

Project: Mustang
Site: D Section 21
Well: Vogler State D33-769
Wellbore: Wellbore #1
Design: Plan 1

Northern Region - DJ Basin

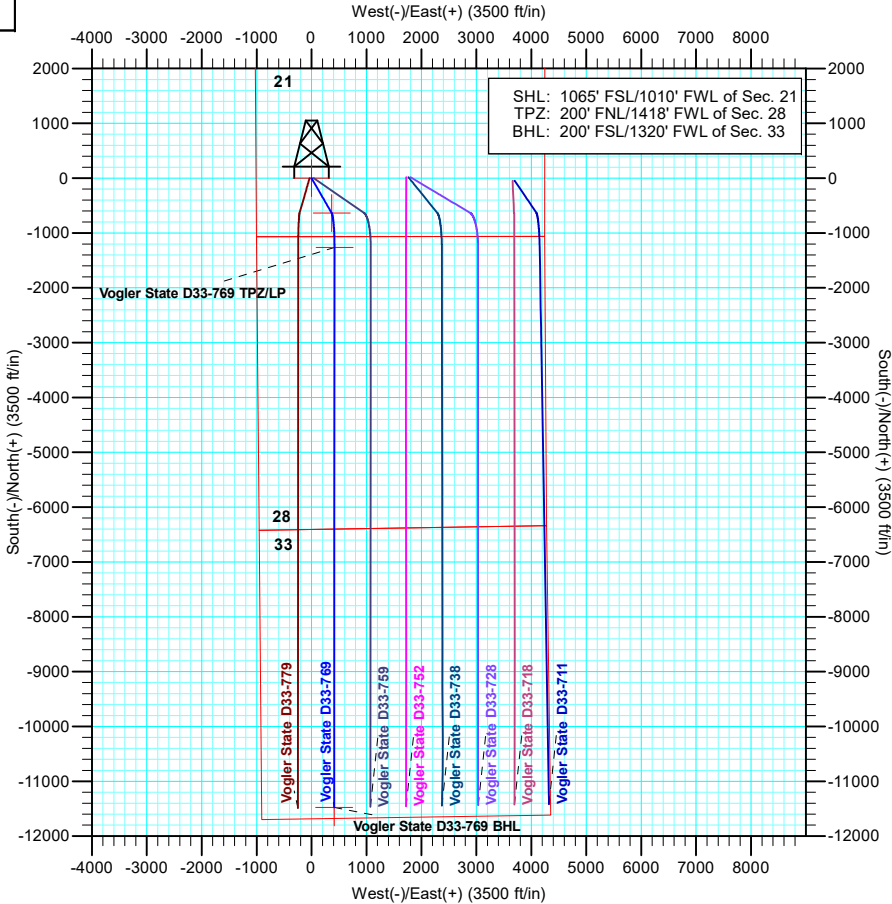
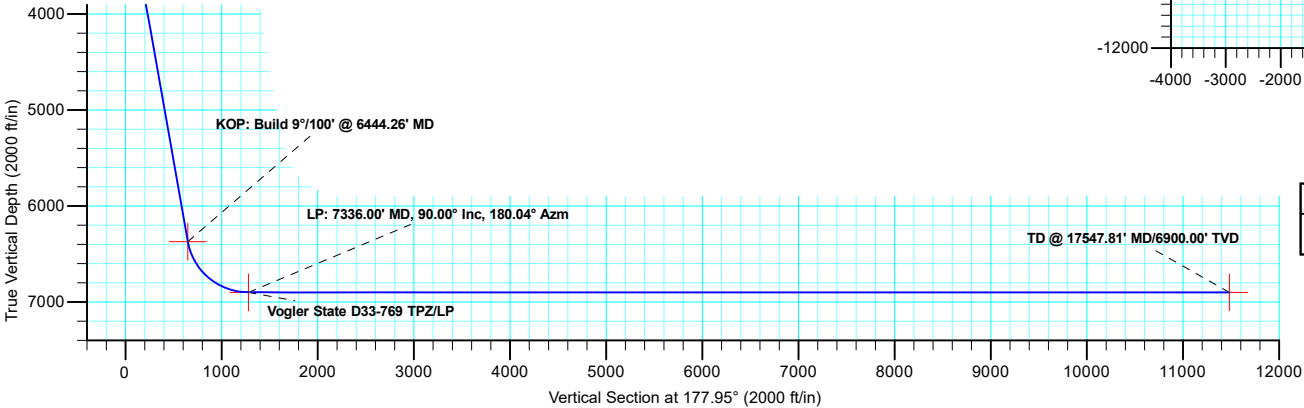
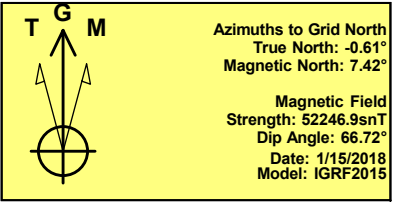
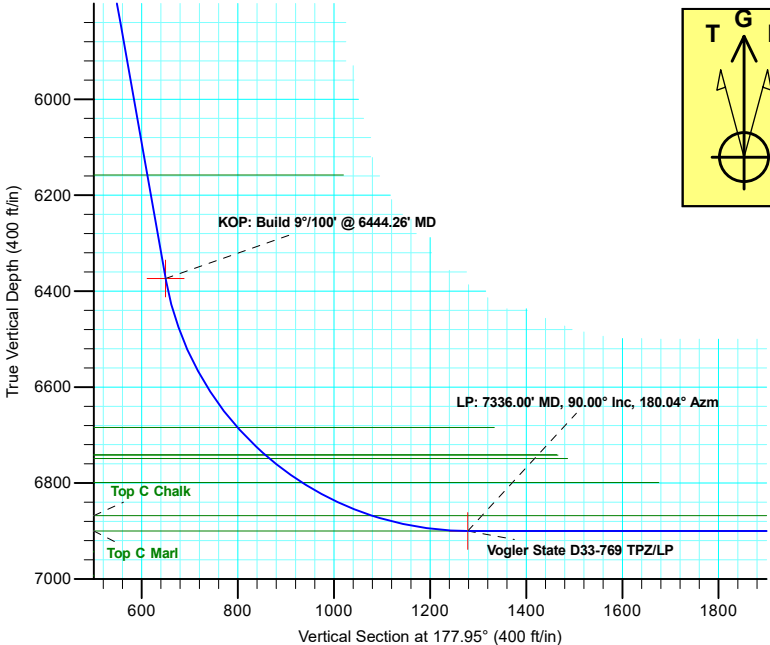
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

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	2400.00	0.00	0.00	2400.00	0.00	0.00	0.00	0.00	0.00	
3	2962.72	11.25	150.17	2959.11	-47.79	27.41	2.00	150.17	48.74	
4	6444.26	11.25	150.17	6373.70	-637.21	365.44	0.00	0.00	649.86	
5	7336.00	90.00	180.04	6900.00	-1264.68	417.18	9.00	30.36	1278.78	Vogler State D33-769 TPZ/LP
6	17547.81	90.00	180.04	6900.00	-11476.49	410.31	0.00	0.00	11483.83	Vogler State D33-769 BHL

WELL DETAILS: Vogler State D33-769

+N/-S	+E/-W	Northing	Ground Level: Easting	4796.00 Latitude	Longitude	Slot
0.00	0.00	1319509.94	3261957.18	40.2066490	-104.5620921	



Plan: Plan 1 (Vogler State D33-769/Wellbore #1)

Created By: Shelly C. Peterkin Date: 14:43, August 07 2018

Northern Region - DJ Basin

Mustang

D Section 21

Vogler State D33-769

Wellbore #1

Plan: Plan 1

Standard Planning Report

07 August, 2018

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-769
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4826.00ft
Project:	Mustang	MD Reference:	Well @ 4826.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-769	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Project	Mustang, 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		D Section 21			
Site Position:		Northing:	1,323,041.88 usft	Latitude:	40.2163540
From:	Lat/Long	Easting:	3,261,613.48 usft	Longitude:	-104.5631890
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.61 °

Well	Vogler State D33-769					
Well Position	+N/-S	-3,531.95 ft	Northing:	1,319,509.94 usft	Latitude:	40.2066490
	+E/-W	343.71 ft	Easting:	3,261,957.18 usft	Longitude:	-104.5620921
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,796.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/15/2018	8.03	66.72	52,246.88562752

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	177.95

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
2,962.72	11.25	150.17	2,959.11	-47.79	27.41	2.00	2.00	0.00	150.17	
6,444.26	11.25	150.17	6,373.70	-637.21	365.44	0.00	0.00	0.00	0.00	
7,336.00	90.00	180.04	6,900.00	-1,264.68	417.18	9.00	8.83	3.35	30.36	Vogler State D33-769
17,547.81	90.00	180.04	6,900.00	-11,476.50	410.31	0.00	0.00	0.00	0.00	Vogler State D33-769

Noble Energy, Inc.

Planning Report

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Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4826.00ft
Project:	Mustang	MD Reference:	Well @ 4826.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-769	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

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
631.00	0.00	0.00	631.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
766.00	0.00	0.00	766.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Pierre Aquifer Top									
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
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
1,633.00	0.00	0.00	1,633.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Pierre Aquifer Base									
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
Build 2°/100'									
2,500.00	2.00	150.17	2,499.98	-1.51	0.87	1.54	2.00	2.00	0.00
2,600.00	4.00	150.17	2,599.84	-6.05	3.47	6.17	2.00	2.00	0.00
2,700.00	6.00	150.17	2,699.45	-13.61	7.81	13.88	2.00	2.00	0.00
2,800.00	8.00	150.17	2,798.70	-24.18	13.87	24.67	2.00	2.00	0.00
2,900.00	10.00	150.17	2,897.47	-37.75	21.65	38.50	2.00	2.00	0.00
2,962.72	11.25	150.17	2,959.11	-47.79	27.41	48.74	2.00	2.00	0.00
Hold 11.25° Inc., 150.17° Azm									
3,000.00	11.25	150.17	2,995.67	-54.10	31.03	55.17	0.00	0.00	0.00
3,100.00	11.25	150.17	3,093.75	-71.03	40.74	72.44	0.00	0.00	0.00
3,200.00	11.25	150.17	3,191.83	-87.96	50.45	89.71	0.00	0.00	0.00
3,300.00	11.25	150.17	3,289.90	-104.89	60.15	106.97	0.00	0.00	0.00
3,400.00	11.25	150.17	3,387.98	-121.82	69.86	124.24	0.00	0.00	0.00
3,500.00	11.25	150.17	3,486.06	-138.75	79.57	141.50	0.00	0.00	0.00
3,600.00	11.25	150.17	3,584.13	-155.68	89.28	158.77	0.00	0.00	0.00
3,700.00	11.25	150.17	3,682.21	-172.61	98.99	176.04	0.00	0.00	0.00
3,800.00	11.25	150.17	3,780.29	-189.54	108.70	193.30	0.00	0.00	0.00
3,875.16	11.25	150.17	3,854.00	-202.26	116.00	206.28	0.00	0.00	0.00
Parkman									
3,900.00	11.25	150.17	3,878.36	-206.47	118.41	210.57	0.00	0.00	0.00
4,000.00	11.25	150.17	3,976.44	-223.40	128.12	227.83	0.00	0.00	0.00
4,100.00	11.25	150.17	4,074.52	-240.33	137.83	245.10	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

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Project:	Mustang	MD Reference:	Well @ 4826.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-769	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

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)
4,112.73	11.25	150.17	4,087.00	-242.48	139.07	247.30	0.00	0.00	0.00
Sussex									
4,200.00	11.25	150.17	4,172.60	-257.26	147.54	262.37	0.00	0.00	0.00
4,300.00	11.25	150.17	4,270.67	-274.19	157.25	279.63	0.00	0.00	0.00
4,400.00	11.25	150.17	4,368.75	-291.12	166.96	296.90	0.00	0.00	0.00
4,500.00	11.25	150.17	4,466.83	-308.05	176.67	314.16	0.00	0.00	0.00
4,600.00	11.25	150.17	4,564.90	-324.98	186.38	331.43	0.00	0.00	0.00
4,700.00	11.25	150.17	4,662.98	-341.91	196.09	348.70	0.00	0.00	0.00
4,800.00	11.25	150.17	4,761.06	-358.84	205.80	365.96	0.00	0.00	0.00
4,900.00	11.25	150.17	4,859.14	-375.77	215.51	383.23	0.00	0.00	0.00
5,000.00	11.25	150.17	4,957.21	-392.70	225.21	400.50	0.00	0.00	0.00
5,081.35	11.25	150.17	5,037.00	-406.47	233.11	414.54	0.00	0.00	0.00
Shannon									
5,100.00	11.25	150.17	5,055.29	-409.63	234.92	417.76	0.00	0.00	0.00
5,200.00	11.25	150.17	5,153.37	-426.56	244.63	435.03	0.00	0.00	0.00
5,300.00	11.25	150.17	5,251.44	-443.49	254.34	452.29	0.00	0.00	0.00
5,400.00	11.25	150.17	5,349.52	-460.42	264.05	469.56	0.00	0.00	0.00
5,500.00	11.25	150.17	5,447.60	-477.35	273.76	486.83	0.00	0.00	0.00
5,600.00	11.25	150.17	5,545.67	-494.28	283.47	504.09	0.00	0.00	0.00
5,700.00	11.25	150.17	5,643.75	-511.21	293.18	521.36	0.00	0.00	0.00
5,800.00	11.25	150.17	5,741.83	-528.14	302.89	538.62	0.00	0.00	0.00
5,900.00	11.25	150.17	5,839.91	-545.07	312.60	555.89	0.00	0.00	0.00
6,000.00	11.25	150.17	5,937.98	-562.00	322.31	573.16	0.00	0.00	0.00
6,100.00	11.25	150.17	6,036.06	-578.93	332.02	590.42	0.00	0.00	0.00
6,200.00	11.25	150.17	6,134.14	-595.86	341.73	607.69	0.00	0.00	0.00
6,224.33	11.25	150.17	6,158.00	-599.98	344.09	611.89	0.00	0.00	0.00
Teepee Buttes									
6,300.00	11.25	150.17	6,232.21	-612.79	351.44	624.95	0.00	0.00	0.00
6,400.00	11.25	150.17	6,330.29	-629.72	361.15	642.22	0.00	0.00	0.00
6,444.26	11.25	150.17	6,373.70	-637.21	365.44	649.86	0.00	0.00	0.00
KOP: Build 9°/100' @ 6444.26' MD									
6,450.00	11.70	151.45	6,379.32	-638.21	366.00	650.88	9.00	7.82	22.42
6,500.00	15.79	159.51	6,427.89	-649.04	370.81	661.87	9.00	8.16	16.12
6,550.00	20.04	164.28	6,475.45	-663.67	375.51	676.66	9.00	8.52	9.52
6,600.00	24.39	167.41	6,521.73	-682.00	380.09	695.14	9.00	8.69	6.27
6,650.00	28.78	169.64	6,566.44	-703.92	384.50	717.21	9.00	8.78	4.46
6,700.00	33.19	171.32	6,609.29	-729.30	388.73	742.73	9.00	8.83	3.37
6,750.00	37.63	172.65	6,650.04	-757.98	392.75	771.53	9.00	8.87	2.65
6,794.08	41.54	173.62	6,684.00	-785.87	396.10	799.52	9.00	8.89	2.19
Sharon Springs									
6,800.00	42.07	173.73	6,688.41	-789.79	396.53	803.45	9.00	8.90	2.00
6,850.00	46.53	174.65	6,724.19	-824.52	400.06	838.29	9.00	8.91	1.82
6,874.95	48.75	175.05	6,741.00	-842.88	401.71	856.70	9.00	8.92	1.63
Top A Chalk									
6,876.47	48.89	175.08	6,742.00	-844.02	401.81	857.84	9.00	8.92	1.57
Top A Marl									
6,887.22	49.85	175.24	6,749.00	-852.15	402.50	865.99	9.00	8.92	1.54
Top B Chalk									
6,900.00	50.99	175.43	6,757.15	-861.97	403.30	875.83	9.00	8.93	1.49
6,950.00	55.45	176.13	6,787.07	-901.90	406.24	915.84	9.00	8.93	1.39
6,971.56	57.38	176.40	6,799.00	-919.82	407.41	933.79	9.00	8.94	1.28
Top B Marl									
7,000.00	59.92	176.75	6,813.79	-944.06	408.86	958.07	9.00	8.94	1.22

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-769
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4826.00ft
Project:	Mustang	MD Reference:	Well @ 4826.00ft
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Well:	Vogler State D33-769	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

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)
7,050.00	64.39	177.32	6,837.14	-988.20	411.14	1,002.26	9.00	8.94	1.14
7,100.00	68.87	177.84	6,856.97	-1,034.05	413.08	1,048.15	9.00	8.95	1.05
7,132.79	71.80	178.17	6,868.00	-1,064.91	414.15	1,079.03	9.00	8.95	1.00
Top C Chalk									
7,150.00	73.34	178.34	6,873.15	-1,081.32	414.65	1,095.44	9.00	8.95	0.98
7,200.00	77.82	178.81	6,885.60	-1,129.72	415.85	1,143.85	9.00	8.95	0.95
7,250.00	82.30	179.27	6,894.23	-1,178.95	416.67	1,193.08	9.00	8.95	0.92
7,300.00	86.78	179.72	6,898.99	-1,228.70	417.11	1,242.82	9.00	8.96	0.90
7,336.00	90.00	180.04	6,900.00	-1,264.68	417.18	1,278.78	9.00	8.96	0.89
LP: 7336.00' MD, 90.00° Inc, 180.04° Azm - Top C Marl									
7,400.00	90.00	180.04	6,900.00	-1,328.68	417.14	1,342.74	0.00	0.00	0.00
7,500.00	90.00	180.04	6,900.00	-1,428.68	417.07	1,442.67	0.00	0.00	0.00
7,600.00	90.00	180.04	6,900.00	-1,528.68	417.01	1,542.61	0.00	0.00	0.00
7,700.00	90.00	180.04	6,900.00	-1,628.68	416.94	1,642.54	0.00	0.00	0.00
7,800.00	90.00	180.04	6,900.00	-1,728.68	416.87	1,742.48	0.00	0.00	0.00
7,900.00	90.00	180.04	6,900.00	-1,828.68	416.80	1,842.41	0.00	0.00	0.00
8,000.00	90.00	180.04	6,900.00	-1,928.68	416.74	1,942.34	0.00	0.00	0.00
8,100.00	90.00	180.04	6,900.00	-2,028.68	416.67	2,042.28	0.00	0.00	0.00
8,200.00	90.00	180.04	6,900.00	-2,128.68	416.60	2,142.21	0.00	0.00	0.00
8,300.00	90.00	180.04	6,900.00	-2,228.68	416.54	2,242.14	0.00	0.00	0.00
8,400.00	90.00	180.04	6,900.00	-2,328.68	416.47	2,342.08	0.00	0.00	0.00
8,500.00	90.00	180.04	6,900.00	-2,428.68	416.40	2,442.01	0.00	0.00	0.00
8,600.00	90.00	180.04	6,900.00	-2,528.68	416.33	2,541.95	0.00	0.00	0.00
8,700.00	90.00	180.04	6,900.00	-2,628.68	416.27	2,641.88	0.00	0.00	0.00
8,800.00	90.00	180.04	6,900.00	-2,728.68	416.20	2,741.81	0.00	0.00	0.00
8,900.00	90.00	180.04	6,900.00	-2,828.68	416.13	2,841.75	0.00	0.00	0.00
9,000.00	90.00	180.04	6,900.00	-2,928.68	416.06	2,941.68	0.00	0.00	0.00
9,100.00	90.00	180.04	6,900.00	-3,028.68	416.00	3,041.61	0.00	0.00	0.00
9,200.00	90.00	180.04	6,900.00	-3,128.68	415.93	3,141.55	0.00	0.00	0.00
9,300.00	90.00	180.04	6,900.00	-3,228.68	415.86	3,241.48	0.00	0.00	0.00
9,400.00	90.00	180.04	6,900.00	-3,328.68	415.79	3,341.42	0.00	0.00	0.00
9,500.00	90.00	180.04	6,900.00	-3,428.68	415.73	3,441.35	0.00	0.00	0.00
9,600.00	90.00	180.04	6,900.00	-3,528.68	415.66	3,541.28	0.00	0.00	0.00
9,700.00	90.00	180.04	6,900.00	-3,628.68	415.59	3,641.22	0.00	0.00	0.00
9,800.00	90.00	180.04	6,900.00	-3,728.68	415.52	3,741.15	0.00	0.00	0.00
9,900.00	90.00	180.04	6,900.00	-3,828.68	415.46	3,841.08	0.00	0.00	0.00
10,000.00	90.00	180.04	6,900.00	-3,928.68	415.39	3,941.02	0.00	0.00	0.00
10,100.00	90.00	180.04	6,900.00	-4,028.68	415.32	4,040.95	0.00	0.00	0.00
10,200.00	90.00	180.04	6,900.00	-4,128.68	415.25	4,140.88	0.00	0.00	0.00
10,300.00	90.00	180.04	6,900.00	-4,228.68	415.19	4,240.82	0.00	0.00	0.00
10,400.00	90.00	180.04	6,900.00	-4,328.68	415.12	4,340.75	0.00	0.00	0.00
10,500.00	90.00	180.04	6,900.00	-4,428.68	415.05	4,440.69	0.00	0.00	0.00
10,600.00	90.00	180.04	6,900.00	-4,528.68	414.99	4,540.62	0.00	0.00	0.00
10,700.00	90.00	180.04	6,900.00	-4,628.68	414.92	4,640.55	0.00	0.00	0.00
10,800.00	90.00	180.04	6,900.00	-4,728.68	414.85	4,740.49	0.00	0.00	0.00
10,900.00	90.00	180.04	6,900.00	-4,828.68	414.78	4,840.42	0.00	0.00	0.00
11,000.00	90.00	180.04	6,900.00	-4,928.68	414.72	4,940.35	0.00	0.00	0.00
11,100.00	90.00	180.04	6,900.00	-5,028.68	414.65	5,040.29	0.00	0.00	0.00
11,200.00	90.00	180.04	6,900.00	-5,128.68	414.58	5,140.22	0.00	0.00	0.00
11,300.00	90.00	180.04	6,900.00	-5,228.68	414.51	5,240.16	0.00	0.00	0.00
11,400.00	90.00	180.04	6,900.00	-5,328.68	414.45	5,340.09	0.00	0.00	0.00
11,500.00	90.00	180.04	6,900.00	-5,428.68	414.38	5,440.02	0.00	0.00	0.00
11,600.00	90.00	180.04	6,900.00	-5,528.68	414.31	5,539.96	0.00	0.00	0.00
11,700.00	90.00	180.04	6,900.00	-5,628.68	414.24	5,639.89	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-769
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4826.00ft
Project:	Mustang	MD Reference:	Well @ 4826.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-769	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

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)
11,800.00	90.00	180.04	6,900.00	-5,728.68	414.18	5,739.82	0.00	0.00	0.00
11,900.00	90.00	180.04	6,900.00	-5,828.68	414.11	5,839.76	0.00	0.00	0.00
12,000.00	90.00	180.04	6,900.00	-5,928.68	414.04	5,939.69	0.00	0.00	0.00
12,100.00	90.00	180.04	6,900.00	-6,028.68	413.97	6,039.63	0.00	0.00	0.00
12,200.00	90.00	180.04	6,900.00	-6,128.68	413.91	6,139.56	0.00	0.00	0.00
12,300.00	90.00	180.04	6,900.00	-6,228.68	413.84	6,239.49	0.00	0.00	0.00
12,400.00	90.00	180.04	6,900.00	-6,328.68	413.77	6,339.43	0.00	0.00	0.00
12,500.00	90.00	180.04	6,900.00	-6,428.68	413.70	6,439.36	0.00	0.00	0.00
12,600.00	90.00	180.04	6,900.00	-6,528.68	413.64	6,539.29	0.00	0.00	0.00
12,700.00	90.00	180.04	6,900.00	-6,628.68	413.57	6,639.23	0.00	0.00	0.00
12,800.00	90.00	180.04	6,900.00	-6,728.68	413.50	6,739.16	0.00	0.00	0.00
12,900.00	90.00	180.04	6,900.00	-6,828.68	413.44	6,839.10	0.00	0.00	0.00
13,000.00	90.00	180.04	6,900.00	-6,928.68	413.37	6,939.03	0.00	0.00	0.00
13,100.00	90.00	180.04	6,900.00	-7,028.68	413.30	7,038.96	0.00	0.00	0.00
13,200.00	90.00	180.04	6,900.00	-7,128.68	413.23	7,138.90	0.00	0.00	0.00
13,300.00	90.00	180.04	6,900.00	-7,228.68	413.17	7,238.83	0.00	0.00	0.00
13,400.00	90.00	180.04	6,900.00	-7,328.68	413.10	7,338.76	0.00	0.00	0.00
13,500.00	90.00	180.04	6,900.00	-7,428.68	413.03	7,438.70	0.00	0.00	0.00
13,600.00	90.00	180.04	6,900.00	-7,528.68	412.96	7,538.63	0.00	0.00	0.00
13,700.00	90.00	180.04	6,900.00	-7,628.68	412.90	7,638.57	0.00	0.00	0.00
13,800.00	90.00	180.04	6,900.00	-7,728.68	412.83	7,738.50	0.00	0.00	0.00
13,900.00	90.00	180.04	6,900.00	-7,828.68	412.76	7,838.43	0.00	0.00	0.00
14,000.00	90.00	180.04	6,900.00	-7,928.68	412.69	7,938.37	0.00	0.00	0.00
14,100.00	90.00	180.04	6,900.00	-8,028.68	412.63	8,038.30	0.00	0.00	0.00
14,200.00	90.00	180.04	6,900.00	-8,128.68	412.56	8,138.23	0.00	0.00	0.00
14,300.00	90.00	180.04	6,900.00	-8,228.68	412.49	8,238.17	0.00	0.00	0.00
14,400.00	90.00	180.04	6,900.00	-8,328.68	412.42	8,338.10	0.00	0.00	0.00
14,500.00	90.00	180.04	6,900.00	-8,428.68	412.36	8,438.04	0.00	0.00	0.00
14,600.00	90.00	180.04	6,900.00	-8,528.68	412.29	8,537.97	0.00	0.00	0.00
14,700.00	90.00	180.04	6,900.00	-8,628.68	412.22	8,637.90	0.00	0.00	0.00
14,800.00	90.00	180.04	6,900.00	-8,728.68	412.15	8,737.84	0.00	0.00	0.00
14,900.00	90.00	180.04	6,900.00	-8,828.68	412.09	8,837.77	0.00	0.00	0.00
15,000.00	90.00	180.04	6,900.00	-8,928.68	412.02	8,937.70	0.00	0.00	0.00
15,100.00	90.00	180.04	6,900.00	-9,028.68	411.95	9,037.64	0.00	0.00	0.00
15,200.00	90.00	180.04	6,900.00	-9,128.68	411.89	9,137.57	0.00	0.00	0.00
15,300.00	90.00	180.04	6,900.00	-9,228.68	411.82	9,237.50	0.00	0.00	0.00
15,400.00	90.00	180.04	6,900.00	-9,328.68	411.75	9,337.44	0.00	0.00	0.00
15,500.00	90.00	180.04	6,900.00	-9,428.68	411.68	9,437.37	0.00	0.00	0.00
15,600.00	90.00	180.04	6,900.00	-9,528.68	411.62	9,537.31	0.00	0.00	0.00
15,700.00	90.00	180.04	6,900.00	-9,628.68	411.55	9,637.24	0.00	0.00	0.00
15,800.00	90.00	180.04	6,900.00	-9,728.68	411.48	9,737.17	0.00	0.00	0.00
15,900.00	90.00	180.04	6,900.00	-9,828.68	411.41	9,837.11	0.00	0.00	0.00
16,000.00	90.00	180.04	6,900.00	-9,928.68	411.35	9,937.04	0.00	0.00	0.00
16,100.00	90.00	180.04	6,900.00	-10,028.68	411.28	10,036.97	0.00	0.00	0.00
16,200.00	90.00	180.04	6,900.00	-10,128.68	411.21	10,136.91	0.00	0.00	0.00
16,300.00	90.00	180.04	6,900.00	-10,228.68	411.14	10,236.84	0.00	0.00	0.00
16,400.00	90.00	180.04	6,900.00	-10,328.68	411.08	10,336.78	0.00	0.00	0.00
16,500.00	90.00	180.04	6,900.00	-10,428.68	411.01	10,436.71	0.00	0.00	0.00
16,600.00	90.00	180.04	6,900.00	-10,528.68	410.94	10,536.64	0.00	0.00	0.00
16,700.00	90.00	180.04	6,900.00	-10,628.68	410.87	10,636.58	0.00	0.00	0.00
16,800.00	90.00	180.04	6,900.00	-10,728.68	410.81	10,736.51	0.00	0.00	0.00
16,900.00	90.00	180.04	6,900.00	-10,828.68	410.74	10,836.44	0.00	0.00	0.00
17,000.00	90.00	180.04	6,900.00	-10,928.68	410.67	10,936.38	0.00	0.00	0.00
17,100.00	90.00	180.04	6,900.00	-11,028.68	410.60	11,036.31	0.00	0.00	0.00

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-769
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4826.00ft
Project:	Mustang	MD Reference:	Well @ 4826.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-769	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

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)
17,200.00	90.00	180.04	6,900.00	-11,128.68	410.54	11,136.25	0.00	0.00	0.00
17,300.00	90.00	180.04	6,900.00	-11,228.68	410.47	11,236.18	0.00	0.00	0.00
17,400.00	90.00	180.04	6,900.00	-11,328.68	410.40	11,336.11	0.00	0.00	0.00
17,500.00	90.00	180.04	6,900.00	-11,428.68	410.34	11,436.05	0.00	0.00	0.00
17,547.81	90.00	180.04	6,900.00	-11,476.50	410.31	11,483.83	0.00	0.00	0.00
TD @ 17547.81' MD/6900.00' TVD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Vogler State D33-769 SI - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,319,509.94	3,261,957.18	40.2066490	-104.5620921
Vogler State D33-769 KI - plan hits target center - Point	0.00	0.00	6,373.70	-637.21	365.44	1,318,872.73	3,262,322.63	40.2048893	-104.5608079
Vogler State D33-769 BI - plan hits target center - Point	0.00	0.00	6,900.00	-11,476.50	410.31	1,308,033.47	3,262,367.49	40.1751345	-104.5610582
Vogler State D33-769 TF - plan hits target center - Point	0.00	0.00	6,900.00	-1,264.68	417.18	1,318,245.26	3,262,374.37	40.2031654	-104.5606465

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
631.00	631.00	Pierre				
766.00	766.00	Upper Pierre Aquifer Top				
1,633.00	1,633.00	Upper Pierre Aquifer Base				
3,875.16	3,854.00	Parkman				
4,112.73	4,087.00	Sussex				
5,081.35	5,037.00	Shannon				
6,224.33	6,158.00	Teepee Buttes				
6,794.08	6,684.00	Sharon Springs				
6,874.95	6,741.00	Top A Chalk				
6,876.47	6,742.00	Top A Marl				
6,887.22	6,749.00	Top B Chalk				
6,971.56	6,799.00	Top B Marl				
7,132.79	6,868.00	Top C Chalk				
7,336.00	6,900.00	Top C Marl				

Noble Energy, Inc.

Planning Report

Database:	EDMP	Local Co-ordinate Reference:	Well Vogler State D33-769
Company:	Northern Region - DJ Basin	TVD Reference:	Well @ 4826.00ft
Project:	Mustang	MD Reference:	Well @ 4826.00ft
Site:	D Section 21	North Reference:	Grid
Well:	Vogler State D33-769	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,400.00	2,400.00	0.00	0.00	Build 2°/100'
2,962.72	2,959.11	-47.79	27.41	Hold 11.25° Inc., 150.17° Azm
6,444.26	6,373.70	-637.21	365.44	KOP: Build 9°/100' @ 6444.26' MD
7,336.00	6,900.00	-1,264.68	417.18	LP: 7336.00' MD, 90.00° Inc, 180.04° Azm
17,547.81	6,900.00	-11,476.50	410.31	TD @ 17547.81' MD/6900.00' TVD

Northern Region - DJ Basin

Mustang

D Section 21

Vogler State D33-769

Wellbore #1

Plan 1

Anticollision Summary Report

01 August, 2018

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-769
Project:	Mustang	TVD Reference:	Well @ 4826.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4826.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-769	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	8/1/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	17,547.63	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						
D Section 21						
Casey Blue D 21-11 (PR) - Wellbore #1 - No Surveys	2,400.00	2,388.00	1,390.46	1,334.33	24.772	CC
Casey Blue D 21-11 (PR) - Wellbore #1 - No Surveys	2,600.00	2,587.84	1,392.48	1,331.69	22.905	ES
Casey Blue D 21-11 (PR) - Wellbore #1 - No Surveys	6,550.00	6,463.58	1,770.38	1,617.88	11.609	SF
Casey Blue D21-13 (PR) - Wellbore #1 - Gyro Surveys	4,045.07	3,990.86	562.18	534.37	20.218	CC
Casey Blue D21-13 (PR) - Wellbore #1 - Gyro Surveys	4,100.00	4,043.38	562.35	534.16	19.950	ES
Casey Blue D21-13 (PR) - Wellbore #1 - Gyro Surveys	6,500.00	6,412.10	777.04	731.73	17.151	SF
Casey Blue D21-14 (SI) - Wellbore #1 - Gyro Surveys	6,482.19	6,393.81	785.34	740.06	17.344	CC
Casey Blue D21-14 (SI) - Wellbore #1 - Gyro Surveys	6,500.00	6,410.92	785.45	740.04	17.297	ES
Casey Blue D21-14 (SI) - Wellbore #1 - Gyro Surveys	6,650.00	6,549.71	796.00	749.51	17.120	SF
Casey Blue D21-3J (PR) - Wellbore #1 - Gyro Surveys	2,454.32	2,442.51	567.19	550.29	33.547	CC, ES
Casey Blue D21-3J (PR) - Wellbore #1 - Gyro Surveys	6,450.00	6,368.21	1,294.52	1,249.78	28.931	SF
Guttersen 21-31 (SI) - Wellbore #1 - Gyro Surveys	259.48	226.48	4,216.14	4,214.82	3,205.668	CC
Guttersen 21-31 (SI) - Wellbore #1 - Gyro Surveys	2,300.00	2,241.78	4,221.33	4,205.66	269.331	ES
Guttersen 21-31 (SI) - Wellbore #1 - Gyro Surveys	6,800.00	6,647.85	4,727.44	4,680.22	100.122	SF
Guttersen 21-42 (SI) - Wellbore #1 - Gyro Surveys	1,841.02	1,825.03	4,234.06	4,221.50	336.994	CC
Guttersen 21-42 (SI) - Wellbore #1 - Gyro Surveys	2,000.00	1,950.86	4,234.55	4,220.98	311.994	ES
Guttersen 21-42 (SI) - Wellbore #1 - Gyro Surveys	6,900.00	6,746.69	4,452.71	4,404.61	92.567	SF
Guttersen 32-21 (PR) - Wellbore #1 - No Surveys	2,400.00	2,392.00	3,144.86	3,088.65	55.948	CC
Guttersen 32-21 (PR) - Wellbore #1 - No Surveys	2,700.00	2,691.45	3,148.72	3,085.52	49.826	ES
Guttersen 32-21 (PR) - Wellbore #1 - No Surveys	6,750.00	6,642.15	3,484.80	3,327.88	22.207	SF
Guttersen 33-21 (PR) - Wellbore #1 - Gyro Surveys	3,455.94	3,412.10	2,444.89	2,421.19	103.184	CC
Guttersen 33-21 (PR) - Wellbore #1 - Gyro Surveys	3,500.00	3,447.47	2,444.97	2,421.00	101.994	ES
Guttersen 33-21 (PR) - Wellbore #1 - Gyro Surveys	6,750.00	6,649.01	2,623.09	2,575.83	55.496	SF
Guttersen 34-21 (PR) - Wellbore #1 - Gyro Surveys	6,559.36	6,424.32	2,010.25	1,964.55	43.994	CC, ES
Guttersen 34-21 (PR) - Wellbore #1 - Gyro Surveys	7,000.00	6,738.64	2,059.48	2,010.91	42.398	SF
Guttersen 41-21 (PR) - Wellbore #1 - Gyro Surveys	944.23	928.26	5,056.61	5,050.39	812.941	CC
Guttersen 41-21 (PR) - Wellbore #1 - Gyro Surveys	2,000.00	1,951.78	5,059.20	5,045.62	372.560	ES
Guttersen 41-21 (PR) - Wellbore #1 - Gyro Surveys	7,000.00	6,790.10	5,568.51	5,520.00	114.794	SF
Guttersen 43-21 (PR) - Wellbore #1 - Gyro Surveys	6,005.55	5,877.61	3,427.22	3,385.52	82.186	CC
Guttersen 43-21 (PR) - Wellbore #1 - Gyro Surveys	6,200.00	6,046.16	3,428.00	3,384.98	79.692	ES
Guttersen 43-21 (PR) - Wellbore #1 - Gyro Surveys	7,050.00	6,944.44	3,560.73	3,511.41	72.188	SF
Guttersen D21-32D (SI) - Wellbore #1 - MWD Surveys	1,831.72	1,886.18	652.64	637.11	42.023	CC
Guttersen D21-32D (SI) - Wellbore #1 - MWD Surveys	1,900.00	1,952.59	653.13	636.84	40.112	ES
Guttersen D21-32D (SI) - Wellbore #1 - MWD Surveys	2,600.00	2,571.76	725.40	702.63	31.852	SF
Guttersen USX D21-17 (PR) - Wellbore #1 - No Surveys	2,400.00	2,376.00	4,173.15	4,117.26	74.667	CC
Guttersen USX D21-17 (PR) - Wellbore #1 - No Surveys	2,700.00	2,675.45	4,177.19	4,114.31	66.436	ES
Guttersen USX D21-17 (PR) - Wellbore #1 - No Surveys	6,800.00	6,664.52	4,524.29	4,366.72	28.713	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 Vogler State D33-769
Project:	Mustang	TVD Reference:	Well @ 4826.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4826.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-769	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
D Section 21						
Guttersen USX D21-20D (PR) - Wellbore #1 - MWD Surv	0.00	0.00	748.42			
Guttersen USX D21-20D (PR) - Wellbore #1 - MWD Surv	400.00	383.90	749.19	746.87	323.358	ES
Guttersen USX D21-20D (PR) - Wellbore #1 - MWD Surv	6,500.00	6,569.50	2,103.63	2,056.01	44.180	SF
Guttersen USX D21-21D (SI) - Wellbore #1 - MWD Surv	183.20	177.20	758.15	757.35	947.535	CC
Guttersen USX D21-21D (SI) - Wellbore #1 - MWD Surv	300.00	287.38	758.78	757.16	470.808	ES
Guttersen USX D21-21D (SI) - Wellbore #1 - MWD Surv	6,600.00	6,723.01	2,391.34	2,342.91	49.375	SF
Guttersen USX D21-24D (PR) - Wellbore #1 - MWD Surv	229.99	223.99	768.70	767.57	680.375	CC
Guttersen USX D21-24D (PR) - Wellbore #1 - MWD Surv	500.00	489.02	769.88	766.84	253.928	ES
Guttersen USX D21-24D (PR) - Wellbore #1 - MWD Surv	6,650.00	6,644.97	1,480.52	1,431.43	30.162	SF
Guttersen USX D21-25 (PR) - Wellbore #1 - MWD Surv	0.00	0.00	738.84			
Guttersen USX D21-25 (PR) - Wellbore #1 - MWD Surv	2,900.00	2,887.38	741.31	721.20	36.868	ES
Guttersen USX D21-25 (PR) - Wellbore #1 - MWD Surv	6,450.00	6,374.96	1,071.56	1,026.29	23.670	SF
Guttersen USX D21-27D (PR) - Wellbore #1 - MWD Surv	257.79	232.80	4,197.46	4,196.18	3,294.103	CC
Guttersen USX D21-27D (PR) - Wellbore #1 - MWD Surv	900.00	852.09	4,198.32	4,192.59	732.563	ES
Guttersen USX D21-27D (PR) - Wellbore #1 - MWD Surv	6,850.00	6,838.10	5,580.39	5,529.62	109.911	SF
Guttersen USX D21-28D (PR) - Wellbore #1 - MWD Surv	2,789.90	3,136.34	4,038.60	4,011.92	151.357	CC
Guttersen USX D21-28D (PR) - Wellbore #1 - MWD Surv	2,800.00	3,140.72	4,038.65	4,011.90	150.949	ES
Guttersen USX D21-28D (PR) - Wellbore #1 - MWD Surv	6,650.00	6,877.60	5,016.88	4,957.15	83.993	SF
Guttersen USX D21-33D (SI) - Wellbore #1 - MWD Surv	2,842.48	2,952.67	323.85	300.50	13.871	CC, ES
Guttersen USX D21-33D (SI) - Wellbore #1 - MWD Surv	3,000.00	3,092.71	335.17	309.73	13.174	SF
Guttersen USX D22-30D (PR) - Wellbore #1 - MWD Surv	100.00	73.03	4,218.04	4,217.79	10,000.000	CC
Guttersen USX D22-30D (PR) - Wellbore #1 - MWD Surv	800.00	755.33	4,218.97	4,214.08	863.095	ES
Guttersen USX D22-30D (PR) - Wellbore #1 - MWD Surv	7,000.00	7,030.15	6,344.09	6,292.66	123.355	SF
Gutterson 18-21 (SI) - Wellbore #1 - Gyro Surveys	2,115.61	2,100.00	2,995.43	2,980.90	206.158	CC
Gutterson 18-21 (SI) - Wellbore #1 - Gyro Surveys	2,400.00	2,366.08	2,996.60	2,980.13	181.924	ES
Gutterson 18-21 (SI) - Wellbore #1 - Gyro Surveys	6,700.00	6,571.92	3,735.27	3,688.83	80.435	SF
HSR Guttersen B 5-21 (PR) - Wellbore #1 - Gyro Survey	383.08	358.11	2,242.14	2,239.92	1,009.625	CC
HSR Guttersen B 5-21 (PR) - Wellbore #1 - Gyro Survey	2,300.00	2,255.23	2,244.17	2,228.46	142.844	ES
HSR Guttersen B 5-21 (PR) - Wellbore #1 - Gyro Survey	6,600.00	6,520.60	3,002.63	2,956.79	65.491	SF
HSR Gutterson 4-21 (PR) - Wellbore #1 - Gyro Surveys	2,466.46	2,523.59	3,473.65	3,456.36	200.962	CC
HSR Gutterson 4-21 (PR) - Wellbore #1 - Gyro Surveys	2,500.00	2,558.48	3,473.82	3,456.30	198.255	ES
HSR Gutterson 4-21 (PR) - Wellbore #1 - Gyro Surveys	6,700.00	6,573.44	4,251.36	4,204.96	91.634	SF
HSR-Guttersen 3-21 (SI) - Wellbore #1 - Gyro Surveys	2,463.72	2,499.92	3,637.11	3,619.94	211.833	CC
HSR-Guttersen 3-21 (SI) - Wellbore #1 - Gyro Surveys	2,500.00	2,536.21	3,637.27	3,619.85	208.789	ES
HSR-Guttersen 3-21 (SI) - Wellbore #1 - Gyro Surveys	6,850.00	6,859.32	4,319.38	4,270.83	88.982	SF
HSR-Guttersen 6-21 (SI) - Wellbore #1 - Gyro Surveys	1,820.99	1,798.02	2,424.32	2,411.91	195.264	CC
HSR-Guttersen 6-21 (SI) - Wellbore #1 - Gyro Surveys	2,404.05	2,383.17	2,424.89	2,408.35	146.577	ES
HSR-Guttersen 6-21 (SI) - Wellbore #1 - Gyro Surveys	6,650.00	6,533.15	3,003.82	2,957.62	65.009	SF
Two E Ranch 1-21C (SI) - Wellbore #1 - Gyro Surveys	6,507.36	6,408.16	2,966.93	2,921.47	65.265	CC, ES
Two E Ranch 1-21C (SI) - Wellbore #1 - Gyro Surveys	7,050.00	6,818.94	3,055.62	3,006.57	62.298	SF
Vogler State D21-720 - Wellbore #1 - Plan 1	7,216.12	7,255.17	3,168.59	3,116.86	61.249	CC, ES
Vogler State D21-720 - Wellbore #1 - Plan 1	8,100.00	6,850.00	3,248.93	3,194.42	59.611	SF
Vogler State D21-731 - Wellbore #1 - Plan 1	3,094.04	2,925.23	1,799.20	1,778.51	86.993	CC
Vogler State D21-731 - Wellbore #1 - Plan 1	3,100.00	2,929.57	1,799.20	1,778.48	86.855	ES
Vogler State D21-731 - Wellbore #1 - Plan 1	8,000.00	6,633.02	2,434.97	2,380.80	44.948	SF
Vogler State D21-740 - Wellbore #1 - Plan 1	3,210.99	3,043.08	1,765.09	1,743.67	82.423	CC
Vogler State D21-740 - Wellbore #1 - Plan 1	3,300.00	3,114.13	1,765.55	1,743.61	80.459	ES
Vogler State D21-740 - Wellbore #1 - Plan 1	7,600.00	6,932.93	1,839.25	1,786.16	34.641	SF
Vogler State D21-750 - Wellbore #1 - Plan 1	7,095.00	7,308.78	1,225.82	1,174.52	23.891	CC
Vogler State D21-750 - Wellbore #1 - Plan 1	7,100.00	7,305.12	1,225.83	1,174.51	23.884	ES
Vogler State D21-750 - Wellbore #1 - Plan 1	7,200.00	7,233.56	1,228.03	1,176.45	23.807	SF
Vogler State D21-760 - Wellbore #1 - Plan 1	2,991.45	2,960.33	152.01	131.72	7.492	CC
Vogler State D21-760 - Wellbore #1 - Plan 1	3,000.00	2,968.47	152.02	131.68	7.475	ES

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 Vogler State D33-769
Project:	Mustang	TVD Reference:	Well @ 4826.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4826.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-769	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
D Section 21						
Vogler State D21-760 - Wellbore #1 - Plan 1	3,100.00	3,063.55	153.89	133.01	7.368	SF
Vogler State D21-770 - Wellbore #1 - Plan 1	7,001.64	7,366.83	94.06	43.06	1.844	CC, ES, SF
Vogler State D21-780 - Wellbore #1 - Plan 1	2,000.00	1,994.00	154.27	140.42	11.137	CC, ES
Vogler State D21-780 - Wellbore #1 - Plan 1	2,200.00	2,183.85	160.49	145.31	10.574	SF
Vogler State D21-790 - Wellbore #1 - Plan 1	3,593.26	3,225.62	3,668.58	3,645.18	156.755	CC
Vogler State D21-790 - Wellbore #1 - Plan 1	3,700.00	3,300.00	3,669.10	3,645.08	152.768	ES
Vogler State D21-790 - Wellbore #1 - Plan 1	8,700.00	6,550.00	3,969.26	3,912.56	70.008	SF
Vogler State D33-711 - Wellbore #1 - Plan 1	1,906.71	1,929.71	3,696.35	3,683.06	278.204	CC
Vogler State D33-711 - Wellbore #1 - Plan 1	6,650.00	6,304.82	3,712.48	3,666.26	80.327	ES
Vogler State D33-711 - Wellbore #1 - Plan 1	17,547.67	17,481.55	3,911.56	3,717.27	20.133	SF
Vogler State D33-718 - Wellbore #1 - Plan 1	7,324.07	7,305.90	3,273.21	3,220.91	62.582	CC
Vogler State D33-718 - Wellbore #1 - Plan 1	17,500.00	17,482.05	3,281.12	3,087.36	16.934	ES
Vogler State D33-718 - Wellbore #1 - Plan 1	17,547.67	17,482.05	3,281.55	3,087.38	16.901	SF
Vogler State D33-728 - Wellbore #1 - Plan 1	1,900.25	1,933.25	1,800.22	1,786.94	135.599	CC
Vogler State D33-728 - Wellbore #1 - Plan 1	2,000.00	2,021.47	1,800.32	1,786.38	129.087	ES
Vogler State D33-728 - Wellbore #1 - Plan 1	17,547.67	17,663.97	2,621.57	2,426.96	13.471	SF
Vogler State D33-738 - Wellbore #1 - Plan 1	3,072.91	2,939.00	1,753.67	1,732.95	84.666	CC
Vogler State D33-738 - Wellbore #1 - Plan 1	3,100.00	2,958.72	1,753.72	1,732.86	84.059	ES
Vogler State D33-738 - Wellbore #1 - Plan 1	17,547.67	17,481.14	1,964.11	1,769.31	10.083	SF
Vogler State D33-752 - Wellbore #1 - Plan 1	7,329.42	7,350.15	1,301.17	1,248.53	24.719	CC
Vogler State D33-752 - Wellbore #1 - Plan 1	17,547.67	17,537.69	1,311.05	1,116.14	6.726	ES, SF
Vogler State D33-759 - Wellbore #1 - Plan 1	2,000.00	2,001.00	38.00	24.12	2.738	CC, ES
Vogler State D33-759 - Wellbore #1 - Plan 1	2,100.00	2,099.87	39.46	24.89	2.708	SF
Vogler State D33-779 - Wellbore #1 - Plan 1	2,000.00	2,000.00	37.00	23.13	2.667	CC
Vogler State D33-779 - Wellbore #1 - Plan 1	2,100.00	2,099.60	37.52	22.95	2.575	ES, SF

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-769
Project:	Mustang	TVD Reference:	Well @ 4826.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4826.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-769	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
D Section 28						
O'SH D 28-7 (P&A) - Wellbore #1 - No Surveys	9,098.84	6,884.00	1,872.98	1,700.59	10.865	CC
O'SH D 28-7 (P&A) - Wellbore #1 - No Surveys	9,100.00	6,884.00	1,872.98	1,700.58	10.864	ES
O'SH D 28-7 (P&A) - Wellbore #1 - No Surveys	9,200.00	6,884.00	1,875.71	1,702.63	10.838	SF
Spike ST GWS D 28-12 (SI) - Wellbore #1 - Gyro Surve	10,487.60	6,877.82	853.55	786.08	12.652	CC, ES
Spike ST GWS D 28-12 (SI) - Wellbore #1 - Gyro Surve	10,500.00	6,877.93	853.64	786.13	12.645	SF
Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su	7,043.41	6,882.74	63.05	13.07	1.261	Level 3, CC
Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su	7,050.00	6,885.62	63.32	13.04	1.259	Level 3, ES, SF
Guttersen D State 28-30D - Wellbore #1 - Guttersen D S	3,891.99	3,829.46	1,418.27	1,388.82	48.165	CC
Guttersen D State 28-30D - Wellbore #1 - Guttersen D S	3,900.00	3,836.03	1,418.27	1,388.77	48.075	ES
Guttersen D State 28-30D - Wellbore #1 - Guttersen D S	7,250.00	6,977.54	1,520.84	1,470.35	30.119	SF
Guttersen State D28-18D (PR) - Wellbore #1 - MWD Sur	8,282.25	6,951.05	1,050.00	992.76	18.344	CC
Guttersen State D28-18D (PR) - Wellbore #1 - MWD Sur	8,300.00	6,950.91	1,050.15	992.76	18.297	ES
Guttersen State D28-18D (PR) - Wellbore #1 - MWD Sur	8,400.00	6,950.07	1,056.58	998.38	18.153	SF
Guttersen State D28-21D (SI) - Wellbore #1 - MWD Surv	9,604.70	6,935.82	1,166.62	1,102.17	18.101	CC, ES
Guttersen State D28-21D (SI) - Wellbore #1 - MWD Surv	9,700.00	6,934.98	1,170.51	1,105.53	18.015	SF
Guttersen State D28-24D (SI) - Wellbore #1 - MWD Surv	11,167.38	7,013.29	1,159.84	1,082.63	15.021	CC, ES
Guttersen State D28-24D (SI) - Wellbore #1 - MWD Surv	11,300.00	7,016.92	1,167.39	1,088.86	14.866	SF
Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur	7,013.02	6,855.07	1,112.95	1,061.68	21.710	CC, ES
Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur	7,100.00	6,891.41	1,116.37	1,064.81	21.652	SF
Guttersen State D28-79HN - Wellbore #1 - Actual	7,600.00	11,086.00	1,337.63	1,226.68	12.056	SF
Guttersen State D28-79HN - Wellbore #1 - Actual	11,216.77	7,566.26	1,151.87	1,074.48	14.883	CC, ES
HSR Guttersen State 10-28 (SI) - Wellbore #1 - Gyro Su	10,382.44	6,906.48	1,611.24	1,544.43	24.117	CC
HSR Guttersen State 10-28 (SI) - Wellbore #1 - Gyro Su	10,400.00	6,906.98	1,611.33	1,544.38	24.066	ES
HSR Guttersen State 10-28 (SI) - Wellbore #1 - Gyro Su	10,600.00	6,912.62	1,625.85	1,557.45	23.770	SF
HSR Guttersen State 15-28 (SI) - Wellbore #1 - Gyro Su	12,014.65	6,831.22	2,215.46	2,137.19	28.308	CC, ES
HSR Guttersen State 15-28 (SI) - Wellbore #1 - Gyro Su	12,400.00	6,856.52	2,248.52	2,167.53	27.763	SF
HSR Guttersen State 7-28 (PR) - Wellbore #1 - Gyro Sur	9,041.74	6,753.22	1,665.55	1,607.69	28.788	CC, ES
HSR Guttersen State 7-28 (PR) - Wellbore #1 - Gyro Sur	9,300.00	6,744.67	1,685.43	1,626.02	28.371	SF
O'SH D 28-1 (SI) - Wellbore #1 - Gyro Surveys	8,123.55	6,903.34	2,862.58	2,809.15	53.579	CC, ES
O'SH D 28-1 (SI) - Wellbore #1 - Gyro Surveys	8,900.00	6,907.05	2,966.01	2,908.54	51.609	SF
O'SH D 28-2 (SI) - Wellbore #1 - Gyro Surveys	7,758.78	6,893.09	1,879.29	1,827.88	36.554	CC, ES
O'SH D 28-2 (SI) - Wellbore #1 - Gyro Surveys	8,100.00	6,892.84	1,910.02	1,857.00	36.025	SF
O'SH D 28-8 (SI) - Wellbore #1 - Gyro Surveys	9,155.83	6,843.58	3,226.94	3,168.21	54.950	CC, ES
O'SH D 28-8 (SI) - Wellbore #1 - Gyro Surveys	10,100.00	6,881.70	3,362.01	3,297.61	52.201	SF
Spike ST GWS D 28-03 (PR) - Wellbore #1 - Gyro Surve	7,626.50	6,868.30	636.34	569.27	9.488	CC, ES, SF
Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys	7,598.35	6,939.07	741.48	690.19	14.457	CC
Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys	7,600.00	6,939.08	741.48	690.19	14.456	ES, SF
Spike State D 28-13 (SI) - Wellbore #1 - Gyro Surveys	11,930.03	6,887.77	763.83	686.07	9.823	CC, ES, SF
Spike State D28-05 (PR) - Wellbore #1 - Gyro Surveys	8,943.76	6,874.06	874.49	816.95	15.200	CC, ES
Spike State D28-05 (PR) - Wellbore #1 - Gyro Surveys	9,000.00	6,874.55	876.29	818.59	15.187	SF
Spike State D28-06 (SI) - Wellbore #1 - Gyro Surveys	8,971.02	6,859.27	817.02	759.24	14.140	CC, ES
Spike State D28-06 (SI) - Wellbore #1 - Gyro Surveys	9,000.00	6,859.51	817.54	759.53	14.095	SF
Spike State D28-11 (SI) - Wellbore #1 - Gyro Surveys	10,281.51	6,892.78	738.76	672.69	11.181	CC, ES
Spike State D28-11 (SI) - Wellbore #1 - Gyro Surveys	10,300.00	6,894.03	739.00	672.75	11.155	SF
Spike State GWS D 28-14 (P&A) - Wellbore #1 - Gyro Su	11,983.66	6,878.24	770.87	692.73	9.866	CC, ES
Spike State GWS D 28-14 (P&A) - Wellbore #1 - Gyro Su	12,000.00	6,879.35	771.04	692.74	9.847	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 Vogler State D33-769
Project:	Mustang	TVD Reference:	Well @ 4826.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4826.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-769	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						
D Section 33						
Cydney White D33-01 (PR) - Wellbore #1 - Gyro Surveys	13,137.91	6,940.68	3,256.59	3,169.82	37.532	CC, ES
Cydney White D33-01 (PR) - Wellbore #1 - Gyro Surveys	13,800.00	6,946.51	3,323.21	3,231.94	36.412	SF
Cydney White D33-02 (PR) - Wellbore #1 - Gyro Surveys	13,093.20	6,897.14	1,946.73	1,860.25	22.510	CC
Cydney White D33-02 (PR) - Wellbore #1 - Gyro Surveys	13,100.00	6,897.20	1,946.74	1,860.20	22.494	ES
Cydney White D33-02 (PR) - Wellbore #1 - Gyro Surveys	13,300.00	6,899.02	1,957.68	1,869.62	22.230	SF
Cydney White D33-07 (PR) - Wellbore #1 - Gyro Surveys	14,383.09	6,918.12	1,882.98	1,786.56	19.528	CC
Cydney White D33-07 (PR) - Wellbore #1 - Gyro Surveys	14,400.00	6,918.00	1,883.06	1,786.48	19.498	ES
Cydney White D33-07 (PR) - Wellbore #1 - Gyro Surveys	14,600.00	6,916.57	1,895.43	1,797.41	19.336	SF
Guttersen D 33-09 (PR) - Wellbore #1 - Gyro Surveys	15,906.17	6,955.53	3,395.59	3,287.16	31.317	CC, ES
Guttersen D 33-09 (PR) - Wellbore #1 - Gyro Surveys	16,400.00	6,955.00	3,431.31	3,319.36	30.651	SF
Guttersen D 33-16 (PR) - Wellbore #1 - Gyro Surveys	17,085.70	6,933.52	3,269.64	3,168.87	32.447	CC
Guttersen D 33-16 (PR) - Wellbore #1 - Gyro Surveys	17,100.00	6,933.40	3,269.67	3,168.78	32.407	ES
Guttersen D 33-16 (PR) - Wellbore #1 - Gyro Surveys	17,547.67	6,929.62	3,302.11	3,198.11	31.751	SF
Guttersen D 33-23 (PR) - Wellbore #1 - Gyro Surveys	16,371.86	6,929.11	2,591.71	2,479.76	23.151	CC
Guttersen D 33-23 (PR) - Wellbore #1 - Gyro Surveys	16,400.00	6,928.96	2,591.87	2,479.67	23.100	ES
Guttersen D 33-23 (PR) - Wellbore #1 - Gyro Surveys	16,700.00	6,927.37	2,612.40	2,498.11	22.857	SF
Guttersen D33-10 (SI) - Wellbore #1 - No Surveys	15,636.69	6,905.00	1,936.79	1,716.47	8.791	CC, ES
Guttersen D33-10 (SI) - Wellbore #1 - No Surveys	15,800.00	6,905.00	1,943.67	1,722.06	8.771	SF
Guttersen D33-15 (PR) - Wellbore #1 - No Surveys	16,962.56	6,910.00	1,954.63	1,723.74	8.466	CC, ES
Guttersen D33-15 (PR) - Wellbore #1 - No Surveys	17,100.00	6,910.00	1,959.45	1,727.46	8.446	SF
HSR Guttersen 11-33 (SI) - Wellbore #1 - No Surveys	15,636.82	6,899.00	637.44	417.23	2.895	CC, ES, SF
HSR Guttersen 13-33 (SI) - Wellbore #1 - Gyro Surveys	17,048.78	6,939.00	758.17	640.74	6.456	CC, ES, SF
HSR Guttersen 14-33 (SI) - Wellbore #1 - Gyro Surveys	17,128.40	6,911.92	731.50	613.82	6.216	CC, ES, SF
HSR Guttersen 3-33 (SI) - Wellbore #1 - Gyro Surveys	13,082.20	6,914.34	638.29	551.83	7.382	CC, ES
HSR Guttersen 3-33 (SI) - Wellbore #1 - Gyro Surveys	13,100.00	6,913.46	638.54	551.89	7.369	SF
HSR Guttersen 4-33 (P&A) - Wellbore #1 - No Surveys	13,158.75	6,914.00	844.27	642.93	4.193	CC, ES, SF
HSR-Guttersen 12-33 (SI) - Wellbore #1 - Gyro Surveys	15,881.06	6,935.16	701.36	593.21	6.485	CC, ES
HSR-Guttersen 12-33 (SI) - Wellbore #1 - Gyro Surveys	15,900.00	6,935.17	701.62	593.42	6.485	SF
HSR-Guttersen 5-33 (SI) - Wellbore #1 - Gyro Surveys	14,608.46	6,906.29	401.33	303.17	4.089	CC, ES, SF
HSR-Guttersen 6-33 (SI) - Wellbore #1 - Gyro Surveys	14,514.47	6,890.94	742.49	645.45	7.652	CC, ES, SF
Y Section 04						
HSR-Guttersen 01-04 - Original Drilling - Original Drilling	17,547.67	7,001.75	3,133.58	3,015.67	26.576	CC, ES, SF
HSR-Guttersen 02-04 - Original Drilling - Original Drilling	17,547.67	6,927.89	2,089.06	1,975.28	18.361	CC, ES, SF
HSR-Guttersen 03-04 - Original Drilling - Original Drilling	17,547.67	6,951.27	1,014.86	938.80	13.342	CC, ES, SF
HSR-Guttersen 05-04 - Original Drilling - Original Drilling	17,547.67	6,981.54	2,340.52	2,275.55	36.021	CC, ES, SF
HSR-Guttersen 07-04 - Original Drilling - Original Drilling	17,547.67	6,943.90	2,706.75	2,616.44	29.970	CC, ES, SF
Melvin Y04-04 - Original Drilling - Original Drilling - As Dr	17,547.67	6,994.25	1,147.54	1,081.62	17.409	CC, ES, SF

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

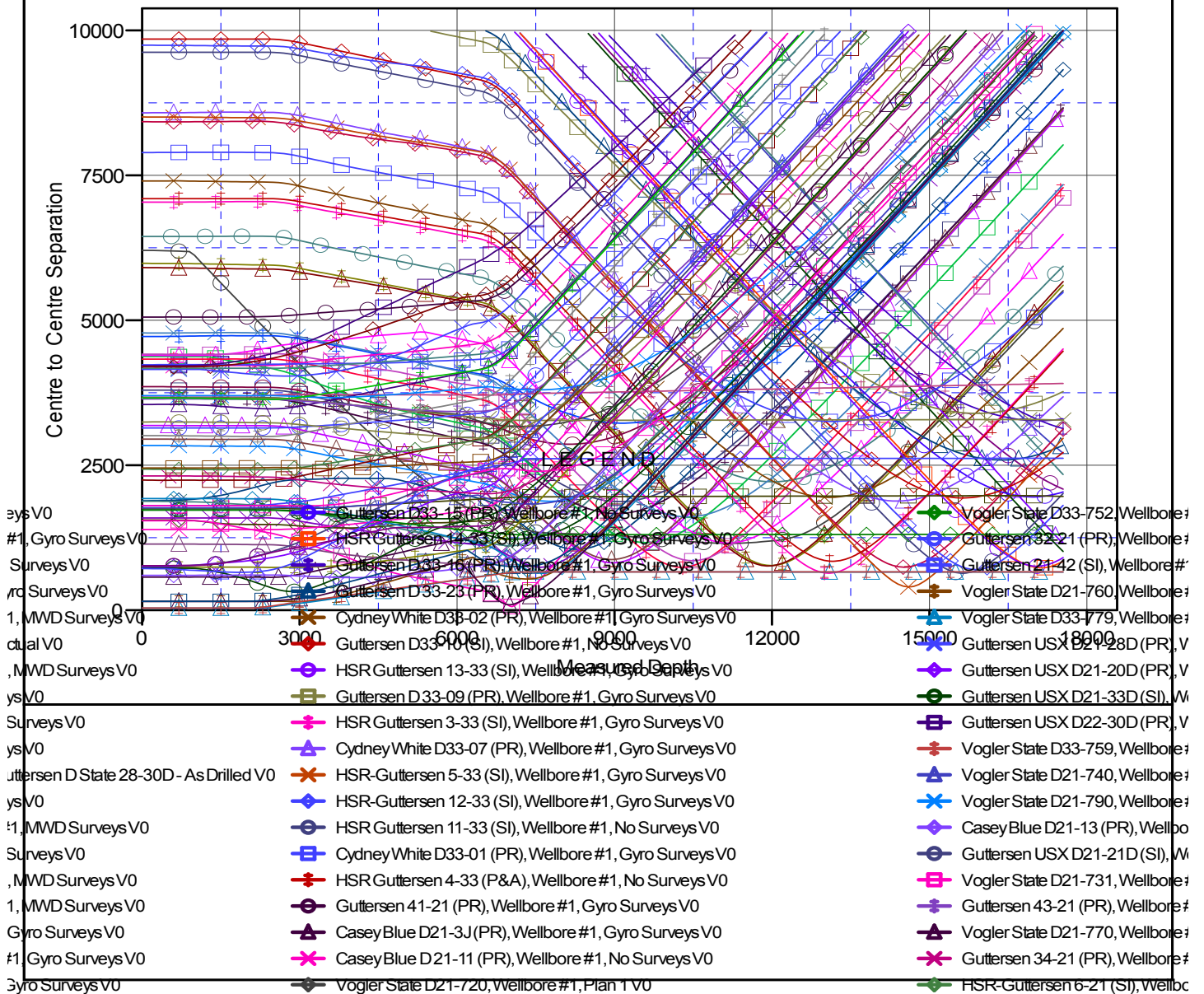
Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Vogler State D33-769
Project:	Mustang	TVD Reference:	Well @ 4826.00ft
Reference Site:	D Section 21	MD Reference:	Well @ 4826.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Vogler State D33-769	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 Depths are relative to Well @ 4826.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Vogler State D33-769
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.61°

Ladder Plot



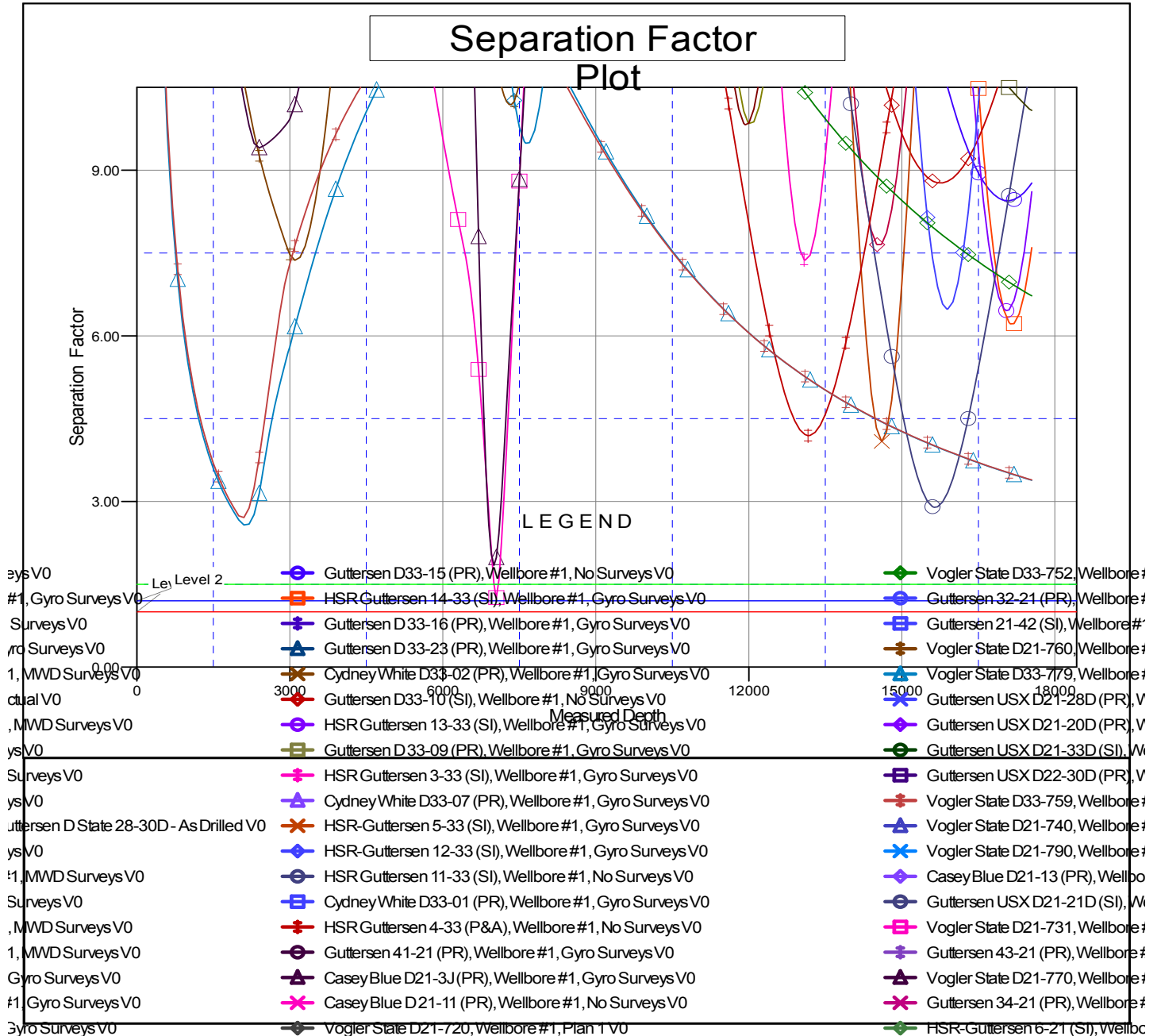
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Offset Depths are relative to Offset Datum
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