

# PETROLEUM DEVELOPMENT CORP DJ Basin

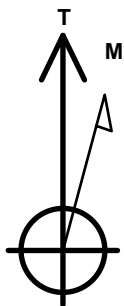
Well Name: **Fern 11V-204**

Surface Location: Fern 5N65W11EJ Pad Sec.11-T5N-R65W  
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
Ground Elevation: 4619.0

+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1397154.12 3240103.81 40.420385 -104.637627  
Original Well Elev WELL @ 4642.0ft (Original Well Elev)

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 336'FNL, 688'FWL, SEC.11	1.0	0.0	0.0	Point
BHL 1410'FNL, 2380'FEL, SEC.9	6732.0	-1257.7	-8321.0	Point
LPL 1594'FNL, 510'FWL, SEC.11	6777.0	-1257.7	-178.2	Point



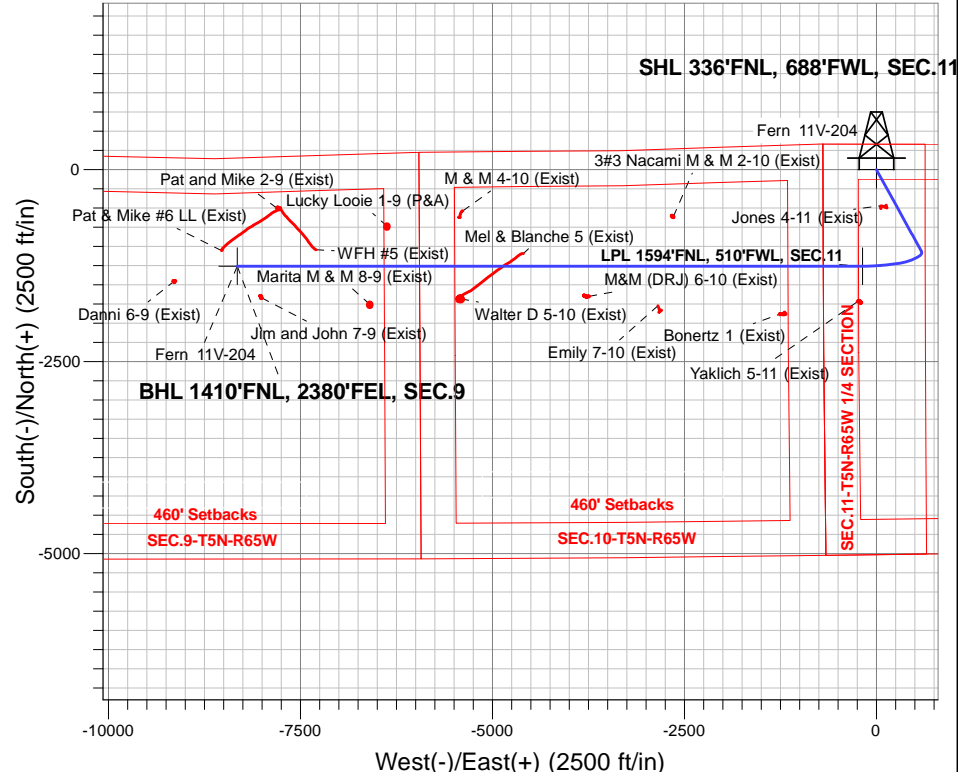
Azimuths to True North  
Magnetic North: 8.10°

Magnetic Field  
Strength: 52613.6snT  
Dip Angle: 66.91°  
Date: 8/10/2016  
Model: IGRF2010

Fern 5N65W11EJ Pad Sec.11-T5N-R65W  
Fern 11V-204  
Plan #1 (8-05-16)  
10:23, August 10 2016

## ANNOTATIONS

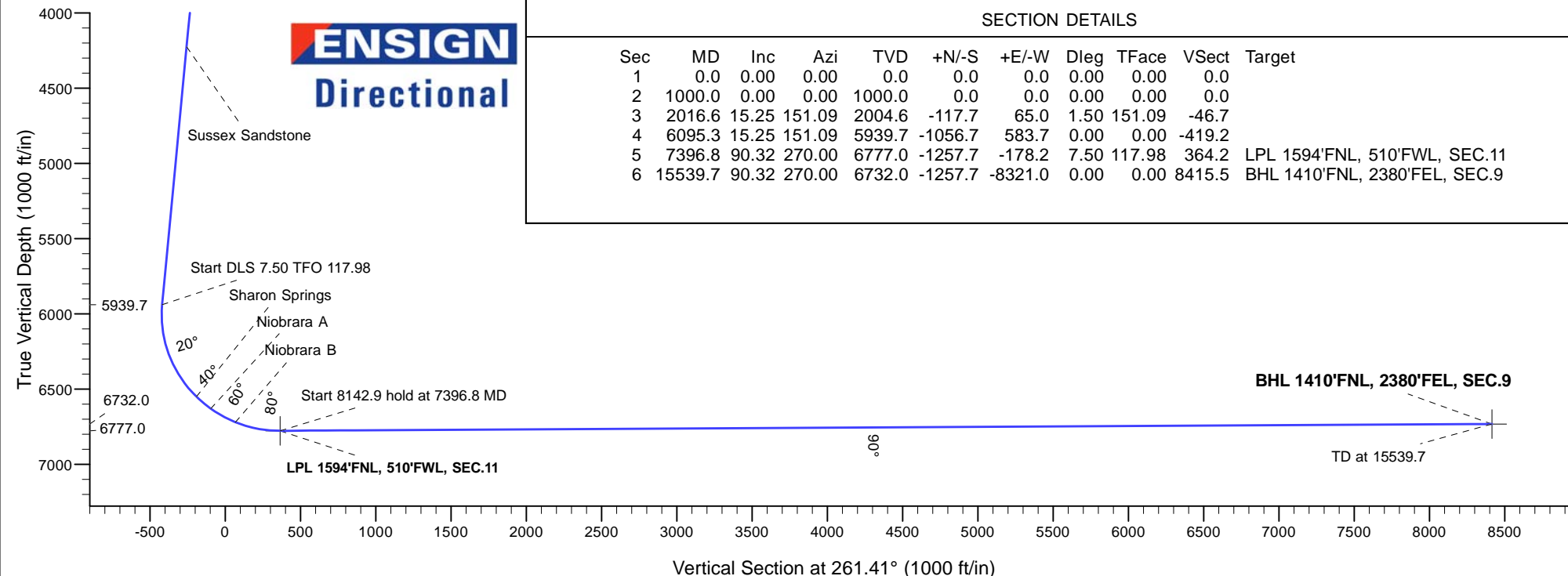
TVD	MD	Annotation
1000.0	1000.0	KOP - Start Build 1.50
2004.6	2016.6	Start 4078.7 hold at 2016.6 MD
5939.7	6095.3	Start DLS 7.50 TFO 117.98
6777.0	7396.8	Start 8142.9 hold at 7396.8 MD
6732.0	15539.7	TD at 15539.7



**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	2016.6	15.25	151.09	2004.6	-117.7	65.0	1.50	151.09	-46.7	
4	6095.3	15.25	151.09	5939.7	-1056.7	583.7	0.00	0.00	-419.2	
5	7396.8	90.32	270.00	6777.0	-1257.7	-178.2	7.50	117.98	364.2	LPL 1594'FNL, 510'FWL, SEC.11
6	15539.7	90.32	270.00	6732.0	-1257.7	-8321.0	0.00	0.00	8415.5	BHL 1410'FNL, 2380'FEL, SEC.9





# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.11-T5N-R65W**

**Fern 5N65W11EJ Pad Sec.11-T5N-R65W**

**Fern 11V-204**

**Wellbore #1**

**Plan #1 (8-05-16)**

## **Anticollision Report**

**10 August, 2016**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Fern 11V-204
<b>Project:</b>	SEC.11-T5N-R65W	<b>TVD Reference:</b>	WELL @ 4642.0ft (Original Well Elev)
<b>Reference Site:</b>	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	<b>MD Reference:</b>	WELL @ 4642.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Fern 11V-204	<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 (8-05-16)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (8-05-16)		
<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 1,000.0 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>	8/10/2016		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	15,539.7	Plan #1 (8-05-16) (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.4-T5N-R65W						
Danni 6-9 (Exist) - Wellbore #1 - Wellbore #1	15,539.7	6,705.4	830.5	518.6	2.662	CC, ES, SF
Jim and John 7-9 (Exist) - Wellbore #1 - Wellbore #1	15,223.9	6,739.2	415.8	114.2	1.379	Level 3, CC, ES, SF
Marita M & M 8-9 (Exist) - Wellbore #1 - Wellbore #1	13,815.6	6,726.5	496.3	93.0	1.230	Level 2, CC, ES, SF
Pat & Mike #6 LL (Exist) - Wellbore #1 - Wellbore #1	15,539.7	6,815.7	286.5	-34.8	0.892	Level 1, CC, ES, SF
Pat and Mike 2-9 (Exist) - Wellbore #1 - Wellbore #1	15,028.0	6,725.8	759.1	462.7	2.561	CC, ES
Pat and Mike 2-9 (Exist) - Wellbore #1 - Wellbore #1	15,100.0	6,725.2	762.5	463.6	2.551	SF
WFH #5 (Exist) - Wellbore #1 - Wellbore #1	14,517.1	6,778.5	214.3	-68.3	0.758	Level 1, CC, ES, SF
Existing Wells Sec.9, 10, & 11						
3#3 Nacami M & M 2-10 (Exist) - Wellbore #1 - Wellbore	9,860.7	6,746.4	649.6	530.8	5.469	CC
3#3 Nacami M & M 2-10 (Exist) - Wellbore #1 - Wellbore	9,900.0	6,745.9	650.8	530.7	5.419	ES
3#3 Nacami M & M 2-10 (Exist) - Wellbore #1 - Wellbore	10,000.0	6,744.8	664.3	540.9	5.382	SF
Bonertz 1 (Exist) - Wellbore #1 - Wellbore #1	8,416.0	6,754.0	605.9	531.7	8.166	CC, ES
Bonertz 1 (Exist) - Wellbore #1 - Wellbore #1	8,600.0	6,753.1	633.2	553.2	7.914	SF
Emily 7-10 (Exist) - Wellbore #1 - Wellbore #1	10,056.3	6,773.0	534.4	409.1	4.265	CC, ES
Emily 7-10 (Exist) - Wellbore #1 - Wellbore #1	10,100.0	6,773.7	536.2	409.4	4.230	SF
Jones 4-11 (Exist) - Wellbore #1 - Wellbore #1	3,230.4	3,152.0	183.3	161.0	8.230	CC, ES
Jones 4-11 (Exist) - Wellbore #1 - Wellbore #1	3,400.0	3,317.7	188.2	164.8	8.050	SF
Lucky Looie 1-9 (P&A) - Wellbore #1 - Wellbore #1	13,592.6	6,719.8	522.6	127.0	1.321	Level 3, CC
Lucky Looie 1-9 (P&A) - Wellbore #1 - Wellbore #1	13,600.0	6,719.7	522.6	126.8	1.320	Level 3, ES, SF
M & M 4-10 (Exist) - Wellbore #1 - Wellbore #1	12,604.8	6,731.4	720.1	506.3	3.368	CC, ES
M & M 4-10 (Exist) - Wellbore #1 - Wellbore #1	12,700.0	6,730.3	726.3	509.3	3.347	SF
M&M (DRJ) 6-10 (Exist) - Wellbore #1 - Wellbore #1	10,961.1	6,738.8	393.2	235.3	2.490	CC, ES
M&M (DRJ) 6-10 (Exist) - Wellbore #1 - Wellbore #1	11,000.0	6,738.3	395.1	235.9	2.481	SF
Mel & Blanche 5 (Exist) - Wellbore #1 - Wellbore #1	11,827.7	6,838.9	164.2	-31.9	0.837	Level 1, CC, ES, SF
Walter D 5-10 (Exist) - Wellbore #1 - Wellbore #1	12,627.6	6,732.5	427.5	213.2	1.995	CC, ES, SF
Yaklich 5-11 (Exist) - Wellbore #1 - Wellbore #1	7,458.2	6,740.5	459.4	413.6	10.026	CC, ES
Yaklich 5-11 (Exist) - Wellbore #1 - Wellbore #1	7,600.0	6,743.3	480.8	431.8	9.810	SF

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Fern 11V-204
<b>Project:</b>	SEC.11-T5N-R65W	<b>TVD Reference:</b>	WELL @ 4642.0ft (Original Well Elev)
<b>Reference Site:</b>	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	<b>MD Reference:</b>	WELL @ 4642.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Fern 11V-204	<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 (8-05-16)	<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						
Fern 5N65W11EJ Pad Sec.11-T5N-R65W						
Fern 11U-204 - Wellbore #1 - Plan #1 (8-05-16)	1,000.0	1,000.0	75.1	69.8	14.346	CC, ES
Fern 11U-204 - Wellbore #1 - Plan #1 (8-05-16)	1,300.0	1,299.2	86.1	79.4	12.858	SF
Fern 11U-334 - Wellbore #1 - Plan #1 (8-05-16)	1,000.0	1,000.0	45.2	39.9	8.635	CC, ES
Fern 11U-334 - Wellbore #1 - Plan #1 (8-05-16)	15,539.7	15,495.3	948.0	353.6	1.595	SF
Fern 11U-434 - Wellbore #1 - Plan #1 (8-05-16)	1,000.0	1,000.0	60.1	54.9	11.491	CC, ES
Fern 11U-434 - Wellbore #1 - Plan #1 (8-05-16)	1,200.0	1,199.9	64.7	58.5	10.365	SF
Fern 11V-214 - Wellbore #1 - Plan #1 (8-05-16)	1,000.0	1,000.0	29.9	24.6	5.711	CC, ES
Fern 11V-214 - Wellbore #1 - Plan #1 (8-05-16)	15,539.7	15,437.9	729.4	133.7	1.224	Level 2, SF
Fern 11V-234 - Wellbore #1 - Plan #1 (8-05-16)	600.0	600.0	29.9	26.8	9.864	CC
Fern 11V-234 - Wellbore #1 - Plan #1 (8-05-16)	15,539.7	15,624.4	407.3	-187.9	0.684	Level 1, ES, SF
Fern 11V-304 - Wellbore #1 - Plan #1 (8-05-16)	1,000.0	1,000.0	14.9	9.7	2.855	CC
Fern 11V-304 - Wellbore #1 - Plan #1 (8-05-16)	15,539.7	15,556.8	300.5	-280.8	0.517	Level 1, ES, SF
Fern 11V-334 - Wellbore #1 - Plan #1 (8-05-16)	800.0	800.0	14.9	10.8	3.616	CC
Fern 11V-334 - Wellbore #1 - Plan #1 (8-05-16)	15,539.7	15,652.7	216.4	-338.0	0.390	Level 1, ES, SF
Fern 11W-214 - Wellbore #1 - Plan #1 (8-05-16)	200.0	200.0	60.1	59.3	72.776	CC, ES
Fern 11W-214 - Wellbore #1 - Plan #1 (8-05-16)	6,200.0	6,090.1	844.9	794.5	16.759	SF
Fern 11W-314 - Wellbore #1 - Plan #1 (8-05-16)	400.0	400.0	44.8	42.9	23.249	CC, ES
Fern 11W-314 - Wellbore #1 - Plan #1 (8-05-16)	15,539.7	15,778.3	762.4	170.9	1.289	Level 3, SF

Offset Design													Existing Wells Sec.4-T5N-R65W - Danni 6-9 (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft							
Survey Program: 100-													Reference		Offset		Semi Major Axis		Distance		Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis		Distance																		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning												
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)													
15,400.0	6,732.8	6,704.2	6,703.7	293.3	14.3	-87.64	-1,448.5	-9,129.2	967.0	659.9	307.09	3.149												
15,500.0	6,732.2	6,705.0	6,704.5	296.7	14.3	-87.90	-1,448.5	-9,129.2	869.2	558.6	310.56	2.799												
15,539.7	6,732.0	6,705.4	6,704.9	298.1	14.3	-88.01	-1,448.5	-9,129.2	830.5	518.6	311.94	2.662	CC, ES, SF											