

# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Bernhardt Farms 13S-443**

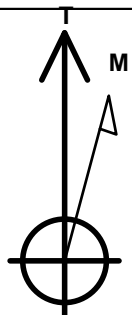
Surface Location: Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4737.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1357007.18	3186244.30	40.311460	-104.832150	

RKB - 15' WELL @ 4752.0ft (RKB - 15')

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2549'FSL, 681'FEL	1.0	0.0	0.0	Point
BHL 500'FSL, 1640'FEL	7257.0	-7289.7	-976.4	Point



Azimuths to True North  
Magnetic North: 8.57°

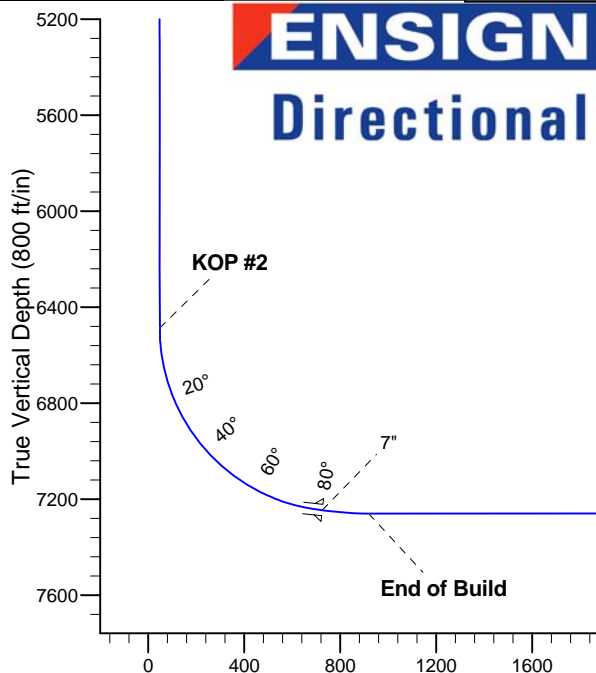
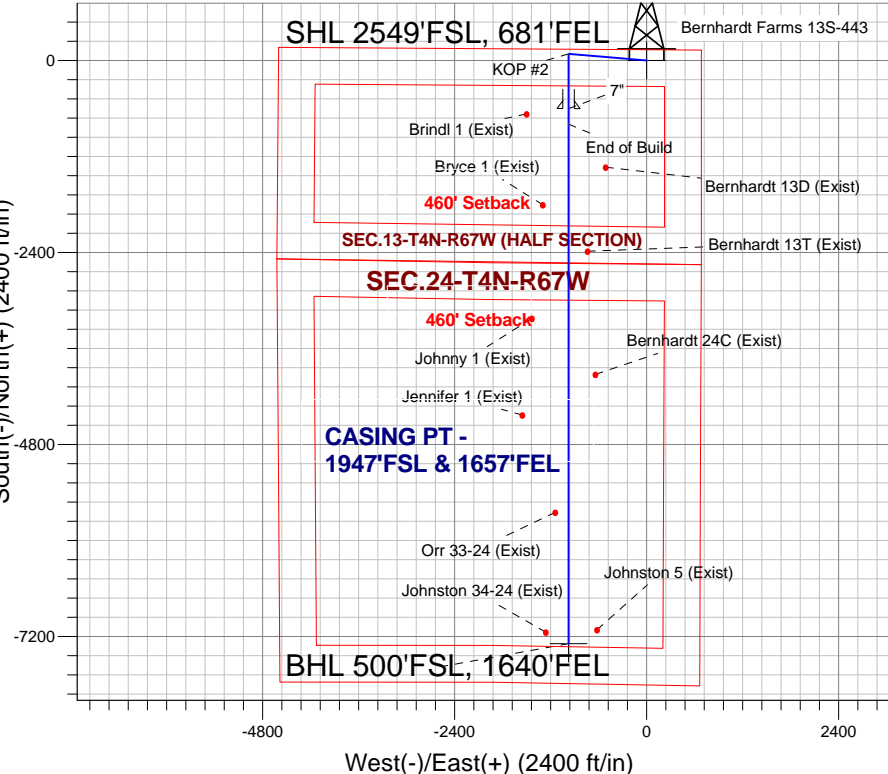
Magnetic Field  
Strength: 52824.2snT  
Dip Angle: 66.88°  
Date: 11/13/2013  
Model: IGRF2010

Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W  
Bernhardt Farms 13S-443  
Plan #1 (11-13-13)  
7:36, November 20 2013

## ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP #1
6486.6	6583.3	KOP #2
7260.4	7897.9	End of Build

South(-)/North(+) (2400 ft/in)



## 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	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	787.5	11.75	274.80	783.4	5.0	-59.8	2.00	274.80	3.0	
4	5009.2	11.75	274.80	4916.6	77.0	-916.6	0.00	0.00	45.4	
5	5596.7	0.00	0.00	5500.0	82.0	-976.4	2.00	180.00	48.3	
6	6583.3	0.00	0.00	6486.6	82.0	-976.4	0.00	0.00	48.3	
7	7703.3	84.00	180.00	7246.4	-602.1	-976.4	7.50	180.00	726.4	
8	7777.3	84.00	180.00	7254.1	-675.7	-976.4	0.00	0.00	799.3	
9	7897.9	90.03	180.00	7260.4	-796.1	-976.4	5.00	0.00	918.6	
10	14391.6	90.03	180.00	7257.0	-7289.7	-976.4	0.00	0.00	7354.8	BHL 500'FSL, 1640'FEL

BHL 500'FSL, 1640'FEL

Vertical Section at 187.63° (800 ft/in)



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.13-T4N-R67W**

**Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W**

**Bernhardt Farms 13S-443**

**Wellbore #1**

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

## **Standard Planning Report**

**20 November, 2013**

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
787.5	11.75	274.80	783.4	5.0	-59.8	2.00	2.00	0.00	274.80	
5,009.2	11.75	274.80	4,916.6	77.0	-916.6	0.00	0.00	0.00	0.00	
5,596.7	0.00	0.00	5,500.0	82.0	-976.4	2.00	-2.00	0.00	180.00	
6,583.3	0.00	0.00	6,486.6	82.0	-976.4	0.00	0.00	0.00	0.00	
7,703.3	84.00	180.00	7,246.4	-602.1	-976.4	7.50	7.50	0.00	180.00	
7,777.3	84.00	180.00	7,254.1	-675.7	-976.4	0.00	0.00	0.00	0.00	
7,897.9	90.03	180.00	7,260.4	-796.1	-976.4	5.00	5.00	0.00	0.00	
14,391.6	90.03	180.00	7,257.0	-7,289.7	-976.4	0.00	0.00	0.00	0.00	BHL 500'FSL, 1640

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Project:</b>	SEC.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-13-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>SHL 2549'FSL, 681'FEL</b>									
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
<b>KOP #1</b>									
300.0	2.00	274.80	300.0	0.1	-1.7	0.1	2.00	2.00	0.00
400.0	4.00	274.80	399.8	0.6	-7.0	0.3	2.00	2.00	0.00
500.0	6.00	274.80	499.5	1.3	-15.6	0.8	2.00	2.00	0.00
600.0	8.00	274.80	598.7	2.3	-27.8	1.4	2.00	2.00	0.00
700.0	10.00	274.80	697.5	3.6	-43.4	2.1	2.00	2.00	0.00
787.5	11.75	274.80	783.4	5.0	-59.8	3.0	2.00	2.00	0.00
800.0	11.75	274.80	795.6	5.2	-62.4	3.1	0.00	0.00	0.00
900.0	11.75	274.80	893.5	6.9	-82.7	4.1	0.00	0.00	0.00
1,000.0	11.75	274.80	991.4	8.6	-102.9	5.1	0.00	0.00	0.00
1,100.0	11.75	274.80	1,089.3	10.3	-123.2	6.1	0.00	0.00	0.00
1,200.0	11.75	274.80	1,187.2	12.1	-143.5	7.1	0.00	0.00	0.00
1,300.0	11.75	274.80	1,285.2	13.8	-163.8	8.1	0.00	0.00	0.00
1,400.0	11.75	274.80	1,383.1	15.5	-184.1	9.1	0.00	0.00	0.00
1,500.0	11.75	274.80	1,481.0	17.2	-204.4	10.1	0.00	0.00	0.00
1,600.0	11.75	274.80	1,578.9	18.9	-224.7	11.1	0.00	0.00	0.00
1,700.0	11.75	274.80	1,676.8	20.6	-245.0	12.1	0.00	0.00	0.00
1,800.0	11.75	274.80	1,774.7	22.3	-265.3	13.1	0.00	0.00	0.00
1,900.0	11.75	274.80	1,872.6	24.0	-285.6	14.1	0.00	0.00	0.00
2,000.0	11.75	274.80	1,970.5	25.7	-305.9	15.1	0.00	0.00	0.00
2,100.0	11.75	274.80	2,068.4	27.4	-326.2	16.2	0.00	0.00	0.00
2,200.0	11.75	274.80	2,166.3	29.1	-346.5	17.2	0.00	0.00	0.00
2,300.0	11.75	274.80	2,264.2	30.8	-366.8	18.2	0.00	0.00	0.00
2,400.0	11.75	274.80	2,362.1	32.5	-387.1	19.2	0.00	0.00	0.00
2,500.0	11.75	274.80	2,460.0	34.2	-407.4	20.2	0.00	0.00	0.00
2,600.0	11.75	274.80	2,557.9	35.9	-427.6	21.2	0.00	0.00	0.00
2,700.0	11.75	274.80	2,655.8	37.6	-447.9	22.2	0.00	0.00	0.00
2,800.0	11.75	274.80	2,753.7	39.3	-468.2	23.2	0.00	0.00	0.00
2,900.0	11.75	274.80	2,851.6	41.0	-488.5	24.2	0.00	0.00	0.00
3,000.0	11.75	274.80	2,949.5	42.7	-508.8	25.2	0.00	0.00	0.00
3,100.0	11.75	274.80	3,047.4	44.4	-529.1	26.2	0.00	0.00	0.00
3,200.0	11.75	274.80	3,145.3	46.1	-549.4	27.2	0.00	0.00	0.00
3,300.0	11.75	274.80	3,243.2	47.8	-569.7	28.2	0.00	0.00	0.00
3,400.0	11.75	274.80	3,341.1	49.5	-590.0	29.2	0.00	0.00	0.00
3,500.0	11.75	274.80	3,439.0	51.3	-610.3	30.2	0.00	0.00	0.00
3,600.0	11.75	274.80	3,536.9	53.0	-630.6	31.2	0.00	0.00	0.00
3,700.0	11.75	274.80	3,634.9	54.7	-650.9	32.2	0.00	0.00	0.00
3,800.0	11.75	274.80	3,732.8	56.4	-671.2	33.2	0.00	0.00	0.00
3,900.0	11.75	274.80	3,830.7	58.1	-691.5	34.2	0.00	0.00	0.00
4,000.0	11.75	274.80	3,928.6	59.8	-711.8	35.2	0.00	0.00	0.00
4,100.0	11.75	274.80	4,026.5	61.5	-732.1	36.2	0.00	0.00	0.00
4,200.0	11.75	274.80	4,124.4	63.2	-752.4	37.3	0.00	0.00	0.00
4,300.0	11.75	274.80	4,222.3	64.9	-772.6	38.3	0.00	0.00	0.00
4,400.0	11.75	274.80	4,320.2	66.6	-792.9	39.3	0.00	0.00	0.00
4,500.0	11.75	274.80	4,418.1	68.3	-813.2	40.3	0.00	0.00	0.00
4,600.0	11.75	274.80	4,516.0	70.0	-833.5	41.3	0.00	0.00	0.00
4,700.0	11.75	274.80	4,613.9	71.7	-853.8	42.3	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Project:</b>	SEC.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-13-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,800.0	11.75	274.80	4,711.8	73.4	-874.1	43.3	0.00	0.00	0.00
4,900.0	11.75	274.80	4,809.7	75.1	-894.4	44.3	0.00	0.00	0.00
5,000.0	11.75	274.80	4,907.6	76.8	-914.7	45.3	0.00	0.00	0.00
5,009.2	11.75	274.80	4,916.6	77.0	-916.6	45.4	0.00	0.00	0.00
5,100.0	9.93	274.80	5,005.8	78.4	-933.6	46.2	2.00	-2.00	0.00
5,200.0	7.93	274.80	5,104.6	79.7	-949.1	47.0	2.00	-2.00	0.00
5,300.0	5.93	274.80	5,203.8	80.7	-961.1	47.6	2.00	-2.00	0.00
5,400.0	3.93	274.80	5,303.5	81.4	-969.7	48.0	2.00	-2.00	0.00
5,500.0	1.93	274.80	5,403.3	81.9	-974.8	48.3	2.00	-2.00	0.00
5,596.7	0.00	0.00	5,500.0	82.0	-976.4	48.3	2.00	-2.00	0.00
5,600.0	0.00	0.00	5,503.3	82.0	-976.4	48.3	0.00	0.00	0.00
5,700.0	0.00	0.00	5,603.3	82.0	-976.4	48.3	0.00	0.00	0.00
5,800.0	0.00	0.00	5,703.3	82.0	-976.4	48.3	0.00	0.00	0.00
5,900.0	0.00	0.00	5,803.3	82.0	-976.4	48.3	0.00	0.00	0.00
6,000.0	0.00	0.00	5,903.3	82.0	-976.4	48.3	0.00	0.00	0.00
6,100.0	0.00	0.00	6,003.3	82.0	-976.4	48.3	0.00	0.00	0.00
6,200.0	0.00	0.00	6,103.3	82.0	-976.4	48.3	0.00	0.00	0.00
6,300.0	0.00	0.00	6,203.3	82.0	-976.4	48.3	0.00	0.00	0.00
6,400.0	0.00	0.00	6,303.3	82.0	-976.4	48.3	0.00	0.00	0.00
6,500.0	0.00	0.00	6,403.3	82.0	-976.4	48.3	0.00	0.00	0.00
6,583.3	0.00	0.00	6,486.6	82.0	-976.4	48.3	0.00	0.00	0.00
<b>KOP #2</b>									
6,600.0	1.25	180.00	6,503.3	81.8	-976.4	48.5	7.49	7.49	0.00
6,700.0	8.75	180.00	6,602.9	73.1	-976.4	57.2	7.50	7.50	0.00
6,800.0	16.25	180.00	6,700.4	51.5	-976.4	78.6	7.50	7.50	0.00
6,900.0	23.75	180.00	6,794.3	17.3	-976.4	112.5	7.50	7.50	0.00
7,000.0	31.25	180.00	6,883.0	-28.8	-976.4	158.2	7.50	7.50	0.00
7,100.0	38.75	180.00	6,964.8	-86.2	-976.4	215.0	7.50	7.50	0.00
7,200.0	46.25	180.00	7,038.5	-153.7	-976.4	281.9	7.50	7.50	0.00
7,300.0	53.75	180.00	7,102.7	-230.2	-976.4	357.8	7.50	7.50	0.00
7,400.0	61.25	180.00	7,156.4	-314.5	-976.4	441.3	7.50	7.50	0.00
7,500.0	68.75	180.00	7,198.6	-405.1	-976.4	531.1	7.50	7.50	0.00
7,600.0	76.25	180.00	7,228.7	-500.4	-976.4	625.6	7.50	7.50	0.00
7,700.0	83.75	180.00	7,246.0	-598.8	-976.4	723.1	7.50	7.50	0.00
7,703.3	84.00	180.00	7,246.4	-602.1	-976.4	726.4	7.50	7.50	0.00
<b>7"</b>									
7,777.3	84.00	180.00	7,254.1	-675.7	-976.4	799.3	0.00	0.00	0.00
7,800.0	85.13	180.00	7,256.3	-698.3	-976.4	821.7	5.00	5.00	0.00
7,897.9	90.03	180.00	7,260.4	-796.0	-976.4	918.6	5.00	5.00	0.00
<b>End of Build</b>									
7,900.0	90.03	180.00	7,260.4	-798.1	-976.4	920.7	0.06	0.06	0.00
8,000.0	90.03	180.00	7,260.3	-898.1	-976.4	1,019.8	0.00	0.00	0.00
8,100.0	90.03	180.00	7,260.3	-998.1	-976.4	1,118.9	0.00	0.00	0.00
8,200.0	90.03	180.00	7,260.2	-1,098.1	-976.4	1,218.0	0.00	0.00	0.00
8,300.0	90.03	180.00	7,260.2	-1,198.1	-976.4	1,317.2	0.00	0.00	0.00
8,400.0	90.03	180.00	7,260.1	-1,298.1	-976.4	1,416.3	0.00	0.00	0.00
8,500.0	90.03	180.00	7,260.1	-1,398.1	-976.4	1,515.4	0.00	0.00	0.00
8,600.0	90.03	180.00	7,260.0	-1,498.1	-976.4	1,614.5	0.00	0.00	0.00
8,700.0	90.03	180.00	7,260.0	-1,598.1	-976.4	1,713.6	0.00	0.00	0.00
8,800.0	90.03	180.00	7,259.9	-1,698.1	-976.4	1,812.7	0.00	0.00	0.00
8,900.0	90.03	180.00	7,259.9	-1,798.1	-976.4	1,911.8	0.00	0.00	0.00
9,000.0	90.03	180.00	7,259.8	-1,898.1	-976.4	2,011.0	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Project:</b>	SEC.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-13-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,100.0	90.03	180.00	7,259.8	-1,998.1	-976.4	2,110.1	0.00	0.00	0.00
9,200.0	90.03	180.00	7,259.7	-2,098.1	-976.4	2,209.2	0.00	0.00	0.00
9,300.0	90.03	180.00	7,259.7	-2,198.1	-976.4	2,308.3	0.00	0.00	0.00
9,400.0	90.03	180.00	7,259.6	-2,298.1	-976.4	2,407.4	0.00	0.00	0.00
9,500.0	90.03	180.00	7,259.6	-2,398.1	-976.4	2,506.5	0.00	0.00	0.00
9,600.0	90.03	180.00	7,259.5	-2,498.1	-976.4	2,605.7	0.00	0.00	0.00
9,700.0	90.03	180.00	7,259.5	-2,598.1	-976.4	2,704.8	0.00	0.00	0.00
9,800.0	90.03	180.00	7,259.4	-2,698.1	-976.4	2,803.9	0.00	0.00	0.00
9,900.0	90.03	180.00	7,259.4	-2,798.1	-976.4	2,903.0	0.00	0.00	0.00
10,000.0	90.03	180.00	7,259.3	-2,898.1	-976.4	3,002.1	0.00	0.00	0.00
10,100.0	90.03	180.00	7,259.2	-2,998.1	-976.4	3,101.2	0.00	0.00	0.00
10,200.0	90.03	180.00	7,259.2	-3,098.1	-976.4	3,200.3	0.00	0.00	0.00
10,300.0	90.03	180.00	7,259.1	-3,198.1	-976.4	3,299.5	0.00	0.00	0.00
10,400.0	90.03	180.00	7,259.1	-3,298.1	-976.4	3,398.6	0.00	0.00	0.00
10,500.0	90.03	180.00	7,259.0	-3,398.1	-976.4	3,497.7	0.00	0.00	0.00
10,600.0	90.03	180.00	7,259.0	-3,498.1	-976.4	3,596.8	0.00	0.00	0.00
10,700.0	90.03	180.00	7,258.9	-3,598.1	-976.4	3,695.9	0.00	0.00	0.00
10,800.0	90.03	180.00	7,258.9	-3,698.1	-976.4	3,795.0	0.00	0.00	0.00
10,900.0	90.03	180.00	7,258.8	-3,798.1	-976.4	3,894.1	0.00	0.00	0.00
11,000.0	90.03	180.00	7,258.8	-3,898.1	-976.4	3,993.3	0.00	0.00	0.00
11,100.0	90.03	180.00	7,258.7	-3,998.1	-976.4	4,092.4	0.00	0.00	0.00
11,200.0	90.03	180.00	7,258.7	-4,098.1	-976.4	4,191.5	0.00	0.00	0.00
11,300.0	90.03	180.00	7,258.6	-4,198.1	-976.4	4,290.6	0.00	0.00	0.00
11,400.0	90.03	180.00	7,258.6	-4,298.1	-976.4	4,389.7	0.00	0.00	0.00
11,500.0	90.03	180.00	7,258.5	-4,398.1	-976.4	4,488.8	0.00	0.00	0.00
11,600.0	90.03	180.00	7,258.5	-4,498.1	-976.4	4,588.0	0.00	0.00	0.00
11,700.0	90.03	180.00	7,258.4	-4,598.1	-976.4	4,687.1	0.00	0.00	0.00
11,800.0	90.03	180.00	7,258.4	-4,698.1	-976.4	4,786.2	0.00	0.00	0.00
11,900.0	90.03	180.00	7,258.3	-4,798.1	-976.4	4,885.3	0.00	0.00	0.00
12,000.0	90.03	180.00	7,258.3	-4,898.1	-976.4	4,984.4	0.00	0.00	0.00
12,100.0	90.03	180.00	7,258.2	-4,998.1	-976.4	5,083.5	0.00	0.00	0.00
12,200.0	90.03	180.00	7,258.1	-5,098.1	-976.4	5,182.6	0.00	0.00	0.00
12,300.0	90.03	180.00	7,258.1	-5,198.1	-976.4	5,281.8	0.00	0.00	0.00
12,400.0	90.03	180.00	7,258.0	-5,298.1	-976.4	5,380.9	0.00	0.00	0.00
12,500.0	90.03	180.00	7,258.0	-5,398.1	-976.4	5,480.0	0.00	0.00	0.00
12,600.0	90.03	180.00	7,257.9	-5,498.1	-976.4	5,579.1	0.00	0.00	0.00
12,700.0	90.03	180.00	7,257.9	-5,598.1	-976.4	5,678.2	0.00	0.00	0.00
12,800.0	90.03	180.00	7,257.8	-5,698.1	-976.4	5,777.3	0.00	0.00	0.00
12,900.0	90.03	180.00	7,257.8	-5,798.1	-976.4	5,876.4	0.00	0.00	0.00
13,000.0	90.03	180.00	7,257.7	-5,898.1	-976.4	5,975.6	0.00	0.00	0.00
13,100.0	90.03	180.00	7,257.7	-5,998.1	-976.4	6,074.7	0.00	0.00	0.00
13,200.0	90.03	180.00	7,257.6	-6,098.1	-976.4	6,173.8	0.00	0.00	0.00
13,300.0	90.03	180.00	7,257.6	-6,198.1	-976.4	6,272.9	0.00	0.00	0.00
13,400.0	90.03	180.00	7,257.5	-6,298.1	-976.4	6,372.0	0.00	0.00	0.00
13,500.0	90.03	180.00	7,257.5	-6,398.1	-976.4	6,471.1	0.00	0.00	0.00
13,600.0	90.03	180.00	7,257.4	-6,498.1	-976.4	6,570.2	0.00	0.00	0.00
13,700.0	90.03	180.00	7,257.4	-6,598.1	-976.4	6,669.4	0.00	0.00	0.00
13,800.0	90.03	180.00	7,257.3	-6,698.1	-976.4	6,768.5	0.00	0.00	0.00
13,900.0	90.03	180.00	7,257.3	-6,798.1	-976.4	6,867.6	0.00	0.00	0.00
14,000.0	90.03	180.00	7,257.2	-6,898.1	-976.4	6,966.7	0.00	0.00	0.00
14,100.0	90.03	180.00	7,257.2	-6,998.1	-976.4	7,065.8	0.00	0.00	0.00
14,200.0	90.03	180.00	7,257.1	-7,098.1	-976.4	7,164.9	0.00	0.00	0.00

Plan Annotations					
	Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
			+N/-S	+E/-W	
			(ft)	(ft)	
	200.0	200.0	0.0	0.0	KOP #1
	6,583.3	6,486.6	82.0	-976.4	KOP #2
	7,897.9	7,260.4	-796.0	-976.4	End of Build



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.13-T4N-R67W**

**Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W**

**Bernhardt Farms 13S-443**

**Wellbore #1**

**Plan #1 (11-13-13)**

## **Anticollision Report**

**20 November, 2013**





<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13S-203 - Wellbore #1 - Plan #1		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)						
6,000.0	5,903.3	5,931.8	5,903.3	22.8	15.5	89.98	82.1	-465.9	510.5	482.9	27.56	18.523					
6,073.5	5,976.8	6,005.2	5,976.8	22.9	15.7	-90.18	82.1	-465.9	510.5	482.7	27.84	18.337					
7,000.0	6,883.0	6,877.5	6,797.4	24.0	17.2	-76.42	-121.2	-465.9	525.8	494.3	31.51	16.687					
8,000.0	7,260.3	7,722.9	7,042.1	29.0	24.6	-66.85	-897.8	-465.9	555.2	512.5	42.69	13.007					
9,000.0	7,259.8	8,722.9	7,040.5	43.1	40.7	-66.75	-1,897.8	-465.9	555.6	482.6	73.00	7.612					
10,000.0	7,259.3	9,722.9	7,038.9	60.3	58.7	-66.65	-2,897.8	-465.9	556.0	449.4	106.68	5.212					
11,000.0	7,258.8	10,722.9	7,037.3	78.4	77.3	-66.55	-3,897.8	-465.9	556.5	415.2	141.31	3.938					
12,000.0	7,258.3	11,722.9	7,035.8	96.9	96.1	-66.45	-4,897.8	-465.9	556.9	380.6	176.30	3.159					
13,000.0	7,257.7	12,722.9	7,034.2	115.7	115.0	-66.35	-5,897.8	-465.9	557.3	345.8	211.46	2.636					
14,000.0	7,257.2	13,722.9	7,032.6	134.5	134.1	-66.26	-6,897.8	-465.9	557.7	311.0	246.68	2.261					
14,391.6	7,257.0	14,114.5	7,032.0	141.9	141.5	-66.22	-7,289.4	-465.9	557.9	297.4	260.49	2.142 SF					

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13S-423 - Wellbore #1 - Plan #1													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD													<b>Offset Well Error:</b>	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	20.94	58.3	22.3	62.4					
1,000.0	991.4	991.4	991.4	2.9	2.1	153.09	58.3	22.3	134.7	130.3	4.46	30.184		
2,000.0	1,970.5	1,970.5	1,970.5	7.4	4.3	169.31	58.3	22.3	329.8	320.6	9.17	35.976		
3,000.0	2,949.5	2,977.6	2,976.2	11.9	6.5	172.22	67.1	-27.8	482.3	468.5	13.89	34.721		
4,000.0	3,928.6	3,966.6	3,963.6	16.4	8.8	173.58	76.9	-83.2	629.8	611.1	18.69	33.698		
5,000.0	4,907.6	4,931.6	4,927.1	21.0	11.1	174.43	86.1	-135.8	779.2	755.8	23.46	33.218		
6,000.0	5,903.3	5,907.8	5,903.3	22.8	13.1	89.71	86.3	-136.7	839.7	812.4	27.30	30.761		
7,000.0	6,883.0	6,910.0	6,884.9	24.0	15.2	-90.25	-25.7	-136.7	839.7	808.7	31.05	27.040		
8,000.0	7,260.3	7,912.1	7,260.4	29.0	24.0	-90.00	-898.1	-136.7	839.7	791.6	48.05	17.475		
9,000.0	7,259.8	8,912.1	7,259.8	43.1	40.5	-90.00	-1,898.1	-136.7	839.7	759.0	80.67	10.409		
10,000.0	7,259.3	9,912.1	7,259.3	60.3	58.7	-90.00	-2,898.1	-136.7	839.7	722.8	116.86	7.185		
11,000.0	7,258.8	10,912.1	7,258.8	78.4	77.3	-90.00	-3,898.1	-136.7	839.7	685.6	154.13	5.448		
12,000.0	7,258.3	11,912.1	7,258.3	96.9	96.2	-90.00	-4,898.1	-136.7	839.7	647.9	191.84	4.377		
13,000.0	7,257.7	12,912.1	7,257.7	115.7	115.2	-90.00	-5,898.1	-136.7	839.7	609.9	229.78	3.654		
14,000.0	7,257.2	13,912.1	7,257.2	134.5	134.2	-90.00	-6,898.1	-136.7	839.7	571.8	267.86	3.135		
14,391.6	7,257.0	14,303.7	7,257.0	141.9	141.7	-90.00	-7,289.7	-136.7	839.7	556.9	282.79	2.969 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design										Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13W-343 - Wellbore #1 - Plan #				Offset Site Error:		0.0 ft	
Survey Program:										0-MWD				Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
0.0	0.0	0.0	0.0	0.0	0.0	19.33	87.4	30.7	92.7								
1,000.0	991.4	991.4	991.4	2.9	2.1	144.10	87.4	30.7	155.1	150.6	4.56	34.014 SF					
2,000.0	1,970.5	1,950.8	1,949.8	7.4	4.2	165.36	87.4	67.7	379.2	370.2	9.09	41.728					
3,000.0	2,949.5	2,917.2	2,914.7	11.9	6.5	170.85	87.4	121.0	632.4	618.7	13.73	46.069					
4,000.0	3,928.6	3,883.6	3,879.6	16.4	8.8	173.19	87.4	174.3	887.9	869.4	18.46	48.104					

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13W-403 - Wellbore #1 - Plan #													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD													<b>Offset Well Error:</b>	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	
0.0	0.0	0.0	0.0	0.0	0.0	20.33	112.9	41.8	120.4					
1,000.0	991.4	991.4	991.4	2.9	2.1	138.83	112.9	41.8	178.4	173.8	4.62	38.603 SF		
2,000.0	1,970.5	1,922.2	1,916.4	7.4	4.5	166.75	86.5	134.7	448.1	439.0	9.05	49.492		
3,000.0	2,949.5	2,866.4	2,852.3	11.9	7.4	174.20	52.4	254.4	769.4	755.7	13.73	56.054		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Bernhardt 13D (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7600-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)		
8,000.0	7,260.3	7,224.3	7,224.3	29.0	144.5	-90.03	-1,333.4	-513.2	635.6	466.9	168.71	3.767	
8,435.2	7,260.1	7,224.1	7,224.1	34.6	144.5	-90.00	-1,333.4	-513.2	463.2	287.5	175.69	2.637	CC, ES, SF
9,000.0	7,259.8	7,223.8	7,223.8	43.1	144.5	-89.96	-1,333.4	-513.2	730.4	545.7	184.75	3.954	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Existing Wells - Sec.13-T4N-R67W - Bernhardt 13T (Exist) - Wellbore #1 - Wellbore #1													Offset Well Error:	0.0 ft
Survey Program: 7600-UNKNOWN														
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	
9,000.0	7,259.8	7,225.8	7,225.8	43.1	144.5	-90.06	-2,386.2	-739.1	542.7	357.9	184.80	2.937		
9,488.1	7,259.6	7,225.6	7,225.6	51.4	144.5	-90.00	-2,386.2	-739.1	237.3	43.7	193.57	1.226	Level 2, CC, ES, SF	
10,000.0	7,259.3	7,225.3	7,225.3	60.3	144.5	-89.94	-2,386.2	-739.1	564.3	361.5	202.77	2.783		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Bernhardt 24C (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:		0.0 ft	
Survey Program: 7600-UNKNOWN												Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
11,000.0	7,258.8	7,227.8	7,227.8	78.4	144.6	-90.00	-3,923.6	-641.5	335.8	114.4	221.40	1.517			
11,033.0	7,258.8	7,227.8	7,227.8	79.0	144.6	-90.00	-3,923.6	-641.5	334.9	112.9	222.03	1.509 CC, ES, SF			



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Existing Wells - Sec.13-T4N-R67W - Brindl 1 (Exist) - Wellbore #1 - Wellbore #1													Offset Well Error:	0.0 ft
Survey Program: 7600-UNKNOWN														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,907.6	4,934.6	4,934.6	21.0	98.7	-57.26	-670.3	-1,500.5	949.3	832.5	116.88	8.122		
5,799.7	5,700.4	5,727.4	5,727.4	22.5	114.5	-61.95	-670.3	-1,500.5	899.3	763.9	135.30	6.646		
6,000.0	5,903.3	5,930.3	5,930.3	22.8	118.6	-145.14	-670.3	-1,500.5	916.8	777.3	139.51	6.572		
7,000.0	6,883.0	6,910.0	6,910.0	24.0	138.2	43.70	-670.3	-1,500.5	828.3	681.1	147.20	5.627		
7,804.8	7,332.6	7,359.6	7,359.6	27.1	147.2	89.97	-670.3	-1,500.5	524.1	354.2	169.85	3.085 CC, ES, SF		
8,000.0	7,260.3	7,287.3	7,287.3	29.0	145.7	89.99	-670.3	-1,500.5	571.5	401.5	169.97	3.362		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Bryce 1 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:		0.0 ft	
Survey Program: 7600-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)				
8,000.0	7,260.3	7,318.3	7,318.3	29.0	146.4	90.08	-1,803.3	-1,299.7	961.1	790.6	170.58	5.635			
8,881.9	7,259.9	7,317.9	7,317.9	41.3	146.4	90.00	-1,803.3	-1,299.7	324.1	139.4	184.74	1.755	CC, ES, SF		
9,000.0	7,259.8	7,317.8	7,317.8	43.1	146.4	89.99	-1,803.3	-1,299.7	336.9	150.3	186.63	1.805			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Jennifer 1 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7600-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 +N/-S	+E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
11,000.0	7,258.8	7,230.8	7,230.8	78.4	144.6	90.03	-4,433.6	-1,556.5	789.4	567.9	221.46	3.564	
11,535.4	7,258.5	7,230.5	7,230.5	88.3	144.6	90.00	-4,433.6	-1,556.5	580.1	348.5	231.54	2.505 CC, ES, SF	
12,000.0	7,258.3	7,230.3	7,230.3	96.9	144.6	89.98	-4,433.6	-1,556.5	743.2	502.9	240.28	3.093	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Existing Wells - Sec.13-T4N-R67W - Johnny 1 (Exist) - Wellbore #1 - Wellbore #1	<b>Offset Site Error:</b>	0.0 ft
Survey Program: 7600-UNKNOWN														<b>Offset Well Error:</b>	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 +N/-S (ft)	Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
10,000.0	7,259.3	7,229.3	7,229.3	60.3	144.6	90.02	-3,224.1	-1,436.5	563.8	361.0	202.85	2.779			
10,325.9	7,259.1	7,229.1	7,229.1	66.1	144.6	90.00	-3,224.1	-1,436.5	460.1	251.2	208.91	2.202	CC, ES, SF		
11,000.0	7,258.8	7,228.8	7,228.8	78.4	144.6	89.96	-3,224.1	-1,436.5	816.1	594.7	221.43	3.686			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing Wells - Sec.13-T4N-R67W - Johnston 34-24 (Exist) - Wellbore #1 - Wellbore #1													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 7600-UNKNOWN													<b>Offset Well Error:</b>	0.0 ft
Reference	Offset	Semi Major Axis		Distance										
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
14,000.0	7,257.2	7,231.2	7,231.2	134.5	144.6	90.03	-7,147.6	-1,260.9	378.4	100.2	278.27	1.360	Level 3	
14,249.5	7,257.1	7,231.1	7,231.1	139.3	144.6	90.00	-7,147.6	-1,260.9	284.5	1.5	283.02	1.005	Level 2, CC, ES, SF	
14,391.6	7,257.0	7,231.0	7,231.0	141.9	144.6	89.99	-7,147.6	-1,260.9	318.0	32.3	285.73	1.113	Level 2	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Johnston 5 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:		0.0 ft	
Survey Program: 7600-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)					
14,000.0	7,257.2	7,230.2	7,230.2	134.5	144.6	-90.02	-7,114.9	-622.1	415.3	137.1	278.25	1.493 Level 3				
14,216.7	7,257.1	7,230.1	7,230.1	138.6	144.6	-90.00	-7,114.9	-622.1	354.3	71.9	282.38	1.255 Level 3, CC, ES, SF				
14,391.6	7,257.0	7,230.0	7,230.0	141.9	144.6	-89.99	-7,114.9	-622.1	395.1	109.4	285.71	1.383 Level 3				

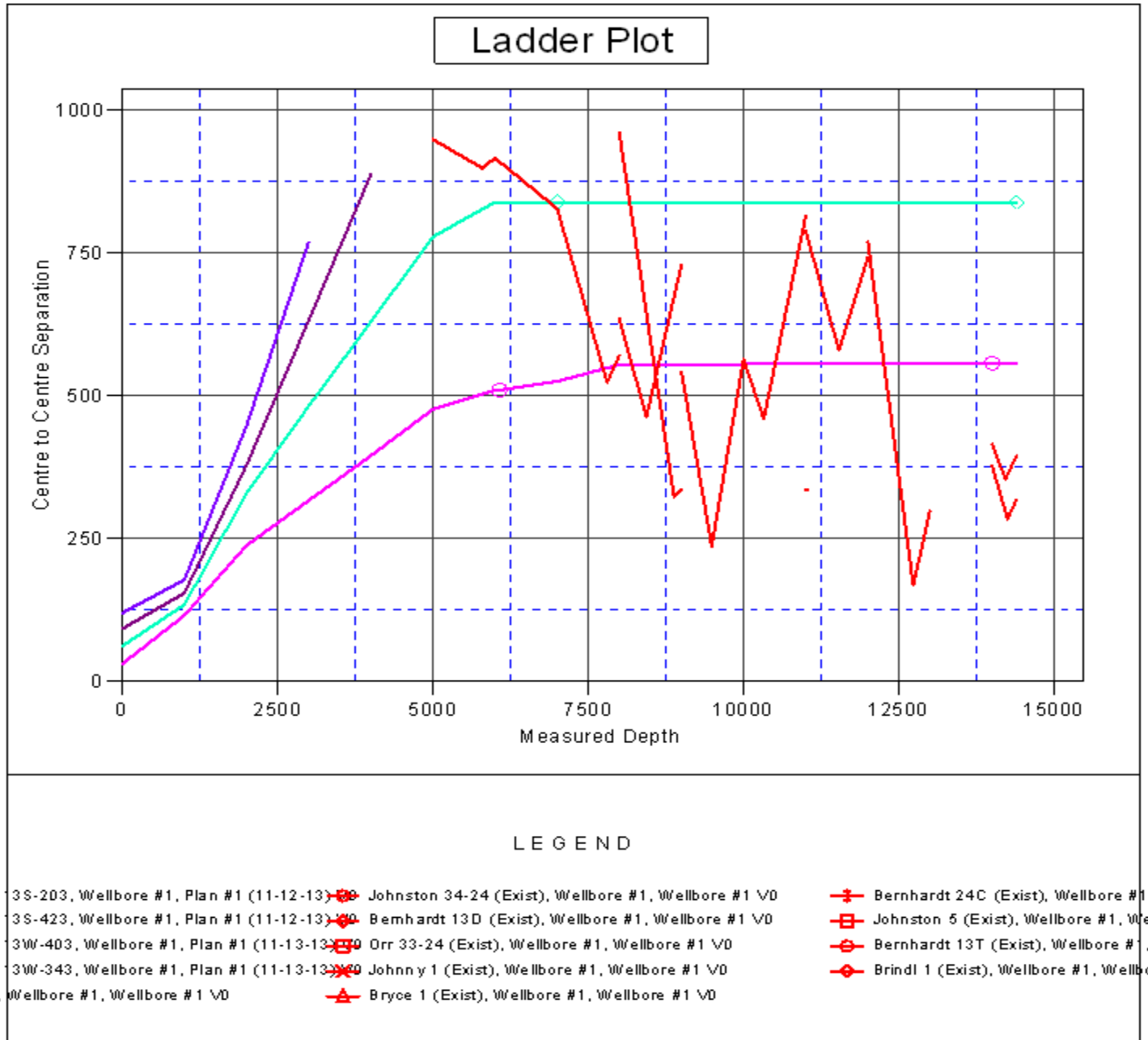
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Existing Wells - Sec.13-T4N-R67W - Orr 33-24 (Exist) - Wellbore #1 - Wellbore #1													Offset Well Error:	0.0 ft
Survey Program: 7600-UNKNOWN														
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	
12,000.0	7,258.3	7,231.3	7,231.3	96.9	144.6	90.13	-5,650.4	-1,143.7	770.6	530.3	240.29	3.207		
12,731.1	7,257.9	7,230.9	7,230.9	110.6	144.6	90.00	-5,650.4	-1,143.7	168.6	-85.5	254.15	0.664 Level 1, CC, ES, SF		
13,000.0	7,257.7	7,230.7	7,230.7	115.7	144.6	89.96	-5,650.4	-1,143.7	299.0	39.7	259.24	1.153 Level 2		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4752.0ft (RKB - 15')  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °

Coordinates are relative to: Bernhardt Farms 13S-443  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.43°





<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-443
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-13-13)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4752.0ft (RKB - 15')  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °

Coordinates are relative to: Bernhardt Farms 13S-443  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.43°

