



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols 0994-24-11E

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

09 March, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-11E
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 0994-24-11E	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 0994-24-11E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,280.76 usft	Latitude:	39.263367
	+E/-W	0.0 usft	Easting:	2,340,137.70 usft	Longitude:	-107.830828
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	2/13/2018	9.45	65.40	51,323.70000000

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	98.06	

Survey Program	Date	3/9/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.0	7,673.0	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	1,529,280.76	2,340,137.70	39.263367	-107.830828
200.0	2.50	74.10	199.9	1.2	4.2	1,529,281.85	2,340,141.92	39.263370	-107.830813
First MWD Survey @ 200.0' MD / 199.9' TVD									
290.0	4.70	74.10	289.8	2.7	9.6	1,529,283.25	2,340,147.40	39.263375	-107.830794
380.0	6.80	80.50	379.3	4.6	18.4	1,529,284.92	2,340,156.25	39.263380	-107.830763
470.0	8.10	78.80	468.5	6.7	29.9	1,529,286.73	2,340,167.77	39.263386	-107.830723
560.0	10.10	81.40	557.4	9.2	43.9	1,529,288.78	2,340,181.85	39.263392	-107.830673
650.0	10.20	81.50	646.0	11.5	59.6	1,529,290.74	2,340,197.59	39.263399	-107.830618
740.0	11.70	82.60	734.3	13.9	76.5	1,529,292.66	2,340,214.58	39.263405	-107.830558
834.0	12.50	93.50	826.3	14.5	96.2	1,529,292.76	2,340,234.20	39.263407	-107.830489
929.0	14.40	98.80	918.7	12.0	118.1	1,529,289.76	2,340,256.06	39.263400	-107.830411
1,023.0	14.20	101.20	1,009.8	8.0	141.0	1,529,285.15	2,340,278.81	39.263389	-107.830330



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Well:	Nichols 0994-24-11E	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
1,118.0	14.90	93.80	1,101.7	4.9	164.6	1,529,281.47	2,340,302.35	39.263381	-107.830247
1,212.0	16.90	94.40	1,192.1	3.1	190.3	1,529,278.96	2,340,327.98	39.263376	-107.830156
1,307.0	16.20	94.50	1,283.2	1.0	217.2	1,529,276.17	2,340,354.89	39.263370	-107.830061
1,402.0	15.70	93.50	1,374.5	-0.8	243.3	1,529,273.68	2,340,380.88	39.263365	-107.829969
1,496.0	17.53	100.07	1,464.6	-4.1	269.9	1,529,269.75	2,340,407.42	39.263356	-107.829875
1,587.0	18.10	99.00	1,551.2	-8.7	297.4	1,529,264.44	2,340,434.75	39.263343	-107.829778
1,682.0	17.70	97.80	1,641.6	-13.0	326.3	1,529,259.43	2,340,463.52	39.263331	-107.829676
1,776.0	17.50	96.00	1,731.2	-16.4	354.5	1,529,255.29	2,340,491.63	39.263322	-107.829576
1,871.0	16.70	100.40	1,822.0	-20.3	382.1	1,529,250.62	2,340,519.15	39.263311	-107.829479
1,965.0	16.40	99.80	1,912.1	-25.0	408.5	1,529,245.25	2,340,545.39	39.263298	-107.829386
2,060.0	15.90	97.80	2,003.4	-29.1	434.6	1,529,240.54	2,340,571.38	39.263287	-107.829293
2,154.0	15.60	96.30	2,093.9	-32.2	459.9	1,529,236.75	2,340,596.61	39.263279	-107.829204
2,249.0	16.90	104.40	2,185.1	-37.1	486.0	1,529,231.25	2,340,622.56	39.263265	-107.829112
2,343.0	16.20	102.10	2,275.2	-43.2	512.0	1,529,224.44	2,340,648.44	39.263248	-107.829020
2,438.0	15.30	101.20	2,366.6	-48.4	537.3	1,529,218.58	2,340,673.56	39.263234	-107.828931
2,532.0	15.00	101.20	2,457.4	-53.2	561.4	1,529,213.19	2,340,697.52	39.263221	-107.828846
2,627.0	14.60	100.80	2,549.2	-57.8	585.2	1,529,207.95	2,340,721.22	39.263208	-107.828761
2,721.0	17.20	100.00	2,639.6	-62.5	610.5	1,529,202.67	2,340,746.42	39.263196	-107.828672
2,816.0	16.70	99.30	2,730.5	-67.1	637.8	1,529,197.32	2,340,773.60	39.263183	-107.828576
2,910.0	16.50	100.10	2,820.6	-71.6	664.3	1,529,192.12	2,340,799.94	39.263170	-107.828482
3,005.0	15.70	98.40	2,911.8	-75.9	690.3	1,529,187.21	2,340,825.82	39.263159	-107.828390
3,099.0	15.70	97.90	3,002.3	-79.5	715.5	1,529,182.96	2,340,850.90	39.263149	-107.828301
3,194.0	15.20	98.30	3,093.9	-83.0	740.5	1,529,178.75	2,340,875.86	39.263139	-107.828213
3,288.0	15.20	98.20	3,184.6	-86.6	764.9	1,529,174.59	2,340,900.15	39.263129	-107.828127
3,383.0	15.10	98.00	3,276.3	-90.1	789.5	1,529,170.47	2,340,924.63	39.263120	-107.828040
3,478.0	14.70	98.00	3,368.1	-93.5	813.7	1,529,166.45	2,340,948.73	39.263110	-107.827954
3,573.0	16.70	99.70	3,459.6	-97.4	839.1	1,529,161.82	2,340,974.01	39.263099	-107.827865
3,667.0	16.20	98.00	3,549.7	-101.5	865.4	1,529,157.05	2,341,000.19	39.263088	-107.827772
3,762.0	16.00	98.50	3,641.0	-105.3	891.5	1,529,152.60	2,341,026.16	39.263078	-107.827680
3,856.0	15.50	97.30	3,731.5	-108.8	916.7	1,529,148.44	2,341,051.33	39.263068	-107.827590
3,951.0	14.40	98.80	3,823.2	-112.3	941.0	1,529,144.40	2,341,075.50	39.263059	-107.827505
4,046.0	15.20	98.10	3,915.1	-115.8	965.0	1,529,140.22	2,341,099.41	39.263049	-107.827420
4,140.0	17.40	100.10	4,005.3	-120.0	991.0	1,529,135.35	2,341,125.33	39.263037	-107.827328
4,235.0	17.40	98.10	4,096.0	-124.5	1,019.1	1,529,130.14	2,341,153.25	39.263025	-107.827229
4,329.0	16.70	95.80	4,185.8	-127.9	1,046.4	1,529,126.10	2,341,180.51	39.263016	-107.827132
4,424.0	15.40	94.70	4,277.1	-130.3	1,072.6	1,529,123.01	2,341,206.59	39.263009	-107.827040
4,519.0	16.90	99.60	4,368.4	-133.6	1,098.8	1,529,119.01	2,341,232.69	39.263000	-107.826948
4,613.0	16.20	99.70	4,458.5	-138.1	1,125.2	1,529,113.84	2,341,258.96	39.262988	-107.826854
4,708.0	15.30	100.10	4,549.9	-142.5	1,150.6	1,529,108.76	2,341,284.24	39.262976	-107.826765
4,802.0	13.60	100.20	4,640.9	-146.7	1,173.7	1,529,104.04	2,341,307.22	39.262964	-107.826683
4,897.0	14.80	100.20	4,733.0	-150.8	1,196.6	1,529,099.32	2,341,330.04	39.262953	-107.826602
4,991.0	13.30	99.70	4,824.2	-154.7	1,219.1	1,529,094.80	2,341,352.41	39.262942	-107.826523
5,086.0	11.70	98.70	4,917.0	-158.0	1,239.4	1,529,090.98	2,341,372.61	39.262933	-107.826451
5,181.0	13.50	96.70	5,009.7	-160.8	1,259.9	1,529,087.71	2,341,393.07	39.262926	-107.826378
5,275.0	12.70	96.30	5,101.2	-163.2	1,281.1	1,529,084.75	2,341,414.17	39.262919	-107.826304
5,370.0	11.10	98.70	5,194.2	-165.7	1,300.5	1,529,081.72	2,341,433.51	39.262912	-107.826235
5,464.0	10.80	99.40	5,286.5	-168.5	1,318.1	1,529,078.46	2,341,451.07	39.262904	-107.826173
5,559.0	9.30	101.60	5,380.0	-171.5	1,334.4	1,529,075.05	2,341,467.29	39.262896	-107.826115
5,654.0	8.20	101.50	5,473.9	-174.4	1,348.6	1,529,071.79	2,341,481.37	39.262888	-107.826065
5,748.0	6.50	97.40	5,567.1	-176.4	1,360.4	1,529,069.47	2,341,493.16	39.262882	-107.826023
5,843.0	5.90	99.10	5,661.6	-177.9	1,370.6	1,529,067.74	2,341,503.27	39.262878	-107.825988
5,937.0	4.30	94.20	5,755.2	-178.9	1,378.9	1,529,066.51	2,341,511.53	39.262876	-107.825958
6,032.0	3.60	98.00	5,850.0	-179.6	1,385.4	1,529,065.67	2,341,518.01	39.262874	-107.825935
6,127.0	3.50	100.20	5,944.8	-180.5	1,391.2	1,529,064.59	2,341,523.80	39.262871	-107.825915
6,222.0	2.50	81.90	6,039.7	-180.8	1,396.1	1,529,064.24	2,341,528.69	39.262871	-107.825897



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Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-11E
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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols 0994-24-11E	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
6,316.0	2.00	84.90	6,133.6	-180.3	1,399.8	1,529,064.58	2,341,532.37	39.262872	-107.825885
6,411.0	1.93	89.43	6,228.5	-180.2	1,403.0	1,529,064.66	2,341,535.62	39.262872	-107.825873
6,506.0	1.41	94.26	6,323.5	-180.2	1,405.8	1,529,064.52	2,341,538.38	39.262872	-107.825863
6,600.0	1.41	90.75	6,417.5	-180.3	1,408.1	1,529,064.36	2,341,540.69	39.262872	-107.825855
6,695.0	0.70	77.83	6,512.4	-180.2	1,409.8	1,529,064.42	2,341,542.43	39.262872	-107.825849
6,790.0	0.31	80.20	6,607.4	-180.1	1,410.6	1,529,064.57	2,341,543.25	39.262873	-107.825846
6,884.0	0.09	187.60	6,701.4	-180.1	1,410.9	1,529,064.53	2,341,543.49	39.262872	-107.825845
6,979.0	0.53	252.12	6,796.4	-180.3	1,410.5	1,529,064.33	2,341,543.06	39.262872	-107.825847
7,074.0	1.18	270.49	6,891.4	-180.4	1,409.1	1,529,064.24	2,341,541.66	39.262872	-107.825852
7,168.0	1.58	273.12	6,985.4	-180.3	1,406.8	1,529,064.38	2,341,539.40	39.262872	-107.825860
7,263.0	1.70	266.70	7,080.4	-180.4	1,404.1	1,529,064.44	2,341,536.69	39.262872	-107.825869
7,357.0	1.32	263.54	7,174.3	-180.6	1,401.6	1,529,064.30	2,341,534.22	39.262871	-107.825878
7,452.0	1.54	245.61	7,269.3	-181.2	1,399.4	1,529,063.71	2,341,531.95	39.262869	-107.825886
7,546.0	1.76	245.79	7,363.3	-182.3	1,396.9	1,529,062.66	2,341,529.46	39.262866	-107.825895
7,619.0	1.89	234.10	7,436.2	-183.5	1,394.9	1,529,061.54	2,341,527.43	39.262863	-107.825902
7,673.0	1.89	234.10	7,490.2	-184.5	1,393.5	1,529,060.54	2,341,525.96	39.262860	-107.825907
Projection to TD @ 7673.0' MD / 7490.2' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	199.9	1.2	4.2	First MWD Survey @ 200.0' MD / 199.9' TVD
7,673.0	7,490.2	-184.5	1,393.5	Projection to TD @ 7673.0' MD / 7490.2' TVD

Checked By: _____	Approved By: _____	Date: _____
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