PDC Energy Inc. DJ Basin

SEC.6-T3N-R65W
Vega 3N65W06 1-16 Pad
Vega 16N

Vega 16N Wellbore #1
Vega 16N_Final Surveys

Anticollision Summary Report

11 June, 2021

Company:	PDC Energy Inc. DJ Basin	**Local Co-ordinate Reference:**	Well Vega 16N
Project:	SEC.6-T3N-R65W	**TVD Reference:**	RKB @ 4995.0ft (Ensign 142 RKB - 28')
Reference Site:	Vega 3N65W06 1-16 Pad	**MD Reference:**	RKB @ 4995.0ft (Ensign 142 RKB - 28')
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Vega 16N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Vega 16N Wellbore #1	**Database:**	US_EDM
Reference Design:	Vega 16N_Final Surveys	**Offset TVD Reference:**	Offset Datum

Reference	Vega 16N_Final Surveys		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 500.0 ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.45 **Sigma**	**Casing Method:**	Not applied

Survey Program **Date** 05/25/2021

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
155.0	15,403.0	Survey #1 (Vega 16N Wellbore #1)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Elkhead 03N65W06 1-16 Pad						
Elkhead 10N - Elkhead 10N Wellbore #1 - Elkhead 10N_	0.0	0.0	499.9			
Elkhead 11N - Elkhead 11N Wellbore #1 - Elkhead 11N_I						Out of range
Elkhead 12N - Elkhead 12N Wellbore #1 - Elkhead 12N_						Out of range
Elkhead 13N - Wellbore #2 (Sidetrack) - Elkhead 13N (W						Out of range
Elkhead 1N - Elkhead 1N Wellbore #1 - Elkhead 1N_Fina	7,566.1	7,602.7	428.0	388.0	10.708	CC
Elkhead 1N - Elkhead 1N Wellbore #1 - Elkhead 1N_Fina	7,701.0	7,496.7	428.3	387.6	10.515	ES
Elkhead 1N - Elkhead 1N Wellbore #1 - Elkhead 1N_Fina	7,800.0	7,431.0	432.0	390.5	10.417	SF
Elkhead 2N - Elkhead 2N Wellbore #1 - Elkhead 2N Fina						Out of range
Elkhead 9N - Elkhead 9N Wellbore #1 - Elkhead 9N_Fina	15,403.0	15,267.6	296.1	-48.6	0.859	Level 1, CC, ES, SF
Existing Wells Sec.6-T3N-R65W						
HSR-Arc 15-6A (SI) - HSR-Arc 15-6A Wellbore #1 - HSR						Out of range
HSR-Jana 11-6A (SI) - Wellbore #1 - Wellbore #1						Out of range
HSR-JT 10-6 (SI) - Wellbore #1 - Wellbore #1						Out of range
HSR-Upson 14-6 (Exist.) - HSR-Upson 14-6 Wellbore #1						Out of range
J.J.Wardell A (P&A) - J.J.Wardell A Wellbore #1 - J.J.Wa						Out of range
Ludwig 2-6 (P&A) - Wellbore #1 - Wellbore #1						Out of range
Ludwig H 6-6X (P&A) - Wellbore #1 - Wellbore #1	1,859.2	1,814.5	376.7	365.7	34.305	CC
Ludwig H 6-6X (P&A) - Wellbore #1 - Wellbore #1	1,900.0	1,855.2	376.8	365.5	33.552	ES
Ludwig H 6-6X (P&A) - Wellbore #1 - Wellbore #1	7,100.0	7,009.2	447.1	410.0	12.050	SF
Wardell 35-6 (SI) - Wellbore #1 - Wellbore #1						Out of range

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Reference Site:	Vega 3N65W06 1-16 Pad	**MD Reference:**	RKB @ 4995.0ft (Ensign 142 RKB - 28')
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Vega 16N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Vega 16N Wellbore #1	**Database:**	US_EDM
Reference Design:	Vega 16N_Final Surveys	**Offset TVD Reference:**	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Existing Wells Sec.7-T3N-R65W						
HSR-Cook 11-7A (SI) - HSR-Cook 11-7A Wellbore #1 - H						Out of range
HSR-Harland 3-7A (P&A) - HSR-Harland 3-7A Wellbore						Out of range
HSR-Norris 4-7 (P&A) - HSR-Norris 4-7 Wellbore #1 - HS						Out of range
HSR-Oberkfell 6-7A (SI) - HSR-Oberkfell 6-7A Wellbore						Out of range
HSR-Roeder 14-7A (SI) - HSR-Roeder 14-7A Wellbore #						Out of range
Wardell 1-7 (Exist.) - Wardell 1-7 Wellbore #1 - Wardell 1						Out of range
Wardell 22-7 (SI) - Wellbore #1 - Wellbore #1						Out of range
Wardell 3-7-5Z (P&A) - Wellbore #1 - Wellbore #1						Out of range
Wardell 4-6-7 (Exist.) - Wardell 4-6-7 Wellbore #1 - Ward	14,265.3	7,349.3	164.8	-17.6	0.904	Level 1, CC, ES, SF
Wardell 4G-7HZ (Exist.) - Wellbore #1 - Wellbore #1						Out of range
Wardell 6-4-7 (Exist.) - Wardell 6-4-7 Wellbore #1 - Ward						Out of range
Wardell 6-8-7 (Exist.) - Wardell 6-8-7 Wellbore #1 - Ward						Out of range
Wardell 7A 2 (Exist.) - Wardell 7A 2 Wellbore #1 - Warde						Out of range
Wardell 7A 3 (Exist.) - Wardell 7A 3 Wellbore #1 - Warde						Out of range
Wardell B 1 (Exist.) - Wardell B 1 Wellbore #1 - Wardell E						Out of range
Wardell UPRR 32-7 (SI) - Wardell Uprr 32-7 Wellbore #1						Out of range
Wardell-UPRR 31-7 (SI) - Wardell Uprr 31-7 Wellbore #1						Out of range

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Reference Site:	Vega 3N65W06 1-16 Pad	**MD Reference:**	RKB @ 4995.0ft (Ensign 142 RKB - 28')
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Vega 16N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Vega 16N Wellbore #1	**Database:**	US_EDM
Reference Design:	Vega 16N_Final Surveys	**Offset TVD Reference:**	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Vega 3N65W06 1-16 Pad						
Vega 10N - Vega 10N Wellbore #1 - Vega 10N_Final Sur	100.0	100.0	90.0	89.7	424.240	CC
Vega 10N - Vega 10N Wellbore #1 - Vega 10N_Final Sur	200.0	200.0	90.0	89.4	154.051	ES
Vega 10N - Vega 10N Wellbore #1 - Vega 10N_Final Sur	1,900.0	1,876.1	296.8	283.1	21.671	SF
Vega 12N - Vega 12N Wellbore #1 - Vega 12N Final Sur	0.0	0.0	60.0			
Vega 12N - Vega 12N Wellbore #1 - Vega 12N Final Sur	200.0	200.0	60.2	59.6	101.074	ES
Vega 12N - Vega 12N Wellbore #1 - Vega 12N Final Sur	2,300.0	2,280.0	302.7	286.7	18.943	SF
Vega 13N - Vega 13N Wellbore #1 - Vega 13N_Final Sur	0.0	0.0	45.0			
Vega 13N - Vega 13N Wellbore #1 - Vega 13N_Final Sur	200.0	200.0	45.2	44.6	77.200	ES
Vega 13N - Vega 13N Wellbore #1 - Vega 13N_Final Sur	2,500.0	2,481.7	273.0	256.6	16.668	SF
Vega 14N - Vega 14N Wellbore #1 - Vega 14N_Final Sur	0.0	0.0	30.0			
Vega 14N - Vega 14N Wellbore #1 - Vega 14N_Final Sur	200.0	199.9	30.4	29.8	51.120	ES
Vega 14N - Vega 14N Wellbore #1 - Vega 14N_Final Sur	2,000.0	1,993.2	212.5	198.7	15.389	SF
Vega 15N - Vega 15N Wellbore #1 - Vega 15N Final Sur	0.0	0.0	15.0			
Vega 15N - Vega 15N Wellbore #1 - Vega 15N Final Sur	15,403.0	15,275.0	353.5	-0.6	0.998	Level 1, ES, SF
Vega 16N - Vega 16N Wellbore #1 - Plan #4 (5.18.21)	1,759.1	1,759.1	0.2	-0.2	0.437	Level 1, CC
Vega 16N - Vega 16N Wellbore #1 - Plan #4 (5.18.21)	13,400.0	13,381.7	2.6	-119.0	0.021	Level 1, SF
Vega 16N - Vega 16N Wellbore #1 - Plan #4 (5.18.21)	15,403.0	15,384.5	11.8	-223.2	0.050	Level 1, ES
Vega 1N - Vega 1N Wellbore #1 - Vega 1N Wellbore #1	0.0	8.0	120.0			
Vega 1N - Vega 1N Wellbore #1 - Vega 1N Wellbore #1	1,600.0	1,544.4	362.6	351.8	33.524	SF
Vega 2N - Vega 2N Wellbore #1 - Vega 2N Wellbore #1	100.0	108.1	135.0	134.8	606.860	CC
Vega 2N - Vega 2N Wellbore #1 - Vega 2N Wellbore #1	200.0	208.0	135.0	134.4	226.163	ES
Vega 2N - Vega 2N Wellbore #1 - Vega 2N Wellbore #1	1,700.0	1,661.0	342.2	332.5	35.088	SF
Vega 3N - Vega 3N Wellbore #1 - Vega 3N Wellbore #1	200.0	208.0	149.9	149.3	251.640	CC, ES
Vega 3N - Vega 3N Wellbore #1 - Vega 3N Wellbore #1	1,700.0	1,635.2	418.6	408.0	39.403	SF
Vega 4N - Vega 4N Wellbore #1 - Vega 4N Wellbore #1	200.0	208.2	164.7	164.1	275.563	CC, ES
Vega 4N - Vega 4N Wellbore #1 - Vega 4N Wellbore #1	1,800.0	1,706.0	432.7	422.4	42.410	SF
Vega 5N - Vega 5N Wellbore #1 - Vega 5N Wellbore #1	0.0	8.0	180.0			
Vega 5N - Vega 5N Wellbore #1 - Vega 5N Wellbore #1	200.0	208.0	180.1	179.5	297.031	ES
Vega 5N - Vega 5N Wellbore #1 - Vega 5N Wellbore #1	1,800.0	1,706.0	492.8	482.4	47.145	SF
Vega 6N - Vega 6N Wellbore #1 - Vega 6N Wellbore #1	0.0	7.9	195.0			
Vega 6N - Vega 6N Wellbore #1 - Vega 6N Wellbore #1	1,600.0	1,513.0	473.3	464.2	52.095	SF
Vega 7N - Vega 7N Wellbore #1 - Vega 7N Wellbore #1	0.0	8.0	210.0			
Vega 7N - Vega 7N Wellbore #1 - Vega 7N Wellbore #1	200.0	207.6	210.2	209.6	346.072	ES
Vega 7N - Vega 7N Wellbore #1 - Vega 7N Wellbore #1	1,300.0	1,229.4	424.8	417.7	59.970	SF
Vega 8N - Vega 8N Wellbore #1 - Vega 8N Wellbore #1	0.0	8.0	224.9			
Vega 8N - Vega 8N Wellbore #1 - Vega 8N Wellbore #1	100.0	107.4	225.1	224.9	1,013.621	ES
Vega 8N - Vega 8N Wellbore #1 - Vega 8N Wellbore #1	1,300.0	1,197.0	493.4	486.4	70.767	SF
Vega 9N - Vega 9N Wellbore #1 - Vega 9N_As Drilled	100.0	100.1	105.0	104.8	495.179	CC
Vega 9N - Vega 9N Wellbore #1 - Vega 9N_As Drilled	200.0	200.1	105.0	104.4	177.941	ES
Vega 9N - Vega 9N Wellbore #1 - Vega 9N_As Drilled	1,700.0	1,661.6	315.3	302.5	24.595	SF

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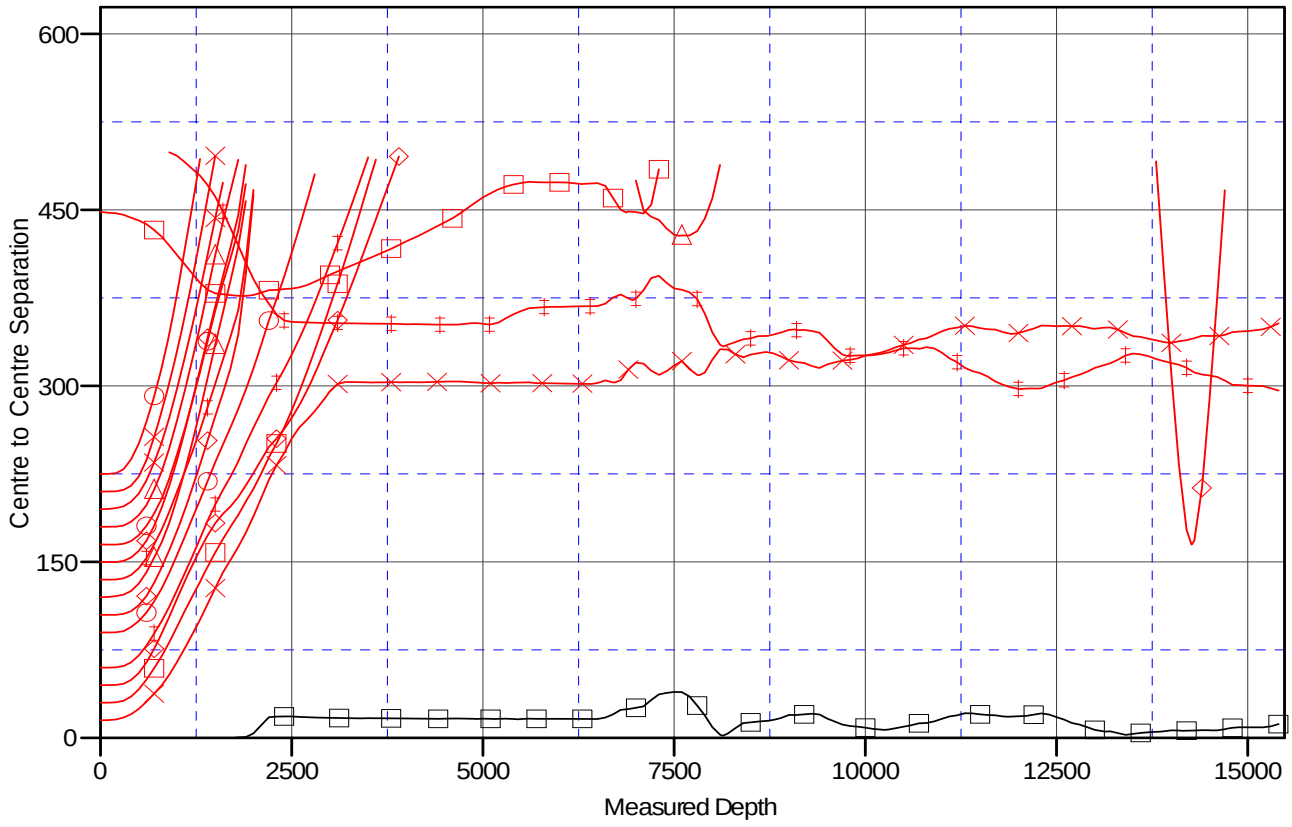
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Vega 16N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Vega 16N Wellbore #1	**Database:**	US_EDM
Reference Design:	Vega 16N_Final Surveys	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 4995.0ft (Ensign 142 RKB - 2
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000
Coordinates are relative to: Vega 16N
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.51°

Ladder Plot



L E G E N D

lbore #1 V0
Elkhead 10N_Final Surveys V0
khead 9N_Final Surveys V0
khead 1N_Final Surveys V0
llbore #1, Wardell 4-6-7 Wellbore #1 V0
N Wellbore #1 V0
a 13N_Final Surveys V0

Vega 7N, Vega 7N Wellbore #1, Vega 7N Wellbore #1 V0
Vega 9N, Vega 9N Wellbore #1, Vega 9N_As Drilled V0
Vega 6N, Vega 6N Wellbore #1, Vega 6N Wellbore #1 V0
Vega 1N, Vega 1N Wellbore #1, Vega 1N Wellbore #1 V0
Vega 3N, Vega 3N Wellbore #1, Vega 3N Wellbore #1 V0
Vega 4N, Vega 4N Wellbore #1, Vega 4N Wellbore #1 V0
Vega 15N, Vega 15N Wellbore #1, Vega 15N Final Surveys V0

Vega 2N, Vega 2N Wellbore #1, V
Vega 5N, Vega 5N Wellbore #1, V
Vega 12N, Vega 12N Wellbore #1
Vega 16N, Vega 16N Wellbore #1
Vega 14N, Vega 14N Wellbore #1
Vega 10N, Vega 10N Wellbore #1

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Reference Well:	Vega 16N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Vega 16N Wellbore #1	**Database:**	US_EDM
Reference Design:	Vega 16N_Final Surveys	**Offset TVD Reference:**	Offset Datum

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Offset Depths are relative to Offset Datum
Central Meridian is -105.500000
Coordinates are relative to: Vega 16N
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.51°