

# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Dillard 20R-303**

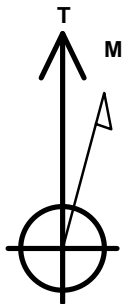
Surface Location: Dillard 20M-HZ Pad Sec.20-T7N-R64W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4899.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1449973.60	3257602.04	40.564880	-104.572800	

RKB - 15' WELL @ 4914.0ft (RKB - 15')

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BHL 500'FSL, 1506'FEL	7114.0	-4524.8	911.5	Point



Azimuths to True North  
Magnetic North: 8.49°

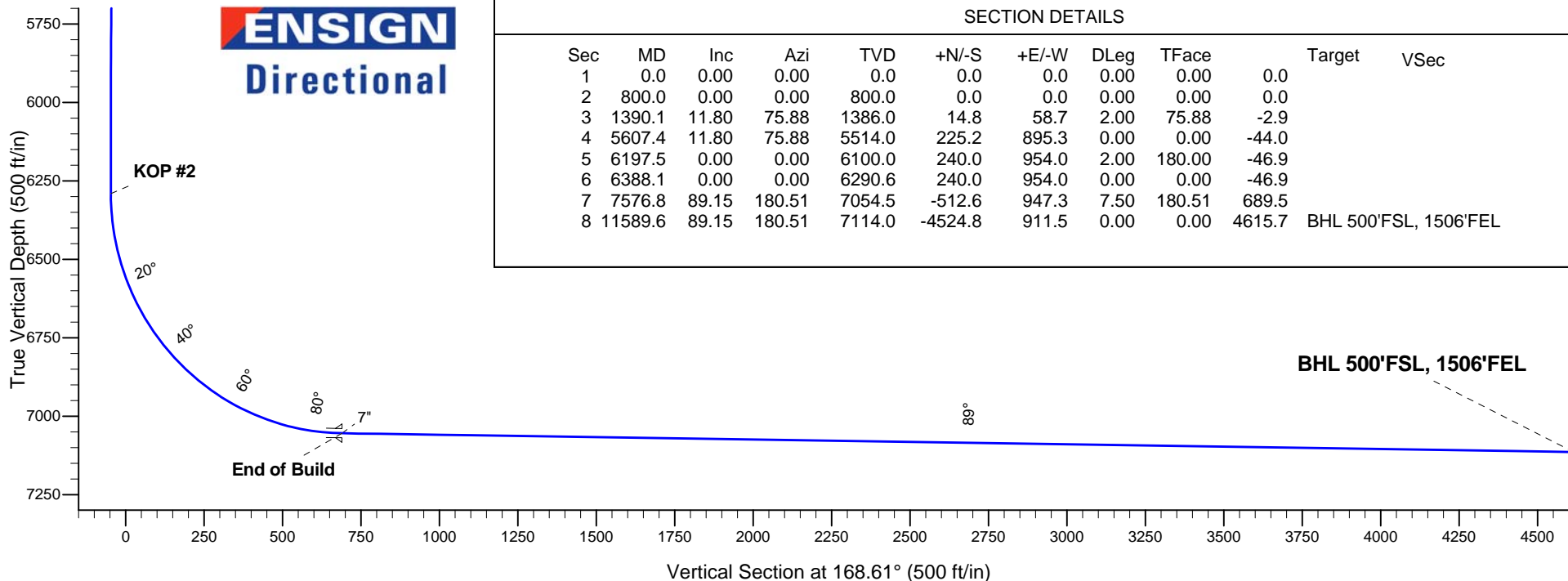
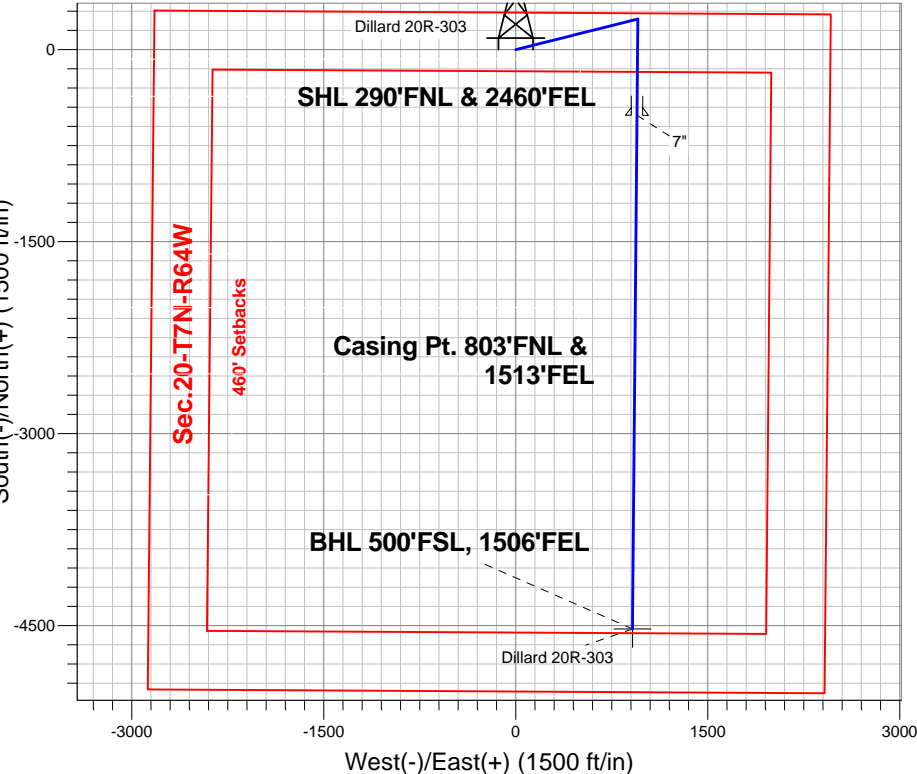
Magnetic Field  
Strength: 53014.6snT  
Dip Angle: 67.14°  
Date: 7/25/2013  
Model: IGRF2010

## ANNOTATIONS

TVD	MD	Annotation
800.0	800.0	KOP #1
6290.6	6388.1	KOP #2
7054.5	7576.8	End of Build

Dillard 20M-HZ Pad Sec.20-T7N-R64W  
Dillard 20R-303  
Plan #2 (7-25-13)  
14:15, July 25 2013

South(-)/North(+) (1500 ft/in)



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	Target	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1390.1	11.80	75.88	1386.0	14.8	58.7	2.00	75.88	-2.9	
4	5607.4	11.80	75.88	5514.0	225.2	895.3	0.00	0.00	-44.0	
5	6197.5	0.00	0.00	6100.0	240.0	954.0	2.00	180.00	-46.9	
6	6388.1	0.00	0.00	6290.6	240.0	954.0	0.00	0.00	-46.9	
7	7576.8	89.15	180.51	7054.5	-512.6	947.3	7.50	180.51	689.5	
8	11589.6	89.15	180.51	7114.0	-4524.8	911.5	0.00	0.00	4615.7	BHL 500'FSL, 1506'FEL



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.20-T7N-R64W**

**Dillard 20M-HZ Pad Sec.20-T7N-R64W**

**Dillard 20R-303**

**Wellbore #1**

**Plan: Plan #2 (7-25-13)**

## **Standard Planning Report**

**25 July, 2013**

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Project:</b>	SEC.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 (7-25-13)		

<b>Project</b>	SEC.20-T7N-R64W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W		
<b>Site Position:</b>		<b>Northing:</b>	1,449,911.68 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,257,602.69 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40.564710
		<b>Longitude:</b>	-104.572800
		<b>Grid Convergence:</b>	0.60 °

<b>Well</b>	Dillard 20R-303		
<b>Well Position</b>	<b>+N/-S</b>	61.9 ft	<b>Northing:</b>
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/25/2013	8.49	67.14	53,015

<b>Design</b>	Plan #2 (7-25-13)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	168.61

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,390.1	11.80	75.88	1,386.0	14.8	58.7	2.00	2.00	0.00	75.88	
5,607.4	11.80	75.88	5,514.0	225.2	895.3	0.00	0.00	0.00	0.00	
6,197.5	0.00	0.00	6,100.0	240.0	954.0	2.00	-2.00	0.00	180.00	
6,388.1	0.00	0.00	6,290.6	240.0	954.0	0.00	0.00	0.00	0.00	
7,576.8	89.15	180.51	7,054.5	-512.6	947.3	7.50	7.50	0.00	180.51	
11,589.6	89.15	180.51	7,114.0	-4,524.8	911.5	0.00	0.00	0.00	0.00	BHL 500'FSL, 1506

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<b>Project:</b>	SEC.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 (7-25-13)		

## Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP #1</b>									
900.0	2.00	75.88	900.0	0.4	1.7	-0.1	2.00	2.00	0.00
1,000.0	4.00	75.88	999.8	1.7	6.8	-0.3	2.00	2.00	0.00
1,100.0	6.00	75.88	1,099.5	3.8	15.2	-0.7	2.00	2.00	0.00
1,200.0	8.00	75.88	1,198.7	6.8	27.0	-1.3	2.00	2.00	0.00
1,300.0	10.00	75.88	1,297.5	10.6	42.2	-2.1	2.00	2.00	0.00
1,390.1	11.80	75.88	1,386.0	14.8	58.7	-2.9	2.00	2.00	0.00
1,400.0	11.80	75.88	1,395.6	15.3	60.7	-3.0	0.00	0.00	0.00
1,500.0	11.80	75.88	1,493.5	20.3	80.5	-4.0	0.00	0.00	0.00
1,600.0	11.80	75.88	1,591.4	25.2	100.4	-4.9	0.00	0.00	0.00
1,700.0	11.80	75.88	1,689.3	30.2	120.2	-5.9	0.00	0.00	0.00
1,800.0	11.80	75.88	1,787.2	35.2	140.0	-6.9	0.00	0.00	0.00
1,900.0	11.80	75.88	1,885.1	40.2	159.9	-7.9	0.00	0.00	0.00
2,000.0	11.80	75.88	1,982.9	45.2	179.7	-8.8	0.00	0.00	0.00
2,100.0	11.80	75.88	2,080.8	50.2	199.5	-9.8	0.00	0.00	0.00
2,200.0	11.80	75.88	2,178.7	55.2	219.4	-10.8	0.00	0.00	0.00
2,300.0	11.80	75.88	2,276.6	60.2	239.2	-11.8	0.00	0.00	0.00
2,400.0	11.80	75.88	2,374.5	65.2	259.1	-12.7	0.00	0.00	0.00
2,500.0	11.80	75.88	2,472.4	70.2	278.9	-13.7	0.00	0.00	0.00
2,600.0	11.80	75.88	2,570.3	75.2	298.7	-14.7	0.00	0.00	0.00
2,700.0	11.80	75.88	2,668.1	80.1	318.6	-15.7	0.00	0.00	0.00
2,800.0	11.80	75.88	2,766.0	85.1	338.4	-16.6	0.00	0.00	0.00
2,900.0	11.80	75.88	2,863.9	90.1	358.2	-17.6	0.00	0.00	0.00
3,000.0	11.80	75.88	2,961.8	95.1	378.1	-18.6	0.00	0.00	0.00
3,100.0	11.80	75.88	3,059.7	100.1	397.9	-19.6	0.00	0.00	0.00
3,200.0	11.80	75.88	3,157.6	105.1	417.7	-20.5	0.00	0.00	0.00
3,300.0	11.80	75.88	3,255.5	110.1	437.6	-21.5	0.00	0.00	0.00
3,400.0	11.80	75.88	3,353.3	115.1	457.4	-22.5	0.00	0.00	0.00
3,500.0	11.80	75.88	3,451.2	120.1	477.2	-23.5	0.00	0.00	0.00
3,600.0	11.80	75.88	3,549.1	125.1	497.1	-24.4	0.00	0.00	0.00
3,700.0	11.80	75.88	3,647.0	130.0	516.9	-25.4	0.00	0.00	0.00
3,800.0	11.80	75.88	3,744.9	135.0	536.8	-26.4	0.00	0.00	0.00
3,900.0	11.80	75.88	3,842.8	140.0	556.6	-27.4	0.00	0.00	0.00
4,000.0	11.80	75.88	3,940.7	145.0	576.4	-28.3	0.00	0.00	0.00
4,100.0	11.80	75.88	4,038.5	150.0	596.3	-29.3	0.00	0.00	0.00
4,200.0	11.80	75.88	4,136.4	155.0	616.1	-30.3	0.00	0.00	0.00
4,300.0	11.80	75.88	4,234.3	160.0	635.9	-31.3	0.00	0.00	0.00
4,400.0	11.80	75.88	4,332.2	165.0	655.8	-32.2	0.00	0.00	0.00
4,500.0	11.80	75.88	4,430.1	170.0	675.6	-33.2	0.00	0.00	0.00
4,600.0	11.80	75.88	4,528.0	175.0	695.4	-34.2	0.00	0.00	0.00
4,700.0	11.80	75.88	4,625.9	179.9	715.3	-35.2	0.00	0.00	0.00
4,800.0	11.80	75.88	4,723.7	184.9	735.1	-36.2	0.00	0.00	0.00
4,900.0	11.80	75.88	4,821.6	189.9	755.0	-37.1	0.00	0.00	0.00
5,000.0	11.80	75.88	4,919.5	194.9	774.8	-38.1	0.00	0.00	0.00

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<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 (7-25-13)		

## Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,100.0	11.80	75.88	5,017.4	199.9	794.6	-39.1	0.00	0.00	0.00
5,200.0	11.80	75.88	5,115.3	204.9	814.5	-40.1	0.00	0.00	0.00
5,300.0	11.80	75.88	5,213.2	209.9	834.3	-41.0	0.00	0.00	0.00
5,400.0	11.80	75.88	5,311.1	214.9	854.1	-42.0	0.00	0.00	0.00
5,500.0	11.80	75.88	5,408.9	219.9	874.0	-43.0	0.00	0.00	0.00
5,600.0	11.80	75.88	5,506.8	224.9	893.8	-44.0	0.00	0.00	0.00
5,607.4	11.80	75.88	5,514.0	225.2	895.3	-44.0	0.00	0.00	0.00
5,700.0	9.95	75.88	5,605.0	229.5	912.2	-44.9	2.00	-2.00	0.00
5,800.0	7.95	75.88	5,703.8	233.3	927.3	-45.6	2.00	-2.00	0.00
5,900.0	5.95	75.88	5,803.0	236.2	939.0	-46.2	2.00	-2.00	0.00
6,000.0	3.95	75.88	5,902.7	238.3	947.4	-46.6	2.00	-2.00	0.00
6,100.0	1.95	75.88	6,002.5	239.6	952.4	-46.8	2.00	-2.00	0.00
6,197.5	0.00	0.00	6,100.0	240.0	954.0	-46.9	2.00	-2.00	0.00
6,200.0	0.00	0.00	6,102.5	240.0	954.0	-46.9	0.00	0.00	0.00
6,300.0	0.00	0.00	6,202.5	240.0	954.0	-46.9	0.00	0.00	0.00
6,388.1	0.00	0.00	6,290.6	240.0	954.0	-46.9	0.00	0.00	0.00
<b>KOP #2</b>									
6,400.0	0.89	180.51	6,302.5	239.9	954.0	-46.8	7.50	7.50	0.00
6,500.0	8.39	180.51	6,402.1	231.8	953.9	-38.9	7.50	7.50	0.00
6,600.0	15.89	180.51	6,499.8	210.8	953.7	-18.3	7.50	7.50	0.00
6,700.0	23.39	180.51	6,593.9	177.2	953.4	14.5	7.50	7.50	0.00
6,800.0	30.89	180.51	6,682.8	131.6	953.0	59.1	7.50	7.50	0.00
6,900.0	38.39	180.51	6,765.1	74.8	952.5	114.7	7.50	7.50	0.00
7,000.0	45.89	180.51	6,839.1	7.8	951.9	180.3	7.50	7.50	0.00
7,100.0	53.39	180.51	6,903.9	-68.4	951.2	254.8	7.50	7.50	0.00
7,200.0	60.89	180.51	6,958.1	-152.3	950.5	337.0	7.50	7.50	0.00
7,300.0	68.39	180.51	7,000.9	-242.6	949.7	425.3	7.50	7.50	0.00
7,400.0	75.89	180.51	7,031.5	-337.7	948.8	518.4	7.50	7.50	0.00
7,500.0	83.39	180.51	7,049.5	-436.0	948.0	614.6	7.50	7.50	0.00
7,576.8	89.15	180.51	7,054.5	-512.6	947.3	689.6	7.50	7.50	0.00
<b>End of Build - 7"</b>									
7,600.0	89.15	180.51	7,054.8	-535.8	947.1	712.3	0.00	0.00	0.00
7,700.0	89.15	180.51	7,056.3	-635.8	946.2	810.1	0.00	0.00	0.00
7,800.0	89.15	180.51	7,057.8	-735.8	945.3	907.9	0.00	0.00	0.00
7,900.0	89.15	180.51	7,059.3	-835.8	944.4	1,005.8	0.00	0.00	0.00
8,000.0	89.15	180.51	7,060.7	-935.8	943.5	1,103.6	0.00	0.00	0.00
8,100.0	89.15	180.51	7,062.2	-1,035.7	942.6	1,201.5	0.00	0.00	0.00
8,200.0	89.15	180.51	7,063.7	-1,135.7	941.7	1,299.3	0.00	0.00	0.00
8,300.0	89.15	180.51	7,065.2	-1,235.7	940.8	1,397.1	0.00	0.00	0.00
8,400.0	89.15	180.51	7,066.7	-1,335.7	939.9	1,495.0	0.00	0.00	0.00
8,500.0	89.15	180.51	7,068.2	-1,435.7	939.0	1,592.8	0.00	0.00	0.00
8,600.0	89.15	180.51	7,069.6	-1,535.7	938.2	1,690.7	0.00	0.00	0.00
8,700.0	89.15	180.51	7,071.1	-1,635.6	937.3	1,788.5	0.00	0.00	0.00
8,800.0	89.15	180.51	7,072.6	-1,735.6	936.4	1,886.3	0.00	0.00	0.00
8,900.0	89.15	180.51	7,074.1	-1,835.6	935.5	1,984.2	0.00	0.00	0.00
9,000.0	89.15	180.51	7,075.6	-1,935.6	934.6	2,082.0	0.00	0.00	0.00
9,100.0	89.15	180.51	7,077.1	-2,035.6	933.7	2,179.9	0.00	0.00	0.00
9,200.0	89.15	180.51	7,078.6	-2,135.6	932.8	2,277.7	0.00	0.00	0.00
9,300.0	89.15	180.51	7,080.0	-2,235.6	931.9	2,375.5	0.00	0.00	0.00
9,400.0	89.15	180.51	7,081.5	-2,335.5	931.0	2,473.4	0.00	0.00	0.00
9,500.0	89.15	180.51	7,083.0	-2,435.5	930.1	2,571.2	0.00	0.00	0.00
9,600.0	89.15	180.51	7,084.5	-2,535.5	929.2	2,669.1	0.00	0.00	0.00
9,700.0	89.15	180.51	7,086.0	-2,635.5	928.3	2,766.9	0.00	0.00	0.00

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<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Project:</b>	SEC.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 (7-25-13)		

## Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,800.0	89.15	180.51	7,087.5	-2,735.5	927.5	2,864.8	0.00	0.00	0.00
9,900.0	89.15	180.51	7,088.9	-2,835.5	926.6	2,962.6	0.00	0.00	0.00
10,000.0	89.15	180.51	7,090.4	-2,935.5	925.7	3,060.4	0.00	0.00	0.00
10,100.0	89.15	180.51	7,091.9	-3,035.4	924.8	3,158.3	0.00	0.00	0.00
10,200.0	89.15	180.51	7,093.4	-3,135.4	923.9	3,256.1	0.00	0.00	0.00
10,300.0	89.15	180.51	7,094.9	-3,235.4	923.0	3,354.0	0.00	0.00	0.00
10,400.0	89.15	180.51	7,096.4	-3,335.4	922.1	3,451.8	0.00	0.00	0.00
10,500.0	89.15	180.51	7,097.8	-3,435.4	921.2	3,549.6	0.00	0.00	0.00
10,600.0	89.15	180.51	7,099.3	-3,535.4	920.3	3,647.5	0.00	0.00	0.00
10,700.0	89.15	180.51	7,100.8	-3,635.3	919.4	3,745.3	0.00	0.00	0.00
10,800.0	89.15	180.51	7,102.3	-3,735.3	918.5	3,843.2	0.00	0.00	0.00
10,900.0	89.15	180.51	7,103.8	-3,835.3	917.6	3,941.0	0.00	0.00	0.00
11,000.0	89.15	180.51	7,105.3	-3,935.3	916.7	4,038.8	0.00	0.00	0.00
11,100.0	89.15	180.51	7,106.7	-4,035.3	915.9	4,136.7	0.00	0.00	0.00
11,200.0	89.15	180.51	7,108.2	-4,135.3	915.0	4,234.5	0.00	0.00	0.00
11,300.0	89.15	180.51	7,109.7	-4,235.3	914.1	4,332.4	0.00	0.00	0.00
11,400.0	89.15	180.51	7,111.2	-4,335.2	913.2	4,430.2	0.00	0.00	0.00
11,500.0	89.15	180.51	7,112.7	-4,435.2	912.3	4,528.0	0.00	0.00	0.00
11,589.6	89.15	180.51	7,114.0	-4,524.8	911.5	4,615.7	0.00	0.00	0.00
BHL 500'FSL, 1506'FEL									

## Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,576.8	7,054.5	7"	7	8-3/4

## Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
800.0	800.0	0.0	0.0	KOP #1
6,388.1	6,290.6	240.0	954.0	KOP #2
7,576.8	7,054.5	-512.6	947.3	End of Build



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.20-T7N-R64W**

**Dillard 20M-HZ Pad Sec.20-T7N-R64W**

**Dillard 20R-303**

**Wellbore #1**

**Plan #2 (7-25-13)**

## **Anticollision Report**

**25 July, 2013**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #2 (7-25-13)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b> 7/25/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,589.6	Plan #2 (7-25-13) (Wellbore #1)	MWD	MWD - Standard

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (ft)</b>	<b>Offset Measured Depth (ft)</b>	<b>Distance Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
Dillard 20M-HZ Pad Sec.20-T7N-R64W						
Dillard 20M-203 - Wellbore #1 - Plan #1 (11-28-12)	800.0	800.0	61.9	58.6	18.368	CC, ES
Dillard 20M-203 - Wellbore #1 - Plan #1 (11-28-12)	11,590.3	11,434.0	986.1	809.5	5.585	SF
Dillard 20R-443 - Wellbore #1 - Plan #1 (11-28-12)	800.0	800.0	29.1	25.8	8.644	CC, ES
Dillard 20R-443 - Wellbore #1 - Plan #1 (11-28-12)	11,590.3	11,614.5	327.0	153.0	1.879	SF

<b>Offset Design</b>												
Dillard 20M-HZ Pad Sec.20-T7N-R64W - Dillard 20M-203 - Wellbore #1 - Plan #1 (11-28-12)												
Survey Program: 0-MWD												
<b>Reference</b>	<b>Offset</b>	<b>Semi Major Axis</b>			<b>Distance</b>							
<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Reference (ft)</b>	<b>Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-61.9	0.0	61.9			
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-61.9	0.0	61.9	61.7	0.22	275.517
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-61.9	0.0	61.9	61.3	0.67	91.839
300.0	300.0	300.0	300.0	0.6	0.6	-180.00	-61.9	0.0	61.9	60.8	1.12	55.103
400.0	400.0	400.0	400.0	0.8	0.8	-180.00	-61.9	0.0	61.9	60.4	1.57	39.360
500.0	500.0	500.0	500.0	1.0	1.0	-180.00	-61.9	0.0	61.9	59.9	2.02	30.613
600.0	600.0	600.0	600.0	1.2	1.2	-180.00	-61.9	0.0	61.9	59.5	2.47	25.047
700.0	700.0	700.0	700.0	1.5	1.5	-180.00	-61.9	0.0	61.9	59.0	2.92	21.194
800.0	800.0	800.0	800.0	1.7	1.7	-180.00	-61.9	0.0	61.9	58.6	3.37	18.368 CC, ES
900.0	900.0	900.0	900.0	1.9	1.9	105.67	-61.9	0.0	62.4	58.6	3.81	16.364
1,000.0	999.8	999.8	999.8	2.1	2.1	110.15	-61.9	0.0	64.0	59.7	4.25	15.060
1,100.0	1,099.5	1,099.5	1,099.5	2.3	2.4	117.03	-61.9	0.0	67.5	62.8	4.70	14.370
1,200.0	1,198.7	1,198.7	1,198.7	2.6	2.6	125.33	-61.9	0.0	73.9	68.7	5.16	14.326
1,300.0	1,297.5	1,297.5	1,297.5	2.9	2.8	133.87	-61.9	0.0	83.9	78.3	5.62	14.941
1,400.0	1,395.6	1,395.6	1,395.6	3.2	3.0	141.70	-61.9	0.0	98.2	92.1	6.08	16.162
1,500.0	1,493.5	1,493.5	1,493.5	3.6	3.2	147.99	-61.9	0.0	115.1	108.5	6.54	17.595
1,600.0	1,591.4	1,591.4	1,591.4	3.9	3.5	152.65	-61.9	0.0	132.9	125.9	7.00	18.989
1,700.0	1,689.3	1,689.3	1,689.3	4.3	3.7	156.19	-61.9	0.0	151.5	144.0	7.46	20.299
1,800.0	1,787.2	1,787.2	1,787.2	4.7	3.9	158.96	-61.9	0.0	170.4	162.5	7.92	21.511
1,900.0	1,885.1	1,885.1	1,885.1	5.1	4.1	161.17	-61.9	0.0	189.7	181.3	8.39	22.623
2,000.0	1,982.9	1,982.9	1,982.9	5.6	4.3	162.98	-61.9	0.0	209.2	200.4	8.85	23.640
2,100.0	2,080.8	2,080.8	2,080.8	6.0	4.6	164.48	-61.9	0.0	228.9	219.6	9.32	24.570

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Dillard 20M-HZ Pad Sec.20-T7N-R64W - Dillard 20M-203 - Wellbore #1 - Plan #1 (11-28-12)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
2,200.0	2,178.7	2,178.7	2,178.7	6.4	4.8	165.74	-61.9	0.0	248.7	238.9	9.78	25.421	
2,300.0	2,276.6	2,276.6	2,276.6	6.8	5.0	166.81	-61.9	0.0	268.6	258.3	10.25	26.201	
2,400.0	2,374.5	2,374.5	2,374.5	7.3	5.2	167.74	-61.9	0.0	288.6	277.8	10.72	26.917	
2,500.0	2,472.4	2,472.4	2,472.4	7.7	5.4	168.54	-61.9	0.0	308.6	297.4	11.19	27.576	
2,600.0	2,570.3	2,573.0	2,573.0	8.2	5.7	169.42	-61.0	-0.1	328.4	316.7	11.66	28.155	
2,700.0	2,668.1	2,674.7	2,674.6	8.6	5.9	170.76	-56.6	-0.5	347.2	335.1	12.13	28.631	
2,800.0	2,766.0	2,776.2	2,775.7	9.0	6.1	172.50	-48.7	-1.3	365.2	352.6	12.58	29.021	
2,900.0	2,863.9	2,876.3	2,875.3	9.5	6.4	174.55	-37.5	-2.4	382.7	369.6	13.04	29.346	
3,000.0	2,961.8	2,973.9	2,972.1	9.9	6.6	176.51	-25.6	-3.5	400.4	386.8	13.50	29.648	
3,100.0	3,059.7	3,071.4	3,068.9	10.4	6.8	178.30	-13.8	-4.7	418.5	404.5	13.98	29.932	
3,200.0	3,157.6	3,168.9	3,165.7	10.8	7.1	179.94	-1.9	-5.8	436.9	422.5	14.47	30.198	
3,300.0	3,255.5	3,266.4	3,262.5	11.3	7.3	-178.55	10.0	-6.9	455.7	440.7	14.97	30.445	
3,400.0	3,353.3	3,364.0	3,359.3	11.7	7.6	-177.15	21.8	-8.1	474.8	459.3	15.48	30.674	
3,500.0	3,451.2	3,461.5	3,456.1	12.1	7.8	-175.87	33.7	-9.2	494.1	478.1	16.00	30.886	
3,600.0	3,549.1	3,559.0	3,552.8	12.6	8.1	-174.68	45.5	-10.4	513.7	497.2	16.53	31.082	
3,700.0	3,647.0	3,656.6	3,649.6	13.0	8.3	-173.58	57.4	-11.5	533.4	516.4	17.06	31.264	
3,800.0	3,744.9	3,754.1	3,746.4	13.5	8.6	-172.55	69.3	-12.7	553.4	535.8	17.61	31.432	
3,900.0	3,842.8	3,851.6	3,843.2	13.9	8.9	-171.60	81.1	-13.8	573.5	555.3	18.15	31.587	
4,000.0	3,940.7	3,949.1	3,940.0	14.4	9.1	-170.71	93.0	-15.0	593.7	575.0	18.71	31.732	
4,100.0	4,038.5	4,046.7	4,036.8	14.8	9.4	-169.88	104.8	-16.1	614.1	594.8	19.27	31.867	
4,200.0	4,136.4	4,144.2	4,133.6	15.3	9.7	-169.10	116.7	-17.3	634.5	614.7	19.83	31.992	
4,300.0	4,234.3	4,241.7	4,230.4	15.7	10.0	-168.38	128.6	-18.4	655.1	634.7	20.40	32.109	
4,400.0	4,332.2	4,339.2	4,327.2	16.2	10.2	-167.69	140.4	-19.6	675.8	654.8	20.98	32.218	
4,500.0	4,430.1	4,436.8	4,424.0	16.6	10.5	-167.05	152.3	-20.7	696.6	675.0	21.55	32.320	
4,600.0	4,528.0	4,534.3	4,520.8	17.1	10.8	-166.44	164.1	-21.9	717.4	695.3	22.13	32.416	
4,700.0	4,625.9	4,631.8	4,617.6	17.5	11.1	-165.87	176.0	-23.0	738.3	715.6	22.71	32.506	
4,800.0	4,723.7	4,729.3	4,714.4	18.0	11.4	-165.33	187.8	-24.1	759.3	736.0	23.30	32.591	
4,900.0	4,821.6	4,826.9	4,811.2	18.4	11.6	-164.81	199.7	-25.3	780.4	756.5	23.89	32.671	
5,000.0	4,919.5	4,924.4	4,908.0	18.9	11.9	-164.33	211.6	-26.4	801.5	777.0	24.47	32.747	
5,100.0	5,017.4	5,024.0	5,006.9	19.3	12.2	-163.90	223.1	-27.6	822.6	797.5	25.04	32.848	
5,200.0	5,115.3	5,125.5	5,108.1	19.8	12.4	-163.70	231.7	-28.4	843.3	817.7	25.55	33.008	
5,300.0	5,213.2	5,227.3	5,209.7	20.2	12.6	-163.76	236.7	-28.9	863.6	837.6	26.02	33.193	
5,400.0	5,311.1	5,328.7	5,311.1	20.7	12.8	-164.05	238.1	-29.0	883.4	857.0	26.45	33.399	
5,500.0	5,408.9	5,426.5	5,408.9	21.1	13.0	-164.41	238.1	-29.0	903.2	876.3	26.89	33.590	
5,600.0	5,506.8	5,524.4	5,506.8	21.6	13.2	-164.75	238.1	-29.0	922.9	895.6	27.34	33.757	
5,700.0	5,605.0	5,622.6	5,605.0	22.0	13.4	-165.14	238.1	-29.0	941.3	913.4	27.83	33.819	
5,800.0	5,703.8	5,721.4	5,703.8	22.2	13.6	-165.46	238.1	-29.0	956.3	928.0	28.28	33.818	
5,900.0	5,803.0	5,820.6	5,803.0	22.5	13.8	-165.70	238.1	-29.0	968.0	939.3	28.69	33.738	
6,000.0	5,902.7	5,920.3	5,902.7	22.7	14.0	-165.86	238.1	-29.0	976.4	947.3	29.07	33.585	
6,100.0	6,002.5	6,020.1	6,002.5	22.9	14.2	-165.96	238.1	-29.0	981.4	952.0	29.42	33.360	
6,200.0	6,102.5	6,120.1	6,102.5	23.0	14.4	-90.11	238.1	-29.0	983.0	953.3	29.70	33.098	
6,300.0	6,202.5	6,220.1	6,202.5	23.1	14.6	-90.11	238.1	-29.0	983.0	952.9	30.08	32.674	
6,400.0	6,302.5	6,318.8	6,301.0	23.2	14.7	89.15	234.2	-29.0	983.1	952.6	30.43	32.306	
6,500.0	6,402.1	6,416.0	6,396.9	23.3	14.8	88.67	218.3	-29.2	983.2	952.6	30.59	32.142	
6,600.0	6,499.8	6,512.3	6,489.1	23.4	14.8	88.21	190.7	-29.4	983.4	952.8	30.65	32.088	
6,700.0	6,593.9	6,607.7	6,576.2	23.4	14.8	87.78	152.1	-29.8	983.7	953.1	30.65	32.095	
6,800.0	6,682.8	6,702.3	6,657.3	23.4	14.8	87.39	103.4	-30.2	984.0	953.3	30.65	32.101	
6,900.0	6,765.1	6,796.2	6,731.1	23.4	14.8	87.04	45.5	-30.7	984.3	953.6	30.73	32.033	
7,000.0	6,839.1	6,889.5	6,797.0	23.4	14.9	86.74	-20.5	-31.3	984.6	953.6	30.94	31.818	
7,100.0	6,903.9	6,982.3	6,854.0	23.5	15.1	86.49	-93.6	-32.0	984.9	953.5	31.37	31.395	
7,200.0	6,958.1	7,074.7	6,901.6	23.6	15.4	86.30	-172.8	-32.7	985.1	953.0	32.06	30.730	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Dillard 20M-HZ Pad Sec.20-T7N-R64W - Dillard 20M-203 - Wellbore #1 - Plan #1 (11-28-12)											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)				
7,300.0	7,000.9	7,166.8	6,939.1	23.8	15.9	86.16	-256.9	-33.5	985.2	952.2	33.04	29.822			
7,400.0	7,031.5	7,258.8	6,966.3	24.1	16.6	86.09	-344.7	-34.3	985.3	951.0	34.32	28.707			
7,500.0	7,049.5	7,350.0	6,982.5	24.6	17.3	86.08	-434.4	-35.1	985.4	949.5	35.90	27.451			
7,594.6	7,055.9	7,438.2	6,988.1	25.2	18.2	86.05	-522.4	-35.9	985.4	947.7	37.66	26.168			
7,600.0	7,054.8	7,443.7	6,988.1	25.3	18.3	86.12	-527.8	-36.0	985.3	947.6	37.77	26.086			
7,700.0	7,056.3	7,543.7	6,989.6	26.0	19.4	86.12	-627.8	-36.9	985.3	945.3	40.01	24.625			
7,800.0	7,057.8	7,643.7	6,991.0	26.9	20.7	86.12	-727.8	-37.8	985.4	942.9	42.47	23.200			
7,900.0	7,059.3	7,743.7	6,992.5	28.0	22.0	86.11	-827.8	-38.7	985.4	940.3	45.12	21.837			
8,000.0	7,060.7	7,843.7	6,993.9	29.1	23.4	86.11	-927.8	-39.6	985.4	937.5	47.94	20.556			
8,100.0	7,062.2	7,943.7	6,995.4	30.3	24.9	86.11	-1,027.8	-40.5	985.4	934.5	50.88	19.366			
8,200.0	7,063.7	8,043.7	6,996.8	31.6	26.5	86.11	-1,127.8	-41.4	985.4	931.5	53.94	18.269			
8,300.0	7,065.2	8,143.7	6,998.3	33.0	28.1	86.11	-1,227.7	-42.3	985.5	928.4	57.09	17.261			
8,400.0	7,066.7	8,243.7	6,999.7	34.4	29.7	86.10	-1,327.7	-43.2	985.5	925.2	60.32	16.337			
8,500.0	7,068.2	8,343.7	7,001.2	35.9	31.3	86.10	-1,427.7	-44.1	985.5	921.9	63.62	15.490			
8,600.0	7,069.6	8,443.7	7,002.6	37.4	33.0	86.10	-1,527.7	-45.0	985.5	918.5	66.98	14.714			
8,700.0	7,071.1	8,543.7	7,004.1	39.0	34.8	86.10	-1,627.7	-46.0	985.5	915.2	70.38	14.003			
8,800.0	7,072.6	8,643.7	7,005.5	40.6	36.5	86.10	-1,727.7	-46.9	985.6	911.7	73.83	13.349			
8,900.0	7,074.1	8,743.7	7,007.0	42.2	38.2	86.09	-1,827.7	-47.8	985.6	908.3	77.31	12.748			
9,000.0	7,075.6	8,843.7	7,008.4	43.8	40.0	86.09	-1,927.6	-48.7	985.6	904.8	80.82	12.194			
9,100.0	7,077.1	8,943.7	7,009.9	45.5	41.8	86.09	-2,027.6	-49.6	985.6	901.2	84.37	11.682			
9,200.0	7,078.6	9,043.7	7,011.3	47.2	43.6	86.09	-2,127.6	-50.5	985.6	897.7	87.93	11.209			
9,300.0	7,080.0	9,143.7	7,012.8	48.9	45.4	86.09	-2,227.6	-51.4	985.7	894.1	91.52	10.769			
9,400.0	7,081.5	9,243.7	7,014.2	50.6	47.2	86.08	-2,327.6	-52.3	985.7	890.5	95.13	10.361			
9,500.0	7,083.0	9,343.7	7,015.7	52.3	49.0	86.08	-2,427.6	-53.2	985.7	886.9	98.76	9.981			
9,600.0	7,084.5	9,443.7	7,017.1	54.1	50.9	86.08	-2,527.6	-54.1	985.7	883.3	102.40	9.626			
9,700.0	7,086.0	9,543.7	7,018.6	55.8	52.7	86.08	-2,627.5	-55.0	985.7	879.7	106.05	9.295			
9,800.0	7,087.5	9,643.7	7,020.0	57.6	54.5	86.08	-2,727.5	-56.0	985.7	876.0	109.72	8.985			
9,900.0	7,088.9	9,743.7	7,021.5	59.4	56.4	86.07	-2,827.5	-56.9	985.8	872.4	113.39	8.693			
10,000.0	7,090.4	9,843.7	7,022.9	61.2	58.2	86.07	-2,927.5	-57.8	985.8	868.7	117.08	8.420			
10,100.0	7,091.9	9,943.7	7,024.4	62.9	60.1	86.07	-3,027.5	-58.7	985.8	865.0	120.78	8.162			
10,200.0	7,093.4	10,043.7	7,025.8	64.7	62.0	86.07	-3,127.5	-59.6	985.8	861.3	124.48	7.919			
10,300.0	7,094.9	10,143.7	7,027.3	66.6	63.8	86.07	-3,227.4	-60.5	985.8	857.6	128.19	7.690			
10,400.0	7,096.4	10,243.7	7,028.7	68.4	65.7	86.07	-3,327.4	-61.4	985.9	853.9	131.91	7.474			
10,500.0	7,097.8	10,343.7	7,030.2	70.2	67.6	86.06	-3,427.4	-62.3	985.9	850.2	135.64	7.268			
10,600.0	7,099.3	10,443.7	7,031.6	72.0	69.4	86.06	-3,527.4	-63.2	985.9	846.5	139.37	7.074			
10,700.0	7,100.8	10,543.7	7,033.1	73.8	71.3	86.06	-3,627.4	-64.1	985.9	842.8	143.11	6.889			
10,800.0	7,102.3	10,643.7	7,034.5	75.7	73.2	86.06	-3,727.4	-65.0	985.9	839.1	146.85	6.714			
10,900.0	7,103.8	10,743.7	7,035.9	77.5	75.1	86.06	-3,827.4	-65.9	986.0	835.4	150.59	6.547			
11,000.0	7,105.3	10,843.7	7,037.4	79.3	76.9	86.05	-3,927.3	-66.9	986.0	831.6	154.34	6.388			
11,100.0	7,106.7	10,943.7	7,038.8	81.2	78.8	86.05	-4,027.3	-67.8	986.0	827.9	158.10	6.237			
11,200.0	7,108.2	11,043.7	7,040.3	83.0	80.7	86.05	-4,127.3	-68.7	986.0	824.2	161.86	6.092			
11,300.0	7,109.7	11,143.7	7,041.7	84.9	82.6	86.05	-4,227.3	-69.6	986.0	820.4	165.62	5.954			
11,400.0	7,111.2	11,243.7	7,043.2	86.8	84.5	86.05	-4,327.3	-70.5	986.0	816.7	169.38	5.821			
11,500.0	7,112.7	11,343.7	7,044.6	88.6	86.4	86.04	-4,427.3	-71.4	986.1	812.9	173.15	5.695			
11,590.3	7,114.0	11,434.0	7,045.9	90.3	88.1	86.04	-4,517.6	-72.2	986.1	809.5	176.56	5.585 SF			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Dillard 20M-HZ Pad Sec.20-T7N-R64W - Dillard 20R-443 - Wellbore #1 - Plan #1 (11-28-12)		Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-29.1	0.0	29.1							
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-29.1	0.0	29.1	28.9	0.22	129.654				
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-29.1	0.0	29.1	28.5	0.67	43.218				
300.0	300.0	300.0	300.0	0.6	0.6	-180.00	-29.1	0.0	29.1	28.0	1.12	25.931				
400.0	400.0	400.0	400.0	0.8	0.8	-180.00	-29.1	0.0	29.1	27.6	1.57	18.522				
500.0	500.0	500.0	500.0	1.0	1.0	-180.00	-29.1	0.0	29.1	27.1	2.02	14.406				
600.0	600.0	600.0	600.0	1.2	1.2	-180.00	-29.1	0.0	29.1	26.7	2.47	11.787				
700.0	700.0	700.0	700.0	1.5	1.5	-180.00	-29.1	0.0	29.1	26.2	2.92	9.973				
800.0	800.0	800.0	800.0	1.7	1.7	-180.00	-29.1	0.0	29.1	25.8	3.37	8.644 CC, ES				
900.0	900.0	900.0	900.0	1.9	1.9	107.39	-29.1	0.0	29.6	25.8	3.81	7.770				
1,000.0	999.8	999.8	999.8	2.1	2.1	116.44	-29.1	0.0	31.6	27.3	4.25	7.433				
1,100.0	1,099.5	1,100.4	1,100.3	2.3	2.4	126.93	-28.5	1.6	35.0	30.4	4.69	7.478				
1,200.0	1,198.7	1,201.1	1,200.9	2.6	2.6	135.91	-26.4	6.5	39.1	34.0	5.12	7.632				
1,300.0	1,297.5	1,302.1	1,301.5	2.9	2.8	143.65	-22.9	14.7	43.6	38.0	5.57	7.836				
1,400.0	1,395.6	1,403.3	1,402.0	3.2	3.0	150.40	-18.1	26.1	48.5	42.5	6.01	8.069				
1,500.0	1,493.5	1,503.8	1,501.3	3.6	3.3	155.66	-12.2	40.1	52.4	46.0	6.47	8.105				
1,600.0	1,591.4	1,603.6	1,599.9	3.9	3.6	160.08	-6.2	54.2	56.5	49.6	6.93	8.155				
1,700.0	1,689.3	1,703.4	1,698.6	4.3	3.9	163.88	-0.2	68.3	60.9	53.5	7.39	8.240				
1,800.0	1,787.2	1,803.2	1,797.2	4.7	4.2	167.16	5.7	82.4	65.5	57.6	7.85	8.342				
1,900.0	1,885.1	1,903.1	1,895.8	5.1	4.5	170.00	11.7	96.5	70.3	62.0	8.32	8.452				
2,000.0	1,982.9	2,002.9	1,994.5	5.6	4.9	172.47	17.7	110.7	75.2	66.4	8.78	8.562				
2,100.0	2,080.8	2,102.7	2,093.1	6.0	5.2	174.64	23.7	124.8	80.3	71.0	9.26	8.668				
2,200.0	2,178.7	2,202.6	2,191.8	6.4	5.5	176.55	29.6	138.9	85.4	75.7	9.74	8.768				
2,300.0	2,276.6	2,302.4	2,290.4	6.8	5.9	178.23	35.6	153.0	90.7	80.4	10.23	8.862				
2,400.0	2,374.5	2,402.2	2,389.1	7.3	6.2	179.74	41.6	167.1	96.0	85.3	10.73	8.947				
2,500.0	2,472.4	2,502.0	2,487.7	7.7	6.6	-178.92	47.6	181.3	101.4	90.1	11.23	9.026				
2,600.0	2,570.3	2,601.9	2,586.4	8.2	6.9	-177.71	53.5	195.4	106.8	95.1	11.74	9.097				
2,700.0	2,668.1	2,701.7	2,685.0	8.6	7.3	-176.62	59.5	209.5	112.3	100.0	12.25	9.162				
2,800.0	2,766.0	2,801.5	2,783.6	9.0	7.6	-175.63	65.5	223.6	117.8	105.0	12.77	9.221				
2,900.0	2,863.9	2,901.4	2,882.3	9.5	8.0	-174.73	71.5	237.7	123.3	110.0	13.29	9.275				
3,000.0	2,961.8	3,001.2	2,980.9	9.9	8.3	-173.91	77.4	251.9	128.9	115.0	13.82	9.323				
3,100.0	3,059.7	3,101.0	3,079.6	10.4	8.7	-173.15	83.4	266.0	134.5	120.1	14.35	9.367				
3,200.0	3,157.6	3,200.8	3,178.2	10.8	9.0	-172.46	89.4	280.1	140.1	125.2	14.89	9.407				
3,300.0	3,255.5	3,300.7	3,276.9	11.3	9.4	-171.82	95.4	294.2	145.7	130.3	15.43	9.444				
3,400.0	3,353.3	3,400.5	3,375.5	11.7	9.7	-171.22	101.3	308.3	151.3	135.4	15.97	9.477				
3,500.0	3,451.2	3,500.3	3,474.2	12.1	10.1	-170.67	107.3	322.5	157.0	140.5	16.51	9.508				
3,600.0	3,549.1	3,600.2	3,572.8	12.6	10.5	-170.16	113.3	336.6	162.7	145.6	17.06	9.536				
3,700.0	3,647.0	3,700.0	3,671.4	13.0	10.8	-169.68	119.3	350.7	168.4	150.7	17.61	9.562				
3,800.0	3,744.9	3,799.8	3,770.1	13.5	11.2	-169.23	125.2	364.8	174.1	155.9	18.16	9.585				
3,900.0	3,842.8	3,899.6	3,868.7	13.9	11.5	-168.82	131.2	378.9	179.8	161.0	18.71	9.607				
4,000.0	3,940.7	3,999.5	3,967.4	14.4	11.9	-168.42	137.2	393.1	185.5	166.2	19.27	9.627				
4,100.0	4,038.5	4,099.3	4,066.0	14.8	12.3	-168.05	143.2	407.2	191.2	171.4	19.82	9.645				
4,200.0	4,136.4	4,199.1	4,164.7	15.3	12.6	-167.71	149.1	421.3	196.9	176.5	20.38	9.662				
4,300.0	4,234.3	4,299.0	4,263.3	15.7	13.0	-167.38	155.1	435.4	202.7	181.7	20.94	9.678				
4,400.0	4,332.2	4,398.8	4,362.0	16.2	13.3	-167.07	161.1	449.5	208.4	186.9	21.50	9.693				
4,500.0	4,430.1	4,498.6	4,460.6	16.6	13.7	-166.78	167.1	463.6	214.2	192.1	22.06	9.707				
4,600.0	4,528.0	4,598.4	4,559.2	17.1	14.1	-166.50	173.0	477.8	219.9	197.3	22.63	9.719				
4,700.0	4,625.9	4,698.3	4,657.9	17.5	14.4	-166.24	179.0	491.9	225.7	202.5	23.19	9.731				
4,800.0	4,723.7	4,798.1	4,756.5	18.0	14.8	-165.98	185.0	506.0	231.4	207.7	23.76	9.742				
4,900.0	4,821.6	4,897.9	4,855.2	18.4	15.1	-165.75	191.0	520.1	237.2	212.9	24.32	9.753				
5,000.0	4,919.5	4,997.8	4,953.8	18.9	15.5	-165.52	196.9	534.2	243.0	218.1	24.89	9.763				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Dillard 20M-HZ Pad Sec.20-T7N-R64W - Dillard 20R-443 - Wellbore #1 - Plan #1 (11-28-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	5,017.4	5,097.6	5,052.5	19.3	15.9	-165.30	202.9	548.4	248.8	223.3	25.46	9.772		
5,200.0	5,115.3	5,197.4	5,151.1	19.8	16.2	-165.10	208.9	562.5	254.5	228.5	26.03	9.780		
5,300.0	5,213.2	5,297.2	5,249.8	20.2	16.6	-164.90	214.9	576.6	260.3	233.7	26.60	9.788		
5,400.0	5,311.1	5,397.1	5,348.4	20.7	17.0	-164.71	220.9	590.7	266.1	238.9	27.17	9.796		
5,500.0	5,408.9	5,496.9	5,447.0	21.1	17.3	-164.53	226.8	604.8	271.9	244.2	27.74	9.803		
5,600.0	5,506.8	5,589.7	5,538.9	21.6	17.6	-164.46	232.0	617.0	278.8	250.5	28.25	9.868		
5,700.0	5,605.0	5,681.1	5,629.7	22.0	17.8	-164.61	235.9	626.2	287.1	258.4	28.71	10.002		
5,800.0	5,703.8	5,772.3	5,720.7	22.2	18.0	-164.81	238.7	632.8	295.0	265.9	29.08	10.145		
5,900.0	5,803.0	5,863.3	5,811.6	22.5	18.2	-165.07	240.3	636.7	302.4	273.0	29.39	10.290		
6,000.0	5,902.7	5,954.4	5,902.7	22.7	18.3	-165.38	240.9	638.0	309.4	279.8	29.65	10.436		
6,100.0	6,002.5	6,054.3	6,002.5	22.9	18.5	-165.64	240.9	638.0	314.4	284.5	29.90	10.515		
6,200.0	6,102.5	6,154.3	6,102.5	23.0	18.6	-89.84	240.9	638.0	316.0	285.9	30.08	10.504		
6,300.0	6,202.5	6,254.3	6,202.5	23.1	18.8	-89.84	240.9	638.0	316.0	285.6	30.45	10.377		
6,400.0	6,302.5	6,354.3	6,302.5	23.2	18.9	89.66	240.9	638.0	316.0	285.1	30.89	10.230		
6,440.6	6,343.1	6,394.9	6,343.1	23.3	19.0	89.97	240.9	638.0	316.0	284.9	31.06	10.174		
6,500.0	6,402.1	6,454.2	6,402.4	23.3	19.1	90.95	239.9	638.0	316.0	284.7	31.37	10.074		
6,600.0	6,499.8	6,555.0	6,502.5	23.4	19.2	92.66	228.1	637.9	316.3	284.5	31.79	9.951		
6,700.0	6,593.9	6,657.2	6,601.4	23.4	19.2	94.33	202.9	637.7	316.9	284.8	32.07	9.882		
6,800.0	6,682.8	6,760.6	6,697.2	23.4	19.2	95.94	164.1	637.3	317.7	285.5	32.22	9.863		
6,900.0	6,765.1	6,865.4	6,788.0	23.4	19.2	97.44	112.1	636.8	318.7	286.4	32.28	9.875		
7,000.0	6,839.1	6,971.4	6,871.8	23.4	19.2	98.81	47.3	636.2	319.8	287.5	32.34	9.890		
7,100.0	6,903.9	7,078.5	6,946.5	23.5	19.2	100.02	-29.4	635.5	320.9	288.4	32.52	9.869		
7,200.0	6,958.1	7,186.7	7,010.4	23.6	19.3	101.04	-116.6	634.8	322.0	289.1	32.98	9.765		
7,300.0	7,000.9	7,295.7	7,061.6	23.8	19.5	101.87	-212.7	633.9	323.0	289.2	33.83	9.548		
7,400.0	7,031.5	7,405.5	7,098.9	24.1	19.9	102.48	-315.9	632.9	323.7	288.6	35.17	9.204		
7,500.0	7,049.5	7,515.7	7,121.0	24.6	20.5	102.85	-423.8	632.0	324.2	287.2	37.03	8.755		
7,600.0	7,054.8	7,618.0	7,131.9	25.3	21.3	103.72	-525.4	631.0	325.5	286.3	39.18	8.307		
7,700.0	7,056.3	7,724.4	7,137.4	26.0	22.3	104.38	-631.7	630.1	326.4	285.0	41.41	7.882		
7,800.0	7,057.8	7,824.4	7,138.8	26.9	23.4	104.38	-731.7	629.2	326.4	282.6	43.81	7.450		
7,900.0	7,059.3	7,924.4	7,140.3	28.0	24.6	104.38	-831.7	628.3	326.4	280.0	46.38	7.037		
8,000.0	7,060.7	8,024.4	7,141.8	29.1	25.9	104.38	-931.7	627.3	326.4	277.3	49.10	6.647		
8,100.0	7,062.2	8,124.4	7,143.3	30.3	27.3	104.38	-1,031.7	626.4	326.4	274.5	51.95	6.283		
8,200.0	7,063.7	8,224.4	7,144.8	31.6	28.7	104.38	-1,131.6	625.5	326.4	271.5	54.91	5.945		
8,300.0	7,065.2	8,324.4	7,146.3	33.0	30.2	104.38	-1,231.6	624.6	326.5	268.5	57.96	5.632		
8,400.0	7,066.7	8,424.4	7,147.7	34.4	31.8	104.38	-1,331.6	623.7	326.5	265.4	61.09	5.345		
8,500.0	7,068.2	8,524.4	7,149.2	35.9	33.4	104.38	-1,431.6	622.8	326.5	262.2	64.28	5.080		
8,600.0	7,069.6	8,624.4	7,150.7	37.4	35.0	104.37	-1,531.6	621.9	326.5	259.0	67.52	4.835		
8,700.0	7,071.1	8,724.4	7,152.2	39.0	36.6	104.37	-1,631.6	621.0	326.5	255.7	70.82	4.611		
8,800.0	7,072.6	8,824.4	7,153.7	40.6	38.3	104.37	-1,731.6	620.1	326.5	252.4	74.16	4.403		
8,900.0	7,074.1	8,924.4	7,155.1	42.2	40.0	104.37	-1,831.5	619.2	326.6	249.0	77.53	4.212		
9,000.0	7,075.6	9,024.4	7,156.6	43.8	41.7	104.37	-1,931.5	618.3	326.6	245.6	80.94	4.035		
9,100.0	7,077.1	9,124.4	7,158.1	45.5	43.4	104.37	-2,031.5	617.3	326.6	242.2	84.38	3.871		
9,200.0	7,078.6	9,224.4	7,159.6	47.2	45.2	104.37	-2,131.5	616.4	326.6	238.8	87.84	3.718		
9,300.0	7,080.0	9,324.4	7,161.1	48.9	46.9	104.37	-2,231.5	615.5	326.6	235.3	91.32	3.577		
9,400.0	7,081.5	9,424.4	7,162.6	50.6	48.7	104.37	-2,331.5	614.6	326.6	231.8	94.82	3.445		
9,500.0	7,083.0	9,524.4	7,164.0	52.3	50.5	104.36	-2,431.4	613.7	326.7	228.3	98.34	3.322		
9,600.0	7,084.5	9,624.4	7,165.5	54.1	52.3	104.36	-2,531.4	612.8	326.7	224.8	101.88	3.207		
9,700.0	7,086.0	9,724.4	7,167.0	55.8	54.1	104.36	-2,631.4	611.9	326.7	221.3	105.43	3.099		
9,800.0	7,087.5	9,824.4	7,168.5	57.6	55.9	104.36	-2,731.4	611.0	326.7	217.7	108.99	2.998		
9,900.0	7,088.9	9,924.4	7,170.0	59.4	57.7	104.36	-2,831.4	610.1	326.7	214.2	112.57	2.903		
10,000.0	7,090.4	10,024.4	7,171.4	61.2	59.5	104.36	-2,931.4	609.2	326.7	210.6	116.15	2.813		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Dillard 20M-HZ Pad Sec.20-T7N-R64W - Dillard 20R-443 - Wellbore #1 - Plan #1 (11-28-12)												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,091.9	10,124.4	7,172.9	62.9	61.3	104.36	-3,031.4	608.2	326.8	207.0	119.74	2.729	
10,200.0	7,093.4	10,224.4	7,174.4	64.7	63.2	104.36	-3,131.3	607.3	326.8	203.4	123.35	2.649	
10,300.0	7,094.9	10,324.4	7,175.9	66.6	65.0	104.36	-3,231.3	606.4	326.8	199.8	126.96	2.574	
10,400.0	7,096.4	10,424.4	7,177.4	68.4	66.9	104.35	-3,331.3	605.5	326.8	196.2	130.58	2.503	
10,500.0	7,097.8	10,524.4	7,178.8	70.2	68.7	104.35	-3,431.3	604.6	326.8	192.6	134.20	2.435	
10,600.0	7,099.3	10,624.4	7,180.3	72.0	70.6	104.35	-3,531.3	603.7	326.8	189.0	137.83	2.371	
10,700.0	7,100.8	10,724.4	7,181.8	73.8	72.4	104.35	-3,631.3	602.8	326.9	185.4	141.47	2.310	
10,800.0	7,102.3	10,824.4	7,183.3	75.7	74.3	104.35	-3,731.3	601.9	326.9	181.8	145.11	2.253	
10,900.0	7,103.8	10,924.4	7,184.8	77.5	76.1	104.35	-3,831.2	601.0	326.9	178.1	148.76	2.197	
11,000.0	7,105.3	11,024.4	7,186.3	79.3	78.0	104.35	-3,931.2	600.1	326.9	174.5	152.41	2.145	
11,100.0	7,106.7	11,124.4	7,187.7	81.2	79.9	104.35	-4,031.2	599.1	326.9	170.9	156.07	2.095	
11,200.0	7,108.2	11,224.4	7,189.2	83.0	81.7	104.35	-4,131.2	598.2	326.9	167.2	159.73	2.047	
11,300.0	7,109.7	11,324.4	7,190.7	84.9	83.6	104.35	-4,231.2	597.3	327.0	163.6	163.39	2.001	
11,400.0	7,111.2	11,424.4	7,192.2	86.8	85.5	104.34	-4,331.2	596.4	327.0	159.9	167.06	1.957	
11,500.0	7,112.7	11,524.4	7,193.7	88.6	87.3	104.34	-4,431.1	595.5	327.0	156.3	170.73	1.915	
11,541.5	7,113.3	11,566.0	7,194.3	89.4	88.1	104.34	-4,472.7	595.1	327.0	154.7	172.26	1.898	
11,590.3	7,114.0	11,614.5	7,195.0	90.3	89.0	104.34	-4,521.2	594.7	327.0	153.0	174.04	1.879 SF	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
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<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4914.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Dillard 20R-303

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.60°



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Reference Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Dillard 20R-303	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #2 (7-25-13)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4914.0ft (RKB - 15')  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °

Coordinates are relative to: Dillard 20R-303  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.60°

