

PDC Energy Inc. DJ Basin

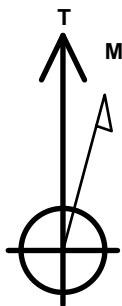
Well Name: **Josephine 190-314**

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 Latitude Longitude Slot
0.0 0.0 1385066.89 3253129.81 40.386850 -104.591290
Original Well Elev WELL @ 4649.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1834'FNL, 2215'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 2330'FNL, 2453'FEL, SEC.24	6798.0	-483.9	-5410.1	Point
LPL 2373'FNL, 2051'FEL, SEC.19	6813.0	-542.1	166.9	Point



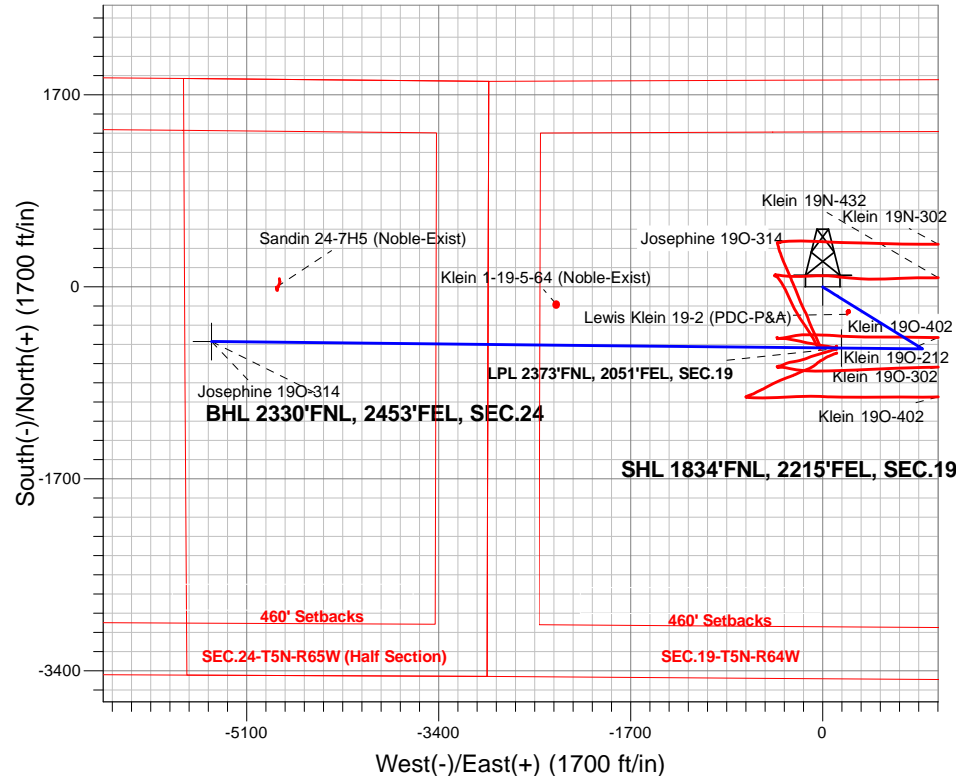
Azimuths to True North
Magnetic North: 7.99°

Magnetic Field
Strength: 52539.7snT
Dip Angle: 66.87°
Date: 3/10/2017
Model: IGRF2010

Josephine 5N64W19N Pad Sec.19-T5N-R64W
Josephine 190-314
Plan #3 (3-09-17)
11:25, March 10 2017

ANNOTATIONS

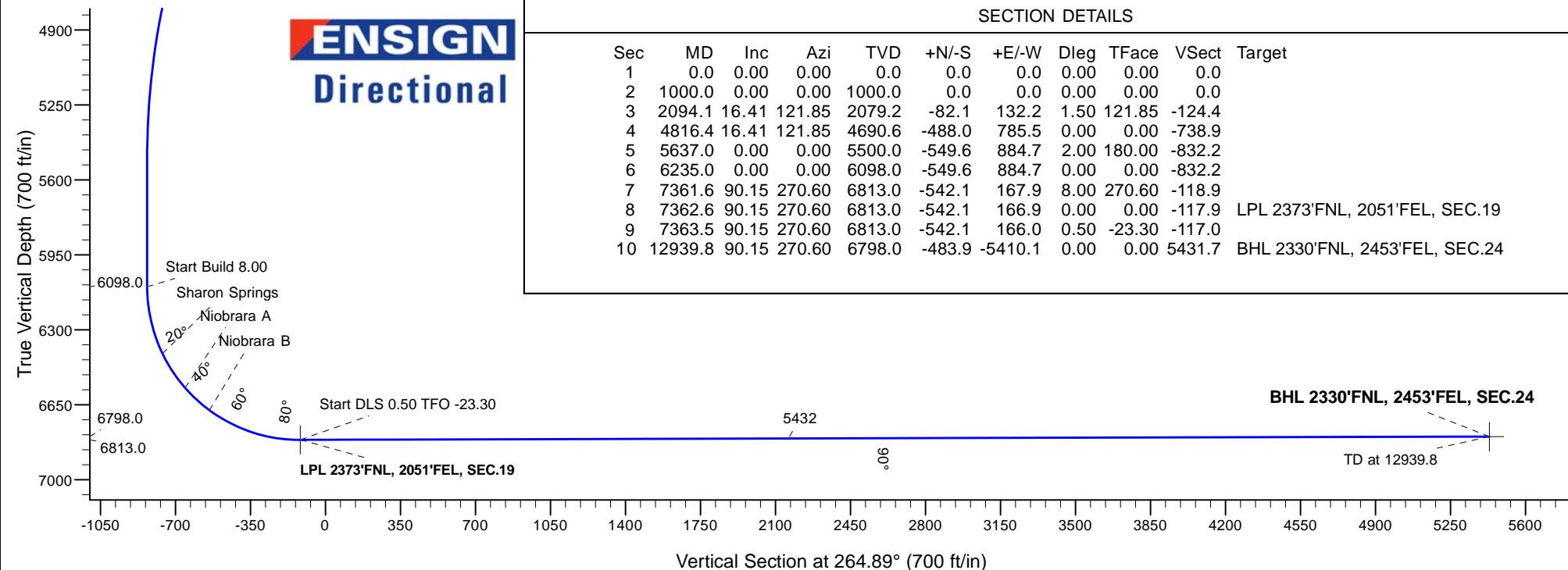
TVD	MD	Annotation
1000.0	1000.0	KOP - Start Build 1.50
4690.6	4816.4	Start Drop -2.00
6098.0	6235.0	Start Build 8.00
6813.0	7362.6	Start DLS 0.50 TFO -23.30
6813.0	7363.5	Start 5576.3 hold at 7363.5 MD
6798.0	12939.8	TD at 12939.8



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	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	2094.1	16.41	121.85	2079.2	-82.1	132.2	1.50	121.85	-124.4	
4	4816.4	16.41	121.85	4690.6	-488.0	785.5	0.00	0.00	-738.9	
5	5637.0	0.00	0.00	5500.0	-549.6	884.7	2.00	180.00	-832.2	
6	6235.0	0.00	0.00	6098.0	-549.6	884.7	0.00	0.00	-832.2	
7	7361.6	90.15	270.60	6813.0	-542.1	167.9	8.00	270.60	-118.9	
8	7362.6	90.15	270.60	6813.0	-542.1	166.9	0.00	0.00	-117.9	LPL 2373'FNL, 2051'FEL, SEC.19
9	7363.5	90.15	270.60	6813.0	-542.1	166.0	0.50	-23.30	-117.0	
10	12939.8	90.15	270.60	6798.0	-483.9	-5410.1	0.00	0.00	5431.7	BHL 2330'FNL, 2453'FEL, SEC.24





PDC Energy Inc. DJ Basin

SEC.19-T5N-R64W

Josephine 5N64W19N Pad Sec.19-T5N-R64W

Josephine 19O-314

Wellbore #1

Plan #3 (3-09-17)

Anticollision Report

10 March, 2017



Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Josephine 190-314
Project:	SEC.19-T5N-R64W	TVD Reference:	WELL @ 4649.0ft (Original Well Elev)
Reference Site:	Josephine 5N64W19N Pad Sec.19-T5N-R64W	MD Reference:	WELL @ 4649.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Josephine 190-314	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #3 (3-09-17)	Offset TVD Reference:	Offset Datum

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

Survey Tool Program	Date	3/10/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	12,939.8	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
Offset Well - Wellbore - Design						
Existing Wells Sec.19-T5N-R64W						
Klein 1-19-5-64 (Noble-Exist) - Wellbore #1 - Wellbore #1	9,892.9	6,789.2	362.8	92.1	1.340	Level 3, CC
Klein 1-19-5-64 (Noble-Exist) - Wellbore #1 - Wellbore #1	9,900.0	6,789.2	362.9	91.9	1.339	Level 3, ES, SF
Lewis Klein 19-2 (PDC-P&A) - Wellbore #1 - Wellbore #1	2,646.9	2,585.8	57.5	41.8	3.664	CC, ES, SF
Existing Wells Sec.24-T5N-R65W (GRID)						
Sandin 24-7H5 (Noble-Exist) - Wellbore #1 - Wellbore #1	12,366.0	6,783.2	487.7	283.0	2.383	CC, ES
Sandin 24-7H5 (Noble-Exist) - Wellbore #1 - Wellbore #1	12,400.0	6,783.7	488.8	283.0	2.375	SF
Josephine 5N64W19N Pad Sec.19-T5N-R64W						
Josephine 19M-234 - Wellbore #1 - Plan #3 (3-09-17)	400.0	400.0	120.2	118.3	62.372	CC, ES
Josephine 19M-234 - Wellbore #1 - Plan #3 (3-09-17)	1,100.0	1,074.6	176.5	170.7	30.481	SF
Josephine 19M-334 - Wellbore #1 - Plan #3 (3-09-17)	600.0	600.0	105.7	102.6	34.883	CC, ES
Josephine 19M-334 - Wellbore #1 - Plan #3 (3-09-17)	1,100.0	1,086.4	133.4	127.7	23.199	SF
Josephine 19M-404 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	134.8	134.0	163.187	CC, ES
Josephine 19M-404 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	965.8	208.5	203.1	38.572	SF
Josephine 19N-204 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	1,000.0	43.7	38.5	8.357	CC, ES
Josephine 19N-204 - Wellbore #1 - Plan #3 (3-09-17)	1,200.0	1,199.9	46.7	40.4	7.454	SF
Josephine 19N-214 - Wellbore #1 - Plan #3 (3-09-17)	800.0	800.0	87.4	83.3	21.171	CC, ES
Josephine 19N-214 - Wellbore #1 - Plan #3 (3-09-17)	1,200.0	1,192.4	105.0	98.8	16.812	SF
Josephine 19N-314 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	1,000.0	72.9	67.6	13.927	CC, ES
Josephine 19N-314 - Wellbore #1 - Plan #3 (3-09-17)	1,200.0	1,197.3	79.0	72.8	12.650	SF
Josephine 19N-334 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	1,000.0	29.1	23.9	5.571	CC, ES
Josephine 19N-334 - Wellbore #1 - Plan #3 (3-09-17)	12,939.8	12,945.7	601.1	184.3	1.442	Level 3, SF
Josephine 19N-404 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	1,000.0	58.3	53.1	11.142	CC, ES
Josephine 19N-404 - Wellbore #1 - Plan #3 (3-09-17)	1,300.0	1,299.0	65.8	59.0	9.711	SF
Josephine 19O-204 - Wellbore #1 - Plan #3 (3-09-17)	500.0	500.0	14.8	12.4	5.987	CC
Josephine 19O-204 - Wellbore #1 - Plan #3 (3-09-17)	12,939.8	12,907.9	294.7	-103.4	0.740	Level 1, ES, SF
Josephine 19O-214 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	1,000.0	14.6	9.3	2.785	CC
Josephine 19O-214 - Wellbore #1 - Plan #3 (3-09-17)	12,939.8	12,824.3	270.4	-122.5	0.688	Level 1, ES, SF

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Reference Site:	Josephine 5N64W19N Pad Sec.19-T5N-R64W	MD Reference:	WELL @ 4649.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Josephine 190-314	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #3 (3-09-17)	Offset TVD Reference:	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 190-HZ Pad Sec.19-T5N-R64W						
Klein 19N-302 - Wellbore #1 - Wellbore #1	1,932.5	1,960.3	311.5	298.5	23.871	CC, ES
Klein 19N-302 - Wellbore #1 - Wellbore #1	2,200.0	2,196.0	334.9	319.3	21.516	SF
Klein 19N-432 - Wellbore #1 - Wellbore #1	1,995.7	2,015.0	384.9	371.9	29.454	CC
Klein 19N-432 - Wellbore #1 - Wellbore #1	2,000.0	2,019.0	384.9	371.8	29.359	ES
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,950.0	7,604.2	648.3	591.1	11.340	SF
Klein 19O-212 - Wellbore #1 - Wellbore #1	7,150.0	7,295.7	102.5	49.0	1.918	SF
Klein 19O-212 - Wellbore #1 - Wellbore #1	7,200.0	7,248.0	101.5	48.6	1.918	CC, ES
Klein 19O-302 - Wellbore #1 - Wellbore #1	7,218.2	7,385.1	203.3	154.5	4.172	CC
Klein 19O-302 - Wellbore #1 - Wellbore #1	7,666.9	6,904.4	205.9	150.9	3.743	ES
Klein 19O-302 - Wellbore #1 - Wellbore #1	7,700.0	6,879.2	206.9	151.6	3.741	SF
Klein 19O-402 - Wellbore #1 - Wellbore #1	7,699.7	7,159.1	434.1	374.9	7.329	CC
Klein 19O-402 - Wellbore #1 - Wellbore #1	7,800.0	7,069.7	436.0	374.4	7.079	ES
Klein 19O-402 - Wellbore #1 - Wellbore #1	8,000.0	6,904.5	454.2	387.8	6.838	SF

Offset Design Existing Wells Sec.19-T5N-R64W - Klein 1-19-5-64 (Noble-Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6990-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)			
9,200.0	6,808.1	6,791.1	6,791.1	81.6	166.4	90.29	-152.9	-2,359.6	782.2	534.2	247.92	3.155		
9,300.0	6,807.8	6,790.8	6,790.8	84.8	166.4	90.25	-152.9	-2,359.6	695.1	443.9	251.18	2.767		
9,400.0	6,807.5	6,790.5	6,790.5	88.1	166.4	90.21	-152.9	-2,359.6	612.0	357.6	254.45	2.405		
9,500.0	6,807.3	6,790.3	6,790.3	91.4	166.4	90.17	-152.9	-2,359.6	534.8	277.1	257.74	2.075		
9,600.0	6,807.0	6,790.0	6,790.0	94.7	166.4	90.12	-152.9	-2,359.6	466.3	205.3	261.03	1.786		
9,700.0	6,806.7	6,789.7	6,789.7	98.0	166.3	90.08	-152.9	-2,359.6	410.9	146.6	264.34	1.555		
9,800.0	6,806.4	6,789.4	6,789.4	101.3	166.3	90.04	-152.9	-2,359.6	374.5	106.9	267.66	1.399	Level 3	
9,892.9	6,806.2	6,789.2	6,789.2	104.4	166.3	90.00	-152.9	-2,359.6	362.8	92.1	270.74	1.340	Level 3, CC	
9,900.0	6,806.2	6,789.2	6,789.2	104.7	166.3	90.00	-152.9	-2,359.6	362.9	91.9	270.98	1.339	Level 3, ES, SF	
10,000.0	6,805.9	6,788.9	6,788.9	108.0	166.3	89.95	-152.9	-2,359.6	378.3	104.0	274.31	1.379	Level 3	
10,100.0	6,805.6	6,788.6	6,788.6	111.4	166.3	89.91	-152.9	-2,359.6	417.8	140.1	277.64	1.505		
10,200.0	6,805.4	6,788.4	6,788.4	114.7	166.3	89.87	-152.9	-2,359.6	475.3	194.3	280.99	1.692		
10,300.0	6,805.1	6,788.1	6,788.1	118.1	166.3	89.83	-152.9	-2,359.6	545.3	261.0	284.33	1.918		
10,400.0	6,804.8	6,787.8	6,787.8	121.4	166.3	89.78	-152.9	-2,359.6	623.5	335.8	287.68	2.167		
10,500.0	6,804.6	6,787.6	6,787.6	124.8	166.3	89.74	-152.9	-2,359.6	707.2	416.2	291.04	2.430		
10,600.0	6,804.3	6,787.3	6,787.3	128.2	166.3	89.70	-152.9	-2,359.6	794.7	500.3	294.40	2.699		