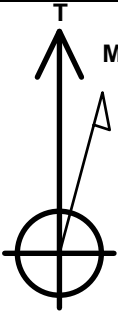


PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: Sandin 24C-201  
Surface Location: Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W  
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
Ground Elevation: 4634.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1385286.53 3248207.90 40.387590 -104.608950  
RKB - 23' WELL @ 4657.0ft (RKB - 23')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1570'FNL & 1965'FEL, Sec.24	1.0	0.0	0.0	Point
BHL 50'FNL & 1190'FEL, Sec.12	6647.0	12091.6	813.0	Point
LPL 50'FSL & 1190'FEL, Sec.13	6762.0	1610.3	780.0	Point



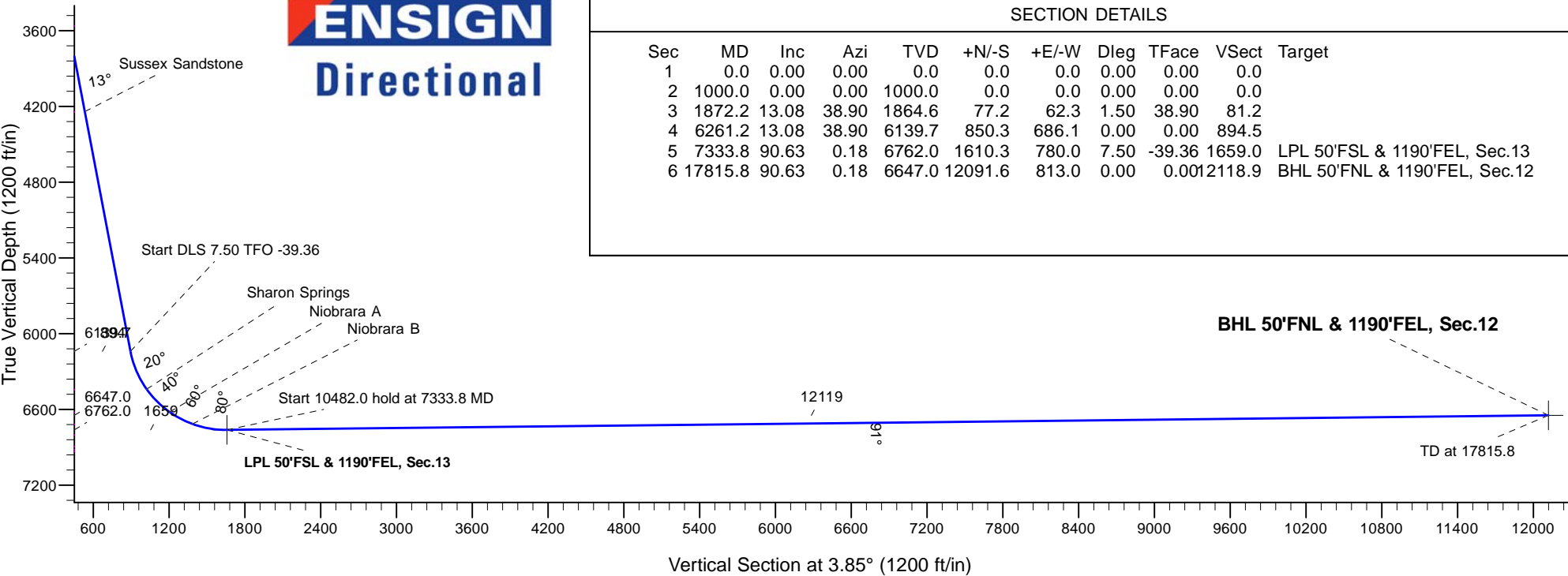
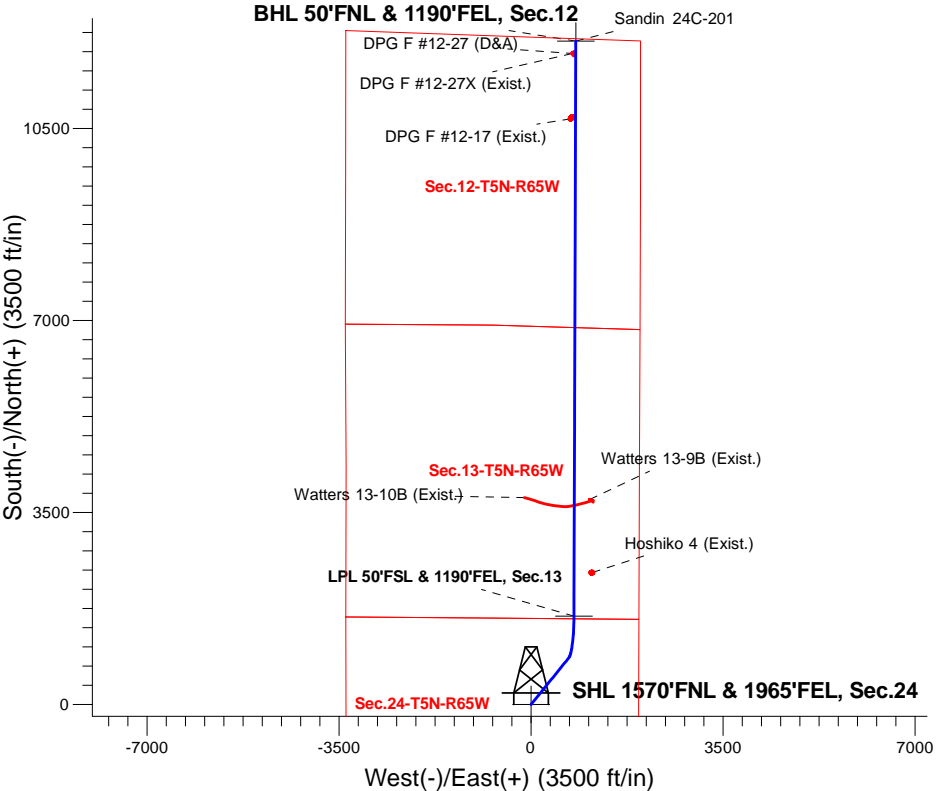
Azimuths to True North  
Magnetic North: 8.03°

Magnetic Field  
Strength: 52561.0snT  
Dip Angle: 66.87°  
Date: 12/21/2016  
Model: IGRF2010

Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W  
Sandin 24C-201  
Plan #1 (12-20-16)  
17:33, December 27 2016

ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP - Start Build 1.50
1864.6	1872.2	Start 4389.0 hold at 1872.2 MD
6139.7	6261.2	Start DLS 7.50 TFO -39.36
6762.0	7333.8	Start 10482.0 hold at 7333.8 MD
6647.0	17815.8	TD at 17815.8



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	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	1872.2	13.08	38.90	1864.6	77.2	62.3	1.50	38.90	81.2	
4	6261.2	13.08	38.90	6139.7	850.3	686.1	0.00	0.00	894.5	
5	7333.8	90.63	0.18	6762.0	1610.3	780.0	7.50	-39.36	1659.0	LPL 50'FSL & 1190'FEL, Sec.13
6	17815.8	90.63	0.18	6647.0	12091.6	813.0	0.00	0.00	12118.9	BHL 50'FNL & 1190'FEL, Sec.12

# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.24-T5N-R65W**

**Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W**

**Sandin 24C-201**

**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 Sandin 24C-201
<b>Project:</b>	SEC.24-T5N-R65W	<b>TVD Reference:</b>	WELL @ 4657.0ft (RKB - 23')
<b>Reference Site:</b>	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W	<b>MD Reference:</b>	WELL @ 4657.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sandin 24C-201	<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>	MD Interval 100.0ft	<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 1,200.0 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	17,815.8	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
<b>Offset Well - Wellbore - Design</b>						
Existing Wells - Sec.7-T5N-R64W						
DPG F #12-27 (D&A) - Wellbore #1 - Wellbore #1	17,589.1	6,595.5	28.8	-410.3	0.066	Level 1, CC, ES, SF
Existing Wells (GRID) - Sec.7-T5N-R64W						
DPG F #12-17 (Exist.) - Wellbore #1 - Wellbore #1	16,402.6	6,609.0	89.8	-278.2	0.244	Level 1, CC, ES, SF
DPG F #12-27X (Exist.) - Wellbore #1 - Wellbore #1	17,595.2	6,597.2	72.1	-221.2	0.246	Level 1, CC, ES, SF
Existing Wells Sec.24-T5N-R65W						
Hoshiko 4 (Exist.) - Wellbore #1 - Wellbore #1	8,128.4	6,723.7	334.9	261.9	4.588	CC, ES, SF
Watters 13-10B (Exist.) - Wellbore #1 - Wellbore #1	9,470.4	6,860.6	850.2	746.0	8.159	CC
Watters 13-10B (Exist.) - Wellbore #1 - Wellbore #1	9,500.0	6,862.5	850.7	745.8	8.109	ES
Watters 13-10B (Exist.) - Wellbore #1 - Wellbore #1	9,600.0	6,869.1	860.0	752.7	8.013	SF
Watters 13-9B (Exist.) - Wellbore #1 - Wellbore #1	9,462.1	6,705.8	278.2	171.1	2.597	CC, ES, SF
Josephine 5N64W19N Pad Sec.19-T5N-R64W						
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	7,047.0	10,952.6	103.2	22.0	1.272	Level 3, CC, ES, SF
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	6,800.0	10,917.6	222.6	104.3	1.882	SF
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	6,888.9	10,909.8	199.2	93.9	1.893	CC, ES
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	7,200.0	11,072.8	160.0	99.3	2.637	SF
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	7,256.6	11,071.6	147.6	92.8	2.694	CC, ES
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	6,300.0	10,764.5	969.3	802.3	5.805	SF
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	6,400.0	10,750.3	945.0	783.2	5.841	ES
Josephine 19N-204 - Wellbore #1 - Plan #1 (12-20-16)	6,455.9	10,742.6	941.3	783.6	5.968	CC
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	6,600.0	10,805.7	320.7	176.9	2.230	SF
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	6,691.1	10,795.1	302.3	169.1	2.270	CC, ES
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	6,500.0	10,866.1	562.8	409.1	3.663	SF
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	6,600.0	10,853.5	536.0	392.2	3.726	ES
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	6,637.9	10,849.0	533.7	394.2	3.825	CC
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	6,300.0	10,829.6	1,180.6	1,014.0	7.088	SF
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	6,400.0	10,815.1	1,158.1	996.7	7.178	ES
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	6,456.1	10,807.2	1,154.7	997.4	7.342	CC
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	6,400.0	10,931.7	845.3	684.2	5.245	SF
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	6,595.1	10,906.9	798.6	654.5	5.542	CC, ES

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Sandin 24C-201
<b>Project:</b>	SEC.24-T5N-R65W	<b>TVD Reference:</b>	WELL @ 4657.0ft (RKB - 23')
<b>Reference Site:</b>	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W	<b>MD Reference:</b>	WELL @ 4657.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sandin 24C-201	<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
Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W						
Sandin 24C-221 - Wellbore #1 - Plan #1 (12-20-16)	600.0	600.0	30.6	27.6	10.117	CC
Sandin 24C-221 - Wellbore #1 - Plan #1 (12-20-16)	17,815.8	17,867.1	515.9	-39.1	0.930	Level 1, ES, SF
Sandin 24C-241 - Wellbore #1 - Plan #1 (12-21-16)	1,000.0	1,000.0	30.6	25.4	5.857	CC
Sandin 24C-241 - Wellbore #1 - Plan #1 (12-21-16)	17,815.8	17,772.4	574.1	17.1	1.031	Level 2, ES, SF
Sandin 24C-301 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	1,000.0	13.9	8.7	2.662	CC
Sandin 24C-301 - Wellbore #1 - Plan #1 (12-20-16)	17,815.8	17,748.6	336.0	-160.8	0.676	Level 1, ES, SF
Sandin 24C-321 - Wellbore #1 - Plan #1 (12-20-16)	800.0	800.0	13.9	9.8	3.372	CC
Sandin 24C-321 - Wellbore #1 - Plan #1 (12-20-16)	17,800.0	17,780.5	300.5	-175.7	0.631	Level 1, SF
Sandin 24C-321 - Wellbore #1 - Plan #1 (12-20-16)	17,815.8	17,785.8	300.7	-175.8	0.631	Level 1, ES
Sandin 24N-221 - Wellbore #1 - Plan #1 (12-21-16)	600.0	600.0	58.5	55.5	19.315	CC
Sandin 24N-221 - Wellbore #1 - Plan #1 (12-21-16)	700.0	699.5	58.9	55.4	16.479	ES
Sandin 24N-221 - Wellbore #1 - Plan #1 (12-21-16)	17,815.8	17,776.9	1,131.3	564.8	1.997	SF
Sandin 24N-241 - Wellbore #1 - Plan #1 (12-21-16)	200.0	200.0	89.1	88.3	107.920	CC, ES
Sandin 24N-241 - Wellbore #1 - Plan #1 (12-21-16)	1,000.0	975.5	159.4	153.8	28.458	SF
Sandin 24N-301 - Wellbore #1 - Plan #1 (12-21-16)	400.0	400.0	75.2	73.3	39.025	CC, ES
Sandin 24N-301 - Wellbore #1 - Plan #1 (12-21-16)	1,000.0	988.7	108.2	102.9	20.204	SF
Sandin 24N-321 - Wellbore #1 - Plan #1 (12-21-16)	1,000.0	1,000.0	44.6	39.3	8.520	CC, ES
Sandin 24N-321 - Wellbore #1 - Plan #1 (12-21-16)	17,815.8	17,727.7	873.2	316.6	1.569	SF
Sandin 24V-341 - Wellbore #1 - Plan #1 (12-20-16)	400.0	400.0	44.6	42.6	23.126	CC, ES
Sandin 24V-341 - Wellbore #1 - Plan #1 (12-20-16)	17,815.8	17,866.2	827.4	274.7	1.497	Level 3, SF
Sandin 24V-401 - Wellbore #1 - Plan #1 (12-20-16)	200.0	200.0	61.3	60.5	74.195	CC, ES
Sandin 24V-401 - Wellbore #1 - Plan #1 (12-20-16)	17,815.8	17,919.0	1,160.5	612.6	2.118	SF

Offset Design		Existing Wells - Sec.7-T5N-R64W - DPG F #12-27 (D&A) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft	
Survey Program:		7055-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)				
16,400.0	6,662.5	6,608.5	6,608.5	250.2	161.9	-114.37	11,864.9	783.5	1,189.4	810.4	378.97	3.138			
16,500.0	6,661.4	6,607.4	6,607.4	252.5	161.9	-112.54	11,864.9	783.5	1,089.4	703.5	385.87	2.823			
16,600.0	6,660.3	6,606.3	6,606.3	254.9	161.9	-110.65	11,864.9	783.5	989.4	596.9	392.57	2.520			
16,700.0	6,659.2	6,605.2	6,605.2	257.2	161.8	-108.71	11,864.9	783.5	889.5	490.5	399.04	2.229			
16,800.0	6,658.1	6,604.1	6,604.1	259.6	161.8	-106.73	11,864.9	783.5	789.6	384.3	405.23	1.948			
16,900.0	6,657.0	6,603.0	6,603.0	261.9	161.8	-104.71	11,864.9	783.5	689.6	278.6	411.09	1.678			
17,000.0	6,656.0	6,602.0	6,602.0	264.2	161.7	-102.65	11,864.9	783.5	589.8	173.2	416.56	1.416	Level 3		
17,100.0	6,654.9	6,600.9	6,600.9	266.6	161.7	-100.56	11,864.9	783.5	489.9	68.3	421.62	1.162	Level 2		
17,200.0	6,653.8	6,599.8	6,599.8	268.9	161.7	-98.43	11,864.9	783.5	390.1	-36.1	426.22	0.915	Level 1		
17,300.0	6,652.7	6,598.7	6,598.7	271.3	161.7	-96.29	11,864.9	783.5	290.5	-139.8	430.32	0.675	Level 1		
17,400.0	6,651.6	6,597.6	6,597.6	273.6	161.6	-94.12	11,864.9	783.5	191.3	-242.6	433.89	0.441	Level 1		
17,500.0	6,650.5	6,596.5	6,596.5	275.9	161.6	-91.94	11,864.9	783.5	93.6	-343.3	436.90	0.214	Level 1		
17,589.1	6,649.5	6,595.5	6,595.5	278.0	161.6	-90.00	11,864.9	783.5	28.8	-410.3	439.10	0.066	Level 1, CC, ES, SF		
17,600.0	6,649.4	6,595.4	6,595.4	278.3	161.6	-89.76	11,864.9	783.5	30.8	-408.5	439.34	0.070	Level 1		
17,700.0	6,648.3	6,594.3	6,594.3	280.6	161.6	-87.58	11,864.9	783.5	114.6	-326.6	441.19	0.260	Level 1		
17,800.0	6,647.2	6,593.2	6,593.2	282.9	161.5	-85.41	11,864.9	783.5	212.9	-229.6	442.45	0.481	Level 1		
17,815.8	6,647.0	6,593.0	6,593.0	283.3	161.5	-85.06	11,864.9	783.5	228.5	-214.1	442.60	0.516	Level 1		

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