



HOBBS OCD
APR 01 2019
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Alley Cat 17-20 Fed Com No. 215H
Lea County, NM

October 11, 2018

Job No. LNM5185618

Survey Completion Report



PRODIRECTIONAL

Survey Certification Letter

October 11, 2018



Operator Name: Devon Energy Corp.
Well Name: Alley Cat 17-20 Fed Com No. 215H
County/Parish: Lea County,
State: NM
Rig Name: Cactus 126
Job Number: LNM5185618

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	147' MD – 21,378' MD	21,436' MD	09/16/18 – 10/08/18	MWD

Sincerely,

Mike Coats
Regulatory Specialist
Professional Directional

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

prodirectional.com

The Standard of Excellence in Directional Supervision



Devon Energy Corp.

**Lea County, NM
Alley Cat 17-20 Fed Com
No. 215H
OH**

Survey: ProDirectional

Survey Report

11 October, 2018





ProDirectional
Survey Report



Company:	Devon Energy Corp.	Local Co-ordinate Reference:	Well 215H
Project:	Lea County, NM (NAD83)	TVD Reference:	GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
Site:	Alley Cat 17-20 Fed Com	MD Reference:	GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys 147-21436 MD	Database:	WellPlanner1

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

Site	Alley Cat 17-20 Fed Com			
Site Position:		Northing:	478,366.95 usft	Latitude: 32.313471
From:	Map	Easting:	739,655.66 usft	Longitude: -103.691385
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.34 °

Well	215H			
Well Position	+N/-S	0.00 usft	Northing:	478,366.95 usft
	+E/-W	0.00 usft	Easting:	739,655.66 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft
				Latitude: 32.313471
				Longitude: -103.691385
				Ground Level: 3,620.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/9/2018	6.85	60.07	48,069.00

Design	Surveys 147-21436 MD			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.62

Survey Program	Date	10/11/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
147.00	21,436.00	Survey #1 (OH)	MWD+HDGM	OWSG MWD + HDGM



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Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
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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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	478,366.95	739,655.66
147.00	0.40	88.50	147.00	-0.01	0.01	0.51	0.51	88.50	478,366.96	739,656.17	
Pro MWD First Survey: 147' MD											
239.00	0.50	87.10	239.00	-0.03	0.04	1.23	1.24	88.05	478,366.99	739,656.89	
331.00	0.60	85.30	330.99	-0.09	0.10	2.12	2.12	87.24	478,367.05	739,657.78	
423.00	0.60	86.10	422.99	-0.15	0.17	3.08	3.08	86.76	478,367.12	739,658.74	
515.00	0.60	88.90	514.98	-0.19	0.22	4.04	4.04	86.94	478,367.17	739,659.70	
608.00	0.70	88.30	607.98	-0.21	0.24	5.09	5.10	87.28	478,367.19	739,660.75	
701.00	0.80	88.10	700.97	-0.24	0.28	6.31	6.32	87.45	478,367.23	739,661.97	
793.00	0.80	87.00	792.96	-0.29	0.34	7.59	7.60	87.47	478,367.29	739,663.25	
884.00	0.80	86.60	883.95	-0.35	0.41	8.86	8.87	87.37	478,367.36	739,664.52	
976.00	0.60	81.40	975.94	-0.45	0.52	9.98	9.99	87.04	478,367.47	739,665.64	
1,037.00	0.60	81.30	1,036.94	-0.54	0.61	10.61	10.63	86.69	478,367.56	739,666.27	
1,156.00	0.50	110.00	1,155.93	-0.45	0.53	11.71	11.73	87.41	478,367.48	739,667.37	
1,248.00	0.40	122.30	1,247.93	-0.14	0.22	12.36	12.37	88.98	478,367.17	739,668.02	
1,340.00	0.30	144.70	1,339.93	0.23	-0.15	12.77	12.77	90.66	478,366.80	739,668.43	
1,431.00	0.20	170.30	1,430.93	0.58	-0.50	12.94	12.95	92.21	478,366.45	739,668.60	
1,524.00	0.30	215.10	1,523.93	0.94	-0.86	12.83	12.85	93.83	478,366.09	739,668.49	
1,648.00	0.30	242.30	1,647.93	1.36	-1.27	12.35	12.42	95.89	478,365.68	739,668.01	
1,741.00	0.30	227.60	1,740.93	1.63	-1.55	11.96	12.06	97.39	478,365.40	739,667.62	
1,835.00	0.20	212.60	1,834.92	1.93	-1.86	11.69	11.83	99.02	478,365.09	739,667.35	
1,930.00	0.20	232.60	1,929.92	2.17	-2.10	11.47	11.66	100.36	478,364.85	739,667.13	
2,023.00	0.20	238.30	2,022.92	2.35	-2.28	11.20	11.43	101.51	478,364.67	739,666.86	
2,118.00	0.10	238.80	2,117.92	2.48	-2.41	10.99	11.25	102.37	478,364.54	739,666.65	
2,211.00	0.10	272.20	2,210.92	2.52	-2.45	10.84	11.11	102.74	478,364.50	739,666.50	
2,305.00	0.10	253.20	2,304.92	2.54	-2.47	10.68	10.96	103.03	478,364.48	739,666.34	
2,400.00	0.10	271.60	2,399.92	2.56	-2.49	10.51	10.80	103.33	478,364.46	739,666.17	



ProDirectional
Survey Report



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Project: Lea County, NM (NAD83)
Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
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MD Reference: GL 3620'+KB 25.5' @ 3645.50usft (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)
2,493.00	0.20	252.70	2,492.92	2.61	-2.54	10.28	10.59	103.87	478,364.41	739,665.94
2,588.00	0.20	240.20	2,587.92	2.74	-2.67	9.97	10.33	104.98	478,364.28	739,665.63
2,682.00	0.20	244.10	2,681.92	2.89	-2.82	9.68	10.09	106.25	478,364.13	739,665.34
2,776.00	0.30	210.80	2,775.92	3.17	-3.11	9.41	9.91	108.26	478,363.84	739,665.07
2,869.00	0.30	223.50	2,868.92	3.55	-3.49	9.12	9.76	110.95	478,363.46	739,664.78
2,963.00	0.30	225.40	2,962.92	3.90	-3.84	8.77	9.58	113.65	478,363.11	739,664.43
3,057.00	0.50	237.50	3,056.92	4.29	-4.24	8.25	9.28	117.17	478,362.71	739,663.91
3,151.00	0.90	244.30	3,150.91	4.82	-4.78	7.24	8.67	123.40	478,362.17	739,662.90
3,245.00	1.00	264.70	3,244.90	5.21	-5.17	5.76	7.74	131.92	478,361.78	739,661.42
3,339.00	0.10	356.10	3,338.89	5.20	-5.17	4.94	7.15	136.29	478,361.78	739,660.60
3,433.00	0.40	91.20	3,432.89	5.13	-5.09	5.26	7.32	134.06	478,361.86	739,660.92
3,527.00	0.00	102.10	3,526.89	5.13	-5.10	5.59	7.56	132.37	478,361.85	739,661.25
3,621.00	0.20	67.70	3,620.89	5.07	-5.04	5.74	7.64	131.26	478,361.91	739,661.40
3,715.00	0.40	77.60	3,714.89	4.94	-4.90	6.21	7.91	128.28	478,362.05	739,661.87
3,809.00	0.80	79.90	3,808.88	4.76	-4.72	7.18	8.59	123.31	478,362.23	739,662.84
3,903.00	1.20	101.10	3,902.87	4.85	-4.79	8.79	10.01	118.59	478,362.16	739,664.45
3,997.00	1.20	134.50	3,996.85	5.74	-5.67	10.46	11.90	118.47	478,361.28	739,666.12
4,091.00	0.30	230.40	4,090.84	6.59	-6.52	10.97	12.76	120.71	478,360.43	739,666.63
4,185.00	0.10	253.80	4,184.84	6.77	-6.70	10.70	12.63	122.04	478,360.25	739,666.36
4,279.00	1.10	135.10	4,278.84	7.43	-7.36	11.26	13.45	123.17	478,359.59	739,666.92
4,373.00	0.90	155.20	4,372.82	8.75	-8.67	12.21	14.97	125.38	478,358.28	739,667.87
4,467.00	0.20	256.90	4,466.82	9.46	-9.38	12.36	15.51	127.19	478,357.57	739,668.02
4,562.00	0.20	298.20	4,561.82	9.42	-9.34	12.05	15.24	127.77	478,357.61	739,667.71
4,656.00	0.20	256.10	4,655.82	9.38	-9.30	11.75	14.98	128.36	478,357.65	739,667.41
4,750.00	0.20	237.70	4,749.82	9.50	-9.42	11.45	14.83	129.46	478,357.53	739,667.11
4,844.00	0.10	255.20	4,843.82	9.61	-9.53	11.23	14.73	130.33	478,357.42	739,666.89
4,939.00	0.00	239.30	4,938.82	9.63	-9.55	11.15	14.68	130.59	478,357.40	739,666.81



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Survey Report



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Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
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Local Co-ordinate Reference: Well 215H
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Survey

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5,033.00	0.10	165.50	5,032.82	9.71	-9.63	11.17	14.75	130.78	478,357.32	739,666.83
5,127.00	0.10	111.00	5,126.82	9.82	-9.74	11.27	14.90	130.85	478,357.21	739,666.93
5,221.00	0.20	56.50	5,220.81	9.76	-9.68	11.48	15.02	130.14	478,357.27	739,667.14
5,316.00	0.20	58.50	5,315.81	9.58	-9.50	11.76	15.12	128.94	478,357.45	739,667.42
5,410.00	0.20	41.00	5,409.81	9.37	-9.29	12.01	15.18	127.74	478,357.66	739,667.67
5,504.00	0.20	35.80	5,503.81	9.12	-9.04	12.21	15.19	126.50	478,357.91	739,667.87
5,598.00	0.30	77.60	5,597.81	8.93	-8.85	12.55	15.36	125.20	478,358.10	739,668.21
5,692.00	0.20	41.10	5,691.81	8.76	-8.67	12.90	15.54	123.93	478,358.28	739,668.56
5,786.00	0.20	43.80	5,785.81	8.52	-8.43	13.12	15.59	122.73	478,358.52	739,668.78
5,880.00	0.20	39.10	5,879.81	8.27	-8.19	13.33	15.65	121.55	478,358.76	739,668.99
5,974.00	0.20	66.80	5,973.81	8.08	-7.99	13.59	15.77	120.47	478,358.96	739,669.25
6,068.00	0.20	18.90	6,067.81	7.87	-7.77	13.79	15.83	119.41	478,359.18	739,669.45
6,162.00	0.20	52.70	6,161.81	7.61	-7.52	13.98	15.87	118.28	478,359.43	739,669.64
6,256.00	0.10	66.20	6,255.81	7.48	-7.39	14.18	15.99	117.52	478,359.56	739,669.84
6,350.00	0.20	46.40	6,349.81	7.34	-7.24	14.38	16.10	116.74	478,359.71	739,670.04
6,444.00	0.10	69.50	6,443.81	7.20	-7.10	14.57	16.21	115.98	478,359.85	739,670.23
6,538.00	0.20	104.90	6,537.81	7.21	-7.11	14.81	16.43	115.66	478,359.84	739,670.47
6,632.00	0.30	135.20	6,631.81	7.43	-7.33	15.14	16.82	115.84	478,359.62	739,670.80
6,726.00	0.30	164.50	6,725.81	7.84	-7.74	15.38	17.22	116.72	478,359.21	739,671.04
6,820.00	0.50	174.70	6,819.80	8.49	-8.39	15.48	17.61	118.45	478,358.56	739,671.14
6,914.00	0.60	166.50	6,913.80	9.38	-9.27	15.63	18.18	120.68	478,357.68	739,671.29
7,008.00	0.90	184.60	7,007.79	10.59	-10.49	15.69	18.87	123.76	478,356.46	739,671.35
7,102.00	0.80	183.40	7,101.78	11.98	-11.88	15.59	19.60	127.30	478,355.07	739,671.25
7,196.00	0.70	195.50	7,195.77	13.19	-13.09	15.40	20.21	130.36	478,353.86	739,671.06
7,290.00	0.80	205.10	7,289.76	14.33	-14.24	14.97	20.66	133.56	478,352.71	739,670.63
7,384.00	0.80	209.10	7,383.75	15.50	-15.40	14.37	21.07	136.99	478,351.55	739,670.03
7,478.00	0.40	166.30	7,477.75	16.39	-16.30	14.13	21.57	139.07	478,350.65	739,669.79



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7,572.00	0.60	116.40	7,571.75	16.93	-16.83	14.65	22.31	138.97	478,350.12	739,670.31
7,666.00	0.80	115.10	7,665.74	17.43	-17.33	15.68	23.37	137.86	478,349.62	739,671.34
7,760.00	0.70	129.40	7,759.73	18.08	-17.97	16.72	24.55	137.07	478,348.98	739,672.38
7,854.00	0.70	130.10	7,853.72	18.82	-18.71	17.60	25.69	136.74	478,348.24	739,673.26
7,948.00	0.80	140.30	7,947.72	19.70	-19.58	18.46	26.91	136.69	478,347.37	739,674.12
8,042.00	0.90	142.50	8,041.71	20.80	-20.67	19.33	28.30	136.92	478,346.28	739,674.99
8,136.00	1.10	142.70	8,135.69	22.11	-21.98	20.33	29.94	137.23	478,344.97	739,675.99
8,230.00	1.30	148.70	8,229.67	23.75	-23.60	21.43	31.88	137.77	478,343.35	739,677.09
8,324.00	1.40	150.40	8,323.65	25.66	-25.51	22.55	34.05	138.53	478,341.44	739,678.21
8,418.00	1.30	157.40	8,417.62	27.65	-27.50	23.53	36.19	139.45	478,339.45	739,679.19
8,512.00	0.80	145.30	8,511.60	29.18	-29.02	24.31	37.86	140.05	478,337.93	739,679.97
8,606.00	0.90	183.70	8,605.59	30.46	-30.30	24.63	39.05	140.89	478,336.65	739,680.29
8,664.00	1.30	207.40	8,663.58	31.50	-31.34	24.30	39.66	142.20	478,335.61	739,679.96
8,758.00	0.90	191.70	8,757.57	33.16	-33.01	23.66	40.61	144.36	478,333.94	739,679.32
8,852.00	0.80	339.90	8,851.56	33.27	-33.11	23.29	40.48	144.88	478,333.84	739,678.95
8,946.00	1.20	350.50	8,945.55	31.68	-31.53	22.90	38.96	144.01	478,335.42	739,678.56
9,040.00	0.10	248.60	9,039.54	30.73	-30.58	22.66	38.06	143.47	478,336.37	739,678.32
9,134.00	0.20	175.00	9,133.54	30.93	-30.78	22.60	38.18	143.71	478,336.17	739,678.26
9,228.00	0.20	28.60	9,227.54	30.95	-30.80	22.69	38.25	143.62	478,336.15	739,678.35
9,322.00	1.00	336.50	9,321.53	30.05	-29.90	22.44	37.39	143.11	478,337.05	739,678.10
9,416.00	1.60	321.90	9,415.51	28.26	-28.12	21.31	35.28	142.85	478,338.83	739,676.97
9,510.00	2.00	305.20	9,509.46	26.26	-26.14	19.16	32.41	143.76	478,340.81	739,674.82
9,604.00	1.40	267.90	9,603.43	25.34	-25.23	16.67	30.24	146.56	478,341.72	739,672.33
9,698.00	0.30	71.60	9,697.42	25.30	-25.20	15.75	29.72	147.99	478,341.75	739,671.41
9,792.00	0.80	66.60	9,791.41	24.97	-24.86	16.59	29.89	146.29	478,342.09	739,672.25
9,886.00	0.10	128.70	9,885.41	24.76	-24.65	17.26	30.09	145.01	478,342.30	739,672.92
9,944.00	0.30	208.70	9,943.41	24.93	-24.82	17.22	30.21	145.24	478,342.13	739,672.88



ProDirectional
Survey Report



Company: Devon Energy Corp.
Project: Lea County, NM (NAD83)
Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
TVD Reference: GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
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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)
9,979.00	0.40	235.40	9,978.41	25.08	-24.97	17.08	30.25	145.63	478,341.98	739,672.74
KOP: 9979' MD, 572' FSL & 974' FEL										
10,073.00	10.30	183.30	10,071.89	33.67	-33.56	16.32	37.32	154.07	478,333.39	739,671.98
10,167.00	19.50	180.60	10,162.63	57.80	-57.69	15.67	59.78	164.80	478,309.26	739,671.33
10,261.00	29.90	182.60	10,247.92	96.99	-96.89	14.44	97.97	171.52	478,270.06	739,670.10
10,355.00	38.30	178.90	10,325.69	149.61	-149.52	13.94	150.17	174.67	478,217.43	739,669.60
10,449.00	49.90	173.50	10,393.11	214.73	-214.61	18.58	215.42	175.05	478,152.34	739,674.24
10,543.00	58.80	170.00	10,447.85	290.28	-290.09	29.66	291.60	174.16	478,076.86	739,685.32
10,637.00	65.40	171.80	10,491.81	372.35	-372.08	42.75	374.53	173.45	477,994.87	739,698.41
10,732.00	74.50	172.00	10,524.35	460.69	-460.34	55.31	463.65	173.15	477,906.61	739,710.97
10,779.00	82.20	172.30	10,533.83	506.30	-505.90	61.59	509.64	173.06	477,861.05	739,717.25
10,788.00	83.50	172.90	10,534.95	515.16	-514.76	62.74	518.57	173.05	477,852.19	739,718.40
10,871.00	88.44	173.61	10,540.78	597.42	-596.95	72.46	601.34	173.08	477,770.00	739,728.12
Sec. Line: 10871' MD, 925' FEL										
10,882.00	89.10	173.70	10,541.02	608.36	-607.88	73.68	612.33	173.09	477,759.07	739,729.34
10,977.00	90.20	176.00	10,541.60	703.02	-702.49	82.20	707.28	173.33	477,664.46	739,737.86
11,070.00	90.20	176.10	10,541.27	795.84	-795.27	88.61	800.19	173.64	477,571.68	739,744.27
11,165.00	89.10	178.10	10,541.85	890.74	-890.14	93.41	895.03	174.01	477,476.81	739,748.07
11,202.00	89.10	178.69	10,542.43	927.73	-927.12	94.45	931.92	174.18	477,439.83	739,750.11
FTP: 11202' MD, 330' FNL & 907' FEL										
11,259.00	89.10	179.60	10,543.33	984.72	-984.11	95.30	988.71	174.47	477,382.84	739,750.96
11,353.00	89.10	180.00	10,544.80	1,078.71	-1,078.09	95.63	1,082.33	174.93	477,288.86	739,751.29
11,447.00	88.90	180.30	10,546.45	1,172.69	-1,172.08	95.38	1,175.95	175.35	477,194.87	739,751.04
11,539.00	88.40	181.00	10,548.61	1,264.65	-1,264.05	94.34	1,267.56	175.73	477,102.90	739,750.00
11,631.00	89.70	181.20	10,550.14	1,356.60	-1,356.02	92.57	1,359.17	176.09	477,010.93	739,748.23
11,723.00	89.50	181.20	10,550.78	1,448.56	-1,447.99	90.65	1,450.83	176.42	476,918.96	739,746.31
11,815.00	90.40	179.90	10,550.86	1,540.55	-1,539.99	89.76	1,542.60	176.66	476,826.96	739,745.42



ProDirectional
Survey Report



Company: Devon Energy Corp.
Project: Lea County, NM (NAD83)
Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
TVD Reference: GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
MD Reference: GL 3620'+KB 25.5' @ 3645.50usft (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)
11,908.00	90.40	180.00	10,550.21	1,633.54	-1,632.98	89.84	1,635.45	176.85	476,733.97	739,745.50
12,000.00	91.20	180.30	10,548.93	1,725.53	-1,724.97	89.60	1,727.30	177.03	476,641.98	739,745.26
12,092.00	91.30	181.00	10,546.92	1,817.49	-1,816.95	88.56	1,819.10	177.21	476,550.00	739,744.22
12,184.00	90.70	181.80	10,545.31	1,909.43	-1,908.90	86.31	1,910.85	177.41	476,458.05	739,741.97
12,276.00	89.10	181.40	10,545.47	2,001.38	-2,000.86	83.74	2,002.62	177.60	476,366.09	739,739.40
12,369.00	88.10	181.10	10,547.75	2,094.31	-2,093.81	81.72	2,095.41	177.77	476,273.14	739,737.38
12,461.00	89.20	180.40	10,549.91	2,186.26	-2,185.78	80.51	2,187.26	177.89	476,181.17	739,736.17
12,552.00	90.10	180.00	10,550.47	2,277.26	-2,276.77	80.19	2,278.19	177.98	476,090.18	739,735.85
12,644.00	91.10	179.60	10,549.51	2,369.25	-2,368.77	80.52	2,370.13	178.05	475,998.18	739,736.18
12,736.00	90.90	179.30	10,547.90	2,461.23	-2,460.75	81.40	2,462.09	178.11	475,906.20	739,737.06
12,827.00	91.60	178.90	10,545.92	2,552.21	-2,551.71	82.83	2,553.06	178.14	475,815.24	739,738.49
12,921.00	91.70	178.70	10,543.21	2,646.16	-2,645.66	84.80	2,647.01	178.16	475,721.29	739,740.46
13,016.00	91.20	178.70	10,540.81	2,741.12	-2,740.60	86.95	2,741.98	178.18	475,626.35	739,742.61
13,110.00	90.30	179.20	10,539.58	2,835.10	-2,834.57	88.67	2,835.96	178.21	475,532.38	739,744.33
13,204.00	89.60	179.00	10,539.66	2,929.10	-2,928.56	90.15	2,929.95	178.24	475,438.39	739,745.81
13,298.00	90.60	178.60	10,539.49	3,023.08	-3,022.54	92.12	3,023.94	178.25	475,344.41	739,747.78
13,392.00	90.80	178.30	10,538.34	3,117.06	-3,116.50	94.66	3,117.94	178.26	475,250.45	739,750.32
13,486.00	90.60	177.30	10,537.20	3,211.00	-3,210.42	98.27	3,211.92	178.25	475,156.53	739,753.93
13,580.00	90.90	178.50	10,535.97	3,304.95	-3,304.35	101.71	3,305.91	178.24	475,062.60	739,757.37
13,674.00	90.70	178.80	10,534.65	3,398.93	-3,398.31	103.93	3,399.90	178.25	474,968.64	739,759.59
13,768.00	90.70	178.80	10,533.50	3,492.91	-3,492.29	105.90	3,493.89	178.26	474,874.66	739,761.56
13,862.00	91.00	179.00	10,532.11	3,586.89	-3,586.26	107.70	3,587.87	178.28	474,780.69	739,763.36
13,956.00	90.20	179.00	10,531.13	3,680.88	-3,680.24	109.34	3,681.86	178.30	474,686.71	739,765.00
14,050.00	89.80	179.40	10,531.13	3,774.88	-3,774.23	110.65	3,775.85	178.32	474,592.72	739,766.31
14,144.00	89.50	179.60	10,531.70	3,868.88	-3,868.22	111.47	3,869.83	178.35	474,498.73	739,767.13
14,239.00	89.70	180.10	10,532.36	3,963.87	-3,963.22	111.72	3,964.79	178.39	474,403.73	739,767.38
14,333.00	90.50	180.60	10,532.20	4,057.86	-4,057.22	111.15	4,058.74	178.43	474,309.73	739,766.81



ProDirectional
Survey Report



Company: Devon Energy Corp.
Project: Lea County, NM (NAD83)
Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
TVD Reference: GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
MD Reference: GL 3620'+KB 25.5' @ 3645.50usft (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)
14,427.00	90.40	180.90	10,531.46	4,151.84	-4,151.21	109.92	4,152.66	178.48	474,215.74	739,765.58
14,521.00	89.00	180.80	10,531.95	4,245.82	-4,245.19	108.52	4,246.58	178.54	474,121.76	739,764.18
14,615.00	89.20	181.10	10,533.43	4,339.78	-4,339.17	106.96	4,340.48	178.59	474,027.78	739,762.62
14,710.00	89.90	181.00	10,534.18	4,434.75	-4,434.15	105.22	4,435.40	178.64	473,932.80	739,760.88
14,804.00	90.10	180.90	10,534.18	4,528.72	-4,528.13	103.66	4,529.32	178.69	473,838.82	739,759.32
14,898.00	89.60	181.30	10,534.42	4,622.69	-4,622.12	101.86	4,623.24	178.74	473,744.83	739,757.52
14,992.00	90.70	180.90	10,534.18	4,716.66	-4,716.10	100.06	4,717.16	178.78	473,650.85	739,755.72
15,086.00	91.20	181.00	10,532.62	4,810.62	-4,810.07	98.50	4,811.08	178.83	473,556.88	739,754.16
15,180.00	91.10	181.30	10,530.73	4,904.57	-4,904.03	96.61	4,904.98	178.87	473,462.92	739,752.27
15,274.00	91.40	180.50	10,528.68	4,998.52	-4,998.00	95.14	4,998.90	178.91	473,368.95	739,750.80
15,368.00	90.30	179.90	10,527.29	5,092.50	-5,091.98	94.81	5,092.87	178.93	473,274.97	739,750.47
15,462.00	90.10	179.50	10,526.96	5,186.50	-5,185.98	95.30	5,186.86	178.95	473,180.97	739,750.96
15,556.00	89.80	179.20	10,527.04	5,280.50	-5,279.98	96.37	5,280.86	178.95	473,086.97	739,752.03
15,650.00	88.30	178.40	10,528.60	5,374.47	-5,373.94	98.33	5,374.84	178.95	472,993.01	739,753.99
15,744.00	89.00	178.10	10,530.81	5,468.42	-5,467.87	101.20	5,468.81	178.94	472,899.08	739,756.86
15,838.00	89.70	178.40	10,531.88	5,562.39	-5,561.82	104.07	5,562.79	178.93	472,805.13	739,759.73
15,933.00	89.80	178.60	10,532.29	5,657.37	-5,656.78	106.56	5,657.79	178.92	472,710.17	739,762.22
16,027.00	88.80	178.90	10,533.44	5,751.35	-5,750.75	108.61	5,751.78	178.92	472,616.20	739,764.27
16,121.00	90.40	178.50	10,534.10	5,845.33	-5,844.72	110.74	5,845.77	178.91	472,522.23	739,766.40
16,155.00	90.40	178.39	10,533.86	5,879.32	-5,878.71	111.67	5,879.77	178.91	472,488.24	739,767.33
Sec. Line: 16155' MD, 920' FEL										
16,215.00	90.40	178.20	10,533.44	5,939.30	-5,938.68	113.45	5,939.77	178.91	472,428.27	739,769.11
16,309.00	90.20	178.00	10,532.95	6,033.27	-6,032.63	116.57	6,033.76	178.89	472,334.32	739,772.23
16,403.00	90.00	177.90	10,532.79	6,127.23	-6,126.57	119.93	6,127.74	178.88	472,240.38	739,775.59
16,497.00	90.30	178.70	10,532.54	6,221.20	-6,220.53	122.72	6,221.74	178.87	472,146.42	739,778.38
16,592.00	90.80	179.60	10,531.63	6,316.20	-6,315.51	124.13	6,316.73	178.87	472,051.44	739,779.79
16,686.00	90.50	179.80	10,530.56	6,410.19	-6,409.50	124.62	6,410.71	178.89	471,957.45	739,780.28



ProDirectional
Survey Report



Company: Devon Energy Corp.
Project: Lea County, NM (NAD83)
Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
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MD Reference: GL 3620'+KB 25.5' @ 3645.50usft (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)
16,780.00	91.10	180.40	10,529.25	6,504.18	-6,503.49	124.46	6,504.68	178.90	471,863.46	739,780.12
16,874.00	90.30	180.50	10,528.10	6,598.16	-6,597.48	123.72	6,598.64	178.93	471,769.47	739,779.38
16,968.00	90.10	180.80	10,527.77	6,692.14	-6,691.48	122.65	6,692.60	178.95	471,675.47	739,778.31
17,062.00	89.90	180.50	10,527.77	6,786.13	-6,785.47	121.58	6,786.56	178.97	471,581.48	739,777.24
17,156.00	89.80	181.10	10,528.02	6,880.11	-6,879.46	120.27	6,880.51	179.00	471,487.49	739,775.93
17,250.00	89.40	180.30	10,528.67	6,974.09	-6,973.45	119.12	6,974.47	179.02	471,393.50	739,774.78
17,344.00	90.20	179.00	10,529.00	7,068.08	-7,067.44	119.70	7,068.46	179.03	471,299.51	739,775.36
17,438.00	90.80	179.50	10,528.35	7,162.08	-7,161.43	120.93	7,162.45	179.03	471,205.52	739,776.59
17,532.00	90.40	179.60	10,527.53	7,256.07	-7,255.43	121.67	7,256.45	179.04	471,111.52	739,777.33
17,626.00	90.50	179.70	10,526.79	7,350.07	-7,349.42	122.24	7,350.44	179.05	471,017.53	739,777.90
17,720.00	90.20	180.10	10,526.21	7,444.07	-7,443.42	122.40	7,444.43	179.06	470,923.53	739,778.06
17,815.00	90.00	180.40	10,526.05	7,539.06	-7,538.42	121.99	7,539.41	179.07	470,828.53	739,777.65
17,909.00	90.00	180.00	10,526.05	7,633.06	-7,632.42	121.66	7,633.39	179.09	470,734.53	739,777.32
18,003.00	90.50	179.80	10,525.64	7,727.05	-7,726.42	121.83	7,727.38	179.10	470,640.53	739,777.49
18,097.00	89.60	180.20	10,525.56	7,821.05	-7,820.42	121.83	7,821.36	179.11	470,546.53	739,777.49
18,191.00	89.90	179.60	10,525.97	7,915.05	-7,914.41	121.99	7,915.35	179.12	470,452.54	739,777.65
18,285.00	90.30	180.40	10,525.80	8,009.05	-8,008.41	121.99	8,009.34	179.13	470,358.54	739,777.65
18,379.00	91.30	180.00	10,524.49	8,103.03	-8,102.40	121.66	8,103.32	179.14	470,264.55	739,777.32
18,473.00	91.50	180.00	10,522.19	8,197.00	-8,196.37	121.66	8,197.28	179.15	470,170.58	739,777.32
18,567.00	91.80	180.10	10,519.49	8,290.96	-8,290.33	121.58	8,291.23	179.16	470,076.62	739,777.24
18,662.00	92.50	179.60	10,515.92	8,385.89	-8,385.27	121.83	8,386.15	179.17	469,981.68	739,777.49
18,756.00	90.40	179.30	10,513.54	8,479.85	-8,479.23	122.73	8,480.11	179.17	469,887.72	739,778.39
18,850.00	88.70	179.60	10,514.28	8,573.85	-8,573.22	123.63	8,574.11	179.17	469,793.73	739,779.29
18,944.00	87.60	178.70	10,517.32	8,667.79	-8,667.15	125.03	8,668.06	179.17	469,699.80	739,780.69
19,038.00	87.70	178.60	10,521.17	8,761.70	-8,761.05	127.24	8,761.97	179.17	469,605.90	739,782.90
19,133.00	89.80	178.30	10,523.24	8,856.65	-8,855.99	129.81	8,856.94	179.16	469,510.96	739,785.47
19,227.00	89.50	178.40	10,523.82	8,950.63	-8,949.95	132.51	8,950.93	179.15	469,417.00	739,788.17



ProDirectional
Survey Report



Company: Devon Energy Corp.
Project: Lea County, NM (NAD83)
Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
TVD Reference: GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
MD Reference: GL 3620'+KB 25.5' @ 3645.50usft (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)
19,321.00	90.10	178.60	10,524.15	9,044.61	-9,043.91	134.98	9,044.92	179.14	469,323.04	739,790.64
19,415.00	87.40	177.40	10,526.20	9,138.54	-9,137.82	138.25	9,138.87	179.13	469,229.13	739,793.91
19,509.00	88.20	177.80	10,529.80	9,232.41	-9,231.67	142.19	9,232.76	179.12	469,135.28	739,797.85
19,603.00	88.80	178.60	10,532.27	9,326.35	-9,325.59	145.14	9,326.72	179.11	469,041.36	739,800.80
19,697.00	89.70	178.50	10,533.50	9,420.32	-9,419.55	147.52	9,420.71	179.10	468,947.40	739,803.18
19,791.00	90.50	179.00	10,533.33	9,514.31	-9,513.53	149.57	9,514.70	179.10	468,853.42	739,805.23
19,885.00	91.30	179.60	10,531.86	9,608.30	-9,607.51	150.72	9,608.69	179.10	468,759.44	739,806.38
19,979.00	91.80	179.80	10,529.31	9,702.26	-9,701.47	151.21	9,702.65	179.11	468,665.48	739,806.87
20,073.00	92.10	179.90	10,526.11	9,796.21	-9,795.42	151.45	9,796.59	179.11	468,571.53	739,807.11
20,167.00	91.70	179.60	10,523.00	9,890.15	-9,889.36	151.86	9,890.53	179.12	468,477.59	739,807.52
20,261.00	91.70	179.60	10,520.21	9,984.11	-9,983.32	152.52	9,984.48	179.12	468,383.63	739,808.18
20,355.00	90.60	180.30	10,518.32	10,078.09	-10,077.30	152.60	10,078.45	179.13	468,289.65	739,808.26
20,449.00	90.60	180.40	10,517.34	10,172.08	-10,171.29	152.03	10,172.43	179.14	468,195.66	739,807.69
20,543.00	89.80	180.60	10,517.01	10,266.06	-10,265.29	151.21	10,266.40	179.16	468,101.66	739,806.87
20,637.00	89.10	180.10	10,517.91	10,360.05	-10,359.28	150.63	10,360.37	179.17	468,007.67	739,806.29
20,732.00	89.10	180.10	10,519.40	10,455.04	-10,454.27	150.47	10,455.35	179.18	467,912.68	739,806.13
20,826.00	89.40	180.10	10,520.63	10,549.02	-10,548.26	150.30	10,549.33	179.18	467,818.69	739,805.96
20,920.00	89.80	180.50	10,521.29	10,643.02	-10,642.26	149.81	10,643.31	179.19	467,724.69	739,805.47
21,014.00	90.40	181.00	10,521.13	10,737.00	-10,736.25	148.58	10,737.27	179.21	467,630.70	739,804.24
21,106.00	90.50	180.80	10,520.40	10,828.97	-10,828.23	147.14	10,829.23	179.22	467,538.72	739,802.80
LTP: 21106' MD, 330' FSL & 916' FEL										
21,200.00	90.50	181.30	10,519.58	10,922.94	-10,922.21	145.41	10,923.18	179.24	467,444.74	739,801.07
21,294.00	90.80	181.20	10,518.52	11,016.89	-11,016.18	143.36	11,017.12	179.25	467,350.77	739,799.02
21,378.00	91.40	181.10	10,516.91	11,100.85	-11,100.15	141.68	11,101.06	179.27	467,266.80	739,797.34
Final Survey: 21378' MD										
21,436.00	91.40	181.10	10,515.49	11,158.81	-11,158.12	140.56	11,159.01	179.28	467,208.83	739,796.22
Final TD: 21436' MD, 0.5' FSL & 924' FEL										



ProDirectional
Survey Report



Company: Devon Energy Corp.
Project: Lea County, NM (NAD83)
Site: Alley Cat 17-20 Fed Com
Well: 215H
Wellbore: OH
Design: Surveys 147-21436 MD

Local Co-ordinate Reference: Well 215H
TVD Reference: GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
MD Reference: GL 3620'+KB 25.5' @ 3645.50usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
147.00	147.00	0.01	0.51	Pro MWD First Survey: 147' MD
9,979.00	9,978.41	-24.97	17.08	KOP: 9979' MD, 572' FSL & 974' FEL
10,871.00	10,540.78	-596.95	72.46	Sec. Line: 10871' MD, 925' FEL
11,202.00	10,542.43	-927.12	94.45	FTP: 11202' MD, 330' FNL & 907' FEL
16,155.00	10,533.86	-5,878.71	111.67	Sec. Line: 16155' MD, 920' FEL
21,106.00	10,520.40	-10,828.23	147.14	LTP: 21106' MD, 330' FSL & 916' FEL
21,378.00	10,516.91	-11,100.15	141.68	Final Survey: 21378' MD
21,436.00	10,515.49	-11,158.12	140.56	Final TD: 21436' MD, 0.5' FSL & 924' FEL