

Nabors M55

Chisholm Energy Holdings

Eddy County, NM (NAD 83) Cottonwood 28-33 Federal

API#

Cottonwood 28-33 Fed Com 2BS 7H

NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 24 2018

Wellbore #1

Design: Actual

30-015-44650

RECEIVED

Sperry Drilling Services

Combo Report

08 May, 2018

Provide Signature Page for
Directional Survey

Well Coordinates: 32° 01' 14.73" N
104° 17' 33.06" W

North American Datum 1983
New Mexico Eastern Zone
371,292.90 N
553,986.90 E

Ground Level: 3,384.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well Cottonwood 28-33 Fed Com 2BS 7H

GE 3384 + 22' KB @ 3406.00usft (Nabors M55)

N

Grid

API US Survey Feet

Version: 5000.1 Build: 81E

Report Version: Midcon Combo v1.12

HALLIBURTON

Design Report for Cottonwood 28-33 Fed Com 2BS 7H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
0.00	0.00	0.00	0.00	0.00 N	0.00 E	371,292.90	553,986.90	0.00	0.00	0.00	
123.00	0.12	24.63	123.00	0.12 N	0.05 E	371,293.02	553,986.95	0.10	-0.12	24.63	
211.00	0.35	239.13	211.00	0.06 N	0.14 W	371,292.96	553,986.76	0.52	-0.06	-154.11	
300.00	0.74	218.48	300.00	0.53 S	0.73 W	371,292.37	553,986.17	0.48	0.53	-37.31	
377.00	0.83	234.71	376.99	1.24 S	1.49 W	371,291.66	553,985.41	0.31	1.24	76.21	
489.00	1.41	230.61	488.97	2.58 S	3.22 W	371,290.32	553,983.68	0.52	2.58	-9.92	
583.00	1.21	224.70	582.94	4.02 S	4.81 W	371,288.88	553,982.09	0.26	4.02	-148.89	
678.00	1.02	234.68	677.92	5.22 S	6.21 W	371,287.68	553,980.69	0.29	5.22	139.29	
750.00	0.83	206.69	749.91	6.06 S	6.97 W	371,286.84	553,979.93	0.67	6.06	-126.39	
844.00	0.99	207.47	843.90	7.39 S	7.65 W	371,285.51	553,979.25	0.17	7.39	4.82	
939.00	0.99	53.04	938.90	7.62 S	7.37 W	371,285.28	553,979.53	2.03	7.62	-167.21	
1,034.00	1.42	36.05	1,033.88	6.18 S	6.02 W	371,286.72	553,980.88	0.58	6.18	-48.42	
1,128.00	2.02	43.07	1,127.83	4.03 S	4.20 W	371,288.87	553,982.70	0.68	4.03	22.88	
1,222.00	1.25	37.60	1,221.80	2.00 S	2.45 W	371,290.90	553,984.45	0.83	2.00	-171.27	
1,317.00	1.37	50.72	1,316.77	0.46 S	0.94 W	371,292.44	553,985.96	0.34	0.46	74.84	
1,412.00	2.34	76.89	1,411.72	0.70 N	1.83 E	371,293.60	553,988.73	1.33	-0.70	54.71	
1,507.00	3.57	77.97	1,506.59	1.75 N	6.61 E	371,294.65	553,993.51	1.30	-1.75	3.13	
1,591.00	3.99	79.88	1,590.41	2.81 N	12.05 E	371,295.71	553,998.95	0.52	-2.81	17.64	
1,665.00	3.62	82.63	1,664.25	3.56 N	16.90 E	371,296.46	554,003.80	0.56	-3.56	155.11	
1,729.00	1.74	99.18	1,728.17	3.67 N	19.86 E	371,296.57	554,006.76	3.15	-3.67	165.75	
1,823.00	1.23	204.89	1,822.16	2.52 N	20.85 E	371,295.42	554,007.75	2.54	-2.52	150.26	
1,918.00	1.32	211.27	1,917.13	0.66 N	19.85 E	371,293.56	554,006.75	0.18	-0.66	60.84	
2,013.00	1.18	208.81	2,012.11	1.13 S	18.81 E	371,291.77	554,005.71	0.16	1.13	-160.25	
2,139.00	1.86	72.79	2,138.09	1.66 S	20.14 E	371,291.24	554,007.04	2.25	1.66	-152.84	
2,202.00	1.81	76.85	2,201.06	1.13 S	22.09 E	371,291.77	554,008.99	0.22	1.13	113.06	
2,297.00	1.73	76.56	2,296.01	0.46 S	24.94 E	371,292.44	554,011.84	0.08	0.46	-173.76	
2,392.00	0.35	168.06	2,391.00	0.41 S	26.40 E	371,292.49	554,013.30	1.87	0.41	168.62	
2,487.00	1.09	228.60	2,485.99	1.29 S	25.78 E	371,291.61	554,012.68	1.02	1.29	78.90	
2,582.00	0.99	235.30	2,580.97	2.35 S	24.43 E	371,290.55	554,011.33	0.17	2.35	132.75	
2,676.00	1.14	234.86	2,674.96	3.35 S	22.99 E	371,289.55	554,009.89	0.16	3.35	-3.34	
2,771.00	0.19	271.59	2,769.95	3.89 S	22.06 E	371,289.01	554,008.96	1.05	3.89	173.44	
2,866.00	0.74	11.63	2,864.95	3.29 S	22.03 E	371,289.61	554,008.93	0.84	3.29	113.64	
2,961.00	0.64	37.77	2,959.94	2.27 S	22.48 E	371,290.63	554,009.38	0.34	2.27	120.40	
3,056.00	0.74	19.08	3,054.93	1.27 S	23.00 E	371,291.63	554,009.90	0.26	1.27	-75.58	
3,151.00	0.47	36.93	3,149.93	0.38 S	23.44 E	371,292.52	554,010.34	0.34	0.38	153.79	
3,246.00	0.22	62.18	3,244.93	0.02 N	23.83 E	371,292.92	554,010.73	0.30	-0.02	160.90	

Design Report for Cottonwood 28-33 Fed Com 2BS 7H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,341.00	0.03	274.24	3,339.93	0.11 N	23.97 E	371,293.01	554,010.87	0.26	-0.11	-176.29	
3,435.00	0.10	262.61	3,433.93	0.10 N	23.86 E	371,293.00	554,010.76	0.08	-0.10	-16.53	
3,530.00	0.40	190.20	3,528.93	0.24 S	23.72 E	371,292.66	554,010.62	0.40	0.24	-86.87	
3,625.00	0.31	226.53	3,623.92	0.74 S	23.48 E	371,292.16	554,010.38	0.25	0.74	129.29	
3,719.00	0.07	145.03	3,717.92	0.96 S	23.33 E	371,291.94	554,010.23	0.33	0.96	-166.99	
3,814.00	0.34	213.67	3,812.92	1.25 S	23.20 E	371,291.65	554,010.10	0.34	1.25	80.35	
3,909.00	0.53	213.54	3,907.92	1.85 S	22.80 E	371,291.05	554,009.70	0.20	1.85	-0.36	
4,003.00	1.00	242.55	4,001.91	2.59 S	21.84 E	371,290.31	554,008.74	0.63	2.59	54.61	
4,098.00	0.65	82.54	4,096.91	2.90 S	21.63 E	371,290.00	554,008.53	1.71	2.90	-172.15	
4,193.00	1.03	77.34	4,191.90	2.64 S	23.00 E	371,290.26	554,009.90	0.41	2.64	-13.95	
4,288.00	0.59	93.77	4,286.89	2.49 S	24.32 E	371,290.41	554,011.22	0.52	2.49	160.22	
4,382.00	0.48	118.94	4,380.88	2.71 S	25.15 E	371,290.19	554,012.05	0.27	2.71	127.31	
4,477.00	0.66	107.43	4,475.88	3.07 S	26.02 E	371,289.83	554,012.92	0.22	3.07	-38.30	
4,572.00	0.79	127.73	4,570.87	3.63 S	27.06 E	371,289.27	554,013.96	0.30	3.63	73.55	
4,667.00	0.85	134.31	4,665.86	4.52 S	28.08 E	371,288.38	554,014.98	0.12	4.52	60.81	
4,761.00	0.88	139.32	4,759.85	5.56 S	29.05 E	371,287.34	554,015.95	0.09	5.56	70.88	
4,856.00	0.27	225.43	4,854.85	6.27 S	29.37 E	371,286.63	554,016.27	0.95	6.27	162.64	
4,950.00	0.61	259.75	4,948.84	6.51 S	28.72 E	371,286.39	554,015.62	0.44	6.51	55.79	
5,045.00	0.52	274.19	5,043.84	6.57 S	27.79 E	371,286.33	554,014.69	0.18	6.57	129.38	
5,140.00	0.90	254.80	5,138.83	6.74 S	26.64 E	371,286.16	554,013.54	0.47	6.74	-42.25	
5,234.00	0.83	16.72	5,232.83	6.28 S	26.12 E	371,286.62	554,013.02	1.61	6.28	152.24	
5,329.00	0.35	27.26	5,327.82	5.36 S	26.46 E	371,287.54	554,013.36	0.52	5.36	172.49	
5,423.00	0.10	28.28	5,421.82	5.03 S	26.63 E	371,287.87	554,013.53	0.27	5.03	179.59	
5,518.00	0.38	166.51	5,516.82	5.27 S	26.74 E	371,287.63	554,013.64	0.48	5.27	146.57	
5,613.00	0.46	206.32	5,611.82	5.92 S	26.64 E	371,286.98	554,013.54	0.31	5.92	95.17	
5,707.00	0.59	288.62	5,705.82	6.10 S	26.02 E	371,286.80	554,012.92	0.74	6.10	123.08	
5,802.00	1.32	286.31	5,800.80	5.64 S	24.50 E	371,287.26	554,011.40	0.77	5.64	-4.17	
5,895.00	1.50	294.06	5,893.77	4.84 S	22.36 E	371,288.06	554,009.26	0.28	4.84	50.57	
5,991.00	1.18	305.02	5,989.75	3.76 S	20.41 E	371,289.14	554,007.31	0.43	3.76	146.70	
6,085.00	1.00	286.99	6,083.73	2.96 S	18.83 E	371,289.94	554,005.73	0.41	2.96	-126.51	
6,180.00	0.52	344.75	6,178.72	2.31 S	17.92 E	371,290.59	554,004.82	0.89	2.31	148.67	
6,274.00	0.00	12.31	6,272.72	1.89 S	17.81 E	371,291.01	554,004.71	0.55	1.89	180.00	
6,370.00	0.20	181.53	6,368.72	2.06 S	17.81 E	371,290.84	554,004.71	0.21	2.06	181.53	
6,391.00	0.35	150.75	6,389.72	2.15 S	17.84 E	371,290.75	554,004.74	0.98	2.15	-60.65	
6,449.00	0.22	142.13	6,447.72	2.40 S	17.99 E	371,290.50	554,004.89	0.24	2.40	-166.02	
6,480.00	3.42	83.73	6,478.70	2.34 S	18.95 E	371,290.56	554,005.85	10.68	2.34	-61.64	
6,512.00	7.82	85.81	6,510.54	2.08 S	22.07 E	371,290.82	554,008.97	13.76	2.08	3.69	

Design Report for Cottonwood 28-33 Fed Com 2BS 7H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,543.00	12.47	87.88	6,541.05	1.80 S	27.52 E	371,291.10	554,014.42	15.04	1.80	5.50	
6,575.00	17.33	89.54	6,571.96	1.63 S	35.74 E	371,291.27	554,022.64	15.24	1.63	5.82	
6,607.00	21.75	90.65	6,602.11	1.66 S	46.44 E	371,291.24	554,033.34	13.86	1.66	5.33	
6,638.00	26.60	91.93	6,630.38	1.96 S	59.13 E	371,290.94	554,046.03	15.74	1.96	6.76	
6,670.00	30.10	91.44	6,658.54	2.41 S	74.32 E	371,290.49	554,061.22	10.96	2.41	-4.02	
6,701.00	33.55	89.78	6,684.88	2.57 S	90.66 E	371,290.33	554,077.56	11.48	2.57	-14.95	
6,732.00	37.13	88.94	6,710.16	2.36 S	108.59 E	371,290.54	554,095.49	11.65	2.36	-8.07	
6,763.00	41.48	88.11	6,734.14	1.85 S	128.21 E	371,291.05	554,115.11	14.13	1.85	-7.21	
6,795.00	45.10	88.76	6,757.43	1.26 S	150.14 E	371,291.64	554,137.04	11.40	1.26	7.26	
6,827.00	46.92	92.29	6,779.66	1.48 S	173.16 E	371,291.42	554,160.06	9.76	1.48	55.61	
6,858.00	47.00	97.89	6,800.83	3.49 S	195.71 E	371,289.41	554,182.61	13.20	3.49	90.79	
6,890.00	47.85	102.87	6,822.48	7.74 S	218.87 E	371,285.16	554,205.77	11.76	7.74	78.64	
6,922.00	48.94	107.58	6,843.74	14.02 S	241.94 E	371,278.88	554,228.84	11.52	14.02	74.38	
6,953.00	49.30	113.39	6,864.04	22.22 S	263.88 E	371,270.68	554,250.78	14.22	22.22	87.22	
6,985.00	49.83	117.83	6,884.80	32.75 S	285.83 E	371,260.15	554,272.73	10.69	32.75	82.53	
7,017.00	49.39	122.45	6,905.54	44.98 S	306.90 E	371,247.92	554,293.80	11.08	44.98	98.62	
7,048.00	50.20	125.72	6,925.55	58.25 S	326.50 E	371,234.65	554,313.40	8.47	58.25	73.09	
7,079.00	50.36	129.18	6,945.37	72.74 S	345.43 E	371,220.16	554,332.33	8.60	72.74	87.67	
7,111.00	51.55	134.29	6,965.53	89.28 S	363.95 E	371,203.62	554,350.85	12.95	89.28	74.93	
7,143.00	52.44	137.58	6,985.24	107.40 S	381.48 E	371,185.50	554,368.38	8.56	107.40	72.07	
7,174.00	53.89	140.59	7,003.83	126.15 S	397.72 E	371,166.75	554,384.62	9.07	126.15	59.87	
7,205.00	55.97	143.56	7,021.64	146.16 S	413.31 E	371,146.74	554,400.21	10.32	146.16	50.31	
7,236.00	57.91	145.59	7,038.55	167.34 S	428.36 E	371,125.56	554,415.26	8.32	167.34	41.81	
7,267.00	59.52	149.32	7,054.65	189.67 S	442.60 E	371,103.23	554,429.50	11.52	189.67	64.18	
7,299.00	61.59	151.06	7,070.38	213.84 S	456.45 E	371,079.06	554,443.35	8.02	213.84	36.64	
7,331.00	62.81	151.60	7,085.31	238.68 S	470.03 E	371,054.22	554,456.93	4.09	238.68	21.51	
7,363.00	62.97	151.18	7,099.89	263.69 S	483.67 E	371,029.21	554,470.57	1.27	263.69	-66.93	
7,394.00	63.12	150.67	7,113.94	287.84 S	497.10 E	371,005.06	554,484.00	1.54	287.84	-71.85	
7,426.00	62.96	150.16	7,128.45	312.64 S	511.18 E	370,980.26	554,498.08	1.51	312.64	-109.51	
7,457.00	65.12	152.19	7,142.02	337.06 S	524.61 E	370,955.84	554,511.51	9.12	337.06	40.65	
7,489.00	67.42	155.03	7,154.90	363.30 S	537.62 E	370,929.60	554,524.52	10.85	363.30	49.08	
7,520.00	69.26	156.96	7,166.34	389.61 S	549.34 E	370,903.29	554,536.24	8.29	389.61	44.63	
7,552.00	71.16	159.39	7,177.18	417.56 S	560.53 E	370,875.34	554,547.43	9.29	417.56	50.69	
7,584.00	72.79	161.51	7,187.08	446.24 S	570.71 E	370,846.66	554,557.61	8.10	446.24	51.37	
7,615.00	74.83	162.83	7,195.72	474.58 S	579.82 E	370,818.32	554,566.72	7.75	474.58	32.04	
7,646.00	76.90	165.58	7,203.30	503.50 S	588.00 E	370,789.40	554,574.90	10.89	503.50	52.52	
7,678.00	78.92	167.63	7,210.00	533.93 S	595.25 E	370,758.97	554,582.15	8.89	533.93	45.00	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)								
7,710.00	81.65	168.65	7,215.40	564.80 S	601.73 E	370,728.10	554,588.63	9.09	564.80	20.31	
7,742.00	84.05	170.10	7,219.38	596.00 S	607.58 E	370,696.90	554,594.48	8.74	596.00	31.03	
7,773.00	85.25	171.91	7,222.27	626.49 S	612.41 E	370,666.41	554,599.31	6.98	626.49	56.43	
7,804.00	85.83	173.88	7,224.68	657.15 S	616.23 E	370,635.75	554,603.13	6.61	657.15	73.63	
7,836.00	86.51	176.02	7,226.82	688.96 S	619.04 E	370,603.94	554,605.94	7.00	688.96	72.41	
7,885.00	88.06	178.62	7,229.14	737.84 S	621.33 E	370,555.06	554,608.23	6.17	737.84	59.24	
7,929.00	90.49	181.26	7,229.70	781.83 S	621.37 E	370,511.07	554,608.27	8.15	781.83	47.39	
8,024.00	92.66	182.29	7,227.09	876.74 S	618.43 E	370,416.16	554,605.33	2.53	876.74	25.37	
8,118.00	91.36	180.32	7,223.79	970.65 S	616.29 E	370,322.25	554,603.19	2.51	970.65	-123.40	
8,213.00	90.99	179.10	7,221.84	1,065.63 S	616.77 E	370,227.27	554,603.67	1.34	1,065.63	-106.86	
8,308.00	91.42	179.33	7,219.84	1,160.60 S	618.07 E	370,132.30	554,604.97	0.51	1,160.60	28.13	
8,402.00	92.59	179.51	7,216.55	1,254.54 S	619.02 E	370,038.36	554,605.92	1.26	1,254.54	8.74	
8,497.00	90.31	180.80	7,214.15	1,349.50 S	618.77 E	369,943.40	554,605.67	2.76	1,349.50	150.49	
8,591.00	90.74	181.57	7,213.29	1,443.47 S	616.82 E	369,849.43	554,603.72	0.94	1,443.47	60.82	
8,686.00	91.98	181.77	7,211.03	1,538.40 S	614.06 E	369,754.50	554,600.96	1.32	1,538.40	9.16	
8,781.00	90.49	182.08	7,208.99	1,633.33 S	610.87 E	369,659.57	554,597.77	1.60	1,633.33	168.25	
8,875.00	90.68	182.46	7,208.03	1,727.25 S	607.14 E	369,565.65	554,594.04	0.45	1,727.25	63.43	
8,970.00	92.28	182.63	7,205.57	1,822.12 S	602.93 E	369,470.78	554,589.83	1.69	1,822.12	6.06	
9,064.00	91.79	182.13	7,202.24	1,915.98 S	599.02 E	369,376.92	554,585.92	0.74	1,915.98	-134.43	
9,159.00	91.98	182.39	7,199.11	2,010.85 S	595.28 E	369,282.05	554,582.18	0.34	2,010.85	53.82	
9,254.00	89.94	181.65	7,197.52	2,105.77 S	591.93 E	369,187.13	554,578.83	2.28	2,105.77	-160.06	
9,349.00	90.00	179.35	7,197.57	2,200.76 S	591.10 E	369,092.14	554,578.00	2.42	2,200.76	-88.51	
9,444.00	90.99	178.10	7,196.75	2,295.73 S	593.22 E	368,997.17	554,580.12	1.68	2,295.73	-51.62	
9,539.00	92.29	178.22	7,194.03	2,390.64 S	596.27 E	368,902.26	554,583.17	1.37	2,390.64	5.27	
9,634.00	90.43	179.34	7,191.78	2,485.59 S	598.29 E	368,807.31	554,585.19	2.29	2,485.59	148.94	
9,729.00	91.30	180.08	7,190.34	2,580.58 S	598.77 E	368,712.32	554,585.67	1.20	2,580.58	40.38	
9,824.00	90.31	178.63	7,189.01	2,675.56 S	599.84 E	368,617.34	554,586.74	1.85	2,675.56	-124.31	
9,919.00	90.12	178.72	7,188.65	2,770.53 S	602.03 E	368,522.37	554,588.93	0.22	2,770.53	154.65	
10,013.00	91.11	179.27	7,187.64	2,864.51 S	603.68 E	368,428.39	554,590.58	1.20	2,864.51	29.05	
10,108.00	92.35	179.59	7,184.77	2,959.46 S	604.63 E	368,333.44	554,591.53	1.35	2,959.46	14.46	
10,203.00	93.46	179.09	7,179.96	3,054.33 S	605.72 E	368,238.57	554,592.62	1.28	3,054.33	-24.21	
10,298.00	92.47	178.64	7,175.04	3,149.18 S	607.60 E	368,143.72	554,594.50	1.14	3,149.18	-155.57	
10,392.00	90.12	178.41	7,172.92	3,243.12 S	610.02 E	368,049.78	554,596.92	2.51	3,243.12	-174.41	
10,487.00	90.80	178.91	7,172.16	3,338.09 S	612.24 E	367,954.81	554,599.14	0.89	3,338.09	36.32	
10,582.00	92.47	180.16	7,169.45	3,433.04 S	613.01 E	367,859.86	554,599.91	2.20	3,433.04	36.79	
10,676.00	91.24	180.80	7,166.40	3,526.99 S	612.22 E	367,765.91	554,599.12	1.47	3,526.99	152.51	

Design Report for Cottonwood 28-33 Fed Com 2BS 7H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,771.00	88.95	179.96	7,166.25	3,621.98 S	611.59 E	367,670.92	554,598.49	2.57	3,621.98	-159.85	
10,866.00	90.37	179.18	7,166.81	3,716.97 S	612.31 E	367,575.93	554,599.21	1.71	3,716.97	-28.78	
10,961.00	92.16	179.08	7,164.71	3,811.93 S	613.75 E	367,480.97	554,600.65	1.89	3,811.93	-3.20	
11,055.00	91.85	179.25	7,161.42	3,905.87 S	615.12 E	367,387.03	554,602.02	0.38	3,905.87	151.27	
11,151.00	92.04	179.79	7,158.17	4,001.81 S	615.92 E	367,291.09	554,602.82	0.60	4,001.81	70.60	
11,245.00	93.03	180.25	7,154.01	4,095.71 S	615.89 E	367,197.19	554,602.79	1.16	4,095.71	24.89	
11,340.00	91.30	180.52	7,150.42	4,190.64 S	615.25 E	367,102.26	554,602.15	1.84	4,190.64	171.13	
11,435.00	90.00	180.74	7,149.34	4,285.63 S	614.21 E	367,007.27	554,601.11	1.39	4,285.63	170.39	
11,530.00	88.40	180.81	7,150.67	4,380.61 S	612.92 E	366,912.29	554,599.82	1.69	4,380.61	177.50	
11,624.00	88.89	181.18	7,152.89	4,474.56 S	611.29 E	366,818.34	554,598.19	0.65	4,474.56	37.05	
11,719.00	90.00	181.79	7,153.81	4,569.53 S	608.83 E	366,723.37	554,595.73	1.33	4,569.53	28.79	
11,814.00	89.63	180.33	7,154.12	4,664.51 S	607.07 E	366,628.39	554,593.97	1.59	4,664.51	-104.22	
11,909.00	89.32	178.94	7,154.99	4,759.50 S	607.68 E	366,533.40	554,594.58	1.50	4,759.50	-102.58	
12,004.00	90.12	178.98	7,155.45	4,854.48 S	609.40 E	366,438.42	554,596.30	0.84	4,854.48	2.86	
12,097.00	91.42	179.64	7,154.20	4,947.46 S	610.52 E	366,345.44	554,597.42	1.57	4,947.46	26.91	
12,192.00	90.80	179.26	7,152.36	5,042.44 S	611.43 E	366,250.46	554,598.33	0.77	5,042.44	-148.50	
12,287.00	91.36	179.40	7,150.57	5,137.42 S	612.54 E	366,155.48	554,599.44	0.61	5,137.42	14.03	
12,382.00	90.93	178.93	7,148.67	5,232.39 S	613.93 E	366,060.51	554,600.83	0.67	5,232.39	-132.46	
12,476.00	91.36	178.80	7,146.80	5,326.35 S	615.79 E	365,966.55	554,602.69	0.48	5,326.35	-16.82	
12,571.00	90.31	179.22	7,145.41	5,421.32 S	617.43 E	365,871.58	554,604.33	1.19	5,421.32	158.20	
12,666.00	89.63	179.05	7,145.46	5,516.31 S	618.86 E	365,776.59	554,605.76	0.74	5,516.31	-165.96	
12,761.00	91.05	179.54	7,144.90	5,611.30 S	620.03 E	365,681.60	554,606.93	1.58	5,611.30	19.04	
12,855.00	89.94	179.27	7,144.08	5,705.29 S	621.01 E	365,587.61	554,607.91	1.22	5,705.29	-166.33	
12,950.00	89.14	178.80	7,144.85	5,800.27 S	622.61 E	365,492.63	554,609.51	0.98	5,800.27	-149.57	
13,044.00	90.12	179.51	7,145.45	5,894.26 S	623.99 E	365,398.64	554,610.89	1.29	5,894.26	35.93	
13,139.00	91.17	179.91	7,144.39	5,989.25 S	624.48 E	365,303.65	554,611.38	1.18	5,989.25	20.85	
13,234.00	90.49	178.99	7,143.01	6,084.23 S	625.39 E	365,208.67	554,612.29	1.20	6,084.23	-126.46	
13,331.00	90.12	178.58	7,142.49	6,181.21 S	627.44 E	365,111.69	554,614.34	0.57	6,181.21	-132.06	
13,426.00	90.12	178.95	7,142.29	6,276.19 S	629.49 E	365,016.71	554,616.39	0.39	6,276.19	90.00	
13,520.00	90.19	179.54	7,142.04	6,370.18 S	630.73 E	364,922.72	554,617.63	0.63	6,370.18	83.23	
13,615.00	89.75	179.72	7,142.09	6,465.18 S	631.34 E	364,827.72	554,618.24	0.50	6,465.18	157.75	
13,709.00	88.71	178.20	7,143.35	6,559.15 S	633.05 E	364,733.75	554,619.95	1.96	6,559.15	-124.39	
13,802.00	88.76	176.64	7,145.41	6,652.03 S	637.24 E	364,640.87	554,624.14	1.68	6,652.03	-88.18	
13,896.00	89.14	175.68	7,147.13	6,745.80 S	643.53 E	364,547.10	554,630.43	1.10	6,745.80	-68.41	
13,991.00	90.12	177.26	7,147.74	6,840.61 S	649.38 E	364,452.29	554,636.28	1.96	6,840.61	58.20	
14,085.00	89.88	177.56	7,147.74	6,934.52 S	653.63 E	364,358.38	554,640.53	0.41	6,934.52	128.66	
14,180.00	89.69	178.07	7,148.10	7,029.45 S	657.25 E	364,263.45	554,644.15	0.57	7,029.45	110.43	

Design Report for Cottonwood 28-33 Fed Com 2BS 7H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,271.00	89.32	178.71	7,148.88	7,120.41 S	659.80 E	364,172.49	554,646.70	0.81	7,120.41	120.04	Last MWD Survey - 14271.00' MD
14,339.00	89.32	178.71	7,149.69	7,188.39 S	661.34 E	364,104.51	554,648.24	0.00	7,188.39	0.00	Projection to TD - 14339.00' MD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
14,271.00	7,148.88	-7,120.41	659.80	Last MWD Survey - 14271.00' MD
14,339.00	7,149.69	-7,188.39	661.34	Projection to TD - 14339.00' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
123.00	14,271.00	Survey #1	MWD
14,339.00	14,339.00	Survey #2	Blind (OWSG)

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (°)	+N/-S (°)	+E/-W (°)	Northing (°)	Easting (°)	Latitude	Longitude
- hit/miss target									
- Shape									
()									

Design Report for Cottonwood 28-33 Fed Com 2BS 7H - Actual

Directional Difficulty Index

Average Dogleg over Survey: 1.84 °/100usft

Maximum Dogleg over Survey: 15.74 °/100usft at 6,638.00
usft

Net Tortousity applicable to Plans: 0.28 °/100usft

Directional Difficulty Index: 6.602

Audit Info

North Reference Sheet for Cottonwood 28-33 Federal - Cottonwood 28-33 Fed Com 2BS 7H - Wellbore #1

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

Vertical Depths are relative to GE 3384 + 22' KB @ 3406.00usft (Nabors M55). Northing and Easting are relative to Cottonwood 28-33 Fed Com 2BS 7H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is 104° 20' 0.000 W°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 0° 0' 0.000 N°

False Easting: 541,337.50usft, False Northing: 0.00usft, Scale Reduction: 0.99990927

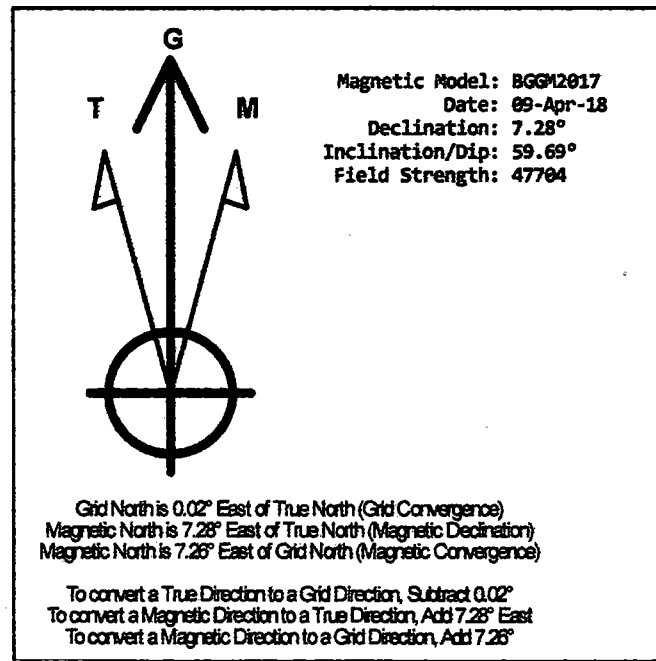
Grid Coordinates of Well: 371,292.90 usft N, 553,986.90 usft E

Geographical Coordinates of Well: 32° 01' 14.73" N, 104° 17' 33.06" W

Grid Convergence at Surface is: 0.02°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,339.00usft
the Bottom Hole Displacement is 7,218.74usft in the Direction of 174.74° (Grid).

Magnetic Convergence at surface is: -7.26° (9 April 2018, , BGGM2017)





Chisholm Energy Holdings

GE 3384 + 22' KB @ 3406.00usft (Nabors M55)

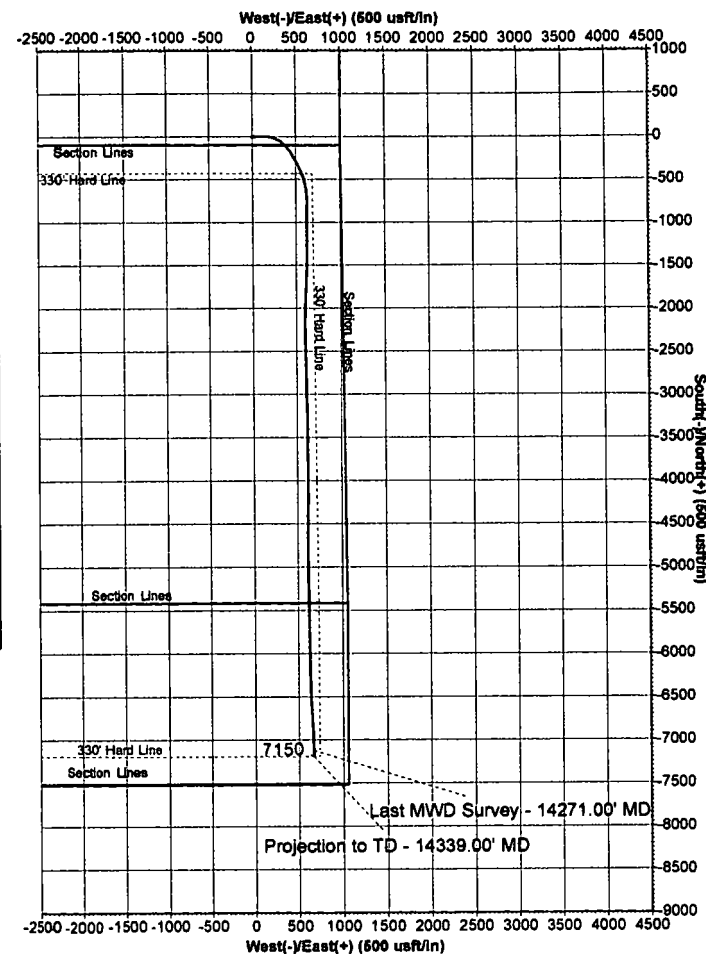
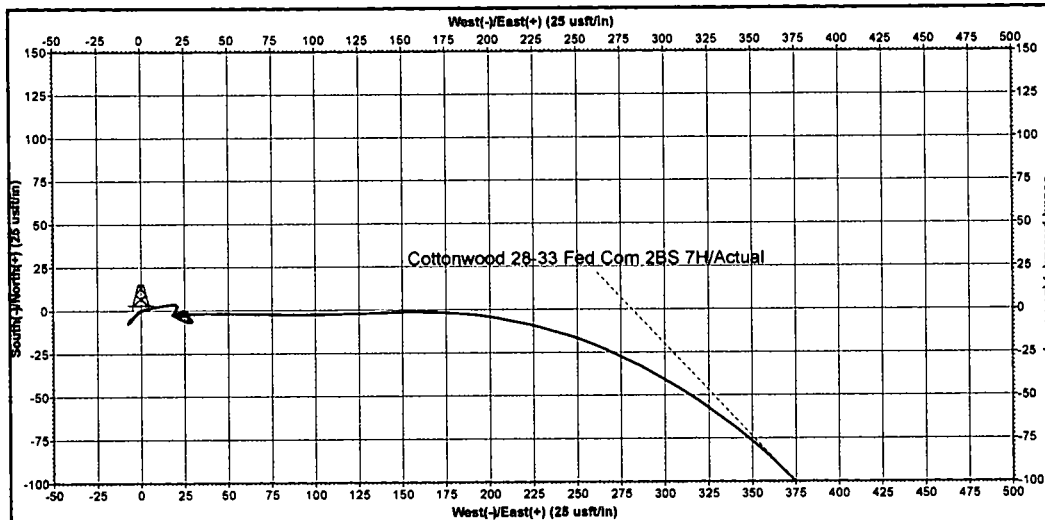
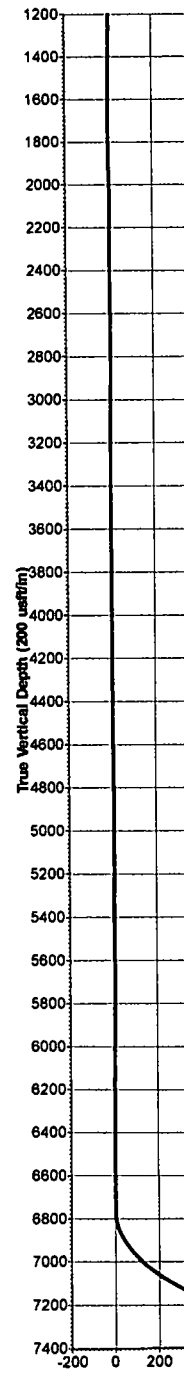
Ground Level: 3384.00

Project: Eddy County, NM (NAD 83)
Site: Cottonwood 28-33 Federal
Well: Cottonwood 28-33 Fed Com 2BS 7H
Wellbore: Wellbore #1
Design: Actual
Rig: Nabors M55

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: New Mexico Eastern Zone



Azimuths to Grid North
True North: -0.02°
Magnetic North: 7.26°
Magnetic Field
Strength: 47703.7nT
Dip Angle: 59.69°
Date: 4/9/2018
Model: BOGM2017



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Projection to TD - 14339.00' MD
Last MWD Survey - 14271.00' MD

Ve in at 180.00° 1 usft/in