



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-03E

Wellbore #1

Design: Wellbore #1

QES Survey Report

27 August, 2017





Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-03E
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 19-03E	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 19-03E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,024.80 usft	Latitude:	39.262978
	+E/-W	0.0 usft	Easting:	2,344,601.48 usft	Longitude:	-107.815045
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	51,400.24546899

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	52.14	

Survey Program	Date	8/27/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
204.0	8,466.0	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	4.80	78.20	203.8	1.7	8.4	7.7	2.35	2.35	0.00	
295.0	7.40	49.00	294.3	6.4	16.5	16.9	4.36	2.86	-32.09	
386.0	10.70	50.50	384.1	15.6	27.5	31.2	3.64	3.63	1.65	
476.0	13.10	49.90	472.2	27.5	41.7	49.8	2.67	2.67	-0.67	
567.0	15.40	42.40	560.4	43.0	57.7	72.0	3.24	2.53	-8.24	
657.0	17.90	44.70	646.6	61.7	75.5	97.5	2.87	2.78	2.56	
749.0	20.80	50.20	733.4	82.2	98.0	127.9	3.72	3.15	5.98	
839.0	23.50	51.40	816.7	103.6	124.3	161.8	3.04	3.00	1.33	
930.0	26.20	51.70	899.3	127.4	154.3	200.0	2.97	2.97	0.33	



Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-03E
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 19-03E	North Reference:	True
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)
1,025.0	28.90	50.60	983.5	155.0	188.5	243.9	2.89	2.84	-1.16
1,119.0	32.00	50.60	1,064.6	185.2	225.3	291.6	3.30	3.30	0.00
1,214.0	33.60	52.40	1,144.4	217.2	265.6	343.0	1.97	1.68	1.89
1,309.0	34.10	51.70	1,223.3	249.8	307.3	395.9	0.67	0.53	-0.74
1,404.0	34.20	51.90	1,301.9	282.8	349.2	449.3	0.16	0.11	0.21
1,498.0	34.60	51.70	1,379.5	315.6	391.0	502.4	0.44	0.43	-0.21
1,623.0	35.10	52.90	1,482.1	359.3	447.5	573.8	0.68	0.40	0.96
1,717.0	35.00	52.50	1,559.0	392.0	490.4	627.8	0.27	-0.11	-0.43
1,812.0	34.60	51.60	1,637.0	425.3	533.2	682.0	0.69	-0.42	-0.95
1,907.0	34.20	51.20	1,715.4	458.8	575.1	735.7	0.48	-0.42	-0.42
2,001.0	33.30	50.90	1,793.6	491.6	615.7	787.9	0.97	-0.96	-0.32
2,096.0	33.60	52.70	1,872.8	524.0	656.9	840.2	1.09	0.32	1.89
2,191.0	32.60	53.10	1,952.4	555.3	698.3	892.1	1.08	-1.05	0.42
2,285.0	33.80	53.60	2,031.1	586.0	739.5	943.6	1.31	1.28	0.53
2,380.0	34.60	54.80	2,109.7	617.3	782.9	996.9	1.10	0.84	1.26
2,474.0	33.90	55.20	2,187.4	647.6	826.2	1,049.8	0.78	-0.74	0.43
2,569.0	35.00	53.50	2,265.7	678.9	869.8	1,103.4	1.54	1.16	-1.79
2,664.0	33.50	53.40	2,344.2	710.8	912.8	1,156.9	1.58	-1.58	-0.11
2,758.0	31.80	53.90	2,423.4	740.8	953.6	1,207.6	1.83	-1.81	0.53
2,853.0	32.20	53.50	2,503.9	770.6	994.2	1,257.9	0.48	0.42	-0.42
2,947.0	33.30	52.10	2,583.0	801.4	1,034.7	1,308.8	1.42	1.17	-1.49
3,042.0	35.40	53.90	2,661.4	833.6	1,077.5	1,362.4	2.46	2.21	1.89
3,136.0	35.10	53.80	2,738.2	865.6	1,121.3	1,416.6	0.33	-0.32	-0.11
3,231.0	34.20	53.30	2,816.3	897.7	1,164.8	1,470.6	0.99	-0.95	-0.53
3,326.0	33.80	53.30	2,895.1	929.5	1,207.4	1,523.7	0.42	-0.42	0.00
3,420.0	32.70	52.20	2,973.7	960.7	1,248.4	1,575.2	1.33	-1.17	-1.17
3,515.0	33.60	52.80	3,053.2	992.3	1,289.6	1,627.2	1.01	0.95	0.63
3,609.0	33.50	50.30	3,131.6	1,024.6	1,330.3	1,679.1	1.47	-0.11	-2.66
3,704.0	32.90	49.70	3,211.1	1,058.0	1,370.1	1,731.1	0.72	-0.63	-0.63
3,798.0	31.90	50.10	3,290.4	1,090.5	1,408.7	1,781.4	1.09	-1.06	0.43
3,893.0	30.50	50.10	3,371.7	1,122.0	1,446.4	1,830.6	1.47	-1.47	0.00
3,988.0	31.20	51.00	3,453.3	1,153.0	1,484.0	1,879.3	0.88	0.74	0.95
4,083.0	32.40	51.70	3,534.0	1,184.2	1,523.1	1,929.3	1.32	1.26	0.74
4,177.0	33.30	52.10	3,613.0	1,215.7	1,563.3	1,980.3	0.98	0.96	0.43
4,272.0	34.00	51.10	3,692.0	1,248.4	1,604.5	2,033.0	0.94	0.74	-1.05
4,367.0	33.30	51.20	3,771.1	1,281.4	1,645.5	2,085.6	0.74	-0.74	0.11
4,461.0	31.50	50.90	3,850.5	1,313.1	1,684.7	2,136.0	1.92	-1.91	-0.32
4,555.0	31.70	50.80	3,930.5	1,344.2	1,722.9	2,185.2	0.22	0.21	-0.11
4,650.0	32.30	51.40	4,011.1	1,375.8	1,762.1	2,235.5	0.71	0.63	0.63
4,744.0	33.30	52.00	4,090.1	1,407.3	1,802.0	2,286.5	1.12	1.06	0.64
4,839.0	32.80	51.60	4,169.8	1,439.4	1,842.7	2,338.3	0.57	-0.53	-0.42
4,933.0	33.20	52.50	4,248.6	1,470.9	1,883.1	2,389.5	0.67	0.43	0.96
5,028.0	33.30	51.60	4,328.0	1,502.9	1,924.2	2,441.5	0.53	0.11	-0.95



Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-03E
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 19-03E	North Reference:	True
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)	
5,123.0	33.00	50.40	4,407.6	1,535.6	1,964.6	2,493.5	0.76	-0.32	-1.26	
5,217.0	32.80	51.10	4,486.5	1,567.9	2,004.1	2,544.5	0.46	-0.21	0.74	
5,312.0	30.40	50.80	4,567.4	1,599.2	2,042.7	2,594.3	2.53	-2.53	-0.32	
5,406.0	29.10	50.30	4,649.0	1,628.9	2,078.8	2,640.9	1.41	-1.38	-0.53	
5,501.0	26.80	50.40	4,732.9	1,657.3	2,113.0	2,685.4	2.42	-2.42	0.11	
5,596.0	24.70	50.00	4,818.5	1,683.7	2,144.8	2,726.7	2.22	-2.21	-0.42	
5,690.0	22.90	49.50	4,904.5	1,708.2	2,173.7	2,764.6	1.93	-1.91	-0.53	
5,785.0	20.90	48.50	4,992.6	1,731.4	2,200.5	2,799.9	2.14	-2.11	-1.05	
5,880.0	18.50	49.90	5,082.1	1,752.4	2,224.7	2,831.9	2.57	-2.53	1.47	
5,974.0	15.60	50.40	5,171.9	1,770.0	2,245.8	2,859.5	3.09	-3.09	0.53	
6,069.0	12.70	49.00	5,264.0	1,785.0	2,263.6	2,882.7	3.07	-3.05	-1.47	
6,163.0	11.90	47.50	5,355.9	1,798.4	2,278.5	2,902.6	0.92	-0.85	-1.60	
6,258.0	10.30	48.50	5,449.1	1,810.6	2,292.1	2,920.9	1.70	-1.68	1.05	
6,352.0	7.30	48.20	5,542.0	1,820.2	2,302.8	2,935.2	3.19	-3.19	-0.32	
6,447.0	4.90	53.20	5,636.4	1,826.6	2,310.6	2,945.3	2.59	-2.53	5.26	
6,541.0	2.90	62.00	5,730.2	1,830.1	2,315.9	2,951.7	2.21	-2.13	9.36	
6,636.0	2.40	65.50	5,825.1	1,832.1	2,319.8	2,956.0	0.55	-0.53	3.68	
6,730.0	2.30	72.20	5,919.0	1,833.5	2,323.4	2,959.6	0.31	-0.11	7.13	
6,825.0	1.70	84.50	6,014.0	1,834.2	2,326.6	2,962.6	0.77	-0.63	12.95	
6,920.0	0.70	85.40	6,109.0	1,834.4	2,328.6	2,964.3	1.05	-1.05	0.95	
7,014.0	0.50	75.80	6,202.9	1,834.5	2,329.6	2,965.2	0.24	-0.21	-10.21	
7,109.0	0.50	84.30	6,297.9	1,834.7	2,330.4	2,965.9	0.08	0.00	8.95	
7,204.0	0.20	37.00	6,392.9	1,834.9	2,330.9	2,966.4	0.41	-0.32	-49.79	
7,298.0	0.00	236.70	6,486.9	1,835.0	2,331.0	2,966.6	0.21	-0.21	0.00	
7,393.0	0.20	301.30	6,581.9	1,835.1	2,330.9	2,966.5	0.21	0.21	0.00	
7,487.0	0.50	251.10	6,675.9	1,835.0	2,330.3	2,966.0	0.43	0.32	-53.40	
7,582.0	0.70	286.00	6,770.9	1,835.0	2,329.4	2,965.3	0.43	0.21	36.74	
7,676.0	0.80	282.70	6,864.9	1,835.3	2,328.2	2,964.6	0.12	0.11	-3.51	
7,771.0	0.10	222.50	6,959.9	1,835.4	2,327.5	2,964.1	0.80	-0.74	-63.37	
7,866.0	0.40	170.80	7,054.9	1,835.0	2,327.5	2,963.8	0.37	0.32	-54.42	
7,960.0	0.80	212.80	7,148.9	1,834.2	2,327.2	2,963.0	0.61	0.43	44.68	
8,055.0	1.00	238.30	7,243.9	1,833.2	2,326.1	2,961.6	0.47	0.21	26.84	
8,149.0	0.80	271.50	7,337.9	1,832.8	2,324.8	2,960.3	0.58	-0.21	35.32	
8,244.0	1.50	266.50	7,432.9	1,832.7	2,322.9	2,958.7	0.74	0.74	-5.26	
8,338.0	1.40	279.60	7,526.8	1,832.8	2,320.5	2,956.9	0.37	-0.11	13.94	
8,410.0	1.50	261.90	7,598.8	1,832.8	2,318.7	2,955.5	0.63	0.14	-24.58	
Projection to TD @ 8466.0' MD / 7654.8' TVD										
8,466.0	1.50	261.90	7,654.8	1,832.6	2,317.3	2,954.2	0.00	0.00	0.00	



Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-03E
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 19-03E	North Reference:	True
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)	
204.0	203.8	1.7	8.4	First MWD Survey @ 204.0' MD / 203.8' TVD
8,466.0	7,654.8	1,832.6	2,317.3	Projection to TD @ 8466.0' MD / 7654.8' TVD