



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-02W

Wellbore #1

Design: Wellbore #1

QES Survey Report

17 August, 2017





Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-02W
Project:	Mesa County, CO	TVD Reference:	well @ 7286.0usft (H&P #290)
Site:	Bruton 19-06 Pad	MD Reference:	well @ 7286.0usft (H&P #290)
Well:	Bruton 19-02W	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Mesa County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	Bruton 19-06 Pad				
Site Position:		Northing:	1,528,940.55 usft	Latitude:	39.262756
From:	Lat/Long	Easting:	2,344,737.10 usft	Longitude:	-107.814558
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.46 °

Well	Bruton 19-02W					
Well Position	+N/-S	0.0 usft	Northing:	1,529,031.14 usft	Latitude:	39.262994
	+E/-W	0.0 usft	Easting:	2,344,590.62 usft	Longitude:	-107.815084
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,262.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/8/2017	9.58	65.43	51,400.24952992

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)	Direction (°)	
	0.0	0.0	0.0	352.78	

Survey Program	Date	8/17/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
204.0	8,052.0	MWD Surveys (Wellbore #1)	MWD default	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	
First MWD Survey @ 204.0' MD / 203.8' TVD										
204.0	4.10	338.30	203.8	6.8	-2.7	7.1	2.01	2.01	0.00	
295.0	5.70	345.90	294.5	14.2	-5.0	14.7	1.89	1.76	8.35	
386.0	8.40	356.70	384.8	25.2	-6.5	25.8	3.29	2.97	11.87	
476.0	12.30	356.70	473.3	41.3	-7.4	41.9	4.33	4.33	0.00	
567.0	14.30	356.30	561.9	62.2	-8.7	62.8	2.20	2.20	-0.44	
658.0	16.30	352.30	649.6	86.1	-11.1	86.8	2.48	2.20	-4.40	
749.0	19.00	352.00	736.4	113.4	-14.9	114.4	2.97	2.97	-0.33	
840.0	19.10	351.50	822.4	142.8	-19.2	144.1	0.21	0.11	-0.55	
930.0	20.10	352.00	907.2	172.7	-23.5	174.3	1.13	1.11	0.56	



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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)
1,025.0	23.60	352.00	995.3	207.7	-28.4	209.6	3.68	3.68	0.00
1,119.0	24.30	351.10	1,081.2	245.5	-34.0	247.8	0.84	0.74	-0.96
1,214.0	22.60	351.00	1,168.4	282.8	-39.9	285.6	1.79	-1.79	-0.11
1,309.0	22.10	349.40	1,256.2	318.4	-46.1	321.7	0.83	-0.53	-1.68
1,404.0	24.70	350.40	1,343.4	355.5	-52.7	359.3	2.77	2.74	1.05
1,499.0	25.40	352.60	1,429.5	395.3	-58.6	399.6	1.23	0.74	2.32
1,589.0	24.70	352.20	1,511.0	433.1	-63.6	437.7	0.80	-0.78	-0.44
1,683.0	24.60	351.40	1,596.4	471.9	-69.2	476.9	0.37	-0.11	-0.85
1,778.0	24.70	351.90	1,682.8	511.1	-75.0	516.5	0.24	0.11	0.53
1,873.0	24.60	351.80	1,769.1	550.3	-80.6	556.1	0.11	-0.11	-0.11
1,967.0	24.00	351.60	1,854.8	588.6	-86.2	594.8	0.64	-0.64	-0.21
2,062.0	23.20	350.90	1,941.9	626.2	-92.0	632.8	0.89	-0.84	-0.74
2,157.0	23.70	350.70	2,029.0	663.5	-98.0	670.6	0.53	0.53	-0.21
2,251.0	23.20	353.60	2,115.3	700.6	-103.1	708.0	1.34	-0.53	3.09
2,346.0	22.20	352.80	2,202.9	737.0	-107.4	744.6	1.10	-1.05	-0.84
2,440.0	23.20	353.10	2,289.6	773.0	-111.9	780.9	1.07	1.06	0.32
2,535.0	24.40	353.50	2,376.5	811.0	-116.4	819.2	1.27	1.26	0.42
2,630.0	22.70	351.60	2,463.6	848.7	-121.3	857.2	1.96	-1.79	-2.00
2,725.0	23.90	352.00	2,550.9	885.9	-126.6	894.7	1.27	1.26	0.42
2,819.0	23.10	351.50	2,637.1	922.9	-132.0	932.2	0.88	-0.85	-0.53
2,914.0	24.30	351.70	2,724.1	960.7	-137.6	970.4	1.27	1.26	0.21
3,008.0	24.40	351.00	2,809.7	999.0	-143.4	1,009.1	0.32	0.11	-0.74
3,103.0	24.40	349.10	2,896.2	1,037.7	-150.2	1,048.3	0.83	0.00	-2.00
3,198.0	23.90	348.80	2,982.9	1,075.8	-157.6	1,087.1	0.54	-0.53	-0.32
3,292.0	24.50	350.70	3,068.6	1,113.8	-164.5	1,125.6	1.05	0.64	2.02
3,387.0	24.70	355.90	3,155.0	1,153.0	-169.1	1,165.1	2.29	0.21	5.47
3,481.0	24.20	355.30	3,240.6	1,191.8	-172.1	1,204.0	0.59	-0.53	-0.64
3,576.0	23.90	354.90	3,327.3	1,230.4	-175.4	1,242.6	0.36	-0.32	-0.42
3,671.0	23.30	354.00	3,414.4	1,268.2	-179.1	1,280.7	0.74	-0.63	-0.95
3,765.0	22.40	352.30	3,501.0	1,304.5	-183.4	1,317.2	1.19	-0.96	-1.81
3,860.0	23.90	352.60	3,588.4	1,341.5	-188.3	1,354.5	1.58	1.58	0.32
3,954.0	23.90	351.80	3,674.3	1,379.2	-193.5	1,392.6	0.34	0.00	-0.85
4,049.0	23.70	350.70	3,761.2	1,417.1	-199.3	1,430.9	0.51	-0.21	-1.16
4,143.0	23.20	349.40	3,847.5	1,453.9	-205.8	1,468.3	0.77	-0.53	-1.38
4,238.0	24.00	351.00	3,934.5	1,491.4	-212.2	1,506.3	1.08	0.84	1.68
4,333.0	24.90	351.80	4,021.0	1,530.3	-218.1	1,545.6	1.01	0.95	0.84
4,427.0	24.30	350.20	4,106.5	1,568.9	-224.2	1,584.7	0.95	-0.64	-1.70
4,522.0	24.00	349.60	4,193.2	1,607.2	-231.0	1,623.5	0.41	-0.32	-0.63
4,616.0	24.40	351.00	4,278.9	1,645.2	-237.5	1,662.0	0.74	0.43	1.49
4,711.0	24.00	355.00	4,365.6	1,683.8	-242.3	1,700.9	1.78	-0.42	4.21
4,806.0	24.00	356.00	4,452.3	1,722.3	-245.3	1,739.5	0.43	0.00	1.05
4,901.0	23.80	355.90	4,539.2	1,760.7	-248.0	1,777.9	0.21	-0.21	-0.11
4,995.0	23.00	356.90	4,625.5	1,798.0	-250.4	1,815.2	0.95	-0.85	1.06



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Survey										
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5,090.0	20.30	355.90	4,713.8	1,833.0	-252.5	1,850.2	2.87	-2.84	-1.05	
5,184.0	19.80	355.70	4,802.1	1,865.1	-254.9	1,882.3	0.54	-0.53	-0.21	
5,279.0	19.00	353.90	4,891.7	1,896.5	-257.8	1,913.9	1.05	-0.84	-1.89	
5,373.0	17.10	352.90	4,981.0	1,925.5	-261.1	1,943.0	2.05	-2.02	-1.06	
5,468.0	14.90	353.50	5,072.4	1,951.4	-264.2	1,969.2	2.32	-2.32	0.63	
5,562.0	13.60	356.80	5,163.5	1,974.5	-266.2	1,992.3	1.63	-1.38	3.51	
5,657.0	12.20	355.30	5,256.1	1,995.6	-267.6	2,013.5	1.52	-1.47	-1.58	
5,751.0	10.90	354.30	5,348.2	2,014.4	-269.3	2,032.3	1.40	-1.38	-1.06	
5,846.0	9.20	355.30	5,441.7	2,030.9	-270.8	2,048.8	1.80	-1.79	1.05	
5,941.0	7.40	356.80	5,535.7	2,044.6	-271.8	2,062.5	1.91	-1.89	1.58	
6,035.0	5.30	355.80	5,629.1	2,055.0	-272.5	2,072.9	2.24	-2.23	-1.06	
6,129.0	3.80	1.80	5,722.8	2,062.4	-272.7	2,080.3	1.67	-1.60	6.38	
6,224.0	1.80	1.10	5,817.7	2,067.0	-272.6	2,084.9	2.11	-2.11	-0.74	
6,319.0	0.70	347.70	5,912.7	2,069.1	-272.7	2,087.0	1.19	-1.16	-14.11	
6,413.0	0.50	332.80	6,006.7	2,070.0	-273.0	2,087.9	0.27	-0.21	-15.85	
6,508.0	0.20	268.00	6,101.7	2,070.4	-273.3	2,088.3	0.48	-0.32	-68.21	
6,603.0	0.60	229.00	6,196.7	2,070.1	-273.9	2,088.1	0.49	0.42	-41.05	
6,697.0	1.30	221.70	6,290.6	2,068.9	-274.9	2,087.1	0.75	0.74	-7.77	
6,769.0	1.10	206.50	6,362.6	2,067.7	-275.8	2,086.0	0.52	-0.28	-21.11	
6,886.0	0.60	228.30	6,479.6	2,066.3	-276.7	2,084.7	0.50	-0.43	18.63	
6,981.0	0.90	237.00	6,574.6	2,065.6	-277.7	2,084.1	0.34	0.32	9.16	
7,076.0	1.80	228.00	6,669.6	2,064.1	-279.5	2,082.9	0.97	0.95	-9.47	
7,170.0	0.80	250.40	6,763.6	2,062.9	-281.2	2,081.9	1.17	-1.06	23.83	
7,265.0	0.60	350.10	6,858.6	2,063.2	-281.9	2,082.3	1.13	-0.21	104.95	
7,359.0	0.80	18.40	6,952.5	2,064.3	-281.8	2,083.4	0.42	0.21	30.11	
7,454.0	0.20	3.50	7,047.5	2,065.1	-281.6	2,084.1	0.64	-0.63	-15.68	
7,548.0	0.57	270.60	7,141.5	2,065.3	-282.0	2,084.3	0.65	0.39	-98.83	
7,643.0	0.62	162.70	7,236.5	2,064.8	-282.3	2,083.9	1.01	0.05	-113.58	
7,738.0	1.00	164.60	7,331.5	2,063.5	-282.0	2,082.6	0.40	0.40	2.00	
7,832.0	0.90	176.20	7,425.5	2,062.0	-281.7	2,081.0	0.23	-0.11	12.34	
7,927.0	0.80	188.70	7,520.5	2,060.6	-281.8	2,079.6	0.22	-0.11	13.16	
7,996.0	1.10	203.40	7,589.5	2,059.5	-282.1	2,078.6	0.56	0.43	21.30	
Projection to TD @ 8052.0' MD / 7645.5' TVD										
8,052.0	1.10	203.40	7,645.5	2,058.5	-282.5	2,077.7	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
204.0	203.8	6.8	-2.7	First MWD Survey @ 204.0' MD / 203.8' TVD	
8,052.0	7,645.5	2,058.5	-282.5	Projection to TD @ 8052.0' MD / 7645.5' TVD	



Survey Report



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