

NABORS

NABORS DRILLING TECHNOLOGIES USA, INC
515 West Greens Road
Houston, TX 77067
Phone: 281 874 0035
Fax 281 872 5205

HOBBS OCD

JUL 27 2018

RECEIVED

Tuesday, October 31, 2017

State of New Mexico
County of Lea County

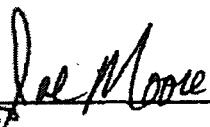
Subject: Survey Certification Letter

Survey Company: NABORS DRILLING TECH USA, INC.
Job Number: T3867
Survey Job Type: Nabors MWD
Customer: Devon Energy Corporation
Well Name: Cotton Draw Unit 509H
Rig Name: Nabors X20

Surface: 32.1245605 N 103.7077354 W
A.P.I. No: 30-025-43916
Location: Lea County, NM
RKB Height: 33'
Distance to Bit: 69'

Surveyor Name	Surveyor Title	Borehole Number	Start Depth	End Depth	Start Date	End Date	Type of	TD Straight Line Projection
Joe Moore	MWD Supervisor	OH	182'	19111'	10/09/17	10/31/17	MWD	20111'

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.



Joe Moore
MWD Supervisor
NABORS DRILLING TECHNOLOGIES USA, INC.



Devon Energy Corporation

**Lea Co., NM
Cotton Draw Unit
#509H**

OH

Design: Surveys

Standard Survey Report

06 November, 2017





Nabors
Survey Report



Company: Devon Energy Corporation
Project: Lea Co., NM
Site: Cotton Draw Unit
Well: #509H
Wellbore: OH
Design: Surveys

Local Co-ordinate Reference: Well #509H
TVD Reference: KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
MD Reference: KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: RyanUSA_ODBC_32Bit

Project	Lea 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:	409,613.360 usft
From:	Map	Easting:	735,004.450 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 7' 28.41785 N
		Longitude:	103° 42' 27.84741 W
		Grid Convergence:	0.33 °

Well	#509H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	32° 7' 28.41785 N
		Longitude:	103° 42' 27.84741 W
		Ground Level:	3,409.20 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	9/15/2017	6.85
			Dip Angle
			(°)
			59.83
			Field Strength
			(nT)
			48,003.20000000

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

Survey Program	Date: 11/8/2017		
From	To	Survey (Wellbore)	Tool Name
(ft)	(ft)		
182.00	20,111.00	Survey #1 NDS (OH)	MWD+HRGM
			Description
			OWSG MWD + HRGM

Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Rate
(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
182.00	0.69	192.50	182.00	-1.07	-0.24	-1.07	0.38	0.38	0.00
313.00	0.19	236.79	312.99	-1.96	-0.59	-1.96	0.43	-0.38	33.81
404.00	0.56	176.50	403.99	-2.49	-0.69	-2.49	0.54	0.41	-66.25
496.00	0.56	185.82	495.99	-3.38	-0.71	-3.38	0.10	0.00	10.13
588.00	0.50	184.41	587.98	-4.23	-0.78	-4.23	0.07	-0.07	-1.53
678.00	0.44	184.23	677.98	-4.97	-0.84	-4.97	0.07	-0.07	-0.20
792.00	0.50	167.71	791.97	-5.89	-0.77	-5.89	0.13	0.05	-14.49
892.00	0.50	194.25	891.97	-6.74	-0.78	-6.74	0.23	0.00	26.54
984.00	0.56	177.03	983.97	-7.57	-0.86	-7.57	0.18	0.07	-18.72



Nabors
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: RyanUSA_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)
1,075.00	0.50	197.77	1,074.96	-8.40	-0.95	-8.40	0.22	-0.07	22.79
1,166.00	0.38	191.62	1,165.96	-9.07	-1.14	-9.07	0.14	-0.13	-6.76
1,257.00	0.19	160.33	1,256.96	-9.51	-1.15	-9.51	0.26	-0.21	-34.38
1,348.00	0.25	210.43	1,347.96	-8.82	-1.20	-8.82	0.21	0.07	55.05
1,440.00	0.13	104.25	1,439.96	-10.02	-1.20	-10.02	0.34	-0.13	-115.41
1,532.00	0.25	163.14	1,531.96	-10.24	-1.04	-10.24	0.23	0.13	64.01
1,623.00	0.06	164.02	1,622.96	-10.47	-0.97	-10.47	0.21	-0.21	0.97
1,715.00	0.19	176.88	1,714.96	-10.67	-0.94	-10.67	0.14	0.14	13.76
1,809.00	0.13	254.02	1,808.96	-10.86	-1.04	-10.86	0.22	-0.06	82.28
1,903.00	0.13	199.53	1,902.96	-10.99	-1.18	-10.99	0.13	0.00	-57.97
1,998.00	0.13	294.98	1,997.96	-11.04	-1.31	-11.04	0.20	0.00	100.47
2,092.00	0.06	263.51	2,091.96	-11.00	-1.45	-11.00	0.09	-0.07	-33.48
2,186.00	0.25	24.10	2,185.96	-10.82	-1.42	-10.82	0.30	0.20	128.29
2,280.00	0.25	20.23	2,279.96	-10.44	-1.27	-10.44	0.02	0.00	-4.12
2,374.00	0.44	17.77	2,373.96	-9.91	-1.08	-9.91	0.20	0.20	-2.62
2,468.00	0.69	20.76	2,467.95	-9.03	-0.77	-9.03	0.27	0.27	3.18
2,562.00	0.81	11.27	2,561.94	-7.85	-0.44	-7.85	0.18	0.13	-10.10
2,657.00	0.75	11.62	2,656.93	-6.59	-0.19	-6.59	0.06	-0.06	0.37
2,750.00	0.63	9.86	2,749.93	-5.49	0.02	-5.49	0.13	-0.13	-1.89
2,845.00	0.69	350.88	2,844.92	-4.41	0.02	-4.41	0.24	0.06	-19.98
2,939.00	0.75	8.63	2,938.91	-3.24	0.03	-3.24	0.24	0.06	18.88
3,034.00	0.81	9.16	3,033.90	-1.96	0.23	-1.96	0.06	0.06	0.56
3,128.00	1.06	14.08	3,127.89	-0.46	0.54	-0.46	0.28	0.27	5.23
3,222.00	0.75	6.52	3,221.88	0.99	0.82	0.99	0.35	-0.33	-8.04
3,316.00	0.75	317.83	3,315.87	2.06	0.48	2.06	0.66	0.00	-51.80
3,410.00	0.69	322.57	3,409.86	2.97	-0.28	2.97	0.09	-0.06	5.04
3,504.00	0.69	315.37	3,503.86	3.82	-1.02	3.82	0.09	0.00	-7.66
3,599.00	0.88	306.58	3,598.85	4.66	-2.01	4.66	0.24	0.20	-9.25
3,693.00	0.88	296.03	3,692.84	5.41	-3.23	5.41	0.17	0.00	-11.22
3,787.00	0.38	294.80	3,786.83	5.85	-4.17	5.85	0.53	-0.53	-1.31
3,880.00	0.13	147.50	3,879.83	5.89	-4.39	5.89	0.53	-0.27	-158.39
3,974.00	0.19	174.39	3,973.83	5.65	-4.32	5.65	0.10	0.06	28.61
4,069.00	0.63	162.79	4,068.83	4.99	-4.15	4.99	0.47	0.46	-12.21
4,163.00	1.25	162.09	4,162.81	3.52	-3.68	3.52	0.66	0.66	-0.74
4,257.00	1.08	146.09	4,256.80	1.83	-2.88	1.83	0.40	-0.20	-17.02
4,314.00	0.63	127.81	4,313.79	1.20	-2.34	1.20	0.88	-0.75	-32.07
4,438.00	0.44	96.70	4,437.78	0.72	-1.32	0.72	0.27	-0.15	-25.09
4,532.00	1.44	91.60	4,531.77	0.65	0.21	0.65	1.07	1.06	-5.43
4,627.00	2.81	114.63	4,626.70	-0.36	3.52	-0.36	1.67	1.44	24.24
4,721.00	4.38	116.03	4,720.52	-2.89	8.85	-2.89	1.67	1.67	1.49
4,816.00	5.50	128.93	4,815.16	-7.22	15.74	-7.22	1.53	1.18	11.47
4,909.00	5.56	128.93	4,907.73	-12.60	22.91	-12.60	0.06	0.06	0.00
5,004.00	5.19	136.60	5,002.32	-18.49	29.54	-18.49	1.03	-0.39	10.18
5,098.00	5.31	157.16	5,095.93	-25.59	34.15	-25.59	1.99	0.13	21.87



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Survey Report



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Well: #509H
Wellbore: OH
Design: Surveys

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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)
5,192.00	5.13	156.81	5,189.54	-33.46	37.49	-33.48	0.19	-0.19	-0.37
5,286.00	4.94	158.22	5,283.18	-41.08	40.65	-41.08	0.24	-0.20	1.50
5,380.00	5.38	149.25	5,376.80	-48.63	44.40	-48.63	0.98	0.47	-9.54
5,475.00	5.38	152.77	5,471.38	-56.41	48.72	-56.41	0.35	0.00	3.71
5,569.00	5.06	148.20	5,564.99	-63.86	52.92	-63.86	0.56	-0.34	-4.86
5,663.00	5.38	148.55	5,658.60	-71.14	57.40	-71.14	0.34	0.34	0.37
5,758.00	5.50	152.24	5,753.17	-78.97	61.85	-78.97	0.39	0.13	3.88
5,849.00	5.25	150.48	5,843.77	-86.45	65.93	-86.45	0.33	-0.27	-1.93
5,943.00	5.19	147.15	5,937.38	-93.76	70.36	-93.76	0.33	-0.06	-3.54
6,037.00	5.38	149.61	6,030.98	-101.14	74.89	-101.14	0.31	0.20	2.62
6,132.00	5.19	151.38	6,125.58	-108.75	79.20	-108.75	0.26	-0.20	1.84
6,226.00	4.44	147.67	6,219.25	-115.55	83.19	-115.55	0.86	-0.80	-3.93
6,320.00	5.56	145.04	6,312.89	-122.36	87.74	-122.36	1.22	1.19	-2.80
6,415.00	5.94	147.67	6,407.41	-130.29	93.01	-130.29	0.49	0.40	2.77
6,509.00	5.63	149.08	6,500.93	-138.35	97.98	-138.35	0.36	-0.33	1.50
6,603.00	5.56	150.66	6,594.48	-146.28	102.58	-146.28	0.18	-0.07	1.68
6,698.00	5.31	148.55	6,689.06	-154.04	107.13	-154.04	0.34	-0.26	-2.22
6,792.00	4.94	148.02	6,782.68	-161.18	111.54	-161.18	0.40	-0.39	-0.56
6,887.00	4.69	150.48	6,877.34	-168.03	115.62	-168.03	0.34	-0.26	2.59
6,981.00	4.88	144.33	6,971.02	-174.82	119.85	-174.82	0.58	0.20	-6.54
7,075.00	5.13	140.82	7,064.66	-181.13	124.83	-181.13	0.42	0.27	-3.73
7,170.00	6.06	149.78	7,159.21	-188.76	130.04	-188.76	1.34	0.88	9.43
7,264.00	5.50	161.03	7,252.73	-197.30	134.00	-197.30	1.34	-0.60	11.97
7,358.00	5.56	157.69	7,348.30	-205.78	137.20	-205.78	0.35	0.06	-3.55
7,451.00	5.25	158.22	7,438.88	-213.90	140.48	-213.90	0.34	-0.33	0.57
7,546.00	4.63	161.03	7,533.53	-221.56	143.34	-221.56	0.70	-0.65	2.96
7,640.00	5.13	152.24	7,627.19	-228.87	146.53	-228.87	0.96	0.53	-9.35
7,735.00	5.31	151.54	7,721.79	-236.49	150.81	-236.49	0.20	0.19	-0.74
7,829.00	5.19	151.89	7,815.40	-244.06	154.88	-244.06	0.13	-0.13	0.37
7,924.00	5.38	152.59	7,910.00	-251.81	158.76	-251.81	0.21	0.20	0.74
8,017.00	4.13	149.96	8,002.67	-258.58	162.44	-258.58	1.36	-1.34	-2.83
8,111.00	5.31	141.87	8,096.36	-264.93	166.82	-264.93	1.44	1.26	-8.61
8,206.00	5.06	141.17	8,190.97	-271.65	172.16	-271.65	0.27	-0.26	-0.74
8,300.00	4.25	140.82	8,284.66	-277.58	176.96	-277.58	0.86	-0.86	-0.37
8,395.00	4.25	135.19	8,379.39	-282.80	181.67	-282.80	0.44	0.00	-5.93
8,489.00	5.13	136.25	8,473.08	-288.31	187.03	-288.31	0.94	0.94	1.13
8,583.00	3.88	128.34	8,566.79	-293.32	192.43	-293.32	1.48	-1.33	-8.41
8,677.00	3.06	136.60	8,660.62	-297.12	196.65	-297.12	1.02	-0.87	8.79
8,771.00	3.69	158.04	8,754.46	-301.74	199.50	-301.74	1.49	0.67	22.81
8,865.00	2.81	147.50	8,848.30	-306.49	201.87	-306.49	1.13	-0.94	-11.21
8,959.00	2.88	146.44	8,942.19	-310.40	204.42	-310.40	0.09	0.07	-1.13
9,051.00	2.38	130.09	9,034.09	-313.56	207.16	-313.56	0.97	-0.54	-17.77
9,146.00	1.25	81.05	9,129.05	-314.67	209.69	-314.67	1.92	-1.19	-51.62



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9,241.00	2.31	130.80	9,224.01	-315.76	212.16	-315.76	1.87	1.12	52.37
9,334.00	3.00	132.91	9,316.91	-318.64	215.36	-318.64	0.75	0.74	2.27
9,429.00	2.56	132.38	9,411.79	-321.76	218.75	-321.76	0.46	-0.46	-0.56
9,523.00	2.31	136.80	9,505.71	-324.56	221.60	-324.56	0.33	-0.27	4.49
9,618.00	2.19	132.73	9,600.64	-327.18	224.25	-327.18	0.20	-0.13	-4.07
9,712.00	1.19	215.17	9,694.60	-329.20	225.01	-329.20	2.50	-1.06	87.70
9,806.00	1.31	246.11	9,788.58	-330.43	223.46	-330.43	0.72	0.13	32.91
9,900.00	0.94	244.00	9,882.56	-331.20	221.79	-331.20	0.40	-0.39	-2.24
9,918.00	1.00	246.81	9,900.56	-331.33	221.51	-331.33	0.43	0.33	15.61
9,997.00	1.94	341.38	9,979.54	-330.33	220.45	-330.33	2.85	1.19	119.71
10,002.03	2.59	345.77	9,984.57	-330.14	220.40	-330.14	13.35	12.90	87.23
CDU_#509H_KOP									
10,042.00	7.88	354.39	10,024.36	-326.54	219.91	-326.54	13.35	13.24	21.57
10,091.00	11.19	357.91	10,072.88	-318.44	219.40	-318.44	6.86	6.76	7.18
10,136.00	16.75	356.85	10,116.33	-307.59	218.89	-307.59	12.37	12.36	-2.36
10,185.00	21.88	0.37	10,162.56	-291.40	218.58	-291.40	10.73	10.47	7.18
10,230.00	28.13	0.37	10,203.32	-272.39	218.68	-272.39	13.89	13.89	0.00
10,279.00	33.69	1.07	10,245.34	-247.23	219.01	-247.23	11.37	11.35	1.43
10,324.00	38.81	0.54	10,281.62	-220.83	219.38	-220.83	11.40	11.38	-1.18
10,374.00	45.63	358.79	10,318.63	-187.06	219.15	-187.06	13.84	13.64	-3.50
10,419.00	51.50	357.73	10,348.40	-153.35	218.11	-153.35	13.18	13.04	-2.36
10,468.00	56.13	358.08	10,377.32	-113.84	216.67	-113.84	9.47	9.45	0.71
10,513.00	60.56	359.49	10,400.93	-75.56	215.87	-75.56	10.20	9.84	3.13
10,562.00	65.06	2.13	10,423.32	-31.99	216.50	-31.99	10.36	9.18	5.39
10,607.00	72.44	4.06	10,439.62	9.85	218.78	9.85	16.88	16.40	4.29
10,655.00	78.25	2.83	10,451.75	56.19	221.56	56.19	12.36	12.10	-2.56
10,696.00	81.44	0.19	10,458.98	96.52	222.62	96.52	10.03	7.78	-6.44
10,741.00	85.13	358.96	10,464.24	141.20	222.29	141.20	8.64	8.20	-2.73
10,768.79	86.41	359.38	10,466.29	168.91	221.89	168.91	4.85	4.81	1.52
CDU_#509H_EOC									
10,787.00	87.25	359.86	10,467.30	187.10	221.74	187.10	4.85	4.81	1.52
10,832.00	89.31	359.49	10,468.65	232.07	221.40	232.07	4.59	4.58	-0.38
10,879.00	91.06	0.19	10,468.50	279.07	221.27	279.07	4.01	3.72	1.49
10,969.00	92.00	0.54	10,466.10	369.03	221.85	369.03	1.11	1.04	0.39
11,061.00	92.81	0.37	10,462.24	460.95	222.58	460.95	0.90	0.88	-0.18
11,153.00	91.25	0.89	10,458.98	552.88	223.59	552.88	1.79	-1.70	0.57
11,244.00	91.69	0.72	10,456.64	643.84	224.86	643.84	0.52	0.48	-0.19
11,336.00	90.19	359.49	10,455.13	735.83	225.03	735.83	2.11	-1.63	-1.34
11,430.00	90.00	359.31	10,454.98	829.82	224.05	829.82	0.28	-0.20	-0.19
11,524.00	91.25	358.79	10,453.95	923.80	222.49	923.80	1.44	1.33	-0.55
11,618.00	91.88	359.14	10,451.39	1,017.75	220.79	1,017.75	0.77	0.67	0.37
11,713.00	91.88	358.79	10,448.27	1,112.68	219.08	1,112.68	0.37	0.00	-0.37
11,807.00	92.38	358.96	10,444.78	1,206.60	217.23	1,206.60	0.56	0.53	0.18
11,901.00	91.75	359.14	10,441.39	1,300.53	215.68	1,300.53	0.70	-0.67	0.19



Nabors
Survey Report



Company: Devon Energy Corporation
Project: Lea Co., NM
Site: Cotton Draw Unit
Well: #509H
Wellbore: OH
Design: Surveys

Local Co-ordinate Reference: Well #509H
TVD Reference: KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
MD Reference: KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: RyanUSA_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)
11,996.00	91.38	359.31	10,438.79	1,395.48	214.39	1,395.48	0.43	-0.39	0.18
12,089.00	91.63	358.96	10,436.35	1,488.44	212.99	1,488.44	0.46	0.27	-0.38
12,183.00	90.00	0.19	10,435.01	1,582.42	212.29	1,582.42	2.17	-1.73	1.31
12,277.00	91.13	0.02	10,434.09	1,676.42	212.46	1,676.42	1.22	1.20	-0.18
12,372.00	90.31	0.19	10,432.89	1,771.41	212.64	1,771.41	0.88	-0.86	0.18
12,466.00	89.44	0.19	10,433.10	1,865.40	212.95	1,865.40	0.93	-0.93	0.00
12,560.00	89.94	0.19	10,433.61	1,959.40	213.26	1,959.40	0.53	0.53	0.00
12,654.00	89.25	0.54	10,434.27	2,053.40	213.86	2,053.40	0.82	-0.73	0.37
12,748.00	89.63	0.37	10,435.19	2,147.39	214.61	2,147.39	0.44	0.40	-0.18
12,843.00	90.31	0.02	10,435.24	2,242.39	214.93	2,242.39	0.81	0.72	-0.37
12,938.00	89.38	359.31	10,435.50	2,337.39	214.37	2,337.39	1.23	-0.98	-0.75
13,033.00	90.08	358.79	10,435.96	2,432.37	212.80	2,432.37	0.90	0.72	-0.55
13,127.00	91.19	358.79	10,434.94	2,526.34	210.81	2,526.34	1.20	1.20	0.00
13,222.00	90.50	359.31	10,433.53	2,621.32	209.24	2,621.32	0.91	-0.73	0.55
13,316.00	89.25	359.49	10,433.74	2,715.31	208.26	2,715.31	1.34	-1.33	0.19
13,410.00	89.94	359.49	10,434.40	2,809.30	207.42	2,809.30	0.73	0.73	0.00
13,503.00	89.38	0.02	10,434.96	2,902.30	207.02	2,902.30	0.83	-0.60	0.57
13,597.00	89.50	359.84	10,435.87	2,996.30	206.91	2,996.30	0.23	0.13	-0.19
13,691.00	90.13	359.31	10,436.18	3,090.29	206.21	3,090.29	0.88	0.67	-0.56
13,785.00	89.69	0.02	10,436.33	3,184.29	205.66	3,184.29	0.89	-0.47	0.76
13,879.00	90.94	359.49	10,435.81	3,278.29	205.26	3,278.29	1.44	1.33	-0.56
13,974.00	90.50	0.54	10,434.62	3,373.28	205.28	3,373.28	1.20	-0.46	1.11
14,068.00	90.13	1.60	10,434.10	3,467.26	207.04	3,467.26	1.19	-0.39	1.13
14,162.00	89.63	1.77	10,434.30	3,561.22	209.80	3,561.22	0.56	-0.53	0.18
14,257.00	90.31	1.60	10,434.35	3,656.17	212.59	3,656.17	0.74	0.72	-0.18
14,351.00	89.19	1.25	10,434.76	3,750.14	214.93	3,750.14	1.25	-1.19	-0.37
14,445.00	89.25	0.72	10,436.04	3,844.12	216.55	3,844.12	0.57	0.06	-0.56
14,539.00	88.94	1.07	10,437.52	3,938.10	218.02	3,938.10	0.50	-0.33	0.37
14,633.00	89.06	0.72	10,439.16	4,032.07	219.48	4,032.07	0.39	0.13	-0.37
14,727.00	89.94	1.07	10,439.98	4,126.05	220.95	4,126.05	1.01	0.94	0.37
14,821.00	90.13	1.77	10,439.92	4,220.02	223.28	4,220.02	0.77	0.20	0.74
14,915.00	90.38	0.02	10,439.50	4,314.01	224.75	4,314.01	1.88	0.27	-1.86
15,009.00	89.19	359.66	10,439.86	4,408.01	224.49	4,408.01	1.32	-1.27	-0.38
15,104.00	89.13	0.02	10,441.25	4,502.99	224.22	4,502.99	0.38	-0.06	0.38
15,198.00	89.94	359.66	10,442.01	4,596.99	223.96	4,596.99	0.94	0.86	-0.38
15,292.00	90.94	0.72	10,441.29	4,690.98	224.27	4,690.98	1.55	1.06	1.13
15,386.00	90.63	0.89	10,440.00	4,784.97	225.59	4,784.97	0.38	-0.33	0.18
15,481.00	89.50	0.89	10,439.90	4,879.95	227.07	4,879.95	1.19	-1.19	0.00
15,575.00	89.75	1.42	10,440.51	4,973.93	228.96	4,973.93	0.62	0.27	0.56
15,669.00	90.56	1.42	10,440.26	5,067.90	231.29	5,067.90	0.86	0.86	0.00
15,762.00	89.75	0.37	10,440.01	5,160.89	232.74	5,160.89	1.43	-0.87	-1.13
15,857.00	88.69	359.31	10,441.30	5,255.88	232.48	5,255.88	1.58	-1.12	-1.12
15,949.03	88.75	359.65	10,443.36	5,347.88	231.65	5,347.88	0.38	0.06	0.37



Nabors
Survey Report



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Project: Lea Co., NM
Site: Cotton Draw Unit
Well: #509H
Wellbore: OH
Design: Surveys

Local Co-ordinate Reference: Well #509H
TVD Reference: KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
MD Reference: KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: RyanUSA_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)
CDU_#509H_T1V3 - CDU_#509H_T1 - CDU_#509H_T1V2									
15,951.00	88.75	359.66	10,443.40	5,349.85	231.63	5,349.85	0.38	0.06	0.37
16,046.00	89.25	359.31	10,445.06	5,444.83	230.78	5,444.83	0.64	0.53	-0.37
16,140.00	89.31	359.66	10,446.24	5,538.82	229.94	5,538.82	0.38	0.06	0.37
16,234.00	89.81	359.49	10,446.96	5,632.81	229.24	5,632.81	0.56	0.53	-0.18
16,329.00	89.06	359.49	10,447.90	5,727.80	228.39	5,727.80	0.79	-0.79	0.00
16,422.00	89.31	359.14	10,449.22	5,820.79	227.28	5,820.79	0.46	0.27	-0.38
16,521.00	89.81	0.89	10,449.98	5,919.78	227.31	5,919.78	1.84	0.51	1.77
16,616.00	91.19	1.77	10,449.15	6,014.75	229.51	6,014.75	1.72	1.45	0.93
16,710.00	91.38	0.89	10,447.04	6,108.70	231.69	6,108.70	0.96	0.20	-0.94
16,805.00	91.19	0.02	10,444.91	6,203.67	232.45	6,203.67	0.94	-0.20	-0.92
16,899.00	89.08	358.96	10,444.71	6,297.66	231.61	6,297.66	2.53	-2.27	-1.13
16,993.00	89.31	358.96	10,446.04	6,391.63	229.91	6,391.63	0.27	0.27	0.00
17,087.00	90.00	359.49	10,446.61	6,485.62	228.63	6,485.62	0.93	0.73	0.56
17,181.00	88.69	359.31	10,447.68	6,579.61	227.65	6,579.61	1.41	-1.39	-0.19
17,275.00	88.75	359.66	10,449.78	6,673.58	226.80	6,673.58	0.38	0.06	0.37
17,369.00	89.69	0.37	10,451.06	6,767.57	226.83	6,767.57	1.25	1.00	0.76
17,464.00	89.69	0.37	10,451.58	6,862.57	227.44	6,862.57	0.00	0.00	0.00
17,558.00	90.69	0.72	10,451.27	6,956.56	228.34	6,956.56	1.13	1.06	0.37
17,652.00	90.25	0.72	10,450.49	7,050.55	229.52	7,050.55	0.47	-0.47	0.00
17,746.00	88.69	358.79	10,451.38	7,144.54	229.12	7,144.54	2.64	-1.66	-2.05
17,840.00	89.06	359.14	10,453.21	7,238.51	227.42	7,238.51	0.54	0.39	0.37
17,934.00	89.44	358.96	10,454.44	7,332.48	225.86	7,332.48	0.45	0.40	-0.19
18,029.00	89.75	359.66	10,455.11	7,427.47	224.72	7,427.47	0.81	0.33	0.74
18,123.00	88.00	358.96	10,456.96	7,521.45	223.59	7,521.45	2.01	-1.86	-0.74
18,217.00	88.75	358.61	10,459.62	7,615.39	221.59	7,615.39	0.88	0.80	-0.37
18,311.00	88.88	358.79	10,461.57	7,709.34	219.46	7,709.34	0.24	0.14	0.19
18,406.00	89.69	358.96	10,462.75	7,804.31	217.60	7,804.31	0.87	0.85	0.18
18,500.00	91.63	359.84	10,461.67	7,898.30	216.61	7,898.30	2.27	2.06	0.94
18,594.00	89.88	0.02	10,460.43	7,992.29	216.50	7,992.29	1.87	-1.86	0.19
18,688.00	88.94	359.66	10,461.40	8,086.28	216.23	8,086.28	1.07	-1.00	-0.38
18,782.00	89.06	0.02	10,463.04	8,180.26	215.97	8,180.26	0.40	0.13	0.38
18,875.00	88.19	0.54	10,465.27	8,273.24	216.43	8,273.24	1.09	-0.94	0.56
18,970.00	89.44	0.72	10,467.24	8,368.21	217.47	8,368.21	1.33	1.32	0.19
19,064.00	87.94	0.02	10,469.38	8,462.18	218.08	8,462.18	1.78	-1.60	-0.74
19,158.00	87.88	359.66	10,472.81	8,556.11	217.81	8,556.11	0.39	-0.06	-0.38
19,252.00	88.63	0.19	10,475.68	8,650.07	217.69	8,650.07	0.98	0.80	0.56
19,346.00	89.31	0.37	10,477.37	8,744.05	218.15	8,744.05	0.75	0.72	0.19
19,440.00	89.75	1.07	10,478.14	8,838.04	219.33	8,838.04	0.88	0.47	0.74
19,535.00	90.44	1.60	10,477.98	8,933.01	221.55	8,933.01	0.92	0.73	0.56
19,628.00	91.56	1.60	10,476.36	9,025.96	224.14	9,025.96	1.20	1.20	0.00
19,723.00	92.25	2.13	10,473.20	9,120.86	227.23	9,120.86	0.92	0.73	0.56
19,817.00	90.25	0.19	10,471.15	9,214.81	229.13	9,214.81	2.96	-2.13	-2.06
19,911.00	88.00	0.19	10,472.58	9,308.79	229.45	9,308.79	2.39	-2.39	0.00



Nabors
Survey Report



Company: Devon Energy Corporation
Project: Lea Co., NM
Site: Cotton Draw Unit
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Wellbore: OH
Design: Surveys

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #509H
KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
KB=32' (Nabors X20) @ 3441.20ft (Nabors X20)
Grid
Minimum Curvature
RyanUSA_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)
20,111.00	88.00	0.19	10,479.56	9,508.67	230.11	9,508.67	0.00	0.00	0.00
CDU_#509H_BHL									

Checked By: _____ Approved By: _____ Date: _____