

PETROLEUM DEVELOPMENT CORP DJ Basin

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

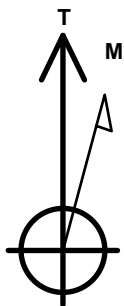
Surface Location: Josephine 5N64W19N Pad Sec.19-T5N-R64W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4626.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1385125.87	3253196.06	40.387010	-104.591050	

Original Well Elev WELL @ 4649.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1774'FNL, 2150'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 1244'FNL, 2462'FEL, SEC.24	6898.0	543.4	-5482.2	Point
LPL 1244'FNL, 2302'FWL, SEC.19	6898.0	528.3	-718.7	Point



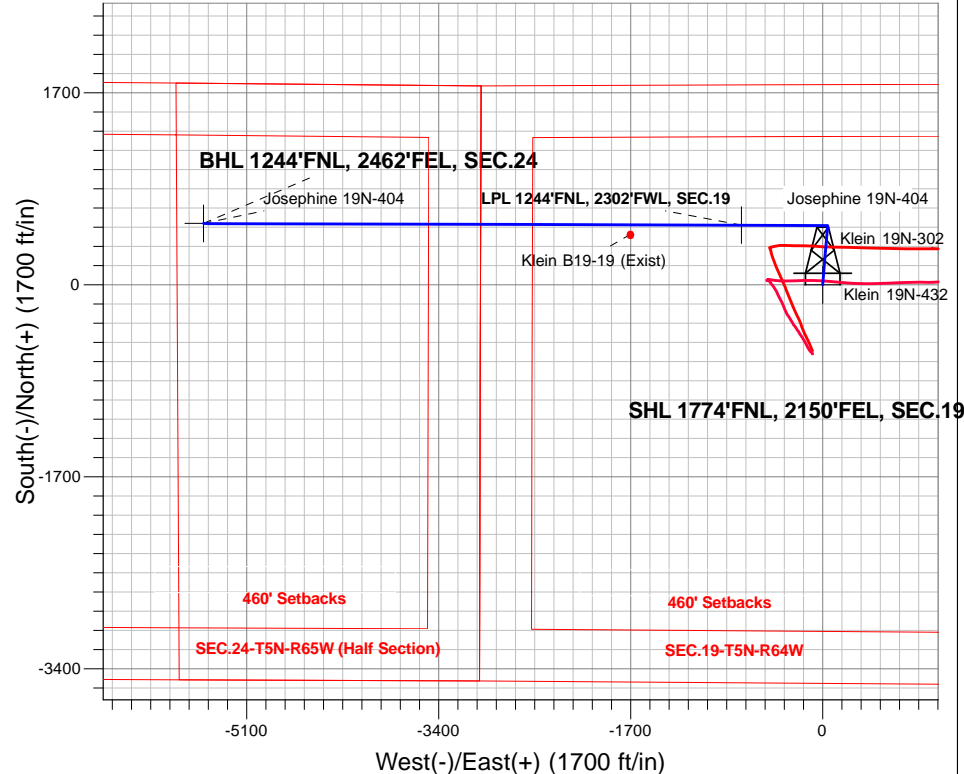
Azimuths to True North
Magnetic North: 8.03°

Magnetic Field
Strength: 52562.9snT
Dip Angle: 66.87°
Date: 12/20/2016
Model: IGRF2010

Josephine 5N64W19N Pad Sec.19-T5N-R64W
Josephine 19N-404
Plan #1 (12-20-16)
10:47, December 27 2016

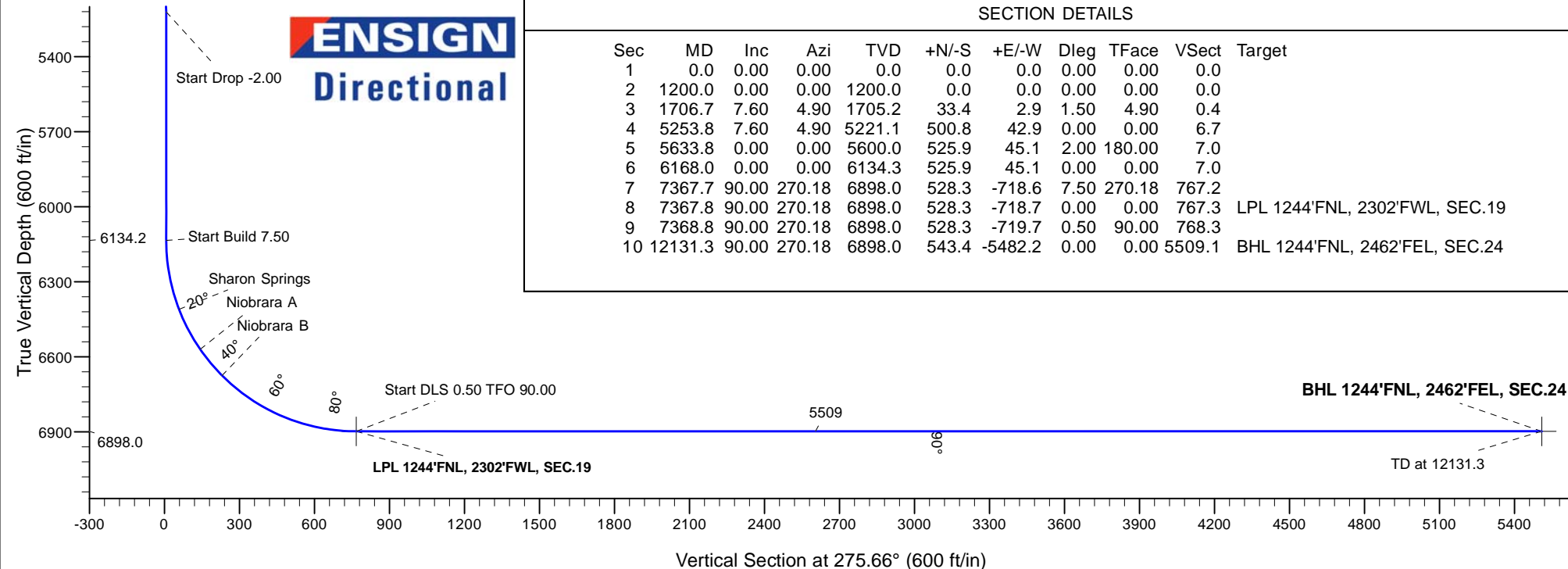
ANNOTATIONS

TVD	MD	Annotation
1200.0	1200.0	KOP - Start Build 1.50
5221.1	5253.8	Start Drop -2.00
6134.3	6168.0	Start Build 7.50
6898.0	7367.8	Start DLS 0.50 TFO 90.00
6898.0	7368.8	Start 4762.6 hold at 7368.8 MD
6898.0	12131.3	TD at 12131.3



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	1706.7	7.60	4.90	1705.2	33.4	2.9	1.50	4.90	0.4	
4	5253.8	7.60	4.90	5221.1	500.8	42.9	0.00	0.00	6.7	
5	5633.8	0.00	0.00	5600.0	525.9	45.1	2.00	180.00	7.0	
6	6168.0	0.00	0.00	6134.3	525.9	45.1	0.00	0.00	7.0	
7	7367.7	90.00	270.18	6898.0	528.3	-718.6	7.50	270.18	767.2	
8	7367.8	90.00	270.18	6898.0	528.3	-718.7	0.00	0.00	767.3	LPL 1244'FNL, 2302'FWL, SEC.19
9	7368.8	90.00	270.18	6898.0	528.3	-719.7	0.50	90.00	768.3	
10	12131.3	90.00	270.18	6898.0	543.4	-5482.2	0.00	0.00	5509.1	BHL 1244'FNL, 2462'FEL, SEC.24





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R64W

Josephine 5N64W19N Pad Sec.19-T5N-R64W

Josephine 19N-404

Wellbore #1

Plan #1 (12-20-16)

Anticollision Report

27 December, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Josephine 19N-404
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 19N-404	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	12,131.3	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	62.0	60.2	35.531	CC
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	400.0	401.0	62.0	60.1	32.119	ES
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	800.0	793.2	82.6	78.5	19.975	SF
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	600.0	600.0	47.4	44.4	15.664	CC, ES
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	12,131.3	12,162.8	760.6	388.1	2.042	SF
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	200.0	200.0	76.6	75.7	92.681	CC, ES
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	900.0	879.0	138.9	134.2	29.397	SF
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	1,200.0	1,200.0	14.6	8.2	2.301	CC, ES
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	12,131.3	11,945.7	332.8	21.7	1.070	Level 2, SF
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	800.0	800.0	32.9	28.8	7.966	CC, ES
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	12,131.3	12,028.7	523.9	171.1	1.485	Level 3, SF
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	1,000.0	14.6	9.3	2.785	CC
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	12,131.3	12,077.6	277.0	-75.9	0.785	Level 1, ES, SF
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	1,200.0	1,200.0	29.1	22.8	4.602	CC, ES
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	12,131.3	12,021.0	494.7	127.9	1.349	Level 3, SF
Josephine 19O-204 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	72.9	70.4	29.403	CC, ES
Josephine 19O-204 - Wellbore #1 - Plan #1 (12-20-16)	900.0	891.2	93.3	88.8	20.603	SF
Josephine 19O-214 - Wellbore #1 - Plan #1 (12-20-16)	1,200.0	1,200.0	43.7	37.4	6.904	CC, ES
Josephine 19O-214 - Wellbore #1 - Plan #1 (12-20-16)	1,300.0	1,300.0	45.0	38.1	6.541	SF
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	1,000.0	58.3	53.1	11.142	CC, ES
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	1,200.0	1,196.8	63.4	57.2	10.173	SF
Klein (Existing) Sec.19-T5N-R64W						
Klein B19-19 (Exist) - Wellbore #1 - Wellbore #1	8,350.9	6,880.0	83.2	-144.9	0.365	Level 1, CC, ES, SF
Klein 19O-HZ Pad Sec.19-T5N-R64W						
Klein 19N-302 - Wellbore #1 - Wellbore #1	6,820.9	6,883.8	179.4	139.8	4.536	CC, ES, SF
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,804.8	6,872.9	488.9	450.1	12.609	CC, ES
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,850.0	6,866.6	490.9	451.8	12.531	SF