

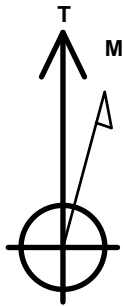
# PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Josephine 190-214**

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 1385082.15 3253196.51 40.386890 -104.591050  
 Original Well Elev WELL @ 4649.0ft (Original Well Elev)

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1819'FNL, 2149'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 2073'FNL, 2455'FEL, SEC.24	6708.0	-243.5	-5476.9	Point
LPL 2073'FNL, 2312'FWL, SEC.19	6728.0	-258.6	-710.4	Point



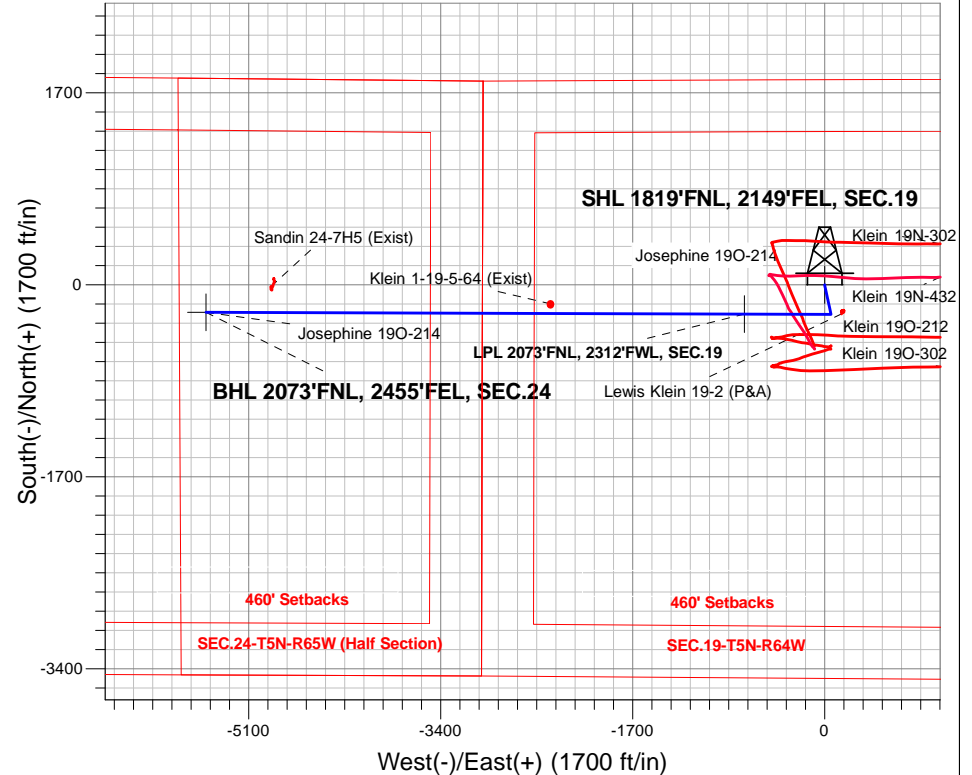
Azimuths to True North  
 Magnetic North: 8.02°

Magnetic Field  
 Strength: 52560.8snT  
 Dip Angle: 66.87°  
 Date: 12/27/2016  
 Model: IGRF2010

Josephine 5N64W19N Pad Sec.19-T5N-R64W  
 Josephine 190-214  
 Plan #1 (12-20-16)  
 10:18, December 27 2016

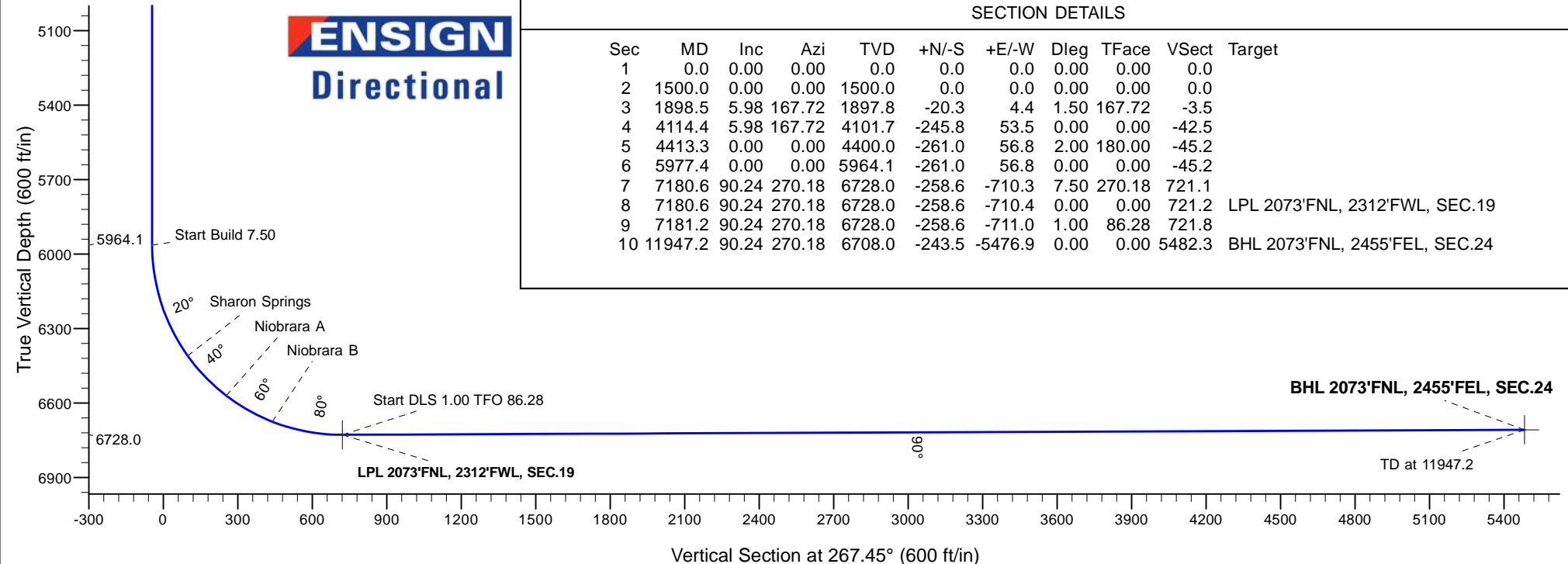
## ANNOTATIONS

TVD	MD	Annotation
1500.0	1500.0	KOP - Start Build 1.50
4101.7	4114.4	Start Drop -2.00
5964.1	5977.4	Start Build 7.50
6728.0	7180.6	Start DLS 1.00 TFO 86.28
6728.0	7181.2	Start 4765.9 hold at 7181.2 MD
6708.0	11947.2	TD at 11947.2



## 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	1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	
3	1898.5	5.98	167.72	1897.8	-20.3	4.4	1.50	167.72	-3.5	
4	4114.4	5.98	167.72	4101.7	-245.8	53.5	0.00	0.00	-42.5	
5	4413.3	0.00	0.00	4400.0	-261.0	56.8	2.00	180.00	-45.2	
6	5977.4	0.00	0.00	5964.1	-261.0	56.8	0.00	0.00	-45.2	
7	7180.6	90.24	270.18	6728.0	-258.6	-710.3	7.50	270.18	721.1	
8	7180.6	90.24	270.18	6728.0	-258.6	-710.4	0.00	0.00	721.2	LPL 2073'FNL, 2312'FWL, SEC.19
9	7181.2	90.24	270.18	6728.0	-258.6	-711.0	1.00	86.28	721.8	
10	11947.2	90.24	270.18	6708.0	-243.5	-5476.9	0.00	0.00	5482.3	BHL 2073'FNL, 2455'FEL, SEC.24





# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.19-T5N-R64W**

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

**Josephine 19O-214**

**Wellbore #1**

**Plan #1 (12-20-16)**

## **Anticollision Report**

**27 December, 2016**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Josephine 19O-214
<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 19O-214	<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 #1 (12-20-16)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (12-20-16)		
<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>	12/27/2016		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,946.2	Plan #1 (12-20-16) (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.24-T5N-R65W						
Sandin 24-7H5 (Exist) - Wellbore #1 - Wellbore #1	11,368.0	6,694.5	227.7	43.9	1.239	Level 2, CC, ES, SF
Josephine 5N64W19N Pad Sec.19-T5N-R64W						
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	366.3	367.3	105.7	103.9	60.576	CC
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	400.0	400.0	105.7	103.8	54.837	ES
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	980.3	151.4	146.1	28.917	SF
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	600.0	600.0	91.1	88.1	30.087	CC, ES
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	1,100.0	1,085.7	122.9	117.1	21.292	SF
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	200.0	200.0	120.3	119.4	145.589	CC, ES
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	1,100.0	1,057.8	221.7	215.8	37.882	SF
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	1,400.0	1,400.0	29.1	21.7	3.921	CC, ES
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	11,947.2	11,941.1	557.3	183.5	1.491	Level 3, SF
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	800.0	800.0	76.6	72.4	18.536	CC, ES
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	1,100.0	1,093.5	88.1	82.3	15.255	SF
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	1,000.0	58.3	53.1	11.142	CC, ES
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	1,200.0	1,196.8	63.4	57.1	10.027	SF
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	1,500.0	1,500.0	14.6	6.6	1.826	CC
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	11,947.2	12,024.3	357.6	-4.9	0.986	Level 1, ES, SF
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	1,200.0	1,200.0	43.7	37.4	6.904	CC, ES
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	1,300.0	1,298.9	45.0	38.1	6.542	SF
Josephine 19O-204 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	29.1	26.7	11.760	CC, ES
Josephine 19O-204 - Wellbore #1 - Plan #1 (12-20-16)	11,947.2	11,976.3	477.2	103.6	1.277	Level 3, SF
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	1,000.0	14.6	9.3	2.785	CC
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	11,947.2	12,050.9	270.4	-83.3	0.765	Level 1, ES, SF
Klein (Existing) Sec.19-T5N-R64W						
Klein 1-19-5-64 (Exist) - Wellbore #1 - Wellbore #1	8,896.9	6,703.8	85.7	-161.8	0.346	Level 1, CC, SF
Klein 1-19-5-64 (Exist) - Wellbore #1 - Wellbore #1	8,900.0	6,703.8	85.8	-161.9	0.346	Level 1, ES
Lewis Klein 19-2 (P&A) - Wellbore #1 - Wellbore #1	5,431.3	5,394.3	95.4	69.5	3.684	CC
Lewis Klein 19-2 (P&A) - Wellbore #1 - Wellbore #1	5,600.0	5,562.8	95.8	69.1	3.594	ES
Lewis Klein 19-2 (P&A) - Wellbore #1 - Wellbore #1	6,000.0	5,961.0	101.3	71.9	3.445	SF

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Josephine 19O-214
<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 19O-214	<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 #1 (12-20-16)	<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	2,506.7	2,530.9	286.0	268.6	16.451	CC, ES
Klein 19N-302 - Wellbore #1 - Wellbore #1	2,700.0	2,711.2	293.8	275.1	15.716	SF
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,750.8	6,719.0	337.6	299.5	8.864	CC, ES
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,800.0	6,719.0	341.1	302.3	8.784	SF
Klein 19O-212 - Wellbore #1 - Wellbore #1	6,695.1	6,673.4	179.9	142.6	4.822	CC, ES
Klein 19O-212 - Wellbore #1 - Wellbore #1	6,700.0	6,672.8	180.0	142.6	4.816	SF
Klein 19O-302 - Wellbore #1 - Wellbore #1	6,795.0	6,646.9	478.2	439.2	12.257	CC
Klein 19O-302 - Wellbore #1 - Wellbore #1	6,800.0	6,647.0	478.2	439.1	12.234	ES
Klein 19O-302 - Wellbore #1 - Wellbore #1	6,900.0	6,643.6	488.8	448.0	11.976	SF

Offset Design													Offset Site Error:	0.0 ft
Existing Wells - Sec.24-T5N-R65W - Sandin 24-7H5 (Exist) - Wellbore #1 - Wellbore #1													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		
10,700.0	6,713.2	6,691.9	6,689.4	144.6	16.5	88.73	-17.6	-4,896.9	705.7	544.8	160.97	4.384		
10,800.0	6,712.8	6,692.3	6,689.7	148.0	16.5	88.82	-17.6	-4,896.9	611.9	447.5	164.39	3.722		
10,900.0	6,712.4	6,692.7	6,690.1	151.4	16.5	88.91	-17.6	-4,896.9	520.4	352.6	167.81	3.101		
11,000.0	6,712.0	6,693.0	6,690.5	154.8	16.5	89.01	-17.6	-4,896.9	432.7	261.5	171.24	2.527		
11,100.0	6,711.6	6,693.4	6,690.9	158.2	16.5	89.10	-17.6	-4,896.9	351.7	177.0	174.67	2.013		
11,200.0	6,711.1	6,693.8	6,691.3	161.7	16.5	89.21	-17.6	-4,896.9	283.0	104.9	178.09	1.589		
11,300.0	6,710.7	6,694.3	6,691.7	165.1	16.5	89.31	-17.6	-4,896.9	237.6	56.1	181.52	1.309	Level 3	
11,368.0	6,710.4	6,694.5	6,692.0	167.4	16.5	89.38	-17.6	-4,897.0	227.7	43.9	183.85	1.239	Level 2, CC, ES, SF	
11,400.0	6,710.3	6,694.7	6,692.1	168.5	16.5	89.42	-17.6	-4,897.0	230.0	45.0	184.95	1.243	Level 2	
11,500.0	6,709.9	6,695.1	6,692.6	171.9	16.5	89.53	-17.6	-4,897.0	263.2	74.8	188.38	1.397	Level 3	
11,600.0	6,709.5	6,695.6	6,693.0	175.4	16.5	89.65	-17.6	-4,897.0	325.1	133.3	191.81	1.695		
11,700.0	6,709.0	6,696.1	6,693.5	178.8	16.5	89.77	-17.6	-4,897.0	402.6	207.4	195.24	2.062		
11,800.0	6,708.6	6,696.5	6,694.0	182.2	16.5	89.89	-17.6	-4,897.0	488.4	289.7	198.67	2.458		
11,900.0	6,708.2	6,697.1	6,694.5	185.6	16.5	90.02	-17.6	-4,897.0	578.7	376.6	202.10	2.863		
11,947.2	6,708.0	6,697.3	6,694.7	186.7	16.5	90.08	-17.6	-4,897.0	622.3	419.2	203.15	3.063		