

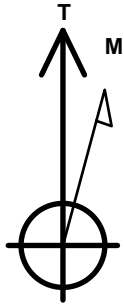
PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Josephine 19O-204**

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 1385053.01 3253196.81 40.386810 -104.591050
 Original Well Elev WELL @ 4649.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1849'FNL, 2149'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 2550'FNL, 2452'FEL, SEC.24	6708.0	-691.6	-5474.2	Point
LPL 2478'FNL, 2318'FWL, SEC.19	6728.0	-631.1	-704.8	Point



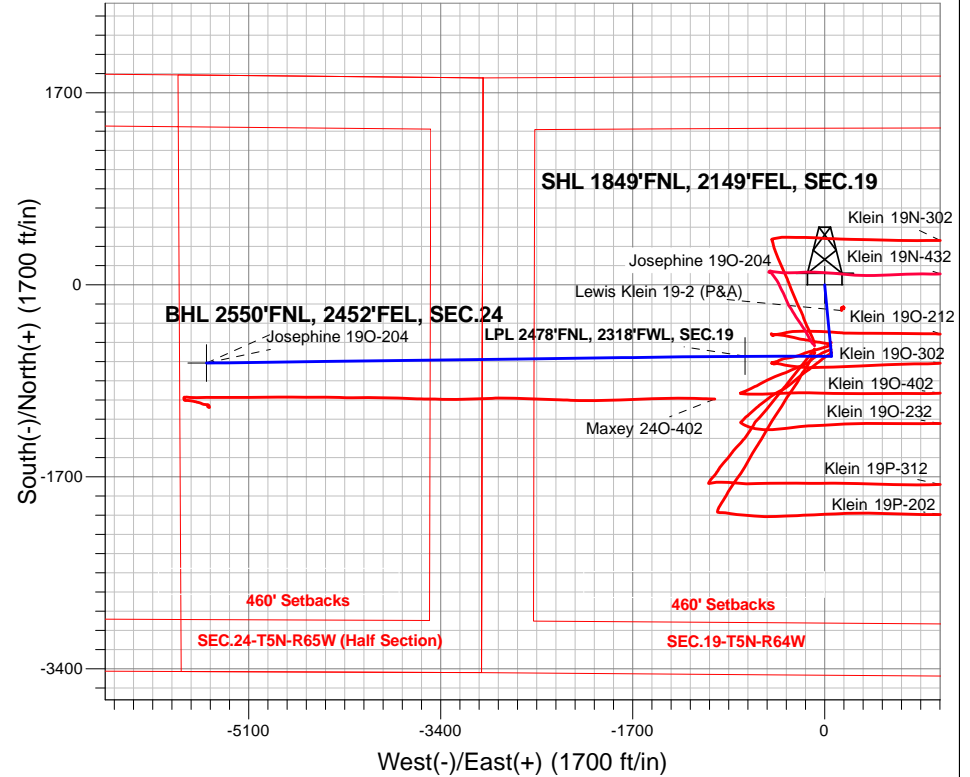
Azimuths to True North
 Magnetic North: 8.02°

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

Josephine 5N64W19N Pad Sec.19-T5N-R64W
 Josephine 19O-204
 Plan #1 (12-20-16)
 8:32, December 27 2016

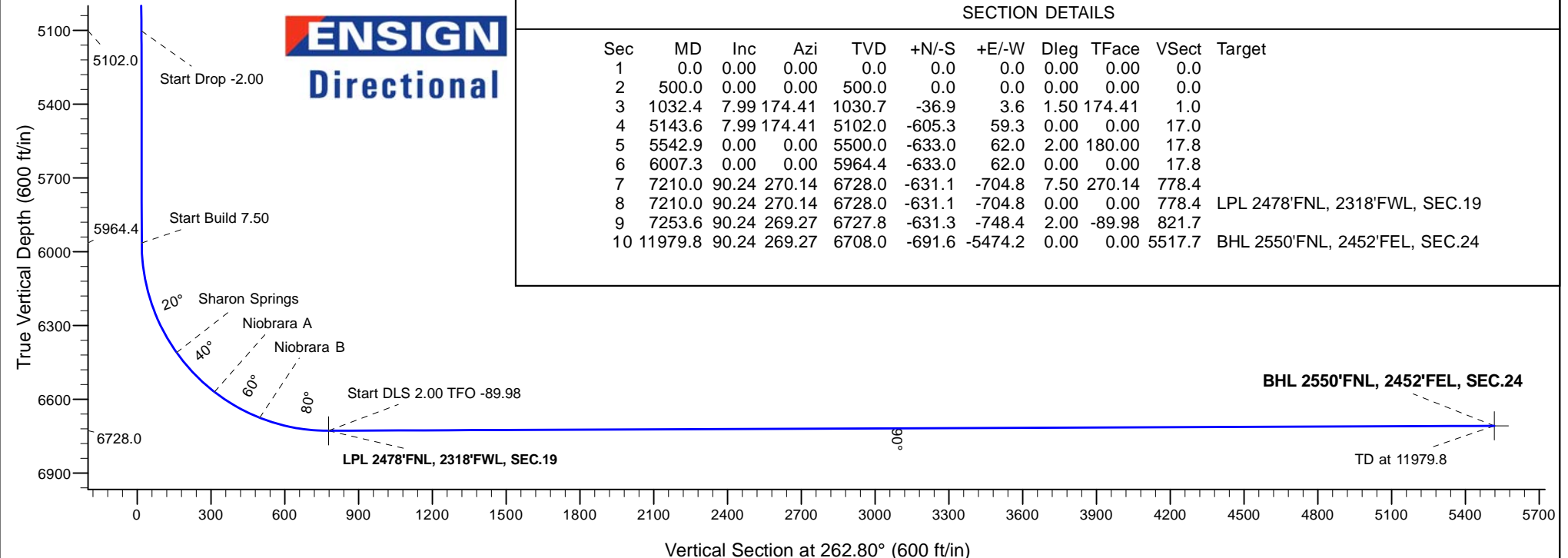
ANNOTATIONS

TVD	MD	Annotation
500.0	500.0	KOP - Start Build 1.50
5102.0	5143.6	Start Drop -2.00
5964.4	6007.3	Start Build 7.50
6728.0	7210.0	Start DLS 2.00 TFO -89.98
6727.8	7253.6	Start 4726.2 hold at 7253.6 MD
6708.0	11979.8	TD at 11979.8



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	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1032.4	7.99	174.41	1030.7	-36.9	3.6	1.50	174.41	1.0	
4	5143.6	7.99	174.41	5102.0	-605.3	59.3	0.00	0.00	17.0	
5	5542.9	0.00	0.00	5500.0	-633.0	62.0	2.00	180.00	17.8	
6	6007.3	0.00	0.00	5964.4	-633.0	62.0	0.00	0.00	17.8	
7	7210.0	90.24	270.14	6728.0	-631.1	-704.8	7.50	270.14	778.4	
8	7210.0	90.24	270.14	6728.0	-631.1	-704.8	0.00	0.00	778.4	LPL 2478'FNL, 2318'FWL, SEC.19
9	7253.6	90.24	269.27	6727.8	-631.3	-748.4	2.00	-89.98	821.7	
10	11979.8	90.24	269.27	6708.0	-691.6	-5474.2	0.00	0.00	5517.7	BHL 2550'FNL, 2452'FEL, SEC.24





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R64W

Josephine 5N64W19N Pad Sec.19-T5N-R64W

Josephine 19O-204

Wellbore #1

Plan #1 (12-20-16)

Anticollision Report

27 December, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Josephine 190-204
Project:	SECT.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 190-204	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 #1 (12-20-16)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (12-20-16)		
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	12/27/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,979.6	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						
Josephine 5N64W19N Pad Sec.19-T5N-R64W						
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	366.3	367.3	134.8	133.1	77.274	CC
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	400.0	400.0	134.8	132.9	69.952	ES
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	900.0	878.2	187.0	182.4	40.956	SF
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	120.3	117.8	48.528	CC, ES
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	900.0	888.1	152.4	147.8	33.448	SF
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	200.0	200.0	149.4	148.6	180.861	CC, ES
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	900.0	862.7	231.0	226.4	50.363	SF
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	58.3	55.8	23.522	CC, ES
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	900.0	899.3	79.1	74.6	17.359	SF
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	105.7	103.2	42.648	CC, ES
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	900.0	896.1	127.8	123.3	28.061	SF
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	87.4	85.0	35.282	CC, ES
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	998.6	120.0	114.9	23.551	SF
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	43.7	41.2	17.642	CC, ES
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	800.0	799.7	55.4	51.4	13.764	SF
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	72.9	70.4	29.403	CC, ES
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	900.0	899.3	93.7	89.2	20.555	SF
Josephine 19O-214 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	29.1	26.7	11.760	CC, ES
Josephine 19O-214 - Wellbore #1 - Plan #1 (12-20-16)	11,979.8	11,943.0	477.2	103.4	1.277	Level 3, SF
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	14.6	12.1	5.881	CC
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	11,979.8	12,047.8	239.8	-110.1	0.685	Level 1, ES, SF
Klein (Existing) Sec.19-T5N-R64W						
Lewis Klein 19-2 (P&A) - Wellbore #1 - Wellbore #1	2,299.7	2,261.3	146.2	133.6	11.625	CC
Lewis Klein 19-2 (P&A) - Wellbore #1 - Wellbore #1	2,300.0	2,261.6	146.2	133.6	11.623	ES
Lewis Klein 19-2 (P&A) - Wellbore #1 - Wellbore #1	2,700.0	2,656.8	157.4	142.6	10.592	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Josephine 19O-204
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 19O-204	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 #1 (12-20-16)	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 19O-HZ Pad Sec.19-T5N-R64W						
Klein 19N-302 - Wellbore #1 - Wellbore #1	2,052.8	2,053.2	231.3	216.5	15.654	CC, ES
Klein 19N-302 - Wellbore #1 - Wellbore #1	2,200.0	2,186.5	237.8	221.9	14.927	SF
Klein 19N-432 - Wellbore #1 - Wellbore #1	2,225.6	2,216.4	278.0	262.6	18.005	CC, ES
Klein 19N-432 - Wellbore #1 - Wellbore #1	2,600.0	2,578.2	294.0	276.0	16.306	SF
Klein 19O-212 - Wellbore #1 - Wellbore #1	6,731.2	6,662.5	221.3	183.2	5.809	CC, ES
Klein 19O-212 - Wellbore #1 - Wellbore #1	6,750.0	6,659.9	222.1	183.8	5.800	SF
Klein 19O-232 - Wellbore #1 - Wellbore #1	1,604.9	1,521.0	550.5	542.1	66.117	CC
Klein 19O-232 - Wellbore #1 - Wellbore #1	1,800.0	1,711.8	551.1	541.5	57.560	ES
Klein 19O-232 - Wellbore #1 - Wellbore #1	7,400.0	6,607.0	703.7	647.6	12.543	SF
Klein 19O-302 - Wellbore #1 - Wellbore #1	6,830.0	6,690.0	79.6	39.9	2.006	CC, ES, SF
Klein 19O-402 - Wellbore #1 - Wellbore #1	7,004.0	6,859.7	333.5	287.3	7.208	CC, ES
Klein 19O-402 - Wellbore #1 - Wellbore #1	7,100.0	6,808.9	343.1	294.6	7.063	SF
Klein 19P-202 - Wellbore #1 - Wellbore #1	0.0	0.0	604.1			
Klein 19P-202 - Wellbore #1 - Wellbore #1	200.0	197.9	604.4	603.8	875.367	ES
Klein 19P-202 - Wellbore #1 - Wellbore #1	2,000.0	1,786.9	786.3	775.5	72.806	SF
Klein 19P-312 - Wellbore #1 - Wellbore #1	0.0	0.0	575.4			
Klein 19P-312 - Wellbore #1 - Wellbore #1	400.0	389.2	575.8	574.0	315.637	ES
Klein 19P-312 - Wellbore #1 - Wellbore #1	2,400.0	2,187.0	786.6	772.9	57.498	SF
Maxey 24O-HZ Pad Sec.24-T5N-R65W						
Maxey 24O-402 - Wellbore #1 - Wellbore #1	11,893.0	6,798.2	306.2	104.0	1.514	CC
Maxey 24O-402 - Wellbore #1 - Wellbore #1	11,900.0	6,792.7	306.2	103.9	1.513	ES, SF

Offset Design		Josephine 5N64W19N Pad Sec.19-T5N-R64W - Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)											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	1.0	1.0	0.0	0.0	-1.18	134.8	-2.8	134.8	134.8	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-1.18	134.8	-2.8	134.8	134.5	0.28	484.804			
200.0	200.0	201.0	201.0	0.4	0.4	-1.18	134.8	-2.8	134.8	134.0	0.83	162.675			
300.0	300.0	301.0	301.0	0.7	0.7	-1.18	134.8	-2.8	134.8	133.4	1.38	97.735			
366.3	366.3	367.3	367.3	0.9	0.9	-1.18	134.8	-2.8	134.8	133.1	1.74	77.274	CC		
400.0	400.0	400.0	400.0	1.0	1.0	-1.18	134.8	-2.8	134.8	132.9	1.93	69.952	ES		
500.0	500.0	497.5	497.5	1.2	1.2	-1.16	136.0	-2.7	136.1	133.6	2.47	55.053			
600.0	600.0	593.9	593.8	1.5	1.5	-175.52	139.7	-2.6	141.2	138.2	2.99	47.170			
700.0	699.9	689.7	689.4	1.7	1.8	-175.51	145.8	-2.5	151.4	147.9	3.50	43.209			
800.0	799.7	784.6	784.0	2.0	2.1	-175.51	154.1	-2.2	166.7	162.7	4.03	41.357			
900.0	899.3	878.2	876.9	2.2	2.4	-175.54	164.7	-1.9	187.0	182.4	4.57	40.956	SF		
1,000.0	998.6	970.2	968.1	2.5	2.7	-175.56	177.2	-1.5	212.2	207.1	5.10	41.569			
1,032.4	1,030.7	1,000.0	997.5	2.7	2.8	-175.57	181.8	-1.4	221.4	216.1	5.28	41.929			
1,100.0	1,097.6	1,060.4	1,057.1	2.9	3.0	-175.61	191.7	-1.1	241.6	236.0	5.63	42.876			
1,200.0	1,196.7	1,149.2	1,144.5	3.3	3.4	-175.62	208.0	-0.6	273.4	267.2	6.17	44.336			
1,300.0	1,295.7	1,236.7	1,230.0	3.7	3.8	-175.62	226.0	0.0	307.3	300.6	6.70	45.858			
1,400.0	1,394.7	1,322.6	1,313.7	4.0	4.3	-175.59	245.6	0.5	343.4	336.1	7.24	47.426			
1,500.0	1,493.7	1,407.1	1,395.5	4.4	4.7	-175.56	266.7	1.2	381.5	373.7	7.78	49.031			
1,600.0	1,592.8	1,490.0	1,475.2	4.9	5.2	-175.52	289.2	1.9	421.6	413.3	8.33	50.643			
1,700.0	1,691.8	1,571.3	1,553.0	5.3	5.8	-175.47	312.9	2.6	463.8	454.9	8.87	52.272			

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