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Devon Energy

Eddy County, NM (NAD-83)

Spud Muffin 31-30 Com

Spud Muffin 31-30 332H

OH

Design: OH

Standard Survey Report

12 March, 2019

LEAM Drilling Services

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_User Db

Project	Eddy County, NM (NAD-83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Spud Muffin 31-30 Com		
Site Position:		Northing:	456,837.82 usft
From:	Map	Easting:	637,646.02 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 15' 19.9378 N
		Longitude:	104° 1' 18.4160 W
		Grid Convergence:	0.17 °

Well	Spud Muffin 31-30 332H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 15' 21.5066 N
		Longitude:	104° 1' 28.4302 W
		Ground Level:	2,959.40 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	12/3/2018	7.12
			Dip Angle
			(°)
			60.03
			Field Strength
			(nT)
			47,955.00000000

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			0.00

Survey Program	Date	3/12/2019		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
172.00	19,890.00	Survey #1 - MWD (OH)	LEAM MWD+HDGM	MWD+HDGM
19,942.00	19,942.00	Projection (OH)	Project	Projection

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
172.00	0.20	77.80	172.00	0.06	0.29	0.06	0.12	0.12	0.00
263.00	0.00	248.30	263.00	0.10	0.45	0.10	0.22	-0.22	0.00
427.00	0.30	353.60	427.00	0.52	0.40	0.52	0.18	0.18	0.00
514.00	0.80	337.10	513.99	1.31	0.14	1.31	0.60	0.57	-18.97
606.00	1.00	336.50	605.98	2.64	-0.43	2.64	0.22	0.22	-0.65
699.00	1.60	336.50	698.96	4.57	-1.27	4.57	0.65	0.65	0.00
781.00	1.40	323.00	780.93	6.42	-2.33	6.42	0.49	-0.24	-16.46
873.00	0.70	301.20	872.92	7.61	-3.49	7.61	0.86	-0.76	-23.70
965.00	1.10	331.10	964.90	8.68	-4.40	8.68	0.66	0.43	32.50

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Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,057.00	1.10	328.50	1,056.89	10.20	-5.28	10.20	0.05	0.00	-2.83
1,149.00	0.20	318.60	1,148.88	11.07	-5.85	11.07	0.98	-0.98	-10.76
1,240.00	0.50	321.40	1,239.88	11.50	-6.20	11.50	0.33	0.33	3.08
1,331.00	0.60	2.60	1,330.87	12.29	-6.43	12.29	0.44	0.11	45.27
1,423.00	0.40	113.60	1,422.87	12.64	-6.11	12.64	0.90	-0.22	120.65
1,514.00	0.40	93.60	1,513.87	12.50	-5.51	12.50	0.15	0.00	-21.98
1,610.00	0.40	29.10	1,609.87	12.77	-5.01	12.77	0.44	0.00	-67.19
1,703.00	1.00	359.00	1,702.86	13.86	-4.87	13.86	0.74	0.65	-32.37
1,794.00	1.20	342.50	1,793.84	15.57	-5.17	15.57	0.41	0.22	-18.13
1,888.00	0.40	10.50	1,887.84	16.83	-5.40	16.83	0.92	-0.85	29.79
1,982.00	0.50	142.10	1,981.83	16.83	-5.09	16.83	0.87	0.11	140.00
2,076.00	0.00	170.30	2,075.83	16.50	-4.84	16.50	0.53	-0.53	0.00
2,171.00	0.60	177.60	2,170.83	16.01	-4.82	16.01	0.63	0.63	0.00
2,266.00	2.00	181.00	2,265.80	13.85	-4.83	13.85	1.48	1.47	3.58
2,361.00	3.60	178.20	2,360.69	9.21	-4.76	9.21	1.69	1.68	-2.95
2,455.00	3.40	153.90	2,454.52	3.76	-3.44	3.76	1.58	-0.21	-25.85
2,550.00	4.30	157.80	2,549.30	-2.07	-0.86	-2.07	0.99	0.95	4.11
2,644.00	4.30	157.90	2,643.04	-8.60	1.80	-8.60	0.01	0.00	0.11
2,739.00	3.80	152.80	2,737.80	-14.70	4.58	-14.70	0.65	-0.53	-5.37
2,833.00	3.50	149.90	2,831.61	-19.95	7.44	-19.95	0.37	-0.32	-3.09
2,928.00	3.40	150.70	2,926.44	-24.91	10.28	-24.91	0.12	-0.11	0.84
3,023.00	3.30	151.30	3,021.28	-29.77	12.97	-29.77	0.11	-0.11	0.63
3,117.00	3.10	148.30	3,115.13	-34.31	15.60	-34.31	0.28	-0.21	-3.19
3,212.00	3.90	157.80	3,209.95	-39.48	18.17	-39.48	1.04	0.84	10.00
3,307.00	4.90	162.00	3,304.67	-46.33	20.65	-46.33	1.11	1.05	4.42
3,401.00	4.30	162.20	3,398.37	-53.51	22.96	-53.51	0.64	-0.64	0.21
3,495.00	5.40	166.40	3,492.03	-61.16	25.08	-61.16	1.23	1.17	4.47
3,589.00	6.80	171.50	3,585.50	-70.96	26.94	-70.96	1.60	1.49	5.43
3,684.00	7.70	170.80	3,679.74	-82.81	28.79	-82.81	0.95	0.95	-0.74
3,779.00	7.60	170.30	3,773.89	-95.28	30.87	-95.28	0.13	-0.11	-0.53
3,874.00	7.20	169.70	3,868.10	-107.33	32.99	-107.33	0.43	-0.42	-0.63
3,969.00	6.90	169.70	3,962.38	-118.81	35.08	-118.81	0.32	-0.32	0.00
4,062.00	7.60	169.00	4,054.64	-130.34	37.25	-130.34	0.76	0.75	-0.75
4,157.00	7.30	169.50	4,148.83	-142.44	39.55	-142.44	0.32	-0.32	0.53
4,251.00	6.80	170.60	4,242.12	-153.80	41.55	-153.80	0.55	-0.53	1.17
4,346.00	7.10	169.40	4,336.42	-165.12	43.54	-165.12	0.35	0.32	-1.26
4,441.00	7.40	170.40	4,430.67	-176.93	45.64	-176.93	0.34	0.32	1.05
4,534.00	7.10	171.30	4,522.92	-188.51	47.51	-188.51	0.34	-0.32	0.97
4,629.00	6.90	171.30	4,617.21	-199.96	49.26	-199.96	0.21	-0.21	0.00
4,723.00	6.60	172.50	4,710.56	-210.89	50.82	-210.89	0.35	-0.32	1.28
4,817.00	7.00	172.20	4,803.90	-221.92	52.31	-221.92	0.43	0.43	-0.32
4,912.00	6.60	174.10	4,898.23	-233.09	53.65	-233.09	0.48	-0.42	2.00
5,007.00	6.90	171.30	4,992.57	-244.16	55.08	-244.16	0.47	0.32	-2.95

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,102.00	6.90	170.30	5,086.89	-255.43	56.90	-255.43	0.13	0.00	-1.05
5,197.00	7.00	167.10	5,181.19	-266.70	59.16	-266.70	0.42	0.11	-3.37
5,291.00	6.10	166.20	5,274.57	-277.13	61.63	-277.13	0.96	-0.96	-0.96
5,386.00	5.90	168.10	5,369.05	-286.81	63.84	-286.81	0.30	-0.21	2.00
5,480.00	7.20	166.00	5,462.44	-297.25	66.26	-297.25	1.41	1.38	-2.23
5,574.00	7.40	167.10	5,555.68	-308.87	69.03	-308.87	0.26	0.21	1.17
5,668.00	6.80	168.00	5,648.95	-320.21	71.54	-320.21	0.65	-0.64	0.96
5,763.00	7.50	163.40	5,743.22	-331.66	74.48	-331.66	0.95	0.74	-4.84
5,858.00	8.20	158.60	5,837.33	-343.91	78.73	-343.91	1.01	0.74	-5.05
5,953.00	7.80	158.80	5,931.40	-356.22	83.53	-356.22	0.42	-0.42	0.21
6,047.00	6.90	158.60	6,024.63	-367.43	87.90	-367.43	0.96	-0.96	-0.21
6,142.00	6.40	158.80	6,118.99	-377.68	91.89	-377.68	0.53	-0.53	0.21
6,235.00	6.50	158.30	6,211.40	-387.40	95.71	-387.40	0.12	0.11	-0.54
6,329.00	8.40	161.60	6,304.60	-398.86	99.85	-398.86	2.07	2.02	3.51
6,424.00	8.30	163.70	6,398.60	-412.03	103.96	-412.03	0.34	-0.11	2.21
6,519.00	7.20	163.20	6,492.73	-424.31	107.61	-424.31	1.16	-1.16	-0.53
6,614.00	5.70	161.80	6,587.12	-434.49	110.80	-434.49	1.59	-1.58	-1.47
6,709.00	5.90	160.80	6,681.64	-443.58	113.88	-443.58	0.24	0.21	-1.05
6,804.00	6.00	161.80	6,776.12	-452.91	117.04	-452.91	0.15	0.11	1.05
6,899.00	4.70	158.80	6,870.71	-461.25	120.00	-461.25	1.40	-1.37	-3.16
6,993.00	3.20	147.20	6,964.48	-467.05	122.81	-467.05	1.80	-1.60	-12.34
7,088.00	3.10	153.20	7,059.34	-471.57	125.41	-471.57	0.36	-0.11	6.32
7,182.00	4.80	172.70	7,153.12	-477.74	127.05	-477.74	2.28	1.81	20.74
7,277.00	5.20	176.90	7,247.76	-485.98	127.79	-485.98	0.57	0.42	4.42
7,371.00	4.80	176.60	7,341.40	-494.16	128.25	-494.16	0.43	-0.43	-0.32
7,467.00	5.20	177.80	7,437.03	-502.52	128.66	-502.52	0.43	0.42	1.25
7,561.00	4.90	175.70	7,530.67	-510.78	129.12	-510.78	0.37	-0.32	-2.23
7,655.00	3.80	174.50	7,624.40	-517.88	129.72	-517.88	1.17	-1.17	-1.28
7,750.00	2.60	172.20	7,719.25	-523.15	130.32	-523.15	1.27	-1.26	-2.42
7,845.00	2.80	158.30	7,814.14	-527.44	131.47	-527.44	0.72	0.21	-14.63
7,939.00	2.10	144.10	7,908.06	-530.97	133.33	-530.97	0.98	-0.74	-15.11
8,033.00	1.80	79.70	8,002.01	-532.10	135.79	-532.10	2.23	-0.32	-68.51
8,128.00	2.60	59.00	8,096.94	-530.73	139.10	-530.73	1.17	0.84	-21.79
8,223.00	1.80	41.20	8,191.87	-528.49	141.93	-528.49	1.10	-0.84	-18.74
8,312.00	1.30	39.40	8,280.84	-526.66	143.50	-526.66	0.56	-0.56	-2.02
8,406.00	0.60	89.90	8,374.83	-525.84	144.66	-525.84	1.09	-0.74	53.72
8,501.00	1.00	175.30	8,469.82	-526.66	145.23	-526.66	1.18	0.42	89.89
8,596.00	0.80	205.80	8,564.81	-528.09	145.01	-528.09	0.54	-0.21	32.11
8,690.00	1.30	277.10	8,658.80	-528.54	143.67	-528.54	1.37	0.53	75.85
8,784.00	0.60	211.60	8,752.79	-528.83	142.35	-528.83	1.26	-0.74	-69.68
8,879.00	1.60	131.20	8,847.77	-530.13	143.09	-530.13	1.70	1.05	-84.63
8,966.00	1.10	152.40	8,934.75	-531.67	144.39	-531.67	0.80	-0.57	24.37
9,078.00	1.70	160.20	9,046.71	-534.19	145.45	-534.19	0.56	0.54	6.96

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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9,173.00	2.90	17.70	9,141.68	-533.22	146.66	-533.22	4.60	1.26	-150.00
9,268.00	12.90	2.70	9,235.66	-520.31	147.89	-520.31	10.66	10.53	-15.79
9,316.00	18.50	4.00	9,281.85	-507.35	148.67	-507.35	11.69	11.67	2.71
9,362.00	24.10	3.90	9,324.69	-490.68	149.82	-490.68	12.17	12.17	-0.22
9,409.00	29.60	3.20	9,366.61	-469.50	151.13	-469.50	11.72	11.70	-1.49
9,456.00	35.30	1.10	9,406.26	-444.32	152.03	-444.32	12.36	12.13	-4.47
9,503.00	40.20	359.40	9,443.41	-415.55	152.14	-415.55	10.66	10.43	-3.62
9,550.00	44.20	359.70	9,478.22	-383.99	151.89	-383.99	8.52	8.51	0.64
9,597.00	49.20	359.10	9,510.44	-349.80	151.53	-349.80	10.68	10.64	-1.28
9,645.00	53.90	358.30	9,540.28	-312.23	150.67	-312.23	9.88	9.79	-1.67
9,692.00	57.00	359.30	9,566.94	-273.53	149.86	-273.53	6.82	6.60	2.13
9,740.00	60.20	0.20	9,591.94	-232.57	149.69	-232.57	6.86	6.67	1.88
9,787.00	64.50	0.30	9,613.75	-190.94	149.87	-190.94	9.15	9.15	0.21
9,834.00	70.10	0.00	9,631.88	-147.60	149.98	-147.60	11.93	11.91	-0.64
9,881.00	73.30	359.90	9,646.63	-102.98	149.94	-102.98	6.81	6.81	-0.21
9,929.00	76.30	0.40	9,659.22	-56.67	150.06	-56.67	6.33	6.25	1.04
9,976.00	79.40	359.40	9,669.11	-10.73	149.98	-10.73	6.92	6.60	-2.13
10,024.00	81.90	358.70	9,676.91	36.62	149.20	36.62	5.40	5.21	-1.46
10,071.00	88.40	359.30	9,680.88	83.42	148.38	83.42	13.89	13.83	1.28
10,119.00	89.30	359.00	9,681.84	131.41	147.67	131.41	1.98	1.88	-0.63
10,213.00	89.30	359.20	9,682.99	225.39	146.19	225.39	0.21	0.00	0.21
10,308.00	90.00	358.10	9,683.57	320.36	143.95	320.36	1.37	0.74	-1.16
10,402.00	91.30	357.30	9,682.50	414.27	140.18	414.27	1.62	1.38	-0.85
10,496.00	88.60	358.50	9,682.59	508.20	136.74	508.20	3.14	-2.87	1.28
10,591.00	88.80	0.10	9,684.74	603.17	135.58	603.17	1.70	0.21	1.68
10,686.00	88.90	359.80	9,686.65	698.15	135.49	698.15	0.33	0.11	-0.32
10,780.00	89.10	359.50	9,688.29	792.13	134.92	792.13	0.38	0.21	-0.32
10,874.00	90.10	359.60	9,688.95	886.12	134.18	886.12	1.07	1.06	0.11
10,969.00	90.50	359.20	9,688.45	981.12	133.19	981.12	0.60	0.42	-0.42
11,064.00	90.50	0.20	9,687.62	1,076.11	132.69	1,076.11	1.05	0.00	1.05
11,159.00	87.40	1.10	9,689.36	1,171.08	133.77	1,171.08	3.40	-3.26	0.95
11,253.00	87.20	0.60	9,693.79	1,264.96	135.16	1,264.96	0.57	-0.21	-0.53
11,348.00	87.10	0.50	9,698.51	1,359.84	136.07	1,359.84	0.15	-0.11	-0.11
11,443.00	89.60	1.20	9,701.25	1,454.78	137.48	1,454.78	2.73	2.63	0.74
11,537.00	89.30	1.20	9,702.15	1,548.76	139.45	1,548.76	0.32	-0.32	0.00
11,632.00	89.30	0.30	9,703.31	1,643.74	140.69	1,643.74	0.95	0.00	-0.95
11,727.00	90.20	1.10	9,703.72	1,738.73	141.85	1,738.73	1.27	0.95	0.84
11,822.00	90.60	359.50	9,703.06	1,833.72	142.35	1,833.72	1.74	0.42	-1.68
11,916.00	91.20	359.10	9,701.58	1,927.70	141.20	1,927.70	0.77	0.64	-0.43
12,010.00	91.20	359.20	9,699.62	2,021.67	139.81	2,021.67	0.11	0.00	0.11
12,105.00	91.20	359.70	9,697.63	2,116.65	138.90	2,116.65	0.53	0.00	0.53
12,199.00	90.20	358.90	9,696.48	2,210.63	137.75	2,210.63	1.36	-1.06	-0.85
12,294.00	91.30	359.70	9,695.23	2,305.61	136.59	2,305.61	1.43	1.16	0.84
12,388.00	91.50	1.00	9,692.94	2,399.58	137.16	2,399.58	1.40	0.21	1.38

LEAM Drilling Services

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,483.00	90.70	1.10	9,691.11	2,494.55	138.90	2,494.55	0.85	-0.84	0.11
12,577.00	90.90	1.50	9,689.80	2,588.51	141.03	2,588.51	0.48	0.21	0.43
12,672.00	86.10	359.20	9,692.29	2,683.45	141.62	2,683.45	5.60	-5.05	-2.42
12,767.00	85.80	358.80	9,699.00	2,778.19	139.96	2,778.19	0.53	-0.32	-0.42
12,861.00	87.00	359.30	9,704.90	2,871.99	138.41	2,871.99	1.38	1.28	0.53
12,956.00	88.90	359.30	9,708.30	2,966.92	137.25	2,966.92	2.00	2.00	0.00
13,051.00	90.80	0.90	9,708.55	3,061.91	137.41	3,061.91	2.61	2.00	1.68
13,145.00	90.60	1.60	9,707.40	3,155.88	139.46	3,155.88	0.77	-0.21	0.74
13,239.00	91.20	1.10	9,705.92	3,249.84	141.68	3,249.84	0.83	0.64	-0.53
13,334.00	91.20	2.40	9,703.93	3,344.78	144.58	3,344.78	1.37	0.00	1.37
13,429.00	89.10	0.80	9,703.68	3,439.73	147.23	3,439.73	2.78	-2.21	-1.68
13,522.00	87.80	0.00	9,706.20	3,532.69	147.88	3,532.69	1.64	-1.40	-0.86
13,617.00	87.90	0.00	9,709.76	3,627.63	147.88	3,627.63	0.11	0.11	0.00
13,712.00	88.30	359.50	9,712.91	3,722.57	147.46	3,722.57	0.67	0.42	-0.53
13,806.00	88.00	359.20	9,715.95	3,816.52	146.40	3,816.52	0.45	-0.32	-0.32
13,901.00	88.80	0.10	9,718.60	3,911.48	145.82	3,911.48	1.27	0.84	0.95
13,996.00	88.20	359.80	9,721.09	4,006.44	145.74	4,006.44	0.71	-0.63	-0.32
14,091.00	92.00	1.40	9,720.92	4,101.42	146.73	4,101.42	4.34	4.00	1.68
14,185.00	91.90	0.60	9,717.72	4,195.35	148.37	4,195.35	0.86	-0.11	-0.85
14,279.00	92.20	1.40	9,714.36	4,289.27	150.01	4,289.27	0.91	0.32	0.85
14,374.00	92.30	1.30	9,710.63	4,384.17	152.25	4,384.17	0.15	0.11	-0.11
14,468.00	91.50	0.20	9,707.51	4,478.11	153.48	4,478.11	1.45	-0.85	-1.17
14,563.00	90.80	0.30	9,705.61	4,573.09	153.89	4,573.09	0.74	-0.74	0.11
14,658.00	88.80	359.30	9,705.94	4,668.08	153.56	4,668.08	2.35	-2.11	-1.05
14,753.00	88.40	359.00	9,708.26	4,763.04	152.15	4,763.04	0.53	-0.42	-0.32
14,848.00	88.30	359.00	9,710.99	4,857.99	150.49	4,857.99	0.11	-0.11	0.00
14,942.00	89.70	359.60	9,712.63	4,951.97	149.34	4,951.97	1.62	1.49	0.64
15,036.00	90.20	0.00	9,712.72	5,045.97	149.02	5,045.97	0.68	0.53	0.43
15,131.00	93.20	2.50	9,709.90	5,140.88	151.09	5,140.88	4.11	3.16	2.63
15,224.00	94.10	2.80	9,703.98	5,233.59	155.38	5,233.59	1.02	0.97	0.32
15,318.00	92.00	1.00	9,698.98	5,327.40	158.49	5,327.40	2.94	-2.23	-1.91
15,413.00	90.30	1.90	9,697.07	5,422.35	160.89	5,422.35	2.02	-1.79	0.95
15,507.00	90.30	1.00	9,696.58	5,516.31	163.27	5,516.31	0.96	0.00	-0.96
15,602.00	88.80	0.80	9,697.32	5,611.30	164.76	5,611.30	1.59	-1.58	-0.21
15,696.00	91.70	2.30	9,696.91	5,705.25	167.30	5,705.25	3.47	3.09	1.60
15,766.00	89.00	1.10	9,696.49	5,775.21	169.38	5,775.21	4.22	-3.86	-1.71
15,860.00	88.10	0.90	9,698.86	5,869.16	171.02	5,869.16	0.98	-0.96	-0.21
15,956.00	87.30	358.40	9,702.72	5,965.07	170.43	5,965.07	2.73	-0.83	-2.60
16,051.00	87.00	358.60	9,707.44	6,059.92	167.95	6,059.92	0.38	-0.32	0.21
16,145.00	87.60	358.70	9,711.87	6,153.79	165.74	6,153.79	0.65	0.64	0.11
16,240.00	88.40	358.20	9,715.18	6,248.70	163.17	6,248.70	0.99	0.84	-0.53
16,334.00	89.40	359.00	9,716.99	6,342.65	160.87	6,342.65	1.36	1.06	0.85
16,428.00	89.10	359.00	9,718.22	6,436.63	159.23	6,436.63	0.32	-0.32	0.00

LEAM Drilling Services

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
16,522.00	89.10	357.50	9,719.70	6,530.57	156.36	6,530.57	1.60	0.00	-1.60	
16,617.00	89.70	356.40	9,720.69	6,625.43	151.31	6,625.43	1.32	0.63	-1.16	
16,711.00	91.20	356.50	9,719.95	6,719.24	145.49	6,719.24	1.60	1.60	0.11	
16,806.00	90.30	356.50	9,718.71	6,814.06	139.69	6,814.06	0.95	-0.95	0.00	
16,900.00	90.70	357.00	9,717.89	6,907.90	134.36	6,907.90	0.68	0.43	0.53	
16,995.00	91.10	359.30	9,716.40	7,002.84	131.29	7,002.84	2.46	0.42	2.42	
17,090.00	91.30	358.80	9,714.41	7,097.80	129.72	7,097.80	0.57	0.21	-0.53	
17,184.00	90.60	1.10	9,712.85	7,191.78	129.64	7,191.78	2.56	-0.74	2.45	
17,279.00	89.80	0.70	9,712.52	7,286.77	131.13	7,286.77	0.94	-0.84	-0.42	
17,374.00	89.20	0.40	9,713.35	7,381.76	132.04	7,381.76	0.71	-0.63	-0.32	
17,468.00	89.40	1.00	9,714.49	7,475.74	133.19	7,475.74	0.67	0.21	0.64	
17,561.00	89.70	1.20	9,715.22	7,568.72	134.98	7,568.72	0.39	0.32	0.22	
17,656.00	89.40	1.50	9,715.97	7,663.70	137.21	7,663.70	0.45	-0.32	0.32	
17,751.00	89.10	1.20	9,717.21	7,758.66	139.45	7,758.66	0.45	-0.32	-0.32	
17,846.00	90.20	1.10	9,717.79	7,853.64	141.36	7,853.64	1.16	1.16	-0.11	
17,941.00	90.50	0.50	9,717.21	7,948.63	142.69	7,948.63	0.71	0.32	-0.63	
18,035.00	90.10	359.70	9,716.72	8,042.62	142.85	8,042.62	0.95	-0.43	-0.85	
18,129.00	91.10	0.70	9,715.74	8,136.62	143.18	8,136.62	1.50	1.06	1.06	
18,224.00	90.60	0.40	9,714.33	8,231.60	144.09	8,231.60	0.61	-0.53	-0.32	
18,318.00	90.30	0.10	9,713.59	8,325.60	144.50	8,325.60	0.45	-0.32	-0.32	
18,412.00	89.80	0.40	9,713.51	8,419.60	144.91	8,419.60	0.62	-0.53	0.32	
18,506.00	91.20	1.40	9,712.69	8,513.58	146.39	8,513.58	1.83	1.49	1.06	
18,601.00	91.00	1.30	9,710.86	8,608.53	148.62	8,608.53	0.24	-0.21	-0.11	
18,695.00	92.00	1.10	9,708.40	8,702.48	150.59	8,702.48	1.08	1.06	-0.21	
18,790.00	91.70	0.80	9,705.34	8,797.42	152.17	8,797.42	0.45	-0.32	-0.32	
18,884.00	91.50	0.90	9,702.71	8,891.37	153.56	8,891.37	0.24	-0.21	0.11	
18,978.00	90.60	0.70	9,700.99	8,985.34	154.87	8,985.34	0.98	-0.96	-0.21	
19,073.00	89.60	0.40	9,700.82	9,080.34	155.78	9,080.34	1.10	-1.05	-0.32	
19,168.00	89.20	0.20	9,701.82	9,175.33	156.28	9,175.33	0.47	-0.42	-0.21	
19,262.00	88.70	359.70	9,703.54	9,269.31	156.20	9,269.31	0.75	-0.53	-0.53	
19,357.00	89.40	0.00	9,705.12	9,364.30	155.95	9,364.30	0.80	0.74	0.32	
19,452.00	91.50	0.70	9,704.37	9,459.29	156.53	9,459.29	2.33	2.21	0.74	
19,546.00	91.50	0.50	9,701.91	9,553.25	157.51	9,553.25	0.21	0.00	-0.21	
19,640.00	91.30	0.20	9,699.61	9,647.22	158.09	9,647.22	0.38	-0.21	-0.32	
19,734.00	91.00	359.70	9,697.73	9,741.20	158.01	9,741.20	0.62	-0.32	-0.53	
19,829.00	90.80	359.30	9,696.23	9,836.19	157.18	9,836.19	0.47	-0.21	-0.42	
19,890.00	90.50	358.90	9,695.54	9,897.18	156.22	9,897.18	0.82	-0.49	-0.66	
19,942.00	90.50	358.90	9,695.09	9,949.16	155.22	9,949.16	0.00	0.00	0.00	

LEAM Drilling Services

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_User Db

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
SHL (SM 332H) - 625' F:	0.00	0.00	0.00	0.00	0.00	456,993.86	636,785.66	32° 15' 21.5066 N	104° 1' 28.4302 W
- actual wellpath hits target center									
- Point									
BHL (SM 332H) - 19.95'	0.00	0.00	9,695.09	9,949.16	155.22	466,943.02	636,940.89	32° 16' 59.9576 N	104° 1' 26.2885 W
- actual wellpath hits target center									
- Point									

Casing Points				
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(usft)	(usft)		(")	(")
9,018.00	8,986.74	7 5/8"	7-5/8	9-7/8

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S	+E/-W	
(usft)	(usft)	(usft)	(usft)	
9,239.22	9,207.45	-525.97	147.57	100' FSL HL Crossing @ 9239.22' MD
14,650.01	9,705.78	4,660.10	153.65	SL Crossing @ 14650.01' MD
19,861.91	9,695.82	9,869.09	156.71	100' FNL HL Crossing @ 19861.91' MD
19,942.00	9,695.09	9,949.16	155.22	TD Projection

Checked By: _____	Approved By: _____	Date: _____
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