



**HOBBS OCD**

**JUN 14 2019**

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**North Thistle 3-34 State Com No. 2H  
Lea County, NM**

**November 29, 2018**

**Job No. LNM5191018**

# **Survey Completion Report**



PRODIRECTIONAL

# Survey Certification Letter

November 29, 2018



Operator Name: Devon Energy Corp.  
Well Name: North Thistle 3-34 State Com No. 2H  
County/Parish: Lea County,  
State: NM  
Rig Name: Cactus 126  
Job Number: LNM5191018

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

<u>Surveyor</u>	<u>Surveyed Depths</u>	<u>Projection to Bit</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
ProDirectional	178' MD – 19,727' MD	19,788' MD	11/13/18 – 11/26/18	MWD

Sincerely,

Mike Coats  
Regulatory Specialist  
Professional Directional

850 Conroe Park West Drive | Conroe, TX 77303 | Phone: 936.441.7266

[prodirectional.com](http://prodirectional.com)

*The Standard of Excellence in Directional Supervision*



## **Devon Energy Corp.**

**Lea County, NM  
North Thistle 3-34 State Com  
No. 2H  
OH**

**Survey: ProDirectional**

## **Survey Report**

**29 November, 2018**





**ProDirectional**  
Survey Report



**Company:** Devon Energy Corp.  
**Project:** Lea County, NM (NAD83)  
**Site:** North Thistle 3-34 State Com  
**Well:** 2H  
**Wellbore:** OH  
**Design:** Surveys 178-19788 MD

**Local Co-ordinate Reference:** Well 2H  
**TVD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**MD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

<b>Project</b>	Lea County, NM (NAD83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Eastern Zone		

<b>Site</b>	North Thistle 3-34 State Com		
<b>Site Position:</b>		<b>Northing:</b>	483,599.20 usft
<b>From:</b>	Map	<b>Easting:</b>	778,951.10 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	32.327141
		<b>Longitude:</b>	-103.564074
		<b>Grid Convergence:</b>	0.41 °

<b>Well</b>	2H					
<b>Well Position</b>	<b>+N-S</b>	0.00 usft	<b>Northing:</b>	483,599.10 usft	<b>Latitude:</b>	32.327140
	<b>+E-W</b>	0.00 usft	<b>Easting:</b>	778,981.00 usft	<b>Longitude:</b>	-103.563978
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	3,595.00 usft

<b>Wellbore</b>	OH					
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>	
			(°)	(°)	(nT)	
	HDGM	10/17/2018	6.75	60.08	48,059.80	

<b>Design</b>	Surveys 178-19788 MD				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>		<b>Depth From (TVD)</b>	<b>+N-S</b>	<b>+E-W</b>	<b>Direction</b>
		(usft)	(usft)	(usft)	(°)
		0.00	0.00	0.00	359.55

<b>Survey Program</b>	<b>Date</b>	11/29/2018			
<b>From</b>	<b>To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
(usft)	(usft)				
178.00	19,788.00	Survey #1 (OH)	MWD+HDGM	OWSG MWD + HDGM	



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Survey Report



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 MD Reference: GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: WellPlanner1

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (")	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	483,599.10	778,981.00
178.00	0.50	305.00	178.00	0.45	0.45	-0.64	0.78	305.00	483,599.55	778,980.36
<b>Pro MWD First Survey: 178' MD</b>										
271.00	0.20	275.50	271.00	0.70	0.69	-1.13	1.33	301.54	483,599.79	778,979.87
363.00	0.20	333.30	363.00	0.86	0.85	-1.36	1.61	302.04	483,599.95	778,979.64
453.00	0.50	298.80	452.99	1.20	1.18	-1.78	2.13	303.64	483,600.28	778,979.22
545.00	0.40	281.10	544.99	1.46	1.44	-2.44	2.84	300.46	483,600.54	778,978.56
637.00	0.40	276.70	636.99	1.56	1.54	-3.08	3.44	296.53	483,600.64	778,977.92
729.00	0.60	324.00	728.99	1.99	1.96	-3.68	4.17	298.09	483,601.06	778,977.32
821.00	0.40	282.40	820.98	2.46	2.42	-4.28	4.92	299.53	483,601.52	778,976.72
914.00	0.50	291.50	913.98	2.68	2.64	-4.97	5.63	297.98	483,601.74	778,976.03
974.00	0.60	311.30	973.98	2.99	2.94	-5.45	6.20	298.37	483,602.04	778,975.55
1,054.00	0.20	302.90	1,053.97	3.34	3.30	-5.88	6.74	299.26	483,602.40	778,975.12
1,146.00	0.30	325.40	1,145.97	3.63	3.58	-6.15	7.12	300.20	483,602.68	778,974.85
1,238.00	0.20	316.70	1,237.97	3.95	3.90	-6.40	7.49	301.33	483,603.00	778,974.60
1,330.00	0.10	45.00	1,329.97	4.12	4.07	-6.45	7.63	302.24	483,603.17	778,974.55
1,422.00	0.30	153.70	1,421.97	3.96	3.91	-6.29	7.41	301.87	483,603.01	778,974.71
1,513.00	0.50	165.80	1,512.97	3.36	3.31	-6.09	6.93	298.55	483,602.41	778,974.91
1,604.00	0.50	180.20	1,603.97	2.58	2.53	-5.99	6.50	292.90	483,601.63	778,975.01
1,698.00	0.30	170.80	1,697.96	1.92	1.88	-5.95	6.24	287.51	483,600.98	778,975.05
1,792.00	0.40	200.00	1,791.96	1.37	1.33	-6.03	6.17	282.41	483,600.43	778,974.97
1,886.00	0.40	192.60	1,885.96	0.75	0.70	-6.21	6.25	276.41	483,599.80	778,974.79
1,980.00	0.30	202.40	1,979.96	0.20	0.15	-6.38	6.38	271.35	483,599.25	778,974.62
2,074.00	0.10	146.70	2,073.96	-0.10	-0.15	-6.43	6.43	268.70	483,598.95	778,974.57
2,168.00	0.10	68.60	2,167.96	-0.13	-0.18	-6.30	6.31	268.33	483,598.92	778,974.70
2,262.00	0.10	130.30	2,261.96	-0.16	-0.21	-6.16	6.17	268.07	483,598.89	778,974.84
2,357.00	0.20	90.70	2,356.96	-0.22	-0.26	-5.94	5.94	267.46	483,598.84	778,975.06



**ProDirectional**  
Survey Report



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**Design:** Surveys 178-19788 MD

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MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (")	Northing (usft)	Easting (usft)
2,450.00	0.20	49.50	2,449.96	-0.12	-0.16	-5.65	5.65	268.38	483,598.94	778,975.35
2,544.00	0.30	47.60	2,543.96	0.15	0.11	-5.34	5.34	271.21	483,599.21	778,975.66
2,638.00	0.40	39.10	2,637.95	0.57	0.53	-4.95	4.98	276.15	483,599.63	778,976.05
2,732.00	0.70	53.00	2,731.95	1.17	1.13	-4.29	4.44	284.80	483,600.23	778,976.71
2,827.00	0.70	54.30	2,826.94	1.85	1.82	-3.35	3.82	298.50	483,600.92	778,977.65
2,921.00	0.90	61.50	2,920.93	2.53	2.51	-2.24	3.36	318.25	483,601.61	778,978.76
3,015.00	0.80	48.40	3,014.92	3.31	3.30	-1.10	3.48	341.55	483,602.40	778,979.90
3,109.00	0.80	44.10	3,108.91	4.20	4.20	-0.15	4.21	357.92	483,603.30	778,980.85
3,203.00	0.80	49.70	3,202.90	5.09	5.10	0.80	5.16	8.97	483,604.20	778,981.80
3,297.00	0.80	47.60	3,296.90	5.95	5.97	1.79	6.23	16.70	483,605.07	778,982.79
3,391.00	1.00	52.00	3,390.88	6.89	6.91	2.92	7.51	22.90	483,606.01	778,983.92
3,485.00	1.10	52.10	3,484.87	7.94	7.97	4.28	9.05	28.22	483,607.07	778,985.28
3,597.00	1.10	35.90	3,596.85	9.46	9.50	5.76	11.11	31.21	483,608.60	778,986.76
3,673.00	1.10	30.20	3,672.83	10.67	10.73	6.55	12.57	31.42	483,609.83	778,987.55
3,767.00	0.30	40.50	3,766.83	11.64	11.69	7.17	13.71	31.50	483,610.79	778,988.17
3,861.00	0.60	204.00	3,860.82	11.37	11.43	7.13	13.47	31.94	483,610.53	778,988.13
3,955.00	0.80	214.60	3,954.82	10.39	10.44	6.55	12.33	32.11	483,609.54	778,987.55
4,049.00	2.30	225.10	4,048.78	8.53	8.57	4.84	9.84	29.48	483,607.67	778,985.84
4,143.00	3.00	221.90	4,142.68	5.39	5.41	1.87	5.72	19.03	483,604.51	778,982.87
4,238.00	3.00	210.40	4,237.55	1.42	1.41	-1.05	1.76	323.29	483,600.51	778,979.95
4,332.00	3.90	213.50	4,331.38	-3.34	-3.38	-4.06	5.28	230.28	483,595.72	778,976.94
4,427.00	4.30	219.60	4,426.14	-8.75	-8.81	-8.12	11.98	222.64	483,590.29	778,972.88
4,521.00	5.10	220.80	4,519.82	-14.59	-14.69	-13.09	19.68	221.70	483,584.41	778,967.91
4,615.00	5.50	226.00	4,613.42	-20.83	-20.98	-19.06	28.35	222.25	483,578.12	778,961.94
4,709.00	5.80	225.90	4,706.96	-27.22	-27.42	-25.71	37.59	223.16	483,571.68	778,955.29
4,803.00	6.70	224.20	4,800.40	-34.40	-34.66	-32.95	47.82	223.55	483,564.44	778,948.05
4,897.00	6.70	226.50	4,893.76	-42.04	-42.36	-40.75	58.78	223.89	483,556.74	778,940.25



**ProDirectional**  
Survey Report



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**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
4,991.00	5.90	227.60	4,987.19	-49.01	-49.39	-48.29	69.08	224.35	483,549.71	778,932.71
5,055.00	5.40	227.20	5,050.88	-53.24	-53.66	-52.93	75.37	224.61	483,545.44	778,928.07
5,179.00	4.50	229.00	5,174.42	-60.33	-60.81	-60.88	86.05	225.03	483,538.29	778,920.12
5,273.00	5.20	231.60	5,268.08	-65.35	-65.88	-67.01	93.97	225.49	483,533.22	778,913.99
5,367.00	6.00	232.40	5,361.63	-70.94	-71.52	-74.24	103.09	226.07	483,527.58	778,906.76
5,460.00	8.30	230.80	5,453.90	-78.07	-78.73	-83.29	114.61	226.61	483,520.37	778,897.71
5,554.00	8.20	230.60	5,546.93	-86.54	-87.27	-93.73	128.07	227.04	483,511.83	778,887.27
5,648.00	8.00	229.40	5,639.99	-94.97	-95.79	-103.88	141.30	227.32	483,503.31	778,877.12
5,742.00	7.30	231.30	5,733.15	-102.88	-103.78	-113.50	153.79	227.56	483,495.32	778,867.50
5,836.00	6.70	232.30	5,826.45	-109.90	-110.86	-122.50	165.22	227.85	483,488.24	778,858.50
5,930.00	6.20	232.40	5,919.86	-116.28	-117.32	-130.86	175.75	228.12	483,481.78	778,850.14
6,024.00	6.20	230.90	6,013.31	-122.52	-123.61	-138.82	185.88	228.32	483,475.49	778,842.18
6,118.00	5.80	231.20	6,106.79	-128.64	-129.79	-146.46	195.70	228.45	483,469.31	778,834.54
6,212.00	5.60	230.30	6,200.33	-134.49	-135.70	-153.69	205.03	228.56	483,463.40	778,827.31
6,306.00	5.60	229.50	6,293.88	-140.34	-141.61	-160.71	214.20	228.62	483,457.49	778,820.29
6,400.00	5.40	230.30	6,387.45	-146.09	-147.41	-167.60	223.20	228.67	483,451.69	778,813.40
6,494.00	5.50	231.10	6,481.02	-151.69	-153.06	-174.51	232.13	228.75	483,446.04	778,806.49
6,588.00	5.40	230.80	6,574.60	-157.26	-158.69	-181.44	241.05	228.83	483,440.41	778,799.56
6,682.00	4.50	231.30	6,668.24	-162.31	-163.79	-187.75	249.15	228.90	483,435.31	778,793.25
6,776.00	4.30	232.50	6,761.97	-166.72	-168.24	-193.42	256.35	228.98	483,430.86	778,787.58
6,870.00	3.50	235.80	6,855.75	-170.43	-172.00	-198.59	262.72	229.10	483,427.10	778,782.41
6,964.00	3.40	233.90	6,949.58	-173.65	-175.25	-203.22	268.35	229.23	483,423.85	778,777.78
7,059.00	2.80	234.70	7,044.44	-176.62	-178.25	-207.39	273.47	229.32	483,420.85	778,773.61
7,153.00	2.30	227.50	7,138.35	-179.19	-180.85	-210.65	277.64	229.35	483,418.25	778,770.35
7,247.00	1.40	212.60	7,232.30	-181.42	-183.10	-212.66	280.62	229.27	483,416.00	778,768.34
7,341.00	0.80	201.20	7,326.28	-182.99	-184.68	-213.52	282.30	229.14	483,414.42	778,767.48
7,435.00	0.80	190.20	7,420.27	-184.25	-185.93	-213.87	283.39	229.00	483,413.17	778,767.13



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7,529.00	0.30	69.10	7,514.27	-184.81	-186.49	-213.76	283.67	228.90	483,412.61	778,767.24
7,623.00	0.80	41.00	7,608.26	-184.23	-185.91	-213.10	282.79	228.90	483,413.19	778,767.90
7,717.00	0.90	53.40	7,702.25	-183.30	-184.97	-212.07	281.41	228.90	483,414.13	778,768.93
7,811.00	0.70	56.90	7,796.24	-182.56	-184.22	-211.00	280.10	228.88	483,414.88	778,770.00
7,905.00	0.90	67.00	7,890.23	-181.96	-183.62	-209.84	278.83	228.81	483,415.48	778,771.16
7,999.00	0.80	71.40	7,984.22	-181.48	-183.12	-208.54	277.53	228.71	483,415.98	778,772.46
8,093.00	0.50	82.40	8,078.22	-181.22	-182.86	-207.51	276.58	228.61	483,416.24	778,773.49
8,187.00	0.70	79.30	8,172.21	-181.07	-182.69	-206.54	275.75	228.51	483,416.41	778,774.46
8,281.00	0.50	52.10	8,266.21	-180.72	-182.34	-205.65	274.84	228.44	483,416.76	778,775.35
8,375.00	0.50	60.30	8,360.20	-180.27	-181.88	-204.97	274.03	228.42	483,417.22	778,776.03
8,469.00	0.80	56.10	8,454.20	-179.70	-181.31	-204.07	272.98	228.38	483,417.79	778,776.93
8,563.00	0.70	51.10	8,548.19	-178.98	-180.59	-203.08	271.76	228.36	483,418.51	778,777.92
8,657.00	0.40	50.90	8,642.19	-178.42	-180.02	-202.38	270.86	228.35	483,419.08	778,778.62
8,751.00	0.50	14.10	8,736.18	-177.82	-179.41	-202.02	270.19	228.39	483,419.69	778,778.98
8,845.00	0.60	353.50	8,830.18	-176.93	-178.53	-201.98	269.57	228.53	483,420.57	778,779.02
8,939.00	0.70	327.20	8,924.17	-175.96	-177.55	-202.35	269.20	228.73	483,421.55	778,778.65
<b>KOP: 8939' MD, 53' FSL &amp; 1284' FWL</b>										
9,033.00	4.20	345.80	9,018.07	-172.13	-173.73	-203.50	267.57	229.51	483,425.37	778,777.50
9,127.00	15.30	353.60	9,110.57	-156.40	-158.02	-205.73	259.42	232.47	483,441.08	778,775.27
9,202.00	25.02	359.10	9,180.90	-130.64	-132.27	-207.09	245.73	237.43	483,466.83	778,773.91
<b>FTP: 9202' MD, 100' FSL &amp; 1280' FWL</b>										
9,221.00	27.50	359.90	9,197.94	-122.23	-123.86	-207.16	241.37	239.12	483,475.24	778,773.84
9,315.00	34.70	359.70	9,278.37	-73.71	-75.34	-207.34	220.60	250.03	483,523.76	778,773.66
9,409.00	42.00	357.40	9,352.05	-15.44	-17.09	-208.91	209.61	265.32	483,582.01	778,772.09
9,503.00	50.90	356.90	9,416.75	52.55	50.89	-212.31	218.33	283.48	483,649.99	778,768.69
9,597.00	58.50	359.10	9,471.03	129.18	127.50	-214.92	249.89	300.68	483,726.60	778,766.08
9,691.00	67.30	0.10	9,513.81	212.78	211.09	-215.47	301.64	314.41	483,810.19	778,765.53





**ProDirectional**  
Survey Report



**Company:** Devon Energy Corp.  
**Project:** Lea County, NM (NAD83)  
**Site:** North Thistle 3-34 State Com  
**Well:** 2H  
**Wellbore:** OH  
**Design:** Surveys 178-19788 MD

**Local Co-ordinate Reference:** Well 2H  
**TVD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**MD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

**Survey**

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (")	Northing (usft)	Easting (usft)
9,785.00	77.10	1.70	9,542.51	302.14	300.47	-214.04	368.91	324.54	483,899.57	778,766.96
9,841.00	84.30	2.30	9,551.56	357.32	355.66	-212.11	414.11	329.19	483,954.76	778,768.89
9,935.00	87.70	1.50	9,558.11	450.99	449.37	-209.00	495.59	335.06	484,048.47	778,772.00
10,029.00	90.90	1.20	9,559.26	544.93	543.32	-206.78	581.34	339.16	484,142.42	778,774.22
10,123.00	91.20	359.80	9,557.54	638.90	637.30	-205.96	669.75	342.09	484,236.40	778,775.04
10,217.00	89.20	356.10	9,557.21	732.84	731.22	-209.33	760.59	344.03	484,330.32	778,771.67
10,311.00	90.70	355.90	9,557.29	826.66	824.99	-215.88	852.76	345.34	484,424.09	778,765.12
10,405.00	92.80	357.50	9,554.42	920.49	918.78	-221.29	945.05	346.46	484,517.88	778,759.71
10,499.00	93.50	357.70	9,549.25	1,014.29	1,012.55	-225.22	1,037.30	347.46	484,611.65	778,755.78
10,593.00	93.70	357.30	9,543.35	1,108.04	1,106.28	-229.31	1,129.79	348.29	484,705.38	778,751.69
10,687.00	93.30	358.60	9,537.61	1,201.83	1,200.04	-232.67	1,222.39	349.03	484,799.14	778,748.33
10,780.00	91.60	0.30	9,533.64	1,294.74	1,292.94	-233.56	1,313.87	349.76	484,892.04	778,747.44
10,872.00	89.80	1.60	9,532.51	1,386.70	1,384.92	-232.04	1,404.22	350.49	484,984.02	778,748.96
10,964.00	89.30	1.50	9,533.24	1,478.64	1,476.88	-229.55	1,494.61	351.17	485,075.98	778,751.45
11,055.00	89.10	1.80	9,534.51	1,569.57	1,567.83	-226.93	1,584.17	351.76	485,166.93	778,754.07
11,146.00	89.10	1.40	9,535.94	1,660.50	1,658.79	-224.39	1,673.90	352.30	485,257.89	778,756.61
11,239.00	89.00	1.30	9,537.48	1,753.44	1,751.75	-222.20	1,765.79	352.77	485,350.85	778,758.80
11,331.00	90.40	0.90	9,537.96	1,845.40	1,843.73	-220.43	1,856.86	353.18	485,442.83	778,760.57
11,423.00	90.90	1.10	9,536.92	1,937.37	1,935.71	-218.82	1,948.04	353.55	485,534.81	778,762.18
11,515.00	91.30	0.80	9,535.15	2,029.32	2,027.68	-217.30	2,039.29	353.88	485,626.78	778,763.70
11,607.00	91.80	0.50	9,532.66	2,121.27	2,119.64	-216.26	2,130.64	354.17	485,718.74	778,764.74
11,699.00	90.10	358.70	9,531.14	2,213.25	2,211.62	-216.90	2,222.23	354.40	485,810.72	778,764.10
11,791.00	90.00	357.80	9,531.06	2,305.23	2,303.57	-219.71	2,314.03	354.55	485,902.67	778,761.29
11,883.00	90.20	356.80	9,530.90	2,397.15	2,395.47	-224.04	2,405.92	354.66	485,994.57	778,756.96
11,974.00	91.50	357.20	9,529.55	2,488.05	2,486.33	-228.80	2,496.84	354.74	486,085.43	778,752.20
12,066.00	91.70	356.90	9,526.98	2,579.93	2,578.17	-233.54	2,588.73	354.82	486,177.27	778,747.46
12,160.00	92.20	356.80	9,523.78	2,673.77	2,671.98	-238.70	2,682.62	354.90	486,271.08	778,742.30



**ProDirectional**  
Survey Report



**Company:** Devon Energy Corp.  
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**Site:** North Thistle 3-34 State Com  
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**Wellbore:** OH  
**Design:** Surveys 178-19788 MD

**Local Co-ordinate Reference:** Well 2H  
**TVD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**MD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
12,254.00	91.30	357.90	9,520.91	2,767.65	2,765.83	-243.04	2,776.49	354.98	486,364.93	778,737.96
12,348.00	90.90	359.80	9,519.10	2,861.63	2,859.79	-244.93	2,870.26	355.10	486,458.89	778,736.07
12,442.00	89.50	1.50	9,518.77	2,955.60	2,953.78	-243.86	2,963.83	355.28	486,552.88	778,737.14
12,536.00	89.40	1.50	9,519.68	3,049.54	3,047.74	-241.40	3,057.29	355.47	486,646.84	778,739.60
12,630.00	89.70	1.60	9,520.42	3,143.48	3,141.70	-238.86	3,150.77	355.65	486,740.80	778,742.14
12,724.00	90.20	1.60	9,520.50	3,237.42	3,235.67	-236.23	3,244.28	355.82	486,834.77	778,744.77
12,818.00	90.00	1.30	9,520.33	3,331.37	3,329.64	-233.86	3,337.84	355.98	486,928.74	778,747.14
12,912.00	89.90	1.00	9,520.42	3,425.33	3,423.62	-231.97	3,431.47	356.12	487,022.72	778,749.03
13,006.00	89.90	0.30	9,520.58	3,519.32	3,517.61	-230.90	3,525.18	356.24	487,116.71	778,750.10
13,100.00	90.20	0.10	9,520.50	3,613.31	3,611.61	-230.58	3,618.96	356.35	487,210.71	778,750.42
13,194.00	90.30	359.50	9,520.09	3,707.31	3,705.61	-230.90	3,712.80	356.43	487,304.71	778,750.10
13,289.00	90.00	359.30	9,519.84	3,802.31	3,800.60	-231.90	3,807.67	356.51	487,399.70	778,749.10
13,383.00	90.50	359.10	9,519.43	3,896.30	3,894.59	-233.21	3,901.57	356.57	487,493.69	778,747.79
13,477.00	89.40	359.80	9,519.51	3,990.30	3,988.59	-234.11	3,995.45	356.64	487,587.69	778,746.89
13,571.00	88.70	359.70	9,521.07	4,084.29	4,082.57	-234.52	4,089.30	356.71	487,681.67	778,746.48
13,665.00	88.70	359.50	9,523.20	4,178.26	4,176.54	-235.18	4,183.16	356.78	487,775.64	778,745.82
13,759.00	88.90	359.10	9,525.17	4,272.24	4,270.52	-236.33	4,277.05	356.83	487,869.62	778,744.67
13,853.00	89.40	358.30	9,526.56	4,366.22	4,364.48	-238.46	4,370.99	356.87	487,963.58	778,742.54
13,947.00	89.80	358.40	9,527.22	4,460.20	4,458.44	-241.17	4,464.96	356.90	488,057.54	778,739.83
14,041.00	90.00	358.70	9,527.38	4,554.18	4,552.41	-243.54	4,558.92	356.94	488,151.51	778,737.46
14,135.00	89.80	358.50	9,527.55	4,648.17	4,646.38	-245.84	4,652.88	356.97	488,245.48	778,735.16
14,229.00	89.80	358.20	9,527.88	4,742.15	4,740.34	-248.55	4,746.85	357.00	488,339.44	778,732.45
14,324.00	89.50	358.00	9,528.46	4,837.11	4,835.29	-251.70	4,841.83	357.02	488,434.39	778,729.30
14,418.00	89.20	357.90	9,529.52	4,931.07	4,929.22	-255.06	4,935.82	357.04	488,528.32	778,725.94
14,512.00	89.30	357.90	9,530.75	5,025.02	5,023.15	-258.50	5,029.80	357.05	488,622.25	778,722.50
14,606.00	89.80	358.00	9,531.49	5,118.99	5,117.09	-261.87	5,123.78	357.07	488,716.19	778,719.13
14,700.00	91.30	359.40	9,530.59	5,212.97	5,211.05	-264.00	5,217.74	357.10	488,810.15	778,717.00



**ProDirectional**  
Survey Report



**Company:** Devon Energy Corp.  
**Project:** Lea County, NM (NAD83)  
**Site:** North Thistle 3-34 State Com  
**Well:** 2H  
**Wellbore:** OH  
**Design:** Surveys 178-19788 MD

**Local Co-ordinate Reference:** Well 2H  
**TVD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**MD Reference:** GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

MD (usft)	Inc (")	Azl (azimuth) (")	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (")	Northing (usft)	Easting (usft)
14,794.00	92.20	359.90	9,527.72	5,306.92	5,305.01	-264.57	5,311.60	357.14	488,904.11	778,716.43
14,888.00	91.70	0.10	9,524.52	5,400.86	5,398.95	-264.57	5,405.43	357.19	488,998.05	778,716.43
14,982.00	91.50	0.30	9,521.90	5,494.82	5,492.91	-264.25	5,499.27	357.25	489,092.01	778,716.75
15,076.00	90.70	1.10	9,520.09	5,588.78	5,586.89	-263.10	5,593.08	357.30	489,185.99	778,717.90
15,170.00	89.60	1.60	9,519.85	5,682.73	5,680.86	-260.88	5,686.85	357.37	489,279.96	778,720.12
15,264.00	88.30	0.70	9,521.57	5,776.68	5,774.82	-259.00	5,780.63	357.43	489,373.92	778,722.00
15,358.00	88.90	0.00	9,523.86	5,870.64	5,868.79	-258.42	5,874.48	357.48	489,467.89	778,722.58
15,452.00	88.80	359.90	9,525.75	5,964.62	5,962.77	-258.50	5,968.37	357.52	489,561.87	778,722.50
15,546.00	89.70	359.20	9,526.98	6,058.61	6,056.76	-259.24	6,062.31	357.55	489,655.86	778,721.76
15,640.00	89.90	358.80	9,527.31	6,152.60	6,150.74	-260.88	6,156.27	357.57	489,749.84	778,720.12
15,733.00	90.30	357.70	9,527.15	6,245.58	6,243.70	-263.72	6,249.27	357.58	489,842.80	778,717.28
15,828.00	90.50	358.50	9,526.48	6,340.54	6,338.64	-266.87	6,344.26	357.59	489,937.74	778,714.13
15,922.00	91.10	358.70	9,525.17	6,434.52	6,432.61	-269.17	6,438.24	357.60	490,031.71	778,711.83
16,016.00	91.20	1.00	9,523.29	6,528.50	6,526.58	-269.41	6,532.14	357.64	490,125.68	778,711.59
16,110.00	92.10	1.00	9,520.58	6,622.43	6,620.53	-267.78	6,625.94	357.68	490,219.63	778,713.22
16,204.00	91.40	1.80	9,517.71	6,716.33	6,714.45	-265.48	6,719.70	357.74	490,313.55	778,715.52
16,298.00	89.40	2.40	9,517.05	6,810.23	6,808.38	-262.04	6,813.42	357.80	490,407.48	778,718.96
16,392.00	88.60	3.00	9,518.69	6,904.07	6,902.26	-257.61	6,907.07	357.86	490,501.36	778,723.39
16,486.00	87.70	3.20	9,521.73	6,997.84	6,996.08	-252.53	7,000.63	357.93	490,595.18	778,728.47
16,580.00	88.20	1.60	9,525.09	7,091.66	7,089.93	-248.59	7,094.29	357.99	490,689.03	778,732.41
16,674.00	87.80	0.90	9,528.37	7,185.56	7,183.85	-246.54	7,188.08	358.03	490,782.95	778,734.46
16,768.00	89.30	359.30	9,530.75	7,279.52	7,277.81	-246.38	7,281.98	358.06	490,876.91	778,734.62
16,862.00	89.00	359.00	9,532.14	7,373.51	7,371.79	-247.78	7,375.95	358.07	490,970.89	778,733.22
16,956.00	90.00	358.90	9,532.96	7,467.50	7,465.77	-249.50	7,469.94	358.09	491,064.87	778,731.50
17,050.00	90.50	359.30	9,532.55	7,561.50	7,559.76	-250.97	7,563.92	358.10	491,158.86	778,730.03
17,144.00	90.40	359.20	9,531.82	7,655.49	7,653.75	-252.20	7,657.90	358.11	491,252.85	778,728.80
17,239.00	90.40	358.20	9,531.15	7,750.48	7,748.72	-254.36	7,752.89	358.12	491,347.82	778,726.64



ProDirectional  
Survey Report



Company: Devon Energy Corp.  
Project: Lea County, NM (NAD83)  
Site: North Thistle 3-34 State Com  
Well: 2H  
Wellbore: OH  
Design: Surveys 178-19788 MD

Local Co-ordinate Reference: Well 2H  
TVD Reference: GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
MD Reference: GL 3595'+KB 25' @ 3620.00usft (Cactus 126)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: WellPlanner1

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
17,333.00	90.60	358.10	9,530.33	7,844.45	7,842.67	-257.39	7,846.89	358.12	491,441.77	778,723.61
17,427.00	90.80	358.90	9,529.18	7,938.42	7,936.63	-259.85	7,940.88	358.12	491,535.73	778,721.15
17,521.00	89.90	359.50	9,528.61	8,032.42	8,030.61	-261.17	8,034.86	358.14	491,629.71	778,719.83
17,615.00	90.30	359.50	9,528.44	8,126.42	8,124.61	-261.99	8,128.83	358.15	491,723.71	778,719.01
17,709.00	89.50	0.30	9,528.61	8,220.41	8,218.61	-262.15	8,222.79	358.17	491,817.71	778,718.85
17,802.00	89.20	0.40	9,529.66	8,313.40	8,311.60	-261.58	8,315.72	358.20	491,910.70	778,719.42
17,896.00	89.70	0.50	9,530.57	8,407.38	8,405.59	-260.85	8,409.64	358.22	492,004.69	778,720.15
17,991.00	89.10	0.20	9,531.56	8,502.37	8,500.59	-260.26	8,504.57	358.25	492,099.69	778,720.74
18,084.00	89.10	1.00	9,533.02	8,595.34	8,593.57	-259.29	8,597.48	358.27	492,192.67	778,721.71
18,178.00	88.90	1.60	9,534.66	8,689.28	8,687.53	-257.16	8,691.33	358.30	492,286.63	778,723.84
18,272.00	90.00	0.80	9,535.56	8,783.24	8,781.50	-255.19	8,785.21	358.34	492,380.60	778,725.81
18,366.00	90.20	359.90	9,535.40	8,877.23	8,875.50	-254.62	8,879.15	358.36	492,474.60	778,726.38
18,460.00	90.00	0.30	9,535.24	8,971.22	8,969.50	-254.45	8,973.11	358.38	492,568.60	778,726.55
18,554.00	90.60	359.50	9,534.74	9,065.22	9,063.50	-254.62	9,067.07	358.39	492,662.60	778,726.38
18,648.00	90.60	358.80	9,533.76	9,159.21	9,157.48	-256.01	9,161.06	358.40	492,756.58	778,724.99
18,742.00	91.00	359.50	9,532.45	9,253.20	9,251.46	-257.40	9,255.04	358.41	492,850.56	778,723.60
18,836.00	89.80	358.70	9,531.79	9,347.19	9,345.44	-258.88	9,349.03	358.41	492,944.54	778,722.12
18,930.00	90.60	359.40	9,531.46	9,441.18	9,439.43	-260.44	9,443.02	358.42	493,038.53	778,720.56
19,024.00	89.80	359.50	9,531.14	9,535.18	9,533.42	-261.34	9,537.00	358.43	493,132.52	778,719.66
19,118.00	88.40	358.80	9,532.61	9,629.16	9,627.40	-262.74	9,630.98	358.44	493,226.50	778,718.26
19,212.00	87.90	358.30	9,535.65	9,723.10	9,721.32	-265.11	9,724.93	358.44	493,320.42	778,715.89
19,306.00	89.90	358.20	9,537.45	9,817.05	9,815.25	-267.98	9,818.91	358.44	493,414.35	778,713.02
19,401.00	91.20	358.10	9,536.54	9,912.02	9,910.20	-271.05	9,913.90	358.43	493,509.30	778,709.95
19,495.00	90.50	358.30	9,535.14	10,005.98	10,004.14	-274.00	10,007.89	358.43	493,603.24	778,707.00
19,590.00	90.40	358.50	9,534.40	10,100.96	10,099.10	-276.65	10,102.89	358.43	493,698.20	778,704.35
19,684.00	90.10	358.80	9,533.99	10,194.95	10,193.07	-278.87	10,196.89	358.43	493,792.17	778,702.13



**ProDirectional**  
Survey Report



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**Project:** Lea County, NM (NAD83)  
**Site:** North Thistle 3-34 State Com  
**Well:** 2H  
**Wellbore:** OH  
**Design:** Surveys 178-19788 MD

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**Survey Calculation Method:** Minimum Curvature  
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**Survey**

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (")	Northing (usft)	Easting (usft)
19,708.00	90.27	358.97	9,533.91	10,218.95	10,217.07	-279.34	10,220.89	358.43	493,816.17	778,701.66
<b>LTP: 19708' MD, 100' FNL &amp; 1287' FWL</b>										
19,727.00	90.40	359.10	9,533.80	10,237.95	10,236.06	-279.66	10,239.88	358.44	493,835.16	778,701.34
<b>Final Survey: 19727' MD</b>										
19,788.00	90.40	359.10	9,533.37	10,298.94	10,297.06	-280.62	10,300.88	358.44	493,896.16	778,700.38
<b>Final TD: 19788' MD, 20' FNL &amp; 1289' FWL</b>										

**Survey Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
178.00	178.00	0.45	-0.64	Pro MWD First Survey: 178' MD
8,939.00	8,924.17	-177.55	-202.35	KOP: 8939' MD, 53' FSL & 1284' FWL
9,202.00	9,180.90	-132.27	-207.09	FTP: 9202' MD, 100' FSL & 1280' FWL
19,708.00	9,533.91	10,217.07	-279.34	LTP: 19708' MD, 100' FNL & 1287' FWL
19,727.00	9,533.80	10,236.06	-279.66	Final Survey: 19727' MD
19,788.00	9,533.37	10,297.06	-280.62	Final TD: 19788' MD, 20' FNL & 1289' FWL