

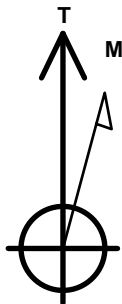
PDC Energy Inc. DJ Basin

Well Name: **Jagged 8N**

Surface Location: Jagged 4N64W08 Pad Sec.8-T4N-R64W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4772.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1362799.78 3257682.66 40.325600 -104.575780
Original Well Elev WELL @ 4795.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2167'FSL, 2290'FWL, SEC.8	1.0	0.0	0.0	Point
BHL 1120'FSL, 2297'FWL, SEC.7	6805.0	-1097.9	-5027.3	Point
LPL 1120'FSL, 1908'FWL, SEC.8	6805.0	-1049.5	-384.3	Point



Azimuths to True North
Magnetic North: 7.94°

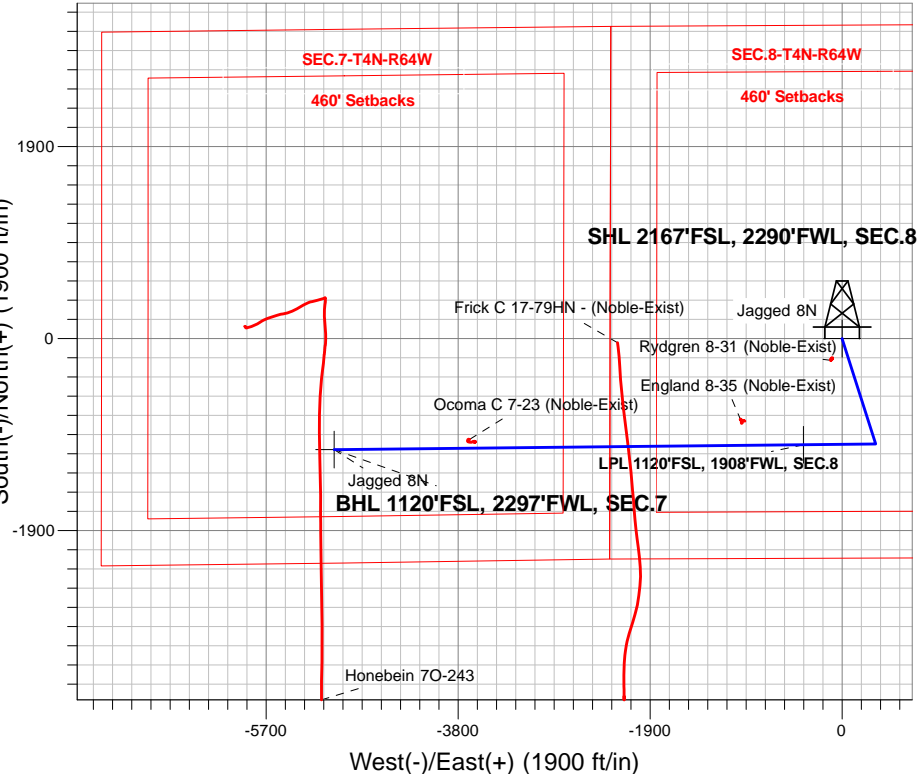
Magnetic Field
Strength: 52476.4snT
Dip Angle: 66.81°
Date: 6/28/2017
Model: IGRF2010

Jagged 4N64W08 Pad Sec.8-T4N-R64W
Jagged 8N
Plan #2 (6-27-17)
9:53, June 28 2017

ANNOTATIONS

TVD	MD	Annotation
600.0	600.0	KOP - Start Build 1.50
5223.5	5340.4	Start Drop -2.00
5900.0	6023.4	Start 189.2 hold at 6023.4 MD
6089.2	6212.5	Start Build 8.00
6805.0	7337.4	Start 4642.8 hold at 7337.4 MD
6805.0	11980.2	TD at 11980.2

South(-)/North(+) (1900 ft/in)

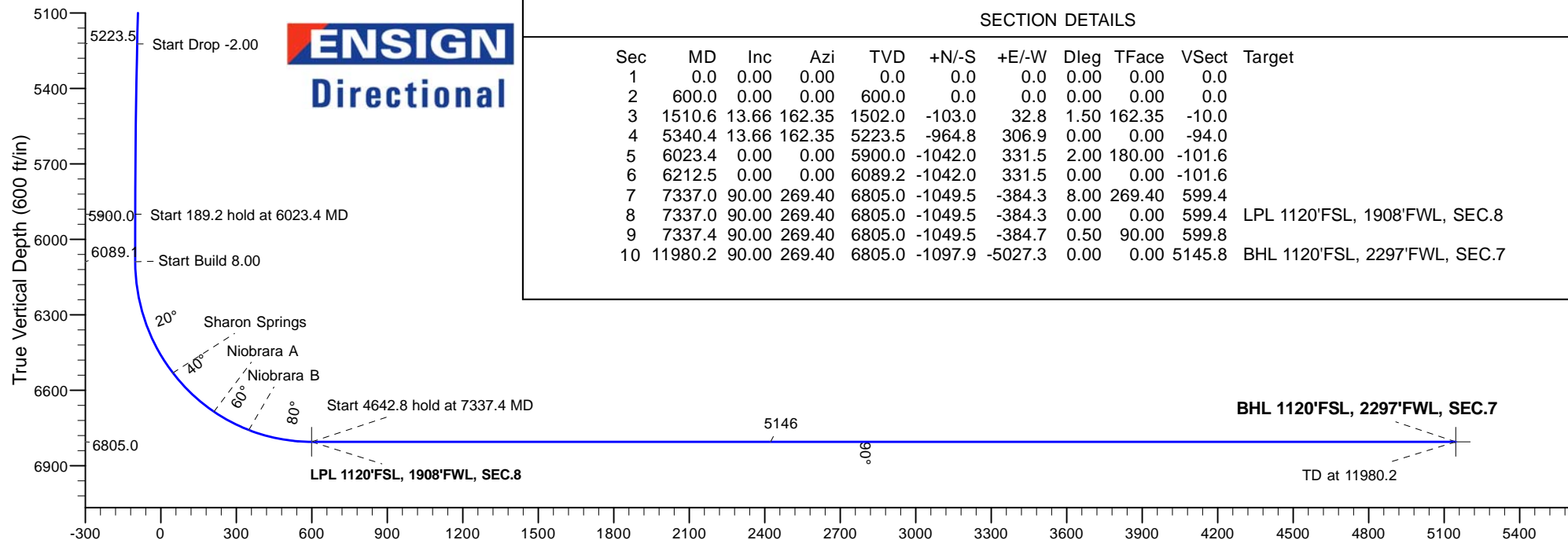


West(-)/East(+) (1900 ft/in)

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	1510.6	13.66	162.35	1502.0	-103.0	32.8	1.50	162.35	-10.0	
4	5340.4	13.66	162.35	5223.5	-964.8	306.9	0.00	0.00	-94.0	
5	6023.4	0.00	0.00	5900.0	-1042.0	331.5	2.00	180.00	-101.6	
6	6212.5	0.00	0.00	6089.2	-1042.0	331.5	0.00	0.00	-101.6	
7	7337.0	90.00	269.40	6805.0	-1049.5	-384.3	8.00	269.40	599.4	
8	7337.0	90.00	269.40	6805.0	-1049.5	-384.3	0.00	0.00	599.4	LPL 1120'FSL, 1908'FWL, SEC.8
9	7337.4	90.00	269.40	6805.0	-1049.5	-384.7	0.50	90.00	599.8	
10	11980.2	90.00	269.40	6805.0	-1097.9	-5027.3	0.00	0.00	5145.8	BHL 1120'FSL, 2297'FWL, SEC.7

ENSIGN
Directional



Vertical Section at 257.68° (600 ft/in)

PDC Energy Inc. DJ Basin

SEC.8-T4N-R64W

Jagged 4N64W08 Pad Sec.8-T4N-R64W

Jagged 8N

Wellbore #1

Plan #2 (6-27-17)

Anticollision Summary Report

28 June, 2017

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Jagged 8N
Project:	SEC.8-T4N-R64W	TVD Reference:	WELL @ 4795.0ft (Original Well Elev)
Reference Site:	Jagged 4N64W08 Pad Sec.8-T4N-R64W	MD Reference:	WELL @ 4795.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Jagged 8N	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 #2 (6-27-17)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (6-27-17)		
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 6/28/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,980.2	Plan #2 (6-27-17) (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.7-T4N-R64W (GRID)						
Ocoma C 7-23 (Noble-Exist) - Wellbore #1 - Wellbore #1	10,646.3	6,845.0	87.8	-61.1	0.590	Level 1, CC, ES, SF
Existing Wells Sec.8-T4N-R64W (GRID)						
England 8-35 (Noble-Exist) - Wellbore #1 - Wellbore #1	7,949.6	6,808.3	243.2	183.6	4.084	CC, ES
England 8-35 (Noble-Exist) - Wellbore #1 - Wellbore #1	8,000.0	6,808.6	248.3	187.3	4.066	SF
Rydgren 8-31 (Noble-Exist) - Wellbore #1 - Wellbore #1	1,728.9	1,691.2	153.9	143.3	14.525	CC, ES
Rydgren 8-31 (Noble-Exist) - Wellbore #1 - Wellbore #1	2,000.0	1,954.7	166.0	153.4	13.113	SF
Frick Pad 18-4N-64W						
Frick C 17-79HN - (Noble-Exist) - API #05-123-33279 - M	9,069.4	9,701.5	89.7	37.0	1.701	CC, ES, SF
Honebein 4N64W7K Pad Sec.7-T4N-R64W						
Honebein 7O-243 - Wellbore #1 - Wellbore #1	11,980.2	8,260.4	171.6	108.4	2.715	CC, ES, SF
Jagged 4N64W08 Pad Sec.8-T4N-R64W						
Jagged 10N - Wellbore #1 - Plan #2 (6-27-17)	412.2	412.3	30.1	28.2	15.521	CC, ES
Jagged 10N - Wellbore #1 - Plan #2 (6-27-17)	700.0	698.1	39.5	36.0	11.108	SF
Jagged 1N - Wellbore #1 - Plan #3 (6-27-17)	200.0	200.0	106.0	105.1	128.272	CC
Jagged 1N - Wellbore #1 - Plan #3 (6-27-17)	300.0	299.2	106.3	105.0	77.434	ES
Jagged 1N - Wellbore #1 - Plan #3 (6-27-17)	1,000.0	982.6	156.1	150.7	29.314	SF
Jagged 2N - Wellbore #1 - Plan #3 (6-27-17)	400.0	400.0	89.2	87.3	46.294	CC, ES
Jagged 2N - Wellbore #1 - Plan #3 (6-27-17)	1,000.0	987.1	119.9	114.8	23.252	SF
Jagged 3N - Wellbore #1 - Plan #3 (6-27-17)	600.0	600.0	75.3	72.2	24.847	CC, ES
Jagged 3N - Wellbore #1 - Plan #3 (6-27-17)	1,000.0	991.4	90.4	85.3	17.779	SF
Jagged 4N - Wellbore #1 - Plan #2 (6-27-17)	846.2	845.3	59.7	55.4	13.964	CC, ES
Jagged 4N - Wellbore #1 - Plan #2 (6-27-17)	1,100.0	1,094.2	69.9	64.2	12.432	SF
Jagged 5N - Wellbore #1 - Plan #2 (6-27-17)	921.5	921.1	42.5	37.8	9.080	CC, ES
Jagged 5N - Wellbore #1 - Plan #2 (6-27-17)	11,980.2	12,010.5	761.1	408.2	2.157	SF
Jagged 6N - Wellbore #1 - Plan #2 (6-27-17)	866.6	866.4	29.2	24.8	6.657	CC
Jagged 6N - Wellbore #1 - Plan #2 (6-27-17)	900.0	899.7	29.3	24.8	6.425	ES
Jagged 6N - Wellbore #1 - Plan #2 (6-27-17)	11,980.2	11,915.7	490.0	132.9	1.372	Level 3, SF
Jagged 7N - Wellbore #1 - Plan #3 (6-27-17)	779.7	779.6	13.3	9.3	3.369	CC
Jagged 7N - Wellbore #1 - Plan #3 (6-27-17)	11,980.2	12,068.9	280.0	-41.4	0.871	Level 1, ES, SF
Jagged 9C - Wellbore #1 - Plan #3 (6-27-17)	563.8	563.8	13.5	10.7	4.873	CC
Jagged 9C - Wellbore #1 - Plan #3 (6-27-17)	600.0	600.0	13.6	10.6	4.607	ES
Jagged 9C - Wellbore #1 - Plan #3 (6-27-17)	11,980.2	12,213.9	334.5	31.9	1.106	Level 2, SF

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