



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols Federal 0994-24-19E

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

09 May, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols Federal 0994-24-19E
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 Federal 0994-24-19E	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 Federal 0994-24-19E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,228.10 usft	Latitude:	39.263222
	+E/-W	0.0 usft	Easting:	2,340,130.97 usft	Longitude:	-107.830847
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	146.83	

Survey Program	Date	5/8/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
382.0	8,062.0	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	1,529,228.10	2,340,130.97	39.263222	-107.830847
382.0	1.80	121.90	381.9	-3.2	5.1	1,529,224.80	2,340,135.98	39.263213	-107.830829
First MWD Survey @ 382.0' MD / 381.9' TVD									
473.0	3.90	131.90	472.8	-6.0	8.6	1,529,221.89	2,340,139.42	39.263206	-107.830817
563.0	6.90	152.10	562.4	-12.8	13.4	1,529,214.94	2,340,144.05	39.263187	-107.830800
658.0	8.40	148.70	656.6	-23.8	19.7	1,529,203.81	2,340,150.05	39.263157	-107.830778
752.0	11.60	149.70	749.1	-37.8	28.0	1,529,189.58	2,340,158.02	39.263118	-107.830748
847.0	15.10	147.90	841.5	-56.6	39.4	1,529,170.55	2,340,168.93	39.263067	-107.830708
942.0	17.30	147.40	932.8	-78.9	53.6	1,529,147.81	2,340,182.54	39.263005	-107.830658
1,036.0	19.00	148.60	1,022.1	-103.8	69.1	1,529,122.59	2,340,197.40	39.262937	-107.830603
1,131.0	19.64	145.93	1,111.7	-130.2	86.1	1,529,095.73	2,340,213.72	39.262865	-107.830543
1,225.0	20.00	144.62	1,200.2	-156.4	104.3	1,529,069.08	2,340,231.20	39.262793	-107.830479



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Well:	Nichols Federal 0994-24-19E	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
1,320.0	20.39	145.85	1,289.3	-183.3	123.0	1,529,041.67	2,340,249.20	39.262719	-107.830413
1,414.0	20.87	144.35	1,377.3	-210.5	141.9	1,529,014.04	2,340,267.45	39.262644	-107.830346
1,489.0	20.92	144.35	1,447.4	-232.2	157.5	1,528,991.91	2,340,282.48	39.262584	-107.830291
1,622.0	20.40	144.20	1,571.8	-270.3	184.9	1,528,953.12	2,340,308.89	39.262480	-107.830194
1,716.0	20.20	143.80	1,660.0	-296.7	204.1	1,528,926.25	2,340,327.37	39.262407	-107.830126
1,810.0	19.80	146.20	1,748.3	-323.0	222.5	1,528,899.46	2,340,345.13	39.262335	-107.830061
1,905.0	19.40	145.90	1,837.8	-349.5	240.3	1,528,872.58	2,340,362.25	39.262263	-107.829998
1,999.0	19.70	147.20	1,926.4	-375.7	257.7	1,528,845.90	2,340,378.90	39.262190	-107.829937
2,094.0	18.70	147.00	2,016.1	-401.9	274.6	1,528,819.24	2,340,395.19	39.262118	-107.829877
2,189.0	19.00	148.90	2,106.0	-428.0	290.9	1,528,792.82	2,340,410.80	39.262047	-107.829820
2,283.0	19.80	150.20	2,194.7	-454.9	306.7	1,528,765.50	2,340,425.92	39.261973	-107.829764
2,377.0	20.30	149.70	2,283.0	-482.8	322.9	1,528,737.20	2,340,441.34	39.261897	-107.829707
2,472.0	20.20	150.20	2,372.1	-511.2	339.3	1,528,708.33	2,340,457.07	39.261818	-107.829649
2,566.0	21.40	148.50	2,460.0	-539.9	356.4	1,528,679.19	2,340,473.36	39.261740	-107.829589
2,661.0	23.70	146.80	2,547.7	-570.7	375.9	1,528,647.95	2,340,492.07	39.261655	-107.829520
2,756.0	25.90	148.00	2,633.9	-604.3	397.3	1,528,613.83	2,340,512.66	39.261563	-107.829444
2,850.0	28.30	148.20	2,717.6	-640.6	419.9	1,528,576.91	2,340,534.34	39.261463	-107.829364
2,945.0	31.20	146.90	2,800.1	-680.4	445.3	1,528,536.51	2,340,558.62	39.261354	-107.829275
3,040.0	33.00	146.00	2,880.6	-722.5	473.2	1,528,493.75	2,340,585.44	39.261238	-107.829176
3,134.0	34.40	146.50	2,958.8	-765.8	502.1	1,528,449.65	2,340,613.29	39.261119	-107.829074
3,229.0	36.70	146.70	3,036.1	-811.9	532.5	1,528,402.78	2,340,642.50	39.260993	-107.828966
3,324.0	37.40	146.50	3,111.9	-859.7	564.0	1,528,354.20	2,340,672.77	39.260862	-107.828855
3,418.0	38.30	146.40	3,186.1	-907.8	595.9	1,528,305.33	2,340,703.40	39.260730	-107.828743
3,513.0	39.60	145.10	3,260.0	-957.1	629.5	1,528,255.13	2,340,735.74	39.260594	-107.828624
3,607.0	39.40	144.90	3,332.5	-1,006.1	663.8	1,528,205.28	2,340,768.77	39.260460	-107.828503
3,702.0	38.80	144.40	3,406.2	-1,055.0	698.5	1,528,155.54	2,340,802.17	39.260325	-107.828380
3,797.0	40.20	145.30	3,479.5	-1,104.4	733.3	1,528,105.26	2,340,835.67	39.260190	-107.828258
3,891.0	40.50	145.60	3,551.2	-1,154.5	767.8	1,528,054.26	2,340,868.89	39.260052	-107.828136
3,986.0	39.90	145.10	3,623.7	-1,205.0	802.7	1,528,002.94	2,340,902.45	39.259914	-107.828013
4,080.0	38.80	144.00	3,696.4	-1,253.5	837.2	1,527,953.51	2,340,935.75	39.259780	-107.827890
4,175.0	39.70	146.40	3,770.0	-1,302.9	871.5	1,527,903.30	2,340,968.76	39.259645	-107.827769
4,269.0	39.70	145.60	3,842.3	-1,352.7	905.1	1,527,852.67	2,341,001.05	39.259508	-107.827651
4,364.0	39.40	146.50	3,915.6	-1,402.8	938.9	1,527,801.65	2,341,033.53	39.259370	-107.827531
4,458.0	39.90	145.50	3,987.9	-1,452.6	972.4	1,527,751.08	2,341,065.79	39.259234	-107.827413
4,553.0	38.30	146.70	4,061.7	-1,502.3	1,005.8	1,527,700.52	2,341,097.93	39.259097	-107.827295
4,648.0	36.50	146.70	4,137.1	-1,550.5	1,037.5	1,527,651.50	2,341,128.36	39.258965	-107.827183
4,742.0	34.40	145.70	4,213.7	-1,595.8	1,067.8	1,527,605.42	2,341,157.50	39.258841	-107.827076
4,837.0	34.00	145.80	4,292.3	-1,639.9	1,097.9	1,527,560.53	2,341,186.41	39.258719	-107.826970
4,931.0	33.40	146.00	4,370.5	-1,683.1	1,127.1	1,527,516.61	2,341,214.53	39.258601	-107.826867
5,026.0	31.10	146.80	4,450.8	-1,725.3	1,155.2	1,527,473.69	2,341,241.50	39.258485	-107.826768
5,121.0	29.70	148.20	4,532.8	-1,765.9	1,181.0	1,527,432.50	2,341,266.29	39.258374	-107.826676
5,215.0	27.70	146.90	4,615.2	-1,804.0	1,205.2	1,527,393.80	2,341,289.51	39.258269	-107.826591
5,310.0	25.70	147.10	4,700.1	-1,839.8	1,228.5	1,527,357.42	2,341,311.83	39.258171	-107.826509
5,405.0	24.00	148.40	4,786.3	-1,873.5	1,249.8	1,527,323.13	2,341,332.27	39.258078	-107.826433
5,499.0	23.80	149.10	4,872.2	-1,906.1	1,269.5	1,527,290.08	2,341,351.19	39.257989	-107.826364
5,594.0	22.80	149.20	4,959.5	-1,938.3	1,288.8	1,527,257.33	2,341,369.62	39.257900	-107.826296
5,689.0	20.20	150.10	5,047.8	-1,968.4	1,306.4	1,527,226.86	2,341,386.45	39.257818	-107.826234
5,783.0	18.30	151.00	5,136.6	-1,995.4	1,321.7	1,527,199.50	2,341,401.00	39.257743	-107.826180
5,878.0	17.60	148.20	5,227.0	-2,020.6	1,336.5	1,527,173.87	2,341,415.15	39.257674	-107.826127
5,973.0	15.00	147.40	5,318.1	-2,043.2	1,350.7	1,527,150.95	2,341,428.76	39.257612	-107.826077
6,067.0	13.40	152.10	5,409.3	-2,063.1	1,362.3	1,527,130.78	2,341,439.90	39.257558	-107.826036
6,162.0	11.90	147.40	5,502.0	-2,081.0	1,372.7	1,527,112.54	2,341,449.86	39.257508	-107.825999
6,257.0	10.00	148.00	5,595.2	-2,096.3	1,382.4	1,527,097.05	2,341,459.12	39.257466	-107.825965
6,351.0	8.30	149.00	5,688.0	-2,109.0	1,390.2	1,527,084.11	2,341,466.61	39.257431	-107.825938
6,446.0	6.50	142.40	5,782.2	-2,119.2	1,397.0	1,527,073.80	2,341,473.16	39.257404	-107.825914



Survey Report - Geographic



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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols Federal 0994-24-19E	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
6,541.0	4.10	146.20	5,876.8	-2,126.2	1,402.2	1,527,066.59	2,341,478.14	39.257384	-107.825895
6,635.0	3.90	135.70	5,970.6	-2,131.3	1,406.3	1,527,061.40	2,341,482.11	39.257370	-107.825881
6,730.0	2.90	145.80	6,065.4	-2,135.6	1,409.9	1,527,057.01	2,341,485.61	39.257358	-107.825868
6,824.0	2.90	152.90	6,159.3	-2,139.7	1,412.3	1,527,052.87	2,341,487.92	39.257347	-107.825860
6,919.0	1.90	174.30	6,254.2	-2,143.4	1,413.6	1,527,049.13	2,341,489.08	39.257337	-107.825855
7,014.0	1.30	174.10	6,349.2	-2,146.1	1,413.8	1,527,046.49	2,341,489.28	39.257330	-107.825854
7,108.0	1.67	186.63	6,443.2	-2,148.5	1,413.8	1,527,044.07	2,341,489.17	39.257323	-107.825854
7,203.0	1.36	212.29	6,538.1	-2,150.8	1,413.0	1,527,041.76	2,341,488.35	39.257317	-107.825857
7,297.0	1.63	213.35	6,632.1	-2,152.9	1,411.7	1,527,039.73	2,341,486.96	39.257311	-107.825862
7,392.0	2.29	222.40	6,727.0	-2,155.4	1,409.7	1,527,037.26	2,341,484.88	39.257304	-107.825869
7,487.0	1.76	221.26	6,822.0	-2,157.9	1,407.4	1,527,034.82	2,341,482.57	39.257297	-107.825877
7,581.0	2.15	223.19	6,915.9	-2,160.3	1,405.3	1,527,032.50	2,341,480.35	39.257291	-107.825884
7,676.0	2.42	221.87	7,010.8	-2,163.1	1,402.7	1,527,029.78	2,341,477.72	39.257283	-107.825893
7,771.0	2.46	215.90	7,105.8	-2,166.2	1,400.2	1,527,026.70	2,341,475.11	39.257274	-107.825902
7,865.0	2.37	208.25	7,199.7	-2,169.5	1,398.1	1,527,023.40	2,341,472.92	39.257265	-107.825910
7,959.0	2.50	209.22	7,293.6	-2,173.0	1,396.2	1,527,019.95	2,341,470.91	39.257256	-107.825917
8,005.0	2.37	209.74	7,339.6	-2,174.7	1,395.2	1,527,018.28	2,341,469.91	39.257251	-107.825920
8,062.0	2.37	209.74	7,396.5	-2,176.8	1,394.0	1,527,016.26	2,341,468.69	39.257245	-107.825924
Projection to TD @ 8062.0' MD / 7396.5' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
382.0	381.9	-3.2	5.1	First MWD Survey @ 382.0' MD / 381.9' TVD
8,062.0	7,396.5	-2,176.8	1,394.0	Projection to TD @ 8062.0' MD / 7396.5' TVD