



MOSES OCD

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BTA Oil Producers, LLC

Lea County, NM (NAD 83)

Sec 16, T22-S, R34-E

Grama 8817 16-9 Fed Com #4H

Wellbore #1

Design: Wellbore #1

QES Survey Report

13 December, 2018





Survey Report



Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Grama 8817 16-9 Fed Com #4H
Project:	Lea County, NM (NAD83)	TVD Reference:	WELL @ 3501.0usft (Patterson #594)
Site:	Sec 16, T22-S, R34-E	MD Reference:	WELL @ 3501.0usft (Patterson #594)
Well:	Grama 8817 16-9 Fed Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Sec 16, T22-S, R34-E		
Site Position:		Northing:	504,874.80 usft
From:	Map	Easting:	808,619.20 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 23' 5.986 N
		Longitude:	103° 28' 2.920 W
		Grid Convergence:	0.46 °

Well	Grama 8817 16-9 Fed Com #4H		
Well Position	+N/-S	0.0 usft	Northing: 504,865.50 usft
	+E/-W	0.0 usft	Easting: 806,969.60 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 23' 6.025 N
		Longitude:	103° 28' 22.157 W
		Ground Level:	3,476.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	11/20/2018	6.76
			Dip Angle (°)
			60.21
			Field Strength (nT)
			47,896.50451549

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°)
			356.22

Survey Program	Date	12/13/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,652.0	MS Directional Gyro's (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
1,786.0	20,508.0	QES MWD Surveys (Wellbore #1)	OWSG (Rev2) MWD	OWSG MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.60	345.83	100.0	0.5	-0.1	0.5	0.60	0.60	0.00
200.0	0.82	341.67	200.0	1.7	-0.5	1.7	0.23	0.22	-4.16
300.0	0.72	333.29	300.0	2.9	-1.0	3.0	0.15	-0.10	-8.38
400.0	0.51	318.99	400.0	3.8	-1.6	3.9	0.26	-0.21	-14.30
500.0	0.13	275.01	500.0	4.2	-2.0	4.3	0.43	-0.38	-43.98
600.0	0.07	244.50	600.0	4.2	-2.1	4.3	0.08	-0.06	-30.51
700.0	0.21	345.19	700.0	4.3	-2.2	4.5	0.23	0.14	100.69
800.0	0.44	312.14	800.0	4.7	-2.6	4.9	0.29	0.23	-33.05
900.0	0.51	285.36	900.0	5.1	-3.3	5.3	0.23	0.07	-26.78



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Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.0	0.61	272.15	1,000.0	5.3	-4.2	5.5	0.16	0.10	-13.21
1,100.0	0.41	274.83	1,100.0	5.3	-5.1	5.6	0.20	-0.20	2.68
1,200.0	0.44	324.49	1,200.0	5.7	-5.7	6.0	0.36	0.03	49.66
1,300.0	0.38	326.97	1,300.0	6.2	-6.1	6.6	0.06	-0.06	2.48
1,400.0	0.26	260.70	1,400.0	6.5	-6.5	6.9	0.36	-0.12	-66.27
1,500.0	0.25	224.06	1,500.0	6.3	-6.9	6.7	0.16	-0.01	-36.64
1,600.0	0.05	305.66	1,600.0	6.2	-7.1	6.6	0.25	-0.20	81.60
Gyro Tie-in @ 1652.0' MD / 1652.0' TVD									
1,652.0	0.21	296.43	1,652.0	6.2	-7.2	6.7	0.31	0.31	-17.75
1,786.0	0.40	228.70	1,786.0	6.0	-7.8	6.5	0.28	0.14	-50.54
1,975.0	0.30	261.70	1,974.9	5.5	-8.7	6.1	0.12	-0.05	17.46
2,165.0	0.70	207.60	2,164.9	4.4	-9.8	5.0	0.30	0.21	-28.47
2,353.0	0.80	218.30	2,352.9	2.4	-11.1	3.1	0.09	0.05	5.69
2,543.0	0.50	226.70	2,542.9	0.8	-12.5	1.6	0.17	-0.16	4.42
2,733.0	0.20	86.50	2,732.9	0.2	-12.8	1.0	0.35	-0.16	-73.79
2,922.0	1.30	63.30	2,921.9	1.2	-10.6	1.9	0.59	0.58	-12.28
3,112.0	1.30	51.70	3,111.8	3.5	-7.0	3.9	0.14	0.00	-6.11
3,301.0	0.60	290.20	3,300.8	5.2	-6.2	5.6	0.90	-0.37	-64.29
3,491.0	0.10	321.50	3,490.8	5.6	-7.2	6.1	0.27	-0.26	16.47
3,680.0	0.40	310.10	3,679.8	6.2	-7.8	6.7	0.16	0.16	-6.03
3,870.0	0.80	284.60	3,869.8	7.0	-9.6	7.6	0.25	0.21	-13.42
4,060.0	1.00	258.50	4,059.8	7.0	-12.5	7.8	0.24	0.11	-13.74
4,250.0	3.20	257.70	4,249.6	5.5	-19.4	6.8	1.16	1.16	-0.42
4,439.0	6.10	256.10	4,438.0	2.0	-34.3	4.2	1.54	1.53	-0.85
4,629.0	7.90	254.20	4,626.6	-4.0	-56.6	-0.3	0.96	0.95	-1.00
4,819.0	7.30	254.30	4,814.9	-10.8	-80.8	-5.5	0.32	-0.32	0.05
5,008.0	7.10	254.90	5,002.4	-17.1	-103.6	-10.3	0.11	-0.11	0.32
5,198.0	6.40	258.20	5,191.1	-22.4	-125.3	-14.0	0.42	-0.37	1.74
5,314.0	6.20	260.10	5,306.4	-24.8	-137.8	-15.6	0.25	-0.17	1.64
5,393.0	6.10	258.20	5,384.9	-26.4	-146.2	-16.7	0.29	-0.13	-2.41
5,520.0	7.70	259.20	5,511.0	-29.3	-161.1	-18.6	1.26	1.26	0.79
5,710.0	8.00	259.60	5,699.2	-34.1	-186.6	-21.7	0.16	0.16	0.21
5,900.0	7.70	261.20	5,887.5	-38.4	-212.2	-24.4	0.20	-0.16	0.84
6,090.0	9.20	261.90	6,075.4	-42.5	-239.8	-26.6	0.79	0.79	0.37
6,279.0	10.40	255.00	6,261.6	-49.1	-271.3	-31.1	0.89	0.63	-3.65
6,469.0	10.40	255.70	6,448.5	-57.7	-304.5	-37.5	0.07	0.00	0.37
6,659.0	10.10	256.80	6,635.5	-65.8	-337.3	-43.4	0.19	-0.16	0.58
6,849.0	10.00	257.30	6,822.6	-73.2	-369.6	-48.7	0.07	-0.05	0.26
7,039.0	10.10	261.00	7,009.7	-79.4	-402.1	-52.8	0.34	0.05	1.95
7,229.0	8.80	255.20	7,197.1	-85.8	-432.7	-57.1	0.85	-0.68	-3.05
7,418.0	8.40	254.70	7,384.0	-93.1	-460.0	-62.6	0.22	-0.21	-0.26
7,608.0	7.80	255.00	7,572.1	-100.1	-485.8	-67.9	0.32	-0.32	0.16
7,798.0	7.00	257.00	7,760.5	-106.0	-509.5	-72.2	0.44	-0.42	1.05



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7,987.0	6.50	258.20	7,948.2	-110.8	-531.2	-75.6	0.27	-0.26	0.63
8,177.0	6.10	257.00	8,137.0	-115.3	-551.6	-78.7	0.22	-0.21	-0.63
8,367.0	5.50	256.80	8,326.0	-119.6	-570.3	-81.8	0.32	-0.32	-0.11
8,557.0	3.80	250.10	8,515.4	-123.9	-585.1	-85.0	0.94	-0.89	-3.53
8,747.0	2.40	255.60	8,705.1	-127.0	-594.8	-87.5	0.75	-0.74	2.89
8,937.0	1.10	255.70	8,895.0	-128.4	-600.5	-88.6	0.68	-0.68	0.05
9,127.0	1.10	264.50	9,085.0	-129.1	-604.0	-89.0	0.09	0.00	4.63
9,317.0	1.10	248.00	9,275.0	-129.9	-607.6	-89.6	0.17	0.00	-8.68
9,506.0	1.20	264.00	9,463.9	-130.8	-611.2	-90.2	0.18	0.05	8.47
9,696.0	1.00	278.10	9,653.9	-130.8	-614.8	-90.0	0.18	-0.11	7.42
9,818.0	1.10	278.90	9,775.9	-130.4	-617.0	-89.5	0.08	0.08	0.66
9,905.0	5.20	341.70	9,862.7	-126.6	-619.1	-85.5	5.51	4.71	72.18
10,000.0	14.70	348.00	9,956.2	-110.7	-623.0	-69.3	10.05	10.00	6.63
10,095.0	23.60	353.30	10,045.9	-79.9	-627.7	-38.4	9.54	9.37	5.58
10,190.0	31.10	352.90	10,130.2	-36.6	-633.0	5.2	7.90	7.89	-0.42
10,284.0	36.30	356.10	10,208.4	15.3	-637.9	57.3	5.84	5.53	3.40
10,379.0	45.50	358.00	10,280.1	77.3	-641.0	119.4	9.77	9.68	2.00
330' FSL Crossed @ 10444.2' MD / 10322.9' TVD									
10,444.2	52.30	357.28	10,322.9	126.4	-643.0	168.5	10.46	10.42	-1.11
10,473.0	55.30	357.00	10,339.9	149.6	-644.2	191.7	10.46	10.43	-0.96
10,568.0	65.20	0.10	10,387.0	231.9	-646.1	274.0	10.80	10.42	3.26
10,663.0	74.30	1.70	10,419.9	320.9	-644.7	362.7	9.71	9.58	1.68
10,758.0	84.60	0.10	10,437.3	414.2	-643.3	455.7	10.97	10.84	-1.68
10,853.0	89.20	359.40	10,442.4	509.0	-643.7	550.4	4.90	4.84	-0.74
10,948.0	90.10	359.30	10,443.0	604.0	-644.7	645.2	0.95	0.95	-0.11
11,054.0	94.10	358.90	10,439.1	709.9	-646.4	751.0	3.79	3.77	-0.38
11,149.0	92.70	359.80	10,433.5	804.7	-647.5	845.7	1.75	-1.47	0.95
11,244.0	92.70	1.90	10,429.0	899.6	-646.1	940.3	2.21	0.00	2.21
11,339.0	93.70	2.80	10,423.7	994.4	-642.2	1,034.6	1.42	1.05	0.95
11,434.0	93.70	2.80	10,417.5	1,089.1	-637.6	1,128.7	0.00	0.00	0.00
11,529.0	93.70	3.00	10,411.4	1,183.8	-632.8	1,222.9	0.21	0.00	0.21
11,624.0	93.60	2.60	10,405.4	1,278.5	-628.1	1,317.1	0.43	-0.11	-0.42
11,718.0	92.80	1.40	10,400.1	1,372.2	-624.9	1,410.5	1.53	-0.85	-1.28
11,813.0	92.70	1.40	10,395.6	1,467.1	-622.5	1,505.0	0.11	-0.11	0.00
11,908.0	93.50	0.90	10,390.4	1,562.0	-620.6	1,599.5	0.99	0.84	-0.53
12,003.0	93.60	359.30	10,384.5	1,656.8	-620.5	1,694.1	1.68	0.11	-1.68
12,098.0	93.40	359.40	10,378.7	1,751.6	-621.5	1,788.7	0.24	-0.21	0.11
12,193.0	93.60	359.40	10,372.9	1,846.4	-622.5	1,883.4	0.21	0.21	0.00
12,288.0	93.70	359.30	10,366.9	1,941.2	-623.6	1,978.1	0.15	0.11	-0.11
12,383.0	90.80	358.70	10,363.2	2,036.1	-625.3	2,072.9	3.12	-3.05	-0.63
12,478.0	90.80	358.70	10,361.8	2,131.1	-627.4	2,167.8	0.00	0.00	0.00
12,572.0	90.80	359.30	10,360.5	2,225.0	-629.1	2,261.7	0.64	0.00	0.64
12,668.0	90.70	359.10	10,359.3	2,321.0	-630.4	2,357.5	0.23	-0.10	-0.21
12,763.0	90.80	359.10	10,358.0	2,416.0	-631.9	2,452.4	0.11	0.11	0.00



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12,857.0	90.90	358.90	10,356.6	2,510.0	-633.5	2,546.3	0.24	0.11	-0.21
12,952.0	90.80	359.30	10,355.2	2,605.0	-635.0	2,641.2	0.43	-0.11	0.42
13,047.0	90.80	359.10	10,353.9	2,699.9	-636.4	2,736.0	0.21	0.00	-0.21
13,142.0	90.00	359.40	10,353.2	2,794.9	-637.6	2,830.9	0.90	-0.84	0.32
13,237.0	88.70	359.30	10,354.3	2,889.9	-638.7	2,925.7	1.37	-1.37	-0.11
13,332.0	90.00	358.60	10,355.4	2,984.9	-640.4	3,020.6	1.55	1.37	-0.74
13,427.0	90.00	359.30	10,355.4	3,079.9	-642.2	3,115.5	0.74	0.00	0.74
13,522.0	90.10	0.10	10,355.3	3,174.9	-642.7	3,210.3	0.85	0.11	0.84
13,617.0	90.10	0.10	10,355.1	3,269.9	-642.5	3,305.1	0.00	0.00	0.00
13,711.0	90.00	0.00	10,355.1	3,363.9	-642.4	3,398.9	0.15	-0.11	-0.11
13,806.0	90.10	359.80	10,355.0	3,458.9	-642.6	3,493.7	0.24	0.11	-0.21
13,901.0	91.00	359.40	10,354.1	3,553.9	-643.2	3,588.5	1.04	0.95	-0.42
13,996.0	91.20	359.40	10,352.2	3,648.8	-644.2	3,683.4	0.21	0.21	0.00
14,091.0	91.00	358.90	10,350.4	3,743.8	-645.6	3,778.2	0.57	-0.21	-0.53
14,186.0	91.10	358.60	10,348.7	3,838.8	-647.7	3,873.1	0.33	0.11	-0.32
14,281.0	91.90	359.40	10,346.2	3,933.7	-649.4	3,968.0	1.19	0.84	0.84
14,376.0	91.90	0.00	10,343.0	4,028.7	-649.9	4,062.8	0.63	0.00	0.63
14,471.0	92.00	0.00	10,339.8	4,123.6	-649.9	4,157.5	0.11	0.11	0.00
14,567.0	91.90	359.30	10,336.5	4,219.6	-650.5	4,253.3	0.74	-0.10	-0.73
14,662.0	91.70	358.40	10,333.6	4,314.5	-652.4	4,348.1	0.97	-0.21	-0.95
14,758.0	92.40	357.90	10,330.1	4,410.4	-655.5	4,444.0	0.90	0.73	-0.52
14,853.0	92.90	358.20	10,325.7	4,505.2	-658.7	4,538.8	0.61	0.53	0.32
14,949.0	93.00	358.90	10,320.8	4,601.1	-661.1	4,634.6	0.74	0.10	0.73
15,045.0	93.10	359.30	10,315.7	4,696.9	-662.6	4,730.4	0.43	0.10	0.42
15,140.0	93.10	359.80	10,310.5	4,791.8	-663.4	4,825.1	0.53	0.00	0.53
15,236.0	93.20	0.10	10,305.3	4,887.6	-663.4	4,920.7	0.33	0.10	0.31
15,332.0	94.30	0.70	10,299.0	4,983.4	-662.8	5,016.3	1.30	1.15	0.63
15,428.0	94.80	0.90	10,291.4	5,079.1	-661.4	5,111.7	0.56	0.52	0.21
15,520.0	92.10	1.40	10,285.8	5,170.9	-659.6	5,203.1	2.98	-2.93	0.54
15,615.0	88.10	1.70	10,285.7	5,265.9	-657.0	5,297.7	4.22	-4.21	0.32
15,711.0	87.80	1.60	10,289.1	5,361.8	-654.3	5,393.2	0.33	-0.31	-0.10
15,806.0	88.20	1.70	10,292.4	5,456.7	-651.5	5,487.7	0.43	0.42	0.11
15,901.0	88.40	1.90	10,295.2	5,551.6	-648.5	5,582.2	0.30	0.21	0.21
15,997.0	89.10	1.90	10,297.3	5,647.5	-645.4	5,677.8	0.73	0.73	0.00
16,092.0	90.00	1.70	10,298.1	5,742.4	-642.4	5,772.3	0.97	0.95	-0.21
16,188.0	88.20	2.60	10,299.6	5,838.4	-638.8	5,867.8	2.10	-1.88	0.94
16,284.0	88.00	0.90	10,302.8	5,934.3	-635.9	5,963.3	1.78	-0.21	-1.77
16,379.0	87.00	358.20	10,306.9	6,029.2	-636.6	6,058.0	3.03	-1.05	-2.84
16,475.0	87.10	358.40	10,311.9	6,125.0	-639.4	6,153.8	0.23	0.10	0.21
16,570.0	87.10	0.30	10,316.7	6,219.9	-640.5	6,248.5	2.00	0.00	2.00
16,665.0	88.20	1.00	10,320.6	6,314.8	-639.4	6,343.2	1.37	1.16	0.74
16,760.0	89.70	1.20	10,322.3	6,409.7	-637.6	6,437.8	1.59	1.58	0.21
16,855.0	89.90	1.20	10,322.6	6,504.7	-635.6	6,532.5	0.21	0.21	0.00



Survey Report



Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Grama 8817 16-9 Fed Com #4H
Project:	Lea County, NM (NAD 83)	TVD Reference:	WELL @ 3501.0usft (Patterson #594)
Site:	Sec 16, T22-S, R34-E	MD Reference:	WELL @ 3501.0usft (Patterson #594)
Well:	Grama 8817 16-9 Fed Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,950.0	89.90	1.40	10,322.8	6,599.7	-633.5	6,627.1	0.21	0.00	0.21
17,045.0	88.50	0.30	10,324.1	6,694.7	-632.1	6,721.8	1.87	-1.47	-1.16
17,139.0	89.00	358.70	10,326.2	6,788.6	-632.9	6,815.6	1.78	0.53	-1.70
17,234.0	89.10	358.20	10,327.7	6,883.6	-635.5	6,910.5	0.54	0.11	-0.53
17,329.0	89.10	358.20	10,329.2	6,978.5	-638.4	7,005.4	0.00	0.00	0.00
17,424.0	89.10	358.20	10,330.7	7,073.5	-641.4	7,100.4	0.00	0.00	0.00
17,518.0	89.00	358.00	10,332.3	7,167.4	-644.5	7,194.3	0.24	-0.11	-0.21
17,613.0	89.00	358.00	10,333.9	7,262.3	-647.8	7,289.2	0.00	0.00	0.00
17,708.0	89.00	358.90	10,335.6	7,357.3	-650.4	7,384.2	0.95	0.00	0.95
17,803.0	89.00	358.90	10,337.3	7,452.2	-652.2	7,479.0	0.00	0.00	0.00
17,898.0	89.00	359.10	10,338.9	7,547.2	-653.9	7,573.9	0.21	0.00	0.21
17,994.0	89.00	358.70	10,340.6	7,643.2	-655.7	7,669.8	0.42	0.00	-0.42
18,089.0	89.20	359.40	10,342.1	7,738.2	-657.3	7,764.7	0.77	0.21	0.74
18,185.0	92.30	358.90	10,340.8	7,834.1	-658.7	7,860.5	3.27	3.23	-0.52
18,281.0	93.00	359.10	10,336.4	7,930.0	-660.4	7,956.3	0.76	0.73	0.21
18,376.0	93.00	358.90	10,331.4	8,024.9	-662.1	8,051.1	0.21	0.00	-0.21
18,472.0	93.20	359.80	10,326.2	8,120.7	-663.2	8,146.8	0.96	0.21	0.94
18,566.0	92.90	0.10	10,321.2	8,214.6	-663.2	8,240.4	0.45	-0.32	0.32
18,661.0	93.10	0.30	10,316.3	8,309.5	-662.9	8,335.1	0.30	0.21	0.21
18,756.0	93.10	0.30	10,311.1	8,404.3	-662.4	8,429.7	0.00	0.00	0.00
18,850.0	93.10	0.00	10,306.0	8,498.2	-662.2	8,523.3	0.32	0.00	-0.32
18,945.0	93.10	0.00	10,300.9	8,593.0	-662.2	8,618.0	0.00	0.00	0.00
19,041.0	93.10	359.80	10,295.7	8,688.9	-662.3	8,713.7	0.21	0.00	-0.21
19,135.0	93.10	0.10	10,290.6	8,782.8	-662.4	8,807.3	0.32	0.00	0.32
19,231.0	93.00	0.50	10,285.5	8,878.6	-661.9	8,902.9	0.43	-0.10	0.42
19,327.0	92.10	0.50	10,281.2	8,974.5	-661.1	8,998.6	0.94	-0.94	0.00
19,422.0	92.20	0.50	10,277.7	9,069.4	-660.2	9,093.2	0.11	0.11	0.00
19,517.0	92.20	0.10	10,274.0	9,164.4	-659.8	9,187.9	0.42	0.00	-0.42
19,613.0	92.20	359.40	10,270.4	9,260.3	-660.2	9,283.7	0.73	0.00	-0.73
19,709.0	92.20	359.60	10,266.7	9,356.2	-661.0	9,379.5	0.21	0.00	0.21
19,804.0	92.10	359.40	10,263.1	9,451.2	-661.8	9,474.2	0.24	-0.11	-0.21
19,899.0	92.10	359.30	10,259.6	9,546.1	-662.9	9,569.0	0.11	0.00	-0.11
19,995.0	92.10	0.00	10,256.1	9,642.0	-663.5	9,664.8	0.73	0.00	0.73
20,090.0	92.20	0.10	10,252.5	9,737.0	-663.4	9,759.5	0.15	0.11	0.11
20,186.0	92.30	1.00	10,248.8	9,832.9	-662.5	9,855.2	0.94	0.10	0.94
20,280.0	92.70	1.70	10,244.7	9,926.8	-660.3	9,948.7	0.86	0.43	0.74
20,375.0	93.30	2.40	10,239.7	10,021.6	-656.9	10,043.1	0.97	0.63	0.74
330' FNL Crossed @ 20377.6' MD / 10239.5' TVD									
20,377.6	93.30	2.42	10,239.5	10,024.2	-656.8	10,045.7	0.62	0.00	0.62
20,472.0	93.30	3.00	10,234.1	10,118.3	-652.3	10,139.3	0.62	0.00	0.62
TD @ 20508.0' MD / 10232.0' TVD									
20,508.0	93.30	3.00	10,232.0	10,154.2	-650.4	10,175.0	0.00	0.00	0.00



Survey Report



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Well:	Grama 8817 16-9 Fed Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,652.0	1,652.0	6.2	-7.2	Gyro Tie-in @ 1652.0' MD / 1652.0' TVD
10,444.2	10,322.9	126.4	-643.0	330' FSL Crossed @ 10444.2' MD / 10322.9' TVD
20,377.6	10,239.5	10,024.2	-656.8	330' FNL Crossed @ 20377.6' MD / 10239.5' TVD
20,508.0	10,232.0	10,154.2	-650.4	TD @ 20508.0' MD / 10232.0' TVD