

WPXENERGY

30-015-43841

WPX Energy

Eddy County, New Mexico (NAD 83)

Cavern State 16

1H

Wellbore #1

NM OIL CONSERVATION
ARTESIA DISTRICT

OCT 17 2016

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Design: Surveys

Standard Survey Report

29 August, 2016

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Company:	WPX Energy	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3182.50usft (Orion Phoenix)
Site:	Cavern State 16	MD Reference:	WELL @ 3182.50usft (Orion Phoenix)
Well:	1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM, Conroe

Project	Eddy County, New Mexico (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Well	1H		
Well Position	+N/-S	0.00 usft	Northing: 474,317.18 usft
	+E/-W	0.00 usft	Easting: 581,628.88 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Ground Level:	3,157.50 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	User Defined	8/10/2016	7.66	60.10	48,142

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	89.41	

Survey Program	Date: 8/29/2016				
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
155.00	2,106.00	MS MWD (Wellbore #1)	MWD	OWSG MWD - Standard	
2,162.00	13,850.00	MS MWD + Surcon MSA (Wellbore #1)	MWD	OWSG MWD - Standard	

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155.00	0.60	105.00	155.00	-0.21	0.78	0.78	0.39	0.39	0.00
307.00	1.30	114.10	306.98	-1.12	3.13	3.11	0.47	0.46	5.99
404.00	1.90	107.40	403.94	-2.05	5.67	5.64	0.65	0.62	-6.91
518.00	2.10	105.00	517.87	-3.16	9.49	9.45	0.19	0.18	-2.11
698.00	0.60	67.20	697.82	-3.64	13.54	13.50	0.93	-0.83	-21.00
789.00	0.50	33.80	788.81	-3.13	14.20	14.17	0.36	-0.11	-36.70
879.00	0.50	43.50	878.81	-2.52	14.69	14.66	0.09	0.00	10.78
970.00	0.40	32.70	969.80	-1.96	15.13	15.11	0.14	-0.11	-11.87
1,060.00	0.40	41.20	1,059.80	-1.46	15.51	15.50	0.07	0.00	9.44
1,150.00	0.70	84.00	1,149.80	-1.17	16.27	16.25	0.54	0.33	47.56
1,240.00	2.00	100.50	1,239.77	-1.40	18.36	18.34	1.49	1.44	18.33
1,331.00	3.00	105.80	1,330.68	-2.34	22.21	22.18	1.13	1.10	5.82
1,420.00	2.10	126.40	1,419.60	-3.94	25.76	25.72	1.43	-1.01	23.15
1,511.00	0.70	164.90	1,510.57	-5.46	27.25	27.19	1.77	-1.54	42.31

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM Conroe

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,601.00	0.90	147.80	1,600.56	-6.59	27.77	27.70	0.34	0.22	-19.00
1,695.00	2.20	121.00	1,694.53	-8.15	29.71	29.62	1.55	1.38	-28.51
1,790.00	0.30	103.10	1,789.50	-9.14	31.51	31.42	2.02	-2.00	-18.84
1,885.00	0.20	298.90	1,884.50	-9.12	31.61	31.52	0.52	-0.11	-172.84
1,979.00	0.40	272.30	1,978.50	-9.03	31.14	31.05	0.25	0.21	-28.30
2,074.00	0.40	226.20	2,073.49	-9.24	30.57	30.47	0.33	0.00	-48.53
2,106.00	0.40	231.40	2,105.49	-9.39	30.40	30.30	0.11	0.00	16.25
2,162.00	0.71	277.13	2,161.49	-9.47	29.91	29.81	0.92	0.54	81.67
2,258.00	3.39	302.27	2,257.42	-7.88	26.92	26.84	2.89	2.80	26.18
2,353.00	7.01	294.13	2,352.02	-4.01	19.25	19.21	3.87	3.80	-8.56
2,448.00	10.00	293.54	2,445.96	1.66	6.39	6.41	3.16	3.15	-0.63
2,542.00	11.02	294.09	2,538.38	8.59	-9.29	-9.20	1.08	1.08	0.59
2,638.00	10.62	283.34	2,632.69	14.37	-26.27	-26.12	2.14	-0.41	-11.20
2,733.00	10.53	271.43	2,726.08	16.61	-43.47	-43.30	2.30	-0.10	-12.54
2,828.00	10.22	268.81	2,819.53	16.65	-60.58	-60.41	0.59	-0.32	-2.76
2,923.00	10.00	268.85	2,913.05	16.31	-77.26	-77.08	0.24	-0.24	0.04
3,018.00	9.43	268.56	3,006.69	15.95	-93.28	-93.11	0.61	-0.60	-0.30
3,113.00	9.43	260.10	3,100.41	14.42	-108.72	-108.57	1.46	0.00	-8.91
3,208.00	7.62	252.23	3,194.36	11.16	-122.38	-122.26	2.26	-1.90	-8.28
3,302.00	7.40	251.23	3,287.56	7.31	-134.05	-133.97	0.27	-0.23	-1.06
3,397.00	4.71	253.06	3,382.02	4.20	-143.58	-143.53	2.84	-2.83	1.93
3,493.00	2.51	242.73	3,477.82	2.09	-149.22	-149.19	2.38	-2.29	-10.76
3,588.00	0.40	4.97	3,572.80	1.46	-151.05	-151.02	2.89	-2.23	128.67
3,682.00	1.01	39.41	3,666.79	2.43	-150.49	-150.46	0.77	0.66	36.64
3,778.00	0.88	30.97	3,762.77	3.72	-149.57	-149.52	0.20	-0.14	-8.79
3,872.00	0.79	27.37	3,856.76	4.91	-148.90	-148.84	0.11	-0.09	-3.83
3,967.00	0.71	25.97	3,951.76	6.02	-148.34	-148.27	0.09	-0.09	-1.48
4,062.00	0.62	15.55	4,046.75	7.04	-147.95	-147.87	0.16	-0.09	-10.97
4,156.00	0.70	11.33	4,140.74	8.10	-147.70	-147.61	0.11	0.09	-4.49
4,250.00	0.62	347.10	4,234.74	9.16	-147.70	-147.60	0.31	-0.09	-25.77
4,346.00	0.79	339.14	4,330.73	10.28	-148.05	-147.94	0.21	0.18	-8.29
4,441.00	0.88	339.78	4,425.72	11.58	-148.54	-148.41	0.09	0.09	0.68
4,536.00	1.01	339.89	4,520.71	13.06	-149.08	-148.94	0.14	0.14	0.11
4,630.00	1.01	339.82	4,614.69	14.62	-149.65	-149.49	0.00	0.00	-0.07
4,725.00	0.79	339.04	4,709.68	16.02	-150.18	-150.00	0.23	-0.23	-0.83
4,821.00	0.88	211.45	4,805.68	16.01	-150.80	-150.63	1.57	0.09	-132.90
4,916.00	1.19	206.73	4,900.66	14.51	-151.62	-151.47	0.34	0.32	-4.96
5,010.00	1.19	212.57	4,994.64	12.81	-152.59	-152.45	0.13	0.00	6.21
5,105.00	1.32	210.17	5,089.62	11.03	-153.67	-153.55	0.15	0.14	-2.52
5,200.00	1.32	207.48	5,184.59	9.11	-154.73	-154.62	0.07	0.00	-2.83
5,295.00	1.41	207.66	5,279.57	7.11	-155.77	-155.69	0.09	0.09	0.18
5,390.00	1.32	207.82	5,374.54	5.10	-156.83	-156.77	0.09	-0.09	0.17
5,485.00	1.19	213.36	5,469.52	3.31	-157.88	-157.84	0.19	-0.14	5.83

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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,580.00	1.01	210.68	5,564.50	1.76	-158.85	-158.83	0.19	-0.19	-2.82
5,675.00	0.70	181.28	5,659.49	0.46	-159.29	-159.28	0.56	-0.32	-30.94
5,770.00	0.62	136.13	5,754.48	-0.50	-158.95	-158.95	0.54	-0.09	-47.53
5,865.00	0.22	240.10	5,849.48	-0.96	-158.76	-158.76	0.74	-0.42	109.44
5,960.00	0.62	267.41	5,944.48	-1.07	-159.43	-159.43	0.46	0.42	28.75
6,055.00	1.10	260.74	6,039.47	-1.24	-160.84	-160.84	0.52	0.51	-7.03
6,150.00	1.72	277.44	6,134.44	-1.20	-163.15	-163.15	0.77	0.65	17.58
6,245.00	1.10	30.74	6,229.42	-0.23	-164.10	-164.09	2.50	-0.65	119.26
6,339.00	1.10	30.30	6,323.40	1.32	-163.18	-163.16	0.01	0.00	-0.47
6,434.00	0.88	350.42	6,418.39	2.83	-162.84	-162.80	0.74	-0.23	-41.97
6,528.00	1.10	317.43	6,512.38	4.21	-163.57	-163.52	0.64	0.23	-35.10
6,624.00	0.40	73.56	6,608.37	4.98	-163.88	-163.82	1.38	-0.73	120.98
6,718.00	0.09	212.58	6,702.37	5.01	-163.60	-163.54	0.50	-0.33	147.89
6,813.00	0.62	247.13	6,797.37	4.75	-164.11	-164.06	0.58	0.56	36.37
6,908.00	0.62	258.97	6,892.36	4.46	-165.09	-165.03	0.13	0.00	12.46
7,003.00	0.79	307.93	6,987.36	4.76	-166.11	-166.05	0.64	0.19	51.54
7,097.00	1.10	309.76	7,081.34	5.74	-167.31	-167.25	0.33	0.33	1.95
7,193.00	1.19	312.85	7,177.32	7.01	-168.75	-168.67	0.11	0.09	3.22
7,288.00	0.22	193.18	7,272.32	7.50	-169.52	-169.43	1.38	-1.02	-125.97
7,382.00	0.62	222.24	7,366.32	6.95	-169.90	-169.82	0.47	0.42	30.92
7,477.00	0.48	247.46	7,461.31	6.42	-170.61	-170.54	0.29	-0.14	26.55
7,572.00	1.01	261.09	7,556.30	6.13	-171.81	-171.74	0.58	0.56	14.34
7,667.00	1.32	261.41	7,651.28	5.84	-173.73	-173.66	0.32	0.32	0.33
7,761.00	1.01	181.13	7,745.27	4.85	-174.81	-174.75	1.62	-0.33	-85.40
7,856.00	1.19	121.99	7,840.25	3.49	-173.99	-173.95	1.15	0.19	-62.25
7,951.00	0.31	139.88	7,935.25	2.77	-172.99	-172.96	0.95	-0.93	18.83
8,046.00	0.62	215.66	8,030.24	2.16	-173.13	-173.10	0.65	0.32	79.77
8,141.00	0.62	254.55	8,125.24	1.61	-173.92	-173.89	0.43	0.00	40.94
8,236.00	0.70	323.21	8,220.23	1.94	-174.76	-174.73	0.79	0.09	72.27
8,331.00	0.88	329.99	8,315.22	3.04	-175.47	-175.43	0.21	0.19	7.14
8,385.00	0.88	312.83	8,369.22	3.68	-175.99	-175.94	0.49	0.00	-31.78
8,453.00	0.62	330.02	8,437.21	4.35	-176.55	-176.50	0.51	-0.39	25.28
8,547.00	8.88	94.33	8,530.85	4.24	-169.56	-169.50	9.83	8.79	132.25
8,642.00	18.68	93.19	8,623.00	2.84	-147.00	-146.97	10.32	10.32	-1.21
8,736.00	30.41	92.64	8,708.36	0.90	-108.07	-108.06	12.49	12.48	-0.58
8,831.00	41.04	95.72	8,785.38	-3.33	-52.85	-52.89	11.34	11.19	3.24
8,925.00	49.18	95.86	8,851.66	-10.05	13.35	13.24	8.66	8.66	0.15
9,020.00	57.33	91.67	8,908.46	-14.90	89.22	89.06	9.28	8.58	-4.41
9,067.94	59.35	86.82	8,933.63	-14.34	130.00	129.85	9.59	4.21	-10.13
FTP - 9067.94' MD									
9,074.00	59.62	86.22	8,936.71	-14.03	135.21	135.06	9.59	4.42	-9.89
Top of Wolfcamp - 9074.00' MD									
9,115.00	61.50	82.25	8,956.87	-10.43	170.73	170.61	9.59	4.59	-9.68
9,210.00	64.77	84.45	8,999.80	-0.64	254.89	254.87	4.02	3.44	2.32



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9,305.00	74.28	86.98	9,032.99	5.93	343.53	343.57	10.32	10.02	2.66
9,400.00	84.21	88.02	9,050.69	9.98	436.66	436.74	10.51	10.45	1.09
9,478.00	87.29	88.28	9,056.47	12.48	514.39	514.49	3.96	3.94	0.33
9,524.00	86.89	87.14	9,058.80	14.32	560.30	560.41	2.64	-0.87	-2.50
9,614.00	88.00	87.61	9,062.82	18.44	650.11	650.27	1.34	1.23	0.53
9,706.00	89.01	90.05	9,065.22	20.31	742.05	742.22	2.86	1.10	2.64
9,797.00	89.01	90.48	9,066.80	19.89	833.04	833.20	0.48	0.00	0.48
9,887.00	87.69	90.23	9,069.40	19.34	923.00	923.15	1.49	-1.47	-0.28
9,978.00	87.69	90.04	9,073.07	19.12	1,013.92	1,014.06	0.20	0.00	-0.20
10,069.00	86.41	89.35	9,077.76	19.60	1,104.80	1,104.94	1.60	-1.41	-0.76
10,160.00	87.51	89.34	9,082.59	20.64	1,195.66	1,195.81	1.21	1.21	0.00
10,250.00	91.70	90.67	9,083.22	20.63	1,285.64	1,285.78	4.88	4.65	1.47
10,341.00	88.21	88.90	9,083.29	20.98	1,376.62	1,376.76	4.29	-3.83	-1.94
10,432.00	87.60	88.91	9,086.61	22.72	1,467.54	1,467.70	0.68	-0.68	0.01
10,523.00	89.32	90.67	9,089.06	23.06	1,558.50	1,558.66	2.70	1.89	1.93
10,614.00	90.42	90.40	9,089.27	22.22	1,649.49	1,649.64	1.24	1.21	-0.29
10,705.00	90.29	89.88	9,088.71	21.99	1,740.49	1,740.63	0.59	-0.15	-0.57
10,796.00	88.22	89.61	9,089.90	22.40	1,831.48	1,831.61	2.29	-2.27	-0.30
10,887.00	88.39	89.52	9,092.59	23.09	1,922.44	1,922.57	0.21	0.19	-0.09
10,978.00	91.61	90.22	9,092.59	23.30	2,013.42	2,013.56	3.62	3.54	0.76
11,069.00	89.80	89.61	9,091.47	23.44	2,104.41	2,104.54	2.10	-1.98	-0.67
11,160.00	91.12	89.53	9,090.74	24.13	2,195.40	2,195.54	1.45	1.45	-0.09
11,251.00	87.38	86.98	9,091.93	26.89	2,286.33	2,286.49	4.98	-4.12	-2.79
11,342.00	89.89	88.11	9,094.10	30.79	2,377.21	2,377.40	3.02	2.76	1.23
11,433.00	91.12	88.98	9,093.30	33.10	2,468.18	2,468.39	1.66	1.36	0.96
11,524.00	91.30	90.40	9,091.37	33.60	2,559.15	2,559.36	1.57	0.19	1.56
11,615.00	92.09	90.68	9,088.68	32.74	2,650.11	2,650.31	0.92	0.87	0.30
11,707.00	91.52	89.88	9,085.78	32.30	2,742.06	2,742.25	1.07	-0.62	-0.86
11,798.00	90.60	89.07	9,084.10	33.13	2,833.04	2,833.23	1.35	-1.02	-0.89
11,889.00	88.79	88.38	9,084.59	35.15	2,924.01	2,924.22	2.13	-1.99	-0.76
11,980.00	88.22	88.72	9,086.97	37.45	3,014.95	3,015.18	0.73	-0.63	0.38
12,071.00	91.12	89.98	9,087.49	38.48	3,105.93	3,106.16	3.48	3.19	1.38
12,162.00	87.91	88.19	9,088.26	39.93	3,196.90	3,197.14	4.04	-3.53	-1.96
12,252.00	88.48	88.72	9,091.10	42.35	3,286.82	3,287.09	0.86	0.64	0.58
12,343.00	89.49	88.98	9,092.70	44.17	3,377.79	3,378.07	1.15	1.11	0.29
12,434.00	88.30	87.51	9,094.45	46.96	3,468.73	3,469.03	2.08	-1.31	-1.62
12,525.00	89.58	87.39	9,096.13	51.01	3,559.62	3,559.96	1.41	1.40	-0.13
12,616.00	90.29	87.14	9,096.24	55.35	3,650.51	3,650.89	0.82	0.77	-0.27
12,707.00	88.00	86.78	9,097.60	60.17	3,741.37	3,741.79	2.55	-2.52	-0.39
12,798.00	88.30	87.67	9,100.54	64.57	3,832.22	3,832.68	1.04	0.34	0.98
12,889.00	89.01	90.93	9,102.68	65.68	3,923.17	3,923.64	3.66	0.77	3.58
12,980.00	87.11	90.06	9,105.76	64.89	4,014.11	4,014.57	2.29	-2.08	-0.96
13,071.00	90.29	92.51	9,107.82	62.85	4,105.04	4,105.47	4.41	3.49	2.69

Company:	WPX Energy	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3182.50usft (Orion Phoenix)
Site:	Cavern State 16	MD Reference:	WELL @ 3182.50usft (Orion Phoenix)
Well:	1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM Conroe

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,162.00	90.99	92.25	9,106.81	59.07	4,195.96	4,196.35	0.83	0.77	-0.29
13,254.00	89.89	92.24	9,106.10	55.47	4,287.89	4,288.23	1.20	-1.20	0.00
13,344.00	89.19	92.43	9,106.83	51.80	4,377.81	4,378.11	0.81	-0.78	0.20
13,435.00	89.10	92.77	9,108.19	47.67	4,468.70	4,468.96	0.39	-0.10	0.38
13,526.00	90.20	93.31	9,108.75	42.84	4,559.57	4,559.77	1.35	1.21	0.59
13,617.00	89.19	92.95	9,109.24	37.87	4,650.43	4,650.58	1.18	-1.11	-0.40
13,708.00	90.11	93.92	9,109.80	32.42	4,741.27	4,741.35	1.47	1.02	1.06
13,722.40	89.97	93.92	9,109.79	31.44	4,755.63	4,755.70	1.01	-1.01	0.00
LTP - 13722.40' MD									
13,778.00	89.41	93.92	9,110.10	27.64	4,811.10	4,811.13	1.01	-1.01	0.00
13,850.00	89.41	93.92	9,110.84	22.71	4,882.93	4,882.90	0.00	0.00	0.00
Projection to TD - 13850.00' MD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,067.94	8,933.63	-14.34	130.00	FTP - 9067.94' MD
9,074.00	8,936.71	-14.03	135.21	Top of Wolfcamp - 9074.00' MD
13,722.40	9,109.79	31.44	4,755.63	LTP - 13722.40' MD
13,850.00	9,110.84	22.71	4,882.93	Projection to TD - 13850.00' MD