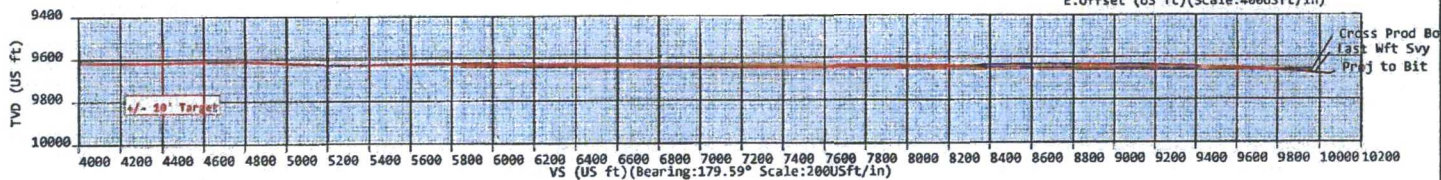
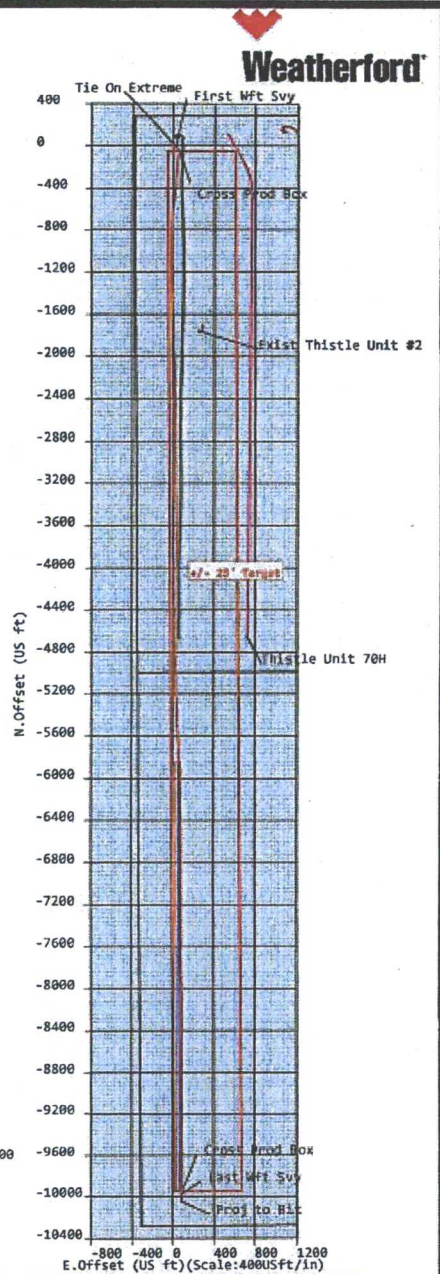
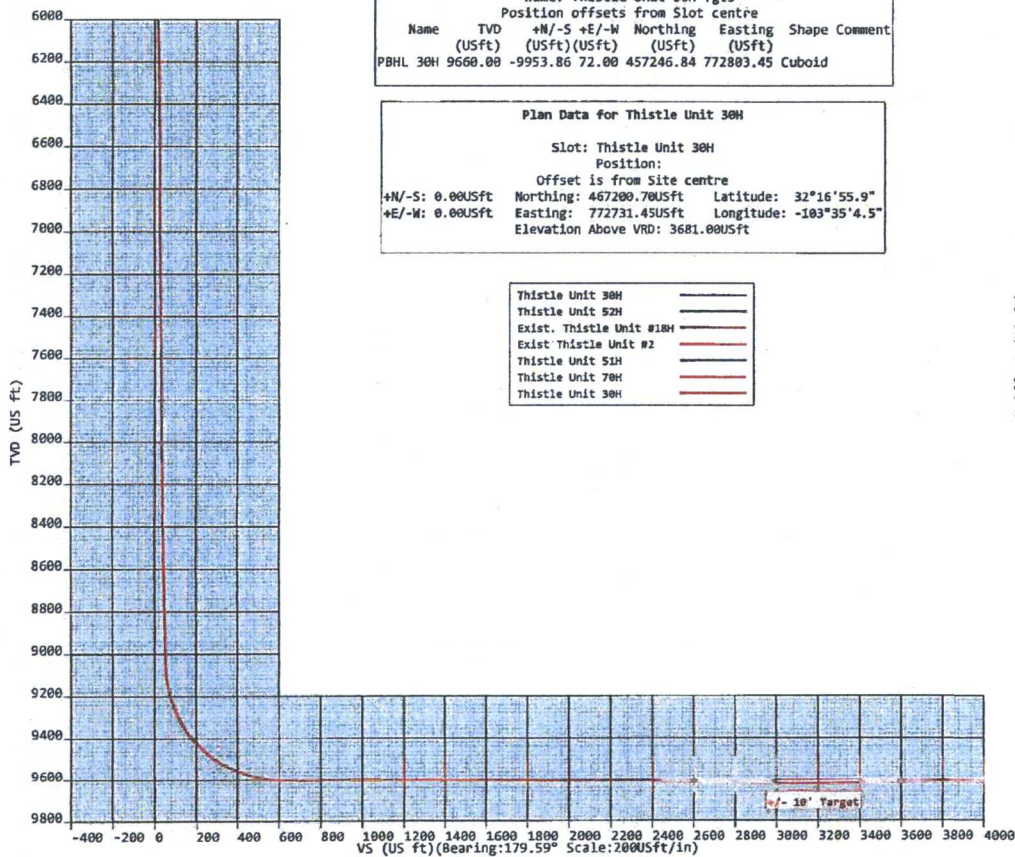
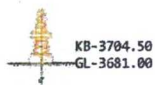


devon

Thistle Unit 30H
Lea Co, NM



**5D Survey Report**

Devon Energy

Field Name: *Lea Co, NM Nad 83 NMEZ*
Site Name: *Thistle Unit 30H*
Well Name: *Thistle Unit 30H*
Survey: *Definitive survey*

11 January 2016





Thistle Unit 30H

Field Name: Lea Co, NM Nad 83 NMEZ	Map Units: US ft		Company Name: Devon Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: Thistle Unit 30H	Units: US ft	North Reference: Grid	Convergence Angle: 0.40	
	Position:	Northing: 467200.70US ft	Latitude: 32° 16' 55.88"	
		Easting: 772731.45US ft	Longitude: -103° 35' 4.49"	
	Elevation above MSL: 3681.00 US ft		Comment:	
Slot: Thistle Unit 30H	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northing: 467200.70US ft	Latitude: 32°16'55.88"	
	+E/-W: 0.00US ft	Easting: 772731.45US ft	Longitude: -103°35'4.49"	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 3681.00US ft			
Well: Thistle Unit 30H	Type: Main well		UWI:	
	File Number:	Comment:		
	Closure Distance: 10049.3US ft	Closure Azimuth: 179.48°		
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: -0.00US ft	+E/-W: -0.00US ft	Az: 179.59°	
Drill floor: Survey Name: Definitive Survey				
Rig Height (Kelly Bushing): 23.50us ft	Elevation above MSL: 3704.50us ft	Inclination: 0.00°	Azimuth: 0.00°	
Survey Name: Definitive Survey				
Date: 15/Oct/2015	Survey Tool: See Survey Tool Ranges below.	Comment:	Company:	
Magnetic Model:				
Model Name: bggm2015	Date: 30/Nov/2015	Field Strength: 48232.7nT	Declination: 7.22°	Dip: 60.19°
Tie Point:				
MD: 0.00 US ft	Inclination: 0.00°	Azimuth: 0.00°	TVD: 0.00 US ft	North Offset: -0.00 US ft East Offset: -0.00 US ft
Survey Tool Ranges:				
Name	Start MD(USFt)	End MD(USFt)	Source Survey	
MWD	0.00	5067.00	Extreme MWD	
MWD	5067.00	19365.00	Wft MWD Svy	

5D Survey Report

Casing Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)								
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name
5243.00	1.76	125.28	5242.45	-3.47	22.40	467197.23	772753.85	9 5/8 in

Wellpath created using minimum curvature.

Survey Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (°/100US ft)	Northing (US ft)	Easting (US ft)	Comment
0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	467200.70	772731.45	
152.00	0.10	346.70	152.00	0.13	-0.03	-0.13	0.07	467200.83	772731.42	
305.00	0.40	350.20	305.00	0.79	-0.15	-0.79	0.20	467201.48	772731.30	
445.00	0.50	74.20	445.00	1.43	0.35	-1.43	0.43	467202.13	772731.80	
586.00	0.20	237.60	585.99	1.47	0.74	-1.46	0.49	467202.16	772732.19	
770.00	0.30	224.30	769.99	0.95	0.13	-0.95	0.06	467201.65	772731.58	
955.00	0.60	196.30	954.99	-0.32	-0.48	0.32	0.20	467200.37	772730.97	
1138.00	0.40	233.30	1137.98	-1.63	-1.26	1.62	0.20	467199.07	772730.19	
1322.00	0.40	253.10	1321.98	-2.20	-2.39	2.18	0.07	467198.50	772729.06	
1445.00	0.40	280.53	1444.97	-2.24	-3.22	2.22	0.15	467198.45	772728.23	
1628.00	0.48	288.83	1627.97	-1.88	-4.58	1.85	0.06	467198.82	772726.87	
1819.00	0.40	295.99	1818.96	-1.33	-5.93	1.29	0.05	467199.37	772725.52	
2010.00	0.31	284.92	2009.96	-0.90	-7.03	0.85	0.06	467199.79	772724.42	
2201.00	0.22	254.60	2200.96	-0.87	-7.89	0.81	0.09	467199.83	772723.57	
2390.00	0.09	156.29	2389.96	-1.10	-8.18	1.04	0.13	467199.60	772723.28	
2584.00	0.09	123.03	2583.96	-1.32	-7.99	1.26	0.03	467199.37	772723.46	
2772.00	0.22	344.82	2771.95	-1.05	-7.96	1.00	0.16	467199.64	772723.49	
2968.00	0.22	336.42	2967.95	-0.35	-8.21	0.29	0.02	467200.35	772723.25	
3158.00	0.31	297.01	3157.95	0.22	-8.81	-0.28	0.10	467200.92	772722.64	
3348.00	0.22	209.60	3347.95	0.14	-9.45	-0.21	0.20	467200.83	772722.00	
3539.00	0.22	89.32	3538.95	-0.18	-9.26	0.11	0.20	467200.52	772722.19	
3731.00	0.30	63.30	3730.95	0.05	-8.45	-0.11	0.07	467200.75	772723.01	
3921.00	0.60	32.72	3920.94	1.11	-7.46	-1.17	0.20	467201.81	772723.99	
4113.00	0.50	61.81	4112.93	2.36	-6.18	-2.40	0.15	467203.05	772725.27	
4304.00	0.80	59.70	4303.92	3.42	-4.30	-3.45	0.16	467204.12	772727.16	
4491.00	1.50	87.30	4490.88	4.20	-0.72	-4.20	0.47	467204.89	772730.73	
4591.00	1.60	84.00	4590.85	4.40	1.97	-4.39	0.13	467205.10	772733.42	
4685.00	2.00	94.81	4684.80	4.40	4.91	-4.37	0.56	467205.10	772736.36	
4777.00	2.60	97.80	4776.73	3.99	8.58	-3.92	0.66	467204.68	772740.03	
4874.00	2.30	109.09	4873.64	3.05	12.60	-2.96	0.58	467203.75	772744.05	
4971.00	1.80	127.29	4970.58	1.49	15.65	-1.38	0.84	467202.19	772747.10	
5067.00	1.80	126.63	5066.53	-0.32	18.06	0.45	0.02	467200.37	772749.51	
5195.00	1.70	125.53	5194.47	-2.63	21.22	2.78	0.08	467198.07	772752.67	Tie On Extreme
5309.00	1.85	124.96	5308.41	-4.66	24.10	4.83	0.13	467196.03	772755.55	First Wft Svy
5500.00	1.84	123.36	5499.32	-8.12	29.19	8.32	0.03	467192.58	772760.64	
5691.00	1.61	135.47	5690.23	-11.71	33.63	11.95	0.23	467188.98	772765.08	
5882.00	1.66	137.51	5881.15	-15.67	37.38	15.93	0.04	467185.03	772768.83	
6073.00	1.88	132.43	6072.06	-19.82	41.56	20.12	0.14	467180.88	772773.02	
6264.00	0.73	146.87	6263.01	-22.95	44.54	23.27	0.62	467177.74	772775.99	
6455.00	0.73	149.92	6453.99	-25.03	45.82	25.35	0.02	467175.67	772777.27	
6646.00	0.55	126.96	6644.98	-26.63	47.16	26.97	0.16	467174.07	772778.61	
6837.00	0.38	110.57	6835.97	-27.40	48.48	27.75	0.11	467173.29	772779.94	
7028.00	0.14	149.18	7026.97	-27.83	49.20	28.18	0.15	467172.87	772780.65	
7218.00	0.43	159.47	7216.97	-28.69	49.57	29.05	0.15	467172.00	772781.02	
7409.00	0.41	140.98	7407.96	-29.90	50.25	30.25	0.07	467170.80	772781.70	
7600.00	0.80	151.66	7598.95	-31.60	51.31	31.97	0.21	467169.10	772782.76	
7791.00	0.70	129.06	7789.94	-33.51	52.85	33.89	0.16	467167.19	772784.30	
7982.00	0.78	120.76	7980.92	-34.91	54.87	35.30	0.07	467165.79	772786.32	
8173.00	1.07	153.85	8171.90	-37.17	56.78	37.58	0.31	467163.52	772788.23	
8356.00	0.98	175.23	8354.87	-40.27	57.66	40.68	0.21	467160.43	772789.11	
8547.00	1.02	175.94	8545.84	-43.59	57.91	44.00	0.02	467157.10	772789.37	

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (°/100US ft)	Northing (US ft)	Easting (US ft)	Comment
8738.00	1.05	170.94	8736.81	-47.02	58.31	47.43	0.05	467153.68	772789.76	
8929.00	1.00	180.56	8927.78	-50.41	58.57	50.83	0.09	467150.29	772790.02	
9003.00	0.81	180.52	9001.77	-51.58	58.56	52.00	0.26	467149.12	772790.01	Cross Prod Box
9025.00	0.76	180.51	9023.77	-51.88	58.56	52.30	0.23	467148.82	772790.01	
9088.00	4.35	193.66	9086.69	-54.62	57.99	55.03	5.74	467146.08	772789.44	
9120.00	8.64	195.64	9118.48	-58.12	57.05	58.52	13.42	467142.58	772788.50	
9152.00	12.70	193.83	9149.92	-63.85	55.56	64.24	12.73	467136.85	772787.02	
9184.00	15.56	190.23	9180.95	-71.49	53.96	71.87	9.35	467129.21	772785.41	
9216.00	18.00	190.92	9211.59	-80.57	52.26	80.94	7.65	467120.13	772783.71	
9264.00	21.24	189.20	9256.79	-96.44	49.46	96.79	6.86	467104.26	772780.92	
9312.00	26.12	186.96	9300.74	-115.52	46.79	115.85	10.34	467085.17	772778.24	
9360.00	31.39	186.16	9342.81	-138.45	44.17	138.77	11.01	467062.24	772775.62	
9407.00	37.33	184.80	9381.59	-164.85	41.66	165.14	12.74	467035.85	772773.11	
9455.00	42.84	183.64	9418.30	-195.66	39.41	195.94	11.58	467005.03	772770.86	
9503.00	48.60	183.81	9451.80	-229.94	37.17	230.20	12.00	466970.76	772768.62	
9550.00	53.47	184.24	9481.34	-266.38	34.60	266.62	10.39	466934.31	772766.05	
9598.00	58.34	184.06	9508.24	-306.01	31.73	306.23	10.15	466894.68	772763.18	
9646.00	63.11	184.31	9531.71	-347.76	28.67	347.96	9.95	466852.94	772760.12	
9694.00	67.77	185.67	9551.65	-391.24	24.87	391.41	10.04	466809.46	772756.32	
9742.00	71.65	186.71	9568.30	-435.99	20.01	436.12	8.33	466764.71	772751.46	
9789.00	75.51	186.43	9581.58	-480.77	14.85	480.86	8.23	466719.93	772746.30	
9837.00	80.52	187.28	9591.54	-527.37	9.25	527.42	10.58	466673.33	772740.70	
9873.00	83.06	186.24	9596.69	-562.75	5.05	562.77	7.61	466637.95	772736.50	
9937.00	88.25	184.23	9601.53	-626.27	-0.76	626.25	8.69	466574.42	772730.69	
9969.00	89.86	182.35	9602.06	-658.21	-2.60	658.18	7.73	466542.48	772728.85	
10064.00	91.47	182.22	9600.96	-753.13	-6.39	753.06	1.70	466447.57	772725.06	
10160.00	90.21	180.72	9599.55	-849.08	-8.85	849.00	2.04	466351.61	772722.60	
10255.00	90.42	180.41	9599.03	-944.08	-9.79	943.98	0.39	466256.62	772721.67	
10351.00	89.58	180.36	9599.03	-1040.07	-10.43	1039.97	0.88	466160.62	772721.02	
10446.00	89.58	180.67	9599.72	-1135.07	-11.29	1134.96	0.33	466065.63	772720.17	
10542.00	90.00	179.05	9600.08	-1231.06	-11.05	1230.95	1.74	465969.63	772720.40	
10638.00	89.65	177.21	9600.37	-1327.01	-7.92	1326.92	1.95	465873.69	772723.53	
10733.00	89.44	177.25	9601.12	-1421.89	-3.33	1421.83	0.23	465778.80	772728.12	
10829.00	89.72	177.46	9601.83	-1517.79	1.10	1517.76	0.36	465682.91	772732.55	
10924.00	89.30	178.31	9602.64	-1612.72	4.61	1612.71	1.00	465587.98	772736.06	
11020.00	89.37	178.16	9603.75	-1708.67	7.57	1708.68	0.17	465492.03	772739.02	
11115.00	89.02	178.19	9605.09	-1803.61	10.59	1803.64	0.37	465397.09	772742.04	
11211.00	89.79	179.28	9606.09	-1899.58	12.71	1899.62	1.39	465301.12	772744.16	
11306.00	89.58	178.48	9606.61	-1994.56	14.57	1994.61	0.87	465206.14	772746.02	
11402.00	90.07	178.64	9606.90	-2090.53	16.98	2090.59	0.54	465110.17	772748.43	
11497.00	90.14	178.80	9606.73	-2185.50	19.10	2185.58	0.18	465015.19	772750.55	
11592.00	90.77	179.27	9605.97	-2280.48	20.70	2280.57	0.83	464920.21	772752.15	
11688.00	88.81	178.83	9606.33	-2376.47	22.29	2376.56	2.09	464824.23	772753.74	
11783.00	88.11	178.30	9608.88	-2471.40	24.67	2471.51	0.92	464729.29	772756.12	
11879.00	88.18	179.31	9611.99	-2567.33	26.67	2567.45	1.05	464633.37	772758.12	
11974.00	88.25	179.18	9614.95	-2662.27	27.92	2662.41	0.16	464538.42	772759.37	
12069.00	89.30	179.75	9616.98	-2757.25	28.81	2757.38	1.26	464443.45	772760.26	
12165.00	89.65	179.54	9617.86	-2853.24	29.40	2853.38	0.43	464347.46	772760.86	
12260.00	89.02	179.65	9618.96	-2948.23	30.08	2948.37	0.67	464252.46	772761.53	
12356.00	89.23	179.82	9620.42	-3044.22	30.52	3044.36	0.28	464156.48	772761.97	
12451.00	89.79	179.12	9621.24	-3139.21	31.40	3139.35	0.94	464061.49	772762.85	
12547.00	90.49	178.72	9621.00	-3235.19	33.21	3235.35	0.84	463965.50	772764.66	
12642.00	91.05	178.65	9619.73	-3330.16	35.39	3330.33	0.59	463870.54	772766.84	
12738.00	91.26	178.93	9617.79	-3426.12	37.41	3426.30	0.36	463774.58	772768.87	
12834.00	91.89	178.72	9615.15	-3522.06	39.38	3522.25	0.69	463678.64	772770.83	
12929.00	91.26	179.72	9612.54	-3617.01	40.68	3617.21	1.24	463583.68	772772.13	
13024.00	92.24	179.47	9609.64	-3711.97	41.35	3712.17	1.06	463488.73	772772.80	
13120.00	89.65	179.81	9608.06	-3807.94	41.95	3808.15	2.72	463392.75	772773.40	

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	Comment
13216.00	89.23	181.61	9608.99	-3903.93	40.76	3904.12	1.93	463296.77	772772.21	
13311.00	87.41	180.64	9611.78	-3998.86	38.90	3999.04	2.17	463201.83	772770.35	
13407.00	87.48	179.68	9616.06	-4094.77	38.63	4094.94	1.00	463105.93	772770.08	
13502.00	88.25	179.61	9619.60	-4189.70	39.22	4189.87	0.81	463011.00	772770.67	
13598.00	90.28	180.39	9620.83	-4285.68	39.22	4285.85	2.27	462915.01	772770.67	
13693.00	91.05	180.58	9619.73	-4380.67	38.41	4380.84	0.83	462820.02	772769.86	
13789.00	91.40	180.47	9617.68	-4476.65	37.53	4476.80	0.38	462724.05	772768.98	
13885.00	90.70	180.47	9615.92	-4572.63	36.74	4572.77	0.73	462628.07	772768.20	
13980.00	89.93	180.87	9615.39	-4667.62	35.63	4667.75	0.91	462533.08	772767.09	
14076.00	89.86	181.14	9615.57	-4763.60	33.95	4763.72	0.29	462437.09	772765.40	
14171.00	88.18	180.47	9617.19	-4858.58	32.62	4858.68	1.90	462342.12	772764.07	
14267.00	86.71	179.51	9621.47	-4954.48	32.63	4954.58	1.83	462246.22	772764.08	
14362.00	87.83	179.23	9626.00	-5049.36	33.68	5049.47	1.22	462151.33	772765.13	
14458.00	88.53	178.39	9629.05	-5145.29	35.67	5145.41	1.14	462055.41	772767.12	
14554.00	89.79	178.18	9630.45	-5241.24	38.54	5241.38	1.33	461959.46	772769.99	
14649.00	89.44	177.00	9631.09	-5336.15	42.54	5336.32	1.30	461864.55	772773.99	
14745.00	91.12	177.16	9630.62	-5432.02	47.43	5432.22	1.76	461768.68	772778.88	
14815.00	91.61	177.32	9628.96	-5501.92	50.80	5502.14	0.74	461698.78	772782.25	
14910.00	91.12	178.05	9626.69	-5596.81	54.63	5597.06	0.93	461603.88	772786.08	
15006.00	90.77	177.89	9625.11	-5692.74	58.03	5693.01	0.40	461507.96	772789.48	
15102.00	88.95	177.43	9625.34	-5788.65	61.95	5788.95	1.96	461412.04	772793.40	
15197.00	88.53	176.92	9627.43	-5883.51	66.63	5883.84	0.70	461317.18	772798.08	
15292.00	88.81	177.56	9629.64	-5978.38	71.20	5978.73	0.74	461222.32	772802.66	
15388.00	89.09	177.34	9631.40	-6074.27	75.48	6074.65	0.37	461126.43	772806.93	
15484.00	89.58	177.84	9632.51	-6170.17	79.51	6170.59	0.73	461030.52	772810.96	
15579.00	89.79	178.39	9633.03	-6265.12	82.64	6265.55	0.62	460935.57	772814.09	
15675.00	89.23	179.09	9633.86	-6361.09	84.75	6361.54	0.93	460839.60	772816.20	
15770.00	89.30	179.53	9635.07	-6456.08	85.89	6456.53	0.47	460744.62	772817.34	
15866.00	89.23	179.58	9636.31	-6552.07	86.64	6552.52	0.09	460648.63	772818.09	
15961.00	89.30	180.02	9637.52	-6647.06	86.97	6647.51	0.47	460553.64	772818.42	
16057.00	89.09	180.13	9638.87	-6743.05	86.84	6743.50	0.25	460457.65	772818.30	
16153.00	87.76	179.69	9641.51	-6839.01	86.99	6839.46	1.46	460361.68	772818.45	
16248.00	90.14	180.53	9643.25	-6933.99	86.81	6934.43	2.66	460266.71	772818.26	
16344.00	89.44	179.97	9643.60	-7029.98	86.39	7030.42	0.93	460170.71	772817.84	
16439.00	89.16	179.38	9644.77	-7124.98	86.93	7125.42	0.69	460075.72	772818.38	
16535.00	90.49	179.89	9645.06	-7220.97	87.54	7221.41	1.48	459979.73	772818.99	
16630.00	90.63	179.96	9644.13	-7315.97	87.67	7316.41	0.16	459884.73	772819.12	
16726.00	89.86	179.93	9643.72	-7411.96	87.76	7412.40	0.80	459788.73	772819.21	
16822.00	90.28	180.39	9643.60	-7507.96	87.49	7508.40	0.65	459692.73	772818.94	
16917.00	90.70	180.81	9642.79	-7602.95	86.50	7603.38	0.63	459597.74	772817.95	
17013.00	90.00	179.38	9642.20	-7698.95	86.34	7699.37	1.66	459501.75	772817.79	
17108.00	89.65	179.25	9642.49	-7793.94	87.47	7794.37	0.39	459406.75	772818.92	
17204.00	89.02	178.51	9643.61	-7889.92	89.35	7890.35	1.01	459310.78	772820.80	
17299.00	90.14	178.71	9644.30	-7984.88	91.65	7985.34	1.20	459215.81	772823.11	
17395.00	89.58	178.96	9644.54	-8080.86	93.61	8081.33	0.64	459119.83	772825.06	
17490.00	90.91	179.66	9644.13	-8175.85	94.75	8176.32	1.58	459024.84	772826.20	
17586.00	92.31	179.99	9641.43	-8271.81	95.04	8272.28	1.50	458928.88	772826.49	
17682.00	91.54	180.35	9638.21	-8367.76	94.76	8368.22	0.89	458832.94	772826.21	
17777.00	91.68	180.15	9635.54	-8462.72	94.34	8463.18	0.26	458737.98	772825.80	
17873.00	90.63	180.35	9633.61	-8558.70	93.92	8559.15	1.11	458642.00	772825.38	
17968.00	89.79	180.24	9633.26	-8653.69	93.44	8654.14	0.89	458547.00	772824.89	
18064.00	88.95	179.97	9634.31	-8749.69	93.26	8750.13	0.92	458451.01	772824.71	
18160.00	89.58	180.22	9635.54	-8845.68	93.10	8846.12	0.71	458355.02	772824.55	
18255.00	89.79	180.05	9636.07	-8940.68	92.88	8941.11	0.28	458260.02	772824.33	
18351.00	90.35	179.68	9635.95	-9036.68	93.10	9037.11	0.70	458164.02	772824.55	
18447.00	89.30	179.90	9636.24	-9132.67	93.45	9133.11	1.12	458068.02	772824.91	
18542.00	88.04	180.12	9638.45	-9227.65	93.44	9228.08	1.35	457973.05	772824.89	
18638.00	88.04	179.49	9641.73	-9323.59	93.76	9324.02	0.66	457877.11	772825.22	
18733.00	87.62	178.54	9645.33	-9418.50	95.40	9418.95	1.09	457782.19	772826.85	

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS 100US ft)	Northing (US ft)	Easting (US ft)	Comment
18829.00	89.16	178.35	9648.03	-9514.43	98.00	9514.89	1.62	457686.27	772829.45	
18924.00	87.83	179.33	9650.52	-9609.37	99.92	9609.84	1.74	457591.32	772831.38	
19020.00	86.43	179.88	9655.33	-9705.25	100.58	9705.72	1.57	457495.45	772832.04	
19115.00	85.02	181.50	9662.41	-9799.97	99.44	9800.43	2.26	457400.73	772830.90	
19211.00	85.38	182.16	9670.44	-9895.58	96.39	9896.02	0.78	457305.11	772827.84	
19269.35	85.07	181.87	9675.30	-9953.70	94.35	9954.12	0.73	457247.00	772825.80	Cross Prod Box
19290.00	84.96	181.76	9677.09	-9974.26	93.69	9974.67	0.75	457226.44	772825.15	Last Wft Svy
19365.00	84.96	181.76	9683.68	-10048.93	91.40	10049.33	0.00	457151.76	772822.85	Proj to Bit



Directional Survey

DELAWARE BASIN EAST UNRESTRICTED

Well Name: THISTLE UNIT 30H

Sub-Division DELAWARE BASIN EAST		Region BASIN EAST		Field Name JOHNSON RANCH		County LEA		State/Province NM					
Surface Legal Location SEC 28-23S-33E		APN/UA# 3002541147		Latitude (°) 32° 16' 55.88" N		Longitude (°) 103° 35' 4.49" W		Orig KB Elevation (ft) 3,704.50		Ground Elev MSL (ft) 3,681.00		KB - GL (ft) 23.50	
Wellbore Name OH		Parent Wellbore OH		SAP Well ID		Vertical Section Direction (°) 179.59							
Kick Offs & Key Depths													
Date 12/30/2015				Type CURVE				Top Depth (ft/KB) 9,070.0					
Actual Deviation Survey EXTREME, Proposed? No				Deviation? No		Proposed? No		Proposed Deviation Survey					
Deviation Survey													
Date 12/21/2015				Description EXTREME									
MD Tie In (ft/KB) 0.00		TVD Tie In (ft/KB) 0.00		Inclination Tie In (°) 0.00		Azimuth Tie In (°) 0.00		NS Tie In (ft) 0.00		EW Tie In (ft) 0.00			
Survey Data													
Date	MD (ft/KB)	Incl (°)	Azm (°)	TVD (ft/KB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Survey Tool	Survey Company			
12/21/2...	152.00	0.10	346.70	152.00	-0.13	0.13	-0.03	0.07	MWD	EXTREME			
12/21/2...	305.00	0.40	350.20	305.00	-0.79	0.79	-0.15	0.20	MWD	EXTREME			
12/21/2...	445.00	0.50	74.20	445.00	-1.43	1.43	0.35	0.43	MWD	EXTREME			
12/21/2...	586.00	0.20	237.60	585.99	-1.46	1.47	0.74	0.49	MWD	EXTREME			
12/21/2...	770.00	0.30	224.30	769.99	-0.95	0.95	0.13	0.06	MWD	EXTREME			
12/21/2...	955.00	0.60	196.30	954.99	0.32	-0.32	-0.48	0.20	MWD	EXTREME			
12/21/2...	1,138.00	0.40	233.30	1,137.98	1.62	-1.63	-1.26	0.20	MWD	EXTREME			
12/21/2...	1,322.00	0.40	253.10	1,321.98	2.18	-2.20	-2.39	0.07	MWD	EXTREME			
12/21/2...	1,445.00	0.40	280.53	1,444.97	2.22	-2.24	-3.22	0.15	MWD	EXTREME			
12/21/2...	1,628.00	0.48	288.83	1,627.97	1.85	-1.88	-4.58	0.06	MWD	EXTREME			
12/21/2...	1,819.00	0.40	295.99	1,818.96	1.29	-1.33	-5.93	0.05	MWD	EXTREME			
12/21/2...	2,010.00	0.31	284.92	2,009.96	0.85	-0.90	-7.03	0.06	MWD	EXTREME			
12/21/2...	2,201.00	0.22	254.60	2,200.96	0.81	-0.87	-7.89	0.09	MWD	EXTREME			
12/21/2...	2,390.00	0.09	156.29	2,389.96	1.04	-1.10	-8.18	0.13	MWD	EXTREME			
12/21/2...	2,584.00	0.09	123.03	2,583.96	1.26	-1.32	-7.99	0.03	MWD	EXTREME			
12/21/2...	2,772.00	0.22	344.82	2,771.95	1.00	-1.05	-7.98	0.16	MWD	EXTREME			
12/21/2...	2,968.00	0.22	336.42	2,967.95	0.29	-0.35	-8.21	0.02	MWD	EXTREME			
12/21/2...	3,158.00	0.31	297.01	3,157.95	-0.28	0.22	-8.81	0.10	MWD	EXTREME			
12/21/2...	3,348.00	0.22	209.60	3,347.95	-0.21	0.14	-9.45	0.20	MWD	EXTREME			
12/21/2...	3,539.00	0.22	89.32	3,538.95	0.11	-0.18	-9.26	0.20	MWD	EXTREME			
12/21/2...	3,731.00	0.30	63.30	3,730.95	-0.11	0.05	-8.45	0.07	MWD	EXTREME			
12/21/2...	3,921.00	0.60	32.72	3,920.94	-1.17	1.11	-7.46	0.20	MWD	EXTREME			
12/21/2...	4,113.00	0.50	61.81	4,112.93	-2.40	2.36	-6.18	0.15	MWD	EXTREME			
12/21/2...	4,304.00	0.80	59.70	4,303.92	-3.45	3.42	-4.30	0.16	MWD	EXTREME			
12/21/2...	4,491.00	1.50	87.30	4,490.88	-4.20	4.20	-0.72	0.47	MWD	EXTREME			
12/21/2...	4,591.00	1.60	84.00	4,590.85	-4.39	4.40	1.97	0.13	MWD	EXTREME			
12/21/2...	4,685.00	2.00	94.81	4,684.80	-4.37	4.40	4.91	0.56	MWD	EXTREME			
12/21/2...	4,777.00	2.60	97.80	4,776.73	-3.92	3.99	8.58	0.66	MWD	EXTREME			
12/21/2...	4,874.00	2.30	109.09	4,873.64	-2.96	3.05	12.60	0.58	MWD	EXTREME			
12/21/2...	4,971.00	1.80	127.29	4,970.58	-1.38	1.49	15.65	0.84	MWD	EXTREME			
12/21/2...	5,067.00	1.80	126.63	5,066.53	0.45	-0.32	18.06	0.02	MWD	EXTREME			
12/21/2...	5,195.00	1.70	125.53	5,194.47	2.78	-2.63	21.22	0.08	MWD	EXTREME			
12/21/2...	5,309.00	1.85	124.96	5,308.41	4.83	-4.66	24.10	0.13	MWD	WETHERFORD			
12/21/2...	5,500.00	1.84	123.36	5,499.32	8.32	-8.12	29.19	0.03	MWD	WETHERFORD			
12/21/2...	5,691.00	1.61	135.47	5,690.23	11.95	-11.71	33.63	0.23	MWD	WETHERFORD			
12/21/2...	5,882.00	1.66	137.51	5,881.15	15.93	-15.67	37.38	0.04	MWD	WETHERFORD			
12/21/2...	6,073.00	1.88	132.43	6,072.06	20.12	-19.82	41.56	0.14	MWD	WETHERFORD			
12/21/2...	6,264.00	0.73	146.87	6,263.01	23.27	-22.95	44.54	0.62	MWD	WETHERFORD			
12/21/2...	6,455.00	0.73	149.92	6,453.99	25.35	-25.03	45.82	0.02	MWD	WETHERFORD			
12/21/2...	6,646.00	0.55	126.96	6,644.98	26.97	-26.63	47.16	0.16	MWD	WETHERFORD			
12/21/2...	6,837.00	0.38	110.57	6,835.97	27.75	-27.40	48.48	0.11	MWD	WETHERFORD			
12/21/2...	7,028.00	0.14	149.18	7,026.97	28.18	-27.83	49.20	0.15	MWD	WETHERFORD			
12/21/2...	7,218.00	0.43	159.47	7,216.97	29.05	-28.69	49.57	0.15	MWD	WETHERFORD			
12/21/2...	7,409.00	0.41	140.98	7,407.96	30.25	-29.90	50.25	0.07	MWD	WETHERFORD			
12/21/2...	7,600.00	0.80	151.66	7,598.95	31.97	-31.60	51.31	0.21	MWD	WETHERFORD			
12/21/2...	7,791.00	0.70	129.06	7,789.94	33.89	-33.51	52.85	0.16	MWD	WETHERFORD			
12/21/2...	7,982.00	0.78	120.76	7,980.92	35.30	-34.91	54.87	0.07	MWD	WETHERFORD			
12/21/2...	8,173.00	1.07	153.85	8,171.90	37.58	-37.17	56.78	0.31	MWD	WETHERFORD			
12/21/2...	8,356.00	0.98	175.23	8,354.87	40.68	-40.27	57.66	0.21	MWD	WETHERFORD			
12/21/2...	8,547.00	1.02	175.94	8,545.84	44.00	-43.59	57.91	0.02	MWD	WETHERFORD			
12/21/2...	8,738.00	1.05	170.94	8,736.81	47.43	-47.02	58.31	0.05	MWD	WETHERFORD			
12/21/2...	8,929.00	1.00	180.56	8,927.78	50.83	-50.41	58.57	0.09	MWD	WETHERFORD			
12/21/2...	9,025.00	0.76	180.51	9,023.77	52.30	-51.88	58.56	0.25	MWD	WETHERFORD			
12/21/2...	9,088.00	4.35	193.66	9,086.69	55.04	-54.62	57.99	5.74	MWD	WETHERFORD			
12/21/2...	9,120.00	8.64	195.64	9,118.48	58.53	-58.12	57.05	13.42	MWD	WETHERFORD			
12/21/2...	9,152.00	12.70	193.83	9,149.92	64.25	-63.85	55.56	12.73	MWD	WETHERFORD			
12/21/2...	9,184.00	15.56	190.23	9,180.95	71.88	-71.49	53.96	9.35	MWD	WETHERFORD			
12/21/2...	9,216.00	18.00	190.92	9,211.59	80.95	-80.57	52.26	7.85	MWD	WETHERFORD			
12/21/2...	9,264.00	21.24	189.20	9,256.79	96.79	-96.44	49.46	6.86	MWD	WETHERFORD			
12/21/2...	9,312.00	26.12	186.96	9,300.74	115.86	-115.53	46.79	10.34	MWD	WETHERFORD			
12/21/2...	9,360.00	31.39	186.16	9,342.81	138.77	-138.46	44.17	11.01	MWD	WETHERFORD			
12/21/2...	9,407.00	37.33	184.80	9,381.59	165.15	-164.85	41.66	12.74	MWD	WETHERFORD			



Directional Survey

DELAWARE BASIN EAST UNRESTRICTED

Well Name: THISTLE UNIT 30H

Sub-Division		Region		Field Name				County		State/Province	
DELAWARE BASIN EAST		BASIN EAST		JOHNSON RANCH				LEA		NM	
Surface Legal Location		APN/UMI		Latitude (°)		Longitude (°)		Orig KB Elevation (ft)		Ground Elev MSL (ft)	
SEC 28-23S-33E		3002541147		32° 16' 55.88" N		103° 35' 4.49" W		3,704.50		3,681.00	
Survey Data											
Date	MD (ft)	Incl (°)	Azm (°)	TVD (ft)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company	
12/21/2...	9,455.00	42.84	183.64	9,418.30	195.94	-195.67	39.41	11.58	MWD	WETHERFORD	
12/21/2...	9,503.00	48.60	183.81	9,451.80	230.20	-229.94	37.17	12.00	MWD	WETHERFORD	
12/21/2...	9,550.00	53.47	184.24	9,481.34	266.63	-266.39	34.60	10.39	MWD	WETHERFORD	
12/21/2...	9,598.00	58.34	184.06	9,508.24	306.24	-306.02	31.73	10.15	MWD	WETHERFORD	
12/21/2...	9,646.00	63.11	184.31	9,531.71	347.96	-347.76	28.67	9.95	MWD	WETHERFORD	
12/21/2...	9,694.00	67.77	185.67	9,551.65	391.41	-391.24	24.87	10.04	MWD	WETHERFORD	
12/21/2...	9,742.00	71.65	186.71	9,568.30	436.12	-435.99	20.01	8.33	MWD	WETHERFORD	
12/21/2...	9,789.00	75.51	186.43	9,581.58	480.86	-480.77	14.85	8.23	MWD	WETHERFORD	
12/21/2...	9,837.00	80.52	187.28	9,591.54	527.42	-527.37	9.25	10.58	MWD	WETHERFORD	
12/21/2...	9,873.00	83.06	186.24	9,596.89	562.77	-562.75	5.05	7.61	MWD	WETHERFORD	
12/21/2...	9,937.00	88.25	184.23	9,601.53	626.26	-626.28	-0.78	8.69	MWD	WETHERFORD	
12/21/2...	9,969.00	89.86	182.35	9,602.06	658.18	-658.22	-2.60	7.73	MWD	WETHERFORD	
12/21/2...	10,064.00	91.47	182.22	9,600.96	753.07	-753.13	-6.39	1.70	MWD	WETHERFORD	
12/21/2...	10,160.00	90.21	180.72	9,599.55	849.00	-849.09	-8.85	2.04	MWD	WETHERFORD	
12/21/2...	10,255.00	90.42	180.41	9,599.03	943.99	-944.08	-9.79	0.39	MWD	WETHERFORD	
12/21/2...	10,351.00	89.58	180.36	9,599.03	1,039.98	-1,040.08	-10.43	0.88	MWD	WETHERFORD	
12/21/2...	10,446.00	89.58	180.67	9,599.72	1,134.96	-1,135.07	-11.29	0.33	MWD	WETHERFORD	
12/21/2...	10,542.00	90.00	179.05	9,600.08	1,230.96	-1,231.07	-11.05	1.74	MWD	WETHERFORD	
12/21/2...	10,638.00	89.65	177.21	9,600.37	1,326.92	-1,327.01	-7.92	1.95	MWD	WETHERFORD	
12/21/2...	10,733.00	89.44	177.25	9,601.12	1,421.84	-1,421.90	-3.33	0.23	MWD	WETHERFORD	
12/21/2...	10,829.00	89.72	177.46	9,601.83	1,517.76	-1,517.79	1.10	0.36	MWD	WETHERFORD	
12/21/2...	10,924.00	89.30	178.31	9,602.64	1,612.71	-1,612.72	4.61	1.00	MWD	WETHERFORD	
12/21/2...	11,020.00	89.37	178.16	9,603.75	1,708.68	-1,708.67	7.57	0.17	MWD	WETHERFORD	
12/21/2...	11,115.00	89.02	178.19	9,605.09	1,803.64	-1,803.61	10.59	0.37	MWD	WETHERFORD	
12/21/2...	11,211.00	89.79	179.28	9,606.09	1,899.62	-1,899.58	12.71	1.39	MWD	WETHERFORD	
12/21/2...	11,306.00	89.58	178.48	9,606.61	1,994.61	-1,994.56	14.57	0.87	MWD	WETHERFORD	
12/21/2...	11,402.00	90.07	178.64	9,606.90	2,090.60	-2,090.63	16.98	0.54	MWD	WETHERFORD	
12/21/2...	11,497.00	90.14	178.80	9,606.73	2,185.59	-2,185.51	19.10	0.18	MWD	WETHERFORD	
12/21/2...	11,592.00	90.77	179.27	9,605.97	2,280.58	-2,280.49	20.70	0.83	MWD	WETHERFORD	
12/21/2...	11,688.00	88.81	178.83	9,606.33	2,376.57	-2,376.47	22.29	2.09	MWD	WETHERFORD	
12/21/2...	11,783.00	88.11	178.30	9,608.88	2,471.52	-2,471.41	24.67	0.92	MWD	WETHERFORD	
12/21/2...	11,879.00	88.18	179.31	9,611.99	2,567.46	-2,567.33	26.67	1.05	MWD	WETHERFORD	
12/21/2...	11,974.00	88.25	179.18	9,614.95	2,662.41	-2,662.28	27.92	0.16	MWD	WETHERFORD	
12/21/2...	12,069.00	89.30	179.75	9,616.98	2,757.39	-2,757.25	28.81	1.26	MWD	WETHERFORD	
12/21/2...	12,165.00	89.65	179.54	9,617.86	2,853.38	-2,853.24	29.40	0.43	MWD	WETHERFORD	
12/21/2...	12,260.00	89.02	179.65	9,618.96	2,948.38	-2,948.24	30.08	0.67	MWD	WETHERFORD	
12/21/2...	12,356.00	89.23	179.82	9,620.42	3,044.36	-3,044.22	30.52	0.28	MWD	WETHERFORD	
12/21/2...	12,451.00	89.79	179.12	9,621.24	3,139.36	-3,139.21	31.40	0.94	MWD	WETHERFORD	
12/21/2...	12,547.00	90.49	178.72	9,621.00	3,235.35	-3,235.20	33.21	0.84	MWD	WETHERFORD	
12/21/2...	12,642.00	91.05	178.65	9,619.73	3,330.33	-3,330.16	35.39	0.59	MWD	WETHERFORD	
12/21/2...	12,738.00	91.26	178.93	9,617.79	3,426.30	-3,426.12	37.41	0.36	MWD	WETHERFORD	
12/21/2...	12,834.00	91.89	178.72	9,615.15	3,522.26	-3,522.06	39.38	0.69	MWD	WETHERFORD	
12/21/2...	12,929.00	91.26	179.72	9,612.54	3,617.22	-3,617.02	40.68	1.24	MWD	WETHERFORD	
12/21/2...	13,024.00	92.24	179.47	9,609.64	3,712.17	-3,711.97	41.35	1.06	MWD	WETHERFORD	
12/21/2...	13,120.00	89.65	179.81	9,608.06	3,808.15	-3,807.95	41.95	2.72	MWD	WETHERFORD	
12/21/2...	13,216.00	89.23	181.61	9,608.99	3,904.12	-3,903.93	40.76	1.93	MWD	WETHERFORD	
12/21/2...	13,311.00	87.41	180.64	9,611.78	3,999.04	-3,998.87	38.90	2.17	MWD	WETHERFORD	
12/21/2...	13,407.00	87.48	179.68	9,616.06	4,094.94	-4,094.77	38.63	1.00	MWD	WETHERFORD	
12/21/2...	13,502.00	88.25	179.61	9,619.60	4,189.87	-4,189.70	39.22	0.81	MWD	WETHERFORD	
12/21/2...	13,598.00	90.28	180.39	9,620.83	4,285.86	-4,285.69	39.22	2.27	MWD	WETHERFORD	
12/21/2...	13,693.00	91.05	180.58	9,619.73	4,380.84	-4,380.68	38.41	0.83	MWD	WETHERFORD	
12/21/2...	13,789.00	91.40	180.47	9,617.68	4,476.80	-4,476.65	37.53	0.38	MWD	WETHERFORD	
12/21/2...	13,885.00	90.70	180.47	9,615.92	4,572.78	-4,572.63	36.74	0.73	MWD	WETHERFORD	
12/21/2...	13,980.00	89.93	180.87	9,615.39	4,667.76	-4,667.62	35.63	0.91	MWD	WETHERFORD	
12/21/2...	14,076.00	89.86	181.14	9,615.57	4,763.73	-4,763.61	33.95	0.29	MWD	WETHERFORD	
12/21/2...	14,171.00	88.18	180.47	9,617.19	4,858.69	-4,858.58	32.62	1.90	MWD	WETHERFORD	
12/21/2...	14,267.00	86.71	179.51	9,621.47	4,954.59	-4,954.48	32.63	1.83	MWD	WETHERFORD	
12/21/2...	14,362.00	87.83	179.23	9,626.00	5,049.48	-5,049.37	33.68	1.22	MWD	WETHERFORD	
12/21/2...	14,458.00	88.53	178.39	9,629.05	5,145.42	-5,145.29	35.67	1.14	MWD	WETHERFORD	
12/21/2...	14,554.00	89.79	178.18	9,630.45	5,241.38	-5,241.24	38.54	1.33	MWD	WETHERFORD	
12/21/2...	14,649.00	89.44	177.00	9,631.09	5,336.32	-5,336.15	42.54	1.30	MWD	WETHERFORD	
12/21/2...	14,745.00	91.12	177.16	9,630.62	5,432.22	-5,432.02	47.43	1.76	MWD	WETHERFORD	
12/21/2...	14,815.00	91.61	177.32	9,628.96	5,502.14	-5,501.92	50.80	0.74	MWD	WETHERFORD	
12/21/2...	14,910.00	91.12	178.05	9,626.69	5,597.06	-5,596.82	54.63	0.93	MWD	WETHERFORD	
12/21/2...	15,006.00	90.77	177.89	9,625.11	5,693.01	-5,692.74	58.03	0.40	MWD	WETHERFORD	
12/21/2...	15,102.00	88.95	177.43	9,625.34	5,788.95	-5,788.66	61.95	1.96	MWD	WETHERFORD	
12/21/2...	15,197.00	88.53	176.92	9,627.43	5,883.84	-5,883.52	66.63	0.70	MWD	WETHERFORD	
12/21/2...	15,292.00	88.81	177.56	9,629.64	5,978.74	-5,978.38	71.20	0.74	MWD	WETHERFORD	
12/21/2...	15,388.00	89.09	177.34	9,631.40	6,074.66	-6,074.27	75.48	0.37	MWD	WETHERFORD	
12/21/2...	15,484.00	89.58	177.84	9,632.51	6,170.59	-6,170.18	79.51	0.73	MWD	WETHERFORD	
12/21/2...	15,579.00	89.79	178.39	9,633.03	6,265.56	-6,265.13	82.84	0.82	MWD	WETHERFORD	
12/21/2...	15,675.00	89.23	179.09	9,633.86	6,361.54	-6,361.10	84.75	0.93	MWD	WETHERFORD	
12/21/2...	15,770.00	89.30	179.53	9,635.07	6,456.53	-6,456.08	85.89	0.47	MWD	WETHERFORD	

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Report Printed: 3/16/2018



Directional Survey

DELAWARE BASIN EAST UNRESTRICTED

Well Name: THISTLE UNIT 30H

Sub-Direction		Region		Field Name		Country		Survey		
DELAWARE BASIN EAST		BASIN EAST		JOHNSON RANCH		LEA		NIN		
Surface Land Location		Easting (ft)		Latitude (°)		Longitude (°)		Ground Elevation (ft)		
SEC 28-23S-33E		3000254-1147		32° 16' 55.88" N		103° 35' 4.49" W		3,704.50		
Survey Data								3,681.00		
Date	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	VS (ft)	NS (ft)	EW (ft)	DLS	Survey Tool	Survey Company
12/21/2...	15,866.00	89.23	179.58	9,636.31	6,552.52	-6,552.07	86.64	0.09	MWD	WETTERFORD
12/21/2...	15,961.00	89.30	180.02	9,637.52	6,647.52	-6,647.06	86.97	0.47	MWD	WETTERFORD
12/21/2...	16,057.00	89.09	180.13	9,638.67	6,743.50	-6,743.05	86.84	0.26	MWD	WETTERFORD
12/21/2...	16,153.00	87.76	179.67	9,641.51	6,839.46	-6,839.02	87.07	1.47	MWD	WETTERFORD
12/21/2...	16,248.00	90.14	180.53	9,643.26	6,934.44	-6,933.99	86.84	2.66	MWD	WETTERFORD
12/21/2...	16,344.00	89.44	179.67	9,643.60	7,030.43	-7,029.99	86.43	0.93	MWD	WETTERFORD
12/21/2...	16,439.00	89.16	179.38	9,644.76	7,126.42	-7,124.98	86.96	0.69	MWD	WETTERFORD
12/21/2...	16,535.00	90.49	179.89	9,645.06	7,221.42	-7,220.97	87.58	1.48	MWD	WETTERFORD
12/21/2...	16,630.00	90.63	179.96	9,644.13	7,316.41	-7,315.97	87.70	0.16	MWD	WETTERFORD
12/21/2...	16,726.00	89.86	179.93	9,643.72	7,412.41	-7,411.97	87.79	0.80	MWD	WETTERFORD
12/21/2...	16,822.00	90.28	180.39	9,643.60	7,508.40	-7,507.97	87.62	0.65	MWD	WETTERFORD
12/21/2...	16,917.00	90.70	180.81	9,642.79	7,603.38	-7,602.96	86.53	0.83	MWD	WETTERFORD
12/21/2...	17,013.00	90.00	179.38	9,642.20	7,699.37	-7,698.95	86.37	1.66	MWD	WETTERFORD
12/21/2...	17,108.00	89.66	179.25	9,642.49	7,794.37	-7,793.95	87.51	0.39	MWD	WETTERFORD
12/21/2...	17,204.00	89.02	178.51	9,643.61	7,890.36	-7,889.92	89.38	1.01	MWD	WETTERFORD
12/21/2...	17,299.00	90.14	178.71	9,644.30	7,985.34	-7,984.89	91.69	1.20	MWD	WETTERFORD
12/21/2...	17,395.00	89.58	178.96	9,644.64	8,081.33	-8,080.87	93.64	0.64	MWD	WETTERFORD
12/21/2...	17,490.00	90.91	179.66	9,644.13	8,176.33	-8,175.86	94.78	1.58	MWD	WETTERFORD
12/21/2...	17,586.00	92.31	179.99	9,641.43	8,272.28	-8,271.82	95.08	1.50	MWD	WETTERFORD
12/21/2...	17,682.00	91.54	180.35	9,638.22	8,368.22	-8,367.76	94.79	0.89	MWD	WETTERFORD
12/21/2...	17,777.00	91.68	180.15	9,635.64	8,463.18	-8,462.72	94.36	0.26	MWD	WETTERFORD
12/21/2...	17,873.00	90.63	180.35	9,633.61	8,559.15	-8,558.70	93.96	1.11	MWD	WETTERFORD
12/21/2...	17,968.00	89.79	180.24	9,633.26	8,654.14	-8,653.70	93.47	0.89	MWD	WETTERFORD
12/21/2...	18,064.00	88.95	179.97	9,634.07	8,750.13	-8,749.69	93.29	0.92	MWD	WETTERFORD
12/21/2...	18,160.00	89.58	180.22	9,635.61	8,846.12	-8,845.68	93.13	0.71	MWD	WETTERFORD
12/21/2...	18,255.00	89.79	180.05	9,636.07	8,941.12	-8,940.68	92.97	0.28	MWD	WETTERFORD
12/21/2...	18,351.00	90.36	179.68	9,635.95	9,037.11	-9,036.68	93.14	0.70	MWD	WETTERFORD
12/21/2...	18,447.00	89.30	179.90	9,636.24	9,133.11	-9,132.68	93.49	1.12	MWD	WETTERFORD
12/21/2...	18,542.00	88.04	180.12	9,638.45	9,228.08	-9,227.65	93.47	1.35	MWD	WETTERFORD
12/21/2...	18,638.00	88.04	179.49	9,641.73	9,324.02	-9,323.59	93.80	0.86	MWD	WETTERFORD
12/21/2...	18,733.00	87.62	178.54	9,645.33	9,418.95	-9,418.51	95.43	1.09	MWD	WETTERFORD
12/21/2...	18,829.00	89.16	178.35	9,648.03	9,514.89	-9,514.43	98.03	1.62	MWD	WETTERFORD
12/21/2...	18,924.00	87.83	179.33	9,650.52	9,609.85	-9,609.38	99.96	1.74	MWD	WETTERFORD
12/21/2...	19,020.00	86.43	179.88	9,655.53	9,705.72	-9,705.25	100.82	1.57	MWD	WETTERFORD
12/21/2...	19,115.00	85.02	181.50	9,662.41	9,800.44	-9,799.97	99.48	2.26	MWD	WETTERFORD
12/21/2...	19,211.00	85.38	182.16	9,670.44	9,896.03	-9,895.59	96.42	0.78	MWD	WETTERFORD
12/21/2...	19,290.00	84.98	181.76	9,677.09	9,974.68	-9,974.26	93.73	0.73	MWD	WETTERFORD
12/21/2...	19,365.00	84.96	181.76	9,683.68	10,049.33	-10,048.94	91.44	0.00	BIT	WETTERFORD



Weatherford®

Evaluation, Drilling & Intervention
10000 West County Rd. 116
P.O. Box 61028
Midland, TX USA 79711
Tel. (432) 561-8892 Fax (432) 561-8895

Devon Energy
333 W. Sheridan Ave
Oklahoma City, OK, 73102

Date: January 13, 2016

Attention: Spencer Stuart

Re: Devon Energy
Well: Thistle Unit 30H
Lea County, New Mexico

Enclosed, please find the original survey performed on the referenced well by Precision Energy Services, Inc. (P-5 No. 676004), a Weatherford company. Other information required by your office is as follows:

Name & Title Of Surveyor	Well Number	Surveyed Depths	Dates Performed	Type of Survey
Shane Slater MWD Supervisor	30H	5309 MD 19290 MD	12/27/2015 1/8/2016	Measurement While Drilling

A notarized plan vs. actual is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Jonathan Leger
MWD Ops Coordinator

On this, the 22nd day of January, 2016, before me a notary public, the undersigned officer, personally appeared Jonathan Leger, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same for the purposes therein contained.

In witness hereof, I hereunto set my hand and official seal.

Notary Public

