

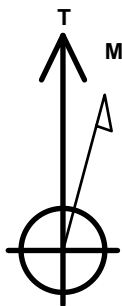
# PDC Energy Inc. DJ Basin

Well Name: **Josephine 19N-404**

Surface Location: Josephine 5N64W19N Pad Sec.19-T5N-R64W  
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone  
Ground Elevation: 4626.0  
+N/-S +E/-W Northing Easting Longitude Slot  
0.0 0.0 1385125.17 3253129.21 40.387010 -104.591290  
Original Well Elev WELL @ 4649.0ft (Original Well Elev)

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1774'FNL, 2215'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 1244'FNL, 2462'FEL, SEC.24	6898.0	543.4	-5415.4	Point
LPL 1244'FNL, 2045'FEL, SEC.19	6898.0	528.3	166.9	Point



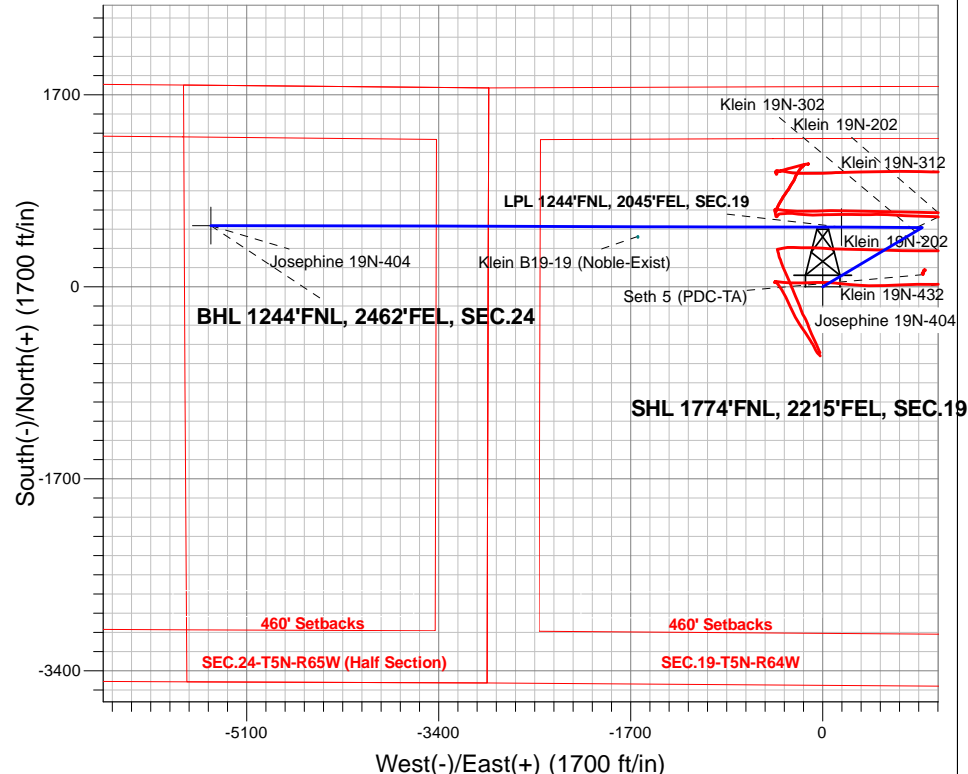
Azimuths to True North  
Magnetic North: 7.99°

Magnetic Field  
Strength: 52539.8snT  
Dip Angle: 66.87°  
Date: 3/10/2017  
Model: IGRF2010

Josephine 5N64W19N Pad Sec.19-T5N-R64W  
Josephine 19N-404  
Plan #3 (3-09-17)  
9:51, March 10 2017

## ANNOTATIONS

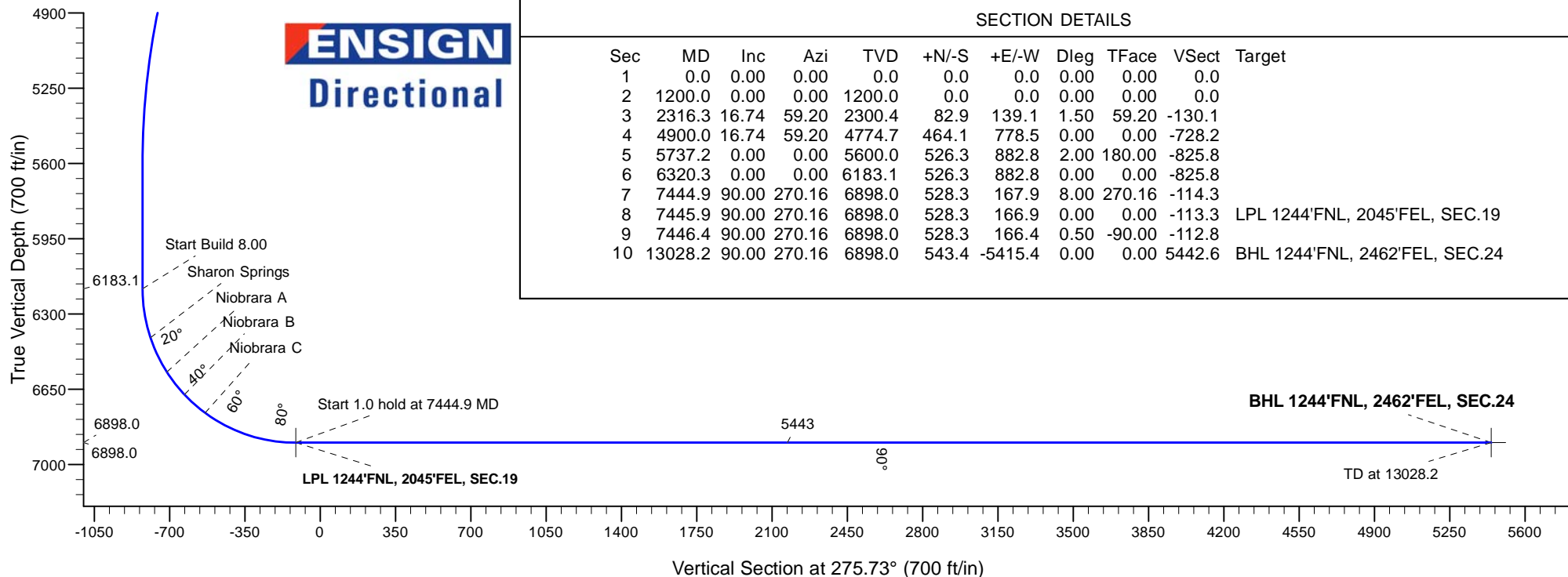
TVD	MD	Annotation
1200.0	1200.0	KOP - Start Build 1.50
4774.6	4900.0	Start Drop -2.00
6183.1	6320.3	Start Build 8.00
6898.0	7444.9	Start 1.0 hold at 7444.9 MD
6898.0	7446.4	Start 5581.8 hold at 7446.4 MD
6898.0	13028.2	TD at 13028.2



**ENSIGN**  
Directional

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	2316.3	16.74	59.20	2300.4	82.9	139.1	1.50	59.20	-130.1	
4	4900.0	16.74	59.20	4774.7	464.1	778.5	0.00	0.00	-728.2	
5	5737.2	0.00	0.00	5600.0	526.3	882.8	2.00	180.00	-825.8	
6	6320.3	0.00	0.00	6183.1	526.3	882.8	0.00	0.00	-825.8	
7	7444.9	90.00	270.16	6898.0	528.3	167.9	8.00	270.16	-114.3	
8	7445.9	90.00	270.16	6898.0	528.3	166.9	0.00	0.00	-113.3	LPL 1244'FNL, 2045'FEL, SEC.19
9	7446.4	90.00	270.16	6898.0	528.3	166.4	0.50	-90.00	-112.8	
10	13028.2	90.00	270.16	6898.0	543.4	-5415.4	0.00	0.00	5442.6	BHL 1244'FNL, 2462'FEL, SEC.24



## **PDC Energy Inc. DJ Basin**

**SEC.19-T5N-R64W**

**Josephine 5N64W19N Pad Sec.19-T5N-R64W**

**Josephine 19N-404**

**Wellbore #1**

**Plan #3 (3-09-17)**

## **Anticollision Report**

**10 March, 2017**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Josephine 19N-404
<b>Project:</b>	SEC.19-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Reference Site:</b>	Josephine 5N64W19N Pad Sec.19-T5N-R64W	<b>MD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Josephine 19N-404	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #3 (3-09-17)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #3 (3-09-17)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 800.0 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.45 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b> 3/10/2017			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	13,028.2	Plan #3 (3-09-17) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
Existing Wells Sec.19-T5N-R64W						
Klein B19-19 (Noble-Exist) - Wellbore #1 - Wellbore #1	9,247.7	6,880.0	85.0	-6.1	0.933	Level 1, CC, ES, SF
Seth 5 (PDC-TA) - Wellbore #1 - Wellbore #1	4,656.1	4,517.1	342.7	309.5	10.309	CC
Seth 5 (PDC-TA) - Wellbore #1 - Wellbore #1	4,700.0	4,559.9	342.9	309.2	10.191	ES
Seth 5 (PDC-TA) - Wellbore #1 - Wellbore #1	6,550.0	6,382.7	411.5	370.0	9.925	SF
Josephine 5N64W19N Pad Sec.19-T5N-R64W						
Josephine 19M-234 - Wellbore #1 - Plan #3 (3-09-17)	400.0	400.0	61.9	60.0	32.129	CC, ES
Josephine 19M-234 - Wellbore #1 - Plan #3 (3-09-17)	5,000.0	4,881.7	782.6	734.0	16.087	SF
Josephine 19M-334 - Wellbore #1 - Plan #3 (3-09-17)	600.0	600.0	47.4	44.3	15.637	CC, ES
Josephine 19M-334 - Wellbore #1 - Plan #3 (3-09-17)	13,028.2	13,043.8	760.7	349.6	1.850	SF
Josephine 19M-404 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	76.5	75.7	92.620	CC, ES
Josephine 19M-404 - Wellbore #1 - Plan #3 (3-09-17)	4,400.0	4,265.1	788.7	748.3	19.536	SF
Josephine 19N-204 - Wellbore #1 - Plan #3 (3-09-17)	1,200.0	1,200.0	14.6	8.2	2.301	CC
Josephine 19N-204 - Wellbore #1 - Plan #3 (3-09-17)	13,028.2	12,826.5	332.8	-12.2	0.965	Level 1, ES, SF
Josephine 19N-214 - Wellbore #1 - Plan #3 (3-09-17)	800.0	800.0	29.1	25.0	7.058	CC, ES
Josephine 19N-214 - Wellbore #1 - Plan #3 (3-09-17)	13,028.2	12,903.6	523.8	133.7	1.343	Level 3, SF
Josephine 19N-314 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	1,000.0	14.6	9.3	2.785	CC
Josephine 19N-314 - Wellbore #1 - Plan #3 (3-09-17)	13,028.2	12,966.5	277.3	-112.1	0.712	Level 1, ES, SF
Josephine 19N-334 - Wellbore #1 - Plan #3 (3-09-17)	1,200.0	1,200.0	29.1	22.8	4.602	CC, ES
Josephine 19N-334 - Wellbore #1 - Plan #3 (3-09-17)	13,028.2	12,950.2	494.8	86.6	1.212	Level 2, SF
Josephine 19O-204 - Wellbore #1 - Plan #3 (3-09-17)	500.0	500.0	72.9	70.4	29.425	CC, ES
Josephine 19O-204 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	990.5	98.5	93.4	19.278	SF
Josephine 19O-214 - Wellbore #1 - Plan #3 (3-09-17)	1,200.0	1,200.0	43.7	37.4	6.904	CC, ES
Josephine 19O-214 - Wellbore #1 - Plan #3 (3-09-17)	1,400.0	1,399.9	46.6	39.2	6.289	SF
Josephine 19O-314 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	1,000.0	58.3	53.1	11.142	CC, ES
Josephine 19O-314 - Wellbore #1 - Plan #3 (3-09-17)	1,300.0	1,297.0	65.7	58.9	9.704	SF
Klein 19MN-HZ Pad Sec.19-T5N-R64W						
Klein 19N-202 - Wellbore #1 - Wellbore #1	6,925.5	7,475.3	138.4	78.0	2.291	CC, ES, SF
Klein 19N-202 - Wellbore #2 - Sidetrack - Wellbore #2 - S	6,935.9	7,488.5	109.1	49.7	1.838	CC, ES, SF
Klein 19N-312 - Wellbore #1 - Wellbore #1	6,950.0	7,579.0	501.5	442.9	8.553	SF
Klein 19N-312 - Wellbore #1 - Wellbore #1	7,100.0	7,458.0	492.5	436.0	8.720	ES
Klein 19N-312 - Wellbore #1 - Wellbore #1	7,527.5	7,046.2	489.8	438.5	9.560	CC

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Josephine 19N-404
<b>Project:</b>	SEC.19-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Reference Site:</b>	Josephine 5N64W19N Pad Sec.19-T5N-R64W	<b>MD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Josephine 19N-404	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #3 (3-09-17)	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Klein 19O-HZ Pad Sec.19-T5N-R64W						
Klein 19N-302 - Wellbore #1 - Wellbore #1	7,000.0	7,625.1	204.0	144.0	3.400	SF
Klein 19N-302 - Wellbore #1 - Wellbore #1	7,050.0	7,584.7	201.5	143.6	3.480	ES
Klein 19N-302 - Wellbore #1 - Wellbore #1	7,057.0	7,579.0	201.4	143.9	3.499	CC
Klein 19N-432 - Wellbore #1 - Wellbore #1	1,786.2	1,851.4	493.4	482.7	46.078	CC
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,900.0	7,747.2	545.9	483.0	8.682	SF
Klein 19N-432 - Wellbore #1 - Wellbore #1	7,564.5	7,088.7	495.6	444.0	9.602	ES

Offset Design													Offset Site Error:	0.0 ft
Existing Wells Sec.19-T5N-R64W - Klein B19-19 (Noble-Exist) - Wellbore #1 - Wellbore #1													Offset Well Error:	0.0 ft
Survey Program: 7038-NS-GYRO-MS														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
8,500.0	6,898.0	6,880.0	6,880.0	56.2	11.2	-90.00	448.2	-1,635.2	752.6	685.2	67.39	11.168		
8,600.0	6,898.0	6,880.0	6,880.0	59.3	11.2	-90.00	448.2	-1,635.2	653.3	582.8	70.46	9.272		
8,700.0	6,898.0	6,880.0	6,880.0	62.4	11.2	-90.00	448.2	-1,635.2	554.3	480.7	73.57	7.535		
8,800.0	6,898.0	6,880.0	6,880.0	65.5	11.2	-90.00	448.2	-1,635.2	455.7	379.0	76.71	5.941		
8,900.0	6,898.0	6,880.0	6,880.0	68.7	11.2	-90.00	448.2	-1,635.2	358.0	278.1	79.88	4.481		
9,000.0	6,898.0	6,880.0	6,880.0	71.9	11.2	-90.00	448.2	-1,635.2	261.9	178.8	83.08	3.153		
9,100.0	6,898.0	6,880.0	6,880.0	75.1	11.2	-90.00	448.2	-1,635.2	170.4	84.2	86.29	1.975		
9,200.0	6,898.0	6,880.0	6,880.0	78.4	11.2	-90.00	448.2	-1,635.2	97.5	8.0	89.53	1.089	Level 2	
9,247.7	6,898.0	6,880.0	6,880.0	79.9	11.2	-90.00	448.2	-1,635.2	85.0	-6.1	91.08	0.933	Level 1, CC, ES, SF	
9,300.0	6,898.0	6,880.0	6,880.0	81.6	11.2	-90.00	448.2	-1,635.2	99.8	7.0	92.79	1.076	Level 2	
9,400.0	6,898.0	6,880.0	6,880.0	84.9	11.2	-90.00	448.2	-1,635.2	174.4	78.3	96.05	1.816		
9,500.0	6,898.0	6,880.0	6,880.0	88.2	11.2	-90.00	448.2	-1,635.2	266.2	166.9	99.34	2.680		
9,600.0	6,898.0	6,880.0	6,880.0	91.5	11.2	-90.00	448.2	-1,635.2	362.4	259.7	102.63	3.531		
9,700.0	6,898.0	6,880.0	6,880.0	94.8	11.2	-90.00	448.2	-1,635.2	460.2	354.3	105.94	4.344		
9,800.0	6,898.0	6,880.0	6,880.0	98.1	11.2	-90.00	448.2	-1,635.2	558.8	449.5	109.25	5.115		
9,900.0	6,898.0	6,880.0	6,880.0	101.4	11.2	-90.00	448.2	-1,635.2	657.8	545.2	112.57	5.843		
10,000.0	6,898.0	6,880.0	6,880.0	104.8	11.2	-90.00	448.2	-1,635.2	757.1	641.1	115.91	6.532		