

30 α5 38434



Survey Certification Form

State of NM

Eddy County

I, Randy W. Rakowitz, certify that; I am employed by LEAM Drilling Systems LLC, that I did on the day(s) of August 1, 2013 through August 9, 2013, conduct or supervise the taking of MWD Survey from a depth of 9,682' to 14,518' MD; that the data is true, correct, complete and within the limitations of the tools as set forth by LEAM Drilling Systems LLC, that I am authorized and qualified to make this report; that this survey was conducted at the request of Devon Energy for the Cotton Draw Unit 117H in Eddy County, NM; and that I reviewed this report and find that it conforms to the principals and procedures as set forth by LEAM Drilling Systems LLC.

A handwritten signature in black ink, appearing to read 'Randy W. Rakowitz', written over a horizontal line.

Randy W. Rakowitz
MWD Operations Coordinator

DEVON ENERGY

Project: Eddy County, NM (NAD-83)
 Site: Cotton Draw Unit
 Well: 117H
 Wellbore: OH
 Design: OH



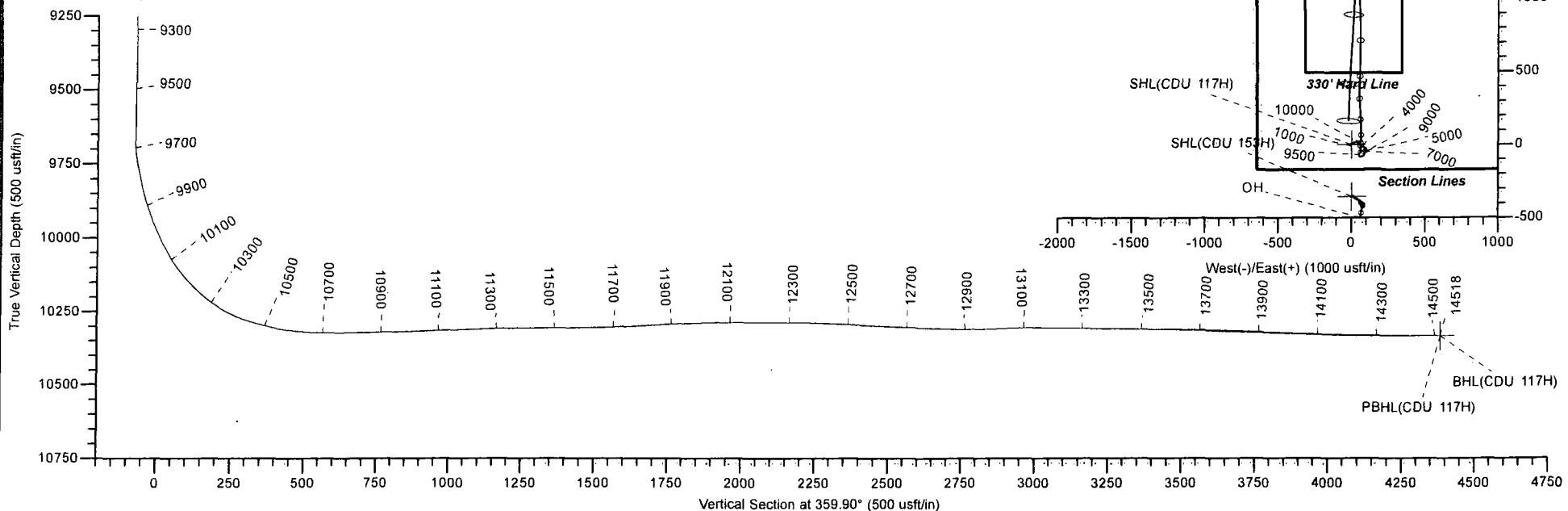
Azimuths to Grid North
 True North: -0.30°
 Magnetic North: 7.14°

Magnetic Field
 Strength: 48379.2snT
 Dip Angle: 60.06°
 Date: 04/09/2013
 Model: IGRF2010

devon

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
SHL(CDU 117H)	0.00	0.00	0.00	425040.23	717633.89	32° 10' 2.031 N	103° 45' 48.891 W
PBHL(CDU 117H)	10335.00	4381.86	-7.84	429422.09	717626.06	32° 10' 45.393 N	103° 45' 48.713 W
BHL(CDU 117H)	10335.05	4381.36	-8.13	429421.59	717625.76	32° 10' 45.388 N	103° 45' 48.716 W



LEAM DRILLING SYSTEMS LLC
 2010 East Davis, Conroe, Texas 77301
 Phone: 936/756-7577, Fax 936/756-7595

Design: OH (117H/OH)
 Cotton Draw Unit
 Created By: Tyler Carlson Date: 12.10, August 27 2013
 Date: _____
 Approved: _____ Date: _____

Leam Drilling Systems LLC

Survey Report

Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well 117H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Site:	Cotton Draw Unit	MD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Well:	117H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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		Cotton Draw Unit			
Site Position:		Northing:	419,194.51 usft	Latitude:	32° 9' 3.901 N
From:	Map	Easting:	722,955.98 usft	Longitude:	103° 44' 47.345 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

Well	117H					
Well Position	+N/-S	0.00 usft	Northing:	425,040.23 usft	Latitude:	32° 10' 2.031 N
	+E/-W	0.00 usft	Easting:	717,633.89 usft	Longitude:	103° 45' 48.891 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,443.00 usft

Wellbore		OH			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	04/09/13	7.45	60.06	48,379

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
					359.90

Survey Program		Date	08/27/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
111.02	9,574.80	Survey #1 (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s	
9,682.00	14,452.00	Survey #2 (OH)	LEAM MWD+IGRF	MWD+IGRF	
14,518.00	14,518.00	Survey #3 (OH)	Project	Projection	

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	
111.02	0.43	251.59	111.02	-0.13	-0.40	-0.13	0.39	0.39	0.00	
207.13	0.33	242.64	207.13	-0.37	-0.98	-0.37	0.12	-0.10	-9.31	
303.24	0.75	238.61	303.23	-0.83	-1.77	-0.82	0.44	0.44	-4.19	
399.35	0.55	236.33	399.34	-1.41	-2.69	-1.41	0.21	-0.21	-2.37	
495.46	1.11	229.90	495.44	-2.27	-3.78	-2.26	0.59	0.58	-6.69	
591.57	1.24	227.75	591.53	-3.57	-5.26	-3.56	0.14	0.14	-2.24	
687.68	1.16	208.46	687.61	-5.12	-6.50	-5.11	0.43	-0.08	-20.07	
783.79	1.05	244.26	783.71	-6.36	-7.75	-6.34	0.72	-0.11	37.25	

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Site:	Cotton Draw Unit	MD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Well:	117H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM:5000.1 Single User Db

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)
879.90	0.65	261.26	879.81	-6.82	-9.09	-6.81	0.49	-0.42	17.69
976.01	0.12	6.22	975.92	-6.81	-9.61	-6.79	0.72	-0.55	109.21
1,072.12	0.41	28.89	1,072.02	-6.40	-9.44	-6.39	0.32	0.30	23.59
1,168.23	0.36	37.79	1,168.13	-5.86	-9.09	-5.85	0.08	-0.05	9.26
1,264.34	0.53	33.86	1,264.24	-5.26	-8.65	-5.24	0.18	0.18	-4.09
1,360.45	0.49	21.43	1,360.35	-4.51	-8.26	-4.49	0.12	-0.04	-12.93
1,456.56	0.61	18.82	1,456.45	-3.64	-7.94	-3.62	0.13	0.12	-2.72
1,552.67	0.59	20.29	1,552.56	-2.69	-7.60	-2.68	0.03	-0.02	1.53
1,648.78	1.07	34.39	1,648.66	-1.49	-6.93	-1.47	0.54	0.50	14.67
1,744.89	1.93	40.85	1,744.73	0.48	-5.36	0.49	0.91	0.89	6.72
1,841.00	2.14	49.98	1,840.78	2.86	-2.93	2.86	0.40	0.22	9.50
1,937.11	1.94	49.79	1,936.83	5.06	-0.31	5.06	0.21	-0.21	-0.20
2,033.22	2.47	56.41	2,032.87	7.26	2.66	7.25	0.61	0.55	6.89
2,129.33	2.56	64.78	2,128.89	9.32	6.32	9.31	0.39	0.09	8.71
2,225.44	2.53	62.90	2,224.90	11.20	10.15	11.18	0.09	-0.03	-1.96
2,321.55	1.96	66.19	2,320.94	12.83	13.55	12.80	0.61	-0.59	3.42
2,417.66	1.93	79.73	2,416.99	13.78	16.64	13.75	0.48	-0.03	14.09
2,513.77	1.82	80.08	2,513.05	14.33	19.74	14.30	0.12	-0.11	0.36
2,609.88	2.19	80.04	2,609.10	14.91	23.05	14.87	0.38	0.38	-0.04
2,705.99	1.88	81.10	2,705.15	15.47	26.42	15.43	0.32	-0.32	1.10
2,802.10	1.29	78.13	2,801.22	15.94	29.03	15.89	0.62	-0.61	-3.09
2,898.21	1.87	94.57	2,897.30	16.04	31.65	15.98	0.76	0.60	17.11
2,994.32	1.32	96.37	2,993.37	15.79	34.32	15.73	0.57	-0.57	1.87
3,090.43	1.33	101.21	3,089.45	15.45	36.51	15.39	0.12	0.01	5.04
3,186.54	2.06	103.26	3,185.52	14.84	39.29	14.77	0.76	0.76	2.13
3,282.65	2.15	113.52	3,281.57	13.72	42.62	13.65	0.40	0.09	10.68
3,378.76	1.95	104.45	3,377.62	12.59	45.86	12.51	0.40	-0.21	-9.44
3,474.87	2.14	103.70	3,473.67	11.76	49.19	11.67	0.20	0.20	-0.78
3,570.98	2.28	120.05	3,569.70	10.38	52.58	10.29	0.67	0.15	17.01
3,667.09	3.77	121.72	3,665.68	7.76	56.93	7.66	1.55	1.55	1.74
3,763.20	3.77	135.87	3,761.58	3.83	61.81	3.72	0.97	0.00	14.72
3,859.31	3.49	125.06	3,857.50	-0.12	66.41	-0.24	0.77	-0.29	-11.25
3,955.42	4.53	127.40	3,953.37	-4.10	71.82	-4.23	1.10	1.08	2.43
4,051.53	5.17	133.40	4,049.14	-9.38	77.98	-9.52	0.85	0.67	6.24
4,147.64	5.32	139.02	4,144.85	-15.72	84.05	-15.87	0.56	0.16	5.85
4,243.75	4.25	142.23	4,240.62	-21.90	89.15	-22.06	1.15	-1.11	3.34
4,339.86	3.07	142.51	4,336.53	-26.76	92.90	-26.92	1.23	-1.23	0.29
4,435.97	2.18	145.12	4,432.54	-30.30	95.51	-30.47	0.93	-0.93	2.72
4,532.08	2.26	159.98	4,528.58	-33.58	97.21	-33.75	0.60	0.08	15.46
4,628.19	1.78	168.34	4,624.63	-36.82	98.16	-37.00	0.58	-0.50	8.70
4,724.30	1.59	164.57	4,720.70	-39.57	98.81	-39.75	0.23	-0.20	-3.92
4,820.41	1.33	173.36	4,816.78	-41.96	99.30	-42.14	0.36	-0.27	9.15
4,916.52	0.81	164.64	4,912.87	-43.73	99.60	-43.90	0.57	-0.54	-9.07

Leam Drilling Systems LLC

Survey Report

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Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Site:	Cotton Draw Unit	MD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Well:	117H	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)
5,012.63	0.36	169.90	5,008.98	-44.68	99.84	-44.86	0.47	-0.47	5.47
5,108.74	0.33	184.59	5,105.08	-45.25	99.87	-45.43	0.10	-0.03	15.28
5,204.85	0.67	221.41	5,201.19	-45.95	99.47	-46.13	0.47	0.35	38.31
5,300.96	0.62	228.28	5,297.29	-46.72	98.71	-46.89	0.10	-0.05	7.15
5,397.07	0.90	244.71	5,393.40	-47.39	97.64	-47.56	0.37	0.29	17.09
5,493.18	0.42	272.44	5,489.50	-47.69	96.61	-47.87	0.59	-0.50	28.85
5,589.29	0.99	277.27	5,585.60	-47.57	95.43	-47.74	0.60	0.59	5.03
5,685.40	0.25	316.90	5,681.71	-47.31	94.47	-47.48	0.85	-0.77	41.23
5,781.51	0.61	306.91	5,777.81	-46.85	93.91	-47.02	0.38	0.37	-10.39
5,877.62	0.37	285.76	5,873.92	-46.46	93.21	-46.63	0.31	-0.25	-22.01
5,973.73	0.86	279.86	5,970.02	-46.25	92.20	-46.42	0.51	0.51	-6.14
6,069.84	0.50	263.01	6,066.13	-46.18	91.07	-46.34	0.42	-0.37	-17.53
6,165.95	0.23	266.78	6,162.24	-46.24	90.46	-46.41	0.28	-0.28	3.92
6,262.06	0.41	271.48	6,258.34	-46.25	89.93	-46.41	0.19	0.19	4.89
6,358.17	0.37	290.82	6,354.45	-46.13	89.29	-46.29	0.14	-0.04	20.12
6,454.28	0.70	248.57	6,450.56	-46.23	88.46	-46.39	0.51	0.34	-43.96
6,550.39	0.72	200.45	6,546.66	-47.01	87.70	-47.17	0.60	0.02	-50.07
6,646.50	0.16	185.26	6,642.77	-47.71	87.47	-47.87	0.59	-0.58	-15.80
6,742.61	0.11	189.48	6,738.88	-47.94	87.45	-48.09	0.05	-0.05	4.39
6,838.72	0.54	189.80	6,834.99	-48.47	87.35	-48.63	0.45	0.45	0.33
6,934.83	0.50	199.36	6,931.09	-49.31	87.14	-49.47	0.10	-0.04	9.95
7,030.94	0.12	206.77	7,027.20	-49.80	86.95	-49.96	0.40	-0.40	7.71
7,127.05	0.46	220.18	7,123.31	-50.18	86.66	-50.34	0.36	0.35	13.95
7,223.16	0.70	231.79	7,219.41	-50.84	85.95	-51.00	0.28	0.25	12.08
7,319.27	0.50	234.53	7,315.52	-51.45	85.15	-51.60	0.21	-0.21	2.85
7,415.38	1.31	262.66	7,411.62	-51.83	83.72	-51.98	0.94	0.84	29.27
7,511.49	1.25	241.24	7,507.70	-52.48	81.71	-52.62	0.50	-0.06	-22.29
7,607.60	0.99	231.10	7,603.79	-53.50	80.14	-53.65	0.34	-0.27	-10.55
7,703.71	0.89	229.77	7,699.89	-54.51	78.93	-54.65	0.11	-0.10	-1.38
7,799.82	1.51	168.04	7,795.98	-56.23	78.62	-56.37	1.40	0.65	-64.23
7,895.93	1.33	190.75	7,892.06	-58.56	78.67	-58.70	0.61	-0.19	23.63
7,992.04	1.27	201.98	7,988.15	-60.65	78.07	-60.79	0.27	-0.06	11.68
8,088.15	1.02	214.71	8,084.24	-62.34	77.18	-62.47	0.37	-0.26	13.25
8,184.26	0.84	214.17	8,180.34	-63.62	76.30	-63.76	0.19	-0.19	-0.56
8,280.37	0.33	198.05	8,276.44	-64.47	75.82	-64.60	0.55	-0.53	-16.77
8,376.48	0.64	186.47	8,372.55	-65.27	75.67	-65.40	0.34	0.32	-12.05
8,472.59	0.59	201.57	8,468.65	-66.26	75.43	-66.39	0.18	-0.05	15.71
8,568.70	1.26	246.50	8,564.75	-67.14	74.28	-67.27	0.98	0.70	46.75
8,664.81	1.74	242.49	8,660.83	-68.24	72.01	-68.36	0.51	0.50	-4.17
8,760.92	1.43	243.64	8,756.90	-69.44	69.64	-69.57	0.32	-0.32	1.20
8,857.03	0.89	268.58	8,852.99	-69.99	67.82	-70.11	0.76	-0.56	25.95
8,953.14	0.98	295.85	8,949.09	-69.65	66.34	-69.77	0.47	0.09	28.37
9,049.25	0.60	304.33	9,045.19	-69.01	65.18	-69.13	0.41	-0.40	8.82

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Design:	OH	Database:	EDM 5000.1 Single User Db

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)
9,145.36	0.23	309.36	9,141.30	-68.61	64.62	-68.72	0.39	-0.38	5.23
9,241.47	0.38	283.43	9,237.41	-68.41	64.16	-68.52	0.21	0.16	-26.98
9,337.58	0.75	214.34	9,333.51	-68.85	63.49	-68.97	0.74	0.38	-71.89
9,433.69	0.92	198.15	9,429.61	-70.11	62.90	-70.22	0.30	0.18	-16.85
9,529.80	0.85	183.81	9,525.71	-71.55	62.61	-71.66	0.24	-0.07	-14.92
9,574.80	0.85	197.84	9,570.71	-72.20	62.49	-72.31	0.46	0.00	31.18
9,682.00	0.70	313.20	9,677.90	-72.51	61.77	-72.62	1.22	-0.14	107.61
9,714.00	4.40	356.20	9,709.87	-71.15	61.54	-71.26	12.24	11.56	134.38
9,745.00	8.70	358.20	9,740.66	-67.62	61.39	-67.73	13.89	13.87	6.45
9,777.00	10.60	355.70	9,772.20	-62.27	61.09	-62.37	6.08	5.94	-7.81
9,808.00	12.20	357.60	9,802.59	-56.15	60.74	-56.26	5.30	5.16	6.13
9,839.00	14.10	359.90	9,832.77	-49.10	60.60	-49.21	6.36	6.13	7.42
9,871.00	16.60	0.50	9,863.63	-40.63	60.63	-40.74	7.83	7.81	1.88
9,902.00	18.30	2.20	9,893.20	-31.34	60.86	-31.45	5.72	5.48	5.48
9,934.00	20.00	2.90	9,923.43	-20.85	61.33	-20.96	5.36	5.31	2.19
9,966.00	21.70	2.60	9,953.33	-9.48	61.87	-9.59	5.32	5.31	-0.94
9,997.00	24.10	2.00	9,981.89	2.58	62.35	2.47	7.78	7.74	-1.94
10,029.00	26.40	1.30	10,010.83	16.22	62.74	16.11	7.25	7.19	-2.19
10,060.00	28.90	0.80	10,038.29	30.60	63.00	30.49	8.10	8.06	-1.61
10,092.00	31.90	0.10	10,065.89	46.79	63.13	46.68	9.44	9.38	-2.19
10,123.00	34.90	0.60	10,091.76	63.86	63.23	63.74	9.72	9.68	1.61
10,155.00	38.00	0.30	10,117.50	82.86	63.38	82.75	9.70	9.69	-0.94
10,186.00	41.50	359.40	10,141.33	102.68	63.32	102.57	11.44	11.29	-2.90
10,218.00	44.60	357.30	10,164.71	124.51	62.68	124.40	10.67	9.69	-6.56
10,250.00	47.70	356.80	10,186.88	147.56	61.49	147.45	9.75	9.69	-1.56
10,282.00	51.30	356.80	10,207.66	171.85	60.13	171.74	11.25	11.25	0.00
10,314.00	55.00	357.10	10,226.85	197.41	58.77	197.31	11.59	11.56	0.94
10,345.00	59.70	356.90	10,243.57	223.47	57.41	223.37	15.17	15.16	-0.65
10,377.00	64.80	357.10	10,258.46	251.74	55.93	251.64	15.95	15.94	0.63
10,408.00	68.30	356.90	10,270.79	280.14	54.44	280.04	11.31	11.29	-0.65
10,441.00	71.30	357.60	10,282.19	311.07	52.95	310.98	9.31	9.09	2.12
10,472.00	74.20	358.70	10,291.38	340.66	52.00	340.56	9.95	9.35	3.55
10,504.00	76.70	0.10	10,299.42	371.63	51.68	371.53	8.89	7.81	4.38
10,536.00	79.00	1.20	10,306.15	402.90	52.03	402.81	7.93	7.19	3.44
10,567.00	81.40	1.30	10,311.43	433.44	52.70	433.35	7.75	7.74	0.32
10,599.00	83.30	2.00	10,315.69	465.14	53.61	465.05	6.32	5.94	2.19
10,631.00	85.30	1.90	10,318.87	496.96	54.70	496.87	6.26	6.25	-0.31
10,663.00	87.10	1.00	10,320.99	528.88	55.51	528.78	6.29	5.63	-2.81
10,695.00	89.30	359.90	10,321.99	560.86	55.76	560.76	7.69	6.88	-3.44
10,750.00	90.70	0.50	10,321.99	615.86	55.95	615.76	2.77	2.55	1.09
10,844.00	91.20	1.20	10,320.44	709.84	57.34	709.73	0.92	0.53	0.74
10,939.00	91.40	359.60	10,318.28	804.81	58.01	804.70	1.70	0.21	-1.68
11,034.00	91.90	358.00	10,315.54	899.74	56.02	899.64	1.76	0.53	-1.68
11,129.00	92.10	357.10	10,312.23	994.60	51.96	994.50	0.97	0.21	-0.95

Leam Drilling Systems LLC

Survey Report

Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well 117H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Site:	Cotton Draw Unit	MD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Well:	117H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
11,223.00	91.70	357.10	10,309.11	1,088.43	47.21	1,088.34	0.43	-0.43	0.00
11,317.00	90.90	357.50	10,306.98	1,182.30	42.78	1,182.22	0.95	-0.85	0.43
11,412.00	90.10	358.50	10,306.15	1,277.23	39.46	1,277.16	1.35	-0.84	1.05
11,508.00	90.30	359.60	10,305.82	1,373.22	37.87	1,373.15	1.16	0.21	1.15
11,602.00	90.50	358.70	10,305.16	1,467.20	36.48	1,467.14	0.98	0.21	-0.96
11,697.00	92.00	0.30	10,303.09	1,562.17	35.65	1,562.11	2.31	1.58	1.68
11,792.00	93.10	1.00	10,298.86	1,657.07	36.72	1,657.00	1.37	1.16	0.74
11,887.00	92.90	0.60	10,293.89	1,751.93	38.05	1,751.86	0.47	-0.21	-0.42
11,982.00	91.30	0.80	10,290.41	1,846.86	39.21	1,846.78	1.70	-1.68	0.21
12,076.00	90.40	0.30	10,289.01	1,940.84	40.11	1,940.77	1.10	-0.96	-0.53
12,171.00	88.90	359.40	10,289.59	2,035.83	39.86	2,035.76	1.84	-1.58	-0.95
12,265.00	90.00	359.40	10,290.50	2,129.82	38.88	2,129.75	1.17	1.17	0.00
12,361.00	88.90	359.40	10,291.42	2,225.81	37.87	2,225.74	1.15	-1.15	0.00
12,455.00	87.30	358.40	10,294.53	2,319.74	36.07	2,319.67	2.01	-1.70	-1.06
12,550.00	86.50	358.20	10,299.67	2,414.56	33.26	2,414.49	0.87	-0.84	-0.21
12,645.00	87.30	358.50	10,304.81	2,509.38	30.52	2,509.32	0.90	0.84	0.32
12,740.00	87.90	359.10	10,308.79	2,604.27	28.54	2,604.22	0.89	0.63	0.63
12,835.00	88.50	358.90	10,311.77	2,699.21	26.88	2,699.16	0.67	0.63	-0.21
12,929.00	90.30	358.90	10,312.76	2,793.19	25.08	2,793.14	1.91	1.91	0.00
13,024.00	92.00	358.90	10,310.85	2,888.14	23.25	2,888.10	1.79	1.79	0.00
13,118.00	91.30	359.10	10,308.14	2,982.09	21.61	2,982.05	0.77	-0.74	0.21
13,214.00	88.70	358.20	10,308.14	3,078.06	19.35	3,078.02	2.87	-2.71	-0.94
13,308.00	88.60	358.70	10,310.36	3,171.99	16.81	3,171.96	0.54	-0.11	0.53
13,404.00	89.70	359.40	10,311.78	3,267.97	15.22	3,267.94	1.36	1.15	0.73
13,499.00	89.30	359.20	10,312.61	3,362.96	14.06	3,362.93	0.47	-0.42	-0.21
13,595.00	90.10	359.40	10,313.11	3,458.95	12.88	3,458.92	0.86	0.83	0.21
13,690.00	88.70	359.20	10,314.11	3,553.93	11.72	3,553.91	1.49	-1.47	-0.21
13,785.00	87.90	358.90	10,316.93	3,648.88	10.15	3,648.85	0.90	-0.84	-0.32
13,881.00	87.80	358.90	10,320.53	3,744.79	8.31	3,744.77	0.10	-0.10	0.00
13,976.00	87.80	358.70	10,324.17	3,839.70	6.32	3,839.68	0.21	0.00	-0.21
14,071.00	87.90	358.50	10,327.74	3,934.61	4.00	3,934.59	0.24	0.11	-0.21
14,167.00	88.50	358.50	10,330.75	4,030.53	1.49	4,030.52	0.63	0.63	0.00
14,262.00	88.90	358.40	10,332.91	4,125.47	-1.08	4,125.46	0.43	0.42	-0.11
14,357.00	89.50	358.70	10,334.23	4,220.43	-3.48	4,220.43	0.71	0.63	0.32
14,452.00	89.80	358.20	10,334.82	4,315.39	-6.05	4,315.39	0.61	0.32	-0.53
14,518.00	89.80	358.20	10,335.05	4,381.36	-8.13	4,381.36	0.00	0.00	0.00

Leam Drilling Systems LLC

Survey Report

Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well 117H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Site:	Cotton Draw Unit	MD Reference:	GE 3443' + KB 28' @ 3471.00usft (Permitting)
Well:	117H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
SHL(CDU 117H)	0.00	0.00	0.00	0.00	0.00	425,040.23	717,633.89	32° 10' 2.031 N	103° 45' 48.891 W
- actual wellpath hits target center									
- Point									
PBHL(CDU 117H)	0.00	0.01	10,335.0	4,381.86	-7.84	429,422.09	717,626.05	32° 10' 45.393 N	103° 45' 48.713 W
			0						
- actual wellpath misses target center by 0.58usft at 14518.00usft MD (10335.05 TVD, 4381.36 N, -8.13 E)									
- Point									
BHL(CDU 117H)	0.00	0.00	10,335.0	4,381.36	-8.13	429,421.59	717,625.76	32° 10' 45.388 N	103° 45' 48.716 W
			5						
- actual wellpath misses target center by 0.01usft at 14518.00usft MD (10335.05 TVD, 4381.36 N, -8.13 E)									
- Point									

Checked By: _____ Approved By: _____ Date: _____