



NABORS DRILLING TECHNOLOGIES USA, INC.
515 West Greens Road
Houston, TX 77067
Phone: 281.874.0035
Fax: 281.872.5205

Thursday, August 30, 2018

Railroad Commission of Texas
Oil and Gas Division
PO Box 12967
Capitol Station
Austin, TX 78711-2967

Subject: **Survey Certification Letter**

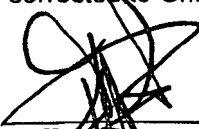
Attention: **Pam Johns**

Survey Company: **NABORS DRILLING TECH USA, INC.**
Job Number: **T5171**
Survey Job Type: **Nabors MWD**
Customer: **Devon Energy Corporation**
Well Name: **Cotton Draw Unit 517H**
Rig Name: **Nabors X20**

Operator #: **598880**
Surface: **32 11 39.3677807, -103 43 28.168124**
A.P.I. No: **30-015-44718**
Location: **Eddy, NM**
RKB Height: **32'**
Distance to Bit: **67'**

Surveyor Name	Surveyor Title	Borehole Number	Start Depth	End Depth	Start Date	End Date	Type of	TD Straight
								Line Projection
Jeffrey Parsons	MWD Supervisor	OH	184'	19281'	08/16/18	08/30/18	MWD	19348'

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by NABORS DRILLING TECHNOLOGIES USA, INC. I am authorized and qualified to review the data, calculations and these reports; the reports represents true and correct Directional Surveys of this well based on the original data, the minimum curvature method, corrected to Grid North and obtained at the well site.



Jeffrey Parsons
MWD Supervisor
NABORS DRILLING TECHNOLOGIES USA, INC.

The Devon logo consists of the word "devon" in a lowercase, sans-serif font, positioned to the left of a stylized graphic of three horizontal bars of increasing length, stacked vertically.

Devon Energy Corporation

**Eddy Co., NM
Cotton Draw Unit
517H**

OH

Design: Surveys

Standard Survey Report

30 August, 2018





Nabors
Survey Report



Company:	Devon Energy Corporation	Local Co-ordinate Reference:	Well 517H
Project:	Eddy Co., NM	TVD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Site:	Cotton Draw Unit	MD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Well:	517H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Ryan USA_ODBC_32bit

Project	Eddy Co., NM		
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:	434,943.040 usft
From:	Map	Easting:	729,763.800 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 11' 39.367416 N
		Longitude:	103° 43' 27.121085 W
		Grid Convergence:	0.32 °

Well	517H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	32° 11' 39.367807 N
		Longitude:	103° 43' 28.168124 W
		Ground Level:	3,541.40 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	User Defined	6/1/2018	6.93
			Dip Angle
			(°)
			59.92
			Field Strength
			(nT)
			48,027.30000000

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction
			(°)
			189.63

Survey Program	Date 8/30/2018		
From	To	Survey (Wellbore)	Tool Name
(ft)	(ft)		
184.00	19,348.00	Survey #1 (OH)	MWD+IFR1
			Description
			OWSG MWD + IFR1

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
184.00	0.50	125.79	184.00	-0.47	0.65	0.35	0.27	0.27	0.00
243.00	0.19	247.78	243.00	-0.66	0.77	0.52	1.05	-0.53	206.76
332.00	0.69	136.34	331.99	-1.10	1.00	0.92	0.88	0.56	-125.21
423.00	0.56	153.39	422.99	-1.89	1.58	1.60	0.25	-0.14	18.74
513.00	0.63	140.20	512.98	-2.67	2.09	2.28	0.17	0.08	-14.66
605.00	0.63	131.24	604.98	-3.39	2.80	2.87	0.11	0.00	-9.74
691.00	0.50	146.71	690.98	-4.02	3.36	3.40	0.23	-0.15	17.99
878.00	0.31	196.81	877.97	-5.18	3.66	4.50	0.21	-0.10	26.79
969.00	0.69	266.77	968.97	-5.45	3.04	4.86	0.72	0.42	76.88



Nabors
Survey Report



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Project:	Eddy Co., NM	TVD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Site:	Cotton Draw Unit	MD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Well:	517H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Ryan USA_ODBC_32bit

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,061.00	2.19	284.52	1,060.94	-5.04	0.79	4.84	1.68	1.63	19.29
1,152.00	4.19	292.96	1,151.79	-3.31	-3.96	3.92	2.25	2.20	9.27
1,243.00	4.25	294.36	1,242.54	-0.62	-10.09	2.30	0.13	0.07	1.54
1,333.00	5.50	302.80	1,332.22	3.09	-16.75	-0.25	1.60	1.39	9.38
1,425.00	6.81	279.25	1,423.70	6.36	-25.84	-1.95	3.06	1.42	-25.60
1,517.00	6.94	275.56	1,515.04	7.78	-36.76	-1.52	0.50	0.14	-4.01
1,609.00	7.75	279.77	1,606.28	9.37	-48.41	-1.14	1.06	0.88	4.58
1,701.00	7.88	279.07	1,697.43	11.41	-60.75	-1.09	0.18	0.14	-0.76
1,796.00	7.75	279.60	1,791.55	13.51	-73.49	-1.02	0.16	-0.14	0.56
1,891.00	8.56	278.90	1,885.59	15.67	-86.79	-0.93	0.86	0.85	-0.74
1,985.00	9.94	280.30	1,978.36	18.20	-101.69	-0.94	1.49	1.47	1.49
2,079.00	9.63	279.60	2,070.99	20.96	-117.42	-1.03	0.35	-0.33	-0.74
2,172.00	11.44	283.82	2,162.42	24.47	-134.05	-1.70	2.11	1.95	4.54
2,267.00	12.06	282.76	2,255.43	28.91	-152.88	-2.93	0.69	0.65	-1.12
2,362.00	12.63	280.83	2,348.24	33.05	-172.76	-3.69	0.74	0.60	-2.03
2,456.00	12.13	280.30	2,440.05	36.75	-192.57	-4.02	0.55	-0.53	-0.56
2,550.00	12.88	280.83	2,531.82	40.48	-212.58	-4.35	0.81	0.80	0.56
2,644.00	13.44	281.88	2,623.35	44.70	-233.56	-5.00	0.65	0.60	1.12
2,738.00	13.13	279.95	2,714.84	48.79	-254.76	-5.49	0.58	-0.33	-2.05
2,833.00	12.75	279.42	2,807.42	52.37	-275.73	-5.51	0.42	-0.40	-0.56
2,927.00	12.31	279.07	2,899.18	55.65	-295.86	-5.37	0.48	-0.47	-0.37
3,021.00	12.06	278.72	2,991.07	58.72	-315.46	-5.12	0.28	-0.27	-0.37
3,115.00	12.38	282.94	3,082.94	62.47	-334.99	-5.55	1.01	0.34	4.49
3,210.00	12.00	284.87	3,175.80	67.28	-354.46	-7.04	0.59	-0.40	2.03
3,304.00	11.44	284.70	3,267.84	72.15	-372.92	-8.75	0.60	-0.60	-0.18
3,399.00	11.94	285.57	3,360.87	77.18	-391.50	-10.60	0.56	0.53	0.92
3,493.00	12.69	285.22	3,452.70	82.50	-410.83	-12.61	0.80	0.80	-0.37
3,587.00	12.19	283.99	3,544.50	87.61	-430.43	-14.37	0.60	-0.53	-1.31
3,682.00	12.94	279.95	3,637.22	91.88	-450.64	-15.20	1.22	0.79	-4.25
3,776.00	12.94	278.02	3,728.83	95.16	-471.42	-14.96	0.46	0.00	-2.05
3,870.00	13.63	279.95	3,820.32	98.54	-492.75	-14.73	0.87	0.73	2.05
3,965.00	14.00	280.83	3,912.57	102.64	-515.07	-15.03	0.45	0.39	0.93
4,059.00	12.81	278.02	4,004.01	106.23	-536.55	-14.97	1.44	-1.27	-2.99
4,153.00	11.88	279.42	4,095.83	109.27	-556.42	-14.65	1.04	-0.99	1.49
4,248.00	11.94	279.95	4,188.79	112.56	-575.74	-14.66	0.13	0.06	0.56
4,342.00	12.56	278.54	4,280.65	115.76	-595.43	-14.52	0.73	0.66	-1.50
4,436.00	13.25	282.59	4,372.28	119.63	-616.05	-14.89	1.21	0.73	4.31
4,529.00	12.38	283.29	4,462.96	124.24	-636.16	-16.07	0.95	-0.94	0.75
4,626.00	10.69	278.37	4,558.00	127.94	-655.18	-16.54	2.01	-1.74	-5.07
4,720.00	11.44	281.71	4,650.25	131.10	-672.93	-16.69	1.05	0.80	3.55
4,814.00	13.44	286.45	4,742.04	136.09	-692.54	-18.32	2.39	2.13	5.04
4,908.00	14.44	288.04	4,833.27	142.81	-714.16	-21.33	1.14	1.06	1.69
5,002.00	14.31	287.16	4,924.33	149.87	-736.40	-24.57	0.27	-0.14	-0.94
5,097.00	14.94	286.10	5,016.25	156.73	-759.39	-27.49	0.72	0.66	-1.12



Nabors
Survey Report



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Project:	Eddy Co., NM	TVD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Site:	Cotton Draw Unit	MD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Well:	517H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Ryan USA_ODBC_32bit

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,191.00	14.88	284.52	5,107.09	163.12	-782.71	-29.88	0.44	-0.06	-1.68
5,285.00	14.94	285.05	5,197.92	169.29	-806.10	-32.06	0.16	0.06	0.56
5,380.00	15.00	283.29	5,289.70	175.30	-829.89	-34.00	0.48	0.06	-1.85
5,475.00	14.81	282.41	5,381.50	180.73	-853.71	-35.37	0.31	-0.20	-0.93
5,569.00	14.81	281.53	5,472.38	185.71	-877.22	-36.35	0.24	0.00	-0.94
5,664.00	14.69	281.18	5,564.25	190.48	-900.93	-37.08	0.16	-0.13	-0.37
5,758.00	14.63	280.30	5,655.19	194.91	-924.30	-37.54	0.25	-0.06	-0.94
5,853.00	14.31	277.49	5,747.18	198.59	-947.75	-37.24	0.81	-0.34	-2.96
5,947.00	13.88	277.49	5,838.35	201.57	-970.44	-36.39	0.46	-0.46	0.00
6,041.00	13.94	277.14	5,929.59	204.45	-992.86	-35.48	0.11	0.06	-0.37
6,136.00	13.50	278.19	6,021.88	207.45	-1,015.19	-34.70	0.53	-0.46	1.11
6,230.00	12.56	279.07	6,113.46	210.62	-1,036.14	-34.32	1.02	-1.00	0.94
6,324.00	11.75	279.25	6,205.35	213.77	-1,055.68	-34.16	0.86	-0.86	0.19
6,418.00	11.31	283.99	6,297.45	217.54	-1,074.07	-34.80	1.11	-0.47	5.04
6,513.00	11.06	283.11	6,390.65	221.86	-1,091.99	-36.06	0.32	-0.26	-0.93
6,607.00	10.88	283.29	6,482.93	225.94	-1,109.40	-37.17	0.19	-0.19	0.19
6,701.00	10.69	283.29	6,575.27	229.99	-1,126.52	-38.30	0.20	-0.20	0.00
6,795.00	10.75	282.94	6,667.63	233.95	-1,143.55	-39.36	0.09	0.06	-0.37
6,890.00	10.38	280.83	6,761.02	237.55	-1,160.59	-40.05	0.56	-0.39	-2.22
6,984.00	9.81	279.77	6,853.57	240.50	-1,176.80	-40.25	0.64	-0.61	-1.13
7,078.00	9.56	282.06	6,946.23	243.49	-1,192.32	-40.60	0.49	-0.27	2.44
7,172.00	10.88	284.17	7,038.73	247.29	-1,208.56	-41.63	1.46	1.40	2.24
7,266.00	11.63	285.40	7,130.92	251.98	-1,226.30	-43.28	0.84	0.80	1.31
7,360.00	12.63	281.53	7,222.83	256.55	-1,245.50	-44.58	1.37	1.06	-4.12
7,454.00	11.75	279.77	7,314.71	260.23	-1,265.00	-44.94	1.02	-0.94	-1.87
7,549.00	11.50	279.42	7,407.76	263.42	-1,283.88	-44.93	0.27	-0.26	-0.37
7,643.00	11.50	279.42	7,499.87	266.48	-1,302.37	-44.86	0.00	0.00	0.00
7,736.00	11.38	278.02	7,591.02	269.28	-1,320.60	-44.57	0.33	-0.13	-1.51
7,831.00	11.50	283.11	7,684.14	272.74	-1,339.10	-44.88	1.07	0.13	5.36
7,925.00	12.63	288.21	7,776.06	278.07	-1,357.99	-46.98	1.65	1.20	5.43
8,020.00	14.19	286.28	7,868.47	284.58	-1,379.04	-49.88	1.71	1.64	-2.03
8,114.00	13.38	285.05	7,959.76	290.64	-1,400.60	-52.24	0.92	-0.86	-1.31
8,208.00	12.56	282.94	8,051.36	295.75	-1,421.06	-53.86	1.01	-0.87	-2.24
8,302.00	12.56	279.60	8,143.12	299.74	-1,441.10	-54.45	0.77	0.00	-3.55
8,396.00	11.75	277.84	8,235.01	302.75	-1,460.66	-54.14	0.95	-0.86	-1.87
8,490.00	10.94	275.91	8,327.17	304.98	-1,479.02	-53.26	0.95	-0.86	-2.05
8,521.00	10.75	276.43	8,357.62	305.61	-1,484.82	-52.91	0.69	-0.61	1.68
8,627.44	15.24	261.64	8,461.33	304.68	-1,508.54	-48.03	5.22	4.22	-13.89
CDU_517H_KOP									
8,679.00	17.63	257.27	8,510.78	301.98	-1,522.86	-42.97	5.22	4.64	-8.48
8,774.00	24.94	247.25	8,599.27	291.04	-1,555.42	-26.74	8.57	7.69	-10.55
8,819.00	25.81	231.79	8,639.98	281.30	-1,571.89	-14.39	14.81	1.93	-34.36
8,868.00	26.88	216.49	8,683.94	265.78	-1,586.87	3.42	13.99	2.18	-31.22

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Well:	517H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Ryan USA_ODBC_32bit

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
8,913.00	27.75	207.88	8,723.94	248.34	-1,597.83	22.46	8.98	1.93	-19.13	
8,962.00	31.81	204.72	8,766.46	226.51	-1,608.57	45.77	8.88	8.29	-6.45	
9,007.00	36.88	199.27	8,803.61	202.97	-1,617.99	70.56	13.17	11.27	-12.11	
9,056.00	43.75	196.28	8,840.95	172.79	-1,627.60	101.92	14.56	14.02	-6.10	
9,101.00	47.81	189.60	8,872.35	141.39	-1,634.75	134.08	13.94	9.02	-14.84	
9,149.00	50.38	182.57	8,903.80	105.35	-1,638.55	170.24	12.29	5.35	-14.65	
9,194.00	56.88	181.69	8,930.47	69.16	-1,639.89	206.14	14.53	14.44	-1.96	
9,243.00	63.31	182.04	8,954.89	26.73	-1,641.27	248.21	13.14	13.12	0.71	
9,288.00	66.44	182.57	8,973.99	-13.97	-1,642.91	288.61	7.04	6.96	1.18	
9,336.00	69.25	184.15	8,992.09	-58.35	-1,645.52	332.79	6.60	5.85	3.29	
9,381.00	72.25	184.32	9,006.93	-100.71	-1,648.66	375.09	6.68	6.67	0.38	
9,431.00	76.25	184.68	9,020.50	-148.67	-1,652.44	423.01	8.03	8.00	0.72	
9,476.00	79.94	181.86	9,029.78	-192.62	-1,654.94	466.75	10.24	8.20	-6.27	
9,525.00	86.38	180.99	9,035.61	-241.23	-1,656.15	514.88	13.26	13.14	-1.78	
9,535.67	86.67	180.93	9,036.26	-251.88	-1,656.33	525.41	2.80	2.74	-0.55	
CDU_517H_EOC										
9,591.00	88.19	180.63	9,038.74	-307.15	-1,657.08	580.02	2.80	2.74	-0.55	
9,686.00	88.69	180.81	9,041.32	-402.11	-1,658.27	673.84	0.56	0.53	0.19	
9,780.00	88.94	181.16	9,043.27	-496.07	-1,659.89	766.75	0.46	0.27	0.37	
9,874.00	90.31	182.57	9,043.88	-590.01	-1,662.95	859.89	2.09	1.46	1.50	
9,968.00	89.50	182.57	9,044.04	-683.92	-1,667.16	953.17	0.86	-0.86	0.00	
10,062.00	89.56	182.57	9,044.81	-777.82	-1,671.38	1,046.46	0.06	0.06	0.00	
10,156.00	91.00	181.16	9,044.35	-871.77	-1,674.44	1,139.59	2.14	1.53	-1.50	
10,251.00	91.50	181.34	9,042.28	-966.72	-1,676.51	1,233.55	0.56	0.53	0.19	
10,345.00	92.00	180.81	9,039.41	-1,060.66	-1,678.27	1,326.46	0.77	0.53	-0.56	
10,439.00	91.81	179.93	9,036.28	-1,154.60	-1,678.88	1,419.19	0.96	-0.20	-0.94	
10,534.00	93.31	179.40	9,032.04	-1,249.50	-1,678.32	1,512.66	1.67	1.58	-0.56	
10,628.00	92.19	179.58	9,027.53	-1,343.39	-1,677.49	1,605.08	1.21	-1.19	0.19	
10,719.00	90.00	179.23	9,025.79	-1,434.36	-1,676.54	1,694.61	2.44	-2.41	-0.38	
10,810.00	88.19	178.70	9,027.23	-1,525.33	-1,674.90	1,784.03	2.07	-1.99	-0.58	
10,900.00	87.94	178.35	9,030.27	-1,615.25	-1,672.58	1,872.29	0.48	-0.28	-0.39	
10,992.00	87.69	178.35	9,033.77	-1,707.15	-1,669.94	1,962.45	0.27	-0.27	0.00	
11,082.00	88.56	178.88	9,036.72	-1,797.07	-1,667.76	2,050.74	1.13	0.97	0.59	
11,173.00	88.69	178.70	9,038.90	-1,888.03	-1,665.84	2,140.09	0.24	0.14	-0.20	
11,264.00	89.94	179.23	9,039.99	-1,979.00	-1,664.20	2,229.51	1.49	1.37	0.58	
11,355.00	90.75	179.40	9,039.44	-2,069.99	-1,663.11	2,319.04	0.91	0.89	0.19	
11,446.00	91.38	178.88	9,037.75	-2,160.97	-1,661.74	2,408.50	0.90	0.69	-0.57	
11,537.00	91.31	179.40	9,035.62	-2,251.93	-1,660.38	2,497.95	0.58	-0.08	0.57	
11,628.00	91.69	179.93	9,033.23	-2,342.90	-1,659.85	2,587.55	0.72	0.42	0.58	
11,719.00	92.81	182.39	9,029.66	-2,433.80	-1,661.69	2,677.48	2.97	1.23	2.70	
11,812.00	90.56	183.09	9,026.93	-2,526.65	-1,666.13	2,769.76	2.53	-2.42	0.75	
11,904.00	89.38	182.04	9,026.97	-2,618.55	-1,670.25	2,861.06	1.72	-1.28	-1.14	
11,996.00	88.56	182.22	9,028.63	-2,710.47	-1,673.67	2,952.26	0.91	-0.89	0.20	
12,090.00	87.25	181.86	9,032.06	-2,804.35	-1,677.01	3,045.37	1.45	-1.39	-0.38	

Company:	Devon Energy Corporation	Local Co-ordinate Reference:	Well 517H
Project:	Eddy Co., NM	TVD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Site:	Cotton Draw Unit	MD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Well:	517H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Ryan USA_ODBC_32bit

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
12,184.00	88.56	180.63	9,035.50	-2,898.26	-1,679.05	3,138.30	1.91	1.39	-1.31	
12,278.00	91.50	180.99	9,035.45	-2,992.24	-1,680.38	3,231.18	3.15	3.13	0.38	
12,372.00	91.06	180.11	9,033.35	-3,086.21	-1,681.28	3,323.97	1.05	-0.47	-0.94	
12,466.00	92.13	180.46	9,030.73	-3,180.17	-1,681.75	3,416.69	1.20	1.14	0.37	
12,560.00	90.44	179.40	9,028.63	-3,274.14	-1,681.63	3,509.32	2.12	-1.80	-1.13	
12,654.00	89.94	179.40	9,028.32	-3,368.14	-1,680.65	3,601.82	0.53	-0.53	0.00	
12,748.00	89.00	179.40	9,029.18	-3,462.13	-1,679.67	3,694.32	1.00	-1.00	0.00	
12,842.00	89.19	179.58	9,030.67	-3,556.11	-1,678.83	3,786.84	0.28	0.20	0.19	
12,936.00	88.38	178.35	9,032.66	-3,650.07	-1,677.13	3,879.20	1.57	-0.86	-1.31	
12,962.31	88.54	178.16	9,033.37	-3,676.36	-1,676.33	3,904.98	0.94	0.59	-0.74	
CDU_517H_T1										
13,031.00	88.94	177.65	9,034.88	-3,744.99	-1,673.82	3,972.22	0.94	0.59	-0.74	
13,125.00	89.31	175.71	9,036.32	-3,838.81	-1,668.37	4,063.81	2.10	0.39	-2.06	
13,219.00	87.31	173.60	9,039.09	-3,932.35	-1,659.62	4,154.57	3.09	-2.13	-2.24	
13,313.00	88.88	172.37	9,042.22	-4,025.59	-1,648.15	4,244.58	2.12	1.67	-1.31	
13,408.00	90.81	171.67	9,042.47	-4,119.67	-1,634.96	4,335.12	2.16	2.03	-0.74	
13,502.00	91.00	171.84	9,040.99	-4,212.69	-1,621.48	4,424.57	0.27	0.20	0.18	
13,573.76	91.29	171.31	9,039.56	-4,283.65	-1,610.97	4,492.78	0.85	0.40	-0.74	
CDU_517H_T2										
13,596.00	91.38	171.14	9,039.04	-4,305.63	-1,607.58	4,513.88	0.85	0.40	-0.74	
13,688.00	89.94	173.07	9,037.98	-4,396.75	-1,594.94	4,601.60	2.62	-1.57	2.10	
13,782.00	90.50	173.07	9,037.62	-4,490.06	-1,583.60	4,691.70	0.60	0.60	0.00	
13,877.00	90.06	173.60	9,037.15	-4,584.41	-1,572.57	4,782.88	0.73	-0.46	0.56	
13,971.00	91.38	175.71	9,035.97	-4,677.99	-1,563.82	4,873.67	2.65	1.40	2.24	
14,065.00	91.19	175.89	9,033.86	-4,771.71	-1,556.94	4,964.93	0.28	-0.20	0.19	
14,159.00	90.81	175.71	9,032.22	-4,865.45	-1,550.05	5,056.19	0.45	-0.40	-0.19	
14,253.00	90.44	177.65	9,031.20	-4,959.28	-1,544.61	5,147.79	2.10	-0.39	2.06	
14,348.00	89.69	178.17	9,031.09	-5,054.22	-1,541.14	5,240.80	0.96	-0.79	0.55	
14,441.00	90.69	180.28	9,030.78	-5,147.20	-1,539.89	5,332.27	2.51	1.08	2.27	
14,535.00	87.94	182.39	9,031.90	-5,241.15	-1,542.08	5,425.26	3.69	-2.93	2.24	
14,573.99	88.32	182.96	9,033.18	-5,280.07	-1,543.90	5,463.94	1.76	0.98	1.47	
CDU_517H_T3										
14,631.00	88.88	183.80	9,034.57	-5,336.97	-1,547.26	5,520.60	1.76	0.98	1.47	
14,724.00	90.63	188.02	9,034.97	-5,429.45	-1,556.83	5,613.38	4.91	1.88	4.54	
14,819.00	91.06	186.96	9,033.57	-5,523.63	-1,569.21	5,708.30	1.20	0.45	-1.12	
14,913.00	91.19	187.31	9,031.72	-5,616.88	-1,580.89	5,802.19	0.40	0.14	0.37	
15,007.00	89.69	183.62	9,031.00	-5,710.44	-1,589.84	5,895.92	4.24	-1.60	-3.93	
15,101.00	90.00	185.03	9,031.25	-5,804.17	-1,596.92	5,989.52	1.54	0.33	1.50	
15,196.00	89.38	181.69	9,031.77	-5,898.99	-1,602.49	6,083.93	3.58	-0.65	-3.52	
15,290.00	89.75	180.81	9,032.48	-5,992.96	-1,604.54	6,176.93	1.02	0.39	-0.94	
15,384.00	89.69	179.05	9,032.94	-6,086.96	-1,604.43	6,269.58	1.87	-0.06	-1.87	
15,478.00	89.81	179.23	9,033.35	-6,180.94	-1,603.02	6,362.01	0.23	0.13	0.19	
15,573.00	90.50	178.70	9,033.09	-6,275.93	-1,601.30	6,455.36	0.92	0.73	-0.56	
15,666.00	90.13	180.11	9,032.58	-6,368.92	-1,600.33	6,546.88	1.57	-0.40	1.52	



Nabors
Survey Report



Company:	Devon Energy Corporation	Local Co-ordinate Reference:	Well 517H
Project:	Eddy Co., NM	TVD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Site:	Cotton Draw Unit	MD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Well:	517H	North Reference:	Gnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Ryan USA_ODBC_32bit

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,760.00	88.88	180.63	9,033.39	-6,462.91	-1,600.94	6,639.65	1.44	-1.33	0.55
15,854.00	89.75	183.45	9,034.52	-6,556.83	-1,604.29	6,732.81	3.14	0.93	3.00
15,948.00	90.81	183.62	9,034.06	-6,650.65	-1,610.08	6,826.28	1.14	1.13	0.18
16,041.00	92.06	183.97	9,031.73	-6,743.42	-1,616.24	6,918.77	1.40	1.34	0.38
16,135.00	88.75	181.16	9,031.06	-6,837.30	-1,620.44	7,012.03	4.62	-3.52	-2.99
16,229.00	88.00	180.11	9,033.73	-6,931.25	-1,621.48	7,104.83	1.37	-0.80	-1.12
16,322.00	87.81	179.75	9,037.13	-7,024.19	-1,621.37	7,196.44	0.44	-0.20	-0.39
16,416.00	87.94	179.40	9,040.62	-7,118.12	-1,620.67	7,288.93	0.40	0.14	-0.37
16,509.00	90.63	181.51	9,041.78	-7,211.10	-1,621.41	7,380.72	3.68	2.89	2.27
16,603.00	91.31	181.69	9,040.18	-7,305.05	-1,624.04	7,473.79	0.75	0.72	0.19
16,697.00	92.31	182.39	9,037.22	-7,398.94	-1,627.38	7,566.92	1.30	1.06	0.74
16,791.00	90.75	181.86	9,034.71	-7,492.84	-1,630.86	7,660.07	1.75	-1.66	-0.56
16,884.00	91.44	182.04	9,032.93	-7,585.77	-1,634.03	7,752.22	0.77	0.74	0.19
16,977.00	89.50	181.34	9,032.17	-7,678.72	-1,636.77	7,844.32	2.22	-2.09	-0.75
17,070.00	89.38	180.81	9,033.07	-7,771.70	-1,638.52	7,936.28	0.58	-0.13	-0.57
17,164.00	90.63	180.28	9,033.07	-7,865.69	-1,639.41	8,029.10	1.44	1.33	-0.56
17,257.00	90.25	180.46	9,032.35	-7,958.69	-1,640.01	8,120.89	0.45	-0.41	0.19
17,351.00	90.56	180.28	9,031.69	-8,052.68	-1,640.62	8,213.66	0.38	0.33	-0.19
17,445.00	91.00	180.11	9,030.41	-8,146.67	-1,640.94	8,306.38	0.50	0.47	-0.18
17,538.00	89.94	179.58	9,029.65	-8,239.67	-1,640.69	8,398.02	1.27	-1.14	-0.57
17,632.00	89.19	178.70	9,030.36	-8,333.65	-1,639.27	8,490.45	1.23	-0.80	-0.94
17,725.00	87.25	177.65	9,033.25	-8,426.55	-1,636.31	8,581.54	2.37	-2.09	-1.13
17,818.00	87.94	178.88	9,037.15	-8,519.43	-1,633.50	8,672.64	1.52	0.74	1.32
17,911.00	90.25	181.51	9,038.62	-8,612.40	-1,633.82	8,764.35	3.76	2.48	2.83
18,005.00	91.13	180.99	9,037.49	-8,706.37	-1,635.87	8,857.34	1.09	0.94	-0.55
18,099.00	90.69	181.69	9,035.99	-8,800.33	-1,638.07	8,950.35	0.88	-0.47	0.74
18,193.00	90.25	181.16	9,035.22	-8,894.30	-1,640.40	9,043.38	0.73	-0.47	-0.56
18,287.00	89.75	180.28	9,035.22	-8,988.29	-1,641.59	9,136.25	1.08	-0.53	-0.94
18,380.00	89.81	180.28	9,035.58	-9,081.29	-1,642.04	9,228.01	0.06	0.06	0.00
18,473.00	91.44	181.69	9,034.57	-9,174.26	-1,643.64	9,319.94	2.32	1.75	1.52
18,567.00	92.56	181.86	9,031.29	-9,268.16	-1,646.55	9,413.00	1.21	1.19	0.18
18,661.00	90.50	181.51	9,028.78	-9,362.08	-1,649.31	9,506.06	2.22	-2.19	-0.37
18,755.00	89.56	180.11	9,028.73	-9,456.07	-1,650.64	9,598.95	1.79	-1.00	-1.49
18,849.00	89.50	179.58	9,029.50	-9,550.06	-1,650.39	9,691.58	0.57	-0.06	-0.56
18,943.00	89.94	178.35	9,029.96	-9,644.05	-1,648.69	9,783.95	1.39	0.47	-1.31
19,037.00	89.38	177.65	9,030.51	-9,737.99	-1,645.41	9,876.02	0.95	-0.60	-0.74
19,132.00	86.06	180.46	9,034.29	-9,832.88	-1,643.84	9,969.31	4.58	-3.49	2.96
19,171.34	85.82	180.01	9,037.08	-9,872.11	-1,644.00	10,008.02	1.29	-0.60	-1.14
CDU_517H_BHL									
19,225.00	85.50	179.40	9,041.14	-9,925.62	-1,643.73	10,060.73	1.29	-0.60	-1.14
19,281.00	85.94	178.88	9,045.32	-9,981.46	-1,642.89	10,115.64	1.21	0.79	-0.93
19,348.00	85.94	178.88	9,050.06	-10,048.28	-1,641.58	10,181.30	0.00	0.00	0.00
PTB - CDU_517H_TD									



Nabors
Survey Report



Company:	Devon Energy Corporation	Local Co-ordinate Reference:	Well 517H
Project:	Eddy Co., NM	TVD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Site:	Cotton Draw Unit	MD Reference:	KB=32' (Nabors X20) @ 3573.40ft (Nabors X20)
Well:	517H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Ryan USA_ODBC_32bit

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
19,348.00	9,050.06	-10,048.28	-1,641.58	PTB

Checked By: _____ Approved By: _____ Date: _____



Project: Eddy Co., NM
Site: Cotton Draw Unit
Well: 517H
Wellbore: OH
Plan: PH4 (517H)OH

WELL DETAILS: 517H

Ground Elevation: 3541.40
RXB Elevation: KB-32 (Nabors X20) @ 3573.40ft (Nabors X20)
Rig Name: Nabors X20

	+NLS	+EJW	Northing	Easting	Latitude	Longitude
	0.00	0.00	434842.570	728673.830	32° 11' 38.367807 N	103° 43' 28.169124 W

SECTION DETAILS

M/D	Inc	Azi	TVD	+NLS	+EJW	Diag	Tface	Vsect
18099.00	90.00	181.69	9033.99	-8900.33	-1638.07	0.00	0.00	8949.89
18215.62	90.10	180.00	9038.31	-8916.33	-1639.78	2.00	133.25	9064.59
18318.56	90.00	181.86	9037.02	-8918.85	-1641.46	2.00	64.22	9166.98
19348.26	90.00	181.86	9037.00	-10050.00	-1673.00	0.00	0.00	10189.63

CDU_517H_TD

PROJECT DETAILS: Eddy Co., NM
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid



Azimuths to Grid North
True North: -0.32°
Magnetic North: 6.61°
Magnetic Field
Strength: 48027.3uT
Dip Angle: 68.92°
Date: 6/1/2018
Model: USER DEFINED



FORMATION TOP DEPTHS		
TVD (ft)	MDP (ft)	Formation
507.00	897.50	Rhyolite
1027.00	1037.04	Siltstone
1457.00	1459.51	Base of Salt
1457.00	1457.86	Dolomite
1457.00	1456.42	Bed Canyon
1452.00	1558.28	Cherry Canyon
1512.00	1595.37	Wetmore
1641.00	1607.44	1st BSHS Unit
1627.00	1604.66	Leonard A
1672.00	1613.05	Leonard B

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+NLS	+EJW	Northing	Easting
CDU_517H_BHL	9037.00	-8963.87	205.48	435072.720	728674.310
CDU_517H_EDC	9037.00	-251.78	-1660.70	434496.791	728673.133
CDU_517H_KOP	8452.84	323.49	-1544.44	433296.039	728129.393
CDU_517H_T1	9037.00	-3876.23	-1675.00	431265.347	727998.833
CDU_517H_T2	9037.00	-4282.82	-1612.62	430658.763	728061.411
CDU_517H_T3	9037.00	-5278.14	-1677.70	429654.440	728096.133
CDU_517H_TD	9037.00	-10050.00	-1675.00	434893.590	727998.633

