

Noble Energy

Weld County, CO

Sec. 15-T5N-R63W (Wells Ranch PAD)

Wells Ranch USX BB15-65HN - A1

Plan B - Rev 0 - Tgt 0 - Plugback 1

Design: MWD Survey

Sperry Drilling Services

Standard Report

28 April, 2011

Well Coordinates: 1,390,897.02 N, 3,297,655.33 E (40° 24' 05.36" N, 104° 25' 52.36" W)

Ground Level: 4,665.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch USX BB15-65HN - SI

Viewing Datum: KB @ 4689.00ft (Rig KB)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Design Report for Wells Ranch USX BB15-65HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
802.00	0.31	219.74	802.00	-1.67	-1.39	-1.11	0.04
894.00	1.88	168.01	893.98	-3.34	-1.23	-0.70	1.85
986.00	3.73	174.15	985.86	-7.79	-0.61	0.61	2.03
1,078.00	3.57	172.66	1,077.68	-13.61	0.06	2.18	0.20
1,173.00	7.43	177.14	1,172.22	-22.68	0.74	4.27	4.09
1,268.00	9.82	179.84	1,266.14	-36.92	1.07	6.82	2.55
1,362.00	11.83	185.79	1,358.47	-54.52	0.12	8.63	2.44
1,457.00	12.73	189.60	1,451.29	-74.53	-2.61	9.06	1.27
1,552.00	11.87	188.11	1,544.11	-94.52	-5.73	9.09	0.96
1,646.00	12.61	189.87	1,635.98	-114.20	-8.85	9.08	0.88
1,741.00	10.98	188.23	1,728.97	-133.38	-11.93	9.03	1.75
1,836.00	12.06	189.95	1,822.05	-152.11	-14.94	8.98	1.19
1,931.00	9.62	189.82	1,915.35	-169.71	-18.01	8.70	2.57
2,025.00	13.18	200.39	2,007.49	-187.50	-23.08	6.46	4.38
2,120.00	12.71	201.31	2,100.08	-207.39	-30.65	2.09	0.54
2,218.00	11.22	201.91	2,195.94	-226.28	-38.13	-2.35	1.53
2,314.00	11.89	192.95	2,290.01	-244.58	-43.83	-5.12	1.99
2,409.00	10.37	191.04	2,383.22	-262.51	-47.66	-6.11	1.65
2,504.00	10.84	184.83	2,476.60	-279.81	-50.05	-5.77	1.30
2,600.00	11.96	184.11	2,570.70	-298.72	-51.52	-4.27	1.18
2,695.00	11.30	184.10	2,663.75	-317.82	-52.90	-2.65	0.69
2,791.00	12.28	184.11	2,757.72	-337.39	-54.30	-0.98	1.02
2,886.00	12.15	184.46	2,850.57	-357.43	-55.80	0.67	0.16
2,982.00	11.02	184.70	2,944.62	-376.65	-57.34	2.15	1.18
3,077.00	11.41	186.53	3,037.80	-395.04	-59.15	3.22	0.56
3,173.00	10.44	184.83	3,132.06	-413.14	-60.96	4.26	1.06
3,268.00	10.34	183.02	3,225.50	-430.23	-62.14	5.77	0.36
3,363.00	9.85	181.71	3,319.03	-446.86	-62.83	7.68	0.57
3,459.00	11.22	184.81	3,413.41	-464.38	-63.86	9.40	1.54
3,554.00	12.01	187.22	3,506.47	-483.40	-65.87	10.37	0.98
3,650.00	12.94	187.16	3,600.20	-503.97	-68.47	11.02	0.97
3,745.00	12.77	186.80	3,692.82	-524.95	-71.04	11.76	0.20
3,841.00	12.85	187.64	3,786.43	-546.06	-73.71	12.41	0.21
3,936.00	11.32	187.20	3,879.32	-565.79	-76.29	12.95	1.61
4,032.00	10.96	184.23	3,973.51	-584.23	-78.14	13.99	0.71
4,127.00	11.28	187.59	4,066.73	-602.45	-80.03	14.97	0.76
4,223.00	10.64	192.14	4,160.98	-620.42	-83.14	14.71	1.12
4,318.00	10.62	191.93	4,254.35	-637.56	-86.79	13.77	0.05
4,414.00	10.78	188.37	4,348.68	-655.10	-89.93	13.41	0.71
4,509.00	10.86	185.62	4,441.99	-672.80	-92.10	14.03	0.55
4,605.00	8.60	182.78	4,536.61	-688.97	-93.33	15.34	2.41
4,700.00	7.47	180.24	4,630.67	-702.24	-93.70	17.04	1.25
4,796.00	6.64	177.51	4,725.95	-714.02	-93.49	19.09	0.93
4,891.00	6.20	176.05	4,820.35	-724.63	-92.89	21.33	0.49
4,986.00	5.91	187.25	4,914.82	-734.60	-93.16	22.63	1.28
5,082.00	5.50	184.53	5,010.35	-744.09	-94.15	23.13	0.51
5,177.00	4.73	182.67	5,104.97	-752.54	-94.69	23.92	0.83
5,272.00	3.21	202.87	5,199.74	-758.90	-95.90	23.71	2.15
5,368.00	2.21	242.44	5,295.64	-762.24	-98.59	21.58	2.15

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,464.00	2.20	233.59	5,391.57	-764.19	-101.71	18.79	0.35
5,559.00	1.74	245.48	5,486.51	-765.87	-104.49	16.31	0.65
5,654.00	1.98	237.46	5,581.46	-767.35	-107.19	13.88	0.37
5,750.00	1.67	258.15	5,677.42	-768.53	-109.96	11.33	0.75
5,782.00	1.71	259.68	5,709.40	-768.71	-110.88	10.44	0.19
5,845.00	0.79	270.59	5,772.39	-768.87	-112.24	9.13	1.50
5,893.00	4.04	84.16	5,820.35	-768.70	-110.89	10.44	10.05
5,941.00	8.88	86.10	5,868.04	-768.27	-105.51	15.68	10.09
5,989.00	13.34	91.47	5,915.12	-768.16	-96.27	24.79	9.53
6,036.00	17.76	94.78	5,960.39	-768.90	-83.70	37.32	9.59
6,084.00	23.33	93.04	6,005.32	-770.01	-66.90	54.09	11.67
6,132.00	26.71	89.82	6,048.82	-770.48	-46.62	74.20	7.59
6,180.00	30.14	86.49	6,091.02	-769.71	-23.79	96.62	7.87
6,227.00	34.29	85.07	6,130.78	-767.85	1.19	121.01	8.97
6,275.00	37.85	84.08	6,169.57	-765.17	29.32	148.37	7.52
6,323.00	38.81	83.46	6,207.23	-761.94	58.91	177.10	2.15
6,371.00	40.04	82.76	6,244.30	-758.28	89.17	206.42	2.72
6,418.00	42.32	82.75	6,279.68	-754.38	119.87	236.13	4.85
6,466.00	43.82	83.10	6,314.74	-750.34	152.40	267.63	3.16
6,514.00	48.65	87.00	6,347.94	-747.40	186.91	301.26	11.64
6,604.62	58.01	87.00	6,402.00	-743.60	259.42	372.29	10.33
Sharon Springs Mrkr							
6,612.00	58.77	87.00	6,405.87	-743.27	265.69	378.43	10.33
Projection To Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,612.00	6,405.87	-743.27	265.69	Projection To Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	Wells Ranch USX BB15-65HN_PlanB - Rev0_BHL Tgt	98.98	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
802.00	6,612.00	Sperry MWD Surveys	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
674.00	674.00	9-5/8in	9-5/8	13-3/4
1,000.00	999.83	7"	7	8-3/4