

Project: Mustang  
Site: DD Section 30  
Well: Gutteresen State DD30-785  
Wellbore: Gutteresen State DD30-785  
Design: Plan #1

# Northern Region - DJ Basin

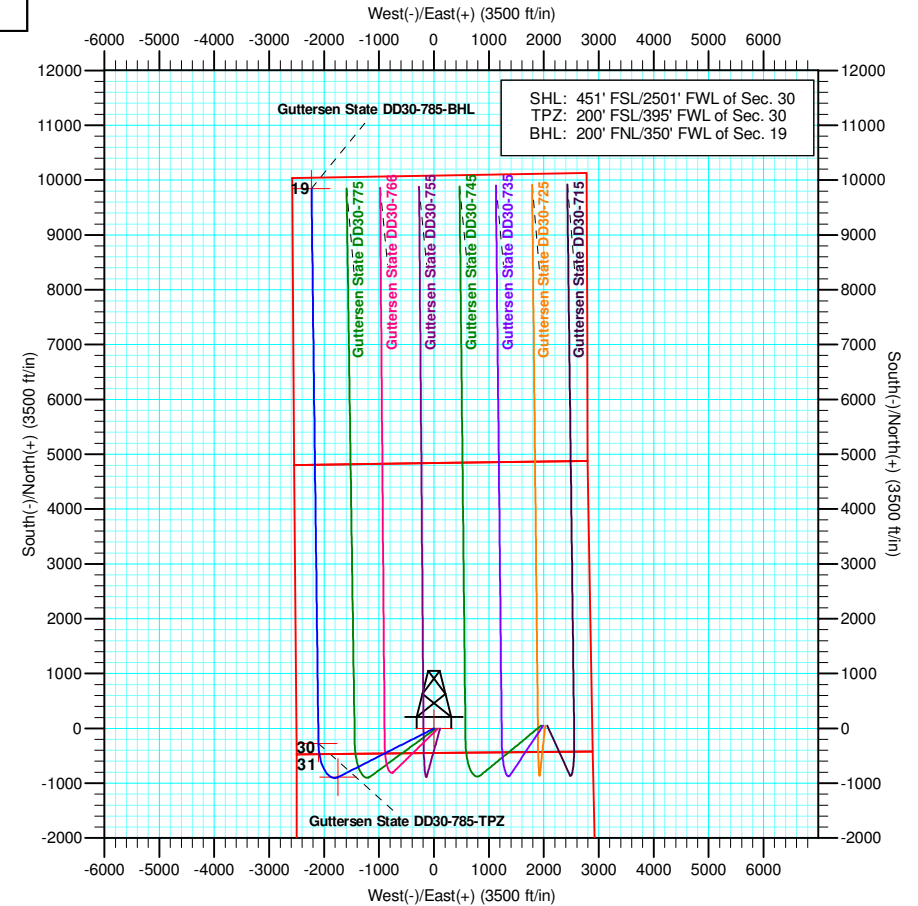
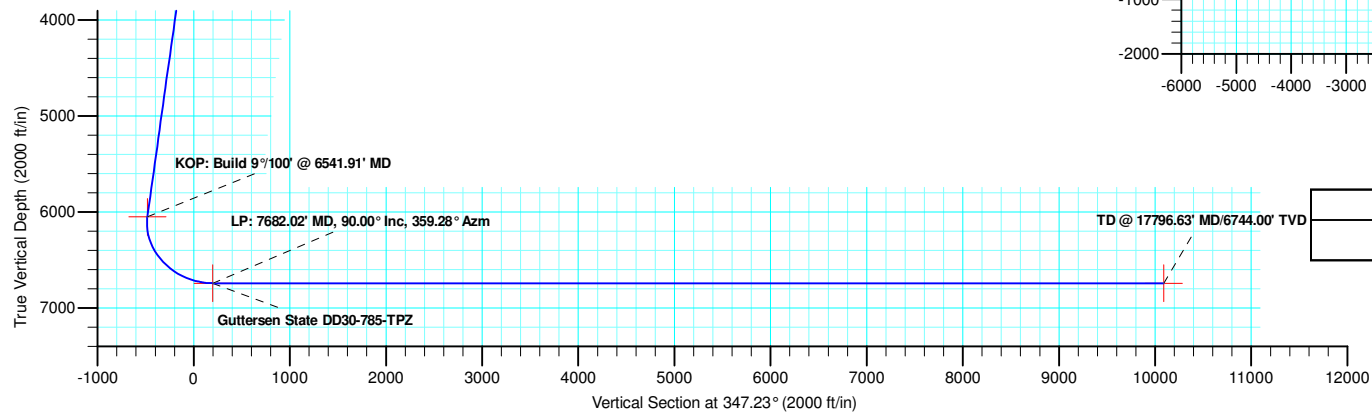
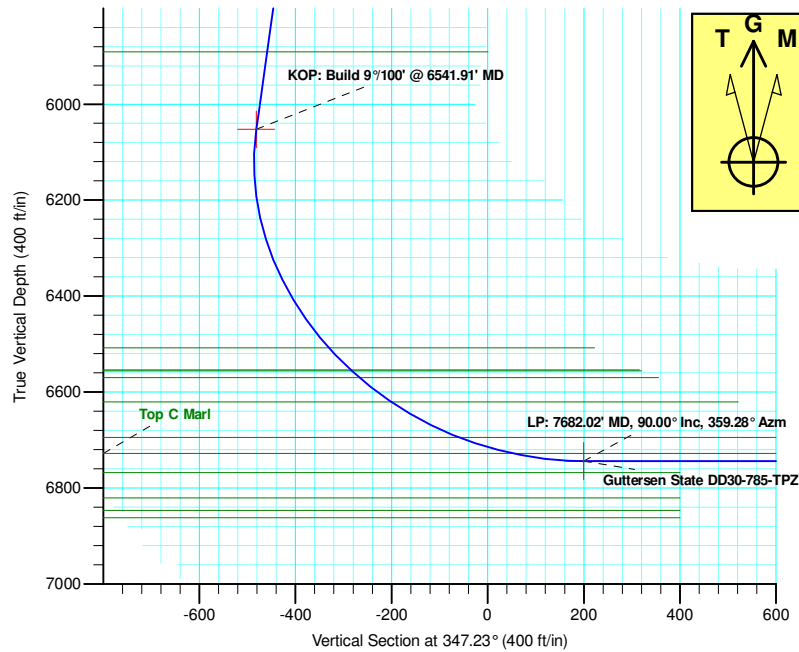
Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1994.00	0.00	0.00	1994.00	0.00	0.00	0.00	0.00	0.00	
3	3175.75	29.54	243.00	3124.07	-135.27	-265.51	2.50	243.00	-73.24	
4	6541.91	29.54	243.00	6052.56	-888.76	-1744.44	0.00	0.00	-481.21	
5	7682.02	90.00	359.28	6744.00	-271.95	-2103.60	9.00	113.25	199.73	Gutteresen State DD30-785-TPZ
6	17796.63	90.00	359.28	6744.00	9841.87	-2230.48	0.00	0.00	10091.45	Gutteresen State DD30-785-BHL

WELL DETAILS: Gutteresen State DD30-785

+N/-S	+E/-W	Northing	Ground Level: Easting	4794.00 Latitude	Longitude	Slot
0.00	0.00	1313834.89	3284560.69	40.1903867	-104.4814030	



Plan: Plan #1 (Gutteresen State DD30-785/Gutteresen State DD30-785)

Created By: Keith Noack Date: 11:43, August 28 2018

# **Northern Region - DJ Basin**

**Mustang**

**DD Section 30**

**Guttersen State DD30-785**

**Guttersen State DD30-785**

**Plan: Plan #1**

## **Standard Planning Report**

**28 August, 2018**

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site:</b>	DD Section 30	<b>North Reference:</b>	Grid
<b>Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Guttersen State DD30-785		
<b>Design:</b>	Plan #1		

<b>Project</b>	Mustang, Weld County Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site	DD Section 30				
Site Position:		Northing:	1,316,013.13 usft	Latitude:	40.1963600
From:	Lat/Long	Easting:	3,284,747.15 usft	Longitude:	-104.4806460
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.66 °

Well	Guttersen State DD30-785					
Well Position	+N/-S	-2,178.24 ft	Northing:	1,313,834.89 usft	Latitude:	40.1903868
	+E/-W	-186.45 ft	Easting:	3,284,560.70 usft	Longitude:	-104.4814030
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,794.00 ft

<b>Wellbore</b>	Guttersen State DD30-785				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	7/12/2018	7.93	66.70	52,191.17127615

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	347.23

<b>Plan Sections</b>										
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	
1,994.00	0.00	0.00	1,994.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,175.75	29.54	243.00	3,124.07	-135.27	-265.51	2.50	2.50	0.00	243.00	
6,541.91	29.54	243.00	6,052.56	-888.76	-1,744.44	0.00	0.00	0.00	0.00	
7,682.02	90.00	359.28	6,744.00	-271.95	-2,103.60	9.00	5.30	10.20	113.25	Guttersen State DD
17,796.63	90.00	359.28	6,744.00	9,841.87	-2,230.48	0.00	0.00	0.00	0.00	Guttersen State DD

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<b>Project:</b>	Mustang	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site:</b>	DD Section 30	<b>North Reference:</b>	Grid
<b>Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Guttersen State DD30-785		
<b>Design:</b>	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
613.00	0.00	0.00	613.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Pierre</b>									
687.00	0.00	0.00	687.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Upper Pierre Aquifer Top</b>									
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
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
1,624.00	0.00	0.00	1,624.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Upper Pierre Aquifer Base</b>									
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
1,994.00	0.00	0.00	1,994.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Build: 2°/100'</b>									
2,000.00	0.15	243.00	2,000.00	0.00	-0.01	0.00	2.50	2.50	0.00
2,100.00	2.65	243.00	2,099.96	-1.11	-2.18	-0.60	2.50	2.50	0.00
2,200.00	5.15	243.00	2,199.72	-4.20	-8.24	-2.27	2.50	2.50	0.00
2,300.00	7.65	243.00	2,299.09	-9.26	-18.17	-5.01	2.50	2.50	0.00
2,400.00	10.15	243.00	2,397.88	-16.28	-31.96	-8.82	2.50	2.50	0.00
2,500.00	12.65	243.00	2,495.90	-25.25	-49.57	-13.67	2.50	2.50	0.00
2,600.00	15.15	243.00	2,592.96	-36.16	-70.97	-19.58	2.50	2.50	0.00
2,700.00	17.65	243.00	2,688.89	-48.98	-96.13	-26.52	2.50	2.50	0.00
2,800.00	20.15	243.00	2,783.49	-63.68	-124.99	-34.48	2.50	2.50	0.00
2,900.00	22.65	243.00	2,876.59	-80.24	-157.50	-43.45	2.50	2.50	0.00
3,000.00	25.15	243.00	2,968.00	-98.63	-193.59	-53.40	2.50	2.50	0.00
3,100.00	27.65	243.00	3,057.57	-118.81	-233.21	-64.33	2.50	2.50	0.00
3,175.75	29.54	243.00	3,124.07	-135.27	-265.51	-73.24	2.50	2.50	0.00
<b>Hold: 29.54° Inc, 243.00° Azm</b>									
3,200.00	29.54	243.00	3,145.17	-140.70	-276.17	-76.18	0.00	0.00	0.00
3,300.00	29.54	243.00	3,232.17	-163.08	-320.10	-88.30	0.00	0.00	0.00
3,400.00	29.54	243.00	3,319.17	-185.47	-364.04	-100.42	0.00	0.00	0.00
3,500.00	29.54	243.00	3,406.17	-207.85	-407.97	-112.54	0.00	0.00	0.00
3,600.00	29.54	243.00	3,493.16	-230.24	-451.91	-124.66	0.00	0.00	0.00
3,700.00	29.54	243.00	3,580.16	-252.62	-495.84	-136.78	0.00	0.00	0.00
3,741.19	29.54	243.00	3,616.00	-261.84	-513.94	-141.77	0.00	0.00	0.00
<b>Parkman</b>									
3,800.00	29.54	243.00	3,667.16	-275.01	-539.78	-148.90	0.00	0.00	0.00
3,900.00	29.54	243.00	3,754.16	-297.39	-583.71	-161.02	0.00	0.00	0.00
4,000.00	29.54	243.00	3,841.16	-319.77	-627.65	-173.14	0.00	0.00	0.00

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## Planning Report

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<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site:</b>	DD Section 30	<b>North Reference:</b>	Grid
<b>Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Guttersen State DD30-785		
<b>Design:</b>	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)	
4,100.00	29.54	243.00	3,928.15	-342.16	-671.58	-185.26	0.00	0.00	0.00	
4,200.00	29.54	243.00	4,015.15	-364.54	-715.52	-197.38	0.00	0.00	0.00	
4,226.26	29.54	243.00	4,038.00	-370.42	-727.06	-200.56	0.00	0.00	0.00	
<b>Sussex</b>										
4,300.00	29.54	243.00	4,102.15	-386.93	-759.45	-209.50	0.00	0.00	0.00	
4,400.00	29.54	243.00	4,189.15	-409.31	-803.39	-221.62	0.00	0.00	0.00	
4,438.91	29.54	243.00	4,223.00	-418.02	-820.48	-226.33	0.00	0.00	0.00	
<b>Shannon</b>										
4,500.00	29.54	243.00	4,276.15	-431.69	-847.32	-233.74	0.00	0.00	0.00	
4,600.00	29.54	243.00	4,363.14	-454.08	-891.26	-245.86	0.00	0.00	0.00	
4,700.00	29.54	243.00	4,450.14	-476.46	-935.19	-257.97	0.00	0.00	0.00	
4,800.00	29.54	243.00	4,537.14	-498.85	-979.13	-270.09	0.00	0.00	0.00	
4,900.00	29.54	243.00	4,624.14	-521.23	-1,023.07	-282.21	0.00	0.00	0.00	
5,000.00	29.54	243.00	4,711.14	-543.61	-1,067.00	-294.33	0.00	0.00	0.00	
5,100.00	29.54	243.00	4,798.13	-566.00	-1,110.94	-306.45	0.00	0.00	0.00	
5,200.00	29.54	243.00	4,885.13	-588.38	-1,154.87	-318.57	0.00	0.00	0.00	
5,300.00	29.54	243.00	4,972.13	-610.77	-1,198.81	-330.69	0.00	0.00	0.00	
5,400.00	29.54	243.00	5,059.13	-633.15	-1,242.74	-342.81	0.00	0.00	0.00	
5,500.00	29.54	243.00	5,146.13	-655.53	-1,286.68	-354.93	0.00	0.00	0.00	
5,600.00	29.54	243.00	5,233.12	-677.92	-1,330.61	-367.05	0.00	0.00	0.00	
5,700.00	29.54	243.00	5,320.12	-700.30	-1,374.55	-379.17	0.00	0.00	0.00	
5,800.00	29.54	243.00	5,407.12	-722.69	-1,418.48	-391.29	0.00	0.00	0.00	
5,900.00	29.54	243.00	5,494.12	-745.07	-1,462.42	-403.41	0.00	0.00	0.00	
6,000.00	29.54	243.00	5,581.12	-767.45	-1,506.35	-415.53	0.00	0.00	0.00	
6,100.00	29.54	243.00	5,668.11	-789.84	-1,550.29	-427.65	0.00	0.00	0.00	
6,200.00	29.54	243.00	5,755.11	-812.22	-1,594.22	-439.77	0.00	0.00	0.00	
6,300.00	29.54	243.00	5,842.11	-834.61	-1,638.16	-451.89	0.00	0.00	0.00	
6,356.20	29.54	243.00	5,891.00	-847.19	-1,662.85	-458.70	0.00	0.00	0.00	
<b>Teepee Buttes</b>										
6,400.00	29.54	243.00	5,929.11	-856.99	-1,682.09	-464.01	0.00	0.00	0.00	
6,500.00	29.54	243.00	6,016.11	-879.37	-1,726.03	-476.13	0.00	0.00	0.00	
6,541.91	29.54	243.00	6,052.56	-888.76	-1,744.44	-481.21	0.00	0.00	0.00	
<b>KOP: Build 9°/100' @ 6541.91' MD</b>										
6,550.00	29.26	244.37	6,059.61	-890.52	-1,748.00	-482.14	9.00	-3.47	16.92	
6,600.00	27.86	253.32	6,103.55	-899.16	-1,770.22	-485.66	9.00	-2.81	17.90	
6,650.00	27.08	262.94	6,147.93	-903.91	-1,792.72	-485.32	9.00	-1.56	19.24	
6,700.00	26.98	272.85	6,192.49	-904.75	-1,815.36	-481.13	9.00	-0.19	19.82	
6,750.00	27.58	282.59	6,236.95	-901.66	-1,837.99	-473.11	9.00	1.18	19.49	
6,800.00	28.81	291.76	6,281.04	-894.67	-1,860.49	-461.32	9.00	2.47	18.34	
6,850.00	30.61	300.09	6,324.49	-883.81	-1,882.70	-445.83	9.00	3.60	16.66	
6,900.00	32.89	307.48	6,367.02	-869.16	-1,904.50	-426.72	9.00	4.55	14.77	
6,950.00	35.54	313.94	6,408.37	-850.81	-1,925.75	-404.12	9.00	5.31	12.93	
7,000.00	38.50	319.58	6,448.30	-828.86	-1,946.32	-378.17	9.00	5.92	11.27	
7,050.00	41.70	324.50	6,486.55	-803.46	-1,966.08	-349.03	9.00	6.39	9.85	
7,079.18	43.65	327.09	6,508.00	-787.11	-1,977.19	-330.63	9.00	6.69	8.88	
<b>Sharon Springs</b>										
7,100.00	45.08	328.83	6,522.89	-774.76	-1,984.91	-316.88	9.00	6.85	8.34	
7,145.34	48.27	332.33	6,554.00	-746.03	-2,001.08	-285.29	9.00	7.04	7.71	
<b>Top A Chalk</b>										
7,148.35	48.49	332.55	6,556.00	-744.04	-2,002.12	-283.11	9.00	7.16	7.30	
<b>Top A Marl</b>										
7,150.00	48.60	332.67	6,557.09	-742.94	-2,002.69	-281.92	9.00	7.17	7.26	
7,169.80	50.03	334.07	6,570.00	-729.51	-2,009.42	-267.34	9.00	7.22	7.09	

# Noble Energy, Inc.

## Planning Report

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<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site:</b>	DD Section 30	<b>North Reference:</b>	Grid
<b>Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Guttersen State DD30-785		
<b>Design:</b>	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)
<b>Top B Chalk</b>									
7,200.00	52.24	336.10	6,588.95	-708.19	-2,019.32	-244.35	9.00	7.32	6.73
7,250.00	55.97	339.21	6,618.26	-670.73	-2,034.69	-204.42	9.00	7.46	6.22
7,254.92	56.34	339.50	6,621.00	-666.91	-2,036.13	-200.37	9.00	7.54	5.91
<b>Top B Marl</b>									
7,300.00	59.77	342.06	6,644.85	-630.79	-2,048.70	-162.37	9.00	7.61	5.67
7,350.00	63.63	344.69	6,668.55	-588.61	-2,061.28	-118.46	9.00	7.72	5.26
7,400.00	67.53	347.15	6,689.22	-544.46	-2,072.33	-72.96	9.00	7.81	4.92
7,415.53	68.75	347.89	6,695.00	-530.39	-2,075.45	-58.54	9.00	7.85	4.73
<b>Top C Chalk</b>									
7,450.00	71.47	349.48	6,706.72	-498.61	-2,081.81	-26.14	9.00	7.89	4.61
7,500.00	75.44	351.70	6,720.96	-451.34	-2,089.64	21.69	9.00	7.93	4.44
7,530.49	77.87	353.01	6,728.00	-421.93	-2,093.58	51.24	9.00	7.96	4.31
<b>Top C Marl</b>									
7,550.00	79.42	353.84	6,731.84	-402.93	-2,095.77	70.25	9.00	7.98	4.24
7,600.00	83.42	355.92	6,739.30	-353.70	-2,100.18	119.24	9.00	8.00	4.17
7,650.00	87.43	357.97	6,743.28	-303.95	-2,102.83	168.35	9.00	8.02	4.11
7,682.02	90.00	359.28	6,744.00	-271.95	-2,103.60	199.73	9.00	8.02	4.08
<b>LP: 7682.02' MD, 90.00° Inc, 359.28° Azm</b>									
7,700.00	90.00	359.28	6,744.00	-253.97	-2,103.82	217.31	0.00	0.00	0.00
7,800.00	90.00	359.28	6,744.00	-153.98	-2,105.08	315.11	0.00	0.00	0.00
7,900.00	90.00	359.28	6,744.00	-53.98	-2,106.33	412.91	0.00	0.00	0.00
8,000.00	90.00	359.28	6,744.00	46.01	-2,107.59	510.70	0.00	0.00	0.00
8,100.00	90.00	359.28	6,744.00	146.00	-2,108.84	608.50	0.00	0.00	0.00
8,200.00	90.00	359.28	6,744.00	245.99	-2,110.09	706.30	0.00	0.00	0.00
8,300.00	90.00	359.28	6,744.00	345.98	-2,111.35	804.09	0.00	0.00	0.00
8,400.00	90.00	359.28	6,744.00	445.98	-2,112.60	901.89	0.00	0.00	0.00
8,500.00	90.00	359.28	6,744.00	545.97	-2,113.86	999.68	0.00	0.00	0.00
8,600.00	90.00	359.28	6,744.00	645.96	-2,115.11	1,097.48	0.00	0.00	0.00
8,700.00	90.00	359.28	6,744.00	745.95	-2,116.37	1,195.28	0.00	0.00	0.00
8,800.00	90.00	359.28	6,744.00	845.95	-2,117.62	1,293.07	0.00	0.00	0.00
8,900.00	90.00	359.28	6,744.00	945.94	-2,118.88	1,390.87	0.00	0.00	0.00
9,000.00	90.00	359.28	6,744.00	1,045.93	-2,120.13	1,488.67	0.00	0.00	0.00
9,100.00	90.00	359.28	6,744.00	1,145.92	-2,121.38	1,586.46	0.00	0.00	0.00
9,200.00	90.00	359.28	6,744.00	1,245.91	-2,122.64	1,684.26	0.00	0.00	0.00
9,300.00	90.00	359.28	6,744.00	1,345.91	-2,123.89	1,782.06	0.00	0.00	0.00
9,400.00	90.00	359.28	6,744.00	1,445.90	-2,125.15	1,879.85	0.00	0.00	0.00
9,500.00	90.00	359.28	6,744.00	1,545.89	-2,126.40	1,977.65	0.00	0.00	0.00
9,600.00	90.00	359.28	6,744.00	1,645.88	-2,127.66	2,075.44	0.00	0.00	0.00
9,700.00	90.00	359.28	6,744.00	1,745.87	-2,128.91	2,173.24	0.00	0.00	0.00
9,800.00	90.00	359.28	6,744.00	1,845.87	-2,130.17	2,271.04	0.00	0.00	0.00
9,900.00	90.00	359.28	6,744.00	1,945.86	-2,131.42	2,368.83	0.00	0.00	0.00
10,000.00	90.00	359.28	6,744.00	2,045.85	-2,132.67	2,466.63	0.00	0.00	0.00
10,100.00	90.00	359.28	6,744.00	2,145.84	-2,133.93	2,564.43	0.00	0.00	0.00
10,200.00	90.00	359.28	6,744.00	2,245.83	-2,135.18	2,662.22	0.00	0.00	0.00
10,300.00	90.00	359.28	6,744.00	2,345.83	-2,136.44	2,760.02	0.00	0.00	0.00
10,400.00	90.00	359.28	6,744.00	2,445.82	-2,137.69	2,857.82	0.00	0.00	0.00
10,500.00	90.00	359.28	6,744.00	2,545.81	-2,138.95	2,955.61	0.00	0.00	0.00
10,600.00	90.00	359.28	6,744.00	2,645.80	-2,140.20	3,053.41	0.00	0.00	0.00
10,700.00	90.00	359.28	6,744.00	2,745.80	-2,141.46	3,151.20	0.00	0.00	0.00
10,800.00	90.00	359.28	6,744.00	2,845.79	-2,142.71	3,249.00	0.00	0.00	0.00
10,900.00	90.00	359.28	6,744.00	2,945.78	-2,143.96	3,346.80	0.00	0.00	0.00
11,000.00	90.00	359.28	6,744.00	3,045.77	-2,145.22	3,444.59	0.00	0.00	0.00

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site:</b>	DD Section 30	<b>North Reference:</b>	Grid
<b>Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Guttersen State DD30-785		
<b>Design:</b>	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)
11,100.00	90.00	359.28	6,744.00	3,145.76	-2,146.47	3,542.39	0.00	0.00	0.00
11,200.00	90.00	359.28	6,744.00	3,245.76	-2,147.73	3,640.19	0.00	0.00	0.00
11,300.00	90.00	359.28	6,744.00	3,345.75	-2,148.98	3,737.98	0.00	0.00	0.00
11,400.00	90.00	359.28	6,744.00	3,445.74	-2,150.24	3,835.78	0.00	0.00	0.00
11,500.00	90.00	359.28	6,744.00	3,545.73	-2,151.49	3,933.58	0.00	0.00	0.00
11,600.00	90.00	359.28	6,744.00	3,645.72	-2,152.75	4,031.37	0.00	0.00	0.00
11,700.00	90.00	359.28	6,744.00	3,745.72	-2,154.00	4,129.17	0.00	0.00	0.00
11,800.00	90.00	359.28	6,744.00	3,845.71	-2,155.25	4,226.96	0.00	0.00	0.00
11,900.00	90.00	359.28	6,744.00	3,945.70	-2,156.51	4,324.76	0.00	0.00	0.00
12,000.00	90.00	359.28	6,744.00	4,045.69	-2,157.76	4,422.56	0.00	0.00	0.00
12,100.00	90.00	359.28	6,744.00	4,145.69	-2,159.02	4,520.35	0.00	0.00	0.00
12,200.00	90.00	359.28	6,744.00	4,245.68	-2,160.27	4,618.15	0.00	0.00	0.00
12,300.00	90.00	359.28	6,744.00	4,345.67	-2,161.53	4,715.95	0.00	0.00	0.00
12,400.00	90.00	359.28	6,744.00	4,445.66	-2,162.78	4,813.74	0.00	0.00	0.00
12,500.00	90.00	359.28	6,744.00	4,545.65	-2,164.04	4,911.54	0.00	0.00	0.00
12,600.00	90.00	359.28	6,744.00	4,645.65	-2,165.29	5,009.34	0.00	0.00	0.00
12,700.00	90.00	359.28	6,744.00	4,745.64	-2,166.54	5,107.13	0.00	0.00	0.00
12,800.00	90.00	359.28	6,744.00	4,845.63	-2,167.80	5,204.93	0.00	0.00	0.00
12,900.00	90.00	359.28	6,744.00	4,945.62	-2,169.05	5,302.72	0.00	0.00	0.00
13,000.00	90.00	359.28	6,744.00	5,045.61	-2,170.31	5,400.52	0.00	0.00	0.00
13,100.00	90.00	359.28	6,744.00	5,145.61	-2,171.56	5,498.32	0.00	0.00	0.00
13,200.00	90.00	359.28	6,744.00	5,245.60	-2,172.82	5,596.11	0.00	0.00	0.00
13,300.00	90.00	359.28	6,744.00	5,345.59	-2,174.07	5,693.91	0.00	0.00	0.00
13,400.00	90.00	359.28	6,744.00	5,445.58	-2,175.33	5,791.71	0.00	0.00	0.00
13,500.00	90.00	359.28	6,744.00	5,545.58	-2,176.58	5,889.50	0.00	0.00	0.00
13,600.00	90.00	359.28	6,744.00	5,645.57	-2,177.83	5,987.30	0.00	0.00	0.00
13,700.00	90.00	359.28	6,744.00	5,745.56	-2,179.09	6,085.10	0.00	0.00	0.00
13,800.00	90.00	359.28	6,744.00	5,845.55	-2,180.34	6,182.89	0.00	0.00	0.00
13,900.00	90.00	359.28	6,744.00	5,945.54	-2,181.60	6,280.69	0.00	0.00	0.00
14,000.00	90.00	359.28	6,744.00	6,045.54	-2,182.85	6,378.48	0.00	0.00	0.00
14,100.00	90.00	359.28	6,744.00	6,145.53	-2,184.11	6,476.28	0.00	0.00	0.00
14,200.00	90.00	359.28	6,744.00	6,245.52	-2,185.36	6,574.08	0.00	0.00	0.00
14,300.00	90.00	359.28	6,744.00	6,345.51	-2,186.62	6,671.87	0.00	0.00	0.00
14,400.00	90.00	359.28	6,744.00	6,445.50	-2,187.87	6,769.67	0.00	0.00	0.00
14,500.00	90.00	359.28	6,744.00	6,545.50	-2,189.12	6,867.47	0.00	0.00	0.00
14,600.00	90.00	359.28	6,744.00	6,645.49	-2,190.38	6,965.26	0.00	0.00	0.00
14,700.00	90.00	359.28	6,744.00	6,745.48	-2,191.63	7,063.06	0.00	0.00	0.00
14,800.00	90.00	359.28	6,744.00	6,845.47	-2,192.89	7,160.86	0.00	0.00	0.00
14,900.00	90.00	359.28	6,744.00	6,945.47	-2,194.14	7,258.65	0.00	0.00	0.00
15,000.00	90.00	359.28	6,744.00	7,045.46	-2,195.40	7,356.45	0.00	0.00	0.00
15,100.00	90.00	359.28	6,744.00	7,145.45	-2,196.65	7,454.25	0.00	0.00	0.00
15,200.00	90.00	359.28	6,744.00	7,245.44	-2,197.91	7,552.04	0.00	0.00	0.00
15,300.00	90.00	359.28	6,744.00	7,345.43	-2,199.16	7,649.84	0.00	0.00	0.00
15,400.00	90.00	359.28	6,744.00	7,445.43	-2,200.41	7,747.63	0.00	0.00	0.00
15,500.00	90.00	359.28	6,744.00	7,545.42	-2,201.67	7,845.43	0.00	0.00	0.00
15,600.00	90.00	359.28	6,744.00	7,645.41	-2,202.92	7,943.23	0.00	0.00	0.00
15,700.00	90.00	359.28	6,744.00	7,745.40	-2,204.18	8,041.02	0.00	0.00	0.00
15,800.00	90.00	359.28	6,744.00	7,845.39	-2,205.43	8,138.82	0.00	0.00	0.00
15,900.00	90.00	359.28	6,744.00	7,945.39	-2,206.69	8,236.62	0.00	0.00	0.00
16,000.00	90.00	359.28	6,744.00	8,045.38	-2,207.94	8,334.41	0.00	0.00	0.00
16,100.00	90.00	359.28	6,744.00	8,145.37	-2,209.20	8,432.21	0.00	0.00	0.00
16,200.00	90.00	359.28	6,744.00	8,245.36	-2,210.45	8,530.01	0.00	0.00	0.00
16,300.00	90.00	359.28	6,744.00	8,345.36	-2,211.70	8,627.80	0.00	0.00	0.00
16,400.00	90.00	359.28	6,744.00	8,445.35	-2,212.96	8,725.60	0.00	0.00	0.00

# Noble Energy, Inc.

## Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site:</b>	DD Section 30	<b>North Reference:</b>	Grid
<b>Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Guttersen State DD30-785		
<b>Design:</b>	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)
16,500.00	90.00	359.28	6,744.00	8,545.34	-2,214.21	8,823.39	0.00	0.00	0.00
16,600.00	90.00	359.28	6,744.00	8,645.33	-2,215.47	8,921.19	0.00	0.00	0.00
16,700.00	90.00	359.28	6,744.00	8,745.32	-2,216.72	9,018.99	0.00	0.00	0.00
16,800.00	90.00	359.28	6,744.00	8,845.32	-2,217.98	9,116.78	0.00	0.00	0.00
16,900.00	90.00	359.28	6,744.00	8,945.31	-2,219.23	9,214.58	0.00	0.00	0.00
17,000.00	90.00	359.28	6,744.00	9,045.30	-2,220.49	9,312.38	0.00	0.00	0.00
17,100.00	90.00	359.28	6,744.00	9,145.29	-2,221.74	9,410.17	0.00	0.00	0.00
17,200.00	90.00	359.28	6,744.00	9,245.28	-2,222.99	9,507.97	0.00	0.00	0.00
17,300.00	90.00	359.28	6,744.00	9,345.28	-2,224.25	9,605.77	0.00	0.00	0.00
17,400.00	90.00	359.28	6,744.00	9,445.27	-2,225.50	9,703.56	0.00	0.00	0.00
17,500.00	90.00	359.28	6,744.00	9,545.26	-2,226.76	9,801.36	0.00	0.00	0.00
17,600.00	90.00	359.28	6,744.00	9,645.25	-2,228.01	9,899.15	0.00	0.00	0.00
17,700.00	90.00	359.28	6,744.00	9,745.24	-2,229.27	9,996.95	0.00	0.00	0.00
17,796.63	90.00	359.28	6,744.00	9,841.87	-2,230.48	10,091.45	0.00	0.00	0.00
TD @ 17796.63' MD/6744.00' 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									
Guttersen State DD30C - plan hits target center - Point	0.00	0.01	0.00	0.00	0.00	1,313,834.89	3,284,560.70	40.1903868	-104.4814030
Guttersen State DD30C - plan hits target center - Point	0.00	0.00	6,052.57	-888.76	-1,744.44	1,312,946.14	3,282,816.26	40.1880020	-104.4876830
Guttersen State DD30C - plan misses target center by 0.32ft at 17796.56ft MD (6744.00 TVD, 9841.80 N, -2230.48 E) - Point	0.00	0.00	6,744.00	9,841.79	-2,230.80	1,323,676.67	3,282,329.90	40.2174719	-104.4889859
Guttersen State DD30C - plan hits target center - Point	0.00	0.00	6,744.00	-271.95	-2,103.60	1,313,562.94	3,282,457.11	40.1897064	-104.4889433



**Noble Energy, Inc.**  
Planning Report

<b>Database:</b>	EDMP	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Company:</b>	Northern Region - DJ Basin	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Project:</b>	Mustang	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site:</b>	DD Section 30	<b>North Reference:</b>	Grid
<b>Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Guttersen State DD30-785		
<b>Design:</b>	Plan #1		

**Formations**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
613.00	613.00	Pierre			
687.00	687.00	Upper Pierre Aquifer Top			
1,624.00	1,624.00	Upper Pierre Aquifer Base			
3,741.19	3,616.00	Parkman			
4,226.26	4,038.00	Sussex			
4,438.91	4,223.00	Shannon			
6,356.20	5,891.00	Teepee Buttes			
7,079.18	6,508.00	Sharon Springs			
7,145.34	6,554.00	Top A Chalk			
7,148.35	6,556.00	Top A Marl			
7,169.80	6,570.00	Top B Chalk			
7,254.92	6,621.00	Top B Marl			
7,415.53	6,695.00	Top C Chalk			
7,530.49	6,728.00	Top C Marl			

**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,994.00	1,994.00	0.00	0.00	Build: 2°/100'
3,175.75	3,124.07	-135.27	-265.51	Hold: 29.54° Inc, 243.00° Azm
6,541.91	6,052.56	-888.76	-1,744.44	KOP: Build 9°/100' @ 6541.91' MD
7,682.02	6,744.00	-271.95	-2,103.60	LP: 7682.02' MD, 90.00° Inc, 359.28° Azm
17,796.63	6,744.00	9,841.87	-2,230.48	TD @ 17796.63' MD/6744.00' TVD

# **Northern Region - DJ Basin**

**Mustang**

**DD Section 30**

**Guttersen State DD30-785**

**Guttersen State DD30-785**

**Plan #1**

## **Anticollision Summary Report**

**28 August, 2018**

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Guttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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	8/20/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,796.63	Plan #1 (Guttersen State DD30-785)	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 24						
Dalbey D 24-10 (PR) - Wellbore #1 - Gyro Surveys	14,358.45	6,695.54	1,989.15	1,904.05	23.373	CC
Dalbey D 24-10 (PR) - Wellbore #1 - Gyro Surveys	14,400.00	6,695.56	1,989.59	1,904.02	23.251	ES
Dalbey D 24-10 (PR) - Wellbore #1 - Gyro Surveys	14,700.00	6,695.66	2,018.26	1,929.94	22.852	SF
Dalbey D 24-15 (SI) - Wellbore #1 - Gyro Surveys	13,401.81	6,668.36	2,466.03	2,387.83	31.534	CC, ES
Dalbey D 24-15 (SI) - Wellbore #1 - Gyro Surveys	13,900.00	6,671.52	2,515.85	2,433.32	30.487	SF
Glazier 2-24 (SI) - Wellbore #1 - Gyro Surveys	16,566.44	6,689.31	1,327.36	1,225.53	13.035	CC
Glazier 2-24 (SI) - Wellbore #1 - Gyro Surveys	16,600.00	6,689.14	1,327.78	1,225.49	12.980	ES
Glazier 2-24 (SI) - Wellbore #1 - Gyro Surveys	16,700.00	6,688.62	1,334.06	1,230.65	12.900	SF
Guttersen 11-24 (PR) - Wellbore #1 - Gyro Surveys	17,372.33	6,773.50	5,000.92	4,892.93	46.308	CC
Guttersen 11-24 (PR) - Wellbore #1 - Gyro Surveys	17,400.00	6,773.50	5,001.00	4,892.74	46.195	ES
Guttersen 11-24 (PR) - Wellbore #1 - Gyro Surveys	17,796.63	6,773.52	5,018.89	4,907.09	44.893	SF
Guttersen 12-24 (PR) - Wellbore #1 - Gyro Surveys	16,075.54	6,726.86	5,026.01	4,927.96	51.258	CC
Guttersen 12-24 (PR) - Wellbore #1 - Gyro Surveys	16,100.00	6,726.81	5,026.07	4,927.79	51.139	ES
Guttersen 12-24 (PR) - Wellbore #1 - Gyro Surveys	17,500.00	6,724.11	5,223.97	5,115.22	48.039	SF
Guttersen 21-24 (PR) - Wellbore #1 - Gyro Surveys	17,376.08	6,743.30	3,682.50	3,574.05	33.956	CC
Guttersen 21-24 (PR) - Wellbore #1 - Gyro Surveys	17,400.00	6,743.23	3,682.58	3,573.89	33.880	ES
Guttersen 21-24 (PR) - Wellbore #1 - Gyro Surveys	17,796.63	6,741.96	3,706.44	3,594.18	33.017	SF
Guttersen 22-24 (PR) - Wellbore #1 - Gyro Surveys	16,147.10	6,721.44	3,640.79	3,542.06	36.876	CC
Guttersen 22-24 (PR) - Wellbore #1 - Gyro Surveys	16,200.00	6,721.39	3,641.17	3,541.91	36.684	ES
Guttersen 22-24 (PR) - Wellbore #1 - Gyro Surveys	16,900.00	6,720.71	3,717.82	3,612.92	35.440	SF
Guttersen 24A (PR) - Wellbore #1 - Gyro Surveys	16,706.82	6,712.89	4,314.85	4,211.95	41.932	CC, ES
Guttersen 24A (PR) - Wellbore #1 - Gyro Surveys	17,700.00	6,721.93	4,427.67	4,316.96	39.994	SF
Guttersen 24J (PR) - Wellbore #1 - Gyro Surveys	17,796.63	6,691.26	4,221.58	4,110.69	38.070	CC, ES, SF
Guttersen 24N (PR) - Wellbore #1 - MWD Surveys	16,735.90	6,645.07	3,086.17	2,984.02	30.213	CC
Guttersen 24N (PR) - Wellbore #1 - MWD Surveys	16,800.00	6,644.77	3,086.84	2,984.02	30.024	ES
Guttersen 24N (PR) - Wellbore #1 - MWD Surveys	17,300.00	6,642.38	3,137.30	3,030.34	29.331	SF
Guttersen 24S (PR) - Wellbore #1 - MWD Surveys	15,237.66	6,686.93	1,634.37	1,543.65	18.015	CC, ES
Guttersen 24S (PR) - Wellbore #1 - MWD Surveys	15,500.00	6,685.13	1,655.29	1,561.94	17.731	SF
Guttersen 43-24 (PR) - Wellbore #1 - Gyro Surveys	14,610.05	6,677.23	1,096.51	1,009.35	12.580	CC, ES
Guttersen 43-24 (PR) - Wellbore #1 - Gyro Surveys	14,700.00	6,676.84	1,100.19	1,011.84	12.452	SF
Guttersen 44-24 (PR) - Wellbore #1 - Gyro Surveys	13,371.60	6,711.96	1,032.17	954.21	13.240	CC
Guttersen 44-24 (PR) - Wellbore #1 - Gyro Surveys	13,400.00	6,711.90	1,032.56	954.20	13.178	ES
Guttersen 44-24 (PR) - Wellbore #1 - Gyro Surveys	13,500.00	6,711.72	1,040.12	960.59	13.078	SF
Karch Blue D 24-12 (PA) - Wellbore #1 - Gyro Surveys	14,896.82	6,703.12	4,979.55	4,890.48	55.907	CC
Karch Blue D 24-12 (PA) - Wellbore #1 - Gyro Surveys	14,900.00	6,703.13	4,979.55	4,890.46	55.889	ES
Karch Blue D 24-12 (PA) - Wellbore #1 - Gyro Surveys	16,400.00	6,703.63	5,201.49	5,101.21	51.869	SF
Karch Blue D 24-14 (PR) - No Surveys	13,359.39	6,685.00	3,425.31	3,236.87	18.177	CC

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

**Noble Energy, Inc.**  
Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Gutttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Gutttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Gutttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

**Summary**

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Separation Factor	Warning
D Section 24						
Karch Blue D 24-14 (PR) - Wellbore #1 - No Surveys	13,400.00	6,685.00	3,425.55	3,236.73	18.142	ES
Karch Blue D 24-14 (PR) - Wellbore #1 - No Surveys	13,800.00	6,685.00	3,453.54	3,261.25	17.960	SF
Karch Blue D24-11 (PA) - Wellbore #1 - Gyro Surveys	14,884.75	6,638.19	3,562.94	3,467.36	37.276	CC
Karch Blue D24-11 (PA) - Wellbore #1 - Gyro Surveys	14,900.00	6,638.34	3,562.97	3,467.24	37.218	ES
Karch Blue D24-11 (PA) - Wellbore #1 - Gyro Surveys	15,700.00	6,646.33	3,655.01	3,552.80	35.762	SF
Koerner 31-24 (SI) - Wellbore #1 - Gyro Surveys	17,416.91	6,653.95	2,359.18	2,250.65	21.738	CC, ES
Koerner 31-24 (SI) - Wellbore #1 - Gyro Surveys	17,796.63	6,656.62	2,389.54	2,277.59	21.346	SF
Koerner 32-24 (SI) - Wellbore #1 - Gyro Surveys	15,982.55	6,753.76	2,356.63	2,259.48	24.258	CC
Koerner 32-24 (SI) - Wellbore #1 - Gyro Surveys	16,000.00	6,753.75	2,356.69	2,259.35	24.210	ES
Koerner 32-24 (SI) - Wellbore #1 - Gyro Surveys	16,400.00	6,746.53	2,393.32	2,292.46	23.731	SF
Koerner 42-24 (SI) - Wellbore #1 - Gyro Surveys	15,961.42	6,681.56	1,051.55	954.32	10.815	CC, ES
Koerner 42-24 (SI) - Wellbore #1 - Gyro Surveys	16,100.00	6,680.01	1,060.64	961.72	10.722	SF
LF Ranch 1-24 (SI) - Wellbore #1 - Gyro Surveys	13,787.95	6,815.81	4,645.14	4,564.08	57.310	CC
LF Ranch 1-24 (SI) - Wellbore #1 - Gyro Surveys	13,800.00	6,815.92	4,645.15	4,563.99	57.235	ES
LF Ranch 1-24 (SI) - Wellbore #1 - Gyro Surveys	15,200.00	6,828.52	4,855.00	4,763.36	52.981	SF

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Guttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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 25						
Coors Energy 13-25D (PR) - Wellbore #1 - MWD Survey	9,464.12	6,841.37	4,992.40	4,930.01	80.015	CC
Coors Energy 13-25D (PR) - Wellbore #1 - MWD Survey	9,500.00	6,841.47	4,992.53	4,929.91	79.726	ES
Coors Energy 13-25D (PR) - Wellbore #1 - MWD Survey	11,800.00	6,848.62	5,511.84	5,433.41	70.282	SF
Coors Energy 14-25D (PR) - Wellbore #1 - MWD Survey	8,180.23	6,957.99	5,015.50	4,964.45	98.244	CC, ES
Coors Energy 14-25D (PR) - Wellbore #1 - MWD Survey	11,000.00	6,976.51	5,753.78	5,690.29	90.621	SF
Coors Energy 23-25D (PR) - Wellbore #1 - MWD Survey	9,460.24	6,884.19	3,667.02	3,606.58	60.679	CC, ES
Coors Energy 23-25D (PR) - Wellbore #1 - MWD Survey	10,500.00	6,884.67	3,811.58	3,746.56	58.628	SF
Coors Energy 24-25 (PR) - Wellbore #1 - Gyro Surveys	7,886.58	6,759.12	3,532.01	3,481.23	69.554	CC, ES
Coors Energy 24-25 (PR) - Wellbore #1 - Gyro Surveys	8,900.00	6,760.84	3,674.52	3,621.31	69.057	SF
Coors Energy 25HD (PR) - Wellbore #1 - MWD Surveys	8,817.99	6,996.32	5,474.13	5,418.35	98.128	CC, ES
Coors Energy 25HD (PR) - Wellbore #1 - MWD Surveys	12,000.00	6,981.88	6,331.75	6,254.70	82.168	SF
Coors Energy 25LD (PR) - Wellbore #1 - MWD Surveys	7,650.00	6,954.94	4,326.37	4,274.06	82.710	SF
Coors Energy 25LD (PR) - Wellbore #1 - MWD Surveys	7,680.12	6,956.17	4,325.92	4,273.64	82.738	CC, ES
Coors Energy 25TD (PR) - Wellbore #1 - MWD Surveys	7,623.87	6,759.02	1,624.59	1,573.26	31.654	CC, ES, SF
Coors Energy 25XD (PR) - Wellbore #1 - MWD Surveys	8,700.00	6,955.87	506.75	450.43	8.997	SF
Coors Energy 25XD (PR) - Wellbore #1 - MWD Surveys	8,788.87	6,954.72	498.90	443.78	9.051	CC, ES
Coors Energy 25YD (PR) - Wellbore #1 - MWD Surveys	7,597.44	6,919.55	479.69	425.70	8.884	CC
Coors Energy 25YD (PR) - Wellbore #1 - MWD Surveys	7,600.00	6,919.93	479.70	425.66	8.877	ES
Coors Energy 25YD (PR) - Wellbore #1 - MWD Surveys	7,650.00	6,925.63	483.49	428.56	8.802	SF
Coors Energy 33-25D (PR) - Wellbore #1 - MWD Survey	9,441.21	6,890.02	2,356.14	2,293.19	37.427	CC, ES
Coors Energy 33-25D (PR) - Wellbore #1 - MWD Survey	10,100.00	6,891.69	2,446.51	2,378.57	36.009	SF
Coors Energy 34-25 (PR) - Wellbore #1 - Gyro Surveys	7,867.92	6,714.78	2,535.74	2,485.05	50.024	CC, ES
Coors Energy 34-25 (PR) - Wellbore #1 - Gyro Surveys	8,000.00	6,714.80	2,539.18	2,488.42	50.020	SF
Coors Energy 43-25D (PR) - Wellbore #1 - MWD Survey	9,447.74	6,947.20	1,061.46	999.04	17.003	CC, ES, SF
Coors Energy 44-25D (PR) - Wellbore #1 - MWD Survey	8,140.20	6,794.20	1,043.22	992.66	20.635	CC, ES
Coors Energy 44-25D (PR) - Wellbore #1 - MWD Survey	8,200.00	6,794.08	1,044.93	994.27	20.626	SF
Dalbey D 25-03 (SI) - Wellbore #1 - Gyro Surveys	11,713.48	6,870.03	3,981.61	3,914.96	59.736	CC, ES
Dalbey D 25-03 (SI) - Wellbore #1 - Gyro Surveys	13,100.00	6,823.72	4,215.72	4,139.14	55.045	SF
Dalbey D 25-05 (SI) - Wellbore #1 - Gyro Surveys	10,784.32	6,967.57	5,180.71	5,118.80	83.682	CC
Dalbey D 25-05 (SI) - Wellbore #1 - Gyro Surveys	10,800.00	6,965.98	5,180.74	5,118.73	83.549	ES
Dalbey D 25-05 (SI) - Wellbore #1 - Gyro Surveys	13,000.00	6,760.40	5,630.23	5,554.51	74.351	SF
Guttersen 11-25 (PR) - Wellbore #1 - MWD Surveys	12,147.51	6,797.53	4,978.39	4,909.83	72.618	CC
Guttersen 11-25 (PR) - Wellbore #1 - MWD Surveys	12,200.00	6,796.98	4,978.67	4,909.69	72.178	ES
Guttersen 11-25 (PR) - Wellbore #1 - MWD Surveys	14,000.00	6,779.24	5,311.85	5,230.24	65.085	SF
Guttersen 22-25 (PR) - Wellbore #1 - MWD Surveys	10,872.95	6,753.26	3,560.12	3,499.71	58.928	CC
Guttersen 22-25 (PR) - Wellbore #1 - MWD Surveys	10,900.00	6,752.17	3,560.23	3,499.61	58.735	ES
Guttersen 22-25 (PR) - Wellbore #1 - MWD Surveys	12,100.00	6,702.70	3,765.31	3,696.39	54.628	SF
Guttersen 25E (PR) - Wellbore #1 - MWD Surveys	12,745.75	6,720.96	5,378.79	5,305.92	73.808	CC
Guttersen 25E (PR) - Wellbore #1 - MWD Surveys	12,800.00	6,720.16	5,379.07	5,305.74	73.359	ES
Guttersen 25E (PR) - Wellbore #1 - MWD Surveys	14,800.00	6,690.44	5,757.66	5,670.29	65.907	SF
Guttersen 25KD (PR) - Wellbore #1 - MWD Surveys	10,262.97	7,026.11	4,318.72	4,259.88	73.403	CC
Guttersen 25KD (PR) - Wellbore #1 - MWD Surveys	10,300.00	7,026.68	4,318.87	4,259.83	73.147	ES
Guttersen 25KD (PR) - Wellbore #1 - MWD Surveys	12,200.00	7,053.81	4,733.11	4,661.46	66.050	SF
Guttersen 25O (PR) - Wellbore #1 - MWD Surveys	10,387.72	6,698.39	3,124.29	3,066.27	53.850	CC
Guttersen 25O (PR) - Wellbore #1 - MWD Surveys	10,400.00	6,698.39	3,124.32	3,066.21	53.772	ES
Guttersen 25O (PR) - Wellbore #1 - MWD Surveys	11,400.00	6,698.97	3,284.19	3,219.38	50.672	SF
Guttersen D 25-17 (SI) - Wellbore #1 - Gyro Surveys	11,464.73	6,632.45	1,884.09	1,818.66	28.798	CC
Guttersen D 25-17 (SI) - Wellbore #1 - Gyro Surveys	11,500.00	6,631.97	1,884.42	1,818.65	28.653	ES
Guttersen D 25-17 (SI) - Wellbore #1 - Gyro Surveys	11,900.00	6,626.48	1,933.70	1,864.58	27.973	SF
Guttersen D25-715 - Wellbore #1 - Plan #1	17,796.63	14,852.64	678.21	522.15	4.346	CC, ES, SF
Guttersen D25-724 - Wellbore #1 - Plan #1	17,796.63	14,705.40	1,290.79	1,133.70	8.217	CC, ES, SF
Guttersen D25-734 - Wellbore #1 - Plan #1	17,796.63	14,722.69	1,922.17	1,768.15	12.480	CC, ES, SF
Guttersen D25-743 - Wellbore #1 - Plan #1	9,668.52	6,415.11	2,532.64	2,472.66	42.223	CC

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

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Guttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

### Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Separation Factor	Warning
D Section 25						
Guttersen D25-743 - Wellbore #1 - Plan #1	17,796.63	14,856.44	2,545.36	2,389.19	16.299	ES, SF
Guttersen D25-753 - Wellbore #1 - Plan #1	17,796.63	15,041.37	3,150.06	2,994.47	20.246	CC, ES, SF
Guttersen D25-762 - Wellbore #1 - Plan #1	17,796.63	14,960.22	3,738.87	3,583.14	24.009	CC, ES, SF
Guttersen D25-772 - Wellbore #1 - Plan #1	9,704.91	6,377.98	4,381.65	4,321.47	72.815	CC
Guttersen D25-772 - Wellbore #1 - Plan #1	17,796.63	15,110.62	4,407.30	4,252.24	28.423	ES, SF
Guttersen D25-781 - Wellbore #1 - Plan #1	10,057.34	5,668.13	4,857.81	4,797.17	80.113	CC
Guttersen D25-781 - Wellbore #1 - Plan #1	10,100.00	5,650.03	4,857.96	4,797.12	79.849	ES
Guttersen D25-781 - Wellbore #1 - Plan #1	17,796.63	15,127.67	5,025.90	4,870.87	32.419	SF
Guttersen State D36-714 - Wellbore #1 - Plan #1	7,600.00	9,500.73	696.49	632.51	10.887	SF
Guttersen State D36-714 - Wellbore #1 - Plan #1	9,971.89	7,134.47	667.13	608.08	11.299	CC
Guttersen State D36-714 - Wellbore #1 - Plan #1	10,000.00	7,111.12	667.23	608.02	11.269	ES
Guttersen State D36-724 - Wellbore #1 - Plan #1	7,550.00	9,472.98	1,325.79	1,261.65	20.672	SF
Guttersen State D36-724 - Wellbore #1 - Plan #1	10,088.50	6,946.03	1,290.48	1,231.50	21.879	CC
Guttersen State D36-724 - Wellbore #1 - Plan #1	10,100.00	6,936.49	1,290.49	1,231.44	21.855	ES
Guttersen State D36-733 - Wellbore #1 - Plan #1	10,365.20	6,623.81	1,901.23	1,840.60	31.358	CC
Guttersen State D36-733 - Wellbore #1 - Plan #1	10,400.00	6,602.77	1,901.42	1,840.51	31.218	ES
Guttersen State D36-733 - Wellbore #1 - Plan #1	10,900.00	6,417.17	1,955.69	1,890.78	30.133	SF
Guttersen State D36-743 - Wellbore #1 - Plan #1	9,900.00	9,900.00	2,541.04	2,472.01	36.815	SF
Guttersen State D36-743 - Wellbore #1 - Plan #1	10,533.36	6,294.33	2,471.19	2,408.59	39.470	CC, ES
Guttersen State D36-752 - Wellbore #1 - Plan #1	7,400.00	9,703.25	3,214.20	3,146.63	47.569	SF
Guttersen State D36-752 - Wellbore #1 - Plan #1	9,976.78	7,165.18	3,157.18	3,097.06	52.516	CC
Guttersen State D36-752 - Wellbore #1 - Plan #1	10,000.00	7,150.00	3,157.21	3,097.02	52.454	ES
Guttersen State D36-762 - Wellbore #1 - Plan #1	10,438.93	6,620.30	3,744.27	3,683.19	61.306	CC, ES
Guttersen State D36-762 - Wellbore #1 - Plan #1	11,800.00	6,396.75	3,964.33	3,894.40	56.687	SF
Guttersen State D36-771 - Wellbore #1 - Plan #1	10,608.46	6,113.96	4,301.59	4,239.50	69.286	CC, ES
Guttersen State D36-771 - Wellbore #1 - Plan #1	12,300.00	5,687.62	4,602.52	4,529.82	63.307	SF
Guttersen State D36-781 - Wellbore #1 - Plan #1	10,804.44	5,470.38	4,756.43	4,693.60	75.697	CC, ES
Guttersen State D36-781 - Wellbore #1 - Plan #1	12,700.00	5,010.92	5,099.58	5,025.14	68.513	SF
Karch Blue D 25-02 (DA) - Wellbore #1 - No Surveys	12,071.39	6,681.00	2,354.63	2,175.16	13.120	CC
Karch Blue D 25-02 (DA) - Wellbore #1 - No Surveys	12,100.00	6,681.00	2,354.81	2,175.06	13.101	ES
Karch Blue D 25-02 (DA) - Wellbore #1 - No Surveys	12,300.00	6,681.00	2,365.70	2,184.15	13.030	SF
Karch Blue D 25-08 (SI) - Wellbore #1 - Gyro Surveys	10,793.00	6,667.84	1,071.77	1,010.41	17.466	CC
Karch Blue D 25-08 (SI) - Wellbore #1 - Gyro Surveys	10,800.00	6,667.68	1,071.80	1,010.36	17.445	ES
Karch Blue D 25-08 (SI) - Wellbore #1 - Gyro Surveys	11,000.00	6,663.24	1,091.57	1,028.14	17.210	SF
Karch Blue D25-07 (SI) - Wellbore #1 - Gyro Surveys	10,798.34	6,689.43	2,395.68	2,334.53	39.178	CC
Karch Blue D25-07 (SI) - Wellbore #1 - Gyro Surveys	10,800.00	6,689.43	2,395.68	2,334.52	39.169	ES
Karch Blue D25-07 (SI) - Wellbore #1 - Gyro Surveys	11,400.00	6,687.77	2,470.08	2,404.42	37.620	SF
L F Ranch 2-25 (PR) - Wellbore #1 - Gyro Surveys	12,028.97	6,671.67	1,077.43	1,008.54	15.640	CC, ES
L F Ranch 2-25 (PR) - Wellbore #1 - Gyro Surveys	12,200.00	6,667.62	1,090.91	1,020.08	15.401	SF
LF Ranches 1 (PA) - Wellbore #1 - No Surveys	11,738.69	6,685.00	1,366.22	1,188.84	7.702	CC, ES
LF Ranches 1 (PA) - Wellbore #1 - No Surveys	11,800.00	6,685.00	1,367.59	1,189.54	7.681	SF

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



**Noble Energy, Inc.**  
Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Guttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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
<b>D Section 36</b>						
Kanga State D 36-1JI (SI) - Wellbore #1 - Gyro Surveys	7,189.93	6,549.05	1,232.08	1,183.11	25.161	CC, ES
Kanga State D 36-1JI (SI) - Wellbore #1 - Gyro Surveys	7,250.00	6,589.40	1,234.58	1,185.38	25.093	SF
Kanga State D 36-2JI - Wellbore #1 - Gyro Surveys	7,483.01	6,726.44	2,528.85	2,478.54	50.265	CC, ES
Kanga State D 36-2JI - Wellbore #1 - Gyro Surveys	7,550.00	6,744.72	2,531.35	2,480.97	50.247	SF
Kanga State D36-11JI (PR) - Wellbore #1 - Gyro Surveys	7,001.86	6,386.74	4,853.02	4,763.50	54.210	CC, ES
Kanga State D36-11JI (PR) - Wellbore #1 - Gyro Surveys	7,350.00	6,606.68	4,925.59	4,832.58	52.960	SF
Rhoo State D36-07JI (SI) - Wellbore #1 - Gyro Surveys	7,119.32	6,616.11	3,006.94	2,958.08	61.541	CC, ES
Rhoo State D36-07JI (SI) - Wellbore #1 - Gyro Surveys	7,300.00	6,702.87	3,027.19	2,977.50	60.920	SF
Spike State D 36-04 (SI) - Gyro Surveys - Wellbore #1	7,513.42	6,818.29	5,096.95	5,046.50	101.034	CC, ES
Spike State D 36-04 (SI) - Gyro Surveys - Wellbore #1	7,600.00	6,834.65	5,100.48	5,049.95	100.930	SF
Spike State D 36-3 (SI) - Wellbore #1 - No Surveys	7,424.21	6,699.10	3,943.87	3,783.07	24.528	CC, ES
Spike State D 36-3 (SI) - Wellbore #1 - No Surveys	7,550.00	6,732.84	3,951.71	3,790.15	24.460	SF
Spike State D36-05 (SI) - Wellbore #1 - Gyro Surveys	7,150.00	7,150.00	5,522.99	5,471.88	108.056	SF
Spike State D36-05 (SI) - Wellbore #1 - Gyro Surveys	7,281.30	6,757.45	5,515.17	5,465.38	110.778	CC, ES
Spike State D36-06 (PA) - Wellbore #1 - Gyro Surveys	7,196.21	6,650.66	4,345.14	4,295.84	88.138	CC
Spike State D36-06 (PA) - Wellbore #1 - Gyro Surveys	7,200.00	6,654.22	4,345.14	4,295.83	88.106	ES
Spike State D36-06 (PA) - Wellbore #1 - Gyro Surveys	8,300.00	8,300.00	4,802.40	4,745.22	83.987	SF
State 09 (SI) - Wellbore #1 - Gyro Surveys	7,110.78	6,451.08	2,086.46	2,037.79	42.863	CC, ES
State 09 (SI) - Wellbore #1 - Gyro Surveys	7,250.00	6,638.06	2,097.08	2,047.81	42.562	SF
State 30 (SI) - Wellbore #1 - Gyro Surveys	6,989.09	6,408.24	5,590.66	5,542.31	115.632	CC, ES
State 30 (SI) - Wellbore #1 - Gyro Surveys	7,350.00	6,640.91	5,669.34	5,619.07	112.772	SF
<b>DD Section 18</b>						
Guttersen 18D - Wellbore #1 - Wellbore #1 - As Drilled	17,796.63	6,682.35	3,891.45	3,783.61	36.085	CC, ES, SF
Guttersen 24-18 - Wellbore #1 - Wellbore #1 - As Drilled	17,796.63	6,704.66	1,911.15	1,804.41	17.905	CC, ES, SF
Guttersen 33-18 - Wellbore #1 - Wellbore #1 - As Drilled	17,796.63	6,733.12	3,754.28	3,652.38	36.843	CC, ES, SF
Guttersen 34-18 - Wellbore #1 - Wellbore #1 - As Drilled	17,796.63	6,714.35	3,036.99	2,927.02	27.615	CC, ES, SF
Guttersen 43-18 - Wellbore #1 - Wellbore #1 - As Drilled	17,796.63	6,737.59	4,764.41	4,655.10	43.585	CC, ES, SF
Guttersen 44-18 - Wellbore #1 - Wellbore #1 - As Drilled	17,796.63	6,701.97	4,359.08	4,248.62	39.464	CC, ES, SF
Karch Blue DD18-03J - Wellbore #1 - Wellbore #1 - As D	17,796.63	6,734.03	2,314.82	2,227.58	26.532	CC, ES, SF
Karch Blue DD18-12 - Original Drilling - Original Drilling -	17,796.63	6,680.57	2,290.77	2,227.17	36.017	CC, ES, SF
Karch Blue DD18-13 - Wellbore #1 - Wellbore #1 - As Dr	17,796.63	6,694.32	805.43	743.06	12.913	CC, ES, SF
<b>DD Section 19</b>						
Champlin 366 Amoco B1 (PR) - Wellbore #1 - Gyro Surv	14,900.00	14,900.00	4,165.11	4,047.49	35.411	SF
Champlin 366 Amoco B1 (PR) - Wellbore #1 - Gyro Surv	16,312.09	6,653.62	3,918.85	3,819.37	39.393	CC, ES
Champlin 366 Amoco D1 (PA) - Wellbore #1 - No Survey	13,717.36	6,705.00	1,283.98	1,092.57	6.708	CC, ES, SF
Guttersen 31-19 (PR) - Wellbore #1 - Gyro Surveys	17,310.15	6,695.30	3,000.08	2,892.48	27.882	CC, ES
Guttersen 31-19 (PR) - Wellbore #1 - Gyro Surveys	17,500.00	6,692.17	3,006.08	2,897.74	27.746	SF
Guttersen 44-19 (SI) - Wellbore #1 - No Surveys	13,443.95	6,750.00	4,314.76	4,124.41	22.668	CC, ES
Guttersen 44-19 (SI) - Wellbore #1 - No Surveys	13,900.00	6,750.00	4,338.79	4,146.23	22.532	SF
<b>DD Section 20</b>						
Spike State DD 20-02J (PR) - Wellbore #1 - Gyro Survey	17,117.90	6,769.31	5,867.28	5,760.98	55.196	CC, ES
Spike State DD 20-02J (PR) - Wellbore #1 - Gyro Survey	17,796.63	6,760.09	5,906.40	5,796.37	53.680	SF
Spike State DD 20-03J (PR) - Wellbore #1 - Gyro Survey	14,006.52	6,717.88	6,253.93	6,171.34	75.726	CC, ES
Spike State DD 20-03J (PR) - Wellbore #1 - Gyro Survey	15,700.00	6,730.23	6,479.14	6,388.08	71.150	SF

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

# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Gutttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Gutttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Gutttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
DD Section 29						
Offset Well - Wellbore - Design						
Champlin 366 Amoco C UT 1 (PR) - Wellbore #1 - Gyro	2,009.99	2,096.95	7,600.31	7,586.17	537.510	CC, ES
Champlin 366 Amoco C UT 1 (PR) - Wellbore #1 - Gyro	15,500.00	7,054.58	9,377.20	9,289.90	107.417	SF
Champlin Amoco 1 (PA) - Wellbore #1 - No Surveys	1,994.00	2,032.01	4,284.73	4,237.17	90.100	CC
Champlin Amoco 1 (PA) - Wellbore #1 - No Surveys	2,000.00	2,038.01	4,284.73	4,237.04	89.834	ES
Champlin Amoco 1 (PA) - Wellbore #1 - No Surveys	9,600.00	6,782.01	6,361.42	6,194.37	38.083	SF
Gutttersen 42-29 (PR) - Wellbore #1 - Gyro Surveys	2,013.21	2,112.03	8,104.99	8,090.80	571.113	CC, ES
Gutttersen 42-29 (PR) - Wellbore #1 - Gyro Surveys	13,800.00	7,057.87	9,973.73	9,864.12	90.991	SF
DD Section 30						
Gutttersen 11-30 (PR) - Wellbore #1 - Gyro Surveys	12,100.00	6,689.77	261.10	191.57	3.755	SF
Gutttersen 11-30 (PR) - Wellbore #1 - Gyro Surveys	12,115.92	6,689.57	260.61	191.36	3.763	CC, ES
Gutttersen 12-30 (PR) - Wellbore #1 - Gyro Surveys	10,697.14	6,692.84	173.07	112.37	2.851	CC, ES, SF
Gutttersen 22-30 (PR) - Wellbore #1 - Gyro Surveys	10,765.63	6,673.54	1,584.31	1,523.79	26.181	CC, ES
Gutttersen 22-30 (PR) - Wellbore #1 - Gyro Surveys	10,800.00	6,672.61	1,584.68	1,524.11	26.162	SF
Gutttersen 30 A (PR) - Wellbore #1 - Gyro Surveys	11,395.33	6,683.26	986.06	921.56	15.289	CC, ES, SF
Gutttersen State DD30-715 - Gutttersen State DD30-715 -	1,994.00	2,023.00	2,062.06	2,048.12	147.990	CC
Gutttersen State DD30-715 - Gutttersen State DD30-715 -	2,000.00	2,029.00	2,062.06	2,048.09	147.543	ES
Gutttersen State DD30-715 - Gutttersen State DD30-715 -	17,796.63	17,380.39	4,657.14	4,479.96	26.285	SF
Gutttersen State DD30-725 - Gutttersen State DD30-725 -	1,994.00	2,023.00	2,025.06	2,011.13	145.334	CC
Gutttersen State DD30-725 - Gutttersen State DD30-725 -	2,000.00	2,029.00	2,025.07	2,011.09	144.896	ES
Gutttersen State DD30-725 - Gutttersen State DD30-725 -	17,796.63	17,241.82	4,018.25	3,841.63	22.751	SF
Gutttersen State DD30-735 - Gutttersen State DD30-735 -	1,994.00	2,023.00	1,987.07	1,973.14	142.608	CC
Gutttersen State DD30-735 - Gutttersen State DD30-735 -	2,000.00	2,029.00	1,987.08	1,973.10	142.178	ES
Gutttersen State DD30-735 - Gutttersen State DD30-735 -	17,796.63	17,413.37	3,357.07	3,180.31	18.993	SF
Gutttersen State DD30-745 - Gutttersen State DD30-745 -	1,994.00	2,023.00	1,950.07	1,936.14	139.953	CC
Gutttersen State DD30-745 - Gutttersen State DD30-745 -	2,000.00	2,029.00	1,950.08	1,936.11	139.531	ES
Gutttersen State DD30-745 - Gutttersen State DD30-745 -	17,796.63	17,569.86	2,696.02	2,519.69	15.290	SF
Gutttersen State DD30-755 - Gutttersen State DD30-755 -	1,994.00	1,993.00	112.01	98.18	8.101	CC
Gutttersen State DD30-755 - Gutttersen State DD30-755 -	2,000.00	1,999.00	112.01	98.14	8.077	ES
Gutttersen State DD30-755 - Gutttersen State DD30-755 -	2,200.00	2,200.94	118.41	103.20	7.788	SF
Gutttersen State DD30-766 - Gutttersen State DD30-766 -	1,994.00	2,007.00	75.01	61.13	5.405	CC, ES
Gutttersen State DD30-766 - Gutttersen State DD30-766 -	2,100.00	2,098.96	77.19	62.64	5.302	SF
Gutttersen State DD30-775 - Gutttersen State DD30-775 -	1,994.00	1,994.00	37.01	23.18	2.676	CC
Gutttersen State DD30-775 - Gutttersen State DD30-775 -	2,000.00	2,000.00	37.02	23.15	2.669	ES
Gutttersen State DD30-775 - Gutttersen State DD30-775 -	2,100.00	2,101.05	37.77	23.23	2.597	SF
Gutttersen YY06-756 - Gutttersen YY06-756 - Plan #1	1,994.00	2,010.00	187.48	173.59	13.500	CC, ES
Gutttersen YY06-756 - Gutttersen YY06-756 - Plan #1	2,200.00	2,204.28	195.83	180.56	12.821	SF
Gutttersen YY06-766 - Gutttersen YY06-766 - Plan #1	1,994.00	2,010.00	167.27	153.38	12.045	CC, ES
Gutttersen YY06-766 - Gutttersen YY06-766 - Plan #1	2,200.00	2,204.28	174.79	159.52	11.443	SF
Gutttersen YY06-775 - Gutttersen YY06-775 - Plan #1	1,994.00	2,009.00	154.99	141.11	11.164	CC, ES
Gutttersen YY06-775 - Gutttersen YY06-775 - Plan #1	7,100.00	7,400.36	502.91	447.10	9.010	SF
Gutttersen YY06-785 - Gutttersen YY06-785 - Plan #1	7,500.00	7,389.56	65.29	6.78	1.116	Level 2, SF
Gutttersen YY06-785 - Gutttersen YY06-785 - Plan #1	7,510.59	7,381.04	64.98	6.75	1.116	Level 2, CC, ES
Karch Blue DD 30-12 (PA) - Wellbore #1 - No Surveys	9,576.75	6,696.00	122.94	-42.77	0.742	Level 1, CC, ES, SF
Karch Blue DD 30-14 (PA) - Wellbore #1 - No Surveys	3,304.18	3,193.81	338.73	263.18	4.484	CC, ES
Karch Blue DD 30-14 (PA) - Wellbore #1 - No Surveys	3,400.00	3,277.17	342.01	264.39	4.406	SF
Karch Blue DD 30-3 J (PA) - Wellbore #1 - No Surveys	9,018.82	6,701.00	1,290.31	1,126.60	7.882	CC, ES, SF
L F Ranch 2-30 (PR) - Wellbore #1 - Gyro Surveys	11,764.75	6,770.44	1,571.09	1,503.18	23.132	CC, ES
L F Ranch 2-30 (PR) - Wellbore #1 - Gyro Surveys	11,800.00	6,770.03	1,571.49	1,503.51	23.117	SF
State 19 (PA) - Wellbore #1 - NO Surveys	11,401.54	6,752.00	3,795.45	3,618.86	21.493	CC, ES
State 19 (PA) - Wellbore #1 - NO Surveys	11,700.00	6,752.00	3,807.17	3,629.28	21.402	SF

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



# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Gutttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Gutttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Gutttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
DD Section 31						
Gutttersen 31Q-221 (PR) - Wellbore #1 - MWD Surveys	5,942.31	10,956.00	2,517.81	2,415.59	24.630	CC
Gutttersen 31Q-221 (PR) - Wellbore #1 - MWD Surveys	6,000.00	10,956.00	2,518.47	2,415.23	24.393	ES
Gutttersen 31Q-221 (PR) - Wellbore #1 - MWD Surveys	6,541.91	10,956.00	2,588.22	2,477.62	23.402	SF
Gutttersen 31Q-401 (PR) - Wellbore #1 - MWD Surveys	6,259.41	11,132.00	2,356.81	2,252.61	22.617	CC
Gutttersen 31Q-401 (PR) - Wellbore #1 - MWD Surveys	6,300.00	11,132.00	2,357.16	2,252.20	22.457	ES
Gutttersen 31Q-401 (PR) - Wellbore #1 - MWD Surveys	6,750.00	11,132.00	2,408.90	2,297.36	21.598	SF
Gutttersen 31T-301 (PR) - Wellbore #1 - MWD Surveys	5,731.20	11,048.00	3,138.45	3,037.58	31.114	CC
Gutttersen 31T-301 (PR) - Wellbore #1 - MWD Surveys	5,800.00	11,048.00	3,139.20	3,037.27	30.798	ES
Gutttersen 31T-301 (PR) - Wellbore #1 - MWD Surveys	6,541.91	11,048.00	3,241.47	3,130.75	29.278	SF
Gutttersen 31T-441 (PR) - Wellbore #1 - MWD Surveys	5,978.62	11,127.00	2,887.72	2,785.57	28.268	CC
Gutttersen 31T-441 (PR) - Wellbore #1 - MWD Surveys	6,000.00	11,127.00	2,887.80	2,785.30	28.172	ES
Gutttersen 31T-441 (PR) - Wellbore #1 - MWD Surveys	6,650.00	11,127.00	2,965.31	2,854.39	26.733	SF
Gutttersen 33-31 (PR) - Wellbore #1 - Gyro Surveys	4,903.79	4,783.19	3,717.00	3,681.19	103.791	CC
Gutttersen 33-31 (PR) - Wellbore #1 - Gyro Surveys	5,000.00	4,849.67	3,717.47	3,680.93	101.742	ES
Gutttersen 33-31 (PR) - Wellbore #1 - Gyro Surveys	6,850.00	6,304.60	3,929.55	3,878.71	77.299	SF
YY Section 6						
Gutttersen 6M-303 (PR) - Wellbore #1 - Wellbore #1	6,472.00	5,881.00	5,380.82	5,332.36	111.019	CC
Gutttersen 6M-303 (PR) - Wellbore #1 - Wellbore #1	6,500.00	5,881.00	5,380.90	5,332.29	110.697	ES
Gutttersen 6M-303 (PR) - Wellbore #1 - Wellbore #1	6,800.00	5,913.00	5,437.87	5,387.79	108.599	SF
Gutttersen 6M-423 (PR) - Wellbore #1 - MWD Surveys	6,198.07	5,724.00	5,537.55	5,491.65	120.648	CC
Gutttersen 6M-423 (PR) - Wellbore #1 - MWD Surveys	6,300.00	5,807.40	5,537.85	5,491.11	118.505	ES
Gutttersen 6M-423 (PR) - Wellbore #1 - MWD Surveys	6,800.00	6,010.00	5,600.87	5,550.97	112.241	SF
Gutttersen 6R-243 (PR) - Wellbore #1 - Gyro Surveys	5,842.90	5,501.06	5,675.30	5,631.11	128.442	CC
Gutttersen 6R-243 (PR) - Wellbore #1 - Gyro Surveys	5,900.00	5,533.00	5,675.49	5,630.90	127.295	ES
Gutttersen 6R-243 (PR) - Wellbore #1 - Gyro Surveys	6,800.00	5,946.00	5,758.86	5,708.49	114.321	SF
Gutttersen 6R-403 (PR) - Wellbore #1 - MWD Surveys	4,276.44	3,781.09	5,780.48	5,749.31	185.463	CC
Gutttersen 6R-403 (PR) - Wellbore #1 - MWD Surveys	4,300.00	3,787.31	5,780.51	5,749.21	184.660	ES
Gutttersen 6R-403 (PR) - Wellbore #1 - MWD Surveys	6,800.00	5,979.00	5,936.37	5,884.53	114.525	SF
Gutterson 31-6 (SI) - Wellbore #1 - Gyro Surveys	6,549.42	6,114.13	6,178.00	6,128.95	125.941	CC
Gutterson 31-6 (SI) - Wellbore #1 - Gyro Surveys	6,550.00	6,114.49	6,178.00	6,128.94	125.930	ES
Gutterson 31-6 (SI) - Wellbore #1 - Gyro Surveys	6,950.00	6,417.54	6,293.28	6,241.40	121.293	SF
Gutterson 32-6 (SI) - Wellbore #1 - Gyro Surveys	6,573.86	6,160.03	7,347.91	7,298.61	149.048	CC, ES
Gutterson 32-6 (SI) - Wellbore #1 - Gyro Surveys	6,900.00	6,900.00	7,428.82	7,375.44	139.172	SF
J.H. Cuykendall John 1 (PA) - Wellbore #1 - Gyro Survey	6,657.95	5,959.44	9,121.49	9,073.08	188.405	CC, ES
J.H. Cuykendall John 1 (PA) - Wellbore #1 - Gyro Survey	7,100.00	7,100.00	9,264.04	9,209.95	171.262	SF

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

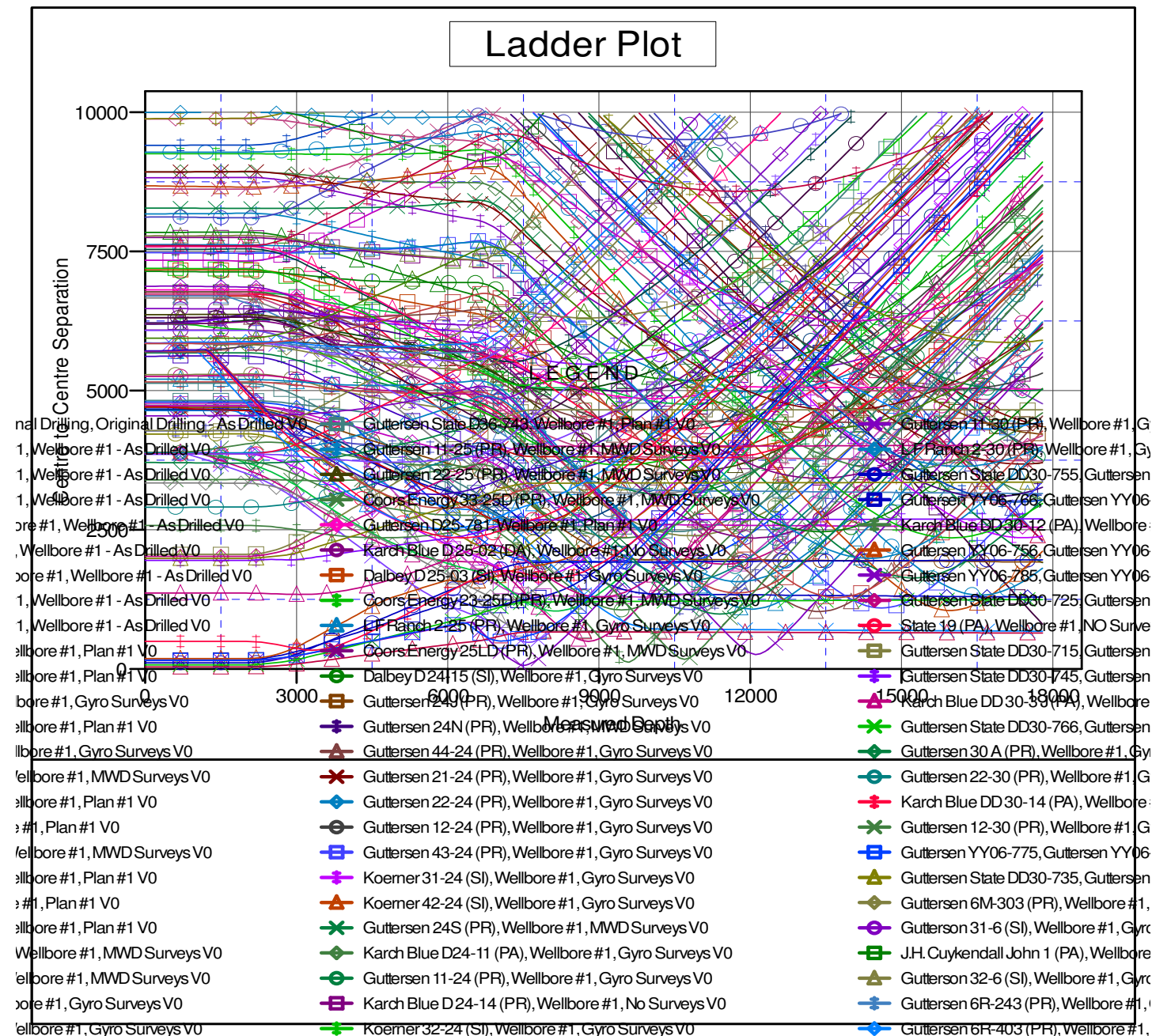
## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Guttersen State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Guttersen State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Guttersen State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Coordinates are relative to: Guttersen State DD30-785

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is:  $0.66^\circ$



# Noble Energy, Inc.

## Anticollision Summary Report

<b>Company:</b>	Northern Region - DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Guttersten State DD30-785
<b>Project:</b>	Mustang	<b>TVD Reference:</b>	KB @ 4824.00ft
<b>Reference Site:</b>	DD Section 30	<b>MD Reference:</b>	KB @ 4824.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Guttersten State DD30-785	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Guttersten State DD30-785	<b>Database:</b>	EDMP
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to KB @ 4824.00ft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.5000000

Coordinates are relative to: Guttersten State DD30-785  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.66°

