



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-01W

Wellbore #1

Design: Wellbore #1

QES Survey Report

23 August, 2017





Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-01W
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 19-01W	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 19-01W					
Well Position	+N/-S	0.0 usft	Northing:	1,529,031.89 usft	Latitude:	39.262997
	+E/-W	0.0 usft	Easting:	2,344,600.87 usft	Longitude:	-107.815047
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	51,400.25560896

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	351.53	

Survey Program	Date	8/23/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
204.0	8,170.0	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 / 203.9' TVD									
204.0	2.60	357.60	203.9	4.6	-0.2	4.6	1.27	1.27	0.00
295.0	4.60	4.00	294.7	10.3	0.0	10.2	2.24	2.20	7.03
386.0	6.50	0.40	385.3	19.1	0.3	18.9	2.12	2.09	-3.96
476.0	9.40	357.40	474.4	31.6	0.0	31.2	3.25	3.22	-3.33
567.0	11.90	358.50	563.9	48.4	-0.6	47.9	2.76	2.75	1.21
658.0	15.00	356.70	652.4	69.5	-1.5	69.0	3.44	3.41	-1.98
749.0	17.70	358.20	739.7	95.1	-2.7	94.4	3.00	2.97	1.65
840.0	20.00	359.00	825.8	124.5	-3.4	123.6	2.54	2.53	0.88
930.0	22.20	358.90	909.7	156.9	-4.0	155.7	2.44	2.44	-0.11



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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	25.80	358.80	996.5	195.5	-4.7	194.1	3.79	3.79	-0.11
1,119.0	27.20	357.80	1,080.6	237.4	-6.0	235.7	1.56	1.49	-1.06
1,214.0	26.20	357.60	1,165.5	280.1	-7.7	278.2	1.06	-1.05	-0.21
1,309.0	27.20	357.00	1,250.4	322.7	-9.7	320.6	1.09	1.05	-0.63
1,404.0	26.90	356.50	1,335.0	365.8	-12.2	363.6	0.40	-0.32	-0.53
1,499.0	27.20	357.50	1,419.6	409.0	-14.4	406.6	0.57	0.32	1.05
1,589.0	26.20	356.40	1,500.0	449.4	-16.6	446.9	1.24	-1.11	-1.22
1,683.0	27.20	354.80	1,584.0	491.5	-19.8	489.0	1.31	1.06	-1.70
1,778.0	28.70	352.10	1,667.9	535.7	-24.9	533.5	2.07	1.58	-2.84
1,872.0	28.40	351.60	1,750.5	580.2	-31.3	578.4	0.41	-0.32	-0.53
1,967.0	28.00	351.00	1,834.2	624.5	-38.1	623.3	0.52	-0.42	-0.63
2,062.0	26.60	350.90	1,918.6	667.6	-44.9	666.9	1.47	-1.47	-0.11
2,156.0	28.00	351.40	2,002.1	710.2	-51.6	710.0	1.51	1.49	0.53
2,251.0	27.10	351.50	2,086.4	753.6	-58.1	754.0	0.95	-0.95	0.11
2,346.0	25.70	351.30	2,171.5	795.4	-64.4	796.2	1.48	-1.47	-0.21
2,440.0	27.80	350.20	2,255.4	837.1	-71.2	838.5	2.30	2.23	-1.17
2,535.0	26.90	350.60	2,339.8	880.2	-78.5	882.1	0.97	-0.95	0.42
2,630.0	25.80	349.10	2,424.9	921.7	-85.9	924.3	1.35	-1.16	-1.58
2,724.0	26.10	352.60	2,509.4	962.3	-92.4	965.4	1.66	0.32	3.72
2,819.0	28.30	351.80	2,593.9	1,005.3	-98.4	1,008.8	2.35	2.32	-0.84
2,913.0	27.50	350.90	2,677.0	1,048.8	-105.0	1,052.8	0.96	-0.85	-0.96
3,008.0	27.00	351.00	2,761.4	1,091.7	-111.8	1,096.3	0.53	-0.53	0.11
3,103.0	27.00	350.70	2,846.1	1,134.3	-118.7	1,139.4	0.14	0.00	-0.32
3,197.0	26.70	350.00	2,930.0	1,176.2	-125.8	1,181.9	0.46	-0.32	-0.74
3,292.0	26.00	350.10	3,015.1	1,217.7	-133.1	1,224.0	0.74	-0.74	0.11
3,386.0	24.90	349.30	3,100.0	1,257.4	-140.3	1,264.4	1.23	-1.17	-0.85
3,481.0	26.10	353.20	3,185.7	1,297.8	-146.5	1,305.3	2.17	1.26	4.11
3,576.0	27.90	352.80	3,270.4	1,340.6	-151.7	1,348.4	1.90	1.89	-0.42
3,670.0	27.20	352.10	3,353.7	1,383.7	-157.4	1,391.8	0.82	-0.74	-0.74
3,765.0	26.40	351.90	3,438.5	1,426.2	-163.4	1,434.7	0.85	-0.84	-0.21
3,859.0	25.60	351.10	3,523.0	1,466.9	-169.5	1,475.9	0.93	-0.85	-0.85
3,954.0	26.60	353.20	3,608.3	1,508.3	-175.2	1,517.7	1.43	1.05	2.21
4,048.0	29.20	352.60	3,691.4	1,552.0	-180.6	1,561.6	2.78	2.77	-0.64
4,143.0	29.50	353.00	3,774.2	1,598.1	-186.5	1,608.2	0.38	0.32	0.42
4,238.0	29.00	351.50	3,857.1	1,644.1	-192.7	1,654.6	0.93	-0.53	-1.58
4,332.0	27.60	350.50	3,939.8	1,688.2	-199.7	1,699.2	1.57	-1.49	-1.06
4,427.0	28.90	354.40	4,023.5	1,732.7	-205.6	1,744.1	2.38	1.37	4.11
4,522.0	28.60	354.00	4,106.8	1,778.2	-210.2	1,789.7	0.38	-0.32	-0.42
4,616.0	28.00	353.70	4,189.6	1,822.5	-214.9	1,834.3	0.66	-0.64	-0.32
4,711.0	27.20	353.10	4,273.7	1,866.2	-220.0	1,878.3	0.89	-0.84	-0.63
4,806.0	26.00	352.20	4,358.7	1,908.4	-225.4	1,920.8	1.33	-1.26	-0.95
4,900.0	25.20	353.30	4,443.5	1,948.7	-230.6	1,961.4	0.99	-0.85	1.17
4,995.0	24.30	352.00	4,529.7	1,988.1	-235.6	2,001.1	1.11	-0.95	-1.37



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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)	
5,089.0	23.50	351.40	4,615.7	2,025.8	-241.1	2,039.2	0.89	-0.85	-0.64	
5,184.0	20.50	352.90	4,703.7	2,061.0	-246.0	2,074.8	3.21	-3.16	1.58	
5,279.0	19.40	352.20	4,793.0	2,093.2	-250.2	2,107.2	1.18	-1.16	-0.74	
5,373.0	18.30	353.10	4,882.0	2,123.3	-254.1	2,137.6	1.21	-1.17	0.96	
5,468.0	16.60	353.10	4,972.6	2,151.6	-257.5	2,166.1	1.79	-1.79	0.00	
5,562.0	15.20	348.90	5,063.0	2,177.0	-261.5	2,191.8	1.93	-1.49	-4.47	
5,656.0	15.20	350.30	5,153.7	2,201.3	-266.0	2,216.4	0.39	0.00	1.49	
5,751.0	13.70	351.60	5,245.7	2,224.7	-269.7	2,240.1	1.62	-1.58	1.37	
5,846.0	11.60	350.50	5,338.4	2,245.2	-272.9	2,260.9	2.22	-2.21	-1.16	
5,940.0	9.30	349.30	5,430.9	2,262.0	-275.9	2,278.0	2.46	-2.45	-1.28	
6,035.0	6.90	355.30	5,524.9	2,275.2	-277.8	2,291.3	2.68	-2.53	6.32	
6,129.0	4.10	348.70	5,618.5	2,284.2	-278.9	2,300.3	3.05	-2.98	-7.02	
6,224.0	3.70	346.40	5,713.2	2,290.5	-280.3	2,306.8	0.45	-0.42	-2.42	
6,319.0	2.90	331.40	5,808.1	2,295.6	-282.2	2,312.1	1.23	-0.84	-15.79	
6,413.0	3.00	333.50	5,902.0	2,299.8	-284.4	2,316.6	0.16	0.11	2.23	
6,508.0	3.30	348.90	5,996.8	2,304.7	-286.0	2,321.7	0.94	0.32	16.21	
6,602.0	2.90	352.20	6,090.7	2,309.8	-286.9	2,326.8	0.47	-0.43	3.51	
6,697.0	2.10	347.30	6,185.6	2,313.8	-287.6	2,331.0	0.87	-0.84	-5.16	
6,792.0	1.30	325.50	6,280.6	2,316.4	-288.6	2,333.7	1.07	-0.84	-22.95	
6,886.0	0.60	291.60	6,374.5	2,317.5	-289.7	2,334.9	0.92	-0.74	-36.06	
6,981.0	0.70	279.60	6,469.5	2,317.8	-290.7	2,335.3	0.18	0.11	-12.63	
7,075.0	1.50	354.80	6,563.5	2,319.1	-291.4	2,336.7	1.58	0.85	80.00	
7,170.0	0.90	351.50	6,658.5	2,321.1	-291.6	2,338.7	0.64	-0.63	-3.47	
7,264.0	0.30	287.60	6,752.5	2,321.9	-291.9	2,339.5	0.87	-0.64	-67.98	
7,359.0	0.30	262.80	6,847.5	2,321.9	-292.4	2,339.7	0.14	0.00	-26.11	
7,453.0	0.60	215.80	6,941.5	2,321.5	-293.0	2,339.3	0.48	0.32	-50.00	
7,548.0	0.60	228.10	7,036.5	2,320.7	-293.6	2,338.7	0.14	0.00	12.95	
7,642.0	0.70	316.70	7,130.5	2,320.8	-294.4	2,338.9	0.97	0.11	94.26	
7,737.0	0.60	359.90	7,225.5	2,321.8	-294.8	2,339.8	0.51	-0.11	45.47	
7,832.0	0.80	60.70	7,320.5	2,322.6	-294.2	2,340.6	0.77	0.21	64.00	
7,926.0	0.30	107.10	7,414.5	2,322.8	-293.4	2,340.7	0.67	-0.53	49.36	
8,021.0	0.30	128.00	7,509.5	2,322.6	-293.0	2,340.4	0.11	0.00	22.00	
8,114.0	0.60	200.20	7,602.5	2,322.0	-292.9	2,339.8	0.63	0.32	77.63	
Projection to TD @ 8170.0' MD / 7658.6' TVD										
8,170.0	0.60	200.20	7,658.5	2,321.4	-293.1	2,339.3	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
204.0	203.9	4.6	-0.2	First MWD Survey @ 204.0' MD / 203.9' TVD	
8,170.0	7,658.5	2,321.4	-293.1	Projection to TD @ 8170.0' MD / 7658.6' TVD	



Survey Report



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