

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Bernhardt 6K-443**

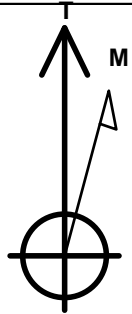
Surface Location: Bernhardt 4N66W6G Pad Sec.6-T4N-R66W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4722.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0367	459.43	3187746.18	40.340120	-104.826480	
RKB - 15' WELL @ 4737.0ft (RKB - 15')						

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2272'FSL & 921'FWL, Sec.6	1.0	0.0	0.0	Point
BHL 2161'FNL & 735'FWL, Sec.7	7210.0	-4437.3	-178.4	Point



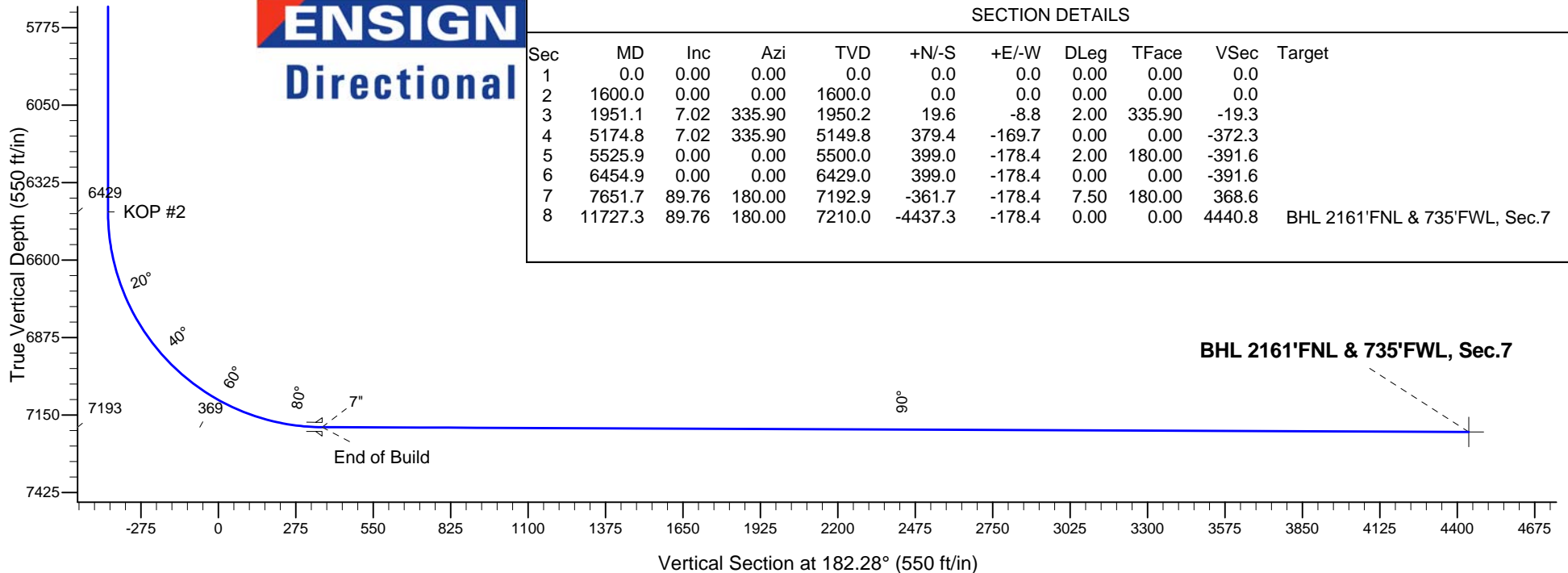
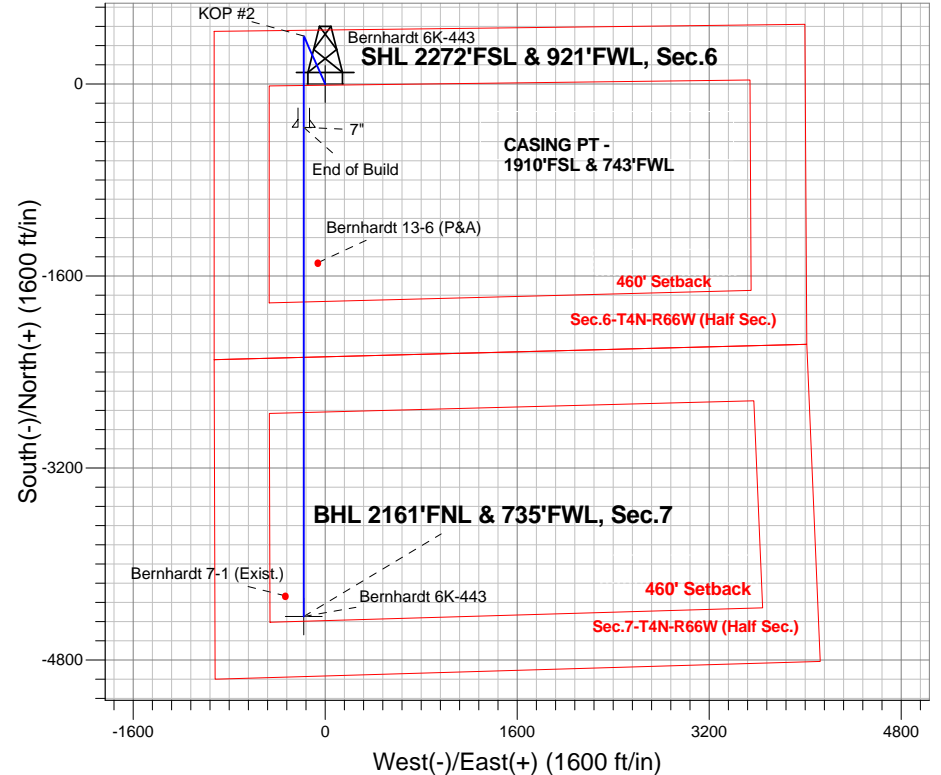
Azimuths to True North
Magnetic North: 8.46°

Magnetic Field
Strength: 52755.2srT
Dip Angle: 66.88°
Date: 9/3/2014
Model: IGRF2010

Bernhardt 4N66W6G Pad Sec.6-T4N-R66W
Bernhardt 6K-443
Plan #2 (9-3-14)

ANNOTATIONS

TVD	MD	Annotation
1600.0	1600.0	KOP #1
6429.0	6454.9	KOP #2
7192.9	7651.7	End of Build





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.6-T4N-R66W

Bernhardt 4N66W6G Pad Sec.6-T4N-R66W

Bernhardt 6K-443

Wellbore #1

Plan: Plan #2 (9-3-14)

Standard Planning Report

08 September, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Project:	SEC.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	North Reference:	True
Well:	Bernhardt 6K-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

Project	SEC.6-T4N-R66W, 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						Bernhardt 4N66W6G Pad Sec.6-T4N-R66W											
Site Position:						Northing:			1,367,654.84 ft			Latitude:			40.340660		
From:			Lat/Long			Easting:			3,187,571.86 ft			Longitude:			-104.827100		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.43 °		

Well	Bernhardt 6K-443					
Well Position	+N/-S	-196.7 ft	Northing:	1,367,459.43 ft	Latitude:	40.340120
	+E/-W	172.8 ft	Easting:	3,187,746.18 ft	Longitude:	-104.826480
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,722.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/3/2014	8.46	66.88	52,755

Design	Plan #2 (9-3-14)			
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	182.28

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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,951.1	7.02	335.90	1,950.2	19.6	-8.8	2.00	2.00	0.00	335.90	
5,174.8	7.02	335.90	5,149.8	379.4	-169.7	0.00	0.00	0.00	0.00	
5,525.9	0.00	0.00	5,500.0	399.0	-178.4	2.00	-2.00	0.00	180.00	
6,454.9	0.00	0.00	6,429.0	399.0	-178.4	0.00	0.00	0.00	0.00	
7,651.7	89.76	180.00	7,192.9	-361.7	-178.4	7.50	7.50	0.00	180.00	
11,727.3	89.76	180.00	7,210.0	-4,437.3	-178.4	0.00	0.00	0.00	0.00	BHL 2161'FNL & 73

Database:	Landmark	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Project:	SEC.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	North Reference:	True
Well:	Bernhardt 6K-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

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
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,700.0	2.00	335.90	1,700.0	1.6	-0.7	-1.6	2.00	2.00	0.00
1,800.0	4.00	335.90	1,799.8	6.4	-2.8	-6.3	2.00	2.00	0.00
1,900.0	6.00	335.90	1,899.5	14.3	-6.4	-14.1	2.00	2.00	0.00
1,951.1	7.02	335.90	1,950.2	19.6	-8.8	-19.3	2.00	2.00	0.00
2,000.0	7.02	335.90	1,998.8	25.1	-11.2	-24.6	0.00	0.00	0.00
2,100.0	7.02	335.90	2,098.0	36.2	-16.2	-35.6	0.00	0.00	0.00
2,200.0	7.02	335.90	2,197.3	47.4	-21.2	-46.5	0.00	0.00	0.00
2,300.0	7.02	335.90	2,296.5	58.6	-26.2	-57.5	0.00	0.00	0.00
2,400.0	7.02	335.90	2,395.8	69.7	-31.2	-68.4	0.00	0.00	0.00
2,500.0	7.02	335.90	2,495.0	80.9	-36.2	-79.4	0.00	0.00	0.00
2,600.0	7.02	335.90	2,594.3	92.0	-41.2	-90.3	0.00	0.00	0.00
2,700.0	7.02	335.90	2,693.5	103.2	-46.2	-101.3	0.00	0.00	0.00
2,800.0	7.02	335.90	2,792.8	114.4	-51.1	-112.2	0.00	0.00	0.00
2,900.0	7.02	335.90	2,892.0	125.5	-56.1	-123.2	0.00	0.00	0.00
3,000.0	7.02	335.90	2,991.3	136.7	-61.1	-134.1	0.00	0.00	0.00
3,100.0	7.02	335.90	3,090.5	147.8	-66.1	-145.1	0.00	0.00	0.00
3,200.0	7.02	335.90	3,189.8	159.0	-71.1	-156.0	0.00	0.00	0.00
3,300.0	7.02	335.90	3,289.0	170.2	-76.1	-167.0	0.00	0.00	0.00
3,400.0	7.02	335.90	3,388.3	181.3	-81.1	-177.9	0.00	0.00	0.00
3,500.0	7.02	335.90	3,487.5	192.5	-86.1	-188.9	0.00	0.00	0.00
3,600.0	7.02	335.90	3,586.8	203.6	-91.1	-199.8	0.00	0.00	0.00
3,700.0	7.02	335.90	3,686.0	214.8	-96.1	-210.8	0.00	0.00	0.00
3,800.0	7.02	335.90	3,785.3	226.0	-101.1	-221.7	0.00	0.00	0.00
3,900.0	7.02	335.90	3,884.5	237.1	-106.0	-232.7	0.00	0.00	0.00
4,000.0	7.02	335.90	3,983.8	248.3	-111.0	-243.7	0.00	0.00	0.00
4,100.0	7.02	335.90	4,083.0	259.4	-116.0	-254.6	0.00	0.00	0.00
4,200.0	7.02	335.90	4,182.3	270.6	-121.0	-265.6	0.00	0.00	0.00
4,300.0	7.02	335.90	4,281.5	281.8	-126.0	-276.5	0.00	0.00	0.00
4,400.0	7.02	335.90	4,380.8	292.9	-131.0	-287.5	0.00	0.00	0.00
4,500.0	7.02	335.90	4,480.0	304.1	-136.0	-298.4	0.00	0.00	0.00
4,600.0	7.02	335.90	4,579.3	315.2	-141.0	-309.4	0.00	0.00	0.00
4,700.0	7.02	335.90	4,678.5	326.4	-146.0	-320.3	0.00	0.00	0.00
4,800.0	7.02	335.90	4,777.8	337.6	-151.0	-331.3	0.00	0.00	0.00
4,900.0	7.02	335.90	4,877.0	348.7	-156.0	-342.2	0.00	0.00	0.00
5,000.0	7.02	335.90	4,976.3	359.9	-160.9	-353.2	0.00	0.00	0.00

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Well:	Bernhardt 6K-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

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	7.02	335.90	5,075.5	371.0	-165.9	-364.1	0.00	0.00	0.00
5,174.8	7.02	335.90	5,149.8	379.4	-169.7	-372.3	0.00	0.00	0.00
5,200.0	6.52	335.90	5,174.8	382.1	-170.9	-375.0	2.00	-2.00	0.00
5,300.0	4.52	335.90	5,274.3	390.9	-174.8	-383.6	2.00	-2.00	0.00
5,400.0	2.52	335.90	5,374.1	396.5	-177.3	-389.1	2.00	-2.00	0.00
5,500.0	0.52	335.90	5,474.1	398.9	-178.4	-391.5	2.00	-2.00	0.00
5,525.9	0.00	0.00	5,500.0	399.0	-178.4	-391.6	2.00	-2.00	0.00
5,600.0	0.00	0.00	5,574.1	399.0	-178.4	-391.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,674.1	399.0	-178.4	-391.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,774.1	399.0	-178.4	-391.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,874.1	399.0	-178.4	-391.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,974.1	399.0	-178.4	-391.6	0.00	0.00	0.00
6,100.0	0.00	0.00	6,074.1	399.0	-178.4	-391.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,174.1	399.0	-178.4	-391.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,274.1	399.0	-178.4	-391.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,374.1	399.0	-178.4	-391.6	0.00	0.00	0.00
6,454.9	0.00	0.00	6,429.0	399.0	-178.4	-391.6	0.00	0.00	0.00
KOP #2									
6,500.0	3.38	180.00	6,474.0	397.7	-178.4	-390.2	7.50	7.50	0.00
6,600.0	10.88	180.00	6,573.2	385.3	-178.4	-377.8	7.50	7.50	0.00
6,700.0	18.38	180.00	6,669.9	360.0	-178.4	-352.6	7.50	7.50	0.00
6,800.0	25.88	180.00	6,762.4	322.4	-178.4	-315.0	7.50	7.50	0.00
6,900.0	33.38	180.00	6,849.3	273.0	-178.4	-265.6	7.50	7.50	0.00
7,000.0	40.88	180.00	6,929.0	212.7	-178.4	-205.4	7.50	7.50	0.00
7,100.0	48.38	180.00	7,000.1	142.5	-178.4	-135.2	7.50	7.50	0.00
7,200.0	55.88	180.00	7,061.4	63.6	-178.4	-56.4	7.50	7.50	0.00
7,300.0	63.38	180.00	7,112.0	-22.6	-178.4	29.7	7.50	7.50	0.00
7,400.0	70.88	180.00	7,150.8	-114.7	-178.4	121.7	7.50	7.50	0.00
7,500.0	78.38	180.00	7,177.3	-211.1	-178.4	218.0	7.50	7.50	0.00
7,600.0	85.88	180.00	7,191.0	-310.1	-178.4	316.9	7.50	7.50	0.00
7,651.7	89.76	180.00	7,192.9	-361.7	-178.4	368.5	7.50	7.50	0.00
End of Build - 7"									
7,700.0	89.76	180.00	7,193.1	-410.0	-178.4	416.8	0.00	0.00	0.00
7,800.0	89.76	180.00	7,193.5	-510.0	-178.4	516.7	0.00	0.00	0.00
7,900.0	89.76	180.00	7,194.0	-610.0	-178.4	616.6	0.00	0.00	0.00
8,000.0	89.76	180.00	7,194.4	-710.0	-178.4	716.6	0.00	0.00	0.00
8,100.0	89.76	180.00	7,194.8	-810.0	-178.4	816.5	0.00	0.00	0.00
8,200.0	89.76	180.00	7,195.2	-910.0	-178.4	916.4	0.00	0.00	0.00
8,300.0	89.76	180.00	7,195.6	-1,010.0	-178.4	1,016.3	0.00	0.00	0.00
8,400.0	89.76	180.00	7,196.1	-1,110.0	-178.4	1,116.2	0.00	0.00	0.00
8,500.0	89.76	180.00	7,196.5	-1,210.0	-178.4	1,216.2	0.00	0.00	0.00
8,600.0	89.76	180.00	7,196.9	-1,310.0	-178.4	1,316.1	0.00	0.00	0.00
8,700.0	89.76	180.00	7,197.3	-1,410.0	-178.4	1,416.0	0.00	0.00	0.00
8,800.0	89.76	180.00	7,197.7	-1,510.0	-178.4	1,515.9	0.00	0.00	0.00
8,900.0	89.76	180.00	7,198.2	-1,610.0	-178.4	1,615.8	0.00	0.00	0.00
9,000.0	89.76	180.00	7,198.6	-1,710.0	-178.4	1,715.8	0.00	0.00	0.00
9,100.0	89.76	180.00	7,199.0	-1,810.0	-178.4	1,815.7	0.00	0.00	0.00
9,200.0	89.76	180.00	7,199.4	-1,910.0	-178.4	1,915.6	0.00	0.00	0.00
9,300.0	89.76	180.00	7,199.8	-2,010.0	-178.4	2,015.5	0.00	0.00	0.00
9,400.0	89.76	180.00	7,200.3	-2,110.0	-178.4	2,115.4	0.00	0.00	0.00
9,500.0	89.76	180.00	7,200.7	-2,210.0	-178.4	2,215.4	0.00	0.00	0.00
9,600.0	89.76	180.00	7,201.1	-2,310.0	-178.4	2,315.3	0.00	0.00	0.00
9,700.0	89.76	180.00	7,201.5	-2,410.0	-178.4	2,415.2	0.00	0.00	0.00

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Project:	SEC.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	North Reference:	True
Well:	Bernhardt 6K-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

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	89.76	180.00	7,201.9	-2,510.0	-178.4	2,515.1	0.00	0.00	0.00
9,900.0	89.76	180.00	7,202.3	-2,610.0	-178.4	2,615.0	0.00	0.00	0.00
10,000.0	89.76	180.00	7,202.8	-2,710.0	-178.4	2,715.0	0.00	0.00	0.00
10,100.0	89.76	180.00	7,203.2	-2,810.0	-178.4	2,814.9	0.00	0.00	0.00
10,200.0	89.76	180.00	7,203.6	-2,910.0	-178.4	2,914.8	0.00	0.00	0.00
10,300.0	89.76	180.00	7,204.0	-3,010.0	-178.4	3,014.7	0.00	0.00	0.00
10,400.0	89.76	180.00	7,204.4	-3,110.0	-178.4	3,114.6	0.00	0.00	0.00
10,500.0	89.76	180.00	7,204.9	-3,210.0	-178.4	3,214.6	0.00	0.00	0.00
10,600.0	89.76	180.00	7,205.3	-3,310.0	-178.4	3,314.5	0.00	0.00	0.00
10,700.0	89.76	180.00	7,205.7	-3,410.0	-178.4	3,414.4	0.00	0.00	0.00
10,800.0	89.76	180.00	7,206.1	-3,510.0	-178.4	3,514.3	0.00	0.00	0.00
10,900.0	89.76	180.00	7,206.5	-3,610.0	-178.4	3,614.2	0.00	0.00	0.00
11,000.0	89.76	180.00	7,207.0	-3,710.0	-178.4	3,714.2	0.00	0.00	0.00
11,100.0	89.76	180.00	7,207.4	-3,810.0	-178.4	3,814.1	0.00	0.00	0.00
11,200.0	89.76	180.00	7,207.8	-3,910.0	-178.4	3,914.0	0.00	0.00	0.00
11,300.0	89.76	180.00	7,208.2	-4,010.0	-178.4	4,013.9	0.00	0.00	0.00
11,400.0	89.76	180.00	7,208.6	-4,110.0	-178.4	4,113.8	0.00	0.00	0.00
11,500.0	89.76	180.00	7,209.0	-4,210.0	-178.4	4,213.7	0.00	0.00	0.00
11,600.0	89.76	180.00	7,209.5	-4,310.0	-178.4	4,313.7	0.00	0.00	0.00
11,700.0	89.76	180.00	7,209.9	-4,410.0	-178.4	4,413.6	0.00	0.00	0.00
11,727.3	89.76	180.00	7,210.0	-4,437.3	-178.4	4,440.8	0.00	0.00	0.00

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 2272'FSL & 921'I	0.00	0.00	1.0	0.0	0.0	1,367,459.44	3,187,746.18	40.340120	-104.826480
- plan hits target center									
- Point									
BHL 2161'FNL & 735'	0.00	0.00	7,210.0	-4,437.3	-178.4	1,363,021.14	3,187,601.45	40.327940	-104.827120
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,651.7	7,192.9	7"	7	7-1/2	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,600.0	1,600.0	0.0	0.0	KOP #1
6,454.9	6,429.0	399.0	-178.4	KOP #2
7,651.7	7,192.9	-361.7	-178.4	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.6-T4N-R66W

Bernhardt 4N66W6G Pad Sec.6-T4N-R66W

Bernhardt 6K-443

Wellbore #1

Plan #2 (9-3-14)

Anticollision Report

08 September, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (9-3-14)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 600.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date	9/5/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,726.5	Plan #2 (9-3-14) (Wellbore #1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Bernhardt 4N66W6G Pad Sec.6-T4N-R66W						
Bernhardt 6G-323 - Wellbore #1 - Plan #2 (9-3-14)	800.0	800.0	28.8	25.4	8.546	CC, ES
Bernhardt 6G-323 - Wellbore #1 - Plan #2 (9-3-14)	11,727.3	11,655.7	355.6	189.6	2.142	SF
Bernhardt 6G-403 - Wellbore #1 - Plan #2 (9-3-14)	200.0	200.0	60.3	59.7	89.469	CC, ES
Bernhardt 6G-403 - Wellbore #1 - Plan #2 (9-3-14)	5,300.0	5,259.0	563.2	534.9	19.912	SF
Bernhardt 6K-243 - Wellbore #1 - Plan #2 (9-3-14)	1,600.0	1,600.0	29.9	23.0	4.297	CC
Bernhardt 6K-243 - Wellbore #1 - Plan #2 (9-3-14)	1,700.0	1,700.0	30.1	22.7	4.056	ES
Bernhardt 6K-243 - Wellbore #1 - Plan #2 (9-3-14)	11,727.3	11,552.2	386.7	232.3	2.504	SF
Existing Wells Sec.6-T4N-R66W						
Bernhardt 13-6 (P&A) - Wellbore #1 - Wellbore #1	8,779.3	7,173.7	116.0	-61.7	0.653	Level 1, CC, ES, SF
Bernhardt 7-1 (Exist.) - Wellbore #1 - Wellbore #1	11,556.1	7,201.3	153.3	-75.7	0.669	Level 1, CC, ES, SF

Offset Design Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6G-323 - Wellbore #1 - Plan #2 (9-3-14)													Offset Site Error: 0.0 ft
Survey Program: 0-MWD													Offset Well Error: 0.0 ft
Reference	Offset	Semi Major Axis			Distance								Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-104.66	-7.3	-27.9	28.8				
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-7.3	-27.9	28.8	28.6	0.22	128.197	
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-7.3	-27.9	28.8	28.1	0.67	42.732	
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-7.3	-27.9	28.8	27.7	1.12	25.639	
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-7.3	-27.9	28.8	27.2	1.57	18.314	
500.0	500.0	500.0	500.0	1.0	1.0	-104.66	-7.3	-27.9	28.8	26.8	2.02	14.244	
600.0	600.0	600.0	600.0	1.2	1.2	-104.66	-7.3	-27.9	28.8	26.3	2.47	11.654	
700.0	700.0	700.0	700.0	1.5	1.5	-104.66	-7.3	-27.9	28.8	25.9	2.92	9.861	
800.0	800.0	800.0	800.0	1.7	1.7	-104.66	-7.3	-27.9	28.8	25.4	3.37	8.546	CC, ES
900.0	900.0	899.4	899.4	1.9	1.9	-101.95	-6.2	-29.2	29.9	26.0	3.81	7.825	
1,000.0	1,000.0	998.5	998.4	2.1	2.1	-94.95	-2.9	-33.1	33.3	29.0	4.26	7.823	
1,100.0	1,100.0	1,097.2	1,096.7	2.4	2.4	-86.23	2.6	-39.7	39.9	35.2	4.70	8.482	
1,200.0	1,200.0	1,195.7	1,194.5	2.6	2.6	-78.24	10.1	-48.6	50.0	44.8	5.16	9.692	
1,300.0	1,300.0	1,294.9	1,292.9	2.8	2.9	-72.67	18.1	-58.2	61.4	55.7	5.60	10.949	
1,400.0	1,400.0	1,394.1	1,391.3	3.0	3.1	-68.87	26.2	-67.7	73.1	67.1	6.05	12.078	
1,500.0	1,500.0	1,493.3	1,489.7	3.3	3.4	-66.13	34.2	-77.3	85.1	78.6	6.51	13.078	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6G-323 - Wellbore #1 - Plan #2 (9-3-14)													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	Semi Major Axis	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
1,600.0	1,600.0	1,592.5	1,588.1	3.5	3.7	-64.07		42.2	-86.8	97.3	90.3	6.97	13.961	
1,700.0	1,700.0	1,691.9	1,686.7	3.7	4.0	-38.81		50.3	-96.4	108.2	100.8	7.41	14.605	
1,800.0	1,799.8	1,791.5	1,785.6	3.9	4.3	-38.93		58.3	-106.0	116.4	108.5	7.86	14.811	
1,900.0	1,899.5	1,891.4	1,884.6	4.2	4.6	-40.09		66.4	-115.6	121.9	113.6	8.31	14.668	
2,000.0	1,998.8	1,991.2	1,983.7	4.4	4.9	-42.12		74.5	-125.3	125.2	116.4	8.78	14.260	
2,100.0	2,098.0	2,091.0	2,082.7	4.6	5.2	-44.21		82.6	-134.9	128.3	119.0	9.27	13.848	
2,200.0	2,197.3	2,190.9	2,181.8	4.9	5.5	-46.19		90.6	-144.5	131.6	121.8	9.76	13.478	
2,300.0	2,296.5	2,290.7	2,280.8	5.2	5.9	-48.08		98.7	-154.1	135.0	124.7	10.27	13.146	
2,400.0	2,395.8	2,390.6	2,379.9	5.4	6.2	-49.87		106.8	-163.7	138.6	127.8	10.79	12.844	
2,500.0	2,495.0	2,490.4	2,478.9	5.7	6.5	-51.57		114.9	-173.4	142.2	130.9	11.32	12.571	
2,600.0	2,594.3	2,590.3	2,578.0	6.0	6.8	-53.18		122.9	-183.0	146.1	134.2	11.85	12.323	
2,700.0	2,693.5	2,690.1	2,677.0	6.3	7.1	-54.71		131.0	-192.6	150.0	137.6	12.40	12.096	
2,800.0	2,792.8	2,790.0	2,776.1	6.5	7.4	-56.16		139.1	-202.2	154.0	141.0	12.95	11.888	
2,900.0	2,892.0	2,889.8	2,875.1	6.8	7.8	-57.54		147.2	-211.8	158.1	144.6	13.51	11.698	
3,000.0	2,991.3	2,989.7	2,974.2	7.1	8.1	-58.85		155.3	-221.5	162.3	148.2	14.08	11.524	
3,100.0	3,090.5	3,089.5	3,073.2	7.4	8.4	-60.09		163.3	-231.1	166.6	151.9	14.66	11.364	
3,200.0	3,189.8	3,189.3	3,172.3	7.7	8.7	-61.26		171.4	-240.7	170.9	155.7	15.24	11.217	
3,300.0	3,289.0	3,289.2	3,271.3	8.0	9.0	-62.38		179.5	-250.3	175.4	159.5	15.83	11.081	
3,400.0	3,388.3	3,389.0	3,370.4	8.3	9.4	-63.44		187.6	-259.9	179.8	163.4	16.42	10.955	
3,500.0	3,487.5	3,488.9	3,469.4	8.6	9.7	-64.46		195.6	-269.5	184.4	167.4	17.01	10.839	
3,600.0	3,586.8	3,588.7	3,568.5	8.9	10.0	-65.42		203.7	-279.2	189.0	171.4	17.61	10.732	
3,700.0	3,686.0	3,688.6	3,667.5	9.2	10.3	-66.33		211.8	-288.8	193.6	175.4	18.21	10.632	
3,800.0	3,785.3	3,788.4	3,766.6	9.5	10.6	-67.21		219.9	-298.4	198.3	179.5	18.82	10.540	
3,900.0	3,884.5	3,888.3	3,865.6	9.8	11.0	-68.04		228.0	-308.0	203.1	183.6	19.43	10.453	
4,000.0	3,983.8	3,988.1	3,964.7	10.1	11.3	-68.83		236.0	-317.6	207.8	187.8	20.04	10.373	
4,100.0	4,083.0	4,087.9	4,063.7	10.4	11.6	-69.59		244.1	-327.3	212.7	192.0	20.65	10.299	
4,200.0	4,182.3	4,187.8	4,162.8	10.7	11.9	-70.32		252.2	-336.9	217.5	196.3	21.27	10.229	
4,300.0	4,281.5	4,287.6	4,261.8	11.0	12.2	-71.01		260.3	-346.5	222.4	200.5	21.88	10.164	
4,400.0	4,380.8	4,387.5	4,360.9	11.3	12.6	-71.67		268.3	-356.1	227.3	204.8	22.50	10.103	
4,500.0	4,480.0	4,487.3	4,459.9	11.6	12.9	-72.31		276.4	-365.7	232.3	209.2	23.12	10.046	
4,600.0	4,579.3	4,587.2	4,559.0	12.0	13.2	-72.92		284.5	-375.4	237.3	213.5	23.74	9.992	
4,700.0	4,678.5	4,687.0	4,658.0	12.3	13.5	-73.50		292.6	-385.0	242.3	217.9	24.37	9.942	
4,800.0	4,777.8	4,786.9	4,757.1	12.6	13.9	-74.06		300.7	-394.6	247.3	222.3	24.99	9.895	
4,900.0	4,877.0	4,886.7	4,856.2	12.9	14.2	-74.60		308.7	-404.2	252.3	226.7	25.62	9.851	
5,000.0	4,976.3	4,986.6	4,955.2	13.2	14.5	-75.12		316.8	-413.8	257.4	231.2	26.24	9.809	
5,100.0	5,075.5	5,086.4	5,054.3	13.5	14.8	-75.61		324.9	-423.5	262.5	235.6	26.87	9.769	
5,200.0	5,174.8	5,186.2	5,153.3	13.8	15.1	-76.09		333.0	-433.1	267.6	240.1	27.49	9.736	
5,300.0	5,274.3	5,286.1	5,252.3	14.0	15.5	-76.13		341.0	-442.7	273.4	245.4	28.00	9.764	
5,400.0	5,374.1	5,385.8	5,351.3	14.2	15.8	-75.49		349.1	-452.3	280.0	251.5	28.43	9.847	
5,500.0	5,474.1	5,485.2	5,449.9	14.4	16.1	-74.24		357.2	-461.9	287.6	258.8	28.79	9.989	
5,600.0	5,574.1	5,584.5	5,548.4	14.6	16.4	-96.58		365.2	-471.4	296.1	267.0	29.09	10.177	
5,700.0	5,674.1	5,683.7	5,646.8	14.7	16.8	-94.87		373.2	-481.0	304.9	275.5	29.42	10.364	
5,800.0	5,774.1	5,783.4	5,745.7	14.9	17.1	-93.25		381.3	-490.6	313.9	284.2	29.75	10.554	
5,900.0	5,874.1	5,891.7	5,853.4	15.1	17.3	-91.86		388.6	-499.3	321.7	291.6	30.05	10.706	
6,000.0	5,974.1	6,000.7	5,962.2	15.3	17.5	-91.00		393.3	-504.9	326.7	296.4	30.37	10.758	
6,100.0	6,074.1	6,110.2	6,071.6	15.5	17.7	-90.64		395.3	-507.3	328.9	298.2	30.71	10.709	
6,200.0	6,174.1	6,212.7	6,174.1	15.7	17.9	-90.62		395.4	-507.4	329.0	297.9	31.08	10.586	
6,300.0	6,274.1	6,312.7	6,274.1	15.9	18.0	-90.62		395.4	-507.4	329.0	297.6	31.46	10.459	
6,356.5	6,330.6	6,369.1	6,330.6	16.0	18.1	-90.62		395.4	-507.4	329.0	297.3	31.67	10.388	
6,400.0	6,374.1	6,412.5	6,373.9	16.1	18.2	-90.69		395.0	-507.4	329.0	297.2	31.83	10.336	
6,500.0	6,474.0	6,511.2	6,472.1	16.2	18.3	87.87		385.5	-507.4	329.2	297.0	32.22	10.218	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design		Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6G-323 - Wellbore #1 - Plan #2 (9-3-14)											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	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
6,600.0	6,573.2	6,608.5	6,566.8	16.3	18.3	86.13	363.8	-507.4	329.8	297.3	32.43	10.169			
6,700.0	6,669.9	6,704.6	6,657.0	16.3	18.2	84.48	330.8	-507.4	330.5	298.1	32.46	10.183			
6,800.0	6,762.4	6,800.0	6,741.7	16.2	18.1	82.92	287.0	-507.4	331.5	299.2	32.34	10.251			
6,900.0	6,849.3	6,893.7	6,819.0	16.1	18.0	81.50	234.1	-507.4	332.7	300.5	32.14	10.352			
7,000.0	6,929.0	6,987.0	6,888.9	16.0	17.9	80.23	172.4	-507.4	333.9	302.0	31.91	10.462			
7,100.0	7,000.1	7,079.5	6,950.3	16.0	17.8	79.12	103.3	-507.4	335.0	303.3	31.76	10.548			
7,200.0	7,061.4	7,171.3	7,002.5	15.9	17.7	78.19	27.8	-507.4	336.1	304.3	31.79	10.574			
7,300.0	7,112.0	7,262.7	7,045.2	16.0	17.7	77.45	-52.9	-507.4	337.1	305.0	32.08	10.509			
7,400.0	7,150.8	7,353.7	7,077.8	16.4	17.7	76.90	-137.9	-507.4	337.8	305.1	32.73	10.322			
7,500.0	7,177.3	7,444.5	7,100.0	17.0	18.0	76.55	-225.8	-507.4	338.3	304.5	33.76	10.021			
7,600.0	7,191.0	7,535.1	7,111.6	17.7	18.6	76.40	-315.6	-507.4	338.5	303.3	35.18	9.621			
7,700.0	7,193.1	7,628.8	7,113.1	18.7	19.4	76.32	-409.3	-507.4	338.6	301.7	36.93	9.168			
7,800.0	7,193.5	7,728.8	7,112.1	19.7	20.4	76.10	-509.2	-507.4	338.9	300.0	38.95	8.702			
7,900.0	7,194.0	7,828.8	7,111.2	20.9	21.6	75.88	-609.2	-507.4	339.3	298.1	41.20	8.234			
8,000.0	7,194.4	7,928.8	7,110.2	22.2	22.8	75.65	-709.2	-507.4	339.6	295.9	43.66	7.779			
8,100.0	7,194.8	8,028.8	7,109.3	23.6	24.2	75.43	-809.2	-507.4	339.9	293.7	46.27	7.346			
8,200.0	7,195.2	8,128.7	7,108.4	25.0	25.6	75.21	-909.2	-507.4	340.3	291.2	49.03	6.940			
8,300.0	7,195.6	8,228.7	7,107.4	26.5	27.0	74.99	-1,009.2	-507.4	340.6	288.7	51.90	6.564			
8,400.0	7,196.1	8,328.7	7,106.5	28.0	28.5	74.77	-1,109.2	-507.4	341.0	286.1	54.86	6.216			
8,500.0	7,196.5	8,428.7	7,105.5	29.6	30.1	74.55	-1,209.2	-507.4	341.3	283.4	57.90	5.895			
8,600.0	7,196.9	8,528.7	7,104.6	31.3	31.7	74.33	-1,309.1	-507.4	341.7	280.7	61.01	5.601			
8,700.0	7,197.3	8,628.7	7,103.6	32.9	33.3	74.11	-1,409.1	-507.4	342.1	277.9	64.17	5.331			
8,800.0	7,197.7	8,728.7	7,102.7	34.6	35.0	73.89	-1,509.1	-507.4	342.5	275.1	67.38	5.083			
8,900.0	7,198.2	8,828.7	7,101.8	36.3	36.7	73.67	-1,609.1	-507.4	342.8	272.2	70.62	4.854			
9,000.0	7,198.6	8,928.7	7,100.8	38.1	38.4	73.45	-1,709.1	-507.4	343.2	269.3	73.90	4.644			
9,100.0	7,199.0	9,028.7	7,099.9	39.8	40.1	73.23	-1,809.1	-507.4	343.6	266.4	77.20	4.451			
9,200.0	7,199.4	9,128.7	7,098.9	41.6	41.9	73.02	-1,909.1	-507.4	344.0	263.5	80.53	4.272			
9,300.0	7,199.8	9,228.6	7,098.0	43.3	43.6	72.80	-2,009.0	-507.4	344.4	260.5	83.87	4.106			
9,400.0	7,200.3	9,328.6	7,097.0	45.1	45.4	72.58	-2,109.0	-507.4	344.8	257.6	87.23	3.953			
9,500.0	7,200.7	9,428.6	7,096.1	46.9	47.2	72.37	-2,209.0	-507.4	345.2	254.6	90.61	3.810			
9,600.0	7,201.1	9,528.6	7,095.2	48.7	49.0	72.15	-2,309.0	-507.4	345.6	251.6	93.99	3.677			
9,700.0	7,201.5	9,628.6	7,094.2	50.5	50.8	71.94	-2,409.0	-507.4	346.1	248.7	97.38	3.554			
9,800.0	7,201.9	9,728.6	7,093.3	52.4	52.6	71.73	-2,509.0	-507.4	346.5	245.7	100.78	3.438			
9,900.0	7,202.3	9,828.6	7,092.3	54.2	54.4	71.51	-2,609.0	-507.4	346.9	242.7	104.18	3.330			
10,000.0	7,202.8	9,928.6	7,091.4	56.0	56.2	71.30	-2,708.9	-507.4	347.3	239.8	107.58	3.229			
10,100.0	7,203.2	10,028.6	7,090.5	57.9	58.0	71.09	-2,808.9	-507.4	347.8	236.8	110.99	3.133			
10,200.0	7,203.6	10,128.6	7,089.5	59.7	59.9	70.87	-2,908.9	-507.4	348.2	233.8	114.40	3.044			
10,300.0	7,204.0	10,228.6	7,088.6	61.6	61.7	70.66	-3,008.9	-507.4	348.7	230.9	117.81	2.960			
10,400.0	7,204.4	10,328.5	7,087.6	63.4	63.5	70.45	-3,108.9	-507.4	349.1	227.9	121.21	2.880			
10,500.0	7,204.9	10,428.5	7,086.7	65.3	65.4	70.24	-3,208.9	-507.4	349.6	225.0	124.62	2.805			
10,600.0	7,205.3	10,528.5	7,085.7	67.2	67.2	70.03	-3,308.9	-507.4	350.0	222.0	128.02	2.734			
10,700.0	7,205.7	10,628.5	7,084.8	69.0	69.1	69.82	-3,408.8	-507.4	350.5	219.1	131.42	2.667			
10,800.0	7,206.1	10,728.5	7,083.9	70.9	71.0	69.61	-3,508.8	-507.4	351.0	216.2	134.82	2.603			
10,900.0	7,206.5	10,828.5	7,082.9	72.8	72.8	69.41	-3,608.8	-507.4	351.5	213.2	138.21	2.543			
11,000.0	7,207.0	10,928.5	7,082.0	74.6	74.7	69.20	-3,708.8	-507.4	351.9	210.3	141.60	2.485			
11,100.0	7,207.4	11,028.5	7,081.0	76.5	76.6	68.99	-3,808.8	-507.4	352.4	207.4	144.99	2.431			
11,200.0	7,207.8	11,128.5	7,080.1	78.4	78.4	68.79	-3,908.8	-507.4	352.9	204.6	148.37	2.379			
11,300.0	7,208.2	11,228.5	7,079.1	80.3	80.3	68.58	-4,008.8	-507.4	353.4	201.7	151.74	2.329			
11,400.0	7,208.6	11,328.5	7,078.2	82.1	82.2	68.38	-4,108.8	-507.4	353.9	198.8	155.11	2.282			
11,500.0	7,209.0	11,428.4	7,077.3	84.0	84.1	68.17	-4,208.7	-507.4	354.4	195.9	158.47	2.236			
11,600.0	7,209.5	11,528.4	7,076.3	85.9	85.9	67.97	-4,308.7	-507.4	354.9	193.1	161.83	2.193			

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6G-323 - Wellbore #1 - Plan #2 (9-3-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
11,700.0	7,209.9	11,628.4	7,075.4	87.8	87.8	67.76	-4,408.7	-507.4	355.4	190.3	165.17	2.152	
11,727.3	7,210.0	11,655.7	7,075.1	88.2	88.3	67.71	-4,436.0	-507.4	355.6	189.6	165.99	2.142 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6G-403 - Wellbore #1 - Plan #2 (9-3-14)													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	Semi Major Axis	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
0.0	0.0	0.0	0.0	0.0	0.0	-103.98	-103.98	-14.6	-58.5	60.3				
100.0	100.0	100.0	100.0	0.1	0.1	-103.98	-103.98	-14.6	-58.5	60.3	60.1	0.22	268.407	
200.0	200.0	200.0	200.0	0.3	0.3	-103.98	-103.98	-14.6	-58.5	60.3	59.7	0.67	89.469 CC, ES	
300.0	300.0	298.4	298.4	0.6	0.6	-102.94	-102.94	-13.8	-60.0	61.6	60.5	1.12	55.199	
400.0	400.0	396.6	396.4	0.8	0.8	-100.07	-100.07	-11.5	-64.5	65.6	64.1	1.57	41.909	
500.0	500.0	494.3	493.8	1.0	1.0	-96.03	-96.03	-7.6	-71.9	72.6	70.6	2.02	35.911	
600.0	600.0	591.3	590.1	1.2	1.3	-91.57	-91.57	-2.3	-82.2	82.8	80.4	2.48	33.378	
700.0	700.0	688.6	686.3	1.5	1.6	-87.29	-87.29	4.5	-95.2	96.3	93.3	2.95	32.654	
800.0	800.0	787.4	783.8	1.7	2.0	-83.90	-83.90	11.6	-108.9	110.7	107.3	3.41	32.509	
900.0	900.0	886.1	881.4	1.9	2.3	-81.29	-81.29	18.8	-122.6	125.5	121.6	3.87	32.433	
1,000.0	1,000.0	984.9	978.9	2.1	2.7	-79.23	-79.23	25.9	-136.4	140.4	136.1	4.34	32.378	
1,100.0	1,100.0	1,083.7	1,076.5	2.4	3.0	-77.57	-77.57	33.1	-150.1	155.5	150.7	4.81	32.332	
1,200.0	1,200.0	1,182.4	1,174.0	2.6	3.4	-76.21	-76.21	40.2	-163.8	170.7	165.4	5.29	32.291	
1,300.0	1,300.0	1,281.2	1,271.6	2.8	3.7	-75.06	-75.06	47.4	-177.5	185.9	180.2	5.76	32.255	
1,400.0	1,400.0	1,380.0	1,369.1	3.0	4.1	-74.10	-74.10	54.5	-191.3	201.3	195.0	6.25	32.221	
1,500.0	1,500.0	1,478.7	1,466.6	3.3	4.5	-73.26	-73.26	61.6	-205.0	216.6	209.9	6.73	32.189	
1,600.0	1,600.0	1,577.5	1,564.2	3.5	4.8	-72.54	-72.54	68.8	-218.7	232.1	224.8	7.22	32.160	
1,700.0	1,700.0	1,676.4	1,661.9	3.7	5.2	-71.90	-71.90	75.9	-232.5	246.4	238.8	7.60	32.415	
1,800.0	1,799.8	1,775.7	1,760.0	3.9	5.6	-71.26	-71.26	83.1	-246.3	258.3	250.3	8.07	32.006	
1,900.0	1,899.5	1,875.2	1,858.2	4.2	5.9	-70.68	-70.68	90.3	-260.1	268.0	259.5	8.55	31.351	
2,000.0	1,998.8	1,974.7	1,956.5	4.4	6.3	-70.14	-70.14	97.5	-273.9	275.8	266.7	9.04	30.507	
2,100.0	2,098.0	2,074.2	2,054.8	4.6	6.7	-69.63	-69.63	104.7	-287.7	283.4	273.8	9.54	29.693	
2,200.0	2,197.3	2,173.7	2,153.1	4.9	7.0	-69.14	-69.14	111.9	-301.6	291.1	281.0	10.06	28.944	
2,300.0	2,296.5	2,273.3	2,251.4	5.2	7.4	-68.67	-68.67	119.1	-315.4	298.9	288.3	10.58	28.254	
2,400.0	2,395.8	2,372.8	2,349.7	5.4	7.8	-68.22	-68.22	126.3	-329.2	306.9	295.8	11.11	27.618	
2,500.0	2,495.0	2,472.3	2,448.0	5.7	8.1	-67.78	-67.78	133.5	-343.1	314.9	303.3	11.65	27.030	
2,600.0	2,594.3	2,571.8	2,546.3	6.0	8.5	-67.35	-67.35	140.7	-356.9	323.1	310.9	12.20	26.485	
2,700.0	2,693.5	2,671.4	2,644.6	6.3	8.9	-66.93	-66.93	147.9	-370.7	331.3	318.5	12.75	25.981	
2,800.0	2,792.8	2,770.9	2,742.9	6.5	9.2	-66.52	-66.52	155.1	-384.6	339.6	326.3	13.31	25.512	
2,900.0	2,892.0	2,870.4	2,841.2	6.8	9.6	-66.12	-66.12	162.3	-398.4	348.0	334.1	13.88	25.076	
3,000.0	2,991.3	2,969.9	2,939.4	7.1	10.0	-65.72	-65.72	169.5	-412.2	356.4	342.0	14.45	24.670	
3,100.0	3,090.5	3,069.5	3,037.7	7.4	10.4	-65.33	-65.33	176.7	-426.1	364.9	349.9	15.02	24.291	
3,200.0	3,189.8	3,169.0	3,136.0	7.7	10.7	-64.94	-64.94	183.9	-439.9	373.5	357.9	15.60	23.937	
3,300.0	3,289.0	3,268.5	3,234.3	8.0	11.1	-64.56	-64.56	191.1	-453.7	382.1	365.9	16.19	23.606	
3,400.0	3,388.3	3,368.0	3,332.6	8.3	11.5	-64.18	-64.18	198.3	-467.6	390.8	374.0	16.78	23.295	
3,500.0	3,487.5	3,467.6	3,430.9	8.6	11.8	-63.80	-63.80	205.5	-481.4	399.5	382.2	17.37	23.004	
3,600.0	3,586.8	3,567.1	3,529.2	8.9	12.2	-63.42	-63.42	212.7	-495.2	408.3	390.4	17.96	22.731	
3,700.0	3,686.0	3,666.6	3,627.5	9.2	12.6	-63.04	-63.04	219.9	-509.0	417.1	398.6	18.56	22.473	
3,800.0	3,785.3	3,766.1	3,725.8	9.5	13.0	-62.66	-62.66	227.1	-522.9	426.0	406.8	19.16	22.231	
3,900.0	3,884.5	3,865.7	3,824.1	9.8	13.3	-62.28	-62.28	234.3	-536.7	434.9	415.1	19.77	22.003	
4,000.0	3,983.8	3,965.2	3,922.4	10.1	13.7	-61.90	-61.90	241.5	-550.5	443.8	423.4	20.37	21.787	
4,100.0	4,083.0	4,064.7	4,020.7	10.4	14.1	-61.52	-61.52	248.7	-564.4	452.8	431.8	20.98	21.583	
4,200.0	4,182.3	4,164.2	4,119.0	10.7	14.4	-61.14	-61.14	255.9	-578.2	461.8	440.2	21.59	21.390	
4,300.0	4,281.5	4,263.8	4,217.3	11.0	14.8	-60.76	-60.76	263.1	-592.0	470.8	448.6	22.20	21.207	
4,400.0	4,380.8	4,363.3	4,315.6	11.3	15.2	-60.38	-60.38	270.3	-605.9	479.8	457.0	22.81	21.034	
4,500.0	4,480.0	4,462.8	4,413.9	11.6	15.5	-60.00	-60.00	277.5	-619.7	488.9	465.5	23.43	20.869	
4,600.0	4,579.3	4,562.3	4,512.2	12.0	15.9	-59.62	-59.62	284.7	-633.5	498.0	474.0	24.04	20.712	
4,700.0	4,678.5	4,661.9	4,610.5	12.3	16.3	-59.24	-59.24	291.9	-647.4	507.1	482.5	24.66	20.564	
4,800.0	4,777.8	4,761.4	4,708.8	12.6	16.7	-58.86	-58.86	299.1	-661.2	516.3	491.0	25.28	20.422	
4,900.0	4,877.0	4,860.9	4,807.1	12.9	17.0	-58.48	-58.48	306.3	-675.0	525.5	499.6	25.90	20.287	
5,000.0	4,976.3	4,960.4	4,905.4	13.2	17.4	-58.10	-58.10	313.5	-688.8	534.7	508.1	26.52	20.158	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6G-403 - Wellbore #1 - Plan #2 (9-3-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,075.5	5,060.0	5,003.7	13.5	17.8	-70.52	320.7	-702.7	543.9	516.7	27.15	20.035	
5,200.0	5,174.8	5,159.5	5,102.0	13.8	18.1	-70.88	327.9	-716.5	553.1	525.4	27.76	19.924	
5,300.0	5,274.3	5,259.0	5,200.2	14.0	18.5	-71.13	335.0	-730.3	563.2	534.9	28.29	19.912 SF	
5,400.0	5,374.1	5,358.3	5,298.3	14.2	18.9	-71.07	342.2	-744.1	574.4	545.7	28.75	19.983	
5,500.0	5,474.1	5,457.4	5,396.1	14.4	19.2	-70.72	349.4	-757.9	586.8	557.7	29.14	20.136	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design		Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6K-243 - Wellbore #1 - Plan #2 (9-3-14)											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	68.60	10.9	27.9	29.9					
100.0	100.0	100.0	100.0	0.1	0.1	68.60	10.9	27.9	29.9	29.7	0.22	133.211		
200.0	200.0	200.0	200.0	0.3	0.3	68.60	10.9	27.9	29.9	29.3	0.67	44.404		
300.0	300.0	300.0	300.0	0.6	0.6	68.60	10.9	27.9	29.9	28.8	1.12	26.642		
400.0	400.0	400.0	400.0	0.8	0.8	68.60	10.9	27.9	29.9	28.4	1.57	19.030		
500.0	500.0	500.0	500.0	1.0	1.0	68.60	10.9	27.9	29.9	27.9	2.02	14.801		
600.0	600.0	600.0	600.0	1.2	1.2	68.60	10.9	27.9	29.9	27.5	2.47	12.110		
700.0	700.0	700.0	700.0	1.5	1.5	68.60	10.9	27.9	29.9	27.0	2.92	10.247		
800.0	800.0	800.0	800.0	1.7	1.7	68.60	10.9	27.9	29.9	26.6	3.37	8.881		
900.0	900.0	900.0	900.0	1.9	1.9	68.60	10.9	27.9	29.9	26.1	3.82	7.836		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	68.60	10.9	27.9	29.9	25.7	4.27	7.011		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	68.60	10.9	27.9	29.9	25.2	4.72	6.343		
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	68.60	10.9	27.9	29.9	24.8	5.17	5.792		
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	68.60	10.9	27.9	29.9	24.3	5.62	5.328		
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	68.60	10.9	27.9	29.9	23.9	6.07	4.934		
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	68.60	10.9	27.9	29.9	23.4	6.52	4.593		
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	68.60	10.9	27.9	29.9	23.0	6.97	4.297 CC		
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	96.01	10.9	27.9	30.1	22.7	7.42	4.056 ES		
1,800.0	1,799.8	1,799.8	1,799.8	3.9	3.9	105.63	10.9	27.9	31.1	23.2	7.86	3.952		
1,900.0	1,899.5	1,899.5	1,899.5	4.2	4.2	119.63	10.9	27.9	34.5	26.2	8.30	4.151		
2,000.0	1,998.8	1,998.8	1,998.8	4.4	4.4	133.78	10.9	27.9	41.6	32.8	8.74	4.759		
2,100.0	2,098.0	2,098.3	2,098.3	4.6	4.6	141.90	12.5	28.4	50.5	41.3	9.18	5.501		
2,200.0	2,197.3	2,198.3	2,198.2	4.9	4.8	144.29	17.5	29.9	59.2	49.6	9.63	6.152		
2,300.0	2,296.5	2,298.5	2,297.9	5.2	5.1	143.17	25.8	32.5	67.3	57.2	10.09	6.664		
2,400.0	2,395.8	2,398.4	2,397.2	5.4	5.3	139.85	37.1	36.1	74.8	64.2	10.58	7.069		
2,500.0	2,495.0	2,498.0	2,496.0	5.7	5.5	136.67	49.0	39.8	82.4	71.3	11.07	7.440		
2,600.0	2,594.3	2,597.6	2,594.8	6.0	5.8	134.03	61.0	43.6	90.2	78.6	11.58	7.789		
2,700.0	2,693.5	2,697.2	2,693.6	6.3	6.0	131.82	73.0	47.3	98.2	86.1	12.10	8.115		
2,800.0	2,792.8	2,796.9	2,792.4	6.5	6.3	129.94	84.9	51.0	106.3	93.7	12.64	8.417		
2,900.0	2,892.0	2,896.5	2,891.3	6.8	6.5	128.33	96.9	54.8	114.6	101.4	13.17	8.696		
3,000.0	2,991.3	2,996.1	2,990.1	7.1	6.8	126.94	108.8	58.5	122.9	109.1	13.72	8.955		
3,100.0	3,090.5	3,095.7	3,088.9	7.4	7.1	125.73	120.8	62.3	131.2	117.0	14.27	9.193		
3,200.0	3,189.8	3,195.3	3,187.7	7.7	7.4	124.66	132.7	66.0	139.6	124.8	14.83	9.415		
3,300.0	3,289.0	3,294.9	3,286.6	8.0	7.6	123.71	144.7	69.8	148.1	132.7	15.40	9.619		
3,400.0	3,388.3	3,394.5	3,385.4	8.3	7.9	122.86	156.6	73.5	156.6	140.6	15.96	9.809		
3,500.0	3,487.5	3,494.2	3,484.2	8.6	8.2	122.10	168.6	77.3	165.1	148.6	16.53	9.986		
3,600.0	3,586.8	3,593.8	3,583.0	8.9	8.5	121.42	180.5	81.0	173.7	156.5	17.11	10.150		
3,700.0	3,686.0	3,693.4	3,681.9	9.2	8.8	120.80	192.5	84.7	182.2	164.5	17.69	10.303		
3,800.0	3,785.3	3,793.0	3,780.7	9.5	9.1	120.24	204.4	88.5	190.8	172.5	18.27	10.445		
3,900.0	3,884.5	3,892.6	3,879.5	9.8	9.4	119.72	216.4	92.2	199.4	180.6	18.85	10.579		
4,000.0	3,983.8	3,992.2	3,978.3	10.1	9.7	119.25	228.3	96.0	208.0	188.6	19.44	10.704		
4,100.0	4,083.0	4,091.8	4,077.1	10.4	10.0	118.81	240.3	99.7	216.7	196.6	20.02	10.821		
4,200.0	4,182.3	4,191.5	4,176.0	10.7	10.3	118.41	252.3	103.5	225.3	204.7	20.61	10.931		
4,300.0	4,281.5	4,291.1	4,274.8	11.0	10.6	118.04	264.2	107.2	234.0	212.8	21.20	11.035		
4,400.0	4,380.8	4,390.7	4,373.6	11.3	10.9	117.69	276.2	110.9	242.6	220.8	21.80	11.132		
4,500.0	4,480.0	4,490.3	4,472.4	11.6	11.2	117.37	288.1	114.7	251.3	228.9	22.39	11.224		
4,600.0	4,579.3	4,589.9	4,571.3	12.0	11.5	117.07	300.1	118.4	260.0	237.0	22.98	11.311		
4,700.0	4,678.5	4,689.5	4,670.1	12.3	11.8	116.79	312.0	122.2	268.7	245.1	23.58	11.394		
4,800.0	4,777.8	4,789.1	4,768.9	12.6	12.1	116.53	324.0	125.9	277.4	253.2	24.18	11.472		
4,900.0	4,877.0	4,888.7	4,867.7	12.9	12.4	116.28	335.9	129.7	286.1	261.3	24.78	11.546		
5,000.0	4,976.3	4,988.4	4,966.6	13.2	12.7	116.05	347.9	133.4	294.8	269.4	25.38	11.616		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6K-243 - Wellbore #1 - Plan #2 (9-3-14)													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	Semi Major Axis	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	5,075.5	5,088.0	5,065.4	13.5	13.0	115.83	115.83	359.8	137.2	303.5	277.5	25.98	11.683	
5,200.0	5,174.8	5,187.6	5,164.2	13.8	13.3	115.64	115.64	371.8	140.9	312.1	285.6	26.57	11.746	
5,300.0	5,274.3	5,288.0	5,263.8	14.0	13.6	115.17	115.17	383.7	144.6	319.7	292.6	27.11	11.794	
5,400.0	5,374.1	5,391.1	5,366.4	14.2	13.9	114.54	114.54	393.5	147.7	325.1	297.6	27.55	11.801	
5,500.0	5,474.1	5,494.5	5,469.6	14.4	14.1	113.93	113.93	399.8	149.7	328.1	300.2	27.94	11.745	
5,600.0	5,574.1	5,598.1	5,573.1	14.6	14.2	89.39	89.39	402.5	150.5	329.0	300.7	28.29	11.631	
5,700.0	5,674.1	5,699.0	5,674.1	14.7	14.4	89.37	89.37	402.6	150.6	329.0	300.4	28.65	11.486	
5,800.0	5,774.1	5,799.0	5,774.1	14.9	14.6	89.37	89.37	402.6	150.6	329.0	300.0	29.03	11.335	
5,900.0	5,874.1	5,899.0	5,874.1	15.1	14.8	89.37	89.37	402.6	150.6	329.0	299.6	29.41	11.187	
6,000.0	5,974.1	5,999.0	5,974.1	15.3	15.0	89.37	89.37	402.6	150.6	329.0	299.2	29.80	11.043	
6,100.0	6,074.1	6,099.0	6,074.1	15.5	15.2	89.37	89.37	402.6	150.6	329.0	298.8	30.18	10.901	
6,200.0	6,174.1	6,199.0	6,174.1	15.7	15.4	89.37	89.37	402.6	150.6	329.0	298.4	30.57	10.762	
6,300.0	6,274.1	6,299.1	6,274.1	15.9	15.6	89.38	89.38	402.5	150.6	329.0	298.1	30.96	10.628	
6,362.5	6,336.6	6,361.6	6,336.6	16.0	15.6	90.00	90.00	399.0	150.6	329.0	297.9	31.15	10.563	
6,400.0	6,374.1	6,398.7	6,373.4	16.1	15.7	90.78	90.78	394.5	150.6	329.0	297.8	31.24	10.532	
6,500.0	6,474.0	6,495.1	6,467.6	16.2	15.7	-85.91	-85.91	374.5	150.6	329.9	298.5	31.39	10.508	
6,600.0	6,573.2	6,588.7	6,556.0	16.3	15.6	-82.40	-82.40	343.9	150.6	332.0	300.7	31.35	10.592	
6,700.0	6,669.9	6,680.1	6,638.1	16.3	15.6	-79.09	-79.09	303.8	150.6	335.3	304.1	31.16	10.759	
6,800.0	6,762.4	6,769.7	6,713.3	16.2	15.5	-76.03	-76.03	255.2	150.6	339.4	308.5	30.87	10.994	
6,900.0	6,849.3	6,857.7	6,781.1	16.1	15.4	-73.25	-73.25	199.3	150.6	344.0	313.5	30.52	11.272	
7,000.0	6,929.0	6,944.2	6,841.2	16.0	15.4	-70.79	-70.79	137.1	150.6	348.8	318.6	30.16	11.563	
7,100.0	7,000.1	7,029.5	6,893.1	16.0	15.4	-68.67	-68.67	69.4	150.6	353.6	323.7	29.89	11.829	
7,200.0	7,061.4	7,113.9	6,936.8	15.9	15.5	-66.89	-66.89	-2.7	150.6	358.0	328.3	29.77	12.025	
7,300.0	7,112.0	7,200.0	6,972.8	16.0	15.9	-65.42	-65.42	-80.9	150.6	361.9	332.0	29.90	12.104	
7,400.0	7,150.8	7,280.4	6,998.3	16.4	16.3	-64.36	-64.36	-157.0	150.6	365.1	334.7	30.34	12.031	
7,500.0	7,177.3	7,362.8	7,016.1	17.0	16.8	-63.61	-63.61	-237.5	150.6	367.3	336.2	31.14	11.796	
7,600.0	7,191.0	7,445.0	7,025.0	17.7	17.5	-63.20	-63.20	-319.2	150.6	368.6	336.3	32.31	11.408	
7,700.0	7,193.1	7,535.1	7,025.9	18.7	18.4	-63.06	-63.06	-409.2	150.6	369.1	335.2	33.90	10.888	
7,800.0	7,193.5	7,635.1	7,025.5	19.7	19.5	-62.94	-62.94	-509.2	150.6	369.5	333.7	35.80	10.320	
7,900.0	7,194.0	7,735.1	7,025.0	20.9	20.7	-62.81	-62.81	-609.2	150.6	369.9	331.9	37.92	9.753	
8,000.0	7,194.4	7,835.1	7,024.5	22.2	22.0	-62.69	-62.69	-709.2	150.6	370.3	330.0	40.23	9.204	
8,100.0	7,194.8	7,935.1	7,024.0	23.6	23.4	-62.57	-62.57	-809.2	150.6	370.7	328.0	42.69	8.683	
8,200.0	7,195.2	8,035.0	7,023.6	25.0	24.8	-62.45	-62.45	-909.2	150.6	371.1	325.8	45.27	8.197	
8,300.0	7,195.6	8,135.0	7,023.1	26.5	26.4	-62.33	-62.33	-1,009.2	150.6	371.5	323.5	47.96	7.746	
8,400.0	7,196.1	8,235.0	7,022.6	28.0	27.9	-62.20	-62.20	-1,109.2	150.6	371.9	321.2	50.73	7.331	
8,500.0	7,196.5	8,335.0	7,022.2	29.6	29.5	-62.08	-62.08	-1,209.2	150.6	372.3	318.8	53.57	6.950	
8,600.0	7,196.9	8,435.0	7,021.7	31.3	31.2	-61.96	-61.96	-1,309.2	150.6	372.7	316.3	56.48	6.600	
8,700.0	7,197.3	8,535.0	7,021.2	32.9	32.9	-61.84	-61.84	-1,409.2	150.6	373.2	313.7	59.43	6.279	
8,800.0	7,197.7	8,635.0	7,020.7	34.6	34.6	-61.72	-61.72	-1,509.2	150.6	373.6	311.2	62.42	5.985	
8,900.0	7,198.2	8,735.0	7,020.3	36.3	36.3	-61.60	-61.60	-1,609.2	150.6	374.0	308.6	65.45	5.714	
9,000.0	7,198.6	8,835.0	7,019.8	38.1	38.0	-61.48	-61.48	-1,709.2	150.6	374.4	305.9	68.51	5.465	
9,100.0	7,199.0	8,935.0	7,019.3	39.8	39.8	-61.36	-61.36	-1,809.2	150.6	374.9	303.3	71.59	5.236	
9,200.0	7,199.4	9,035.0	7,018.9	41.6	41.5	-61.24	-61.24	-1,909.2	150.6	375.3	300.6	74.70	5.024	
9,300.0	7,199.8	9,135.0	7,018.4	43.3	43.3	-61.12	-61.12	-2,009.1	150.6	375.7	297.9	77.82	4.828	
9,400.0	7,200.3	9,235.0	7,017.9	45.1	45.1	-61.01	-61.01	-2,109.1	150.6	376.1	295.2	80.95	4.647	
9,500.0	7,200.7	9,335.0	7,017.4	46.9	46.9	-60.89	-60.89	-2,209.1	150.6	376.6	292.5	84.10	4.478	
9,600.0	7,201.1	9,435.0	7,017.0	48.7	48.7	-60.77	-60.77	-2,309.1	150.6	377.0	289.8	87.26	4.321	
9,700.0	7,201.5	9,535.0	7,016.5	50.5	50.6	-60.65	-60.65	-2,409.1	150.6	377.4	287.0	90.42	4.174	
9,800.0	7,201.9	9,635.0	7,016.0	52.4	52.4	-60.53	-60.53	-2,509.1	150.6	377.9	284.3	93.59	4.038	
9,900.0	7,202.3	9,735.0	7,015.6	54.2	54.2	-60.42	-60.42	-2,609.1	150.6	378.3	281.6	96.77	3.910	
10,000.0	7,202.8	9,835.0	7,015.1	56.0	56.1	-60.30	-60.30	-2,709.1	150.6	378.8	278.8	99.95	3.790	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6G Pad Sec.6-T4N-R66W - Bernhardt 6K-243 - Wellbore #1 - Plan #2 (9-3-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,203.2	9,935.0	7,014.6	57.9	57.9	-60.18	-2,809.1	150.6	379.2	276.1	103.13	3.677	
10,200.0	7,203.6	10,035.0	7,014.1	59.7	59.8	-60.07	-2,909.1	150.6	379.7	273.3	106.32	3.571	
10,300.0	7,204.0	10,135.0	7,013.7	61.6	61.6	-59.95	-3,009.1	150.6	380.1	270.6	109.51	3.471	
10,400.0	7,204.4	10,235.0	7,013.2	63.4	63.5	-59.83	-3,109.1	150.6	380.5	267.8	112.70	3.377	
10,500.0	7,204.9	10,335.0	7,012.7	65.3	65.3	-59.72	-3,209.1	150.6	381.0	265.1	115.88	3.288	
10,600.0	7,205.3	10,435.0	7,012.3	67.2	67.2	-59.60	-3,309.1	150.6	381.4	262.4	119.07	3.203	
10,700.0	7,205.7	10,534.9	7,011.8	69.0	69.1	-59.49	-3,409.1	150.6	381.9	259.6	122.26	3.124	
10,800.0	7,206.1	10,634.9	7,011.3	70.9	71.0	-59.37	-3,509.1	150.6	382.3	256.9	125.45	3.048	
10,900.0	7,206.5	10,734.9	7,010.9	72.8	72.8	-59.26	-3,609.1	150.6	382.8	254.2	128.63	2.976	
11,000.0	7,207.0	10,834.9	7,010.4	74.6	74.7	-59.14	-3,709.1	150.6	383.3	251.4	131.81	2.908	
11,100.0	7,207.4	10,934.9	7,009.9	76.5	76.6	-59.03	-3,809.1	150.6	383.7	248.7	134.99	2.843	
11,200.0	7,207.8	11,034.9	7,009.4	78.4	78.5	-58.92	-3,909.0	150.6	384.2	246.0	138.17	2.781	
11,300.0	7,208.2	11,134.9	7,009.0	80.3	80.3	-58.80	-4,009.0	150.6	384.6	243.3	141.34	2.721	
11,400.0	7,208.6	11,234.9	7,008.5	82.1	82.2	-58.69	-4,109.0	150.6	385.1	240.6	144.51	2.665	
11,500.0	7,209.0	11,334.9	7,008.0	84.0	84.1	-58.58	-4,209.0	150.6	385.6	237.9	147.67	2.611	
11,600.0	7,209.5	11,434.9	7,007.6	85.9	86.0	-58.46	-4,309.0	150.6	386.0	235.2	150.84	2.559	
11,700.0	7,209.9	11,534.9	7,007.1	87.8	87.8	-58.35	-4,409.0	150.6	386.5	232.6	153.87	2.512	
11,727.3	7,210.0	11,552.2	7,007.0	88.2	88.0	-58.33	-4,426.3	150.6	386.7	232.3	154.43	2.504 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.6-T4N-R66W - Bernhardt 13-6 (P&A) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft	
Survey Program: 7292-UNKNOWN												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)		
8,200.0	7,195.2	7,171.2	7,171.2	25.0	143.4	-88.80	-1,489.3	-62.4	590.8	422.5	168.28	3.511	
8,300.0	7,195.6	7,171.6	7,171.6	26.5	143.4	-89.01	-1,489.3	-62.4	493.1	323.3	169.81	2.904	
8,400.0	7,196.1	7,172.1	7,172.1	28.0	143.4	-89.22	-1,489.3	-62.4	396.6	225.2	171.38	2.314	
8,500.0	7,196.5	7,172.5	7,172.5	29.6	143.4	-89.42	-1,489.3	-62.4	302.4	129.4	172.99	1.748	
8,600.0	7,196.9	7,172.9	7,172.9	31.3	143.5	-89.63	-1,489.3	-62.4	213.5	38.9	174.64	1.223 Level 2	
8,700.0	7,197.3	7,173.3	7,173.3	32.9	143.5	-89.84	-1,489.3	-62.4	140.5	-35.8	176.31	0.797 Level 1	
8,779.3	7,197.7	7,173.7	7,173.7	34.3	143.5	-90.00	-1,489.3	-62.4	116.0	-61.7	177.66	0.653 Level 1, CC, ES, SF	
8,800.0	7,197.7	7,173.7	7,173.7	34.6	143.5	-90.04	-1,489.3	-62.4	117.8	-60.2	178.01	0.662 Level 1	
8,900.0	7,198.2	7,174.2	7,174.2	36.3	143.5	-90.25	-1,489.3	-62.4	167.4	-12.3	179.74	0.931 Level 1	
9,000.0	7,198.6	7,174.6	7,174.6	38.1	143.5	-90.46	-1,489.3	-62.4	249.3	67.9	181.47	1.374 Level 3	
9,100.0	7,199.0	7,175.0	7,175.0	39.8	143.5	-90.66	-1,489.3	-62.4	341.0	157.8	183.23	1.861	
9,200.0	7,199.4	7,175.4	7,175.4	41.6	143.5	-90.87	-1,489.3	-62.4	436.4	251.4	184.99	2.359	
9,300.0	7,199.8	7,175.8	7,175.8	43.3	143.5	-91.08	-1,489.3	-62.4	533.5	346.7	186.77	2.856	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.6-T4N-R66W - Bernhardt 7-1 (Exist.) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft		
Survey Program: 7310-UNKNOWN														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth Depth (ft)	Vertical Depth (ft)	Measured Depth Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
11,000.0	7,207.0	7,199.0	7,199.0	74.6	144.0	89.13	-4,266.0	-331.8	576.8	358.3	218.55	2.639				
11,100.0	7,207.4	7,199.4	7,199.4	76.5	144.0	89.29	-4,266.0	-331.8	481.1	260.7	220.44	2.183				
11,200.0	7,207.8	7,199.8	7,199.8	78.4	144.0	89.44	-4,266.0	-331.8	387.7	165.3	222.33	1.744				
11,300.0	7,208.2	7,200.2	7,200.2	80.3	144.0	89.60	-4,266.0	-331.8	298.5	74.2	224.23	1.331 Level 3				
11,400.0	7,208.6	7,200.6	7,200.6	82.1	144.0	89.76	-4,266.0	-331.8	218.8	-7.3	226.12	0.968 Level 1				
11,500.0	7,209.0	7,201.0	7,201.0	84.0	144.0	89.91	-4,266.0	-331.8	163.3	-64.7	228.01	0.716 Level 1				
11,556.1	7,209.3	7,201.3	7,201.3	85.1	144.0	90.00	-4,266.0	-331.8	153.3	-75.7	229.07	0.669 Level 1, CC, ES, SF				
11,600.0	7,209.5	7,201.5	7,201.5	85.9	144.0	90.07	-4,266.0	-331.8	159.5	-70.4	229.91	0.694 Level 1				
11,700.0	7,209.9	7,201.9	7,201.9	87.8	144.0	90.23	-4,266.0	-331.8	210.3	-21.5	231.80	0.907 Level 1				
11,727.3	7,210.0	7,202.0	7,202.0	88.2	144.0	90.27	-4,266.0	-331.8	229.9	-2.4	232.21	0.990 Level 1				

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4737.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Bernhardt 6K-443

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.44°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-443
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4737.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4737.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-443	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 #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4737.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Bernhardt 6K-443
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.44°

