



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.19-T3N-R64W

Butterball D19-17D Pad Sec.19-T3N-R64W

Butterball D19-17D

Wellbore #1

Noble Butterball D19-17D Plan #1 (2-15-12)

Anticollision Report

22 February, 2012



Local Co-ordinate Reference:	Well Butterball D19-17D
TVD Reference:	WELL @ 4803.0ft (Original Well Elev)
MD Reference:	WELL @ 4803.0ft (Original Well Elev)
North Reference:	True
Survey Calculation Method:	Minimum Curvature
Output errors are at	2.00 sigma
Database:	Landmark
Offset TVD Reference:	Offset Datum

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Reference Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Site Error: 0.0ft
Reference Well: Butterball D19-17D
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Offset Design Butterball D19-17D Pad Sec.19-T3N-R64W - Butterball D19-18D - Wellbore #1 - Noble Butterball D19-1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
2,100.0	1,994.0	2,095.9	2,079.7	12.2	5.6	-174.58	41.5	145.1	420.1	409.8	10.28	40.869		
2,200.0	2,083.7	2,192.9	2,174.5	13.2	6.0	-174.80	42.5	165.2	444.7	433.8	10.89	40.839		
2,300.0	2,173.4	2,289.8	2,269.3	14.2	6.4	-175.00	43.5	185.3	469.3	457.8	11.50	40.801		
2,400.0	2,263.1	2,386.7	2,364.1	15.1	6.9	-175.18	44.5	205.4	493.9	481.8	12.12	40.759		
2,500.0	2,352.8	2,483.6	2,458.9	16.1	7.3	-175.34	45.5	225.5	518.5	505.7	12.73	40.714		
2,600.0	2,442.5	2,580.5	2,553.7	17.0	7.7	-175.49	46.5	245.6	543.1	529.7	13.35	40.668		
2,700.0	2,532.2	2,677.5	2,648.5	18.0	8.1	-175.63	47.5	265.7	567.7	553.7	13.97	40.620		
2,800.0	2,621.9	2,774.4	2,743.3	19.0	8.5	-175.75	48.5	285.8	592.3	577.7	14.60	40.573		
2,900.0	2,711.6	2,871.3	2,838.1	19.9	9.0	-175.86	49.5	305.9	616.9	601.6	15.22	40.527		
3,000.0	2,801.3	2,968.2	2,932.9	20.9	9.4	-175.97	50.5	326.0	641.5	625.6	15.85	40.481		
3,100.0	2,891.0	3,065.1	3,027.7	21.8	9.8	-176.07	51.5	346.1	666.1	649.6	16.47	40.436		
3,200.0	2,980.7	3,162.1	3,122.5	22.8	10.3	-176.16	52.5	366.2	690.7	673.6	17.10	40.392		
3,300.0	3,070.4	3,259.0	3,217.3	23.8	10.7	-176.24	53.5	386.3	715.3	697.6	17.73	40.349		
3,400.0	3,160.1	3,355.9	3,312.1	24.7	11.1	-176.32	54.5	406.4	739.9	721.6	18.36	40.308		
3,500.0	3,249.8	3,452.8	3,406.9	25.7	11.6	-176.39	55.5	426.5	764.5	745.5	18.99	40.267		
3,600.0	3,339.5	3,549.7	3,501.7	26.7	12.0	-176.46	56.5	446.6	789.1	769.5	19.62	40.229		
3,700.0	3,429.2	3,646.6	3,596.5	27.6	12.4	-176.53	57.5	466.7	813.8	793.5	20.25	40.191		
3,800.0	3,518.9	3,743.6	3,691.4	28.6	12.9	-176.59	58.5	486.8	838.4	817.5	20.88	40.155		
3,900.0	3,608.6	3,840.5	3,786.2	29.5	13.3	-176.65	59.5	506.9	863.0	841.5	21.51	40.119		
4,000.0	3,698.3	3,937.4	3,881.0	30.5	13.8	-176.70	60.5	527.0	887.6	865.5	22.14	40.085		
4,100.0	3,788.0	4,034.3	3,975.8	31.5	14.2	-176.75	61.5	547.2	912.2	889.5	22.78	40.053		
4,200.0	3,877.7	4,131.2	4,070.6	32.4	14.6	-176.80	62.5	567.3	936.8	913.4	23.41	40.021		
4,300.0	3,967.3	4,228.2	4,165.4	33.4	15.1	-176.85	63.5	587.4	961.5	937.4	24.04	39.990		
4,400.0	4,057.0	4,325.1	4,260.2	34.4	15.5	-176.89	64.5	607.5	986.1	961.4	24.68	39.960		
4,500.0	4,146.7	4,422.0	4,355.0	35.3	16.0	-176.93	65.5	627.6	1,010.7	985.4	25.31	39.932		
4,600.0	4,236.4	4,518.9	4,449.8	36.3	16.4	-176.97	66.5	647.7	1,035.3	1,009.4	25.95	39.904		
4,700.0	4,326.1	4,615.8	4,544.6	37.3	16.8	-177.01	67.5	667.8	1,060.0	1,033.4	26.58	39.877		
4,800.0	4,415.8	4,712.8	4,639.4	38.2	17.3	-177.05	68.5	687.9	1,084.6	1,057.4	27.22	39.851		
4,900.0	4,505.5	4,809.7	4,734.2	39.2	17.7	-177.08	69.5	708.0	1,109.2	1,081.4	27.85	39.826		
5,000.0	4,595.2	4,906.6	4,829.0	40.2	18.2	-177.12	70.5	728.1	1,133.8	1,105.3	28.49	39.801		
5,100.0	4,684.9	5,003.5	4,923.8	41.1	18.6	-177.15	71.5	748.2	1,158.5	1,129.3	29.12	39.778		
5,200.0	4,774.6	5,100.4	5,018.6	42.1	19.0	-177.18	72.5	768.3	1,183.1	1,153.3	29.76	39.755		
5,300.0	4,864.3	5,194.8	5,110.9	43.1	19.5	-177.21	73.5	787.9	1,207.7	1,177.3	30.39	39.743		
5,400.0	4,954.0	5,262.6	5,177.4	44.0	19.7	-177.23	74.1	801.0	1,233.7	1,202.8	30.92	39.898		
5,500.0	5,043.7	5,329.4	5,243.3	45.0	19.9	-177.26	74.7	812.4	1,261.9	1,230.5	31.45	40.128		
5,600.0	5,133.4	5,400.0	5,313.1	46.0	20.1	-177.29	75.2	822.8	1,292.4	1,260.4	31.98	40.416		
5,700.0	5,223.1	5,460.3	5,373.0	46.9	20.2	-177.32	75.6	830.3	1,325.0	1,292.5	32.48	40.795		
5,800.0	5,313.4	5,524.6	5,436.8	47.8	20.4	-177.39	75.9	836.9	1,358.4	1,325.3	33.07	41.079		
5,900.0	5,405.1	5,600.0	5,512.0	48.5	20.5	-177.46	76.2	842.9	1,390.7	1,357.1	33.62	41.365		
6,000.0	5,498.2	5,652.4	5,564.3	49.1	20.6	-177.52	76.4	845.8	1,421.7	1,387.7	34.07	41.724		
6,100.0	5,592.4	5,716.0	5,627.9	49.7	20.7	-177.57	76.5	848.1	1,451.6	1,417.1	34.49	42.084		
6,200.0	5,687.8	5,788.1	5,700.0	50.2	20.8	-177.63	76.5	849.0	1,480.3	1,445.4	34.87	42.453		
6,300.0	5,784.2	5,871.3	5,783.2	50.7	20.9	-177.69	76.5	849.0	1,506.9	1,471.7	35.22	42.791		
6,400.0	5,881.4	5,968.5	5,880.4	51.1	21.1	-177.75	76.5	849.0	1,530.2	1,494.6	35.53	43.064		
6,500.0	5,979.4	6,066.5	5,978.4	51.4	21.2	-177.79	76.5	849.0	1,550.0	1,514.2	35.80	43.299		
6,600.0	6,078.1	6,165.2	6,077.1	51.7	21.3	-177.83	76.5	849.0	1,566.5	1,530.5	36.01	43.499		
6,700.0	6,177.2	6,264.3	6,176.2	52.0	21.4	-177.85	76.5	849.0	1,579.5	1,543.3	36.17	43.665		
6,800.0	6,276.8	6,363.8	6,275.8	52.1	21.6	-177.87	76.5	849.0	1,589.0	1,552.7	36.28	43.798		
6,900.0	6,376.6	6,463.7	6,375.6	52.3	21.7	-177.89	76.5	849.0	1,595.0	1,558.7	36.33	43.899		
7,000.0	6,476.5	6,563.6	6,475.5	52.4	21.9	-177.89	76.5	849.0	1,597.6	1,561.3	36.33	43.969		
7,100.0	6,576.5	6,663.6	6,575.5	52.4	22.0	-89.09	76.5	849.0	1,597.7	1,561.1	36.57	43.688		
7,200.0	6,676.5	6,763.6	6,675.5	52.5	22.1	-89.09	76.5	849.0	1,597.7	1,560.8	36.89	43.309		

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

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Reference Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Site Error: 0.0ft
Reference Well: Butterball D19-17D
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Offset Design Butterball D19-17D Pad Sec.19-T3N-R64W - Butterball D19-18D - Wellbore #1 - Noble Butterball D19-1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
7,300.0	6,776.5	6,863.6	6,775.5	52.5	22.3	-89.09	76.5	849.0	1,597.7	1,560.5	37.21	42.935		
7,400.0	6,876.5	6,963.6	6,875.5	52.6	22.4	-89.09	76.5	849.0	1,597.7	1,560.2	37.54	42.564		
7,500.0	6,976.5	7,063.6	6,975.5	52.7	22.6	-89.09	76.5	849.0	1,597.7	1,559.8	37.86	42.196		
7,600.0	7,076.5	7,163.6	7,075.5	52.7	22.7	-89.09	76.5	849.0	1,597.7	1,559.5	38.19	41.833		
7,700.0	7,176.5	7,263.6	7,175.5	52.8	22.9	-89.09	76.5	849.0	1,597.7	1,559.2	38.52	41.473		
7,800.0	7,276.5	7,363.6	7,275.5	52.8	23.0	-89.09	76.5	849.0	1,597.7	1,558.8	38.86	41.117		
7,900.0	7,376.5	7,463.6	7,375.5	52.9	23.2	-89.09	76.5	849.0	1,597.7	1,558.5	39.19	40.766		
8,000.0	7,476.5	7,563.6	7,475.5	53.0	23.3	-89.09	76.5	849.0	1,597.7	1,558.2	39.53	40.417		
8,100.0	7,576.5	7,663.6	7,575.5	53.1	23.5	-89.09	76.5	849.0	1,597.7	1,557.8	39.87	40.073		
8,166.5	7,643.0	7,730.1	7,642.0	53.1	23.6	-89.09	76.5	849.0	1,597.7	1,557.6	40.10	39.847		

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Reference Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Site Error: 0.0ft
Reference Well: Butterball D19-17D
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Offset Design Butterball D19-17D Pad Sec.19-T3N-R64W - Butterball D19-19D - Wellbore #1 - Noble Butterball D19-1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	-43.79		14.6	-14.0	20.2					
100.0	100.0	100.0	100.0	0.1	0.1	-43.79		14.6	-14.0	20.2	20.0	0.22	89.781		
200.0	200.0	200.0	200.0	0.3	0.3	-43.79		14.6	-14.0	20.2	19.5	0.67	29.927 CC, ES		
300.0	300.0	300.0	300.0	0.6	0.6	-136.02		14.6	-14.0	21.4	20.3	1.12	19.159		
400.0	399.8	399.8	399.8	0.8	0.8	-144.18		14.6	-14.0	25.4	23.9	1.56	16.249 SF		
500.0	499.5	499.5	499.5	1.0	1.0	-153.03		14.6	-14.0	32.9	30.9	2.02	16.262		
600.0	598.7	598.7	598.7	1.3	1.2	-160.14		14.6	-14.0	44.1	41.6	2.48	17.760		
700.0	697.5	697.5	697.5	1.6	1.5	-165.22		14.6	-14.0	59.1	56.1	2.95	20.055		
800.0	795.6	795.2	795.2	2.0	1.7	-168.97		14.3	-14.2	77.8	74.4	3.40	22.908		
900.0	893.1	890.9	890.8	2.5	1.8	-172.98		11.6	-15.8	101.4	97.6	3.82	26.521		
1,000.0	989.6	984.5	984.3	3.0	2.0	-176.84		6.4	-19.0	130.2	125.9	4.26	30.529		
1,100.0	1,085.3	1,075.7	1,075.0	3.6	2.2	179.76		-1.1	-23.7	164.3	159.6	4.73	34.767		
1,200.0	1,179.8	1,163.9	1,162.5	4.2	2.4	176.86		-10.8	-29.8	203.7	198.5	5.21	39.093		
1,300.0	1,273.2	1,248.9	1,246.4	4.9	2.7	174.39		-22.2	-36.9	248.3	242.6	5.72	43.394		
1,400.0	1,365.2	1,334.6	1,330.7	5.7	2.9	172.32		-35.2	-45.0	297.4	291.1	6.26	47.490		
1,500.0	1,455.8	1,419.6	1,414.4	6.6	3.2	170.82		-48.1	-53.1	349.7	342.9	6.81	51.340		
1,600.0	1,545.5	1,503.6	1,496.9	7.5	3.5	169.88		-60.9	-61.0	403.8	396.4	7.41	54.513		
1,700.0	1,635.2	1,587.5	1,579.5	8.5	3.8	169.18		-73.7	-69.0	458.0	450.0	8.03	57.074		
1,800.0	1,724.9	1,671.4	1,662.0	9.4	4.1	168.63		-86.5	-77.0	512.3	503.6	8.66	59.180		
1,900.0	1,814.6	1,755.3	1,744.6	10.3	4.4	168.18		-99.2	-84.9	566.6	557.3	9.30	60.937		
2,000.0	1,904.3	1,839.2	1,827.1	11.3	4.7	167.81		-112.0	-92.9	620.9	611.0	9.95	62.430		
2,100.0	1,994.0	1,923.1	1,909.7	12.2	5.1	167.51		-124.8	-100.8	675.2	664.6	10.60	63.698		
2,200.0	2,083.7	2,007.0	1,992.2	13.2	5.4	167.24		-137.5	-108.2	729.6	718.3	11.26	64.786		
2,300.0	2,173.4	2,090.9	2,074.7	14.2	5.7	167.02		-150.3	-116.8	783.9	772.0	11.93	65.725		
2,400.0	2,263.1	2,174.8	2,157.3	15.1	6.0	166.82		-163.1	-124.7	838.3	825.7	12.60	66.542		
2,500.0	2,352.8	2,258.7	2,239.8	16.1	6.4	166.65		-175.9	-132.7	892.6	879.3	13.27	67.261		
2,600.0	2,442.5	2,342.6	2,322.4	17.0	6.7	166.49		-188.6	-140.7	947.0	933.0	13.95	67.896		
2,700.0	2,532.2	2,426.5	2,404.9	18.0	7.0	166.36		-201.4	-148.6	1,001.4	986.7	14.63	68.460		
2,800.0	2,621.9	2,510.4	2,487.5	19.0	7.4	166.23		-214.2	-156.6	1,055.7	1,040.4	15.31	68.964		
2,900.0	2,711.6	2,594.3	2,570.0	19.9	7.7	166.12		-226.9	-164.6	1,110.1	1,094.1	15.99	69.415		
3,000.0	2,801.3	2,678.3	2,652.6	20.9	8.1	166.02		-239.7	-172.5	1,164.5	1,147.8	16.68	69.822		
3,100.0	2,891.0	2,762.2	2,735.1	21.8	8.4	165.93		-252.5	-180.5	1,218.9	1,201.5	17.37	70.190		
3,200.0	2,980.7	2,846.1	2,817.7	22.8	8.7	165.85		-265.3	-188.4	1,273.2	1,255.2	18.05	70.524		
3,300.0	3,070.4	2,930.0	2,900.2	23.8	9.1	165.77		-278.0	-196.4	1,327.6	1,308.9	18.74	70.829		
3,400.0	3,160.1	3,013.9	2,982.7	24.7	9.4	165.70		-290.8	-204.4	1,382.0	1,362.6	19.44	71.108		
3,500.0	3,249.8	3,097.8	3,065.3	25.7	9.7	165.63		-303.6	-212.3	1,436.4	1,416.3	20.13	71.364		
3,600.0	3,339.5	3,181.7	3,147.8	26.7	10.1	165.57		-316.3	-220.3	1,490.8	1,470.0	20.82	71.599		
3,700.0	3,429.2	3,265.6	3,230.4	27.6	10.4	165.52		-329.1	-228.3	1,545.2	1,523.7	21.52	71.816		
3,800.0	3,518.9	3,349.5	3,312.9	28.6	10.8	165.47		-341.9	-236.2	1,599.6	1,577.4	22.21	72.017		
3,900.0	3,608.6	3,433.4	3,395.5	29.5	11.1	165.42		-354.6	-244.2	1,654.0	1,631.1	22.91	72.203		
4,000.0	3,698.3	3,517.3	3,478.0	30.5	11.5	165.37		-367.4	-252.2	1,708.4	1,684.7	23.60	72.376		
4,100.0	3,788.0	3,601.2	3,560.6	31.5	11.8	165.33		-380.2	-260.1	1,762.7	1,738.4	24.30	72.537		
4,200.0	3,877.7	3,685.1	3,643.1	32.4	12.1	165.29		-393.0	-268.1	1,817.1	1,792.1	25.00	72.686		
4,300.0	3,967.3	3,769.0	3,725.6	33.4	12.5	165.25		-405.7	-276.0	1,871.5	1,845.8	25.70	72.826		
4,400.0	4,057.0	3,852.9	3,808.2	34.4	12.8	165.21		-418.5	-284.0	1,925.9	1,899.5	26.40	72.957		
4,500.0	4,146.7	3,936.8	3,890.7	35.3	13.2	165.18		-431.3	-292.0	1,980.3	1,953.2	27.10	73.080		
4,600.0	4,236.4	4,020.7	3,973.3	36.3	13.5	165.15		-444.0	-299.9	2,034.7	2,006.9	27.80	73.195		
4,700.0	4,326.1	4,104.7	4,055.8	37.3	13.9	165.12		-456.8	-307.9	2,089.1	2,060.6	28.50	73.304		
4,800.0	4,415.8	4,188.6	4,138.4	38.2	14.2	165.09		-469.6	-315.9	2,143.5	2,114.3	29.20	73.405		
4,900.0	4,505.5	4,272.5	4,220.9	39.2	14.6	165.06		-482.4	-323.8	2,197.9	2,168.0	29.90	73.501		
5,000.0	4,595.2	4,379.5	4,326.3	40.2	15.0	165.03		-495.2	-333.8	2,252.2	2,221.6	30.66	73.469		
5,100.0	4,684.9	4,580.9	4,525.9	41.1	15.5	165.17		-520.7	-347.7	2,303.6	2,272.1	31.47	73.198		

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

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Reference Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Site Error: 0.0ft
Reference Well: Butterball D19-17D
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Offet Design Butterball D19-17D Pad Sec.19-T3N-R64W - Butterball D19-19D - Wellbore #1 - Noble Butterball D19-1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore +N/-S (ft)	Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.0	4,774.6	4,793.4	4,738.0	42.1	15.8	165.59	-531.3	-354.3	2,350.5	2,318.3	32.16	73.095		
5,300.0	4,864.3	4,919.7	4,864.3	43.1	16.0	165.95	-531.9	-354.7	2,393.8	2,361.1	32.70	73.212		
5,400.0	4,954.0	5,009.4	4,954.0	44.0	16.1	166.20	-531.9	-354.7	2,436.9	2,403.7	33.20	73.399		
5,500.0	5,043.7	5,099.1	5,043.7	45.0	16.2	166.44	-531.9	-354.7	2,480.1	2,446.4	33.71	73.581		
5,600.0	5,133.4	5,188.8	5,133.4	46.0	16.3	166.68	-531.9	-354.7	2,523.4	2,489.1	34.21	73.755		
5,700.0	5,223.1	5,278.5	5,223.1	46.9	16.5	166.90	-531.9	-354.7	2,566.6	2,531.9	34.72	73.924		
5,800.0	5,313.4	5,368.8	5,313.4	47.8	16.6	167.30	-531.9	-354.7	2,608.7	2,573.4	35.35	73.793		
5,900.0	5,405.1	5,460.5	5,405.1	48.5	16.7	167.67	-531.9	-354.7	2,647.7	2,611.8	35.94	73.674		
6,000.0	5,498.2	5,553.6	5,498.2	49.1	16.8	167.99	-531.9	-354.7	2,683.6	2,647.1	36.49	73.551		
6,100.0	5,592.4	5,647.9	5,592.4	49.7	16.9	168.28	-531.9	-354.7	2,716.3	2,679.3	36.99	73.428		
6,200.0	5,687.8	5,743.2	5,687.8	50.2	17.1	168.53	-531.9	-354.7	2,745.8	2,708.3	37.46	73.305		
6,300.0	5,784.2	5,839.6	5,784.2	50.7	17.2	168.75	-531.9	-354.7	2,772.0	2,734.1	37.88	73.186		
6,400.0	5,881.4	5,936.9	5,881.4	51.1	17.3	168.93	-531.9	-354.7	2,794.8	2,756.6	38.25	73.072		
6,500.0	5,979.4	6,034.9	5,979.4	51.4	17.5	169.08	-531.9	-354.7	2,814.4	2,775.8	38.57	72.962		
6,600.0	6,078.1	6,133.5	6,078.1	51.7	17.6	169.21	-531.9	-354.7	2,830.5	2,791.7	38.85	72.859		
6,700.0	6,177.2	6,232.6	6,177.2	52.0	17.8	169.31	-531.9	-354.7	2,843.3	2,804.2	39.08	72.761		
6,800.0	6,276.8	6,332.2	6,276.8	52.1	17.9	169.38	-531.9	-354.7	2,852.7	2,813.4	39.26	72.668		
6,900.0	6,376.6	6,432.0	6,376.6	52.3	18.1	169.42	-531.9	-354.7	2,858.6	2,819.2	39.39	72.580		
7,000.0	6,476.5	6,531.9	6,476.5	52.4	18.2	169.44	-531.9	-354.7	2,861.1	2,821.7	39.47	72.495		
7,100.0	6,576.5	6,631.9	6,576.5	52.4	18.4	-101.76	-531.9	-354.7	2,861.2	2,821.5	39.70	72.079		
7,200.0	6,676.5	6,731.9	6,676.5	52.5	18.5	-101.76	-531.9	-354.7	2,861.2	2,821.3	39.98	71.565		
7,300.0	6,776.5	6,831.9	6,776.5	52.5	18.7	-101.76	-531.9	-354.7	2,861.2	2,821.0	40.27	71.052		
7,400.0	6,876.5	6,931.9	6,876.5	52.6	18.8	-101.76	-531.9	-354.7	2,861.2	2,820.7	40.56	70.542		
7,500.0	6,976.5	7,031.9	6,976.5	52.7	19.0	-101.76	-531.9	-354.7	2,861.2	2,820.4	40.85	70.035		
7,600.0	7,076.5	7,131.9	7,076.5	52.7	19.1	-101.76	-531.9	-354.7	2,861.2	2,820.1	41.15	69.530		
7,700.0	7,176.5	7,231.9	7,176.5	52.8	19.3	-101.76	-531.9	-354.7	2,861.2	2,819.8	41.45	69.028		
7,800.0	7,276.5	7,331.9	7,276.5	52.8	19.5	-101.76	-531.9	-354.7	2,861.2	2,819.5	41.75	68.529		
7,900.0	7,376.5	7,431.9	7,376.5	52.9	19.6	-101.76	-531.9	-354.7	2,861.2	2,819.2	42.06	68.033		
8,000.0	7,476.5	7,531.9	7,476.5	53.0	19.8	-101.76	-531.9	-354.7	2,861.2	2,818.9	42.36	67.540		
8,100.0	7,576.5	7,631.9	7,576.5	53.1	20.0	-101.76	-531.9	-354.7	2,861.2	2,818.6	42.67	67.051		
8,166.5	7,643.0	7,698.4	7,643.0	53.1	20.1	-101.76	-531.9	-354.7	2,861.2	2,818.4	42.88	66.727		

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Reference Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Site Error: 0.0ft
Reference Well: Butterball D19-17D
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Offset Design Butterball D19-17D Pad Sec.19-T3N-R64W - Mile High 2-19-1 (Exist.) - Wellbore #1 - Design #1													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	106.43	-561.0	1,902.0	1,983.0					
100.0	100.0	83.0	83.0	0.1	0.1	106.43	-561.0	1,902.0	1,983.0	1,982.8	0.21	9,640.279		
200.0	200.0	183.0	183.0	0.3	0.3	106.43	-561.0	1,902.0	1,983.0	1,982.3	0.64	3,117.425		
300.0	300.0	283.0	283.0	0.6	0.5	17.66	-561.0	1,902.0	1,981.3	1,980.2	1.08	1,831.702		
400.0	399.8	382.8	382.8	0.8	0.7	17.73	-561.0	1,902.0	1,976.3	1,974.8	1.53	1,291.853		
500.0	499.5	482.5	482.5	1.0	1.0	17.86	-561.0	1,902.0	1,968.0	1,966.0	1.99	991.390		
600.0	598.7	581.7	581.7	1.3	1.2	18.04	-561.0	1,902.0	1,956.4	1,954.0	2.45	799.787		
700.0	697.5	680.5	680.5	1.6	1.4	18.28	-561.0	1,902.0	1,941.5	1,938.6	2.91	666.307		
800.0	795.6	778.6	778.6	2.0	1.6	18.57	-561.0	1,902.0	1,923.4	1,920.0	3.39	567.391		
900.0	893.1	876.1	876.1	2.5	1.9	18.93	-561.0	1,902.0	1,902.0	1,898.2	3.88	490.670		
1,000.0	989.6	972.6	972.6	3.0	2.1	19.35	-561.0	1,902.0	1,877.5	1,873.1	4.38	429.043		
1,100.0	1,085.3	1,068.3	1,068.3	3.6	2.3	19.85	-561.0	1,902.0	1,849.8	1,844.9	4.89	378.152		
1,200.0	1,179.8	1,162.8	1,162.8	4.2	2.5	20.42	-561.0	1,902.0	1,819.1	1,813.6	5.43	335.174		
1,300.0	1,273.2	1,256.2	1,256.2	4.9	2.7	21.07	-561.0	1,902.0	1,785.3	1,779.3	5.99	298.202		
1,400.0	1,365.2	1,348.2	1,348.2	5.7	2.9	21.82	-561.0	1,902.0	1,748.5	1,741.9	6.58	265.906		
1,500.0	1,455.8	1,438.8	1,438.8	6.6	3.1	22.67	-561.0	1,902.0	1,708.9	1,701.7	7.20	237.330		
1,600.0	1,545.5	1,528.5	1,528.5	7.5	3.3	23.29	-561.0	1,902.0	1,667.6	1,659.7	7.88	211.720		
1,700.0	1,635.2	1,618.2	1,618.2	8.5	3.5	23.89	-561.0	1,902.0	1,626.4	1,617.9	8.58	189.638		
1,800.0	1,724.9	1,707.9	1,707.9	9.4	3.7	24.53	-561.0	1,902.0	1,585.4	1,576.1	9.30	170.521		
1,900.0	1,814.6	1,797.6	1,797.6	10.3	3.9	25.20	-561.0	1,902.0	1,544.6	1,534.6	10.04	153.851		
2,000.0	1,904.3	1,887.3	1,887.3	11.3	4.1	25.90	-561.0	1,902.0	1,504.0	1,493.2	10.80	139.216		
2,100.0	1,994.0	1,977.0	1,977.0	12.2	4.3	26.64	-561.0	1,902.0	1,463.5	1,452.0	11.59	126.288		
2,200.0	2,083.7	2,066.7	2,066.7	13.2	4.5	27.42	-561.0	1,902.0	1,423.3	1,410.9	12.40	114.803		
2,300.0	2,173.4	2,156.4	2,156.4	14.2	4.7	28.25	-561.0	1,902.0	1,383.4	1,370.2	13.23	104.547		
2,400.0	2,263.1	2,246.1	2,246.1	15.1	4.9	29.12	-561.0	1,902.0	1,343.7	1,329.6	14.09	95.346		
2,500.0	2,352.8	2,335.8	2,335.8	16.1	5.1	30.04	-561.0	1,902.0	1,304.3	1,289.3	14.98	87.057		
2,600.0	2,442.5	2,425.5	2,425.5	17.0	5.3	31.02	-561.0	1,902.0	1,265.2	1,249.3	15.90	79.565		
2,700.0	2,532.2	2,515.2	2,515.2	18.0	5.5	32.05	-561.0	1,902.0	1,226.5	1,209.6	16.85	72.769		
2,800.0	2,621.9	2,604.9	2,604.9	19.0	5.7	33.15	-561.0	1,902.0	1,188.1	1,170.3	17.84	66.590		
2,900.0	2,711.6	2,694.6	2,694.6	19.9	5.9	34.32	-561.0	1,902.0	1,150.2	1,131.3	18.87	60.958		
3,000.0	2,801.3	2,784.3	2,784.3	20.9	6.1	35.56	-561.0	1,902.0	1,112.7	1,092.8	19.94	55.815		
3,100.0	2,891.0	2,874.0	2,874.0	21.8	6.3	36.88	-561.0	1,902.0	1,075.8	1,054.7	21.05	51.111		
3,200.0	2,980.7	2,963.7	2,963.7	22.8	6.5	38.28	-561.0	1,902.0	1,039.4	1,017.2	22.21	46.806		
3,300.0	3,070.4	3,053.4	3,053.4	23.8	6.8	39.78	-561.0	1,902.0	1,003.6	980.2	23.42	42.863		
3,400.0	3,160.1	3,143.1	3,143.1	24.7	7.0	41.38	-561.0	1,902.0	968.6	943.9	24.68	39.250		
3,500.0	3,249.8	3,232.8	3,232.8	25.7	7.2	43.09	-561.0	1,902.0	934.3	908.3	25.99	35.942		
3,600.0	3,339.5	3,322.5	3,322.5	26.7	7.4	44.92	-561.0	1,902.0	900.9	873.5	27.37	32.915		
3,700.0	3,429.2	3,412.2	3,412.2	27.6	7.6	46.87	-561.0	1,902.0	868.4	839.6	28.80	30.149		
3,800.0	3,518.9	3,501.9	3,501.9	28.6	7.8	48.95	-561.0	1,902.0	837.0	806.7	30.30	27.626		
3,900.0	3,608.6	3,591.6	3,591.6	29.5	8.0	51.17	-561.0	1,902.0	806.9	775.0	31.85	25.331		
4,000.0	3,698.3	3,681.3	3,681.3	30.5	8.2	53.54	-561.0	1,902.0	778.0	744.6	33.47	23.250		
4,100.0	3,788.0	3,771.0	3,771.0	31.5	8.4	56.07	-561.0	1,902.0	750.7	715.6	35.13	21.371		
4,200.0	3,877.7	3,860.7	3,860.7	32.4	8.6	58.75	-561.0	1,902.0	725.1	688.2	36.84	19.683		
4,300.0	3,967.3	3,950.3	3,950.3	33.4	8.8	61.60	-561.0	1,902.0	701.2	662.7	38.58	18.177		
4,400.0	4,057.0	4,040.0	4,040.0	34.4	9.0	64.61	-561.0	1,902.0	679.5	639.1	40.34	16.843		
4,500.0	4,146.7	4,129.7	4,129.7	35.3	9.2	67.77	-561.0	1,902.0	660.0	617.8	42.11	15.673		
4,600.0	4,236.4	4,219.4	4,219.4	36.3	9.4	71.09	-561.0	1,902.0	642.9	599.0	43.86	14.658		
4,700.0	4,326.1	4,309.1	4,309.1	37.3	9.6	74.54	-561.0	1,902.0	628.5	582.9	45.57	13.792		
4,800.0	4,415.8	4,398.8	4,398.8	38.2	9.8	78.11	-561.0	1,902.0	616.9	569.7	47.21	13.067		
4,900.0	4,505.5	4,488.5	4,488.5	39.2	10.0	81.78	-561.0	1,902.0	608.3	559.6	48.76	12.475		
5,000.0	4,595.2	4,578.2	4,578.2	40.2	10.2	85.51	-561.0	1,902.0	602.9	552.7	50.20	12.010		
5,100.0	4,684.9	4,667.9	4,667.9	41.1	10.4	89.29	-561.0	1,902.0	600.6	549.1	51.50	11.663		

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

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Reference Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Site Error: 0.0ft
Reference Well: Butterball D19-17D
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Noble Butterball D19-17D Plan #1 (2-15-12)

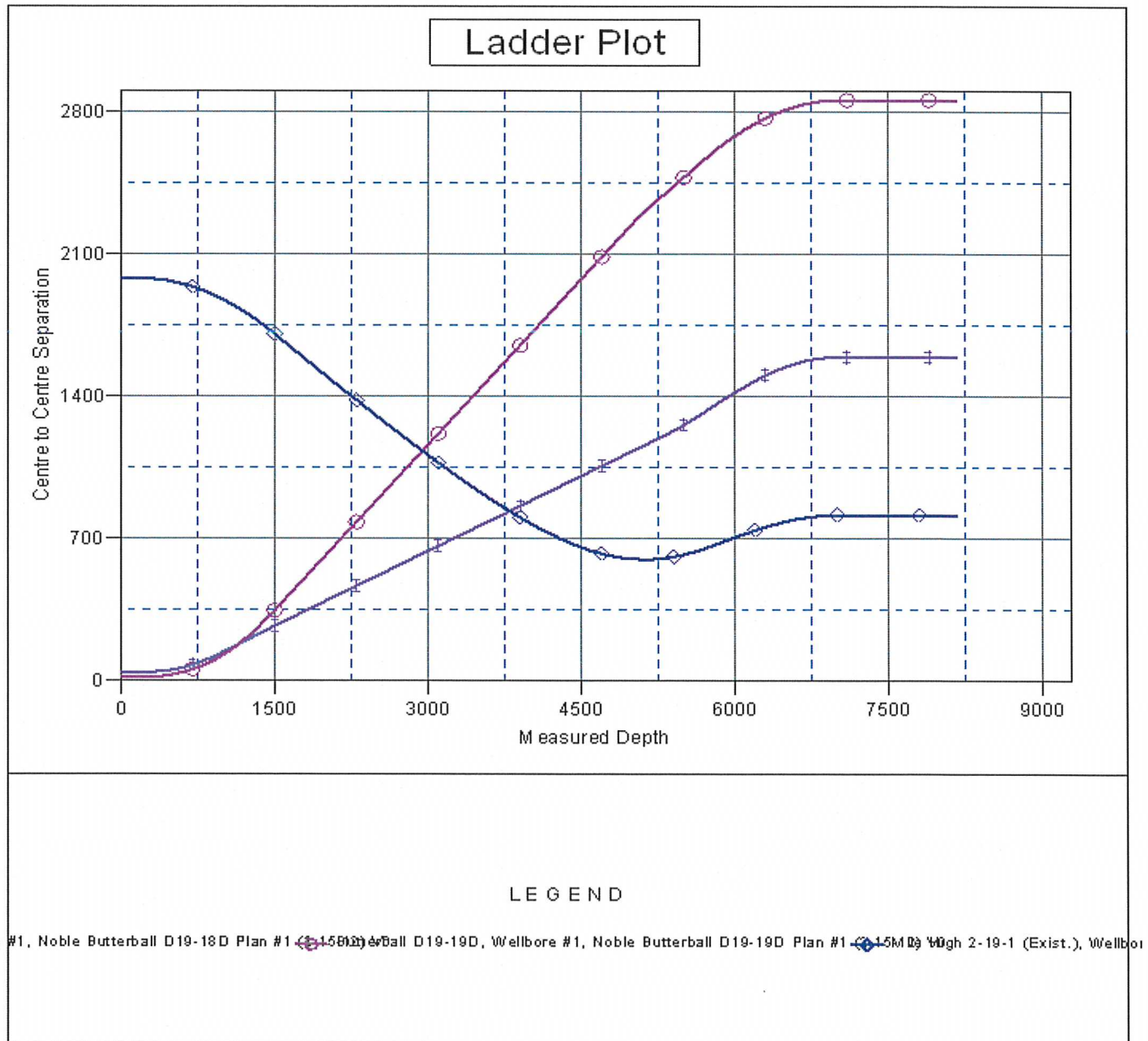
Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Offset Design Butterball D19-17D Pad Sec.19-T3N-R64W - Mile High 2-19-1 (Exist.) - Wellbore #1 - Design #1													Offset Site Error: 0.0ft
Survey Program: 0-MWD													Offset Well Error: 0.0ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,118.8	4,701.8	4,684.8	4,684.8	41.3	10.4	90.00	-561.0	1,902.0	600.6	548.8	51.73	11.610	CC, ES
5,200.0	4,774.6	4,757.6	4,757.6	42.1	10.6	93.07	-561.0	1,902.0	601.6	549.0	52.65	11.427	
5,300.0	4,864.3	4,847.3	4,847.3	43.1	10.8	96.82	-561.0	1,902.0	605.9	552.2	53.64	11.296	
5,400.0	4,954.0	4,937.0	4,937.0	44.0	11.0	100.52	-561.0	1,902.0	613.3	558.8	54.47	11.260	SF
5,500.0	5,043.7	5,026.7	5,026.7	45.0	11.2	104.13	-561.0	1,902.0	623.8	568.6	55.13	11.314	
5,600.0	5,133.4	5,116.4	5,116.4	46.0	11.4	107.63	-561.0	1,902.0	637.1	581.5	55.65	11.449	
5,700.0	5,223.1	5,206.1	5,206.1	46.9	11.6	110.99	-561.0	1,902.0	653.2	597.2	56.03	11.658	
5,800.0	5,313.4	5,296.4	5,296.4	47.8	11.8	114.44	-561.0	1,902.0	671.3	615.1	56.15	11.954	
5,900.0	5,405.1	5,388.1	5,388.1	48.5	12.0	117.60	-561.0	1,902.0	690.0	633.9	56.08	12.304	
6,000.0	5,498.2	5,481.2	5,481.2	49.1	12.2	120.42	-561.0	1,902.0	708.7	652.8	55.95	12.668	
6,100.0	5,592.4	5,575.4	5,575.4	49.7	12.4	122.90	-561.0	1,902.0	727.0	671.2	55.79	13.031	
6,200.0	5,687.8	5,670.8	5,670.8	50.2	12.6	125.07	-561.0	1,902.0	744.3	688.7	55.63	13.380	
6,300.0	5,784.2	5,767.2	5,767.2	50.7	12.9	126.94	-561.0	1,902.0	760.4	704.9	55.49	13.703	
6,400.0	5,881.4	5,864.4	5,864.4	51.1	13.1	128.52	-561.0	1,902.0	774.9	719.5	55.38	13.993	
6,500.0	5,979.4	5,962.4	5,962.4	51.4	13.3	129.84	-561.0	1,902.0	787.6	732.3	55.30	14.241	
6,600.0	6,078.1	6,061.1	6,061.1	51.7	13.5	130.90	-561.0	1,902.0	798.3	743.1	55.27	14.443	
6,700.0	6,177.2	6,160.2	6,160.2	52.0	13.7	131.72	-561.0	1,902.0	807.0	751.7	55.29	14.595	
6,800.0	6,276.8	6,259.8	6,259.8	52.1	14.0	132.32	-561.0	1,902.0	813.4	758.0	55.36	14.693	
6,900.0	6,376.6	6,359.6	6,359.6	52.3	14.2	132.69	-561.0	1,902.0	817.4	762.0	55.47	14.736	
7,000.0	6,476.5	6,459.5	6,459.5	52.4	14.4	132.85	-561.0	1,902.0	819.2	763.5	55.64	14.722	
7,100.0	6,576.5	6,559.5	6,559.5	52.4	14.6	-138.34	-561.0	1,902.0	819.3	763.3	55.92	14.652	
7,200.0	6,676.5	6,659.5	6,659.5	52.5	14.9	-138.34	-561.0	1,902.0	819.3	763.0	56.21	14.574	
7,300.0	6,776.5	6,759.5	6,759.5	52.5	15.1	-138.34	-561.0	1,902.0	819.3	762.7	56.51	14.497	
7,400.0	6,876.5	6,859.5	6,859.5	52.6	15.3	-138.34	-561.0	1,902.0	819.3	762.4	56.81	14.421	
7,500.0	6,976.5	6,959.5	6,959.5	52.7	15.5	-138.34	-561.0	1,902.0	819.3	762.1	57.11	14.346	
7,600.0	7,076.5	7,059.5	7,059.5	52.7	15.8	-138.34	-561.0	1,902.0	819.3	761.8	57.41	14.270	
7,700.0	7,176.5	7,159.5	7,159.5	52.8	16.0	-138.34	-561.0	1,902.0	819.3	761.5	57.71	14.196	
7,800.0	7,276.5	7,259.5	7,259.5	52.8	16.2	-138.34	-561.0	1,902.0	819.3	761.2	58.01	14.122	
7,900.0	7,376.5	7,359.5	7,359.5	52.9	16.4	-138.34	-561.0	1,902.0	819.3	760.9	58.32	14.048	
8,000.0	7,476.5	7,459.5	7,459.5	53.0	16.7	-138.34	-561.0	1,902.0	819.3	760.6	58.62	13.975	
8,100.0	7,576.5	7,559.5	7,559.5	53.1	16.9	-138.34	-561.0	1,902.0	819.3	760.3	58.93	13.902	
8,166.5	7,643.0	7,626.0	7,626.0	53.1	17.0	-138.34	-561.0	1,902.0	819.3	760.1	59.13	13.854	

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Reference Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Site Error: 0.0ft
Reference Well: Butterball D19-17D
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 4803.0ft (Original Well Elev) Coordinates are relative to: Butterball D19-17D
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.58°



Local Co-ordinate Reference:	Well Butterball D19-17D
TVD Reference:	WELL @ 4803.0ft (Original Well Elev)
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