



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 30-10 Pad**

**Bruton 30-14W**

**A-8**

**Design: Wellbore #1**

## **Survey Report - Geographic**

**04 December, 2017**





## Survey Report - Geographic



<b>Company:</b>	Laramie Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	well @ 7673.0usft (H&P #522)
<b>Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	well @ 7673.0usft (H&P #522)
<b>Well:</b>	Bruton 30-14W	<b>North Reference:</b>	True
<b>Wellbore:</b>	A-8	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

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

Site	Bruton 30-10 Pad				
Site Position:		Northing:	1,523,424.58 usft	Latitude:	39.247725
From:	Map	Easting:	2,346,291.81 usft	Longitude:	-107.808574
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.46 °

Well	Bruton 30-14W,					
Well Position	+N/-S	0.0 usft	Northing:	1,523,592.12 usft	Latitude:	39.248178
	+E/-W	0.0 usft	Easting:	2,346,192.62 usft	Longitude:	-107.808939
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,643.0 usft

<b>Wellbore</b>	A-8				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	11/22/2017	9.54	65.41	51,357.73886856

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	249.55	

<b>Survey Program</b>	<b>Date</b>	12/4/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
110.0	8,199.0	QES MWD Surveys (A-8)	MWD default	MWD - Standard	

<b>Survey</b>									
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>
0.0	0.00	0.00	0.0	0.0	0.0	1,523,592.12	2,346,192.62	39.248178	-107.808939
110.0	0.50	252.50	110.0	-0.1	-0.5	1,523,591.98	2,346,192.16	39.248177	-107.808941
<b>First MWD Survey @ 110.0' MD / 110.0' TVD</b>									
201.0	0.70	283.80	201.0	-0.1	-1.4	1,523,592.02	2,346,191.24	39.248177	-107.808944
292.0	3.20	262.30	291.9	-0.3	-4.4	1,523,591.89	2,346,188.18	39.248177	-107.808955
383.0	5.50	261.20	382.7	-1.3	-11.3	1,523,591.06	2,346,181.33	39.248174	-107.808979
475.0	8.10	254.10	474.0	-3.8	-21.9	1,523,588.88	2,346,170.68	39.248167	-107.809016
566.0	11.20	246.50	563.7	-9.1	-36.1	1,523,583.96	2,346,156.28	39.248153	-107.809067
657.0	13.90	244.20	652.5	-17.4	-54.1	1,523,576.14	2,346,138.12	39.248130	-107.809130
748.0	16.60	247.20	740.3	-27.2	-75.9	1,523,566.90	2,346,116.05	39.248103	-107.809207
840.0	19.20	247.60	827.9	-38.0	-102.0	1,523,556.70	2,346,089.68	39.248073	-107.809299
930.0	22.80	248.90	911.9	-49.9	-132.0	1,523,545.55	2,346,059.42	39.248041	-107.809405



# Survey Report - Geographic



<b>Company:</b>	Laramie Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	well @ 7673.0usft (H&P #522)
<b>Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	well @ 7673.0usft (H&P #522)
<b>Well:</b>	Bruton 30-14W	<b>North Reference:</b>	True
<b>Wellbore:</b>	A-8	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,022.0	24.60	250.40	996.1	-62.8	-166.6	1,523,533.59	2,346,024.43	39.248005	-107.809528
1,116.0	24.90	249.30	1,081.5	-76.3	-203.6	1,523,520.98	2,345,987.16	39.247968	-107.809658
1,210.0	26.40	250.40	1,166.2	-90.3	-241.8	1,523,507.95	2,345,948.62	39.247930	-107.809793
1,304.0	26.50	249.40	1,250.4	-104.7	-281.1	1,523,494.56	2,345,908.94	39.247890	-107.809932
1,398.0	26.90	249.40	1,334.3	-119.6	-320.6	1,523,480.71	2,345,869.04	39.247849	-107.810071
1,492.0	27.40	249.80	1,418.0	-134.5	-360.8	1,523,466.79	2,345,828.47	39.247808	-107.810213
1,586.0	26.90	250.10	1,501.6	-149.3	-401.1	1,523,453.11	2,345,787.82	39.247768	-107.810356
1,680.0	26.70	248.30	1,585.5	-164.3	-440.8	1,523,439.07	2,345,747.83	39.247727	-107.810496
1,775.0	26.30	247.20	1,670.6	-180.3	-480.0	1,523,424.03	2,345,708.21	39.247683	-107.810634
1,869.0	26.10	248.30	1,754.9	-196.1	-518.4	1,523,409.30	2,345,669.41	39.247639	-107.810770
1,963.0	26.50	251.70	1,839.2	-210.3	-557.5	1,523,396.06	2,345,629.93	39.247600	-107.810908
2,057.0	25.60	250.10	1,923.6	-223.8	-596.5	1,523,383.56	2,345,590.60	39.247563	-107.811046
2,151.0	26.50	253.10	2,008.1	-236.8	-635.7	1,523,371.55	2,345,551.12	39.247528	-107.811184
2,246.0	25.80	251.60	2,093.4	-249.5	-675.6	1,523,359.88	2,345,510.91	39.247493	-107.811325
2,340.0	25.30	251.10	2,178.2	-262.4	-714.0	1,523,347.90	2,345,472.18	39.247457	-107.811460
2,434.0	26.40	253.30	2,262.8	-275.0	-753.0	1,523,336.38	2,345,432.85	39.247423	-107.811598
2,528.0	26.00	254.00	2,347.1	-286.6	-792.8	1,523,325.71	2,345,392.75	39.247391	-107.811739
2,622.0	26.40	250.40	2,431.4	-299.3	-832.3	1,523,314.03	2,345,352.94	39.247356	-107.811878
2,716.0	25.50	251.10	2,516.0	-312.9	-871.2	1,523,301.46	2,345,313.78	39.247319	-107.812015
2,811.0	25.80	250.00	2,601.6	-326.6	-909.9	1,523,288.75	2,345,274.67	39.247281	-107.812152
2,905.0	24.10	248.00	2,686.8	-340.8	-947.0	1,523,275.51	2,345,237.30	39.247242	-107.812283
2,999.0	24.00	249.10	2,772.7	-354.8	-982.6	1,523,262.41	2,345,201.30	39.247204	-107.812409
3,093.0	25.80	250.30	2,857.9	-368.5	-1,019.7	1,523,249.64	2,345,163.85	39.247166	-107.812540
3,188.0	27.20	251.20	2,943.0	-382.5	-1,059.8	1,523,236.70	2,345,123.48	39.247128	-107.812681
3,282.0	26.60	251.00	3,026.8	-396.2	-1,100.0	1,523,223.95	2,345,082.91	39.247090	-107.812823
3,376.0	26.40	252.80	3,110.9	-409.3	-1,139.9	1,523,211.94	2,345,042.73	39.247054	-107.812964
3,470.0	26.50	249.70	3,195.1	-422.7	-1,179.5	1,523,199.49	2,345,002.77	39.247017	-107.813104
3,565.0	25.90	250.30	3,280.3	-437.1	-1,218.9	1,523,186.15	2,344,963.00	39.246978	-107.813243
3,659.0	26.40	246.80	3,364.7	-452.2	-1,257.4	1,523,171.98	2,344,924.09	39.246936	-107.813379
3,753.0	26.10	247.10	3,449.0	-468.5	-1,295.7	1,523,156.68	2,344,885.44	39.246891	-107.813514
3,847.0	26.00	247.20	3,533.4	-484.5	-1,333.7	1,523,141.62	2,344,847.00	39.246847	-107.813649
3,942.0	25.70	249.00	3,618.9	-500.0	-1,372.2	1,523,127.15	2,344,808.19	39.246805	-107.813784
4,036.0	25.80	249.80	3,703.6	-514.4	-1,410.4	1,523,113.76	2,344,769.61	39.246765	-107.813919
4,130.0	25.80	250.20	3,788.2	-528.4	-1,448.8	1,523,100.75	2,344,730.83	39.246727	-107.814055
4,224.0	26.90	249.30	3,872.5	-542.8	-1,488.0	1,523,087.30	2,344,691.33	39.246687	-107.814193
4,319.0	28.20	248.90	3,956.7	-558.5	-1,529.0	1,523,072.67	2,344,649.90	39.246644	-107.814338
4,413.0	28.10	248.30	4,039.6	-574.7	-1,570.3	1,523,057.55	2,344,608.21	39.246600	-107.814484
4,507.0	26.90	249.50	4,123.0	-590.3	-1,610.8	1,523,042.95	2,344,567.34	39.246557	-107.814627
4,601.0	26.50	250.50	4,206.9	-604.7	-1,650.5	1,523,029.51	2,344,527.30	39.246517	-107.814767
4,695.0	26.10	249.30	4,291.2	-619.1	-1,689.6	1,523,016.20	2,344,487.84	39.246478	-107.814905
4,790.0	25.60	250.90	4,376.7	-633.2	-1,728.5	1,523,003.10	2,344,448.55	39.246439	-107.815043
4,884.0	24.10	249.00	4,462.0	-646.7	-1,765.7	1,522,990.52	2,344,411.11	39.246402	-107.815174
4,979.0	23.80	249.00	4,548.8	-660.5	-1,801.7	1,522,977.62	2,344,374.77	39.246364	-107.815301
5,073.0	22.40	250.20	4,635.3	-673.4	-1,836.2	1,522,965.64	2,344,339.89	39.246329	-107.815423
5,167.0	20.60	250.50	4,722.7	-685.0	-1,868.7	1,522,954.88	2,344,307.16	39.246297	-107.815537
5,261.0	20.40	249.80	4,810.8	-696.1	-1,899.6	1,522,944.49	2,344,275.93	39.246266	-107.815647
5,356.0	19.00	249.50	4,900.2	-707.3	-1,929.6	1,522,934.12	2,344,245.63	39.246236	-107.815753
5,450.0	17.70	249.10	4,989.4	-717.7	-1,957.3	1,522,924.37	2,344,217.69	39.246207	-107.815851
5,544.0	14.80	249.90	5,079.7	-726.9	-1,982.0	1,522,915.78	2,344,192.83	39.246182	-107.815938
5,638.0	11.60	250.80	5,171.2	-734.2	-2,002.2	1,522,909.06	2,344,172.45	39.246162	-107.816009
5,732.0	9.70	252.80	5,263.6	-739.6	-2,018.7	1,522,904.03	2,344,155.82	39.246147	-107.816067
5,826.0	7.10	253.30	5,356.5	-743.6	-2,031.8	1,522,900.35	2,344,142.59	39.246136	-107.816113
5,921.0	4.40	247.90	5,451.1	-746.7	-2,040.8	1,522,897.52	2,344,133.52	39.246127	-107.816145
6,015.0	2.40	236.70	5,544.9	-749.1	-2,045.8	1,522,895.21	2,344,128.47	39.246121	-107.816163
6,109.0	0.30	238.90	5,638.8	-750.3	-2,047.6	1,522,894.05	2,344,126.59	39.246117	-107.816169



## Survey Report - Geographic



<b>Company:</b>	Laramie Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	well @ 7673.0usft (H&P #522)
<b>Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	well @ 7673.0usft (H&P #522)
<b>Well:</b>	Bruton 30-14W	<b>North Reference:</b>	True
<b>Wellbore:</b>	A-8	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

## Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,204.0	0.20	298.20	5,733.8	-750.4	-2,048.0	1,522,894.01	2,344,126.23	39.246117	-107.816171
6,298.0	1.00	328.30	5,827.8	-749.6	-2,048.6	1,522,894.80	2,344,125.67	39.246119	-107.816173
6,392.0	1.10	327.90	5,921.8	-748.2	-2,049.5	1,522,896.28	2,344,124.80	39.246123	-107.816176
6,486.0	1.30	299.80	6,015.8	-746.9	-2,050.9	1,522,897.61	2,344,123.43	39.246127	-107.816181
6,581.0	0.70	285.90	6,110.8	-746.2	-2,052.4	1,522,898.35	2,344,121.95	39.246129	-107.816186
6,674.0	1.00	236.60	6,203.8	-746.5	-2,053.6	1,522,898.09	2,344,120.72	39.246128	-107.816191
6,769.0	1.10	239.10	6,298.8	-747.4	-2,055.1	1,522,897.20	2,344,119.22	39.246126	-107.816196
6,863.0	1.20	231.10	6,392.7	-748.5	-2,056.6	1,522,896.16	2,344,117.65	39.246123	-107.816201
6,957.0	2.00	226.80	6,486.7	-750.2	-2,058.6	1,522,894.47	2,344,115.65	39.246118	-107.816208
7,051.0	2.40	226.20	6,580.6	-752.7	-2,061.2	1,522,892.05	2,344,112.97	39.246111	-107.816217
7,145.0	2.70	235.60	6,674.5	-755.3	-2,064.4	1,522,889.52	2,344,109.66	39.246104	-107.816229
7,239.0	2.80	223.10	6,768.4	-758.2	-2,067.8	1,522,886.68	2,344,106.19	39.246096	-107.816241
7,334.0	3.40	227.20	6,863.3	-761.8	-2,071.5	1,522,883.17	2,344,102.45	39.246086	-107.816254
7,428.0	3.30	223.30	6,957.1	-765.7	-2,075.4	1,522,879.40	2,344,098.45	39.246075	-107.816267
7,522.0	3.70	224.50	7,051.0	-769.8	-2,079.4	1,522,875.37	2,344,094.36	39.246064	-107.816281
7,616.0	3.60	229.30	7,144.8	-773.9	-2,083.7	1,522,871.40	2,344,089.90	39.246053	-107.816297
7,710.0	4.10	228.60	7,238.6	-778.1	-2,088.5	1,522,867.37	2,344,085.04	39.246041	-107.816314
7,804.0	4.90	226.80	7,332.3	-783.0	-2,093.9	1,522,862.54	2,344,079.46	39.246028	-107.816333
7,898.0	3.60	219.90	7,426.0	-788.1	-2,098.8	1,522,857.65	2,344,074.52	39.246014	-107.816350
7,993.0	3.30	215.30	7,520.8	-792.6	-2,102.2	1,522,853.22	2,344,070.91	39.246001	-107.816362
8,087.0	3.60	218.50	7,614.7	-797.1	-2,105.6	1,522,848.79	2,344,067.40	39.245989	-107.816374
8,139.0	3.40	224.50	7,666.6	-799.5	-2,107.7	1,522,846.47	2,344,065.24	39.245983	-107.816382
8,199.0	3.40	224.50	7,726.5	-802.0	-2,110.2	1,522,844.00	2,344,062.68	39.245976	-107.816390

Projection to TD @ 8199.0' MD / 7726.5' TVD

## Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
110.0	110.0	-0.1	-0.5	First MWD Survey @ 110.0' MD / 110.0' TVD
8,199.0	7,726.5	-802.0	-2,110.2	Projection to TD @ 8199.0' MD / 7726.5' TVD