

Noble Energy

Garfield County, CO

Sec. 20-T7S-R94W

Rulison Federal 20-11D

Plan #1

Plan: Plan #1 Proposal

Sperry Drilling Services

Proposal Report

22 January, 2009

Well Coordinates: 589,022.77 N, 1,317,886.53 E (39° 25' 32.78" N, 107° 54' 53.77" W)

Ground Level: 7,906.00 ft

Local Coordinate Origin:

Centered on Well Rulison Federal 20-11D

Viewing Datum:

RKB 25' @ 7931.00ft (Original Well Elev)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 42

HALLIBURTON

Plan Report for Rulison Federal 20-11D - Plan #1 Proposal

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)	Toolface Azimuth (°)
0.00	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	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kickoff at 225.00ft										
300.00	1.50	341.48	299.99	0.93	-0.31	0.98	2.00	2.00	0.00	341.48
400.00	3.50	341.48	399.89	5.07	-1.70	5.34	2.00	2.00	0.00	0.00
500.00	5.50	341.48	499.58	12.51	-4.19	13.17	2.00	2.00	0.00	0.00
515.00	5.80	341.48	514.50	13.91	-4.66	14.65	2.00	2.00	0.00	0.00
Build Rate = 2.00°/100ft										
600.00	7.50	341.48	598.93	23.24	-7.78	24.48	2.00	2.00	0.00	0.00
700.00	9.50	341.48	697.83	37.25	-12.48	39.24	2.00	2.00	0.00	0.00
800.00	11.50	341.48	796.15	54.53	-18.27	57.44	2.00	2.00	0.00	0.00
807.42	11.65	341.48	803.42	55.95	-18.74	58.93	2.00	2.00	0.00	0.00
End Build at 807.42ft										
900.00	11.65	341.48	894.09	73.67	-24.67	77.60	0.00	0.00	0.00	0.00
1,000.00	11.65	341.48	992.03	92.82	-31.09	97.77	0.00	0.00	0.00	0.00
1,100.00	11.65	341.48	1,089.97	111.96	-37.50	117.94	0.00	0.00	0.00	0.00
1,200.00	11.65	341.48	1,187.91	131.11	-43.91	138.10	0.00	0.00	0.00	0.00
1,300.00	11.65	341.48	1,285.85	150.25	-50.32	158.27	0.00	0.00	0.00	0.00
1,400.00	11.65	341.48	1,383.79	169.40	-56.74	178.44	0.00	0.00	0.00	0.00
1,500.00	11.65	341.48	1,481.73	188.54	-63.15	198.60	0.00	0.00	0.00	0.00
1,600.00	11.65	341.48	1,579.67	207.69	-69.56	218.77	0.00	0.00	0.00	0.00
1,700.00	11.65	341.48	1,677.61	226.83	-75.97	238.94	0.00	0.00	0.00	0.00
1,800.00	11.65	341.48	1,775.55	245.98	-82.39	259.10	0.00	0.00	0.00	0.00
1,900.00	11.65	341.48	1,873.49	265.12	-88.80	279.27	0.00	0.00	0.00	0.00
2,000.00	11.65	341.48	1,971.44	284.27	-95.21	299.44	0.00	0.00	0.00	0.00
2,100.00	11.65	341.48	2,069.38	303.41	-101.62	319.60	0.00	0.00	0.00	0.00
2,200.00	11.65	341.48	2,167.32	322.56	-108.04	339.77	0.00	0.00	0.00	0.00
2,300.00	11.65	341.48	2,265.26	341.70	-114.45	359.94	0.00	0.00	0.00	0.00
2,400.00	11.65	341.48	2,363.20	360.85	-120.86	380.11	0.00	0.00	0.00	0.00
2,500.00	11.65	341.48	2,461.14	379.99	-127.27	400.27	0.00	0.00	0.00	0.00
8 5/8" Casing Pt.										
2,600.00	11.65	341.48	2,559.08	399.14	-133.69	420.44	0.00	0.00	0.00	0.00
2,700.00	11.65	341.48	2,657.02	418.28	-140.10	440.61	0.00	0.00	0.00	0.00
2,800.00	11.65	341.48	2,754.96	437.43	-146.51	460.77	0.00	0.00	0.00	0.00
2,900.00	11.65	341.48	2,852.90	456.57	-152.92	480.94	0.00	0.00	0.00	0.00
3,000.00	11.65	341.48	2,950.84	475.72	-159.33	501.11	0.00	0.00	0.00	0.00
3,100.00	11.65	341.48	3,048.78	494.86	-165.75	521.27	0.00	0.00	0.00	0.00
3,200.00	11.65	341.48	3,146.72	514.01	-172.16	541.44	0.00	0.00	0.00	0.00
3,300.00	11.65	341.48	3,244.66	533.15	-178.57	561.61	0.00	0.00	0.00	0.00
11.65 Inclination										
3,400.00	11.65	341.48	3,342.60	552.30	-184.98	581.77	0.00	0.00	0.00	0.00
3,500.00	11.65	341.48	3,440.54	571.44	-191.40	601.94	0.00	0.00	0.00	0.00
3,600.00	11.65	341.48	3,538.48	590.59	-197.81	622.11	0.00	0.00	0.00	0.00
3,700.00	11.65	341.48	3,636.42	609.73	-204.22	642.28	0.00	0.00	0.00	0.00
3,800.00	11.65	341.48	3,734.36	628.88	-210.63	662.44	0.00	0.00	0.00	0.00
3,900.00	11.65	341.48	3,832.30	648.02	-217.05	682.61	0.00	0.00	0.00	0.00
4,000.00	11.65	341.48	3,930.25	667.17	-223.46	702.78	0.00	0.00	0.00	0.00
4,100.00	11.65	341.48	4,028.19	686.32	-229.87	722.94	0.00	0.00	0.00	0.00
4,200.00	11.65	341.48	4,126.13	705.46	-236.28	743.11	0.00	0.00	0.00	0.00
4,300.00	11.65	341.48	4,224.07	724.61	-242.70	763.28	0.00	0.00	0.00	0.00
4,400.00	11.65	341.48	4,322.01	743.75	-249.11	783.44	0.00	0.00	0.00	0.00
4,500.00	11.65	341.48	4,419.95	762.90	-255.52	803.61	0.00	0.00	0.00	0.00
4,600.00	11.65	341.48	4,517.89	782.04	-261.93	823.78	0.00	0.00	0.00	0.00
4,700.00	11.65	341.48	4,615.83	801.19	-268.35	843.94	0.00	0.00	0.00	0.00
4,800.00	11.65	341.48	4,713.77	820.33	-274.76	864.11	0.00	0.00	0.00	0.00
4,900.00	11.65	341.48	4,811.71	839.48	-281.17	884.28	0.00	0.00	0.00	0.00

Plan Report for Rulison Federal 20-11D - Plan #1 Proposal

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)	Toolface Azimuth (°)
5,000.00	11.65	341.48	4,909.65	858.62	-287.58	904.45	0.00	0.00	0.00	0.00
5,100.00	11.65	341.48	5,007.59	877.77	-293.99	924.61	0.00	0.00	0.00	0.00
5,200.00	11.65	341.48	5,105.53	896.91	-300.41	944.78	0.00	0.00	0.00	0.00
5,300.00	11.65	341.48	5,203.47	916.06	-306.82	964.95	0.00	0.00	0.00	0.00
5,400.00	11.65	341.48	5,301.41	935.20	-313.23	985.11	0.00	0.00	0.00	0.00
5,500.00	11.65	341.48	5,399.35	954.35	-319.64	1,005.28	0.00	0.00	0.00	0.00
5,600.00	11.65	341.48	5,497.29	973.49	-326.06	1,025.45	0.00	0.00	0.00	0.00
5,700.00	11.65	341.48	5,595.23	992.64	-332.47	1,045.61	0.00	0.00	0.00	0.00
5,800.00	11.65	341.48	5,693.17	1,011.78	-338.88	1,065.78	0.00	0.00	0.00	0.00
5,833.29	11.65	341.48	5,725.78	1,018.16	-341.02	1,072.49	0.00	0.00	0.00	0.00
Begin Drop at 5833.29ft										
5,900.00	10.65	341.48	5,791.23	1,030.39	-345.11	1,085.38	1.50	-1.50	0.00	180.00
6,000.00	9.15	341.48	5,889.74	1,046.68	-350.57	1,102.55	1.50	-1.50	0.00	180.00
6,100.00	7.65	341.48	5,988.66	1,060.53	-355.21	1,117.13	1.50	-1.50	0.00	180.00
6,200.00	6.15	341.48	6,087.94	1,071.92	-359.02	1,129.13	1.50	-1.50	0.00	180.00
6,220.00	5.85	341.48	6,107.83	1,073.90	-359.69	1,131.21	1.50	-1.50	0.00	180.00
Drop Rate = 1.50°/100ft										
6,300.00	4.65	341.48	6,187.49	1,080.84	-362.01	1,138.52	1.50	-1.50	0.00	-180.00
6,400.00	3.15	341.48	6,287.26	1,087.29	-364.17	1,145.31	1.50	-1.50	0.00	180.00
6,500.00	1.65	341.48	6,387.17	1,091.25	-365.50	1,149.49	1.50	-1.50	0.00	180.00
6,600.00	0.15	341.48	6,487.15	1,092.74	-366.00	1,151.06	1.50	-1.50	0.00	180.00
6,609.85	0.00	0.00	6,497.00	1,092.75	-366.00	1,151.07	1.50	-1.50	0.00	180.00
End Drop at 6609.85ft - Williams Fork - Rulison Federal 20-11D Plan #1 Driller's Tgt										
6,700.00	0.07	243.44	6,587.15	1,092.72	-366.05	1,151.06	0.08	0.08	0.00	243.44
6,800.00	0.15	243.44	6,687.15	1,092.64	-366.23	1,151.05	0.08	0.08	0.00	0.00
6,900.00	0.23	243.44	6,787.15	1,092.49	-366.53	1,151.01	0.08	0.08	0.00	0.00
7,000.00	0.31	243.44	6,887.15	1,092.27	-366.95	1,150.97	0.08	0.08	0.00	0.00
7,100.00	0.39	243.44	6,987.15	1,092.00	-367.50	1,150.91	0.08	0.08	0.00	0.00
7,200.00	0.47	243.44	7,087.14	1,091.66	-368.17	1,150.85	0.08	0.08	0.00	0.00
7,300.00	0.55	243.44	7,187.14	1,091.26	-368.97	1,150.76	0.08	0.08	0.00	0.00
7,400.00	0.63	243.44	7,287.13	1,090.80	-369.90	1,150.67	0.08	0.08	0.00	0.00
7,427.87	0.65	243.44	7,315.00	1,090.66	-370.18	1,150.64	0.08	0.08	0.00	0.00
Top of Gas										
7,500.00	0.71	243.44	7,387.13	1,090.28	-370.95	1,150.56	0.08	0.08	0.00	0.00
7,600.00	0.79	243.44	7,487.12	1,089.69	-372.12	1,150.44	0.08	0.08	0.00	0.00
7,700.00	0.87	243.44	7,587.11	1,089.04	-373.42	1,150.31	0.08	0.08	0.00	0.00
7,800.00	0.95	243.44	7,687.10	1,088.33	-374.84	1,150.16	0.08	0.08	0.00	0.00
7,900.00	1.03	243.44	7,787.08	1,087.55	-376.39	1,150.00	0.08	0.08	0.00	0.00
8,000.00	1.11	243.44	7,887.06	1,086.72	-378.07	1,149.83	0.08	0.08	0.00	0.00
8,100.00	1.19	243.44	7,987.04	1,085.82	-379.87	1,149.64	0.08	0.08	0.00	0.00
8,200.00	1.27	243.44	8,087.02	1,084.86	-381.79	1,149.45	0.08	0.08	0.00	0.00
8,300.00	1.35	243.44	8,186.99	1,083.83	-383.84	1,149.24	0.08	0.08	0.00	0.00
8,400.00	1.43	243.44	8,286.96	1,082.75	-386.01	1,149.01	0.08	0.08	0.00	0.00
8,500.00	1.51	243.44	8,386.93	1,081.60	-388.31	1,148.78	0.08	0.08	0.00	0.00
8,600.00	1.59	243.44	8,486.89	1,080.39	-390.73	1,148.53	0.08	0.08	0.00	0.00
8,637.51	1.62	243.44	8,524.39	1,079.92	-391.67	1,148.43	0.08	0.08	0.00	0.00
8,700.00	1.57	243.44	8,586.86	1,079.14	-393.23	1,148.27	0.08	-0.08	0.00	180.00
8,800.00	1.48	243.44	8,686.82	1,077.95	-395.61	1,148.02	0.08	-0.08	0.00	180.00
8,900.00	1.40	243.44	8,786.79	1,076.82	-397.86	1,147.79	0.08	-0.08	0.00	180.00
9,000.00	1.32	243.44	8,886.76	1,075.76	-399.98	1,147.58	0.08	-0.08	0.00	180.00
9,100.00	1.23	243.44	8,986.74	1,074.77	-401.97	1,147.37	0.08	-0.08	0.00	180.00
9,200.00	1.15	243.44	9,086.71	1,073.84	-403.83	1,147.18	0.08	-0.08	0.00	180.00
9,201.29	1.15	243.44	9,088.00	1,073.83	-403.85	1,147.18	0.00	0.00	0.00	0.00
Cameo										
9,300.00	1.06	243.44	9,186.70	1,072.97	-405.56	1,147.00	0.09	-0.09	0.00	180.00
9,400.00	0.98	243.44	9,286.68	1,072.18	-407.15	1,146.84	0.08	-0.08	0.00	180.00
9,500.00	0.89	243.44	9,386.67	1,071.45	-408.61	1,146.69	0.08	-0.08	0.00	180.00
9,600.00	0.81	243.44	9,486.66	1,070.78	-409.94	1,146.55	0.08	-0.08	0.00	180.00
9,661.35	0.76	243.44	9,548.00	1,070.41	-410.69	1,146.47	0.08	-0.08	0.00	-180.00

Plan Report for Rulison Federal 20-11D - Plan #1 Proposal

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)	Toolface Azimuth (°)
Rollins										
9,700.00	0.73	243.44	9,586.65	1,070.18	-411.14	1,146.43	0.08	-0.08	0.00	180.00
9,800.00	0.64	243.44	9,686.64	1,069.65	-412.20	1,146.32	0.08	-0.08	0.00	180.00
9,900.00	0.56	243.44	9,786.63	1,069.18	-413.14	1,146.22	0.08	-0.08	0.00	180.00
10,000.00	0.47	243.44	9,886.63	1,068.78	-413.94	1,146.14	0.08	-0.08	0.00	180.00
10,000.37	0.47	243.44	9,887.00	1,068.78	-413.95	1,146.14	0.00	0.00	0.00	0.00
Cozzette										
10,100.00	0.39	243.44	9,986.63	1,068.45	-414.61	1,146.07	0.08	-0.08	0.00	180.00
10,200.00	0.30	243.44	10,086.62	1,068.18	-415.15	1,146.02	0.08	-0.08	0.00	180.00
10,279.38	0.24	243.44	10,166.00	1,068.01	-415.49	1,145.98	0.08	-0.08	0.00	-180.00
Corcoran										
10,300.00	0.22	243.44	10,186.62	1,067.97	-415.56	1,145.97	0.08	-0.08	0.00	180.00
10,400.00	0.13	243.44	10,286.62	1,067.83	-415.84	1,145.95	0.08	-0.08	0.00	180.00
10,409.38	0.13	243.44	10,296.00	1,067.83	-415.86	1,145.94	0.08	-0.08	0.00	-180.00
Mancos										
10,500.00	0.05	243.44	10,386.62	1,067.76	-415.98	1,145.93	0.08	-0.08	0.00	180.00
10,559.38	0.00	0.00	10,446.00	1,067.75	-416.00	1,145.93	0.08	-0.08	0.00	180.00

Rulison Federal 20-11D Plan #1 BH Tgt

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
225.00	225.00	0.00	0.00	Kickoff at 225.00ft
515.00	514.50	13.91	-4.66	Build Rate = 2.00°/100ft
807.42	803.42	55.95	-18.74	End Build at 807.42ft
3,300.00	3,244.66	533.15	-178.57	11.65 Inclination
5,833.29	5,725.78	1,018.16	-341.02	Begin Drop at 5833.29ft
6,220.00	6,107.83	1,073.90	-359.69	Drop Rate = 1.50°/100ft
6,609.85	6,497.00	1,092.75	-366.00	End Drop at 6609.85ft
10,559.38	10,446.00	1,067.75	-416.00	Total Depth = 10559.38ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Rulison Federal 20-11D Plan #1 BH Tgt	338.71	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	10,559.38	Plan #1 Proposal	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
2,500.00	2,461.14	8 5/8" Casing Pt.	8-5/8	11

Plan Report for Rulison Federal 20-11D - Plan #1 Proposal

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,609.85	6,497.00	Williams Fork		0.00	
7,427.87	7,315.00	Top of Gas		0.00	
9,201.29	9,088.00	Cameo		0.00	
9,661.35	9,548.00	Rollins		0.00	
10,000.37	9,887.00	Cozzette		0.00	
10,279.38	10,166.00	Corcoran		0.00	
10,409.38	10,296.00	Mancos		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Rulison Federal 20-11D Hardline	0.00	0.00	0.00	Polygon
Rulison Federal 20-11D Plan #1 Driller's Tgt	6,497.00	1,092.75	-366.00	Rectangle
Rulison Federal 20-11D Plan #1 BH Tgt	10,446.00	1,067.75	-416.00	Point
Rulison Federal 20-11D Plan #1 Zone Tgt	7,315.00	1,067.75	-416.00	Rectangle

North Reference Sheet for Sec. 20-T7S-R94W - Rulison Federal 20-11D - Plan #1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB 25' @ 7931.00ft (Original Well Elev). Northing and Easting are relative to Rulison Federal 20-11D

Coordinate System is US State Plane 1927 (Exact solution), Colorado Central 502 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 39° 45' 0.000 N°

False Easting: 2,000,000.00ft, False Northing: 0.00ft, Scale Reduction: 0.99995193

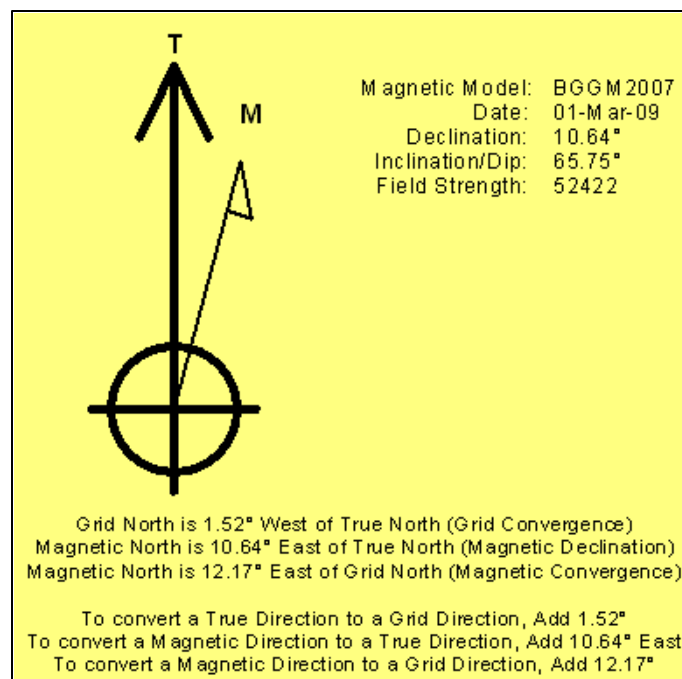
Grid Coordinates of Well: 589,022.77 ft N, 1,317,886.53 ft E

Geographical Coordinates of Well: 39° 25' 32.78" N, 107° 54' 53.77" W

Grid Convergence at Surface is: -1.52°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,559.38ft
the Bottom Hole Displacement is 1,145.93ft in the Direction of 338.71° (True).

Magnetic Convergence at surface is: -12.17° (1 March 2009, , BGGM2007)



Project: Garfield County, CO
Site: Sec. 20-T7S-R94W
Well: Rulison Federal 20-11D
Wellbore: Plan #1
Plan: Plan #1 Proposal

Noble Energy

HALLIBURTON

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	
3	807.42	11.65	341.48	803.41	55.95	-18.74	2.00	341.48	58.93	
4	5833.29	11.65	341.48	5725.78	1018.16	-341.02	0.00	0.00	1072.49	Rulison Federal 20-11D Plan #1 Driller's Tgt
5	6609.85	0.00	0.00	6497.00	1092.75	-366.00	1.50	180.00	1151.07	
6	8637.51	1.62	243.44	8524.39	1079.92	-391.67	0.08	243.44	1148.43	
7	10559.38	0.00	0.00	10446.00	1067.75	-416.00	0.08	180.00	1145.93	Rulison Federal 20-11D Plan #1 BH Tgt

WELL DETAILS: Rulison Federal 20-11D

Northing	Easting	Ground Level:	Latitude	Longitude
589022.77	1317886.53	7906.00	39° 25' 32.785 N	107° 54' 53.771 W

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6497.00	6609.85	Williams Fork
7315.00	7427.87	Top of Gas
9088.00	9201.29	Cameo
9548.00	9661.35	Rollins
9887.00	10000.37	Cozzette
10166.00	10279.38	Corcoran
10296.00	10409.38	Mancos

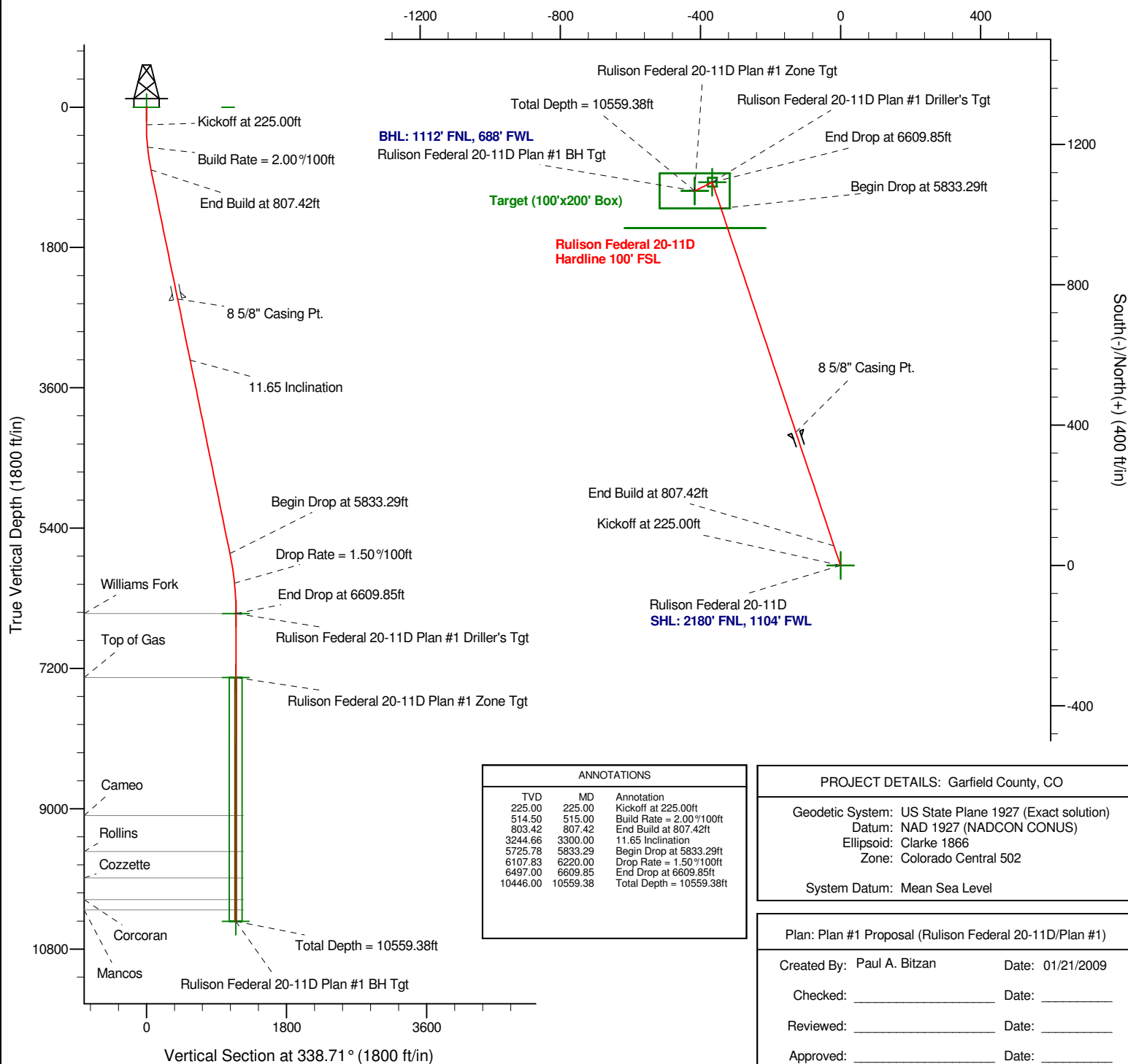
WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
Rulison Federal 20-11D Hardline	0.00	0.00	0.00	Polygon
Rulison Federal 20-11D Plan #1 Driller's Tgt	6497.00	1092.75	-366.00	Rectangle (Sides: L25.00 W25.00)
Rulison Federal 20-11D Plan #1 Zone Tgt	7315.00	1067.75	-416.00	Rectangle (Sides: L100.00 W200.00)
Rulison Federal 20-11D Plan #1 BH Tgt	10446.00	1067.75	-416.00	Point



Azimuths to True North
Magnetic North: 10.64°
Magnetic Field
Strength: 52422.0nT
Dip Angle: 65.75°
Date: 3/1/2009
Model: BGGM2007

West(-)/East(+) (400 ft/in)



ANNOTATIONS

TVD	MD	Annotation
225.00	225.00	Kickoff at 225.00ft
514.50	515.00	Build Rate = 2.00%/100ft
803.42	807.42	End Build at 807.42ft
3244.66	3300.00	11.65 Incline
5725.78	5833.29	Begin Drop at 5833.29ft
6107.83	6220.00	Drop Rate = 1.50%/100ft
6497.00	6609.85	End Drop at 6609.85ft
10446.00	10559.38	Total Depth = 10559.38ft

PROJECT DETAILS: Garfield County, CO

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Colorado Central 502

System Datum: Mean Sea Level

Plan: Plan #1 Proposal (Rulison Federal 20-11D/Plan #1)

Created By: Paul A. Bitzan Date: 01/21/2009

Checked: _____ Date: _____

Reviewed: _____ Date: _____

Approved: _____ Date: _____