

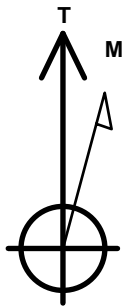
# PDC Energy Inc. DJ Basin

Well Name: **Thistle Down 31H-312**

Surface Location: Thistle Down 5N64W31H Pad Sec.31-T5N-R64W  
 North American Datum 1983 , US State Plane 1983 Colorado Northern Zone  
 Ground Elevation: 4804.0  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.0 0.0 1372530.01 3251619.41 40.352480 -104.597170  
 Original Well Elev WELL @ 4827.0ft (Original Well Elev)

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1474'FSL, 1357'FWL, SEC.31	1.0	0.0	0.0	Point
BHL 1792'FSL, 800'FWL, SEC.32	6926.0	335.6	4721.4	Point
LPL 1792'FSL, 738'FWL, SEC.31	6966.0	313.3	-620.4	Point



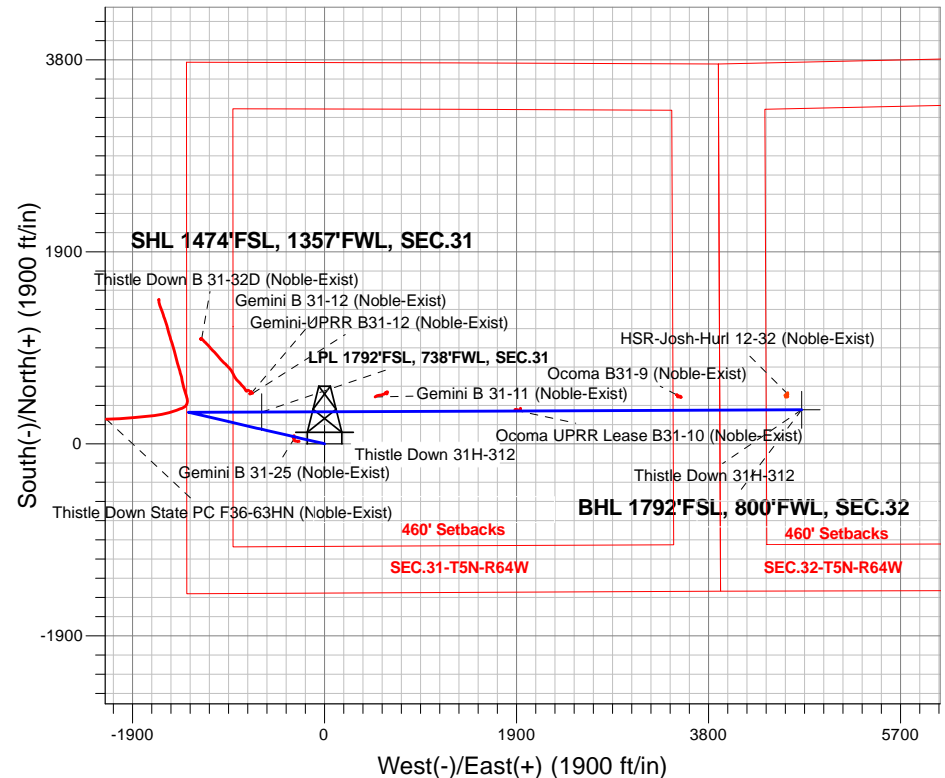
Azimuths to True North  
 Magnetic North: 8.00°

Magnetic Field  
 Strength: 52520.6snT  
 Dip Angle: 66.84°  
 Date: 3/7/2017  
 Model: IGRF2010

Thistle Down 5N64W31H Pad Sec.31-T5N-R64W  
 Thistle Down 31H-312  
 Plan #1 (2-28-17)  
 13:15, March 07 2017

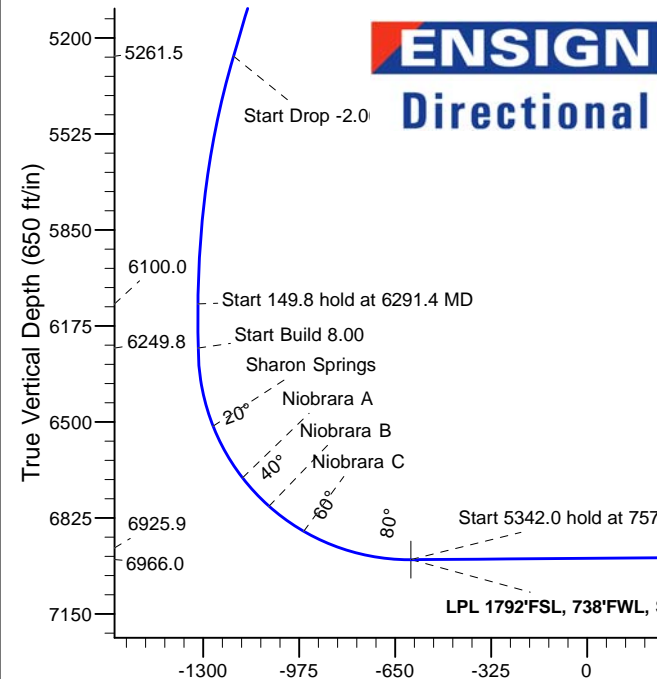
## ANNOTATIONS

TVD	MD	Annotation
600.0	600.0	KOP - Start Build 1.50
5261.5	5440.4	Start Drop -2.00
6100.0	6291.4	Start 149.8 hold at 6291.4 MD
6249.8	6441.2	Start Build 8.00
6966.0	7571.6	Start 5342.0 hold at 7571.6 MD
6925.9	12913.6	TD at 12913.6



## 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	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1734.6	17.02	283.02	1718.0	37.7	-163.0	1.50	283.02	-159.9	
4	5440.4	17.02	283.02	5261.5	282.0	-1219.8	0.00	0.00	-1196.7	
5	6291.4	0.00	0.00	6100.0	310.3	-1342.0	2.00	180.00	-1316.6	
6	6441.2	0.00	0.00	6249.8	310.3	-1342.0	0.00	0.00	-1316.6	
7	7571.6	90.43	89.76	6966.0	313.3	-620.4	8.00	89.76	-596.6	
8	7571.6	90.43	89.76	6966.0	313.3	-620.4	0.00	0.00	-596.6	LPL 1792'FSL, 738'FWL, SEC.31
9	12913.6	90.43	89.76	6925.9	335.7	4721.4	0.00	0.00	4733.3	BHL 1792'FSL, 800'FWL, SEC.32



Vertical Section at 85.93° (650 ft/in)

BHL 1792'FSL, 800'FWL, SEC.32

TD at 12913.6



## **PDC Energy Inc. DJ Basin**

**SEC.31-T5N-R64W**

**Thistle Down 5N64W31H Pad Sec.31-T5N-R64W**

**Thistle Down 31H-312**

**Wellbore #1**

**Plan #1 (2-28-17)**

## **Anticollision Report**

**07 March, 2017**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Thistle Down 31H-312
<b>Project:</b>	SEC.31-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Reference Site:</b>	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	<b>MD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Thistle Down 31H-312	<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 (2-28-17)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (2-28-17)		
<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> 3/7/2017			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	12,913.6	Plan #1 (2-28-17) (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.31-T5N-R64W (GRID)						
Gemini B 31-11 (Noble-Exist) - Wellbore #1 - Wellbore #1	8,701.9	6,950.4	150.3	72.9	1.943	CC, ES, SF
Gemini B 31-25 (Noble-Exist) - Wellbore #1 - Wellbore #	2,092.2	2,028.9	38.4	23.6	2.594	CC
Gemini B 31-25 (Noble-Exist) - Wellbore #1 - Wellbore #	2,100.0	2,036.4	38.5	23.6	2.584	ES, SF
Ocoma B31-9 (Noble-Exist) - Wellbore #1 - Wellbore #1	11,677.6	6,897.9	154.4	-17.0	0.901	Level 1, CC, ES, SF
Ocoma UPRR Lease B31-10 (Noble-Exist) - Wellbore #1	10,079.1	6,934.5	9.2	-109.8	0.077	Level 1, CC, ES, SF
Existing Wells Sec.32-T5N-R64W (GRID)						
HSR-Josh-Hurl 12-32 (Noble-Exist) - Wellbore #1 - Wellb	12,772.6	6,880.9	156.6	-51.9	0.751	Level 1, CC, ES, SF
Thistle Down 5N64W31H Pad Sec.31-T5N-R64W						
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	366.3	367.3	14.6	12.8	8.352	CC
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	12,913.6	12,860.6	285.8	-100.1	0.741	Level 1, ES, SF
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	166.3	167.3	29.1	28.5	45.282	CC
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	200.0	201.0	29.1	28.3	35.154	ES
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	12,913.6	12,955.9	542.7	146.3	1.369	Level 3, SF
Thistle Down 31H-202 - Wellbore #1 - Plan #1 (2-28-17)	600.0	600.0	14.6	11.5	4.811	CC
Thistle Down 31H-202 - Wellbore #1 - Plan #1 (2-28-17)	12,913.6	12,847.1	282.1	-102.8	0.733	Level 1, ES, SF
Thistle Down 31H-232 - Wellbore #1 - Plan #1 (2-28-17)	600.0	600.0	47.4	44.3	15.637	CC
Thistle Down 31H-232 - Wellbore #1 - Plan #1 (2-28-17)	700.0	700.0	47.7	44.1	13.362	ES
Thistle Down 31H-232 - Wellbore #1 - Plan #1 (2-28-17)	12,913.6	12,870.4	786.4	391.3	1.991	SF
Thistle Down 31H-302 - Wellbore #1 - Plan #1 (2-28-17)	600.0	600.0	29.1	26.1	9.623	CC
Thistle Down 31H-302 - Wellbore #1 - Plan #1 (2-28-17)	700.0	700.0	29.5	25.9	8.259	ES
Thistle Down 31H-302 - Wellbore #1 - Plan #1 (2-28-17)	12,913.6	12,918.7	539.3	142.4	1.359	Level 3, SF
Thistle Down 31H-332 - Wellbore #1 - Plan #1 (2-28-17)	600.0	599.0	61.9	58.9	20.467	CC, ES
Thistle Down 31H-332 - Wellbore #1 - Plan #1 (2-28-17)	1,200.0	1,193.0	93.5	87.1	14.484	SF
Thistle Down 31I-212 - Wellbore #1 - Plan #1 (2-28-17)	400.0	399.0	76.5	74.6	39.753	CC, ES
Thistle Down 31I-212 - Wellbore #1 - Plan #1 (2-28-17)	3,800.0	3,674.9	799.1	757.8	19.343	SF
Thistle Down 31I-302 - Wellbore #1 - Plan #1 (2-28-17)	200.0	199.0	91.1	90.3	110.630	CC, ES
Thistle Down 31I-302 - Wellbore #1 - Plan #1 (2-28-17)	3,200.0	3,050.0	781.4	749.0	24.146	SF
Thistle Down PC F36-63HN Pad Sec.36-T5N-R65W						
Thistle Down State PC F36-63HN (Noble-Exist) - Wellbo	6,441.2	6,333.2	69.6	13.3	1.236	Level 2, ES, SF
Thistle Down State PC F36-63HN (Noble-Exist) - Wellbo	6,458.7	6,348.4	69.1	20.5	1.420	Level 3, CC

