

Project: Cummins  
 Site: AB Section 32  
 Well: Westerman A5-726  
 Wellbore: Wellbore #1  
 Design: Plan #1



# Noble Energy

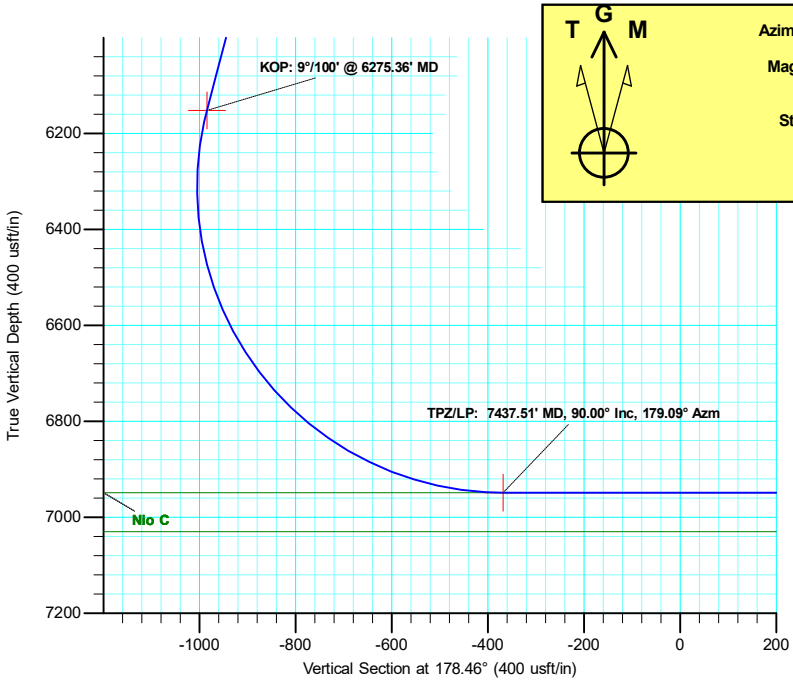
Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Colorado Northern Zone  
 System Datum: Mean Sea Level

### 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	2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	
3	2732.58	14.65	4.17	2724.63	92.91	6.78	2.00	4.17	-92.70	
4	6275.36	14.65	4.17	6152.20	986.65	71.99	0.00	0.00	-984.37	
5	7437.51	90.00	179.09	6949.00	370.94	100.21	9.00	174.75	-368.12	TPZ-Westerman A5-726
6	17476.09	90.00	179.09	6949.00	-9666.38	259.48	0.00	0.00	9669.86	BHL-Westerman A5-726

### WELL DETAILS: Westerman A5-726

+N/-S	+E/-W	Northing	Ground Level: Easting	4814.00 Latitude	Longitude
0.00	0.00	1439107.37	3258883.16	40.535018	-104.568600

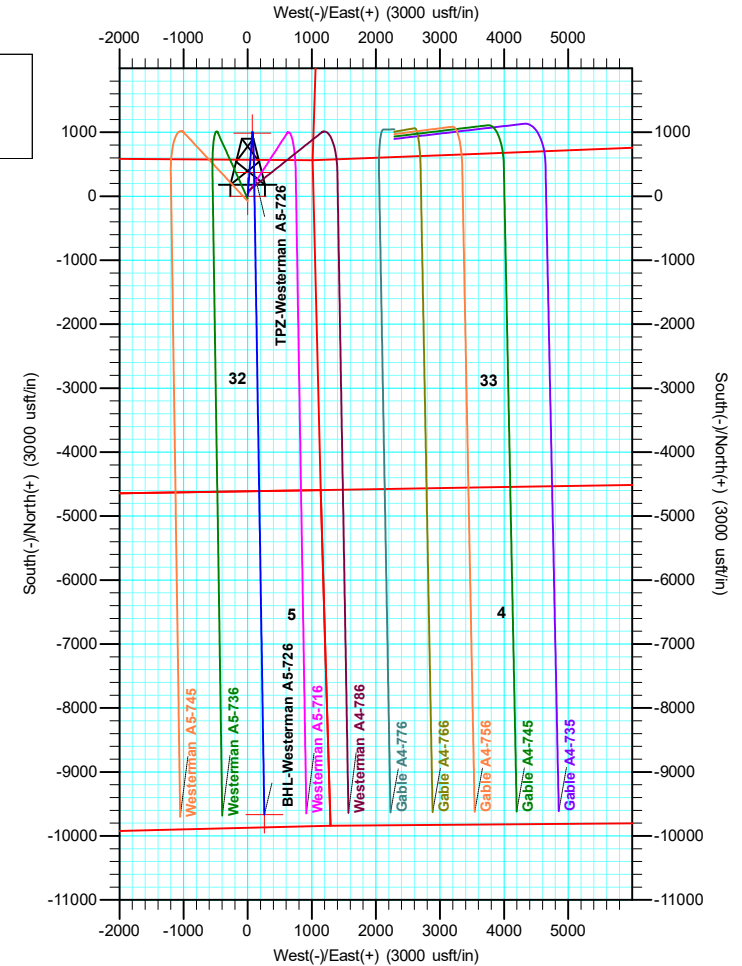
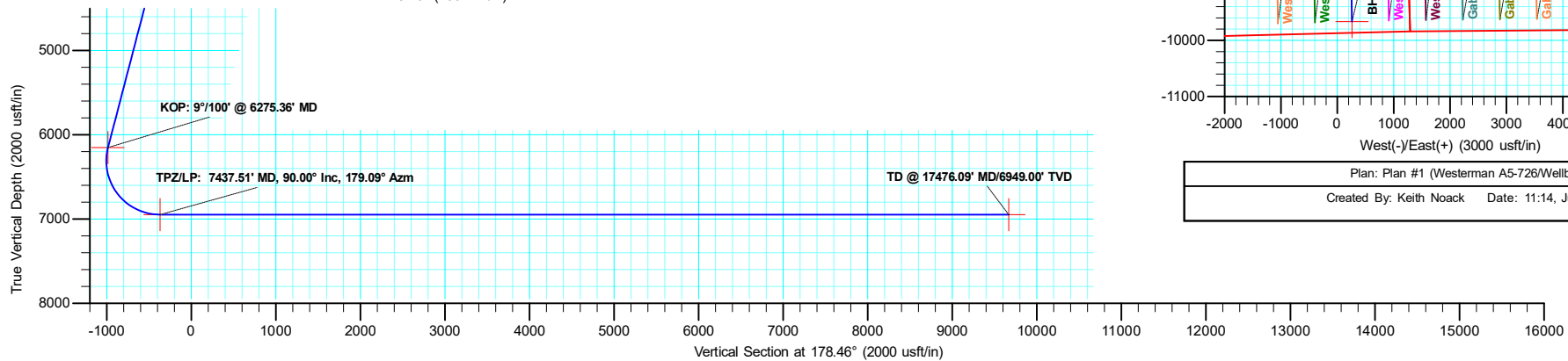


**T G M**

Azimuths to Grid North  
 True North: -0.60°  
 Magnetic North: 7.30°

Magnetic Field  
 Strength: 52253.1nT  
 Dip Angle: 66.94°  
 Date: 6/20/2019  
 Model: IGRF2015

SHL: 572 FNL/ 1027 FEL Sec. AB32  
 TPZ: 200 FNL/ 918 FEL Sec. AB32  
 BHL: 200 FSL/ 1027 FEL Sec. A5



Plan: Plan #1 (Westerman A5-726/Wellbore #1)  
 Created By: Keith Noack Date: 11:14, June 21 2019



# **Noble Energy**

**Cummins  
AB Section 32  
Westerman A5-726**

**Wellbore #1**

**Plan: Plan #1**

## **Standard Planning Report**

**21 June, 2019**



<b>Database:</b>	Local	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Company:</b>	Noble Energy	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Project:</b>	Cummins	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site:</b>	AB Section 32	<b>North Reference:</b>	Grid
<b>Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

<b>Project</b>	Cummins, 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		

<b>Site</b>	AB Section 32				
<b>Site Position:</b>		<b>Northing:</b>	1,437,026.14 usft	<b>Latitude:</b>	40.529357
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,257,086.37 usft	<b>Longitude:</b>	-104.575142
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.60 °

<b>Well</b>	Westerman A5-726					
<b>Well Position</b>	<b>+N/-S</b>	2,081.23 usft	<b>Northing:</b>	1,439,107.37 usft	<b>Latitude:</b>	40.535018
	<b>+E/-W</b>	1,796.79 usft	<b>Easting:</b>	3,258,883.16 usft	<b>Longitude:</b>	-104.568600
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	4,814.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	6/20/2019	7.90	66.94	52,253.08565850

<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	178.46

<b>Plan Survey Tool Program</b>	<b>Date</b>	6/20/2019			
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	17,476.09	Plan #1 (Wellbore #1)	2_MWD+IFR1+MS A008Mb: IFR dec & multi-st	

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
2,732.58	14.65	4.17	2,724.63	92.91	6.78	2.00	2.00	0.00	4.17	
6,275.36	14.65	4.17	6,152.20	986.65	71.99	0.00	0.00	0.00	0.00	
7,437.51	90.00	179.09	6,949.00	370.94	100.21	9.00	6.48	15.05	174.75	TPZ-Westerman A5
17,476.09	90.00	179.09	6,949.00	-9,666.38	259.48	0.00	0.00	0.00	0.00	BHL-Westerman A5

<b>Database:</b>	Local	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Company:</b>	Noble Energy	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Project:</b>	Cummins	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site:</b>	AB Section 32	<b>North Reference:</b>	Grid
<b>Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SHL-Westerman A5-726</b>										
100.00	0.00	0.00	100.00	0.00	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	0.00
300.00	0.00	0.00	300.00	0.00	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	0.00
500.00	0.00	0.00	500.00	0.00	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	0.00
700.00	0.00	0.00	700.00	0.00	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	0.00
900.00	0.00	0.00	900.00	0.00	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	0.00
1,100.00	0.00	0.00	1,100.00	0.00	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	0.00
1,300.00	0.00	0.00	1,300.00	0.00	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	0.00
1,500.00	0.00	0.00	1,500.00	0.00	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	0.00
1,700.00	0.00	0.00	1,700.00	0.00	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	0.00
1,900.00	0.00	0.00	1,900.00	0.00	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	0.00
<b>Build: 2°/100' @ 2000.00' MD</b>										
2,100.00	2.00	4.17	2,099.98	1.74	0.13	-1.74	2.00	2.00	2.00	0.00
2,200.00	4.00	4.17	2,199.84	6.96	0.51	-6.94	2.00	2.00	2.00	0.00
2,300.00	6.00	4.17	2,299.45	15.65	1.14	-15.62	2.00	2.00	2.00	0.00
2,400.00	8.00	4.17	2,398.70	27.81	2.03	-27.74	2.00	2.00	2.00	0.00
2,500.00	10.00	4.17	2,497.47	43.41	3.17	-43.31	2.00	2.00	2.00	0.00
2,600.00	12.00	4.17	2,595.62	62.44	4.56	-62.29	2.00	2.00	2.00	0.00
2,700.00	14.00	4.17	2,693.06	84.87	6.19	-84.67	2.00	2.00	2.00	0.00
2,732.58	14.65	4.17	2,724.63	92.91	6.78	-92.70	2.00	2.00	2.00	0.00
<b>Hold: 14.65° Inc, 4.17° Azm</b>										
2,800.00	14.65	4.17	2,789.85	109.92	8.02	-109.66	0.00	0.00	0.00	0.00
2,900.00	14.65	4.17	2,886.60	135.15	9.86	-134.83	0.00	0.00	0.00	0.00
3,000.00	14.65	4.17	2,983.35	160.37	11.70	-160.00	0.00	0.00	0.00	0.00
3,100.00	14.65	4.17	3,080.09	185.60	13.54	-185.17	0.00	0.00	0.00	0.00
3,200.00	14.65	4.17	3,176.84	210.83	15.38	-210.34	0.00	0.00	0.00	0.00
3,300.00	14.65	4.17	3,273.59	236.05	17.22	-235.51	0.00	0.00	0.00	0.00
3,400.00	14.65	4.17	3,370.34	261.28	19.06	-260.68	0.00	0.00	0.00	0.00
3,500.00	14.65	4.17	3,467.09	286.51	20.90	-285.84	0.00	0.00	0.00	0.00
3,600.00	14.65	4.17	3,563.83	311.74	22.74	-311.01	0.00	0.00	0.00	0.00
3,700.00	14.65	4.17	3,660.58	336.96	24.59	-336.18	0.00	0.00	0.00	0.00
3,800.00	14.65	4.17	3,757.33	362.19	26.43	-361.35	0.00	0.00	0.00	0.00
3,900.00	14.65	4.17	3,854.08	387.42	28.27	-386.52	0.00	0.00	0.00	0.00
4,000.00	14.65	4.17	3,950.83	412.64	30.11	-411.69	0.00	0.00	0.00	0.00
4,100.00	14.65	4.17	4,047.58	437.87	31.95	-436.86	0.00	0.00	0.00	0.00
4,200.00	14.65	4.17	4,144.32	463.10	33.79	-462.03	0.00	0.00	0.00	0.00
4,300.00	14.65	4.17	4,241.07	488.33	35.63	-487.19	0.00	0.00	0.00	0.00
4,400.00	14.65	4.17	4,337.82	513.55	37.47	-512.36	0.00	0.00	0.00	0.00
4,500.00	14.65	4.17	4,434.57	538.78	39.31	-537.53	0.00	0.00	0.00	0.00
4,600.00	14.65	4.17	4,531.32	564.01	41.15	-562.70	0.00	0.00	0.00	0.00
4,700.00	14.65	4.17	4,628.06	589.23	42.99	-587.87	0.00	0.00	0.00	0.00
4,800.00	14.65	4.17	4,724.81	614.46	44.83	-613.04	0.00	0.00	0.00	0.00

<b>Database:</b>	Local	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Company:</b>	Noble Energy	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Project:</b>	Cummins	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site:</b>	AB Section 32	<b>North Reference:</b>	Grid
<b>Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,900.00	14.65	4.17	4,821.56	639.69	46.67	-638.21	0.00	0.00	0.00
5,000.00	14.65	4.17	4,918.31	664.92	48.51	-663.37	0.00	0.00	0.00
5,100.00	14.65	4.17	5,015.06	690.14	50.35	-688.54	0.00	0.00	0.00
5,200.00	14.65	4.17	5,111.81	715.37	52.19	-713.71	0.00	0.00	0.00
5,300.00	14.65	4.17	5,208.55	740.60	54.03	-738.88	0.00	0.00	0.00
5,400.00	14.65	4.17	5,305.30	765.82	55.88	-764.05	0.00	0.00	0.00
5,500.00	14.65	4.17	5,402.05	791.05	57.72	-789.22	0.00	0.00	0.00
5,600.00	14.65	4.17	5,498.80	816.28	59.56	-814.39	0.00	0.00	0.00
5,700.00	14.65	4.17	5,595.55	841.51	61.40	-839.56	0.00	0.00	0.00
5,800.00	14.65	4.17	5,692.29	866.73	63.24	-864.72	0.00	0.00	0.00
5,900.00	14.65	4.17	5,789.04	891.96	65.08	-889.89	0.00	0.00	0.00
6,000.00	14.65	4.17	5,885.79	917.19	66.92	-915.06	0.00	0.00	0.00
6,100.00	14.65	4.17	5,982.54	942.41	68.76	-940.23	0.00	0.00	0.00
6,200.00	14.65	4.17	6,079.29	967.64	70.60	-965.40	0.00	0.00	0.00
6,275.36	14.65	4.17	6,152.20	986.65	71.99	-984.37	0.00	0.00	0.00
<b>KOP: 9°/100' @ 6275.36' MD - KOP-Westerman A5-726</b>									
6,300.00	12.45	5.11	6,176.15	992.41	72.45	-990.10	9.00	-8.96	3.82
6,350.00	7.99	8.59	6,225.34	1,001.21	73.45	-998.88	9.00	-8.92	6.96
6,400.00	3.63	20.52	6,275.08	1,006.13	74.52	-1,003.77	9.00	-8.72	23.86
6,450.00	1.74	129.38	6,325.04	1,007.13	75.67	-1,004.74	9.00	-3.77	217.72
6,500.00	5.78	165.86	6,374.93	1,004.21	76.87	-1,001.78	9.00	8.08	72.96
6,550.00	10.21	171.70	6,424.43	997.38	78.12	-994.92	9.00	8.86	11.68
6,600.00	14.68	174.02	6,473.24	986.68	79.42	-984.20	9.00	8.95	4.63
6,650.00	19.17	175.27	6,521.07	972.19	80.76	-969.68	9.00	8.97	2.50
6,700.00	23.66	176.06	6,567.60	953.99	82.13	-951.45	9.00	8.98	1.58
6,750.00	28.15	176.61	6,612.57	932.20	83.51	-929.62	9.00	8.99	1.10
6,800.00	32.65	177.02	6,655.68	906.94	84.91	-904.34	9.00	8.99	0.82
6,850.00	37.14	177.34	6,696.68	878.38	86.32	-875.75	9.00	8.99	0.64
6,900.00	41.64	177.60	6,735.31	846.68	87.71	-844.03	9.00	8.99	0.52
6,950.00	46.14	177.82	6,771.33	812.06	89.10	-809.37	9.00	8.99	0.43
7,000.00	50.64	178.00	6,804.53	774.71	90.46	-772.00	9.00	9.00	0.37
7,050.00	55.14	178.17	6,834.69	734.87	91.79	-732.14	9.00	9.00	0.33
7,100.00	59.63	178.31	6,861.63	692.78	93.08	-690.04	9.00	9.00	0.29
7,150.00	64.13	178.45	6,885.19	648.71	94.33	-645.95	9.00	9.00	0.27
7,200.00	68.63	178.57	6,905.22	602.93	95.52	-600.15	9.00	9.00	0.25
7,250.00	73.13	178.69	6,921.59	555.71	96.65	-552.92	9.00	9.00	0.23
7,300.00	77.63	178.80	6,934.21	507.36	97.71	-504.55	9.00	9.00	0.22
7,350.00	82.13	178.91	6,943.00	458.16	98.69	-455.34	9.00	9.00	0.22
7,400.00	86.63	179.01	6,947.90	408.42	99.59	-405.60	9.00	9.00	0.21
7,437.51	90.00	179.09	6,949.00	370.94	100.21	-368.12	9.00	9.00	0.21
<b>TPZ/LP: 7437.51' MD, 90.00° Inc, 179.09° Azm - TPZ-Westerman A5-726</b>									
7,500.00	90.00	179.09	6,949.00	308.45	101.20	-305.63	0.00	0.00	0.00
7,600.00	90.00	179.09	6,949.00	208.47	102.79	-205.63	0.00	0.00	0.00
7,700.00	90.00	179.09	6,949.00	108.48	104.38	-105.64	0.00	0.00	0.00
7,800.00	90.00	179.09	6,949.00	8.49	105.96	-5.65	0.00	0.00	0.00
7,900.00	90.00	179.09	6,949.00	-91.50	107.55	94.35	0.00	0.00	0.00
8,000.00	90.00	179.09	6,949.00	-191.48	109.14	194.34	0.00	0.00	0.00
8,100.00	90.00	179.09	6,949.00	-291.47	110.72	294.34	0.00	0.00	0.00
8,200.00	90.00	179.09	6,949.00	-391.46	112.31	394.33	0.00	0.00	0.00
8,300.00	90.00	179.09	6,949.00	-491.44	113.90	494.32	0.00	0.00	0.00
8,400.00	90.00	179.09	6,949.00	-591.43	115.48	594.32	0.00	0.00	0.00
8,500.00	90.00	179.09	6,949.00	-691.42	117.07	694.31	0.00	0.00	0.00
8,600.00	90.00	179.09	6,949.00	-791.41	118.66	794.31	0.00	0.00	0.00
8,700.00	90.00	179.09	6,949.00	-891.39	120.24	894.30	0.00	0.00	0.00

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<b>Project:</b>	Cummins	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site:</b>	AB Section 32	<b>North Reference:</b>	Grid
<b>Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,800.00	90.00	179.09	6,949.00	-991.38	121.83	994.29	0.00	0.00	0.00	
8,900.00	90.00	179.09	6,949.00	-1,091.37	123.42	1,094.29	0.00	0.00	0.00	
9,000.00	90.00	179.09	6,949.00	-1,191.36	125.00	1,194.28	0.00	0.00	0.00	
9,100.00	90.00	179.09	6,949.00	-1,291.34	126.59	1,294.28	0.00	0.00	0.00	
9,200.00	90.00	179.09	6,949.00	-1,391.33	128.17	1,394.27	0.00	0.00	0.00	
9,300.00	90.00	179.09	6,949.00	-1,491.32	129.76	1,494.26	0.00	0.00	0.00	
9,400.00	90.00	179.09	6,949.00	-1,591.31	131.35	1,594.26	0.00	0.00	0.00	
9,500.00	90.00	179.09	6,949.00	-1,691.29	132.93	1,694.25	0.00	0.00	0.00	
9,600.00	90.00	179.09	6,949.00	-1,791.28	134.52	1,794.25	0.00	0.00	0.00	
9,700.00	90.00	179.09	6,949.00	-1,891.27	136.11	1,894.24	0.00	0.00	0.00	
9,800.00	90.00	179.09	6,949.00	-1,991.26	137.69	1,994.23	0.00	0.00	0.00	
9,900.00	90.00	179.09	6,949.00	-2,091.24	139.28	2,094.23	0.00	0.00	0.00	
10,000.00	90.00	179.09	6,949.00	-2,191.23	140.87	2,194.22	0.00	0.00	0.00	
10,100.00	90.00	179.09	6,949.00	-2,291.22	142.45	2,294.22	0.00	0.00	0.00	
10,200.00	90.00	179.09	6,949.00	-2,391.21	144.04	2,394.21	0.00	0.00	0.00	
10,300.00	90.00	179.09	6,949.00	-2,491.19	145.63	2,494.20	0.00	0.00	0.00	
10,400.00	90.00	179.09	6,949.00	-2,591.18	147.21	2,594.20	0.00	0.00	0.00	
10,500.00	90.00	179.09	6,949.00	-2,691.17	148.80	2,694.19	0.00	0.00	0.00	
10,600.00	90.00	179.09	6,949.00	-2,791.16	150.39	2,794.19	0.00	0.00	0.00	
10,700.00	90.00	179.09	6,949.00	-2,891.14	151.97	2,894.18	0.00	0.00	0.00	
10,800.00	90.00	179.09	6,949.00	-2,991.13	153.56	2,994.17	0.00	0.00	0.00	
10,900.00	90.00	179.09	6,949.00	-3,091.12	155.15	3,094.17	0.00	0.00	0.00	
11,000.00	90.00	179.09	6,949.00	-3,191.11	156.73	3,194.16	0.00	0.00	0.00	
11,100.00	90.00	179.09	6,949.00	-3,291.09	158.32	3,294.16	0.00	0.00	0.00	
11,200.00	90.00	179.09	6,949.00	-3,391.08	159.91	3,394.15	0.00	0.00	0.00	
11,300.00	90.00	179.09	6,949.00	-3,491.07	161.49	3,494.14	0.00	0.00	0.00	
11,400.00	90.00	179.09	6,949.00	-3,591.05	163.08	3,594.14	0.00	0.00	0.00	
11,500.00	90.00	179.09	6,949.00	-3,691.04	164.66	3,694.13	0.00	0.00	0.00	
11,600.00	90.00	179.09	6,949.00	-3,791.03	166.25	3,794.13	0.00	0.00	0.00	
11,700.00	90.00	179.09	6,949.00	-3,891.02	167.84	3,894.12	0.00	0.00	0.00	
11,800.00	90.00	179.09	6,949.00	-3,991.00	169.42	3,994.11	0.00	0.00	0.00	
11,900.00	90.00	179.09	6,949.00	-4,090.99	171.01	4,094.11	0.00	0.00	0.00	
12,000.00	90.00	179.09	6,949.00	-4,190.98	172.60	4,194.10	0.00	0.00	0.00	
12,100.00	90.00	179.09	6,949.00	-4,290.97	174.18	4,294.10	0.00	0.00	0.00	
12,200.00	90.00	179.09	6,949.00	-4,390.95	175.77	4,394.09	0.00	0.00	0.00	
12,300.00	90.00	179.09	6,949.00	-4,490.94	177.36	4,494.08	0.00	0.00	0.00	
12,400.00	90.00	179.09	6,949.00	-4,590.93	178.94	4,594.08	0.00	0.00	0.00	
12,500.00	90.00	179.09	6,949.00	-4,690.92	180.53	4,694.07	0.00	0.00	0.00	
12,600.00	90.00	179.09	6,949.00	-4,790.90	182.12	4,794.07	0.00	0.00	0.00	
12,700.00	90.00	179.09	6,949.00	-4,890.89	183.70	4,894.06	0.00	0.00	0.00	
12,800.00	90.00	179.09	6,949.00	-4,990.88	185.29	4,994.05	0.00	0.00	0.00	
12,900.00	90.00	179.09	6,949.00	-5,090.87	186.88	5,094.05	0.00	0.00	0.00	
13,000.00	90.00	179.09	6,949.00	-5,190.85	188.46	5,194.04	0.00	0.00	0.00	
13,100.00	90.00	179.09	6,949.00	-5,290.84	190.05	5,294.04	0.00	0.00	0.00	
13,200.00	90.00	179.09	6,949.00	-5,390.83	191.64	5,394.03	0.00	0.00	0.00	
13,300.00	90.00	179.09	6,949.00	-5,490.82	193.22	5,494.02	0.00	0.00	0.00	
13,400.00	90.00	179.09	6,949.00	-5,590.80	194.81	5,594.02	0.00	0.00	0.00	
13,500.00	90.00	179.09	6,949.00	-5,690.79	196.40	5,694.01	0.00	0.00	0.00	
13,600.00	90.00	179.09	6,949.00	-5,790.78	197.98	5,794.01	0.00	0.00	0.00	
13,700.00	90.00	179.09	6,949.00	-5,890.77	199.57	5,894.00	0.00	0.00	0.00	
13,800.00	90.00	179.09	6,949.00	-5,990.75	201.15	5,993.99	0.00	0.00	0.00	
13,900.00	90.00	179.09	6,949.00	-6,090.74	202.74	6,093.99	0.00	0.00	0.00	
14,000.00	90.00	179.09	6,949.00	-6,190.73	204.33	6,193.98	0.00	0.00	0.00	
14,100.00	90.00	179.09	6,949.00	-6,290.72	205.91	6,293.98	0.00	0.00	0.00	

<b>Database:</b>	Local	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Company:</b>	Noble Energy	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Project:</b>	Cummins	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site:</b>	AB Section 32	<b>North Reference:</b>	Grid
<b>Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
14,200.00	90.00	179.09	6,949.00	-6,390.70	207.50	6,393.97	0.00	0.00	0.00	
14,300.00	90.00	179.09	6,949.00	-6,490.69	209.09	6,493.96	0.00	0.00	0.00	
14,400.00	90.00	179.09	6,949.00	-6,590.68	210.67	6,593.96	0.00	0.00	0.00	
14,500.00	90.00	179.09	6,949.00	-6,690.66	212.26	6,693.95	0.00	0.00	0.00	
14,600.00	90.00	179.09	6,949.00	-6,790.65	213.85	6,793.95	0.00	0.00	0.00	
14,700.00	90.00	179.09	6,949.00	-6,890.64	215.43	6,893.94	0.00	0.00	0.00	
14,800.00	90.00	179.09	6,949.00	-6,990.63	217.02	6,993.93	0.00	0.00	0.00	
14,900.00	90.00	179.09	6,949.00	-7,090.61	218.61	7,093.93	0.00	0.00	0.00	
15,000.00	90.00	179.09	6,949.00	-7,190.60	220.19	7,193.92	0.00	0.00	0.00	
15,100.00	90.00	179.09	6,949.00	-7,290.59	221.78	7,293.92	0.00	0.00	0.00	
15,200.00	90.00	179.09	6,949.00	-7,390.58	223.37	7,393.91	0.00	0.00	0.00	
15,300.00	90.00	179.09	6,949.00	-7,490.56	224.95	7,493.90	0.00	0.00	0.00	
15,400.00	90.00	179.09	6,949.00	-7,590.55	226.54	7,593.90	0.00	0.00	0.00	
15,500.00	90.00	179.09	6,949.00	-7,690.54	228.13	7,693.89	0.00	0.00	0.00	
15,600.00	90.00	179.09	6,949.00	-7,790.53	229.71	7,793.89	0.00	0.00	0.00	
15,700.00	90.00	179.09	6,949.00	-7,890.51	231.30	7,893.88	0.00	0.00	0.00	
15,800.00	90.00	179.09	6,949.00	-7,990.50	232.88	7,993.87	0.00	0.00	0.00	
15,900.00	90.00	179.09	6,949.00	-8,090.49	234.47	8,093.87	0.00	0.00	0.00	
16,000.00	90.00	179.09	6,949.00	-8,190.48	236.06	8,193.86	0.00	0.00	0.00	
16,100.00	90.00	179.09	6,949.00	-8,290.46	237.64	8,293.85	0.00	0.00	0.00	
16,200.00	90.00	179.09	6,949.00	-8,390.45	239.23	8,393.85	0.00	0.00	0.00	
16,300.00	90.00	179.09	6,949.00	-8,490.44	240.82	8,493.84	0.00	0.00	0.00	
16,400.00	90.00	179.09	6,949.00	-8,590.43	242.40	8,593.84	0.00	0.00	0.00	
16,500.00	90.00	179.09	6,949.00	-8,690.41	243.99	8,693.83	0.00	0.00	0.00	
16,600.00	90.00	179.09	6,949.00	-8,790.40	245.58	8,793.82	0.00	0.00	0.00	
16,700.00	90.00	179.09	6,949.00	-8,890.39	247.16	8,893.82	0.00	0.00	0.00	
16,800.00	90.00	179.09	6,949.00	-8,990.38	248.75	8,993.81	0.00	0.00	0.00	
16,900.00	90.00	179.09	6,949.00	-9,090.36	250.34	9,093.81	0.00	0.00	0.00	
17,000.00	90.00	179.09	6,949.00	-9,190.35	251.92	9,193.80	0.00	0.00	0.00	
17,100.00	90.00	179.09	6,949.00	-9,290.34	253.51	9,293.79	0.00	0.00	0.00	
17,200.00	90.00	179.09	6,949.00	-9,390.32	255.10	9,393.79	0.00	0.00	0.00	
17,300.00	90.00	179.09	6,949.00	-9,490.31	256.68	9,493.78	0.00	0.00	0.00	
17,400.00	90.00	179.09	6,949.00	-9,590.30	258.27	9,593.78	0.00	0.00	0.00	
17,476.09	90.00	179.09	6,949.00	-9,666.38	259.48	9,669.86	0.00	0.00	0.00	
<b>TD @ 17476.09' MD/6949.00' TVD - BHL-Westerman A5-726</b>										

<b>Database:</b>	Local	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Company:</b>	Noble Energy	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Project:</b>	Cummins	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site:</b>	AB Section 32	<b>North Reference:</b>	Grid
<b>Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

**Design Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL-Westerman A5-7 - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,439,107.37	3,258,883.16	40.535018	-104.568600
KOP-Westerman A5-7 - plan hits target center - Point	0.00	0.00	6,152.20	986.65	71.99	1,440,094.03	3,258,955.15	40.537724	-104.568304
BHL-Westerman A5-7 - plan hits target center - Point	0.00	0.00	6,949.00	-9,666.38	259.48	1,429,440.99	3,259,142.64	40.508478	-104.568032
TPZ-Westerman A5-7 - plan hits target center - Point	0.00	0.00	6,949.00	370.94	100.21	1,439,478.31	3,258,983.38	40.536033	-104.568226

**Formations**

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,437.51	6,949.00	Nio C		0.00	

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,000.00	2,000.00	0.00	0.00	Build: 2°/100' @ 2000.00' MD
2,732.58	2,724.63	92.91	6.78	Hold: 14.65° Inc, 4.17° Azm
6,275.36	6,152.20	986.65	71.99	KOP: 9°/100' @ 6275.36' MD
7,437.51	6,949.00	370.94	100.21	TPZ/LP: 7437.51' MD, 90.00° Inc, 179.09° Azm
17,476.09	6,949.00	-9,666.38	259.48	TD @ 17476.09' MD/6949.00' TVD



# **Noble Energy**

**Cummins  
AB Section 32  
Westerman A5-726**

**Wellbore #1  
Plan #1**

## **Anticollision Summary Report**

**21 June, 2019**



# Anticollision Summary Report



<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum ellipse separation of 1,000.00 usft	<b>Error Surface:</b>	Pedal Curve
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	6/20/2019		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	17,476.09	Plan #1 (Wellbore #1)	2_MWD+IFR1+MS	A008Mb: IFR dec & multi-station analysis

Summary						
Site Name Offset Well - Wellbore - Design	Reference	Offset	Distance		Separation Factor	Warning
	Measured Depth (usft)	Measured Depth (usft)	Between Centres (usft)	Between Ellipses (usft)		
A Section 04						
BARRELL #41-4 (SI) - Wellbore #1 - No Surveys	12,891.59	6,955.00	5,393.60	5,063.38	16.333	CC
BARRELL #41-4 (SI) - Wellbore #1 - No Surveys	12,900.00	6,955.00	5,393.61	5,063.32	16.330	ES
BARRELL #41-4 (SI) - Wellbore #1 - No Surveys	13,500.00	6,955.00	5,427.81	5,093.34	16.228	SF
BARRELL #42-4 (PA) - Wellbore #1 - No Surveys	14,196.78	6,945.00	5,578.74	5,239.22	16.431	CC
BARRELL #42-4 (PA) - Wellbore #1 - No Surveys	14,200.00	6,945.00	5,578.74	5,239.20	16.430	ES
BARRELL #42-4 (PA) - Wellbore #1 - No Surveys	14,800.00	6,945.00	5,611.26	5,267.41	16.319	SF
DILLARD A #4-4 (SI) - Wellbore #1 - As-Drilled	13,058.50	6,891.31	1,603.61	1,526.41	20.772	CC, ES
DILLARD A #4-4 (SI) - Wellbore #1 - As-Drilled	13,200.00	6,890.53	1,609.84	1,531.71	20.603	SF
ERICKSON #14-4 (PR) - Wellbore #1 - No Surveys	17,204.88	6,970.00	1,865.04	1,501.18	5.126	CC, ES
ERICKSON #14-4 (PR) - Wellbore #1 - No Surveys	17,300.00	6,970.00	1,867.46	1,502.92	5.123	SF
ERICKSON #24-4 (PR) - Wellbore #1 - No Surveys	17,200.84	6,965.00	3,177.53	2,813.90	8.738	CC, ES
ERICKSON #24-4 (PR) - Wellbore #1 - No Surveys	17,400.00	6,965.00	3,183.76	2,818.68	8.721	SF
ERICKSON #34-4 (PR) - Wellbore #1 - As-Drilled	17,289.53	6,973.13	4,424.82	4,314.82	40.225	CC
ERICKSON #34-4 (PR) - Wellbore #1 - As-Drilled	17,300.00	6,973.09	4,424.84	4,314.75	40.195	ES
ERICKSON #34-4 (PR) - Wellbore #1 - As-Drilled	17,476.09	6,972.35	4,428.76	4,317.32	39.744	SF
ERICKSON A #4-12 (SI) - Wellbore #1 - No Surveys	15,697.33	6,965.00	1,654.45	1,302.62	4.702	CC
ERICKSON A #4-12 (SI) - Wellbore #1 - No Surveys	15,700.00	6,965.00	1,654.46	1,302.60	4.702	ES
ERICKSON A #4-12 (SI) - Wellbore #1 - No Surveys	15,800.00	6,965.00	1,657.64	1,305.09	4.702	SF
ERICKSON A #4-5 (PR) - Wellbore #1 - No Surveys	14,201.92	6,937.00	1,739.10	1,399.87	5.127	CC, ES
ERICKSON A #4-5 (PR) - Wellbore #1 - No Surveys	14,300.00	6,937.00	1,741.86	1,401.94	5.124	SF
LAWLEY #31-4 (PR) - Wellbore #1 - No Surveys	13,027.25	6,965.00	4,150.17	3,818.55	12.515	CC, ES
LAWLEY #31-4 (PR) - Wellbore #1 - No Surveys	13,400.00	6,965.00	4,166.87	3,832.65	12.467	SF
LAWLEY #32-4(PR) - Wellbore #1 - No Surveys	14,141.66	6,965.00	4,074.88	3,734.98	11.989	CC
LAWLEY #32-4(PR) - Wellbore #1 - No Surveys	14,200.00	6,965.00	4,075.29	3,734.95	11.974	ES
LAWLEY #32-4(PR) - Wellbore #1 - No Surveys	14,500.00	6,965.00	4,090.60	3,748.14	11.945	SF
LAWLEY #33-4 (PR) - Wellbore #1 - No Surveys	15,914.20	6,975.00	4,457.73	4,103.80	12.595	CC, ES
LAWLEY #33-4 (PR) - Wellbore #1 - No Surveys	16,300.00	6,975.00	4,474.39	4,117.66	12.543	SF
LAWLEY #43-4 (PR) - Wellbore #1 - No Surveys	15,898.20	6,955.00	5,595.04	5,242.03	15.850	CC
LAWLEY #43-4 (PR) - Wellbore #1 - No Surveys	15,900.00	6,955.00	5,595.04	5,242.02	15.849	ES
LAWLEY #43-4 (PR) - Wellbore #1 - No Surveys	16,500.00	6,955.00	5,627.31	5,269.94	15.747	SF
LAWLEY #44-4D (PR) - Wellbore #1 - As-Drilled	16,854.17	6,883.26	5,576.82	5,464.37	49.594	CC
LAWLEY #44-4D (PR) - Wellbore #1 - As-Drilled	16,900.00	6,883.09	5,577.01	5,464.21	49.439	ES
LAWLEY #44-4D (PR) - Wellbore #1 - As-Drilled	17,476.09	6,880.90	5,611.39	5,494.62	48.053	SF

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

<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
A Section 05						
DYER #13-5 (PA) - Wellbore #1 - As-Drilled	15,555.68	6,875.52	3,769.53	3,673.44	39.231	CC
DYER #13-5 (PA) - Wellbore #1 - As-Drilled	15,600.00	6,875.50	3,769.79	3,673.37	39.097	ES
DYER #13-5 (PA) - Wellbore #1 - As-Drilled	16,200.00	6,875.32	3,824.20	3,724.14	38.219	SF
DYER USX A #05-14 (PR) - Wellbore #1 - No Surveys	17,036.55	6,881.00	2,346.74	1,987.76	6.537	CC, ES
DYER USX A #05-14 (PR) - Wellbore #1 - No Surveys	17,100.00	6,881.00	2,347.59	1,988.16	6.531	SF
ERICKSON #5-43 (PR) - Wellbore #1 - No Surveys	16,991.99	6,898.00	1,158.89	799.58	3.225	CC
ERICKSON #5-43 (PR) - Wellbore #1 - No Surveys	17,000.00	6,898.00	1,158.91	799.55	3.225	ES, SF
GRADY DYER #14-5 (PA) - Wellbore #1 - No Surveys	17,031.95	6,860.00	3,851.04	3,492.94	10.754	CC, ES
GRADY DYER #14-5 (PA) - Wellbore #1 - No Surveys	17,300.00	6,860.00	3,860.36	3,500.36	10.723	SF
GRADY DYER #23-5 (PA) - Wellbore #1 - No Surveys	15,884.53	6,875.00	2,493.39	2,143.69	7.130	CC
GRADY DYER #23-5 (PA) - Wellbore #1 - No Surveys	15,900.00	6,875.00	2,493.43	2,143.62	7.128	ES
GRADY DYER #23-5 (PA) - Wellbore #1 - No Surveys	16,000.00	6,875.00	2,496.06	2,145.56	7.121	SF
OWL CREEK #7 (SI) - Wellbore #1 - No Surveys	15,648.37	6,932.00	324.53	-25.60	0.927	Level 1, CC, ES, SF
OWL CREEK #7-5 (SI) - Wellbore #1 - No Surveys	17,025.63	6,936.00	356.10	-4.99	0.986	Level 1, CC, ES, SF
ROUSE USX A #05-01 (SI) - Wellbore #1 - No Surveys	12,892.84	6,911.00	486.05	157.57	1.480	Level 3, CC
ROUSE USX A #05-01 (SI) - Wellbore #1 - No Surveys	12,900.00	6,911.00	486.10	157.57	1.480	Level 3, ES, SF
ROUSE USX A #05-02 (SI) - Wellbore #1 - No Surveys	13,235.46	6,901.00	909.22	578.64	2.750	CC, ES, SF
ROUSE USX A #05-03 (SI) - Wellbore #1 - No Surveys	13,245.31	6,876.00	2,184.28	1,854.63	6.626	CC, ES
ROUSE USX A #05-03 (SI) - Wellbore #1 - No Surveys	13,300.00	6,876.00	2,184.96	1,854.94	6.621	SF
ROUSE USX A #05-04 (SI) - Wellbore #1 - As-Drilled	13,222.33	6,844.90	3,707.76	3,629.48	47.368	CC, ES
ROUSE USX A #05-04 (SI) - Wellbore #1 - As-Drilled	14,000.00	6,833.49	3,788.42	3,705.56	45.723	SF
ROUSE USX A #05-05 (SI) - Wellbore #1 - No Surveys	14,567.52	6,851.00	3,824.94	3,486.37	11.297	CC
ROUSE USX A #05-05 (SI) - Wellbore #1 - No Surveys	14,600.00	6,851.00	3,825.08	3,486.27	11.290	ES
ROUSE USX A #05-05 (SI) - Wellbore #1 - No Surveys	14,800.00	6,851.00	3,832.00	3,491.79	11.264	SF
ROUSE USX A #05-06 (SI) - Wellbore #1 - As-drilled	14,596.83	6,922.50	2,157.66	2,068.79	24.279	CC
ROUSE USX A #05-06 (SI) - Wellbore #1 - As-drilled	14,600.00	6,922.48	2,157.66	2,068.77	24.273	ES
ROUSE USX A #05-06 (SI) - Wellbore #1 - As-drilled	14,800.00	6,921.15	2,167.21	2,077.11	24.053	SF
ROUSE USX A #05-07 (SI) - Wellbore #1 - No Surveys	14,579.31	6,907.00	995.43	654.53	2.920	CC, ES
ROUSE USX A #05-07 (SI) - Wellbore #1 - No Surveys	14,600.00	6,907.00	995.65	654.61	2.919	SF
ROUSE USX A #05-08 (SI) - Wellbore #1 - No Surveys	14,571.12	6,931.00	327.79	-14.01	0.959	Level 1, CC, ES, SF
ROUSE-USX A #5-17 (SI) - Wellbore #1 - As-Drilled	13,768.25	6,929.83	132.77	50.16	1.607	CC, ES, SF
ROUSE-USX A #5-19 (SI) - Wellbore #1 - No Surveys	13,735.60	6,864.00	3,065.51	2,732.71	9.211	CC, ES
ROUSE-USX A #5-19 (SI) - Wellbore #1 - No Surveys	13,900.00	6,864.00	3,069.92	2,735.98	9.193	SF
A Section 08						
ERICKSON A #8-1(PR) - Wellbore #1 - No Surveys	17,476.09	6,936.00	899.19	584.62	2.858	CC, ES, SF
ERICKSON A #8-17(PR) - Wellbore #1 - No Surveys	17,476.09	6,942.00	1,557.29	1,249.69	5.063	CC, ES, SF
ERICKSON A #8-2 - Wellbore #1 - No Surveys	17,476.09	6,917.00	1,374.81	1,027.65	3.960	CC, ES, SF
ERICKSON A #8-7(PR) - Wellbore #1 - No Surveys	17,476.09	6,916.00	2,350.95	2,031.94	7.369	CC, ES, SF
ERICKSON A #8-8(PR) - Wellbore #1 - No Surveys	17,476.09	6,954.00	2,222.33	1,911.38	7.147	CC, ES, SF
FRANCEN #23-8(PR) - Wellbore #1 - No Surveys	17,476.09	6,890.00	4,514.32	4,183.93	13.664	CC, ES, SF
FRANCEN #24-8(PR) - Wellbore #1 - No Surveys	17,476.09	6,881.00	5,506.86	5,187.17	17.226	CC, ES, SF
FRANCIS #11-8(SI) - Wellbore #1 - No Surveys	17,476.09	6,865.00	3,946.23	3,585.63	10.944	CC, ES, SF
FRANCIS #21-8(SI) - Wellbore #1 - No Surveys	17,476.09	6,885.00	2,619.27	2,259.22	7.275	CC, ES, SF
FRANCIS #22-8(SI) - Wellbore #1 - No Surveys	17,476.09	6,890.00	3,483.30	3,140.88	10.173	CC, ES, SF
GRADY #1(DA) - Wellbore #1 - No Surveys	17,476.09	6,874.00	4,412.32	4,060.53	12.543	CC, ES, SF
MILE HIGH SHEEP #8-32(PR) - Wellbore #1 - No Surveys	17,476.09	6,876.00	5,382.19	5,040.70	15.761	CC, ES, SF
MILE HIGH SHEEP #8-33(SI) - Wellbore #1 - As-Drilled	17,476.09	6,844.15	5,970.30	5,887.62	72.214	CC, ES, SF
MILE-HI SHEEP #8-35(PR) - Wellbore #1 - No Surveys	17,476.09	6,884.00	5,335.18	5,000.96	15.963	CC, ES, SF
UHRICH #33-8(PA) - Wellbore #1 - As-Drilled	17,476.09	6,880.25	3,815.05	3,754.49	62.992	CC, ES, SF
UHRICH #34-8(PA) - Wellbore #1 - No Surveys	17,476.09	6,878.00	5,176.36	4,868.18	16.797	CC, ES, SF
UHRICH #43-8(PR) - Wellbore #1 - No Surveys	17,476.09	6,935.00	3,743.05	3,435.74	12.180	CC, ES, SF
UHRICH #44-8(PR) - Wellbore #1 - NO Surveys	17,476.09	6,906.00	5,090.85	4,785.81	16.689	CC, ES, SF

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



## Anticollision Summary Report



<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
A Section 09						
HOWARD LAKE #11-9(SI) - Wellbore #1 - No Surveys	17,476.09	6,955.00	1,896.10	1,545.08	5.402	CC, ES, SF
HOWARD LAKE #12-9(SI) - Wellbore #1 - No Surveys	17,476.09	6,965.00	2,671.40	2,337.11	7.991	CC, ES, SF
HOWARD LAKE #21-9(SI) - Wellbore #1 - No Surveys	17,476.09	6,995.00	3,019.07	2,656.71	8.332	CC, ES, SF
HOWARD LAKE #41-9(PA) - Wellbore #1 - No Surveys	17,476.09	6,955.00	5,836.23	5,472.28	16.036	CC, ES, SF
HOWARD LAKE #42-9(SI) - Wellbore #1 - No Surveys	17,476.09	6,955.00	6,162.39	5,802.93	17.144	CC, ES, SF
Howard USX #A09-09D - Wellbore #1 - As-Drilled	17,476.09	7,100.00	6,606.86	6,498.28	60.850	CC, ES, SF
Howard USX #A09-14D - Wellbore #1 - As-Drilled	17,476.09	7,181.87	5,665.46	5,569.53	59.058	CC, ES, SF
Howard USX #A09-15D(PR) - Wellbore #1 - As-Drilled	17,476.09	6,891.79	6,417.74	6,328.08	71.576	CC, ES, SF
Howard USX #A09-23(SI) - Wellbore #1 - No Surveys	17,476.09	6,952.00	6,577.04	6,229.98	18.950	CC, ES, SF
HOWARD USX A #09-02D(PR) - Wellbore #1 - As-Drilled	17,476.09	7,381.35	4,267.97	4,125.55	29.969	CC, ES, SF
HOWARD USX A #09-06D(SI) - Wellbore #1 - As-Drilled	17,476.09	7,069.60	3,750.37	3,654.39	39.077	CC, ES, SF
HOWARD USX A #09-19(SI) - Wellbore #1 - As-Drilled	17,476.09	7,010.35	2,802.65	2,706.73	29.221	CC, ES, SF
HOWARD USX A #9-10(PR) - Wellbore #1 - No Surveys	17,476.09	6,959.00	5,509.48	5,162.34	15.871	CC, ES, SF
HOWARD USX A #9-11(PR) - Wellbore #1 - As-Drilled	17,476.09	6,767.78	4,523.98	4,439.58	53.602	CC, ES, SF
HOWARD USX A #9-13 - Wellbore #1 - As-Drilled	17,476.09	6,836.73	5,187.42	5,125.19	83.355	CC, ES, SF
HOWARD USX A #9-16 - Wellbore #1 - As-Drilled	17,476.09	7,000.00	7,405.68	7,314.36	81.095	CC, ES, SF
HOWARD USX A #9-7(PA) - Wellbore #1 - As-Drilled	17,476.09	7,100.00	4,963.18	4,854.93	45.849	CC, ES, SF
OWL CREEK #5(PA) - Wellbore #1 - No Surveys	17,476.09	6,962.00	5,595.71	5,231.17	15.350	CC, ES, SF

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

<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
AB Section 28						
Gable A4-735 - Wellbore #1 - Plan #1	1,907.92	1,943.92	2,457.81	2,444.47	184.220	CC
Gable A4-735 - Wellbore #1 - Plan #1	2,000.00	2,000.00	2,458.07	2,444.20	177.201	ES
Gable A4-735 - Wellbore #1 - Plan #1	17,476.09	18,077.21	4,595.12	4,416.27	25.692	SF
Gable A4-745 - Wellbore #1 - Plan #1	1,907.09	1,944.09	2,471.73	2,458.39	185.296	CC
Gable A4-745 - Wellbore #1 - Plan #1	2,000.00	2,000.00	2,472.01	2,458.14	178.206	ES
Gable A4-745 - Wellbore #1 - Plan #1	17,476.09	17,722.07	3,938.09	3,759.24	22.018	SF
Gable A4-756 - Wellbore #1 - Plan #1	1,907.09	1,944.09	2,486.14	2,472.80	186.376	CC
Gable A4-756 - Wellbore #1 - Plan #1	2,000.00	2,000.00	2,486.42	2,472.55	179.244	ES
Gable A4-756 - Wellbore #1 - Plan #1	17,476.09	17,602.46	3,282.77	3,104.26	18.391	SF
Gable A4-766 - Wellbore #1 - Plan #1	4,010.66	3,800.00	2,356.44	2,328.95	85.725	CC, ES
Gable A4-766 - Wellbore #1 - Plan #1	17,476.09	17,422.02	2,625.43	2,447.13	14.724	SF
Gable A4-776 - Wellbore #1 - Plan #1	7,428.34	7,437.76	1,950.53	1,900.48	38.973	CC
Gable A4-776 - Wellbore #1 - Plan #1	17,476.09	17,483.38	1,970.75	1,792.51	11.057	ES, SF
HOFFNER #1(PA) - HOFFNER #1 - As-Drilled	6,595.67	6,479.72	1,637.76	1,591.46	35.369	CC
HOFFNER #1(PA) - HOFFNER #1 - As-Drilled	6,600.00	6,484.20	1,637.77	1,591.43	35.348	ES
HOFFNER #1(PA) - HOFFNER #1 - As-Drilled	6,950.00	6,775.21	1,660.11	1,612.04	34.534	SF
MOJACK #1-28(PR) - MOJACK #1-28 - No Surveys	6,457.40	6,388.43	7,176.20	7,025.00	47.462	CC
MOJACK #1-28(PR) - MOJACK #1-28 - No Surveys	6,500.00	6,430.92	7,177.05	7,024.87	47.162	ES
MOJACK #1-28(PR) - MOJACK #1-28 - No Surveys	7,100.00	6,917.63	7,358.04	7,195.09	45.153	SF
MOJACK #2-28(PR) - MOJACK #2-28 - No Surveys	6,452.98	6,374.01	6,150.58	5,999.68	40.760	CC, ES
MOJACK #2-28(PR) - MOJACK #2-28 - No Surveys	7,000.00	6,850.52	6,305.44	6,143.94	39.044	SF
Mojack #I-28HN (SI) - Mojack #I-28HN - As-Drilled	6,900.00	11,666.00	3,767.62	3,657.98	34.365	SF
Mojack #I-28HN (SI) - Mojack #I-28HN - As-Drilled	6,943.28	11,666.00	3,767.23	3,657.65	34.379	CC, ES
Mojack #J-28HN(SI) - Mojack #J-28HN - As-Drilled	6,950.00	11,650.00	4,084.38	3,974.81	37.276	SF
Mojack #J-28HN(SI) - Mojack #J-28HN - As-Drilled	6,967.04	11,650.00	4,084.32	3,974.76	37.278	CC, ES
Mojack #K-28HN (SI) - Mojack #K-28HN - As-Drilled	6,946.36	11,603.00	4,408.29	4,298.89	40.295	CC, ES
Mojack #K-28HN (SI) - Mojack #K-28HN - As-Drilled	6,950.00	11,603.00	4,408.29	4,298.89	40.295	SF
Mojack #L-28HN (PR) - Mojack #L-28HN - As-Drilled	6,938.58	11,601.00	4,750.24	4,640.19	43.165	CC, ES
Mojack #L-28HN (PR) - Mojack #L-28HN - As-Drilled	7,000.00	11,601.00	4,750.89	4,640.78	43.145	SF
Mojack #M-28HN (PR) - Mojack #M-28HN - As-Drilled	11,848.82	16,821.00	5,061.29	4,841.00	22.976	CC
Mojack #M-28HN (PR) - Mojack #M-28HN - As-Drilled	12,000.00	16,917.00	5,061.59	4,838.56	22.694	ES
Mojack #M-28HN (PR) - Mojack #M-28HN - As-Drilled	12,400.00	16,917.00	5,081.72	4,856.51	22.564	SF
MOJACK #N-28HC (PR) - MOJACK #N-28HC OH - As-C	7,191.53	12,174.00	5,562.18	5,444.02	47.071	CC
MOJACK #N-28HC (PR) - MOJACK #N-28HC OH - As-C	7,200.00	12,174.00	5,562.19	5,444.01	47.062	ES
MOJACK #N-28HC (PR) - MOJACK #N-28HC OH - As-C	7,400.00	12,174.00	5,568.05	5,449.50	46.965	SF
MOJACK #N-28HC (PR) - MOJACK #N-28HC ST01 - As	7,371.26	12,423.00	5,408.29	5,286.89	44.548	CC
MOJACK #N-28HC (PR) - MOJACK #N-28HC ST01 - As	12,000.00	17,023.00	5,464.83	5,241.85	24.508	ES
MOJACK #N-28HC (PR) - MOJACK #N-28HC ST01 - As	12,500.00	17,023.00	5,492.71	5,266.57	24.289	SF
Mojack #O-28HN (PR) - Mojack #O-28HN - As-Drilled	11,837.48	16,797.00	5,747.99	5,528.14	26.146	CC
Mojack #O-28HN (PR) - Mojack #O-28HN - As-Drilled	11,900.00	16,797.00	5,748.33	5,527.94	26.083	ES
Mojack #O-28HN (PR) - Mojack #O-28HN - As-Drilled	12,500.00	16,797.00	5,786.04	5,561.58	25.778	SF
Mojack #P-28HN (PR) - Mojack #P-28HN - As-Drilled	11,943.18	17,043.00	6,060.26	5,837.76	27.237	CC
Mojack #P-28HN (PR) - Mojack #P-28HN - As-Drilled	12,000.00	17,043.00	6,060.52	5,837.49	27.174	ES
Mojack #P-28HN (PR) - Mojack #P-28HN - As-Drilled	12,800.00	17,043.00	6,120.53	5,891.85	26.765	SF
Mojack AB30-615 - Wellbore #1 - Plan #1	6,967.14	11,632.62	271.85	194.72	3.525	CC
Mojack AB30-615 - Wellbore #1 - Plan #1	7,000.00	11,631.93	274.67	194.03	3.406	ES, SF
Mojack AB30-625 - Wellbore #1 - Plan #1	6,749.35	11,335.65	775.70	692.38	9.310	CC
Mojack AB30-625 - Wellbore #1 - Plan #1	6,750.00	11,335.64	775.70	692.36	9.308	ES
Mojack AB30-625 - Wellbore #1 - Plan #1	6,800.00	11,334.59	779.36	694.71	9.207	SF
Mojack AB30-635 - Wellbore #1 - Plan #1	6,648.58	11,143.25	1,373.82	1,289.17	16.229	CC
Mojack AB30-635 - Wellbore #1 - Plan #1	6,650.00	11,143.21	1,373.83	1,289.16	16.226	ES
Mojack AB30-635 - Wellbore #1 - Plan #1	6,750.00	11,141.03	1,385.57	1,299.72	16.140	SF
Mojack AB30-645 - Wellbore #1 - Plan #1	6,604.56	11,054.58	2,009.60	1,924.87	23.718	CC, ES

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



Anticollision Summary Report



<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
AB Section 28						
Mojack AB30-645 - Wellbore #1 - Plan #1	6,700.00	11,052.45	2,018.98	1,933.41	23.592	SF
Mojack AB30-655 - Wellbore #1 - Plan #1	6,562.86	10,994.87	2,636.96	2,551.82	30.970	CC, ES
Mojack AB30-655 - Wellbore #1 - Plan #1	6,650.00	10,992.89	2,644.34	2,558.56	30.826	SF
Mojack AB30-665 - Wellbore #1 - Plan #1	6,551.32	11,049.32	3,290.99	3,205.87	38.665	CC, ES
Mojack AB30-665 - Wellbore #1 - Plan #1	6,700.00	11,045.99	3,311.55	3,225.46	38.465	SF
Mojack AB30-675 - Wellbore #1 - Plan #1	6,533.45	11,174.77	3,934.89	3,849.20	45.919	CC, ES
Mojack AB30-675 - Wellbore #1 - Plan #1	6,700.00	11,171.03	3,959.97	3,873.25	45.663	SF
Mojack AB30-685 - Wellbore #1 - Plan #1	6,525.26	11,312.84	4,544.19	4,458.47	53.015	CC, ES
Mojack AB30-685 - Wellbore #1 - Plan #1	6,700.00	11,308.69	4,571.28	4,484.49	52.676	SF
RICH #3-28(TA) - RICH #3-28 - No Surveys	6,448.59	6,362.63	5,206.82	5,056.17	34.561	CC
RICH #3-28(TA) - RICH #3-28 - No Surveys	6,450.00	6,364.03	5,206.82	5,056.13	34.554	ES
RICH #3-28(TA) - RICH #3-28 - No Surveys	6,900.00	6,774.30	5,330.47	5,170.64	33.351	SF
RICH #4-28(SI) - RICH #4-28 - No Surveys	6,443.87	6,334.90	4,567.96	4,417.87	30.436	CC
RICH #4-28(SI) - RICH #4-28 - No Surveys	6,450.00	6,341.03	4,567.98	4,417.76	30.407	ES
RICH #4-28(SI) - RICH #4-28 - No Surveys	6,850.00	6,712.67	4,683.29	4,524.79	29.548	SF
ROBEL #12-28(PR) - ROBEL #12-28 - As-Drilled	6,462.25	6,464.06	2,305.42	2,257.53	48.141	CC, ES
ROBEL #12-28(PR) - ROBEL #12-28 - As-Drilled	6,650.00	6,640.53	2,324.21	2,275.30	47.518	SF
ROBEL #14-28(PR) - ROBEL #14-28 - As-Drilled	771.01	789.00	2,825.94	2,822.01	719.308	CC
ROBEL #14-28(PR) - ROBEL #14-28 - As-Drilled	1,000.00	994.04	2,826.83	2,821.34	514.550	ES
ROBEL #14-28(PR) - ROBEL #14-28 - As-Drilled	7,250.00	7,086.12	3,019.66	2,966.01	56.285	SF
Robel #19-28(PR) - Robel #19-28 - No Surveys	6,469.98	6,352.99	2,199.61	2,049.08	14.613	CC
Robel #19-28(PR) - Robel #19-28 - No Surveys	6,500.00	6,382.92	2,199.90	2,048.68	14.548	ES
Robel #19-28(PR) - Robel #19-28 - No Surveys	6,850.00	6,704.67	2,248.35	2,089.89	14.189	SF
Weld County #16-28(PR) - Weld County #16-28 - No Sur	6,778.60	6,665.46	5,730.67	5,573.10	36.371	CC
Weld County #16-28(PR) - Weld County #16-28 - No Sur	6,900.00	6,763.30	5,731.64	5,571.89	35.880	ES
Weld County #16-28(PR) - Weld County #16-28 - No Sur	7,350.00	6,970.99	5,759.93	5,595.60	35.050	SF
Weld County #20-28(SI) - Weld County #20-28 - As-Drille	6,540.06	6,648.01	5,057.28	5,005.29	97.285	CC
Weld County #20-28(SI) - Weld County #20-28 - As-Drille	6,550.00	6,655.25	5,057.29	5,005.26	97.191	ES
Weld County #20-28(SI) - Weld County #20-28 - As-Drille	7,200.00	7,118.65	5,134.45	5,079.54	93.504	SF
Weld County #9-28(PR) - Weld County #9-28 - As-Drilled	6,494.86	6,671.28	5,874.18	5,818.30	105.122	CC
Weld County #9-28(PR) - Weld County #9-28 - As-Drilled	6,500.00	6,676.88	5,874.18	5,818.28	105.072	ES
Weld County #9-28(PR) - Weld County #9-28 - As-Drilled	6,950.00	7,095.48	5,920.96	5,863.37	102.818	SF

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



## Anticollision Summary Report



<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
AB Section 29						
DILLARD - USX AB #29-17(SI) - DILLARD - USX AB #29	6,443.92	6,357.68	3,521.44	3,476.02	77.519	CC
DILLARD - USX AB #29-17(SI) - DILLARD - USX AB #29	6,450.00	6,363.13	3,521.47	3,476.01	77.453	ES
DILLARD - USX AB #29-17(SI) - DILLARD - USX AB #29	6,700.00	6,598.58	3,572.99	3,526.09	76.185	SF
Dillard USX #AB29-02(SI) - Dillard USX #AB29-02 - As-C	6,445.71	6,414.17	4,419.77	4,264.44	28.452	CC
Dillard USX #AB29-02(SI) - Dillard USX #AB29-02 - As-C	6,450.00	6,420.06	4,419.79	4,264.30	28.426	ES
Dillard USX #AB29-02(SI) - Dillard USX #AB29-02 - As-C	6,750.00	6,634.54	4,494.75	4,334.66	28.076	SF
DILLARD USX AB #29-7(SI) - DILLARD USX AB #29-7 -	6,440.22	6,343.82	3,081.19	3,035.86	67.972	CC, ES
DILLARD USX AB #29-7(SI) - DILLARD USX AB #29-7 -	6,650.00	6,537.16	3,114.77	3,068.21	66.895	SF
FAULKNER-USX AB #29-14(SI) - FAULKNER-USX AB #	6,411.06	6,299.99	2,408.71	2,363.50	53.278	CC, ES
FAULKNER-USX AB #29-14(SI) - FAULKNER-USX AB #	7,000.00	6,717.13	2,462.22	2,414.20	51.276	SF
FAULKNER-USX AB #29-25(SI) - FAULKNER-USX AB #	6,392.42	6,213.50	3,133.22	2,985.75	21.247	CC
FAULKNER-USX AB #29-25(SI) - FAULKNER-USX AB #	6,450.00	6,271.03	3,134.03	2,985.22	21.060	ES
FAULKNER-USX AB #29-25(SI) - FAULKNER-USX AB #	7,000.00	6,750.52	3,224.00	3,064.42	20.203	SF
FAULKNER-USX AB #29-6(SI) - FAULKNER-USX AB #2	6,431.53	6,318.48	3,635.80	3,474.62	22.557	CC
FAULKNER-USX AB #29-6(SI) - FAULKNER-USX AB #2	6,450.00	6,339.49	3,636.01	3,474.25	22.478	ES
FAULKNER-USX AB #29-6(SI) - FAULKNER-USX AB #2	6,650.00	6,563.30	3,664.86	3,497.08	21.843	SF
HEINZE - USX AB #29-10(PR) - HEINZE - USX AB #29-	6,433.39	6,319.82	1,809.71	1,659.47	12.046	CC
HEINZE - USX AB #29-10(PR) - HEINZE - USX AB #29-	6,450.00	6,337.88	1,809.89	1,659.22	12.012	ES
HEINZE - USX AB #29-10(PR) - HEINZE - USX AB #29-	6,650.00	6,521.86	1,842.42	1,687.29	11.877	SF
HEINZE #44-29(PR) - HEINZE #44-29 - No Surveys	6,659.65	6,506.15	554.94	400.83	3.601	CC
HEINZE #44-29(PR) - HEINZE #44-29 - No Surveys	6,700.00	6,543.59	555.22	400.27	3.583	ES
HEINZE #44-29(PR) - HEINZE #44-29 - No Surveys	6,800.00	6,631.67	559.44	402.51	3.565	SF
HEINZE USX AB #29-09D(PR) - HEINZE USX AB #29-0	1,341.93	1,323.76	1,514.91	1,505.91	168.222	CC
HEINZE USX AB #29-09D(PR) - HEINZE USX AB #29-0	6,450.00	6,709.29	1,539.12	1,486.10	29.031	ES
HEINZE USX AB #29-09D(PR) - HEINZE USX AB #29-0	6,550.00	6,811.01	1,547.45	1,493.88	28.887	SF
HEINZE USX AB #29-15(PR) - HEINZE USX AB #29-15	6,394.90	6,256.63	996.32	951.52	22.238	CC
HEINZE USX AB #29-15(PR) - HEINZE USX AB #29-15	6,400.00	6,261.60	996.32	951.49	22.221	ES
HEINZE USX AB #29-15(PR) - HEINZE USX AB #29-15	6,700.00	6,547.85	1,015.04	968.39	21.759	SF
OWL CREEK #13(SI) - OWL CREEK #13 - No Surveys	6,425.44	6,272.48	5,495.37	5,346.61	36.941	CC
OWL CREEK #13(SI) - OWL CREEK #13 - No Surveys	6,450.00	6,297.03	5,495.74	5,346.41	36.803	ES
OWL CREEK #13(SI) - OWL CREEK #13 - No Surveys	6,900.00	6,707.30	5,626.82	5,468.35	35.507	SF

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

<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
AB Section 32						
CECIL #32-32 (PR) - Wellbore #1 - No Surveys	10,629.64	6,874.00	3,432.12	3,120.44	11.012	CC, ES
CECIL #32-32 (PR) - Wellbore #1 - No Surveys	10,800.00	6,874.00	3,436.34	3,123.67	10.990	SF
CECIL #32-34 (PR) - Wellbore #1 - No Surveys	11,767.69	6,879.00	2,512.62	2,193.36	7.870	CC
CECIL #32-34 (PR) - Wellbore #1 - No Surveys	11,800.00	6,879.00	2,512.83	2,193.36	7.866	ES
CECIL #32-34 (PR) - Wellbore #1 - No Surveys	11,900.00	6,879.00	2,516.10	2,196.01	7.861	SF
LAW #1 (PA) - Wellbore #1 - No Surveys	10,466.62	6,874.00	2,332.33	2,021.63	7.507	CC, ES
LAW #1 (PA) - Wellbore #1 - No Surveys	10,600.00	6,874.00	2,336.14	2,024.70	7.501	SF
LEY #1-32(PA) - LEY #1-32 - No Surveys	2,000.00	1,946.99	3,504.78	3,458.90	76.396	CC
LEY #1-32(PA) - LEY #1-32 - No Surveys	7,851.13	6,895.99	3,610.59	3,447.42	22.128	ES
LEY #1-32(PA) - LEY #1-32 - No Surveys	8,000.00	6,895.99	3,613.65	3,450.28	22.118	SF
MCCRORY #1 (DA) - Wellbore #1 - No Surveys	2,000.00	1,971.00	846.37	760.60	9.867	CC
MCCRORY #1 (DA) - Wellbore #1 - No Surveys	2,100.00	2,070.98	847.90	757.77	9.407	ES
MCCRORY #1 (DA) - Wellbore #1 - No Surveys	4,200.00	4,100.00	1,273.47	1,094.61	7.120	SF
NC Farms #10-32 (SI) - Wellbore #1 - As-Drilled	10,200.00	7,370.38	1,120.25	1,041.63	14.249	SF
NC Farms #10-32 (SI) - Wellbore #1 - As-Drilled	10,349.43	7,371.98	1,110.24	1,032.71	14.319	CC, ES
NC Farms #15-32(SI) - Wellbore #1 - As-Drilled	11,775.40	7,089.75	1,007.24	936.41	14.222	CC, ES, SF
NC Farms #16-32(PR) - Wellbore #1 - As-Drilled	11,743.75	6,961.52	321.17	251.86	4.634	CC, ES, SF
NC Farms #20-32 (SI) - Wellbore #1 - As-Drilled	11,125.62	7,099.16	330.20	259.42	4.665	CC, ES, SF
NC Farms #9-32 (SI) - Wellbore #1 - As-Drilled	10,477.18	7,217.57	291.77	217.62	3.935	CC, ES, SF
SCOTT #32-13 (SI) - Wellbore #1 - No Surveys	9,323.14	6,899.00	1,173.32	867.65	3.839	CC, ES, SF
SCOTT #32-14 (PR) - Wellbore #1 - No Surveys	8,996.86	6,924.00	482.38	177.09	1.580	CC
SCOTT #32-14 (PR) - Wellbore #1 - No Surveys	9,000.00	6,924.00	482.39	177.09	1.580	ES, SF
WESTERMAN #32-11 (SI) - Wellbore #1 - No Surveys	7,690.58	6,916.00	91.87	-209.84	0.305	Level 1, CC, ES, SF
Westerman A4-786 - Wellbore #1 - Plan #1	2,521.16	2,508.23	65.32	47.97	3.764	CC, ES
Westerman A4-786 - Wellbore #1 - Plan #1	2,600.00	2,584.47	66.41	48.60	3.729	SF
Westerman A5-716 - Wellbore #1 - Plan #1	2,376.45	2,372.17	33.62	17.18	2.045	CC
Westerman A5-716 - Wellbore #1 - Plan #1	2,400.00	2,395.40	33.66	17.07	2.029	ES
Westerman A5-716 - Wellbore #1 - Plan #1	2,500.00	2,493.93	34.87	17.65	2.025	SF
Westerman A5-736 - Wellbore #1 - Plan #1	2,012.25	2,013.41	37.50	23.53	2.685	CC
Westerman A5-736 - Wellbore #1 - Plan #1	2,200.00	2,203.36	38.12	22.83	2.493	ES
Westerman A5-736 - Wellbore #1 - Plan #1	2,300.00	2,304.42	39.36	23.37	2.462	SF
Westerman A5-745 - Wellbore #1 - Plan #1	2,000.00	2,000.00	75.00	61.13	5.406	CC
Westerman A5-745 - Wellbore #1 - Plan #1	2,100.00	2,101.93	75.45	60.86	5.171	ES
Westerman A5-745 - Wellbore #1 - Plan #1	2,300.00	2,305.31	79.87	63.86	4.990	SF

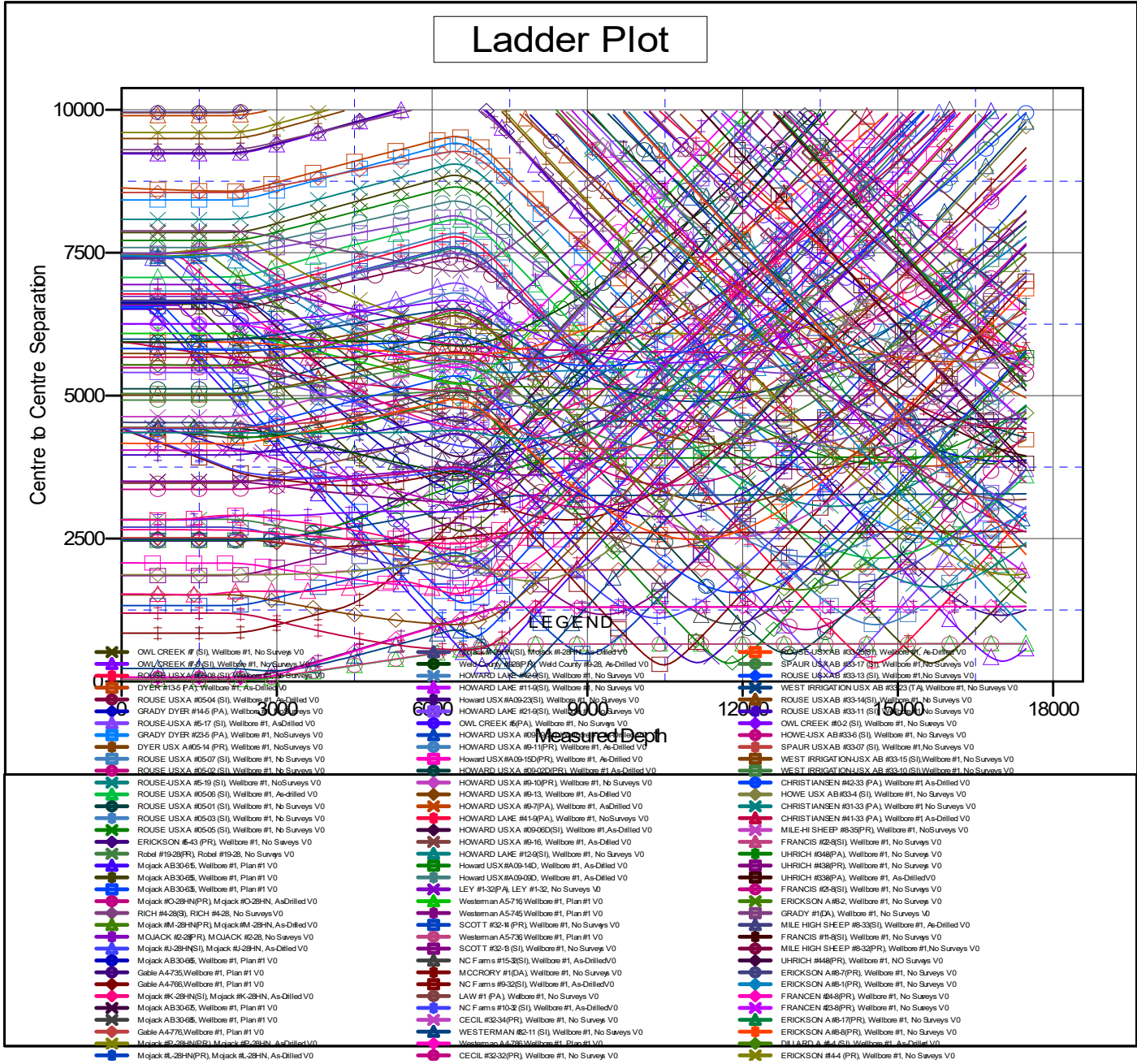
<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
AB Section 33						
CHRISTIANSEN #31-33 (PA) - Wellbore #1 - No Surveys	7,858.15	6,975.00	4,246.48	3,942.22	13.957	CC, ES
CHRISTIANSEN #31-33 (PA) - Wellbore #1 - No Surveys	8,000.00	6,975.00	4,248.85	3,944.37	13.955	SF
CHRISTIANSEN #41-33 (PA) - Wellbore #1 - As-Drilled	7,854.47	6,974.03	5,652.12	5,602.64	114.240	CC, ES
CHRISTIANSEN #41-33 (PA) - Wellbore #1 - As-Drilled	10,600.00	7,022.79	6,283.45	6,224.29	106.201	SF
CHRISTIANSEN #42-33 (PA) - Wellbore #1 - As-Drilled	9,197.64	6,918.82	5,519.49	5,466.27	103.700	CC
CHRISTIANSEN #42-33 (PA) - Wellbore #1 - As-Drilled	9,200.00	6,918.81	5,519.49	5,466.26	103.681	ES
CHRISTIANSEN #42-33 (PA) - Wellbore #1 - As-Drilled	11,600.00	6,906.82	6,019.63	5,954.77	92.799	SF
HOWE USX AB #33-4 (SI) - Wellbore #1 - No Surveys	7,932.56	6,940.00	1,758.34	1,455.38	5.804	CC, ES, SF
HOWE-USX AB #33-6 (SI) - Wellbore #1 - No Surveys	8,977.62	6,962.00	3,045.39	2,738.65	9.928	CC
HOWE-USX AB #33-6 (SI) - Wellbore #1 - No Surveys	9,000.00	6,962.00	3,045.47	2,738.65	9.926	ES
HOWE-USX AB #33-6 (SI) - Wellbore #1 - No Surveys	9,100.00	6,962.00	3,047.85	2,740.62	9.920	SF
OWL CREEK #10-2 (SI) - Wellbore #1 - No Surveys	10,435.95	6,971.00	5,571.63	5,257.22	17.721	CC
OWL CREEK #10-2 (SI) - Wellbore #1 - No Surveys	10,500.00	6,971.00	5,571.99	5,257.21	17.701	ES
OWL CREEK #10-2 (SI) - Wellbore #1 - No Surveys	11,000.00	6,971.00	5,600.10	5,282.31	17.622	SF
ROUSE USX AB #33-11 (SI) - Wellbore #1 - No Surveys	10,411.43	6,953.00	2,881.10	2,567.56	9.189	CC, ES
ROUSE USX AB #33-11 (SI) - Wellbore #1 - No Surveys	10,600.00	6,953.00	2,887.26	2,572.62	9.176	SF
ROUSE USX AB #33-13 (SI) - Wellbore #1 - No Surveys	11,909.76	6,928.00	1,551.05	1,228.86	4.814	CC, ES
ROUSE USX AB #33-13 (SI) - Wellbore #1 - No Surveys	12,000.00	6,928.00	1,553.68	1,230.89	4.813	SF
ROUSE USX AB #33-14(SI) - Wellbore #1 - No Surveys	11,660.36	6,952.00	3,102.24	2,780.79	9.651	CC
ROUSE USX AB #33-14(SI) - Wellbore #1 - No Surveys	11,700.00	6,952.00	3,102.49	2,780.77	9.644	ES
ROUSE USX AB #33-14(SI) - Wellbore #1 - No Surveys	11,900.00	6,952.00	3,111.48	2,788.45	9.632	SF
ROUSE-USX AB #33-25(SI) - Wellbore #1 - As-Drilled	11,064.26	6,901.09	2,484.44	2,421.05	39.193	CC, ES
ROUSE-USX AB #33-25(SI) - Wellbore #1 - As-Drilled	11,500.00	6,914.02	2,522.32	2,456.37	38.243	SF
SPAUR USX AB #33-07 (SI) - Wellbore #1 - No Surveys	9,303.57	6,982.00	4,072.20	3,763.30	13.183	CC, ES
SPAUR USX AB #33-07 (SI) - Wellbore #1 - No Surveys	9,600.00	6,982.00	4,082.97	3,772.68	13.159	SF
SPAUR USX AB #33-17 (SI) - Wellbore #1 - No Surveys	8,589.41	6,978.00	4,754.15	4,448.13	15.536	CC
SPAUR USX AB #33-17 (SI) - Wellbore #1 - No Surveys	8,600.00	6,978.00	4,754.16	4,448.11	15.534	ES
SPAUR USX AB #33-17 (SI) - Wellbore #1 - No Surveys	8,900.00	6,978.00	4,764.28	4,457.20	15.515	SF
WEST IRRIGATION USX AB #33-23 (TA) - Wellbore #1 -	11,092.99	6,979.00	4,899.67	4,580.89	15.370	CC
WEST IRRIGATION USX AB #33-23 (TA) - Wellbore #1 -	11,100.00	6,979.00	4,899.68	4,580.85	15.368	ES
WEST IRRIGATION USX AB #33-23 (TA) - Wellbore #1 -	11,600.00	6,979.00	4,925.84	4,603.82	15.297	SF
WEST IRRIGATION-USX AB #33-10 (SI) - Wellbore #1 -	10,636.19	6,974.00	4,064.72	3,749.00	12.874	CC, ES
WEST IRRIGATION-USX AB #33-10 (SI) - Wellbore #1 -	10,900.00	6,974.00	4,073.27	3,755.94	12.836	SF
WEST IRRIGATION-USX AB #33-15 (SI) - Wellbore #1 -	11,654.16	6,962.00	4,150.90	3,829.09	12.899	CC
WEST IRRIGATION-USX AB #33-15 (SI) - Wellbore #1 -	11,700.00	6,962.00	4,151.15	3,829.03	12.887	ES
WEST IRRIGATION-USX AB #33-15 (SI) - Wellbore #1 -	12,000.00	6,962.00	4,165.28	3,841.18	12.852	SF

<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westerman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westerman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to KB @ 4844.00usft  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000

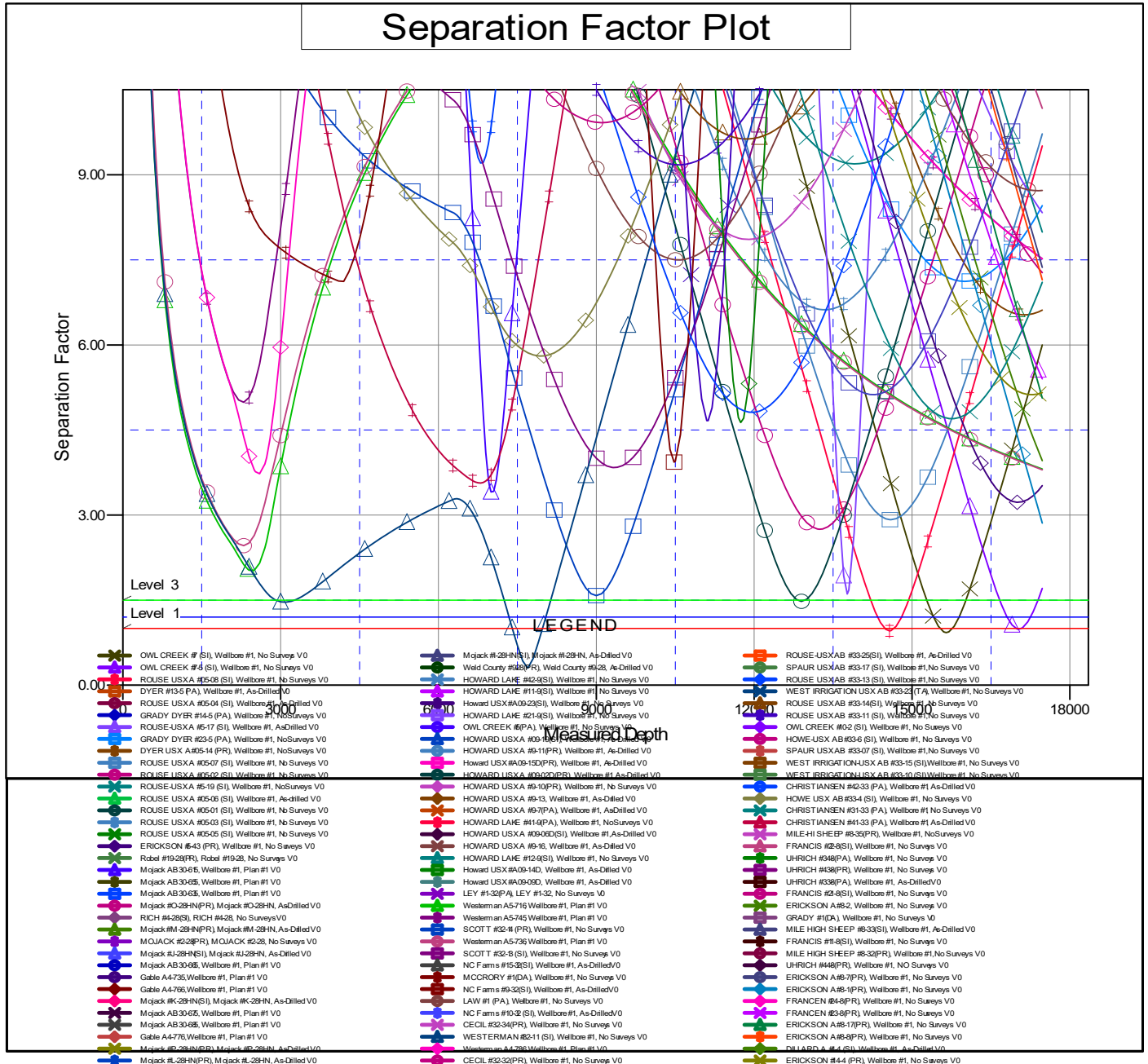
Coordinates are relative to: Westerman A5-726  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.60°



<b>Company:</b>	Noble Energy	<b>Local Co-ordinate Reference:</b>	Well Westernman A5-726
<b>Project:</b>	Cummins	<b>TVD Reference:</b>	KB @ 4844.00usft
<b>Reference Site:</b>	AB Section 32	<b>MD Reference:</b>	KB @ 4844.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Westernman A5-726	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Local
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to KB @ 4844.00usft  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000

Coordinates are relative to: Westernman A5-726  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.60°



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