

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Brown 23P-321**

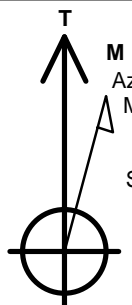
Surface Location: Brown 5N65W23 Pad Sec.23-T5N-R65W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4643.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1382632.17	3243450.66	40.380434	-104.626121	

Original Well Elev WELL @ 4656.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
50' E/W Hardline (23P-321)	1.0	5488.0	-991.2	Rectangle (Sides: L8153.4 W100.0)
SHL 1082'FSL & 1419'FEL, Sec.23	1.0	0.0	0.0	Point
BHL 0'FNL & 2391'FEL, Sec.14	6867.0	9564.7	-991.2	Point



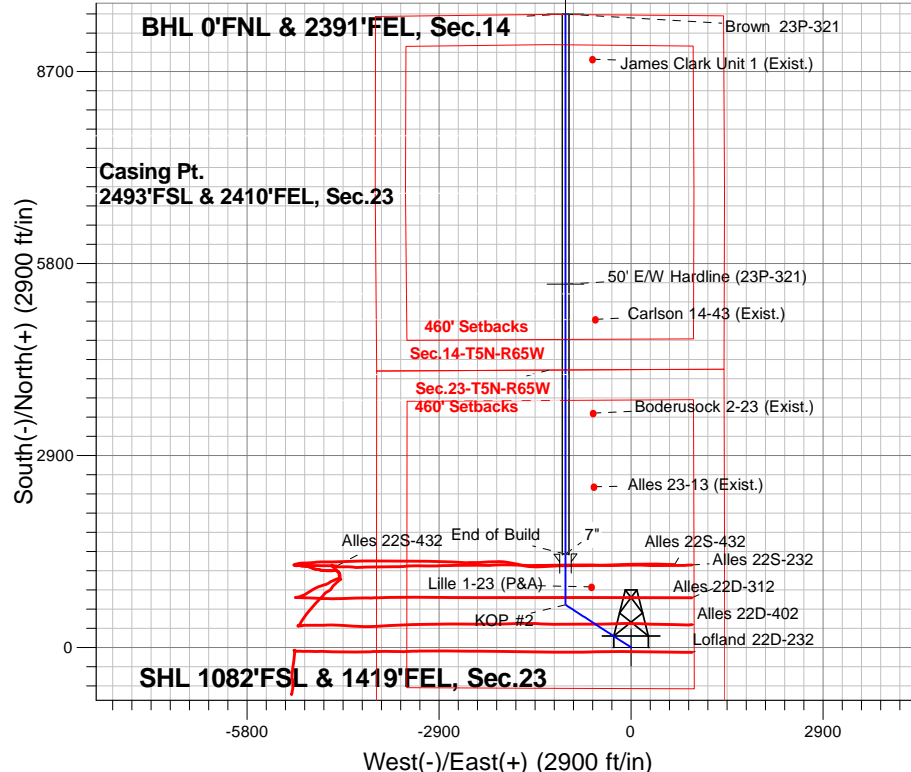
Azimuths to True North
Magnetic North: 8.22°

Magnetic Field
Strength: 52692.7snT
Dip Angle: 66.91°
Date: 9/2/2015
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
400.0	400.0	KOP #1
6132.9	6271.8	KOP #2
6896.9	7474.6	End of Build

Brown 5N65W23 Pad Sec.23-T5N-R65W
Brown 23P-321
Plan #1 (9-2-15)
11:26, September 04 2015



Sussex
Shannon

ENSIGN
Directional

True Vertical Depth (1000 ft/in)

KOP #2

Sharon Springs

Niobrara A

Niobrara B

Niobrara C

1506

20°

40°

60°

80°

1506

7"

End of Build

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	1347.9	14.22	303.04	1338.2	63.8	-98.1	1.50	303.04	73.6	
4	5328.0	14.22	303.04	5196.4	596.8	-917.6	0.00	0.00	688.2	
5	6038.9	0.00	0.00	5900.0	644.6	-991.2	2.00	180.00	743.3	
6	6271.8	0.00	0.00	6132.9	644.6	-991.2	0.00	0.00	743.3	
7	7474.6	90.21	360.00	6896.9	1411.3	-991.2	7.50	360.00	1506.0	
8	15628.0	90.21	360.00	6867.0	9564.7	-991.2	0.00	0.00	9615.9	BHL 0'FNL & 2391'FEL, Sec.14

BHL 0'FNL & 2391'FEL, Sec.14

Vertical Section at 354.08° (1000 ft/in)

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.23-T5N-R65W

Brown 5N65W23 Pad Sec.23-T5N-R65W

Brown 23P-321

Wellbore #1

Plan: Plan #1 (9-2-15)

Standard Planning Report

04 September, 2015

Database:	US_EDM	Local Co-ordinate Reference:	Well Brown 23P-321
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Project:	SEC.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	North Reference:	True
Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (9-2-15)		

Project	SEC.23-T5N-R65W		
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		Brown 5N65W23 Pad Sec.23-T5N-R65W			
Site Position:		Northing:	1,382,632.17 usft	Latitude:	40.380434
From:	Lat/Long	Easting:	3,243,450.66 usft	Longitude:	-104.626121
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.56

Well	Brown 23P-321					
Well Position	+N/-S	0.0 ft	Northing:	1,382,632.17 usft	Latitude:	40.380434
	+E/-W	0.0 ft	Easting:	3,243,450.66 usft	Longitude:	-104.626121
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,643.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/2/2015	8.22	66.91	52,693

Design	Plan #1 (9-2-15)			
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	354.08

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,347.9	14.22	303.04	1,338.2	63.8	-98.1	1.50	1.50	0.00	303.04	
5,328.0	14.22	303.04	5,196.4	596.8	-917.6	0.00	0.00	0.00	0.00	
6,038.9	0.00	0.00	5,900.0	644.6	-991.2	2.00	-2.00	0.00	180.00	
6,271.8	0.00	0.00	6,132.9	644.6	-991.2	0.00	0.00	0.00	0.00	
7,474.6	90.21	360.00	6,896.9	1,411.3	-991.2	7.50	7.50	0.00	360.00	
15,628.0	90.21	360.00	6,867.0	9,564.7	-991.2	0.00	0.00	0.00	0.00	BHL 0'FNL & 2391'FE

Database:	US_EDM	Local Co-ordinate Reference:	Well Brown 23P-321
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Project:	SEC.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	North Reference:	True
Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (9-2-15)		

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
50' E/W Hardline (23P-321) - SHL 1082'FSL & 1419'FEL, Sec.23									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
500.0	1.50	303.04	500.0	0.7	-1.1	0.8	1.50	1.50	0.00
600.0	3.00	303.04	599.9	2.9	-4.4	3.3	1.50	1.50	0.00
700.0	4.50	303.04	699.7	6.4	-9.9	7.4	1.50	1.50	0.00
800.0	6.00	303.04	799.3	11.4	-17.5	13.2	1.50	1.50	0.00
900.0	7.50	303.04	898.6	17.8	-27.4	20.5	1.50	1.50	0.00
1,000.0	9.00	303.04	997.5	25.6	-39.4	29.6	1.50	1.50	0.00
1,100.0	10.50	303.04	1,096.1	34.9	-53.6	40.2	1.50	1.50	0.00
1,200.0	12.00	303.04	1,194.2	45.5	-70.0	52.5	1.50	1.50	0.00
1,300.0	13.50	303.04	1,291.7	57.5	-88.5	66.4	1.50	1.50	0.00
1,347.9	14.22	303.04	1,338.2	63.8	-98.1	73.6	1.50	1.50	0.00
1,400.0	14.22	303.04	1,388.7	70.8	-108.8	81.6	0.00	0.00	0.00
1,500.0	14.22	303.04	1,485.6	84.2	-129.4	97.1	0.00	0.00	0.00
1,600.0	14.22	303.04	1,582.6	97.6	-150.0	112.5	0.00	0.00	0.00
1,700.0	14.22	303.04	1,679.5	110.9	-170.6	127.9	0.00	0.00	0.00
1,800.0	14.22	303.04	1,776.5	124.3	-191.2	143.4	0.00	0.00	0.00
1,900.0	14.22	303.04	1,873.4	137.7	-211.8	158.8	0.00	0.00	0.00
2,000.0	14.22	303.04	1,970.3	151.1	-232.4	174.3	0.00	0.00	0.00
2,100.0	14.22	303.04	2,067.3	164.5	-253.0	189.7	0.00	0.00	0.00
2,200.0	14.22	303.04	2,164.2	177.9	-273.5	205.1	0.00	0.00	0.00
2,300.0	14.22	303.04	2,261.1	191.3	-294.1	220.6	0.00	0.00	0.00
2,400.0	14.22	303.04	2,358.1	204.7	-314.7	236.0	0.00	0.00	0.00
2,500.0	14.22	303.04	2,455.0	218.1	-335.3	251.5	0.00	0.00	0.00
2,600.0	14.22	303.04	2,551.9	231.5	-355.9	266.9	0.00	0.00	0.00
2,700.0	14.22	303.04	2,648.9	244.9	-376.5	282.4	0.00	0.00	0.00
2,800.0	14.22	303.04	2,745.8	258.2	-397.1	297.8	0.00	0.00	0.00
2,900.0	14.22	303.04	2,842.8	271.6	-417.7	313.2	0.00	0.00	0.00
3,000.0	14.22	303.04	2,939.7	285.0	-438.3	328.7	0.00	0.00	0.00
3,100.0	14.22	303.04	3,036.6	298.4	-458.9	344.1	0.00	0.00	0.00
3,200.0	14.22	303.04	3,133.6	311.8	-479.4	359.6	0.00	0.00	0.00
3,300.0	14.22	303.04	3,230.5	325.2	-500.0	375.0	0.00	0.00	0.00
3,400.0	14.22	303.04	3,327.4	338.6	-520.6	390.4	0.00	0.00	0.00
3,500.0	14.22	303.04	3,424.4	352.0	-541.2	405.9	0.00	0.00	0.00
3,578.0	14.22	303.04	3,500.0	362.4	-557.3	417.9	0.00	0.00	0.00
Parkman									
3,600.0	14.22	303.04	3,521.3	365.4	-561.8	421.3	0.00	0.00	0.00
3,700.0	14.22	303.04	3,618.3	378.8	-582.4	436.8	0.00	0.00	0.00
3,800.0	14.22	303.04	3,715.2	392.1	-603.0	452.2	0.00	0.00	0.00
3,900.0	14.22	303.04	3,812.1	405.5	-623.6	467.7	0.00	0.00	0.00
4,000.0	14.22	303.04	3,909.1	418.9	-644.2	483.1	0.00	0.00	0.00
4,100.0	14.22	303.04	4,006.0	432.3	-664.8	498.5	0.00	0.00	0.00
4,200.0	14.22	303.04	4,102.9	445.7	-685.3	514.0	0.00	0.00	0.00
4,300.0	14.22	303.04	4,199.9	459.1	-705.9	529.4	0.00	0.00	0.00
4,351.7	14.22	303.04	4,250.0	466.0	-716.6	537.4	0.00	0.00	0.00
Sussex									
4,400.0	14.22	303.04	4,296.8	472.5	-726.5	544.9	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Brown 23P-321
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Project:	SEC.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	North Reference:	True
Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (9-2-15)		

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)
4,500.0	14.22	303.04	4,393.7	485.9	-747.1	560.3	0.00	0.00	0.00
4,506.5	14.22	303.04	4,400.0	486.7	-748.4	561.3	0.00	0.00	0.00
Shannon									
4,600.0	14.22	303.04	4,490.7	499.3	-767.7	575.7	0.00	0.00	0.00
4,700.0	14.22	303.04	4,587.6	512.7	-788.3	591.2	0.00	0.00	0.00
4,800.0	14.22	303.04	4,684.6	526.1	-808.9	606.6	0.00	0.00	0.00
4,900.0	14.22	303.04	4,781.5	539.4	-829.5	622.1	0.00	0.00	0.00
5,000.0	14.22	303.04	4,878.4	552.8	-850.1	637.5	0.00	0.00	0.00
5,100.0	14.22	303.04	4,975.4	566.2	-870.7	653.0	0.00	0.00	0.00
5,200.0	14.22	303.04	5,072.3	579.6	-891.2	668.4	0.00	0.00	0.00
5,300.0	14.22	303.04	5,169.2	593.0	-911.8	683.8	0.00	0.00	0.00
5,328.0	14.22	303.04	5,196.4	596.8	-917.6	688.2	0.00	0.00	0.00
5,400.0	12.78	303.04	5,266.4	605.9	-931.7	698.7	2.00	-2.00	0.00
5,500.0	10.78	303.04	5,364.3	617.0	-948.8	711.6	2.00	-2.00	0.00
5,600.0	8.78	303.04	5,462.8	626.3	-963.0	722.2	2.00	-2.00	0.00
5,700.0	6.78	303.04	5,561.9	633.7	-974.4	730.7	2.00	-2.00	0.00
5,800.0	4.78	303.04	5,661.4	639.2	-982.8	737.1	2.00	-2.00	0.00
5,900.0	2.78	303.04	5,761.2	642.8	-988.3	741.2	2.00	-2.00	0.00
6,000.0	0.78	303.04	5,861.1	644.5	-990.9	743.2	2.00	-2.00	0.00
6,038.9	0.00	0.00	5,900.0	644.6	-991.2	743.3	2.00	-2.00	0.00
6,100.0	0.00	0.00	5,961.1	644.6	-991.2	743.3	0.00	0.00	0.00
6,200.0	0.00	0.00	6,061.1	644.6	-991.2	743.3	0.00	0.00	0.00
6,271.8	0.00	0.00	6,132.9	644.6	-991.2	743.3	0.00	0.00	0.00
KOP #2									
6,300.0	2.11	360.00	6,161.1	645.1	-991.2	743.8	7.49	7.49	0.00
6,400.0	9.61	360.00	6,260.5	655.3	-991.2	754.0	7.50	7.50	0.00
6,500.0	17.11	360.00	6,357.7	678.4	-991.2	777.0	7.50	7.50	0.00
6,600.0	24.61	360.00	6,451.1	714.0	-991.2	812.4	7.50	7.50	0.00
6,654.7	28.72	360.00	6,500.0	738.6	-991.2	836.8	7.50	7.50	0.00
Sharon Springs									
6,700.0	32.11	360.00	6,539.0	761.5	-991.2	859.6	7.50	7.50	0.00
6,800.0	39.61	360.00	6,620.0	820.0	-991.2	917.8	7.50	7.50	0.00
6,813.0	40.59	360.00	6,630.0	828.4	-991.2	926.2	7.50	7.50	0.00
Niobrara A									
6,900.0	47.11	360.00	6,692.7	888.6	-991.2	986.1	7.50	7.50	0.00
7,000.0	54.61	360.00	6,755.8	966.1	-991.2	1,063.2	7.50	7.50	0.00
7,007.4	55.17	360.00	6,760.0	972.2	-991.2	1,069.2	7.50	7.50	0.00
Niobrara B									
7,100.0	62.11	360.00	6,808.2	1,051.2	-991.2	1,147.8	7.50	7.50	0.00
7,175.2	67.75	360.00	6,840.0	1,119.3	-991.2	1,215.5	7.50	7.50	0.00
Niobrara C									
7,200.0	69.61	360.00	6,849.0	1,142.4	-991.2	1,238.5	7.50	7.50	0.00
7,300.0	77.11	360.00	6,877.6	1,238.2	-991.2	1,333.7	7.50	7.50	0.00
7,400.0	84.61	360.00	6,893.5	1,336.8	-991.2	1,431.9	7.50	7.50	0.00
7,474.6	90.21	360.00	6,896.9	1,411.3	-991.2	1,506.0	7.50	7.50	0.00
End of Build - 7"									
7,500.0	90.21	360.00	6,896.8	1,436.7	-991.2	1,531.2	0.01	0.01	0.00
7,600.0	90.21	360.00	6,896.4	1,536.7	-991.2	1,630.7	0.00	0.00	0.00
7,700.0	90.21	360.00	6,896.1	1,636.7	-991.2	1,730.2	0.00	0.00	0.00
7,800.0	90.21	360.00	6,895.7	1,736.7	-991.2	1,829.6	0.00	0.00	0.00
7,900.0	90.21	360.00	6,895.3	1,836.7	-991.2	1,929.1	0.00	0.00	0.00
8,000.0	90.21	360.00	6,895.0	1,936.7	-991.2	2,028.6	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Brown 23P-321
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Project:	SEC.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	North Reference:	True
Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (9-2-15)		

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)
8,100.0	90.21	360.00	6,894.6	2,036.7	-991.2	2,128.0	0.00	0.00	0.00
8,200.0	90.21	360.00	6,894.2	2,136.7	-991.2	2,227.5	0.00	0.00	0.00
8,300.0	90.21	360.00	6,893.9	2,236.7	-991.2	2,327.0	0.00	0.00	0.00
8,400.0	90.21	360.00	6,893.5	2,336.7	-991.2	2,426.4	0.00	0.00	0.00
8,500.0	90.21	360.00	6,893.1	2,436.7	-991.2	2,525.9	0.00	0.00	0.00
8,600.0	90.21	360.00	6,892.8	2,536.7	-991.2	2,625.4	0.00	0.00	0.00
8,700.0	90.21	360.00	6,892.4	2,636.7	-991.2	2,724.8	0.00	0.00	0.00
8,800.0	90.21	360.00	6,892.0	2,736.7	-991.2	2,824.3	0.00	0.00	0.00
8,900.0	90.21	360.00	6,891.7	2,836.7	-991.2	2,923.8	0.00	0.00	0.00
9,000.0	90.21	360.00	6,891.3	2,936.7	-991.2	3,023.2	0.00	0.00	0.00
9,100.0	90.21	360.00	6,890.9	3,036.7	-991.2	3,122.7	0.00	0.00	0.00
9,200.0	90.21	360.00	6,890.6	3,136.7	-991.2	3,222.2	0.00	0.00	0.00
9,300.0	90.21	360.00	6,890.2	3,236.7	-991.2	3,321.6	0.00	0.00	0.00
9,400.0	90.21	360.00	6,889.8	3,336.7	-991.2	3,421.1	0.00	0.00	0.00
9,500.0	90.21	360.00	6,889.5	3,436.7	-991.2	3,520.6	0.00	0.00	0.00
9,600.0	90.21	360.00	6,889.1	3,536.7	-991.2	3,620.0	0.00	0.00	0.00
9,700.0	90.21	360.00	6,888.7	3,636.7	-991.2	3,719.5	0.00	0.00	0.00
9,800.0	90.21	360.00	6,888.4	3,736.7	-991.2	3,819.0	0.00	0.00	0.00
9,900.0	90.21	360.00	6,888.0	3,836.7	-991.2	3,918.4	0.00	0.00	0.00
10,000.0	90.21	360.00	6,887.6	3,936.7	-991.2	4,017.9	0.00	0.00	0.00
10,100.0	90.21	360.00	6,887.3	4,036.7	-991.2	4,117.4	0.00	0.00	0.00
10,200.0	90.21	360.00	6,886.9	4,136.7	-991.2	4,216.8	0.00	0.00	0.00
10,300.0	90.21	360.00	6,886.5	4,236.7	-991.2	4,316.3	0.00	0.00	0.00
10,400.0	90.21	360.00	6,886.2	4,336.7	-991.2	4,415.8	0.00	0.00	0.00
10,500.0	90.21	360.00	6,885.8	4,436.7	-991.2	4,515.2	0.00	0.00	0.00
10,600.0	90.21	360.00	6,885.4	4,536.7	-991.2	4,614.7	0.00	0.00	0.00
10,700.0	90.21	360.00	6,885.1	4,636.7	-991.2	4,714.2	0.00	0.00	0.00
10,800.0	90.21	360.00	6,884.7	4,736.7	-991.2	4,813.6	0.00	0.00	0.00
10,900.0	90.21	360.00	6,884.3	4,836.7	-991.2	4,913.1	0.00	0.00	0.00
11,000.0	90.21	360.00	6,884.0	4,936.7	-991.2	5,012.6	0.00	0.00	0.00
11,100.0	90.21	360.00	6,883.6	5,036.7	-991.2	5,112.0	0.00	0.00	0.00
11,200.0	90.21	360.00	6,883.2	5,136.7	-991.2	5,211.5	0.00	0.00	0.00
11,300.0	90.21	360.00	6,882.9	5,236.7	-991.2	5,311.0	0.00	0.00	0.00
11,400.0	90.21	360.00	6,882.5	5,336.7	-991.2	5,410.4	0.00	0.00	0.00
11,500.0	90.21	360.00	6,882.1	5,436.7	-991.2	5,509.9	0.00	0.00	0.00
11,600.0	90.21	360.00	6,881.8	5,536.7	-991.2	5,609.4	0.00	0.00	0.00
11,700.0	90.21	360.00	6,881.4	5,636.7	-991.2	5,708.8	0.00	0.00	0.00
11,800.0	90.21	360.00	6,881.0	5,736.7	-991.2	5,808.3	0.00	0.00	0.00
11,900.0	90.21	360.00	6,880.7	5,836.7	-991.2	5,907.8	0.00	0.00	0.00
12,000.0	90.21	360.00	6,880.3	5,936.7	-991.2	6,007.2	0.00	0.00	0.00
12,100.0	90.21	360.00	6,879.9	6,036.7	-991.2	6,106.7	0.00	0.00	0.00
12,200.0	90.21	360.00	6,879.6	6,136.7	-991.2	6,206.2	0.00	0.00	0.00
12,300.0	90.21	360.00	6,879.2	6,236.7	-991.2	6,305.6	0.00	0.00	0.00
12,400.0	90.21	360.00	6,878.8	6,336.7	-991.2	6,405.1	0.00	0.00	0.00
12,500.0	90.21	360.00	6,878.5	6,436.7	-991.2	6,504.6	0.00	0.00	0.00
12,600.0	90.21	360.00	6,878.1	6,536.7	-991.2	6,604.0	0.00	0.00	0.00
12,700.0	90.21	360.00	6,877.7	6,636.7	-991.2	6,703.5	0.00	0.00	0.00
12,800.0	90.21	360.00	6,877.4	6,736.7	-991.2	6,803.0	0.00	0.00	0.00
12,900.0	90.21	360.00	6,877.0	6,836.7	-991.2	6,902.4	0.00	0.00	0.00
13,000.0	90.21	360.00	6,876.6	6,936.7	-991.2	7,001.9	0.00	0.00	0.00
13,100.0	90.21	360.00	6,876.3	7,036.7	-991.2	7,101.4	0.00	0.00	0.00
13,200.0	90.21	360.00	6,875.9	7,136.7	-991.2	7,200.8	0.00	0.00	0.00
13,300.0	90.21	360.00	6,875.5	7,236.7	-991.2	7,300.3	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Brown 23P-321
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Project:	SEC.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	North Reference:	True
Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (9-2-15)		

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)
13,400.0	90.21	360.00	6,875.2	7,336.7	-991.2	7,399.8	0.00	0.00	0.00
13,500.0	90.21	360.00	6,874.8	7,436.7	-991.2	7,499.2	0.00	0.00	0.00
13,600.0	90.21	360.00	6,874.4	7,536.7	-991.2	7,598.7	0.00	0.00	0.00
13,700.0	90.21	360.00	6,874.1	7,636.7	-991.2	7,698.2	0.00	0.00	0.00
13,800.0	90.21	360.00	6,873.7	7,736.7	-991.2	7,797.6	0.00	0.00	0.00
13,900.0	90.21	360.00	6,873.3	7,836.7	-991.2	7,897.1	0.00	0.00	0.00
14,000.0	90.21	360.00	6,873.0	7,936.7	-991.2	7,996.6	0.00	0.00	0.00
14,100.0	90.21	360.00	6,872.6	8,036.7	-991.2	8,096.0	0.00	0.00	0.00
14,200.0	90.21	360.00	6,872.2	8,136.7	-991.2	8,195.5	0.00	0.00	0.00
14,300.0	90.21	360.00	6,871.9	8,236.7	-991.2	8,295.0	0.00	0.00	0.00
14,400.0	90.21	360.00	6,871.5	8,336.7	-991.2	8,394.4	0.00	0.00	0.00
14,500.0	90.21	360.00	6,871.1	8,436.7	-991.2	8,493.9	0.00	0.00	0.00
14,600.0	90.21	360.00	6,870.8	8,536.7	-991.2	8,593.4	0.00	0.00	0.00
14,700.0	90.21	360.00	6,870.4	8,636.7	-991.2	8,692.8	0.00	0.00	0.00
14,800.0	90.21	360.00	6,870.0	8,736.7	-991.2	8,792.3	0.00	0.00	0.00
14,900.0	90.21	360.00	6,869.7	8,836.7	-991.2	8,891.8	0.00	0.00	0.00
15,000.0	90.21	360.00	6,869.3	8,936.7	-991.2	8,991.2	0.00	0.00	0.00
15,100.0	90.21	360.00	6,868.9	9,036.7	-991.2	9,090.7	0.00	0.00	0.00
15,200.0	90.21	360.00	6,868.6	9,136.7	-991.2	9,190.2	0.00	0.00	0.00
15,300.0	90.21	360.00	6,868.2	9,236.7	-991.2	9,289.6	0.00	0.00	0.00
15,400.0	90.21	360.00	6,867.8	9,336.7	-991.2	9,389.1	0.00	0.00	0.00
15,500.0	90.21	360.00	6,867.5	9,436.7	-991.2	9,488.6	0.00	0.00	0.00
15,600.0	90.21	360.00	6,867.1	9,536.7	-991.2	9,588.0	0.00	0.00	0.00
15,628.0	90.21	360.00	6,867.0	9,564.7	-991.2	9,615.9	0.00	0.00	0.00
BHL 0°FNL & 2391°FEL, Sec.14									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
50' E/W Hardline (23P-3 - hit/miss target - Shape - plan misses target center by 5576.8ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E) - Rectangle (sides W100.0 H8,153.4 D0.0)	0.00	0.00	1.0	5,488.0	-991.2	1,388,109.90	3,242,405.47	40.395498	-104.629680
SHL 1082°FSL & 1419°FEL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,382,632.17	3,243,450.66	40.380434	-104.626121
BHL 0°FNL & 2391°FEL, - plan hits target center - Point	0.00	0.00	6,867.0	9,564.7	-991.2	1,392,186.20	3,242,365.33	40.406688	-104.629680

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,474.6	6,896.9	7"	7	7-1/2	

Database:	US_EDM	Local Co-ordinate Reference:	Well Brown 23P-321
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Project:	SEC.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	North Reference:	True
Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (9-2-15)		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,578.0	3,500.0	Parkman		0.00	
4,351.7	4,250.0	Sussex		0.00	
4,506.5	4,400.0	Shannon		0.00	
6,654.7	6,500.0	Sharon Springs		0.00	
6,813.0	6,630.0	Niobrara A		0.00	
7,007.4	6,760.0	Niobrara B		0.00	
7,175.2	6,840.0	Niobrara C		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
400.0	400.0	0.0	0.0	KOP #1
6,271.8	6,132.9	644.6	-991.2	KOP #2
7,474.6	6,896.9	1,411.3	-991.2	End of Build

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.23-T5N-R65W

Brown 5N65W23 Pad Sec.23-T5N-R65W

Brown 23P-321

Wellbore #1

Plan #1 (9-2-15)

Anticollision Report

04 September, 2015

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (9-2-15)		
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 1,000.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	9/4/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	15,628.0	Plan #1 (9-2-15) (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						
Alles 22S-HZ Pad Sec.22-T5N-R65W						
Alles 22D-312 - Wellbore #1 - Wellbore #1	6,850.0	10,708.9	235.9	136.6	2.376	SF
Alles 22D-312 - Wellbore #1 - Wellbore #1	6,900.0	10,708.0	224.2	130.1	2.384	ES
Alles 22D-312 - Wellbore #1 - Wellbore #1	6,916.9	10,707.7	223.4	131.2	2.423	CC
Alles 22D-402 - Wellbore #1 - Wellbore #1	6,650.0	10,797.4	597.1	481.3	5.155	SF
Alles 22D-402 - Wellbore #1 - Wellbore #1	6,750.0	10,797.0	574.6	466.8	5.331	ES
Alles 22D-402 - Wellbore #1 - Wellbore #1	6,775.3	10,797.0	573.6	468.1	5.437	CC
Alles 22S-232 - Wellbore #1 - Wellbore #1	7,286.3	9,978.4	74.8	30.4	1.683	CC, ES, SF
Alles 22S-432 - Wellbore #1 - Wellbore #1						Out of range
Alles 22S-432 - Wellbore #2 - Wellbore #2	7,300.0	10,771.5	107.5	59.6	2.247	SF
Alles 22S-432 - Wellbore #2 - Wellbore #2	7,318.3	10,771.8	105.7	59.6	2.293	CC, ES
Brown 5N65W23 Pad Sec.23-T5N-R65W						
Brown 23D-201 - Wellbore #1 - Plan #1 (9-2-15)	400.0	400.0	45.1	43.6	28.690	CC, ES
Brown 23D-201 - Wellbore #1 - Plan #1 (9-2-15)	15,628.0	15,243.9	989.8	625.1	2.714	SF
Brown 23D-341 - Wellbore #1 - Plan #1 (9-2-15)	400.0	400.0	30.1	28.5	19.125	CC, ES
Brown 23D-341 - Wellbore #1 - Plan #1 (9-2-15)	15,628.0	15,239.9	656.2	290.0	1.792	SF
Brown 23P-201 - Wellbore #1 - Plan #1 (8-31-15)	200.0	200.0	15.0	14.4	22.311	CC
Brown 23P-201 - Wellbore #1 - Plan #1 (8-31-15)	15,628.0	15,388.9	295.8	-65.3	0.819	Level 1, ES, SF
Brown 23P-221 - Wellbore #1 - Plan #1 (9-2-15)	400.0	400.0	15.0	13.5	9.565	CC
Brown 23P-221 - Wellbore #1 - Plan #1 (9-2-15)	15,628.0	15,280.6	328.4	-25.9	0.927	Level 1, ES, SF
Existing Sec. 23-T5N-R65W						
Alles 23-13 (Exist.) - Wellbore #1 - Wellbore #1	8,492.2	6,876.2	429.6	243.5	2.309	CC
Alles 23-13 (Exist.) - Wellbore #1 - Wellbore #1	8,500.0	6,876.1	429.6	243.5	2.308	ES, SF
Boderusock 2-23 (Exist.) - Wellbore #1 - Wellbore #1	9,603.3	6,873.1	416.8	210.4	2.020	CC, ES, SF
Carlson 14-43 (Exist.) - Wellbore #1 - Wellbore #1	11,017.9	6,846.9	452.2	219.8	1.946	CC, ES, SF
James Clark Unit 1 (Exist.) - Wellbore #1 - Wellbore #1	14,948.2	6,829.5	408.5	101.7	1.332	Level 3, CC, ES, SF
Lofland 22T & Alles 22S-HZ Existing Wells						
Lille 1-23 (P&A) - Wellbore #1 - Wellbore #1	6,937.3	6,719.4	392.5	234.7	2.488	CC
Lille 1-23 (P&A) - Wellbore #1 - Wellbore #1	6,950.0	6,727.5	392.6	234.7	2.486	ES, SF
Lofland 22T-HZ Pad Sec.22-T5N-R65W						
Lofland 22D-232 - Wellbore #1 - Wellbore #1	6,500.0	10,652.9	876.5	743.6	6.596	SF
Lofland 22D-232 - Wellbore #1 - Wellbore #1	6,600.0	10,652.8	863.8	736.3	6.779	ES
Lofland 22D-232 - Wellbore #1 - Wellbore #1	6,602.0	10,652.8	863.7	736.5	6.786	CC

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 60-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	
6,038.9	5,900.0	10,721.9	6,874.7	26.0	107.3	9.02	752.7	-974.0	976.9	845.9	130.96	7.459	
6,100.0	5,961.1	10,721.1	6,874.7	26.1	107.2	8.59	752.7	-974.8	916.2	785.1	131.05	6.991	
6,200.0	6,061.1	10,719.7	6,874.7	26.2	107.2	7.85	752.7	-976.3	817.0	685.7	131.21	6.226	
6,271.8	6,132.9	10,718.6	6,874.8	26.3	107.2	7.30	752.7	-977.3	745.8	614.5	131.32	5.680	
6,300.0	6,161.1	10,718.2	6,874.8	26.3	107.2	9.37	752.7	-977.7	717.9	586.9	131.04	5.479	
6,350.0	6,211.0	10,717.4	6,874.8	26.4	107.1	19.26	752.8	-978.5	668.1	540.8	127.32	5.248	
6,400.0	6,260.5	10,716.6	6,874.8	26.5	107.1	116.24	752.8	-979.3	618.1	554.9	63.25	9.773	
6,450.0	6,309.5	10,715.8	6,874.8	26.6	107.1	166.08	752.8	-980.1	568.2	445.9	122.30	4.646	
6,500.0	6,357.7	10,715.0	6,874.8	26.8	107.1	172.71	752.8	-980.9	518.6	394.7	123.85	4.187	
6,550.0	6,405.0	10,714.1	6,874.8	27.0	107.1	175.19	752.8	-981.8	469.5	347.2	122.33	3.838	
6,600.0	6,451.1	10,713.3	6,874.9	27.2	107.0	176.50	752.8	-982.6	421.6	301.8	119.80	3.519	
6,650.0	6,495.9	10,712.4	6,874.9	27.5	107.0	177.32	752.8	-983.5	375.5	258.8	116.63	3.219	
6,700.0	6,539.0	10,711.5	6,874.9	27.7	107.0	177.88	752.8	-984.4	332.0	219.1	112.94	2.940	
6,750.0	6,580.5	10,710.7	6,874.9	28.0	107.0	178.30	752.8	-985.2	292.8	184.0	108.79	2.691	
6,800.0	6,620.0	10,709.8	6,874.9	28.4	106.9	178.64	752.8	-986.1	259.8	155.6	104.22	2.493	
6,850.0	6,657.5	10,708.9	6,875.0	28.7	106.9	178.92	752.8	-987.0	235.9	136.6	99.29	2.376 SF	
6,900.0	6,692.7	10,708.0	6,875.0	29.1	106.9	179.16	752.8	-987.9	224.2	130.1	94.03	2.384 ES	
6,916.9	6,704.0	10,707.7	6,875.0	29.2	106.9	179.24	752.8	-988.2	223.4	131.2	92.19	2.423 CC	
6,950.0	6,725.5	10,707.1	6,875.0	29.5	106.9	179.39	752.8	-988.8	226.5	138.0	88.49	2.560	
7,000.0	6,755.8	10,706.3	6,875.0	30.0	106.8	179.60	752.8	-989.6	242.5	159.8	82.71	2.932	
7,050.0	6,783.4	10,705.4	6,875.0	30.5	106.8	179.81	752.8	-990.5	269.7	192.9	76.76	3.513	
7,100.0	6,808.2	10,704.6	6,875.0	31.0	106.8	-179.96	752.8	-991.3	305.0	234.3	70.71	4.313	
7,150.0	6,830.1	10,703.8	6,875.1	31.5	106.8	-179.70	752.8	-992.1	345.8	281.1	64.65	5.348	
7,200.0	6,849.0	10,703.1	6,875.1	32.1	106.7	-179.41	752.8	-992.8	390.2	331.5	58.70	6.647	
7,250.0	6,864.9	10,702.5	6,875.1	32.7	106.7	-179.03	752.8	-993.4	437.1	384.0	53.01	8.244	
7,300.0	6,877.6	10,702.0	6,875.1	33.3	106.7	-178.44	752.8	-993.9	485.4	437.6	47.78	10.158	
7,350.0	6,887.2	10,701.5	6,875.1	33.9	106.7	-177.30	752.8	-994.4	534.7	491.4	43.26	12.359	
7,400.0	6,893.5	10,701.1	6,875.1	34.6	106.7	-173.59	752.8	-994.8	584.4	544.7	39.74	14.706	
7,450.0	6,896.6	10,700.7	6,875.1	35.3	106.7	-28.65	752.8	-995.2	634.4	587.7	46.73	13.576	
7,474.6	6,896.9	10,700.6	6,875.1	35.6	106.7	-8.35	752.8	-995.3	659.0	618.7	40.39	16.317	
7,500.0	6,896.8	10,700.5	6,875.1	36.0	106.7	-8.62	752.8	-995.4	684.4	643.7	40.65	16.836	
7,600.0	6,896.4	10,699.9	6,875.2	37.4	106.7	-9.68	752.8	-996.0	784.3	742.6	41.70	18.807	
7,700.0	6,896.1	10,699.4	6,875.2	38.8	106.6	-10.73	752.8	-996.5	884.2	841.5	42.79	20.664	
7,800.0	6,895.7	10,698.9	6,875.2	40.3	106.6	-11.78	752.8	-997.0	984.2	940.3	43.92	22.410	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design													Alles 22S-HZ Pad Sec.22-T5N-R65W - Alles 22D-402 - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft
Survey Program:				121-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)						
6,200.0	6,061.1	10,800.4	6,956.0	26.2	106.2	178.00	351.2	-980.9	938.0	808.8	129.24	7.258					
6,271.8	6,132.9	10,799.9	6,956.0	26.3	106.2	178.11	351.2	-981.5	870.1	740.7	129.35	6.727					
6,300.0	6,161.1	10,799.6	6,956.0	26.3	106.2	178.32	351.2	-981.7	843.8	714.5	129.36	6.523					
6,350.0	6,211.0	10,799.3	6,956.0	26.4	106.2	178.60	351.2	-982.1	798.6	669.6	128.95	6.193					
6,400.0	6,260.5	10,798.9	6,956.0	26.5	106.2	178.80	351.2	-982.4	755.5	627.5	128.00	5.902					
6,450.0	6,309.5	10,798.6	6,956.0	26.6	106.2	178.94	351.2	-982.8	715.2	588.7	126.54	5.652					
6,500.0	6,357.7	10,798.2	6,956.0	26.8	106.2	179.05	351.2	-983.1	678.5	553.9	124.58	5.446					
6,550.0	6,405.0	10,797.9	6,956.0	27.0	106.2	179.14	351.2	-983.4	646.0	523.9	122.12	5.290					
6,600.0	6,451.1	10,797.7	6,956.0	27.2	106.2	179.20	351.2	-983.7	618.6	499.4	119.20	5.189					
6,650.0	6,495.9	10,797.4	6,956.0	27.5	106.2	179.25	351.2	-983.9	597.1	481.3	115.82	5.155 SF					
6,700.0	6,539.0	10,797.2	6,956.0	27.7	106.2	179.29	351.2	-984.1	582.2	470.2	112.01	5.198					
6,750.0	6,580.5	10,797.0	6,956.0	28.0	106.2	179.31	351.1	-984.3	574.6	466.8	107.78	5.331 ES					
6,775.3	6,600.8	10,797.0	6,956.0	28.2	106.2	179.32	351.1	-984.4	573.6	468.1	105.50	5.437 CC					
6,800.0	6,620.0	10,796.9	6,956.0	28.4	106.1	179.33	351.1	-984.5	574.6	471.4	103.18	5.568					
6,850.0	6,657.5	10,796.8	6,956.0	28.7	106.1	179.33	351.1	-984.6	582.1	483.8	98.23	5.926					
6,900.0	6,692.7	10,796.7	6,956.0	29.1	106.1	179.33	351.1	-984.6	596.8	503.9	92.96	6.420					
6,950.0	6,725.5	10,796.6	6,956.0	29.5	106.1	179.31	351.1	-984.7	618.2	530.8	87.43	7.071					
7,000.0	6,755.8	10,796.6	6,956.0	30.0	106.1	179.28	351.1	-984.7	645.6	563.9	81.68	7.904					
7,050.0	6,783.4	10,796.7	6,956.0	30.5	106.1	179.24	351.1	-984.7	678.0	602.3	75.76	8.949					
7,100.0	6,808.2	10,796.7	6,956.0	31.0	106.1	179.18	351.1	-984.6	714.7	645.0	69.77	10.244					
7,150.0	6,830.1	10,796.8	6,956.0	31.5	106.1	179.09	351.1	-984.5	754.9	691.2	63.79	11.835					
7,200.0	6,849.0	10,796.9	6,956.0	32.1	106.2	178.96	351.1	-984.4	798.0	740.0	57.95	13.770					
7,250.0	6,864.9	10,797.1	6,956.0	32.7	106.2	178.78	351.1	-984.2	843.2	790.8	52.42	16.086					
7,300.0	6,877.6	10,797.3	6,956.0	33.3	106.2	178.50	351.2	-984.1	890.1	842.7	47.44	18.765					
7,350.0	6,887.2	10,797.5	6,956.0	33.9	106.2	178.03	351.2	-983.8	938.3	895.0	43.32	21.662					
7,400.0	6,893.5	10,797.7	6,956.0	34.6	106.2	177.13	351.2	-983.6	987.4	946.9	40.50	24.379					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 123-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	
6,200.0	6,061.1	9,984.7	6,805.8	26.2	95.6	0.51	1,242.9	-985.9	952.2	832.9	119.31	7.980	
6,271.8	6,132.9	9,983.6	6,805.8	26.3	95.6	0.40	1,242.9	-986.9	897.4	778.1	119.36	7.518	
6,300.0	6,161.1	9,983.2	6,805.8	26.3	95.6	0.38	1,242.9	-987.3	876.3	756.9	119.37	7.341	
6,350.0	6,211.0	9,982.6	6,805.8	26.4	95.6	0.34	1,242.9	-988.0	838.0	719.0	119.02	7.041	
6,400.0	6,260.5	9,982.0	6,805.8	26.5	95.5	0.30	1,242.9	-988.6	798.9	680.7	118.20	6.759	
6,450.0	6,309.5	9,981.4	6,805.8	26.6	95.5	0.26	1,242.9	-989.1	759.0	642.1	116.91	6.492	
6,500.0	6,357.7	9,980.9	6,805.8	26.8	95.5	0.21	1,242.9	-989.6	718.2	603.1	115.16	6.237	
6,550.0	6,405.0	9,980.5	6,805.9	27.0	95.5	0.17	1,242.9	-990.1	676.8	563.8	112.97	5.991	
6,600.0	6,451.1	9,980.1	6,805.9	27.2	95.5	0.12	1,242.9	-990.5	634.6	524.3	110.33	5.752	
6,650.0	6,495.9	9,979.7	6,805.9	27.5	95.5	0.06	1,242.9	-990.9	591.8	484.5	107.27	5.517	
6,700.0	6,539.0	9,979.4	6,805.9	27.7	95.5	0.00	1,242.9	-991.2	548.5	444.7	103.81	5.283	
6,750.0	6,580.5	9,979.1	6,805.9	28.0	95.5	-0.07	1,242.9	-991.5	504.6	404.6	99.96	5.048	
6,800.0	6,620.0	9,978.8	6,805.9	28.4	95.5	-0.15	1,242.9	-991.7	460.3	364.5	95.74	4.808	
6,850.0	6,657.5	9,978.6	6,805.9	28.7	95.5	-0.23	1,242.9	-991.9	415.6	324.4	91.19	4.558	
6,900.0	6,692.7	9,978.5	6,805.9	29.1	95.4	-0.33	1,242.9	-992.1	370.7	284.3	86.34	4.293	
6,950.0	6,725.5	9,978.3	6,805.9	29.5	95.4	-0.43	1,242.9	-992.2	325.6	244.4	81.21	4.009	
7,000.0	6,755.8	9,978.2	6,805.9	30.0	95.4	-0.54	1,242.9	-992.3	280.5	204.7	75.86	3.698	
7,050.0	6,783.4	9,978.2	6,805.9	30.5	95.4	-0.64	1,242.9	-992.4	235.8	165.4	70.34	3.352	
7,100.0	6,808.2	9,978.2	6,805.9	31.0	95.4	-0.74	1,242.9	-992.4	191.7	127.0	64.71	2.963	
7,150.0	6,830.1	9,978.2	6,805.9	31.5	95.4	-0.81	1,242.9	-992.4	149.4	90.4	59.05	2.530	
7,200.0	6,849.0	9,978.2	6,805.9	32.1	95.4	-0.83	1,242.9	-992.3	111.0	57.5	53.47	2.076	
7,250.0	6,864.9	9,978.3	6,805.9	32.7	95.4	-0.80	1,242.9	-992.2	82.4	34.3	48.10	1.713	
7,286.3	6,874.5	9,978.4	6,805.9	33.1	95.4	-0.73	1,242.9	-992.1	74.8	30.4	44.44	1.683 CC, ES, SF	
7,300.0	6,877.6	9,978.5	6,805.9	33.3	95.4	-0.69	1,242.9	-992.1	75.9	32.8	43.13	1.760	
7,350.0	6,887.2	9,978.7	6,805.9	33.9	95.5	-0.53	1,242.9	-991.9	96.2	57.4	38.82	2.478	
7,400.0	6,893.5	9,978.9	6,805.9	34.6	95.5	-0.33	1,242.9	-991.6	131.2	95.8	35.47	3.700	
7,450.0	6,896.6	9,979.2	6,805.9	35.3	95.5	-0.12	1,242.9	-991.4	172.2	138.8	33.46	5.148	
7,474.6	6,896.9	9,979.3	6,805.9	35.6	95.5	-0.02	1,242.9	-991.2	193.4	160.4	33.04	5.854	
7,500.0	6,896.8	9,979.5	6,805.9	36.0	95.5	0.09	1,242.9	-991.0	215.8	182.7	33.19	6.504	
7,600.0	6,896.4	9,980.3	6,805.9	37.4	95.5	0.53	1,242.9	-990.3	308.7	274.9	33.77	9.142	
7,700.0	6,896.1	9,981.1	6,805.8	38.8	95.5	1.01	1,242.9	-989.5	404.9	370.6	34.37	11.783	
7,800.0	6,895.7	9,982.0	6,805.8	40.3	95.5	1.55	1,242.9	-988.6	502.7	467.7	34.98	14.368	
7,900.0	6,895.3	9,983.0	6,805.8	41.9	95.6	2.15	1,242.9	-987.6	601.1	565.5	35.62	16.875	
8,000.0	6,895.0	9,984.1	6,805.8	43.4	95.6	2.83	1,242.9	-986.4	700.0	663.8	36.28	19.293	
8,100.0	6,894.6	9,985.4	6,805.8	45.0	95.6	3.59	1,242.9	-985.2	799.2	762.2	36.98	21.615	
8,200.0	6,894.2	9,986.8	6,805.8	46.7	95.7	4.46	1,242.9	-983.7	898.6	860.9	37.71	23.831	
8,300.0	6,893.9	9,988.5	6,805.7	48.3	95.7	5.46	1,242.9	-982.0	998.1	959.6	38.49	25.928	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design Alles 22S-HZ Pad Sec.22-T5N-R65W - Alles 22S-432 - Wellbore #2 - Wellbore #2												Offset Site Error:	0.0 ft
Survey Program: 125-MWD, 6034-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
6,350.0	6,211.0	10,790.0	6,987.8	26.4	108.0	2.84	1,235.5	-966.1	970.8	839.1	131.62	7.376	
6,400.0	6,260.5	10,787.8	6,987.9	26.5	107.9	2.90	1,235.4	-968.3	927.6	796.9	130.65	7.100	
6,450.0	6,309.5	10,785.7	6,988.1	26.6	107.9	2.98	1,235.4	-970.4	883.4	754.3	129.18	6.839	
6,500.0	6,357.7	10,783.7	6,988.2	26.8	107.8	3.07	1,235.3	-972.5	838.4	711.2	127.20	6.591	
6,550.0	6,405.0	10,781.7	6,988.3	27.0	107.8	3.20	1,235.3	-974.4	792.5	667.8	124.74	6.353	
6,600.0	6,451.1	10,779.8	6,988.4	27.2	107.7	3.38	1,235.2	-976.3	745.8	624.0	121.81	6.123	
6,650.0	6,495.9	10,778.1	6,988.5	27.5	107.7	3.63	1,235.1	-978.1	698.4	580.0	118.43	5.897	
6,700.0	6,539.0	10,776.4	6,988.6	27.7	107.6	4.00	1,235.1	-979.7	650.3	535.7	114.61	5.675	
6,750.0	6,580.5	10,775.0	6,988.7	28.0	107.6	4.61	1,235.0	-981.1	601.7	491.3	110.38	5.451	
6,800.0	6,620.0	10,773.7	6,988.7	28.4	107.5	5.71	1,235.0	-982.5	552.5	446.8	105.77	5.224	
6,850.0	6,657.5	10,772.5	6,988.8	28.7	107.5	8.16	1,235.0	-983.6	503.0	402.2	100.75	4.993	
6,900.0	6,692.7	10,771.6	6,988.9	29.1	107.5	17.06	1,234.9	-984.5	453.2	358.8	94.34	4.803	
6,950.0	6,725.5	10,770.8	6,988.9	29.5	107.5	137.70	1,234.9	-985.3	403.2	332.5	70.70	5.702	
7,000.0	6,755.8	10,770.3	6,988.9	30.0	107.4	170.31	1,234.9	-985.8	353.3	271.7	81.54	4.332	
7,050.0	6,783.4	10,769.9	6,989.0	30.5	107.4	174.57	1,234.9	-986.2	303.7	227.1	76.62	3.964	
7,100.0	6,808.2	10,769.8	6,989.0	31.0	107.4	176.03	1,234.9	-986.3	255.0	184.2	70.81	3.601	
7,150.0	6,830.1	10,769.9	6,989.0	31.5	107.4	176.63	1,234.9	-986.2	208.0	143.2	64.79	3.210	
7,200.0	6,849.0	10,770.2	6,988.9	32.1	107.4	176.82	1,234.9	-985.9	164.5	105.7	58.81	2.797	
7,250.0	6,864.9	10,770.8	6,988.9	32.7	107.5	176.74	1,234.9	-985.3	128.3	75.3	53.08	2.418	
7,300.0	6,877.6	10,771.5	6,988.9	33.3	107.5	176.44	1,234.9	-984.6	107.5	59.6	47.83	2.247 SF	
7,318.3	6,881.5	10,771.8	6,988.9	33.5	107.5	176.27	1,234.9	-984.3	105.7	59.6	46.09	2.293 CC, ES	
7,350.0	6,887.2	10,772.4	6,988.8	33.9	107.5	175.91	1,235.0	-983.7	111.0	67.6	43.40	2.557	
7,400.0	6,893.5	10,773.6	6,988.7	34.6	107.5	175.10	1,235.0	-982.6	137.0	96.8	40.21	3.406	
7,450.0	6,896.6	10,774.9	6,988.7	35.3	107.6	173.88	1,235.0	-981.3	175.7	136.9	38.75	4.533	
7,474.6	6,896.9	10,775.6	6,988.6	35.6	107.6	173.05	1,235.1	-980.5	197.2	158.4	38.80	5.082	
7,500.0	6,896.8	10,776.3	6,988.6	36.0	107.6	172.57	1,235.1	-979.8	220.2	181.1	39.10	5.632	
7,600.0	6,896.4	10,779.2	6,988.4	37.4	107.7	170.71	1,235.2	-976.9	314.4	274.1	40.30	7.802	
7,700.0	6,896.1	10,782.0	6,988.3	38.8	107.8	168.91	1,235.3	-974.2	411.4	369.8	41.55	9.900	
7,800.0	6,895.7	10,784.7	6,988.1	40.3	107.8	167.18	1,235.3	-971.5	509.5	466.6	42.85	11.891	
7,900.0	6,895.3	10,787.3	6,988.0	41.9	107.9	165.52	1,235.4	-968.8	608.2	564.0	44.17	13.768	
8,000.0	6,895.0	10,789.8	6,987.8	43.4	108.0	163.93	1,235.5	-966.3	707.3	661.7	45.54	15.531	
8,100.0	6,894.6	10,792.3	6,987.7	45.0	108.1	162.40	1,235.6	-963.8	806.5	759.6	46.93	17.186	
8,200.0	6,894.2	10,795.0	6,987.6	46.7	108.1	160.77	1,235.6	-961.2	906.0	857.6	48.42	18.712	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	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		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)					
0.0	0.0	0.0	0.0	0.0	0.0	90.93	-0.7	45.1	45.1				
100.0	100.0	100.0	100.0	0.1	0.1	90.93	-0.7	45.1	45.1	44.9	0.22	200.829	
200.0	200.0	200.0	200.0	0.3	0.3	90.93	-0.7	45.1	45.1	44.5	0.67	66.943	
300.0	300.0	300.0	300.0	0.6	0.6	90.93	-0.7	45.1	45.1	44.0	1.12	40.166	
400.0	400.0	400.0	400.0	0.8	0.8	90.93	-0.7	45.1	45.1	43.6	1.57	28.690 CC, ES	
500.0	500.0	500.0	500.0	1.0	1.0	148.75	-0.7	45.1	46.3	44.2	2.02	22.895	
600.0	599.9	599.9	599.9	1.2	1.2	151.07	-0.7	45.1	49.7	47.2	2.47	20.117	
700.0	699.7	699.7	699.7	1.5	1.5	154.30	-0.7	45.1	55.5	52.5	2.92	18.988	
800.0	799.3	799.3	799.3	1.7	1.7	157.82	-0.7	45.1	63.8	60.5	3.38	18.902	
900.0	898.6	898.6	898.6	2.0	1.9	161.16	-0.7	45.1	74.9	71.0	3.84	19.520	
1,000.0	997.5	997.5	997.5	2.3	2.1	164.10	-0.7	45.1	88.6	84.3	4.29	20.631	
1,100.0	1,096.1	1,096.1	1,096.1	2.6	2.4	166.57	-0.7	45.1	105.0	100.2	4.75	22.095	
1,200.0	1,194.2	1,194.2	1,194.2	3.0	2.6	168.61	-0.7	45.1	124.0	118.8	5.21	23.816	
1,300.0	1,291.7	1,291.7	1,291.7	3.4	2.8	170.26	-0.7	45.1	145.8	140.1	5.67	25.728	
1,347.9	1,338.2	1,338.2	1,338.2	3.6	2.9	170.94	-0.7	45.1	157.1	151.2	5.88	26.696	
1,400.0	1,388.7	1,388.7	1,388.7	3.9	3.0	171.62	-0.7	45.1	169.7	163.6	6.13	27.712	
1,500.0	1,485.6	1,487.8	1,487.8	4.4	3.2	172.43	0.3	45.1	193.6	187.0	6.60	29.358	
1,600.0	1,582.6	1,587.8	1,587.7	4.8	3.5	172.45	3.9	44.9	216.3	209.2	7.07	30.587	
1,700.0	1,679.5	1,688.3	1,688.0	5.3	3.7	171.90	10.1	44.5	237.7	230.2	7.56	31.455	
1,800.0	1,776.5	1,789.2	1,788.5	5.8	3.9	170.91	19.0	44.0	258.0	249.9	8.06	32.014	
1,900.0	1,873.4	1,890.4	1,889.0	6.4	4.2	169.56	30.7	43.4	277.1	268.6	8.58	32.301	
2,000.0	1,970.3	1,991.6	1,989.3	6.9	4.4	167.91	44.9	42.6	295.3	286.2	9.13	32.348	
2,100.0	2,067.3	2,092.9	2,089.1	7.4	4.7	166.00	61.8	41.6	312.7	303.0	9.72	32.180	
2,200.0	2,164.2	2,193.9	2,188.2	7.9	5.0	163.87	81.4	40.5	329.4	319.1	10.35	31.820	
2,300.0	2,261.1	2,294.7	2,286.5	8.4	5.3	161.53	103.4	39.3	345.7	334.7	11.05	31.296	
2,400.0	2,358.1	2,393.4	2,382.4	8.9	5.7	159.12	127.1	38.0	361.9	350.1	11.80	30.682	
2,500.0	2,455.0	2,491.0	2,477.0	9.4	6.1	156.91	150.8	36.6	378.6	366.0	12.58	30.098	
2,600.0	2,551.9	2,588.6	2,571.7	10.0	6.5	154.88	174.4	35.3	395.8	382.4	13.39	29.554	
2,700.0	2,648.9	2,686.1	2,666.3	10.5	6.9	153.03	198.0	34.0	413.5	399.3	14.23	29.053	
2,800.0	2,745.8	2,783.7	2,761.0	11.0	7.3	151.32	221.7	32.6	431.5	416.5	15.09	28.596	
2,900.0	2,842.8	2,881.3	2,855.6	11.5	7.7	149.75	245.3	31.3	449.9	434.0	15.97	28.181	
3,000.0	2,939.7	2,978.8	2,950.3	12.0	8.2	148.31	269.0	30.0	468.7	451.8	16.86	27.805	
3,100.0	3,036.6	3,076.4	3,044.9	12.6	8.6	146.97	292.6	28.7	487.6	469.9	17.75	27.465	
3,200.0	3,133.6	3,174.0	3,139.6	13.1	9.0	145.73	316.2	27.3	506.8	488.2	18.66	27.158	
3,300.0	3,230.5	3,271.5	3,234.2	13.6	9.5	144.59	339.9	26.0	526.3	506.7	19.58	26.880	
3,400.0	3,327.4	3,369.1	3,328.9	14.1	9.9	143.52	363.5	24.7	545.9	525.4	20.50	26.630	
3,500.0	3,424.4	3,466.6	3,423.5	14.6	10.4	142.53	387.1	23.4	565.7	544.2	21.42	26.403	
3,600.0	3,521.3	3,564.2	3,518.2	15.2	10.8	141.60	410.8	22.0	585.6	563.3	22.35	26.198	
3,700.0	3,618.3	3,661.8	3,612.8	15.7	11.3	140.74	434.4	20.7	605.7	582.4	23.29	26.011	
3,800.0	3,715.2	3,759.3	3,707.4	16.2	11.8	139.93	458.1	19.4	625.9	601.7	24.22	25.842	
3,900.0	3,812.1	3,856.9	3,802.1	16.7	12.2	139.17	481.7	18.1	646.2	621.0	25.16	25.688	
4,000.0	3,909.1	3,954.5	3,896.7	17.3	12.7	138.45	505.3	16.7	666.6	640.5	26.09	25.547	
4,100.0	4,006.0	4,052.0	3,991.4	17.8	13.2	137.78	529.0	15.4	687.1	660.1	27.03	25.418	
4,200.0	4,102.9	4,149.6	4,086.0	18.3	13.6	137.15	552.6	14.1	707.7	679.8	27.97	25.301	
4,300.0	4,199.9	4,247.2	4,180.7	18.8	14.1	136.56	576.3	12.7	728.4	699.5	28.91	25.192	
4,400.0	4,296.8	4,344.7	4,275.3	19.4	14.6	135.99	599.9	11.4	749.2	719.3	29.86	25.093	
4,500.0	4,393.7	4,442.3	4,370.0	19.9	15.1	135.46	623.5	10.1	770.0	739.2	30.80	25.002	
4,600.0	4,490.7	4,539.8	4,464.6	20.4	15.5	134.95	647.2	8.8	790.9	759.1	31.74	24.917	
4,700.0	4,587.6	4,637.4	4,559.3	20.9	16.0	134.47	670.8	7.4	811.8	779.1	32.68	24.840	
4,800.0	4,684.6	4,735.0	4,653.9	21.5	16.5	134.02	694.5	6.1	832.8	799.1	33.62	24.768	
4,900.0	4,781.5	4,832.5	4,748.6	22.0	17.0	133.58	718.1	4.8	853.8	819.2	34.57	24.701	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design		Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23D-201 - Wellbore #1 - Plan #1 (9-2-15)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance								Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,878.4	4,930.1	4,843.2	22.5	17.5	133.17	741.7	3.5	874.9	839.4	35.51	24.639			
5,100.0	4,975.4	5,027.7	4,937.9	23.0	17.9	132.78	765.4	2.1	896.0	859.5	36.45	24.581			
5,200.0	5,072.3	5,125.2	5,032.5	23.6	18.4	132.40	789.0	0.8	917.2	879.8	37.39	24.527			
5,300.0	5,169.2	5,224.3	5,128.6	24.1	18.9	132.05	812.9	-0.5	938.3	900.0	38.32	24.483			
5,328.0	5,196.4	5,253.4	5,157.0	24.2	19.0	131.97	819.6	-0.9	944.2	905.6	38.57	24.477			
5,400.0	5,266.4	5,328.6	5,230.5	24.6	19.3	132.02	835.5	-1.8	958.5	919.3	39.18	24.462			
5,500.0	5,364.3	5,433.8	5,333.9	24.9	19.6	132.12	854.5	-2.9	975.7	935.9	39.88	24.467			
5,600.0	5,462.8	5,539.8	5,438.8	25.2	19.9	132.23	869.7	-3.7	990.0	949.5	40.48	24.454			
7,350.0	6,887.2	7,029.8	6,742.8	33.9	28.9	81.20	1,350.4	-5.0	998.7	941.4	57.26	17.441			
7,400.0	6,893.5	7,070.2	6,758.0	34.6	29.6	81.94	1,387.8	-5.0	996.7	938.1	58.62	17.004			
7,450.0	6,896.6	7,111.0	6,771.3	35.3	30.2	82.70	1,426.3	-5.0	994.9	934.8	60.03	16.572			
7,474.6	6,896.9	7,131.3	6,777.2	35.6	30.6	83.08	1,445.7	-5.0	994.0	933.2	60.75	16.361			
7,500.0	6,896.8	7,150.0	6,782.1	36.0	30.9	83.37	1,463.8	-5.0	993.2	931.7	61.51	16.147			
7,600.0	6,896.4	7,238.3	6,799.4	37.4	32.3	84.38	1,550.3	-5.0	991.0	926.2	64.76	15.304			
7,700.0	6,896.1	7,327.1	6,806.6	38.8	33.9	84.82	1,638.8	-5.0	990.2	922.2	67.98	14.566			
7,744.5	6,895.9	7,369.2	6,806.7	39.5	34.6	84.83	1,680.9	-5.0	990.2	920.7	69.46	14.256			
7,800.0	6,895.7	7,424.7	6,806.6	40.3	35.5	84.84	1,736.4	-5.0	990.2	918.8	71.34	13.879			
7,900.0	6,895.3	7,524.7	6,806.3	41.9	37.3	84.84	1,836.4	-5.0	990.2	915.4	74.78	13.240			
8,000.0	6,895.0	7,624.7	6,805.9	43.4	39.0	84.84	1,936.4	-5.0	990.2	911.9	78.26	12.652			
8,100.0	6,894.6	7,724.7	6,805.6	45.0	40.8	84.84	2,036.4	-5.0	990.2	908.4	81.77	12.109			
8,200.0	6,894.2	7,824.7	6,805.3	46.7	42.6	84.85	2,136.4	-5.0	990.1	904.8	85.30	11.607			
8,300.0	6,893.9	7,924.7	6,805.0	48.3	44.4	84.85	2,236.4	-5.0	990.1	901.3	88.86	11.142			
8,400.0	6,893.5	8,024.7	6,804.7	50.0	46.2	84.85	2,336.4	-5.0	990.1	897.7	92.44	10.711			
8,500.0	6,893.1	8,124.7	6,804.4	51.7	48.0	84.86	2,436.4	-5.0	990.1	894.1	96.04	10.309			
8,600.0	6,892.8	8,224.7	6,804.1	53.4	49.9	84.86	2,536.4	-5.0	990.1	890.5	99.66	9.935			
8,700.0	6,892.4	8,324.7	6,803.7	55.1	51.7	84.86	2,636.4	-5.0	990.1	886.8	103.29	9.586			
8,800.0	6,892.0	8,424.7	6,803.4	56.8	53.5	84.87	2,736.4	-5.0	990.1	883.2	106.94	9.259			
8,900.0	6,891.7	8,524.7	6,803.1	58.5	55.4	84.87	2,836.4	-5.0	990.1	879.5	110.60	8.952			
9,000.0	6,891.3	8,624.7	6,802.8	60.3	57.2	84.87	2,936.4	-5.0	990.1	875.8	114.27	8.665			
9,100.0	6,890.9	8,724.7	6,802.5	62.0	59.1	84.87	3,036.4	-5.0	990.1	872.2	117.95	8.395			
9,200.0	6,890.6	8,824.7	6,802.2	63.8	60.9	84.88	3,136.4	-5.0	990.1	868.5	121.64	8.140			
9,300.0	6,890.2	8,924.7	6,801.9	65.6	62.8	84.88	3,236.4	-5.0	990.1	864.8	125.33	7.900			
9,400.0	6,889.8	9,024.7	6,801.5	67.4	64.7	84.88	3,336.4	-5.0	990.1	861.1	129.04	7.673			
9,500.0	6,889.5	9,124.7	6,801.2	69.2	66.5	84.89	3,436.4	-5.0	990.1	857.3	132.75	7.458			
9,600.0	6,889.1	9,224.7	6,800.9	71.0	68.4	84.89	3,536.4	-5.0	990.1	853.6	136.47	7.255			
9,700.0	6,888.7	9,324.7	6,800.6	72.8	70.3	84.89	3,636.4	-5.0	990.1	849.9	140.19	7.062			
9,800.0	6,888.4	9,424.7	6,800.3	74.6	72.2	84.90	3,736.4	-5.0	990.1	846.2	143.92	6.879			
9,900.0	6,888.0	9,524.7	6,800.0	76.4	74.0	84.90	3,836.4	-5.0	990.1	842.4	147.66	6.705			
10,000.0	6,887.6	9,624.7	6,799.7	78.2	75.9	84.90	3,936.4	-5.0	990.1	838.7	151.40	6.540			
10,100.0	6,887.3	9,724.7	6,799.3	80.1	77.8	84.91	4,036.4	-5.0	990.1	834.9	155.14	6.382			
10,200.0	6,886.9	9,824.7	6,799.0	81.9	79.7	84.91	4,136.4	-5.0	990.1	831.2	158.89	6.231			
10,300.0	6,886.5	9,924.7	6,798.7	83.7	81.6	84.91	4,236.4	-5.0	990.1	827.4	162.64	6.087			
10,400.0	6,886.2	10,024.7	6,798.4	85.6	83.5	84.91	4,336.4	-5.0	990.0	823.7	166.40	5.950			
10,500.0	6,885.8	10,124.7	6,798.1	87.4	85.3	84.92	4,436.4	-5.0	990.0	819.9	170.15	5.819			
10,600.0	6,885.4	10,224.7	6,797.8	89.3	87.2	84.92	4,536.4	-5.0	990.0	816.1	173.92	5.693			
10,700.0	6,885.1	10,324.7	6,797.5	91.1	89.1	84.92	4,636.4	-5.0	990.0	812.4	177.68	5.572			
10,800.0	6,884.7	10,424.7	6,797.1	93.0	91.0	84.93	4,736.4	-5.0	990.0	808.6	181.45	5.456			
10,900.0	6,884.3	10,524.7	6,796.8	94.8	92.9	84.93	4,836.4	-5.0	990.0	804.8	185.22	5.345			
11,000.0	6,884.0	10,624.7	6,796.5	96.7	94.8	84.93	4,936.4	-5.0	990.0	801.0	188.99	5.238			
11,100.0	6,883.6	10,724.7	6,796.2	98.5	96.7	84.94	5,036.4	-5.0	990.0	797.3	192.76	5.136			
11,200.0	6,883.2	10,824.7	6,795.9	100.4	98.6	84.94	5,136.4	-5.0	990.0	793.5	196.54	5.037			

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23D-201 - Wellbore #1 - Plan #1 (9-2-15)												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
11,300.0	6,882.9	10,924.7	6,795.6	102.3	100.5	84.94	5,236.4	-5.0	990.0	789.7	200.32	4.942	
11,400.0	6,882.5	11,024.7	6,795.3	104.1	102.4	84.94	5,336.4	-5.0	990.0	785.9	204.10	4.851	
11,500.0	6,882.1	11,124.7	6,794.9	106.0	104.3	84.95	5,436.4	-5.0	990.0	782.1	207.88	4.762	
11,600.0	6,881.8	11,224.7	6,794.6	107.9	106.2	84.95	5,536.4	-5.0	990.0	778.3	211.67	4.677	
11,700.0	6,881.4	11,324.7	6,794.3	109.7	108.1	84.95	5,636.4	-5.0	990.0	774.5	215.45	4.595	
11,800.0	6,881.0	11,424.7	6,794.0	111.6	110.0	84.96	5,736.4	-5.0	990.0	770.7	219.24	4.516	
11,900.0	6,880.7	11,524.7	6,793.7	113.5	111.9	84.96	5,836.4	-5.0	990.0	767.0	223.03	4.439	
12,000.0	6,880.3	11,624.7	6,793.4	115.4	113.8	84.96	5,936.4	-5.0	990.0	763.2	226.82	4.365	
12,100.0	6,879.9	11,724.7	6,793.1	117.2	115.7	84.97	6,036.4	-5.0	990.0	759.4	230.61	4.293	
12,200.0	6,879.6	11,824.7	6,792.7	119.1	117.6	84.97	6,136.4	-5.0	990.0	755.6	234.40	4.223	
12,300.0	6,879.2	11,924.7	6,792.4	121.0	119.5	84.97	6,236.4	-5.0	990.0	751.8	238.19	4.156	
12,400.0	6,878.8	12,024.7	6,792.1	122.9	121.4	84.97	6,336.4	-5.0	990.0	748.0	241.99	4.091	
12,500.0	6,878.5	12,124.7	6,791.8	124.8	123.3	84.98	6,436.4	-5.0	990.0	744.2	245.79	4.028	
12,600.0	6,878.1	12,224.7	6,791.5	126.7	125.2	84.98	6,536.4	-5.0	989.9	740.4	249.58	3.966	
12,700.0	6,877.7	12,324.7	6,791.2	128.5	127.1	84.98	6,636.4	-5.0	989.9	736.6	253.38	3.907	
12,800.0	6,877.4	12,424.7	6,790.9	130.4	129.0	84.99	6,736.4	-5.0	989.9	732.8	257.18	3.849	
12,900.0	6,877.0	12,524.7	6,790.5	132.3	130.9	84.99	6,836.4	-5.0	989.9	729.0	260.98	3.793	
13,000.0	6,876.6	12,624.7	6,790.2	134.2	132.9	84.99	6,936.4	-5.0	989.9	725.1	264.78	3.739	
13,100.0	6,876.3	12,724.7	6,789.9	136.1	134.8	85.00	7,036.4	-5.0	989.9	721.3	268.58	3.686	
13,200.0	6,875.9	12,824.7	6,789.6	138.0	136.7	85.00	7,136.4	-5.0	989.9	717.5	272.38	3.634	
13,300.0	6,875.5	12,924.7	6,789.3	139.9	138.6	85.00	7,236.4	-5.0	989.9	713.7	276.19	3.584	
13,400.0	6,875.2	13,024.7	6,789.0	141.8	140.5	85.00	7,336.4	-5.0	989.9	709.9	279.99	3.535	
13,500.0	6,874.8	13,124.7	6,788.7	143.6	142.4	85.01	7,436.4	-5.0	989.9	706.1	283.80	3.488	
13,600.0	6,874.4	13,224.7	6,788.3	145.5	144.3	85.01	7,536.4	-5.0	989.9	702.3	287.60	3.442	
13,700.0	6,874.1	13,324.7	6,788.0	147.4	146.2	85.01	7,636.4	-5.0	989.9	698.5	291.41	3.397	
13,800.0	6,873.7	13,424.7	6,787.7	149.3	148.1	85.02	7,736.4	-5.0	989.9	694.7	295.21	3.353	
13,900.0	6,873.3	13,524.7	6,787.4	151.2	150.0	85.02	7,836.4	-5.0	989.9	690.9	299.02	3.310	
14,000.0	6,873.0	13,624.7	6,787.1	153.1	151.9	85.02	7,936.4	-5.0	989.9	687.1	302.83	3.269	
14,100.0	6,872.6	13,724.7	6,786.8	155.0	153.9	85.03	8,036.4	-5.0	989.9	683.2	306.64	3.228	
14,200.0	6,872.2	13,824.7	6,786.5	156.9	155.8	85.03	8,136.4	-5.0	989.9	679.4	310.45	3.189	
14,300.0	6,871.9	13,924.7	6,786.1	158.8	157.7	85.03	8,236.4	-5.0	989.9	675.6	314.26	3.150	
14,400.0	6,871.5	14,024.7	6,785.8	160.7	159.6	85.03	8,336.4	-5.0	989.9	671.8	318.07	3.112	
14,500.0	6,871.1	14,124.7	6,785.5	162.6	161.5	85.04	8,436.4	-5.0	989.9	668.0	321.88	3.075	
14,600.0	6,870.8	14,224.7	6,785.2	164.5	163.4	85.04	8,536.4	-5.0	989.9	664.2	325.69	3.039	
14,700.0	6,870.4	14,324.7	6,784.9	166.4	165.3	85.04	8,636.4	-5.0	989.9	660.4	329.50	3.004	
14,800.0	6,870.0	14,424.7	6,784.6	168.3	167.2	85.05	8,736.4	-5.0	989.8	656.5	333.31	2.970	
14,900.0	6,869.7	14,524.7	6,784.3	170.2	169.2	85.05	8,836.4	-5.0	989.8	652.7	337.12	2.936	
15,000.0	6,869.3	14,624.7	6,783.9	172.1	171.1	85.05	8,936.4	-5.0	989.8	648.9	340.94	2.903	
15,100.0	6,868.9	14,724.7	6,783.6	174.0	173.0	85.06	9,036.4	-5.0	989.8	645.1	344.75	2.871	
15,200.0	6,868.6	14,824.7	6,783.3	175.9	174.9	85.06	9,136.4	-5.0	989.8	641.3	348.56	2.840	
15,300.0	6,868.2	14,924.7	6,783.0	177.8	176.8	85.06	9,236.4	-5.0	989.8	637.4	352.38	2.809	
15,400.0	6,867.8	15,024.7	6,782.7	179.7	178.7	85.07	9,336.4	-5.0	989.8	633.6	356.19	2.779	
15,500.0	6,867.5	15,124.7	6,782.4	181.6	180.6	85.07	9,436.4	-5.0	989.8	629.8	360.01	2.749	
15,600.0	6,867.1	15,224.7	6,782.1	183.5	182.5	85.07	9,536.4	-5.0	989.8	626.0	363.82	2.721	
15,618.9	6,867.0	15,243.6	6,782.0	183.9	182.9	85.07	9,555.3	-5.0	989.8	625.3	364.54	2.715	
15,628.0	6,867.0	15,243.9	6,782.0	184.1	182.9	85.07	9,555.5	-5.0	989.8	625.1	364.72	2.714 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23D-341 - Wellbore #1 - Plan #1 (9-2-15)													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		
0.0	0.0	0.0	0.0	0.0	0.0	90.70	-0.4	30.1	30.1					
100.0	100.0	100.0	100.0	0.1	0.1	90.70	-0.4	30.1	30.1	29.9	0.22	133.878		
200.0	200.0	200.0	200.0	0.3	0.3	90.70	-0.4	30.1	30.1	29.4	0.67	44.626		
300.0	300.0	300.0	300.0	0.6	0.6	90.70	-0.4	30.1	30.1	29.0	1.12	26.776		
400.0	400.0	400.0	400.0	0.8	0.8	90.70	-0.4	30.1	30.1	28.5	1.57	19.125 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	148.94	-0.4	30.1	31.2	29.2	2.02	15.446		
600.0	599.9	599.9	599.9	1.2	1.2	152.27	-0.4	30.1	34.6	32.2	2.47	14.029		
700.0	699.7	699.7	699.7	1.5	1.5	156.54	-0.4	30.1	40.5	37.6	2.92	13.874		
800.0	799.3	799.3	799.3	1.7	1.7	160.75	-0.4	30.1	49.1	45.7	3.38	14.527		
900.0	898.6	898.6	898.6	2.0	1.9	164.39	-0.4	30.1	60.3	56.5	3.83	15.724		
1,000.0	997.5	997.5	997.5	2.3	2.1	167.32	-0.4	30.1	74.2	69.9	4.29	17.295		
1,100.0	1,096.1	1,097.6	1,097.6	2.6	2.4	169.06	0.8	29.7	90.0	85.2	4.75	18.955		
1,200.0	1,194.2	1,198.0	1,197.9	3.0	2.6	169.48	4.5	28.3	106.6	101.4	5.20	20.487		
1,300.0	1,291.7	1,298.5	1,298.2	3.4	2.8	169.09	10.6	26.1	124.0	118.3	5.67	21.882		
1,347.9	1,338.2	1,346.7	1,346.2	3.6	2.9	168.70	14.4	24.7	132.6	126.7	5.89	22.500		
1,400.0	1,388.7	1,399.2	1,398.5	3.9	3.0	168.18	19.2	23.0	141.8	135.7	6.15	23.077		
1,500.0	1,485.6	1,500.4	1,499.0	4.4	3.3	166.78	30.4	18.9	158.3	151.7	6.65	23.791		
1,600.0	1,582.6	1,602.0	1,599.5	4.8	3.6	164.94	44.1	13.9	173.2	166.0	7.20	24.072		
1,700.0	1,679.5	1,703.7	1,699.8	5.3	3.9	162.74	60.4	8.0	186.7	178.9	7.78	23.993		
1,800.0	1,776.5	1,805.6	1,799.6	5.8	4.2	160.18	79.2	1.1	198.9	190.5	8.42	23.614		
1,900.0	1,873.4	1,907.4	1,898.9	6.4	4.6	157.31	100.4	-6.6	210.1	200.9	9.14	22.993		
2,000.0	1,970.3	2,008.4	1,996.8	6.9	5.0	154.15	123.9	-15.2	220.4	210.5	9.93	22.202		
2,100.0	2,067.3	2,107.1	2,092.2	7.4	5.4	151.16	147.7	-23.8	231.1	220.3	10.78	21.440		
2,200.0	2,164.2	2,205.9	2,187.7	7.9	5.9	148.44	171.4	-32.5	242.3	230.6	11.67	20.762		
2,300.0	2,261.1	2,304.6	2,283.1	8.4	6.3	145.97	195.1	-41.1	254.0	241.4	12.59	20.166		
2,400.0	2,358.1	2,403.3	2,378.6	8.9	6.8	143.71	218.8	-49.8	266.1	252.6	13.55	19.646		
2,500.0	2,455.0	2,502.1	2,474.0	9.4	7.2	141.65	242.6	-58.4	278.6	264.1	14.52	19.192		
2,600.0	2,551.9	2,600.8	2,569.4	10.0	7.7	139.76	266.3	-67.1	291.4	275.9	15.50	18.797		
2,700.0	2,648.9	2,699.5	2,664.9	10.5	8.2	138.04	290.0	-75.7	304.6	288.1	16.50	18.454		
2,800.0	2,745.8	2,798.3	2,760.3	11.0	8.7	136.46	313.7	-84.4	317.9	300.4	17.51	18.154		
2,900.0	2,842.8	2,897.0	2,855.8	11.5	9.2	135.00	337.5	-93.0	331.5	313.0	18.53	17.893		
3,000.0	2,939.7	2,995.7	2,951.2	12.0	9.7	133.66	361.2	-101.7	345.3	325.8	19.55	17.664		
3,100.0	3,036.6	3,094.5	3,046.7	12.6	10.2	132.43	384.9	-110.3	359.3	338.7	20.57	17.463		
3,200.0	3,133.6	3,193.2	3,142.1	13.1	10.7	131.28	408.7	-119.0	373.4	351.8	21.60	17.287		
3,300.0	3,230.5	3,291.9	3,237.6	13.6	11.2	130.22	432.4	-127.6	387.6	365.0	22.63	17.131		
3,400.0	3,327.4	3,390.7	3,333.0	14.1	11.7	129.24	456.1	-136.3	402.0	378.3	23.66	16.993		
3,500.0	3,424.4	3,489.4	3,428.5	14.6	12.2	128.32	479.8	-144.9	416.5	391.8	24.69	16.870		
3,600.0	3,521.3	3,588.1	3,523.9	15.2	12.7	127.46	503.6	-153.5	431.0	405.3	25.72	16.761		
3,700.0	3,618.3	3,686.9	3,619.4	15.7	13.2	126.67	527.3	-162.2	445.7	418.9	26.75	16.663		
3,800.0	3,715.2	3,785.6	3,714.8	16.2	13.7	125.92	551.0	-170.8	460.4	432.7	27.78	16.576		
3,900.0	3,812.1	3,884.3	3,810.3	16.7	14.3	125.21	574.8	-179.5	475.2	446.4	28.81	16.497		
4,000.0	3,909.1	3,983.1	3,905.7	17.3	14.8	124.55	598.5	-188.1	490.1	460.3	29.84	16.427		
4,100.0	4,006.0	4,081.8	4,001.2	17.8	15.3	123.93	622.2	-196.8	505.1	474.2	30.87	16.363		
4,200.0	4,102.9	4,180.5	4,096.6	18.3	15.8	123.35	645.9	-205.4	520.1	488.2	31.89	16.305		
4,300.0	4,199.9	4,279.3	4,192.1	18.8	16.3	122.79	669.7	-214.1	535.1	502.2	32.92	16.253		
4,400.0	4,296.8	4,378.0	4,287.5	19.4	16.8	122.27	693.4	-222.7	550.2	516.2	33.95	16.206		
4,500.0	4,393.7	4,476.7	4,383.0	19.9	17.3	121.78	717.1	-231.4	565.3	530.3	34.98	16.163		
4,600.0	4,490.7	4,575.5	4,478.4	20.4	17.9	121.31	740.9	-240.0	580.5	544.5	36.00	16.123		
4,700.0	4,587.6	4,674.2	4,573.9	20.9	18.4	120.86	764.6	-248.7	595.7	558.7	37.03	16.087		
4,800.0	4,684.6	4,772.9	4,669.3	21.5	18.9	120.44	788.3	-257.3	610.9	572.9	38.05	16.054		
4,900.0	4,781.5	4,871.7	4,764.8	22.0	19.4	120.04	812.0	-265.9	626.2	587.1	39.08	16.024		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23D-341 - Wellbore #1 - Plan #1 (9-2-15)												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	4,878.4	4,970.4	4,860.2	22.5	19.9	119.65	835.8	-274.6	641.5	601.4	40.10	15.997	
5,100.0	4,975.4	5,069.1	4,955.7	23.0	20.4	119.29	859.5	-283.2	656.9	615.7	41.13	15.971	
5,200.0	5,072.3	5,167.9	5,051.1	23.6	21.0	118.94	883.2	-291.9	672.2	630.1	42.15	15.948	
5,300.0	5,169.2	5,266.6	5,146.6	24.1	21.5	118.61	907.0	-300.5	687.6	644.4	43.17	15.926	
5,328.0	5,196.4	5,294.4	5,173.5	24.2	21.6	118.52	913.6	-303.0	691.9	648.4	43.46	15.922	
5,400.0	5,266.4	5,368.0	5,244.9	24.6	21.9	118.49	930.3	-309.0	702.4	658.3	44.08	15.936	
5,500.0	5,364.3	5,470.6	5,345.1	24.9	22.3	118.46	950.7	-316.5	715.2	670.4	44.82	15.957	
5,600.0	5,462.8	5,573.6	5,446.5	25.2	22.6	118.44	967.7	-322.7	725.9	680.4	45.47	15.963	
5,700.0	5,561.9	5,677.0	5,548.9	25.5	22.9	118.43	981.3	-327.6	734.4	688.3	46.03	15.953	
5,800.0	5,661.4	5,780.7	5,652.0	25.7	23.1	118.42	991.5	-331.3	740.7	694.2	46.50	15.929	
5,900.0	5,761.2	5,884.5	5,755.6	25.9	23.3	118.41	998.2	-333.8	744.9	698.0	46.87	15.891	
6,000.0	5,861.1	5,988.5	5,859.5	26.0	23.5	118.41	1,001.4	-334.9	746.8	699.7	47.15	15.838	
6,038.9	5,900.0	6,029.0	5,900.0	26.0	23.5	61.45	1,001.6	-335.0	747.0	699.7	47.24	15.813	
6,100.0	5,961.1	6,090.1	5,961.1	26.1	23.6	61.45	1,001.6	-335.0	747.0	699.6	47.37	15.769	
6,200.0	6,061.1	6,190.1	6,061.1	26.2	23.7	61.45	1,001.6	-335.0	747.0	699.4	47.61	15.691	
6,242.9	6,104.1	6,233.0	6,104.1	26.2	23.8	61.45	1,001.6	-335.0	747.0	699.3	47.71	15.657	
6,271.8	6,132.9	6,250.0	6,121.0	26.3	23.8	61.45	1,001.6	-335.0	747.1	699.3	47.76	15.641	
6,300.0	6,161.1	6,276.4	6,147.4	26.3	23.8	61.43	1,002.2	-335.0	747.1	699.3	47.83	15.620	
6,350.0	6,211.0	6,310.4	6,181.4	26.4	23.9	61.46	1,004.3	-335.0	746.9	699.0	47.92	15.588	
6,400.0	6,260.5	6,350.0	6,220.7	26.5	24.0	61.59	1,008.6	-335.0	746.2	698.2	48.01	15.543	
6,450.0	6,309.5	6,378.6	6,249.0	26.6	24.1	61.77	1,012.9	-335.0	745.0	696.9	48.08	15.496	
6,500.0	6,357.7	6,412.8	6,282.5	26.8	24.2	62.05	1,019.6	-335.0	743.3	695.2	48.16	15.436	
6,550.0	6,405.0	6,450.0	6,318.6	27.0	24.4	62.43	1,028.4	-335.0	741.2	692.9	48.25	15.363	
6,600.0	6,451.1	6,481.4	6,348.7	27.2	24.6	62.84	1,037.3	-335.0	738.6	690.3	48.33	15.281	
6,650.0	6,495.9	6,515.8	6,381.3	27.5	24.8	63.36	1,048.4	-335.0	735.6	687.1	48.45	15.184	
6,700.0	6,539.0	6,550.0	6,413.1	27.7	25.0	63.96	1,060.9	-335.0	732.1	683.6	48.58	15.071	
6,750.0	6,580.5	6,585.0	6,445.1	28.0	25.2	64.65	1,075.2	-335.0	728.4	679.6	48.76	14.936	
6,800.0	6,620.0	6,619.9	6,476.2	28.4	25.5	65.41	1,090.8	-335.0	724.2	675.2	48.99	14.783	
6,850.0	6,657.5	6,650.0	6,502.6	28.7	25.8	66.17	1,105.5	-335.0	719.8	670.6	49.23	14.622	
6,900.0	6,692.7	6,690.2	6,536.7	29.1	26.1	67.17	1,126.6	-335.0	715.2	665.5	49.63	14.410	
6,950.0	6,725.5	6,725.7	6,566.0	29.5	26.4	68.17	1,146.7	-335.0	710.3	660.2	50.07	14.186	
7,000.0	6,755.8	6,761.4	6,594.4	30.0	26.8	69.25	1,168.4	-335.0	705.3	654.7	50.59	13.940	
7,050.0	6,783.4	6,800.0	6,624.0	30.5	27.2	70.45	1,193.2	-335.0	700.2	648.9	51.25	13.663	
7,100.0	6,808.2	6,833.8	6,648.8	31.0	27.6	71.62	1,216.2	-335.0	695.1	643.1	51.95	13.380	
7,150.0	6,830.1	6,870.6	6,674.6	31.5	28.0	72.92	1,242.3	-335.0	690.0	637.2	52.79	13.071	
7,200.0	6,849.0	6,907.7	6,699.4	32.1	28.5	74.28	1,270.0	-335.0	685.0	631.2	53.74	12.747	
7,250.0	6,864.9	6,950.0	6,725.9	32.7	29.0	75.84	1,302.9	-335.0	680.2	625.3	54.88	12.394	
7,300.0	6,877.6	6,983.4	6,745.5	33.3	29.5	77.19	1,329.9	-335.0	675.6	619.6	55.97	12.069	
7,350.0	6,887.2	7,022.0	6,766.7	33.9	30.0	78.72	1,362.1	-335.0	671.3	614.0	57.25	11.725	
7,400.0	6,893.5	7,061.2	6,786.6	34.6	30.6	80.31	1,395.9	-335.0	667.4	608.8	58.63	11.383	
7,450.0	6,896.6	7,100.0	6,804.5	35.3	31.1	81.91	1,430.4	-335.0	664.0	603.9	60.08	11.052	
7,474.6	6,896.9	7,120.9	6,813.4	35.6	31.5	82.76	1,449.3	-335.0	662.5	601.6	60.86	10.885	
7,500.0	6,896.8	7,141.8	6,821.8	36.0	31.8	83.49	1,468.4	-335.0	661.2	599.4	61.72	10.712	
7,600.0	6,896.4	7,228.5	6,850.9	37.4	33.1	86.04	1,550.1	-335.0	657.8	592.7	65.12	10.102	
7,700.0	6,896.1	7,321.6	6,871.7	38.8	34.7	87.87	1,640.7	-335.0	656.6	588.1	68.54	9.579	
7,800.0	6,895.7	7,418.7	6,881.4	40.3	36.3	88.76	1,737.2	-335.0	656.3	584.3	71.97	9.119	
7,851.6	6,895.5	7,469.7	6,881.9	41.1	37.2	88.81	1,788.2	-335.0	656.3	582.5	73.74	8.900	
7,900.0	6,895.3	7,518.1	6,881.8	41.9	38.0	88.82	1,836.7	-335.0	656.3	580.9	75.41	8.703	
8,000.0	6,895.0	7,618.1	6,881.6	43.4	39.7	88.84	1,936.7	-335.0	656.3	577.4	78.89	8.319	
8,100.0	6,894.6	7,718.1	6,881.4	45.0	41.5	88.85	2,036.7	-335.0	656.3	573.9	82.40	7.964	
8,200.0	6,894.2	7,818.1	6,881.2	46.7	43.2	88.87	2,136.7	-335.0	656.3	570.3	85.94	7.636	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23D-341 - Wellbore #1 - Plan #1 (9-2-15)												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
8,300.0	6,893.9	7,918.1	6,881.1	48.3	45.0	88.88	2,236.7	-335.0	656.3	566.7	89.51	7.332	
8,400.0	6,893.5	8,018.1	6,880.9	50.0	46.8	88.90	2,336.7	-335.0	656.3	563.2	93.10	7.049	
8,500.0	6,893.1	8,118.1	6,880.7	51.7	48.6	88.91	2,436.7	-335.0	656.3	559.5	96.70	6.786	
8,600.0	6,892.8	8,218.1	6,880.5	53.4	50.4	88.93	2,536.7	-335.0	656.2	555.9	100.33	6.541	
8,700.0	6,892.4	8,318.1	6,880.3	55.1	52.2	88.94	2,636.7	-335.0	656.2	552.3	103.97	6.312	
8,800.0	6,892.0	8,418.1	6,880.1	56.8	54.0	88.96	2,736.7	-335.0	656.2	548.6	107.62	6.098	
8,900.0	6,891.7	8,518.1	6,879.9	58.5	55.9	88.97	2,836.7	-335.0	656.2	545.0	111.29	5.897	
9,000.0	6,891.3	8,618.1	6,879.7	60.3	57.7	88.99	2,936.7	-335.0	656.2	541.3	114.97	5.708	
9,100.0	6,890.9	8,718.1	6,879.5	62.0	59.5	89.00	3,036.7	-335.0	656.2	537.6	118.65	5.531	
9,200.0	6,890.6	8,818.1	6,879.3	63.8	61.4	89.02	3,136.7	-335.0	656.2	533.9	122.35	5.363	
9,300.0	6,890.2	8,918.1	6,879.1	65.6	63.2	89.03	3,236.7	-335.0	656.2	530.2	126.06	5.206	
9,400.0	6,889.8	9,018.1	6,878.9	67.4	65.1	89.05	3,336.7	-335.0	656.2	526.5	129.77	5.057	
9,500.0	6,889.5	9,118.1	6,878.8	69.2	66.9	89.07	3,436.7	-335.0	656.2	522.7	133.49	4.916	
9,600.0	6,889.1	9,218.1	6,878.6	71.0	68.8	89.08	3,536.7	-335.0	656.2	519.0	137.22	4.782	
9,700.0	6,888.7	9,318.1	6,878.4	72.8	70.7	89.10	3,636.7	-335.0	656.2	515.3	140.96	4.655	
9,800.0	6,888.4	9,418.1	6,878.2	74.6	72.5	89.11	3,736.7	-335.0	656.2	511.5	144.70	4.535	
9,900.0	6,888.0	9,518.1	6,878.0	76.4	74.4	89.13	3,836.7	-335.0	656.2	507.8	148.44	4.421	
10,000.0	6,887.6	9,618.1	6,877.8	78.2	76.3	89.14	3,936.7	-335.0	656.2	504.0	152.19	4.312	
10,100.0	6,887.3	9,718.1	6,877.6	80.1	78.1	89.16	4,036.7	-335.0	656.2	500.3	155.94	4.208	
10,200.0	6,886.9	9,818.1	6,877.4	81.9	80.0	89.17	4,136.7	-335.0	656.2	496.5	159.70	4.109	
10,300.0	6,886.5	9,918.1	6,877.2	83.7	81.9	89.19	4,236.7	-335.0	656.2	492.7	163.47	4.014	
10,400.0	6,886.2	10,018.1	6,877.0	85.6	83.8	89.20	4,336.7	-335.0	656.2	489.0	167.23	3.924	
10,500.0	6,885.8	10,118.1	6,876.8	87.4	85.6	89.22	4,436.7	-335.0	656.2	485.2	171.00	3.837	
10,600.0	6,885.4	10,218.1	6,876.6	89.3	87.5	89.23	4,536.7	-335.0	656.2	481.4	174.77	3.755	
10,700.0	6,885.1	10,318.1	6,876.4	91.1	89.4	89.25	4,636.7	-335.0	656.2	477.6	178.55	3.675	
10,800.0	6,884.7	10,418.1	6,876.3	93.0	91.3	89.26	4,736.7	-335.0	656.2	473.9	182.33	3.599	
10,900.0	6,884.3	10,518.1	6,876.1	94.8	93.2	89.28	4,836.7	-335.0	656.2	470.1	186.11	3.526	
11,000.0	6,884.0	10,618.1	6,875.9	96.7	95.1	89.29	4,936.7	-335.0	656.2	466.3	189.89	3.456	
11,100.0	6,883.6	10,718.1	6,875.7	98.5	97.0	89.31	5,036.7	-335.0	656.2	462.5	193.68	3.388	
11,200.0	6,883.2	10,818.1	6,875.5	100.4	98.9	89.32	5,136.7	-335.0	656.2	458.7	197.47	3.323	
11,300.0	6,882.9	10,918.1	6,875.3	102.3	100.7	89.34	5,236.7	-335.0	656.2	454.9	201.26	3.260	
11,400.0	6,882.5	11,018.1	6,875.1	104.1	102.6	89.35	5,336.7	-335.0	656.2	451.1	205.05	3.200	
11,500.0	6,882.1	11,118.1	6,874.9	106.0	104.5	89.37	5,436.7	-335.0	656.2	447.3	208.84	3.142	
11,600.0	6,881.8	11,218.1	6,874.7	107.9	106.4	89.39	5,536.7	-335.0	656.2	443.5	212.64	3.086	
11,700.0	6,881.4	11,318.1	6,874.5	109.7	108.3	89.40	5,636.7	-335.0	656.2	439.7	216.43	3.032	
11,800.0	6,881.0	11,418.1	6,874.3	111.6	110.2	89.42	5,736.7	-335.0	656.2	435.9	220.23	2.979	
11,900.0	6,880.7	11,518.1	6,874.1	113.5	112.1	89.43	5,836.7	-335.0	656.2	432.1	224.03	2.929	
12,000.0	6,880.3	11,618.1	6,874.0	115.4	114.0	89.45	5,936.7	-335.0	656.2	428.3	227.83	2.880	
12,100.0	6,879.9	11,718.1	6,873.8	117.2	115.9	89.46	6,036.7	-335.0	656.2	424.5	231.64	2.833	
12,200.0	6,879.6	11,818.1	6,873.6	119.1	117.8	89.48	6,136.7	-335.0	656.2	420.7	235.44	2.787	
12,300.0	6,879.2	11,918.1	6,873.4	121.0	119.7	89.49	6,236.7	-335.0	656.2	416.9	239.25	2.743	
12,400.0	6,878.8	12,018.1	6,873.2	122.9	121.6	89.51	6,336.7	-335.0	656.2	413.1	243.05	2.700	
12,500.0	6,878.5	12,118.1	6,873.0	124.8	123.5	89.52	6,436.7	-335.0	656.2	409.3	246.86	2.658	
12,600.0	6,878.1	12,218.1	6,872.8	126.7	125.4	89.54	6,536.7	-335.0	656.2	405.5	250.67	2.618	
12,700.0	6,877.7	12,318.1	6,872.6	128.5	127.3	89.55	6,636.7	-335.0	656.2	401.7	254.48	2.578	
12,800.0	6,877.4	12,418.1	6,872.4	130.4	129.2	89.57	6,736.7	-335.0	656.2	397.9	258.29	2.540	
12,900.0	6,877.0	12,518.1	6,872.2	132.3	131.1	89.58	6,836.7	-335.0	656.2	394.1	262.10	2.503	
13,000.0	6,876.6	12,618.1	6,872.0	134.2	133.0	89.60	6,936.7	-335.0	656.1	390.2	265.91	2.468	
13,100.0	6,876.3	12,718.1	6,871.8	136.1	134.9	89.61	7,036.7	-335.0	656.1	386.4	269.72	2.433	
13,200.0	6,875.9	12,818.1	6,871.6	138.0	136.9	89.63	7,136.7	-335.0	656.1	382.6	273.54	2.399	
13,300.0	6,875.5	12,918.1	6,871.5	139.9	138.8	89.64	7,236.7	-335.0	656.1	378.8	277.35	2.366	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design		Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23D-341 - Wellbore #1 - Plan #1 (9-2-15)										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		
13,400.0	6,875.2	13,018.1	6,871.3	141.8	140.7	89.66	7,336.7	-335.0	656.1	375.0	281.17	2.334		
13,500.0	6,874.8	13,118.1	6,871.1	143.6	142.6	89.67	7,436.7	-335.0	656.1	371.2	284.98	2.302		
13,600.0	6,874.4	13,218.1	6,870.9	145.5	144.5	89.69	7,536.7	-335.0	656.1	367.3	288.80	2.272		
13,700.0	6,874.1	13,318.1	6,870.7	147.4	146.4	89.71	7,636.7	-335.0	656.1	363.5	292.62	2.242		
13,800.0	6,873.7	13,418.1	6,870.5	149.3	148.3	89.72	7,736.7	-335.0	656.1	359.7	296.44	2.213		
13,900.0	6,873.3	13,518.1	6,870.3	151.2	150.2	89.74	7,836.7	-335.0	656.1	355.9	300.26	2.185		
14,000.0	6,873.0	13,618.1	6,870.1	153.1	152.1	89.75	7,936.7	-335.0	656.1	352.1	304.07	2.158		
14,100.0	6,872.6	13,718.1	6,869.9	155.0	154.0	89.77	8,036.7	-335.0	656.1	348.2	307.89	2.131		
14,200.0	6,872.2	13,818.1	6,869.7	156.9	155.9	89.78	8,136.7	-335.0	656.1	344.4	311.71	2.105		
14,300.0	6,871.9	13,918.1	6,869.5	158.8	157.8	89.80	8,236.7	-335.0	656.1	340.6	315.54	2.079		
14,400.0	6,871.5	14,018.1	6,869.3	160.7	159.7	89.81	8,336.7	-335.0	656.1	336.8	319.36	2.055		
14,500.0	6,871.1	14,118.1	6,869.2	162.6	161.7	89.83	8,436.7	-335.0	656.1	333.0	323.18	2.030		
14,600.0	6,870.8	14,218.1	6,869.0	164.5	163.6	89.84	8,536.7	-335.0	656.1	329.1	327.00	2.007		
14,700.0	6,870.4	14,318.1	6,868.8	166.4	165.5	89.86	8,636.7	-335.0	656.1	325.3	330.82	1.983		
14,800.0	6,870.0	14,418.1	6,868.6	168.3	167.4	89.87	8,736.7	-335.0	656.1	321.5	334.65	1.961		
14,900.0	6,869.7	14,518.1	6,868.4	170.2	169.3	89.89	8,836.7	-335.0	656.1	317.7	338.47	1.939		
15,000.0	6,869.3	14,618.1	6,868.2	172.1	171.2	89.90	8,936.7	-335.0	656.1	313.8	342.29	1.917		
15,100.0	6,868.9	14,718.1	6,868.0	174.0	173.1	89.92	9,036.7	-335.0	656.1	310.0	346.12	1.896		
15,200.0	6,868.6	14,818.1	6,867.8	175.9	175.0	89.93	9,136.7	-335.0	656.1	306.2	349.94	1.875		
15,300.0	6,868.2	14,918.1	6,867.6	177.8	176.9	89.95	9,236.7	-335.0	656.1	302.4	353.77	1.855		
15,400.0	6,867.8	15,018.1	6,867.4	179.7	178.8	89.96	9,336.7	-335.0	656.1	298.5	357.59	1.835		
15,500.0	6,867.5	15,118.1	6,867.2	181.6	180.8	89.98	9,436.7	-335.0	656.1	294.7	361.42	1.815		
15,600.0	6,867.1	15,218.1	6,867.0	183.5	182.7	89.99	9,536.7	-335.0	656.1	290.9	365.24	1.796		
15,610.5	6,867.1	15,228.6	6,867.0	183.7	182.9	90.00	9,547.1	-335.0	656.1	290.5	365.64	1.794		
15,628.0	6,867.0	15,239.9	6,867.0	184.1	183.1	90.00	9,558.5	-335.0	656.2	290.0	366.20	1.792 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-90.02	0.0	-15.0	15.0	15.0	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	-90.02	0.0	-15.0	15.0	14.8	0.22	66.934		
200.0	200.0	200.0	200.0	0.3	0.3	-90.02	0.0	-15.0	15.0	14.4	0.67	22.311 CC		
300.0	300.0	299.7	299.6	0.6	0.6	-87.34	0.7	-16.1	16.1	15.0	1.12	14.399		
400.0	400.0	399.2	399.1	0.8	0.8	-81.14	3.0	-19.3	19.5	18.0	1.57	12.438		
500.0	500.0	498.5	498.2	1.0	1.0	-18.57	6.8	-24.5	24.3	22.3	2.01	12.063		
600.0	599.9	597.7	597.0	1.2	1.3	-14.62	12.0	-31.9	29.1	26.7	2.46	11.835		
700.0	699.7	696.8	695.4	1.5	1.6	-11.65	18.7	-41.3	34.0	31.1	2.92	11.664		
800.0	799.3	795.8	793.3	1.7	1.9	-9.29	26.9	-52.8	39.0	35.6	3.38	11.521		
900.0	898.6	894.6	890.7	2.0	2.2	-7.33	36.5	-66.4	43.9	40.1	3.86	11.391		
1,000.0	997.5	993.2	987.6	2.3	2.6	-5.65	47.6	-81.9	48.9	44.5	4.34	11.267		
1,100.0	1,096.1	1,091.8	1,083.7	2.6	3.0	-4.17	60.1	-99.5	53.8	49.0	4.83	11.143		
1,200.0	1,194.2	1,190.2	1,179.2	3.0	3.5	-2.85	74.0	-119.1	58.7	53.4	5.33	11.016		
1,300.0	1,291.7	1,288.5	1,273.9	3.4	4.0	-1.64	89.3	-140.6	63.6	57.7	5.84	10.883		
1,347.9	1,338.2	1,335.6	1,318.9	3.6	4.3	-1.10	97.1	-151.6	65.9	59.8	6.09	10.819		
1,400.0	1,388.7	1,386.7	1,367.7	3.9	4.6	-0.52	106.0	-164.1	68.8	62.4	6.37	10.799		
1,500.0	1,485.6	1,485.4	1,461.3	4.4	5.2	0.50	124.0	-189.5	76.1	69.1	6.92	10.985		
1,600.0	1,582.6	1,585.1	1,555.8	4.8	5.8	1.37	142.5	-215.4	83.8	76.3	7.49	11.189		
1,700.0	1,679.5	1,684.8	1,650.3	5.3	6.5	2.08	161.0	-241.4	91.5	83.5	8.06	11.356		
1,800.0	1,776.5	1,784.5	1,744.7	5.8	7.1	2.68	179.4	-267.4	99.3	90.6	8.64	11.493		
1,900.0	1,873.4	1,884.2	1,839.2	6.4	7.8	3.20	197.9	-293.4	107.0	97.8	9.22	11.607		
2,000.0	1,970.3	1,983.9	1,933.6	6.9	8.4	3.65	216.4	-319.4	114.8	105.0	9.81	11.703		
2,100.0	2,067.3	2,083.5	2,028.1	7.4	9.1	4.04	234.8	-345.3	122.5	112.1	10.40	11.784		
2,200.0	2,164.2	2,183.2	2,122.6	7.9	9.8	4.38	253.3	-371.3	130.3	119.3	10.99	11.853		
2,300.0	2,261.1	2,282.9	2,217.0	8.4	10.4	4.68	271.8	-397.3	138.1	126.5	11.59	11.913		
2,400.0	2,358.1	2,382.6	2,311.5	8.9	11.1	4.96	290.3	-423.3	145.9	133.7	12.19	11.964		
2,500.0	2,455.0	2,482.3	2,405.9	9.4	11.7	5.20	308.7	-449.2	153.6	140.9	12.79	12.009		
2,600.0	2,551.9	2,582.0	2,500.4	10.0	12.4	5.42	327.2	-475.2	161.4	148.0	13.40	12.048		
2,700.0	2,648.9	2,681.7	2,594.9	10.5	13.1	5.62	345.7	-501.2	169.2	155.2	14.01	12.082		
2,800.0	2,745.8	2,781.4	2,689.3	11.0	13.7	5.81	364.1	-527.2	177.0	162.4	14.61	12.113		
2,900.0	2,842.8	2,881.1	2,783.8	11.5	14.4	5.97	382.6	-553.2	184.8	169.6	15.22	12.140		
3,000.0	2,939.7	2,980.8	2,878.3	12.0	15.1	6.13	401.1	-579.1	192.6	176.8	15.83	12.164		
3,100.0	3,036.6	3,080.5	2,972.7	12.6	15.7	6.27	419.6	-605.1	200.4	183.9	16.44	12.185		
3,200.0	3,133.6	3,180.2	3,067.2	13.1	16.4	6.40	438.0	-631.1	208.2	191.1	17.06	12.205		
3,300.0	3,230.5	3,279.9	3,161.6	13.6	17.1	6.52	456.5	-657.1	216.0	198.3	17.67	12.222		
3,400.0	3,327.4	3,379.6	3,256.1	14.1	17.7	6.64	475.0	-683.0	223.8	205.5	18.28	12.238		
3,500.0	3,424.4	3,479.3	3,350.6	14.6	18.4	6.74	493.4	-709.0	231.6	212.7	18.90	12.252		
3,600.0	3,521.3	3,579.0	3,445.0	15.2	19.1	6.84	511.9	-735.0	239.4	219.8	19.52	12.265		
3,700.0	3,618.3	3,678.7	3,539.5	15.7	19.7	6.93	530.4	-761.0	247.2	227.0	20.13	12.277		
3,800.0	3,715.2	3,778.4	3,633.9	16.2	20.4	7.02	548.9	-787.0	255.0	234.2	20.75	12.288		
3,900.0	3,812.1	3,878.1	3,728.4	16.7	21.1	7.10	567.3	-812.9	262.8	241.4	21.37	12.298		
4,000.0	3,909.1	3,977.7	3,822.9	17.3	21.7	7.18	585.8	-838.9	270.6	248.6	21.98	12.308		
4,100.0	4,006.0	4,077.4	3,917.3	17.8	22.4	7.25	604.3	-864.9	278.4	255.8	22.60	12.316		
4,200.0	4,102.9	4,177.1	4,011.8	18.3	23.1	7.32	622.7	-890.9	286.2	262.9	23.22	12.324		
4,300.0	4,199.9	4,276.8	4,106.3	18.8	23.7	7.39	641.2	-916.8	294.0	270.1	23.84	12.331		
4,400.0	4,296.8	4,376.5	4,200.7	19.4	24.4	7.45	659.7	-942.8	301.8	277.3	24.46	12.338		
4,500.0	4,393.7	4,476.2	4,295.2	19.9	25.1	7.51	678.2	-968.8	309.6	284.5	25.08	12.344		
4,600.0	4,490.7	4,575.9	4,389.6	20.4	25.8	7.56	696.6	-994.8	317.4	291.7	25.70	12.350		
4,700.0	4,587.6	4,675.6	4,484.1	20.9	26.4	7.62	715.1	-1,020.8	325.2	298.9	26.32	12.356		
4,800.0	4,684.6	4,775.3	4,578.6	21.5	27.1	7.67	733.6	-1,046.7	333.0	306.0	26.94	12.361		
4,900.0	4,781.5	4,875.0	4,673.0	22.0	27.8	7.71	752.0	-1,072.7	340.8	313.2	27.56	12.365		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design		Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23P-201 - Wellbore #1 - Plan #1 (8-31-15)											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	4,878.4	4,974.7	4,767.5	22.5	28.4	7.76	770.5	-1,098.7	348.6	320.4	28.18	12.370			
5,100.0	4,975.4	5,074.4	4,861.9	23.0	29.1	7.80	789.0	-1,124.7	356.4	327.6	28.80	12.374			
5,200.0	5,072.3	5,174.1	4,956.4	23.6	29.8	7.85	807.5	-1,150.6	364.2	334.8	29.42	12.378			
5,300.0	5,169.2	5,284.2	5,061.1	24.1	30.4	7.91	827.2	-1,178.5	371.0	340.9	30.06	12.344			
5,328.0	5,196.4	5,316.3	5,091.9	24.2	30.6	7.94	832.6	-1,186.0	372.2	342.0	30.23	12.314			
5,400.0	5,266.4	5,399.0	5,171.5	24.6	31.0	8.02	845.4	-1,204.1	374.9	344.3	30.63	12.241			
5,500.0	5,364.3	5,514.0	5,283.3	24.9	31.4	8.12	861.1	-1,226.1	378.1	347.0	31.09	12.164			
5,600.0	5,462.8	5,629.1	5,396.2	25.2	31.8	8.21	874.1	-1,244.4	380.8	349.3	31.48	12.099			
5,700.0	5,561.9	5,744.4	5,510.0	25.5	32.1	8.27	884.5	-1,259.1	383.0	351.2	31.79	12.046			
5,800.0	5,661.4	5,859.8	5,624.6	25.7	32.4	8.32	892.3	-1,270.0	384.6	352.5	32.04	12.005			
5,900.0	5,761.2	5,975.2	5,739.7	25.9	32.6	8.35	897.4	-1,277.1	385.6	353.4	32.21	11.974			
6,000.0	5,861.1	6,090.7	5,855.1	26.0	32.7	8.37	899.8	-1,280.5	386.1	353.8	32.30	11.954			
6,038.9	5,900.0	6,135.6	5,900.0	26.0	32.8	-48.60	900.0	-1,280.8	386.2	353.8	32.32	11.948			
6,100.0	5,961.1	6,196.7	5,961.1	26.1	32.8	-48.60	900.0	-1,280.8	386.2	353.6	32.51	11.878			
6,163.6	6,024.7	6,260.3	6,024.7	26.2	32.9	-48.60	900.0	-1,280.8	386.2	353.4	32.72	11.801			
6,200.0	6,061.1	6,294.6	6,059.0	26.2	32.9	-48.59	900.0	-1,280.8	386.2	353.3	32.84	11.760			
6,271.8	6,132.9	6,350.0	6,114.4	26.3	33.0	-48.32	902.5	-1,280.8	388.3	355.2	33.11	11.728			
6,300.0	6,161.1	6,369.3	6,133.5	26.3	33.0	-48.09	904.3	-1,280.8	389.6	356.2	33.40	11.664			
6,350.0	6,211.0	6,400.0	6,164.0	26.4	33.1	-47.76	908.2	-1,280.8	391.7	357.9	33.85	11.574			
6,400.0	6,260.5	6,443.5	6,206.9	26.5	33.2	-47.47	915.7	-1,280.8	393.2	358.9	34.22	11.489			
6,450.0	6,309.5	6,480.6	6,243.0	26.6	33.3	-47.31	924.1	-1,280.8	394.1	359.6	34.48	11.429			
6,500.0	6,357.7	6,517.6	6,278.6	26.8	33.4	-47.25	934.2	-1,280.8	394.4	359.8	34.65	11.384			
6,550.0	6,405.0	6,550.0	6,309.3	27.0	33.5	-47.29	944.4	-1,280.8	394.2	359.5	34.73	11.349			
6,553.0	6,407.8	6,556.9	6,315.8	27.0	33.6	-47.30	946.7	-1,280.8	394.1	359.4	34.75	11.343			
6,600.0	6,451.1	6,591.7	6,348.2	27.2	33.7	-47.43	959.4	-1,280.8	393.4	358.6	34.79	11.305			
6,650.0	6,495.9	6,628.7	6,382.0	27.5	33.9	-47.67	974.6	-1,280.8	392.0	357.1	34.83	11.253			
6,700.0	6,539.0	6,665.9	6,415.1	27.7	34.1	-48.02	991.4	-1,280.8	390.0	355.1	34.90	11.177			
6,750.0	6,580.5	6,700.0	6,444.8	28.0	34.3	-48.43	1,008.3	-1,280.8	387.6	352.6	35.01	11.070			
6,800.0	6,620.0	6,740.4	6,478.9	28.4	34.5	-49.01	1,029.9	-1,280.8	384.5	349.3	35.27	10.902			
6,850.0	6,657.5	6,777.9	6,509.5	28.7	34.8	-49.67	1,051.6	-1,280.8	381.0	345.3	35.68	10.679			
6,900.0	6,692.7	6,815.4	6,539.0	29.1	35.0	-50.44	1,074.8	-1,280.8	377.0	340.7	36.30	10.388			
6,950.0	6,725.5	6,850.0	6,565.2	29.5	35.3	-51.27	1,097.4	-1,280.8	372.6	335.5	37.12	10.039			
7,000.0	6,755.8	6,891.1	6,594.9	30.0	35.6	-52.34	1,125.8	-1,280.8	367.8	329.5	38.30	9.603			
7,050.0	6,783.4	6,929.3	6,621.1	30.5	35.9	-53.47	1,153.5	-1,280.8	362.5	322.8	39.73	9.125			
7,100.0	6,808.2	6,967.7	6,646.0	31.0	36.3	-54.73	1,182.7	-1,280.8	357.0	315.6	41.46	8.611			
7,150.0	6,830.1	7,006.4	6,669.6	31.5	36.6	-56.14	1,213.4	-1,280.8	351.3	307.8	43.48	8.079			
7,200.0	6,849.0	7,050.0	6,694.3	32.1	37.1	-57.82	1,249.3	-1,280.8	345.3	299.5	45.87	7.528			
7,250.0	6,864.9	7,084.6	6,712.5	32.7	37.4	-59.36	1,278.8	-1,280.8	339.2	290.9	48.26	7.029			
7,300.0	6,877.6	7,124.3	6,731.6	33.3	37.8	-61.20	1,313.6	-1,280.8	333.0	282.1	50.94	6.538			
7,350.0	6,887.2	7,164.3	6,749.0	33.9	38.3	-63.19	1,349.6	-1,280.8	326.9	273.2	53.74	6.084			
7,400.0	6,893.5	7,204.8	6,764.7	34.6	38.7	-65.34	1,386.9	-1,280.8	320.9	264.3	56.60	5.671			
7,450.0	6,896.6	7,245.8	6,778.5	35.3	39.2	-67.64	1,425.5	-1,280.8	315.2	255.7	59.45	5.302			
7,474.6	6,896.9	7,266.2	6,784.6	35.6	39.5	-68.83	1,444.9	-1,280.8	312.5	251.6	60.83	5.136			
7,500.0	6,896.8	7,287.4	6,790.4	36.0	39.7	-69.85	1,465.4	-1,280.8	309.9	248.1	61.83	5.012			
7,600.0	6,896.4	7,373.9	6,808.1	37.4	40.8	-73.05	1,550.0	-1,280.8	303.1	237.6	65.53	4.625			
7,700.0	6,896.1	7,463.6	6,816.3	38.8	42.0	-74.60	1,639.3	-1,280.8	300.4	231.5	68.91	4.360			
7,753.7	6,895.9	7,514.6	6,816.6	39.6	42.7	-74.70	1,690.3	-1,280.8	300.3	229.6	70.64	4.251			
7,800.0	6,895.7	7,561.0	6,816.6	40.3	43.4	-74.72	1,736.6	-1,280.8	300.3	228.1	72.16	4.161			
7,900.0	6,895.3	7,661.0	6,816.4	41.9	44.8	-74.77	1,836.6	-1,280.8	300.2	224.7	75.48	3.977			
8,000.0	6,895.0	7,761.0	6,816.3	43.4	46.3	-74.81	1,936.6	-1,280.8	300.1	221.3	78.83	3.807			
8,100.0	6,894.6	7,861.0	6,816.2	45.0	47.7	-74.86	2,036.6	-1,280.8	300.1	217.8	82.22	3.650			

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23P-201 - Wellbore #1 - Plan #1 (8-31-15)												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
8,200.0	6,894.2	7,961.0	6,816.1	46.7	49.3	-74.90	2,136.6	-1,280.8	300.0	214.4	85.63	3.503	
8,300.0	6,893.9	8,060.9	6,816.0	48.3	50.8	-74.95	2,236.6	-1,280.8	299.9	210.9	89.08	3.367	
8,400.0	6,893.5	8,160.9	6,815.8	50.0	52.4	-74.99	2,336.6	-1,280.8	299.9	207.3	92.55	3.240	
8,500.0	6,893.1	8,260.9	6,815.7	51.7	54.0	-75.04	2,436.6	-1,280.8	299.8	203.8	96.04	3.122	
8,600.0	6,892.8	8,360.9	6,815.6	53.4	55.6	-75.08	2,536.6	-1,280.8	299.7	200.2	99.55	3.011	
8,700.0	6,892.4	8,460.9	6,815.5	55.1	57.3	-75.13	2,636.6	-1,280.8	299.7	196.6	103.07	2.907	
8,800.0	6,892.0	8,560.9	6,815.3	56.8	58.9	-75.17	2,736.6	-1,280.8	299.6	193.0	106.62	2.810	
8,900.0	6,891.7	8,660.9	6,815.2	58.5	60.6	-75.22	2,836.6	-1,280.8	299.6	189.4	110.17	2.719	
9,000.0	6,891.3	8,760.9	6,815.1	60.3	62.3	-75.26	2,936.6	-1,280.8	299.5	185.7	113.74	2.633	
9,100.0	6,890.9	8,860.9	6,815.0	62.0	64.0	-75.31	3,036.6	-1,280.8	299.4	182.1	117.33	2.552	
9,200.0	6,890.6	8,960.9	6,814.9	63.8	65.7	-75.35	3,136.6	-1,280.8	299.4	178.4	120.92	2.476	
9,300.0	6,890.2	9,060.9	6,814.7	65.6	67.4	-75.40	3,236.6	-1,280.8	299.3	174.8	124.52	2.404	
9,400.0	6,889.8	9,160.9	6,814.6	67.4	69.1	-75.44	3,336.6	-1,280.8	299.2	171.1	128.14	2.335	
9,500.0	6,889.5	9,260.9	6,814.5	69.2	70.9	-75.49	3,436.6	-1,280.8	299.2	167.4	131.76	2.271	
9,600.0	6,889.1	9,360.9	6,814.4	71.0	72.6	-75.53	3,536.6	-1,280.8	299.1	163.7	135.39	2.209	
9,700.0	6,888.7	9,460.9	6,814.2	72.8	74.4	-75.58	3,636.6	-1,280.8	299.1	160.0	139.03	2.151	
9,800.0	6,888.4	9,560.9	6,814.1	74.6	76.2	-75.62	3,736.6	-1,280.8	299.0	156.3	142.68	2.096	
9,900.0	6,888.0	9,660.9	6,814.0	76.4	78.0	-75.67	3,836.6	-1,280.8	298.9	152.6	146.33	2.043	
10,000.0	6,887.6	9,760.9	6,813.9	78.2	79.7	-75.71	3,936.6	-1,280.8	298.9	148.9	149.99	1.993	
10,100.0	6,887.3	9,860.9	6,813.8	80.1	81.5	-75.76	4,036.6	-1,280.8	298.8	145.2	153.66	1.945	
10,200.0	6,886.9	9,960.9	6,813.6	81.9	83.3	-75.81	4,136.6	-1,280.8	298.8	141.4	157.33	1.899	
10,300.0	6,886.5	10,060.9	6,813.5	83.7	85.1	-75.85	4,236.6	-1,280.8	298.7	137.7	161.00	1.855	
10,400.0	6,886.2	10,160.9	6,813.4	85.6	86.9	-75.90	4,336.6	-1,280.8	298.6	134.0	164.68	1.813	
10,500.0	6,885.8	10,260.9	6,813.3	87.4	88.7	-75.94	4,436.6	-1,280.8	298.6	130.2	168.37	1.773	
10,600.0	6,885.4	10,360.9	6,813.1	89.3	90.6	-75.99	4,536.6	-1,280.8	298.5	126.5	172.06	1.735	
10,700.0	6,885.1	10,460.9	6,813.0	91.1	92.4	-76.03	4,636.6	-1,280.8	298.5	122.7	175.76	1.698	
10,800.0	6,884.7	10,560.9	6,812.9	93.0	94.2	-76.08	4,736.6	-1,280.8	298.4	118.9	179.46	1.663	
10,900.0	6,884.3	10,660.9	6,812.8	94.8	96.0	-76.12	4,836.6	-1,280.8	298.3	115.2	183.16	1.629	
11,000.0	6,884.0	10,760.9	6,812.7	96.7	97.9	-76.17	4,936.6	-1,280.8	298.3	111.4	186.87	1.596	
11,100.0	6,883.6	10,860.9	6,812.5	98.5	99.7	-76.21	5,036.6	-1,280.8	298.2	107.7	190.58	1.565	
11,200.0	6,883.2	10,960.9	6,812.4	100.4	101.5	-76.26	5,136.6	-1,280.8	298.2	103.9	194.29	1.535	
11,300.0	6,882.9	11,060.9	6,812.3	102.3	103.4	-76.31	5,236.6	-1,280.8	298.1	100.1	198.01	1.506	
11,400.0	6,882.5	11,160.9	6,812.2	104.1	105.2	-76.35	5,336.6	-1,280.8	298.1	96.3	201.73	1.477 Level 3	
11,500.0	6,882.1	11,260.9	6,812.0	106.0	107.1	-76.40	5,436.6	-1,280.8	298.0	92.5	205.45	1.450 Level 3	
11,600.0	6,881.8	11,360.9	6,811.9	107.9	108.9	-76.44	5,536.6	-1,280.8	297.9	88.8	209.18	1.424 Level 3	
11,700.0	6,881.4	11,460.9	6,811.8	109.7	110.8	-76.49	5,636.6	-1,280.8	297.9	85.0	212.91	1.399 Level 3	
11,800.0	6,881.0	11,560.9	6,811.7	111.6	112.6	-76.53	5,736.6	-1,280.8	297.8	81.2	216.64	1.375 Level 3	
11,900.0	6,880.7	11,660.9	6,811.6	113.5	114.5	-76.58	5,836.6	-1,280.8	297.8	77.4	220.38	1.351 Level 3	
12,000.0	6,880.3	11,760.9	6,811.4	115.4	116.3	-76.63	5,936.6	-1,280.8	297.7	73.6	224.12	1.328 Level 3	
12,100.0	6,879.9	11,860.9	6,811.3	117.2	118.2	-76.67	6,036.6	-1,280.8	297.7	69.8	227.86	1.306 Level 3	
12,200.0	6,879.6	11,960.9	6,811.2	119.1	120.1	-76.72	6,136.6	-1,280.8	297.6	66.0	231.60	1.285 Level 3	
12,300.0	6,879.2	12,060.9	6,811.1	121.0	121.9	-76.76	6,236.6	-1,280.8	297.5	62.2	235.35	1.264 Level 3	
12,400.0	6,878.8	12,160.9	6,810.9	122.9	123.8	-76.81	6,336.6	-1,280.8	297.5	58.4	239.09	1.244 Level 2	
12,500.0	6,878.5	12,260.9	6,810.8	124.8	125.7	-76.85	6,436.6	-1,280.8	297.4	54.6	242.84	1.225 Level 2	
12,600.0	6,878.1	12,360.9	6,810.7	126.7	127.5	-76.90	6,536.6	-1,280.8	297.4	50.8	246.60	1.206 Level 2	
12,700.0	6,877.7	12,460.9	6,810.6	128.5	129.4	-76.95	6,636.6	-1,280.8	297.3	47.0	250.35	1.188 Level 2	
12,800.0	6,877.4	12,560.9	6,810.5	130.4	131.3	-76.99	6,736.6	-1,280.8	297.3	43.2	254.11	1.170 Level 2	
12,900.0	6,877.0	12,660.9	6,810.3	132.3	133.1	-77.04	6,836.6	-1,280.8	297.2	39.3	257.86	1.153 Level 2	
13,000.0	6,876.6	12,760.9	6,810.2	134.2	135.0	-77.08	6,936.6	-1,280.8	297.2	35.5	261.63	1.136 Level 2	
13,100.0	6,876.3	12,860.9	6,810.1	136.1	136.9	-77.13	7,036.6	-1,280.8	297.1	31.7	265.39	1.119 Level 2	
13,200.0	6,875.9	12,960.9	6,810.0	138.0	138.8	-77.18	7,136.6	-1,280.8	297.0	27.9	269.15	1.104 Level 2	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23P-201 - Wellbore #1 - Plan #1 (8-31-15)													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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
13,300.0	6,875.5	13,060.9	6,809.8	139.9	140.7	-77.22	7,236.6	-1,280.8	297.0	24.1	272.92	1.088	Level 2	
13,400.0	6,875.2	13,160.9	6,809.7	141.8	142.5	-77.27	7,336.6	-1,280.8	296.9	20.3	276.69	1.073	Level 2	
13,500.0	6,874.8	13,260.9	6,809.6	143.6	144.4	-77.31	7,436.6	-1,280.8	296.9	16.4	280.46	1.059	Level 2	
13,600.0	6,874.4	13,360.9	6,809.5	145.5	146.3	-77.36	7,536.6	-1,280.8	296.8	12.6	284.23	1.044	Level 2	
13,700.0	6,874.1	13,460.9	6,809.4	147.4	148.2	-77.41	7,636.6	-1,280.8	296.8	8.8	288.00	1.030	Level 2	
13,800.0	6,873.7	13,560.9	6,809.2	149.3	150.1	-77.45	7,736.6	-1,280.8	296.7	4.9	291.78	1.017	Level 2	
13,900.0	6,873.3	13,660.9	6,809.1	151.2	151.9	-77.50	7,836.6	-1,280.8	296.7	1.1	295.55	1.004	Level 2	
14,000.0	6,873.0	13,760.9	6,809.0	153.1	153.8	-77.54	7,936.6	-1,280.8	296.6	-2.7	299.33	0.991	Level 1	
14,100.0	6,872.6	13,860.9	6,808.9	155.0	155.7	-77.59	8,036.6	-1,280.8	296.6	-6.5	303.11	0.978	Level 1	
14,200.0	6,872.2	13,960.9	6,808.7	156.9	157.6	-77.64	8,136.6	-1,280.8	296.5	-10.4	306.89	0.966	Level 1	
14,300.0	6,871.9	14,060.9	6,808.6	158.8	159.5	-77.68	8,236.6	-1,280.8	296.5	-14.2	310.68	0.954	Level 1	
14,400.0	6,871.5	14,160.9	6,808.5	160.7	161.4	-77.73	8,336.6	-1,280.8	296.4	-18.1	314.46	0.943	Level 1	
14,500.0	6,871.1	14,260.9	6,808.4	162.6	163.3	-77.77	8,436.6	-1,280.8	296.4	-21.9	318.25	0.931	Level 1	
14,600.0	6,870.8	14,360.9	6,808.3	164.5	165.2	-77.82	8,536.6	-1,280.8	296.3	-25.7	322.04	0.920	Level 1	
14,700.0	6,870.4	14,460.9	6,808.1	166.4	167.1	-77.87	8,636.6	-1,280.8	296.3	-29.6	325.82	0.909	Level 1	
14,800.0	6,870.0	14,560.9	6,808.0	168.3	168.9	-77.91	8,736.6	-1,280.8	296.2	-33.4	329.61	0.899	Level 1	
14,900.0	6,869.7	14,660.9	6,807.9	170.2	170.8	-77.96	8,836.6	-1,280.8	296.1	-37.3	333.41	0.888	Level 1	
15,000.0	6,869.3	14,760.9	6,807.8	172.1	172.7	-78.01	8,936.6	-1,280.8	296.1	-41.1	337.20	0.878	Level 1	
15,100.0	6,868.9	14,860.9	6,807.6	174.0	174.6	-78.05	9,036.6	-1,280.8	296.0	-44.9	340.99	0.868	Level 1	
15,200.0	6,868.6	14,960.9	6,807.5	175.9	176.5	-78.10	9,136.6	-1,280.8	296.0	-48.8	344.79	0.858	Level 1	
15,300.0	6,868.2	15,060.9	6,807.4	177.8	178.4	-78.14	9,236.6	-1,280.8	295.9	-52.6	348.59	0.849	Level 1	
15,400.0	6,867.8	15,160.9	6,807.3	179.7	180.3	-78.19	9,336.6	-1,280.8	295.9	-56.5	352.39	0.840	Level 1	
15,500.0	6,867.5	15,260.9	6,807.2	181.6	182.2	-78.24	9,436.6	-1,280.8	295.8	-60.3	356.19	0.831	Level 1	
15,600.0	6,867.1	15,360.9	6,807.0	183.5	184.1	-78.28	9,536.6	-1,280.8	295.8	-64.2	359.99	0.822	Level 1	
15,628.0	6,867.0	15,388.9	6,807.0	184.1	184.6	-78.30	9,564.6	-1,280.8	295.8	-65.3	361.05	0.819	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23P-221 - Wellbore #1 - Plan #1 (9-2-15)												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	91.40	-0.4	15.0	15.0	15.0	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	91.40	-0.4	15.0	15.0	14.8	0.22	66.954	
200.0	200.0	200.0	200.0	0.3	0.3	91.40	-0.4	15.0	15.0	14.4	0.67	22.318	
300.0	300.0	300.0	300.0	0.6	0.6	91.40	-0.4	15.0	15.0	13.9	1.12	13.391	
400.0	400.0	400.0	400.0	0.8	0.8	91.40	-0.4	15.0	15.0	13.5	1.57	9.565 CC	
500.0	500.0	500.0	500.0	1.0	1.0	150.79	-0.4	15.0	16.2	14.2	2.02	8.007	
600.0	599.9	599.9	599.9	1.2	1.2	156.35	-0.4	15.0	19.7	17.2	2.47	7.978	
700.0	699.7	700.2	700.2	1.5	1.5	160.34	0.7	14.2	24.8	21.9	2.92	8.497	
800.0	799.3	800.6	800.5	1.7	1.7	161.47	3.8	11.8	30.4	27.0	3.37	9.020	
900.0	898.6	901.1	900.8	2.0	1.9	161.00	9.0	7.8	36.3	32.5	3.82	9.510	
1,000.0	997.5	1,001.7	1,001.0	2.3	2.2	159.60	16.3	2.1	42.7	38.4	4.29	9.964	
1,100.0	1,096.1	1,102.4	1,101.0	2.6	2.4	157.68	25.7	-5.1	49.6	44.8	4.78	10.378	
1,200.0	1,194.2	1,203.2	1,200.7	3.0	2.7	155.46	37.2	-14.0	56.9	51.6	5.30	10.744	
1,300.0	1,291.7	1,304.0	1,300.0	3.4	3.0	153.10	50.8	-24.5	64.9	59.0	5.87	11.052	
1,347.9	1,338.2	1,352.2	1,347.4	3.6	3.2	151.94	58.1	-30.1	68.9	62.7	6.16	11.171	
1,400.0	1,388.7	1,404.8	1,398.9	3.9	3.4	150.58	66.5	-36.6	73.1	66.6	6.50	11.236	
1,500.0	1,485.6	1,505.8	1,497.3	4.4	3.8	147.24	84.2	-50.3	80.0	72.7	7.23	11.063	
1,600.0	1,582.6	1,605.9	1,594.5	4.8	4.2	143.32	103.5	-65.2	85.9	77.8	8.05	10.664	
1,700.0	1,679.5	1,705.6	1,691.1	5.3	4.7	139.83	122.7	-80.1	92.0	83.1	8.93	10.301	
1,800.0	1,776.5	1,805.3	1,787.8	5.8	5.2	136.78	142.0	-94.9	98.5	88.6	9.86	9.991	
1,900.0	1,873.4	1,904.9	1,884.4	6.4	5.6	134.12	161.3	-109.8	105.2	94.4	10.81	9.728	
2,000.0	1,970.3	2,004.6	1,981.0	6.9	6.1	131.78	180.6	-124.7	112.1	100.3	11.79	9.507	
2,100.0	2,067.3	2,104.3	2,077.7	7.4	6.6	129.71	199.9	-139.6	119.2	106.4	12.79	9.320	
2,200.0	2,164.2	2,203.9	2,174.3	7.9	7.1	127.88	219.2	-154.5	126.4	112.6	13.79	9.162	
2,300.0	2,261.1	2,303.6	2,270.9	8.4	7.6	126.25	238.4	-169.4	133.7	118.9	14.81	9.029	
2,400.0	2,358.1	2,403.2	2,367.6	8.9	8.1	124.78	257.7	-184.3	141.1	125.3	15.83	8.914	
2,500.0	2,455.0	2,502.9	2,464.2	9.4	8.6	123.47	277.0	-199.2	148.6	131.7	16.86	8.816	
2,600.0	2,551.9	2,602.6	2,560.9	10.0	9.1	122.28	296.3	-214.1	156.2	138.3	17.88	8.732	
2,700.0	2,648.9	2,702.2	2,657.5	10.5	9.6	121.20	315.6	-229.0	163.8	144.9	18.92	8.659	
2,800.0	2,745.8	2,801.9	2,754.1	11.0	10.1	120.21	334.9	-243.9	171.5	151.5	19.95	8.595	
2,900.0	2,842.8	2,901.6	2,850.8	11.5	10.6	119.31	354.1	-258.8	179.2	158.2	20.99	8.539	
3,000.0	2,939.7	3,001.2	2,947.4	12.0	11.1	118.49	373.4	-273.7	187.0	165.0	22.02	8.490	
3,100.0	3,036.6	3,100.9	3,044.1	12.6	11.6	117.73	392.7	-288.6	194.8	171.7	23.06	8.447	
3,200.0	3,133.6	3,200.5	3,140.7	13.1	12.1	117.03	412.0	-303.5	202.6	178.5	24.10	8.409	
3,300.0	3,230.5	3,300.2	3,237.3	13.6	12.6	116.38	431.3	-318.4	210.5	185.3	25.13	8.374	
3,400.0	3,327.4	3,399.9	3,334.0	14.1	13.1	115.78	450.6	-333.3	218.4	192.2	26.17	8.344	
3,500.0	3,424.4	3,499.5	3,430.6	14.6	13.6	115.22	469.8	-348.2	226.3	199.1	27.21	8.316	
3,600.0	3,521.3	3,599.2	3,527.3	15.2	14.2	114.70	489.1	-363.1	234.2	206.0	28.25	8.292	
3,700.0	3,618.3	3,698.9	3,623.9	15.7	14.7	114.21	508.4	-377.9	242.2	212.9	29.28	8.269	
3,800.0	3,715.2	3,798.5	3,720.5	16.2	15.2	113.76	527.7	-392.8	250.1	219.8	30.32	8.249	
3,900.0	3,812.1	3,898.2	3,817.2	16.7	15.7	113.33	547.0	-407.7	258.1	226.7	31.36	8.231	
4,000.0	3,909.1	3,997.9	3,913.8	17.3	16.2	112.93	566.3	-422.6	266.1	233.7	32.40	8.214	
4,100.0	4,006.0	4,097.5	4,010.4	17.8	16.7	112.55	585.5	-437.5	274.1	240.7	33.43	8.198	
4,200.0	4,102.9	4,197.2	4,107.1	18.3	17.2	112.19	604.8	-452.4	282.1	247.6	34.47	8.184	
4,300.0	4,199.9	4,296.8	4,203.7	18.8	17.7	111.85	624.1	-467.3	290.1	254.6	35.51	8.171	
4,400.0	4,296.8	4,396.5	4,300.4	19.4	18.3	111.53	643.4	-482.2	298.2	261.6	36.54	8.160	
4,500.0	4,393.7	4,496.2	4,397.0	19.9	18.8	111.23	662.7	-497.1	306.2	268.6	37.58	8.149	
4,600.0	4,490.7	4,595.8	4,493.6	20.4	19.3	110.94	682.0	-512.0	314.3	275.7	38.62	8.138	
4,700.0	4,587.6	4,695.5	4,590.3	20.9	19.8	110.67	701.2	-526.9	322.3	282.7	39.65	8.129	
4,800.0	4,684.6	4,795.2	4,686.9	21.5	20.3	110.41	720.5	-541.8	330.4	289.7	40.69	8.120	
4,900.0	4,781.5	4,894.8	4,783.6	22.0	20.8	110.16	739.8	-556.7	338.5	296.7	41.72	8.112	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23P-221 - Wellbore #1 - Plan #1 (9-2-15)													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	4,878.4	4,994.5	4,880.2	22.5	21.3	109.93	759.1	-571.6	346.6	303.8	42.76	8.105		
5,100.0	4,975.4	5,094.1	4,976.8	23.0	21.8	109.70	778.4	-586.5	354.6	310.8	43.79	8.098		
5,200.0	5,072.3	5,193.8	5,073.5	23.6	22.4	109.49	797.7	-601.4	362.7	317.9	44.83	8.091		
5,300.0	5,169.2	5,293.5	5,170.1	24.1	22.9	109.28	816.9	-616.3	370.8	325.0	45.86	8.085		
5,328.0	5,196.4	5,321.4	5,197.2	24.2	23.0	109.23	822.3	-620.4	373.1	326.9	46.15	8.084		
5,400.0	5,266.4	5,393.1	5,266.9	24.6	23.3	109.19	835.6	-630.7	378.6	331.8	46.80	8.090		
5,500.0	5,364.3	5,492.8	5,364.5	24.9	23.7	109.14	851.7	-643.1	385.4	337.8	47.52	8.110		
5,600.0	5,462.8	5,592.6	5,462.9	25.2	24.0	109.11	865.1	-653.5	391.0	342.8	48.14	8.121		
5,700.0	5,561.9	5,692.5	5,561.8	25.5	24.3	109.09	875.8	-661.7	395.4	346.8	48.68	8.124		
5,800.0	5,661.4	5,792.5	5,661.3	25.7	24.5	109.07	883.7	-667.9	398.8	349.6	49.12	8.118		
5,900.0	5,761.2	5,892.5	5,761.1	25.9	24.7	109.06	889.0	-671.9	400.9	351.5	49.47	8.104		
6,000.0	5,861.1	5,992.5	5,861.1	26.0	24.8	109.05	891.4	-673.8	402.0	352.2	49.73	8.082		
6,038.9	5,900.0	6,031.5	5,900.0	26.0	24.8	52.09	891.6	-674.0	402.0	352.2	49.81	8.071		
6,100.0	5,961.1	6,092.6	5,961.1	26.1	24.9	52.09	891.6	-674.0	402.0	352.1	49.94	8.051		
6,159.2	6,020.3	6,151.8	6,020.3	26.1	25.0	52.09	891.6	-674.0	402.0	352.0	50.07	8.029		
6,200.0	6,061.1	6,188.1	6,066.7	26.2	25.0	52.08	891.8	-674.0	402.1	352.0	50.17	8.016		
6,271.8	6,132.9	6,242.2	6,110.7	26.3	25.1	51.75	894.6	-674.0	404.5	354.1	50.38	8.030		
6,300.0	6,161.1	6,263.3	6,131.7	26.3	25.2	51.47	896.8	-674.0	406.0	355.5	50.47	8.044		
6,350.0	6,211.0	6,300.0	6,168.0	26.4	25.3	51.05	901.9	-674.0	408.2	357.6	50.59	8.070		
6,400.0	6,260.5	6,338.0	6,205.3	26.5	25.4	50.72	909.1	-674.0	410.0	359.3	50.66	8.092		
6,450.0	6,309.5	6,375.3	6,241.5	26.6	25.5	50.50	917.9	-674.0	411.2	360.5	50.68	8.113		
6,500.0	6,357.7	6,412.5	6,277.2	26.8	25.7	50.37	928.4	-674.0	411.8	361.2	50.65	8.131		
6,550.0	6,405.0	6,450.0	6,312.6	27.0	25.9	50.35	940.8	-674.0	412.0	361.4	50.57	8.148		
6,600.0	6,451.1	6,486.9	6,346.8	27.2	26.1	50.42	954.7	-674.0	411.6	361.2	50.44	8.160		
6,650.0	6,495.9	6,524.1	6,380.5	27.5	26.3	50.59	970.3	-674.0	410.7	360.4	50.29	8.167		
6,700.0	6,539.0	6,561.4	6,413.6	27.7	26.6	50.85	987.6	-674.0	409.3	359.1	50.10	8.168		
6,750.0	6,580.5	6,600.0	6,446.9	28.0	26.9	51.23	1,007.2	-674.0	407.3	357.4	49.92	8.160		
6,800.0	6,620.0	6,636.1	6,477.1	28.4	27.2	51.69	1,027.0	-674.0	404.8	355.1	49.72	8.143		
6,850.0	6,657.5	6,673.7	6,507.4	28.7	27.5	52.26	1,049.1	-674.0	401.9	352.4	49.55	8.111		
6,900.0	6,692.7	6,711.3	6,536.7	29.1	27.8	52.94	1,072.7	-674.0	398.5	349.1	49.41	8.065		
6,950.0	6,725.5	6,750.0	6,565.6	29.5	28.2	53.74	1,098.4	-674.0	394.7	345.4	49.35	7.999		
7,000.0	6,755.8	6,787.1	6,592.0	30.0	28.6	54.63	1,124.5	-674.0	390.5	341.2	49.34	7.914		
7,050.0	6,783.4	6,825.3	6,617.9	30.5	29.0	55.65	1,152.6	-674.0	386.0	336.5	49.45	7.805		
7,100.0	6,808.2	6,863.7	6,642.4	31.0	29.4	56.78	1,182.1	-674.0	381.1	331.4	49.67	7.672		
7,150.0	6,830.1	6,900.0	6,664.2	31.5	29.9	57.98	1,211.1	-674.0	376.0	326.0	49.99	7.520		
7,200.0	6,849.0	6,941.3	6,687.3	32.1	30.4	59.42	1,245.3	-674.0	370.6	320.0	50.57	7.329		
7,250.0	6,864.9	6,980.5	6,707.6	32.7	30.9	60.94	1,279.0	-674.0	365.1	313.9	51.28	7.121		
7,300.0	6,877.6	7,020.1	6,726.2	33.3	31.4	62.58	1,313.9	-674.0	359.6	307.4	52.18	6.892		
7,350.0	6,887.2	7,060.1	6,743.1	33.9	31.9	64.36	1,350.1	-674.0	354.0	300.8	53.27	6.646		
7,400.0	6,893.5	7,100.0	6,758.1	34.6	32.5	66.26	1,387.1	-674.0	348.5	294.0	54.55	6.389		
7,450.0	6,896.6	7,141.3	6,771.5	35.3	33.1	68.32	1,426.1	-674.0	343.2	287.2	56.06	6.123		
7,474.6	6,896.9	7,161.6	6,777.4	35.6	33.4	69.38	1,445.5	-674.0	340.7	283.8	56.87	5.991		
7,500.0	6,896.8	7,182.7	6,782.9	36.0	33.7	70.27	1,465.9	-674.0	338.3	280.3	57.94	5.838		
7,600.0	6,896.4	7,268.6	6,799.5	37.4	35.0	73.02	1,550.2	-674.0	331.9	270.0	61.93	5.360		
7,700.0	6,896.1	7,357.5	6,806.6	38.8	36.4	74.26	1,638.7	-674.0	329.6	264.1	65.43	5.037		
7,744.0	6,895.9	7,399.2	6,806.8	39.5	37.1	74.30	1,680.5	-674.0	329.5	262.6	66.84	4.929		
7,800.0	6,895.7	7,455.2	6,806.6	40.3	38.0	74.31	1,736.4	-674.0	329.5	260.8	68.68	4.798		
7,900.0	6,895.3	7,555.2	6,806.3	41.9	39.6	74.32	1,836.4	-674.0	329.5	257.5	71.99	4.577		
8,000.0	6,895.0	7,655.2	6,806.0	43.4	41.3	74.33	1,936.4	-674.0	329.5	254.1	75.34	4.373		
8,100.0	6,894.6	7,755.2	6,805.6	45.0	43.0	74.34	2,036.4	-674.0	329.4	250.7	78.72	4.185		
8,200.0	6,894.2	7,855.2	6,805.3	46.7	44.7	74.34	2,136.4	-674.0	329.4	247.3	82.13	4.011		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23P-221 - Wellbore #1 - Plan #1 (9-2-15)												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
8,300.0	6,893.9	7,955.2	6,805.0	48.3	46.4	74.35	2,236.4	-674.0	329.4	243.8	85.57	3.849	
8,400.0	6,893.5	8,055.2	6,804.7	50.0	48.1	74.36	2,336.4	-674.0	329.4	240.4	89.04	3.700	
8,500.0	6,893.1	8,155.2	6,804.4	51.7	49.9	74.37	2,436.4	-674.0	329.4	236.9	92.52	3.560	
8,600.0	6,892.8	8,255.2	6,804.1	53.4	51.6	74.38	2,536.4	-674.0	329.4	233.3	96.02	3.430	
8,700.0	6,892.4	8,355.2	6,803.8	55.1	53.4	74.39	2,636.4	-674.0	329.4	229.8	99.54	3.309	
8,800.0	6,892.0	8,455.2	6,803.4	56.8	55.2	74.40	2,736.4	-674.0	329.3	226.3	103.07	3.195	
8,900.0	6,891.7	8,555.2	6,803.1	58.5	57.0	74.41	2,836.4	-674.0	329.3	222.7	106.62	3.089	
9,000.0	6,891.3	8,655.2	6,802.8	60.3	58.8	74.41	2,936.4	-674.0	329.3	219.1	110.18	2.989	
9,100.0	6,890.9	8,755.2	6,802.5	62.0	60.6	74.42	3,036.4	-674.0	329.3	215.6	113.75	2.895	
9,200.0	6,890.6	8,855.2	6,802.2	63.8	62.4	74.43	3,136.4	-674.0	329.3	212.0	117.32	2.807	
9,300.0	6,890.2	8,955.2	6,801.9	65.6	64.2	74.44	3,236.4	-674.0	329.3	208.4	120.91	2.723	
9,400.0	6,889.8	9,055.2	6,801.6	67.4	66.0	74.45	3,336.4	-674.0	329.3	204.7	124.51	2.644	
9,500.0	6,889.5	9,155.2	6,801.2	69.2	67.9	74.46	3,436.4	-674.0	329.2	201.1	128.11	2.570	
9,600.0	6,889.1	9,255.2	6,800.9	71.0	69.7	74.47	3,536.4	-674.0	329.2	197.5	131.73	2.499	
9,700.0	6,888.7	9,355.2	6,800.6	72.8	71.6	74.48	3,636.4	-674.0	329.2	193.9	135.34	2.432	
9,800.0	6,888.4	9,455.2	6,800.3	74.6	73.4	74.48	3,736.4	-674.0	329.2	190.2	138.97	2.369	
9,900.0	6,888.0	9,555.2	6,800.0	76.4	75.2	74.49	3,836.4	-674.0	329.2	186.6	142.60	2.309	
10,000.0	6,887.6	9,655.2	6,799.7	78.2	77.1	74.50	3,936.4	-674.0	329.2	182.9	146.23	2.251	
10,100.0	6,887.3	9,755.2	6,799.4	80.1	79.0	74.51	4,036.4	-674.0	329.2	179.3	149.87	2.196	
10,200.0	6,886.9	9,855.2	6,799.0	81.9	80.8	74.52	4,136.4	-674.0	329.1	175.6	153.52	2.144	
10,300.0	6,886.5	9,955.2	6,798.7	83.7	82.7	74.53	4,236.4	-674.0	329.1	172.0	157.16	2.094	
10,400.0	6,886.2	10,055.2	6,798.4	85.6	84.5	74.54	4,336.4	-674.0	329.1	168.3	160.82	2.047	
10,500.0	6,885.8	10,155.2	6,798.1	87.4	86.4	74.55	4,436.4	-674.0	329.1	164.6	164.47	2.001	
10,600.0	6,885.4	10,255.2	6,797.8	89.3	88.3	74.55	4,536.4	-674.0	329.1	161.0	168.13	1.957	
10,700.0	6,885.1	10,355.2	6,797.5	91.1	90.1	74.56	4,636.4	-674.0	329.1	157.3	171.80	1.916	
10,800.0	6,884.7	10,455.2	6,797.2	93.0	92.0	74.57	4,736.4	-674.0	329.1	153.6	175.46	1.875	
10,900.0	6,884.3	10,555.2	6,796.8	94.8	93.9	74.58	4,836.4	-674.0	329.0	149.9	179.13	1.837	
11,000.0	6,884.0	10,655.2	6,796.5	96.7	95.8	74.59	4,936.4	-674.0	329.0	146.2	182.80	1.800	
11,100.0	6,883.6	10,755.2	6,796.2	98.5	97.6	74.60	5,036.4	-674.0	329.0	142.5	186.48	1.764	
11,200.0	6,883.2	10,855.2	6,795.9	100.4	99.5	74.61	5,136.4	-674.0	329.0	138.9	190.15	1.730	
11,300.0	6,882.9	10,955.2	6,795.6	102.3	101.4	74.62	5,236.4	-674.0	329.0	135.2	193.83	1.697	
11,400.0	6,882.5	11,055.2	6,795.3	104.1	103.3	74.63	5,336.4	-674.0	329.0	131.5	197.51	1.666	
11,500.0	6,882.1	11,155.2	6,795.0	106.0	105.2	74.63	5,436.4	-674.0	329.0	127.8	201.20	1.635	
11,600.0	6,881.8	11,255.2	6,794.6	107.9	107.0	74.64	5,536.4	-674.0	329.0	124.1	204.88	1.606	
11,700.0	6,881.4	11,355.2	6,794.3	109.7	108.9	74.65	5,636.4	-674.0	328.9	120.4	208.57	1.577	
11,800.0	6,881.0	11,455.2	6,794.0	111.6	110.8	74.66	5,736.4	-674.0	328.9	116.7	212.26	1.550	
11,900.0	6,880.7	11,555.2	6,793.7	113.5	112.7	74.67	5,836.4	-674.0	328.9	113.0	215.95	1.523	
12,000.0	6,880.3	11,655.2	6,793.4	115.4	114.6	74.68	5,936.4	-674.0	328.9	109.3	219.64	1.497 Level 3	
12,100.0	6,879.9	11,755.2	6,793.1	117.2	116.5	74.69	6,036.4	-674.0	328.9	105.5	223.34	1.473 Level 3	
12,200.0	6,879.6	11,855.2	6,792.8	119.1	118.4	74.70	6,136.4	-674.0	328.9	101.8	227.03	1.449 Level 3	
12,300.0	6,879.2	11,955.2	6,792.4	121.0	120.3	74.70	6,236.4	-674.0	328.9	98.1	230.73	1.425 Level 3	
12,400.0	6,878.8	12,055.2	6,792.1	122.9	122.2	74.71	6,336.4	-674.0	328.8	94.4	234.43	1.403 Level 3	
12,500.0	6,878.5	12,155.2	6,791.8	124.8	124.1	74.72	6,436.4	-674.0	328.8	90.7	238.13	1.381 Level 3	
12,600.0	6,878.1	12,255.2	6,791.5	126.7	126.0	74.73	6,536.4	-674.0	328.8	87.0	241.83	1.360 Level 3	
12,700.0	6,877.7	12,355.2	6,791.2	128.5	127.8	74.74	6,636.4	-674.0	328.8	83.3	245.53	1.339 Level 3	
12,800.0	6,877.4	12,455.2	6,790.9	130.4	129.7	74.75	6,736.4	-674.0	328.8	79.6	249.23	1.319 Level 3	
12,900.0	6,877.0	12,555.2	6,790.6	132.3	131.6	74.76	6,836.4	-674.0	328.8	75.8	252.94	1.300 Level 3	
13,000.0	6,876.6	12,655.2	6,790.2	134.2	133.5	74.77	6,936.4	-674.0	328.8	72.1	256.65	1.281 Level 3	
13,100.0	6,876.3	12,755.2	6,789.9	136.1	135.4	74.77	7,036.4	-674.0	328.7	68.4	260.35	1.263 Level 3	
13,200.0	6,875.9	12,855.2	6,789.6	138.0	137.3	74.78	7,136.4	-674.0	328.7	64.7	264.06	1.245 Level 2	
13,300.0	6,875.5	12,955.2	6,789.3	139.9	139.2	74.79	7,236.4	-674.0	328.7	60.9	267.77	1.228 Level 2	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Brown 5N65W23 Pad Sec.23-T5N-R65W - Brown 23P-221 - Wellbore #1 - Plan #1 (9-2-15)													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		
13,400.0	6,875.2	13,055.2	6,789.0	141.8	141.1	74.80	7,336.4	-674.0	328.7	57.2	271.48	1.211	Level 2	
13,500.0	6,874.8	13,155.2	6,788.7	143.6	143.0	74.81	7,436.4	-674.0	328.7	53.5	275.19	1.194	Level 2	
13,600.0	6,874.4	13,255.2	6,788.4	145.5	144.9	74.82	7,536.4	-674.0	328.7	49.8	278.90	1.178	Level 2	
13,700.0	6,874.1	13,355.2	6,788.0	147.4	146.8	74.83	7,636.4	-674.0	328.7	46.0	282.62	1.163	Level 2	
13,800.0	6,873.7	13,455.2	6,787.7	149.3	148.7	74.84	7,736.4	-674.0	328.6	42.3	286.33	1.148	Level 2	
13,900.0	6,873.3	13,555.2	6,787.4	151.2	150.6	74.85	7,836.4	-674.0	328.6	38.6	290.05	1.133	Level 2	
14,000.0	6,873.0	13,655.2	6,787.1	153.1	152.5	74.85	7,936.4	-674.0	328.6	34.9	293.76	1.119	Level 2	
14,100.0	6,872.6	13,755.2	6,786.8	155.0	154.4	74.86	8,036.4	-674.0	328.6	31.1	297.48	1.105	Level 2	
14,200.0	6,872.2	13,855.2	6,786.5	156.9	156.3	74.87	8,136.4	-674.0	328.6	27.4	301.20	1.091	Level 2	
14,300.0	6,871.9	13,955.2	6,786.2	158.8	158.3	74.88	8,236.4	-674.0	328.6	23.7	304.92	1.078	Level 2	
14,400.0	6,871.5	14,055.2	6,785.8	160.7	160.2	74.89	8,336.4	-674.0	328.6	19.9	308.63	1.065	Level 2	
14,500.0	6,871.1	14,155.2	6,785.5	162.6	162.1	74.90	8,436.4	-674.0	328.6	16.2	312.35	1.052	Level 2	
14,600.0	6,870.8	14,255.2	6,785.2	164.5	164.0	74.91	8,536.4	-674.0	328.5	12.5	316.07	1.039	Level 2	
14,700.0	6,870.4	14,355.2	6,784.9	166.4	165.9	74.92	8,636.4	-674.0	328.5	8.7	319.80	1.027	Level 2	
14,800.0	6,870.0	14,455.2	6,784.6	168.3	167.8	74.92	8,736.4	-674.0	328.5	5.0	323.52	1.015	Level 2	
14,900.0	6,869.7	14,555.2	6,784.3	170.2	169.7	74.93	8,836.4	-674.0	328.5	1.3	327.24	1.004	Level 2	
15,000.0	6,869.3	14,655.2	6,784.0	172.1	171.6	74.94	8,936.4	-674.0	328.5	-2.5	330.96	0.993	Level 1	
15,100.0	6,868.9	14,755.2	6,783.7	174.0	173.5	74.95	9,036.4	-674.0	328.5	-6.2	334.69	0.981	Level 1	
15,200.0	6,868.6	14,855.2	6,783.3	175.9	175.4	74.96	9,136.4	-674.0	328.5	-10.0	338.41	0.971	Level 1	
15,300.0	6,868.2	14,955.2	6,783.0	177.8	177.3	74.97	9,236.4	-674.0	328.4	-13.7	342.14	0.960	Level 1	
15,400.0	6,867.8	15,055.2	6,782.7	179.7	179.2	74.98	9,336.4	-674.0	328.4	-17.4	345.86	0.950	Level 1	
15,500.0	6,867.5	15,155.2	6,782.4	181.6	181.1	74.99	9,436.4	-674.0	328.4	-21.2	349.59	0.939	Level 1	
15,600.0	6,867.1	15,255.2	6,782.1	183.5	183.0	75.00	9,536.4	-674.0	328.4	-24.9	353.32	0.929	Level 1	
15,623.0	6,867.0	15,278.2	6,782.0	184.0	183.5	75.00	9,559.4	-674.0	328.4	-25.8	354.17	0.927	Level 1	
15,628.0	6,867.0	15,280.6	6,782.0	184.1	183.5	75.00	9,561.7	-674.0	328.4	-25.9	354.31	0.927	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Sec. 23-T5N-R65W - Alles 23-13 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7114-UNKNOWN													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		
7,600.0	6,896.4	6,879.4	6,879.4	37.4	137.6	90.44	2,428.9	-561.6	990.2	819.6	170.59	5.805		
7,700.0	6,896.1	6,879.1	6,879.1	38.8	137.6	90.39	2,428.9	-561.6	901.1	728.9	172.24	5.232		
7,800.0	6,895.7	6,878.7	6,878.7	40.3	137.6	90.34	2,428.9	-561.6	814.6	640.7	173.92	4.684		
7,900.0	6,895.3	6,878.3	6,878.3	41.9	137.6	90.29	2,428.9	-561.6	731.6	555.9	175.62	4.166		
8,000.0	6,895.0	6,878.0	6,878.0	43.4	137.6	90.24	2,428.9	-561.6	653.3	475.9	177.34	3.684		
8,100.0	6,894.6	6,877.6	6,877.6	45.0	137.6	90.19	2,428.9	-561.6	581.6	402.6	179.07	3.248		
8,200.0	6,894.2	6,877.2	6,877.2	46.7	137.5	90.14	2,428.9	-561.6	519.5	338.7	180.82	2.873		
8,300.0	6,893.9	6,876.9	6,876.9	48.3	137.5	90.09	2,428.9	-561.6	470.6	288.0	182.59	2.577		
8,400.0	6,893.5	6,876.5	6,876.5	50.0	137.5	90.05	2,428.9	-561.6	439.3	255.0	184.36	2.383		
8,492.2	6,893.2	6,876.2	6,876.2	51.5	137.5	90.00	2,428.9	-561.6	429.6	243.5	186.01	2.309 CC		
8,500.0	6,893.1	6,876.1	6,876.1	51.7	137.5	90.00	2,428.9	-561.6	429.6	243.5	186.15	2.308 ES, SF		
8,600.0	6,892.8	6,875.8	6,875.8	53.4	137.5	89.95	2,428.9	-561.6	442.9	254.9	187.94	2.357		
8,700.0	6,892.4	6,875.4	6,875.4	55.1	137.5	89.90	2,428.9	-561.6	477.2	287.5	189.74	2.515		
8,800.0	6,892.0	6,875.0	6,875.0	56.8	137.5	89.85	2,428.9	-561.6	528.5	336.9	191.55	2.759		
8,900.0	6,891.7	6,874.7	6,874.7	58.5	137.5	89.80	2,428.9	-561.6	592.3	399.0	193.37	3.063		
9,000.0	6,891.3	6,874.3	6,874.3	60.3	137.5	89.75	2,428.9	-561.6	665.1	470.0	195.19	3.408		
9,100.0	6,890.9	6,873.9	6,873.9	62.0	137.5	89.70	2,428.9	-561.6	744.3	547.3	197.02	3.778		
9,200.0	6,890.6	6,873.6	6,873.6	63.8	137.5	89.65	2,428.9	-561.6	828.0	629.1	198.85	4.164		
9,300.0	6,890.2	6,873.2	6,873.2	65.6	137.5	89.61	2,428.9	-561.6	914.9	714.3	200.69	4.559		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Sec. 23-T5N-R65W - Boderusock 2-23 (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7138-UNKNOWN												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	
8,700.0	6,892.4	6,876.4	6,876.4	55.1	137.5	90.46	3,540.0	-574.4	994.8	805.0	189.78	5.242	
8,800.0	6,892.0	6,876.0	6,876.0	56.8	137.5	90.40	3,540.0	-574.4	905.0	713.4	191.59	4.723	
8,900.0	6,891.7	6,875.7	6,875.7	58.5	137.5	90.35	3,540.0	-574.4	817.5	624.1	193.41	4.227	
9,000.0	6,891.3	6,875.3	6,875.3	60.3	137.5	90.30	3,540.0	-574.4	733.3	538.0	195.24	3.756	
9,100.0	6,890.9	6,874.9	6,874.9	62.0	137.5	90.25	3,540.0	-574.4	653.5	456.4	197.07	3.316	
9,200.0	6,890.6	6,874.6	6,874.6	63.8	137.5	90.20	3,540.0	-574.4	580.0	381.1	198.90	2.916	
9,300.0	6,890.2	6,874.2	6,874.2	65.6	137.5	90.15	3,540.0	-574.4	515.5	314.7	200.74	2.568	
9,400.0	6,889.8	6,873.8	6,873.8	67.4	137.5	90.10	3,540.0	-574.4	463.7	261.1	202.58	2.289	
9,500.0	6,889.5	6,873.5	6,873.5	69.2	137.5	90.05	3,540.0	-574.4	429.4	225.0	204.43	2.100	
9,600.0	6,889.1	6,873.1	6,873.1	71.0	137.5	90.00	3,540.0	-574.4	416.8	210.5	206.28	2.020	
9,603.3	6,889.1	6,873.1	6,873.1	71.0	137.5	90.00	3,540.0	-574.4	416.8	210.4	206.34	2.020	CC, ES, SF
9,700.0	6,888.7	6,872.7	6,872.7	72.8	137.5	89.95	3,540.0	-574.4	427.8	219.7	208.13	2.056	
9,800.0	6,888.4	6,872.4	6,872.4	74.6	137.4	89.90	3,540.0	-574.4	460.8	250.9	209.98	2.195	
9,900.0	6,888.0	6,872.0	6,872.0	76.4	137.4	89.85	3,540.0	-574.4	511.6	299.7	211.84	2.415	
10,000.0	6,887.6	6,871.6	6,871.6	78.2	137.4	89.80	3,540.0	-574.4	575.4	361.7	213.70	2.692	
10,100.0	6,887.3	6,871.3	6,871.3	80.1	137.4	89.75	3,540.0	-574.4	648.4	432.8	215.57	3.008	
10,200.0	6,886.9	6,870.9	6,870.9	81.9	137.4	89.70	3,540.0	-574.4	727.8	510.4	217.43	3.347	
10,300.0	6,886.5	6,870.5	6,870.5	83.7	137.4	89.65	3,540.0	-574.4	811.8	592.5	219.30	3.702	
10,400.0	6,886.2	6,870.2	6,870.2	85.6	137.4	89.60	3,540.0	-574.4	899.1	677.9	221.17	4.065	
10,500.0	6,885.8	6,869.8	6,869.8	87.4	137.4	89.55	3,540.0	-574.4	988.8	765.8	223.04	4.433	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Sec. 23-T5N-R65W - Carlson 14-43 (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7080-UNKNOWN												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	
10,200.0	6,886.9	6,849.9	6,849.9	81.9	137.0	90.38	4,954.6	-539.0	934.6	717.6	217.04	4.306	
10,300.0	6,886.5	6,849.5	6,849.5	83.7	137.0	90.33	4,954.6	-539.0	848.5	629.6	218.91	3.876	
10,400.0	6,886.2	6,849.2	6,849.2	85.6	137.0	90.29	4,954.6	-539.0	765.7	544.9	220.78	3.468	
10,500.0	6,885.8	6,848.8	6,848.8	87.4	137.0	90.24	4,954.6	-539.0	687.6	464.9	222.65	3.088	
10,600.0	6,885.4	6,848.4	6,848.4	89.3	137.0	90.19	4,954.6	-539.0	615.7	391.2	224.53	2.742	
10,700.0	6,885.1	6,848.1	6,848.1	91.1	137.0	90.15	4,954.6	-539.0	552.8	326.4	226.40	2.442	
10,800.0	6,884.7	6,847.7	6,847.7	93.0	137.0	90.10	4,954.6	-539.0	502.0	273.7	228.28	2.199	
10,900.0	6,884.3	6,847.3	6,847.3	94.8	136.9	90.05	4,954.6	-539.0	467.3	237.1	230.16	2.030	
11,000.0	6,884.0	6,847.0	6,847.0	96.7	136.9	90.01	4,954.6	-539.0	452.5	220.5	232.04	1.950	
11,017.9	6,883.9	6,846.9	6,846.9	97.0	136.9	90.00	4,954.6	-539.0	452.2	219.8	232.38	1.946 CC, ES, SF	
11,100.0	6,883.6	6,846.6	6,846.6	98.5	136.9	89.96	4,954.6	-539.0	459.6	225.6	233.92	1.965	
11,200.0	6,883.2	6,846.2	6,846.2	100.4	136.9	89.92	4,954.6	-539.0	487.4	251.6	235.80	2.067	
11,300.0	6,882.9	6,845.9	6,845.9	102.3	136.9	89.87	4,954.6	-539.0	532.9	295.2	237.68	2.242	
11,400.0	6,882.5	6,845.5	6,845.5	104.1	136.9	89.82	4,954.6	-539.0	592.0	352.4	239.57	2.471	
11,500.0	6,882.1	6,845.1	6,845.1	106.0	136.9	89.78	4,954.6	-539.0	660.9	419.5	241.45	2.737	
11,600.0	6,881.8	6,844.8	6,844.8	107.9	136.9	89.73	4,954.6	-539.0	737.0	493.7	243.33	3.029	
11,700.0	6,881.4	6,844.4	6,844.4	109.7	136.9	89.68	4,954.6	-539.0	818.3	573.1	245.22	3.337	
11,800.0	6,881.0	6,844.0	6,844.0	111.6	136.9	89.64	4,954.6	-539.0	903.4	656.3	247.11	3.656	
11,900.0	6,880.7	6,843.7	6,843.7	113.5	136.9	89.59	4,954.6	-539.0	991.2	742.2	248.99	3.981	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Sec. 23-T5N-R65W - James Clark Unit 1 (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7620-UNKNOWN												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
14,100.0	6,872.6	6,832.6	6,832.6	155.0	136.7	90.44	8,884.8	-582.6	941.4	650.7	290.70	3.239	
14,200.0	6,872.2	6,832.2	6,832.2	156.9	136.6	90.38	8,884.8	-582.6	852.4	559.8	292.60	2.913	
14,300.0	6,871.9	6,831.9	6,831.9	158.8	136.6	90.33	8,884.8	-582.6	766.2	471.7	294.50	2.602	
14,400.0	6,871.5	6,831.5	6,831.5	160.7	136.6	90.28	8,884.8	-582.6	683.7	387.3	296.40	2.307	
14,500.0	6,871.1	6,831.1	6,831.1	162.6	136.6	90.23	8,884.8	-582.6	606.4	308.1	298.30	2.033	
14,600.0	6,870.8	6,830.8	6,830.8	164.5	136.6	90.18	8,884.8	-582.6	536.8	236.6	300.20	1.788	
14,700.0	6,870.4	6,830.4	6,830.4	166.4	136.6	90.13	8,884.8	-582.6	478.0	175.9	302.11	1.582	
14,800.0	6,870.0	6,830.0	6,830.0	168.3	136.6	90.08	8,884.8	-582.6	434.6	130.6	304.01	1.430	Level 3
14,900.0	6,869.7	6,829.7	6,829.7	170.2	136.6	90.02	8,884.8	-582.6	411.4	105.5	305.91	1.345	Level 3
14,948.2	6,869.5	6,829.5	6,829.5	171.1	136.6	90.00	8,884.8	-582.6	408.5	101.7	306.82	1.332	Level 3, CC, ES, SF
15,000.0	6,869.3	6,829.3	6,829.3	172.1	136.6	89.97	8,884.8	-582.6	411.8	104.0	307.81	1.338	Level 3
15,100.0	6,868.9	6,828.9	6,828.9	174.0	136.6	89.92	8,884.8	-582.6	435.8	126.1	309.71	1.407	Level 3
15,200.0	6,868.6	6,828.6	6,828.6	175.9	136.6	89.87	8,884.8	-582.6	479.9	168.3	311.61	1.540	
15,300.0	6,868.2	6,828.2	6,828.2	177.8	136.6	89.82	8,884.8	-582.6	539.1	225.6	313.51	1.720	
15,400.0	6,867.8	6,827.8	6,827.8	179.7	136.6	89.77	8,884.8	-582.6	609.1	293.7	315.41	1.931	
15,500.0	6,867.5	6,827.5	6,827.5	181.6	136.5	89.72	8,884.8	-582.6	686.6	369.3	317.31	2.164	
15,600.0	6,867.1	6,827.1	6,827.1	183.5	136.5	89.66	8,884.8	-582.6	769.3	450.1	319.21	2.410	
15,628.0	6,867.0	6,827.0	6,827.0	184.1	136.5	89.65	8,884.8	-582.6	793.1	473.4	319.75	2.481	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN												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	
1,300.0	1,291.7	1,293.7	1,293.7	3.4	25.9	26.90	916.6	-598.7	999.2	970.8	28.32	35.283	
1,347.9	1,338.2	1,340.2	1,340.2	3.6	26.8	27.27	916.6	-598.7	988.9	959.6	29.32	33.730	
1,400.0	1,388.7	1,390.7	1,390.7	3.9	27.8	27.61	916.6	-598.7	977.5	947.0	30.48	32.073	
1,500.0	1,485.6	1,487.6	1,487.6	4.4	29.8	28.29	916.6	-598.7	955.6	922.9	32.71	29.215	
1,600.0	1,582.6	1,584.6	1,584.6	4.8	31.7	29.00	916.6	-598.7	933.9	898.9	34.96	26.716	
1,700.0	1,679.5	1,681.5	1,681.5	5.3	33.6	29.74	916.6	-598.7	912.3	875.1	37.22	24.514	
1,800.0	1,776.5	1,778.5	1,778.5	5.8	35.6	30.52	916.6	-598.7	890.9	851.4	39.49	22.561	
1,900.0	1,873.4	1,875.4	1,875.4	6.4	37.5	31.33	916.6	-598.7	869.7	827.9	41.77	20.819	
2,000.0	1,970.3	1,972.3	1,972.3	6.9	39.4	32.19	916.6	-598.7	848.6	804.6	44.07	19.255	
2,100.0	2,067.3	2,069.3	2,069.3	7.4	41.4	33.08	916.6	-598.7	827.8	781.4	46.38	17.846	
2,200.0	2,164.2	2,166.2	2,166.2	7.9	43.3	34.03	916.6	-598.7	807.1	758.4	48.71	16.569	
2,300.0	2,261.1	2,263.1	2,263.1	8.4	45.3	35.02	916.6	-598.7	786.7	735.6	51.05	15.409	
2,400.0	2,358.1	2,360.1	2,360.1	8.9	47.2	36.06	916.6	-598.7	766.5	713.1	53.41	14.351	
2,500.0	2,455.0	2,457.0	2,457.0	9.4	49.1	37.16	916.6	-598.7	746.5	690.8	55.78	13.383	
2,600.0	2,551.9	2,553.9	2,553.9	10.0	51.1	38.31	916.6	-598.7	726.9	668.7	58.17	12.495	
2,700.0	2,648.9	2,650.9	2,650.9	10.5	53.0	39.53	916.6	-598.7	707.6	647.0	60.58	11.679	
2,800.0	2,745.8	2,747.8	2,747.8	11.0	55.0	40.82	916.6	-598.7	688.5	625.5	63.01	10.927	
2,900.0	2,842.8	2,844.8	2,844.8	11.5	56.9	42.17	916.6	-598.7	669.9	604.4	65.46	10.233	
3,000.0	2,939.7	2,941.7	2,941.7	12.0	58.8	43.60	916.6	-598.7	651.6	583.7	67.94	9.592	
3,100.0	3,036.6	3,038.6	3,038.6	12.6	60.8	45.11	916.6	-598.7	633.8	563.4	70.43	8.999	
3,200.0	3,133.6	3,135.6	3,135.6	13.1	62.7	46.70	916.6	-598.7	616.4	543.5	72.95	8.450	
3,300.0	3,230.5	3,232.5	3,232.5	13.6	64.7	48.38	916.6	-598.7	599.6	524.1	75.49	7.942	
3,400.0	3,327.4	3,329.4	3,329.4	14.1	66.6	50.15	916.6	-598.7	583.3	505.2	78.06	7.472	
3,500.0	3,424.4	3,426.4	3,426.4	14.6	68.5	52.02	916.6	-598.7	567.5	486.9	80.65	7.037	
3,600.0	3,521.3	3,523.3	3,523.3	15.2	70.5	53.99	916.6	-598.7	552.5	469.2	83.27	6.635	
3,700.0	3,618.3	3,620.3	3,620.3	15.7	72.4	56.06	916.6	-598.7	538.1	452.2	85.90	6.264	
3,800.0	3,715.2	3,717.2	3,717.2	16.2	74.3	58.23	916.6	-598.7	524.5	435.9	88.56	5.922	
3,900.0	3,812.1	3,814.1	3,814.1	16.7	76.3	60.52	916.6	-598.7	511.7	420.4	91.23	5.608	
4,000.0	3,909.1	3,911.1	3,911.1	17.3	78.2	62.91	916.6	-598.7	499.7	405.8	93.92	5.321	
4,100.0	4,006.0	4,008.0	4,008.0	17.8	80.2	65.41	916.6	-598.7	488.8	392.2	96.62	5.059	
4,200.0	4,102.9	4,104.9	4,104.9	18.3	82.1	68.01	916.6	-598.7	478.8	379.5	99.32	4.821	
4,300.0	4,199.9	4,201.9	4,201.9	18.8	84.0	70.72	916.6	-598.7	469.9	367.9	102.01	4.606	
4,400.0	4,296.8	4,298.8	4,298.8	19.4	86.0	73.51	916.6	-598.7	462.1	357.4	104.70	4.414	
4,500.0	4,393.7	4,395.7	4,395.7	19.9	87.9	76.39	916.6	-598.7	455.6	348.2	107.36	4.243	
4,600.0	4,490.7	4,492.7	4,492.7	20.4	89.9	79.34	916.6	-598.7	450.3	340.3	110.00	4.093	
4,700.0	4,587.6	4,589.6	4,589.6	20.9	91.8	82.35	916.6	-598.7	446.2	333.6	112.60	3.963	
4,800.0	4,684.6	4,686.6	4,686.6	21.5	93.7	85.40	916.6	-598.7	443.5	328.4	115.15	3.852	
4,900.0	4,781.5	4,783.5	4,783.5	22.0	95.7	88.47	916.6	-598.7	442.2	324.5	117.65	3.758	
4,949.5	4,829.5	4,831.5	4,831.5	22.2	96.6	90.00	916.6	-598.7	442.0	323.1	118.87	3.718	
5,000.0	4,878.4	4,880.4	4,880.4	22.5	97.6	91.56	916.6	-598.7	442.2	322.1	120.10	3.682	
5,100.0	4,975.4	4,977.4	4,977.4	23.0	99.5	94.63	916.6	-598.7	443.5	321.1	122.48	3.621	
5,200.0	5,072.3	5,074.3	5,074.3	23.6	101.5	97.68	916.6	-598.7	446.3	321.5	124.80	3.576	
5,300.0	5,169.2	5,171.2	5,171.2	24.1	103.4	100.69	916.6	-598.7	450.3	323.2	127.05	3.544	
5,328.0	5,196.4	5,198.4	5,198.4	24.2	104.0	101.52	916.6	-598.7	451.7	324.0	127.67	3.538	
5,400.0	5,266.4	5,268.4	5,268.4	24.6	105.4	103.61	916.6	-598.7	455.4	326.2	129.24	3.524	
5,500.0	5,364.3	5,366.3	5,366.3	24.9	107.3	106.14	916.6	-598.7	460.8	329.4	131.34	3.508	
5,600.0	5,462.8	5,464.8	5,464.8	25.2	109.3	108.21	916.6	-598.7	465.9	332.4	133.45	3.491	
5,700.0	5,561.9	5,563.9	5,563.9	25.5	111.3	109.85	916.6	-598.7	470.3	334.7	135.56	3.469	
5,800.0	5,661.4	5,663.4	5,663.4	25.7	113.3	111.06	916.6	-598.7	473.8	336.2	137.67	3.442	
5,900.0	5,761.2	5,763.2	5,763.2	25.9	115.3	111.84	916.6	-598.7	476.2	336.5	139.77	3.407	
6,000.0	5,861.1	5,863.1	5,863.1	26.0	117.3	112.21	916.6	-598.7	477.4	335.5	141.87	3.365	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN													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		
6,038.9	5,900.0	5,902.0	5,902.0	26.0	118.0	55.28	916.6	-598.7	477.5	334.8	142.68	3.347		
6,100.0	5,961.1	5,963.1	5,963.1	26.1	119.3	55.28	916.6	-598.7	477.5	333.5	143.97	3.317		
6,200.0	6,061.1	6,063.1	6,063.1	26.2	121.3	55.28	916.6	-598.7	477.5	331.4	146.08	3.269		
6,271.8	6,132.9	6,134.9	6,134.9	26.3	122.7	55.28	916.6	-598.7	477.5	329.9	147.60	3.235		
6,300.0	6,161.1	6,163.1	6,163.1	26.3	123.3	55.35	916.6	-598.7	477.2	329.1	148.15	3.221		
6,350.0	6,211.0	6,213.0	6,213.0	26.4	124.3	55.81	916.6	-598.7	475.2	326.3	148.94	3.191		
6,400.0	6,260.5	6,262.5	6,262.5	26.5	125.3	56.72	916.6	-598.7	471.5	322.0	149.52	3.153		
6,450.0	6,309.5	6,311.5	6,311.5	26.6	126.2	58.08	916.6	-598.7	466.0	316.1	149.93	3.108		
6,500.0	6,357.7	6,359.7	6,359.7	26.8	127.2	59.89	916.6	-598.7	459.1	308.8	150.26	3.055		
6,550.0	6,405.0	6,407.0	6,407.0	27.0	128.1	62.15	916.6	-598.7	450.9	300.3	150.59	2.994		
6,600.0	6,451.1	6,453.1	6,453.1	27.2	129.1	64.86	916.6	-598.7	441.7	290.7	151.02	2.925		
6,650.0	6,495.9	6,497.9	6,497.9	27.5	130.0	67.99	916.6	-598.7	431.9	280.3	151.63	2.848		
6,700.0	6,539.0	6,541.0	6,541.0	27.7	130.8	71.49	916.6	-598.7	422.0	269.5	152.47	2.768		
6,750.0	6,580.5	6,582.5	6,582.5	28.0	131.6	75.28	916.6	-598.7	412.6	259.0	153.53	2.687		
6,800.0	6,620.0	6,622.0	6,622.0	28.4	132.4	79.26	916.6	-598.7	404.2	249.4	154.73	2.612		
6,850.0	6,657.5	6,659.5	6,659.5	28.7	133.2	83.29	916.6	-598.7	397.6	241.6	155.95	2.549		
6,900.0	6,692.7	6,694.7	6,694.7	29.1	133.9	87.22	916.6	-598.7	393.5	236.4	157.05	2.505		
6,937.3	6,717.4	6,719.4	6,719.4	29.4	134.4	90.00	916.6	-598.7	392.5	234.7	157.74	2.488 CC		
6,950.0	6,725.5	6,727.5	6,727.5	29.5	134.5	90.90	916.6	-598.7	392.6	234.7	157.93	2.486 ES, SF		
7,000.0	6,755.8	6,757.8	6,757.8	30.0	135.2	94.18	916.6	-598.7	395.6	237.0	158.56	2.495		
7,050.0	6,783.4	6,785.4	6,785.4	30.5	135.7	96.95	916.6	-598.7	402.9	243.9	158.99	2.534		
7,100.0	6,808.2	6,810.2	6,810.2	31.0	136.2	99.11	916.6	-598.7	414.9	255.6	159.34	2.604		
7,150.0	6,830.1	6,832.1	6,832.1	31.5	136.6	100.60	916.6	-598.7	431.6	271.8	159.79	2.701		
7,200.0	6,849.0	6,851.0	6,851.0	32.1	137.0	101.33	916.6	-598.7	452.8	292.3	160.50	2.821		
7,250.0	6,864.9	6,866.9	6,866.9	32.7	137.3	101.27	916.6	-598.7	478.2	316.6	161.60	2.959		
7,300.0	6,877.6	6,879.6	6,879.6	33.3	137.6	100.36	916.6	-598.7	507.4	344.2	163.13	3.110		
7,350.0	6,887.2	6,889.2	6,889.2	33.9	137.8	98.53	916.6	-598.7	539.8	374.8	165.00	3.271		
7,400.0	6,893.5	6,895.5	6,895.5	34.6	137.9	95.74	916.6	-598.7	575.0	408.0	166.95	3.444		
7,450.0	6,896.6	6,898.6	6,898.6	35.3	138.0	91.96	916.6	-598.7	612.4	443.9	168.49	3.635		
7,474.6	6,896.9	6,898.9	6,898.9	35.6	138.0	89.74	916.6	-598.7	631.5	462.6	168.91	3.739		
7,500.0	6,896.8	6,898.8	6,898.8	36.0	138.0	89.72	916.6	-598.7	651.6	482.2	169.32	3.848		
7,600.0	6,896.4	6,898.4	6,898.4	37.4	138.0	89.67	916.6	-598.7	733.9	562.9	170.94	4.293		
7,700.0	6,896.1	6,898.1	6,898.1	38.8	138.0	89.61	916.6	-598.7	820.1	647.5	172.59	4.752		
7,800.0	6,895.7	6,897.7	6,897.7	40.3	138.0	89.56	916.6	-598.7	909.2	734.9	174.26	5.217		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 122-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	
6,271.8	6,132.9	10,653.0	6,820.8	26.3	113.9	-179.85	-69.5	-993.0	987.3	849.9	137.41	7.185	
6,300.0	6,161.1	10,653.0	6,820.8	26.3	113.9	-179.86	-69.5	-993.0	968.5	831.0	137.46	7.045	
6,350.0	6,211.0	10,653.0	6,820.8	26.4	113.9	-179.86	-69.5	-993.0	938.2	801.1	137.13	6.842	
6,400.0	6,260.5	10,653.0	6,820.8	26.5	113.9	-179.87	-69.5	-993.1	912.4	776.2	136.24	6.697	
6,450.0	6,309.5	10,653.0	6,820.8	26.6	113.9	-179.87	-69.5	-993.1	891.7	756.9	134.82	6.614	
6,500.0	6,357.7	10,652.9	6,820.8	26.8	113.9	-179.87	-69.5	-993.1	876.5	743.6	132.87	6.596 SF	
6,550.0	6,405.0	10,652.9	6,820.8	27.0	113.9	-179.87	-69.5	-993.2	867.1	736.7	130.40	6.650	
6,600.0	6,451.1	10,652.8	6,820.8	27.2	113.8	-179.86	-69.5	-993.2	863.8	736.3	127.42	6.779 ES	
6,602.0	6,453.0	10,652.8	6,820.8	27.2	113.8	-179.86	-69.5	-993.2	863.7	736.5	127.28	6.786 CC	
6,650.0	6,495.9	10,652.7	6,820.8	27.5	113.8	-179.86	-69.5	-993.3	866.6	742.6	123.94	6.992	
6,700.0	6,539.0	10,652.6	6,820.8	27.7	113.8	-179.85	-69.5	-993.4	875.5	755.5	120.00	7.296	
6,750.0	6,580.5	10,652.6	6,820.8	28.0	113.8	-179.84	-69.4	-993.5	890.3	774.7	115.60	7.701	
6,800.0	6,620.0	10,652.4	6,820.8	28.4	113.8	-179.83	-69.4	-993.6	910.5	799.8	110.79	8.219	
6,850.0	6,657.5	10,652.3	6,820.8	28.7	113.8	-179.81	-69.4	-993.7	935.9	830.3	105.58	8.864	
6,900.0	6,692.7	10,652.2	6,820.8	29.1	113.8	-179.79	-69.4	-993.8	965.8	865.8	100.02	9.656	
6,950.0	6,725.5	10,652.1	6,820.8	29.5	113.8	-179.77	-69.4	-994.0	999.8	905.7	94.15	10.620	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4656.0ft (Original Well Elev)

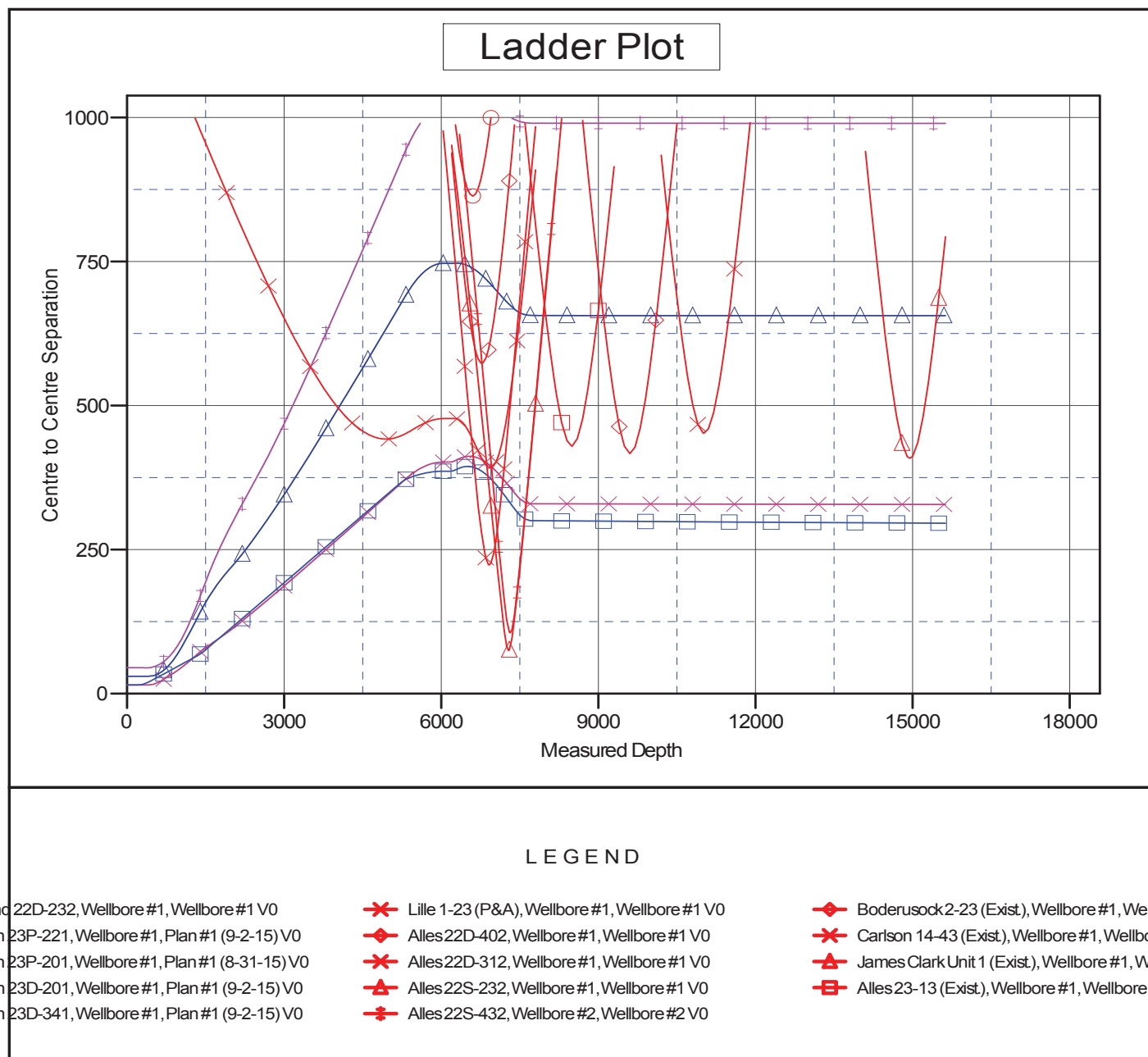
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Brown 23P-321

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.56°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 23P-321
Project:	SEC.23-T5N-R65W	TVD Reference:	WELL @ 4656.0ft (Original Well Elev)
Reference Site:	Brown 5N65W23 Pad Sec.23-T5N-R65W	MD Reference:	WELL @ 4656.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Brown 23P-321	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (9-2-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4656.0ft (Original Well Elev)

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Brown 23P-321

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.56°

