,385.6	12.0	9.1	-122.77	166.3	337.3	401.6	381.2	20.40	19.686	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,500.0	4,472.6	4,485.7	4,485.2	12.3	9.4	-124.88	165.0	334.1	408.0	387.1	20.88	19.535	
4,600.0	4,571.6	4,584.9	4,584.4	12.7	9.6	-126.88	163.4	331.0	414.7	393.3	21.36	19.411	
4,700.0	4,670.6	4,684.1	4,683.5	13.0	9.9	-128.80	161.8	328.1	421.7	399.9	21.83	19.315	
4,800.0	4,769.6	4,783.4	4,782.7	13.3	10.1	-130.67	160.0	325.1	429.2	406.8	22.30	19.244	
4,900.0	4,868.6	4,883.1	4,882.4	13.7	10.4	-132.47	158.1	322.2	436.9	414.1	22.76	19.194	
5,000.0	4,967.6	4,979.4	4,978.6	14.0	10.6	-134.03	156.4	320.2	445.1	421.8	23.22	19.171	
5,100.0	5,066.6	5,074.7	5,073.9	14.4	10.9	-135.50	155.5	318.4	454.3	430.7	23.67	19.191	
5,129.4	5,095.7	5,102.9	5,102.0	14.5	10.9	-135.90	155.3	318.0	457.3	433.5	23.81	19.205	
5,200.0	5,165.7	5,171.4	5,170.6	14.7	11.1	-136.89	155.2	316.9	464.0	439.8	24.14	19.223	
5,300.0	5,265.2	5,269.3	5,268.5	14.9	11.3	-137.96	155.4	315.6	471.7	447.2	24.52	19.235	
5,400.0	5,365.0	5,367.1	5,366.3	15.1	11.5	-138.58	156.1	315.2	477.3	452.4	24.87	19.191	
5,500.0	5,464.9	5,467.5	5,466.7	15.3	11.7	-138.91	157.0	314.5	480.6	455.4	25.19	19.074	
5,535.1	5,500.0	5,503.0	5,502.2	15.3	11.7	-11.52	157.3	314.4	481.0	455.7	25.31	19.006	
5,600.0	5,564.9	5,565.6	5,564.8	15.4	11.8	-11.54	157.9	314.2	481.7	456.2	25.52	18.871	
5,700.0	5,664.9	5,667.0	5,666.2	15.6	12.0	-11.61	159.1	313.4	483.0	457.1	25.89	18.653	
5,800.0	5,764.9	5,767.7	5,766.8	15.8	12.2	-11.71	159.7	312.4	483.8	457.5	26.29	18.400	
5,900.0	5,864.9	5,870.1	5,869.2	15.9	12.5	-11.88	160.1	310.8	484.5	457.8	26.72	18.135	
6,000.0	5,964.9	5,968.5	5,967.6	16.1	12.8	-12.05	160.2	309.3	484.9	457.7	27.14	17.867	
6,100.0	6,064.9	6,067.8	6,066.9	16.2	13.0	-12.22	160.7	307.8	485.7	458.2	27.56	17.625	
6,200.0	6,164.9	6,170.9	6,169.9	16.4	13.3	-12.44	160.9	305.8	486.3	458.3	27.99	17.373	
6,300.0	6,264.9	6,270.8	6,269.9	16.6	13.5	-12.61	160.7	304.3	486.4	458.0	28.43	17.111	
6,400.0	6,364.9	6,369.7	6,368.8	16.7	13.8	-12.78	160.7	302.9	486.8	457.9	28.86	16.866	
6,498.5	6,463.5	6,468.6	6,467.7	16.9	14.0	-13.00	160.7	300.9	487.2	457.9	29.29	16.633	
6,500.0	6,464.9	6,470.1	6,469.2	16.9	14.0	-13.00	160.7	300.9	487.2	457.9	29.30	16.631	
6,550.0	6,514.9	6,521.2	6,520.2	17.0	14.2	-13.21	160.6	299.7	485.7	456.3	29.40	16.520	
6,600.0	6,564.6	6,573.0	6,572.0	17.0	14.3	-13.59	160.3	298.5	480.8	451.4	29.37	16.368	
6,650.0	6,613.9	6,623.2	6,622.2	17.1	14.4	-14.13	159.8	297.4	472.5	443.3	29.21	16.175	
6,700.0	6,662.6	6,671.5	6,670.5	17.1	14.6	-14.84	159.3	296.3	461.2	432.3	28.93	15.944	
6,750.0	6,710.4	6,719.5	6,718.5	17.1	14.7	-15.77	158.8	295.3	446.9	418.4	28.52	15.669	
6,800.0	6,757.2	6,767.1	6,766.1	17.1	14.8	-17.01	158.2	294.1	429.6	401.6	28.00	15.340	
6,850.0	6,802.7	6,812.8	6,811.8	17.1	14.9	-18.59	157.4	292.8	409.3	381.9	27.39	14.945	
6,900.0	6,846.7	6,856.1	6,855.0	17.1	15.0	-20.56	156.8	291.6	386.4	359.7	26.71	14.470	
6,950.0	6,889.1	6,897.7	6,896.6	17.1	15.1	-23.07	156.1	290.4	361.1	335.1	26.01	13.886	
7,000.0	6,929.7	6,937.4	6,936.2	17.1	15.2	-26.25	155.6	289.2	333.7	308.3	25.37	13.152	
7,050.0	6,968.3	6,975.1	6,973.9	17.1	15.3	-30.33	155.1	288.0	304.3	279.4	24.91	12.215	
7,100.0	7,004.7	7,010.7	7,009.5	17.0	15.4	-35.58	154.6	286.8	273.4	248.6	24.81	11.019	
7,150.0	7,038.8	7,044.3	7,043.1	17.0	15.5	-42.28	154.2	285.6	241.6	216.3	25.29	9.555	
7,200.0	7,070.4	7,075.4	7,074.2	17.0	15.6	-50.56	153.8	284.5	209.8	183.3	26.47	7.926	
7,250.0	7,099.5	7,103.9	7,102.7	17.0	15.7	-60.27	153.4	283.5	179.4	151.2	28.21	6.357	
7,300.0	7,125.8	7,129.7	7,128.4	17.0	15.7	-70.73	153.1	282.6	152.9	122.9	30.07	5.087	
7,350.0	7,149.3	7,152.6	7,151.3	16.9	15.8	-80.75	152.8	281.8	134.6	103.1	31.48	4.277	
7,391.0	7,166.3	7,169.1	7,167.8	17.0	15.8	-87.83	152.5	281.2	129.3	97.2	32.16	4.022	CC, ES
7,400.0	7,169.8	7,172.5	7,171.2	17.0	15.8	-89.20	152.5	281.1	129.6	97.4	32.25	4.018	SF
7,450.0	7,187.3	7,189.4	7,188.1	17.1	15.9	-95.33	152.3	280.5	140.6	108.1	32.57	4.317	
7,500.0	7,201.8	7,203.2	7,201.9	17.4	15.9	-98.89	152.1	280.0	165.4	132.6	32.77	5.046	
7,550.0	7,213.0	7,213.8	7,212.5	17.8	15.9	-99.82	152.0	279.7	199.4	166.3	33.11	6.023	
7,600.0	7,221.1	7,221.2	7,219.9	18.2	16.0	-98.06	151.9	279.4	239.1	205.4	33.66	7.102	
7,650.0	7,225.9	7,225.4	7,224.0	18.7	16.0	-93.50	151.8	279.3	282.1	247.8	34.30	8.224	
7,700.0	7,227.4	7,226.2	7,224.9	19.2	16.0	-86.05	151.8	279.2	327.2	292.6	34.62	9.451	
7,708.7	7,227.3	7,226.1	7,224.7	19.3	16.0	-84.47	151.8	279.2	335.1	300.5	34.59	9.688	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,800.0	7,226.1	7,223.7	7,222.3	20.3	16.0	-83.44	151.8	279.3	420.6	385.2	35.48	11.854	
7,900.0	7,224.8	7,221.0	7,219.7	21.5	16.0	-82.30	151.9	279.4	516.5	480.0	36.56	14.130	
8,000.0	7,223.5	7,218.4	7,217.1	22.8	16.0	-81.17	151.9	279.5	613.7	576.0	37.71	16.275	
8,100.0	7,222.2	7,215.8	7,214.5	24.2	15.9	-80.05	151.9	279.6	711.7	672.8	38.93	18.281	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	8.0	8.0	0.0	0.0	49.65	281.9	331.9	435.5	435.5	0.01	N/A	
100.0	100.0	108.1	108.1	0.1	0.1	49.63	282.1	331.7	435.4	435.2	0.26	1,680.248	
106.0	106.0	114.0	114.0	0.1	0.2	49.62	282.1	331.7	435.4	435.1	0.28	1,539.751	
200.0	200.0	206.2	206.2	0.3	0.3	49.62	282.2	331.9	435.6	435.0	0.66	665.048	
300.0	300.0	306.7	306.7	0.6	0.5	49.62	282.5	332.1	436.0	434.9	1.09	401.516	
400.0	400.0	410.0	410.0	0.8	0.7	49.67	282.1	332.3	435.9	434.4	1.47	295.683	
458.5	458.5	466.5	466.5	0.9	0.8	49.72	281.7	332.4	435.7	434.0	1.69	257.395	
500.0	500.0	507.1	507.1	1.0	0.8	49.74	281.6	332.6	435.8	433.9	1.85	235.607	
600.0	600.0	610.4	610.4	1.2	1.0	49.73	281.5	332.3	435.6	433.3	2.24	194.381	
700.0	700.0	708.6	708.6	1.5	1.2	49.71	281.5	332.0	435.2	432.6	2.61	166.553	
793.5	793.5	801.5	801.5	1.7	1.3	49.70	281.4	331.9	435.1	432.2	3.00	145.277	
800.0	800.0	807.9	807.9	1.7	1.3	49.70	281.5	331.9	435.1	432.1	3.02	143.951	
900.0	900.0	906.7	906.7	1.9	1.5	49.68	281.7	331.9	435.3	431.9	3.45	126.308	
1,000.0	1,000.0	1,008.9	1,008.9	2.1	1.8	49.60	282.1	331.6	435.4	431.5	3.89	112.006	
1,100.0	1,100.0	1,110.3	1,110.3	2.4	2.0	49.55	282.2	331.0	435.0	430.7	4.31	100.879	
1,200.0	1,200.0	1,209.3	1,209.2	2.6	2.1	49.58	281.7	330.9	434.6	429.9	4.69	92.600	
1,255.8	1,255.8	1,263.8	1,263.8	2.7	2.2	49.60	281.6	330.9	434.5	429.6	4.90	88.681	
1,300.0	1,300.0	1,307.4	1,307.4	2.8	2.3	49.61	281.6	330.9	434.5	429.5	5.06	85.799	
1,400.0	1,400.0	1,410.2	1,410.2	3.0	2.4	49.63	281.3	330.9	434.3	428.8	5.46	79.550	
1,500.0	1,500.0	1,508.1	1,508.1	3.2	2.6	-77.97	281.2	330.6	433.8	427.9	5.85	74.206	
1,600.0	1,599.9	1,610.6	1,610.6	3.4	2.8	-78.54	281.2	330.2	432.6	426.4	6.24	69.295	
1,700.0	1,699.7	1,709.7	1,709.7	3.6	3.0	-79.49	281.2	329.4	430.8	424.1	6.65	64.766	
1,800.0	1,799.3	1,806.8	1,806.8	3.8	3.3	-80.77	281.6	328.8	429.1	422.0	7.07	60.676	
1,900.0	1,898.6	1,908.9	1,908.8	4.0	3.5	-82.44	281.7	328.4	427.1	419.6	7.52	56.819	
1,940.8	1,939.0	1,948.7	1,948.7	4.1	3.6	-83.19	281.7	328.1	426.2	418.5	7.71	55.314	
2,000.0	1,997.6	2,006.6	2,006.5	4.3	3.7	-84.32	281.8	327.8	425.1	417.1	7.98	53.266	
2,100.0	2,096.6	2,105.8	2,105.8	4.6	3.9	-86.20	281.6	327.7	423.7	415.3	8.41	50.354	
2,200.0	2,195.6	2,207.9	2,207.8	4.8	4.0	-88.09	280.8	327.6	422.3	413.5	8.84	47.761	
2,300.0	2,294.6	2,305.4	2,305.3	5.1	4.2	-89.95	280.1	327.1	421.2	411.9	9.32	45.206	
2,400.0	2,393.6	2,404.2	2,404.2	5.4	4.4	-91.86	279.7	326.7	420.8	411.0	9.82	42.839	
2,500.0	2,492.6	2,505.7	2,505.7	5.7	4.6	-93.78	278.8	326.3	420.6	410.3	10.33	40.727	
2,600.0	2,591.6	2,608.3	2,608.3	6.0	4.8	-95.76	277.4	325.3	420.1	409.2	10.84	38.740	
2,667.3	2,658.2	2,673.6	2,673.5	6.2	5.0	-97.06	276.5	324.4	419.9	408.7	11.20	37.490	
2,700.0	2,690.6	2,705.4	2,705.3	6.3	5.1	-97.70	276.2	323.9	419.9	408.6	11.37	36.926	
2,800.0	2,789.6	2,805.4	2,805.3	6.6	5.3	-99.65	274.8	322.8	420.3	408.4	11.91	35.307	
2,900.0	2,888.6	2,904.8	2,904.7	6.9	5.5	-101.60	273.4	321.4	421.0	408.6	12.44	33.845	
3,000.0	2,987.6	3,000.5	3,000.4	7.3	5.8	-103.52	272.5	320.0	422.6	409.6	12.98	32.565	
3,100.0	3,086.6	3,102.0	3,101.9	7.6	6.0	-105.52	271.5	318.6	424.7	411.2	13.53	31.398	
3,200.0	3,185.6	3,198.0	3,197.9	7.9	6.2	-107.44	270.7	316.8	427.4	413.3	14.06	30.394	
3,300.0	3,284.6	3,296.1	3,295.9	8.2	6.5	-109.39	270.4	315.2	431.0	416.4	14.60	29.520	
3,400.0	3,383.6	3,395.8	3,395.6	8.6	6.7	-111.32	270.0	313.6	435.1	420.0	15.14	28.737	
3,500.0	3,482.6	3,491.9	3,491.7	8.9	7.0	-113.20	269.9	311.7	439.9	424.2	15.66	28.084	
3,600.0	3,581.6	3,591.3	3,591.1	9.2	7.2	-115.07	270.0	310.1	445.5	429.3	16.19	27.517	
3,700.0	3,680.6	3,690.2	3,690.0	9.6	7.5	-116.88	270.0	308.4	451.3	434.6	16.71	27.008	
3,800.0	3,779.6	3,785.1	3,784.9	9.9	7.7	-118.64	270.4	306.3	458.1	440.9	17.21	26.616	
3,900.0	3,878.6	3,882.2	3,881.9	10.3	7.9	-120.39	271.5	304.3	465.9	448.2	17.69	26.333	
4,000.0	3,977.6	3,983.7	3,983.4	10.6	8.1	-122.11	272.5	302.6	474.1	455.9	18.19	26.071	
4,100.0	4,076.6	4,081.4	4,081.1	10.9	8.4	-123.73	273.2	300.7	482.4	463.7	18.67	25.829	
4,200.0	4,175.6	4,183.3	4,183.0	11.3	8.6	-125.38	273.8	298.6	490.9	471.8	19.17	25.605	
4,300.0	4,274.6	4,289.7	4,289.3	11.6	8.9	-127.11	273.2	295.8	498.8	479.1	19.68	25.339	
4,400.0	4,373.6	4,387.8	4,387.4	12.0	9.1	-128.72	271.9	292.6	506.2	486.0	20.17	25.089	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,500.0	4,472.6	4,487.9	4,487.4	12.3	9.4	-130.32	270.6	289.3	514.0	493.3	20.67	24.873	
4,600.0	4,571.6	4,587.3	4,586.7	12.7	9.6	-131.84	269.0	286.3	522.0	500.8	21.15	24.678	
4,700.0	4,670.6	4,686.7	4,686.1	13.0	9.9	-133.30	267.4	283.4	530.2	508.5	21.63	24.509	
4,800.0	4,769.6	4,785.8	4,785.1	13.3	10.1	-134.73	265.6	280.3	538.6	516.5	22.11	24.361	
4,900.0	4,868.6	4,886.3	4,885.5	13.7	10.4	-136.11	263.6	277.4	547.2	524.6	22.58	24.232	
5,000.0	4,967.6	4,981.8	4,981.0	14.0	10.6	-137.30	262.0	275.5	556.2	533.1	23.05	24.131	
5,100.0	5,066.6	5,076.5	5,075.7	14.4	10.9	-138.42	261.1	273.7	566.1	542.6	23.52	24.071	
5,129.4	5,095.7	5,104.5	5,103.7	14.5	10.9	-138.73	261.0	273.3	569.2	545.5	23.66	24.060	
5,200.0	5,165.7	5,172.6	5,171.8	14.7	11.1	-139.50	260.9	272.2	576.2	552.2	23.99	24.016	
5,300.0	5,265.2	5,270.5	5,269.7	14.9	11.3	-140.35	261.1	270.9	584.3	559.9	24.39	23.954	
5,400.0	5,365.0	5,367.9	5,367.1	15.1	11.5	-140.84	261.7	270.5	590.1	565.3	24.75	23.845	
5,500.0	5,464.9	5,468.5	5,467.6	15.3	11.7	-141.10	262.7	269.8	593.4	568.4	25.08	23.666	
5,535.1	5,500.0	5,504.1	5,503.3	15.3	11.7	-13.71	262.9	269.7	593.9	568.7	25.19	23.578	
5,600.0	5,564.9	5,566.1	5,565.2	15.4	11.8	-13.72	263.6	269.5	594.6	569.2	25.41	23.403	
5,700.0	5,664.9	5,667.8	5,667.0	15.6	12.0	-13.78	264.7	268.7	595.9	570.1	25.78	23.117	
5,800.0	5,764.9	5,768.4	5,767.6	15.8	12.3	-13.85	265.4	267.7	596.7	570.6	26.18	22.793	
5,900.0	5,864.9	5,871.4	5,870.6	15.9	12.5	-13.99	265.8	266.0	597.5	570.9	26.61	22.455	
6,000.0	5,964.9	5,969.4	5,968.5	16.1	12.8	-14.12	265.8	264.6	597.9	570.9	27.03	22.119	
6,100.0	6,064.9	6,068.5	6,067.6	16.2	13.0	-14.26	266.4	263.1	598.8	571.4	27.46	21.811	
6,200.0	6,164.9	6,172.4	6,171.4	16.4	13.3	-14.44	266.6	261.1	599.5	571.6	27.90	21.490	
6,300.0	6,264.9	6,272.2	6,271.3	16.6	13.5	-14.58	266.3	259.6	599.6	571.3	28.33	21.164	
6,400.0	6,364.9	6,370.9	6,369.9	16.7	13.8	-14.71	266.4	258.2	600.0	571.3	28.77	20.858	
6,498.5	6,463.5	6,469.8	6,468.8	16.9	14.0	-14.89	266.4	256.2	600.5	571.3	29.20	20.565	
6,500.0	6,464.9	6,471.3	6,470.3	16.9	14.0	-14.89	266.4	256.2	600.5	571.3	29.21	20.562	
6,550.0	6,514.9	6,522.7	6,521.7	17.0	14.2	-15.07	266.2	255.0	599.0	569.7	29.31	20.437	
6,600.0	6,564.6	6,575.0	6,574.0	17.0	14.3	-15.42	265.9	253.8	594.2	564.9	29.29	20.286	
6,650.0	6,613.9	6,625.3	6,624.3	17.1	14.4	-15.93	265.4	252.6	586.1	556.9	29.14	20.112	
6,700.0	6,662.6	6,673.6	6,672.6	17.1	14.6	-16.61	264.9	251.6	574.9	546.0	28.86	19.917	
6,750.0	6,710.4	6,721.7	6,720.7	17.1	14.7	-17.48	264.4	250.5	560.7	532.2	28.47	19.694	
6,800.0	6,757.2	6,769.5	6,768.5	17.1	14.8	-18.63	263.8	249.3	543.5	515.6	27.97	19.431	
6,850.0	6,802.7	6,815.3	6,814.2	17.1	14.9	-20.08	263.1	248.1	523.5	496.1	27.38	19.118	
6,900.0	6,846.7	6,858.4	6,857.3	17.1	15.0	-21.85	262.4	246.8	500.8	474.1	26.72	18.740	
6,950.0	6,889.1	6,900.0	6,898.9	17.1	15.1	-24.04	261.8	245.6	475.7	449.6	26.04	18.265	
7,000.0	6,929.7	6,939.4	6,938.3	17.1	15.2	-26.74	261.2	244.5	448.3	422.9	25.40	17.649	
7,050.0	6,968.3	6,976.9	6,975.8	17.1	15.3	-30.08	260.7	243.3	419.0	394.1	24.89	16.833	
7,100.0	7,004.7	7,012.5	7,011.3	17.0	15.4	-34.23	260.2	242.0	387.9	363.3	24.64	15.747	
7,150.0	7,038.8	7,046.1	7,044.9	17.0	15.5	-39.33	259.8	240.9	355.5	330.8	24.79	14.344	
7,200.0	7,070.4	7,077.2	7,076.0	17.0	15.6	-45.47	259.4	239.8	322.3	296.8	25.46	12.656	
7,250.0	7,099.5	7,105.7	7,104.5	17.0	15.7	-52.62	259.0	238.8	288.9	262.2	26.68	10.826	
7,300.0	7,125.8	7,131.5	7,130.2	17.0	15.7	-60.54	258.7	237.9	256.3	228.0	28.28	9.065	
7,350.0	7,149.3	7,154.4	7,153.1	16.9	15.8	-68.69	258.4	237.1	226.1	196.2	29.92	7.557	
7,400.0	7,169.8	7,174.3	7,173.0	17.0	15.8	-76.37	258.1	236.4	200.4	169.1	31.30	6.405	
7,450.0	7,187.3	7,191.2	7,189.9	17.1	15.9	-82.88	257.9	235.8	182.4	150.1	32.28	5.651	
7,500.0	7,201.8	7,205.0	7,203.7	17.4	15.9	-87.73	257.7	235.3	175.3	142.4	32.92	5.326	
7,502.6	7,202.4	7,205.6	7,204.3	17.4	15.9	-87.93	257.7	235.3	175.3	142.4	32.95	5.321	CC, ES, SF
7,550.0	7,213.0	7,215.6	7,214.3	17.8	15.9	-90.67	257.6	234.9	181.3	147.9	33.40	5.428	
7,600.0	7,221.1	7,223.0	7,221.7	18.2	16.0	-91.56	257.5	234.7	199.6	165.7	33.85	5.896	
7,650.0	7,225.9	7,227.2	7,225.8	18.7	16.0	-90.36	257.4	234.5	227.5	193.2	34.31	6.632	
7,700.0	7,227.4	7,228.1	7,226.7	19.2	16.0	-87.05	257.4	234.5	262.1	227.4	34.68	7.556	
7,708.7	7,227.3	7,227.9	7,226.5	19.3	16.0	-86.27	257.4	234.5	268.5	233.8	34.72	7.733	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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

Survey Program: 100-NS-GYRO-MS

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,800.0	7,226.1	7,225.5	7,224.1	20.3	16.0	-85.49	257.5	234.6	342.7	307.0	35.65	9.612	
7,900.0	7,224.8	7,222.9	7,221.5	21.5	16.0	-84.64	257.5	234.7	431.5	394.7	36.78	11.732	
8,000.0	7,223.5	7,220.2	7,218.9	22.8	16.0	-83.79	257.5	234.8	524.3	486.3	37.99	13.801	
8,100.0	7,222.2	7,217.6	7,216.3	24.2	15.9	-82.94	257.6	234.8	619.4	580.1	39.28	15.770	
8,200.0	7,220.8	7,215.0	7,213.6	25.7	15.9	-82.09	257.6	234.9	715.8	675.2	40.62	17.621	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-143.08	-621.5	-467.0	778.7				
100.0	100.0	56.0	56.0	0.1	0.1	-143.08	-621.5	-467.0	777.4	777.2	0.22	3,566.001	
154.0	154.0	110.0	110.0	0.2	0.2	-143.07	-621.5	-467.1	777.4	777.0	0.46	1,693.123	
200.0	200.0	154.9	154.9	0.3	0.3	-143.07	-621.5	-467.1	777.4	776.8	0.66	1,179.931	
300.0	300.0	253.2	253.2	0.6	0.5	-143.05	-621.5	-467.6	777.8	776.7	1.09	714.297	
400.0	400.0	353.1	353.1	0.8	0.7	-143.03	-621.7	-467.9	778.1	776.6	1.52	513.076	
500.0	500.0	451.8	451.8	1.0	0.9	-143.00	-621.8	-468.6	778.6	776.6	1.95	399.993	
600.0	600.0	552.9	552.9	1.2	1.1	-142.94	-621.7	-469.5	779.1	776.7	2.38	326.907	
700.0	700.0	655.4	655.4	1.5	1.4	-142.86	-621.2	-470.4	779.2	776.4	2.83	275.686	
800.0	800.0	753.3	753.3	1.7	1.6	-142.77	-620.6	-471.6	779.5	776.2	3.26	239.278	
900.0	900.0	854.0	854.0	1.9	1.8	-142.69	-620.3	-472.6	779.8	776.1	3.69	211.274	
1,000.0	1,000.0	956.0	956.0	2.1	2.0	-142.60	-619.6	-473.7	779.9	775.8	4.13	188.952	
1,100.0	1,100.0	1,055.2	1,055.2	2.4	2.2	-142.54	-619.1	-474.3	779.9	775.4	4.56	171.219	
1,200.0	1,200.0	1,153.9	1,153.8	2.6	2.4	-142.50	-618.9	-474.9	780.1	775.2	4.99	156.439	
1,300.0	1,300.0	1,264.1	1,264.0	2.8	2.6	-142.45	-618.6	-475.5	780.3	774.9	5.44	143.337	
1,400.0	1,400.0	1,410.1	1,409.9	3.0	2.9	-142.48	-614.3	-471.7	776.4	770.4	5.98	129.890	
1,500.0	1,500.0	1,543.6	1,542.8	3.2	3.2	90.16	-606.0	-461.7	766.7	760.3	6.47	118.588	
1,600.0	1,599.9	1,657.4	1,655.6	3.4	3.5	90.31	-597.9	-449.3	754.5	747.6	6.89	109.426	
1,700.0	1,699.7	1,766.1	1,763.0	3.6	3.8	90.54	-590.2	-434.7	740.7	733.4	7.33	101.056	
1,800.0	1,799.3	1,881.1	1,876.2	3.8	4.1	90.90	-581.3	-416.4	724.8	717.0	7.80	92.911	
1,900.0	1,898.6	1,979.0	1,972.4	4.0	4.4	91.47	-573.0	-400.3	708.2	699.9	8.25	85.845	
1,940.8	1,939.0	2,019.1	2,011.8	4.1	4.5	91.76	-569.7	-393.7	701.5	693.1	8.44	83.130	
2,000.0	1,997.6	2,083.7	2,075.3	4.3	4.7	92.09	-564.3	-382.7	691.6	682.8	8.74	79.145	
2,100.0	2,096.6	2,167.9	2,158.0	4.6	5.0	92.56	-557.3	-368.8	675.2	666.0	9.19	73.446	
2,200.0	2,195.6	2,265.0	2,253.7	4.8	5.3	93.13	-550.3	-353.7	660.3	650.6	9.69	68.145	
2,300.0	2,294.6	2,357.3	2,344.7	5.1	5.6	93.72	-543.7	-339.9	645.9	635.7	10.19	63.408	
2,400.0	2,393.6	2,450.5	2,436.8	5.4	5.9	94.40	-537.5	-327.0	632.7	622.0	10.69	59.174	
2,500.0	2,492.6	2,545.4	2,530.6	5.7	6.2	95.11	-531.5	-314.0	619.9	608.7	11.21	55.313	
2,600.0	2,591.6	2,635.3	2,619.6	6.0	6.5	95.75	-527.4	-302.4	609.1	597.4	11.72	51.970	
2,700.0	2,690.6	2,749.2	2,732.3	6.3	6.8	96.52	-521.9	-286.4	597.4	585.1	12.30	48.569	
2,800.0	2,789.6	2,862.4	2,843.9	6.6	7.2	97.28	-514.8	-268.3	583.3	570.4	12.88	45.292	
2,900.0	2,888.6	2,966.6	2,946.1	6.9	7.6	98.00	-506.8	-250.1	567.4	553.9	13.46	42.166	
3,000.0	2,987.6	3,055.5	3,033.5	7.3	7.9	98.66	-500.4	-235.0	552.1	538.2	13.99	39.480	
3,100.0	3,086.6	3,148.5	3,125.1	7.6	8.2	99.41	-494.6	-220.4	538.6	524.1	14.52	37.091	
3,200.0	3,185.6	3,244.9	3,220.3	7.9	8.6	100.39	-487.6	-206.6	525.5	510.5	15.06	34.901	
3,300.0	3,284.6	3,340.1	3,314.3	8.2	8.9	101.33	-481.9	-193.1	513.6	498.0	15.59	32.940	
3,400.0	3,383.6	3,439.1	3,412.2	8.6	9.2	102.45	-475.3	-179.9	501.9	485.8	16.13	31.120	
3,500.0	3,482.6	3,538.5	3,510.5	8.9	9.5	103.69	-468.4	-166.8	490.4	473.7	16.66	29.430	
3,600.0	3,581.6	3,650.7	3,621.1	9.2	9.9	104.89	-461.2	-149.5	477.8	460.5	17.24	27.704	
3,700.0	3,680.6	3,755.5	3,723.9	9.6	10.3	105.78	-454.8	-129.7	462.7	444.8	17.82	25.967	
3,800.0	3,779.6	3,850.5	3,817.0	9.9	10.7	106.68	-448.9	-112.1	447.9	429.6	18.36	24.396	
3,900.0	3,878.6	3,944.6	3,909.5	10.3	11.0	107.68	-443.2	-95.5	434.1	415.2	18.89	22.978	
4,000.0	3,977.6	4,046.2	4,009.4	10.6	11.4	108.90	-436.9	-78.4	421.0	401.6	19.44	21.662	
4,100.0	4,076.6	4,142.0	4,103.6	10.9	11.8	110.15	-430.6	-62.1	407.8	387.9	19.96	20.431	
4,200.0	4,175.6	4,233.9	4,194.2	11.3	12.1	111.49	-424.9	-47.7	396.1	375.7	20.47	19.354	
4,300.0	4,274.6	4,318.7	4,278.1	11.6	12.4	112.81	-420.6	-36.4	387.3	366.4	20.95	18.487	
4,400.0	4,373.6	4,406.6	4,365.5	12.0	12.6	114.23	-417.6	-27.1	382.0	360.6	21.43	17.827	
4,500.0	4,472.6	4,493.6	4,452.2	12.3	12.8	115.72	-415.5	-20.6	380.2	358.3	21.90	17.363	
4,503.1	4,475.7	4,496.4	4,455.0	12.3	12.8	115.77	-415.4	-20.4	380.2	358.3	21.91	17.351	CC, ES
4,600.0	4,571.6	4,582.7	4,541.1	12.7	13.0	117.32	-414.1	-16.4	381.6	359.3	22.35	17.071	
4,700.0	4,670.6	4,673.0	4,631.4	13.0	13.2	118.98	-413.4	-14.5	386.0	363.2	22.81	16.924	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,769.6	4,769.7	4,728.2	13.3	13.3	120.77	-412.8	-13.8	392.2	368.9	23.27	16.855	
4,900.0	4,868.6	4,867.5	4,826.0	13.7	13.5	122.53	-412.3	-13.5	399.2	375.4	23.73	16.821	
5,000.0	4,967.6	4,964.6	4,923.1	14.0	13.6	124.18	-412.1	-13.4	406.8	382.6	24.19	16.820	
5,100.0	5,066.6	5,062.8	5,021.3	14.4	13.8	125.73	-412.4	-13.5	415.2	390.6	24.65	16.848	
5,129.4	5,095.7	5,091.7	5,050.2	14.5	13.8	126.18	-412.5	-13.6	417.8	393.0	24.78	16.859	
5,200.0	5,165.7	5,160.4	5,118.9	14.7	14.0	127.24	-412.7	-14.0	423.6	398.6	25.07	16.898	
5,300.0	5,265.2	5,258.9	5,217.4	14.9	14.1	128.36	-413.0	-14.6	430.5	405.1	25.43	16.929	
5,400.0	5,365.0	5,356.0	5,314.5	15.1	14.3	129.04	-413.7	-15.7	435.8	410.0	25.77	16.911	
5,500.0	5,464.9	5,456.1	5,414.6	15.3	14.4	129.36	-414.3	-17.1	439.2	413.1	26.10	16.828	
5,535.1	5,500.0	5,491.3	5,449.7	15.3	14.5	-103.21	-414.5	-17.6	439.8	413.6	26.21	16.781	
5,600.0	5,564.9	5,556.3	5,514.7	15.4	14.6	-103.21	-414.7	-18.5	440.7	414.3	26.44	16.666	
5,700.0	5,664.9	5,657.5	5,616.0	15.6	14.7	-103.20	-415.0	-19.8	442.0	415.2	26.81	16.490	
5,800.0	5,764.9	5,757.6	5,716.0	15.8	14.9	-103.19	-415.1	-20.9	443.1	415.9	27.17	16.310	
5,900.0	5,864.9	5,857.1	5,815.5	15.9	15.0	-103.16	-415.2	-22.0	444.3	416.7	27.53	16.138	
6,000.0	5,964.9	5,956.3	5,914.7	16.1	15.2	-103.11	-415.0	-23.5	445.6	417.8	27.90	15.975	
6,100.0	6,064.9	6,057.2	6,015.6	16.2	15.3	-103.01	-414.6	-24.8	446.9	418.6	28.27	15.810	
6,200.0	6,164.9	6,158.5	6,116.9	16.4	15.5	-102.88	-413.8	-26.2	448.0	419.4	28.64	15.644	
6,300.0	6,264.9	6,258.3	6,216.7	16.6	15.7	-102.68	-412.5	-27.3	448.8	419.8	29.01	15.473	
6,400.0	6,364.9	6,357.8	6,316.1	16.7	15.8	-102.41	-410.7	-28.8	449.9	420.5	29.38	15.312	
6,498.5	6,463.5	6,456.1	6,414.4	16.9	16.0	-102.13	-408.7	-30.3	451.0	421.2	29.75	15.159	
6,500.0	6,464.9	6,457.6	6,415.9	16.9	16.0	-102.12	-408.7	-30.4	451.0	421.2	29.76	15.156	
6,550.0	6,514.9	6,508.5	6,466.8	17.0	16.1	-102.10	-407.5	-31.1	451.9	421.9	29.96	15.082	
6,600.0	6,564.6	6,557.3	6,515.6	17.0	16.2	-102.42	-406.3	-31.9	453.4	423.2	30.14	15.042 SF	
6,650.0	6,613.9	6,605.0	6,563.2	17.1	16.3	-103.05	-405.3	-32.8	455.9	425.6	30.30	15.046	
6,700.0	6,662.6	6,651.8	6,610.0	17.1	16.4	-104.06	-405.2	-33.5	459.5	429.0	30.44	15.095	
6,750.0	6,710.4	6,690.0	6,648.2	17.1	16.4	-105.23	-407.2	-34.1	464.8	434.3	30.53	15.226	
6,800.0	6,757.2	6,722.6	6,680.5	17.1	16.4	-106.43	-411.1	-34.6	472.7	442.2	30.57	15.466	
6,850.0	6,802.7	6,754.9	6,712.3	17.1	16.5	-107.77	-417.0	-35.3	483.9	453.4	30.57	15.828	
6,900.0	6,846.7	6,793.0	6,749.4	17.1	16.5	-109.61	-425.6	-35.6	497.9	467.4	30.55	16.297	
6,950.0	6,889.1	6,826.1	6,781.3	17.1	16.5	-111.10	-434.4	-35.2	515.0	484.5	30.48	16.895	
7,000.0	6,929.7	6,854.3	6,808.2	17.1	16.6	-112.07	-442.7	-34.4	535.3	505.0	30.37	17.627	
7,050.0	6,968.3	6,877.8	6,830.4	17.1	16.6	-112.44	-450.4	-33.4	559.2	529.0	30.26	18.483	
7,100.0	7,004.7	6,897.0	6,848.4	17.0	16.6	-112.11	-457.0	-32.3	586.5	556.3	30.17	19.439	
7,150.0	7,038.8	6,912.2	6,862.5	17.0	16.6	-111.04	-462.5	-31.4	617.1	586.9	30.16	20.460	
7,200.0	7,070.4	6,923.7	6,873.2	17.0	16.6	-109.15	-466.9	-30.6	650.5	620.3	30.25	21.502	
7,250.0	7,099.5	6,957.0	6,903.6	17.0	16.7	-109.39	-480.2	-27.9	687.2	656.9	30.29	22.689	
7,300.0	7,125.8	6,957.0	6,903.6	17.0	16.7	-105.22	-480.2	-27.9	725.1	694.4	30.67	23.641	
7,350.0	7,149.3	6,957.0	6,903.6	16.9	16.7	-100.39	-480.2	-27.9	764.9	733.8	31.11	24.592	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-141.49	-621.9	-494.9	796.1				
100.0	100.0	57.2	57.2	0.1	0.1	-141.49	-621.8	-494.9	794.7	794.5	0.22	3,590.256	
200.0	200.0	159.3	159.3	0.3	0.3	-141.48	-621.4	-494.6	794.2	793.5	0.67	1,193.056	
300.0	300.0	258.0	258.0	0.6	0.5	-141.47	-621.0	-494.4	793.8	792.7	1.09	727.530	
400.0	400.0	358.2	358.2	0.8	0.7	-141.48	-620.8	-494.1	793.4	791.9	1.52	521.476	
500.0	500.0	458.0	458.0	1.0	0.9	-141.48	-620.4	-493.9	793.0	791.1	1.96	405.623	
600.0	600.0	558.4	558.4	1.2	1.2	-141.48	-620.1	-493.6	792.6	790.2	2.39	331.623	
700.0	700.0	657.2	657.2	1.5	1.4	-141.48	-619.8	-493.4	792.2	789.4	2.82	280.818	
800.0	800.0	757.4	757.4	1.7	1.6	-141.51	-619.9	-492.9	792.0	788.7	3.26	243.296	
900.0	900.0	856.6	856.6	1.9	1.8	-141.50	-619.5	-492.8	791.6	787.9	3.69	214.649	
936.8	936.8	891.8	891.8	2.0	1.9	-141.49	-619.4	-492.9	791.6	787.8	3.84	205.889	
1,000.0	1,000.0	952.3	952.3	2.1	2.0	-141.47	-619.3	-493.2	791.7	787.6	4.11	192.430	
1,100.0	1,100.0	1,097.1	1,097.0	2.4	2.3	-141.39	-616.7	-492.5	790.3	785.7	4.65	170.136	
1,200.0	1,200.0	1,229.6	1,229.1	2.6	2.6	-141.02	-606.1	-490.4	783.1	778.0	5.17	151.608	
1,300.0	1,300.0	1,348.2	1,346.5	2.8	2.9	-140.18	-589.4	-491.4	772.8	767.1	5.70	135.626	
1,400.0	1,400.0	1,470.5	1,466.8	3.0	3.3	-139.06	-567.5	-492.2	759.5	753.2	6.30	120.629	
1,500.0	1,500.0	1,585.0	1,578.8	3.2	3.6	95.06	-543.8	-491.6	743.5	736.8	6.72	110.658	
1,600.0	1,599.9	1,670.0	1,661.9	3.4	3.9	96.50	-525.8	-491.3	728.0	720.9	7.15	101.829	
1,700.0	1,699.7	1,767.3	1,757.1	3.6	4.2	98.33	-506.0	-491.7	714.4	706.8	7.63	93.687	
1,800.0	1,799.3	1,863.5	1,851.4	3.8	4.6	100.32	-486.9	-491.1	701.5	693.4	8.13	86.322	
1,900.0	1,898.6	1,948.7	1,935.2	4.0	4.8	102.23	-471.3	-490.9	691.1	682.5	8.61	80.244	
1,940.8	1,939.0	1,988.7	1,974.6	4.1	5.0	103.14	-464.5	-490.6	687.5	678.6	8.83	77.832	
2,000.0	1,997.6	2,042.0	2,027.2	4.3	5.2	104.28	-455.7	-490.0	682.6	673.5	9.14	74.666	
2,100.0	2,096.6	2,128.5	2,112.6	4.6	5.4	106.11	-442.5	-489.5	676.3	666.7	9.67	69.976	
2,200.0	2,195.6	2,216.3	2,199.5	4.8	5.7	108.00	-429.8	-489.9	672.2	662.0	10.21	65.870	
2,300.0	2,294.6	2,301.7	2,284.3	5.1	5.9	109.74	-419.3	-490.6	670.5	659.8	10.73	62.480	
2,316.1	2,310.6	2,315.5	2,297.9	5.2	6.0	110.00	-417.9	-490.7	670.5	659.7	10.81	61.998	CC, ES
2,400.0	2,393.6	2,387.2	2,369.4	5.4	6.2	111.29	-411.6	-491.3	671.3	660.1	11.25	59.700	
2,500.0	2,492.6	2,473.5	2,455.6	5.7	6.4	112.64	-406.7	-492.1	674.5	662.8	11.75	57.407	
2,600.0	2,591.6	2,563.3	2,545.3	6.0	6.5	113.84	-404.4	-493.0	679.8	667.5	12.23	55.562	
2,700.0	2,690.6	2,663.5	2,645.6	6.3	6.7	114.97	-403.9	-493.6	686.0	673.2	12.73	53.905	
2,800.0	2,789.6	2,763.5	2,745.5	6.6	6.9	116.14	-402.6	-494.0	691.9	678.7	13.22	52.345	
2,900.0	2,888.6	2,860.9	2,842.9	6.9	7.1	117.24	-401.8	-494.4	698.3	684.6	13.71	50.950	
3,000.0	2,987.6	2,957.0	2,939.0	7.3	7.3	118.22	-401.9	-494.7	705.2	691.1	14.18	49.722	
3,100.0	3,086.6	3,057.3	3,039.3	7.6	7.4	119.21	-402.2	-495.1	712.6	697.9	14.67	48.583	
3,200.0	3,185.6	3,162.0	3,144.0	7.9	7.6	120.14	-403.4	-494.5	719.5	704.4	15.15	47.488	
3,300.0	3,284.6	3,262.1	3,244.1	8.2	7.8	120.95	-405.0	-493.2	726.1	710.4	15.62	46.477	
3,400.0	3,383.6	3,351.6	3,333.6	8.6	7.9	121.66	-406.7	-492.4	733.3	717.3	16.08	45.615	
3,500.0	3,482.6	3,440.6	3,422.5	8.9	8.1	122.34	-408.8	-492.9	742.3	725.8	16.53	44.901	
3,600.0	3,581.6	3,547.0	3,528.9	9.2	8.3	123.17	-411.2	-494.1	751.8	734.8	17.02	44.182	
3,700.0	3,680.6	3,656.1	3,638.0	9.6	8.5	124.03	-412.8	-493.8	759.9	742.3	17.50	43.411	
3,800.0	3,779.6	3,756.5	3,738.3	9.9	8.6	124.83	-413.6	-493.1	767.5	749.5	17.98	42.680	
3,900.0	3,878.6	3,856.7	3,838.6	10.3	8.8	125.65	-414.0	-492.4	775.1	756.7	18.46	41.994	
4,000.0	3,977.6	3,950.6	3,932.5	10.6	9.0	126.43	-414.0	-492.0	783.0	764.1	18.93	41.375	
4,100.0	4,076.6	4,049.0	4,030.9	10.9	9.2	127.23	-414.3	-492.1	791.7	772.3	19.40	40.807	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-144.90	-620.8	-436.3	760.0				
100.0	100.0	56.3	56.3	0.1	0.1	-144.91	-620.8	-436.2	758.8	758.6	0.22	3,449.718	
200.0	200.0	154.4	154.4	0.3	0.3	-144.93	-621.2	-436.1	759.0	758.3	0.66	1,152.331	
300.0	300.0	252.7	252.7	0.6	0.5	-144.94	-621.6	-436.3	759.5	758.4	1.09	698.044	
400.0	400.0	351.9	351.9	0.8	0.7	-144.95	-622.2	-436.5	760.1	758.6	1.52	499.549	
500.0	500.0	451.8	451.8	1.0	0.9	-144.96	-622.8	-436.8	760.8	758.8	1.96	389.039	
600.0	600.0	550.9	550.9	1.2	1.2	-144.96	-623.4	-437.2	761.5	759.1	2.39	318.806	
700.0	700.0	649.7	649.7	1.5	1.4	-144.97	-624.3	-437.6	762.4	759.6	2.82	270.216	
800.0	800.0	749.7	749.6	1.7	1.6	-144.97	-625.0	-438.2	763.3	760.1	3.26	234.458	
900.0	900.0	848.9	848.9	1.9	1.8	-144.95	-625.7	-439.0	764.4	760.7	3.69	207.216	
1,000.0	1,000.0	951.5	951.5	2.1	2.0	-144.95	-626.5	-439.5	765.3	761.2	4.13	185.513	
1,100.0	1,100.0	1,053.7	1,053.7	2.4	2.2	-144.95	-627.0	-439.8	765.9	761.3	4.56	168.013	
1,200.0	1,200.0	1,182.0	1,182.0	2.6	2.5	-145.08	-626.4	-437.3	764.4	759.3	5.05	151.378	
1,300.0	1,300.0	1,303.3	1,303.0	2.8	2.7	-145.47	-624.7	-429.8	759.6	754.1	5.53	137.321	
1,400.0	1,400.0	1,421.2	1,420.3	3.0	3.0	-146.04	-621.8	-418.9	752.4	746.4	6.01	125.168	
1,500.0	1,500.0	1,539.1	1,537.3	3.2	3.3	86.07	-617.8	-404.5	742.7	736.2	6.50	114.294	
1,600.0	1,599.9	1,645.3	1,642.3	3.4	3.6	85.83	-612.8	-389.9	730.8	723.9	6.94	105.318	
1,700.0	1,699.7	1,750.1	1,745.9	3.6	3.8	85.77	-607.7	-374.8	718.4	711.0	7.39	97.191	
1,800.0	1,799.3	1,854.3	1,848.6	3.8	4.2	85.79	-602.8	-357.7	704.9	697.0	7.88	89.507	
1,900.0	1,898.6	1,955.2	1,947.8	4.0	4.5	85.96	-598.4	-340.1	690.8	682.5	8.37	82.585	
1,940.8	1,939.0	1,998.9	1,990.8	4.1	4.6	86.08	-596.5	-332.1	684.8	676.3	8.58	79.815	
2,000.0	1,997.6	2,063.7	2,054.4	4.3	4.8	86.12	-593.4	-319.9	675.7	666.8	8.92	75.793	
2,100.0	2,096.6	2,162.7	2,151.2	4.6	5.2	86.15	-588.3	-300.4	659.6	650.1	9.47	69.663	
2,200.0	2,195.6	2,260.9	2,247.3	4.8	5.6	86.11	-583.9	-280.6	643.8	633.8	10.04	64.124	
2,300.0	2,294.6	2,362.8	2,347.0	5.1	6.0	86.04	-579.3	-259.7	627.8	617.1	10.64	58.978	
2,400.0	2,393.6	2,463.2	2,445.1	5.4	6.4	86.00	-574.2	-239.0	611.2	600.0	11.25	54.342	
2,500.0	2,492.6	2,556.9	2,536.8	5.7	6.7	86.04	-569.1	-220.6	594.9	583.1	11.82	50.326	
2,600.0	2,591.6	2,651.5	2,629.6	6.0	7.1	86.07	-565.0	-202.4	579.7	567.3	12.41	46.714	
2,700.0	2,690.6	2,750.9	2,727.0	6.3	7.4	86.11	-560.6	-183.4	564.5	551.5	13.02	43.344	
2,800.0	2,789.6	2,850.9	2,825.1	6.6	7.8	86.18	-556.1	-164.4	549.3	535.7	13.64	40.262	
2,900.0	2,888.6	2,951.0	2,923.2	6.9	8.2	86.21	-551.4	-145.0	533.8	519.5	14.28	37.371	
3,000.0	2,987.6	3,046.7	3,017.0	7.3	8.6	86.21	-547.3	-126.2	518.4	503.5	14.91	34.777	
3,100.0	3,086.6	3,138.5	3,107.2	7.6	8.9	86.35	-543.6	-109.8	504.2	488.7	15.50	32.532	
3,200.0	3,185.6	3,239.3	3,206.3	7.9	9.3	86.54	-539.7	-92.2	490.4	474.3	16.12	30.414	
3,300.0	3,284.6	3,339.9	3,305.4	8.2	9.7	86.83	-535.1	-75.1	476.3	459.5	16.75	28.440	
3,400.0	3,383.6	3,437.1	3,401.2	8.6	10.0	87.27	-529.9	-59.4	462.0	444.7	17.34	26.643	
3,500.0	3,482.6	3,536.3	3,499.0	8.9	10.4	87.78	-524.9	-43.8	448.2	430.3	17.93	24.991	
3,600.0	3,581.6	3,629.9	3,591.3	9.2	10.7	88.23	-520.6	-28.9	434.8	416.3	18.52	23.476	
3,700.0	3,680.6	3,724.1	3,684.2	9.6	11.0	88.60	-517.8	-13.9	422.7	403.6	19.11	22.114	
3,800.0	3,779.6	3,817.5	3,776.5	9.9	11.3	88.91	-516.5	0.5	412.1	392.4	19.71	20.904	
3,900.0	3,878.6	3,926.2	3,883.8	10.3	11.7	89.15	-515.1	18.4	401.1	380.7	20.38	19.682	
4,000.0	3,977.6	4,034.8	3,990.3	10.6	12.2	89.11	-512.4	39.6	387.3	366.2	21.09	18.364	
4,100.0	4,076.6	4,138.8	4,091.9	10.9	12.6	89.00	-508.8	61.2	371.9	350.1	21.79	17.064	
4,200.0	4,175.6	4,239.1	4,189.8	11.3	13.1	88.87	-504.6	82.6	355.5	333.0	22.49	15.806	
4,300.0	4,274.6	4,339.5	4,287.6	11.6	13.5	88.71	-500.0	104.4	338.8	315.6	23.20	14.603	
4,400.0	4,373.6	4,438.9	4,384.6	12.0	13.9	88.71	-494.6	125.5	321.5	297.7	23.87	13.469	
4,500.0	4,472.6	4,537.0	4,480.5	12.3	14.3	88.84	-488.8	145.8	304.3	279.8	24.52	12.410	
4,600.0	4,571.6	4,635.3	4,576.5	12.7	14.8	89.06	-482.9	165.7	287.2	262.0	25.16	11.413	
4,700.0	4,670.6	4,732.9	4,671.9	13.0	15.2	89.29	-477.2	185.5	270.2	244.4	25.80	10.473	
4,800.0	4,769.6	4,831.2	4,768.1	13.3	15.6	89.55	-471.7	205.3	253.5	227.1	26.44	9.589	
4,900.0	4,868.6	4,929.7	4,864.5	13.7	16.0	89.91	-466.1	224.8	236.9	209.8	27.07	8.753	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,967.6	5,028.2	4,960.9	14.0	16.4	90.43	-460.2	244.1	220.3	192.6	27.67	7.961	
5,100.0	5,066.6	5,125.5	5,056.2	14.4	16.8	91.16	-454.3	262.6	204.0	175.7	28.25	7.218	
5,129.4	5,095.7	5,153.7	5,083.9	14.5	16.9	91.44	-452.6	267.7	199.3	170.9	28.42	7.015	
5,200.0	5,165.7	5,221.2	5,150.2	14.7	17.1	91.72	-449.0	279.6	188.8	160.0	28.80	6.558	
5,300.0	5,265.2	5,318.9	5,246.4	14.9	17.5	91.04	-445.1	296.7	175.0	145.6	29.38	5.956	
5,400.0	5,365.0	5,419.1	5,344.8	15.1	17.9	88.89	-441.2	314.5	161.0	130.9	30.08	5.353	
5,500.0	5,464.9	5,518.4	5,442.5	15.3	18.3	85.16	-436.3	332.4	146.6	115.7	30.90	4.745	
5,535.1	5,500.0	5,551.9	5,475.4	15.3	18.4	-149.04	-434.6	338.2	141.9	110.7	31.19	4.548	
5,600.0	5,564.9	5,614.8	5,537.5	15.4	18.6	-152.00	-431.5	348.1	134.0	102.3	31.73	4.223	
5,700.0	5,664.9	5,713.7	5,635.0	15.6	19.0	-157.34	-426.6	363.5	122.8	90.2	32.58	3.768	
5,800.0	5,764.9	5,811.9	5,731.9	15.8	19.3	-163.67	-422.0	378.9	113.0	79.5	33.42	3.380	
5,900.0	5,864.9	5,909.7	5,828.7	15.9	19.7	-169.87	-417.4	392.1	105.3	71.1	34.11	3.086	
6,000.0	5,964.9	6,008.3	5,926.6	16.1	19.9	-175.47	-413.4	402.7	99.9	65.2	34.65	2.882	
6,100.0	6,064.9	6,107.0	6,024.9	16.2	20.2	179.71	-409.9	411.0	96.0	60.9	35.08	2.736	
6,200.0	6,164.9	6,206.4	6,124.1	16.4	20.4	175.54	-407.0	417.8	93.3	57.9	35.41	2.635	
6,300.0	6,264.9	6,306.0	6,223.5	16.6	20.6	172.10	-404.4	423.1	91.3	55.6	35.72	2.556	
6,400.0	6,364.9	6,405.6	6,322.9	16.7	20.8	169.26	-402.3	427.3	89.9	53.9	35.99	2.498	
6,498.5	6,463.5	6,503.7	6,421.0	16.9	21.0	167.23	-400.9	430.2	89.1	52.8	36.27	2.457	
6,500.0	6,464.9	6,505.2	6,422.5	16.9	21.0	167.21	-400.9	430.3	89.1	52.8	36.27	2.457	
6,503.1	6,468.0	6,508.2	6,425.5	16.9	21.0	167.16	-400.8	430.3	89.1	52.8	36.27	2.456	CC, ES, SF
6,550.0	6,514.9	6,554.7	6,472.0	17.0	21.1	166.62	-400.4	431.5	90.6	54.3	36.29	2.495	
6,600.0	6,564.6	6,603.8	6,521.0	17.0	21.2	166.66	-400.3	432.4	95.5	59.4	36.19	2.640	
6,650.0	6,613.9	6,652.7	6,569.9	17.1	21.2	167.22	-400.6	433.1	104.0	68.0	35.97	2.892	
6,700.0	6,662.6	6,701.0	6,618.3	17.1	21.3	168.06	-401.0	433.6	115.7	80.1	35.60	3.251	
6,750.0	6,710.4	6,748.7	6,666.0	17.1	21.4	169.03	-401.5	434.0	130.6	95.5	35.08	3.723	
6,800.0	6,757.2	6,795.1	6,712.3	17.1	21.4	170.02	-401.9	434.2	148.6	114.1	34.41	4.317	
6,850.0	6,802.7	6,837.5	6,754.7	17.1	21.5	170.88	-402.8	434.4	170.0	136.4	33.58	5.062	
6,900.0	6,846.7	6,873.9	6,791.1	17.1	21.5	171.53	-404.2	434.5	195.2	162.6	32.58	5.991	
6,950.0	6,889.1	6,901.7	6,818.8	17.1	21.6	171.91	-406.8	434.6	225.4	193.9	31.44	7.169	
7,000.0	6,929.7	6,925.7	6,842.5	17.1	21.6	172.13	-410.3	434.7	260.0	229.9	30.15	8.624	
7,050.0	6,968.3	6,945.9	6,862.4	17.1	21.6	172.20	-414.2	434.7	298.5	269.7	28.74	10.386	
7,100.0	7,004.7	6,960.0	6,876.1	17.0	21.6	171.96	-417.4	434.7	340.0	312.8	27.21	12.498	
7,150.0	7,038.8	6,978.2	6,893.7	17.0	21.6	171.80	-422.0	434.5	383.9	358.4	25.57	15.013	
7,200.0	7,070.4	6,990.4	6,905.4	17.0	21.6	171.18	-425.4	434.3	429.8	405.9	23.87	18.009	
7,250.0	7,099.5	7,003.0	6,917.4	17.0	21.7	170.30	-429.1	433.9	477.1	455.0	22.11	21.581	
7,300.0	7,125.8	7,003.0	6,917.4	17.0	21.7	167.45	-429.1	433.9	525.6	505.1	20.45	25.703	
7,350.0	7,149.3	7,003.0	6,917.4	16.9	21.7	161.40	-429.1	433.9	574.9	555.5	19.38	29.666	
7,400.0	7,169.8	7,013.7	6,927.6	17.0	21.7	150.65	-432.4	433.6	624.5	604.3	20.18	30.937	
7,450.0	7,187.3	7,014.5	6,928.3	17.1	21.7	88.42	-432.7	433.6	674.4	641.5	32.86	20.523	
7,500.0	7,201.8	7,003.0	6,917.4	17.4	21.7	22.03	-429.1	433.9	724.5	705.5	18.96	38.221	
7,550.0	7,213.0	7,003.0	6,917.4	17.8	21.7	12.38	-429.1	433.9	774.2	759.4	14.77	52.412	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-146.88	-621.5	-405.5	743.3				
100.0	100.0	60.7	60.7	0.1	0.1	-146.87	-621.4	-405.6	742.1	741.9	0.23	3,237.878	
200.0	200.0	161.4	161.4	0.3	0.3	-146.79	-620.6	-406.2	741.7	741.0	0.68	1,097.387	
300.0	300.0	261.3	261.3	0.6	0.6	-146.68	-619.6	-407.3	741.5	740.4	1.11	665.980	
400.0	400.0	363.8	363.7	0.8	0.8	-146.56	-618.3	-408.3	741.0	739.4	1.56	476.388	
500.0	500.0	463.6	463.6	1.0	1.0	-146.41	-616.7	-409.6	740.3	738.3	2.00	370.544	
600.0	600.0	564.2	564.2	1.2	1.2	-146.24	-615.0	-411.0	739.7	737.3	2.44	303.410	
700.0	700.0	666.6	666.5	1.5	1.4	-146.10	-613.2	-412.1	738.8	736.0	2.87	257.026	
800.0	800.0	767.9	767.7	1.7	1.6	-145.96	-611.3	-412.9	737.7	734.4	3.31	222.672	
900.0	900.0	867.6	867.4	1.9	1.8	-145.83	-609.4	-413.6	736.5	732.8	3.75	196.468	
1,000.0	1,000.0	966.7	966.6	2.1	2.1	-145.69	-607.5	-414.5	735.4	731.3	4.18	175.900	
1,100.0	1,100.0	1,080.8	1,080.6	2.4	2.3	-145.59	-605.3	-414.6	734.0	729.3	4.64	158.050	
1,200.0	1,200.0	1,202.5	1,202.2	2.6	2.5	-145.84	-602.5	-408.8	729.4	724.3	5.13	142.175	
1,300.0	1,300.0	1,321.1	1,320.3	2.8	2.8	-146.35	-599.0	-398.8	722.2	716.6	5.61	128.673	
1,400.0	1,400.0	1,437.4	1,435.6	3.0	3.1	-147.09	-594.8	-385.0	712.6	706.5	6.10	116.798	
1,500.0	1,500.0	1,558.6	1,555.2	3.2	3.4	84.74	-589.2	-365.8	700.0	693.4	6.57	106.480	
1,600.0	1,599.9	1,666.1	1,660.6	3.4	3.8	84.16	-583.3	-346.0	685.2	678.2	7.04	97.324	
1,700.0	1,699.7	1,761.1	1,753.7	3.6	4.1	83.76	-578.6	-327.3	670.0	662.5	7.49	89.403	
1,800.0	1,799.3	1,867.4	1,857.4	3.8	4.5	83.33	-574.0	-304.7	654.3	646.3	8.02	81.628	
1,900.0	1,898.6	1,966.6	1,954.2	4.0	4.8	83.20	-568.6	-283.3	637.3	628.7	8.54	74.665	
1,940.8	1,939.0	2,002.6	1,989.3	4.1	5.0	83.21	-566.9	-275.6	630.5	621.8	8.74	72.172	
2,000.0	1,997.6	2,056.4	2,041.8	4.3	5.2	83.08	-564.8	-264.1	621.1	612.1	9.05	68.655	
2,100.0	2,096.6	2,148.0	2,131.2	4.6	5.5	82.78	-562.4	-244.3	606.1	596.6	9.60	63.172	
2,200.0	2,195.6	2,252.1	2,232.9	4.8	5.9	82.43	-560.0	-222.1	591.7	581.5	10.21	57.979	
2,300.0	2,294.6	2,352.0	2,330.4	5.1	6.3	82.10	-556.7	-200.5	576.3	565.4	10.83	53.185	
2,400.0	2,393.6	2,448.9	2,424.9	5.4	6.7	81.76	-553.6	-179.7	561.0	549.6	11.46	48.959	
2,500.0	2,492.6	2,556.9	2,530.3	5.7	7.2	81.32	-550.2	-156.0	545.6	533.5	12.15	44.891	
2,600.0	2,591.6	2,670.1	2,639.6	6.0	7.7	80.54	-544.8	-127.4	527.1	514.2	12.93	40.774	
2,700.0	2,690.6	2,768.1	2,734.1	6.3	8.2	79.78	-539.3	-101.9	507.7	494.0	13.66	37.176	
2,800.0	2,789.6	2,859.0	2,821.7	6.6	8.6	78.91	-535.1	-77.7	489.1	474.7	14.38	34.015	
2,900.0	2,888.6	2,949.0	2,908.5	6.9	9.1	77.97	-532.2	-54.1	471.9	456.8	15.10	31.259	
3,000.0	2,987.6	3,045.7	3,002.2	7.3	9.5	77.10	-529.2	-30.6	455.8	440.0	15.81	28.830	
3,100.0	3,086.6	3,140.9	3,095.0	7.6	9.9	76.45	-526.4	-9.7	440.9	424.4	16.51	26.700	
3,200.0	3,185.6	3,240.6	3,192.5	7.9	10.3	75.88	-523.1	11.1	426.2	409.0	17.21	24.758	
3,300.0	3,284.6	3,340.3	3,290.0	8.2	10.7	75.39	-519.3	31.2	411.3	393.4	17.92	22.958	
3,400.0	3,383.6	3,434.8	3,382.7	8.6	11.1	74.99	-515.6	49.6	396.7	378.1	18.59	21.336	
3,500.0	3,482.6	3,532.5	3,478.7	8.9	11.5	74.66	-512.6	67.5	383.2	363.9	19.27	19.884	
3,600.0	3,581.6	3,637.6	3,581.9	9.2	11.9	74.27	-508.6	87.0	369.0	349.0	19.99	18.459	
3,700.0	3,680.6	3,740.7	3,682.6	9.6	12.3	73.62	-503.4	108.2	352.9	332.2	20.74	17.021	
3,800.0	3,779.6	3,836.6	3,776.4	9.9	12.8	72.91	-499.0	128.1	337.3	315.8	21.46	15.718	
3,900.0	3,878.6	3,939.4	3,876.8	10.3	13.2	72.08	-494.0	149.5	321.4	299.2	22.22	14.464	
4,000.0	3,977.6	4,038.1	3,972.8	10.6	13.7	70.92	-488.5	171.6	304.5	281.5	23.00	13.241	
4,100.0	4,076.6	4,134.9	4,067.1	10.9	14.1	69.73	-483.6	192.9	288.2	264.5	23.76	12.129	
4,200.0	4,175.6	4,235.1	4,164.3	11.3	14.6	67.91	-479.0	216.8	272.1	247.5	24.60	11.060	
4,300.0	4,274.6	4,331.9	4,258.0	11.6	15.0	65.77	-474.8	240.6	256.3	230.8	25.44	10.073	
4,400.0	4,373.6	4,429.6	4,352.6	12.0	15.5	63.39	-470.8	264.4	241.2	214.9	26.28	9.179	
4,500.0	4,472.6	4,526.0	4,446.2	12.3	16.0	60.82	-467.2	287.5	227.0	199.9	27.09	8.380	
4,600.0	4,571.6	4,624.3	4,542.4	12.7	16.4	58.84	-464.0	307.5	214.1	186.3	27.84	7.691	
4,700.0	4,670.6	4,724.3	4,640.3	13.0	16.8	56.68	-460.2	327.5	201.1	172.5	28.58	7.035	
4,800.0	4,769.6	4,822.5	4,736.3	13.3	17.2	54.05	-456.4	347.8	188.2	158.9	29.30	6.423	
4,900.0	4,868.6	4,920.7	4,832.4	13.7	17.7	51.21	-453.0	367.7	176.2	146.2	29.99	5.876	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,967.6	5,020.5	4,930.4	14.0	18.1	48.53	-449.4	386.1	164.5	133.9	30.63	5.370	
5,100.0	5,066.6	5,119.4	5,027.6	14.4	18.4	45.53	-445.7	404.2	153.0	121.8	31.23	4.899	
5,129.4	5,095.7	5,148.6	5,056.2	14.5	18.6	44.47	-444.6	409.8	149.7	118.3	31.39	4.768	
5,200.0	5,165.7	5,218.3	5,124.5	14.7	18.9	41.25	-441.9	423.5	142.7	110.9	31.75	4.493	
5,300.0	5,265.2	5,316.9	5,221.0	14.9	19.3	35.27	-438.0	443.4	136.1	104.0	32.05	4.246	
5,400.0	5,365.0	5,417.0	5,319.1	15.1	19.7	28.27	-433.8	463.0	133.7	101.6	32.11	4.164	SF
5,410.4	5,375.4	5,427.3	5,329.2	15.1	19.7	27.48	-433.3	465.0	133.7	101.6	32.10	4.165	CC, ES
5,500.0	5,464.9	5,515.8	5,415.9	15.3	20.1	20.65	-428.9	482.1	135.8	103.9	31.92	4.255	
5,535.1	5,500.0	5,550.2	5,449.6	15.3	20.2	145.45	-427.3	488.5	137.8	106.0	31.81	4.332	
5,600.0	5,564.9	5,613.8	5,512.1	15.4	20.5	140.87	-424.3	500.3	142.7	111.1	31.65	4.509	
5,700.0	5,664.9	5,711.8	5,608.4	15.6	20.9	134.67	-420.3	518.1	152.0	120.5	31.46	4.830	
5,800.0	5,764.9	5,811.1	5,705.9	15.8	21.3	129.21	-416.4	536.0	163.0	131.6	31.33	5.202	
5,900.0	5,864.9	5,913.2	5,806.6	15.9	21.6	124.81	-412.6	552.3	173.5	142.2	31.30	5.543	
6,000.0	5,964.9	6,013.0	5,905.5	16.1	22.0	121.34	-408.9	566.4	183.4	152.0	31.36	5.847	
6,100.0	6,064.9	6,114.8	6,006.2	16.2	22.3	118.27	-405.0	579.9	193.1	161.6	31.47	6.134	
6,200.0	6,164.9	6,217.4	6,108.1	16.4	22.6	115.83	-401.6	591.4	201.6	170.0	31.64	6.371	
6,300.0	6,264.9	6,320.6	6,210.9	16.6	22.8	114.42	-400.1	600.2	208.7	176.8	31.90	6.542	
6,400.0	6,364.9	6,426.2	6,316.3	16.7	23.0	113.55	-399.3	606.4	213.8	181.6	32.20	6.638	
6,498.5	6,463.5	6,528.8	6,418.9	16.9	23.2	113.25	-399.3	609.1	216.2	183.6	32.54	6.644	
6,500.0	6,464.9	6,530.4	6,420.5	16.9	23.2	113.26	-399.3	609.2	216.2	183.7	32.54	6.644	
6,550.0	6,514.9	6,580.8	6,470.9	17.0	23.3	113.57	-399.6	609.9	217.6	185.0	32.66	6.664	
6,600.0	6,564.6	6,630.7	6,520.8	17.0	23.3	114.59	-399.9	610.4	220.3	187.5	32.80	6.717	
6,650.0	6,613.9	6,675.0	6,565.1	17.1	23.4	116.06	-400.6	611.1	224.9	192.0	32.92	6.833	
6,700.0	6,662.6	6,715.5	6,605.5	17.1	23.5	118.00	-402.9	612.2	232.9	199.9	33.00	7.056	
6,750.0	6,710.4	6,753.0	6,642.8	17.1	23.5	120.14	-406.7	613.7	244.7	211.6	33.02	7.409	
6,800.0	6,757.2	6,790.0	6,679.3	17.1	23.6	122.51	-412.4	615.9	261.2	228.3	32.94	7.929	
6,850.0	6,802.7	6,815.0	6,703.7	17.1	23.6	123.71	-417.6	617.7	282.4	249.8	32.65	8.651	
6,900.0	6,846.7	6,842.3	6,730.0	17.1	23.7	125.04	-424.3	619.7	308.3	276.0	32.28	9.550	
6,950.0	6,889.1	6,875.0	6,761.2	17.1	23.7	126.90	-434.0	622.1	338.5	306.7	31.82	10.637	
7,000.0	6,929.7	6,889.5	6,774.8	17.1	23.7	126.14	-438.8	622.9	372.1	340.9	31.25	11.910	
7,050.0	6,968.3	6,911.7	6,795.6	17.1	23.7	126.14	-446.7	623.6	408.9	378.3	30.65	13.342	
7,100.0	7,004.7	6,926.9	6,809.6	17.0	23.7	124.64	-452.5	623.6	448.5	418.3	30.13	14.884	
7,150.0	7,038.8	6,937.7	6,819.5	17.0	23.7	121.72	-456.8	623.5	490.4	460.6	29.83	16.442	
7,200.0	7,070.4	6,945.5	6,826.6	17.0	23.7	117.28	-460.1	623.4	534.3	504.4	29.88	17.884	
7,250.0	7,099.5	6,950.8	6,831.3	17.0	23.7	111.05	-462.3	623.2	579.7	549.3	30.38	19.080	
7,300.0	7,125.8	6,960.0	6,839.6	17.0	23.7	104.36	-466.4	623.0	626.2	595.1	31.12	20.120	
7,350.0	7,149.3	6,960.0	6,839.6	16.9	23.7	93.84	-466.4	623.0	673.3	641.1	32.22	20.901	
7,400.0	7,169.8	6,960.0	6,839.6	17.0	23.7	82.18	-466.4	623.0	721.0	688.1	32.81	21.977	
7,450.0	7,187.3	6,960.0	6,839.6	17.1	23.7	70.37	-466.4	623.0	768.7	736.3	32.40	23.725	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,900.0	7,185.0	7,144.6	7,141.8	73.3	14.3	-89.17	4,205.3	-58.8	726.1	638.8	87.32	8.315	
11,000.0	7,183.7	7,142.8	7,140.0	75.2	14.3	-88.95	4,205.3	-58.8	652.9	563.7	89.17	7.322	
11,100.0	7,182.4	7,141.0	7,138.2	77.0	14.3	-88.73	4,205.3	-58.7	587.7	496.7	91.03	6.456	
11,200.0	7,181.0	7,139.3	7,136.5	78.9	14.3	-88.51	4,205.3	-58.6	533.4	440.5	92.89	5.742	
11,300.0	7,179.7	7,137.5	7,134.7	80.8	14.3	-88.29	4,205.3	-58.6	493.6	398.9	94.75	5.210	
11,400.0	7,178.4	7,135.7	7,132.9	82.6	14.3	-88.07	4,205.3	-58.5	472.0	375.4	96.62	4.885	
11,454.5	7,177.7	7,134.7	7,131.9	83.7	14.3	-87.95	4,205.3	-58.5	468.8	371.2	97.63	4.802	CC, ES
11,500.0	7,177.1	7,133.9	7,131.1	84.5	14.2	-87.85	4,205.3	-58.5	471.0	372.6	98.48	4.783	SF
11,600.0	7,175.7	7,132.1	7,129.3	86.4	14.2	-87.63	4,205.3	-58.4	490.9	390.6	100.34	4.892	
11,654.7	7,175.0	7,131.1	7,128.3	87.4	14.2	-87.52	4,205.3	-58.4	509.8	408.5	101.36	5.030	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,800.0	7,199.6	7,140.7	7,139.6	53.0	14.9	-87.90	3,131.2	-89.5	766.1	698.6	67.47	11.355	
9,900.0	7,198.3	7,140.8	7,139.7	54.8	14.9	-87.91	3,131.2	-89.6	693.4	624.1	69.30	10.006	
10,000.0	7,196.9	7,140.9	7,139.8	56.6	14.9	-87.93	3,131.2	-89.6	628.3	557.1	71.13	8.832	
10,100.0	7,195.6	7,141.0	7,139.9	58.5	14.9	-87.94	3,131.2	-89.6	573.3	500.3	72.98	7.856	
10,200.0	7,194.3	7,141.2	7,140.0	60.3	14.9	-87.95	3,131.2	-89.6	531.6	456.8	74.82	7.105	
10,300.0	7,193.0	7,141.3	7,140.2	62.1	14.9	-87.97	3,131.2	-89.6	506.5	429.8	76.67	6.606	
10,380.3	7,191.9	7,141.4	7,140.3	63.6	14.9	-87.98	3,131.2	-89.6	500.1	421.9	78.16	6.398	CC, ES
10,400.0	7,191.6	7,141.4	7,140.3	64.0	14.9	-87.98	3,131.2	-89.6	500.4	421.9	78.53	6.373	SF
10,500.0	7,190.3	7,141.5	7,140.4	65.8	14.9	-87.99	3,131.2	-89.6	514.2	433.8	80.38	6.396	
10,600.0	7,189.0	7,141.6	7,140.5	67.7	14.9	-88.01	3,131.2	-89.6	546.2	463.9	82.25	6.641	
10,700.0	7,187.7	7,141.7	7,140.6	69.6	14.9	-88.02	3,131.2	-89.6	593.5	509.4	84.11	7.056	
10,800.0	7,186.3	7,141.8	7,140.7	71.4	14.9	-88.03	3,131.2	-89.6	652.8	566.8	85.98	7.593	
10,900.0	7,185.0	7,142.0	7,140.9	73.3	14.9	-88.05	3,131.2	-89.6	721.2	633.3	87.85	8.209	
11,000.0	7,183.7	7,142.1	7,141.0	75.2	14.9	-88.06	3,131.2	-89.6	796.3	706.5	89.72	8.875	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 20Q-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.37	-89.9	1.0	90.0				
100.0	100.0	98.0	98.0	0.1	0.1	179.37	-89.9	1.0	89.9	89.7	0.22	404.146	
200.0	200.0	198.0	198.0	0.3	0.3	179.37	-89.9	1.0	89.9	89.3	0.67	134.266	CC
300.0	300.0	297.7	297.7	0.6	0.5	-179.84	-90.1	-0.3	90.1	89.0	1.11	81.407	ES
400.0	400.0	397.2	397.1	0.8	0.8	-177.44	-90.6	-4.1	90.7	89.2	1.55	58.677	
500.0	500.0	496.5	496.2	1.0	1.0	-173.52	-91.6	-10.4	92.2	90.2	2.00	46.182	
600.0	600.0	595.4	594.7	1.2	1.3	-168.28	-92.8	-19.3	94.8	92.4	2.45	38.719	
700.0	700.0	693.7	692.3	1.5	1.5	-162.07	-94.4	-30.6	99.4	96.5	2.91	34.209	
800.0	800.0	791.4	789.0	1.7	1.8	-155.34	-96.4	-44.3	106.4	103.1	3.36	31.635	
900.0	900.0	888.3	884.6	1.9	2.2	-148.59	-98.7	-60.2	116.4	112.5	3.83	30.392	
1,000.0	1,000.0	984.3	978.8	2.1	2.6	-142.23	-101.3	-78.5	129.5	125.2	4.31	30.056	SF
1,100.0	1,100.0	1,079.4	1,071.6	2.4	3.0	-136.52	-104.2	-98.8	146.0	141.1	4.81	30.317	
1,200.0	1,200.0	1,173.3	1,162.8	2.6	3.5	-131.55	-107.4	-121.1	165.6	160.3	5.35	30.951	
1,300.0	1,300.0	1,266.1	1,252.3	2.8	3.9	-127.32	-110.8	-145.3	188.4	182.5	5.92	31.803	
1,400.0	1,400.0	1,357.7	1,340.0	3.0	4.5	-123.76	-114.5	-171.4	214.1	207.6	6.53	32.775	
1,500.0	1,500.0	1,452.8	1,430.9	3.2	5.0	111.75	-118.5	-199.4	242.0	235.1	6.90	35.046	
1,600.0	1,599.9	1,547.4	1,521.2	3.4	5.6	114.48	-122.5	-227.3	271.5	264.2	7.33	37.038	
1,700.0	1,699.7	1,641.3	1,610.8	3.6	6.2	117.02	-126.5	-255.0	302.8	295.0	7.75	39.066	
1,800.0	1,799.3	1,734.4	1,699.7	3.8	6.8	119.39	-130.4	-282.5	335.9	327.7	8.17	41.118	
1,900.0	1,898.6	1,826.8	1,787.9	4.0	7.3	121.58	-134.3	-309.7	370.9	362.3	8.59	43.175	
1,940.8	1,939.0	1,864.2	1,823.6	4.1	7.6	122.43	-135.8	-320.7	385.8	377.0	8.76	44.013	
2,000.0	1,997.6	1,918.4	1,875.3	4.3	7.9	123.86	-138.1	-336.7	407.7	398.6	9.02	45.195	
2,100.0	2,096.6	2,010.0	1,962.7	4.6	8.5	125.96	-142.0	-363.7	445.1	435.6	9.47	47.019	
2,200.0	2,195.6	2,101.5	2,050.1	4.8	9.1	127.74	-145.8	-390.7	483.0	473.0	9.93	48.643	
2,300.0	2,294.6	2,193.1	2,137.6	5.1	9.7	129.26	-149.7	-417.7	521.2	510.8	10.41	50.089	
2,400.0	2,393.6	2,284.7	2,225.0	5.4	10.2	130.58	-153.5	-444.7	559.7	548.8	10.89	51.381	
2,500.0	2,492.6	2,376.2	2,312.4	5.7	10.8	131.73	-157.4	-471.7	598.4	587.0	11.39	52.537	
2,600.0	2,591.6	2,467.8	2,399.8	6.0	11.4	132.74	-161.2	-498.7	637.4	625.5	11.90	53.575	
2,700.0	2,690.6	2,559.4	2,487.2	6.3	12.0	133.64	-165.1	-525.7	676.4	664.0	12.41	54.510	
2,800.0	2,789.6	2,650.9	2,574.6	6.6	12.6	134.44	-168.9	-552.7	715.6	702.7	12.93	55.356	
2,900.0	2,888.6	2,742.5	2,662.0	6.9	13.1	135.15	-172.8	-579.7	754.9	741.5	13.45	56.122	
3,000.0	2,987.6	2,834.0	2,749.4	7.3	13.7	135.80	-176.7	-606.7	794.3	780.3	13.98	56.820	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 20Q-321 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.42	-75.0	0.8	75.0				
100.0	100.0	98.0	98.0	0.1	0.1	179.42	-75.0	0.8	75.0	74.7	0.22	336.875	
200.0	200.0	198.0	198.0	0.3	0.3	179.42	-75.0	0.8	75.0	74.3	0.67	111.917	
300.0	300.0	298.0	298.0	0.6	0.6	179.42	-75.0	0.8	75.0	73.8	1.12	66.970	
400.0	400.0	398.0	398.0	0.8	0.8	179.42	-75.0	0.8	75.0	73.4	1.57	47.781	CC
500.0	500.0	497.6	497.6	1.0	1.0	-179.64	-75.2	-0.5	75.2	73.2	2.00	37.542	ES
600.0	600.0	597.1	597.0	1.2	1.2	-176.81	-75.9	-4.2	76.1	73.6	2.43	31.262	
700.0	700.0	696.3	696.0	1.5	1.4	-172.24	-77.2	-10.5	77.9	75.0	2.87	27.130	
800.0	800.0	795.2	794.5	1.7	1.7	-166.27	-78.9	-19.3	81.3	78.0	3.32	24.517	
900.0	900.0	893.5	892.1	1.9	1.9	-159.40	-81.1	-30.5	86.8	83.1	3.76	23.074	
1,000.0	1,000.0	991.1	988.7	2.1	2.2	-152.27	-83.8	-44.0	95.1	90.9	4.22	22.553	SF
1,100.0	1,100.0	1,088.0	1,084.2	2.4	2.6	-145.43	-86.9	-59.9	106.4	101.7	4.68	22.739	
1,200.0	1,200.0	1,183.9	1,178.5	2.6	2.9	-139.26	-90.4	-77.9	121.0	115.8	5.16	23.432	
1,300.0	1,300.0	1,278.9	1,271.2	2.8	3.3	-133.92	-94.4	-98.0	138.7	133.0	5.67	24.459	
1,400.0	1,400.0	1,372.8	1,362.3	3.0	3.8	-129.42	-98.7	-120.1	159.5	153.3	6.21	25.688	
1,500.0	1,500.0	1,469.3	1,455.6	3.2	4.2	106.96	-103.4	-144.0	182.7	176.0	6.67	27.378	
1,600.0	1,599.9	1,565.3	1,548.5	3.4	4.7	110.49	-108.1	-167.8	207.5	200.4	7.09	29.258	
1,700.0	1,699.7	1,660.7	1,640.9	3.6	5.2	113.75	-112.8	-191.5	233.9	226.4	7.50	31.175	
1,800.0	1,799.3	1,755.5	1,732.6	3.8	5.7	116.78	-117.4	-215.0	262.3	254.4	7.92	33.122	
1,900.0	1,898.6	1,849.7	1,823.7	4.0	6.2	119.56	-122.0	-238.3	292.6	284.2	8.34	35.082	
1,940.8	1,939.0	1,887.9	1,860.7	4.1	6.4	120.64	-123.9	-247.8	305.5	297.0	8.51	35.885	
2,000.0	1,997.6	1,943.2	1,914.2	4.3	6.7	122.33	-126.6	-261.5	324.7	315.9	8.77	37.008	
2,100.0	2,096.6	2,036.6	2,004.6	4.6	7.2	124.77	-131.1	-284.7	357.5	348.3	9.22	38.758	
2,200.0	2,195.6	2,130.0	2,095.0	4.8	7.7	126.81	-135.7	-307.8	390.8	381.1	9.69	40.330	
2,300.0	2,294.6	2,223.4	2,185.4	5.1	8.2	128.53	-140.2	-331.0	424.5	414.4	10.17	41.742	
2,400.0	2,393.6	2,316.9	2,275.8	5.4	8.7	130.00	-144.8	-354.2	458.5	447.9	10.66	43.011	
2,500.0	2,492.6	2,410.3	2,366.1	5.7	9.2	131.27	-149.3	-377.3	492.8	481.6	11.16	44.154	
2,600.0	2,591.6	2,503.7	2,456.5	6.0	9.7	132.38	-153.9	-400.5	527.2	515.6	11.67	45.187	
2,700.0	2,690.6	2,597.1	2,546.9	6.3	10.2	133.35	-158.5	-423.6	561.8	549.6	12.18	46.122	
2,800.0	2,789.6	2,690.6	2,637.3	6.6	10.7	134.21	-163.0	-446.8	596.5	583.8	12.70	46.971	
2,900.0	2,888.6	2,784.0	2,727.7	6.9	11.2	134.97	-167.6	-470.0	631.3	618.1	13.22	47.745	
3,000.0	2,987.6	2,877.4	2,818.1	7.3	11.7	135.66	-172.1	-493.1	666.2	652.5	13.75	48.453	
3,100.0	3,086.6	2,970.8	2,908.5	7.6	12.2	136.27	-176.7	-516.3	701.2	686.9	14.28	49.101	
3,200.0	3,185.6	3,064.3	2,998.9	7.9	12.7	136.83	-181.2	-539.4	736.2	721.4	14.81	49.697	
3,300.0	3,284.6	3,157.7	3,089.3	8.2	13.3	137.34	-185.8	-562.6	771.3	756.0	15.35	50.247	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.54	-29.9	0.2	29.9				
100.0	100.0	99.0	99.0	0.1	0.1	179.54	-29.9	0.2	29.9	29.7	0.22	133.617	
200.0	200.0	199.0	199.0	0.3	0.3	179.54	-29.9	0.2	29.9	29.2	0.67	44.465	
300.0	300.0	299.0	299.0	0.6	0.6	179.54	-29.9	0.2	29.9	28.8	1.12	26.643	
400.0	400.0	399.0	399.0	0.8	0.8	179.54	-29.9	0.2	29.9	28.3	1.57	19.020	
500.0	500.0	499.0	499.0	1.0	1.0	179.54	-29.9	0.2	29.9	27.9	2.02	14.789	
600.0	600.0	599.0	599.0	1.2	1.2	179.54	-29.9	0.2	29.9	27.4	2.47	12.097	
700.0	700.0	699.0	699.0	1.5	1.5	179.54	-29.9	0.2	29.9	27.0	2.92	10.235	
800.0	800.0	799.0	799.0	1.7	1.7	179.54	-29.9	0.2	29.9	26.5	3.37	8.869	
900.0	900.0	899.0	899.0	1.9	1.9	179.54	-29.9	0.2	29.9	26.1	3.82	7.825	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	179.54	-29.9	0.2	29.9	25.6	4.27	7.001	CC, ES
1,100.0	1,100.0	1,098.4	1,098.4	2.4	2.3	-179.01	-30.9	-0.5	30.9	26.2	4.69	6.586	
1,200.0	1,200.0	1,197.6	1,197.5	2.6	2.5	-175.16	-33.9	-2.9	34.1	29.0	5.10	6.689	
1,300.0	1,300.0	1,296.6	1,296.3	2.8	2.7	-170.16	-39.0	-6.8	39.7	34.2	5.51	7.205	
1,400.0	1,400.0	1,395.1	1,394.4	3.0	2.9	-165.18	-46.1	-12.2	47.9	42.0	5.93	8.077	
1,500.0	1,500.0	1,493.2	1,491.8	3.2	3.1	72.78	-55.1	-19.1	58.4	52.0	6.34	9.212	
1,600.0	1,599.9	1,592.3	1,590.1	3.4	3.4	78.79	-65.2	-26.8	69.9	63.2	6.72	10.391	
1,700.0	1,699.7	1,691.3	1,688.3	3.6	3.6	84.84	-75.3	-34.6	81.7	74.6	7.12	11.470	
1,800.0	1,799.3	1,790.0	1,786.2	3.8	3.9	90.86	-85.3	-42.3	94.2	86.7	7.54	12.505	
1,900.0	1,898.6	1,888.5	1,883.9	4.0	4.2	96.74	-95.3	-49.9	107.9	99.9	7.97	13.534	
1,940.8	1,939.0	1,928.6	1,923.7	4.1	4.3	99.08	-99.4	-53.1	113.9	105.7	8.16	13.959	
2,000.0	1,997.6	1,986.7	1,981.3	4.3	4.5	102.32	-105.3	-57.6	122.9	114.5	8.43	14.575	
2,100.0	2,096.6	2,084.9	2,078.6	4.6	4.8	106.82	-115.3	-65.3	139.0	130.0	8.92	15.584	
2,200.0	2,195.6	2,183.1	2,176.0	4.8	5.1	110.38	-125.3	-72.9	155.7	146.2	9.41	16.533	
2,300.0	2,294.6	2,281.2	2,273.4	5.1	5.4	113.25	-135.2	-80.6	172.8	162.9	9.93	17.413	
2,400.0	2,393.6	2,379.4	2,370.8	5.4	5.7	115.60	-145.2	-88.2	190.3	179.9	10.45	18.221	
2,500.0	2,492.6	2,477.6	2,468.1	5.7	6.0	117.55	-155.2	-95.9	208.1	197.1	10.97	18.963	
2,600.0	2,591.6	2,575.8	2,565.5	6.0	6.3	119.19	-165.2	-103.6	226.1	214.6	11.51	19.641	
2,700.0	2,690.6	2,674.0	2,662.9	6.3	6.6	120.59	-175.2	-111.2	244.2	232.2	12.05	20.262	
2,800.0	2,789.6	2,772.2	2,760.2	6.6	6.9	121.80	-185.2	-118.9	262.5	249.9	12.60	20.831	
2,900.0	2,888.6	2,870.3	2,857.6	6.9	7.2	122.85	-195.1	-126.5	280.8	267.7	13.15	21.353	
3,000.0	2,987.6	2,968.5	2,955.0	7.3	7.5	123.77	-205.1	-134.2	299.2	285.5	13.71	21.833	
3,100.0	3,086.6	3,066.7	3,052.3	7.6	7.9	124.59	-215.1	-141.8	317.7	303.5	14.26	22.275	
3,200.0	3,185.6	3,164.9	3,149.7	7.9	8.2	125.32	-225.1	-149.5	336.3	321.4	14.82	22.684	
3,300.0	3,284.6	3,263.1	3,247.1	8.2	8.5	125.96	-235.1	-157.2	354.9	339.5	15.39	23.062	
3,400.0	3,383.6	3,361.2	3,344.5	8.6	8.8	126.55	-245.1	-164.8	373.5	357.5	15.95	23.412	
3,500.0	3,482.6	3,459.4	3,441.8	8.9	9.1	127.08	-255.0	-172.5	392.2	375.6	16.52	23.738	
3,600.0	3,581.6	3,557.6	3,539.2	9.2	9.4	127.56	-265.0	-180.1	410.9	393.8	17.09	24.041	
3,700.0	3,680.6	3,655.8	3,636.6	9.6	9.8	128.00	-275.0	-187.8	429.6	411.9	17.66	24.324	
3,800.0	3,779.6	3,754.0	3,733.9	9.9	10.1	128.40	-285.0	-195.4	448.3	430.1	18.23	24.588	
3,900.0	3,878.6	3,852.1	3,831.3	10.3	10.4	128.77	-295.0	-203.1	467.1	448.3	18.81	24.836	
4,000.0	3,977.6	3,964.8	3,943.3	10.6	10.7	129.33	-304.7	-210.6	484.4	465.1	19.36	25.021	
4,100.0	4,076.6	4,078.4	4,056.6	10.9	10.9	130.18	-311.0	-215.4	498.8	479.0	19.89	25.084	
4,200.0	4,175.6	4,192.5	4,170.7	11.3	11.1	131.32	-313.8	-217.5	510.4	490.0	20.39	25.028	
4,300.0	4,274.6	4,295.4	4,273.6	11.6	11.3	132.51	-313.9	-217.6	520.0	499.1	20.87	24.910	
4,400.0	4,373.6	4,394.4	4,372.6	12.0	11.4	133.63	-313.9	-217.6	529.7	508.3	21.34	24.823	
4,500.0	4,472.6	4,493.4	4,471.6	12.3	11.6	134.71	-313.9	-217.6	539.5	517.7	21.80	24.752	
4,600.0	4,571.6	4,592.4	4,570.6	12.7	11.8	135.75	-313.9	-217.6	549.6	527.4	22.26	24.695	
4,700.0	4,670.6	4,691.4	4,669.6	13.0	11.9	136.76	-313.9	-217.6	559.9	537.1	22.71	24.650	
4,800.0	4,769.6	4,790.4	4,768.6	13.3	12.1	137.72	-313.9	-217.6	570.3	547.1	23.17	24.617	
4,900.0	4,868.6	4,889.4	4,867.6	13.7	12.3	138.65	-313.9	-217.6	580.8	557.2	23.62	24.594	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,967.6	4,988.4	4,966.6	14.0	12.4	139.55	-313.9	-217.6	591.5	567.5	24.07	24.579	
5,100.0	5,066.6	5,087.4	5,065.6	14.4	12.6	140.42	-313.9	-217.6	602.4	577.9	24.51	24.573	
5,129.4	5,095.7	5,116.6	5,094.7	14.5	12.6	140.67	-313.9	-217.6	605.6	581.0	24.65	24.572	
5,200.0	5,165.7	5,186.5	5,164.7	14.7	12.8	141.30	-313.9	-217.6	612.7	587.7	24.97	24.536	
5,300.0	5,265.2	5,286.0	5,264.2	14.9	12.9	141.97	-313.9	-217.6	620.5	595.1	25.38	24.447	
5,400.0	5,365.0	5,385.8	5,364.0	15.1	13.1	142.39	-313.9	-217.6	625.6	599.8	25.77	24.281	
5,500.0	5,464.9	5,485.8	5,463.9	15.3	13.3	142.59	-313.9	-217.6	628.0	601.8	26.12	24.038	
5,535.1	5,500.0	5,520.8	5,499.0	15.3	13.4	-89.99	-313.9	-217.6	628.1	601.9	26.25	23.933	
5,600.0	5,564.9	5,585.8	5,563.9	15.4	13.5	-89.99	-313.9	-217.6	628.1	601.7	26.48	23.720	
5,700.0	5,664.9	5,685.8	5,663.9	15.6	13.7	-89.99	-313.9	-217.6	628.1	601.3	26.84	23.401	
5,800.0	5,764.9	5,785.8	5,763.9	15.8	13.8	-89.99	-313.9	-217.6	628.1	600.9	27.20	23.089	
5,900.0	5,864.9	5,885.8	5,863.9	15.9	14.0	-89.99	-313.9	-217.6	628.1	600.6	27.57	22.783	
6,000.0	5,964.9	5,985.8	5,963.9	16.1	14.2	-89.99	-313.9	-217.6	628.1	600.2	27.94	22.483	
6,100.0	6,064.9	6,085.8	6,063.9	16.2	14.4	-89.99	-313.9	-217.6	628.1	599.8	28.31	22.189	
6,200.0	6,164.9	6,185.8	6,163.9	16.4	14.6	-89.99	-313.9	-217.6	628.1	599.5	28.68	21.901	
6,300.0	6,264.9	6,285.8	6,263.9	16.6	14.8	-89.99	-313.9	-217.6	628.1	599.1	29.06	21.619	
6,400.0	6,364.9	6,385.8	6,363.9	16.7	15.0	-89.99	-313.9	-217.6	628.1	598.7	29.43	21.342	
6,498.5	6,463.5	6,484.3	6,462.5	16.9	15.1	-89.99	-313.9	-217.6	628.1	598.3	29.81	21.075	
6,500.0	6,464.9	6,485.8	6,463.9	16.9	15.1	-89.98	-313.9	-217.6	628.1	598.3	29.81	21.071	
6,504.8	6,469.8	6,490.6	6,468.8	16.9	15.1	-89.98	-313.9	-217.6	628.1	598.3	29.83	21.058	
6,550.0	6,514.9	6,535.8	6,513.9	17.0	15.2	-89.99	-312.2	-217.6	628.1	598.2	29.98	20.952	
6,600.0	6,564.6	6,585.8	6,563.6	17.0	15.3	-89.99	-307.3	-217.6	628.1	598.0	30.12	20.858	
6,650.0	6,613.9	6,635.8	6,612.9	17.1	15.4	-90.00	-299.1	-217.6	628.1	597.9	30.22	20.787	
6,700.0	6,662.6	6,685.8	6,661.6	17.1	15.4	-90.01	-287.7	-217.6	628.1	597.8	30.29	20.738	
6,750.0	6,710.4	6,735.8	6,709.4	17.1	15.4	-90.01	-273.2	-217.6	628.1	597.8	30.34	20.706	
6,800.0	6,757.2	6,785.8	6,756.2	17.1	15.4	-90.02	-255.5	-217.6	628.1	597.8	30.36	20.687	
6,850.0	6,802.7	6,835.8	6,801.8	17.1	15.5	-90.02	-234.9	-217.6	628.1	597.8	30.38	20.676	
6,900.0	6,846.7	6,885.8	6,845.9	17.1	15.5	-90.03	-211.3	-217.6	628.1	597.7	30.39	20.667	
6,950.0	6,889.1	6,935.8	6,888.3	17.1	15.5	-90.03	-184.8	-217.6	628.1	597.7	30.41	20.653	
7,000.0	6,929.7	6,985.8	6,928.9	17.1	15.5	-90.04	-155.7	-217.6	628.1	597.7	30.45	20.628	
7,050.0	6,968.3	7,035.9	6,967.6	17.1	15.5	-90.04	-123.9	-217.6	628.1	597.6	30.52	20.584	
7,100.0	7,004.7	7,085.9	7,004.1	17.0	15.5	-90.05	-89.7	-217.6	628.1	597.5	30.62	20.514	
7,150.0	7,038.8	7,135.9	7,038.2	17.0	15.5	-90.05	-53.1	-217.6	628.2	597.4	30.77	20.413	
7,200.0	7,070.4	7,186.0	7,069.9	17.0	15.5	-90.06	-14.4	-217.6	628.2	597.2	30.98	20.273	
7,250.0	7,099.5	7,236.0	7,099.0	17.0	15.5	-90.06	26.3	-217.7	628.2	596.9	31.27	20.091	
7,300.0	7,125.8	7,286.1	7,125.4	17.0	15.6	-90.07	68.8	-217.7	628.2	596.5	31.62	19.864	
7,350.0	7,149.3	7,336.1	7,149.0	16.9	15.9	-90.07	112.9	-217.7	628.2	596.1	32.06	19.593	
7,400.0	7,169.8	7,386.2	7,169.6	17.0	16.2	-90.07	158.6	-217.7	628.2	595.6	32.59	19.277	
7,450.0	7,187.3	7,436.2	7,187.1	17.1	16.5	-90.08	205.4	-217.7	628.2	595.0	33.20	18.922	
7,500.0	7,201.8	7,486.3	7,201.6	17.4	16.9	-90.08	253.3	-217.7	628.2	594.3	33.90	18.531	
7,550.0	7,213.0	7,536.3	7,212.9	17.8	17.3	-90.08	302.1	-217.7	628.2	593.5	34.68	18.111	
7,600.0	7,221.1	7,586.4	7,221.0	18.2	17.7	-90.08	351.5	-217.7	628.2	592.6	35.55	17.670	
7,650.0	7,225.9	7,636.5	7,225.8	18.7	18.2	-90.09	401.3	-217.7	628.2	591.7	36.49	17.215	
7,700.0	7,227.4	7,686.5	7,227.4	19.2	18.8	-90.09	451.3	-217.7	628.2	590.7	37.50	16.753	
7,708.7	7,227.3	7,695.2	7,227.3	19.3	18.9	-90.09	460.0	-217.7	628.2	590.5	37.68	16.673	
7,800.0	7,226.1	7,786.5	7,226.1	20.3	19.9	-90.09	551.3	-217.7	628.2	588.5	39.71	15.819	
7,900.0	7,224.8	7,886.5	7,224.8	21.5	21.2	-90.09	651.3	-217.8	628.2	586.0	42.15	14.902	
8,000.0	7,223.5	7,986.5	7,223.4	22.8	22.5	-90.09	751.3	-217.8	628.2	583.4	44.79	14.025	
8,100.0	7,222.2	8,086.5	7,222.1	24.2	23.9	-90.09	851.3	-217.8	628.2	580.6	47.59	13.200	
8,200.0	7,220.8	8,186.5	7,220.8	25.7	25.4	-90.09	951.3	-217.8	628.2	577.7	50.53	12.432	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,300.0	7,219.5	8,286.5	7,219.5	27.2	26.9	-90.09	1,051.3	-217.8	628.2	574.6	53.58	11.725	
8,400.0	7,218.2	8,386.5	7,218.1	28.7	28.5	-90.09	1,151.3	-217.8	628.2	571.5	56.73	11.075	
8,500.0	7,216.8	8,486.5	7,216.8	30.3	30.1	-90.09	1,251.3	-217.8	628.2	568.3	59.95	10.479	
8,600.0	7,215.5	8,586.5	7,215.5	31.9	31.8	-90.09	1,351.2	-217.9	628.2	565.0	63.25	9.933	
8,700.0	7,214.2	8,686.5	7,214.1	33.6	33.5	-90.09	1,451.2	-217.9	628.2	561.6	66.60	9.433	
8,800.0	7,212.9	8,786.5	7,212.8	35.3	35.2	-90.09	1,551.2	-217.9	628.2	558.2	70.00	8.975	
8,900.0	7,211.5	8,886.5	7,211.5	37.0	36.9	-90.09	1,651.2	-217.9	628.2	554.8	73.44	8.554	
9,000.0	7,210.2	8,986.5	7,210.2	38.7	38.6	-90.09	1,751.2	-217.9	628.2	551.3	76.93	8.167	
9,100.0	7,208.9	9,086.5	7,208.8	40.4	40.4	-90.09	1,851.2	-217.9	628.2	547.8	80.44	7.810	
9,200.0	7,207.6	9,186.5	7,207.5	42.2	42.2	-90.09	1,951.2	-218.0	628.3	544.3	83.98	7.481	
9,300.0	7,206.2	9,286.5	7,206.2	44.0	44.0	-90.09	2,051.2	-218.0	628.3	540.7	87.55	7.176	
9,400.0	7,204.9	9,386.5	7,204.9	45.8	45.8	-90.09	2,151.2	-218.0	628.3	537.1	91.14	6.894	
9,500.0	7,203.6	9,486.5	7,203.5	47.5	47.6	-90.09	2,251.2	-218.0	628.3	533.5	94.74	6.631	
9,600.0	7,202.3	9,586.5	7,202.2	49.3	49.4	-90.09	2,351.2	-218.0	628.3	529.9	98.37	6.387	
9,700.0	7,200.9	9,686.5	7,200.9	51.2	51.2	-90.09	2,451.2	-218.0	628.3	526.3	102.01	6.159	
9,800.0	7,199.6	9,786.5	7,199.6	53.0	53.0	-90.09	2,551.1	-218.1	628.3	522.6	105.66	5.946	
9,900.0	7,198.3	9,886.5	7,198.2	54.8	54.9	-90.09	2,651.1	-218.1	628.3	519.0	109.33	5.747	
10,000.0	7,196.9	9,986.5	7,196.9	56.6	56.7	-90.09	2,751.1	-218.1	628.3	515.3	113.01	5.560	
10,100.0	7,195.6	10,086.5	7,195.6	58.5	58.6	-90.09	2,851.1	-218.1	628.3	511.6	116.69	5.384	
10,200.0	7,194.3	10,186.5	7,194.2	60.3	60.4	-90.09	2,951.1	-218.1	628.3	507.9	120.39	5.219	
10,300.0	7,193.0	10,286.5	7,192.9	62.1	62.3	-90.09	3,051.1	-218.1	628.3	504.2	124.10	5.063	
10,400.0	7,191.6	10,386.5	7,191.6	64.0	64.1	-90.09	3,151.1	-218.1	628.3	500.5	127.81	4.916	
10,500.0	7,190.3	10,486.5	7,190.3	65.8	66.0	-90.09	3,251.1	-218.2	628.3	496.8	131.53	4.777	
10,600.0	7,189.0	10,586.5	7,188.9	67.7	67.8	-90.09	3,351.1	-218.2	628.3	493.1	135.26	4.645	
10,700.0	7,187.7	10,686.5	7,187.6	69.6	69.7	-90.09	3,451.1	-218.2	628.3	489.3	138.99	4.521	
10,800.0	7,186.3	10,786.5	7,186.3	71.4	71.6	-90.09	3,551.1	-218.2	628.3	485.6	142.73	4.402	
10,900.0	7,185.0	10,886.5	7,185.0	73.3	73.4	-90.09	3,651.0	-218.2	628.3	481.9	146.47	4.290	
11,000.0	7,183.7	10,986.5	7,183.6	75.2	75.3	-90.09	3,751.0	-218.2	628.3	478.1	150.22	4.183	
11,100.0	7,182.4	11,086.5	7,182.3	77.0	77.2	-90.09	3,851.0	-218.3	628.3	474.4	153.97	4.081	
11,200.0	7,181.0	11,186.5	7,181.0	78.9	79.1	-90.09	3,951.0	-218.3	628.4	470.6	157.72	3.984	
11,300.0	7,179.7	11,286.5	7,179.7	80.8	81.0	-90.09	4,051.0	-218.3	628.4	466.9	161.48	3.891	
11,400.0	7,178.4	11,386.5	7,178.3	82.6	82.8	-90.09	4,151.0	-218.3	628.4	463.1	165.25	3.803	
11,500.0	7,177.1	11,486.5	7,177.0	84.5	84.7	-90.09	4,251.0	-218.3	628.4	459.4	169.01	3.718	
11,600.0	7,175.7	11,586.5	7,175.7	86.4	86.6	-90.09	4,351.0	-218.3	628.4	455.6	172.78	3.637	
11,629.4	7,175.3	11,615.9	7,175.3	87.0	87.2	-90.09	4,380.4	-218.3	628.4	454.5	173.89	3.614	
11,654.7	7,175.0	11,637.7	7,175.0	87.4	87.6	-90.09	4,402.2	-218.3	628.4	453.6	174.78	3.595	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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-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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.36	-60.0	0.7	60.0				
100.0	100.0	99.0	99.0	0.1	0.1	179.36	-60.0	0.7	60.0	59.7	0.22	268.158	
200.0	200.0	199.0	199.0	0.3	0.3	179.36	-60.0	0.7	60.0	59.3	0.67	89.237	
300.0	300.0	299.0	299.0	0.6	0.6	179.36	-60.0	0.7	60.0	58.9	1.12	53.471	
400.0	400.0	399.0	399.0	0.8	0.8	179.36	-60.0	0.7	60.0	58.4	1.57	38.172	
500.0	500.0	499.0	499.0	1.0	1.0	179.36	-60.0	0.7	60.0	58.0	2.02	29.680	
600.0	600.0	599.0	599.0	1.2	1.2	179.36	-60.0	0.7	60.0	57.5	2.47	24.278	CC
700.0	700.0	698.6	698.6	1.5	1.4	-179.48	-60.3	-0.6	60.3	57.4	2.90	20.786	ES
800.0	800.0	798.0	797.9	1.7	1.6	-176.03	-61.4	-4.3	61.5	58.2	3.33	18.505	
900.0	900.0	897.2	896.9	1.9	1.9	-170.62	-63.2	-10.4	64.1	60.3	3.76	17.049	
1,000.0	1,000.0	995.9	995.2	2.1	2.1	-163.83	-65.6	-19.0	68.4	64.3	4.19	16.323	
1,100.0	1,100.0	1,094.2	1,092.8	2.4	2.3	-156.44	-68.8	-30.0	75.3	70.7	4.63	16.251	SF
1,200.0	1,200.0	1,191.7	1,189.4	2.6	2.6	-149.20	-72.6	-43.3	85.1	80.0	5.08	16.738	
1,300.0	1,300.0	1,288.5	1,284.8	2.8	2.9	-142.66	-77.1	-58.8	98.0	92.4	5.55	17.663	
1,400.0	1,400.0	1,384.5	1,379.0	3.0	3.3	-137.06	-82.2	-76.5	114.0	108.0	6.03	18.899	
1,500.0	1,500.0	1,481.5	1,473.9	3.2	3.7	100.41	-87.8	-95.9	132.7	126.1	6.51	20.381	
1,600.0	1,599.9	1,578.8	1,569.0	3.4	4.1	104.97	-93.4	-115.5	152.8	145.9	6.92	22.084	
1,700.0	1,699.7	1,675.5	1,663.6	3.6	4.5	109.18	-99.0	-134.9	174.6	167.3	7.33	23.827	
1,800.0	1,799.3	1,771.8	1,757.7	3.8	4.9	113.06	-104.6	-154.3	198.2	190.5	7.74	25.606	
1,900.0	1,898.6	1,867.4	1,851.2	4.0	5.3	116.62	-110.1	-173.5	223.8	215.6	8.16	27.415	
1,940.8	1,939.0	1,906.3	1,889.2	4.1	5.5	117.99	-112.3	-181.3	234.8	226.5	8.34	28.159	
2,000.0	1,997.6	1,962.5	1,944.2	4.3	5.7	120.02	-115.6	-192.6	251.2	242.6	8.60	29.205	
2,100.0	2,096.6	2,057.6	2,037.2	4.6	6.1	122.91	-121.1	-211.7	279.4	270.4	9.06	30.852	
2,200.0	2,195.6	2,152.6	2,130.1	4.8	6.6	125.27	-126.6	-230.8	308.2	298.7	9.53	32.348	
2,300.0	2,294.6	2,247.7	2,223.1	5.1	7.0	127.24	-132.1	-249.9	337.4	327.4	10.01	33.702	
2,400.0	2,393.6	2,342.7	2,316.0	5.4	7.4	128.89	-137.6	-269.0	366.9	356.4	10.50	34.928	
2,500.0	2,492.6	2,437.8	2,409.0	5.7	7.9	130.30	-143.1	-288.2	396.6	385.6	11.01	36.039	
2,600.0	2,591.6	2,532.8	2,501.9	6.0	8.3	131.51	-148.6	-307.3	426.5	415.0	11.51	37.048	
2,700.0	2,690.6	2,627.9	2,594.9	6.3	8.7	132.56	-154.1	-326.4	456.6	444.6	12.03	37.966	
2,800.0	2,789.6	2,722.9	2,687.8	6.6	9.2	133.49	-159.6	-345.5	486.8	474.3	12.55	38.803	
2,900.0	2,888.6	2,818.0	2,780.8	6.9	9.6	134.30	-165.1	-364.6	517.1	504.1	13.07	39.569	
3,000.0	2,987.6	2,913.0	2,873.7	7.3	10.0	135.03	-170.6	-383.7	547.5	533.9	13.60	40.271	
3,100.0	3,086.6	3,008.1	2,966.7	7.6	10.5	135.68	-176.1	-402.8	578.0	563.9	14.13	40.917	
3,200.0	3,185.6	3,103.1	3,059.6	7.9	10.9	136.27	-181.6	-421.9	608.5	593.9	14.66	41.512	
3,300.0	3,284.6	3,198.2	3,152.6	8.2	11.4	136.80	-187.1	-441.0	639.1	623.9	15.19	42.063	
3,400.0	3,383.6	3,293.2	3,245.5	8.6	11.8	137.28	-192.6	-460.1	669.7	654.0	15.73	42.572	
3,500.0	3,482.6	3,388.3	3,338.5	8.9	12.2	137.72	-198.1	-479.2	700.4	684.1	16.27	43.046	
3,600.0	3,581.6	3,483.3	3,431.4	9.2	12.7	138.12	-203.6	-498.3	731.1	714.3	16.81	43.486	
3,700.0	3,680.6	3,578.4	3,524.4	9.6	13.1	138.49	-209.1	-517.4	761.8	744.4	17.35	43.897	
3,800.0	3,779.6	3,673.5	3,617.3	9.9	13.6	138.83	-214.6	-536.6	792.5	774.6	17.90	44.281	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.53	-45.0	0.4	45.0				
100.0	100.0	99.0	99.0	0.1	0.1	179.53	-45.0	0.4	45.0	44.7	0.22	201.077	
200.0	200.0	199.0	199.0	0.3	0.3	179.53	-45.0	0.4	45.0	44.3	0.67	66.914	
300.0	300.0	299.0	299.0	0.6	0.6	179.53	-45.0	0.4	45.0	43.8	1.12	40.095	
400.0	400.0	399.0	399.0	0.8	0.8	179.53	-45.0	0.4	45.0	43.4	1.57	28.623	
500.0	500.0	499.0	499.0	1.0	1.0	179.53	-45.0	0.4	45.0	42.9	2.02	22.255	
600.0	600.0	599.0	599.0	1.2	1.2	179.53	-45.0	0.4	45.0	42.5	2.47	18.205	
700.0	700.0	699.0	699.0	1.5	1.5	179.53	-45.0	0.4	45.0	42.1	2.92	15.402	
800.0	800.0	799.0	799.0	1.7	1.7	179.53	-45.0	0.4	45.0	41.6	3.37	13.347	CC, ES
900.0	900.0	898.5	898.5	1.9	1.9	-179.03	-45.5	-0.8	45.5	41.7	3.80	11.988	
1,000.0	1,000.0	997.8	997.7	2.1	2.1	-174.88	-47.2	-4.2	47.4	43.2	4.22	11.251	
1,100.0	1,100.0	1,096.9	1,096.6	2.4	2.3	-168.71	-50.0	-10.0	51.1	46.4	4.64	11.012	SF
1,200.0	1,200.0	1,195.6	1,194.9	2.6	2.5	-161.54	-54.0	-18.0	57.0	52.0	5.07	11.255	
1,300.0	1,300.0	1,293.7	1,292.3	2.8	2.7	-154.40	-59.0	-28.3	65.7	60.2	5.50	11.941	
1,400.0	1,400.0	1,391.2	1,388.8	3.0	3.0	-147.99	-65.0	-40.7	77.4	71.4	5.95	12.996	
1,500.0	1,500.0	1,488.9	1,485.3	3.2	3.3	90.54	-72.0	-55.0	91.7	85.3	6.40	14.320	
1,600.0	1,599.9	1,587.2	1,582.2	3.4	3.6	96.25	-79.2	-69.6	107.2	100.4	6.80	15.767	
1,700.0	1,699.7	1,685.1	1,678.7	3.6	4.0	101.60	-86.3	-84.2	124.2	117.0	7.21	17.233	
1,800.0	1,799.3	1,782.6	1,774.9	3.8	4.3	106.56	-93.4	-98.7	142.7	135.1	7.62	18.733	
1,900.0	1,898.6	1,879.7	1,870.6	4.0	4.6	111.15	-100.5	-113.2	163.1	155.0	8.04	20.272	
1,940.8	1,939.0	1,919.2	1,909.5	4.1	4.8	112.91	-103.4	-119.1	171.9	163.7	8.22	20.910	
2,000.0	1,997.6	1,976.3	1,965.9	4.3	5.0	115.42	-107.5	-127.6	185.2	176.7	8.49	21.818	
2,100.0	2,096.6	2,072.9	2,061.1	4.6	5.3	118.93	-114.6	-142.0	208.3	199.3	8.95	23.267	
2,200.0	2,195.6	2,169.5	2,156.4	4.8	5.7	121.73	-121.6	-156.4	232.0	222.6	9.43	24.598	
2,300.0	2,294.6	2,266.1	2,251.6	5.1	6.0	124.02	-128.6	-170.7	256.1	246.2	9.92	25.815	
2,400.0	2,393.6	2,362.6	2,346.9	5.4	6.4	125.92	-135.7	-185.1	280.5	270.1	10.42	26.925	
2,500.0	2,492.6	2,459.2	2,442.1	5.7	6.8	127.51	-142.7	-199.5	305.2	294.3	10.93	27.935	
2,600.0	2,591.6	2,555.8	2,537.4	6.0	7.1	128.86	-149.7	-213.9	330.1	318.7	11.44	28.856	
2,700.0	2,690.6	2,652.4	2,632.6	6.3	7.5	130.03	-156.8	-228.3	355.1	343.2	11.96	29.697	
2,800.0	2,789.6	2,749.0	2,727.9	6.6	7.9	131.04	-163.8	-242.7	380.3	367.8	12.48	30.466	
2,900.0	2,888.6	2,845.6	2,823.1	6.9	8.2	131.93	-170.8	-257.1	405.5	392.5	13.01	31.171	
3,000.0	2,987.6	2,942.1	2,918.3	7.3	8.6	132.71	-177.9	-271.5	430.8	417.3	13.54	31.819	
3,100.0	3,086.6	3,038.7	3,013.6	7.6	9.0	133.41	-184.9	-285.9	456.2	442.1	14.07	32.416	
3,200.0	3,185.6	3,135.3	3,108.8	7.9	9.4	134.03	-191.9	-300.2	481.6	467.0	14.61	32.967	
3,300.0	3,284.6	3,231.9	3,204.1	8.2	9.7	134.59	-199.0	-314.6	507.1	492.0	15.15	33.477	
3,400.0	3,383.6	3,328.5	3,299.3	8.6	10.1	135.10	-206.0	-329.0	532.7	517.0	15.69	33.951	
3,500.0	3,482.6	3,425.1	3,394.6	8.9	10.5	135.56	-213.1	-343.4	558.2	542.0	16.23	34.391	
3,600.0	3,581.6	3,521.6	3,489.8	9.2	10.8	135.98	-220.1	-357.8	583.8	567.1	16.78	34.801	
3,700.0	3,680.6	3,618.2	3,585.1	9.6	11.2	136.36	-227.1	-372.2	609.5	592.1	17.32	35.183	
3,800.0	3,779.6	3,714.8	3,680.3	9.9	11.6	136.72	-234.2	-386.6	635.1	617.2	17.87	35.541	
3,900.0	3,878.6	3,811.4	3,775.6	10.3	12.0	137.04	-241.2	-401.0	660.8	642.4	18.42	35.876	
4,000.0	3,977.6	3,908.0	3,870.8	10.6	12.3	137.35	-248.2	-415.4	686.5	667.5	18.97	36.191	
4,100.0	4,076.6	4,004.6	3,966.1	10.9	12.7	137.63	-255.3	-429.7	712.2	692.6	19.52	36.487	
4,200.0	4,175.6	4,101.1	4,061.3	11.3	13.1	137.89	-262.3	-444.1	737.9	717.8	20.07	36.766	
4,300.0	4,274.6	4,197.7	4,156.5	11.6	13.5	138.13	-269.3	-458.5	763.6	743.0	20.62	37.029	
4,400.0	4,373.6	4,294.3	4,251.8	12.0	13.9	138.36	-276.4	-472.9	789.4	768.2	21.18	37.278	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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-321 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-1.00	15.1	-0.3	15.1	15.1	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-1.00	15.1	-0.3	15.1	14.9	0.23	66.440	
200.0	200.0	201.0	201.0	0.3	0.3	-1.00	15.1	-0.3	15.1	14.4	0.68	22.294	
300.0	300.0	301.0	301.0	0.6	0.6	-1.00	15.1	-0.3	15.1	14.0	1.13	13.394	
400.0	400.0	401.0	401.0	0.8	0.8	-1.00	15.1	-0.3	15.1	13.5	1.58	9.573	
500.0	500.0	501.0	501.0	1.0	1.0	-1.00	15.1	-0.3	15.1	13.1	2.03	7.448	
600.0	600.0	601.0	601.0	1.2	1.2	-1.00	15.1	-0.3	15.1	12.6	2.47	6.095	
700.0	700.0	701.0	701.0	1.5	1.5	-1.00	15.1	-0.3	15.1	12.2	2.92	5.158	
800.0	800.0	801.0	801.0	1.7	1.7	-1.00	15.1	-0.3	15.1	11.7	3.37	4.471	
900.0	900.0	901.0	901.0	1.9	1.9	-1.00	15.1	-0.3	15.1	11.3	3.82	3.945	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-1.00	15.1	-0.3	15.1	10.8	4.27	3.530	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-1.00	15.1	-0.3	15.1	10.4	4.72	3.194	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-1.00	15.1	-0.3	15.1	9.9	5.17	2.916	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-1.00	15.1	-0.3	15.1	9.5	5.62	2.683	
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-1.00	15.1	-0.3	15.1	9.0	6.07	2.484	CC, ES
1,500.0	1,500.0	1,501.0	1,501.0	3.2	3.3	-132.09	15.1	-0.3	15.9	9.4	6.50	2.451	
1,600.0	1,599.9	1,600.9	1,600.9	3.4	3.5	-140.98	15.1	-0.3	18.8	11.9	6.90	2.721	
1,700.0	1,699.7	1,701.3	1,701.3	3.6	3.7	-151.05	13.8	0.2	22.9	15.6	7.29	3.143	
1,800.0	1,799.3	1,801.8	1,801.7	3.8	3.9	-161.11	10.0	1.5	27.4	19.7	7.64	3.584	
1,900.0	1,898.6	1,902.2	1,901.9	4.0	4.0	-170.87	3.8	3.6	32.6	24.6	7.99	4.080	
1,940.8	1,939.0	1,943.2	1,942.8	4.1	4.1	-174.69	0.5	4.7	35.1	26.9	8.14	4.305	
2,000.0	1,997.6	2,002.7	2,002.0	4.3	4.2	-179.99	-5.0	6.6	38.5	30.1	8.37	4.597	
2,100.0	2,096.6	2,102.4	2,101.1	4.6	4.4	172.30	-15.1	10.0	44.2	35.4	8.77	5.034	
2,200.0	2,195.6	2,202.1	2,200.2	4.8	4.7	166.42	-25.1	13.4	50.4	41.2	9.20	5.484	
2,300.0	2,294.6	2,301.8	2,299.4	5.1	4.9	161.88	-35.2	16.8	57.1	47.5	9.65	5.923	
2,400.0	2,393.6	2,401.5	2,398.5	5.4	5.1	158.31	-45.2	20.2	64.1	54.0	10.12	6.339	
2,500.0	2,492.6	2,501.2	2,497.6	5.7	5.4	155.45	-55.3	23.6	71.3	60.7	10.60	6.727	
2,600.0	2,591.6	2,600.9	2,596.7	6.0	5.6	153.11	-65.3	27.0	78.6	67.5	11.10	7.084	
2,700.0	2,690.6	2,700.6	2,695.8	6.3	5.9	151.18	-75.4	30.5	86.1	74.5	11.61	7.413	
2,800.0	2,789.6	2,800.2	2,795.0	6.6	6.1	149.55	-85.4	33.9	93.6	81.5	12.13	7.713	
2,900.0	2,888.6	2,899.9	2,894.1	6.9	6.4	148.17	-95.5	37.3	101.2	88.5	12.67	7.988	
3,000.0	2,987.6	2,999.6	2,993.2	7.3	6.6	146.98	-105.6	40.7	108.8	95.6	13.20	8.240	
3,100.0	3,086.6	3,099.3	3,092.3	7.6	6.9	145.95	-115.6	44.1	116.5	102.7	13.75	8.471	
3,200.0	3,185.6	3,199.0	3,191.4	7.9	7.2	145.04	-125.7	47.5	124.2	109.9	14.30	8.682	
3,300.0	3,284.6	3,298.7	3,290.5	8.2	7.5	144.24	-135.7	50.9	131.9	117.1	14.86	8.877	
3,400.0	3,383.6	3,398.3	3,389.7	8.6	7.7	143.53	-145.8	54.4	139.7	124.2	15.42	9.056	
3,500.0	3,482.6	3,498.0	3,488.8	8.9	8.0	142.89	-155.8	57.8	147.4	131.5	15.99	9.221	
3,600.0	3,581.6	3,597.7	3,587.9	9.2	8.3	142.32	-165.9	61.2	155.2	138.7	16.56	9.374	
3,700.0	3,680.6	3,697.4	3,687.0	9.6	8.6	141.80	-175.9	64.6	163.0	145.9	17.14	9.515	
3,800.0	3,779.6	3,797.1	3,786.1	9.9	8.9	141.33	-186.0	68.0	170.9	153.1	17.71	9.646	
3,900.0	3,878.6	3,896.8	3,885.2	10.3	9.2	140.90	-196.1	71.4	178.7	160.4	18.29	9.768	
4,000.0	3,977.6	3,996.5	3,984.4	10.6	9.4	140.51	-206.1	74.8	186.5	167.6	18.87	9.882	
4,100.0	4,076.6	4,096.1	4,083.5	10.9	9.7	140.15	-216.2	78.3	194.4	174.9	19.46	9.988	
4,200.0	4,175.6	4,195.8	4,182.6	11.3	10.0	139.82	-226.2	81.7	202.2	182.2	20.05	10.088	
4,300.0	4,274.6	4,295.5	4,281.7	11.6	10.3	139.51	-236.3	85.1	210.1	189.4	20.63	10.181	
4,400.0	4,373.6	4,395.2	4,380.8	12.0	10.6	139.22	-246.3	88.5	217.9	196.7	21.23	10.268	
4,500.0	4,472.6	4,494.9	4,479.9	12.3	10.9	138.96	-256.4	91.9	225.8	204.0	21.82	10.350	
4,600.0	4,571.6	4,594.6	4,579.1	12.7	11.2	138.71	-266.4	95.3	233.7	211.3	22.41	10.427	
4,700.0	4,670.6	4,694.2	4,678.2	13.0	11.5	138.48	-276.5	98.7	241.6	218.6	23.01	10.500	
4,800.0	4,769.6	4,793.9	4,777.3	13.3	11.8	138.26	-286.6	102.2	249.4	225.8	23.60	10.569	
4,900.0	4,868.6	4,893.6	4,876.4	13.7	12.1	138.05	-296.6	105.6	257.3	233.1	24.20	10.633	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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-321 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,967.6	4,991.5	4,973.8	14.0	12.3	138.10	-305.5	108.6	265.5	240.7	24.75	10.729	
5,100.0	5,066.6	5,088.7	5,070.8	14.4	12.5	138.80	-311.2	110.5	274.5	249.3	25.20	10.895	
5,129.4	5,095.7	5,117.2	5,099.3	14.5	12.6	139.12	-312.2	110.9	277.3	252.0	25.32	10.955	
5,200.0	5,165.7	5,185.5	5,167.6	14.7	12.7	140.06	-313.7	111.4	283.8	258.3	25.58	11.098	
5,300.0	5,265.2	5,284.1	5,266.2	14.9	12.9	141.36	-313.9	111.4	291.5	265.6	25.89	11.260	
5,400.0	5,365.0	5,383.9	5,366.0	15.1	13.0	142.20	-313.9	111.4	296.6	270.4	26.19	11.323	
5,500.0	5,464.9	5,483.8	5,465.9	15.3	13.2	142.58	-313.9	111.4	298.9	272.4	26.49	11.282	
5,535.1	5,500.0	5,518.9	5,501.0	15.3	13.3	-89.98	-313.9	111.4	299.1	272.5	26.60	11.242	
5,600.0	5,564.9	5,583.8	5,565.9	15.4	13.4	-89.98	-313.9	111.4	299.1	272.3	26.83	11.147	
5,700.0	5,664.9	5,683.8	5,665.9	15.6	13.6	-89.98	-313.9	111.4	299.1	271.9	27.18	11.004	
5,800.0	5,764.9	5,783.8	5,765.9	15.8	13.7	-89.98	-313.9	111.4	299.1	271.6	27.53	10.863	
5,900.0	5,864.9	5,883.8	5,865.9	15.9	13.9	-89.98	-313.9	111.4	299.1	271.2	27.89	10.725	
6,000.0	5,964.9	5,983.8	5,965.9	16.1	14.1	-89.98	-313.9	111.4	299.1	270.8	28.24	10.590	
6,100.0	6,064.9	6,083.8	6,065.9	16.2	14.3	-89.98	-313.9	111.4	299.1	270.5	28.60	10.457	
6,200.0	6,164.9	6,183.8	6,165.9	16.4	14.5	-89.98	-313.9	111.4	299.1	270.1	28.97	10.326	
6,300.0	6,264.9	6,283.8	6,265.9	16.6	14.6	-89.98	-313.9	111.4	299.1	269.8	29.33	10.198	
6,400.0	6,364.9	6,383.8	6,365.9	16.7	14.8	-89.98	-313.9	111.4	299.1	269.4	29.70	10.072	
6,498.5	6,463.5	6,482.3	6,464.5	16.9	15.0	-89.98	-313.9	111.4	299.1	269.0	30.06	9.950	
6,500.0	6,464.9	6,483.8	6,465.9	16.9	15.0	-89.98	-313.9	111.4	299.1	269.0	30.07	9.948	
6,512.4	6,477.4	6,496.2	6,478.4	16.9	15.0	-90.00	-313.9	111.4	299.1	269.0	30.11	9.933	
6,550.0	6,514.9	6,533.8	6,515.9	17.0	15.1	-90.31	-313.9	111.4	299.1	268.8	30.26	9.883	
6,600.0	6,564.6	6,583.5	6,565.7	17.0	15.2	-91.26	-313.9	111.4	299.2	268.7	30.48	9.816	
6,650.0	6,613.9	6,633.8	6,615.8	17.1	15.3	-92.48	-312.1	111.4	299.4	268.7	30.68	9.757	
6,700.0	6,662.6	6,684.4	6,666.2	17.1	15.3	-93.71	-307.0	111.4	299.7	268.9	30.85	9.717	
6,750.0	6,710.4	6,735.5	6,716.6	17.1	15.4	-94.91	-298.4	111.4	300.2	269.2	30.97	9.693	
6,800.0	6,757.2	6,787.1	6,766.7	17.1	15.4	-96.10	-286.4	111.4	300.8	269.8	31.06	9.686	
6,850.0	6,802.7	6,839.1	6,816.4	17.1	15.4	-97.26	-270.8	111.4	301.5	270.4	31.11	9.694	
6,900.0	6,846.7	6,891.6	6,865.3	17.1	15.4	-98.39	-251.8	111.4	302.4	271.3	31.12	9.716	
6,950.0	6,889.1	6,944.6	6,913.1	17.1	15.4	-99.49	-229.2	111.4	303.3	272.2	31.11	9.748	
7,000.0	6,929.7	6,998.0	6,959.7	17.1	15.4	-100.54	-203.1	111.4	304.3	273.2	31.08	9.789	
7,050.0	6,968.3	7,051.8	7,004.7	17.1	15.4	-101.54	-173.6	111.4	305.3	274.3	31.05	9.833	
7,100.0	7,004.7	7,106.1	7,047.9	17.0	15.5	-102.48	-140.7	111.4	306.4	275.4	31.03	9.875	
7,150.0	7,038.8	7,160.8	7,088.9	17.0	15.5	-103.37	-104.5	111.4	307.5	276.5	31.02	9.912	
7,200.0	7,070.4	7,215.9	7,127.5	17.0	15.5	-104.20	-65.2	111.4	308.6	277.5	31.06	9.936	
7,250.0	7,099.5	7,271.4	7,163.4	17.0	15.6	-104.96	-22.9	111.4	309.6	278.5	31.15	9.941	
7,300.0	7,125.8	7,327.2	7,196.4	17.0	15.7	-105.65	22.2	111.4	310.6	279.3	31.31	9.923	
7,350.0	7,149.3	7,383.4	7,226.1	16.9	15.9	-106.26	69.9	111.4	311.6	280.0	31.55	9.875	
7,400.0	7,169.8	7,439.9	7,252.4	17.0	16.1	-106.80	119.8	111.4	312.4	280.5	31.90	9.795	
7,450.0	7,187.3	7,496.7	7,275.0	17.1	16.4	-107.26	171.9	111.4	313.2	280.8	32.36	9.680	
7,500.0	7,201.8	7,553.7	7,293.7	17.4	16.8	-107.64	225.7	111.4	313.8	280.9	32.93	9.529	
7,550.0	7,213.0	7,610.8	7,308.5	17.8	17.2	-107.94	280.9	111.4	314.3	280.7	33.64	9.345	
7,600.0	7,221.1	7,668.1	7,319.0	18.2	17.7	-108.15	337.2	111.4	314.7	280.3	34.46	9.132	
7,650.0	7,225.9	7,725.5	7,325.4	18.7	18.2	-108.28	394.2	111.4	314.9	279.5	35.40	8.896	
7,700.0	7,227.4	7,782.9	7,327.4	19.2	18.7	-108.32	451.6	111.4	315.0	278.6	36.45	8.642	
7,708.7	7,227.3	7,792.9	7,327.3	19.3	18.8	-108.32	461.6	111.4	315.0	278.4	36.64	8.597	
7,800.0	7,226.1	7,884.3	7,325.9	20.3	19.9	-108.27	553.0	111.4	314.9	276.3	38.59	8.161	
7,900.0	7,224.8	7,984.3	7,324.3	21.5	21.1	-108.23	653.0	111.4	314.8	273.9	40.92	7.693	
8,000.0	7,223.5	8,084.3	7,322.7	22.8	22.4	-108.18	752.9	111.4	314.7	271.3	43.44	7.245	
8,100.0	7,222.2	8,184.3	7,321.1	24.2	23.8	-108.13	852.9	111.4	314.6	268.5	46.12	6.822	
8,200.0	7,220.8	8,284.3	7,319.4	25.7	25.2	-108.08	952.9	111.4	314.6	265.6	48.93	6.428	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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-321 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,300.0	7,219.5	8,384.3	7,317.8	27.2	26.8	-108.03	1,052.9	111.4	314.5	262.6	51.85	6.065	
8,400.0	7,218.2	8,484.3	7,316.2	28.7	28.3	-107.99	1,152.9	111.4	314.4	259.5	54.86	5.730	
8,500.0	7,216.8	8,584.3	7,314.6	30.3	29.9	-107.94	1,252.9	111.4	314.3	256.3	57.96	5.423	
8,600.0	7,215.5	8,684.3	7,313.0	31.9	31.6	-107.89	1,352.9	111.4	314.2	253.1	61.12	5.141	
8,700.0	7,214.2	8,784.3	7,311.4	33.6	33.2	-107.84	1,452.9	111.4	314.1	249.8	64.33	4.882	
8,800.0	7,212.9	8,884.3	7,309.8	35.3	34.9	-107.79	1,552.8	111.4	314.0	246.4	67.60	4.645	
8,900.0	7,211.5	8,984.3	7,308.2	37.0	36.7	-107.75	1,652.8	111.3	313.9	243.0	70.91	4.427	
9,000.0	7,210.2	9,084.3	7,306.6	38.7	38.4	-107.70	1,752.8	111.3	313.8	239.6	74.26	4.226	
9,100.0	7,208.9	9,184.3	7,305.0	40.4	40.1	-107.65	1,852.8	111.3	313.7	236.1	77.64	4.041	
9,200.0	7,207.6	9,284.3	7,303.4	42.2	41.9	-107.60	1,952.8	111.3	313.6	232.6	81.05	3.870	
9,300.0	7,206.2	9,384.3	7,301.8	44.0	43.7	-107.55	2,052.8	111.3	313.6	229.1	84.48	3.712	
9,400.0	7,204.9	9,484.3	7,300.2	45.8	45.5	-107.50	2,152.8	111.3	313.5	225.5	87.94	3.565	
9,500.0	7,203.6	9,584.3	7,298.6	47.5	47.3	-107.46	2,252.7	111.3	313.4	222.0	91.42	3.428	
9,600.0	7,202.3	9,684.3	7,297.0	49.3	49.1	-107.41	2,352.7	111.3	313.3	218.4	94.92	3.301	
9,700.0	7,200.9	9,784.3	7,295.4	51.2	50.9	-107.36	2,452.7	111.3	313.2	214.8	98.43	3.182	
9,800.0	7,199.6	9,884.3	7,293.8	53.0	52.7	-107.31	2,552.7	111.3	313.1	211.2	101.96	3.071	
9,900.0	7,198.3	9,984.3	7,292.2	54.8	54.6	-107.26	2,652.7	111.3	313.0	207.5	105.50	2.967	
10,000.0	7,196.9	10,084.3	7,290.5	56.6	56.4	-107.21	2,752.7	111.3	312.9	203.9	109.05	2.870	
10,100.0	7,195.6	10,184.3	7,288.9	58.5	58.2	-107.17	2,852.7	111.3	312.8	200.2	112.62	2.778	
10,200.0	7,194.3	10,284.3	7,287.3	60.3	60.1	-107.12	2,952.7	111.3	312.8	196.6	116.20	2.692	
10,300.0	7,193.0	10,384.3	7,285.7	62.1	61.9	-107.07	3,052.6	111.3	312.7	192.9	119.78	2.610	
10,400.0	7,191.6	10,484.3	7,284.1	64.0	63.8	-107.02	3,152.6	111.3	312.6	189.2	123.38	2.534	
10,500.0	7,190.3	10,584.3	7,282.5	65.8	65.7	-106.97	3,252.6	111.3	312.5	185.5	126.98	2.461	
10,600.0	7,189.0	10,684.3	7,280.9	67.7	67.5	-106.92	3,352.6	111.3	312.4	181.8	130.60	2.392	
10,700.0	7,187.7	10,784.3	7,279.3	69.6	69.4	-106.87	3,452.6	111.3	312.3	178.1	134.22	2.327	
10,800.0	7,186.3	10,884.3	7,277.7	71.4	71.3	-106.82	3,552.6	111.2	312.2	174.4	137.84	2.265	
10,900.0	7,185.0	10,984.3	7,276.1	73.3	73.1	-106.78	3,652.6	111.2	312.2	170.7	141.48	2.206	
11,000.0	7,183.7	11,084.3	7,274.5	75.2	75.0	-106.73	3,752.5	111.2	312.1	167.0	145.11	2.150	
11,100.0	7,182.4	11,184.3	7,272.9	77.0	76.9	-106.68	3,852.5	111.2	312.0	163.2	148.76	2.097	
11,200.0	7,181.0	11,284.3	7,271.3	78.9	78.8	-106.63	3,952.5	111.2	311.9	159.5	152.41	2.046	
11,300.0	7,179.7	11,384.3	7,269.7	80.8	80.6	-106.58	4,052.5	111.2	311.8	155.7	156.07	1.998	
11,400.0	7,178.4	11,484.3	7,268.1	82.6	82.5	-106.53	4,152.5	111.2	311.7	152.0	159.73	1.952	
11,500.0	7,177.1	11,584.3	7,266.5	84.5	84.4	-106.48	4,252.5	111.2	311.6	148.3	163.39	1.907	
11,600.0	7,175.7	11,684.3	7,264.9	86.4	86.3	-106.43	4,352.5	111.2	311.6	144.5	167.06	1.865	
11,640.7	7,175.2	11,725.0	7,264.2	87.2	87.0	-106.41	4,393.2	111.2	311.5	143.1	168.46	1.849	
11,654.7	7,175.0	11,737.7	7,264.0	87.4	87.1	-106.41	4,405.8	111.2	311.5	142.6	168.91	1.844 SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.63	-15.0	0.1	15.0	15.0	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	179.63	-15.0	0.1	15.0	14.8	0.22	66.738	
200.0	200.0	200.0	200.0	0.3	0.3	179.63	-15.0	0.1	15.0	14.3	0.67	22.246	
300.0	300.0	300.0	300.0	0.6	0.6	179.63	-15.0	0.1	15.0	13.9	1.12	13.348	
400.0	400.0	400.0	400.0	0.8	0.8	179.63	-15.0	0.1	15.0	13.4	1.57	9.534	
500.0	500.0	500.0	500.0	1.0	1.0	179.63	-15.0	0.1	15.0	13.0	2.02	7.415	
600.0	600.0	600.0	600.0	1.2	1.2	179.63	-15.0	0.1	15.0	12.5	2.47	6.067	
700.0	700.0	700.0	700.0	1.5	1.5	179.63	-15.0	0.1	15.0	12.1	2.92	5.134	
800.0	800.0	800.0	800.0	1.7	1.7	179.63	-15.0	0.1	15.0	11.6	3.37	4.449	
900.0	900.0	900.0	900.0	1.9	1.9	179.63	-15.0	0.1	15.0	11.2	3.82	3.926	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	179.63	-15.0	0.1	15.0	10.7	4.27	3.513	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	179.63	-15.0	0.1	15.0	10.3	4.72	3.178	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	179.63	-15.0	0.1	15.0	9.8	5.17	2.902	CC, ES
1,300.0	1,300.0	1,299.8	1,299.8	2.8	2.8	175.23	-15.5	1.3	15.6	10.0	5.60	2.781	SF
1,400.0	1,400.0	1,399.5	1,399.4	3.0	3.0	164.06	-17.1	4.9	17.8	11.7	6.02	2.953	
1,500.0	1,500.0	1,499.0	1,498.7	3.2	3.2	25.12	-19.7	10.8	21.3	14.9	6.41	3.319	
1,600.0	1,599.9	1,598.4	1,597.6	3.4	3.4	15.80	-23.3	19.1	25.2	18.4	6.79	3.701	
1,700.0	1,699.7	1,697.6	1,696.2	3.6	3.6	7.93	-27.9	29.8	29.3	22.1	7.18	4.083	
1,800.0	1,799.3	1,796.6	1,794.2	3.8	3.9	1.06	-33.5	42.8	33.8	26.2	7.57	4.464	
1,900.0	1,898.6	1,895.5	1,891.7	4.0	4.2	-5.06	-40.1	58.0	38.6	30.6	7.96	4.846	
1,940.8	1,939.0	1,936.1	1,931.5	4.1	4.3	-7.38	-43.1	64.9	40.6	32.4	8.12	4.993	
2,000.0	1,997.6	1,995.1	1,989.6	4.3	4.5	-10.47	-47.5	75.0	43.3	34.9	8.37	5.172	
2,100.0	2,096.6	2,094.9	2,087.6	4.6	4.8	-14.85	-54.8	92.0	48.2	39.4	8.81	5.471	
2,200.0	2,195.6	2,194.8	2,185.7	4.8	5.2	-18.42	-62.2	109.0	53.3	44.1	9.27	5.755	
2,300.0	2,294.6	2,294.6	2,283.8	5.1	5.5	-21.35	-69.6	126.1	58.6	48.9	9.74	6.019	
2,400.0	2,393.6	2,394.4	2,381.9	5.4	5.9	-23.79	-77.0	143.1	64.0	53.8	10.23	6.261	
2,500.0	2,492.6	2,494.2	2,480.0	5.7	6.3	-25.85	-84.4	160.1	69.5	58.8	10.73	6.482	
2,600.0	2,591.6	2,594.0	2,578.0	6.0	6.6	-27.60	-91.7	177.2	75.1	63.9	11.24	6.682	
2,700.0	2,690.6	2,693.9	2,676.1	6.3	7.0	-29.11	-99.1	194.2	80.8	69.0	11.77	6.862	
2,800.0	2,789.6	2,793.7	2,774.2	6.6	7.4	-30.42	-106.5	211.2	86.5	74.2	12.31	7.025	
2,900.0	2,888.6	2,893.5	2,872.3	6.9	7.8	-31.57	-113.9	228.2	92.2	79.4	12.86	7.172	
3,000.0	2,987.6	2,993.3	2,970.3	7.3	8.2	-32.58	-121.3	245.3	98.0	84.6	13.41	7.305	
3,100.0	3,086.6	3,093.1	3,068.4	7.6	8.6	-33.48	-128.7	262.3	103.8	89.8	13.98	7.426	
3,200.0	3,185.6	3,193.0	3,166.5	7.9	9.0	-34.29	-136.0	279.3	109.6	95.1	14.55	7.535	
3,300.0	3,284.6	3,292.8	3,264.6	8.2	9.4	-35.01	-143.4	296.4	115.5	100.3	15.12	7.635	
3,400.0	3,383.6	3,392.6	3,362.7	8.6	9.8	-35.67	-150.8	313.4	121.3	105.6	15.70	7.726	
3,500.0	3,482.6	3,492.4	3,460.7	8.9	10.2	-36.26	-158.2	330.4	127.2	110.9	16.29	7.809	
3,600.0	3,581.6	3,592.2	3,558.8	9.2	10.6	-36.80	-165.6	347.4	133.1	116.2	16.88	7.885	
3,700.0	3,680.6	3,692.1	3,656.9	9.6	11.0	-37.30	-172.9	364.5	139.0	121.5	17.47	7.955	
3,800.0	3,779.6	3,791.9	3,755.0	9.9	11.4	-37.75	-180.3	381.5	144.9	126.8	18.07	8.019	
3,900.0	3,878.6	3,891.7	3,853.1	10.3	11.9	-38.17	-187.7	398.5	150.8	132.1	18.67	8.078	
4,000.0	3,977.6	3,991.5	3,951.1	10.6	12.3	-38.56	-195.1	415.6	156.7	137.4	19.27	8.133	
4,100.0	4,076.6	4,091.3	4,049.2	10.9	12.7	-38.92	-202.5	432.6	162.6	142.8	19.87	8.184	
4,200.0	4,175.6	4,191.2	4,147.3	11.3	13.1	-39.25	-209.8	449.6	168.6	148.1	20.48	8.231	
4,300.0	4,274.6	4,291.0	4,245.4	11.6	13.5	-39.56	-217.2	466.6	174.5	153.4	21.09	8.275	
4,400.0	4,373.6	4,390.8	4,343.5	12.0	13.9	-39.85	-224.6	483.7	180.5	158.8	21.70	8.317	
4,500.0	4,472.6	4,490.6	4,441.5	12.3	14.3	-40.13	-232.0	500.7	186.4	164.1	22.31	8.355	
4,600.0	4,571.6	4,590.4	4,539.6	12.7	14.8	-40.38	-239.4	517.7	192.4	169.4	22.92	8.391	
4,700.0	4,670.6	4,690.2	4,637.7	13.0	15.2	-40.62	-246.7	534.8	198.3	174.8	23.54	8.424	
4,800.0	4,769.6	4,790.1	4,735.8	13.3	15.6	-40.85	-254.1	551.8	204.3	180.1	24.16	8.456	
4,900.0	4,868.6	4,889.9	4,833.8	13.7	16.0	-41.06	-261.5	568.8	210.2	185.5	24.77	8.486	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,967.6	4,989.7	4,931.9	14.0	16.4	-41.26	-268.9	585.8	216.2	190.8	25.39	8.514	
5,100.0	5,066.6	5,089.5	5,030.0	14.4	16.9	-41.45	-276.3	602.9	222.2	196.1	26.01	8.540	
5,129.4	5,095.7	5,118.9	5,058.9	14.5	17.0	-41.51	-278.4	607.9	223.9	197.7	26.20	8.548	
5,200.0	5,165.7	5,189.3	5,128.0	14.7	17.3	-41.56	-283.6	619.9	228.8	202.2	26.59	8.604	
5,300.0	5,265.2	5,288.9	5,225.9	14.9	17.7	-41.17	-291.0	636.9	237.9	210.9	27.03	8.802	
5,400.0	5,365.0	5,392.9	5,328.2	15.1	18.1	-40.35	-298.4	654.0	249.1	221.8	27.35	9.107	
5,500.0	5,464.9	5,500.8	5,435.0	15.3	18.4	-39.39	-304.7	668.5	260.0	232.4	27.58	9.429	
5,535.1	5,500.0	5,538.8	5,472.7	15.3	18.5	88.37	-306.5	672.7	263.7	236.0	27.64	9.540	
5,600.0	5,564.9	5,609.4	5,542.9	15.4	18.6	89.02	-309.4	679.3	269.7	241.9	27.80	9.702	
5,700.0	5,664.9	5,718.6	5,651.9	15.6	18.8	89.68	-312.5	686.4	276.2	248.1	28.08	9.835	
5,800.0	5,764.9	5,828.3	5,761.5	15.8	19.0	89.98	-313.9	689.7	279.2	250.8	28.40	9.829	
5,900.0	5,864.9	5,931.8	5,864.9	15.9	19.2	90.00	-314.0	689.9	279.4	250.6	28.75	9.717	
6,000.0	5,964.9	6,031.8	5,964.9	16.1	19.3	90.00	-314.0	689.9	279.4	250.3	29.10	9.601	
6,100.0	6,064.9	6,131.8	6,064.9	16.2	19.4	90.00	-314.0	689.9	279.4	249.9	29.45	9.486	
6,200.0	6,164.9	6,231.8	6,164.9	16.4	19.6	90.00	-314.0	689.9	279.4	249.6	29.81	9.373	
6,300.0	6,264.9	6,331.8	6,264.9	16.6	19.7	90.00	-314.0	689.9	279.4	249.2	30.16	9.262	
6,400.0	6,364.9	6,431.8	6,364.9	16.7	19.9	90.00	-314.0	689.9	279.4	248.9	30.52	9.153	
6,498.5	6,463.5	6,530.3	6,463.5	16.9	20.0	90.00	-314.0	689.9	279.4	248.5	30.88	9.047	
6,500.0	6,464.9	6,531.8	6,464.9	16.9	20.0	90.01	-314.0	689.9	279.4	248.5	30.89	9.046	
6,509.4	6,474.4	6,541.2	6,474.4	16.9	20.0	90.02	-314.0	689.9	279.4	248.5	30.92	9.037	
6,550.0	6,514.9	6,581.7	6,514.9	17.0	20.1	90.36	-314.0	689.9	279.4	248.4	31.01	9.009	
6,600.0	6,564.6	6,631.5	6,564.6	17.0	20.1	91.37	-314.0	689.9	279.5	248.4	31.04	9.005	
6,650.0	6,613.9	6,680.8	6,613.9	17.1	20.2	93.01	-314.0	689.9	279.8	248.8	30.96	9.035	
6,700.0	6,662.6	6,729.5	6,662.6	17.1	20.3	95.22	-314.0	689.9	280.6	249.8	30.81	9.107	
6,750.0	6,710.4	6,779.1	6,712.2	17.1	20.4	97.88	-313.2	689.9	282.3	251.7	30.60	9.223	
6,800.0	6,757.2	6,830.3	6,763.3	17.1	20.4	100.57	-309.2	689.9	284.6	254.2	30.38	9.368	
6,850.0	6,802.7	6,882.5	6,814.9	17.1	20.5	103.19	-301.6	689.9	287.6	257.4	30.15	9.539	
6,900.0	6,846.7	6,935.8	6,867.0	17.1	20.5	105.74	-290.1	689.9	291.1	261.2	29.90	9.736	
6,950.0	6,889.1	6,990.3	6,919.2	17.1	20.5	108.19	-274.8	689.9	295.2	265.5	29.64	9.959	
7,000.0	6,929.7	7,046.0	6,971.4	17.1	20.5	110.54	-255.2	689.9	299.7	270.3	29.36	10.206	
7,050.0	6,968.3	7,102.9	7,023.0	17.1	20.5	112.77	-231.4	689.9	304.5	275.4	29.06	10.477	
7,100.0	7,004.7	7,161.1	7,073.9	17.0	20.5	114.86	-203.2	689.9	309.6	280.8	28.75	10.767	
7,150.0	7,038.8	7,220.5	7,123.4	17.0	20.5	116.82	-170.4	689.9	314.8	286.3	28.43	11.073	
7,200.0	7,070.4	7,281.3	7,171.3	17.0	20.5	118.62	-133.0	689.9	320.0	291.9	28.10	11.388	
7,250.0	7,099.5	7,343.3	7,217.0	17.0	20.5	120.27	-91.0	689.9	325.2	297.4	27.78	11.704	
7,300.0	7,125.8	7,406.5	7,259.9	17.0	20.4	121.76	-44.6	689.9	330.1	302.6	27.50	12.006	
7,350.0	7,149.3	7,471.0	7,299.5	16.9	20.4	123.09	6.3	689.9	334.8	307.5	27.26	12.280	
7,400.0	7,169.8	7,536.6	7,335.2	17.0	20.4	124.24	61.2	689.9	339.1	312.0	27.10	12.512	
7,450.0	7,187.3	7,603.2	7,366.6	17.1	20.4	125.23	120.0	689.9	342.8	315.8	27.02	12.688	
7,500.0	7,201.8	7,670.7	7,393.0	17.4	20.5	126.03	182.1	689.9	346.0	319.0	27.08	12.780	
7,550.0	7,213.0	7,739.0	7,414.1	17.8	20.6	126.66	247.0	689.8	348.6	321.3	27.27	12.783	
7,600.0	7,221.1	7,807.8	7,429.3	18.2	20.9	127.11	314.1	689.8	350.5	322.9	27.62	12.688	
7,650.0	7,225.9	7,877.1	7,438.5	18.7	21.2	127.38	382.7	689.8	351.6	323.5	28.14	12.494	
7,700.0	7,227.4	7,946.5	7,441.5	19.2	21.7	127.47	452.0	689.8	352.0	323.1	28.83	12.209	
7,701.3	7,227.4	7,948.0	7,441.5	19.2	21.7	127.47	453.5	689.8	352.0	323.1	28.85	12.202	
7,708.7	7,227.3	7,955.4	7,441.5	19.3	21.7	127.47	460.9	689.8	352.0	323.0	28.94	12.164	
7,800.0	7,226.1	8,046.7	7,441.1	20.3	22.5	127.58	552.2	689.8	352.5	322.0	30.54	11.545	
7,900.0	7,224.8	8,146.7	7,440.8	21.5	23.6	127.71	652.2	689.8	353.1	320.6	32.47	10.875	
8,000.0	7,223.5	8,246.7	7,440.4	22.8	24.7	127.83	752.2	689.8	353.7	319.1	34.57	10.231	
8,100.0	7,222.2	8,346.7	7,440.0	24.2	26.0	127.95	852.2	689.8	354.3	317.5	36.82	9.623	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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

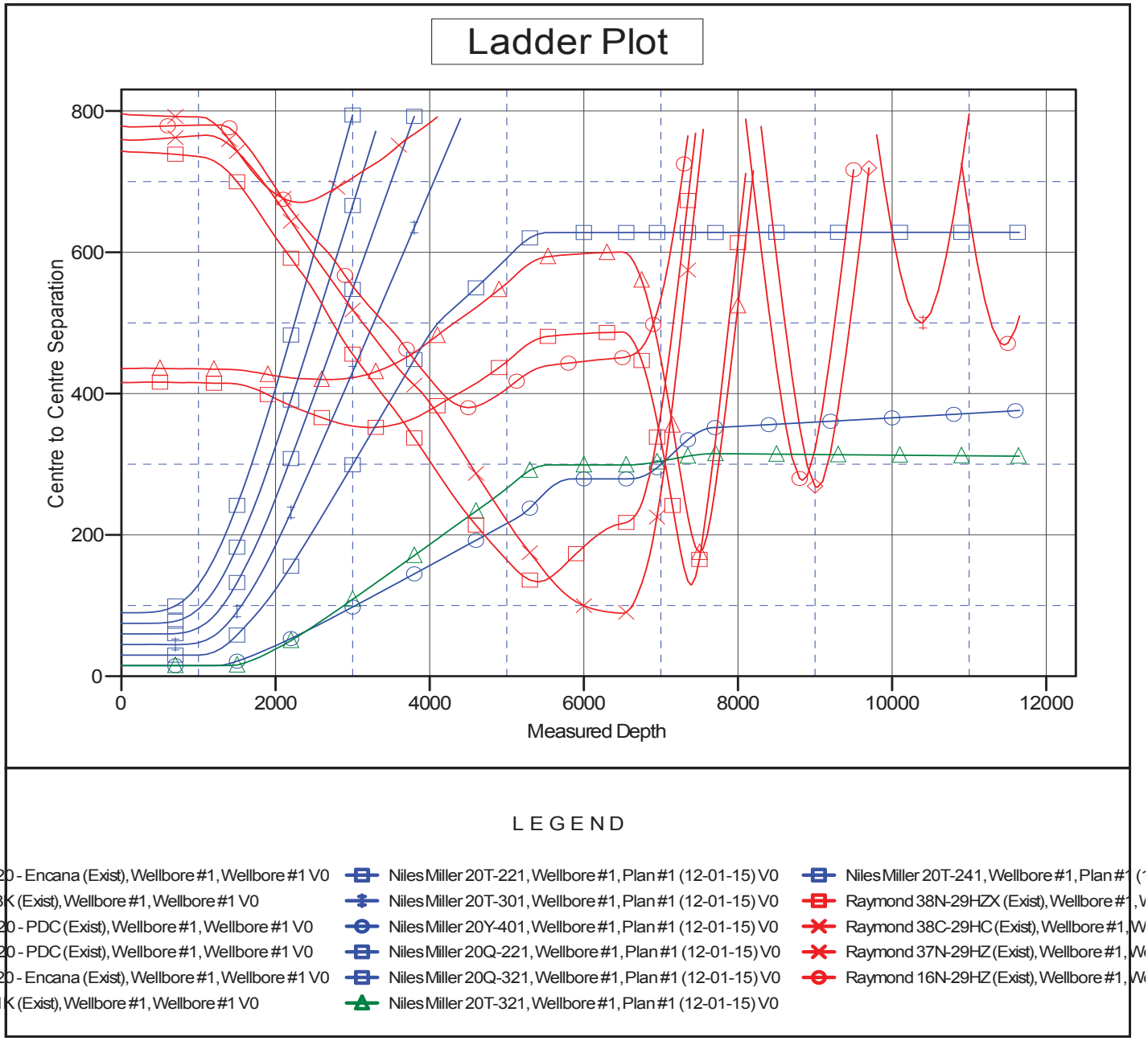
Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,200.0	7,220.8	8,446.7	7,439.7	25.7	27.4	128.07	952.2	689.8	354.9	315.7	39.17	9.059	
8,300.0	7,219.5	8,546.7	7,439.3	27.2	28.8	128.20	1,052.2	689.7	355.5	313.8	41.62	8.540	
8,400.0	7,218.2	8,646.7	7,438.9	28.7	30.3	128.32	1,152.2	689.7	356.1	311.9	44.15	8.065	
8,500.0	7,216.8	8,746.7	7,438.6	30.3	31.8	128.44	1,252.2	689.7	356.6	309.9	46.74	7.631	
8,600.0	7,215.5	8,846.7	7,438.2	31.9	33.3	128.56	1,352.2	689.7	357.2	307.9	49.37	7.236	
8,700.0	7,214.2	8,946.7	7,437.8	33.6	34.9	128.68	1,452.2	689.7	357.8	305.8	52.05	6.875	
8,800.0	7,212.9	9,046.7	7,437.5	35.3	36.6	128.80	1,552.2	689.7	358.4	303.7	54.76	6.545	
8,900.0	7,211.5	9,146.6	7,437.1	37.0	38.2	128.92	1,652.2	689.7	359.0	301.5	57.50	6.244	
9,000.0	7,210.2	9,246.6	7,436.7	38.7	39.9	129.04	1,752.2	689.7	359.6	299.4	60.27	5.967	
9,100.0	7,208.9	9,346.6	7,436.4	40.4	41.6	129.16	1,852.2	689.6	360.2	297.2	63.05	5.714	
9,200.0	7,207.6	9,446.6	7,436.0	42.2	43.3	129.28	1,952.2	689.6	360.9	295.0	65.85	5.480	
9,300.0	7,206.2	9,546.6	7,435.6	44.0	45.1	129.39	2,052.1	689.6	361.5	292.8	68.66	5.265	
9,400.0	7,204.9	9,646.6	7,435.3	45.8	46.8	129.51	2,152.1	689.6	362.1	290.6	71.47	5.066	
9,500.0	7,203.6	9,746.6	7,434.9	47.5	48.6	129.63	2,252.1	689.6	362.7	288.4	74.30	4.881	
9,600.0	7,202.3	9,846.6	7,434.5	49.3	50.3	129.75	2,352.1	689.6	363.3	286.2	77.13	4.710	
9,700.0	7,200.9	9,946.6	7,434.2	51.2	52.1	129.86	2,452.1	689.6	363.9	283.9	79.97	4.550	
9,800.0	7,199.6	10,046.6	7,433.8	53.0	53.9	129.98	2,552.1	689.5	364.5	281.7	82.81	4.402	
9,900.0	7,198.3	10,146.6	7,433.4	54.8	55.7	130.09	2,652.1	689.5	365.1	279.5	85.65	4.263	
10,000.0	7,196.9	10,246.6	7,433.1	56.6	57.5	130.21	2,752.1	689.5	365.7	277.3	88.50	4.133	
10,100.0	7,195.6	10,346.6	7,432.7	58.5	59.3	130.32	2,852.1	689.5	366.4	275.0	91.34	4.011	
10,200.0	7,194.3	10,446.6	7,432.3	60.3	61.1	130.44	2,952.1	689.5	367.0	272.8	94.18	3.896	
10,300.0	7,193.0	10,546.6	7,432.0	62.1	63.0	130.55	3,052.1	689.5	367.6	270.6	97.03	3.789	
10,400.0	7,191.6	10,646.6	7,431.6	64.0	64.8	130.67	3,152.1	689.5	368.2	268.4	99.87	3.687	
10,500.0	7,190.3	10,746.6	7,431.2	65.8	66.6	130.78	3,252.1	689.5	368.9	266.2	102.70	3.591	
10,600.0	7,189.0	10,846.6	7,430.9	67.7	68.5	130.89	3,352.1	689.4	369.5	263.9	105.54	3.501	
10,700.0	7,187.7	10,946.6	7,430.5	69.6	70.3	131.01	3,452.1	689.4	370.1	261.7	108.37	3.415	
10,800.0	7,186.3	11,046.6	7,430.1	71.4	72.2	131.12	3,552.1	689.4	370.7	259.5	111.20	3.334	
10,900.0	7,185.0	11,146.6	7,429.8	73.3	74.0	131.23	3,652.1	689.4	371.4	257.3	114.02	3.257	
11,000.0	7,183.7	11,246.6	7,429.4	75.2	75.9	131.34	3,752.1	689.4	372.0	255.2	116.84	3.184	
11,100.0	7,182.4	11,346.5	7,429.0	77.0	77.7	131.45	3,852.1	689.4	372.6	253.0	119.66	3.114	
11,200.0	7,181.0	11,446.5	7,428.7	78.9	79.6	131.56	3,952.0	689.4	373.3	250.8	122.47	3.048	
11,300.0	7,179.7	11,546.5	7,428.3	80.8	81.4	131.67	4,052.0	689.4	373.9	248.6	125.28	2.985	
11,400.0	7,178.4	11,646.5	7,427.9	82.6	83.3	131.78	4,152.0	689.3	374.5	246.5	128.08	2.924	
11,500.0	7,177.1	11,746.5	7,427.6	84.5	85.2	131.89	4,252.0	689.3	375.2	244.3	130.88	2.867	
11,600.0	7,175.7	11,846.5	7,427.2	86.4	87.0	132.00	4,352.0	689.3	375.8	242.2	133.67	2.812	
11,654.7	7,175.0	11,901.3	7,427.0	87.4	88.1	132.06	4,406.8	689.3	376.2	241.0	135.20	2.782	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 @ 4969.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Niles Miller 20Y-241
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 20Y-241
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4969.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20Y-241	**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 @ 4969.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Niles Miller 20Y-241
Coordinate System is US State Plane 1983, Colorado Northern Zone
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