

PETROLEUM DEVELOPMENT CORP DJ Basin

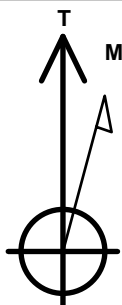
Well Name: **Cockroft 19V-204**

Surface Location: Cockroft 5N63W19C Pad Sec.19-T5N-R63W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4555.0

+N/-S +E/-W Northing Easting Longitude Slot
0.0 0.0 1385867.31 3285759.32 40.388070 -104.474130
RKB - 13' WELL @ 4568.0ft (RKB - 13')

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1414'FNL, 1155'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 1204'FNL, 2151'FEL, SEC.24	6423.0	226.7	-6267.8	Point
LPL 1187'FNL, 825'FEL, SEC.19	6438.0	226.7	330.3	Point



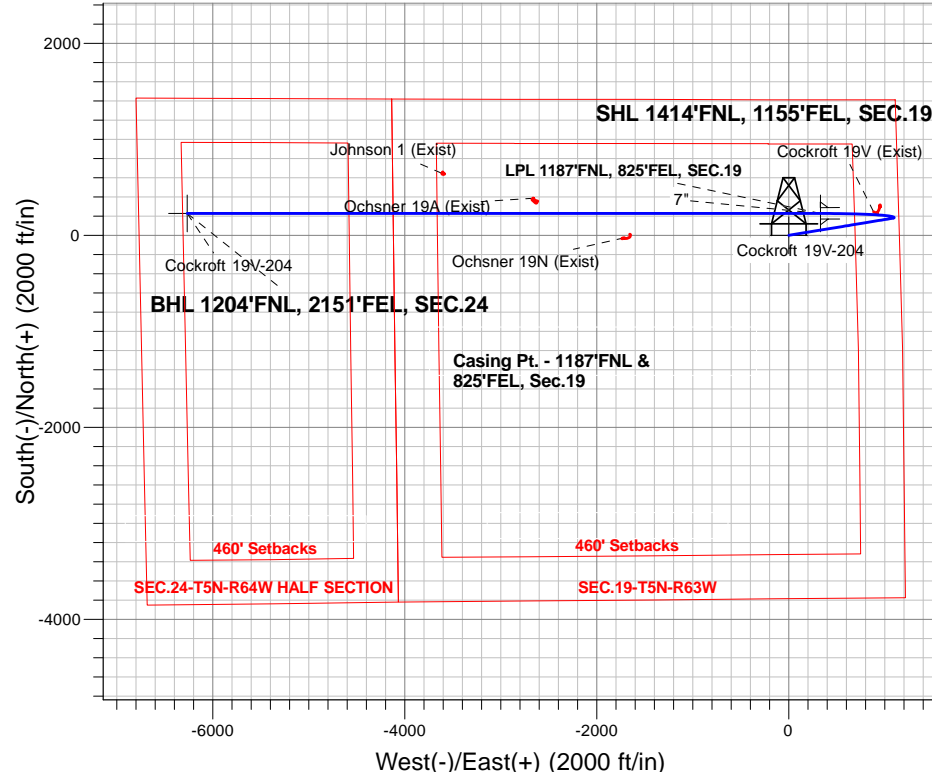
Azimuths to True North
Magnetic North: 8.11°

Magnetic Field
Strength: 52690.6snT
Dip Angle: 66.93°
Date: 11/18/2015
Model: IGRF2010

Cockroft 5N63W19C Pad Sec.19-T5N-R63W
Cockroft 19V-204
Plan #1 (11-13-15)
8:44, November 18 2015

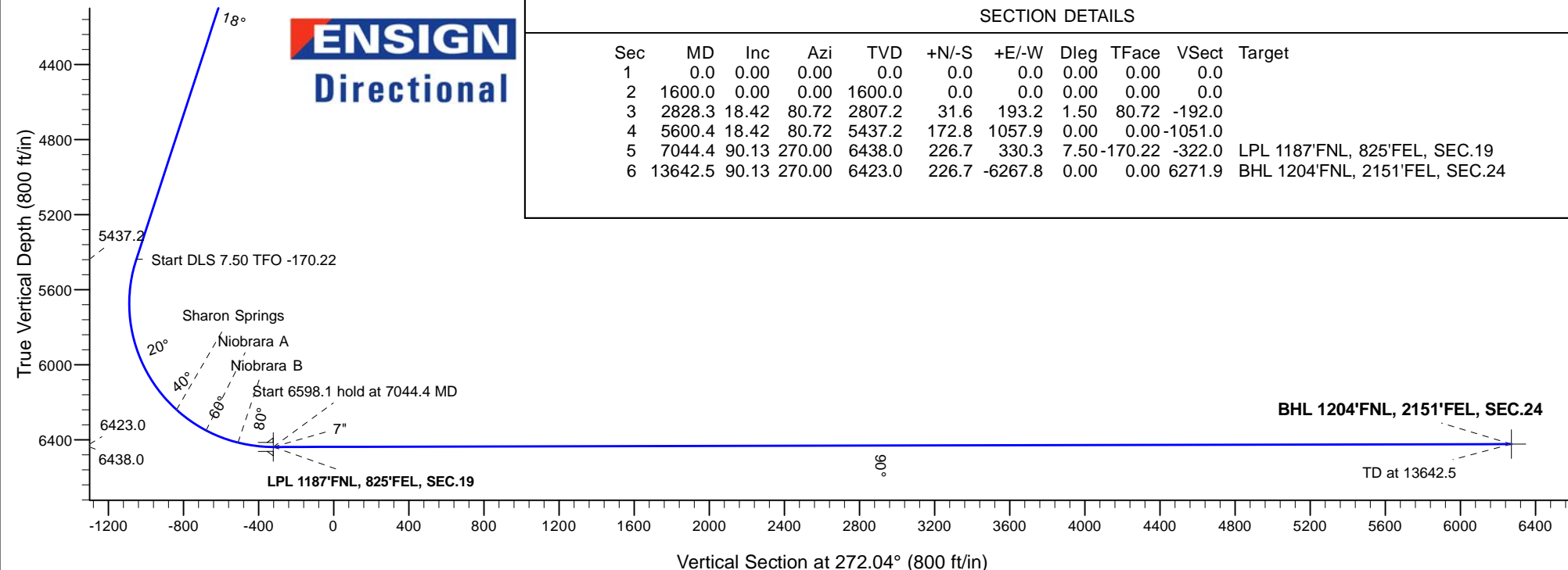
ANNOTATIONS

TVD	MD	Annotation
1600.0	1600.0	KOP - Start Build 1.50
2807.2	2828.3	Start 2772.1 hold at 2828.3 MD
5437.2	5600.4	Start DLS 7.50 TFO -170.22
6438.0	7044.4	Start 6598.1 hold at 7044.4 MD
6423.0	13642.5	TD at 13642.5



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	1600.0	0.00	0.00	1600.0	0.0	0.0	0.00	0.00	0.0	
3	2828.3	18.42	80.72	2807.2	31.6	193.2	1.50	80.72	-192.0	
4	5600.4	18.42	80.72	5437.2	172.8	1057.9	0.00	0.00	-1051.0	
5	7044.4	90.13	270.00	6438.0	226.7	330.3	7.50	-170.22	-322.0	LPL 1187'FNL, 825'FEL, SEC.19
6	13642.5	90.13	270.00	6423.0	226.7	-6267.8	0.00	0.00	6271.9	BHL 1204'FNL, 2151'FEL, SEC.24





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19V-204

Wellbore #1

Plan: Plan #1 (11-13-15)

Standard Planning Report

18 November, 2015

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockroft 19V-204
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19V-204	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

Project	SEC.19-T5N-R63W, 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		Cockroft 5N63W19C Pad Sec.19-T5N-R63W			
Site Position:		Northing:	1,385,863.51 usft	Latitude:	40.388060
From:	Lat/Long	Easting:	3,285,745.44 usft	Longitude:	-104.474180
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.66

Well	Cockroft 19V-204					
Well Position	+N/-S	3.6 ft	Northing:	1,385,867.31 usft	Latitude:	40.388070
	+E/-W	13.9 ft	Easting:	3,285,759.33 usft	Longitude:	-104.474130
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,555.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/18/2015	8.11	66.93	52,691

Design	Plan #1 (11-13-15)			
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	272.04

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,828.3	18.42	80.72	2,807.2	31.6	193.2	1.50	1.50	0.00	80.72	
5,600.4	18.42	80.72	5,437.2	172.8	1,057.9	0.00	0.00	0.00	0.00	
7,044.4	90.13	270.00	6,438.0	226.7	330.3	7.50	4.97	-11.82	-170.22	LPL 1187'FNL, 825'FE
13,642.5	90.13	270.00	6,423.0	226.7	-6,267.8	0.00	0.00	0.00	0.00	BHL 1204'FNL, 2151'I

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockroft 19V-204
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19V-204	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

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 1414'FNL, 1155'FEL, SEC.19									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
1,700.0	1.50	80.72	1,700.0	0.2	1.3	-1.3	1.50	1.50	0.00
1,800.0	3.00	80.72	1,799.9	0.8	5.2	-5.1	1.50	1.50	0.00
1,900.0	4.50	80.72	1,899.7	1.9	11.6	-11.5	1.50	1.50	0.00
2,000.0	6.00	80.72	1,999.3	3.4	20.7	-20.5	1.50	1.50	0.00
2,100.0	7.50	80.72	2,098.6	5.3	32.3	-32.0	1.50	1.50	0.00
2,200.0	9.00	80.72	2,197.5	7.6	46.4	-46.1	1.50	1.50	0.00
2,300.0	10.50	80.72	2,296.1	10.3	63.1	-62.7	1.50	1.50	0.00
2,400.0	12.00	80.72	2,394.2	13.5	82.4	-81.8	1.50	1.50	0.00
2,500.0	13.50	80.72	2,491.7	17.0	104.2	-103.5	1.50	1.50	0.00
2,600.0	15.00	80.72	2,588.6	21.0	128.5	-127.6	1.50	1.50	0.00
2,700.0	16.50	80.72	2,684.9	25.4	155.2	-154.2	1.50	1.50	0.00
2,800.0	18.00	80.72	2,780.4	30.1	184.5	-183.3	1.50	1.50	0.00
2,828.3	18.42	80.72	2,807.2	31.6	193.2	-192.0	1.50	1.50	0.00
Start 2772.1 hold at 2828.3 MD									
2,900.0	18.42	80.72	2,875.3	35.2	215.6	-214.2	0.00	0.00	0.00
3,000.0	18.42	80.72	2,970.1	40.3	246.8	-245.2	0.00	0.00	0.00
3,100.0	18.42	80.72	3,065.0	45.4	278.0	-276.2	0.00	0.00	0.00
3,200.0	18.42	80.72	3,159.9	50.5	309.2	-307.2	0.00	0.00	0.00
3,300.0	18.42	80.72	3,254.8	55.6	340.4	-338.2	0.00	0.00	0.00
3,384.6	18.42	80.72	3,335.0	59.9	366.7	-364.4	0.00	0.00	0.00
Parkman									
3,400.0	18.42	80.72	3,349.6	60.7	371.6	-369.2	0.00	0.00	0.00
3,500.0	18.42	80.72	3,444.5	65.8	402.7	-400.1	0.00	0.00	0.00
3,600.0	18.42	80.72	3,539.4	70.9	433.9	-431.1	0.00	0.00	0.00
3,700.0	18.42	80.72	3,634.3	76.0	465.1	-462.1	0.00	0.00	0.00
3,800.0	18.42	80.72	3,729.1	81.1	496.3	-493.1	0.00	0.00	0.00
3,900.0	18.42	80.72	3,824.0	86.2	527.5	-524.1	0.00	0.00	0.00
4,000.0	18.42	80.72	3,918.9	91.3	558.7	-555.1	0.00	0.00	0.00
4,100.0	18.42	80.72	4,013.8	96.4	589.9	-586.1	0.00	0.00	0.00
4,154.0	18.42	80.72	4,065.0	99.1	606.7	-602.8	0.00	0.00	0.00
Sussex									
4,200.0	18.42	80.72	4,108.6	101.5	621.1	-617.1	0.00	0.00	0.00
4,300.0	18.42	80.72	4,203.5	106.6	652.3	-648.1	0.00	0.00	0.00

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Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19V-204	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

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)
4,400.0	18.42	80.72	4,298.4	111.7	683.5	-679.1	0.00	0.00	0.00
4,500.0	18.42	80.72	4,393.3	116.8	714.7	-710.0	0.00	0.00	0.00
4,600.0	18.42	80.72	4,488.1	121.8	745.8	-741.0	0.00	0.00	0.00
4,700.0	18.42	80.72	4,583.0	126.9	777.0	-772.0	0.00	0.00	0.00
4,800.0	18.42	80.72	4,677.9	132.0	808.2	-803.0	0.00	0.00	0.00
4,900.0	18.42	80.72	4,772.8	137.1	839.4	-834.0	0.00	0.00	0.00
5,000.0	18.42	80.72	4,867.6	142.2	870.6	-865.0	0.00	0.00	0.00
5,100.0	18.42	80.72	4,962.5	147.3	901.8	-896.0	0.00	0.00	0.00
5,200.0	18.42	80.72	5,057.4	152.4	933.0	-927.0	0.00	0.00	0.00
5,300.0	18.42	80.72	5,152.3	157.5	964.2	-958.0	0.00	0.00	0.00
5,400.0	18.42	80.72	5,247.1	162.6	995.4	-988.9	0.00	0.00	0.00
5,500.0	18.42	80.72	5,342.0	167.7	1,026.6	-1,019.9	0.00	0.00	0.00
5,600.0	18.42	80.72	5,436.9	172.8	1,057.8	-1,050.9	0.00	0.00	0.00
5,600.4	18.42	80.72	5,437.2	172.8	1,057.9	-1,051.0	0.00	0.00	0.00
Start DLS 7.50 TFO -170.22									
5,700.0	11.13	74.15	5,533.5	178.0	1,082.7	-1,075.7	7.50	-7.32	-6.59
5,800.0	4.44	46.19	5,632.6	183.3	1,094.8	-1,087.6	7.50	-6.69	-27.96
5,900.0	5.28	305.54	5,732.3	188.7	1,093.8	-1,086.4	7.50	0.85	-100.65
6,000.0	12.19	284.42	5,831.1	194.0	1,079.8	-1,072.2	7.50	6.90	-21.12
6,100.0	19.53	278.72	5,927.3	199.2	1,053.1	-1,045.3	7.50	7.35	-5.70
6,200.0	26.96	276.07	6,019.1	204.1	1,013.9	-1,006.0	7.50	7.43	-2.65
6,300.0	34.42	274.51	6,105.0	208.7	963.1	-955.1	7.50	7.46	-1.57
6,400.0	41.89	273.44	6,183.6	213.0	901.6	-893.4	7.50	7.47	-1.06
6,479.6	47.84	272.80	6,240.0	216.0	845.5	-837.3	7.50	7.48	-0.81
Sharon Springs									
6,500.0	49.37	272.65	6,253.5	216.7	830.2	-822.0	7.50	7.48	-0.72
6,600.0	56.85	272.02	6,313.5	220.0	750.4	-742.1	7.50	7.48	-0.63
6,672.1	62.25	271.63	6,350.0	221.9	688.2	-679.9	7.50	7.49	-0.54
Niobrara A									
6,700.0	64.34	271.49	6,362.5	222.6	663.4	-655.0	7.50	7.49	-0.50
6,800.0	71.83	271.02	6,399.8	224.6	570.7	-562.3	7.50	7.49	-0.47
6,854.6	75.91	270.78	6,415.0	225.4	518.2	-509.9	7.50	7.49	-0.44
Niobrara B									
6,900.0	79.31	270.59	6,424.7	226.0	473.9	-465.6	7.50	7.49	-0.42
7,000.0	86.80	270.18	6,436.8	226.6	374.7	-366.4	7.50	7.49	-0.41
7,044.4	90.13	270.00	6,438.0	226.7	330.3	-322.0	7.49	7.48	-0.40
Start 6598.1 hold at 7044.4 MD - 7" - LPL 1187°FNL, 825°FEL, SEC.19									
7,100.0	90.13	270.00	6,437.9	226.7	274.7	-266.5	0.00	0.00	0.00
7,200.0	90.13	270.00	6,437.6	226.7	174.7	-166.5	0.00	0.00	0.00
7,300.0	90.13	270.00	6,437.4	226.7	74.7	-66.6	0.00	0.00	0.00
7,400.0	90.13	270.00	6,437.2	226.7	-25.3	33.3	0.00	0.00	0.00
7,500.0	90.13	270.00	6,437.0	226.7	-125.3	133.3	0.00	0.00	0.00
7,600.0	90.13	270.00	6,436.7	226.7	-225.3	233.2	0.00	0.00	0.00
7,700.0	90.13	270.00	6,436.5	226.7	-325.3	333.1	0.00	0.00	0.00
7,800.0	90.13	270.00	6,436.3	226.7	-425.3	433.1	0.00	0.00	0.00
7,900.0	90.13	270.00	6,436.1	226.7	-525.3	533.0	0.00	0.00	0.00
8,000.0	90.13	270.00	6,435.8	226.7	-625.3	632.9	0.00	0.00	0.00
8,100.0	90.13	270.00	6,435.6	226.7	-725.3	732.9	0.00	0.00	0.00
8,200.0	90.13	270.00	6,435.4	226.7	-825.3	832.8	0.00	0.00	0.00
8,300.0	90.13	270.00	6,435.1	226.7	-925.3	932.8	0.00	0.00	0.00
8,400.0	90.13	270.00	6,434.9	226.7	-1,025.3	1,032.7	0.00	0.00	0.00
8,500.0	90.13	270.00	6,434.7	226.7	-1,125.3	1,132.6	0.00	0.00	0.00

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Well:	Cockroft 19V-204	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

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)
8,600.0	90.13	270.00	6,434.5	226.7	-1,225.3	1,232.6	0.00	0.00	0.00
8,700.0	90.13	270.00	6,434.2	226.7	-1,325.3	1,332.5	0.00	0.00	0.00
8,800.0	90.13	270.00	6,434.0	226.7	-1,425.3	1,432.4	0.00	0.00	0.00
8,900.0	90.13	270.00	6,433.8	226.7	-1,525.3	1,532.4	0.00	0.00	0.00
9,000.0	90.13	270.00	6,433.6	226.7	-1,625.3	1,632.3	0.00	0.00	0.00
9,100.0	90.13	270.00	6,433.3	226.7	-1,725.3	1,732.2	0.00	0.00	0.00
9,200.0	90.13	270.00	6,433.1	226.7	-1,825.3	1,832.2	0.00	0.00	0.00
9,300.0	90.13	270.00	6,432.9	226.7	-1,925.3	1,932.1	0.00	0.00	0.00
9,400.0	90.13	270.00	6,432.6	226.7	-2,025.3	2,032.1	0.00	0.00	0.00
9,500.0	90.13	270.00	6,432.4	226.7	-2,125.3	2,132.0	0.00	0.00	0.00
9,600.0	90.13	270.00	6,432.2	226.7	-2,225.3	2,231.9	0.00	0.00	0.00
9,700.0	90.13	270.00	6,432.0	226.7	-2,325.3	2,331.9	0.00	0.00	0.00
9,800.0	90.13	270.00	6,431.7	226.7	-2,425.3	2,431.8	0.00	0.00	0.00
9,900.0	90.13	270.00	6,431.5	226.7	-2,525.3	2,531.7	0.00	0.00	0.00
10,000.0	90.13	270.00	6,431.3	226.7	-2,625.3	2,631.7	0.00	0.00	0.00
10,100.0	90.13	270.00	6,431.1	226.7	-2,725.3	2,731.6	0.00	0.00	0.00
10,200.0	90.13	270.00	6,430.8	226.7	-2,825.3	2,831.5	0.00	0.00	0.00
10,300.0	90.13	270.00	6,430.6	226.7	-2,925.3	2,931.5	0.00	0.00	0.00
10,400.0	90.13	270.00	6,430.4	226.7	-3,025.3	3,031.4	0.00	0.00	0.00
10,500.0	90.13	270.00	6,430.1	226.7	-3,125.3	3,131.4	0.00	0.00	0.00
10,600.0	90.13	270.00	6,429.9	226.7	-3,225.3	3,231.3	0.00	0.00	0.00
10,700.0	90.13	270.00	6,429.7	226.7	-3,325.3	3,331.2	0.00	0.00	0.00
10,800.0	90.13	270.00	6,429.5	226.7	-3,425.3	3,431.2	0.00	0.00	0.00
10,900.0	90.13	270.00	6,429.2	226.7	-3,525.3	3,531.1	0.00	0.00	0.00
11,000.0	90.13	270.00	6,429.0	226.7	-3,625.3	3,631.0	0.00	0.00	0.00
11,100.0	90.13	270.00	6,428.8	226.7	-3,725.3	3,731.0	0.00	0.00	0.00
11,200.0	90.13	270.00	6,428.6	226.7	-3,825.3	3,830.9	0.00	0.00	0.00
11,300.0	90.13	270.00	6,428.3	226.7	-3,925.3	3,930.8	0.00	0.00	0.00
11,400.0	90.13	270.00	6,428.1	226.7	-4,025.3	4,030.8	0.00	0.00	0.00
11,500.0	90.13	270.00	6,427.9	226.7	-4,125.3	4,130.7	0.00	0.00	0.00
11,600.0	90.13	270.00	6,427.6	226.7	-4,225.3	4,230.7	0.00	0.00	0.00
11,700.0	90.13	270.00	6,427.4	226.7	-4,325.3	4,330.6	0.00	0.00	0.00
11,800.0	90.13	270.00	6,427.2	226.7	-4,425.3	4,430.5	0.00	0.00	0.00
11,900.0	90.13	270.00	6,427.0	226.7	-4,525.3	4,530.5	0.00	0.00	0.00
12,000.0	90.13	270.00	6,426.7	226.7	-4,625.3	4,630.4	0.00	0.00	0.00
12,100.0	90.13	270.00	6,426.5	226.7	-4,725.3	4,730.3	0.00	0.00	0.00
12,200.0	90.13	270.00	6,426.3	226.7	-4,825.3	4,830.3	0.00	0.00	0.00
12,300.0	90.13	270.00	6,426.1	226.7	-4,925.3	4,930.2	0.00	0.00	0.00
12,400.0	90.13	270.00	6,425.8	226.7	-5,025.3	5,030.1	0.00	0.00	0.00
12,500.0	90.13	270.00	6,425.6	226.7	-5,125.3	5,130.1	0.00	0.00	0.00
12,600.0	90.13	270.00	6,425.4	226.7	-5,225.3	5,230.0	0.00	0.00	0.00
12,700.0	90.13	270.00	6,425.1	226.7	-5,325.3	5,330.0	0.00	0.00	0.00
12,800.0	90.13	270.00	6,424.9	226.7	-5,425.3	5,429.9	0.00	0.00	0.00
12,900.0	90.13	270.00	6,424.7	226.7	-5,525.3	5,529.8	0.00	0.00	0.00
13,000.0	90.13	270.00	6,424.5	226.7	-5,625.3	5,629.8	0.00	0.00	0.00
13,100.0	90.13	270.00	6,424.2	226.7	-5,725.3	5,729.7	0.00	0.00	0.00
13,200.0	90.13	270.00	6,424.0	226.7	-5,825.3	5,829.6	0.00	0.00	0.00
13,300.0	90.13	270.00	6,423.8	226.7	-5,925.3	5,929.6	0.00	0.00	0.00
13,400.0	90.13	270.00	6,423.6	226.7	-6,025.3	6,029.5	0.00	0.00	0.00
13,500.0	90.13	270.00	6,423.3	226.7	-6,125.3	6,129.4	0.00	0.00	0.00
13,600.0	90.13	270.00	6,423.1	226.7	-6,225.3	6,229.4	0.00	0.00	0.00
13,642.5	90.13	270.00	6,423.0	226.7	-6,267.8	6,271.9	0.00	0.00	0.00
TD at 13642.5 - BHL 1204'FNL, 2151'FEL, SEC.24									

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockroft 19V-204
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19V-204	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

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)

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 1414'FNL, 1155'FEI - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,385,867.31	3,285,759.33	40.388070	-104.474130
BHL 1204'FNL, 2151'FE - plan hits target center - Point	0.00	0.00	6,423.0	226.7	-6,267.8	1,386,021.45	3,279,489.60	40.388690	-104.496630
LPL 1187'FNL, 825'FEL, - plan hits target center - Point	0.00	0.00	6,438.0	226.7	330.3	1,386,097.80	3,286,086.97	40.388692	-104.472945

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,044.4	6,438.0	7"	7	8-3/4	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,384.6	3,335.0	Parkman		0.00	
4,154.0	4,065.0	Sussex		0.00	
6,479.6	6,240.0	Sharon Springs		0.00	
6,672.1	6,350.0	Niobrara A		0.00	
6,854.6	6,415.0	Niobrara B		0.00	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,600.0	1,600.0	0.0	0.0	KOP - Start Build 1.50	
2,828.3	2,807.2	31.6	193.2	Start 2772.1 hold at 2828.3 MD	
5,600.4	5,437.2	172.8	1,057.9	Start DLS 7.50 TFO -170.22	
7,044.4	6,438.0	226.7	330.3	Start 6598.1 hold at 7044.4 MD	
13,642.5	6,423.0	226.7	-6,267.8	TD at 13642.5	

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19V-204

Wellbore #1

Plan #1 (11-13-15)

Anticollision Report

18 November, 2015

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (11-13-15)		
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	11/18/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,642.5	Plan #1 (11-13-15) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Cockroft 5N63W19C Pad Sec.19-T5N-R63W						
Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)	600.0	599.0	74.7	72.2	30.234	CC, ES
Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)	5,700.0	5,586.0	711.4	663.0	14.685	SF
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	200.0	199.0	106.2	105.5	157.990	CC, ES
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	5,200.0	5,057.3	796.9	755.3	19.176	SF
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	1,000.0	999.0	45.9	41.6	10.752	CC, ES
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	13,642.5	13,626.1	440.8	44.1	1.111	Level 2, SF
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	1,400.0	1,399.0	14.4	8.3	2.373	CC, ES
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	13,642.5	13,648.3	445.1	47.9	1.121	Level 2, SF
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	1,600.0	1,600.0	14.4	7.4	2.066	CC
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	13,642.5	13,734.8	251.9	-130.0	0.660	Level 1, ES, SF
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	1,200.0	1,199.0	28.8	23.6	5.572	CC
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	13,642.5	13,705.2	255.7	-124.1	0.673	Level 1, ES, SF
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	400.0	399.0	89.1	87.5	56.699	CC, ES
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	4,900.0	4,757.2	799.7	761.7	21.050	SF
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	800.0	799.0	60.3	56.9	17.894	CC, ES
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	1,100.0	1,095.1	68.9	64.3	14.860	SF
Existing Wells Sec.19-T5N-R63W						
Cockroft 19V (Exist) - Wellbore #1 - Wellbore #1	6,373.8	6,178.5	13.8	-20.9	0.399	Level 1, CC, ES, SF
Johnson 1 (Exist) - Wellbore #1 - Wellbore #1	10,987.3	6,409.5	411.8	274.8	3.007	CC
Johnson 1 (Exist) - Wellbore #1 - Wellbore #1	11,000.0	6,409.9	412.0	274.7	3.001	ES, SF
Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1	10,044.5	6,421.7	152.6	42.2	1.382	Level 3, CC, ES, SF
Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1	9,097.2	6,423.9	253.2	168.4	2.985	CC
Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1	9,100.0	6,423.8	253.2	168.3	2.982	ES, SF

Offset Design												Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft	
Survey Program:		0-MWD										Offset Well Error:		0.0 ft			
Reference		Offset		Semi Major Axis			Distance						Warning				
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation					
Depth	Depth	Depth	Depth	Reference	Offset	Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation	Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)						
0.0	0.0	0.0	0.0	0.0	0.0	75.88	18.2	72.4	74.7								
100.0	100.0	99.0	99.0	0.1	0.1	75.88	18.2	72.4	74.7	74.5	0.22	333.941					
200.0	200.0	199.0	199.0	0.3	0.3	75.88	18.2	72.4	74.7	74.0	0.67	111.128					
300.0	300.0	299.0	299.0	0.6	0.6	75.88	18.2	72.4	74.7	73.6	1.12	66.588					

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program:		Reference		Offset		Semi Major Axis		Distance					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
400.0	400.0	399.0	399.0	0.8	0.8	75.88	18.2	72.4	74.7	73.1	1.57	47.536	
500.0	500.0	499.0	499.0	1.0	1.0	75.88	18.2	72.4	74.7	72.7	2.02	36.960	
600.0	600.0	599.0	599.0	1.2	1.2	75.88	18.2	72.4	74.7	72.2	2.47	30.234 CC, ES	
700.0	700.0	697.3	697.3	1.5	1.5	75.44	19.1	73.3	75.8	72.9	2.91	26.027	
800.0	800.0	795.5	795.4	1.7	1.7	74.16	21.6	76.1	79.2	75.8	3.35	23.614	
900.0	900.0	893.4	893.1	1.9	1.9	72.27	25.8	80.7	85.0	81.2	3.80	22.348	
1,000.0	1,000.0	990.9	990.2	2.1	2.1	70.01	31.7	87.2	93.2	88.9	4.26	21.873	
1,100.0	1,100.0	1,087.9	1,086.6	2.4	2.4	67.64	39.2	95.4	103.9	99.1	4.73	21.953	
1,200.0	1,200.0	1,184.3	1,182.0	2.6	2.6	65.35	48.3	105.3	117.1	111.9	5.22	22.421	
1,300.0	1,300.0	1,279.9	1,276.3	2.8	2.9	63.24	59.0	116.9	132.9	127.2	5.74	23.154	
1,400.0	1,400.0	1,374.7	1,369.4	3.0	3.3	61.36	71.1	130.2	151.2	145.0	6.29	24.061	
1,500.0	1,500.0	1,468.5	1,461.0	3.3	3.6	59.73	84.6	144.9	172.1	165.2	6.86	25.074	
1,600.0	1,600.0	1,561.3	1,551.2	3.5	4.0	58.32	99.5	161.2	195.3	187.9	7.47	26.145	
1,700.0	1,700.0	1,653.2	1,639.9	3.7	4.5	-23.59	115.6	178.8	219.9	212.4	7.43	29.608	
1,800.0	1,799.9	1,746.8	1,729.7	3.9	4.9	-24.85	133.5	198.3	244.3	236.4	7.87	31.029	
1,900.0	1,899.7	1,844.0	1,822.8	4.1	5.4	-26.17	152.2	218.8	267.0	258.6	8.33	32.035	
2,000.0	1,999.3	1,941.6	1,916.4	4.3	6.0	-27.50	171.1	239.4	287.5	278.7	8.80	32.670	
2,100.0	2,098.6	2,039.6	2,010.3	4.6	6.5	-28.89	190.0	260.0	306.0	296.7	9.28	32.980	
2,200.0	2,197.5	2,137.8	2,104.4	4.8	7.1	-30.35	208.9	280.7	322.4	312.6	9.77	33.007	
2,300.0	2,296.1	2,236.3	2,198.8	5.1	7.6	-31.90	228.0	301.5	336.9	326.6	10.28	32.783	
2,400.0	2,394.2	2,335.0	2,293.3	5.4	8.2	-33.55	247.0	322.3	349.4	338.6	10.81	32.333	
2,500.0	2,491.7	2,433.7	2,388.0	5.8	8.7	-35.33	266.1	343.1	360.1	348.7	11.37	31.674	
2,600.0	2,588.6	2,532.5	2,482.6	6.1	9.3	-37.26	285.1	364.0	369.1	357.2	11.98	30.824	
2,700.0	2,684.9	2,631.2	2,577.2	6.6	9.8	-39.34	304.2	384.8	376.6	363.9	12.64	29.796	
2,800.0	2,780.4	2,729.8	2,671.7	7.0	10.4	-41.59	323.2	405.6	382.6	369.2	13.37	28.606	
2,828.3	2,807.2	2,757.6	2,698.4	7.2	10.6	-42.27	328.6	411.4	384.0	370.4	13.60	28.243	
2,900.0	2,875.3	2,828.3	2,766.1	7.6	11.0	-44.01	342.2	426.3	387.8	373.6	14.20	27.301	
3,000.0	2,970.1	2,926.8	2,860.4	8.1	11.6	-46.39	361.2	447.1	393.6	378.5	15.10	26.065	
3,100.0	3,065.0	3,025.2	2,954.8	8.7	12.1	-48.69	380.2	467.8	400.1	384.1	16.06	24.919	
3,200.0	3,159.9	3,123.7	3,049.2	9.2	12.7	-50.92	399.2	488.6	407.3	390.2	17.06	23.866	
3,300.0	3,254.8	3,222.2	3,143.5	9.8	13.3	-53.07	418.3	509.4	415.0	396.9	18.12	22.902	
3,400.0	3,349.6	3,320.7	3,237.9	10.4	13.8	-55.14	437.3	530.1	423.3	404.1	19.22	22.025	
3,500.0	3,444.5	3,419.1	3,332.3	11.0	14.4	-57.13	456.3	550.9	432.2	411.8	20.36	21.230	
3,600.0	3,539.4	3,517.6	3,426.6	11.6	15.0	-59.04	475.3	571.7	441.6	420.0	21.53	20.512	
3,700.0	3,634.3	3,616.1	3,521.0	12.3	15.6	-60.87	494.3	592.4	451.4	428.7	22.73	19.864	
3,800.0	3,729.1	3,714.6	3,615.4	12.9	16.1	-62.62	513.3	613.2	461.7	437.8	23.95	19.281	
3,900.0	3,824.0	3,813.0	3,709.7	13.5	16.7	-64.29	532.3	633.9	472.4	447.2	25.19	18.755	
4,000.0	3,918.9	3,911.5	3,804.1	14.1	17.3	-65.89	551.3	654.7	483.5	457.1	26.45	18.283	
4,100.0	4,013.8	4,010.0	3,898.5	14.8	17.9	-67.42	570.3	675.5	495.0	467.3	27.72	17.859	
4,200.0	4,108.6	4,108.5	3,992.8	15.4	18.4	-68.88	589.3	696.2	506.8	477.8	29.00	17.476	
4,300.0	4,203.5	4,206.9	4,087.2	16.1	19.0	-70.28	608.3	717.0	518.9	488.6	30.29	17.133	
4,400.0	4,298.4	4,305.4	4,181.6	16.7	19.6	-71.61	627.4	737.7	531.3	499.7	31.58	16.823	
4,500.0	4,393.3	4,403.9	4,275.9	17.4	20.2	-72.88	646.4	758.5	544.0	511.1	32.88	16.543	
4,600.0	4,488.1	4,502.4	4,370.3	18.0	20.8	-74.09	665.4	779.3	556.9	522.8	34.19	16.291	
4,700.0	4,583.0	4,600.8	4,464.7	18.7	21.3	-75.25	684.4	800.0	570.1	534.6	35.49	16.063	
4,800.0	4,677.9	4,699.3	4,559.0	19.3	21.9	-76.35	703.4	820.8	583.5	546.7	36.80	15.857	
4,900.0	4,772.8	4,797.8	4,653.4	20.0	22.5	-77.41	722.4	841.6	597.1	559.0	38.10	15.670	
5,000.0	4,867.6	4,896.3	4,747.8	20.6	23.1	-78.42	741.4	862.3	610.9	571.5	39.41	15.501	
5,100.0	4,962.5	4,994.7	4,842.1	21.3	23.7	-79.38	760.4	883.1	624.9	584.2	40.71	15.348	
5,200.0	5,057.4	5,093.2	4,936.5	21.9	24.2	-80.31	779.4	903.8	639.0	597.0	42.02	15.208	
5,300.0	5,152.3	5,191.7	5,030.9	22.6	24.8	-81.19	798.4	924.6	653.3	610.0	43.32	15.081	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
5,400.0	5,247.1	5,290.2	5,125.2	23.2	25.4	-82.03	817.4	945.4	667.8	623.1	44.62	14.966					
5,500.0	5,342.0	5,388.6	5,219.6	23.9	26.0	-82.84	836.4	966.1	682.4	636.4	45.92	14.861					
5,600.4	5,437.2	5,487.5	5,314.3	24.6	26.6	-83.62	855.5	987.0	697.1	649.9	47.22	14.765					
5,650.0	5,484.8	5,536.5	5,361.3	24.8	26.8	-82.04	865.0	997.3	704.4	656.5	47.90	14.706					
5,700.0	5,533.5	5,586.0	5,408.7	25.0	27.1	-78.56	874.5	1,007.7	711.4	663.0	48.44	14.685 SF					
5,750.0	5,582.8	5,635.4	5,456.0	25.2	27.4	-70.98	884.1	1,018.1	718.2	669.3	48.89	14.690					
5,800.0	5,632.6	5,684.5	5,503.1	25.3	27.7	-50.99	893.6	1,028.5	724.8	675.6	49.24	14.721					
5,850.0	5,682.5	5,733.1	5,549.6	25.3	28.0	5.50	902.9	1,038.7	731.2	681.7	49.48	14.777					
5,900.0	5,732.3	5,780.9	5,595.5	25.4	28.3	50.26	912.2	1,048.8	737.5	687.9	49.63	14.859					
5,950.0	5,782.0	5,826.5	5,639.3	25.3	28.5	65.51	921.0	1,057.7	743.9	694.2	49.67	14.978					
6,000.0	5,831.1	5,872.1	5,683.6	25.3	28.7	72.38	929.9	1,063.9	750.5	700.9	49.62	15.124					
6,050.0	5,879.6	5,918.6	5,729.0	25.2	28.8	76.38	939.1	1,067.5	757.4	707.9	49.52	15.294					
6,100.0	5,927.3	5,966.0	5,775.5	25.2	29.0	79.08	948.4	1,068.3	764.4	715.1	49.37	15.485					
6,150.0	5,973.8	6,014.4	5,822.9	25.1	29.1	81.11	958.0	1,066.0	771.7	722.5	49.17	15.695					
6,200.0	6,019.1	6,063.8	5,871.0	25.0	29.1	82.74	967.7	1,060.6	779.0	730.1	48.92	15.923					
6,250.0	6,062.9	6,114.4	5,919.8	24.8	29.2	84.11	977.5	1,051.7	786.5	737.8	48.65	16.166					
6,300.0	6,105.0	6,166.2	5,969.1	24.7	29.2	85.31	987.5	1,039.2	794.0	745.6	48.36	16.420					

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	76.11	25.5	103.1	106.2				
100.0	100.0	99.0	99.0	0.1	0.1	76.11	25.5	103.1	106.2	106.0	0.22	474.760	
200.0	200.0	199.0	199.0	0.3	0.3	76.11	25.5	103.1	106.2	105.5	0.67	157.990 CC, ES	
300.0	300.0	296.8	296.8	0.6	0.6	75.73	26.4	103.9	107.2	106.1	1.11	96.153	
400.0	400.0	394.4	394.3	0.8	0.8	74.63	29.2	106.3	110.4	108.8	1.56	70.658	
500.0	500.0	491.8	491.5	1.0	1.0	72.94	33.9	110.4	115.7	113.7	2.02	57.383	
600.0	600.0	588.8	588.1	1.2	1.3	70.82	40.4	116.1	123.4	120.9	2.48	49.688	
700.0	700.0	685.3	684.0	1.5	1.5	68.46	48.7	123.3	133.4	130.5	2.97	44.980	
800.0	800.0	781.1	778.9	1.7	1.8	66.03	58.7	132.1	146.0	142.5	3.47	42.035	
900.0	900.0	876.3	872.7	1.9	2.1	63.66	70.5	142.4	161.0	157.0	4.00	40.199	
1,000.0	1,000.0	970.6	965.4	2.1	2.5	61.44	83.8	154.0	178.6	174.0	4.57	39.087	
1,100.0	1,100.0	1,063.9	1,056.6	2.4	2.9	59.41	98.8	167.1	198.7	193.5	5.16	38.466	
1,200.0	1,200.0	1,156.3	1,146.3	2.6	3.3	57.59	115.2	181.4	221.2	215.5	5.79	38.183	
1,300.0	1,300.0	1,247.5	1,234.4	2.8	3.8	55.97	133.0	197.0	246.3	239.8	6.46	38.151	
1,400.0	1,400.0	1,341.6	1,324.9	3.0	4.3	54.52	152.6	214.1	273.2	266.1	7.16	38.134	
1,500.0	1,500.0	1,437.7	1,417.1	3.3	4.8	53.29	172.8	231.7	300.4	292.5	7.90	38.042	
1,600.0	1,600.0	1,533.7	1,509.4	3.5	5.3	52.27	192.9	249.3	327.7	319.1	8.64	37.941	
1,700.0	1,700.0	1,630.0	1,601.9	3.7	5.8	-29.23	213.1	266.9	354.0	346.3	7.68	46.065	
1,800.0	1,799.9	1,726.9	1,694.9	3.9	6.4	-30.09	233.4	284.7	378.2	370.0	8.16	46.351	
1,900.0	1,899.7	1,824.1	1,788.3	4.1	6.9	-31.03	253.8	302.5	400.3	391.7	8.64	46.341	
2,000.0	1,999.3	1,921.7	1,882.0	4.3	7.5	-32.05	274.2	320.4	420.4	411.2	9.12	46.083	
2,100.0	2,098.6	2,019.6	1,976.0	4.6	8.0	-33.17	294.8	338.3	438.4	428.8	9.61	45.612	
2,200.0	2,197.5	2,117.7	2,070.3	4.8	8.6	-34.39	315.3	356.2	454.6	444.5	10.11	44.951	
2,300.0	2,296.1	2,216.0	2,164.7	5.1	9.1	-35.71	335.9	374.2	468.9	458.2	10.63	44.115	
2,400.0	2,394.2	2,314.4	2,259.2	5.4	9.7	-37.14	356.6	392.3	481.4	470.2	11.16	43.113	
2,500.0	2,491.7	2,412.8	2,353.7	5.8	10.2	-38.69	377.2	410.3	492.1	480.4	11.73	41.952	
2,600.0	2,588.6	2,511.2	2,448.2	6.1	10.8	-40.37	397.8	428.3	501.3	489.0	12.34	40.637	
2,700.0	2,684.9	2,609.5	2,542.6	6.6	11.4	-42.18	418.4	446.3	509.1	496.1	13.00	39.173	
2,800.0	2,780.4	2,707.5	2,636.8	7.0	11.9	-44.14	439.0	464.2	515.5	501.8	13.72	37.571	
2,828.3	2,807.2	2,735.2	2,663.4	7.2	12.1	-44.72	444.8	469.3	517.1	503.2	13.94	37.095	
2,900.0	2,875.3	2,805.5	2,730.8	7.6	12.5	-46.24	459.5	482.2	521.2	506.7	14.53	35.875	
3,000.0	2,970.1	2,903.4	2,824.9	8.1	13.0	-48.32	480.0	500.1	527.6	512.2	15.40	34.266	
3,100.0	3,065.0	3,001.3	2,918.9	8.7	13.6	-50.34	500.6	518.0	534.6	518.3	16.32	32.766	
3,200.0	3,159.9	3,099.2	3,012.9	9.2	14.2	-52.32	521.1	536.0	542.4	525.1	17.29	31.376	
3,300.0	3,254.8	3,197.1	3,107.0	9.8	14.7	-54.24	541.6	553.9	550.8	532.5	18.30	30.094	
3,400.0	3,349.6	3,295.0	3,201.0	10.4	15.3	-56.10	562.1	571.8	559.8	540.4	19.36	28.918	
3,500.0	3,444.5	3,392.9	3,295.0	11.0	15.8	-57.90	582.7	589.7	569.4	548.9	20.45	27.842	
3,600.0	3,539.4	3,490.8	3,389.1	11.6	16.4	-59.64	603.2	607.7	579.5	557.9	21.57	26.861	
3,700.0	3,634.3	3,588.7	3,483.1	12.3	16.9	-61.32	623.7	625.6	590.2	567.4	22.73	25.967	
3,800.0	3,729.1	3,686.6	3,577.2	12.9	17.5	-62.95	644.2	643.5	601.3	577.4	23.91	25.155	
3,900.0	3,824.0	3,784.5	3,671.2	13.5	18.1	-64.51	664.8	661.5	613.0	587.9	25.10	24.417	
4,000.0	3,918.9	3,882.4	3,765.2	14.1	18.6	-66.02	685.3	679.4	625.1	598.8	26.32	23.747	
4,100.0	4,013.8	3,980.3	3,859.3	14.8	19.2	-67.47	705.8	697.3	637.6	610.0	27.55	23.139	
4,200.0	4,108.6	4,078.2	3,953.3	15.4	19.7	-68.86	726.3	715.2	650.5	621.7	28.80	22.587	
4,300.0	4,203.5	4,176.1	4,047.3	16.1	20.3	-70.21	746.9	733.2	663.8	633.7	30.06	22.085	
4,400.0	4,298.4	4,274.0	4,141.4	16.7	20.9	-71.50	767.4	751.1	677.4	646.1	31.32	21.630	
4,500.0	4,393.3	4,371.9	4,235.4	17.4	21.4	-72.73	787.9	769.0	691.4	658.8	32.59	21.215	
4,600.0	4,488.1	4,469.8	4,329.4	18.0	22.0	-73.92	808.4	787.0	705.7	671.8	33.86	20.838	
4,700.0	4,583.0	4,567.7	4,423.5	18.7	22.5	-75.07	829.0	804.9	720.2	685.1	35.14	20.494	
4,800.0	4,677.9	4,665.6	4,517.5	19.3	23.1	-76.17	849.5	822.8	735.1	698.6	36.42	20.181	
4,900.0	4,772.8	4,763.5	4,611.5	20.0	23.7	-77.22	870.0	840.7	750.2	712.5	37.71	19.895	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,867.6	4,861.5	4,705.6	20.6	24.2	-78.24	890.5	858.7	765.5	726.5	38.99	19.633		
5,100.0	4,962.5	4,959.4	4,799.6	21.3	24.8	-79.21	911.1	876.6	781.1	740.8	40.27	19.394		
5,200.0	5,057.4	5,057.3	4,893.6	21.9	25.4	-80.15	931.6	894.5	796.9	755.3	41.56	19.176 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program:		Reference		Offset		Semi Major Axis		Distance					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	76.22	10.9	44.6	45.9				
100.0	100.0	99.0	99.0	0.1	0.1	76.22	10.9	44.6	45.9	45.7	0.22	205.200	
200.0	200.0	199.0	199.0	0.3	0.3	76.22	10.9	44.6	45.9	45.2	0.67	68.286	
300.0	300.0	299.0	299.0	0.6	0.6	76.22	10.9	44.6	45.9	44.8	1.12	40.917	
400.0	400.0	399.0	399.0	0.8	0.8	76.22	10.9	44.6	45.9	44.3	1.57	29.210	
500.0	500.0	499.0	499.0	1.0	1.0	76.22	10.9	44.6	45.9	43.9	2.02	22.711	
600.0	600.0	599.0	599.0	1.2	1.2	76.22	10.9	44.6	45.9	43.4	2.47	18.578	
700.0	700.0	699.0	699.0	1.5	1.5	76.22	10.9	44.6	45.9	43.0	2.92	15.718	
800.0	800.0	799.0	799.0	1.7	1.7	76.22	10.9	44.6	45.9	42.5	3.37	13.621	
900.0	900.0	899.0	899.0	1.9	1.9	76.22	10.9	44.6	45.9	42.1	3.82	12.017	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	76.22	10.9	44.6	45.9	41.6	4.27	10.752 CC, ES	
1,100.0	1,100.0	1,097.8	1,097.8	2.4	2.3	75.86	11.5	45.7	47.1	42.4	4.71	10.008	
1,200.0	1,200.0	1,196.5	1,196.4	2.6	2.6	74.86	13.3	49.1	50.9	45.7	5.15	9.889	
1,300.0	1,300.0	1,295.0	1,294.7	2.8	2.8	73.49	16.2	54.7	57.2	51.6	5.59	10.232	
1,400.0	1,400.0	1,393.0	1,392.3	3.0	3.0	72.02	20.3	62.5	66.0	60.0	6.04	10.931	
1,500.0	1,500.0	1,490.5	1,489.2	3.3	3.2	70.62	25.5	72.5	77.4	70.9	6.51	11.900	
1,600.0	1,600.0	1,587.4	1,585.1	3.5	3.5	69.38	31.8	84.5	91.4	84.4	6.99	13.070	
1,700.0	1,700.0	1,683.8	1,680.1	3.7	3.8	-12.48	39.2	98.7	106.6	99.2	7.34	14.526	
1,800.0	1,799.9	1,779.7	1,774.3	3.9	4.1	-13.70	47.6	114.9	121.8	114.0	7.76	15.695	
1,900.0	1,899.7	1,875.3	1,867.6	4.1	4.5	-14.96	57.1	133.1	137.0	128.8	8.19	16.736	
2,000.0	1,999.3	1,970.4	1,960.0	4.3	4.8	-16.25	67.7	153.3	152.3	143.6	8.62	17.668	
2,100.0	2,098.6	2,065.2	2,051.4	4.6	5.3	-17.55	79.2	175.4	167.6	158.5	9.06	18.502	
2,200.0	2,197.5	2,163.5	2,145.9	4.8	5.7	-18.92	91.9	199.6	182.0	172.5	9.52	19.130	
2,300.0	2,296.1	2,262.7	2,241.1	5.1	6.2	-20.37	104.7	224.0	194.2	184.2	9.99	19.442	
2,400.0	2,394.2	2,362.0	2,336.6	5.4	6.7	-21.91	117.5	248.5	204.0	193.5	10.48	19.472	
2,500.0	2,491.7	2,461.5	2,432.2	5.8	7.3	-23.60	130.3	273.1	211.6	200.6	10.99	19.252	
2,600.0	2,588.6	2,561.1	2,527.8	6.1	7.8	-25.47	143.1	297.6	217.0	205.5	11.54	18.806	
2,700.0	2,684.9	2,660.8	2,623.5	6.6	8.3	-27.56	155.9	322.2	220.4	208.2	12.13	18.159	
2,800.0	2,780.4	2,760.3	2,719.1	7.0	8.9	-29.93	168.7	346.7	221.7	208.9	12.79	17.330	
2,828.3	2,807.2	2,788.4	2,746.2	7.2	9.0	-30.66	172.4	353.7	221.7	208.7	12.99	17.067	
2,851.7	2,829.4	2,811.7	2,768.5	7.3	9.1	-31.28	175.4	359.4	221.7	208.6	13.17	16.832	
2,900.0	2,875.3	2,859.8	2,814.7	7.6	9.4	-32.55	181.5	371.2	221.8	208.2	13.56	16.360	
3,000.0	2,970.1	2,959.3	2,910.3	8.1	10.0	-35.17	194.4	395.8	222.2	207.8	14.40	15.436	
3,100.0	3,065.0	3,058.8	3,005.8	8.7	10.5	-37.77	207.2	420.3	223.2	207.9	15.31	14.580	
3,200.0	3,159.9	3,158.2	3,101.4	9.2	11.1	-40.35	220.0	444.8	224.6	208.3	16.28	13.792	
3,300.0	3,254.8	3,257.7	3,196.9	9.8	11.6	-42.89	232.8	469.3	226.4	209.1	17.32	13.071	
3,400.0	3,349.6	3,357.2	3,292.5	10.4	12.2	-45.39	245.6	493.9	228.7	210.3	18.42	12.416	
3,500.0	3,444.5	3,456.7	3,388.0	11.0	12.8	-47.83	258.4	518.4	231.4	211.8	19.57	11.824	
3,600.0	3,539.4	3,556.1	3,483.6	11.6	13.3	-50.21	271.2	542.9	234.5	213.8	20.77	11.291	
3,700.0	3,634.3	3,655.6	3,579.1	12.3	13.9	-52.53	284.0	567.4	238.1	216.1	22.01	10.814	
3,800.0	3,729.1	3,755.1	3,674.7	12.9	14.4	-54.77	296.8	592.0	242.0	218.7	23.29	10.389	
3,900.0	3,824.0	3,854.6	3,770.2	13.5	15.0	-56.94	309.6	616.5	246.2	221.6	24.60	10.010	
4,000.0	3,918.9	3,954.0	3,865.8	14.1	15.6	-59.04	322.4	641.0	250.9	224.9	25.93	9.673	
4,100.0	4,013.8	4,053.5	3,961.3	14.8	16.2	-61.06	335.2	665.5	255.8	228.5	27.28	9.375	
4,200.0	4,108.6	4,153.0	4,056.9	15.4	16.7	-63.00	348.1	690.1	261.0	232.4	28.65	9.111	
4,300.0	4,203.5	4,252.5	4,152.4	16.1	17.3	-64.86	360.9	714.6	266.6	236.5	30.03	8.878	
4,400.0	4,298.4	4,352.0	4,248.0	16.7	17.9	-66.64	373.7	739.1	272.4	241.0	31.41	8.672	
4,500.0	4,393.3	4,451.4	4,343.5	17.4	18.4	-68.35	386.5	763.6	278.4	245.6	32.80	8.490	
4,600.0	4,488.1	4,550.9	4,439.1	18.0	19.0	-69.99	399.3	788.2	284.7	250.5	34.18	8.329	
4,700.0	4,583.0	4,650.4	4,534.6	18.7	19.6	-71.55	412.1	812.7	291.3	255.7	35.57	8.188	
4,800.0	4,677.9	4,749.9	4,630.2	19.3	20.2	-73.05	424.9	837.2	298.0	261.0	36.96	8.063	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design		Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
4,900.0	4,772.8	4,849.3	4,725.7	20.0	20.7	-74.47	437.7	861.7	304.9	266.6	38.34	7.953			
5,000.0	4,867.6	4,948.8	4,821.3	20.6	21.3	-75.84	450.5	886.3	312.0	272.3	39.71	7.856			
5,100.0	4,962.5	5,048.3	4,916.8	21.3	21.9	-77.14	463.3	910.8	319.3	278.2	41.08	7.771			
5,200.0	5,057.4	5,147.8	5,012.4	21.9	22.5	-78.39	476.1	935.3	326.7	284.2	42.45	7.696			
5,300.0	5,152.3	5,247.2	5,107.9	22.6	23.0	-79.58	488.9	959.8	334.3	290.5	43.81	7.630			
5,400.0	5,247.1	5,346.7	5,203.5	23.2	23.6	-80.71	501.8	984.3	342.0	296.8	45.16	7.573			
5,500.0	5,342.0	5,446.2	5,299.0	23.9	24.2	-81.80	514.6	1,008.9	349.8	303.3	46.50	7.522			
5,600.4	5,437.2	5,546.0	5,394.9	24.6	24.8	-82.84	527.4	1,033.5	357.8	310.0	47.85	7.478			
5,650.0	5,484.8	5,595.5	5,442.4	24.8	25.1	-81.00	533.8	1,045.7	361.7	313.3	48.46	7.464			
5,700.0	5,533.5	5,645.3	5,490.3	25.0	25.4	-77.02	540.2	1,058.0	365.5	316.6	48.93	7.470			
5,750.0	5,582.8	5,693.7	5,537.0	25.2	25.6	-68.95	546.5	1,068.6	369.2	319.9	49.25	7.497			
5,800.0	5,632.6	5,742.1	5,584.4	25.3	25.8	-48.71	552.8	1,076.3	373.0	323.5	49.46	7.541			
5,850.0	5,682.5	5,790.7	5,632.4	25.3	25.9	7.76	559.2	1,081.0	376.8	327.2	49.59	7.598			
5,900.0	5,732.3	5,839.6	5,680.8	25.4	26.0	52.31	565.7	1,082.5	380.6	331.0	49.64	7.668			
5,950.0	5,782.0	5,888.6	5,729.4	25.3	26.1	67.23	572.3	1,081.0	384.5	334.8	49.62	7.748			
6,000.0	5,831.1	5,938.0	5,778.0	25.3	26.1	73.79	578.8	1,076.2	388.3	338.8	49.54	7.839			
6,050.0	5,879.6	5,987.6	5,826.5	25.2	26.1	77.47	585.3	1,068.3	392.2	342.8	49.40	7.939			
6,100.0	5,927.3	6,037.4	5,874.7	25.2	26.1	79.85	591.8	1,057.1	396.0	346.8	49.21	8.046			
6,150.0	5,973.8	6,087.5	5,922.2	25.1	26.0	81.55	598.1	1,042.7	399.8	350.8	48.99	8.160			
6,200.0	6,019.1	6,137.9	5,969.0	25.0	25.9	82.84	604.4	1,025.1	403.5	354.7	48.73	8.279			
6,250.0	6,062.9	6,188.5	6,014.7	24.8	25.8	83.88	610.6	1,004.3	407.1	358.6	48.46	8.400			
6,300.0	6,105.0	6,239.4	6,059.2	24.7	25.7	84.73	616.5	980.3	410.6	362.4	48.19	8.521			
6,350.0	6,145.3	6,290.6	6,102.3	24.6	25.6	85.46	622.3	953.3	414.0	366.1	47.92	8.640			
6,400.0	6,183.6	6,342.1	6,143.7	24.5	25.5	86.08	627.9	923.2	417.3	369.6	47.68	8.752			
6,450.0	6,219.7	6,393.9	6,183.2	24.4	25.3	86.64	633.2	890.2	420.4	372.9	47.48	8.855			
6,500.0	6,253.5	6,445.9	6,220.6	24.4	25.2	87.13	638.2	854.4	423.4	376.0	47.34	8.943			
6,550.0	6,284.8	6,498.2	6,255.6	24.4	25.1	87.57	642.9	815.9	426.2	378.9	47.28	9.013			
6,600.0	6,313.5	6,550.7	6,288.2	24.5	25.0	87.96	647.3	774.8	428.7	381.4	47.32	9.060			
6,650.0	6,339.4	6,603.5	6,317.9	24.6	24.9	88.32	651.3	731.5	431.1	383.6	47.48	9.080			
6,700.0	6,362.5	6,656.5	6,344.8	24.7	24.8	88.65	654.9	685.9	433.2	385.5	47.76	9.071			
6,750.0	6,382.7	6,709.8	6,368.5	24.9	24.9	88.94	658.1	638.3	435.1	386.9	48.18	9.031			
6,800.0	6,399.8	6,763.2	6,389.0	25.2	24.9	89.21	660.9	589.1	436.8	388.0	48.75	8.960			
6,850.0	6,413.9	6,816.9	6,406.0	25.6	25.1	89.44	663.2	538.3	438.1	388.7	49.46	8.859			
6,900.0	6,424.7	6,870.7	6,419.6	26.0	25.3	89.65	665.0	486.2	439.2	388.9	50.31	8.730			
6,950.0	6,432.4	6,924.6	6,429.4	26.5	25.6	89.84	666.3	433.2	440.0	388.7	51.30	8.578			
7,000.0	6,436.8	6,978.7	6,435.6	27.0	26.0	90.00	667.2	379.5	440.6	388.2	52.41	8.406			
7,044.4	6,438.0	7,026.8	6,437.9	27.5	26.4	90.12	667.5	331.4	440.8	387.3	53.49	8.241			
7,100.0	6,437.9	7,083.5	6,437.9	28.2	27.0	90.13	667.5	274.7	440.8	385.9	54.91	8.028			
7,200.0	6,437.6	7,183.5	6,437.7	29.7	28.3	90.13	667.5	174.7	440.8	383.0	57.79	7.628			
7,300.0	6,437.4	7,283.5	6,437.4	31.3	29.8	90.13	667.5	74.7	440.8	379.8	61.05	7.221			
7,400.0	6,437.2	7,383.5	6,437.2	33.1	31.6	90.13	667.5	-25.3	440.8	376.2	64.63	6.821			
7,500.0	6,437.0	7,483.5	6,437.0	35.0	33.5	90.13	667.5	-125.3	440.8	372.3	68.48	6.437			
7,600.0	6,436.7	7,583.5	6,436.8	37.1	35.5	90.13	667.5	-225.3	440.8	368.3	72.57	6.074			
7,700.0	6,436.5	7,683.5	6,436.5	39.2	37.7	90.13	667.5	-325.3	440.8	364.0	76.85	5.736			
7,800.0	6,436.3	7,783.5	6,436.3	41.4	39.9	90.13	667.5	-425.3	440.8	359.5	81.30	5.422			
7,900.0	6,436.1	7,883.5	6,436.1	43.7	42.2	90.13	667.5	-525.3	440.8	354.9	85.88	5.133			
8,000.0	6,435.8	7,983.5	6,435.9	46.0	44.6	90.13	667.5	-625.3	440.8	350.2	90.58	4.867			
8,100.0	6,435.6	8,083.5	6,435.6	48.4	47.0	90.13	667.5	-725.3	440.8	345.4	95.38	4.622			
8,200.0	6,435.4	8,183.5	6,435.4	50.9	49.5	90.13	667.5	-825.3	440.8	340.6	100.26	4.397			
8,300.0	6,435.1	8,283.5	6,435.2	53.3	52.0	90.13	667.5	-925.3	440.8	335.6	105.22	4.189			
8,400.0	6,434.9	8,383.5	6,434.9	55.9	54.5	90.13	667.5	-1,025.3	440.8	330.6	110.25	3.999			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,500.0	6,434.7	8,483.5	6,434.7	58.4	57.0	90.13	90.13	667.5	-1,125.3	440.8	325.5	115.32	3.823	
8,600.0	6,434.5	8,583.5	6,434.5	60.9	59.6	90.13	90.13	667.5	-1,225.3	440.8	320.4	120.45	3.660	
8,700.0	6,434.2	8,683.5	6,434.3	63.5	62.2	90.13	90.13	667.5	-1,325.3	440.8	315.2	125.62	3.509	
8,800.0	6,434.0	8,783.5	6,434.0	66.1	64.8	90.13	90.13	667.5	-1,425.3	440.8	310.0	130.82	3.370	
8,900.0	6,433.8	8,883.5	6,433.8	68.7	67.4	90.13	90.13	667.5	-1,525.3	440.8	304.8	136.06	3.240	
9,000.0	6,433.6	8,983.5	6,433.6	71.4	70.1	90.13	90.13	667.5	-1,625.3	440.8	299.5	141.33	3.119	
9,100.0	6,433.3	9,083.5	6,433.4	74.0	72.7	90.13	90.13	667.5	-1,725.3	440.8	294.2	146.62	3.007	
9,200.0	6,433.1	9,183.5	6,433.1	76.7	75.4	90.13	90.13	667.5	-1,825.3	440.8	288.9	151.94	2.901	
9,300.0	6,432.9	9,283.5	6,432.9	79.3	78.1	90.13	90.13	667.5	-1,925.3	440.8	283.5	157.28	2.803	
9,400.0	6,432.6	9,383.5	6,432.7	82.0	80.8	90.13	90.13	667.5	-2,025.3	440.8	278.2	162.64	2.710	
9,500.0	6,432.4	9,483.5	6,432.4	84.7	83.4	90.13	90.13	667.5	-2,125.3	440.8	272.8	168.01	2.624	
9,600.0	6,432.2	9,583.5	6,432.2	87.4	86.1	90.13	90.13	667.5	-2,225.3	440.8	267.4	173.40	2.542	
9,700.0	6,432.0	9,683.5	6,432.0	90.1	88.9	90.13	90.13	667.5	-2,325.3	440.8	262.0	178.81	2.465	
9,800.0	6,431.7	9,783.5	6,431.8	92.8	91.6	90.13	90.13	667.5	-2,425.3	440.8	256.6	184.23	2.393	
9,900.0	6,431.5	9,883.5	6,431.5	95.5	94.3	90.13	90.13	667.5	-2,525.3	440.8	251.2	189.66	2.324	
10,000.0	6,431.3	9,983.5	6,431.3	98.2	97.0	90.13	90.13	667.5	-2,625.3	440.8	245.7	195.10	2.260	
10,100.0	6,431.1	10,083.5	6,431.1	100.9	99.7	90.13	90.13	667.5	-2,725.3	440.8	240.3	200.55	2.198	
10,200.0	6,430.8	10,183.5	6,430.9	103.7	102.5	90.13	90.13	667.5	-2,825.3	440.8	234.8	206.01	2.140	
10,300.0	6,430.6	10,283.5	6,430.6	106.4	105.2	90.13	90.13	667.5	-2,925.3	440.8	229.4	211.47	2.085	
10,400.0	6,430.4	10,383.5	6,430.4	109.1	107.9	90.13	90.13	667.5	-3,025.3	440.8	223.9	216.95	2.032	
10,500.0	6,430.1	10,483.5	6,430.2	111.9	110.7	90.13	90.13	667.5	-3,125.3	440.8	218.4	222.43	1.982	
10,600.0	6,429.9	10,583.5	6,429.9	114.6	113.4	90.13	90.13	667.5	-3,225.3	440.8	212.9	227.92	1.934	
10,700.0	6,429.7	10,683.5	6,429.7	117.4	116.2	90.13	90.13	667.5	-3,325.3	440.8	207.4	233.42	1.889	
10,800.0	6,429.5	10,783.5	6,429.5	120.1	118.9	90.13	90.13	667.5	-3,425.3	440.8	201.9	238.92	1.845	
10,900.0	6,429.2	10,883.5	6,429.3	122.9	121.7	90.13	90.13	667.5	-3,525.3	440.8	196.4	244.43	1.803	
11,000.0	6,429.0	10,983.5	6,429.0	125.6	124.4	90.13	90.13	667.5	-3,625.3	440.8	190.9	249.94	1.764	
11,100.0	6,428.8	11,083.5	6,428.8	128.4	127.2	90.13	90.13	667.5	-3,725.3	440.8	185.4	255.46	1.726	
11,200.0	6,428.6	11,183.5	6,428.6	131.1	130.0	90.13	90.13	667.5	-3,825.3	440.8	179.8	260.98	1.689	
11,300.0	6,428.3	11,283.5	6,428.3	133.9	132.7	90.13	90.13	667.5	-3,925.3	440.8	174.3	266.51	1.654	
11,400.0	6,428.1	11,383.5	6,428.1	136.6	135.5	90.13	90.13	667.5	-4,025.3	440.8	168.8	272.03	1.620	
11,500.0	6,427.9	11,483.5	6,427.9	139.4	138.3	90.13	90.13	667.5	-4,125.3	440.8	163.3	277.57	1.588	
11,600.0	6,427.6	11,583.5	6,427.7	142.2	141.0	90.13	90.13	667.5	-4,225.3	440.8	157.7	283.10	1.557	
11,700.0	6,427.4	11,683.5	6,427.4	144.9	143.8	90.13	90.13	667.5	-4,325.3	440.8	152.2	288.64	1.527	
11,800.0	6,427.2	11,783.5	6,427.2	147.7	146.6	90.13	90.13	667.5	-4,425.3	440.8	146.6	294.19	1.498 Level 3	
11,900.0	6,427.0	11,883.5	6,427.0	150.5	149.4	90.13	90.13	667.5	-4,525.3	440.8	141.1	299.73	1.471 Level 3	
12,000.0	6,426.7	11,983.5	6,426.8	153.3	152.1	90.13	90.13	667.5	-4,625.3	440.8	135.5	305.28	1.444 Level 3	
12,100.0	6,426.5	12,083.5	6,426.5	156.0	154.9	90.13	90.13	667.5	-4,725.3	440.8	130.0	310.83	1.418 Level 3	
12,200.0	6,426.3	12,183.5	6,426.3	158.8	157.7	90.13	90.13	667.5	-4,825.3	440.8	124.4	316.39	1.393 Level 3	
12,300.0	6,426.1	12,283.5	6,426.1	161.6	160.5	90.13	90.13	667.5	-4,925.3	440.8	118.9	321.94	1.369 Level 3	
12,400.0	6,425.8	12,383.5	6,425.8	164.4	163.2	90.13	90.13	667.5	-5,025.3	440.8	113.3	327.50	1.346 Level 3	
12,500.0	6,425.6	12,483.5	6,425.6	167.1	166.0	90.13	90.13	667.5	-5,125.3	440.8	107.8	333.06	1.324 Level 3	
12,600.0	6,425.4	12,583.5	6,425.4	169.9	168.8	90.13	90.13	667.5	-5,225.3	440.8	102.2	338.62	1.302 Level 3	
12,700.0	6,425.1	12,683.5	6,425.2	172.7	171.6	90.13	90.13	667.5	-5,325.3	440.8	96.6	344.19	1.281 Level 3	
12,800.0	6,424.9	12,783.5	6,424.9	175.5	174.4	90.13	90.13	667.5	-5,425.3	440.8	91.1	349.76	1.260 Level 3	
12,900.0	6,424.7	12,883.5	6,424.7	178.3	177.1	90.13	90.13	667.5	-5,525.3	440.8	85.5	355.32	1.241 Level 2	
13,000.0	6,424.5	12,983.5	6,424.5	181.0	179.9	90.13	90.13	667.5	-5,625.3	440.8	79.9	360.89	1.221 Level 2	
13,100.0	6,424.2	13,083.5	6,424.3	183.8	182.7	90.13	90.13	667.5	-5,725.3	440.8	74.4	366.46	1.203 Level 2	
13,200.0	6,424.0	13,183.5	6,424.0	186.6	185.5	90.13	90.13	667.5	-5,825.3	440.8	68.8	372.04	1.185 Level 2	
13,300.0	6,423.8	13,283.5	6,423.8	189.4	188.3	90.13	90.13	667.5	-5,925.3	440.8	63.2	377.61	1.167 Level 2	
13,400.0	6,423.6	13,383.5	6,423.6	192.2	191.1	90.13	90.13	667.5	-6,025.3	440.8	57.6	383.19	1.150 Level 2	
13,500.0	6,423.3	13,483.5	6,423.3	195.0	193.9	90.13	90.13	667.5	-6,125.3	440.8	52.1	388.76	1.134 Level 2	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Offset														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,600.0	6,423.1	13,583.5	6,423.1	197.8	196.7	90.13	667.5	-6,225.3	440.8	46.5	394.34	1.118	Level 2	
13,642.5	6,423.0	13,626.1	6,423.0	199.0	197.8	90.13	667.5	-6,267.8	440.8	44.1	396.71	1.111	Level 2, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design		Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)											Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	75.36	3.6	13.9	14.4	14.4	0.00	N/A			
100.0	100.0	99.0	99.0	0.1	0.1	75.36	3.6	13.9	14.4	14.2	0.22	64.370			
200.0	200.0	199.0	199.0	0.3	0.3	75.36	3.6	13.9	14.4	13.7	0.67	21.421			
300.0	300.0	299.0	299.0	0.6	0.6	75.36	3.6	13.9	14.4	13.3	1.12	12.836			
400.0	400.0	399.0	399.0	0.8	0.8	75.36	3.6	13.9	14.4	12.8	1.57	9.163			
500.0	500.0	499.0	499.0	1.0	1.0	75.36	3.6	13.9	14.4	12.4	2.02	7.124			
600.0	600.0	599.0	599.0	1.2	1.2	75.36	3.6	13.9	14.4	11.9	2.47	5.828			
700.0	700.0	699.0	699.0	1.5	1.5	75.36	3.6	13.9	14.4	11.5	2.92	4.931			
800.0	800.0	799.0	799.0	1.7	1.7	75.36	3.6	13.9	14.4	11.0	3.37	4.273			
900.0	900.0	899.0	899.0	1.9	1.9	75.36	3.6	13.9	14.4	10.6	3.82	3.770			
1,000.0	1,000.0	999.0	999.0	2.1	2.1	75.36	3.6	13.9	14.4	10.1	4.27	3.373			
1,100.0	1,100.0	1,099.0	1,099.0	2.4	2.4	75.36	3.6	13.9	14.4	9.7	4.72	3.051			
1,200.0	1,200.0	1,199.0	1,199.0	2.6	2.6	75.36	3.6	13.9	14.4	9.2	5.17	2.786			
1,300.0	1,300.0	1,299.0	1,299.0	2.8	2.8	75.36	3.6	13.9	14.4	8.8	5.62	2.563			
1,400.0	1,400.0	1,399.0	1,399.0	3.0	3.0	75.36	3.6	13.9	14.4	8.3	6.07	2.373 CC, ES			
1,500.0	1,500.0	1,498.6	1,498.6	3.3	3.2	77.26	3.4	15.2	15.6	9.1	6.50	2.396			
1,600.0	1,600.0	1,598.1	1,598.0	3.5	3.4	81.58	2.8	19.0	19.2	12.3	6.92	2.778			
1,700.0	1,700.0	1,697.5	1,697.2	3.7	3.6	5.55	1.8	25.4	24.2	16.9	7.33	3.300			
1,800.0	1,799.9	1,796.6	1,795.9	3.9	3.9	10.26	0.3	34.2	29.2	21.5	7.73	3.783			
1,900.0	1,899.7	1,895.6	1,894.2	4.1	4.1	14.94	-1.5	45.6	34.5	26.3	8.13	4.240			
2,000.0	1,999.3	1,994.5	1,992.1	4.3	4.3	19.53	-3.8	59.5	40.0	31.4	8.53	4.687			
2,100.0	2,098.6	2,093.1	2,089.3	4.6	4.6	23.98	-6.5	75.8	45.9	36.9	8.94	5.129			
2,200.0	2,197.5	2,191.6	2,186.0	4.8	4.9	28.24	-9.5	94.6	52.2	42.8	9.37	5.571			
2,300.0	2,296.1	2,289.9	2,281.9	5.1	5.3	32.30	-13.0	115.8	59.1	49.2	9.83	6.010			
2,400.0	2,394.2	2,388.0	2,377.0	5.4	5.7	36.11	-16.8	139.3	66.5	56.2	10.32	6.441			
2,500.0	2,491.7	2,485.9	2,471.3	5.8	6.1	39.68	-21.1	165.2	74.5	63.7	10.88	6.854			
2,600.0	2,588.6	2,584.5	2,565.7	6.1	6.6	43.12	-25.7	193.4	82.9	71.4	11.50	7.211			
2,700.0	2,684.9	2,684.0	2,660.9	6.6	7.1	47.04	-30.4	222.2	90.1	77.8	12.24	7.362			
2,800.0	2,780.4	2,783.6	2,756.1	7.0	7.6	51.56	-35.1	251.0	96.0	82.8	13.11	7.319			
2,828.3	2,807.2	2,811.7	2,783.0	7.2	7.7	52.96	-36.4	259.1	97.4	84.0	13.39	7.278			
2,900.0	2,875.3	2,883.1	2,851.2	7.6	8.1	56.49	-39.7	279.7	101.3	87.1	14.15	7.159			
3,000.0	2,970.1	2,982.6	2,946.3	8.1	8.7	60.96	-44.4	308.4	107.3	92.0	15.27	7.022			
3,100.0	3,065.0	3,082.1	3,041.5	8.7	9.2	64.94	-49.1	337.2	113.8	97.3	16.46	6.915			
3,200.0	3,159.9	3,181.5	3,136.6	9.2	9.8	68.47	-53.8	365.9	120.8	103.2	17.68	6.834			
3,300.0	3,254.8	3,281.0	3,231.7	9.8	10.4	71.61	-58.5	394.7	128.3	109.4	18.93	6.775			
3,400.0	3,349.6	3,380.5	3,326.9	10.4	11.0	74.39	-63.2	423.4	136.1	115.9	20.20	6.735			
3,500.0	3,444.5	3,480.0	3,422.0	11.0	11.5	76.88	-67.9	452.2	144.1	122.7	21.48	6.710			
3,600.0	3,539.4	3,579.5	3,517.1	11.6	12.1	79.09	-72.6	480.9	152.5	129.7	22.77	6.696			
3,700.0	3,634.3	3,679.0	3,612.2	12.3	12.7	81.08	-77.3	509.6	161.0	136.9	24.06	6.692			
3,800.0	3,729.1	3,778.5	3,707.4	12.9	13.3	82.86	-82.0	538.4	169.7	144.3	25.35	6.694			
3,900.0	3,824.0	3,878.0	3,802.5	13.5	13.9	84.47	-86.7	567.1	178.5	151.9	26.64	6.702			
4,000.0	3,918.9	3,977.5	3,897.6	14.1	14.5	85.92	-91.4	595.9	187.5	159.5	27.93	6.713			
4,100.0	4,013.8	4,076.9	3,992.8	14.8	15.1	87.25	-96.1	624.6	196.5	167.3	29.21	6.728			
4,200.0	4,108.6	4,176.4	4,087.9	15.4	15.7	88.45	-100.7	653.4	205.7	175.2	30.50	6.745			
4,300.0	4,203.5	4,275.9	4,183.0	16.1	16.3	89.56	-105.4	682.1	215.0	183.2	31.78	6.764			
4,400.0	4,298.4	4,375.4	4,278.2	16.7	16.9	90.57	-110.1	710.8	224.3	191.2	33.06	6.783			
4,500.0	4,393.3	4,474.9	4,373.3	17.4	17.5	91.50	-114.8	739.6	233.7	199.3	34.35	6.804			
4,600.0	4,488.1	4,574.4	4,468.4	18.0	18.2	92.36	-119.5	768.3	243.1	207.5	35.62	6.825			
4,700.0	4,583.0	4,673.9	4,563.6	18.7	18.8	93.15	-124.2	797.1	252.6	215.7	36.90	6.846			
4,800.0	4,677.9	4,773.4	4,658.7	19.3	19.4	93.89	-128.9	825.8	262.2	224.0	38.18	6.867			
4,900.0	4,772.8	4,872.9	4,753.8	20.0	20.0	94.57	-133.6	854.6	271.7	232.3	39.45	6.888			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program:		Reference		Offset		Semi Major Axis		Distance					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,867.6	4,972.4	4,849.0	20.6	20.6	95.21	-138.3	883.3	281.4	240.6	40.73	6.909	
5,100.0	4,962.5	5,071.8	4,944.1	21.3	21.2	95.81	-143.0	912.1	291.0	249.0	42.00	6.929	
5,200.0	5,057.4	5,171.3	5,039.2	21.9	21.8	96.36	-147.7	940.8	300.7	257.4	43.27	6.949	
5,300.0	5,152.3	5,270.8	5,134.3	22.6	22.4	96.89	-152.4	969.5	310.4	265.8	44.54	6.969	
5,400.0	5,247.1	5,370.3	5,229.5	23.2	23.1	97.38	-157.0	998.3	320.1	274.3	45.81	6.988	
5,500.0	5,342.0	5,469.8	5,324.6	23.9	23.7	97.84	-161.7	1,027.0	329.9	282.8	47.08	7.007	
5,600.4	5,437.2	5,569.7	5,420.1	24.6	24.3	98.28	-166.4	1,055.9	339.7	291.3	48.35	7.025	
5,650.0	5,484.8	5,619.0	5,467.3	24.8	24.6	100.96	-168.8	1,070.1	344.6	295.6	48.92	7.044	
5,700.0	5,533.5	5,668.7	5,515.1	25.0	24.8	104.92	-171.1	1,083.4	349.6	300.2	49.34	7.085	
5,750.0	5,582.8	5,718.5	5,563.8	25.2	25.0	112.70	-173.5	1,093.5	354.7	305.0	49.65	7.143	
5,800.0	5,632.6	5,768.5	5,613.2	25.3	25.2	132.64	-176.0	1,100.5	359.8	309.9	49.88	7.214	
5,850.0	5,682.5	5,818.6	5,663.1	25.3	25.2	-171.16	-178.4	1,104.2	365.0	315.0	50.03	7.296	
5,900.0	5,732.3	5,868.9	5,713.4	25.4	25.3	-126.90	-180.9	1,104.7	370.2	320.1	50.10	7.390	
5,950.0	5,782.0	5,919.4	5,763.7	25.3	25.3	-112.23	-183.4	1,101.8	375.4	325.3	50.10	7.493	
6,000.0	5,831.1	5,970.0	5,813.9	25.3	25.3	-105.93	-185.9	1,095.6	380.5	330.5	50.04	7.605	
6,050.0	5,879.6	6,020.8	5,863.7	25.2	25.3	-102.51	-188.3	1,086.0	385.7	335.7	49.92	7.725	
6,100.0	5,927.3	6,071.9	5,913.0	25.2	25.2	-100.36	-190.8	1,073.1	390.7	340.9	49.76	7.851	
6,150.0	5,973.8	6,123.0	5,961.5	25.1	25.1	-98.89	-193.2	1,056.8	395.6	346.0	49.56	7.982	
6,200.0	6,019.1	6,174.4	6,008.9	25.0	25.0	-97.81	-195.5	1,037.3	400.4	351.1	49.34	8.115	
6,250.0	6,062.9	6,226.0	6,055.1	24.8	24.9	-96.99	-197.8	1,014.5	405.1	356.0	49.10	8.249	
6,300.0	6,105.0	6,277.7	6,099.7	24.7	24.7	-96.33	-200.0	988.6	409.5	360.7	48.86	8.382	
6,350.0	6,145.3	6,329.6	6,142.7	24.6	24.6	-95.79	-202.1	959.6	413.8	365.2	48.64	8.509	
6,400.0	6,183.6	6,381.6	6,183.7	24.5	24.5	-95.34	-204.2	927.6	417.9	369.5	48.44	8.627	
6,450.0	6,219.7	6,433.8	6,222.6	24.4	24.4	-94.95	-206.1	892.8	421.8	373.5	48.30	8.733	
6,500.0	6,253.5	6,486.2	6,259.1	24.4	24.4	-94.62	-207.9	855.4	425.4	377.2	48.21	8.823	
6,550.0	6,284.8	6,538.7	6,293.0	24.4	24.3	-94.32	-209.6	815.4	428.8	380.5	48.22	8.892	
6,600.0	6,313.5	6,591.3	6,324.2	24.5	24.4	-94.06	-211.1	773.1	431.8	383.5	48.32	8.938	
6,650.0	6,339.4	6,644.0	6,352.5	24.6	24.4	-93.83	-212.5	728.6	434.6	386.1	48.53	8.956	
6,700.0	6,362.5	6,696.8	6,377.7	24.7	24.6	-93.62	-213.8	682.2	437.1	388.2	48.87	8.944	
6,750.0	6,382.7	6,749.7	6,399.6	24.9	24.8	-93.44	-214.8	634.1	439.2	389.9	49.34	8.902	
6,800.0	6,399.8	6,802.6	6,418.2	25.2	25.1	-93.27	-215.8	584.5	441.0	391.1	49.96	8.828	
6,850.0	6,413.9	6,855.6	6,433.3	25.6	25.4	-93.12	-216.5	533.8	442.5	391.8	50.71	8.726	
6,900.0	6,424.7	6,908.6	6,444.9	26.0	25.8	-92.99	-217.1	482.0	443.6	392.0	51.60	8.598	
6,950.0	6,432.4	6,961.7	6,452.8	26.5	26.3	-92.87	-217.5	429.6	444.4	391.8	52.61	8.447	
7,000.0	6,436.8	7,014.7	6,457.2	27.0	26.9	-92.77	-217.7	376.8	444.9	391.1	53.74	8.278	
7,044.4	6,438.0	7,061.2	6,458.0	27.5	27.4	-92.70	-217.8	330.3	445.0	390.1	54.82	8.117	
7,100.0	6,437.9	7,116.8	6,457.9	28.2	28.1	-92.70	-217.8	274.7	445.0	388.7	56.26	7.909	
7,200.0	6,437.6	7,216.8	6,457.6	29.7	29.6	-92.70	-217.8	174.7	445.0	385.8	59.16	7.521	
7,300.0	6,437.4	7,316.8	6,457.4	31.3	31.2	-92.70	-217.8	74.7	445.0	382.5	62.43	7.127	
7,400.0	6,437.2	7,416.8	6,457.2	33.1	33.0	-92.70	-217.8	-25.3	445.0	378.9	66.02	6.739	
7,500.0	6,437.0	7,516.8	6,456.9	35.0	34.9	-92.70	-217.8	-125.3	445.0	375.1	69.88	6.368	
7,600.0	6,436.7	7,616.8	6,456.7	37.1	37.0	-92.70	-217.8	-225.3	445.0	371.0	73.96	6.016	
7,700.0	6,436.5	7,716.8	6,456.5	39.2	39.1	-92.70	-217.8	-325.3	445.0	366.7	78.23	5.687	
7,800.0	6,436.3	7,816.8	6,456.3	41.4	41.3	-92.70	-217.8	-425.3	445.0	362.3	82.67	5.382	
7,900.0	6,436.1	7,916.8	6,456.0	43.7	43.6	-92.70	-217.8	-525.3	445.0	357.7	87.24	5.101	
8,000.0	6,435.8	8,016.8	6,455.8	46.0	46.0	-92.70	-217.8	-625.3	445.0	353.0	91.92	4.840	
8,100.0	6,435.6	8,116.8	6,455.6	48.4	48.3	-92.70	-217.8	-725.3	445.0	348.2	96.71	4.601	
8,200.0	6,435.4	8,216.8	6,455.4	50.9	50.8	-92.70	-217.8	-825.3	445.0	343.4	101.58	4.380	
8,300.0	6,435.1	8,316.8	6,455.1	53.3	53.3	-92.70	-217.8	-925.3	445.0	338.4	106.52	4.177	
8,400.0	6,434.9	8,416.8	6,454.9	55.9	55.8	-92.70	-217.8	-1,025.3	445.0	333.4	111.53	3.990	
8,500.0	6,434.7	8,516.8	6,454.7	58.4	58.3	-92.70	-217.8	-1,125.3	445.0	328.4	116.59	3.816	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,600.0	6,434.5	8,616.8	6,454.4	60.9	60.9	-92.70	-217.8	-1,225.3	445.0	323.3	121.70	3.656	
8,700.0	6,434.2	8,716.8	6,454.2	63.5	63.5	-92.70	-217.8	-1,325.3	445.0	318.1	126.86	3.508	
8,800.0	6,434.0	8,816.8	6,454.0	66.1	66.1	-92.70	-217.8	-1,425.3	445.0	312.9	132.05	3.370	
8,900.0	6,433.8	8,916.8	6,453.8	68.7	68.7	-92.70	-217.8	-1,525.3	445.0	307.7	137.27	3.241	
9,000.0	6,433.6	9,016.8	6,453.5	71.4	71.3	-92.70	-217.8	-1,625.3	445.0	302.4	142.53	3.122	
9,100.0	6,433.3	9,116.8	6,453.3	74.0	73.9	-92.70	-217.8	-1,725.3	445.0	297.1	147.81	3.010	
9,200.0	6,433.1	9,216.8	6,453.1	76.7	76.6	-92.70	-217.8	-1,825.3	445.0	291.8	153.12	2.906	
9,300.0	6,432.9	9,316.8	6,452.9	79.3	79.3	-92.70	-217.8	-1,925.3	445.0	286.5	158.44	2.808	
9,400.0	6,432.6	9,416.8	6,452.6	82.0	81.9	-92.70	-217.8	-2,025.3	445.0	281.2	163.79	2.717	
9,500.0	6,432.4	9,516.8	6,452.4	84.7	84.6	-92.70	-217.8	-2,125.3	445.0	275.8	169.15	2.631	
9,600.0	6,432.2	9,616.8	6,452.2	87.4	87.3	-92.70	-217.8	-2,225.3	445.0	270.4	174.53	2.549	
9,700.0	6,432.0	9,716.8	6,451.9	90.1	90.0	-92.70	-217.8	-2,325.3	445.0	265.0	179.93	2.473	
9,800.0	6,431.7	9,816.8	6,451.7	92.8	92.7	-92.70	-217.8	-2,425.3	445.0	259.6	185.33	2.401	
9,900.0	6,431.5	9,916.8	6,451.5	95.5	95.4	-92.70	-217.8	-2,525.3	445.0	254.2	190.75	2.333	
10,000.0	6,431.3	10,016.8	6,451.3	98.2	98.2	-92.70	-217.8	-2,625.3	445.0	248.8	196.18	2.268	
10,100.0	6,431.1	10,116.8	6,451.0	100.9	100.9	-92.70	-217.8	-2,725.3	445.0	243.3	201.62	2.207	
10,200.0	6,430.8	10,216.8	6,450.8	103.7	103.6	-92.70	-217.8	-2,825.3	445.0	237.9	207.07	2.149	
10,300.0	6,430.6	10,316.8	6,450.6	106.4	106.3	-92.70	-217.8	-2,925.3	445.0	232.4	212.53	2.094	
10,400.0	6,430.4	10,416.8	6,450.3	109.1	109.1	-92.70	-217.8	-3,025.3	445.0	227.0	218.00	2.041	
10,500.0	6,430.1	10,516.8	6,450.1	111.9	111.8	-92.70	-217.8	-3,125.3	445.0	221.5	223.47	1.991	
10,600.0	6,429.9	10,616.8	6,449.9	114.6	114.6	-92.70	-217.8	-3,225.3	445.0	216.0	228.95	1.943	
10,700.0	6,429.7	10,716.8	6,449.7	117.4	117.3	-92.70	-217.8	-3,325.3	445.0	210.5	234.44	1.898	
10,800.0	6,429.5	10,816.8	6,449.4	120.1	120.1	-92.70	-217.8	-3,425.3	445.0	205.0	239.93	1.855	
10,900.0	6,429.2	10,916.8	6,449.2	122.9	122.8	-92.70	-217.8	-3,525.3	445.0	199.5	245.43	1.813	
11,000.0	6,429.0	11,016.8	6,449.0	125.6	125.6	-92.70	-217.8	-3,625.3	445.0	194.0	250.93	1.773	
11,100.0	6,428.8	11,116.8	6,448.8	128.4	128.3	-92.70	-217.8	-3,725.3	445.0	188.5	256.44	1.735	
11,200.0	6,428.6	11,216.8	6,448.5	131.1	131.1	-92.70	-217.8	-3,825.3	445.0	183.0	261.95	1.699	
11,300.0	6,428.3	11,316.8	6,448.3	133.9	133.8	-92.70	-217.8	-3,925.3	445.0	177.5	267.47	1.664	
11,400.0	6,428.1	11,416.8	6,448.1	136.6	136.6	-92.70	-217.8	-4,025.3	445.0	172.0	272.99	1.630	
11,500.0	6,427.9	11,516.8	6,447.8	139.4	139.4	-92.70	-217.8	-4,125.3	445.0	166.4	278.52	1.598	
11,600.0	6,427.6	11,616.8	6,447.6	142.2	142.1	-92.70	-217.8	-4,225.3	445.0	160.9	284.05	1.566	
11,700.0	6,427.4	11,716.8	6,447.4	144.9	144.9	-92.70	-217.8	-4,325.3	445.0	155.4	289.58	1.537	
11,800.0	6,427.2	11,816.8	6,447.2	147.7	147.7	-92.70	-217.8	-4,425.3	445.0	149.8	295.11	1.508	
11,900.0	6,427.0	11,916.8	6,446.9	150.5	150.5	-92.70	-217.8	-4,525.3	445.0	144.3	300.65	1.480 Level 3	
12,000.0	6,426.7	12,016.8	6,446.7	153.3	153.2	-92.70	-217.8	-4,625.3	445.0	138.8	306.19	1.453 Level 3	
12,100.0	6,426.5	12,116.8	6,446.5	156.0	156.0	-92.70	-217.8	-4,725.3	445.0	133.2	311.74	1.427 Level 3	
12,200.0	6,426.3	12,216.8	6,446.3	158.8	158.8	-92.70	-217.8	-4,825.3	445.0	127.7	317.28	1.402 Level 3	
12,300.0	6,426.1	12,316.8	6,446.0	161.6	161.6	-92.70	-217.8	-4,925.3	445.0	122.1	322.83	1.378 Level 3	
12,400.0	6,425.8	12,416.8	6,445.8	164.4	164.3	-92.70	-217.8	-5,025.3	445.0	116.6	328.38	1.355 Level 3	
12,500.0	6,425.6	12,516.8	6,445.6	167.1	167.1	-92.70	-217.8	-5,125.3	445.0	111.0	333.94	1.332 Level 3	
12,600.0	6,425.4	12,616.8	6,445.3	169.9	169.9	-92.70	-217.8	-5,225.3	445.0	105.5	339.49	1.311 Level 3	
12,700.0	6,425.1	12,716.8	6,445.1	172.7	172.7	-92.70	-217.8	-5,325.3	445.0	99.9	345.05	1.290 Level 3	
12,800.0	6,424.9	12,816.8	6,444.9	175.5	175.5	-92.70	-217.8	-5,425.3	445.0	94.4	350.61	1.269 Level 3	
12,900.0	6,424.7	12,916.8	6,444.7	178.3	178.2	-92.70	-217.8	-5,525.3	445.0	88.8	356.17	1.249 Level 2	
13,000.0	6,424.5	13,016.8	6,444.4	181.0	181.0	-92.70	-217.8	-5,625.3	445.0	83.2	361.73	1.230 Level 2	
13,100.0	6,424.2	13,116.8	6,444.2	183.8	183.8	-92.70	-217.8	-5,725.3	445.0	77.7	367.29	1.211 Level 2	
13,200.0	6,424.0	13,216.8	6,444.0	186.6	186.6	-92.70	-217.8	-5,825.3	445.0	72.1	372.86	1.193 Level 2	
13,300.0	6,423.8	13,316.8	6,443.8	189.4	189.4	-92.70	-217.8	-5,925.3	445.0	66.5	378.43	1.176 Level 2	
13,400.0	6,423.6	13,416.8	6,443.5	192.2	192.2	-92.70	-217.8	-6,025.3	445.0	61.0	384.00	1.159 Level 2	
13,500.0	6,423.3	13,516.8	6,443.3	195.0	195.0	-92.70	-217.8	-6,125.3	445.0	55.4	389.57	1.142 Level 2	
13,600.0	6,423.1	13,616.8	6,443.1	197.8	197.7	-92.70	-217.8	-6,225.3	445.0	49.8	395.14	1.126 Level 2	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis		Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,617.8	6,423.1	13,634.6	6,443.0	198.3	198.2	-92.70	-217.8	-6,243.1	445.0	48.8	396.13	1.123	Level 2	
13,642.5	6,423.0	13,648.3	6,443.0	199.0	198.6	-92.70	-217.8	-6,256.8	445.1	47.9	397.20	1.121	Level 2, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-104.66	-3.6	-13.9	14.4	14.4	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-3.6	-13.9	14.4	14.2	0.22	64.054		
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-3.6	-13.9	14.4	13.7	0.67	21.351		
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-3.6	-13.9	14.4	13.3	1.12	12.811		
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-3.6	-13.9	14.4	12.8	1.57	9.151		
500.0	500.0	500.0	500.0	1.0	1.0	-104.66	-3.6	-13.9	14.4	12.4	2.02	7.117		
600.0	600.0	600.0	600.0	1.2	1.2	-104.66	-3.6	-13.9	14.4	11.9	2.47	5.823		
700.0	700.0	700.0	700.0	1.5	1.5	-104.66	-3.6	-13.9	14.4	11.5	2.92	4.927		
800.0	800.0	800.0	800.0	1.7	1.7	-104.66	-3.6	-13.9	14.4	11.0	3.37	4.270		
900.0	900.0	900.0	900.0	1.9	1.9	-104.66	-3.6	-13.9	14.4	10.6	3.82	3.768		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-104.66	-3.6	-13.9	14.4	10.1	4.27	3.371		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-104.66	-3.6	-13.9	14.4	9.7	4.72	3.050		
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-104.66	-3.6	-13.9	14.4	9.2	5.17	2.785		
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-104.66	-3.6	-13.9	14.4	8.8	5.62	2.562		
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-104.66	-3.6	-13.9	14.4	8.3	6.07	2.372		
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	-104.66	-3.6	-13.9	14.4	7.9	6.52	2.209		
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	-104.66	-3.6	-13.9	14.4	7.4	6.97	2.066 CC		
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	175.07	-3.6	-13.9	15.7	8.3	7.40	2.121		
1,800.0	1,799.9	1,799.9	1,799.9	3.9	3.9	176.05	-3.6	-13.9	19.6	11.8	7.83	2.506		
1,900.0	1,899.7	1,900.3	1,900.3	4.1	4.1	176.37	-3.7	-12.6	24.9	16.6	8.23	3.021		
2,000.0	1,999.3	2,000.9	2,000.8	4.3	4.3	175.74	-3.7	-8.6	30.2	21.6	8.62	3.499		
2,100.0	2,098.6	2,101.6	2,101.3	4.6	4.6	174.58	-3.7	-2.0	35.5	26.5	9.02	3.942		
2,200.0	2,197.5	2,202.4	2,201.7	4.8	4.8	173.11	-3.8	7.2	41.0	31.6	9.41	4.355		
2,300.0	2,296.1	2,303.4	2,301.9	5.1	5.0	171.43	-3.9	19.2	46.5	36.7	9.81	4.743		
2,400.0	2,394.2	2,404.4	2,401.9	5.4	5.3	169.64	-4.0	33.8	52.2	42.0	10.22	5.106		
2,500.0	2,491.7	2,505.6	2,501.6	5.8	5.5	167.76	-4.1	51.1	58.0	47.3	10.65	5.447		
2,600.0	2,588.6	2,606.9	2,600.9	6.1	5.8	165.83	-4.2	71.0	64.0	52.9	11.09	5.765		
2,700.0	2,684.9	2,708.3	2,699.8	6.6	6.2	163.88	-4.4	93.6	70.1	58.5	11.57	6.057		
2,800.0	2,780.4	2,809.8	2,798.1	7.0	6.6	161.92	-4.6	118.8	76.4	64.3	12.09	6.320		
2,828.3	2,807.2	2,838.5	2,825.8	7.2	6.7	161.37	-4.6	126.4	78.3	66.0	12.25	6.388		
2,900.0	2,875.3	2,911.5	2,895.8	7.6	7.0	159.83	-4.8	146.6	82.3	69.6	12.72	6.475		
3,000.0	2,970.1	3,013.2	2,992.9	8.1	7.5	157.12	-5.0	177.1	86.2	72.7	13.45	6.407		
3,100.0	3,065.0	3,114.5	3,088.8	8.7	8.0	153.70	-5.2	210.0	88.1	73.8	14.30	6.156		
3,200.0	3,159.9	3,214.4	3,183.0	9.2	8.6	150.18	-5.5	243.0	89.6	74.4	15.26	5.873		
3,300.0	3,254.8	3,314.2	3,277.2	9.8	9.1	146.79	-5.7	276.1	91.6	75.3	16.31	5.613		
3,400.0	3,349.6	3,414.1	3,371.4	10.4	9.7	143.56	-5.9	309.2	93.8	76.3	17.45	5.376		
3,500.0	3,444.5	3,513.9	3,465.6	11.0	10.3	140.48	-6.2	342.3	96.3	77.7	18.65	5.163		
3,600.0	3,539.4	3,613.7	3,559.8	11.6	11.0	137.56	-6.4	375.4	99.1	79.2	19.92	4.974		
3,700.0	3,634.3	3,713.6	3,654.0	12.3	11.6	134.81	-6.6	408.5	102.1	80.9	21.23	4.808		
3,800.0	3,729.1	3,813.4	3,748.2	12.9	12.2	132.23	-6.9	441.5	105.3	82.7	22.59	4.663		
3,900.0	3,824.0	3,913.2	3,842.4	13.5	12.9	129.80	-7.1	474.6	108.8	84.8	23.98	4.537		
4,000.0	3,918.9	4,013.1	3,936.6	14.1	13.5	127.52	-7.3	507.7	112.4	87.0	25.38	4.428		
4,100.0	4,013.8	4,112.9	4,030.7	14.8	14.2	125.39	-7.6	540.8	116.2	89.4	26.81	4.334		
4,200.0	4,108.6	4,212.8	4,124.9	15.4	14.9	123.40	-7.8	573.9	120.1	91.9	28.25	4.253		
4,300.0	4,203.5	4,312.6	4,219.1	16.1	15.5	121.54	-8.0	606.9	124.2	94.5	29.69	4.184		
4,400.0	4,298.4	4,412.4	4,313.3	16.7	16.2	119.79	-8.3	640.0	128.4	97.3	31.14	4.124		
4,500.0	4,393.3	4,512.3	4,407.5	17.4	16.9	118.16	-8.5	673.1	132.7	100.1	32.58	4.073		
4,600.0	4,488.1	4,612.1	4,501.7	18.0	17.5	116.63	-8.7	706.2	137.1	103.1	34.03	4.030		
4,700.0	4,583.0	4,711.9	4,595.9	18.7	18.2	115.20	-9.0	739.3	141.6	106.2	35.48	3.992		
4,800.0	4,677.9	4,811.8	4,690.1	19.3	18.9	113.85	-9.2	772.4	146.2	109.3	36.92	3.960		
4,900.0	4,772.8	4,911.6	4,784.3	20.0	19.6	112.59	-9.4	805.4	150.9	112.5	38.36	3.933		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design		Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
							+N/-S (ft)	+E/-W (ft)							
5,000.0	4,867.6	5,011.5	4,878.5	20.6	20.3	111.40	-9.7	838.5	155.6	115.8	39.80	3.910			
5,100.0	4,962.5	5,111.3	4,972.7	21.3	20.9	110.29	-9.9	871.6	160.4	119.2	41.23	3.890			
5,200.0	5,057.4	5,211.1	5,066.9	21.9	21.6	109.24	-10.1	904.7	165.3	122.6	42.66	3.874			
5,300.0	5,152.3	5,311.0	5,161.1	22.6	22.3	108.25	-10.4	937.8	170.2	126.1	44.09	3.860			
5,400.0	5,247.1	5,410.8	5,255.3	23.2	23.0	107.31	-10.6	970.8	175.1	129.6	45.51	3.848			
5,500.0	5,342.0	5,510.6	5,349.5	23.9	23.7	106.43	-10.8	1,003.9	180.1	133.2	46.92	3.839			
5,600.4	5,437.2	5,610.9	5,444.1	24.6	24.4	105.59	-11.1	1,037.1	185.2	136.8	48.34	3.831			
5,650.0	5,484.8	5,660.3	5,490.7	24.8	24.7	107.26	-11.2	1,053.5	187.5	138.5	49.02	3.826			
5,700.0	5,533.5	5,709.3	5,537.2	25.0	25.0	109.82	-11.3	1,069.1	189.8	140.2	49.62	3.825			
5,750.0	5,582.8	5,758.2	5,584.4	25.2	25.2	116.17	-11.4	1,081.8	192.2	142.2	50.07	3.839			
5,800.0	5,632.6	5,807.4	5,632.6	25.3	25.4	134.70	-11.5	1,091.5	194.9	144.5	50.42	3.865			
5,850.0	5,682.5	5,857.0	5,681.8	25.3	25.5	-170.50	-11.6	1,098.1	197.7	147.0	50.65	3.902			
5,900.0	5,732.3	5,906.9	5,731.6	25.4	25.6	-127.60	-11.8	1,101.5	200.6	149.8	50.78	3.950			
5,950.0	5,782.0	5,957.2	5,781.9	25.3	25.7	-114.26	-11.9	1,101.7	203.7	152.9	50.82	4.008			
6,000.0	5,831.1	6,007.9	5,832.4	25.3	25.7	-109.25	-12.0	1,098.5	206.9	156.1	50.76	4.075			
6,050.0	5,879.6	6,059.0	5,883.0	25.2	25.7	-107.06	-12.1	1,091.9	210.1	159.5	50.62	4.151			
6,100.0	5,927.3	6,110.4	5,933.5	25.2	25.6	-106.11	-12.3	1,081.8	213.5	163.1	50.40	4.235			
6,150.0	5,973.8	6,162.3	5,983.5	25.1	25.5	-105.78	-12.4	1,068.3	216.9	166.7	50.13	4.326			
6,200.0	6,019.1	6,214.5	6,032.9	25.0	25.4	-105.78	-12.5	1,051.3	220.2	170.4	49.80	4.423			
6,250.0	6,062.9	6,267.1	6,081.3	24.8	25.3	-105.98	-12.6	1,030.7	223.6	174.2	49.44	4.523			
6,300.0	6,105.0	6,320.1	6,128.5	24.7	25.2	-106.28	-12.8	1,006.7	227.0	177.9	49.05	4.627			
6,350.0	6,145.3	6,373.5	6,174.3	24.6	25.1	-106.64	-12.9	979.3	230.2	181.5	48.67	4.730			
6,400.0	6,183.6	6,427.2	6,218.4	24.5	25.0	-107.03	-13.0	948.5	233.4	185.1	48.30	4.832			
6,450.0	6,219.7	6,481.3	6,260.4	24.4	24.9	-107.42	-13.1	914.5	236.4	188.4	47.97	4.928			
6,500.0	6,253.5	6,535.8	6,300.2	24.4	24.8	-107.79	-13.2	877.3	239.3	191.6	47.70	5.017			
6,550.0	6,284.8	6,590.5	6,337.4	24.4	24.8	-108.15	-13.3	837.2	242.0	194.5	47.51	5.093			
6,600.0	6,313.5	6,645.6	6,371.8	24.5	24.8	-108.47	-13.4	794.3	244.5	197.1	47.42	5.155			
6,650.0	6,339.4	6,700.9	6,403.2	24.6	24.9	-108.75	-13.4	748.7	246.8	199.3	47.46	5.199			
6,700.0	6,362.5	6,756.5	6,431.4	24.7	25.1	-109.00	-13.5	700.8	248.8	201.1	47.64	5.222			
6,750.0	6,382.7	6,812.2	6,456.1	24.9	25.3	-109.20	-13.6	650.8	250.6	202.6	47.97	5.223			
6,800.0	6,399.8	6,868.2	6,477.1	25.2	25.6	-109.36	-13.6	599.0	252.0	203.6	48.47	5.200			
6,850.0	6,413.9	6,924.3	6,494.3	25.6	26.0	-109.48	-13.7	545.6	253.2	204.1	49.12	5.155			
6,900.0	6,424.7	6,980.5	6,507.6	26.0	26.5	-109.54	-13.7	490.9	254.2	204.2	49.94	5.089			
6,950.0	6,432.4	7,036.8	6,516.8	26.5	27.0	-109.56	-13.7	435.4	254.7	203.8	50.92	5.003			
7,000.0	6,436.8	7,093.1	6,521.9	27.0	27.6	-109.53	-13.7	379.3	255.0	203.0	52.03	4.902			
7,044.4	6,438.0	7,142.5	6,523.0	27.5	28.2	-109.47	-13.7	330.0	255.0	201.9	53.12	4.801			
7,100.0	6,437.9	7,198.1	6,522.8	28.2	28.9	-109.45	-13.7	274.4	255.0	200.5	54.49	4.680			
7,200.0	6,437.6	7,298.1	6,522.4	29.7	30.4	-109.42	-13.7	174.4	254.9	197.7	57.27	4.452			
7,300.0	6,437.4	7,398.1	6,522.0	31.3	32.0	-109.38	-13.7	74.4	254.9	194.5	60.39	4.221			
7,400.0	6,437.2	7,498.1	6,521.6	33.1	33.8	-109.35	-13.7	-25.6	254.8	191.0	63.81	3.994			
7,500.0	6,437.0	7,598.1	6,521.3	35.0	35.7	-109.32	-13.7	-125.6	254.8	187.3	67.48	3.776			
7,600.0	6,436.7	7,698.1	6,520.9	37.1	37.7	-109.29	-13.7	-225.6	254.7	183.4	71.36	3.570			
7,700.0	6,436.5	7,798.1	6,520.5	39.2	39.9	-109.25	-13.7	-325.6	254.7	179.3	75.42	3.377			
7,800.0	6,436.3	7,898.1	6,520.1	41.4	42.1	-109.22	-13.7	-425.6	254.6	175.0	79.63	3.198			
7,900.0	6,436.1	7,998.1	6,519.7	43.7	44.4	-109.19	-13.7	-525.6	254.6	170.6	83.98	3.032			
8,000.0	6,435.8	8,098.1	6,519.4	46.0	46.7	-109.16	-13.7	-625.6	254.5	166.1	88.43	2.878			
8,100.0	6,435.6	8,198.1	6,519.0	48.4	49.1	-109.13	-13.7	-725.6	254.5	161.5	92.98	2.737			
8,200.0	6,435.4	8,298.1	6,518.6	50.9	51.5	-109.09	-13.7	-825.6	254.4	156.8	97.61	2.607			
8,300.0	6,435.1	8,398.1	6,518.2	53.3	54.0	-109.06	-13.7	-925.6	254.4	152.1	102.32	2.486			
8,400.0	6,434.9	8,498.1	6,517.8	55.9	56.5	-109.03	-13.7	-1,025.6	254.3	147.3	107.09	2.375			
8,500.0	6,434.7	8,598.1	6,517.5	58.4	59.0	-109.00	-13.7	-1,125.6	254.3	142.4	111.91	2.272			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,600.0	6,434.5	8,698.1	6,517.1	60.9	61.5	-108.96	-13.7	-1,225.6	254.2	137.5	116.78	2.177	
8,700.0	6,434.2	8,798.1	6,516.7	63.5	64.1	-108.93	-13.8	-1,325.6	254.2	132.5	121.69	2.089	
8,800.0	6,434.0	8,898.1	6,516.3	66.1	66.7	-108.90	-13.8	-1,425.6	254.1	127.5	126.64	2.007	
8,900.0	6,433.8	8,998.1	6,515.9	68.7	69.3	-108.87	-13.8	-1,525.6	254.1	122.5	131.63	1.930	
9,000.0	6,433.6	9,098.1	6,515.6	71.4	71.9	-108.83	-13.8	-1,625.6	254.0	117.4	136.64	1.859	
9,100.0	6,433.3	9,198.1	6,515.2	74.0	74.6	-108.80	-13.8	-1,725.6	254.0	112.3	141.69	1.793	
9,200.0	6,433.1	9,298.1	6,514.8	76.7	77.2	-108.77	-13.8	-1,825.6	254.0	107.2	146.75	1.730	
9,300.0	6,432.9	9,398.1	6,514.4	79.3	79.9	-108.74	-13.8	-1,925.6	253.9	102.1	151.84	1.672	
9,400.0	6,432.6	9,498.1	6,514.1	82.0	82.5	-108.71	-13.8	-2,025.6	253.9	96.9	156.95	1.617	
9,500.0	6,432.4	9,598.1	6,513.7	84.7	85.2	-108.67	-13.8	-2,125.6	253.8	91.7	162.08	1.566	
9,600.0	6,432.2	9,698.1	6,513.3	87.4	87.9	-108.64	-13.8	-2,225.6	253.8	86.5	167.23	1.517	
9,700.0	6,432.0	9,798.1	6,512.9	90.1	90.6	-108.61	-13.8	-2,325.6	253.7	81.3	172.39	1.472 Level 3	
9,800.0	6,431.7	9,898.1	6,512.5	92.8	93.3	-108.58	-13.8	-2,425.6	253.7	76.1	177.57	1.429 Level 3	
9,900.0	6,431.5	9,998.1	6,512.2	95.5	96.0	-108.54	-13.8	-2,525.6	253.6	70.9	182.76	1.388 Level 3	
10,000.0	6,431.3	10,098.1	6,511.8	98.2	98.7	-108.51	-13.8	-2,625.6	253.6	65.6	187.96	1.349 Level 3	
10,100.0	6,431.1	10,198.1	6,511.4	100.9	101.4	-108.48	-13.8	-2,725.6	253.5	60.3	193.18	1.312 Level 3	
10,200.0	6,430.8	10,298.1	6,511.0	103.7	104.2	-108.45	-13.8	-2,825.6	253.5	55.1	198.40	1.278 Level 3	
10,300.0	6,430.6	10,398.1	6,510.6	106.4	106.9	-108.41	-13.8	-2,925.6	253.4	49.8	203.64	1.244 Level 2	
10,400.0	6,430.4	10,498.1	6,510.3	109.1	109.6	-108.38	-13.8	-3,025.6	253.4	44.5	208.88	1.213 Level 2	
10,500.0	6,430.1	10,598.1	6,509.9	111.9	112.4	-108.35	-13.8	-3,125.6	253.3	39.2	214.14	1.183 Level 2	
10,600.0	6,429.9	10,698.1	6,509.5	114.6	115.1	-108.32	-13.8	-3,225.6	253.3	33.9	219.40	1.154 Level 2	
10,700.0	6,429.7	10,798.1	6,509.1	117.4	117.8	-108.28	-13.8	-3,325.6	253.2	28.6	224.67	1.127 Level 2	
10,800.0	6,429.5	10,898.1	6,508.7	120.1	120.6	-108.25	-13.8	-3,425.6	253.2	23.2	229.95	1.101 Level 2	
10,900.0	6,429.2	10,998.1	6,508.4	122.9	123.3	-108.22	-13.8	-3,525.6	253.1	17.9	235.23	1.076 Level 2	
11,000.0	6,429.0	11,098.1	6,508.0	125.6	126.1	-108.18	-13.8	-3,625.6	253.1	12.6	240.53	1.052 Level 2	
11,100.0	6,428.8	11,198.1	6,507.6	128.4	128.8	-108.15	-13.8	-3,725.6	253.0	7.2	245.82	1.029 Level 2	
11,200.0	6,428.6	11,298.1	6,507.2	131.1	131.6	-108.12	-13.8	-3,825.6	253.0	1.9	251.13	1.007 Level 2	
11,300.0	6,428.3	11,398.1	6,506.9	133.9	134.4	-108.09	-13.8	-3,925.6	252.9	-3.5	256.44	0.986 Level 1	
11,400.0	6,428.1	11,498.1	6,506.5	136.6	137.1	-108.05	-13.8	-4,025.6	252.9	-8.9	261.76	0.966 Level 1	
11,500.0	6,427.9	11,598.1	6,506.1	139.4	139.9	-108.02	-13.8	-4,125.6	252.9	-14.2	267.08	0.947 Level 1	
11,600.0	6,427.6	11,698.1	6,505.7	142.2	142.6	-107.99	-13.8	-4,225.6	252.8	-19.6	272.41	0.928 Level 1	
11,700.0	6,427.4	11,798.1	6,505.3	144.9	145.4	-107.96	-13.8	-4,325.6	252.8	-25.0	277.74	0.910 Level 1	
11,800.0	6,427.2	11,898.1	6,505.0	147.7	148.2	-107.92	-13.8	-4,425.6	252.7	-30.4	283.08	0.893 Level 1	
11,900.0	6,427.0	11,998.1	6,504.6	150.5	151.0	-107.89	-13.8	-4,525.6	252.7	-35.8	288.42	0.876 Level 1	
12,000.0	6,426.7	12,098.1	6,504.2	153.3	153.7	-107.86	-13.8	-4,625.6	252.6	-41.1	293.77	0.860 Level 1	
12,100.0	6,426.5	12,198.1	6,503.8	156.0	156.5	-107.83	-13.8	-4,725.6	252.6	-46.5	299.12	0.844 Level 1	
12,200.0	6,426.3	12,298.1	6,503.4	158.8	159.3	-107.79	-13.8	-4,825.6	252.5	-51.9	304.47	0.829 Level 1	
12,300.0	6,426.1	12,398.1	6,503.1	161.6	162.0	-107.76	-13.8	-4,925.6	252.5	-57.4	309.83	0.815 Level 1	
12,400.0	6,425.8	12,498.1	6,502.7	164.4	164.8	-107.73	-13.8	-5,025.6	252.4	-62.8	315.19	0.801 Level 1	
12,500.0	6,425.6	12,598.1	6,502.3	167.1	167.6	-107.69	-13.8	-5,125.6	252.4	-68.2	320.56	0.787 Level 1	
12,600.0	6,425.4	12,698.1	6,501.9	169.9	170.4	-107.66	-13.8	-5,225.6	252.3	-73.6	325.93	0.774 Level 1	
12,700.0	6,425.1	12,798.1	6,501.5	172.7	173.2	-107.63	-13.8	-5,325.6	252.3	-79.0	331.30	0.762 Level 1	
12,800.0	6,424.9	12,898.1	6,501.2	175.5	175.9	-107.60	-13.8	-5,425.6	252.2	-84.4	336.68	0.749 Level 1	
12,900.0	6,424.7	12,998.1	6,500.8	178.3	178.7	-107.56	-13.8	-5,525.6	252.2	-89.9	342.06	0.737 Level 1	
13,000.0	6,424.5	13,098.1	6,500.4	181.0	181.5	-107.53	-13.8	-5,625.6	252.2	-95.3	347.45	0.726 Level 1	
13,100.0	6,424.2	13,198.1	6,500.0	183.8	184.3	-107.50	-13.8	-5,725.6	252.1	-100.7	352.84	0.715 Level 1	
13,200.0	6,424.0	13,298.1	6,499.7	186.6	187.1	-107.46	-13.8	-5,825.6	252.1	-106.2	358.23	0.704 Level 1	
13,300.0	6,423.8	13,398.1	6,499.3	189.4	189.9	-107.43	-13.8	-5,925.6	252.0	-111.6	363.62	0.693 Level 1	
13,400.0	6,423.6	13,498.1	6,498.9	192.2	192.6	-107.40	-13.8	-6,025.6	252.0	-117.0	369.02	0.683 Level 1	
13,500.0	6,423.3	13,598.1	6,498.5	195.0	195.4	-107.37	-13.8	-6,125.6	251.9	-122.5	374.42	0.673 Level 1	
13,600.0	6,423.1	13,698.1	6,498.1	197.8	198.2	-107.33	-13.8	-6,225.6	251.9	-127.9	379.82	0.663 Level 1	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis		Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,631.7	6,423.0	13,729.8	6,498.0	198.7	199.1	-107.32	-13.8	-6,257.2	251.9	-129.7	381.54	0.660	Level 1	
13,642.5	6,423.0	13,734.8	6,498.0	199.0	199.2	-107.32	-13.8	-6,262.3	251.9	-130.0	381.96	0.660	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	75.35	7.3	27.9	28.8				
100.0	100.0	99.0	99.0	0.1	0.1	75.35	7.3	27.9	28.8	28.6	0.22	128.746	
200.0	200.0	199.0	199.0	0.3	0.3	75.35	7.3	27.9	28.8	28.1	0.67	42.844	
300.0	300.0	299.0	299.0	0.6	0.6	75.35	7.3	27.9	28.8	27.7	1.12	25.672	
400.0	400.0	399.0	399.0	0.8	0.8	75.35	7.3	27.9	28.8	27.2	1.57	18.327	
500.0	500.0	499.0	499.0	1.0	1.0	75.35	7.3	27.9	28.8	26.8	2.02	14.249	
600.0	600.0	599.0	599.0	1.2	1.2	75.35	7.3	27.9	28.8	26.3	2.47	11.656	
700.0	700.0	699.0	699.0	1.5	1.5	75.35	7.3	27.9	28.8	25.9	2.92	9.862	
800.0	800.0	799.0	799.0	1.7	1.7	75.35	7.3	27.9	28.8	25.4	3.37	8.546	
900.0	900.0	899.0	899.0	1.9	1.9	75.35	7.3	27.9	28.8	25.0	3.82	7.540	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	75.35	7.3	27.9	28.8	24.5	4.27	6.746	
1,100.0	1,100.0	1,099.0	1,099.0	2.4	2.4	75.35	7.3	27.9	28.8	24.1	4.72	6.103	
1,200.0	1,200.0	1,199.0	1,199.0	2.6	2.6	75.35	7.3	27.9	28.8	23.6	5.17	5.572 CC	
1,300.0	1,300.0	1,298.2	1,298.2	2.8	2.8	75.14	7.7	29.0	30.1	24.5	5.61	5.362	
1,400.0	1,400.0	1,397.3	1,397.3	3.0	3.0	74.59	9.0	32.7	33.9	27.9	6.04	5.615	
1,500.0	1,500.0	1,496.2	1,495.9	3.3	3.2	73.91	11.2	38.7	40.4	33.9	6.48	6.227	
1,600.0	1,600.0	1,594.6	1,593.9	3.5	3.4	73.25	14.2	47.0	49.4	42.4	6.93	7.124	
1,700.0	1,700.0	1,692.7	1,691.3	3.7	3.7	-8.18	18.0	57.7	59.7	52.3	7.33	8.135	
1,800.0	1,799.9	1,790.5	1,788.1	3.9	3.9	-9.05	22.6	70.7	69.9	62.2	7.75	9.026	
1,900.0	1,899.7	1,888.0	1,884.3	4.1	4.2	-10.03	28.1	86.0	80.2	72.0	8.16	9.823	
2,000.0	1,999.3	1,985.3	1,979.8	4.3	4.5	-11.06	34.4	103.6	90.5	81.9	8.59	10.537	
2,100.0	2,098.6	2,082.3	2,074.5	4.6	4.9	-12.14	41.5	123.4	100.7	91.7	9.01	11.179	
2,200.0	2,197.5	2,179.1	2,168.4	4.8	5.3	-13.25	49.4	145.3	111.0	101.6	9.44	11.757	
2,300.0	2,296.1	2,275.9	2,261.7	5.1	5.7	-14.37	58.1	169.5	121.3	111.4	9.89	12.270	
2,400.0	2,394.2	2,375.5	2,357.4	5.4	6.2	-15.61	67.3	195.4	130.2	119.8	10.35	12.577	
2,500.0	2,491.7	2,475.2	2,453.3	5.8	6.6	-17.01	76.6	221.3	136.6	125.8	10.83	12.612	
2,600.0	2,588.6	2,575.0	2,549.3	6.1	7.1	-18.63	85.9	247.2	140.6	129.3	11.34	12.404	
2,700.0	2,684.9	2,674.9	2,645.3	6.6	7.7	-20.52	95.2	273.1	142.3	130.4	11.88	11.979	
2,800.0	2,780.4	2,774.7	2,741.2	7.0	8.2	-22.78	104.5	299.0	141.7	129.3	12.48	11.361	
2,828.3	2,807.2	2,802.9	2,768.3	7.2	8.3	-23.50	107.1	306.3	141.2	128.5	12.66	11.155	
2,900.0	2,875.3	2,874.5	2,837.1	7.6	8.7	-25.39	113.7	324.9	139.6	126.5	13.18	10.595	
3,000.0	2,970.1	2,974.3	2,933.0	8.1	9.2	-28.10	123.0	350.8	137.7	123.8	13.96	9.863	
3,100.0	3,065.0	3,074.1	3,028.9	8.7	9.8	-30.87	132.3	376.7	136.1	121.3	14.82	9.185	
3,200.0	3,159.9	3,173.8	3,124.8	9.2	10.3	-33.70	141.6	402.6	134.9	119.1	15.75	8.560	
3,300.0	3,254.8	3,273.6	3,220.7	9.8	10.9	-36.58	150.9	428.5	133.9	117.2	16.77	7.988	
3,400.0	3,349.6	3,373.4	3,316.6	10.4	11.4	-39.49	160.1	454.4	133.3	115.5	17.86	7.467	
3,500.0	3,444.5	3,473.1	3,412.5	11.0	12.0	-42.41	169.4	480.3	133.1	114.1	19.02	6.996	
3,518.9	3,462.5	3,492.0	3,430.7	11.1	12.1	-42.97	171.2	485.2	133.1	113.8	19.25	6.913	
3,600.0	3,539.4	3,572.9	3,508.4	11.6	12.5	-45.34	178.7	506.2	133.2	112.9	20.26	6.575	
3,700.0	3,634.3	3,672.7	3,604.3	12.3	13.1	-48.26	188.0	532.1	133.7	112.1	21.56	6.200	
3,800.0	3,729.1	3,772.4	3,700.2	12.9	13.7	-51.15	197.3	558.0	134.5	111.5	22.91	5.869	
3,900.0	3,824.0	3,872.2	3,796.1	13.5	14.2	-54.00	206.5	583.9	135.6	111.3	24.31	5.579	
4,000.0	3,918.9	3,972.0	3,892.0	14.1	14.8	-56.80	215.8	609.8	137.1	111.3	25.74	5.326	
4,100.0	4,013.8	4,071.7	3,987.9	14.8	15.4	-59.53	225.1	635.7	138.9	111.7	27.19	5.106	
4,200.0	4,108.6	4,171.5	4,083.8	15.4	15.9	-62.18	234.4	661.6	141.0	112.3	28.67	4.917	
4,300.0	4,203.5	4,271.3	4,179.7	16.1	16.5	-64.76	243.7	687.5	143.4	113.2	30.15	4.755	
4,400.0	4,298.4	4,371.0	4,275.6	16.7	17.1	-67.24	252.9	713.4	146.0	114.4	31.63	4.617	
4,500.0	4,393.3	4,470.8	4,371.5	17.4	17.6	-69.63	262.2	739.3	149.0	115.9	33.11	4.500	
4,600.0	4,488.1	4,570.6	4,467.4	18.0	18.2	-71.92	271.5	765.2	152.2	117.6	34.58	4.401	
4,700.0	4,583.0	4,670.3	4,563.3	18.7	18.8	-74.12	280.8	791.0	155.6	119.6	36.03	4.318	
4,800.0	4,677.9	4,770.1	4,659.2	19.3	19.4	-76.22	290.1	816.9	159.2	121.8	37.47	4.250	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
4,900.0	4,772.8	4,869.9	4,755.1	20.0	19.9	-78.22	299.3	842.8	163.1	124.2	38.89	4.194			
5,000.0	4,867.6	4,969.6	4,851.0	20.6	20.5	-80.13	308.6	868.7	167.1	126.8	40.29	4.148			
5,100.0	4,962.5	5,069.4	4,946.9	21.3	21.1	-81.95	317.9	894.6	171.3	129.7	41.67	4.112			
5,200.0	5,057.4	5,169.2	5,042.8	21.9	21.6	-83.67	327.2	920.5	175.7	132.7	43.03	4.084			
5,300.0	5,152.3	5,268.9	5,138.7	22.6	22.2	-85.32	336.5	946.4	180.3	135.9	44.38	4.062			
5,400.0	5,247.1	5,368.7	5,234.6	23.2	22.8	-86.88	345.7	972.3	184.9	139.2	45.70	4.047			
5,500.0	5,342.0	5,468.5	5,330.5	23.9	23.4	-88.36	355.0	998.2	189.7	142.7	47.00	4.037			
5,600.4	5,437.2	5,568.6	5,426.8	24.6	23.9	-89.78	364.3	1,024.2	194.7	146.4	48.29	4.031			
5,650.0	5,484.8	5,618.2	5,474.4	24.8	24.2	-87.77	368.9	1,037.1	196.9	148.0	48.87	4.029			
5,700.0	5,533.5	5,668.1	5,522.4	25.0	24.5	-83.19	373.6	1,050.0	198.6	149.2	49.32	4.026			
5,750.0	5,582.8	5,717.5	5,570.0	25.2	24.8	-73.88	378.2	1,062.8	199.8	150.1	49.67	4.023			
5,800.0	5,632.6	5,765.4	5,616.4	25.3	25.0	-52.10	382.7	1,073.5	201.1	151.2	49.85	4.034			
5,850.0	5,682.5	5,813.8	5,663.9	25.3	25.2	5.93	387.3	1,081.3	202.6	152.7	49.90	4.060			
5,900.0	5,732.3	5,862.5	5,712.2	25.4	25.3	52.01	392.0	1,086.1	204.3	154.5	49.85	4.099			
5,950.0	5,782.0	5,911.7	5,761.1	25.3	25.4	68.46	396.7	1,087.8	206.3	156.6	49.70	4.151			
6,000.0	5,831.1	5,961.3	5,810.4	25.3	25.4	76.52	401.5	1,086.3	208.5	159.1	49.46	4.216			
6,050.0	5,879.6	6,011.4	5,860.1	25.2	25.4	81.65	406.3	1,081.5	210.9	161.8	49.14	4.292			
6,100.0	5,927.3	6,062.0	5,909.7	25.2	25.4	85.45	411.1	1,073.4	213.6	164.8	48.76	4.379			
6,150.0	5,973.8	6,113.1	5,959.3	25.1	25.4	88.52	415.9	1,061.8	216.3	168.0	48.33	4.476			
6,200.0	6,019.1	6,164.6	6,008.4	25.0	25.3	91.13	420.7	1,046.8	219.3	171.4	47.85	4.582			
6,250.0	6,062.9	6,216.7	6,056.8	24.8	25.2	93.41	425.4	1,028.3	222.3	174.9	47.36	4.694			
6,300.0	6,105.0	6,269.3	6,104.4	24.7	25.1	95.44	430.0	1,006.3	225.4	178.6	46.85	4.812			
6,350.0	6,145.3	6,322.4	6,150.7	24.6	25.0	97.28	434.5	980.8	228.6	182.2	46.35	4.932			
6,400.0	6,183.6	6,376.1	6,195.6	24.5	24.8	98.94	438.8	951.8	231.8	185.9	45.87	5.053			
6,450.0	6,219.7	6,430.2	6,238.8	24.4	24.7	100.46	443.0	919.4	234.9	189.5	45.45	5.170			
6,500.0	6,253.5	6,484.9	6,280.0	24.4	24.6	101.84	447.0	883.7	238.0	192.9	45.09	5.279			
6,550.0	6,284.8	6,540.0	6,318.8	24.4	24.4	103.08	450.8	844.8	241.0	196.2	44.82	5.378			
6,600.0	6,313.5	6,595.6	6,355.1	24.5	24.4	104.21	454.3	802.7	243.9	199.2	44.67	5.460			
6,650.0	6,339.4	6,651.7	6,388.4	24.6	24.3	105.22	457.6	757.8	246.6	202.0	44.65	5.523			
6,700.0	6,362.5	6,708.2	6,418.6	24.7	24.3	106.11	460.5	710.2	249.1	204.3	44.79	5.562			
6,750.0	6,382.7	6,765.1	6,445.4	24.9	24.4	106.90	463.1	660.1	251.4	206.3	45.10	5.575			
6,800.0	6,399.8	6,822.3	6,468.5	25.2	24.5	107.58	465.4	607.8	253.4	207.8	45.57	5.560			
6,850.0	6,413.9	6,879.8	6,487.8	25.6	24.8	108.15	467.3	553.7	255.1	208.9	46.22	5.519			
6,900.0	6,424.7	6,937.6	6,503.0	26.0	25.1	108.62	468.8	497.9	256.6	209.5	47.05	5.453			
6,950.0	6,432.4	6,995.6	6,514.0	26.5	25.5	108.99	469.9	441.0	257.6	209.6	48.03	5.364			
7,000.0	6,436.8	7,053.8	6,520.7	27.0	26.1	109.25	470.5	383.2	258.4	209.2	49.17	5.255			
7,044.4	6,438.0	7,105.6	6,523.0	27.5	26.6	109.40	470.8	331.5	258.8	208.5	50.30	5.145			
7,100.0	6,437.9	7,162.7	6,522.8	28.2	27.3	109.40	470.8	274.4	258.8	207.1	51.67	5.008			
7,200.0	6,437.6	7,262.7	6,522.4	29.7	28.6	109.37	470.8	174.4	258.7	204.3	54.42	4.754			
7,300.0	6,437.4	7,362.7	6,522.1	31.3	30.2	109.34	470.8	74.4	258.7	201.1	57.53	4.497			
7,400.0	6,437.2	7,462.7	6,521.7	33.1	32.0	109.30	470.8	-25.6	258.6	197.7	60.94	4.244			
7,500.0	6,437.0	7,562.7	6,521.3	35.0	33.9	109.27	470.8	-125.6	258.6	194.0	64.62	4.001			
7,600.0	6,436.7	7,662.7	6,520.9	37.1	35.9	109.24	470.8	-225.6	258.5	190.0	68.52	3.773			
7,700.0	6,436.5	7,762.7	6,520.5	39.2	38.1	109.21	470.8	-325.6	258.5	185.9	72.60	3.560			
7,800.0	6,436.3	7,862.7	6,520.2	41.4	40.3	109.18	470.8	-425.6	258.4	181.6	76.84	3.363			
7,900.0	6,436.1	7,962.7	6,519.8	43.7	42.6	109.14	470.8	-525.6	258.4	177.2	81.21	3.182			
8,000.0	6,435.8	8,062.7	6,519.4	46.0	45.0	109.11	470.8	-625.6	258.3	172.6	85.69	3.015			
8,100.0	6,435.6	8,162.7	6,519.0	48.4	47.4	109.08	470.8	-725.6	258.3	168.0	90.27	2.861			
8,200.0	6,435.4	8,262.7	6,518.7	50.9	49.8	109.05	470.8	-825.6	258.2	163.3	94.92	2.720			
8,300.0	6,435.1	8,362.7	6,518.3	53.3	52.3	109.02	470.8	-925.6	258.2	158.5	99.65	2.591			
8,400.0	6,434.9	8,462.7	6,517.9	55.9	54.8	108.99	470.8	-1,025.6	258.1	153.7	104.44	2.471			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Offset														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
8,500.0	6,434.7	8,562.7	6,517.5	58.4	57.3	108.95	470.8	-1,125.6	258.1	148.8	109.29	2.361		
8,600.0	6,434.5	8,662.7	6,517.1	60.9	59.9	108.92	470.8	-1,225.6	258.0	143.8	114.18	2.260		
8,700.0	6,434.2	8,762.7	6,516.8	63.5	62.5	108.89	470.8	-1,325.6	258.0	138.9	119.11	2.166		
8,800.0	6,434.0	8,862.7	6,516.4	66.1	65.1	108.86	470.8	-1,425.6	257.9	133.9	124.08	2.079		
8,900.0	6,433.8	8,962.7	6,516.0	68.7	67.7	108.83	470.8	-1,525.6	257.9	128.8	129.08	1.998		
9,000.0	6,433.6	9,062.7	6,515.6	71.4	70.4	108.79	470.8	-1,625.6	257.8	123.7	134.11	1.923		
9,100.0	6,433.3	9,162.7	6,515.2	74.0	73.0	108.76	470.8	-1,725.6	257.8	118.6	139.17	1.852		
9,200.0	6,433.1	9,262.7	6,514.9	76.7	75.7	108.73	470.8	-1,825.6	257.7	113.5	144.25	1.787		
9,300.0	6,432.9	9,362.7	6,514.5	79.3	78.3	108.70	470.8	-1,925.6	257.7	108.3	149.35	1.725		
9,400.0	6,432.6	9,462.7	6,514.1	82.0	81.0	108.67	470.8	-2,025.6	257.6	103.2	154.48	1.668		
9,500.0	6,432.4	9,562.7	6,513.7	84.7	83.7	108.63	470.8	-2,125.6	257.6	98.0	159.62	1.614		
9,600.0	6,432.2	9,662.7	6,513.3	87.4	86.4	108.60	470.8	-2,225.6	257.5	92.8	164.77	1.563		
9,700.0	6,432.0	9,762.7	6,513.0	90.1	89.1	108.57	470.8	-2,325.6	257.5	87.5	169.94	1.515		
9,800.0	6,431.7	9,862.7	6,512.6	92.8	91.8	108.54	470.8	-2,425.6	257.4	82.3	175.13	1.470 Level 3		
9,900.0	6,431.5	9,962.7	6,512.2	95.5	94.5	108.51	470.8	-2,525.6	257.4	77.1	180.33	1.427 Level 3		
10,000.0	6,431.3	10,062.7	6,511.8	98.2	97.3	108.47	470.8	-2,625.6	257.3	71.8	185.54	1.387 Level 3		
10,100.0	6,431.1	10,162.7	6,511.4	100.9	100.0	108.44	470.8	-2,725.6	257.3	66.5	190.76	1.349 Level 3		
10,200.0	6,430.8	10,262.7	6,511.1	103.7	102.7	108.41	470.8	-2,825.6	257.3	61.3	195.99	1.313 Level 3		
10,300.0	6,430.6	10,362.7	6,510.7	106.4	105.5	108.38	470.8	-2,925.6	257.2	56.0	201.23	1.278 Level 3		
10,400.0	6,430.4	10,462.7	6,510.3	109.1	108.2	108.35	470.8	-3,025.6	257.2	50.7	206.48	1.245 Level 2		
10,500.0	6,430.1	10,562.7	6,509.9	111.9	110.9	108.31	470.8	-3,125.6	257.1	45.4	211.74	1.214 Level 2		
10,600.0	6,429.9	10,662.7	6,509.6	114.6	113.7	108.28	470.8	-3,225.6	257.1	40.1	217.01	1.185 Level 2		
10,700.0	6,429.7	10,762.7	6,509.2	117.4	116.4	108.25	470.8	-3,325.6	257.0	34.7	222.29	1.156 Level 2		
10,800.0	6,429.5	10,862.7	6,508.8	120.1	119.2	108.22	470.8	-3,425.6	257.0	29.4	227.57	1.129 Level 2		
10,900.0	6,429.2	10,962.7	6,508.4	122.9	121.9	108.19	470.8	-3,525.6	256.9	24.1	232.86	1.103 Level 2		
11,000.0	6,429.0	11,062.7	6,508.0	125.6	124.7	108.15	470.8	-3,625.6	256.9	18.7	238.15	1.079 Level 2		
11,100.0	6,428.8	11,162.7	6,507.7	128.4	127.4	108.12	470.8	-3,725.6	256.8	13.4	243.45	1.055 Level 2		
11,200.0	6,428.6	11,262.7	6,507.3	131.1	130.2	108.09	470.8	-3,825.6	256.8	8.0	248.76	1.032 Level 2		
11,300.0	6,428.3	11,362.7	6,506.9	133.9	133.0	108.06	470.8	-3,925.6	256.7	2.7	254.07	1.010 Level 2		
11,400.0	6,428.1	11,462.7	6,506.5	136.6	135.7	108.02	470.8	-4,025.6	256.7	-2.7	259.39	0.990 Level 1		
11,500.0	6,427.9	11,562.7	6,506.1	139.4	138.5	107.99	470.8	-4,125.6	256.6	-8.1	264.72	0.969 Level 1		
11,600.0	6,427.6	11,662.7	6,505.8	142.2	141.3	107.96	470.8	-4,225.6	256.6	-13.5	270.05	0.950 Level 1		
11,700.0	6,427.4	11,762.7	6,505.4	144.9	144.0	107.93	470.8	-4,325.6	256.5	-18.8	275.38	0.932 Level 1		
11,800.0	6,427.2	11,862.7	6,505.0	147.7	146.8	107.90	470.8	-4,425.6	256.5	-24.2	280.72	0.914 Level 1		
11,900.0	6,427.0	11,962.7	6,504.6	150.5	149.6	107.86	470.8	-4,525.6	256.5	-29.6	286.06	0.896 Level 1		
12,000.0	6,426.7	12,062.7	6,504.2	153.3	152.4	107.83	470.8	-4,625.6	256.4	-35.0	291.41	0.880 Level 1		
12,100.0	6,426.5	12,162.7	6,503.9	156.0	155.1	107.80	470.8	-4,725.6	256.4	-40.4	296.76	0.864 Level 1		
12,200.0	6,426.3	12,262.7	6,503.5	158.8	157.9	107.77	470.8	-4,825.6	256.3	-45.8	302.11	0.848 Level 1		
12,300.0	6,426.1	12,362.7	6,503.1	161.6	160.7	107.73	470.8	-4,925.6	256.3	-51.2	307.47	0.833 Level 1		
12,400.0	6,425.8	12,462.7	6,502.7	164.4	163.5	107.70	470.8	-5,025.6	256.2	-56.6	312.84	0.819 Level 1		
12,500.0	6,425.6	12,562.7	6,502.4	167.1	166.3	107.67	470.8	-5,125.6	256.2	-62.0	318.20	0.805 Level 1		
12,600.0	6,425.4	12,662.7	6,502.0	169.9	169.0	107.64	470.8	-5,225.6	256.1	-67.4	323.57	0.792 Level 1		
12,700.0	6,425.1	12,762.7	6,501.6	172.7	171.8	107.60	470.8	-5,325.6	256.1	-72.9	328.95	0.778 Level 1		
12,800.0	6,424.9	12,862.7	6,501.2	175.5	174.6	107.57	470.8	-5,425.6	256.0	-78.3	334.32	0.766 Level 1		
12,900.0	6,424.7	12,962.7	6,500.8	178.3	177.4	107.54	470.8	-5,525.6	256.0	-83.7	339.70	0.754 Level 1		
13,000.0	6,424.5	13,062.7	6,500.5	181.0	180.2	107.51	470.8	-5,625.6	255.9	-89.1	345.09	0.742 Level 1		
13,100.0	6,424.2	13,162.7	6,500.1	183.8	183.0	107.47	470.8	-5,725.6	255.9	-94.6	350.47	0.730 Level 1		
13,200.0	6,424.0	13,262.7	6,499.7	186.6	185.7	107.44	470.8	-5,825.6	255.9	-100.0	355.86	0.719 Level 1		
13,300.0	6,423.8	13,362.7	6,499.3	189.4	188.5	107.41	470.8	-5,925.6	255.8	-105.4	361.26	0.708 Level 1		
13,400.0	6,423.6	13,462.7	6,498.9	192.2	191.3	107.38	470.8	-6,025.6	255.8	-110.9	366.65	0.698 Level 1		
13,500.0	6,423.3	13,562.7	6,498.6	195.0	194.1	107.35	470.8	-6,125.6	255.7	-116.3	372.05	0.687 Level 1		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis		Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,600.0	6,423.1	13,662.7	6,498.2	197.8	196.9	107.31	470.8	-6,225.5	255.7	-121.8	377.45	0.677	Level 1	
13,642.5	6,423.0	13,705.2	6,498.0	199.0	198.1	107.30	470.8	-6,268.1	255.7	-124.1	379.75	0.673	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	75.80	21.9	86.4	89.1				
100.0	100.0	99.0	99.0	0.1	0.1	75.80	21.9	86.4	89.1	88.9	0.22	398.314	
200.0	200.0	199.0	199.0	0.3	0.3	75.80	21.9	86.4	89.1	88.4	0.67	132.550	
300.0	300.0	299.0	299.0	0.6	0.6	75.80	21.9	86.4	89.1	88.0	1.12	79.424	
400.0	400.0	399.0	399.0	0.8	0.8	75.80	21.9	86.4	89.1	87.5	1.57	56.699 CC, ES	
500.0	500.0	497.6	497.6	1.0	1.0	76.44	21.1	87.3	89.8	87.8	2.00	44.977	
600.0	600.0	596.1	596.0	1.2	1.2	78.32	18.7	90.2	92.2	89.8	2.42	38.146	
700.0	700.0	694.3	694.0	1.5	1.4	81.24	14.7	95.1	96.4	93.5	2.85	33.788	
800.0	800.0	792.2	791.5	1.7	1.6	84.90	9.1	101.9	102.6	99.3	3.30	31.040	
900.0	900.0	889.5	888.2	1.9	1.9	88.98	2.0	110.6	111.1	107.3	3.78	29.389	
1,000.0	1,000.0	986.2	983.9	2.1	2.2	93.14	-6.6	121.0	122.2	117.9	4.29	28.504	
1,100.0	1,100.0	1,082.1	1,078.5	2.4	2.5	97.15	-16.7	133.3	135.9	131.1	4.83	28.155	
1,200.0	1,200.0	1,177.2	1,171.8	2.6	2.9	100.83	-28.2	147.2	152.3	146.9	5.41	28.182	
1,300.0	1,300.0	1,271.3	1,263.8	2.8	3.3	104.13	-41.0	162.8	171.5	165.5	6.03	28.469	
1,400.0	1,400.0	1,364.3	1,354.1	3.0	3.7	107.01	-55.0	179.9	193.4	186.7	6.68	28.935	
1,500.0	1,500.0	1,456.2	1,442.8	3.3	4.2	109.50	-70.3	198.5	217.9	210.5	7.38	29.539	
1,600.0	1,600.0	1,552.1	1,535.0	3.5	4.7	111.68	-87.0	218.8	244.0	235.8	8.13	30.025	
1,700.0	1,700.0	1,648.5	1,627.7	3.7	5.2	116.67	-103.8	239.2	269.2	261.7	7.56	35.618	
1,800.0	1,799.9	1,745.3	1,720.8	3.9	5.7	124.36	-120.6	259.7	292.7	284.6	8.02	36.496	
1,900.0	1,899.7	1,842.4	1,814.2	4.1	6.3	136.05	-137.6	280.3	314.3	305.8	8.48	37.064	
2,000.0	1,999.3	1,939.9	1,907.9	4.3	6.8	137.79	-154.5	300.9	334.2	325.2	8.94	37.374	
2,100.0	2,098.6	2,037.5	2,001.8	4.6	7.4	139.59	-171.5	321.6	352.4	343.0	9.41	37.462	
2,200.0	2,197.5	2,135.2	2,095.8	4.8	8.0	141.47	-188.6	342.4	369.1	359.2	9.88	37.348	
2,300.0	2,296.1	2,233.1	2,189.9	5.1	8.5	143.45	-205.6	363.1	384.3	373.9	10.37	37.045	
2,400.0	2,394.2	2,330.9	2,284.0	5.4	9.1	145.53	-222.6	383.8	398.2	387.3	10.89	36.560	
2,500.0	2,491.7	2,428.7	2,378.0	5.8	9.7	147.73	-239.7	404.6	410.9	399.4	11.45	35.894	
2,600.0	2,588.6	2,526.4	2,471.9	6.1	10.2	150.05	-256.7	425.2	422.6	410.5	12.06	35.050	
2,700.0	2,684.9	2,623.8	2,565.6	6.6	10.8	152.50	-273.7	445.9	433.5	420.7	12.73	34.036	
2,800.0	2,780.4	2,721.0	2,659.1	7.0	11.4	155.09	-290.6	466.5	443.7	430.2	13.50	32.867	
2,828.3	2,807.2	2,748.5	2,685.5	7.2	11.5	155.84	-295.4	472.3	446.5	432.8	13.73	32.512	
2,900.0	2,875.3	2,818.0	2,752.4	7.6	11.9	157.83	-307.5	487.1	453.9	439.5	14.36	31.602	
3,000.0	2,970.1	2,915.0	2,845.6	8.1	12.5	160.50	-324.4	507.6	465.1	449.8	15.30	30.404	
3,100.0	3,065.0	3,011.9	2,938.8	8.7	13.1	163.04	-341.3	528.2	477.3	461.0	16.29	29.296	
3,200.0	3,159.9	3,108.9	3,032.1	9.2	13.6	165.45	-358.2	548.7	490.4	473.0	17.34	28.283	
3,300.0	3,254.8	3,205.8	3,125.3	9.8	14.2	167.74	-375.0	569.2	504.3	485.9	18.43	27.366	
3,400.0	3,349.6	3,302.8	3,218.5	10.4	14.8	169.91	-391.9	589.8	519.1	499.5	19.56	26.540	
3,500.0	3,444.5	3,399.8	3,311.8	11.0	15.4	171.96	-408.8	610.3	534.5	513.8	20.72	25.802	
3,600.0	3,539.4	3,496.7	3,405.0	11.6	15.9	173.90	-425.7	630.9	550.6	528.7	21.90	25.143	
3,700.0	3,634.3	3,593.7	3,498.3	12.3	16.5	175.73	-442.6	651.4	567.3	544.2	23.10	24.558	
3,800.0	3,729.1	3,690.6	3,591.5	12.9	17.1	177.46	-459.5	672.0	584.6	560.3	24.32	24.039	
3,900.0	3,824.0	3,787.6	3,684.7	13.5	17.6	179.09	-476.4	692.5	602.4	576.8	25.55	23.578	
4,000.0	3,918.9	3,884.5	3,778.0	14.1	18.2	180.62	-493.3	713.1	620.6	593.8	26.78	23.170	
4,100.0	4,013.8	3,981.5	3,871.2	14.8	18.8	182.08	-510.2	733.6	639.2	611.2	28.03	22.808	
4,200.0	4,108.6	4,078.5	3,964.4	15.4	19.3	183.45	-527.1	754.2	658.2	628.9	29.27	22.487	
4,300.0	4,203.5	4,175.4	4,057.7	16.1	19.9	184.74	-543.9	774.7	677.6	647.1	30.52	22.203	
4,400.0	4,298.4	4,272.4	4,150.9	16.7	20.5	185.96	-560.8	795.3	697.3	665.5	31.77	21.950	
4,500.0	4,393.3	4,369.3	4,244.2	17.4	21.1	187.12	-577.7	815.8	717.3	684.2	33.01	21.726	
4,600.0	4,488.1	4,466.3	4,337.4	18.0	21.6	188.21	-594.6	836.4	737.5	703.3	34.26	21.526	
4,700.0	4,583.0	4,563.2	4,430.6	18.7	22.2	189.25	-611.5	856.9	758.0	722.5	35.51	21.349	
4,800.0	4,677.9	4,660.2	4,523.9	19.3	22.8	190.24	-628.4	877.5	778.8	742.0	36.75	21.191	
4,900.0	4,772.8	4,757.2	4,617.1	20.0	23.4	191.17	-645.3	898.0	799.7	761.7	37.99	21.050 SF	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	76.01	14.6	58.5	60.3				
100.0	100.0	99.0	99.0	0.1	0.1	76.01	14.6	58.5	60.3	60.1	0.22	269.569	
200.0	200.0	199.0	199.0	0.3	0.3	76.01	14.6	58.5	60.3	59.6	0.67	89.707	
300.0	300.0	299.0	299.0	0.6	0.6	76.01	14.6	58.5	60.3	59.2	1.12	53.752	
400.0	400.0	399.0	399.0	0.8	0.8	76.01	14.6	58.5	60.3	58.7	1.57	38.373	
500.0	500.0	499.0	499.0	1.0	1.0	76.01	14.6	58.5	60.3	58.3	2.02	29.836	
600.0	600.0	599.0	599.0	1.2	1.2	76.01	14.6	58.5	60.3	57.8	2.47	24.406	
700.0	700.0	699.0	699.0	1.5	1.5	76.01	14.6	58.5	60.3	57.4	2.92	20.648	
800.0	800.0	799.0	799.0	1.7	1.7	76.01	14.6	58.5	60.3	56.9	3.37	17.894 CC, ES	
900.0	900.0	897.9	897.9	1.9	1.9	76.85	13.9	59.6	61.2	57.4	3.80	16.117	
1,000.0	1,000.0	996.6	996.6	2.1	2.1	79.24	11.9	62.8	64.0	59.8	4.21	15.196	
1,100.0	1,100.0	1,095.1	1,094.8	2.4	2.3	82.77	8.7	68.2	68.9	64.3	4.64	14.860 SF	
1,200.0	1,200.0	1,193.2	1,192.5	2.6	2.5	86.93	4.1	75.8	76.2	71.1	5.08	14.998	
1,300.0	1,300.0	1,290.8	1,289.5	2.8	2.7	91.20	-1.8	85.4	86.0	80.4	5.54	15.518	
1,400.0	1,400.0	1,387.7	1,385.4	3.0	3.0	95.22	-8.9	97.1	98.4	92.4	6.03	16.331	
1,500.0	1,500.0	1,483.9	1,480.3	3.3	3.3	98.81	-17.1	110.7	113.6	107.0	6.54	17.354	
1,600.0	1,600.0	1,579.2	1,573.8	3.5	3.6	101.89	-26.6	126.2	131.4	124.3	7.10	18.518	
1,700.0	1,700.0	1,673.8	1,666.2	3.7	4.0	23.85	-37.1	143.5	150.7	143.4	7.28	20.694	
1,800.0	1,799.9	1,767.7	1,757.4	3.9	4.4	26.45	-48.8	162.7	170.3	162.6	7.71	22.086	
1,900.0	1,899.7	1,861.0	1,847.4	4.1	4.8	28.97	-61.5	183.6	190.3	182.2	8.14	23.380	
2,000.0	1,999.3	1,958.7	1,941.3	4.3	5.3	31.50	-75.4	206.5	209.7	201.1	8.59	24.426	
2,100.0	2,098.6	2,056.6	2,035.5	4.6	5.8	33.95	-89.3	229.4	227.3	218.3	9.04	25.158	
2,200.0	2,197.5	2,154.8	2,129.9	4.8	6.4	36.39	-103.3	252.4	243.3	233.8	9.50	25.607	
2,300.0	2,296.1	2,253.1	2,224.5	5.1	6.9	38.88	-117.3	275.5	257.6	247.6	9.99	25.800	
2,400.0	2,394.2	2,351.5	2,319.1	5.4	7.4	41.45	-131.3	298.5	270.5	260.0	10.50	25.759	
2,500.0	2,491.7	2,449.8	2,413.7	5.8	8.0	44.15	-145.3	321.6	282.1	271.0	11.06	25.499	
2,600.0	2,588.6	2,548.2	2,508.3	6.1	8.5	46.99	-159.3	344.6	292.5	280.8	11.68	25.034	
2,700.0	2,684.9	2,646.4	2,602.7	6.6	9.1	49.99	-173.3	367.6	301.9	289.6	12.38	24.381	
2,800.0	2,780.4	2,744.4	2,697.0	7.0	9.6	53.18	-187.3	390.6	310.7	297.5	13.18	23.565	
2,828.3	2,807.2	2,772.1	2,723.6	7.2	9.8	54.11	-191.2	397.1	313.1	299.6	13.43	23.309	
2,900.0	2,875.3	2,842.2	2,791.0	7.6	10.2	56.52	-201.2	413.5	319.4	305.3	14.10	22.649	
3,000.0	2,970.1	2,940.1	2,885.1	8.1	10.8	59.72	-215.1	436.4	329.1	314.0	15.10	21.798	
3,100.0	3,065.0	3,037.9	2,979.2	8.7	11.3	62.74	-229.1	459.3	339.7	323.6	16.16	21.030	
3,200.0	3,159.9	3,135.7	3,073.3	9.2	11.9	65.57	-243.0	482.3	351.3	334.1	17.27	20.347	
3,300.0	3,254.8	3,233.5	3,167.3	9.8	12.5	68.23	-256.9	505.2	363.7	345.3	18.42	19.745	
3,400.0	3,349.6	3,331.3	3,261.4	10.4	13.0	70.70	-270.9	528.1	376.9	357.3	19.61	19.219	
3,500.0	3,444.5	3,429.2	3,355.5	11.0	13.6	73.01	-284.8	551.0	390.7	369.9	20.82	18.761	
3,600.0	3,539.4	3,527.0	3,449.5	11.6	14.2	75.16	-298.7	573.9	405.1	383.0	22.06	18.366	
3,700.0	3,634.3	3,624.8	3,543.6	12.3	14.7	77.17	-312.7	596.8	420.0	396.7	23.30	18.024	
3,800.0	3,729.1	3,722.6	3,637.7	12.9	15.3	79.03	-326.6	619.8	435.4	410.9	24.56	17.730	
3,900.0	3,824.0	3,820.4	3,731.8	13.5	15.9	80.78	-340.5	642.7	451.3	425.5	25.82	17.478	
4,000.0	3,918.9	3,918.3	3,825.8	14.1	16.5	82.40	-354.4	665.6	467.5	440.4	27.09	17.261	
4,100.0	4,013.8	4,016.1	3,919.9	14.8	17.0	83.91	-368.4	688.5	484.1	455.7	28.35	17.074	
4,200.0	4,108.6	4,113.9	4,014.0	15.4	17.6	85.33	-382.3	711.4	501.0	471.4	29.62	16.915	
4,300.0	4,203.5	4,211.7	4,108.1	16.1	18.2	86.65	-396.2	734.3	518.1	487.3	30.88	16.778	
4,400.0	4,298.4	4,309.5	4,202.1	16.7	18.7	87.89	-410.2	757.3	535.6	503.4	32.14	16.661	
4,500.0	4,393.3	4,407.4	4,296.2	17.4	19.3	89.05	-424.1	780.2	553.2	519.8	33.40	16.561	
4,600.0	4,488.1	4,505.2	4,390.3	18.0	19.9	90.14	-438.0	803.1	571.1	536.4	34.66	16.475	
4,700.0	4,583.0	4,603.0	4,484.3	18.7	20.5	91.17	-452.0	826.0	589.1	553.2	35.92	16.403	
4,800.0	4,677.9	4,700.8	4,578.4	19.3	21.0	92.13	-465.9	848.9	607.3	570.2	37.17	16.341	
4,900.0	4,772.8	4,798.6	4,672.5	20.0	21.6	93.04	-479.8	871.9	625.7	587.3	38.42	16.289	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,000.0	4,867.6	4,896.5	4,766.6	20.6	22.2	93.90	-493.8	894.8	644.3	604.6	39.66	16.245		
5,100.0	4,962.5	4,994.3	4,860.6	21.3	22.8	94.71	-507.7	917.7	662.9	622.0	40.90	16.208		
5,200.0	5,057.4	5,092.1	4,954.7	21.9	23.3	95.47	-521.6	940.6	681.7	639.6	42.14	16.178		
5,300.0	5,152.3	5,189.9	5,048.8	22.6	23.9	96.20	-535.5	963.5	700.6	657.2	43.37	16.153		
5,400.0	5,247.1	5,287.8	5,142.9	23.2	24.5	96.88	-549.5	986.4	719.6	675.0	44.61	16.132		
5,500.0	5,342.0	5,385.6	5,236.9	23.9	25.1	97.53	-563.4	1,009.4	738.7	692.8	45.83	16.116		
5,600.4	5,437.2	5,483.8	5,331.3	24.6	25.7	98.15	-577.4	1,032.4	757.9	710.9	47.07	16.104		
5,650.0	5,484.8	5,532.4	5,378.1	24.8	25.9	101.44	-584.3	1,043.8	767.5	719.8	47.68	16.098		
5,700.0	5,533.5	5,581.4	5,425.3	25.0	26.2	106.09	-591.3	1,055.2	777.2	729.0	48.19	16.128		
5,750.0	5,582.8	5,630.3	5,472.3	25.2	26.5	114.32	-598.3	1,066.7	786.9	738.3	48.63	16.180		
5,800.0	5,632.6	5,678.8	5,518.9	25.3	26.8	134.49	-605.2	1,078.1	796.7	747.6	49.01	16.254		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19V (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 600-NS-GYRO-MS												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
2,900.0	2,875.3	2,883.9	2,883.7	7.6	5.3	-12.23	316.0	950.3	786.5	775.2	11.32	69.454	
3,000.0	2,970.1	2,979.9	2,979.7	8.1	5.4	-12.72	315.9	950.7	755.9	744.2	11.72	64.513	
3,100.0	3,065.0	3,080.8	3,080.6	8.7	5.5	-13.25	315.2	950.9	725.1	712.9	12.11	59.864	
3,200.0	3,159.9	3,182.5	3,182.3	9.2	5.6	-13.71	312.9	950.8	693.3	680.8	12.51	55.416	
3,300.0	3,254.8	3,283.7	3,283.4	9.8	5.7	-14.09	309.0	950.2	660.6	647.7	12.91	51.152	
3,400.0	3,349.6	3,384.3	3,383.8	10.4	5.8	-14.38	303.4	949.2	627.0	613.7	13.32	47.064	
3,500.0	3,444.5	3,484.2	3,483.5	11.0	5.9	-14.57	296.3	947.9	592.5	578.7	13.73	43.146	
3,600.0	3,539.4	3,577.8	3,576.7	11.6	6.0	-14.70	288.9	946.3	557.4	543.3	14.16	39.354	
3,700.0	3,634.3	3,670.3	3,669.0	12.3	6.1	-14.93	282.2	944.7	522.5	507.9	14.61	35.768	
3,800.0	3,729.1	3,763.0	3,761.4	12.9	6.3	-15.25	276.1	943.1	487.9	472.8	15.07	32.384	
3,900.0	3,824.0	3,855.7	3,854.0	13.5	6.4	-15.71	270.7	941.3	453.5	437.9	15.54	29.188	
4,000.0	3,918.9	3,948.6	3,946.8	14.1	6.5	-16.34	265.8	939.6	419.3	403.2	16.02	26.168	
4,100.0	4,013.8	4,042.2	4,040.2	14.8	6.7	-17.16	261.6	937.7	385.3	368.8	16.55	23.285	
4,200.0	4,108.6	4,136.5	4,134.4	15.4	6.8	-18.21	257.5	935.7	351.4	334.3	17.13	20.521	
4,300.0	4,203.5	4,230.7	4,228.5	16.1	7.0	-19.51	253.6	933.4	317.5	299.8	17.74	17.901	
4,400.0	4,298.4	4,324.7	4,322.4	16.7	7.2	-21.17	249.9	931.0	283.7	265.3	18.41	15.416	
4,500.0	4,393.3	4,418.7	4,416.3	17.4	7.3	-23.34	246.3	928.4	250.1	231.0	19.15	13.062	
4,600.0	4,488.1	4,512.3	4,509.8	18.0	7.5	-26.21	242.8	925.6	216.9	196.9	20.02	10.835	
4,700.0	4,583.0	4,604.7	4,602.1	18.7	7.7	-30.04	239.7	923.1	184.7	163.6	21.07	8.766	
4,800.0	4,677.9	4,697.5	4,694.9	19.3	7.9	-35.37	236.9	921.1	154.2	131.8	22.39	6.886	
4,900.0	4,772.8	4,790.8	4,788.1	20.0	8.0	-43.03	234.5	919.7	126.2	102.1	24.14	5.231	
5,000.0	4,867.6	4,884.5	4,881.8	20.6	8.2	-54.29	232.3	918.9	102.3	75.9	26.40	3.874	
5,100.0	4,962.5	4,978.7	4,975.9	21.3	8.4	-70.55	230.5	918.6	84.9	56.0	28.90	2.937	
5,200.0	5,057.4	5,073.4	5,070.6	21.9	8.6	-91.40	229.0	918.9	77.9	47.4	30.46	2.557	
5,206.7	5,063.8	5,079.7	5,077.0	22.0	8.6	-92.87	228.9	918.9	77.8	47.4	30.49	2.553	
5,300.0	5,152.3	5,168.3	5,165.6	22.6	8.7	-112.46	227.6	919.5	83.2	53.2	30.00	2.772	
5,400.0	5,247.1	5,263.5	5,260.8	23.2	8.9	-129.11	226.4	920.4	98.4	70.0	28.46	3.459	
5,500.0	5,342.0	5,359.0	5,356.2	23.9	9.1	-140.71	225.3	921.7	119.7	92.6	27.08	4.420	
5,600.4	5,437.2	5,455.1	5,452.2	24.6	9.2	-148.66	224.3	923.3	144.1	117.9	26.21	5.499	
5,650.0	5,484.8	5,500.0	5,497.2	24.8	9.3	-149.22	223.9	924.2	155.4	129.3	26.10	5.953	
5,700.0	5,533.5	5,551.2	5,548.4	25.0	9.4	-147.65	223.5	925.2	164.0	138.0	26.01	6.306	
5,750.0	5,582.8	5,599.9	5,597.1	25.2	9.5	-141.55	223.2	925.9	169.9	144.0	25.94	6.550	
5,800.0	5,632.6	5,649.0	5,646.1	25.3	9.6	-122.89	223.0	926.4	173.0	147.2	25.85	6.694	
5,850.0	5,682.5	5,698.1	5,695.3	25.3	9.6	-67.65	222.9	926.7	173.2	147.5	25.70	6.741	
5,900.0	5,732.3	5,747.3	5,744.4	25.4	9.7	-24.08	222.8	926.8	170.5	145.0	25.48	6.690	
5,950.0	5,782.0	5,796.2	5,793.4	25.3	9.8	-9.88	222.8	926.7	164.7	139.6	25.19	6.541	
6,000.0	5,831.1	5,844.8	5,841.9	25.3	9.9	-3.82	222.9	926.5	156.1	131.2	24.82	6.289	
6,050.0	5,879.6	5,892.8	5,889.9	25.2	10.0	-0.38	223.1	926.0	144.4	120.1	24.38	5.925	
6,100.0	5,927.3	5,940.0	5,937.2	25.2	10.1	2.10	223.3	925.4	129.9	106.0	23.89	5.439	
6,150.0	5,973.8	5,986.4	5,983.6	25.1	10.1	4.37	223.6	924.6	112.6	89.2	23.38	4.814	
6,200.0	6,019.1	6,031.7	6,028.8	25.0	10.2	7.03	224.0	923.7	92.4	69.5	22.96	4.027	
6,250.0	6,062.9	6,075.8	6,072.9	24.8	10.3	11.08	224.4	922.6	69.7	46.9	22.85	3.052	
6,300.0	6,105.0	6,118.4	6,115.5	24.7	10.4	19.51	224.9	921.4	44.8	20.9	23.97	1.870	
6,350.0	6,145.3	6,159.6	6,156.7	24.6	10.5	48.85	225.4	920.0	19.9	-11.0	30.89	0.645 Level 1	
6,373.8	6,163.8	6,178.5	6,175.6	24.6	10.5	88.85	225.7	919.4	13.8	-20.9	34.71	0.399 Level 1, CC, ES, SF	
6,400.0	6,183.6	6,199.0	6,196.0	24.5	10.5	131.38	226.0	918.6	21.5	-5.3	26.76	0.803 Level 1	
6,450.0	6,219.7	6,236.5	6,233.6	24.4	10.6	158.20	226.6	917.2	51.5	33.4	18.12	2.843	
6,500.0	6,253.5	6,272.1	6,269.1	24.4	10.7	165.98	227.3	915.6	86.1	70.7	15.47	5.569	
6,550.0	6,284.8	6,305.4	6,302.4	24.4	10.7	169.50	227.9	914.1	123.3	109.5	13.85	8.908	
6,600.0	6,313.5	6,336.5	6,333.4	24.5	10.8	171.47	228.5	912.6	162.7	150.2	12.49	13.023	
6,650.0	6,339.4	6,365.0	6,361.9	24.6	10.8	172.69	229.1	911.2	203.9	192.7	11.28	18.083	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19V (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 600-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
6,700.0	6,362.5	6,391.0	6,387.8	24.7	10.9	173.51	229.7	909.8	246.9	236.7	10.21	24.175		
6,750.0	6,382.7	6,414.2	6,411.0	24.9	10.9	174.05	230.3	908.5	291.4	282.1	9.35	31.176		
6,800.0	6,399.8	6,434.6	6,431.3	25.2	11.0	174.40	230.8	907.3	337.3	328.6	8.73	38.619		
6,850.0	6,413.9	6,452.0	6,448.7	25.6	11.0	174.58	231.2	906.3	384.3	375.9	8.40	45.761		
6,900.0	6,424.7	6,466.3	6,463.0	26.0	11.0	174.60	231.6	905.4	432.4	424.0	8.34	51.838		
6,950.0	6,432.4	6,477.5	6,474.1	26.5	11.1	174.35	231.8	904.8	481.2	472.6	8.57	56.171		
7,000.0	6,436.8	6,485.4	6,482.0	27.0	11.1	173.56	232.1	904.3	530.6	521.4	9.17	57.862		
7,044.4	6,438.0	6,489.5	6,486.2	27.5	11.1	171.09	232.2	904.0	574.9	564.4	10.48	54.843		
7,100.0	6,437.9	6,493.1	6,489.7	28.2	11.1	171.77	232.3	903.8	630.3	619.7	10.65	59.165		
7,200.0	6,437.6	6,499.7	6,496.2	29.7	11.1	172.73	232.4	903.4	730.1	719.1	11.08	65.890		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
10,400.0	6,430.4	6,394.9	6,394.2	109.1	11.7	86.40	637.9	-3,612.1	717.1	596.5	120.62	5.945		
10,500.0	6,430.1	6,400.0	6,399.2	111.9	11.7	87.10	638.0	-3,612.2	637.8	514.4	123.44	5.167		
10,600.0	6,429.9	6,400.0	6,399.2	114.6	11.7	87.10	638.0	-3,612.2	565.2	439.0	126.17	4.479		
10,700.0	6,429.7	6,402.3	6,401.5	117.4	11.7	87.42	638.1	-3,612.3	502.0	373.1	128.95	3.893		
10,800.0	6,429.5	6,404.9	6,404.1	120.1	11.7	87.78	638.2	-3,612.4	452.3	320.6	131.72	3.434		
10,900.0	6,429.2	6,407.4	6,406.6	122.9	11.7	88.13	638.2	-3,612.4	420.9	286.4	134.50	3.129		
10,987.3	6,429.0	6,409.5	6,408.8	125.3	11.7	88.43	638.3	-3,612.5	411.8	274.8	136.92	3.007 CC		
11,000.0	6,429.0	6,409.9	6,409.1	125.6	11.7	88.47	638.3	-3,612.5	412.0	274.7	137.27	3.001 ES, SF		
11,100.0	6,428.8	6,412.2	6,411.4	128.4	11.7	88.80	638.4	-3,612.6	426.9	286.9	140.05	3.048		
11,200.0	6,428.6	6,414.6	6,413.8	131.1	11.7	89.13	638.4	-3,612.6	463.4	320.6	142.82	3.245		
11,300.0	6,428.3	6,416.8	6,416.0	133.9	11.7	89.44	638.5	-3,612.7	517.0	371.4	145.58	3.551		
11,400.0	6,428.1	6,419.0	6,418.2	136.6	11.7	89.75	638.6	-3,612.8	582.9	434.6	148.35	3.929		
11,500.0	6,427.9	6,421.1	6,420.3	139.4	11.7	90.04	638.6	-3,612.8	657.5	506.4	151.12	4.351		
11,600.0	6,427.6	6,423.2	6,422.4	142.2	11.7	90.33	638.7	-3,612.9	738.1	584.2	153.88	4.797		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 500-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
9,300.0	6,432.9	6,445.9	6,443.5	79.3	11.0	97.94	379.7	-2,669.1	759.6	670.2	89.43	8.494		
9,400.0	6,432.6	6,442.6	6,440.1	82.0	11.0	96.70	379.6	-2,669.2	662.0	569.7	92.33	7.170		
9,500.0	6,432.4	6,439.2	6,436.8	84.7	11.0	95.46	379.6	-2,669.3	565.2	470.0	95.20	5.937		
9,600.0	6,432.2	6,435.9	6,433.5	87.4	11.0	94.24	379.5	-2,669.4	469.8	371.7	98.06	4.791		
9,700.0	6,432.0	6,432.7	6,430.2	90.1	11.0	93.02	379.4	-2,669.5	376.6	275.7	100.89	3.733		
9,800.0	6,431.7	6,429.4	6,427.0	92.8	11.0	91.82	379.4	-2,669.5	288.1	184.4	103.68	2.779		
9,900.0	6,431.5	6,426.3	6,423.8	95.5	11.0	90.63	379.3	-2,669.6	210.1	103.6	106.45	1.974		
10,000.0	6,431.3	6,423.1	6,420.7	98.2	11.0	89.45	379.3	-2,669.7	158.9	49.7	109.18	1.456 Level 3		
10,044.5	6,431.2	6,421.7	6,419.3	99.4	11.0	88.93	379.2	-2,669.8	152.6	42.2	110.38	1.382 Level 3, CC, ES, SF		
10,100.0	6,431.1	6,420.0	6,417.6	100.9	11.0	88.28	379.2	-2,669.8	162.3	50.5	111.87	1.451 Level 3		
10,200.0	6,430.8	6,417.0	6,414.5	103.7	11.0	87.13	379.1	-2,669.9	217.8	103.3	114.52	1.902		
10,300.0	6,430.6	6,413.9	6,411.5	106.4	11.0	86.00	379.1	-2,670.0	297.5	180.3	117.13	2.540		
10,400.0	6,430.4	6,410.9	6,408.5	109.1	11.0	84.88	379.0	-2,670.1	386.7	267.0	119.70	3.231		
10,500.0	6,430.1	6,408.0	6,405.6	111.9	11.0	83.78	379.0	-2,670.2	480.2	357.9	122.22	3.929		
10,600.0	6,429.9	6,405.1	6,402.7	114.6	10.9	82.69	378.9	-2,670.2	575.8	451.1	124.70	4.618		
10,700.0	6,429.7	6,402.2	6,399.8	117.4	10.9	81.63	378.9	-2,670.3	672.7	545.6	127.13	5.291		
10,800.0	6,429.5	6,399.3	6,396.9	120.1	10.9	80.58	378.8	-2,670.4	770.4	640.9	129.52	5.948		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 600-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
8,400.0	6,434.9	6,453.2	6,450.5	55.9	11.0	-96.57	-26.6	-1,721.3	741.2	674.7	66.48	11.148		
8,500.0	6,434.7	6,448.9	6,446.2	58.4	11.0	-95.61	-26.5	-1,721.4	648.2	579.1	69.09	9.381		
8,600.0	6,434.5	6,444.6	6,441.9	60.9	10.9	-94.65	-26.5	-1,721.6	557.5	485.8	71.72	7.774		
8,700.0	6,434.2	6,440.4	6,437.7	63.5	10.9	-93.70	-26.5	-1,721.8	470.7	396.4	74.36	6.331		
8,800.0	6,434.0	6,436.2	6,433.5	66.1	10.9	-92.75	-26.5	-1,721.9	390.2	313.2	77.00	5.068		
8,900.0	6,433.8	6,432.0	6,429.3	68.7	10.9	-91.81	-26.5	-1,722.1	320.8	241.2	79.64	4.028		
9,000.0	6,433.6	6,427.9	6,425.2	71.4	10.9	-90.88	-26.5	-1,722.3	271.2	188.9	82.28	3.296		
9,097.2	6,433.3	6,423.9	6,421.2	73.9	10.9	-89.98	-26.5	-1,722.4	253.2	168.4	84.84	2.985 CC		
9,100.0	6,433.3	6,423.8	6,421.1	74.0	10.9	-89.95	-26.5	-1,722.4	253.2	168.3	84.91	2.982 ES, SF		
9,200.0	6,433.1	6,419.7	6,417.0	76.7	10.9	-89.03	-26.5	-1,722.6	273.3	185.7	87.54	3.122		
9,300.0	6,432.9	6,415.7	6,413.0	79.3	10.9	-88.12	-26.5	-1,722.7	324.3	234.2	90.16	3.598		
9,400.0	6,432.6	6,411.7	6,409.0	82.0	10.9	-87.21	-26.5	-1,722.9	394.6	301.8	92.76	4.254		
9,500.0	6,432.4	6,407.7	6,405.0	84.7	10.9	-86.32	-26.5	-1,723.0	475.5	380.2	95.34	4.988		
9,600.0	6,432.2	6,403.7	6,401.1	87.4	10.9	-85.43	-26.5	-1,723.2	562.6	464.7	97.91	5.746		
9,700.0	6,432.0	6,399.8	6,397.2	90.1	10.9	-84.56	-26.5	-1,723.3	653.4	552.9	100.47	6.504		
9,800.0	6,431.7	6,396.0	6,393.3	92.8	10.9	-83.69	-26.5	-1,723.5	746.5	643.5	103.00	7.248		

Reference Depths are relative to WELL @ 4568.0ft (RKB - 13')	Coordinates are relative to: Cockroft 19V-204
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000	Grid Convergence at Surface is: 0.66°



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19V-204
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4568.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4568.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19V-204	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 (11-13-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4568.0ft (RKB - 13')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19V-204

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°

