

Unit Petroleum

Reno County, Kansas [NAD 83]

Section 17 T24S-R9W

M&M Farms 17 #1H

OH

Design: OH

Standard Survey Report

27 May, 2014





Company:	Unit Petroleum	Local Co-ordinate Reference:	Well M&M Farms 17 #1H
Project:	Reno County, Kansas [NAD 83]	TVD Reference:	14' KB @ 1698.00usft (UDI 331)
Site:	Section 17 T24S-R9W	MD Reference:	14' KB @ 1698.00usft (UDI 331)
Well:	M&M Farms 17 #1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Reno County, Kansas [NAD 83]		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Kansas Southern Zone		Using geodetic scale factor

Site	Section 17 T24S-R9W				
Site Position:		Northing:	1,781,348.00 usft	Latitude:	37° 57' 16.590 N
From:	Map	Easting:	1,361,868.00 usft	Longitude:	98° 19' 41.509 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.11 °

Well	M&M Farms 17 #1H					
Well Position	+N/-S	0.00 usft	Northing:	1,781,348.00 usft	Latitude:	37° 57' 16.590 N
	+E/-W	0.00 usft	Easting:	1,361,868.00 usft	Longitude:	98° 19' 41.509 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,684.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/8/2014	4.54	65.84	52,087

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	339.93	

Survey Program	Date 5/27/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,763.00	Gyro (OH)	CB-GYRO-MS	Camera based gyro multishot	
1,859.00	8,576.00	MWD (OH)	MWD	MWD - Standard	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.01	0.00	258.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Hinshaw #3										
1.70	0.02	258.11	1.70	0.00	0.00	0.00	0.91	0.91	0.00	
Hinshaw 2-17										
100.00	0.91	258.11	100.00	-0.16	-0.78	0.11	0.91	0.91	0.00	
200.00	1.35	254.34	199.98	-0.65	-2.69	0.32	0.45	0.44	-3.77	
300.00	1.22	244.26	299.95	-1.43	-4.78	0.30	0.26	-0.13	-10.08	
400.00	1.09	255.36	399.93	-2.13	-6.66	0.29	0.26	-0.13	11.10	

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Well:	M&M Farms 17 #1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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)
500.00	1.04	245.25	499.91	-2.75	-8.41	0.30	0.19	-0.05	-10.11
600.00	0.54	249.42	599.90	-3.29	-9.67	0.22	0.50	-0.50	4.17
700.00	0.50	242.44	699.90	-3.66	-10.50	0.16	0.07	-0.04	-6.98
800.00	0.46	230.92	799.90	-4.12	-11.20	-0.02	0.10	-0.04	-11.52
900.00	0.41	226.15	899.89	-4.62	-11.77	-0.30	0.06	-0.05	-4.77
1,000.00	0.22	230.47	999.89	-4.99	-12.17	-0.51	0.19	-0.19	4.32
1,100.00	0.45	248.85	1,099.89	-5.25	-12.69	-0.58	0.25	0.23	18.38
1,200.00	0.22	239.66	1,199.89	-5.49	-13.22	-0.62	0.24	-0.23	-9.19
1,300.00	0.55	228.61	1,299.89	-5.90	-13.74	-0.83	0.34	0.33	-11.05
1,400.00	0.40	237.40	1,399.88	-6.41	-14.40	-1.08	0.17	-0.15	8.79
1,573.00	0.30	216.30	1,572.88	-7.10	-15.18	-1.46	0.09	-0.06	-12.20
1,668.00	0.40	238.00	1,667.88	-7.48	-15.60	-1.67	0.17	0.11	22.84
1,763.00	0.30	241.60	1,762.88	-7.77	-16.10	-1.77	0.11	-0.11	3.79
1,859.00	0.30	267.60	1,858.87	-7.90	-16.58	-1.73	0.14	0.00	27.08
1,953.00	0.40	262.00	1,952.87	-7.96	-17.15	-1.59	0.11	0.11	-5.96
2,048.00	0.30	286.20	2,047.87	-7.93	-17.71	-1.37	0.19	-0.11	25.47
2,143.00	0.50	307.30	2,142.87	-7.61	-18.28	-0.88	0.26	0.21	22.21
2,238.00	0.40	318.30	2,237.87	-7.11	-18.83	-0.22	0.14	-0.11	11.58
2,334.00	0.40	322.20	2,333.86	-6.60	-19.26	0.41	0.03	0.00	4.06
2,429.00	0.50	322.10	2,428.86	-6.01	-19.72	1.12	0.11	0.11	-0.11
2,524.00	0.60	328.60	2,523.86	-5.26	-20.23	2.00	0.12	0.11	6.84
2,619.00	0.70	314.60	2,618.85	-4.43	-20.91	3.02	0.20	0.11	-14.74
2,714.00	0.60	327.60	2,713.84	-3.60	-21.59	4.03	0.19	-0.11	13.68
2,809.00	0.50	328.00	2,808.84	-2.83	-22.07	4.92	0.11	-0.11	0.42
2,904.00	0.60	337.70	2,903.84	-2.02	-22.48	5.82	0.14	0.11	10.21
2,999.00	0.50	322.30	2,998.83	-1.23	-22.92	6.71	0.19	-0.11	-16.21
3,056.00	0.40	330.10	3,055.83	-0.86	-23.17	7.15	0.21	-0.18	13.68
3,069.00	0.40	342.30	3,068.83	-0.78	-23.21	7.24	0.65	0.00	93.85
3,101.00	1.50	5.50	3,100.82	-0.25	-23.20	7.73	3.57	3.44	72.50
3,132.00	4.10	12.10	3,131.78	1.24	-22.93	9.03	8.44	8.39	21.29
3,164.00	6.60	15.90	3,163.64	4.12	-22.19	11.49	7.89	7.81	11.88
3,196.00	9.20	18.60	3,195.34	8.32	-20.87	14.97	8.21	8.13	8.44
3,228.00	11.80	19.70	3,226.80	13.82	-18.95	19.49	8.15	8.13	3.44
3,259.00	14.10	19.70	3,257.01	20.36	-16.61	24.83	7.42	7.42	0.00
3,291.00	16.40	17.80	3,287.88	28.34	-13.91	31.39	7.35	7.19	-5.94
3,322.00	18.90	16.50	3,317.42	37.32	-11.15	38.88	8.16	8.06	-4.19
3,354.00	21.80	15.40	3,347.42	48.02	-8.10	47.88	9.14	9.06	-3.44
3,386.00	25.30	15.60	3,376.75	60.34	-4.68	58.28	10.94	10.94	0.63
3,418.00	29.00	16.50	3,405.22	74.36	-0.64	70.07	11.63	11.56	2.81
3,450.00	32.50	18.00	3,432.71	89.98	4.22	83.07	11.20	10.94	4.69
3,481.00	36.20	18.20	3,458.30	106.61	9.66	96.82	11.94	11.94	0.65
3,513.00	39.80	17.80	3,483.51	125.34	15.74	112.33	11.28	11.25	-1.25
3,543.00	43.30	18.10	3,505.96	144.27	21.88	128.00	11.69	11.67	1.00

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Design:	OH	Database:	EDM 5000.1 Single 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)
3,575.00	47.20	17.50	3,528.49	165.90	28.82	145.94	12.26	12.19	-1.88
3,606.00	50.90	16.10	3,548.80	188.31	35.58	164.67	12.41	11.94	-4.52
3,637.00	54.90	14.50	3,567.50	212.16	42.09	184.83	13.54	12.90	-5.16
3,663.00	56.90	13.70	3,582.07	233.04	47.33	202.64	8.10	7.69	-3.08
3,700.00	57.50	13.10	3,602.12	263.29	54.54	228.59	2.12	1.62	-1.62
3,731.00	57.80	13.30	3,618.70	288.79	60.52	250.48	1.11	0.97	0.65
3,762.00	58.10	12.90	3,635.16	314.38	66.48	272.48	1.46	0.97	-1.29
3,794.00	58.50	13.20	3,651.97	340.90	72.62	295.28	1.48	1.25	0.94
3,810.00	59.40	12.90	3,660.22	354.26	75.72	306.76	5.85	5.63	-1.88
3,826.00	60.80	12.40	3,668.20	367.79	78.76	318.43	9.16	8.75	-3.13
3,858.00	64.30	11.30	3,682.95	395.58	84.58	342.53	11.35	10.94	-3.44
3,889.00	68.20	10.10	3,695.43	423.45	89.84	366.91	13.07	12.58	-3.87
3,921.00	70.90	7.20	3,706.61	453.09	94.35	393.20	11.97	8.44	-9.06
3,952.00	73.10	4.20	3,716.19	482.42	97.27	419.75	11.62	7.10	-9.68
3,984.00	73.80	0.70	3,725.31	513.06	98.58	448.08	10.71	2.19	-10.94
4,016.00	73.40	356.90	3,734.35	543.75	97.94	477.12	11.46	-1.25	-11.88
4,048.00	72.90	353.20	3,743.63	574.25	95.30	506.68	11.18	-1.56	-11.56
4,080.00	73.10	349.60	3,752.99	604.50	90.72	536.66	10.78	0.63	-11.25
4,112.00	73.90	345.90	3,762.08	634.48	84.21	567.05	11.36	2.50	-11.56
4,144.00	74.70	343.30	3,770.74	664.18	76.03	597.75	8.21	2.50	-8.13
4,176.00	76.30	342.40	3,778.75	693.78	66.89	628.69	5.69	5.00	-2.81
4,208.00	78.90	341.20	3,785.62	723.47	57.13	659.93	8.91	8.13	-3.75
4,240.00	82.30	340.40	3,790.85	753.27	46.75	691.49	10.91	10.63	-2.50
4,270.00	86.10	339.80	3,793.88	781.33	36.59	721.33	12.82	12.67	-2.00
4,295.00	87.30	339.70	3,795.32	804.75	27.95	746.29	4.82	4.80	-0.40
4,363.00	88.30	338.50	3,797.93	868.23	3.71	814.23	2.30	1.47	-1.76
4,426.00	88.70	339.10	3,799.58	926.94	-19.06	877.19	1.14	0.63	0.95
4,488.00	89.10	340.10	3,800.77	985.04	-40.67	939.18	1.74	0.65	1.61
4,548.95	89.49	340.10	3,801.52	1,042.34	-61.41	1,000.12	0.63	0.63	0.00
M&M Farms 17 1H 1000' VS (5.13)									
4,551.00	89.50	340.10	3,801.54	1,044.28	-62.11	1,002.18	0.63	0.63	0.00
4,613.00	90.00	340.30	3,801.81	1,102.61	-83.11	1,064.17	0.87	0.81	0.32
4,675.00	90.80	340.30	3,801.37	1,160.98	-104.01	1,126.17	1.29	1.29	0.00
4,736.00	89.50	339.60	3,801.22	1,218.28	-124.92	1,187.17	2.42	-2.13	-1.15
4,799.00	89.30	340.30	3,801.87	1,277.46	-146.52	1,250.16	1.16	-0.32	1.11
4,861.00	89.70	340.80	3,802.42	1,335.92	-167.17	1,312.16	1.03	0.65	0.81
4,923.00	89.60	340.70	3,802.79	1,394.45	-187.61	1,374.15	0.23	-0.16	-0.16
4,984.00	89.30	340.90	3,803.38	1,452.05	-207.67	1,435.14	0.59	-0.49	0.33
5,046.00	89.10	340.60	3,804.25	1,510.58	-228.11	1,497.13	0.58	-0.32	-0.48
5,108.00	89.00	340.60	3,805.27	1,569.05	-248.70	1,559.12	0.16	-0.16	0.00
5,169.00	89.60	340.80	3,806.02	1,626.62	-268.86	1,620.11	1.04	0.98	0.33
5,231.00	90.20	341.20	3,806.13	1,685.24	-289.04	1,682.09	1.16	0.97	0.65
5,292.00	89.90	341.10	3,806.07	1,742.97	-308.75	1,743.08	0.52	-0.49	-0.16
5,354.00	89.80	341.00	3,806.24	1,801.61	-328.88	1,805.07	0.23	-0.16	-0.16

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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)	
5,416.00	90.30	341.00	3,806.18	1,860.23	-349.07	1,867.06	0.81	0.81	0.00	
5,477.00	90.80	340.90	3,805.60	1,917.89	-368.98	1,928.04	0.84	0.82	-0.16	
5,537.00	90.90	340.40	3,804.71	1,974.49	-388.86	1,988.03	0.85	0.17	-0.83	
5,548.77	91.01	340.36	3,804.51	1,985.58	-392.81	1,999.80	1.02	0.97	-0.32	
M&M Farms 17 1H 2000' VS (5.13)										
5,599.00	91.50	340.20	3,803.41	2,032.85	-409.75	2,050.02	1.02	0.97	-0.32	
5,660.00	90.90	339.60	3,802.13	2,090.12	-430.71	2,111.00	1.39	-0.98	-0.98	
5,722.00	91.60	339.60	3,800.78	2,148.22	-452.32	2,172.99	1.13	1.13	0.00	
5,785.00	91.10	338.50	3,799.29	2,207.04	-474.84	2,235.96	1.92	-0.79	-1.75	
5,846.00	89.80	338.10	3,798.81	2,263.71	-497.39	2,296.93	2.23	-2.13	-0.66	
5,908.00	90.00	337.50	3,798.92	2,321.12	-520.81	2,358.89	1.02	0.32	-0.97	
5,970.00	90.30	337.10	3,798.76	2,378.31	-544.74	2,420.82	0.81	0.48	-0.65	
6,030.00	90.20	337.30	3,798.50	2,433.62	-567.99	2,480.76	0.37	-0.17	0.33	
6,091.00	90.60	336.60	3,798.07	2,489.75	-591.87	2,541.67	1.32	0.66	-1.15	
6,153.00	90.90	336.30	3,797.26	2,546.58	-616.64	2,603.55	0.68	0.48	-0.48	
6,214.00	91.20	336.00	3,796.14	2,602.36	-641.30	2,664.41	0.70	0.49	-0.49	
6,276.00	90.00	335.30	3,795.49	2,658.84	-666.87	2,726.23	2.24	-1.94	-1.13	
6,338.00	90.10	335.30	3,795.44	2,715.17	-692.77	2,788.03	0.16	0.16	0.00	
6,399.00	89.70	334.70	3,795.55	2,770.46	-718.55	2,848.80	1.18	-0.66	-0.98	
6,461.00	89.40	335.00	3,796.03	2,826.58	-744.90	2,910.56	0.68	-0.48	0.48	
6,523.00	89.90	334.70	3,796.41	2,882.70	-771.25	2,972.31	0.94	0.81	-0.48	
6,558.07	90.23	334.48	3,796.37	2,914.38	-786.30	3,007.23	1.14	0.95	-0.63	
M&M Farms 17 1H 3000' VS (5.13)										
6,586.00	90.50	334.30	3,796.19	2,939.56	-798.37	3,035.03	1.14	0.95	-0.63	
6,649.00	91.20	333.80	3,795.26	2,996.20	-825.94	3,097.69	1.37	1.11	-0.79	
6,713.00	91.90	334.00	3,793.53	3,053.65	-854.08	3,161.31	1.14	1.09	0.31	
6,775.00	90.20	334.40	3,792.39	3,109.46	-881.06	3,222.99	2.82	-2.74	0.65	
6,838.00	89.90	334.80	3,792.34	3,166.37	-908.08	3,285.72	0.79	-0.48	0.63	
6,901.00	90.20	334.20	3,792.28	3,223.23	-935.21	3,348.43	1.06	0.48	-0.95	
6,964.00	90.90	334.80	3,791.68	3,280.09	-962.33	3,411.15	1.46	1.11	0.95	
7,027.00	91.50	334.80	3,790.36	3,337.09	-989.14	3,473.88	0.95	0.95	0.00	
7,091.00	89.30	334.40	3,789.91	3,394.89	-1,016.59	3,537.60	3.49	-3.44	-0.63	
7,153.00	88.80	333.70	3,790.94	3,450.63	-1,043.72	3,599.26	1.39	-0.81	-1.13	
7,217.00	89.50	333.80	3,791.89	3,508.03	-1,072.02	3,662.88	1.10	1.09	0.16	
7,279.00	89.60	333.80	3,792.37	3,563.66	-1,099.40	3,724.53	0.16	0.16	0.00	
7,341.00	89.80	333.40	3,792.70	3,619.19	-1,126.96	3,786.15	0.72	0.32	-0.65	
7,404.00	89.60	333.60	3,793.03	3,675.57	-1,155.07	3,848.75	0.45	-0.32	0.32	
7,468.00	89.70	333.20	3,793.42	3,732.79	-1,183.73	3,912.33	0.64	0.16	-0.63	
7,532.00	89.80	333.20	3,793.70	3,789.92	-1,212.59	3,975.89	0.16	0.16	0.00	
7,561.63	89.80	333.20	3,793.80	3,816.37	-1,225.94	4,005.32	0.00	0.00	0.00	
M&M Farms 17 1H 4000' VS (5.13)										
7,595.00	89.80	333.20	3,793.92	3,846.15	-1,240.99	4,038.46	0.00	0.00	0.00	
7,658.00	89.30	332.80	3,794.41	3,902.28	-1,269.59	4,101.00	1.02	-0.79	-0.63	
7,722.00	90.10	333.20	3,794.75	3,959.31	-1,298.65	4,164.53	1.40	1.25	0.63	



Company:	Unit Petroleum	Local Co-ordinate Reference:	Well M&M Farms 17 #1H
Project:	Reno County, Kansas [NAD 83]	TVD Reference:	14' KB @ 1698.00usft (UDI 331)
Site:	Section 17 T24S-R9W	MD Reference:	14' KB @ 1698.00usft (UDI 331)
Well:	M&M Farms 17 #1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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)	
7,785.00	90.30	333.60	3,794.53	4,015.64	-1,326.85	4,227.12	0.71	0.32	0.63	
7,849.00	90.80	333.40	3,793.91	4,072.91	-1,355.41	4,290.71	0.84	0.78	-0.31	
7,912.00	91.50	333.40	3,792.65	4,129.23	-1,383.61	4,353.29	1.11	1.11	0.00	
7,975.00	91.70	333.00	3,790.89	4,185.44	-1,412.01	4,415.83	0.71	0.32	-0.63	
8,039.00	92.10	333.00	3,788.77	4,242.43	-1,441.05	4,479.33	0.63	0.63	0.00	
8,102.00	90.10	332.90	3,787.56	4,298.53	-1,469.69	4,541.85	3.18	-3.17	-0.16	
8,166.00	90.60	332.40	3,787.17	4,355.37	-1,499.09	4,605.33	1.10	0.78	-0.78	
8,230.00	92.00	332.50	3,785.72	4,412.10	-1,528.68	4,668.77	2.19	2.19	0.16	
8,292.00	90.20	331.80	3,784.53	4,466.91	-1,557.64	4,730.18	3.11	-2.90	-1.13	
8,355.00	90.30	331.60	3,784.25	4,522.38	-1,587.51	4,792.53	0.35	0.16	-0.32	
8,417.00	90.80	331.30	3,783.66	4,576.83	-1,617.14	4,853.85	0.94	0.81	-0.48	
8,479.00	90.60	331.20	3,782.90	4,631.19	-1,646.96	4,915.14	0.36	-0.32	-0.16	
8,511.00	90.60	331.30	3,782.56	4,659.24	-1,662.35	4,946.77	0.31	0.00	0.31	
Last MWD Survey										
8,576.00	90.60	331.30	3,781.88	4,716.25	-1,693.56	5,011.03	0.00	0.00	0.00	
Projection to TD - M&M Farms 17 1H PBHL (5.13)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,511.00	3,782.56	4,659.24	-1,662.35	Last MWD Survey	
8,576.00	3,781.88	4,716.25	-1,693.56	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____