

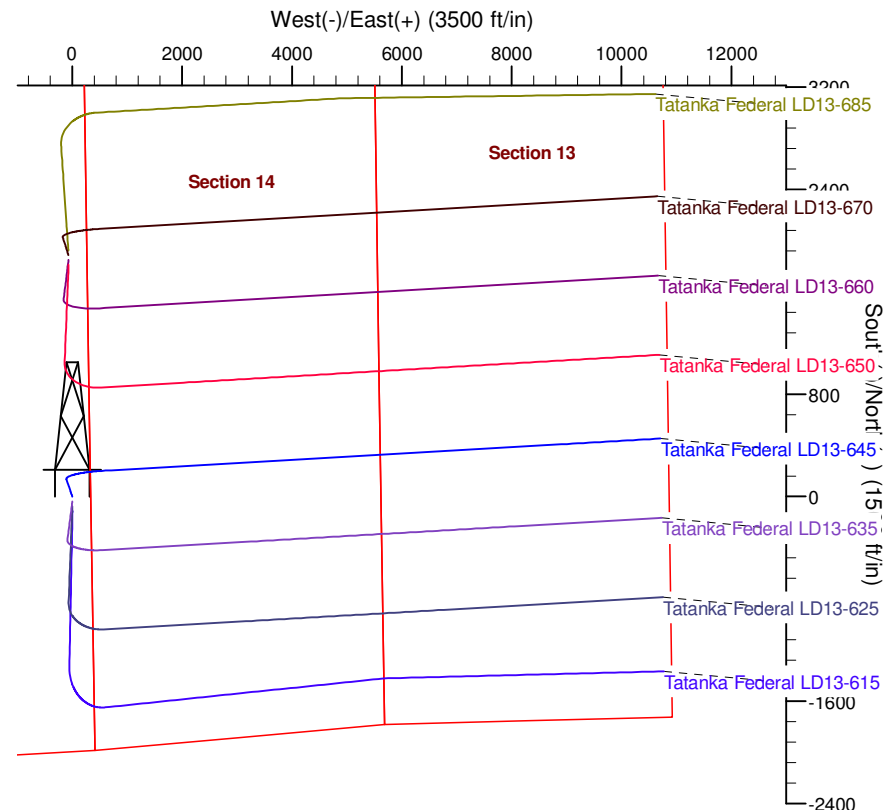
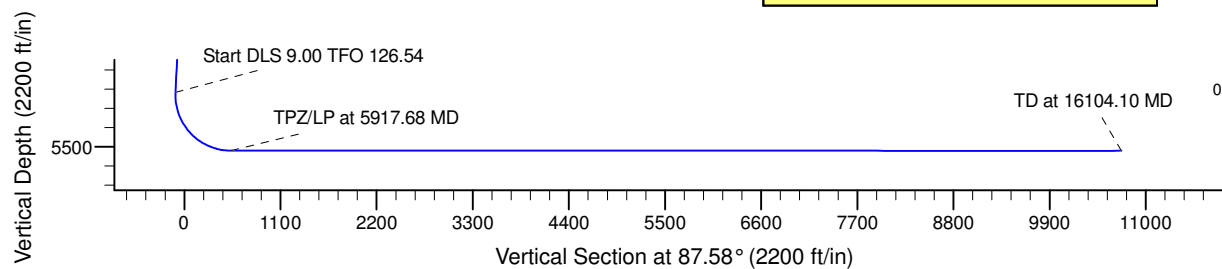
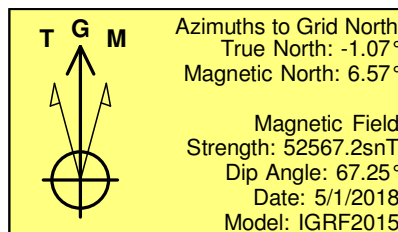
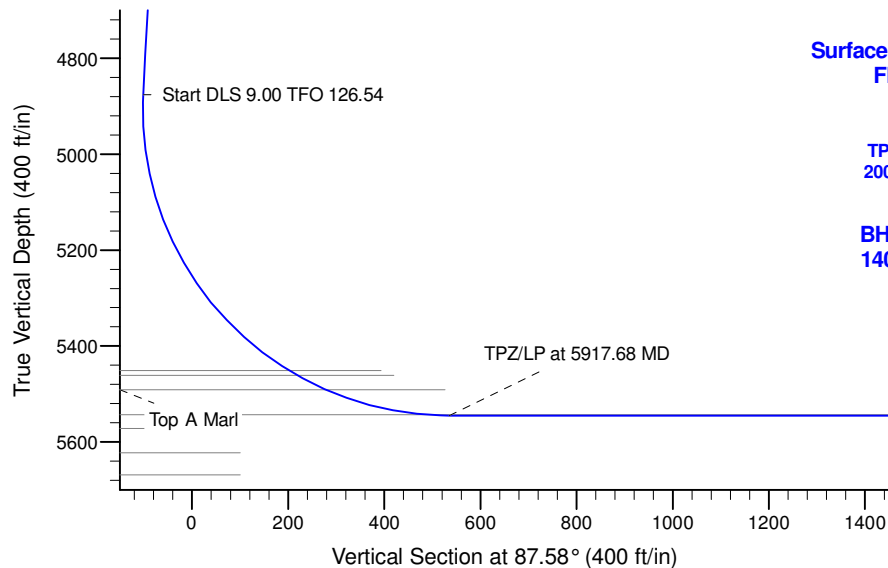
Project: East Pony
Site: LD Section 15
Well: Tatanka Federal LD13-645
Wellbore: Wellbore #1
Design: Plan #1

Northern Region - DJ Basin

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2800.00	0.00	0.00	2800.00	0.00	0.00	0.00	0.00	0.00	
3	3054.86	5.10	321.93	3054.52	8.91	-6.99	2.00	321.93	-6.60	
4	4883.90	5.10	321.93	4876.33	136.85	-107.19	0.00	0.00	-101.30	
5	5917.68	90.00	88.58	5545.00	200.46	527.15	9.00	126.54	535.16	Tatanka Federal LD13-645 TPZ/LP
6	16104.10	90.00	88.58	5545.00	453.26	10710.44	0.00	0.00	10720.03	Tatanka Federal LD13-645 BHL



WELL DETAILS: Tatanka Federal LD13-645

	North	East	Lat	Long
0.00	0.00	1520216.12	4661.00 40.7495900	-103.8418200

Plan: Plan #1 (Tatanka Federal LD13-645/Wellbore #1)

Created By: Colby Baxter Date: 11:17, July 10 2018

Checked: _____ Date: _____

Reviewed: _____ Date: _____

Approved: _____ Date: _____

Northern Region - DJ Basin

East Pony

LD Section 15

Tatanka Federal LD13-645

Wellbore #1

Plan: Plan #1

Standard Survey Report

10 July, 2018

Noble Energy, Inc.

Survey Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Well:	Tatanka Federal LD13-645	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDMP

Project	East Pony, Weld County Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		LD Section 15			
Site Position:		Northing:	1,522,925.45 usft	Latitude:	40.7571973
From:	Map	Easting:	3,456,045.62 usft	Longitude:	-103.8537859
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	1.06 °

Well		Tatanka Federal LD13-645				
Well Position	+N/-S	0.00 ft	Northing:	1,520,216.12 usft	Latitude:	40.7495900
	+E/-W	0.00 ft	Easting:	3,459,411.95 usft	Longitude:	-103.8418200
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,661.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/1/2018	7.64	67.25	52,567.23891643

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	87.58	

Survey Tool Program	Date	7/10/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	16,104.10	Plan #1 (Wellbore #1)	2_MWD+IFR1+MS	A008Mb: IFR dec & multi-station analysis	

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	

Noble Energy, Inc.

Survey Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Well:	Tatanka Federal LD13-645	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDMP

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	2.00	321.93	2,899.98	1.37	-1.08	-1.02	2.00	2.00	0.00
3,000.00	4.00	321.93	2,999.84	5.49	-4.30	-4.07	2.00	2.00	0.00
3,054.86	5.10	321.93	3,054.52	8.91	-6.99	-6.60	2.00	2.00	0.00
3,100.00	5.10	321.93	3,099.49	12.07	-9.46	-8.94	0.00	0.00	0.00
3,200.00	5.10	321.93	3,199.09	19.07	-14.94	-14.12	0.00	0.00	0.00
3,300.00	5.10	321.93	3,298.69	26.06	-20.42	-19.30	0.00	0.00	0.00
3,400.00	5.10	321.93	3,398.30	33.06	-25.89	-24.47	0.00	0.00	0.00
3,500.00	5.10	321.93	3,497.90	40.05	-31.37	-29.65	0.00	0.00	0.00
3,600.00	5.10	321.93	3,597.51	47.04	-36.85	-34.83	0.00	0.00	0.00
3,700.00	5.10	321.93	3,697.11	54.04	-42.33	-40.01	0.00	0.00	0.00
3,800.00	5.10	321.93	3,796.72	61.03	-47.81	-45.18	0.00	0.00	0.00
3,900.00	5.10	321.93	3,896.32	68.03	-53.29	-50.36	0.00	0.00	0.00
4,000.00	5.10	321.93	3,995.93	75.02	-58.76	-55.54	0.00	0.00	0.00
4,100.00	5.10	321.93	4,095.53	82.02	-64.24	-60.72	0.00	0.00	0.00
4,200.00	5.10	321.93	4,195.14	89.01	-69.72	-65.89	0.00	0.00	0.00
4,300.00	5.10	321.93	4,294.74	96.01	-75.20	-71.07	0.00	0.00	0.00
4,400.00	5.10	321.93	4,394.34	103.00	-80.68	-76.25	0.00	0.00	0.00
4,500.00	5.10	321.93	4,493.95	109.99	-86.16	-81.43	0.00	0.00	0.00
4,600.00	5.10	321.93	4,593.55	116.99	-91.63	-86.61	0.00	0.00	0.00
4,700.00	5.10	321.93	4,693.16	123.98	-97.11	-91.78	0.00	0.00	0.00
4,800.00	5.10	321.93	4,792.76	130.98	-102.59	-96.96	0.00	0.00	0.00
4,883.90	5.10	321.93	4,876.33	136.85	-107.19	-101.30	0.00	0.00	0.00
4,900.00	4.39	337.32	4,892.38	137.98	-107.87	-101.94	9.00	-4.38	95.58
5,000.00	8.46	59.81	4,991.89	145.22	-102.97	-96.74	9.00	4.07	82.50
5,100.00	16.90	74.95	5,089.39	152.71	-82.54	-76.01	9.00	8.44	15.14

Noble Energy, Inc.

Survey Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Well:	Tatanka Federal LD13-645	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDMP

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,200.00	25.72	80.03	5,182.47	160.25	-47.06	-40.24	9.00	8.82	5.08
5,300.00	34.62	82.63	5,268.84	167.67	2.58	9.67	9.00	8.91	2.60
5,400.00	43.56	84.26	5,346.38	174.77	65.17	72.50	9.00	8.94	1.63
5,500.00	52.52	85.43	5,413.17	181.39	139.16	146.70	9.00	8.96	1.17
5,600.00	61.49	86.35	5,467.57	187.36	222.73	230.45	9.00	8.97	0.92
5,700.00	70.46	87.12	5,508.24	192.53	313.83	321.69	9.00	8.97	0.77
5,800.00	79.44	87.81	5,534.18	196.78	410.20	418.16	9.00	8.98	0.69
5,900.00	88.41	88.46	5,544.76	200.01	509.49	517.49	9.00	8.98	0.65
5,917.68	90.00	88.58	5,545.00	200.46	527.15	535.16	9.00	8.98	0.64
6,000.00	90.00	88.58	5,545.00	202.50	609.45	617.47	0.00	0.00	0.00
6,100.00	90.00	88.58	5,545.00	204.99	709.42	717.46	0.00	0.00	0.00
6,200.00	90.00	88.58	5,545.00	207.47	809.39	817.44	0.00	0.00	0.00
6,300.00	90.00	88.58	5,545.00	209.95	909.36	917.42	0.00	0.00	0.00
6,400.00	90.00	88.58	5,545.00	212.43	1,009.33	1,017.41	0.00	0.00	0.00
6,500.00	90.00	88.58	5,545.00	214.91	1,109.30	1,117.39	0.00	0.00	0.00
6,600.00	90.00	88.58	5,545.00	217.39	1,209.27	1,217.38	0.00	0.00	0.00
6,700.00	90.00	88.58	5,545.00	219.88	1,309.24	1,317.36	0.00	0.00	0.00
6,800.00	90.00	88.58	5,545.00	222.36	1,409.21	1,417.35	0.00	0.00	0.00
6,900.00	90.00	88.58	5,545.00	224.84	1,509.18	1,517.33	0.00	0.00	0.00
7,000.00	90.00	88.58	5,545.00	227.32	1,609.15	1,617.32	0.00	0.00	0.00
7,100.00	90.00	88.58	5,545.00	229.80	1,709.11	1,717.30	0.00	0.00	0.00
7,200.00	90.00	88.58	5,545.00	232.28	1,809.08	1,817.29	0.00	0.00	0.00
7,300.00	90.00	88.58	5,545.00	234.77	1,909.05	1,917.27	0.00	0.00	0.00
7,400.00	90.00	88.58	5,545.00	237.25	2,009.02	2,017.26	0.00	0.00	0.00
7,500.00	90.00	88.58	5,545.00	239.73	2,108.99	2,117.24	0.00	0.00	0.00
7,600.00	90.00	88.58	5,545.00	242.21	2,208.96	2,217.23	0.00	0.00	0.00
7,700.00	90.00	88.58	5,545.00	244.69	2,308.93	2,317.21	0.00	0.00	0.00
7,800.00	90.00	88.58	5,545.00	247.17	2,408.90	2,417.20	0.00	0.00	0.00
7,900.00	90.00	88.58	5,545.00	249.66	2,508.87	2,517.18	0.00	0.00	0.00
8,000.00	90.00	88.58	5,545.00	252.14	2,608.84	2,617.17	0.00	0.00	0.00
8,100.00	90.00	88.58	5,545.00	254.62	2,708.81	2,717.15	0.00	0.00	0.00
8,200.00	90.00	88.58	5,545.00	257.10	2,808.78	2,817.13	0.00	0.00	0.00
8,300.00	90.00	88.58	5,545.00	259.58	2,908.74	2,917.12	0.00	0.00	0.00
8,400.00	90.00	88.58	5,545.00	262.07	3,008.71	3,017.10	0.00	0.00	0.00
8,500.00	90.00	88.58	5,545.00	264.55	3,108.68	3,117.09	0.00	0.00	0.00
8,600.00	90.00	88.58	5,545.00	267.03	3,208.65	3,217.07	0.00	0.00	0.00
8,700.00	90.00	88.58	5,545.00	269.51	3,308.62	3,317.06	0.00	0.00	0.00
8,800.00	90.00	88.58	5,545.00	271.99	3,408.59	3,417.04	0.00	0.00	0.00
8,900.00	90.00	88.58	5,545.00	274.47	3,508.56	3,517.03	0.00	0.00	0.00
9,000.00	90.00	88.58	5,545.00	276.96	3,608.53	3,617.01	0.00	0.00	0.00
9,100.00	90.00	88.58	5,545.00	279.44	3,708.50	3,717.00	0.00	0.00	0.00
9,200.00	90.00	88.58	5,545.00	281.92	3,808.47	3,816.98	0.00	0.00	0.00
9,300.00	90.00	88.58	5,545.00	284.40	3,908.44	3,916.97	0.00	0.00	0.00

Noble Energy, Inc.

Survey Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Well:	Tatanka Federal LD13-645	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDMP

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,400.00	90.00	88.58	5,545.00	286.88	4,008.41	4,016.95	0.00	0.00	0.00
9,500.00	90.00	88.58	5,545.00	289.36	4,108.38	4,116.94	0.00	0.00	0.00
9,600.00	90.00	88.58	5,545.00	291.85	4,208.34	4,216.92	0.00	0.00	0.00
9,700.00	90.00	88.58	5,545.00	294.33	4,308.31	4,316.91	0.00	0.00	0.00
9,800.00	90.00	88.58	5,545.00	296.81	4,408.28	4,416.89	0.00	0.00	0.00
9,900.00	90.00	88.58	5,545.00	299.29	4,508.25	4,516.87	0.00	0.00	0.00
10,000.00	90.00	88.58	5,545.00	301.77	4,608.22	4,616.86	0.00	0.00	0.00
10,100.00	90.00	88.58	5,545.00	304.25	4,708.19	4,716.84	0.00	0.00	0.00
10,200.00	90.00	88.58	5,545.00	306.74	4,808.16	4,816.83	0.00	0.00	0.00
10,300.00	90.00	88.58	5,545.00	309.22	4,908.13	4,916.81	0.00	0.00	0.00
10,400.00	90.00	88.58	5,545.00	311.70	5,008.10	5,016.80	0.00	0.00	0.00
10,500.00	90.00	88.58	5,545.00	314.18	5,108.07	5,116.78	0.00	0.00	0.00
10,600.00	90.00	88.58	5,545.00	316.66	5,208.04	5,216.77	0.00	0.00	0.00
10,700.00	90.00	88.58	5,545.00	319.14	5,308.01	5,316.75	0.00	0.00	0.00
10,800.00	90.00	88.58	5,545.00	321.63	5,407.97	5,416.74	0.00	0.00	0.00
10,900.00	90.00	88.58	5,545.00	324.11	5,507.94	5,516.72	0.00	0.00	0.00
11,000.00	90.00	88.58	5,545.00	326.59	5,607.91	5,616.71	0.00	0.00	0.00
11,100.00	90.00	88.58	5,545.00	329.07	5,707.88	5,716.69	0.00	0.00	0.00
11,200.00	90.00	88.58	5,545.00	331.55	5,807.85	5,816.68	0.00	0.00	0.00
11,300.00	90.00	88.58	5,545.00	334.03	5,907.82	5,916.66	0.00	0.00	0.00
11,400.00	90.00	88.58	5,545.00	336.52	6,007.79	6,016.65	0.00	0.00	0.00
11,500.00	90.00	88.58	5,545.00	339.00	6,107.76	6,116.63	0.00	0.00	0.00
11,600.00	90.00	88.58	5,545.00	341.48	6,207.73	6,216.62	0.00	0.00	0.00
11,700.00	90.00	88.58	5,545.00	343.96	6,307.70	6,316.60	0.00	0.00	0.00
11,800.00	90.00	88.58	5,545.00	346.44	6,407.67	6,416.58	0.00	0.00	0.00
11,900.00	90.00	88.58	5,545.00	348.92	6,507.64	6,516.57	0.00	0.00	0.00
12,000.00	90.00	88.58	5,545.00	351.41	6,607.61	6,616.55	0.00	0.00	0.00
12,100.00	90.00	88.58	5,545.00	353.89	6,707.57	6,716.54	0.00	0.00	0.00
12,200.00	90.00	88.58	5,545.00	356.37	6,807.54	6,816.52	0.00	0.00	0.00
12,300.00	90.00	88.58	5,545.00	358.85	6,907.51	6,916.51	0.00	0.00	0.00
12,400.00	90.00	88.58	5,545.00	361.33	7,007.48	7,016.49	0.00	0.00	0.00
12,500.00	90.00	88.58	5,545.00	363.81	7,107.45	7,116.48	0.00	0.00	0.00
12,600.00	90.00	88.58	5,545.00	366.30	7,207.42	7,216.46	0.00	0.00	0.00
12,700.00	90.00	88.58	5,545.00	368.78	7,307.39	7,316.45	0.00	0.00	0.00
12,800.00	90.00	88.58	5,545.00	371.26	7,407.36	7,416.43	0.00	0.00	0.00
12,900.00	90.00	88.58	5,545.00	373.74	7,507.33	7,516.42	0.00	0.00	0.00
13,000.00	90.00	88.58	5,545.00	376.22	7,607.30	7,616.40	0.00	0.00	0.00
13,100.00	90.00	88.58	5,545.00	378.70	7,707.27	7,716.39	0.00	0.00	0.00
13,200.00	90.00	88.58	5,545.00	381.19	7,807.24	7,816.37	0.00	0.00	0.00
13,300.00	90.00	88.58	5,545.00	383.67	7,907.20	7,916.36	0.00	0.00	0.00
13,400.00	90.00	88.58	5,545.00	386.15	8,007.17	8,016.34	0.00	0.00	0.00
13,500.00	90.00	88.58	5,545.00	388.63	8,107.14	8,116.33	0.00	0.00	0.00
13,600.00	90.00	88.58	5,545.00	391.11	8,207.11	8,216.31	0.00	0.00	0.00

Noble Energy, Inc.

Survey Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Well:	Tatanka Federal LD13-645	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDMP

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,700.00	90.00	88.58	5,545.00	393.59	8,307.08	8,316.29	0.00	0.00	0.00
13,800.00	90.00	88.58	5,545.00	396.08	8,407.05	8,416.28	0.00	0.00	0.00
13,900.00	90.00	88.58	5,545.00	398.56	8,507.02	8,516.26	0.00	0.00	0.00
14,000.00	90.00	88.58	5,545.00	401.04	8,606.99	8,616.25	0.00	0.00	0.00
14,100.00	90.00	88.58	5,545.00	403.52	8,706.96	8,716.23	0.00	0.00	0.00
14,200.00	90.00	88.58	5,545.00	406.00	8,806.93	8,816.22	0.00	0.00	0.00
14,300.00	90.00	88.58	5,545.00	408.48	8,906.90	8,916.20	0.00	0.00	0.00
14,400.00	90.00	88.58	5,545.00	410.97	9,006.87	9,016.19	0.00	0.00	0.00
14,500.00	90.00	88.58	5,545.00	413.45	9,106.84	9,116.17	0.00	0.00	0.00
14,600.00	90.00	88.58	5,545.00	415.93	9,206.80	9,216.16	0.00	0.00	0.00
14,700.00	90.00	88.58	5,545.00	418.41	9,306.77	9,316.14	0.00	0.00	0.00
14,800.00	90.00	88.58	5,545.00	420.89	9,406.74	9,416.13	0.00	0.00	0.00
14,900.00	90.00	88.58	5,545.00	423.37	9,506.71	9,516.11	0.00	0.00	0.00
15,000.00	90.00	88.58	5,545.00	425.86	9,606.68	9,616.10	0.00	0.00	0.00
15,100.00	90.00	88.58	5,545.00	428.34	9,706.65	9,716.08	0.00	0.00	0.00
15,200.00	90.00	88.58	5,545.00	430.82	9,806.62	9,816.07	0.00	0.00	0.00
15,300.00	90.00	88.58	5,545.00	433.30	9,906.59	9,916.05	0.00	0.00	0.00
15,400.00	90.00	88.58	5,545.00	435.78	10,006.56	10,016.04	0.00	0.00	0.00
15,500.00	90.00	88.58	5,545.00	438.27	10,106.53	10,116.02	0.00	0.00	0.00
15,600.00	90.00	88.58	5,545.00	440.75	10,206.50	10,216.00	0.00	0.00	0.00
15,700.00	90.00	88.58	5,545.00	443.23	10,306.47	10,315.99	0.00	0.00	0.00
15,800.00	90.00	88.58	5,545.00	445.71	10,406.44	10,415.97	0.00	0.00	0.00
15,900.00	90.00	88.58	5,545.00	448.19	10,506.40	10,515.96	0.00	0.00	0.00
16,000.00	90.00	88.58	5,545.00	450.67	10,606.37	10,615.94	0.00	0.00	0.00
16,100.00	90.00	88.58	5,545.00	453.16	10,706.34	10,715.93	0.00	0.00	0.00
16,104.10	90.00	88.58	5,545.00	453.26	10,710.44	10,720.03	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Tatanka Federal LD13-6 - plan misses target center by 4321.19ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	2,709.33	-3,366.33	1,522,925.45	3,456,045.62	40.7571973	-103.8537859
Tatanka Federal LD13-6 - plan misses target center by 0.37ft at 4884.17ft MD (4876.60 TVD, 136.86 N, -107.20 E) - Point	0.00	0.00	4,876.57	137.23	-107.22	1,520,353.36	3,459,304.73	40.7499721	-103.8421976
Tatanka Federal LD13-6 - plan hits target center - Point	0.00	0.00	5,545.00	200.46	527.15	1,520,416.59	3,459,939.10	40.7501130	-103.8399042
Tatanka Federal LD13-6 - plan hits target center - Point	0.00	0.00	5,545.00	453.26	10,710.44	1,520,669.38	3,470,122.37	40.7502777	-103.8031403

Noble Energy, Inc.

Survey Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Well:	Tatanka Federal LD13-645	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDMP

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
384.00	384.00	Pierre				
718.00	718.00	Upper Pierre Aquifer Top				
1,342.00	1,342.00	Upper Pierre Aquifer Base				
3,189.87	3,189.00	Parkman				
3,676.80	3,674.00	Sussex				
4,272.15	4,267.00	Shannon				
4,628.56	4,622.00	Teepee Buttes				
5,566.86	5,451.00	Sharon Springs				
5,586.50	5,461.00	Top A Chalk				
5,653.23	5,491.00	Top A Marl				
5,867.13	5,543.00	Top B Chalk				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2800	2800	0	0	Start Build 2.00	
4884	4876	9	-7	Start DLS 9.00 TFO 126.54	
5918	5545	137	-107	TPZ/LP at 5917.68 MD	
16,104	5545	200	527	TD at 16104.10 MD	

Checked By: _____ Approved By: _____ Date: _____

Northern Region - DJ Basin

East Pony

LD Section 15

Tatanka Federal LD13-645

Wellbore #1

Plan #1

Anticollision Summary Report

10 July, 2018

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Reference Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Tatanka Federal LD13-645	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
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 10,000.00 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	7/10/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	16,104.10	Plan #1 (Wellbore #1)	2_MWD+IFR1+MS	A008Mb: IFR dec & multi-station analysis	

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						
LD Section 01						
McCaffrey State LD12-74-1AHN - Original Drilling - Origin	14,503.05	10,391.02	3,475.46	3,338.11	25.303	CC, ES
McCaffrey State LD12-74-1AHN - Original Drilling - Origin	15,900.00	10,391.02	3,745.70	3,585.36	23.361	SF
McCaffrey State LD12-75-1BHN - Original Drilling - Origin	13,994.66	10,303.02	3,478.95	3,348.89	26.748	CC
McCaffrey State LD12-75-1BHN - Original Drilling - Origin	14,100.00	10,303.02	3,480.55	3,348.81	26.420	ES
McCaffrey State LD12-75-1BHN - Original Drilling - Origin	15,500.00	10,303.02	3,790.67	3,630.36	23.646	SF
McCaffrey State LD12-75HN - Original Drilling - Original	13,621.54	10,402.02	3,482.13	3,354.64	27.313	CC
McCaffrey State LD12-75HN - Original Drilling - Original	13,700.00	10,402.02	3,483.01	3,353.87	26.970	ES
McCaffrey State LD12-75HN - Original Drilling - Original	15,100.00	10,402.02	3,782.99	3,622.84	23.620	SF
Nalen State LD12-76-1AHN - Original Drilling - Original D	13,156.78	10,388.02	3,487.38	3,364.06	28.279	CC, ES
Nalen State LD12-76-1AHN - Original Drilling - Original D	14,800.00	10,388.02	3,855.13	3,709.63	26.497	SF
Nalen State LD12-77-1BHN - Original Drilling - Original D	12,779.29	10,419.02	3,488.33	3,371.68	29.905	CC
Nalen State LD12-77-1BHN - Original Drilling - Original D	12,800.00	10,419.02	3,488.39	3,371.59	29.865	ES
Nalen State LD12-77-1BHN - Original Drilling - Original D	14,500.00	10,419.02	3,889.64	3,743.85	26.679	SF
Nalen State LD12-77HN - Original Drilling - Original Drilli	12,282.85	10,320.02	3,548.26	3,438.90	32.446	CC
Nalen State LD12-77HN - Original Drilling - Original Drilli	12,300.00	10,320.02	3,548.30	3,438.68	32.371	ES
Nalen State LD12-77HN - Original Drilling - Original Drilli	14,000.00	10,320.02	3,941.92	3,797.45	27.285	SF
Smith State LD12-72-1AHN - Original Drilling - Original D	15,763.62	10,216.02	3,468.96	3,314.53	22.463	CC, ES
Smith State LD12-72-1AHN - Original Drilling - Original D	16,104.10	10,216.02	3,485.63	3,328.87	22.236	SF
Smith State LD12-73-1BHN - Original Drilling - Original D	15,331.19	10,286.02	3,470.69	3,323.32	23.552	CC
Smith State LD12-73-1BHN - Original Drilling - Original D	15,400.00	10,286.02	3,471.37	3,323.24	23.435	ES
Smith State LD12-73-1BHN - Original Drilling - Original D	16,104.10	10,286.02	3,555.71	3,395.73	22.226	SF
Smith State LD12-73HN - Original Drilling - Original Drilli	14,898.86	10,349.02	3,474.49	3,333.10	24.573	CC
Smith State LD12-73HN - Original Drilling - Original Drilli	15,000.00	10,349.02	3,475.96	3,332.76	24.272	ES
Smith State LD12-73HN - Original Drilling - Original Drilli	16,104.10	10,349.02	3,677.59	3,510.90	22.062	SF

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

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Reference Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Tatanka Federal LD13-645	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan #1	Offset TVD Reference:	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						
LD Section 02						
Gonsoulin State LD11-76HN - Original Drilling - Original D	7,660.59	10,851.00	3,470.69	3,413.50	60.689	CC, ES
Gonsoulin State LD11-76HN - Original Drilling - Original D	10,400.00	10,851.00	4,421.55	4,309.84	39.580	SF
Gradishar State LD11-72-1BHN - Original Drilling - Origin	10,766.88	10,443.02	3,497.04	3,405.89	38.367	CC
Gradishar State LD11-72-1BHN - Original Drilling - Origin	10,800.00	10,443.02	3,497.20	3,405.69	38.218	ES
Gradishar State LD11-72-1BHN - Original Drilling - Origin	12,800.00	10,443.02	4,045.11	3,913.41	30.715	SF
Gradishar State LD11-72HN - Original Drilling - Original D	10,322.67	10,436.02	3,492.67	3,406.11	40.352	CC
Gradishar State LD11-72HN - Original Drilling - Original D	10,400.00	10,436.02	3,493.52	3,405.58	39.723	ES
Gradishar State LD11-72HN - Original Drilling - Original D	12,400.00	10,436.02	4,063.74	3,931.52	30.735	SF
Gradishar State LD11-73-1AHN - Original Drilling - Origin	9,867.50	10,448.02	3,487.45	3,403.59	41.585	CC
Gradishar State LD11-73-1AHN - Original Drilling - Origin	10,000.00	10,448.02	3,489.97	3,402.97	40.117	ES
Gradishar State LD11-73-1AHN - Original Drilling - Origin	11,900.00	10,448.02	4,036.50	3,904.78	30.645	SF
Little State LD11-74-1BHN - Original Drilling - Original Dr	9,420.01	10,663.00	3,487.78	3,411.52	45.732	CC, ES
Little State LD11-74-1BHN - Original Drilling - Original Dr	11,700.00	10,663.00	4,166.89	4,045.76	34.400	SF
Little State LD11-74HN - Original Drilling - Original Drillin	8,981.42	10,598.00	3,482.08	3,411.38	49.247	CC
Little State LD11-74HN - Original Drilling - Original Drillin	9,000.00	10,598.00	3,482.13	3,411.17	49.072	ES
Little State LD11-74HN - Original Drilling - Original Drillin	11,300.00	10,598.00	4,183.38	4,061.70	34.379	SF
Moses State LD11-77-1AHN - Original Drilling - Original D	7,252.59	10,911.02	3,469.62	3,417.62	66.713	CC
Moses State LD11-77-1AHN - Original Drilling - Original D	7,300.00	10,911.02	3,469.95	3,417.47	66.122	ES
Moses State LD11-77-1AHN - Original Drilling - Original D	10,000.00	10,911.02	4,425.67	4,314.08	39.659	SF
Moses State LD11-78-1BHN - Original Drilling - Original D	6,789.49	10,639.02	3,437.91	3,390.54	72.580	CC
Moses State LD11-78-1BHN - Original Drilling - Original D	6,800.00	10,639.02	3,437.93	3,390.46	72.422	ES
Moses State LD11-78-1BHN - Original Drilling - Original D	9,600.00	10,639.02	4,440.52	4,332.16	40.981	SF
Moses State LD11-78HN - Original Drilling - Original Drill	6,368.64	10,870.02	3,491.55	3,444.87	74.795	CC
Moses State LD11-78HN - Original Drilling - Original Drill	6,400.00	10,870.02	3,491.70	3,444.58	74.112	ES
Moses State LD11-78HN - Original Drilling - Original Drill	9,200.00	10,870.02	4,495.28	4,385.60	40.987	SF
LD Section 11						
Castor LD11-75HN - Original Drilling - Original Drilling - A	8,372.57	9,890.00	3,811.95	3,748.00	59.606	CC
Castor LD11-75HN - Original Drilling - Original Drilling - A	8,400.00	9,890.00	3,812.05	3,747.73	59.262	ES
Castor LD11-75HN - Original Drilling - Original Drilling - A	10,900.00	9,890.00	4,573.72	4,463.26	41.405	SF
LD Section 12						
Castor Federal LD13-78HN - Original Drilling - Original	11,663.07	8,431.48	15.43	-56.21	0.215	Level 1, CC, ES, SF
Castor LD12-78HN - Original Drilling - Original Drilling - A	11,633.25	4,876.00	3,500.03	3,406.47	37.412	CC
Castor LD12-78HN - Original Drilling - Original Drilling - A	11,700.00	4,876.00	3,500.66	3,406.31	37.101	ES
Castor LD12-78HN - Original Drilling - Original Drilling - A	12,500.00	4,876.00	3,605.75	3,504.06	35.460	SF
LD Section 13						
Kog Nicola #1 (DA) - Original Drilling - Original Drilling - A	15,572.10	5,272.00	1,146.04	911.65	4.890	CC, ES
Kog Nicola #1 (DA) - Original Drilling - Original Drilling - A	15,600.00	5,272.00	1,146.38	911.67	4.884	SF
Rauth #G (DA) - Original Drilling - Original Drilling - As D	13,924.48	5,479.00	823.95	605.63	3.774	CC, ES, SF

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Reference Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Tatanka Federal LD13-645	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan #1	Offset TVD Reference:	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						
LD Section 14						
Alice G Nay #1 (PA) - Original Drilling - Original Drilling -	8,687.90	5,491.00	518.82	363.20	3.334	CC, ES
Alice G Nay #1 (PA) - Original Drilling - Original Drilling -	8,700.00	5,491.00	518.96	363.23	3.332	SF
Alice Nay #1 (DA) - Original Drilling - Original Drilling - As	8,666.58	5,521.00	1,474.24	1,318.26	9.452	CC
Alice Nay #1 (DA) - Original Drilling - Original Drilling - As	8,700.00	5,521.00	1,474.62	1,318.26	9.431	ES
Alice Nay #1 (DA) - Original Drilling - Original Drilling - As	8,800.00	5,521.00	1,480.26	1,322.88	9.405	SF
Alice Nay #1/2 (DA) - Original Drilling - Original Drilling -	8,683.56	5,501.00	144.30	-11.46	0.926	Level 1, CC, ES, SF
Alice Nay #1/3 (DA) - Original Drilling - Original Drilling -	9,014.08	5,498.00	185.58	26.10	1.164	Level 2, CC, ES, SF
Alice Nay #2 (DA) - Original Drilling - Original Drilling - As	9,163.71	5,504.00	182.83	21.51	1.133	Level 2, CC, ES, SF
Brady #1 (DA) - Original Drilling - Original Drilling - As Dr	10,327.12	5,534.00	1,165.59	989.98	6.637	CC, ES
Brady #1 (DA) - Original Drilling - Original Drilling - As Dr	10,400.00	5,534.00	1,167.87	991.46	6.620	SF
Castor Federal LD14-68HN - Original Drilling - Original D	7,149.28	6,678.28	2,451.90	2,391.15	40.362	CC
Castor Federal LD14-68HN - Original Drilling - Original D	9,400.00	8,863.30	2,494.31	2,357.31	18.207	ES
Castor Federal LD14-68HN - Original Drilling - Original D	10,600.00	9,850.00	2,554.05	2,377.81	14.492	SF
McDermott #1-14 (PA) - Original Drilling - Original Drilling	8,852.37	5,491.00	352.21	194.72	2.236	CC, ES, SF
Nay #1 (DA) - Original Drilling - Original Drilling - As Drille	8,679.28	5,663.00	818.36	659.40	5.148	CC, ES
Nay #1 (DA) - Original Drilling - Original Drilling - As Drille	8,700.00	5,663.00	818.62	659.43	5.142	SF
Zimith #1 (DA) - Original Drilling - Original Drilling - As Dr	6,709.20	5,514.00	797.43	661.40	5.862	CC, ES, SF

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Tatanka Federal LD13-645
Project:	East Pony	TVD Reference:	KB @ 4691.00ft
Reference Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Tatanka Federal LD13-645	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan #1	Offset TVD Reference:	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						
LD Section 15						
Castor Federal LD15-72HN - Original Drilling - Original D	5,346.66	8,387.26	455.81	398.02	7.886	CC
Castor Federal LD15-72HN - Original Drilling - Original D	5,350.00	8,387.18	455.83	397.77	7.850	ES
Castor Federal LD15-72HN - Original Drilling - Original D	5,450.00	8,385.31	475.43	410.64	7.338	SF
Castor Federal LD15-73-1HN - Original Drilling - Original	5,224.72	8,358.44	734.14	670.58	11.551	CC
Castor Federal LD15-73-1HN - Original Drilling - Original	5,250.00	8,357.22	735.07	670.54	11.391	ES
Castor Federal LD15-73-1HN - Original Drilling - Original	5,350.00	8,353.24	756.68	688.98	11.177	SF
Castor Federal LD15-74-1HN - Original Drilling - Original D	5,197.97	8,461.59	1,033.40	968.96	16.035	CC
Castor Federal LD15-73HN - Original Drilling - Original D	5,200.00	8,461.54	1,033.41	968.90	16.021	ES
Castor Federal LD15-73HN - Original Drilling - Original D	5,300.00	8,459.67	1,046.49	979.53	15.628	SF
Castor Federal LD15-74-1HN - Original Drilling - Original	5,172.88	8,665.14	1,360.51	1,296.67	21.313	CC, ES
Castor Federal LD15-74-1HN - Original Drilling - Original	5,300.00	8,659.61	1,378.92	1,313.10	20.952	SF
Castor Federal LD15-74HN - Original Drilling - Original D	5,121.25	8,451.71	1,652.28	1,588.23	25.796	CC, ES
Castor Federal LD15-74HN - Original Drilling - Original D	5,250.00	8,438.14	1,670.11	1,604.75	25.555	SF
Castor Federal LD15-75-1HN - Original Drilling - Original	5,110.85	8,582.25	2,001.27	1,936.32	30.813	CC, ES
Castor Federal LD15-75-1HN - Original Drilling - Original	5,250.00	8,572.46	2,021.11	1,954.86	30.507	SF
Dillos PC LD15-74HN - Original Drilling - Original Drilling	5,055.04	8,511.43	2,593.82	2,527.21	38.943	CC, ES
Dillos PC LD15-74HN - Original Drilling - Original Drilling	5,200.00	8,502.08	2,614.17	2,546.62	38.697	SF
Fiscus Federal LD15-76HN - Original Drilling - Original D	5,043.02	8,393.19	2,926.02	2,856.90	42.333	CC, ES
Fiscus Federal LD15-76HN - Original Drilling - Original D	5,150.00	8,386.72	2,936.91	2,867.18	42.114	SF
Fiscus Federal LD15-77-1HN - Original Drilling - Original	5,042.90	8,547.68	3,266.88	3,196.89	46.677	CC, ES
Fiscus Federal LD15-77-1HN - Original Drilling - Original	5,150.00	8,542.61	3,277.59	3,206.98	46.416	SF
Fiscus Federal LD15-77HN - Original Drilling - Original D	5,024.03	8,457.02	3,501.61	3,431.76	50.129	CC, ES
Fiscus Federal LD15-77HN - Original Drilling - Original D	5,150.00	8,441.75	3,516.20	3,445.85	49.979	SF
Tatanka Federal LD13-615 - Wellbore #1 - Plan #1	2,115.28	2,117.28	112.98	98.27	7.682	CC
Tatanka Federal LD13-615 - Wellbore #1 - Plan #1	2,200.00	2,201.85	112.98	97.67	7.378	ES
Tatanka Federal LD13-615 - Wellbore #1 - Plan #1	16,104.10	16,454.98	1,820.01	1,549.05	6.717	SF
Tatanka Federal LD13-625 - Wellbore #1 - Plan #1	2,400.00	2,401.00	76.51	59.77	4.570	CC, ES
Tatanka Federal LD13-625 - Wellbore #1 - Plan #1	2,500.00	2,498.35	78.24	60.81	4.490	SF
Tatanka Federal LD13-635 - Wellbore #1 - Plan #1	2,600.00	2,601.00	40.08	21.90	2.205	CC, ES, SF
Tatanka Federal LD13-650 - Wellbore #1 - Plan #1	5,914.83	6,078.51	651.40	609.49	15.543	CC
Tatanka Federal LD13-650 - Wellbore #1 - Plan #1	16,104.10	16,267.79	654.29	382.80	2.410	ES, SF
Tatanka Federal LD13-660 - Wellbore #1 - Plan #1	5,915.74	6,003.99	1,271.74	1,230.25	30.653	CC
Tatanka Federal LD13-660 - Wellbore #1 - Plan #1	16,104.10	16,173.38	1,274.76	1,003.49	4.699	ES, SF
Tatanka Federal LD13-670 - Wellbore #1 - Plan #1	4,887.65	4,769.96	1,884.06	1,849.94	55.229	CC
Tatanka Federal LD13-670 - Wellbore #1 - Plan #1	16,104.10	16,154.79	1,894.72	1,623.38	6.983	ES, SF
Tatanka Federal LD13-685 - Wellbore #1 - Plan #1	2,108.85	2,127.85	1,924.02	1,909.30	130.696	CC
Tatanka Federal LD13-685 - Wellbore #1 - Plan #1	2,200.00	2,200.00	1,924.11	1,908.81	125.708	ES
Tatanka Federal LD13-685 - Wellbore #1 - Plan #1	16,104.10	16,259.63	2,695.03	2,423.19	9.914	SF

Noble Energy, Inc.
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Reference Site:	LD Section 15	MD Reference:	KB @ 4691.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Tatanka Federal LD13-645	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan #1	Offset TVD Reference:	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						
LD Section 22						
Fiscus LD22-76HN - Original Drilling - As Drilled	5,009.70	10,079.02	4,005.61	3,931.48	54.031	CC, ES
Fiscus LD22-76HN - Original Drilling - As Drilled	5,350.00	10,079.02	4,081.66	4,005.10	53.315	SF
Gracie LD22-720 - Original Drilling - Original Drilling - As	5,340.87	10,754.00	2,558.54	2,512.36	55.403	CC, ES
Gracie LD22-720 - Original Drilling - Original Drilling - As	5,450.00	10,754.00	2,562.43	2,516.11	55.322	SF
Gracie LD22-730 - Original Drilling - Original Drilling - As	5,138.42	10,481.00	2,692.54	2,648.79	61.545	CC, ES
Gracie LD22-730 - Original Drilling - Original Drilling - As	5,700.00	10,481.00	2,826.47	2,779.47	60.131	SF
Gracie LD22-740 - Original Drilling - Original Drilling - As	5,060.55	10,427.00	2,972.94	2,905.79	44.275	CC, ES
Gracie LD22-740 - Original Drilling - Original Drilling - As	5,750.00	10,427.00	3,215.24	3,139.16	42.265	SF
Gracie LD22-750 - Original Drilling - Original Drilling - As	5,039.94	10,575.00	3,371.24	3,289.43	41.206	CC
Gracie LD22-750 - Original Drilling - Original Drilling - As	5,050.00	10,575.00	3,371.31	3,289.42	41.165	ES
Gracie LD22-750 - Original Drilling - Original Drilling - As	5,350.00	10,575.00	3,433.72	3,349.04	40.549	SF
Kidd LD22-770 - Original Drilling - Original Drilling - As D	4,991.11	10,396.00	4,331.12	4,245.82	50.773	CC, ES
Kidd LD22-770 - Original Drilling - Original Drilling - As D	5,200.00	10,396.00	4,363.67	4,277.13	50.425	SF
Kidd LD22-780 - Original Drilling - Original Drilling - As D	4,990.32	10,500.00	4,875.29	4,783.01	52.834	CC, ES
Kidd LD22-780 - Original Drilling - Original Drilling - As D	5,200.00	10,500.00	4,908.97	4,815.52	52.531	SF
LD Section 23						
Fiscus Federal LD23-78HN - Original Drilling - Original D	6,418.94	10,037.02	2,834.91	2,789.19	62.006	CC, ES
Fiscus Federal LD23-78HN - Original Drilling - Original D	8,700.00	10,037.02	3,638.67	3,550.11	41.085	SF
Hensley #A-1 (DA) - Hensley #A-1 OH - As-drilled (No Su	9,026.01	5,516.00	2,827.10	2,566.99	10.869	CC, ES
Hensley #A-1 (DA) - Hensley #A-1 OH - As-drilled (No Su	9,300.00	5,516.00	2,840.35	2,577.34	10.799	SF
Ingram #1 (DA) - Ingram #1 OH - As-drilled (No Surveys)	10,345.13	5,512.00	2,813.08	2,537.59	10.211	CC
Ingram #1 (DA) - Ingram #1 OH - As-drilled (No Surveys)	10,400.00	5,512.00	2,813.61	2,537.49	10.190	ES
Ingram #1 (DA) - Ingram #1 OH - As-drilled (No Surveys)	10,600.00	5,512.00	2,824.60	2,546.37	10.152	SF

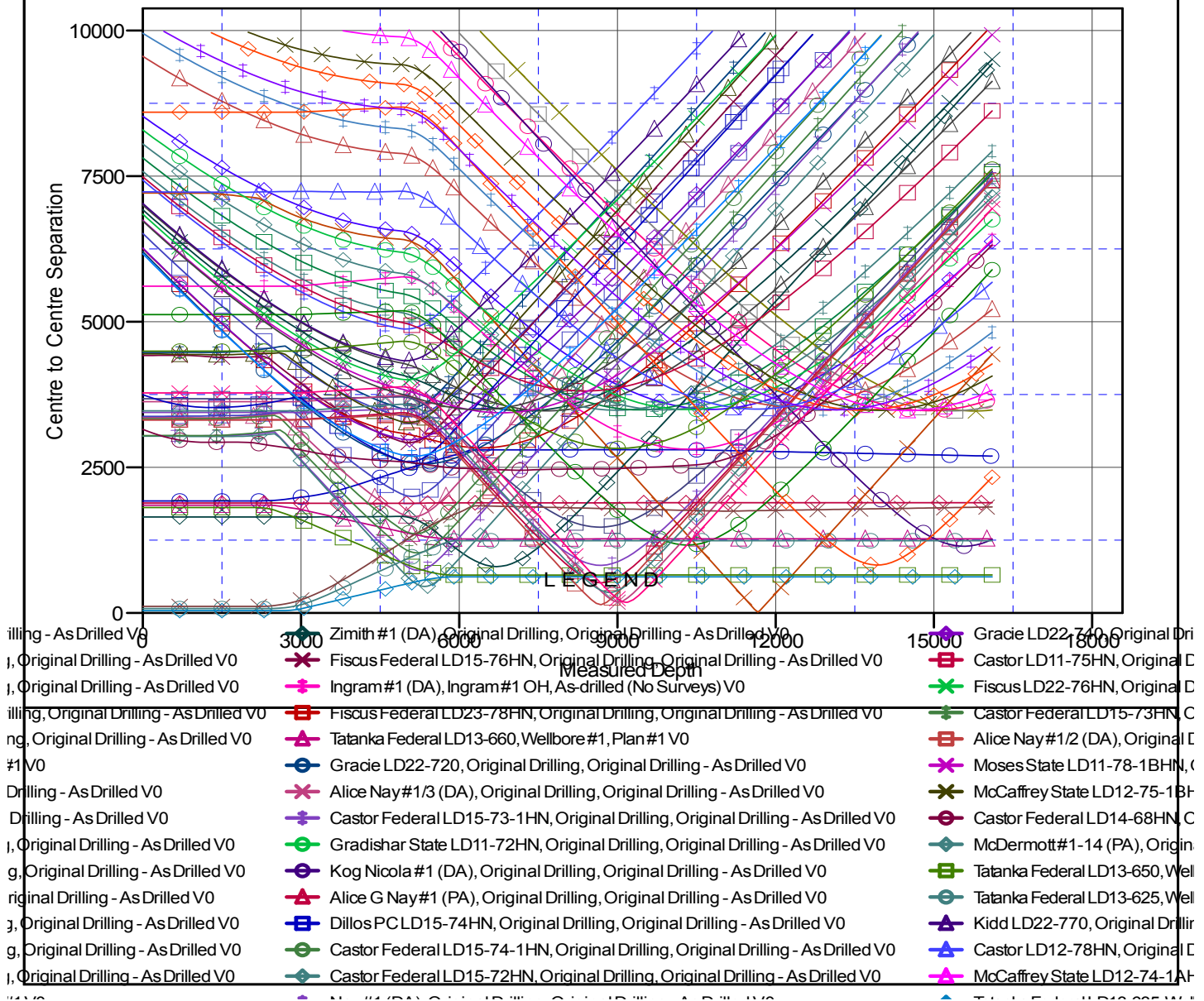
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Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMP
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 4691.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Tatanka Federal LD13-645
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 1.07°

Ladder Plot



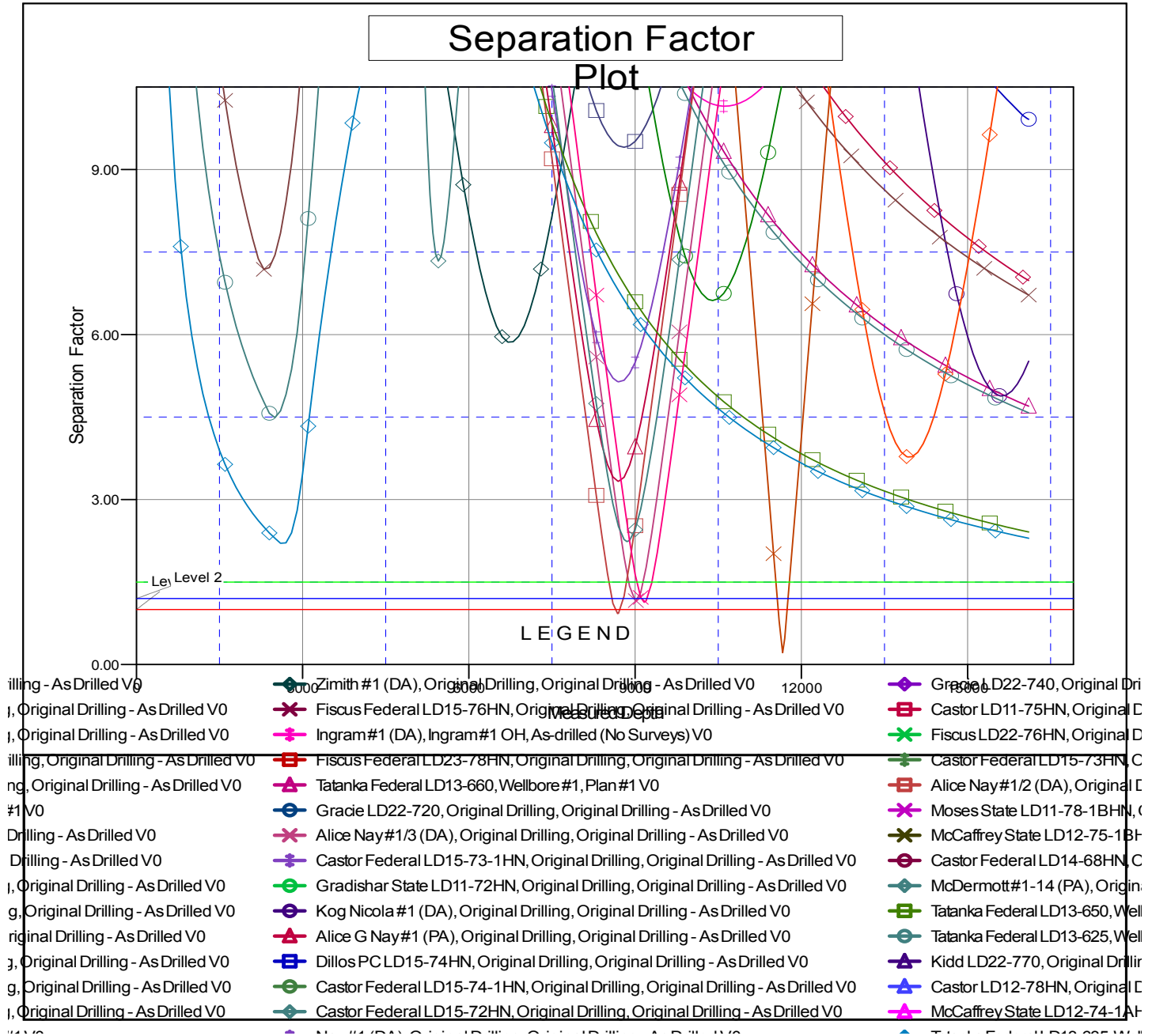
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

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Anticollision Summary Report

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Coordinates are relative to: Tatanka Federal LD13-645
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