

Orion Hercules

XTO Energy Inc.

Lea County, NM (NAD27) Severus 31 Federal Com
API#

Severus 31 Federal Com 4H

Wellbore #1

Design: Actual

RECEIVED
AUG 03 2018
DISTRICT II-ARTESIA O.C.D.

Sperry Drilling Services Combo Report

14 February, 2018

Well Coordinates: 32° 32' 14.62" N
103° 36' 17.21" W

NAD 1927 (NADCON CONUS)
New Mexico East 3001
559,984.40 N
724,523.00 E

Ground Level: 3,687.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well Severus 31 Federal Com 4H

GE 3687 + 24 @ 3711.00usft (Orion Hercules)

N

Grid

Midcon (2 decimal)

Version: 5000.1 Build: 81E

Report Version: Midcon Combo v1.11

HALLIBURTON

HOBBS OCD

Aug 4 2018
30-025-43418

HALLIBURTON**Design Report for Severus 31 Federal Com 4H - Actual**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
0.00	0.00	0.00	-3,711.00	0.00	0.00 N	0.00 E	559,984.40	724,523.00	0.00	0.00	
143.00	0.40	126.80	-3,568.00	143.00	0.30 S	0.40 E	559,984.10	724,523.40	0.28	0.30	
241.00	0.10	114.10	-3,470.00	241.00	0.54 S	0.75 E	559,983.86	724,523.75	0.31	0.54	
471.00	0.30	106.50	-3,240.00	471.00	0.79 S	1.51 E	559,983.61	724,524.51	0.09	0.80	
541.00	0.10	232.70	-3,170.00	541.00	0.88 S	1.64 E	559,983.52	724,524.64	0.53	0.89	
632.00	0.60	256.50	-3,079.01	631.99	1.04 S	1.11 E	559,983.36	724,524.11	0.56	1.05	
733.00	0.80	186.30	-2,978.01	732.99	1.86 S	0.52 E	559,982.54	724,523.52	0.81	1.87	
847.00	1.20	63.70	-2,864.02	846.98	2.13 S	1.50 E	559,982.27	724,524.50	1.55	2.14	
952.00	0.70	206.00	-2,759.03	951.97	2.22 S	2.21 E	559,982.18	724,525.21	1.72	2.23	
1,048.00	0.70	209.20	-2,663.03	1,047.97	3.25 S	1.67 E	559,981.15	724,524.67	0.04	3.27	
1,126.00	0.70	235.10	-2,585.04	1,125.96	3.94 S	1.04 E	559,980.46	724,524.04	0.40	3.95	
1,221.00	0.70	256.10	-2,490.05	1,220.95	4.41 S	0.00 E	559,979.99	724,523.00	0.27	4.41	
1,315.00	0.70	255.60	-2,396.05	1,314.95	4.70 S	1.11 W	559,979.70	724,521.89	0.01	4.69	
1,410.00	0.90	254.80	-2,301.06	1,409.94	5.04 S	2.39 W	559,979.36	724,520.61	0.21	5.02	
1,505.00	0.60	266.50	-2,206.07	1,504.93	5.26 S	3.61 W	559,979.14	724,519.39	0.35	5.24	
1,580.00	0.30	285.90	-2,131.07	1,579.93	5.23 S	4.19 W	559,979.17	724,518.81	0.44	5.20	
1,723.00	0.50	89.30	-1,988.08	1,722.92	5.12 S	3.93 W	559,979.28	724,519.07	0.55	5.10	
1,817.00	0.80	70.00	-1,894.08	1,816.92	4.89 S	2.90 W	559,979.51	724,520.10	0.39	4.87	
1,912.00	0.60	85.70	-1,799.09	1,911.91	4.63 S	1.78 W	559,979.77	724,521.22	0.29	4.62	
2,100.00	0.40	101.60	-1,611.10	2,099.90	4.69 S	0.16 W	559,979.71	724,522.84	0.13	4.69	
2,196.00	0.50	98.20	-1,515.10	2,195.90	4.81 S	0.59 E	559,979.59	724,523.59	0.11	4.82	
2,291.00	0.40	65.20	-1,420.10	2,290.90	4.73 S	1.30 E	559,979.67	724,524.30	0.29	4.74	
2,385.00	0.60	80.40	-1,326.11	2,384.89	4.51 S	2.08 E	559,979.89	724,525.08	0.25	4.53	
2,480.00	0.80	67.50	-1,231.11	2,479.89	4.18 S	3.18 E	559,980.22	724,526.18	0.27	4.20	
2,574.00	1.30	66.00	-1,137.13	2,573.87	3.49 S	4.77 E	559,980.91	724,527.77	0.53	3.52	
2,669.00	1.70	61.00	-1,042.16	2,668.84	2.37 S	6.98 E	559,982.03	724,529.98	0.44	2.42	
2,763.00	2.00	52.20	-948.21	2,762.79	0.69 S	9.50 E	559,983.71	724,532.50	0.44	0.75	
2,858.00	2.40	46.50	-853.28	2,857.72	1.70 N	12.25 E	559,986.10	724,535.25	0.48	-1.62	
2,952.00	2.50	46.20	-759.37	2,951.63	4.47 N	15.16 E	559,988.87	724,538.16	0.11	-4.37	
3,046.00	2.50	47.90	-665.46	3,045.54	7.26 N	18.16 E	559,991.66	724,541.16	0.08	-7.15	
3,140.00	2.70	41.70	-571.55	3,139.45	10.29 N	21.15 E	559,994.69	724,544.15	0.37	-10.15	
3,235.00	2.20	28.90	-476.64	3,234.36	13.56 N	23.52 E	559,997.96	724,546.52	0.78	-13.41	
3,328.00	2.10	6.40	-383.70	3,327.30	16.81 N	24.58 E	560,001.21	724,547.58	0.91	-16.65	
3,419.00	1.80	344.30	-292.75	3,418.25	19.85 N	24.37 E	560,004.25	724,547.37	0.88	-19.69	
3,518.00	1.60	336.10	-193.80	3,517.20	22.61 N	23.39 E	560,007.01	724,546.39	0.32	-22.46	
3,614.00	1.60	329.00	-97.83	3,613.17	24.98 N	22.16 E	560,009.38	724,545.16	0.21	-24.84	
3,703.00	1.90	327.80	-8.88	3,702.12	27.29 N	20.73 E	560,011.69	724,543.73	0.34	-27.16	
3,798.00	2.00	334.60	86.07	3,797.07	30.12 N	19.18 E	560,014.52	724,542.18	0.27	-30.00	
3,894.00	3.30	317.80	181.97	3,892.97	33.69 N	16.61 E	560,018.09	724,539.61	1.56	-33.58	
3,991.00	3.20	315.90	278.81	3,989.81	37.70 N	12.85 E	560,022.10	724,535.85	0.15	-37.61	
4,085.00	2.60	314.20	372.69	4,083.69	41.07 N	9.50 E	560,025.47	724,532.50	0.64	-41.01	

HALLIBURTON**Design Report for Severus 31 Federal Com 4H - Actual**

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					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
4,179.00	2.30	309.70	466.60	4,177.60	43.76 N	6.52 E	560,028.16	724,529.52	0.38	-43.72	
4,273.00	1.70	304.10	560.54	4,271.54	45.75 N	3.91 E	560,030.15	724,526.91	0.67	-45.72	
4,334.00	1.00	294.80	621.53	4,332.53	46.48 N	2.68 E	560,030.88	724,525.68	1.20	-46.46	
4,431.00	1.30	300.50	718.51	4,429.51	47.39 N	0.96 E	560,031.79	724,523.96	0.33	-47.38	
4,527.00	1.30	299.80	814.48	4,525.48	48.48 N	0.92 W	560,032.88	724,522.08	0.02	-48.49	
4,623.00	1.30	288.10	910.46	4,621.46	49.36 N	2.90 W	560,033.76	724,520.10	0.28	-49.38	
4,718.00	1.30	295.60	1,005.43	4,716.43	50.16 N	4.90 W	560,034.56	724,518.10	0.18	-50.19	
4,813.00	1.50	290.60	1,100.41	4,811.41	51.07 N	7.03 W	560,035.47	724,515.97	0.25	-51.11	
4,909.00	1.40	283.50	1,196.38	4,907.38	51.78 N	9.35 W	560,036.18	724,513.65	0.21	-51.84	
5,002.00	1.20	276.40	1,289.35	5,000.35	52.16 N	11.42 W	560,036.56	724,511.58	0.28	-52.23	
5,096.00	1.10	287.10	1,383.33	5,094.33	52.53 N	13.26 W	560,036.93	724,509.74	0.25	-52.62	
5,191.00	1.20	277.70	1,478.31	5,189.31	52.93 N	15.12 W	560,037.33	724,507.88	0.22	-53.03	
5,285.00	1.10	288.70	1,572.29	5,283.29	53.35 N	16.95 W	560,037.75	724,506.05	0.26	-53.46	
5,380.00	1.10	280.90	1,667.28	5,378.28	53.82 N	18.71 W	560,038.22	724,504.29	0.16	-53.94	
5,427.00	0.90	290.90	1,714.27	5,425.27	54.04 N	19.50 W	560,038.44	724,503.50	0.56	-54.16	
5,496.00	0.94	299.61	1,783.26	5,494.26	54.51 N	20.50 W	560,038.91	724,502.50	0.21	-54.64	
5,591.00	0.93	296.52	1,878.25	5,589.25	55.24 N	21.86 W	560,039.64	724,501.14	0.05	-55.38	
5,687.00	0.75	292.98	1,974.24	5,685.24	55.83 N	23.14 W	560,040.23	724,499.86	0.20	-55.98	
5,782.00	0.51	295.82	2,069.23	5,780.23	56.26 N	24.09 W	560,040.66	724,498.91	0.25	-56.41	
5,876.00	0.51	304.95	2,163.23	5,874.23	56.68 N	24.81 W	560,041.08	724,498.19	0.09	-56.84	
5,971.00	0.47	305.97	2,258.23	5,969.23	57.15 N	25.47 W	560,041.55	724,497.53	0.04	-57.31	
6,066.00	0.45	309.23	2,353.22	6,064.22	57.62 N	26.08 W	560,042.02	724,496.92	0.03	-57.78	
6,160.00	0.46	309.11	2,447.22	6,158.22	58.09 N	26.66 W	560,042.49	724,496.34	0.01	-58.26	
6,255.00	0.46	308.33	2,542.22	6,253.22	58.56 N	27.25 W	560,042.96	724,495.75	0.01	-58.74	
6,348.00	0.42	315.74	2,635.21	6,346.21	59.04 N	27.78 W	560,043.44	724,495.22	0.07	-59.22	
6,443.00	0.31	325.67	2,730.21	6,441.21	59.50 N	28.17 W	560,043.90	724,494.83	0.13	-59.68	
6,537.00	0.24	306.36	2,824.21	6,535.21	59.83 N	28.47 W	560,044.23	724,494.53	0.12	-60.01	
6,631.00	0.31	284.24	2,918.21	6,629.21	60.01 N	28.88 W	560,044.41	724,494.12	0.13	-60.19	
6,725.00	0.22	263.24	3,012.21	6,723.21	60.05 N	29.30 W	560,044.45	724,493.70	0.14	-60.24	
6,819.00	0.07	233.69	3,106.21	6,817.21	59.99 N	29.53 W	560,044.39	724,493.47	0.17	-60.18	
6,914.00	0.12	113.95	3,201.21	6,912.21	59.92 N	29.48 W	560,044.32	724,493.52	0.17	-60.11	
7,008.00	0.21	86.47	3,295.21	7,006.21	59.89 N	29.22 W	560,044.29	724,493.78	0.12	-60.08	
7,103.00	0.31	114.15	3,390.21	7,101.21	59.80 N	28.81 W	560,044.20	724,494.19	0.17	-59.98	
7,199.00	0.22	135.56	3,486.21	7,197.21	59.56 N	28.45 W	560,043.96	724,494.55	0.14	-59.74	
7,293.00	0.36	118.35	3,580.20	7,291.20	59.29 N	28.06 W	560,043.69	724,494.94	0.17	-59.47	
7,387.00	0.44	134.15	3,674.20	7,385.20	58.90 N	27.54 W	560,043.30	724,495.46	0.14	-59.07	
7,482.00	0.56	157.27	3,769.20	7,480.20	58.21 N	27.10 W	560,042.61	724,495.90	0.24	-58.39	
7,578.00	0.73	171.56	3,865.19	7,576.19	57.18 N	26.83 W	560,041.58	724,496.17	0.24	-57.35	
7,671.00	0.90	175.28	3,958.18	7,669.18	55.86 N	26.68 W	560,040.26	724,496.32	0.19	-56.03	
7,765.00	0.77	176.47	4,052.17	7,763.17	54.50 N	26.58 W	560,038.90	724,496.42	0.14	-54.67	
7,860.00	0.86	177.49	4,147.16	7,858.16	53.15 N	26.51 W	560,037.55	724,496.49	0.10	-53.32	

HALLIBURTON**Design Report for Severus 31 Federal Com 4H - Actual**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
7,953.00	0.78	177.77	4,240.15	7,951.15	51.82 N	26.46 W	560,036.22	724,496.54	0.09	-51.99	
8,049.00	0.81	177.34	4,336.14	8,047.14	50.49 N	26.40 W	560,034.89	724,496.60	0.03	-50.66	
8,143.00	0.92	181.26	4,430.13	8,141.13	49.07 N	26.39 W	560,033.47	724,496.61	0.13	-49.24	
8,237.00	0.97	180.38	4,524.12	8,235.12	47.52 N	26.41 W	560,031.92	724,496.59	0.06	-47.69	
8,332.00	1.02	175.68	4,619.11	8,330.11	45.87 N	26.35 W	560,030.27	724,496.65	0.10	-46.04	
8,426.00	1.04	175.28	4,713.09	8,424.09	44.19 N	26.22 W	560,028.59	724,496.78	0.02	-44.36	
8,520.00	1.14	169.67	4,807.07	8,518.07	42.42 N	25.98 W	560,026.82	724,497.02	0.16	-42.58	
8,615.00	1.14	162.12	4,902.06	8,613.06	40.59 N	25.52 W	560,024.99	724,497.48	0.16	-40.75	
8,710.00	1.15	155.51	4,997.04	8,708.04	38.82 N	24.84 W	560,023.22	724,498.16	0.14	-38.98	
8,806.00	1.33	141.95	5,093.01	8,804.01	37.07 N	23.75 W	560,021.47	724,499.25	0.36	-37.22	
8,899.00	1.09	123.42	5,185.99	8,896.99	35.73 N	22.35 W	560,020.13	724,500.65	0.49	-35.87	
8,994.00	0.94	82.75	5,280.98	8,991.98	35.33 N	20.82 W	560,019.73	724,502.18	0.76	-35.46	
9,087.00	1.04	69.08	5,373.97	9,084.97	35.73 N	19.27 W	560,020.13	724,503.73	0.27	-35.85	
9,180.00	0.94	77.23	5,466.95	9,177.95	36.20 N	17.74 W	560,020.60	724,505.26	0.19	-36.31	
9,274.00	1.11	99.18	5,560.94	9,271.94	36.22 N	16.09 W	560,020.62	724,506.91	0.45	-36.33	
9,369.00	1.28	83.25	5,655.92	9,366.92	36.20 N	14.13 W	560,020.60	724,508.87	0.39	-36.29	
9,465.00	1.19	75.95	5,751.90	9,462.90	36.57 N	12.10 W	560,020.97	724,510.90	0.19	-36.65	
9,558.00	0.74	69.56	5,844.88	9,555.88	37.01 N	10.60 W	560,021.41	724,512.40	0.50	-37.08	
9,652.00	0.74	93.60	5,938.87	9,649.87	37.19 N	9.42 W	560,021.59	724,513.58	0.33	-37.25	
9,746.00	0.95	164.27	6,032.87	9,743.87	36.40 N	8.61 W	560,020.80	724,514.39	1.06	-36.45	
9,840.00	1.40	124.29	6,126.85	9,837.85	35.00 N	7.45 W	560,019.40	724,515.55	0.97	-35.05	
9,934.00	1.18	136.56	6,220.82	9,931.82	33.65 N	5.83 W	560,018.05	724,517.17	0.37	-33.69	
10,028.00	1.23	143.87	6,314.80	10,025.80	32.13 N	4.57 W	560,016.53	724,518.43	0.17	-32.16	
10,122.00	1.27	151.63	6,408.78	10,119.78	30.40 N	3.48 W	560,014.80	724,519.52	0.18	-30.42	
10,216.00	0.68	133.86	6,502.77	10,213.77	29.10 N	2.58 W	560,013.50	724,520.42	0.70	-29.12	
10,311.00	0.77	142.43	6,597.76	10,308.76	28.20 N	1.79 W	560,012.60	724,521.21	0.15	-28.21	
10,406.00	1.01	151.34	6,692.75	10,403.75	26.96 N	1.00 W	560,011.36	724,522.00	0.29	-26.97	
10,436.00	0.98	158.03	6,722.74	10,433.74	26.49 N	0.77 W	560,010.89	724,522.23	0.40	-26.50	
10,520.00	0.90	186.76	6,806.73	10,517.73	25.17 N	0.58 W	560,009.57	724,522.42	0.56	-25.17	
10,582.00	0.79	163.60	6,868.73	10,579.73	24.28 N	0.52 W	560,008.68	724,522.48	0.57	-24.28	
10,614.00	2.03	226.86	6,900.72	10,611.72	23.68 N	0.87 W	560,008.08	724,522.13	5.68	-23.68	
10,645.00	6.61	250.47	6,931.62	10,642.62	22.71 N	2.95 W	560,007.11	724,520.05	15.54	-22.72	
10,676.00	11.70	251.72	6,962.22	10,673.22	21.12 N	7.62 W	560,005.52	724,515.38	16.43	-21.17	
10,708.00	14.85	257.06	6,993.36	10,704.36	19.19 N	14.70 W	560,003.59	724,508.30	10.55	-19.28	
10,739.00	14.85	262.21	7,023.33	10,734.33	17.76 N	22.51 W	560,002.16	724,500.49	4.26	-17.90	
10,771.00	15.03	261.69	7,054.24	10,765.24	16.60 N	30.68 W	560,001.00	724,492.32	0.70	-16.80	
10,802.00	17.82	260.84	7,083.98	10,794.98	15.27 N	39.34 W	559,999.67	724,483.66	9.03	-15.52	
10,834.00	21.18	259.40	7,114.14	10,825.14	13.42 N	49.86 W	559,997.82	724,473.14	10.61	-13.74	
10,865.00	23.69	261.72	7,142.79	10,853.79	11.50 N	61.53 W	559,995.90	724,461.47	8.58	-11.89	
10,897.00	25.08	262.84	7,171.93	10,882.93	9.72 N	74.62 W	559,994.12	724,448.38	4.58	-10.21	
10,928.00	26.98	258.87	7,199.79	10,910.79	7.55 N	88.04 W	559,991.95	724,434.96	8.31	-8.12	

HALLIBURTON**Design Report for Severus 31 Federal Com 4H - Actual**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
10,959.00	30.32	250.26	7,227.00	10,938.00	3.54 N	102.32 W	559,987.94	724,420.68	17.11	-4.21	
10,991.00	33.96	242.27	7,254.11	10,965.11	3.35 S	117.84 W	559,981.05	724,405.16	17.47	2.59	
11,021.00	35.95	235.14	7,278.70	10,989.70	12.28 S	132.49 W	559,972.12	724,390.51	15.14	11.43	
11,053.00	38.67	228.64	7,304.16	11,015.16	24.27 S	147.71 W	559,960.13	724,375.29	14.95	23.31	
11,084.00	41.21	222.37	7,327.94	11,038.94	38.22 S	161.87 W	559,946.18	724,361.13	15.35	37.17	
11,115.00	44.56	217.92	7,350.66	11,061.66	54.35 S	175.45 W	559,930.05	724,347.55	14.56	53.22	
11,146.00	48.34	214.05	7,372.01	11,083.01	72.54 S	188.62 W	559,911.86	724,334.38	15.18	71.32	
11,177.00	52.12	213.68	7,391.84	11,102.84	92.32 S	201.89 W	559,892.08	724,321.11	12.23	91.01	
11,208.00	54.67	213.52	7,410.33	11,121.33	113.04 S	215.66 W	559,871.36	724,307.34	8.24	111.65	
11,241.00	56.86	212.29	7,428.89	11,139.89	135.95 S	230.48 W	559,848.45	724,292.52	7.32	134.46	
11,272.00	60.25	210.31	7,445.06	11,156.06	158.55 S	244.21 W	559,825.85	724,278.79	12.22	156.97	
11,303.00	63.19	208.43	7,459.75	11,170.75	182.34 S	257.59 W	559,802.06	724,265.41	10.88	180.67	
11,335.00	66.09	205.96	7,473.45	11,184.45	208.06 S	270.80 W	559,776.34	724,252.20	11.44	206.30	
11,366.00	69.20	203.45	7,485.24	11,196.24	234.10 S	282.77 W	559,750.30	724,240.23	12.52	232.27	
11,397.00	71.45	200.52	7,495.68	11,206.68	261.16 S	293.69 W	559,723.24	724,229.31	11.48	259.26	
11,428.00	73.92	198.23	7,504.91	11,215.91	289.08 S	303.51 W	559,695.32	724,219.49	10.64	287.11	
11,459.00	76.20	196.30	7,512.90	11,223.90	317.68 S	312.39 W	559,666.72	724,210.61	9.50	315.65	
11,487.00	78.10	194.34	7,519.13	11,230.13	344.01 S	319.60 W	559,640.39	724,203.40	9.62	341.93	
11,517.00	80.44	192.16	7,524.72	11,235.72	372.69 S	326.35 W	559,611.71	724,196.65	10.57	370.58	
11,548.00	80.84	189.90	7,529.76	11,240.76	402.71 S	332.21 W	559,581.69	724,190.79	7.31	400.56	
11,579.00	80.93	188.11	7,534.67	11,245.67	432.94 S	337.00 W	559,551.46	724,186.00	5.71	430.76	
11,611.00	81.04	186.65	7,539.68	11,250.68	464.28 S	341.06 W	559,520.12	724,181.94	4.52	462.07	
11,642.00	81.56	186.15	7,544.37	11,255.37	494.74 S	344.47 W	559,489.66	724,178.53	2.31	492.50	
11,674.00	81.85	184.22	7,548.99	11,259.99	526.27 S	347.33 W	559,458.13	724,175.67	6.04	524.02	
11,769.00	84.54	181.92	7,560.25	11,271.25	620.45 S	352.38 W	559,363.95	724,170.62	3.71	618.16	
11,862.00	85.83	179.17	7,568.05	11,279.05	713.11 S	353.26 W	559,271.29	724,169.74	3.26	710.81	
11,958.00	87.04	178.67	7,574.02	11,285.02	808.90 S	351.45 W	559,175.50	724,171.55	1.36	806.62	
12,053.00	87.25	178.75	7,578.76	11,289.76	903.76 S	349.32 W	559,080.64	724,173.68	0.24	901.49	
12,147.00	89.60	179.86	7,581.34	11,292.34	997.71 S	348.18 W	558,986.69	724,174.82	2.76	995.44	
12,241.00	90.59	179.93	7,581.18	11,292.18	1,091.71 S	348.00 W	558,892.69	724,175.00	1.06	1,089.44	
12,336.00	89.48	179.32	7,581.12	11,292.12	1,186.71 S	347.38 W	558,797.69	724,175.62	1.33	1,184.44	
12,430.00	87.44	179.37	7,583.65	11,294.65	1,280.66 S	346.31 W	558,703.74	724,176.69	2.17	1,278.40	
12,525.00	87.87	179.17	7,587.54	11,298.54	1,375.57 S	345.10 W	558,608.83	724,177.90	0.50	1,373.32	
12,620.00	88.00	179.05	7,590.96	11,301.96	1,470.50 S	343.62 W	558,513.90	724,179.38	0.19	1,468.25	
12,715.00	88.61	178.77	7,593.77	11,304.77	1,565.44 S	341.82 W	558,418.96	724,181.18	0.71	1,563.20	
12,809.00	87.63	180.28	7,596.86	11,307.86	1,659.38 S	341.04 W	558,325.02	724,181.96	1.91	1,657.15	
12,903.00	87.87	179.55	7,600.55	11,311.55	1,753.31 S	340.90 W	558,231.09	724,182.10	0.82	1,751.07	
12,996.00	88.21	179.02	7,603.73	11,314.73	1,846.25 S	339.74 W	558,138.15	724,183.26	0.68	1,844.01	
13,092.00	88.58	178.89	7,606.42	11,317.42	1,942.19 S	337.99 W	558,042.21	724,185.01	0.41	1,939.97	
13,186.00	89.17	178.85	7,608.26	11,319.26	2,036.16 S	336.14 W	557,948.24	724,186.86	0.63	2,033.94	
13,282.00	89.69	178.65	7,609.22	11,320.22	2,132.13 S	334.04 W	557,852.27	724,188.96	0.58	2,129.93	

HALLIBURTON**Design Report for Severus 31 Federal Com 4H - Actual**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
13,377.00	90.34	178.73	7,609.19	11,320.19	2,227.10 S	331.87 W	557,757.30	724,191.13	0.69	2,224.91	
13,473.00	88.67	180.53	7,610.02	11,321.02	2,323.09 S	331.25 W	557,661.31	724,191.75	2.56	2,320.90	
13,568.00	89.48	180.84	7,611.55	11,322.55	2,418.07 S	332.38 W	557,566.33	724,190.62	0.91	2,415.87	
13,662.00	89.97	181.02	7,612.01	11,323.01	2,512.06 S	333.91 W	557,472.34	724,189.09	0.56	2,509.85	
13,756.00	90.55	180.82	7,611.58	11,322.58	2,606.04 S	335.42 W	557,378.36	724,187.58	0.65	2,603.82	
13,850.00	88.36	180.21	7,612.47	11,323.47	2,700.03 S	336.26 W	557,284.37	724,186.74	2.42	2,697.80	
13,945.00	88.40	180.21	7,615.16	11,326.16	2,794.99 S	336.61 W	557,189.41	724,186.39	0.04	2,792.76	
14,039.00	88.86	180.12	7,617.41	11,328.41	2,888.96 S	336.88 W	557,095.44	724,186.12	0.50	2,886.73	
14,134.00	89.51	180.30	7,618.76	11,329.76	2,983.95 S	337.23 W	557,000.45	724,185.77	0.71	2,981.71	
14,229.00	90.00	180.04	7,619.16	11,330.16	3,078.95 S	337.51 W	556,905.45	724,185.49	0.58	3,076.71	
14,324.00	89.32	179.65	7,619.73	11,330.73	3,173.95 S	337.26 W	556,810.45	724,185.74	0.83	3,171.70	
14,419.00	89.48	179.26	7,620.72	11,331.72	3,268.94 S	336.35 W	556,715.46	724,186.65	0.44	3,266.70	
14,513.00	87.93	178.58	7,622.85	11,333.85	3,362.89 S	334.58 W	556,621.51	724,188.42	1.80	3,360.66	
14,607.00	88.43	178.39	7,625.83	11,336.83	3,456.81 S	332.10 W	556,527.59	724,190.90	0.57	3,454.60	
14,702.00	89.23	178.40	7,627.77	11,338.77	3,551.75 S	329.44 W	556,432.65	724,193.56	0.84	3,549.55	
14,797.00	87.81	179.25	7,630.23	11,341.23	3,646.70 S	327.49 W	556,337.70	724,195.51	1.74	3,644.51	
14,892.00	88.37	178.73	7,633.39	11,344.39	3,741.63 S	325.82 W	556,242.77	724,197.18	0.80	3,739.45	
14,986.00	89.11	178.55	7,635.46	11,346.46	3,835.58 S	323.59 W	556,148.82	724,199.41	0.81	3,833.41	
15,080.00	87.87	179.36	7,637.94	11,348.94	3,929.53 S	321.87 W	556,054.87	724,201.13	1.58	3,927.37	
15,174.00	88.95	180.25	7,640.54	11,351.54	4,023.49 S	321.55 W	555,960.91	724,201.45	1.49	4,021.33	
15,269.00	88.77	179.55	7,642.43	11,353.43	4,118.47 S	321.39 W	555,865.93	724,201.61	0.76	4,116.31	
15,363.00	88.86	178.42	7,644.38	11,355.38	4,212.44 S	319.72 W	555,771.96	724,203.28	1.21	4,210.28	
15,457.00	89.38	178.41	7,645.82	11,356.82	4,306.39 S	317.12 W	555,678.01	724,205.88	0.55	4,304.25	
15,552.00	89.57	177.90	7,646.69	11,357.69	4,401.33 S	314.06 W	555,583.07	724,208.94	0.57	4,399.22	
15,646.00	87.32	178.14	7,649.24	11,360.24	4,495.24 S	310.82 W	555,489.16	724,212.18	2.41	4,493.14	
15,741.00	88.06	178.97	7,653.07	11,364.07	4,590.13 S	308.42 W	555,394.27	724,214.58	1.17	4,588.04	
15,835.00	89.04	179.03	7,655.45	11,366.45	4,684.08 S	306.78 W	555,300.32	724,216.22	1.04	4,682.00	
15,929.00	89.78	178.75	7,656.42	11,367.42	4,778.06 S	304.96 W	555,206.34	724,218.04	0.84	4,775.99	
16,023.00	90.55	178.48	7,656.15	11,367.15	4,872.03 S	302.69 W	555,112.37	724,220.31	0.87	4,869.98	
16,117.00	89.91	177.69	7,655.77	11,366.77	4,965.98 S	299.55 W	555,018.42	724,223.45	1.08	4,963.94	
16,210.00	90.55	177.32	7,655.40	11,366.40	5,058.89 S	295.50 W	554,925.51	724,227.50	0.79	5,056.87	
16,304.00	90.96	176.72	7,654.16	11,365.16	5,152.75 S	290.62 W	554,831.65	724,232.38	0.77	5,150.77	
16,398.00	92.13	176.85	7,651.62	11,362.62	5,246.57 S	285.35 W	554,737.83	724,237.65	1.25	5,244.62	Final MWD Survey: 16398' MD
16,459.00	92.13	176.85	7,649.36	11,360.36	5,307.43 S	282.00 W	554,676.97	724,241.00	0.00	5,305.50	Projection to TD: 16459' MD

HALLIBURTON**Design Report for Severus 31 Federal Com 4H - Actual****Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	179.63	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
143.00	5,427.00	Surface MWD	MWD
5,496.00	16,398.00	Production MWD	MWD
16,459.00	16,459.00	Projection to TD	Blind

Design Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	0	0	0	0	0	0	0		
- Shape									
()									

Directional Difficulty Index

Average Dogleg over Survey:	1.21 °/100usft	Maximum Dogleg over Survey:	17.47 °/100usft at 10,991.00 usft
Net Tortousity applicable to Plans:	0.52 °/100usft	Directional Difficulty Index:	6.214

Audit Info