



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols 0994-24-12E

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

20 March, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-12E
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 0994-24-12E	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 0994-24-12E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,272.41 usft	Latitude:	39.263344
	+E/-W	0.0 usft	Easting:	2,340,136.64 usft	Longitude:	-107.830831
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	3/14/2018	9.45	65.40	51,314.50000000

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	107.19	

Survey Program	Date	3/20/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
335.0	7,648.0	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	1,529,272.41	2,340,136.64	39.263344	-107.830831
335.0	2.20	72.00	334.9	2.0	6.1	1,529,274.24	2,340,142.80	39.263349	-107.830810
First MWD Survey @ 335.0' MD / 334.9' TVD									
380.0	2.50	72.10	379.9	2.6	7.9	1,529,274.76	2,340,144.57	39.263351	-107.830803
470.0	4.40	72.70	469.7	4.2	13.0	1,529,276.26	2,340,149.77	39.263356	-107.830785
560.0	5.10	91.80	559.4	5.1	20.3	1,529,276.97	2,340,157.09	39.263358	-107.830759
650.0	5.60	109.40	649.0	3.5	28.5	1,529,275.18	2,340,165.19	39.263354	-107.830731
740.0	7.10	114.90	738.5	-0.3	37.7	1,529,271.14	2,340,174.27	39.263343	-107.830698
834.0	9.60	111.30	831.5	-5.6	50.2	1,529,265.53	2,340,186.71	39.263329	-107.830654
929.0	11.30	105.70	924.9	-11.0	66.6	1,529,259.71	2,340,202.91	39.263314	-107.830596
1,023.0	13.70	105.40	1,016.7	-16.4	86.2	1,529,253.76	2,340,222.36	39.263299	-107.830527
1,118.0	16.20	104.50	1,108.4	-22.7	109.9	1,529,246.85	2,340,245.87	39.263282	-107.830443



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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols 0994-24-12E	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
1,212.0	18.30	104.10	1,198.2	-29.6	136.9	1,529,239.28	2,340,272.70	39.263263	-107.830348
1,307.0	20.10	106.20	1,287.9	-37.8	167.0	1,529,230.32	2,340,302.62	39.263240	-107.830241
1,402.0	22.00	105.50	1,376.6	-47.1	199.8	1,529,220.17	2,340,335.20	39.263215	-107.830125
1,492.0	22.30	105.80	1,459.9	-56.3	232.5	1,529,210.18	2,340,367.63	39.263190	-107.830010
1,587.0	22.30	106.40	1,547.8	-66.3	267.1	1,529,199.30	2,340,401.99	39.263162	-107.829888
1,682.0	21.90	104.90	1,635.8	-75.9	301.6	1,529,188.78	2,340,436.15	39.263136	-107.829766
1,776.0	20.30	104.40	1,723.5	-84.5	334.3	1,529,179.38	2,340,468.65	39.263112	-107.829651
1,871.0	19.40	104.40	1,812.9	-92.5	365.5	1,529,170.56	2,340,499.68	39.263090	-107.829540
1,965.0	18.90	107.40	1,901.7	-100.9	395.2	1,529,161.36	2,340,529.10	39.263067	-107.829436
2,060.0	17.90	107.00	1,991.8	-109.8	423.8	1,529,151.76	2,340,557.51	39.263043	-107.829334
2,154.0	18.90	107.20	2,081.0	-118.5	452.2	1,529,142.31	2,340,585.64	39.263019	-107.829234
2,249.0	17.20	108.20	2,171.3	-127.5	480.2	1,529,132.66	2,340,613.44	39.262994	-107.829135
2,343.0	18.10	106.90	2,260.9	-136.1	507.4	1,529,123.38	2,340,640.39	39.262970	-107.829039
2,438.0	16.50	108.20	2,351.6	-144.6	534.3	1,529,114.18	2,340,667.10	39.262947	-107.828944
2,532.0	18.40	105.50	2,441.3	-152.7	561.3	1,529,105.36	2,340,693.86	39.262925	-107.828849
2,627.0	18.20	107.40	2,531.5	-161.1	589.9	1,529,096.18	2,340,722.24	39.262902	-107.828748
2,721.0	17.40	106.60	2,621.0	-169.5	617.4	1,529,087.08	2,340,749.49	39.262879	-107.828651
2,816.0	16.40	105.40	2,711.9	-177.2	644.0	1,529,078.78	2,340,775.83	39.262858	-107.828557
2,910.0	17.90	110.90	2,801.7	-185.8	670.2	1,529,069.43	2,340,801.89	39.262834	-107.828464
3,005.0	16.90	110.30	2,892.4	-195.8	696.8	1,529,058.75	2,340,828.22	39.262806	-107.828370
3,099.0	17.80	109.60	2,982.1	-205.4	723.2	1,529,048.52	2,340,854.31	39.262780	-107.828277
3,194.0	17.40	110.50	3,072.6	-215.2	750.2	1,529,037.98	2,340,881.04	39.262753	-107.828182
3,288.0	16.30	108.80	3,162.6	-224.4	775.8	1,529,028.16	2,340,906.45	39.262728	-107.828091
3,383.0	18.00	109.50	3,253.4	-233.6	802.3	1,529,018.28	2,340,932.66	39.262703	-107.827998
3,478.0	17.50	110.80	3,343.9	-243.6	829.5	1,529,007.62	2,340,959.58	39.262675	-107.827902
3,572.0	18.10	107.70	3,433.4	-253.0	856.6	1,528,997.47	2,340,986.46	39.262649	-107.827806
3,667.0	17.60	107.30	3,523.8	-261.8	884.4	1,528,988.00	2,341,013.99	39.262625	-107.827708
3,762.0	17.50	108.40	3,614.4	-270.6	911.6	1,528,978.52	2,341,041.03	39.262601	-107.827612
3,856.0	16.50	106.80	3,704.2	-278.9	937.8	1,528,969.53	2,341,066.99	39.262578	-107.827519
3,951.0	17.60	109.60	3,795.1	-287.6	964.3	1,528,960.14	2,341,093.21	39.262554	-107.827426
4,046.0	17.90	108.30	3,885.6	-297.0	991.7	1,528,950.04	2,341,120.35	39.262528	-107.827329
4,140.0	17.00	110.20	3,975.2	-306.3	1,018.3	1,528,940.08	2,341,146.71	39.262503	-107.827235
4,235.0	17.40	102.70	4,066.0	-314.2	1,045.2	1,528,931.47	2,341,173.40	39.262481	-107.827140
4,329.0	15.90	103.80	4,156.0	-320.4	1,071.4	1,528,924.64	2,341,199.45	39.262464	-107.827047
4,434.0	15.80	104.50	4,257.1	-327.4	1,099.2	1,528,916.92	2,341,227.07	39.262445	-107.826949
4,519.0	16.00	102.40	4,338.8	-332.8	1,121.8	1,528,910.93	2,341,249.56	39.262430	-107.826869
4,613.0	15.60	102.50	4,429.2	-338.3	1,146.8	1,528,904.77	2,341,274.41	39.262415	-107.826781
4,707.0	14.30	102.40	4,520.1	-343.6	1,170.5	1,528,898.93	2,341,297.94	39.262401	-107.826697
4,802.0	14.10	105.50	4,612.2	-349.2	1,193.1	1,528,892.74	2,341,320.40	39.262385	-107.826617
4,896.0	13.10	104.30	4,703.5	-354.9	1,214.5	1,528,886.51	2,341,341.61	39.262370	-107.826542
4,991.0	11.90	104.90	4,796.3	-360.0	1,234.4	1,528,880.82	2,341,361.36	39.262355	-107.826472
5,086.0	10.50	107.90	4,889.5	-365.2	1,252.1	1,528,875.19	2,341,378.93	39.262341	-107.826409
5,180.0	11.30	105.10	4,981.8	-370.2	1,269.1	1,528,869.72	2,341,395.84	39.262327	-107.826349
5,275.0	9.90	105.50	5,075.1	-374.9	1,286.0	1,528,864.68	2,341,412.57	39.262315	-107.826289
5,369.0	9.70	108.00	5,167.8	-379.5	1,301.3	1,528,859.68	2,341,427.76	39.262302	-107.826235
5,464.0	9.10	105.60	5,261.5	-384.0	1,316.1	1,528,854.81	2,341,442.49	39.262290	-107.826183
5,559.0	8.00	107.30	5,355.4	-387.9	1,329.7	1,528,850.48	2,341,455.93	39.262279	-107.826135
5,653.0	7.60	108.70	5,448.6	-391.9	1,341.8	1,528,846.23	2,341,467.96	39.262268	-107.826092
5,748.0	7.00	106.60	5,542.8	-395.5	1,353.3	1,528,842.27	2,341,479.36	39.262258	-107.826052
5,843.0	5.80	110.30	5,637.2	-398.9	1,363.4	1,528,838.69	2,341,489.32	39.262249	-107.826016
5,937.0	5.90	113.80	5,730.7	-402.5	1,372.2	1,528,834.87	2,341,498.10	39.262239	-107.825985
6,032.0	4.90	113.70	5,825.3	-406.1	1,380.4	1,528,831.06	2,341,506.19	39.262229	-107.825956
6,127.0	5.00	118.40	5,919.9	-409.7	1,387.8	1,528,827.27	2,341,513.45	39.262219	-107.825930
6,222.0	4.70	121.30	6,014.6	-413.7	1,394.8	1,528,823.10	2,341,520.32	39.262208	-107.825905
6,316.0	3.80	110.40	6,108.3	-416.7	1,401.0	1,528,819.86	2,341,526.44	39.262200	-107.825883



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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 0994-24-12E	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
6,411.0	2.10	85.60	6,203.2	-417.7	1,405.6	1,528,818.78	2,341,531.10	39.262197	-107.825867
6,506.0	1.85	122.83	6,298.2	-418.4	1,408.7	1,528,818.00	2,341,534.11	39.262195	-107.825856
6,600.0	1.50	147.60	6,392.1	-420.3	1,410.6	1,528,816.09	2,341,536.00	39.262190	-107.825849
6,695.0	0.57	83.10	6,487.1	-421.3	1,411.7	1,528,815.07	2,341,537.11	39.262187	-107.825845
6,790.0	0.48	255.54	6,582.1	-421.3	1,411.8	1,528,815.02	2,341,537.19	39.262187	-107.825845
6,884.0	0.48	187.08	6,676.1	-421.8	1,411.4	1,528,814.54	2,341,536.75	39.262186	-107.825846
6,979.0	0.62	257.21	6,771.1	-422.3	1,410.8	1,528,814.05	2,341,536.18	39.262184	-107.825848
7,073.0	0.44	227.33	6,865.1	-422.7	1,410.1	1,528,813.71	2,341,535.41	39.262183	-107.825851
7,168.0	0.75	209.84	6,960.1	-423.4	1,409.5	1,528,812.94	2,341,534.81	39.262181	-107.825853
7,263.0	0.57	212.04	7,055.1	-424.4	1,408.9	1,528,812.02	2,341,534.23	39.262179	-107.825855
7,357.0	0.75	300.54	7,149.1	-424.5	1,408.2	1,528,811.95	2,341,533.45	39.262179	-107.825858
7,452.0	0.40	304.06	7,244.1	-424.0	1,407.4	1,528,812.47	2,341,532.65	39.262180	-107.825861
7,546.0	0.66	287.62	7,338.1	-423.6	1,406.6	1,528,812.84	2,341,531.88	39.262181	-107.825863
7,591.0	0.97	265.48	7,383.1	-423.6	1,405.9	1,528,812.91	2,341,531.25	39.262181	-107.825866
7,648.0	0.97	265.48	7,440.1	-423.6	1,405.0	1,528,812.86	2,341,530.29	39.262181	-107.825869
Projection to TD @ 7648.0' MD / 7440.1' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
335.0	334.9	2.0	6.1	First MWD Survey @ 335.0' MD / 334.9' TVD
7,648.0	7,440.1	-423.6	1,405.0	Projection to TD @ 7648.0' MD / 7440.1' TVD

Checked By: _____	Approved By: _____	Date: _____
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