PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Dillard 20T-221**

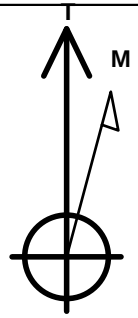
Surface Location: Dillard 20Y-HZ Pad Sec.20-T7N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4865.0

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1445348.05	3259476.22	40.552130	-104.566230	

RKB - 15' WELL @ 4880.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BHL 500'FNL & 874'FEL	6940.0	4426.5	-241.7	Point



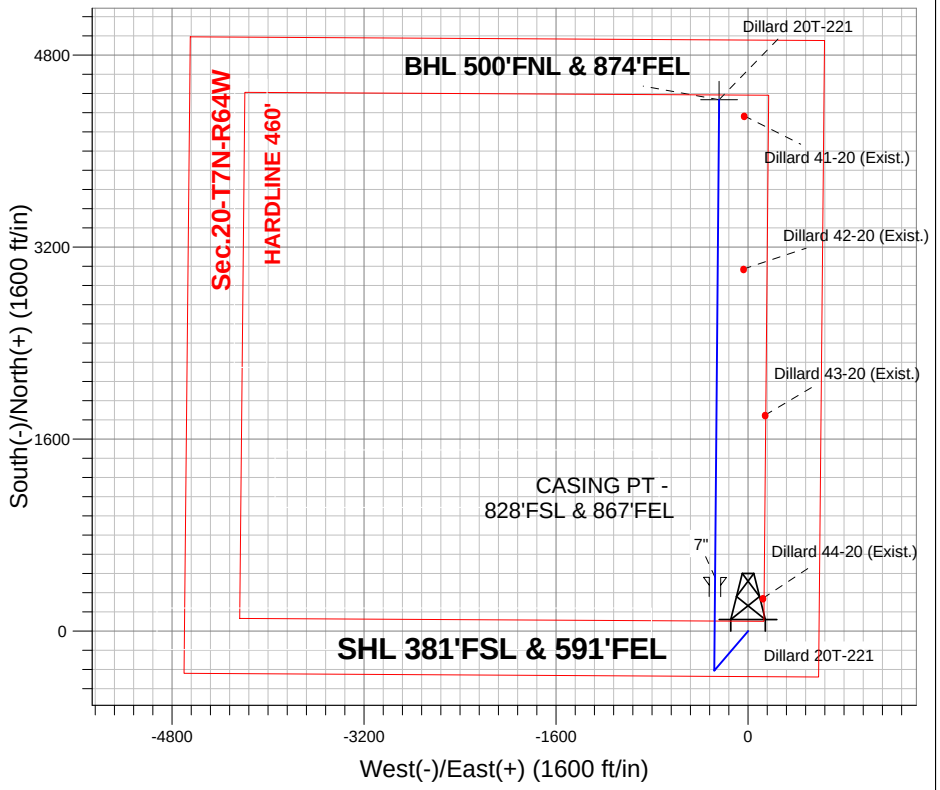
Azimuths to True North
Magnetic North: 8.58°

Magnetic Field
Strength: 53081.9snT
Dip Angle: 67.16°
Date: 11/15/2012
Model: IGRF2010

Dillard 20Y-HZ Pad Sec.20-T7N-R64W
Dillard 20T-221
Plan #1 (11-15-12)
12:02, November 26 2012

ANNOTATIONS

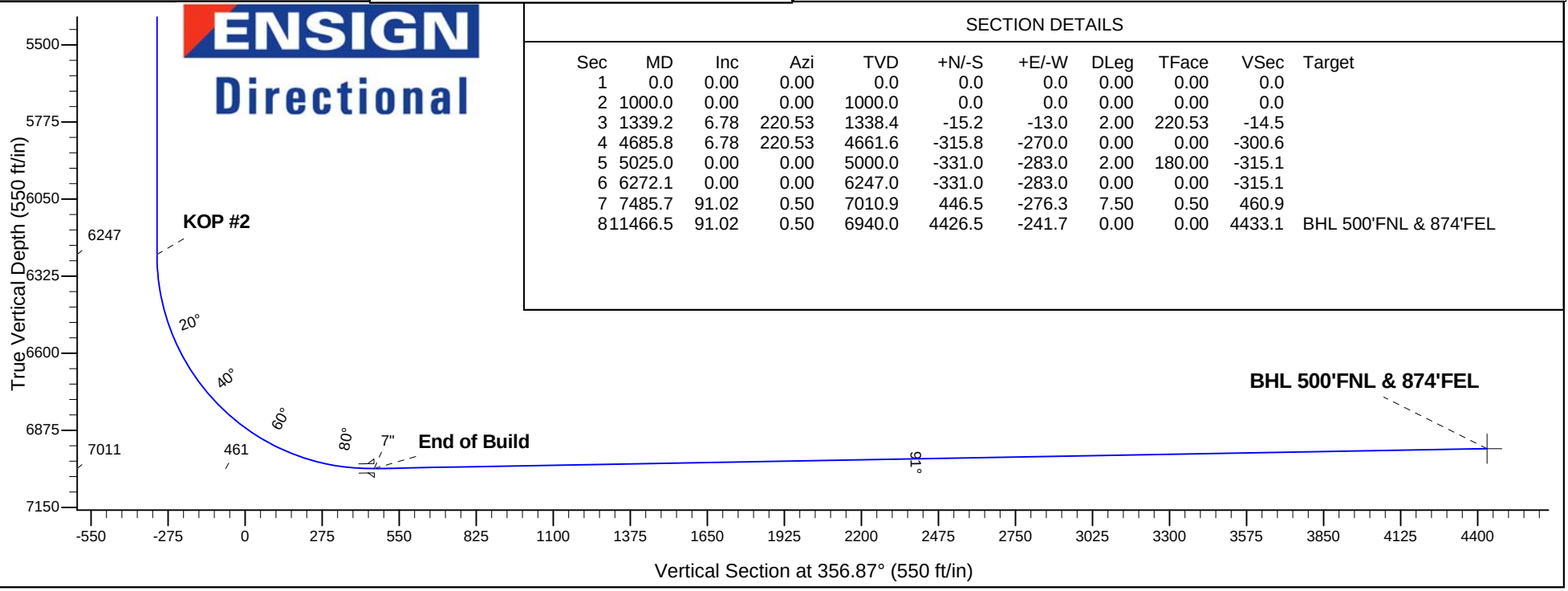
TVD	MD	Annotation
1000.0	1000.0	KOP #1
6247.1	6272.1	KOP #2
7010.9	7485.7	End of Build



ENSIGN Directional

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1339.2	6.78	220.53	1338.4	-15.2	-13.0	2.00	220.53	-14.5	
4	4685.8	6.78	220.53	4661.6	-315.8	-270.0	0.00	0.00	-300.6	
5	5025.0	0.00	0.00	5000.0	-331.0	-283.0	2.00	180.00	-315.1	
6	6272.1	0.00	0.00	6247.0	-331.0	-283.0	0.00	0.00	-315.1	
7	7485.7	91.02	0.50	7010.9	446.5	-276.3	7.50	0.50	460.9	
8	11466.5	91.02	0.50	6940.0	4426.5	-241.7	0.00	0.00	4433.1	BHL 500'FNL & 874'FEL



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T7N-R64W
Dillard 20Y-HZ Pad Sec.20-T7N-R64W
Dillard 20T-221

Wellbore #1

Plan: Plan #1 (11-15-12)

Standard Planning Report

26 November, 2012

Database:	Landmark	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Project SEC.20-T7N-R64W, Weld County, CO

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 Dillard 20Y-HZ Pad Sec.20-T7N-R64W

Site Position:		**Northing:**	1,445,348.38 ft	**Latitude:**	40.552130
From:	Lat/Long	**Easting:**	3,259,506.78 ft	**Longitude:**	-104.566120
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.60 °

Well Dillard 20T-221

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,445,348.05 ft	**Latitude:**	40.552130
	+E/-W	-30.6 ft	**Easting:**	3,259,476.22 ft	**Longitude:**	-104.566230
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,865.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/15/2012	8.58	67.16	53,082

Design Plan #1 (11-15-12)

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	356.87

Plan Sections

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,339.2	6.78	220.53	1,338.4	-15.2	-13.0	2.00	2.00	0.00	220.53	
4,685.8	6.78	220.53	4,661.6	-315.8	-270.0	0.00	0.00	0.00	0.00	
5,025.0	0.00	0.00	5,000.0	-331.0	-283.0	2.00	-2.00	0.00	180.00	
6,272.1	0.00	0.00	6,247.0	-331.0	-283.0	0.00	0.00	0.00	0.00	
7,485.7	91.02	0.50	7,010.9	446.5	-276.3	7.50	7.50	0.00	0.50	
11,466.5	91.02	0.50	6,940.0	4,426.5	-241.7	0.00	0.00	0.00	0.00	BHL 500'FNL & 87

Database:	Landmark	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

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
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	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
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	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
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	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
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	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
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,040.0	0.80	220.53	1,040.0	-0.2	-0.2	-0.2	2.00	2.00	0.00
1,080.0	1.60	220.53	1,080.0	-0.8	-0.7	-0.8	2.00	2.00	0.00
1,120.0	2.40	220.53	1,120.0	-1.9	-1.6	-1.8	2.00	2.00	0.00
1,160.0	3.20	220.53	1,159.9	-3.4	-2.9	-3.2	2.00	2.00	0.00
1,200.0	4.00	220.53	1,199.8	-5.3	-4.5	-5.0	2.00	2.00	0.00
1,240.0	4.80	220.53	1,239.7	-7.6	-6.5	-7.3	2.00	2.00	0.00
1,280.0	5.60	220.53	1,279.6	-10.4	-8.9	-9.9	2.00	2.00	0.00
1,320.0	6.40	220.53	1,319.3	-13.6	-11.6	-12.9	2.00	2.00	0.00
1,339.2	6.78	220.53	1,338.4	-15.2	-13.0	-14.5	2.00	2.00	0.00
1,360.0	6.78	220.53	1,359.1	-17.1	-14.6	-16.3	0.00	0.00	0.00
1,400.0	6.78	220.53	1,398.8	-20.7	-17.7	-19.7	0.00	0.00	0.00
1,440.0	6.78	220.53	1,438.5	-24.3	-20.8	-23.1	0.00	0.00	0.00
1,480.0	6.78	220.53	1,478.2	-27.9	-23.8	-26.5	0.00	0.00	0.00
1,520.0	6.78	220.53	1,517.9	-31.5	-26.9	-30.0	0.00	0.00	0.00
1,560.0	6.78	220.53	1,557.7	-35.1	-30.0	-33.4	0.00	0.00	0.00
1,600.0	6.78	220.53	1,597.4	-38.7	-33.1	-36.8	0.00	0.00	0.00
1,640.0	6.78	220.53	1,637.1	-42.3	-36.1	-40.2	0.00	0.00	0.00
1,680.0	6.78	220.53	1,676.8	-45.8	-39.2	-43.6	0.00	0.00	0.00
1,720.0	6.78	220.53	1,716.5	-49.4	-42.3	-47.1	0.00	0.00	0.00
1,760.0	6.78	220.53	1,756.3	-53.0	-45.3	-50.5	0.00	0.00	0.00
1,800.0	6.78	220.53	1,796.0	-56.6	-48.4	-53.9	0.00	0.00	0.00
1,840.0	6.78	220.53	1,835.7	-60.2	-51.5	-57.3	0.00	0.00	0.00
1,880.0	6.78	220.53	1,875.4	-63.8	-54.6	-60.7	0.00	0.00	0.00
1,920.0	6.78	220.53	1,915.1	-67.4	-57.6	-64.2	0.00	0.00	0.00
1,960.0	6.78	220.53	1,954.9	-71.0	-60.7	-67.6	0.00	0.00	0.00
2,000.0	6.78	220.53	1,994.6	-74.6	-63.8	-71.0	0.00	0.00	0.00

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Project:	SEC.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

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)
2,040.0	6.78	220.53	2,034.3	-78.2	-66.8	-74.4	0.00	0.00	0.00
2,080.0	6.78	220.53	2,074.0	-81.8	-69.9	-77.8	0.00	0.00	0.00
2,120.0	6.78	220.53	2,113.7	-85.4	-73.0	-81.3	0.00	0.00	0.00
2,160.0	6.78	220.53	2,153.5	-88.9	-76.0	-84.7	0.00	0.00	0.00
2,200.0	6.78	220.53	2,193.2	-92.5	-79.1	-88.1	0.00	0.00	0.00
2,240.0	6.78	220.53	2,232.9	-96.1	-82.2	-91.5	0.00	0.00	0.00
2,280.0	6.78	220.53	2,272.6	-99.7	-85.3	-94.9	0.00	0.00	0.00
2,320.0	6.78	220.53	2,312.3	-103.3	-88.3	-98.3	0.00	0.00	0.00
2,360.0	6.78	220.53	2,352.1	-106.9	-91.4	-101.8	0.00	0.00	0.00
2,400.0	6.78	220.53	2,391.8	-110.5	-94.5	-105.2	0.00	0.00	0.00
2,440.0	6.78	220.53	2,431.5	-114.1	-97.5	-108.6	0.00	0.00	0.00
2,480.0	6.78	220.53	2,471.2	-117.7	-100.6	-112.0	0.00	0.00	0.00
2,520.0	6.78	220.53	2,510.9	-121.3	-103.7	-115.4	0.00	0.00	0.00
2,560.0	6.78	220.53	2,550.7	-124.9	-106.8	-118.9	0.00	0.00	0.00
2,600.0	6.78	220.53	2,590.4	-128.5	-109.8	-122.3	0.00	0.00	0.00
2,640.0	6.78	220.53	2,630.1	-132.1	-112.9	-125.7	0.00	0.00	0.00
2,680.0	6.78	220.53	2,669.8	-135.6	-116.0	-129.1	0.00	0.00	0.00
2,720.0	6.78	220.53	2,709.5	-139.2	-119.0	-132.5	0.00	0.00	0.00
2,760.0	6.78	220.53	2,749.3	-142.8	-122.1	-136.0	0.00	0.00	0.00
2,800.0	6.78	220.53	2,789.0	-146.4	-125.2	-139.4	0.00	0.00	0.00
2,840.0	6.78	220.53	2,828.7	-150.0	-128.3	-142.8	0.00	0.00	0.00
2,880.0	6.78	220.53	2,868.4	-153.6	-131.3	-146.2	0.00	0.00	0.00
2,920.0	6.78	220.53	2,908.1	-157.2	-134.4	-149.6	0.00	0.00	0.00
2,960.0	6.78	220.53	2,947.9	-160.8	-137.5	-153.1	0.00	0.00	0.00
3,000.0	6.78	220.53	2,987.6	-164.4	-140.5	-156.5	0.00	0.00	0.00
3,040.0	6.78	220.53	3,027.3	-168.0	-143.6	-159.9	0.00	0.00	0.00
3,080.0	6.78	220.53	3,067.0	-171.6	-146.7	-163.3	0.00	0.00	0.00
3,120.0	6.78	220.53	3,106.7	-175.2	-149.8	-166.7	0.00	0.00	0.00
3,160.0	6.78	220.53	3,146.5	-178.7	-152.8	-170.1	0.00	0.00	0.00
3,200.0	6.78	220.53	3,186.2	-182.3	-155.9	-173.6	0.00	0.00	0.00
3,240.0	6.78	220.53	3,225.9	-185.9	-159.0	-177.0	0.00	0.00	0.00
3,280.0	6.78	220.53	3,265.6	-189.5	-162.0	-180.4	0.00	0.00	0.00
3,320.0	6.78	220.53	3,305.3	-193.1	-165.1	-183.8	0.00	0.00	0.00
3,360.0	6.78	220.53	3,345.1	-196.7	-168.2	-187.2	0.00	0.00	0.00
3,400.0	6.78	220.53	3,384.8	-200.3	-171.2	-190.7	0.00	0.00	0.00
3,440.0	6.78	220.53	3,424.5	-203.9	-174.3	-194.1	0.00	0.00	0.00
3,480.0	6.78	220.53	3,464.2	-207.5	-177.4	-197.5	0.00	0.00	0.00
3,520.0	6.78	220.53	3,503.9	-211.1	-180.5	-200.9	0.00	0.00	0.00
3,560.0	6.78	220.53	3,543.7	-214.7	-183.5	-204.3	0.00	0.00	0.00
3,600.0	6.78	220.53	3,583.4	-218.3	-186.6	-207.8	0.00	0.00	0.00
3,640.0	6.78	220.53	3,623.1	-221.8	-189.7	-211.2	0.00	0.00	0.00
3,680.0	6.78	220.53	3,662.8	-225.4	-192.7	-214.6	0.00	0.00	0.00
3,720.0	6.78	220.53	3,702.5	-229.0	-195.8	-218.0	0.00	0.00	0.00
3,760.0	6.78	220.53	3,742.3	-232.6	-198.9	-221.4	0.00	0.00	0.00
3,800.0	6.78	220.53	3,782.0	-236.2	-202.0	-224.9	0.00	0.00	0.00
3,840.0	6.78	220.53	3,821.7	-239.8	-205.0	-228.3	0.00	0.00	0.00
3,880.0	6.78	220.53	3,861.4	-243.4	-208.1	-231.7	0.00	0.00	0.00
3,920.0	6.78	220.53	3,901.1	-247.0	-211.2	-235.1	0.00	0.00	0.00
3,960.0	6.78	220.53	3,940.9	-250.6	-214.2	-238.5	0.00	0.00	0.00
4,000.0	6.78	220.53	3,980.6	-254.2	-217.3	-241.9	0.00	0.00	0.00
4,040.0	6.78	220.53	4,020.3	-257.8	-220.4	-245.4	0.00	0.00	0.00
4,080.0	6.78	220.53	4,060.0	-261.4	-223.5	-248.8	0.00	0.00	0.00
4,120.0	6.78	220.53	4,099.7	-264.9	-226.5	-252.2	0.00	0.00	0.00

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Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

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)
4,160.0	6.78	220.53	4,139.5	-268.5	-229.6	-255.6	0.00	0.00	0.00
4,200.0	6.78	220.53	4,179.2	-272.1	-232.7	-259.0	0.00	0.00	0.00
4,240.0	6.78	220.53	4,218.9	-275.7	-235.7	-262.5	0.00	0.00	0.00
4,280.0	6.78	220.53	4,258.6	-279.3	-238.8	-265.9	0.00	0.00	0.00
4,320.0	6.78	220.53	4,298.3	-282.9	-241.9	-269.3	0.00	0.00	0.00
4,360.0	6.78	220.53	4,338.1	-286.5	-245.0	-272.7	0.00	0.00	0.00
4,400.0	6.78	220.53	4,377.8	-290.1	-248.0	-276.1	0.00	0.00	0.00
4,440.0	6.78	220.53	4,417.5	-293.7	-251.1	-279.6	0.00	0.00	0.00
4,480.0	6.78	220.53	4,457.2	-297.3	-254.2	-283.0	0.00	0.00	0.00
4,520.0	6.78	220.53	4,496.9	-300.9	-257.2	-286.4	0.00	0.00	0.00
4,560.0	6.78	220.53	4,536.7	-304.5	-260.3	-289.8	0.00	0.00	0.00
4,600.0	6.78	220.53	4,576.4	-308.0	-263.4	-293.2	0.00	0.00	0.00
4,640.0	6.78	220.53	4,616.1	-311.6	-266.4	-296.7	0.00	0.00	0.00
4,680.0	6.78	220.53	4,655.8	-315.2	-269.5	-300.1	0.00	0.00	0.00
4,685.8	6.78	220.53	4,661.6	-315.8	-270.0	-300.6	0.00	0.00	0.00
4,720.0	6.10	220.53	4,695.6	-318.7	-272.5	-303.3	2.00	-2.00	0.00
4,760.0	5.30	220.53	4,735.4	-321.7	-275.0	-306.2	2.00	-2.00	0.00
4,800.0	4.50	220.53	4,775.2	-324.3	-277.3	-308.7	2.00	-2.00	0.00
4,840.0	3.70	220.53	4,815.1	-326.5	-279.1	-310.8	2.00	-2.00	0.00
4,880.0	2.90	220.53	4,855.0	-328.2	-280.6	-312.4	2.00	-2.00	0.00
4,920.0	2.10	220.53	4,895.0	-329.5	-281.7	-313.7	2.00	-2.00	0.00
4,960.0	1.30	220.53	4,935.0	-330.4	-282.5	-314.5	2.00	-2.00	0.00
5,000.0	0.50	220.53	4,975.0	-330.9	-282.9	-315.0	2.00	-2.00	0.00
5,025.0	0.00	0.00	5,000.0	-331.0	-283.0	-315.1	2.00	-2.00	0.00
5,040.0	0.00	0.00	5,015.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,080.0	0.00	0.00	5,055.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,120.0	0.00	0.00	5,095.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,160.0	0.00	0.00	5,135.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,200.0	0.00	0.00	5,175.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,240.0	0.00	0.00	5,215.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,280.0	0.00	0.00	5,255.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,320.0	0.00	0.00	5,295.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,360.0	0.00	0.00	5,335.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,400.0	0.00	0.00	5,375.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,440.0	0.00	0.00	5,415.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,480.0	0.00	0.00	5,455.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,520.0	0.00	0.00	5,495.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,560.0	0.00	0.00	5,535.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,600.0	0.00	0.00	5,575.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,640.0	0.00	0.00	5,615.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,680.0	0.00	0.00	5,655.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,720.0	0.00	0.00	5,695.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,760.0	0.00	0.00	5,735.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,775.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,840.0	0.00	0.00	5,815.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,880.0	0.00	0.00	5,855.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,920.0	0.00	0.00	5,895.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
5,960.0	0.00	0.00	5,935.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,975.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
6,040.0	0.00	0.00	6,015.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
6,080.0	0.00	0.00	6,055.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
6,120.0	0.00	0.00	6,095.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
6,160.0	0.00	0.00	6,135.0	-331.0	-283.0	-315.1	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

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)
6,200.0	0.00	0.00	6,175.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
6,240.0	0.00	0.00	6,215.0	-331.0	-283.0	-315.1	0.00	0.00	0.00
6,272.1	0.00	0.00	6,247.1	-331.0	-283.0	-315.1	0.00	0.00	0.00
KOP #2									
6,280.0	0.60	0.50	6,255.0	-331.0	-283.0	-315.0	7.54	7.54	0.00
6,320.0	3.60	0.50	6,294.9	-329.5	-283.0	-313.6	7.50	7.50	0.00
6,360.0	6.60	0.50	6,334.8	-325.9	-283.0	-310.0	7.50	7.50	0.00
6,400.0	9.60	0.50	6,374.4	-320.3	-282.9	-304.4	7.50	7.50	0.00
6,440.0	12.60	0.50	6,413.6	-312.6	-282.8	-296.7	7.50	7.50	0.00
6,480.0	15.60	0.50	6,452.4	-302.9	-282.8	-287.0	7.50	7.50	0.00
6,520.0	18.60	0.50	6,490.6	-291.1	-282.7	-275.3	7.50	7.50	0.00
6,560.0	21.60	0.50	6,528.2	-277.4	-282.5	-261.6	7.50	7.50	0.00
6,600.0	24.60	0.50	6,565.0	-261.7	-282.4	-245.9	7.50	7.50	0.00
6,640.0	27.60	0.50	6,600.9	-244.1	-282.2	-228.3	7.50	7.50	0.00
6,680.0	30.60	0.50	6,635.9	-224.6	-282.1	-208.9	7.50	7.50	0.00
6,720.0	33.60	0.50	6,669.7	-203.4	-281.9	-187.7	7.50	7.50	0.00
6,760.0	36.60	0.50	6,702.5	-180.4	-281.7	-164.8	7.50	7.50	0.00
6,800.0	39.60	0.50	6,733.9	-155.7	-281.5	-140.2	7.50	7.50	0.00
6,840.0	42.60	0.50	6,764.1	-129.4	-281.3	-113.9	7.50	7.50	0.00
6,880.0	45.60	0.50	6,792.8	-101.6	-281.0	-86.1	7.50	7.50	0.00
6,920.0	48.60	0.50	6,820.0	-72.3	-280.8	-56.9	7.50	7.50	0.00
6,960.0	51.60	0.50	6,845.7	-41.6	-280.5	-26.3	7.50	7.50	0.00
7,000.0	54.60	0.50	6,869.7	-9.7	-280.2	5.6	7.50	7.50	0.00
7,040.0	57.60	0.50	6,892.0	23.5	-279.9	38.8	7.50	7.50	0.00
7,080.0	60.60	0.50	6,912.6	57.9	-279.6	73.0	7.50	7.50	0.00
7,120.0	63.60	0.50	6,931.3	93.2	-279.3	108.3	7.50	7.50	0.00
7,160.0	66.60	0.50	6,948.1	129.5	-279.0	144.5	7.50	7.50	0.00
7,200.0	69.60	0.50	6,963.0	166.6	-278.7	181.5	7.50	7.50	0.00
7,240.0	72.60	0.50	6,976.0	204.4	-278.4	219.3	7.50	7.50	0.00
7,280.0	75.60	0.50	6,987.0	242.9	-278.0	257.7	7.50	7.50	0.00
7,320.0	78.60	0.50	6,995.9	281.9	-277.7	296.6	7.50	7.50	0.00
7,360.0	81.60	0.50	7,002.8	321.3	-277.3	335.9	7.50	7.50	0.00
7,400.0	84.60	0.50	7,007.6	361.0	-277.0	375.5	7.50	7.50	0.00
7,440.0	87.60	0.50	7,010.3	400.9	-276.7	415.4	7.50	7.50	0.00
7,480.0	90.60	0.50	7,010.9	440.9	-276.3	455.3	7.50	7.50	0.00
7,485.7	91.02	0.50	7,010.9	446.6	-276.3	460.9	7.45	7.45	0.00
End of Build - 7"									
7,520.0	91.02	0.50	7,010.3	480.8	-276.0	495.2	0.00	0.00	0.00
7,560.0	91.02	0.50	7,009.5	520.8	-275.6	535.1	0.00	0.00	0.00
7,600.0	91.02	0.50	7,008.8	560.8	-275.3	575.0	0.00	0.00	0.00
7,640.0	91.02	0.50	7,008.1	600.8	-274.9	614.9	0.00	0.00	0.00
7,680.0	91.02	0.50	7,007.4	640.8	-274.6	654.8	0.00	0.00	0.00
7,720.0	91.02	0.50	7,006.7	680.8	-274.2	694.7	0.00	0.00	0.00
7,760.0	91.02	0.50	7,006.0	720.8	-273.9	734.7	0.00	0.00	0.00
7,800.0	91.02	0.50	7,005.3	760.8	-273.5	774.6	0.00	0.00	0.00
7,840.0	91.02	0.50	7,004.6	800.8	-273.2	814.5	0.00	0.00	0.00
7,880.0	91.02	0.50	7,003.8	840.8	-272.8	854.4	0.00	0.00	0.00
7,920.0	91.02	0.50	7,003.1	880.8	-272.5	894.3	0.00	0.00	0.00
7,960.0	91.02	0.50	7,002.4	920.8	-272.1	934.2	0.00	0.00	0.00
8,000.0	91.02	0.50	7,001.7	960.8	-271.8	974.1	0.00	0.00	0.00
8,040.0	91.02	0.50	7,001.0	1,000.7	-271.4	1,014.1	0.00	0.00	0.00
8,080.0	91.02	0.50	7,000.3	1,040.7	-271.1	1,054.0	0.00	0.00	0.00
8,120.0	91.02	0.50	6,999.6	1,080.7	-270.8	1,093.9	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

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)
8,160.0	91.02	0.50	6,998.9	1,120.7	-270.4	1,133.8	0.00	0.00	0.00
8,200.0	91.02	0.50	6,998.1	1,160.7	-270.1	1,173.7	0.00	0.00	0.00
8,240.0	91.02	0.50	6,997.4	1,200.7	-269.7	1,213.6	0.00	0.00	0.00
8,280.0	91.02	0.50	6,996.7	1,240.7	-269.4	1,253.5	0.00	0.00	0.00
8,320.0	91.02	0.50	6,996.0	1,280.7	-269.0	1,293.5	0.00	0.00	0.00
8,360.0	91.02	0.50	6,995.3	1,320.7	-268.7	1,333.4	0.00	0.00	0.00
8,400.0	91.02	0.50	6,994.6	1,360.7	-268.3	1,373.3	0.00	0.00	0.00
8,440.0	91.02	0.50	6,993.9	1,400.7	-268.0	1,413.2	0.00	0.00	0.00
8,480.0	91.02	0.50	6,993.2	1,440.7	-267.6	1,453.1	0.00	0.00	0.00
8,520.0	91.02	0.50	6,992.5	1,480.6	-267.3	1,493.0	0.00	0.00	0.00
8,560.0	91.02	0.50	6,991.7	1,520.6	-266.9	1,532.9	0.00	0.00	0.00
8,600.0	91.02	0.50	6,991.0	1,560.6	-266.6	1,572.8	0.00	0.00	0.00
8,640.0	91.02	0.50	6,990.3	1,600.6	-266.2	1,612.8	0.00	0.00	0.00
8,680.0	91.02	0.50	6,989.6	1,640.6	-265.9	1,652.7	0.00	0.00	0.00
8,720.0	91.02	0.50	6,988.9	1,680.6	-265.5	1,692.6	0.00	0.00	0.00
8,760.0	91.02	0.50	6,988.2	1,720.6	-265.2	1,732.5	0.00	0.00	0.00
8,800.0	91.02	0.50	6,987.5	1,760.6	-264.9	1,772.4	0.00	0.00	0.00
8,840.0	91.02	0.50	6,986.8	1,800.6	-264.5	1,812.3	0.00	0.00	0.00
8,880.0	91.02	0.50	6,986.0	1,840.6	-264.2	1,852.2	0.00	0.00	0.00
8,920.0	91.02	0.50	6,985.3	1,880.6	-263.8	1,892.2	0.00	0.00	0.00
8,960.0	91.02	0.50	6,984.6	1,920.6	-263.5	1,932.1	0.00	0.00	0.00
9,000.0	91.02	0.50	6,983.9	1,960.6	-263.1	1,972.0	0.00	0.00	0.00
9,040.0	91.02	0.50	6,983.2	2,000.5	-262.8	2,011.9	0.00	0.00	0.00
9,080.0	91.02	0.50	6,982.5	2,040.5	-262.4	2,051.8	0.00	0.00	0.00
9,120.0	91.02	0.50	6,981.8	2,080.5	-262.1	2,091.7	0.00	0.00	0.00
9,160.0	91.02	0.50	6,981.1	2,120.5	-261.7	2,131.6	0.00	0.00	0.00
9,200.0	91.02	0.50	6,980.3	2,160.5	-261.4	2,171.6	0.00	0.00	0.00
9,240.0	91.02	0.50	6,979.6	2,200.5	-261.0	2,211.5	0.00	0.00	0.00
9,280.0	91.02	0.50	6,978.9	2,240.5	-260.7	2,251.4	0.00	0.00	0.00
9,320.0	91.02	0.50	6,978.2	2,280.5	-260.3	2,291.3	0.00	0.00	0.00
9,360.0	91.02	0.50	6,977.5	2,320.5	-260.0	2,331.2	0.00	0.00	0.00
9,400.0	91.02	0.50	6,976.8	2,360.5	-259.6	2,371.1	0.00	0.00	0.00
9,440.0	91.02	0.50	6,976.1	2,400.5	-259.3	2,411.0	0.00	0.00	0.00
9,480.0	91.02	0.50	6,975.4	2,440.5	-259.0	2,450.9	0.00	0.00	0.00
9,520.0	91.02	0.50	6,974.6	2,480.5	-258.6	2,490.9	0.00	0.00	0.00
9,560.0	91.02	0.50	6,973.9	2,520.4	-258.3	2,530.8	0.00	0.00	0.00
9,600.0	91.02	0.50	6,973.2	2,560.4	-257.9	2,570.7	0.00	0.00	0.00
9,640.0	91.02	0.50	6,972.5	2,600.4	-257.6	2,610.6	0.00	0.00	0.00
9,680.0	91.02	0.50	6,971.8	2,640.4	-257.2	2,650.5	0.00	0.00	0.00
9,720.0	91.02	0.50	6,971.1	2,680.4	-256.9	2,690.4	0.00	0.00	0.00
9,760.0	91.02	0.50	6,970.4	2,720.4	-256.5	2,730.3	0.00	0.00	0.00
9,800.0	91.02	0.50	6,969.7	2,760.4	-256.2	2,770.3	0.00	0.00	0.00
9,840.0	91.02	0.50	6,969.0	2,800.4	-255.8	2,810.2	0.00	0.00	0.00
9,880.0	91.02	0.50	6,968.2	2,840.4	-255.5	2,850.1	0.00	0.00	0.00
9,920.0	91.02	0.50	6,967.5	2,880.4	-255.1	2,890.0	0.00	0.00	0.00
9,960.0	91.02	0.50	6,966.8	2,920.4	-254.8	2,929.9	0.00	0.00	0.00
10,000.0	91.02	0.50	6,966.1	2,960.4	-254.4	2,969.8	0.00	0.00	0.00
10,040.0	91.02	0.50	6,965.4	3,000.4	-254.1	3,009.7	0.00	0.00	0.00
10,080.0	91.02	0.50	6,964.7	3,040.3	-253.8	3,049.7	0.00	0.00	0.00
10,120.0	91.02	0.50	6,964.0	3,080.3	-253.4	3,089.6	0.00	0.00	0.00
10,160.0	91.02	0.50	6,963.3	3,120.3	-253.1	3,129.5	0.00	0.00	0.00
10,200.0	91.02	0.50	6,962.5	3,160.3	-252.7	3,169.4	0.00	0.00	0.00
10,240.0	91.02	0.50	6,961.8	3,200.3	-252.4	3,209.3	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

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)
10,280.0	91.02	0.50	6,961.1	3,240.3	-252.0	3,249.2	0.00	0.00	0.00
10,320.0	91.02	0.50	6,960.4	3,280.3	-251.7	3,289.1	0.00	0.00	0.00
10,360.0	91.02	0.50	6,959.7	3,320.3	-251.3	3,329.1	0.00	0.00	0.00
10,400.0	91.02	0.50	6,959.0	3,360.3	-251.0	3,369.0	0.00	0.00	0.00
10,440.0	91.02	0.50	6,958.3	3,400.3	-250.6	3,408.9	0.00	0.00	0.00
10,480.0	91.02	0.50	6,957.6	3,440.3	-250.3	3,448.8	0.00	0.00	0.00
10,520.0	91.02	0.50	6,956.8	3,480.3	-249.9	3,488.7	0.00	0.00	0.00
10,560.0	91.02	0.50	6,956.1	3,520.2	-249.6	3,528.6	0.00	0.00	0.00
10,600.0	91.02	0.50	6,955.4	3,560.2	-249.2	3,568.5	0.00	0.00	0.00
10,640.0	91.02	0.50	6,954.7	3,600.2	-248.9	3,608.4	0.00	0.00	0.00
10,680.0	91.02	0.50	6,954.0	3,640.2	-248.5	3,648.4	0.00	0.00	0.00
10,720.0	91.02	0.50	6,953.3	3,680.2	-248.2	3,688.3	0.00	0.00	0.00
10,760.0	91.02	0.50	6,952.6	3,720.2	-247.9	3,728.2	0.00	0.00	0.00
10,800.0	91.02	0.50	6,951.9	3,760.2	-247.5	3,768.1	0.00	0.00	0.00
10,840.0	91.02	0.50	6,951.2	3,800.2	-247.2	3,808.0	0.00	0.00	0.00
10,880.0	91.02	0.50	6,950.4	3,840.2	-246.8	3,847.9	0.00	0.00	0.00
10,920.0	91.02	0.50	6,949.7	3,880.2	-246.5	3,887.8	0.00	0.00	0.00
10,960.0	91.02	0.50	6,949.0	3,920.2	-246.1	3,927.8	0.00	0.00	0.00
11,000.0	91.02	0.50	6,948.3	3,960.2	-245.8	3,967.7	0.00	0.00	0.00
11,040.0	91.02	0.50	6,947.6	4,000.2	-245.4	4,007.6	0.00	0.00	0.00
11,080.0	91.02	0.50	6,946.9	4,040.1	-245.1	4,047.5	0.00	0.00	0.00
11,120.0	91.02	0.50	6,946.2	4,080.1	-244.7	4,087.4	0.00	0.00	0.00
11,160.0	91.02	0.50	6,945.5	4,120.1	-244.4	4,127.3	0.00	0.00	0.00
11,200.0	91.02	0.50	6,944.7	4,160.1	-244.0	4,167.2	0.00	0.00	0.00
11,240.0	91.02	0.50	6,944.0	4,200.1	-243.7	4,207.2	0.00	0.00	0.00
11,280.0	91.02	0.50	6,943.3	4,240.1	-243.3	4,247.1	0.00	0.00	0.00
11,320.0	91.02	0.50	6,942.6	4,280.1	-243.0	4,287.0	0.00	0.00	0.00
11,360.0	91.02	0.50	6,941.9	4,320.1	-242.6	4,326.9	0.00	0.00	0.00
11,400.0	91.02	0.50	6,941.2	4,360.1	-242.3	4,366.8	0.00	0.00	0.00
11,440.0	91.02	0.50	6,940.5	4,400.1	-242.0	4,406.7	0.00	0.00	0.00
11,466.5	91.02	0.50	6,940.0	4,426.5	-241.7	4,433.1	0.00	0.00	0.00
BHL 500'FNL & 874'FEL									

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
BHL 500'FNL & 874'F - plan hits target center - Point	0.00	0.00	6,940.0	4,426.5	-241.7	1,449,771.64	3,259,187.90	40.564280	-104.567100

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,485.7	7,010.9	7"	7	7-1/2

Database:	Landmark	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**North Reference:**	True
Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,000.0	1,000.0	0.0	0.0	KOP #1
6,272.1	6,247.1	-331.0	-283.0	KOP #2
7,485.7	7,010.9	446.6	-276.3	End of Build

ENSIGN Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T7N-R64W
Dillard 20Y-HZ Pad Sec.20-T7N-R64W
Dillard 20T-221

Wellbore #1
Plan #1 (11-15-12)

Anticollision Report

26 November, 2012

PDC ENERGY
Growing E&P Value

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Reference Plan #1 (11-15-12)

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 1,000.0ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 11/26/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,466.5	Plan #1 (11-15-12) (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Dillard 20Y-HZ Pad Sec.20-T7N-R64W						
Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)	800.0	800.0	30.6	27.2	9.067	CC, ES
Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)	11,467.2	11,631.3	359.5	202.6	2.291	SF
Dillard 20Y-401 - Wellbore #1 - Plan #1 (11-15-12)	1,000.0	999.0	30.6	26.3	7.162	CC, ES
Dillard 20Y-401 - Wellbore #1 - Plan #1 (11-15-12)	11,467.2	11,598.7	696.1	525.4	4.079	SF
Existing Wells Sec.20-T7N-R64W						
Dillard 41-20 (Exist.) - Wellbore #1 - Design #1	11,333.4	6,979.4	209.5	108.6	2.076	CC, ES, SF
Dillard 42-20 (Exist.) - Wellbore #1 - Design #1	10,058.1	6,992.1	215.0	138.0	2.792	CC, ES, SF
Dillard 43-20 (Exist.) - Wellbore #1 - Design #1	8,842.7	7,001.7	406.2	351.3	7.402	CC, ES
Dillard 43-20 (Exist.) - Wellbore #1 - Design #1	8,900.0	7,000.7	410.2	354.3	7.340	SF
Dillard 44-20 (Exist.) - Wellbore #1 - Design #1	1,000.0	1,000.0	299.4	295.1	70.097	CC, ES
Dillard 44-20 (Exist.) - Wellbore #1 - Design #1	7,350.0	7,001.3	401.5	368.8	12.289	SF

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-30.6	30.6				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-30.6	30.6	30.3	0.22	136.001	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-30.6	30.6	29.9	0.67	45.334	
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	0.0	-30.6	30.6	29.4	1.12	27.200	
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-30.6	30.6	29.0	1.57	19.429	
500.0	500.0	500.0	500.0	1.0	1.0	-90.00	0.0	-30.6	30.6	28.5	2.02	15.111	
600.0	600.0	600.0	600.0	1.2	1.2	-90.00	0.0	-30.6	30.6	28.1	2.47	12.364	
700.0	700.0	700.0	700.0	1.5	1.5	-90.00	0.0	-30.6	30.6	27.6	2.92	10.462	
800.0	800.0	800.0	800.0	1.7	1.7	-90.00	0.0	-30.6	30.6	27.2	3.37	9.067	CC, ES
900.0	900.0	899.0	899.0	1.9	1.9	-91.54	-0.9	-32.0	32.1	28.3	3.80	8.443	
1,000.0	1,000.0	997.9	997.7	2.1	2.1	-95.38	-3.4	-36.5	36.7	32.5	4.22	8.707	
1,100.0	1,100.0	1,096.3	1,095.8	2.3	2.3	40.87	-7.7	-43.8	43.3	38.7	4.61	9.405	
1,200.0	1,199.8	1,194.6	1,193.3	2.5	2.5	39.64	-13.6	-54.0	50.6	45.6	4.99	10.139	
1,300.0	1,299.5	1,292.5	1,290.1	2.7	2.8	39.71	-21.2	-67.1	58.4	53.0	5.39	10.828	
1,339.2	1,338.4	1,331.4	1,328.4	2.8	2.9	40.02	-24.7	-72.9	61.5	55.9	5.56	11.062	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,400.0	1,398.8	1,392.0	1,388.0	2.9	3.1	40.73	-30.0	-82.1	66.0	60.2	5.83	11.323	
1,500.0	1,498.1	1,491.7	1,486.2	3.2	3.4	41.70	-38.8	-97.3	73.4	67.1	6.29	11.674	
1,600.0	1,597.4	1,591.4	1,584.4	3.4	3.8	42.50	-47.6	-112.4	80.9	74.1	6.77	11.946	
1,700.0	1,696.7	1,691.1	1,682.5	3.7	4.1	43.16	-56.4	-127.5	88.4	81.1	7.27	12.155	
1,800.0	1,796.0	1,790.8	1,780.7	4.0	4.5	43.72	-65.2	-142.6	95.8	88.1	7.78	12.319	
1,900.0	1,895.3	1,890.6	1,878.9	4.3	4.9	44.19	-74.0	-157.8	103.3	95.0	8.30	12.446	
2,000.0	1,994.6	1,990.3	1,977.0	4.5	5.3	44.61	-82.8	-172.9	110.8	102.0	8.83	12.545	
2,100.0	2,093.9	2,090.0	2,075.2	4.8	5.6	44.97	-91.6	-188.0	118.3	108.9	9.37	12.622	
2,200.0	2,193.2	2,189.7	2,173.4	5.1	6.0	45.28	-100.4	-203.1	125.8	115.9	9.92	12.683	
2,300.0	2,292.5	2,289.4	2,271.5	5.4	6.4	45.57	-109.2	-218.2	133.3	122.9	10.47	12.732	
2,400.0	2,391.8	2,389.1	2,369.7	5.7	6.8	45.82	-118.0	-233.4	140.8	129.8	11.03	12.769	
2,500.0	2,491.1	2,488.9	2,467.9	6.0	7.2	46.04	-126.8	-248.5	148.4	136.8	11.59	12.799	
2,600.0	2,590.4	2,588.6	2,566.0	6.3	7.6	46.25	-135.6	-263.6	155.9	143.7	12.16	12.822	
2,700.0	2,689.7	2,688.3	2,664.2	6.6	8.0	46.43	-144.4	-278.7	163.4	150.7	12.72	12.840	
2,800.0	2,789.0	2,788.0	2,762.4	6.9	8.4	46.60	-153.2	-293.9	170.9	157.6	13.30	12.854	
2,900.0	2,888.3	2,887.7	2,860.6	7.3	8.8	46.76	-162.0	-309.0	178.4	164.5	13.87	12.865	
3,000.0	2,987.6	2,987.4	2,958.7	7.6	9.2	46.90	-170.8	-324.1	185.9	171.5	14.44	12.873	
3,100.0	3,086.9	3,087.2	3,056.9	7.9	9.6	47.03	-179.6	-339.2	193.5	178.4	15.02	12.878	
3,200.0	3,186.2	3,186.9	3,155.1	8.2	10.0	47.15	-188.4	-354.4	201.0	185.4	15.60	12.882	
3,300.0	3,285.5	3,286.6	3,253.2	8.5	10.4	47.26	-197.2	-369.5	208.5	192.3	16.18	12.885	
3,400.0	3,384.8	3,386.3	3,351.4	8.8	10.8	47.37	-206.0	-384.6	216.0	199.3	16.76	12.886	
3,500.0	3,484.1	3,486.0	3,449.6	9.1	11.2	47.47	-214.8	-399.7	223.6	206.2	17.35	12.886	
3,600.0	3,583.4	3,585.7	3,547.7	9.4	11.6	47.56	-223.5	-414.9	231.1	213.1	17.93	12.885	
3,700.0	3,682.7	3,685.4	3,645.9	9.8	12.0	47.64	-232.3	-430.0	238.6	220.1	18.52	12.884	
3,800.0	3,782.0	3,785.2	3,744.1	10.1	12.4	47.72	-241.1	-445.1	246.1	227.0	19.11	12.882	
3,900.0	3,881.3	3,884.9	3,842.2	10.4	12.8	47.80	-249.9	-460.2	253.7	234.0	19.69	12.880	
4,000.0	3,980.6	3,984.6	3,940.4	10.7	13.2	47.87	-258.7	-475.4	261.2	240.9	20.28	12.878	
4,100.0	4,079.9	4,084.3	4,038.6	11.0	13.6	47.94	-267.5	-490.5	268.7	247.8	20.87	12.875	
4,200.0	4,179.2	4,184.0	4,136.7	11.3	14.0	48.00	-276.3	-505.6	276.2	254.8	21.46	12.872	
4,300.0	4,278.5	4,283.7	4,234.9	11.7	14.5	48.06	-285.1	-520.7	283.8	261.7	22.05	12.868	
4,400.0	4,377.8	4,383.5	4,333.1	12.0	14.9	48.12	-293.9	-535.8	291.3	268.7	22.64	12.865	
4,500.0	4,477.1	4,483.2	4,431.3	12.3	15.3	48.17	-302.7	-551.0	298.8	275.6	23.23	12.861	
4,600.0	4,576.4	4,586.2	4,532.8	12.6	15.7	48.25	-311.7	-566.4	306.2	282.4	23.82	12.851	
4,685.8	4,661.6	4,680.8	4,626.3	12.9	15.9	48.54	-318.7	-578.4	310.5	286.2	24.32	12.768	
4,700.0	4,675.7	4,696.5	4,641.8	12.9	16.0	48.62	-319.7	-580.1	311.0	286.6	24.39	12.748	
4,800.0	4,775.2	4,806.9	4,751.6	13.1	16.2	49.07	-325.6	-590.2	313.9	289.0	24.86	12.627	
4,900.0	4,875.0	4,917.4	4,861.8	13.3	16.4	49.35	-329.3	-596.7	315.7	290.5	25.25	12.502	
5,000.0	4,975.0	5,027.9	4,972.3	13.5	16.6	49.47	-330.9	-599.5	316.5	290.9	25.59	12.369	
5,025.0	5,000.0	5,055.6	5,000.0	13.5	16.6	-90.00	-331.0	-599.6	316.6	291.0	25.61	12.362	
5,100.0	5,075.0	5,130.6	5,075.0	13.7	16.7	-90.00	-331.0	-599.6	316.6	290.7	25.86	12.242	
5,200.0	5,175.0	5,230.6	5,175.0	13.8	16.8	-90.00	-331.0	-599.6	316.6	290.4	26.18	12.090	
5,300.0	5,275.0	5,330.6	5,275.0	14.0	17.0	-90.00	-331.0	-599.6	316.6	290.1	26.51	11.941	
5,400.0	5,375.0	5,430.6	5,375.0	14.1	17.1	-90.00	-331.0	-599.6	316.6	289.7	26.84	11.794	
5,500.0	5,475.0	5,530.6	5,475.0	14.3	17.2	-90.00	-331.0	-599.6	316.6	289.4	27.18	11.649	
5,600.0	5,575.0	5,630.6	5,575.0	14.4	17.4	-90.00	-331.0	-599.6	316.6	289.1	27.51	11.506	
5,700.0	5,675.0	5,730.6	5,675.0	14.6	17.5	-90.00	-331.0	-599.6	316.6	288.7	27.85	11.365	
5,800.0	5,775.0	5,830.6	5,775.0	14.8	17.7	-90.00	-331.0	-599.6	316.6	288.4	28.20	11.226	
5,900.0	5,875.0	5,930.6	5,875.0	14.9	17.8	-90.00	-331.0	-599.6	316.6	288.0	28.55	11.090	
6,000.0	5,975.0	6,030.6	5,975.0	15.1	18.0	-90.00	-331.0	-599.6	316.6	287.7	28.90	10.956	
6,100.0	6,075.0	6,130.6	6,075.0	15.3	18.1	-90.00	-331.0	-599.6	316.6	287.3	29.25	10.824	
6,200.0	6,175.0	6,230.6	6,175.0	15.4	18.3	-90.00	-331.0	-599.6	316.6	287.0	29.60	10.694	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,272.1	6,247.0	6,302.6	6,247.0	15.6	18.4	-90.00	-331.0	-599.6	316.6	286.7	29.86	10.602	
6,300.0	6,275.0	6,330.5	6,275.0	15.6	18.4	-90.59	-331.0	-599.6	316.6	286.6	30.00	10.553	
6,350.0	6,324.8	6,380.4	6,324.8	15.7	18.5	-91.21	-331.0	-599.6	316.6	286.5	30.09	10.523	
6,400.0	6,374.4	6,430.0	6,374.4	15.7	18.6	-92.40	-331.0	-599.6	316.8	286.7	30.10	10.527	
6,450.0	6,423.4	6,480.2	6,424.6	15.8	18.6	-93.95	-329.8	-599.6	317.3	287.3	30.05	10.562	
6,500.0	6,471.6	6,531.2	6,475.4	15.8	18.7	-95.49	-325.2	-599.5	318.1	288.1	29.97	10.614	
6,550.0	6,518.9	6,582.9	6,526.4	15.8	18.7	-97.02	-317.1	-599.4	319.0	289.2	29.86	10.682	
6,600.0	6,565.0	6,635.1	6,577.3	15.8	18.7	-98.51	-305.4	-599.3	320.2	290.4	29.74	10.765	
6,650.0	6,609.7	6,688.0	6,628.0	15.8	18.8	-99.97	-290.1	-599.2	321.6	291.9	29.61	10.858	
6,700.0	6,652.9	6,741.6	6,678.0	15.7	18.8	-101.38	-271.0	-599.1	323.1	293.6	29.48	10.959	
6,750.0	6,694.4	6,795.9	6,727.2	15.7	18.7	-102.74	-248.2	-598.9	324.8	295.4	29.35	11.065	
6,800.0	6,733.9	6,850.7	6,775.2	15.7	18.7	-104.04	-221.6	-598.6	326.5	297.3	29.23	11.171	
6,850.0	6,771.4	6,906.3	6,821.7	15.7	18.7	-105.27	-191.2	-598.4	328.4	299.3	29.13	11.272	
6,900.0	6,806.6	6,962.5	6,866.4	15.6	18.6	-106.43	-157.2	-598.1	330.3	301.2	29.07	11.364	
6,950.0	6,839.4	7,019.3	6,908.9	15.6	18.6	-107.50	-119.5	-597.8	332.2	303.2	29.04	11.440	
7,000.0	6,869.7	7,076.8	6,948.9	15.6	18.5	-108.50	-78.3	-597.4	334.1	305.0	29.06	11.495	
7,050.0	6,897.3	7,134.8	6,986.1	15.6	18.5	-109.40	-33.7	-597.0	335.9	306.7	29.15	11.523	
7,100.0	6,922.2	7,193.3	7,020.0	15.6	18.5	-110.21	13.9	-596.6	337.5	308.2	29.30	11.520	
7,150.0	6,944.1	7,252.3	7,050.4	15.7	18.4	-110.92	64.5	-596.2	339.1	309.6	29.54	11.479	
7,200.0	6,963.0	7,311.8	7,077.1	16.0	18.5	-111.53	117.6	-595.7	340.5	310.6	29.87	11.399	
7,250.0	6,978.9	7,371.6	7,099.6	16.3	18.5	-112.03	173.0	-595.3	341.6	311.3	30.30	11.276	
7,300.0	6,991.7	7,431.8	7,117.8	16.7	18.6	-112.43	230.3	-594.8	342.6	311.8	30.83	11.113	
7,350.0	7,001.3	7,492.1	7,131.5	17.1	18.8	-112.72	289.1	-594.3	343.3	311.8	31.46	10.911	
7,400.0	7,007.6	7,552.7	7,140.5	17.6	19.2	-112.90	349.0	-593.8	343.7	311.5	32.20	10.676	
7,450.0	7,010.7	7,603.4	7,145.9	18.1	19.5	-113.17	399.4	-593.3	344.6	311.7	32.91	10.472	
7,485.7	7,010.9	7,639.8	7,149.6	18.5	19.8	-113.62	435.6	-593.0	346.0	312.6	33.39	10.361	
7,500.0	7,010.6	7,656.1	7,151.1	18.6	20.0	-113.89	451.8	-592.9	346.6	313.0	33.62	10.311	
7,600.0	7,008.8	7,769.6	7,155.0	19.8	21.1	-114.78	565.3	-591.9	348.8	313.2	35.54	9.813	
7,700.0	7,007.0	7,869.6	7,153.8	21.0	22.3	-114.87	665.3	-591.0	349.0	311.2	37.77	9.240	
7,800.0	7,005.3	7,969.6	7,152.6	22.4	23.6	-114.96	765.2	-590.2	349.3	309.1	40.17	8.694	
7,900.0	7,003.5	8,069.6	7,151.5	23.8	24.9	-115.05	865.2	-589.3	349.5	306.8	42.73	8.181	
8,000.0	7,001.7	8,169.6	7,150.3	25.3	26.3	-115.14	965.2	-588.4	349.8	304.4	45.41	7.704	
8,100.0	6,999.9	8,269.6	7,149.1	26.9	27.8	-115.23	1,065.2	-587.6	350.1	301.9	48.19	7.264	
8,200.0	6,998.1	8,369.6	7,148.0	28.5	29.3	-115.32	1,165.2	-586.7	350.3	299.3	51.06	6.861	
8,300.0	6,996.4	8,469.6	7,146.8	30.1	30.9	-115.41	1,265.2	-585.8	350.6	296.6	54.00	6.492	
8,400.0	6,994.6	8,569.6	7,145.7	31.8	32.5	-115.50	1,365.2	-585.0	350.9	293.9	57.00	6.155	
8,500.0	6,992.8	8,669.6	7,144.5	33.5	34.2	-115.59	1,465.2	-584.1	351.1	291.1	60.05	5.847	
8,600.0	6,991.0	8,769.6	7,143.3	35.2	35.8	-115.69	1,565.1	-583.2	351.4	288.3	63.14	5.565	
8,700.0	6,989.2	8,869.6	7,142.2	36.9	37.5	-115.78	1,665.1	-582.4	351.7	285.4	66.27	5.307	
8,800.0	6,987.5	8,969.6	7,141.0	38.6	39.2	-115.87	1,765.1	-581.5	351.9	282.5	69.43	5.069	
8,900.0	6,985.7	9,069.6	7,139.8	40.4	41.0	-115.96	1,865.1	-580.6	352.2	279.6	72.61	4.851	
9,000.0	6,983.9	9,169.6	7,138.7	42.2	42.7	-116.05	1,965.1	-579.8	352.5	276.7	75.81	4.650	
9,100.0	6,982.1	9,269.6	7,137.5	44.0	44.5	-116.14	2,065.1	-578.9	352.8	273.7	79.03	4.464	
9,200.0	6,980.3	9,369.6	7,136.3	45.8	46.2	-116.22	2,165.1	-578.0	353.0	270.8	82.27	4.291	
9,300.0	6,978.6	9,469.6	7,135.2	47.6	48.0	-116.31	2,265.1	-577.2	353.3	267.8	85.52	4.131	
9,400.0	6,976.8	9,569.6	7,134.0	49.4	49.8	-116.40	2,365.0	-576.3	353.6	264.8	88.78	3.983	
9,500.0	6,975.0	9,669.6	7,132.8	51.2	51.6	-116.49	2,465.0	-575.5	353.9	261.8	92.05	3.844	
9,600.0	6,973.2	9,769.6	7,131.7	53.1	53.4	-116.58	2,565.0	-574.6	354.1	258.8	95.33	3.715	
9,700.0	6,971.4	9,869.6	7,130.5	54.9	55.2	-116.67	2,665.0	-573.7	354.4	255.8	98.61	3.594	
9,800.0	6,969.7	9,969.6	7,129.4	56.8	57.1	-116.76	2,765.0	-572.9	354.7	252.8	101.90	3.481	
9,900.0	6,967.9	10,069.6	7,128.2	58.6	58.9	-116.85	2,865.0	-572.0	355.0	249.8	105.20	3.374	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,000.0	6,966.1	10,169.6	7,127.0	60.5	60.7	-116.94	2,965.0	-571.1	355.2	246.8	108.50	3.274	
10,100.0	6,964.3	10,269.6	7,125.9	62.3	62.6	-117.02	3,065.0	-570.3	355.5	243.7	111.80	3.180	
10,200.0	6,962.5	10,369.6	7,124.7	64.2	64.4	-117.11	3,164.9	-569.4	355.8	240.7	115.10	3.091	
10,300.0	6,960.8	10,469.6	7,123.5	66.0	66.3	-117.20	3,264.9	-568.5	356.1	237.7	118.41	3.007	
10,400.0	6,959.0	10,569.6	7,122.4	67.9	68.1	-117.29	3,364.9	-567.7	356.4	234.7	121.72	2.928	
10,500.0	6,957.2	10,669.6	7,121.2	69.8	70.0	-117.38	3,464.9	-566.8	356.7	231.6	125.03	2.853	
10,600.0	6,955.4	10,769.6	7,120.0	71.6	71.8	-117.46	3,564.9	-565.9	356.9	228.6	128.33	2.781	
10,700.0	6,953.6	10,869.6	7,118.9	73.5	73.7	-117.55	3,664.9	-565.1	357.2	225.6	131.64	2.714	
10,800.0	6,951.9	10,969.6	7,117.7	75.4	75.6	-117.64	3,764.9	-564.2	357.5	222.6	134.95	2.649	
10,900.0	6,950.1	11,069.6	7,116.5	77.3	77.4	-117.73	3,864.9	-563.3	357.8	219.5	138.26	2.588	
11,000.0	6,948.3	11,169.6	7,115.4	79.2	79.3	-117.81	3,964.9	-562.5	358.1	216.5	141.56	2.530	
11,100.0	6,946.5	11,269.6	7,114.2	81.0	81.2	-117.90	4,064.8	-561.6	358.4	213.5	144.87	2.474	
11,200.0	6,944.7	11,369.6	7,113.0	82.9	83.1	-117.99	4,164.8	-560.7	358.7	210.5	148.17	2.421	
11,300.0	6,943.0	11,469.6	7,111.9	84.8	84.9	-118.07	4,264.8	-559.9	359.0	207.5	151.47	2.370	
11,400.0	6,941.2	11,569.6	7,110.7	86.7	86.8	-118.16	4,364.8	-559.0	359.3	204.5	154.77	2.321	
11,466.5	6,940.0	11,631.3	7,110.0	88.0	88.0	-118.21	4,426.5	-558.5	359.5	202.6	156.89	2.291	
11,467.2	6,940.0	11,631.3	7,110.0	88.0	88.0	-118.21	4,426.5	-558.5	359.5	202.6	156.90	2.291	SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20Y-401 - Wellbore #1 - Plan #1 (11-15-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	30.6	30.6				
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	30.6	30.6	30.3	0.22	136.683	
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	30.6	30.6	29.9	0.67	45.485	
300.0	300.0	299.0	299.0	0.6	0.6	90.00	0.0	30.6	30.6	29.4	1.12	27.255	
400.0	400.0	399.0	399.0	0.8	0.8	90.00	0.0	30.6	30.6	29.0	1.57	19.456	
500.0	500.0	499.0	499.0	1.0	1.0	90.00	0.0	30.6	30.6	28.5	2.02	15.128	
600.0	600.0	599.0	599.0	1.2	1.2	90.00	0.0	30.6	30.6	28.1	2.47	12.375	
700.0	700.0	699.0	699.0	1.5	1.5	90.00	0.0	30.6	30.6	27.6	2.92	10.470	
800.0	800.0	799.0	799.0	1.7	1.7	90.00	0.0	30.6	30.6	27.2	3.37	9.073	
900.0	900.0	899.0	899.0	1.9	1.9	90.00	0.0	30.6	30.6	26.7	3.82	8.005	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	90.00	0.0	30.6	30.6	26.3	4.27	7.162	CC, ES
1,100.0	1,100.0	1,099.0	1,099.0	2.3	2.4	-132.91	0.0	30.6	31.7	27.0	4.69	6.763	
1,200.0	1,199.8	1,198.8	1,198.8	2.5	2.6	-139.05	0.0	30.6	35.5	30.4	5.09	6.968	
1,300.0	1,299.5	1,297.7	1,297.6	2.7	2.8	-144.75	-1.1	31.8	43.4	37.9	5.48	7.915	
1,339.2	1,338.4	1,336.3	1,336.3	2.8	2.9	-146.10	-2.2	33.0	47.8	42.2	5.63	8.502	
1,400.0	1,398.8	1,396.0	1,395.8	2.9	3.0	-147.13	-4.5	35.5	55.7	49.8	5.86	9.498	
1,500.0	1,498.1	1,493.9	1,493.3	3.2	3.2	-146.38	-10.2	41.7	69.9	63.7	6.26	11.165	
1,600.0	1,597.4	1,591.1	1,589.9	3.4	3.4	-143.98	-18.0	50.2	86.1	79.4	6.70	12.853	
1,700.0	1,696.7	1,689.1	1,686.9	3.7	3.6	-141.29	-27.4	60.5	103.6	96.5	7.16	14.484	
1,800.0	1,796.0	1,787.4	1,784.2	4.0	3.9	-139.34	-36.9	70.9	121.4	113.8	7.63	15.910	
1,900.0	1,895.3	1,885.8	1,881.5	4.3	4.1	-137.89	-46.3	81.3	139.3	131.2	8.12	17.150	
2,000.0	1,994.6	1,984.1	1,978.9	4.5	4.4	-136.78	-55.8	91.6	157.2	148.6	8.62	18.230	
2,100.0	2,093.9	2,082.4	2,076.2	4.8	4.7	-135.89	-65.3	102.0	175.2	166.1	9.14	19.173	
2,200.0	2,193.2	2,180.8	2,173.5	5.1	5.0	-135.16	-74.8	112.4	193.2	183.6	9.66	20.003	
2,300.0	2,292.5	2,279.1	2,270.8	5.4	5.3	-134.56	-84.3	122.7	211.3	201.1	10.19	20.735	
2,400.0	2,391.8	2,377.4	2,368.2	5.7	5.6	-134.06	-93.7	133.1	229.3	218.6	10.72	21.384	
2,500.0	2,491.1	2,475.8	2,465.5	6.0	6.0	-133.63	-103.2	143.5	247.4	236.1	11.26	21.962	
2,600.0	2,590.4	2,574.1	2,562.8	6.3	6.3	-133.25	-112.7	153.8	265.5	253.7	11.81	22.479	
2,700.0	2,689.7	2,672.4	2,660.2	6.6	6.6	-132.93	-122.2	164.2	283.6	271.2	12.36	22.944	
2,800.0	2,789.0	2,770.8	2,757.5	6.9	6.9	-132.64	-131.6	174.6	301.7	288.8	12.91	23.364	
2,900.0	2,888.3	2,869.1	2,854.8	7.3	7.3	-132.39	-141.1	184.9	319.8	306.3	13.47	23.744	
3,000.0	2,987.6	2,967.5	2,952.1	7.6	7.6	-132.16	-150.6	195.3	337.9	323.9	14.03	24.090	
3,100.0	3,086.9	3,065.8	3,049.5	7.9	7.9	-131.96	-160.1	205.7	356.0	341.4	14.59	24.406	
3,200.0	3,186.2	3,164.1	3,146.8	8.2	8.3	-131.77	-169.6	216.1	374.1	359.0	15.15	24.695	
3,300.0	3,285.5	3,262.5	3,244.1	8.5	8.6	-131.61	-179.0	226.4	392.3	376.6	15.72	24.961	
3,400.0	3,384.8	3,360.8	3,341.5	8.8	8.9	-131.46	-188.5	236.8	410.4	394.1	16.28	25.206	
3,500.0	3,484.1	3,459.1	3,438.8	9.1	9.3	-131.32	-198.0	247.2	428.5	411.7	16.85	25.432	
3,600.0	3,583.4	3,557.5	3,536.1	9.4	9.6	-131.19	-207.5	257.5	446.7	429.2	17.42	25.641	
3,700.0	3,682.7	3,655.8	3,633.4	9.8	9.9	-131.07	-216.9	267.9	464.8	446.8	17.99	25.836	
3,800.0	3,782.0	3,754.2	3,730.8	10.1	10.3	-130.96	-226.4	278.3	482.9	464.4	18.56	26.017	
3,900.0	3,881.3	3,852.5	3,828.1	10.4	10.6	-130.86	-235.9	288.6	501.1	481.9	19.14	26.186	
4,000.0	3,980.6	3,950.8	3,925.4	10.7	11.0	-130.77	-245.4	299.0	519.2	499.5	19.71	26.344	
4,100.0	4,079.9	4,049.2	4,022.8	11.0	11.3	-130.68	-254.9	309.4	537.4	517.1	20.28	26.492	
4,200.0	4,179.2	4,147.5	4,120.1	11.3	11.7	-130.60	-264.3	319.7	555.5	534.6	20.86	26.631	
4,300.0	4,278.5	4,245.8	4,217.4	11.7	12.0	-130.52	-273.8	330.1	573.7	552.2	21.44	26.761	
4,400.0	4,377.8	4,344.2	4,314.7	12.0	12.3	-130.45	-283.3	340.5	591.8	569.8	22.01	26.884	
4,500.0	4,477.1	4,442.5	4,412.1	12.3	12.7	-130.38	-292.8	350.8	609.9	587.4	22.59	27.000	
4,600.0	4,576.4	4,540.9	4,509.4	12.6	13.0	-130.32	-302.3	361.2	628.1	604.9	23.17	27.109	
4,685.8	4,661.6	4,625.6	4,593.3	12.9	13.3	-130.26	-310.4	370.2	643.7	620.0	23.67	27.198	
4,700.0	4,675.7	4,642.4	4,609.9	12.9	13.4	-130.29	-312.0	371.9	646.2	622.4	23.75	27.207	
4,800.0	4,775.2	4,761.3	4,728.0	13.1	13.7	-130.46	-321.3	382.0	660.9	636.6	24.27	27.236	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20Y-401 - Wellbore #1 - Plan #1 (11-15-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,875.0	4,881.4	4,847.8	13.3	13.9	-130.57	-327.3	388.6	670.3	645.6	24.71	27.125	
5,000.0	4,975.0	5,002.2	4,968.5	13.5	14.1	-130.61	-329.9	391.4	674.4	649.3	25.10	26.864	
5,025.0	5,000.0	5,032.5	4,998.8	13.5	14.2	89.92	-330.0	391.6	674.6	649.4	25.21	26.763	
5,100.0	5,075.0	5,107.7	5,074.0	13.7	14.3	89.92	-330.0	391.6	674.6	649.1	25.46	26.491	
5,200.0	5,175.0	5,207.7	5,174.0	13.8	14.5	89.92	-330.0	391.6	674.6	648.8	25.79	26.153	
5,300.0	5,275.0	5,307.7	5,274.0	14.0	14.6	89.92	-330.0	391.6	674.6	648.4	26.13	25.820	
5,400.0	5,375.0	5,407.7	5,374.0	14.1	14.8	89.92	-330.0	391.6	674.6	648.1	26.46	25.491	
5,500.0	5,475.0	5,507.7	5,474.0	14.3	14.9	89.92	-330.0	391.6	674.6	647.8	26.80	25.168	
5,600.0	5,575.0	5,607.7	5,574.0	14.4	15.1	89.92	-330.0	391.6	674.6	647.4	27.15	24.850	
5,700.0	5,675.0	5,707.7	5,674.0	14.6	15.2	89.92	-330.0	391.6	674.6	647.1	27.49	24.537	
5,800.0	5,775.0	5,807.7	5,774.0	14.8	15.4	89.92	-330.0	391.6	674.6	646.7	27.84	24.230	
5,900.0	5,875.0	5,907.7	5,874.0	14.9	15.6	89.92	-330.0	391.6	674.6	646.4	28.19	23.927	
6,000.0	5,975.0	6,007.7	5,974.0	15.1	15.7	89.92	-330.0	391.6	674.6	646.0	28.55	23.630	
6,100.0	6,075.0	6,107.7	6,074.0	15.3	15.9	89.92	-330.0	391.6	674.6	645.7	28.90	23.338	
6,200.0	6,175.0	6,207.7	6,174.0	15.4	16.1	89.92	-330.0	391.6	674.6	645.3	29.26	23.051	
6,272.1	6,247.0	6,279.7	6,246.0	15.6	16.2	89.92	-330.0	391.6	674.6	645.0	29.52	22.848	
6,300.0	6,275.0	6,307.7	6,274.0	15.6	16.2	89.46	-330.0	391.6	674.6	644.9	29.62	22.776	
6,350.0	6,324.8	6,357.6	6,323.8	15.7	16.3	89.76	-330.0	391.6	674.5	644.8	29.78	22.655	
6,374.5	6,349.1	6,381.8	6,348.1	15.7	16.4	90.00	-330.0	391.6	674.5	644.7	29.84	22.604	
6,400.0	6,374.4	6,407.1	6,373.4	15.7	16.4	90.32	-330.0	391.6	674.5	644.6	29.91	22.553	
6,450.0	6,423.4	6,456.9	6,423.2	15.8	16.5	91.03	-328.5	391.6	674.6	644.6	30.01	22.477	
6,500.0	6,471.6	6,507.3	6,473.3	15.8	16.5	91.74	-323.7	391.6	674.9	644.8	30.09	22.431	
6,550.0	6,518.9	6,558.3	6,523.6	15.8	16.6	92.44	-315.5	391.7	675.2	645.0	30.12	22.412	
6,600.0	6,565.0	6,609.8	6,573.8	15.8	16.6	93.14	-303.7	391.8	675.6	645.4	30.14	22.417	
6,650.0	6,609.7	6,662.0	6,623.7	15.8	16.6	93.83	-288.5	391.9	676.1	645.9	30.13	22.441	
6,700.0	6,652.9	6,714.8	6,673.0	15.7	16.6	94.50	-269.6	392.1	676.6	646.5	30.10	22.478	
6,750.0	6,694.4	6,768.3	6,721.5	15.7	16.6	95.16	-247.1	392.2	677.3	647.2	30.08	22.520	
6,800.0	6,733.9	6,822.4	6,768.8	15.7	16.6	95.80	-220.9	392.5	678.0	648.0	30.05	22.560	
6,850.0	6,771.4	6,877.1	6,814.6	15.7	16.6	96.42	-191.0	392.7	678.8	648.8	30.05	22.588	
6,900.0	6,806.6	6,932.4	6,858.7	15.6	16.6	97.00	-157.6	393.0	679.6	649.5	30.08	22.595	
6,950.0	6,839.4	6,988.3	6,900.7	15.6	16.5	97.56	-120.7	393.3	680.4	650.3	30.15	22.570	
7,000.0	6,869.7	7,044.9	6,940.2	15.6	16.5	98.09	-80.3	393.6	681.3	651.0	30.28	22.502	
7,050.0	6,897.3	7,102.0	6,977.1	15.6	16.5	98.58	-36.7	394.0	682.1	651.6	30.48	22.382	
7,100.0	6,922.2	7,159.6	7,010.8	15.6	16.4	99.02	10.1	394.4	682.9	652.1	30.76	22.200	
7,150.0	6,944.1	7,217.8	7,041.2	15.7	16.4	99.43	59.6	394.8	683.7	652.5	31.14	21.953	
7,200.0	6,963.0	7,276.4	7,068.0	16.0	16.4	99.79	111.8	395.2	684.3	652.7	31.63	21.639	
7,250.0	6,978.9	7,335.5	7,090.8	16.3	16.4	100.10	166.2	395.6	685.0	652.8	32.21	21.266	
7,300.0	6,991.7	7,394.9	7,109.4	16.7	16.8	100.36	222.6	396.1	685.5	652.6	32.91	20.829	
7,350.0	7,001.3	7,454.6	7,123.7	17.1	17.3	100.57	280.6	396.6	685.9	652.2	33.72	20.342	
7,400.0	7,007.6	7,514.5	7,133.4	17.6	17.8	100.72	339.7	397.1	686.2	651.6	34.63	19.814	
7,450.0	7,010.7	7,566.9	7,139.0	18.1	18.4	100.89	391.7	397.5	686.6	651.0	35.57	19.301	
7,485.7	7,010.9	7,602.3	7,142.7	18.5	18.7	101.13	427.0	397.8	687.3	651.0	36.25	18.962	
7,500.0	7,010.6	7,618.4	7,144.3	18.6	18.9	101.28	443.0	397.9	687.6	651.0	36.55	18.813	
7,600.0	7,008.8	7,731.9	7,149.0	19.8	20.2	101.83	556.4	398.8	688.7	649.9	38.83	17.737	
7,700.0	7,007.0	7,831.9	7,148.2	21.0	21.4	101.91	656.4	399.7	688.9	647.6	41.26	16.696	
7,800.0	7,005.3	7,931.9	7,147.5	22.4	22.8	101.99	756.4	400.5	689.1	645.2	43.87	15.707	
7,900.0	7,003.5	8,031.9	7,146.7	23.8	24.2	102.08	856.3	401.3	689.2	642.6	46.64	14.779	
8,000.0	7,001.7	8,131.9	7,145.9	25.3	25.6	102.16	956.3	402.1	689.4	639.9	49.53	13.918	
8,100.0	6,999.9	8,231.9	7,145.1	26.9	27.2	102.24	1,056.3	403.0	689.6	637.0	52.54	13.126	
8,200.0	6,998.1	8,331.9	7,144.4	28.5	28.7	102.32	1,156.3	403.8	689.7	634.1	55.63	12.399	
8,300.0	6,996.4	8,431.9	7,143.6	30.1	30.4	102.41	1,256.3	404.6	689.9	631.1	58.80	11.734	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20Y-401 - Wellbore #1 - Plan #1 (11-15-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,400.0	6,994.6	8,531.9	7,142.8	31.8	32.0	102.49	1,356.3	405.4	690.1	628.1	62.03	11.125	
8,500.0	6,992.8	8,631.9	7,142.0	33.5	33.7	102.57	1,456.3	406.2	690.3	624.9	65.32	10.568	
8,600.0	6,991.0	8,731.9	7,141.3	35.2	35.4	102.65	1,556.3	407.1	690.4	621.8	68.65	10.058	
8,700.0	6,989.2	8,831.9	7,140.5	36.9	37.1	102.73	1,656.3	407.9	690.6	618.6	72.02	9.589	
8,800.0	6,987.5	8,931.9	7,139.7	38.6	38.8	102.82	1,756.2	408.7	690.8	615.4	75.42	9.159	
8,900.0	6,985.7	9,031.9	7,138.9	40.4	40.6	102.90	1,856.2	409.5	691.0	612.1	78.86	8.763	
9,000.0	6,983.9	9,131.9	7,138.1	42.2	42.3	102.98	1,956.2	410.4	691.2	608.8	82.31	8.397	
9,100.0	6,982.1	9,231.8	7,137.4	44.0	44.1	103.06	2,056.2	411.2	691.3	605.5	85.79	8.058	
9,200.0	6,980.3	9,331.8	7,136.6	45.8	45.9	103.14	2,156.2	412.0	691.5	602.2	89.29	7.745	
9,300.0	6,978.6	9,431.8	7,135.8	47.6	47.7	103.23	2,256.2	412.8	691.7	598.9	92.80	7.454	
9,400.0	6,976.8	9,531.8	7,135.0	49.4	49.5	103.31	2,356.2	413.7	691.9	595.6	96.33	7.183	
9,500.0	6,975.0	9,631.8	7,134.3	51.2	51.3	103.39	2,456.2	414.5	692.1	592.2	99.87	6.930	
9,600.0	6,973.2	9,731.8	7,133.5	53.1	53.2	103.47	2,556.1	415.3	692.3	588.9	103.42	6.694	
9,700.0	6,971.4	9,831.8	7,132.7	54.9	55.0	103.55	2,656.1	416.1	692.5	585.5	106.98	6.473	
9,800.0	6,969.7	9,931.8	7,131.9	56.8	56.8	103.63	2,756.1	416.9	692.7	582.1	110.55	6.265	
9,900.0	6,967.9	10,031.8	7,131.2	58.6	58.7	103.72	2,856.1	417.8	692.9	578.7	114.13	6.071	
10,000.0	6,966.1	10,131.8	7,130.4	60.5	60.5	103.80	2,956.1	418.6	693.0	575.3	117.71	5.888	
10,100.0	6,964.3	10,231.8	7,129.6	62.3	62.4	103.88	3,056.1	419.4	693.2	571.9	121.30	5.715	
10,200.0	6,962.5	10,331.8	7,128.8	64.2	64.2	103.96	3,156.1	420.2	693.4	568.5	124.89	5.552	
10,300.0	6,960.8	10,431.8	7,128.1	66.0	66.1	104.04	3,256.1	421.1	693.6	565.2	128.49	5.398	
10,400.0	6,959.0	10,531.8	7,127.3	67.9	68.0	104.12	3,356.1	421.9	693.8	561.7	132.09	5.253	
10,500.0	6,957.2	10,631.8	7,126.5	69.8	69.8	104.20	3,456.0	422.7	694.0	558.3	135.70	5.115	
10,600.0	6,955.4	10,731.8	7,125.7	71.6	71.7	104.29	3,556.0	423.5	694.2	554.9	139.30	4.984	
10,700.0	6,953.6	10,831.8	7,125.0	73.5	73.6	104.37	3,656.0	424.4	694.5	551.5	142.91	4.859	
10,800.0	6,951.9	10,931.8	7,124.2	75.4	75.4	104.45	3,756.0	425.2	694.7	548.1	146.53	4.741	
10,900.0	6,950.1	11,031.8	7,123.4	77.3	77.3	104.53	3,856.0	426.0	694.9	544.7	150.14	4.628	
11,000.0	6,948.3	11,131.8	7,122.6	79.2	79.2	104.61	3,956.0	426.8	695.1	541.3	153.75	4.521	
11,100.0	6,946.5	11,231.7	7,121.8	81.0	81.1	104.69	4,056.0	427.6	695.3	537.9	157.37	4.418	
11,200.0	6,944.7	11,331.7	7,121.1	82.9	83.0	104.77	4,156.0	428.5	695.5	534.5	160.99	4.320	
11,300.0	6,943.0	11,431.7	7,120.3	84.8	84.8	104.85	4,256.0	429.3	695.7	531.1	164.60	4.227	
11,400.0	6,941.2	11,531.7	7,119.5	86.7	86.7	104.93	4,355.9	430.1	695.9	527.7	168.22	4.137	
11,466.5	6,940.0	11,598.2	7,119.0	88.0	88.0	104.99	4,422.4	430.7	696.1	525.5	170.62	4.080	
11,467.2	6,940.0	11,598.7	7,119.0	88.0	88.0	104.99	4,422.9	430.7	696.1	525.4	170.64	4.079 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 41-20 (Exist.) - Wellbore #1 - Design #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,400.0	6,959.0	6,996.0	6,996.0	67.9	15.6	94.53	4,291.7	-33.3	956.5	873.2	83.28	11.485	
10,500.0	6,957.2	6,994.2	6,994.2	69.8	15.6	94.05	4,291.7	-33.3	859.2	774.1	85.18	10.087	
10,600.0	6,955.4	6,992.4	6,992.4	71.6	15.6	93.56	4,291.7	-33.3	762.7	675.6	87.08	8.758	
10,700.0	6,953.6	6,990.6	6,990.6	73.5	15.6	93.08	4,291.7	-33.3	667.1	578.1	88.98	7.497	
10,800.0	6,951.9	6,988.9	6,988.9	75.4	15.6	92.59	4,291.7	-33.3	573.0	482.2	90.88	6.306	
10,900.0	6,950.1	6,987.1	6,987.1	77.3	15.6	92.11	4,291.7	-33.3	481.4	388.6	92.77	5.189	
11,000.0	6,948.3	6,985.3	6,985.3	79.2	15.6	91.62	4,291.7	-33.3	393.8	299.1	94.66	4.160	
11,100.0	6,946.5	6,983.5	6,983.5	81.0	15.6	91.14	4,291.7	-33.3	313.7	217.1	96.55	3.249	
11,200.0	6,944.7	6,981.7	6,981.7	82.9	15.6	90.65	4,291.7	-33.3	248.4	150.0	98.44	2.523	
11,300.0	6,943.0	6,980.0	6,980.0	84.8	15.6	90.16	4,291.7	-33.3	212.2	111.9	100.32	2.115	
11,333.4	6,942.4	6,979.4	6,979.4	85.5	15.6	90.00	4,291.7	-33.3	209.5	108.6	100.95	2.076	CC, ES, SF
11,400.0	6,941.2	6,978.2	6,978.2	86.7	15.6	89.68	4,291.7	-33.3	219.9	117.7	102.20	2.151	
11,466.5	6,940.0	6,977.0	6,977.0	88.0	15.6	89.35	4,291.7	-33.3	248.2	144.7	103.44	2.399	
11,467.2	6,940.0	6,977.0	6,977.0	88.0	15.6	89.35	4,291.7	-33.3	248.6	145.1	103.45	2.403	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 42-20 (Exist.) - Wellbore #1 - Design #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,100.0	6,982.1	7,009.1	7,009.1	44.0	15.6	94.53	3,016.6	-38.9	981.8	922.4	59.42	16.524	
9,200.0	6,980.3	7,007.3	7,007.3	45.8	15.6	94.06	3,016.6	-38.9	884.5	823.3	61.23	14.445	
9,300.0	6,978.6	7,005.6	7,005.6	47.6	15.6	93.59	3,016.6	-38.9	787.9	724.8	63.06	12.494	
9,400.0	6,976.8	7,003.8	7,003.8	49.4	15.6	93.12	3,016.6	-38.9	692.2	627.4	64.89	10.668	
9,500.0	6,975.0	7,002.0	7,002.0	51.2	15.6	92.64	3,016.6	-38.9	598.0	531.3	66.73	8.962	
9,600.0	6,973.2	7,000.2	7,000.2	53.1	15.6	92.17	3,016.6	-38.9	506.0	437.4	68.57	7.379	
9,700.0	6,971.4	6,998.4	6,998.4	54.9	15.6	91.70	3,016.6	-38.9	417.7	347.2	70.42	5.931	
9,800.0	6,969.7	6,996.7	6,996.7	56.8	15.6	91.22	3,016.6	-38.9	335.9	263.7	72.26	4.649	
9,900.0	6,967.9	6,994.9	6,994.9	58.6	15.6	90.75	3,016.6	-38.9	266.9	192.8	74.11	3.601	
10,000.0	6,966.1	6,993.1	6,993.1	60.5	15.6	90.28	3,016.6	-38.9	222.8	146.8	75.96	2.933	
10,058.1	6,965.1	6,992.1	6,992.1	61.5	15.6	90.00	3,016.6	-38.9	215.0	138.0	77.03	2.792	CC, ES, SF
10,100.0	6,964.3	6,991.3	6,991.3	62.3	15.6	89.80	3,016.6	-38.9	219.1	141.3	77.81	2.816	
10,200.0	6,962.5	6,989.5	6,989.5	64.2	15.6	89.33	3,016.6	-38.9	257.6	178.0	79.66	3.234	
10,300.0	6,960.8	6,987.8	6,987.8	66.0	15.6	88.85	3,016.6	-38.9	323.6	242.1	81.50	3.971	
10,400.0	6,959.0	6,986.0	6,986.0	67.9	15.6	88.38	3,016.6	-38.9	403.9	320.5	83.35	4.846	
10,500.0	6,957.2	6,984.2	6,984.2	69.8	15.6	87.91	3,016.6	-38.9	491.4	406.2	85.19	5.768	
10,600.0	6,955.4	6,982.4	6,982.4	71.6	15.6	87.43	3,016.6	-38.9	582.9	495.9	87.03	6.698	
10,700.0	6,953.6	6,980.6	6,980.6	73.5	15.6	86.96	3,016.6	-38.9	676.9	588.0	88.86	7.617	
10,800.0	6,951.9	6,978.9	6,978.9	75.4	15.6	86.49	3,016.6	-38.9	772.3	681.6	90.69	8.516	
10,900.0	6,950.1	6,977.1	6,977.1	77.3	15.6	86.01	3,016.6	-38.9	868.8	776.3	92.52	9.391	
11,000.0	6,948.3	6,975.3	6,975.3	79.2	15.6	85.54	3,016.6	-38.9	966.0	871.7	94.34	10.239	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 43-20 (Exist.) - Wellbore #1 - Design #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,000.0	7,001.7	7,016.7	7,016.7	25.3	15.7	92.11	1,799.7	141.7	935.4	894.5	40.83	22.907	
8,100.0	6,999.9	7,014.9	7,014.9	26.9	15.7	91.86	1,799.7	141.7	846.4	804.0	42.38	19.973	
8,200.0	6,998.1	7,013.1	7,013.1	28.5	15.7	91.61	1,799.7	141.7	760.2	716.2	43.97	17.291	
8,300.0	6,996.4	7,011.4	7,011.4	30.1	15.6	91.36	1,799.7	141.7	677.8	632.2	45.59	14.866	
8,400.0	6,994.6	7,009.6	7,009.6	31.8	15.6	91.11	1,799.7	141.7	600.8	553.5	47.25	12.713	
8,500.0	6,992.8	7,007.8	7,007.8	33.5	15.6	90.86	1,799.7	141.7	531.4	482.5	48.94	10.858	
8,600.0	6,991.0	7,006.0	7,006.0	35.2	15.6	90.61	1,799.7	141.7	473.2	422.5	50.65	9.342	
8,700.0	6,989.2	7,004.2	7,004.2	36.9	15.6	90.36	1,799.7	141.7	430.5	378.2	52.38	8.219	
8,800.0	6,987.5	7,002.5	7,002.5	38.6	15.6	90.11	1,799.7	141.7	408.4	354.3	54.13	7.546	
8,842.7	6,986.7	7,001.7	7,001.7	39.4	15.6	90.00	1,799.7	141.7	406.2	351.3	54.88	7.402	CC, ES
8,900.0	6,985.7	7,000.7	7,000.7	40.4	15.6	89.86	1,799.7	141.7	410.2	354.3	55.89	7.340	SF
9,000.0	6,983.9	6,998.9	6,998.9	42.2	15.6	89.61	1,799.7	141.7	435.6	377.9	57.66	7.554	
9,100.0	6,982.1	6,997.1	6,997.1	44.0	15.6	89.35	1,799.7	141.7	480.8	421.4	59.45	8.088	
9,200.0	6,980.3	6,995.3	6,995.3	45.8	15.6	89.10	1,799.7	141.7	541.0	479.7	61.24	8.833	
9,300.0	6,978.6	6,993.6	6,993.6	47.6	15.6	88.85	1,799.7	141.7	611.6	548.6	63.04	9.702	
9,400.0	6,976.8	6,991.8	6,991.8	49.4	15.6	88.60	1,799.7	141.7	689.6	624.7	64.85	10.633	
9,500.0	6,975.0	6,990.0	6,990.0	51.2	15.6	88.35	1,799.7	141.7	772.6	706.0	66.67	11.590	
9,600.0	6,973.2	6,988.2	6,988.2	53.1	15.6	88.10	1,799.7	141.7	859.3	790.8	68.48	12.547	
9,700.0	6,971.4	6,986.4	6,986.4	54.9	15.6	87.85	1,799.7	141.7	948.6	878.3	70.31	13.491	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 44-20 (Exist.) - Wellbore #1 - Design #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	24.11	273.2	122.3	299.4				
100.0	100.0	100.0	100.0	0.1	0.1	24.11	273.2	122.3	299.4	299.1	0.22	1,331.837	
200.0	200.0	200.0	200.0	0.3	0.3	24.11	273.2	122.3	299.4	298.7	0.67	443.946	
300.0	300.0	300.0	300.0	0.6	0.6	24.11	273.2	122.3	299.4	298.2	1.12	266.367	
400.0	400.0	400.0	400.0	0.8	0.8	24.11	273.2	122.3	299.4	297.8	1.57	190.262	
500.0	500.0	500.0	500.0	1.0	1.0	24.11	273.2	122.3	299.4	297.3	2.02	147.982	
600.0	600.0	600.0	600.0	1.2	1.2	24.11	273.2	122.3	299.4	296.9	2.47	121.076	
700.0	700.0	700.0	700.0	1.5	1.5	24.11	273.2	122.3	299.4	296.4	2.92	102.449	
800.0	800.0	800.0	800.0	1.7	1.7	24.11	273.2	122.3	299.4	296.0	3.37	88.789	
900.0	900.0	900.0	900.0	1.9	1.9	24.11	273.2	122.3	299.4	295.5	3.82	78.343	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	24.11	273.2	122.3	299.4	295.1	4.27	70.097	CC, ES
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	163.66	273.2	122.3	301.0	296.3	4.69	64.119	
1,200.0	1,199.8	1,199.8	1,199.8	2.5	2.6	163.91	273.2	122.3	306.1	301.0	5.10	60.037	
1,300.0	1,299.5	1,299.5	1,299.5	2.7	2.8	164.30	273.2	122.3	314.4	308.9	5.50	57.133	
1,339.2	1,338.4	1,338.4	1,338.4	2.8	2.9	164.49	273.2	122.3	318.6	313.0	5.66	56.265	
1,400.0	1,398.8	1,398.8	1,398.8	2.9	3.0	164.83	273.2	122.3	325.6	319.7	5.92	55.005	
1,500.0	1,498.1	1,498.1	1,498.1	3.2	3.3	165.36	273.2	122.3	337.0	330.6	6.34	53.113	
1,600.0	1,597.4	1,597.4	1,597.4	3.4	3.5	165.85	273.2	122.3	348.4	341.7	6.78	51.424	
1,700.0	1,696.7	1,696.7	1,696.7	3.7	3.7	166.31	273.2	122.3	359.9	352.7	7.21	49.911	
1,800.0	1,796.0	1,796.0	1,796.0	4.0	3.9	166.74	273.2	122.3	371.4	363.8	7.65	48.552	
1,900.0	1,895.3	1,895.3	1,895.3	4.3	4.1	167.14	273.2	122.3	382.9	374.8	8.09	47.327	
2,000.0	1,994.6	1,994.6	1,994.6	4.5	4.4	167.53	273.2	122.3	394.5	385.9	8.53	46.218	
2,100.0	2,093.9	2,093.9	2,093.9	4.8	4.6	167.89	273.2	122.3	406.0	397.0	8.98	45.211	
2,200.0	2,193.2	2,193.2	2,193.2	5.1	4.8	168.23	273.2	122.3	417.6	408.1	9.43	44.293	
2,300.0	2,292.5	2,292.5	2,292.5	5.4	5.0	168.55	273.2	122.3	429.1	419.3	9.88	43.453	
2,400.0	2,391.8	2,391.8	2,391.8	5.7	5.3	168.85	273.2	122.3	440.7	430.4	10.33	42.683	
2,500.0	2,491.1	2,491.1	2,491.1	6.0	5.5	169.14	273.2	122.3	452.3	441.5	10.78	41.974	
2,600.0	2,590.4	2,590.4	2,590.4	6.3	5.7	169.42	273.2	122.3	463.9	452.7	11.23	41.320	
2,700.0	2,689.7	2,689.7	2,689.7	6.6	5.9	169.68	273.2	122.3	475.6	463.9	11.68	40.715	
2,800.0	2,789.0	2,789.0	2,789.0	6.9	6.2	169.93	273.2	122.3	487.2	475.1	12.13	40.153	
2,900.0	2,888.3	2,888.3	2,888.3	7.3	6.4	170.16	273.2	122.3	498.8	486.2	12.59	39.630	
3,000.0	2,987.6	2,987.6	2,987.6	7.6	6.6	170.39	273.2	122.3	510.5	497.4	13.04	39.143	
3,100.0	3,086.9	3,086.9	3,086.9	7.9	6.8	170.61	273.2	122.3	522.1	508.6	13.50	38.688	
3,200.0	3,186.2	3,186.2	3,186.2	8.2	7.0	170.81	273.2	122.3	533.8	519.8	13.95	38.261	
3,300.0	3,285.5	3,285.5	3,285.5	8.5	7.3	171.01	273.2	122.3	545.5	531.0	14.41	37.861	
3,400.0	3,384.8	3,384.8	3,384.8	8.8	7.5	171.20	273.2	122.3	557.1	542.3	14.86	37.486	
3,500.0	3,484.1	3,484.1	3,484.1	9.1	7.7	171.38	273.2	122.3	568.8	553.5	15.32	37.132	
3,600.0	3,583.4	3,583.4	3,583.4	9.4	7.9	171.56	273.2	122.3	580.5	564.7	15.78	36.798	
3,700.0	3,682.7	3,682.7	3,682.7	9.8	8.2	171.73	273.2	122.3	592.2	576.0	16.23	36.482	
3,800.0	3,782.0	3,782.0	3,782.0	10.1	8.4	171.89	273.2	122.3	603.9	587.2	16.69	36.184	
3,900.0	3,881.3	3,881.3	3,881.3	10.4	8.6	172.04	273.2	122.3	615.6	598.4	17.15	35.901	
4,000.0	3,980.6	3,980.6	3,980.6	10.7	8.8	172.19	273.2	122.3	627.3	609.7	17.60	35.633	
4,100.0	4,079.9	4,079.9	4,079.9	11.0	9.1	172.34	273.2	122.3	639.0	620.9	18.06	35.378	
4,200.0	4,179.2	4,179.2	4,179.2	11.3	9.3	172.47	273.2	122.3	650.7	632.2	18.52	35.136	
4,300.0	4,278.5	4,278.5	4,278.5	11.7	9.5	172.61	273.2	122.3	662.4	643.4	18.98	34.905	
4,400.0	4,377.8	4,377.8	4,377.8	12.0	9.7	172.74	273.2	122.3	674.1	654.7	19.44	34.685	
4,500.0	4,477.1	4,477.1	4,477.1	12.3	10.0	172.86	273.2	122.3	685.9	666.0	19.89	34.475	
4,600.0	4,576.4	4,576.4	4,576.4	12.6	10.2	172.98	273.2	122.3	697.6	677.2	20.35	34.274	
4,685.8	4,661.6	4,661.6	4,661.6	12.9	10.4	173.08	273.2	122.3	707.6	686.9	20.75	34.109	
4,700.0	4,675.7	4,675.7	4,675.7	12.9	10.4	173.10	273.2	122.3	709.3	688.5	20.82	34.075	
4,800.0	4,775.2	4,775.2	4,775.2	13.1	10.6	173.22	273.2	122.3	718.8	697.5	21.26	33.803	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 44-20 (Exist.) - Wellbore #1 - Design #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,875.0	4,875.0	4,875.0	13.3	10.8	173.29	273.2	122.3	724.9	703.2	21.69	33.422	
5,000.0	4,975.0	4,975.0	4,975.0	13.5	11.1	173.32	273.2	122.3	727.5	705.4	22.09	32.939	
5,025.0	5,000.0	5,000.0	5,000.0	13.5	11.1	33.85	273.2	122.3	727.6	705.4	22.19	32.790	
5,100.0	5,075.0	5,075.0	5,075.0	13.7	11.3	33.85	273.2	122.3	727.6	705.1	22.50	32.331	
5,200.0	5,175.0	5,175.0	5,175.0	13.8	11.5	33.85	273.2	122.3	727.6	704.7	22.92	31.749	
5,300.0	5,275.0	5,275.0	5,275.0	14.0	11.7	33.85	273.2	122.3	727.6	704.2	23.33	31.185	
5,400.0	5,375.0	5,375.0	5,375.0	14.1	12.0	33.85	273.2	122.3	727.6	703.8	23.75	30.640	
5,500.0	5,475.0	5,475.0	5,475.0	14.3	12.2	33.85	273.2	122.3	727.6	703.4	24.16	30.111	
5,600.0	5,575.0	5,575.0	5,575.0	14.4	12.4	33.85	273.2	122.3	727.6	703.0	24.58	29.600	
5,700.0	5,675.0	5,675.0	5,675.0	14.6	12.6	33.85	273.2	122.3	727.6	702.6	25.00	29.104	
5,800.0	5,775.0	5,775.0	5,775.0	14.8	12.9	33.85	273.2	122.3	727.6	702.1	25.42	28.623	
5,900.0	5,875.0	5,875.0	5,875.0	14.9	13.1	33.85	273.2	122.3	727.6	701.7	25.84	28.157	
6,000.0	5,975.0	5,975.0	5,975.0	15.1	13.3	33.85	273.2	122.3	727.6	701.3	26.26	27.705	
6,100.0	6,075.0	6,075.0	6,075.0	15.3	13.5	33.85	273.2	122.3	727.6	700.9	26.68	27.266	
6,200.0	6,175.0	6,175.0	6,175.0	15.4	13.8	33.85	273.2	122.3	727.6	700.5	27.11	26.840	
6,272.1	6,247.0	6,247.0	6,247.0	15.6	13.9	33.85	273.2	122.3	727.6	700.2	27.41	26.541	
6,300.0	6,275.0	6,275.0	6,275.0	15.6	14.0	33.39	273.2	122.3	727.1	699.6	27.49	26.450	
6,350.0	6,324.8	6,324.8	6,324.8	15.7	14.1	33.66	273.2	122.3	724.3	696.7	27.59	26.255	
6,400.0	6,374.4	6,374.4	6,374.4	15.7	14.2	34.20	273.2	122.3	718.7	691.1	27.61	26.029	
6,450.0	6,423.4	6,423.4	6,423.4	15.8	14.3	35.00	273.2	122.3	710.4	682.9	27.57	25.764	
6,500.0	6,471.6	6,471.6	6,471.6	15.8	14.4	36.10	273.2	122.3	699.6	672.1	27.49	25.453	
6,550.0	6,518.9	6,518.9	6,518.9	15.8	14.5	37.50	273.2	122.3	686.3	659.0	27.36	25.083	
6,600.0	6,565.0	6,565.0	6,565.0	15.8	14.6	39.25	273.2	122.3	670.8	643.5	27.23	24.637	
6,650.0	6,609.7	6,609.7	6,609.7	15.8	14.7	41.37	273.2	122.3	653.0	625.9	27.10	24.096	
6,700.0	6,652.9	6,652.9	6,652.9	15.7	14.8	43.88	273.2	122.3	633.3	606.3	27.02	23.439	
6,750.0	6,694.4	6,694.4	6,694.4	15.7	14.9	46.82	273.2	122.3	611.9	584.9	27.02	22.649	
6,800.0	6,733.9	6,733.9	6,733.9	15.7	15.0	50.20	273.2	122.3	589.1	562.0	27.13	21.715	
6,850.0	6,771.4	6,771.4	6,771.4	15.7	15.1	54.02	273.2	122.3	565.2	537.9	27.38	20.645	
6,900.0	6,806.6	6,806.6	6,806.6	15.6	15.2	58.23	273.2	122.3	540.8	513.0	27.78	19.467	
6,950.0	6,839.4	6,839.4	6,839.4	15.6	15.3	62.76	273.2	122.3	516.1	487.8	28.31	18.234	
7,000.0	6,869.7	6,869.7	6,869.7	15.6	15.3	67.47	273.2	122.3	492.0	463.0	28.93	17.007	
7,050.0	6,897.3	6,897.3	6,897.3	15.6	15.4	72.20	273.2	122.3	468.9	439.3	29.58	15.851	
7,100.0	6,922.2	6,922.2	6,922.2	15.6	15.4	76.75	273.2	122.3	447.8	417.6	30.22	14.818	
7,150.0	6,944.1	6,944.1	6,944.1	15.7	15.5	80.91	273.2	122.3	429.5	398.7	30.81	13.943	
7,200.0	6,963.0	6,963.0	6,963.0	16.0	15.5	84.52	273.2	122.3	414.9	383.6	31.32	13.246	
7,250.0	6,978.9	6,978.9	6,978.9	16.3	15.6	87.43	273.2	122.3	404.9	373.1	31.79	12.737	
7,300.0	6,991.7	6,991.7	6,991.7	16.7	15.6	89.54	273.2	122.3	400.3	368.0	32.23	12.419	
7,314.7	6,994.8	6,994.8	6,994.8	16.8	15.6	90.00	273.2	122.3	400.0	367.7	32.36	12.360	
7,350.0	7,001.3	7,001.3	7,001.3	17.1	15.6	90.79	273.2	122.3	401.5	368.8	32.67	12.289	SF
7,400.0	7,007.6	7,007.6	7,007.6	17.6	15.6	91.14	273.2	122.3	408.8	375.7	33.14	12.336	
7,450.0	7,010.7	7,010.7	7,010.7	18.1	15.6	90.55	273.2	122.3	421.9	388.3	33.62	12.548	
7,485.7	7,010.9	7,010.9	7,010.9	18.5	15.6	89.57	273.2	122.3	434.6	400.6	33.98	12.791	
7,500.0	7,010.6	7,010.6	7,010.6	18.6	15.6	89.53	273.2	122.3	440.4	406.2	34.13	12.904	
7,600.0	7,008.8	7,008.8	7,008.8	19.8	15.6	89.28	273.2	122.3	490.7	455.4	35.26	13.917	
7,700.0	7,007.0	7,007.0	7,007.0	21.0	15.6	89.02	273.2	122.3	554.6	518.1	36.50	15.194	
7,800.0	7,005.3	7,005.3	7,005.3	22.4	15.6	88.77	273.2	122.3	628.0	590.1	37.84	16.597	
7,900.0	7,003.5	7,003.5	7,003.5	23.8	15.6	88.51	273.2	122.3	707.9	668.7	39.25	18.035	
8,000.0	7,001.7	7,001.7	7,001.7	25.3	15.6	88.26	273.2	122.3	792.4	751.7	40.74	19.453	
8,100.0	6,999.9	6,999.9	6,999.9	26.9	15.6	88.00	273.2	122.3	880.2	837.9	42.27	20.823	
8,200.0	6,998.1	6,998.1	6,998.1	28.5	15.6	87.75	273.2	122.3	970.3	926.5	43.85	22.128	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4880.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Dillard 20T-221
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Dillard 20T-221
Project:	SEC.20-T7N-R64W	**TVD Reference:**	WELL @ 4880.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	**MD Reference:**	WELL @ 4880.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Dillard 20T-221	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (11-15-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4880.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Dillard 20T-221
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°