



# **Laramie Energy, LLC**

**Mesa County, CO**

**Nichols 24-07 Pad**

**Nichols 0994-24-12W**

**Wellbore #1**

**Design: Wellbore #1**

## **Survey Report - Geographic**

**17 March, 2018**







## Survey Report - Geographic



<b>Company:</b>	Laramie Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	well @ 7236.0usft (H&P #290)
<b>Site:</b>	Nichols 24-07 Pad	<b>MD Reference:</b>	well @ 7236.0usft (H&P #290)
<b>Well:</b>	Nichols 0994-24-12W	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<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		Nichols 24-07 Pad							
Site Position:		Northing:	1,529,213.07	usft	Latitude:	39.263181			
From:	Lat/Long	Easting:	2,340,128.94	usft	Longitude:	-107.830853			
Position Uncertainty:		0.0	usft	Slot Radius:	13-3/16	"	Grid Convergence:	-1.47	°

Well	Nichols 0994-24-12W					
Well Position	+N/-S	0.0 usft	Northing:	1,529,273.76 usft	Latitude:	39.263347
	+E/-W	0.0 usft	Easting:	2,340,126.47 usft	Longitude:	-107.830867
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,212.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	User Defined	3/14/2018	9.45	65.40	51,314.50000000

<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	244.40	

<b>Survey Program</b>	<b>Date</b>	3/17/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
250.0	7,554.0	QES MWD Surveys (Wellbore #1)	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	1,529,273.76	2,340,126.47	39.263347	-107.830867
250.0	3.70	302.00	249.8	4.3	-6.8	1,529,278.21	2,340,119.74	39.263359	-107.830891
<b>First MWD Survey @ 250.0' MD / 249.8' TVD</b>									
340.0	4.90	276.50	339.6	6.3	-13.1	1,529,280.34	2,340,113.51	39.263364	-107.830914
380.0	5.10	274.20	379.4	6.6	-16.6	1,529,280.76	2,340,110.05	39.263365	-107.830926
470.0	7.00	266.60	468.9	6.5	-26.1	1,529,280.97	2,340,100.59	39.263365	-107.830959
560.0	8.30	253.00	558.1	4.3	-37.7	1,529,279.04	2,340,088.85	39.263359	-107.831001
650.0	10.70	248.90	646.9	-0.6	-51.8	1,529,274.50	2,340,074.72	39.263345	-107.831050
740.0	12.40	249.20	735.1	-7.0	-68.6	1,529,268.49	2,340,057.73	39.263328	-107.831110
834.0	14.40	246.00	826.5	-15.4	-88.7	1,529,260.67	2,340,037.41	39.263305	-107.831181
929.0	15.40	238.60	918.3	-26.7	-110.3	1,529,249.85	2,340,015.56	39.263274	-107.831257
1,023.0	17.10	241.60	1,008.6	-39.8	-133.1	1,529,237.36	2,339,992.42	39.263238	-107.831337





## Survey Report - Geographic



<b>Company:</b>	Laramie Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	well @ 7236.0usft (H&P #290)
<b>Site:</b>	Nichols 24-07 Pad	<b>MD Reference:</b>	well @ 7236.0usft (H&P #290)
<b>Well:</b>	Nichols 0994-24-12W	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<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
1,118.0	17.30	240.40	1,099.3	-53.4	-157.6	1,529,224.38	2,339,967.51	39.263200	-107.831424
1,212.0	16.90	235.90	1,189.2	-68.0	-181.1	1,529,210.42	2,339,943.68	39.263160	-107.831507
1,307.0	17.50	244.00	1,279.9	-82.0	-205.4	1,529,197.04	2,339,919.05	39.263122	-107.831593
1,402.0	18.63	249.92	1,370.2	-93.5	-232.5	1,529,186.27	2,339,891.67	39.263090	-107.831688
1,504.0	18.24	248.25	1,467.0	-105.0	-262.6	1,529,175.54	2,339,861.26	39.263059	-107.831795
1,587.0	17.30	247.10	1,546.0	-114.6	-286.0	1,529,166.52	2,339,837.59	39.263032	-107.831878
1,682.0	17.00	245.20	1,636.8	-125.9	-311.7	1,529,155.86	2,339,811.68	39.263001	-107.831968
1,776.0	16.20	246.50	1,726.9	-136.9	-336.2	1,529,145.50	2,339,786.91	39.262971	-107.832055
1,871.0	17.40	248.10	1,817.9	-147.5	-361.5	1,529,135.57	2,339,761.31	39.262942	-107.832144
1,965.0	16.70	246.00	1,907.7	-158.2	-386.9	1,529,125.49	2,339,735.67	39.262913	-107.832234
2,060.0	15.70	245.20	1,998.9	-169.2	-411.0	1,529,115.17	2,339,711.26	39.262883	-107.832319
2,154.0	17.10	247.90	2,089.1	-179.7	-435.4	1,529,105.26	2,339,686.64	39.262854	-107.832405
2,249.0	17.70	245.40	2,179.8	-191.0	-461.4	1,529,094.67	2,339,660.29	39.262823	-107.832497
2,343.0	16.70	244.80	2,269.6	-202.7	-486.6	1,529,083.62	2,339,634.78	39.262791	-107.832586
2,438.0	15.90	244.80	2,360.8	-214.0	-510.8	1,529,072.89	2,339,610.38	39.262759	-107.832671
2,532.0	17.90	248.20	2,450.7	-224.9	-535.8	1,529,062.69	2,339,585.04	39.262730	-107.832760
2,627.0	18.10	247.10	2,541.0	-236.1	-563.0	1,529,052.23	2,339,557.61	39.262699	-107.832856
2,721.0	18.60	244.40	2,630.3	-248.2	-590.0	1,529,040.76	2,339,530.34	39.262666	-107.832951
2,816.0	17.90	243.90	2,720.5	-261.2	-616.7	1,529,028.48	2,339,503.24	39.262630	-107.833046
2,910.0	17.10	244.70	2,810.1	-273.4	-642.2	1,529,016.88	2,339,477.47	39.262596	-107.833135
3,005.0	18.70	240.90	2,900.5	-286.8	-668.1	1,529,004.17	2,339,451.20	39.262560	-107.833227
3,099.0	17.80	241.00	2,989.8	-301.1	-693.9	1,528,990.54	2,339,425.10	39.262520	-107.833318
3,194.0	17.00	241.20	3,080.5	-314.8	-718.7	1,528,977.46	2,339,399.89	39.262483	-107.833406
3,288.0	16.30	240.00	3,170.5	-328.1	-742.2	1,528,964.85	2,339,376.09	39.262446	-107.833489
3,383.0	17.10	241.50	3,261.5	-341.4	-766.0	1,528,952.13	2,339,351.94	39.262410	-107.833573
3,478.0	18.30	242.90	3,352.0	-354.9	-791.6	1,528,939.33	2,339,326.05	39.262373	-107.833663
3,572.0	17.70	241.80	3,441.4	-368.3	-817.3	1,528,926.52	2,339,299.98	39.262336	-107.833754
3,667.0	16.60	242.50	3,532.2	-381.4	-842.1	1,528,914.07	2,339,274.89	39.262300	-107.833841
3,762.0	17.90	243.70	3,622.9	-394.2	-867.2	1,528,901.98	2,339,249.44	39.262265	-107.833930
3,856.0	17.30	244.10	3,712.5	-406.7	-892.7	1,528,890.14	2,339,223.61	39.262230	-107.834020
3,951.0	18.40	245.50	3,802.9	-419.0	-919.1	1,528,878.43	2,339,196.95	39.262196	-107.834113
4,046.0	17.90	245.50	3,893.2	-431.3	-946.0	1,528,866.85	2,339,169.71	39.262163	-107.834208
4,140.0	17.80	244.40	3,982.7	-443.5	-972.1	1,528,855.33	2,339,143.30	39.262129	-107.834301
4,235.0	16.70	245.80	4,073.4	-455.4	-997.7	1,528,844.12	2,339,117.46	39.262097	-107.834391
4,329.0	15.40	244.80	4,163.7	-466.2	-1,021.3	1,528,833.87	2,339,093.58	39.262067	-107.834474
4,424.0	16.80	246.60	4,255.0	-477.1	-1,045.3	1,528,823.67	2,339,069.29	39.262037	-107.834559
4,519.0	16.20	247.20	4,346.1	-487.7	-1,070.1	1,528,813.72	2,339,044.21	39.262008	-107.834647
4,613.0	17.10	245.30	4,436.2	-498.5	-1,094.7	1,528,803.50	2,339,019.30	39.261978	-107.834734
4,708.0	15.30	245.20	4,527.4	-509.6	-1,118.8	1,528,793.03	2,338,994.95	39.261948	-107.834819
4,802.0	14.40	244.40	4,618.2	-519.9	-1,140.6	1,528,783.34	2,338,972.90	39.261920	-107.834896
4,897.0	13.40	242.70	4,710.5	-530.0	-1,161.1	1,528,773.71	2,338,952.21	39.261892	-107.834968
4,991.0	12.10	241.40	4,802.1	-539.7	-1,179.4	1,528,764.47	2,338,933.64	39.261865	-107.835033
5,086.0	11.20	242.90	4,895.2	-548.7	-1,196.3	1,528,755.94	2,338,916.46	39.261840	-107.835093
5,180.0	10.60	242.90	4,987.5	-556.8	-1,212.2	1,528,748.25	2,338,900.43	39.261818	-107.835148
5,275.0	9.60	241.60	5,081.0	-564.5	-1,226.9	1,528,740.89	2,338,885.49	39.261797	-107.835200
5,369.0	7.20	243.70	5,174.0	-570.9	-1,239.1	1,528,734.86	2,338,873.15	39.261780	-107.835244
5,464.0	6.90	243.90	5,268.3	-576.0	-1,249.5	1,528,729.98	2,338,862.56	39.261765	-107.835280
5,559.0	4.00	236.90	5,362.8	-580.3	-1,257.4	1,528,725.87	2,338,854.55	39.261754	-107.835308
5,654.0	0.90	210.70	5,457.7	-582.8	-1,260.6	1,528,723.50	2,338,851.33	39.261747	-107.835320
5,748.0	0.92	215.03	5,551.7	-584.0	-1,261.4	1,528,722.27	2,338,850.49	39.261743	-107.835322
5,843.0	1.58	200.08	5,646.7	-585.9	-1,262.3	1,528,720.43	2,338,849.56	39.261738	-107.835326
5,937.0	1.67	209.40	5,740.7	-588.3	-1,263.4	1,528,718.05	2,338,848.38	39.261732	-107.835329
6,032.0	2.02	211.69	5,835.6	-590.9	-1,265.0	1,528,715.46	2,338,846.75	39.261724	-107.835335
6,127.0	2.02	209.75	5,930.6	-593.8	-1,266.7	1,528,712.63	2,338,844.97	39.261717	-107.835341
6,222.0	1.89	208.08	6,025.5	-596.7	-1,268.3	1,528,709.84	2,338,843.33	39.261709	-107.835347





# Survey Report - Geographic



<b>Company:</b>	Laramie Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	well @ 7236.0usft (H&P #290)
<b>Site:</b>	Nichols 24-07 Pad	<b>MD Reference:</b>	well @ 7236.0usft (H&P #290)
<b>Well:</b>	Nichols 0994-24-12W	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<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
6,316.0	1.41	192.97	6,119.5	-599.2	-1,269.2	1,528,707.37	2,338,842.27	39.261702	-107.835350
6,411.0	1.76	195.51	6,214.4	-601.7	-1,269.9	1,528,704.84	2,338,841.56	39.261695	-107.835352
6,506.0	1.98	216.87	6,309.4	-604.4	-1,271.3	1,528,702.16	2,338,840.11	39.261687	-107.835357
6,600.0	2.15	216.70	6,403.3	-607.1	-1,273.3	1,528,699.50	2,338,838.02	39.261680	-107.835364
6,695.0	2.46	224.43	6,498.2	-610.0	-1,275.8	1,528,696.68	2,338,835.45	39.261672	-107.835373
6,790.0	2.59	219.51	6,593.2	-613.1	-1,278.6	1,528,693.64	2,338,832.58	39.261664	-107.835383
6,884.0	2.55	215.55	6,687.1	-616.5	-1,281.2	1,528,690.36	2,338,829.93	39.261654	-107.835392
6,979.0	2.55	208.61	6,782.0	-620.0	-1,283.4	1,528,686.85	2,338,827.59	39.261645	-107.835400
7,074.0	2.50	205.27	6,876.9	-623.8	-1,285.3	1,528,683.17	2,338,825.60	39.261634	-107.835407
7,168.0	2.33	216.17	6,970.8	-627.2	-1,287.3	1,528,679.83	2,338,823.51	39.261625	-107.835414
7,263.0	2.46	233.13	7,065.7	-629.9	-1,290.1	1,528,677.12	2,338,820.67	39.261617	-107.835424
7,357.0	2.42	231.29	7,159.6	-632.4	-1,293.2	1,528,674.75	2,338,817.45	39.261611	-107.835435
7,452.0	2.42	231.29	7,254.5	-634.9	-1,296.4	1,528,672.32	2,338,814.25	39.261604	-107.835446
7,497.0	2.50	230.76	7,299.5	-636.1	-1,297.9	1,528,671.14	2,338,812.72	39.261600	-107.835451
7,554.0	2.50	230.76	7,356.4	-637.7	-1,299.8	1,528,669.62	2,338,810.76	39.261596	-107.835458
Projection to TD @ 7554.0' MD / 7356.4' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
250.0	249.8	4.3	-6.8	First MWD Survey @ 250.0' MD / 249.8' TVD
7,554.0	7,356.4	-637.7	-1,299.8	Projection to TD @ 7554.0' MD / 7356.4' TVD

Checked By: _____	Approved By: _____	Date: _____
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