



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols 0994-24-19W

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

11 May, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-19W
Project:	Mesa County, CO	TVD Reference:	well @ 7236.0usft (H&P #290)
Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols 0994-24-19W	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		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 0994-24-19W					
Well Position	+N/-S	0.0 usft	Northing:	1,529,229.46 usft	Latitude:	39.263225
	+E/-W	0.0 usft	Easting:	2,340,120.81 usft	Longitude:	-107.830883
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,212.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	5/2/2018	9.44	65.40	51,298.80000000

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	209.18	

Survey Program	Date	5/11/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
232.0	7,949.0	QES MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,529,229.46	2,340,120.81	39.263225	-107.830883
232.0	7.00	211.10	231.4	-12.1	-7.3	1,529,217.53	2,340,113.19	39.263192	-107.830909
First MWD Survey @ 232.0' MD / 231.4' TVD									
293.0	9.40	211.50	291.8	-19.6	-11.8	1,529,210.21	2,340,108.47	39.263171	-107.830925
382.0	11.80	210.20	379.3	-33.6	-20.2	1,529,196.37	2,340,099.74	39.263133	-107.830955
473.0	13.10	212.10	468.1	-50.4	-30.4	1,529,179.86	2,340,089.15	39.263087	-107.830991
563.0	15.20	211.10	555.4	-69.1	-41.9	1,529,161.41	2,340,077.16	39.263035	-107.831031
658.0	17.30	209.20	646.6	-92.1	-55.2	1,529,138.77	2,340,063.25	39.262972	-107.831078
752.0	19.40	209.70	735.8	-117.9	-69.8	1,529,113.38	2,340,048.04	39.262901	-107.831130
847.0	19.60	208.70	825.4	-145.6	-85.2	1,529,086.11	2,340,031.86	39.262825	-107.831184
942.0	19.80	208.20	914.8	-173.7	-100.5	1,529,058.35	2,340,015.89	39.262748	-107.831238
1,036.0	19.70	207.40	1,003.3	-201.8	-115.3	1,529,030.65	2,340,000.36	39.262671	-107.831291



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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols 0994-24-19W	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,131.0	19.40	206.40	1,092.8	-230.2	-129.7	1,529,002.68	2,339,985.25	39.262593	-107.831341
1,225.0	20.20	208.30	1,181.2	-258.5	-144.3	1,528,974.79	2,339,969.90	39.262515	-107.831393
1,320.0	20.60	208.50	1,270.3	-287.6	-160.1	1,528,946.07	2,339,953.40	39.262435	-107.831449
1,414.0	21.70	212.30	1,357.9	-316.8	-177.3	1,528,917.30	2,339,935.48	39.262355	-107.831509
1,509.0	22.00	213.30	1,446.1	-346.5	-196.4	1,528,888.08	2,339,915.57	39.262274	-107.831577
1,521.0	22.00	212.60	1,457.3	-350.3	-198.9	1,528,884.37	2,339,913.03	39.262263	-107.831586
1,622.0	22.00	213.80	1,550.9	-382.0	-219.6	1,528,853.26	2,339,891.51	39.262176	-107.831659
1,716.0	22.10	209.60	1,638.0	-412.0	-238.1	1,528,823.74	2,339,872.21	39.262094	-107.831724
1,811.0	21.60	208.90	1,726.2	-442.8	-255.4	1,528,793.34	2,339,854.15	39.262009	-107.831785
1,905.0	20.90	208.70	1,813.8	-472.7	-271.8	1,528,763.92	2,339,836.98	39.261927	-107.831843
2,000.0	20.30	209.50	1,902.7	-501.9	-288.0	1,528,735.14	2,339,819.98	39.261847	-107.831901
2,095.0	20.00	209.20	1,991.9	-530.4	-304.1	1,528,707.03	2,339,803.21	39.261769	-107.831957
2,189.0	19.50	208.70	2,080.4	-558.2	-319.5	1,528,679.64	2,339,787.13	39.261692	-107.832012
2,283.0	19.20	209.10	2,169.1	-585.5	-334.5	1,528,652.77	2,339,771.38	39.261618	-107.832065
2,378.0	18.10	209.20	2,259.1	-612.0	-349.3	1,528,626.63	2,339,755.91	39.261545	-107.832117
2,472.0	19.70	209.00	2,348.0	-638.6	-364.1	1,528,600.41	2,339,740.43	39.261472	-107.832169
2,567.0	20.40	209.70	2,437.3	-667.0	-380.1	1,528,572.44	2,339,723.74	39.261394	-107.832226
2,661.0	21.80	208.00	2,525.0	-696.6	-396.4	1,528,543.23	2,339,706.67	39.261312	-107.832283
2,756.0	23.70	208.10	2,612.6	-729.0	-413.7	1,528,511.26	2,339,688.57	39.261223	-107.832344
2,851.0	26.60	209.20	2,698.5	-764.5	-433.0	1,528,476.36	2,339,668.29	39.261126	-107.832413
2,946.0	29.10	208.40	2,782.5	-803.4	-454.4	1,528,438.02	2,339,645.94	39.261019	-107.832488
3,040.0	31.30	208.20	2,863.8	-845.0	-476.8	1,528,396.98	2,339,622.46	39.260905	-107.832567
3,135.0	33.90	209.00	2,943.8	-889.9	-501.3	1,528,352.70	2,339,596.81	39.260782	-107.832654
3,229.0	36.60	210.60	3,020.6	-937.0	-528.3	1,528,306.35	2,339,568.63	39.260652	-107.832749
3,324.0	35.70	209.70	3,097.3	-985.4	-556.5	1,528,258.63	2,339,539.25	39.260519	-107.832849
3,419.0	35.00	210.20	3,174.8	-1,033.0	-583.9	1,528,211.73	2,339,510.59	39.260389	-107.832945
3,513.0	36.20	209.00	3,251.2	-1,080.6	-610.9	1,528,164.86	2,339,482.36	39.260258	-107.833041
3,608.0	35.70	207.20	3,328.1	-1,129.8	-637.2	1,528,116.35	2,339,454.84	39.260123	-107.833134
3,703.0	35.20	207.50	3,405.5	-1,178.8	-662.5	1,528,068.08	2,339,428.28	39.259989	-107.833223
3,797.0	36.40	208.80	3,481.7	-1,227.2	-688.5	1,528,020.29	2,339,401.10	39.259856	-107.833315
3,892.0	35.30	207.50	3,558.7	-1,276.3	-714.7	1,527,971.93	2,339,373.59	39.259721	-107.833407
3,986.0	37.00	208.80	3,634.6	-1,325.2	-740.9	1,527,923.73	2,339,346.18	39.259587	-107.833500
4,081.0	35.90	208.00	3,711.0	-1,374.8	-767.7	1,527,874.79	2,339,318.06	39.259450	-107.833595
4,175.0	38.00	208.90	3,786.2	-1,424.5	-794.7	1,527,825.83	2,339,289.87	39.259314	-107.833690
4,270.0	37.70	208.20	3,861.2	-1,475.7	-822.5	1,527,775.36	2,339,260.71	39.259173	-107.833788
4,364.0	38.30	209.70	3,935.2	-1,526.3	-850.5	1,527,725.46	2,339,231.40	39.259034	-107.833887
4,459.0	37.70	210.10	4,010.1	-1,577.0	-879.7	1,527,675.52	2,339,200.96	39.258895	-107.833990
4,554.0	36.10	210.40	4,086.1	-1,626.3	-908.4	1,527,627.00	2,339,170.97	39.258760	-107.834091
4,648.0	36.60	209.00	4,161.8	-1,674.7	-936.0	1,527,579.33	2,339,142.14	39.258627	-107.834189
4,743.0	35.10	209.00	4,238.8	-1,723.4	-963.0	1,527,531.38	2,339,113.93	39.258493	-107.834284
4,837.0	34.50	208.20	4,316.0	-1,770.4	-988.7	1,527,484.95	2,339,087.04	39.258364	-107.834375
4,932.0	32.70	210.00	4,395.1	-1,816.4	-1,014.2	1,527,439.68	2,339,060.33	39.258238	-107.834465
5,027.0	29.10	209.80	4,476.6	-1,858.7	-1,038.5	1,527,398.04	2,339,034.93	39.258122	-107.834551
5,121.0	26.90	208.40	4,559.6	-1,897.2	-1,060.0	1,527,360.06	2,339,012.47	39.258016	-107.834627
5,216.0	24.70	208.50	4,645.1	-1,933.6	-1,079.7	1,527,324.22	2,338,991.85	39.257916	-107.834696
5,311.0	22.70	206.90	4,732.1	-1,967.4	-1,097.5	1,527,290.89	2,338,973.22	39.257823	-107.834759
5,405.0	22.30	208.20	4,819.0	-1,999.3	-1,114.1	1,527,259.44	2,338,955.78	39.257736	-107.834818
5,500.0	21.00	207.50	4,907.2	-2,030.2	-1,130.5	1,527,228.88	2,338,938.61	39.257651	-107.834876
5,595.0	19.10	209.30	4,996.5	-2,058.9	-1,146.0	1,527,200.63	2,338,922.41	39.257572	-107.834930
5,689.0	15.90	211.90	5,086.1	-2,083.2	-1,160.3	1,527,176.66	2,338,907.46	39.257505	-107.834981
5,784.0	14.20	211.90	5,177.9	-2,104.2	-1,173.3	1,527,156.06	2,338,893.89	39.257448	-107.835027
5,879.0	11.60	212.20	5,270.5	-2,122.2	-1,184.6	1,527,138.38	2,338,882.18	39.257398	-107.835067
5,973.0	9.70	212.80	5,362.8	-2,136.8	-1,193.9	1,527,123.96	2,338,872.48	39.257358	-107.835100
6,068.0	7.20	207.50	5,456.8	-2,148.8	-1,201.0	1,527,112.14	2,338,865.09	39.257325	-107.835125
6,163.0	4.80	207.70	5,551.3	-2,157.6	-1,205.6	1,527,103.46	2,338,860.27	39.257301	-107.835141



Survey Report - Geographic



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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols 0994-24-19W	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,257.0	1.80	215.80	5,645.1	-2,162.3	-1,208.3	1,527,098.85	2,338,857.46	39.257288	-107.835150
6,352.0	0.97	234.88	5,740.1	-2,164.0	-1,209.8	1,527,097.22	2,338,855.89	39.257283	-107.835156
6,447.0	1.36	221.70	5,835.1	-2,165.3	-1,211.2	1,527,095.95	2,338,854.45	39.257280	-107.835161
6,541.0	1.14	214.31	5,929.0	-2,166.9	-1,212.5	1,527,094.38	2,338,853.14	39.257276	-107.835165
6,636.0	1.45	198.14	6,024.0	-2,168.8	-1,213.4	1,527,092.48	2,338,852.18	39.257270	-107.835168
6,730.0	1.89	213.96	6,118.0	-2,171.2	-1,214.6	1,527,090.09	2,338,850.88	39.257264	-107.835173
6,825.0	1.80	228.02	6,212.9	-2,173.5	-1,216.6	1,527,087.85	2,338,848.84	39.257257	-107.835180
6,920.0	2.07	224.95	6,307.9	-2,175.7	-1,218.9	1,527,085.70	2,338,846.46	39.257251	-107.835188
7,014.0	2.42	221.78	6,401.8	-2,178.4	-1,221.4	1,527,083.08	2,338,843.87	39.257244	-107.835197
7,109.0	2.59	230.84	6,496.7	-2,181.3	-1,224.4	1,527,080.31	2,338,840.80	39.257236	-107.835208
7,203.0	3.21	231.10	6,590.6	-2,184.3	-1,228.1	1,527,077.41	2,338,837.03	39.257228	-107.835221
7,298.0	2.86	237.69	6,685.5	-2,187.2	-1,232.2	1,527,074.58	2,338,832.88	39.257220	-107.835235
7,392.0	3.87	239.54	6,779.3	-2,190.1	-1,236.9	1,527,071.84	2,338,828.09	39.257212	-107.835252
7,487.0	5.53	238.31	6,874.0	-2,194.1	-1,243.6	1,527,067.98	2,338,821.33	39.257201	-107.835275
7,582.0	5.27	242.35	6,968.5	-2,198.5	-1,251.4	1,527,063.75	2,338,813.46	39.257189	-107.835303
7,676.0	3.38	235.14	7,062.3	-2,202.1	-1,257.5	1,527,060.32	2,338,807.27	39.257179	-107.835324
7,771.0	3.08	239.36	7,157.1	-2,205.0	-1,261.9	1,527,057.54	2,338,802.71	39.257171	-107.835340
7,865.0	2.72	228.64	7,251.0	-2,207.8	-1,265.8	1,527,054.88	2,338,798.79	39.257163	-107.835354
7,892.0	2.59	237.96	7,278.0	-2,208.5	-1,266.8	1,527,054.15	2,338,797.77	39.257161	-107.835357
7,949.0	2.59	237.96	7,334.9	-2,209.9	-1,269.0	1,527,052.84	2,338,795.56	39.257157	-107.835365
Projection to TD @ 7949.0' MD / 7334.9' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
232.0	231.4	-12.1	-7.3	First MWD Survey @ 232.0' MD / 231.4' TVD
7,949.0	7,334.9	-2,209.9	-1,269.0	Projection to TD @ 7949.0' MD / 7334.9' TVD

Checked By: _____ Approved By: _____ Date: _____