



September 5, 2017

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capitol Station
Austin, Texas 78711

Attention: Regulatory Department

Re: Shell Western Exploration and Production Co.
University 19 PW Unit 1404H
Loving County, TX
API #42-301-33215
Job No. 60916

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced Well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Jerad Steel	1404H	245	21,091	6/17/17	8/24/17	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Brittany Carley

Brittany Carley
Operations Administrator



SWEPI

**Loving County, Texas (NAD27)
University 19 PW Unit
1404H**

OH / Job #60916

Survey: Phoenix MWD Surveys

Standard Survey Report

25 August, 2017





Phoenix Technology Services LP

Survey Report



Company:	SWEPI	Local Co-ordinate Reference:	Well 1404H
Project:	Loving County, Texas (NAD27)	TVD Reference:	GL + KB @ 2800.10usft (Ensign 775)
Site:	University 19 PW Unit	MD Reference:	GL + KB @ 2800.10usft (Ensign 775)
Well:	1404H	North Reference:	Grid
Wellbore:	OH / Job #60916	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 775)	Database:	Compass 5000 GCR

Project	Loving County, Texas (NAD27), Loving, Texas		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Texas Central 4203		

Site	University 19 PW Unit		
Site Position:		Northing:	750,929.42 usft
From:	Map	Easting:	1,038,505.07 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	31° 41' 40.73279 N
		Longitude:	103° 25' 30.14063 W
		Grid Convergence:	-1.59 °

Well	1404H		
Well Position	+N-S	0.00 usft	Northing: 752,562.10 usft
	+E-W	0.00 usft	Easting: 1,040,629.64 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	31° 41' 57.46848 N
		Longitude:	103° 25' 6.08351 W
		Ground Level:	2,772.10 usft

Wellbore	OH / Job #60916				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/1/2017	7.02	59.55	47,632

Design	Surveys (Ensign 775)				
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	163.72	

Survey Program	Date	8/25/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
245.00	21,139.00	Phoenix MWD Surveys (OH / Job #60916)	MWD+HDGM+AX	OWSG Rev.2 MWD + HDGM + Axial Correction	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
245.00	1.14	11.67	244.98	2.39	0.49	-2.15	0.47	0.47	0.00	
First Phoenix MWD Survey										
423.00	4.84	317.04	422.73	9.62	-4.27	-10.43	2.41	2.08	-30.69	
606.00	4.91	319.90	605.07	21.26	-14.57	-24.49	0.14	0.04	1.56	
786.00	4.55	323.46	784.46	32.89	-23.79	-38.24	0.26	-0.20	1.98	
967.00	4.43	320.65	964.90	44.06	-32.49	-51.40	0.14	-0.07	-1.55	
1,145.00	4.17	323.69	1,142.40	54.59	-40.68	-63.81	0.19	-0.15	1.71	
1,324.00	4.43	325.87	1,320.90	65.56	-48.42	-76.50	0.17	0.15	1.22	
1,413.00	4.16	320.86	1,409.65	70.91	-52.38	-82.75	0.52	-0.30	-5.63	
1,592.00	4.68	296.29	1,588.13	79.18	-63.03	-93.67	1.09	0.29	-13.73	



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Well:	1404H	North Reference:	Grid
Wellbore:	OH / Job #60916	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 775)	Database:	Compass 5000 GCR

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)
1,771.00	4.61	300.77	1,766.54	86.09	-75.76	-103.88	0.21	-0.04	2.50
1,949.00	4.28	300.14	1,944.01	93.09	-87.65	-113.93	0.19	-0.19	-0.35
2,128.00	4.34	304.48	2,122.50	100.28	-99.01	-124.01	0.19	0.03	2.42
2,306.00	4.07	308.51	2,300.02	108.02	-109.50	-134.39	0.22	-0.15	2.26
2,485.00	4.19	308.86	2,478.56	116.08	-119.56	-144.94	0.07	0.07	0.20
2,663.00	3.90	319.91	2,656.12	124.79	-128.53	-155.82	0.47	-0.16	6.21
2,842.00	3.83	298.68	2,834.72	132.32	-137.69	-165.61	0.80	-0.04	-11.86
3,021.00	3.63	303.74	3,013.34	138.34	-147.65	-174.18	0.22	-0.11	2.83
3,200.00	3.11	305.86	3,192.03	144.33	-156.30	-182.36	0.30	-0.29	1.18
3,378.00	2.44	307.06	3,369.82	149.44	-163.23	-189.21	0.38	-0.38	0.67
3,557.00	1.76	322.13	3,548.70	153.91	-167.96	-194.82	0.49	-0.38	8.42
3,736.00	1.05	30.06	3,727.66	157.50	-168.83	-198.51	0.94	-0.40	37.95
3,915.00	2.74	74.36	3,906.56	160.07	-163.89	-199.59	1.18	0.94	24.75
4,093.00	1.66	94.13	4,084.43	161.03	-157.22	-198.65	0.73	-0.61	11.11
4,272.00	0.71	124.79	4,263.39	160.21	-153.72	-196.88	0.62	-0.53	17.13
4,451.00	0.71	118.74	4,442.37	159.04	-151.84	-195.23	0.04	0.00	-3.38
4,630.00	1.24	109.53	4,621.35	157.86	-149.04	-193.31	0.31	0.30	-5.15
4,808.00	2.17	103.18	4,799.27	156.45	-143.94	-190.53	0.53	0.52	-3.57
4,970.00	1.81	100.32	4,961.17	155.29	-138.44	-187.88	0.23	-0.22	-1.77
5,149.00	1.96	101.92	5,140.07	154.16	-132.66	-185.16	0.09	0.08	0.89
5,328.00	0.47	136.84	5,319.03	152.99	-129.17	-183.06	0.89	-0.83	19.51
5,506.00	0.70	277.49	5,497.03	152.60	-129.74	-182.85	0.62	0.13	79.02
5,685.00	0.59	280.22	5,676.01	152.90	-131.74	-183.70	0.06	-0.06	1.53
5,863.00	0.69	270.78	5,854.00	153.08	-133.71	-184.42	0.08	0.06	-5.30
5,953.00	0.74	271.62	5,944.00	153.10	-134.83	-184.76	0.06	0.06	0.93
6,131.00	0.65	273.79	6,121.98	153.20	-136.99	-185.46	0.05	-0.05	1.22
6,310.00	0.70	267.33	6,300.97	153.22	-139.09	-186.07	0.05	0.03	-3.61
6,489.00	0.68	262.57	6,479.96	153.03	-141.24	-186.49	0.03	-0.01	-2.66
6,668.00	0.67	260.04	6,658.94	152.71	-143.32	-186.77	0.02	-0.01	-1.41
6,846.00	0.78	269.82	6,836.93	152.53	-145.56	-187.22	0.09	0.06	5.49
7,025.00	0.94	258.97	7,015.91	152.24	-148.22	-187.69	0.13	0.09	-6.06
7,204.00	1.03	249.74	7,194.88	151.41	-151.17	-187.71	0.10	0.05	-5.16
7,382.00	1.08	236.18	7,372.85	149.92	-154.06	-187.10	0.14	0.03	-7.62
7,561.00	1.10	218.65	7,551.82	147.64	-156.54	-185.60	0.19	0.01	-9.79
7,740.00	1.02	221.68	7,730.79	145.11	-158.67	-183.77	0.05	-0.04	1.69
7,918.00	0.86	228.61	7,908.77	143.04	-160.73	-182.36	0.11	-0.09	3.89
8,097.00	0.92	232.88	8,087.75	141.28	-162.88	-181.28	0.05	0.03	2.39
8,276.00	1.11	225.55	8,266.72	139.20	-165.26	-179.95	0.13	0.11	-4.09
8,454.00	1.11	227.13	8,444.68	136.82	-167.76	-178.36	0.02	0.00	0.89
8,633.00	1.06	230.39	8,623.65	134.59	-170.30	-176.93	0.04	-0.03	1.82
8,812.00	0.91	233.00	8,802.63	132.68	-172.72	-175.77	0.09	-0.08	1.46
8,901.00	0.79	263.96	8,891.62	132.19	-173.89	-175.63	0.53	-0.13	34.79
9,080.00	1.06	264.05	9,070.59	131.88	-176.76	-176.15	0.15	0.15	0.05



Phoenix Technology Services LP

Survey Report



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Site:	University 19 PW Unit	MD Reference:	GL + KB @ 2800.10usft (Ensign 775)
Well:	1404H	North Reference:	Grid
Wellbore:	OH / Job #60916	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 775)	Database:	Compass 5000 GCR

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)	
9,259.00	1.40	269.70	9,249.55	131.70	-180.60	-177.05	0.20	0.19	3.16	
9,437.00	1.43	271.77	9,427.50	131.76	-184.99	-178.33	0.03	0.02	1.16	
9,527.00	1.73	270.48	9,517.46	131.80	-187.47	-179.07	0.34	0.33	-1.43	
9,705.00	2.36	268.09	9,695.35	131.70	-193.82	-180.76	0.36	0.35	-1.34	
9,884.00	4.27	263.72	9,874.04	130.85	-204.13	-182.83	1.08	1.07	-2.44	
10,064.00	4.86	269.33	10,053.47	130.03	-218.42	-186.05	0.41	0.33	3.12	
10,243.00	4.02	267.19	10,231.93	129.63	-232.27	-189.55	0.48	-0.47	-1.20	
10,422.00	4.00	262.51	10,410.49	128.51	-244.72	-191.96	0.18	-0.01	-2.61	
10,600.00	3.29	260.62	10,588.13	126.87	-255.92	-193.53	0.40	-0.40	-1.06	
10,779.00	2.29	262.24	10,766.92	125.55	-264.53	-194.67	0.56	-0.56	0.91	
10,958.00	1.72	270.28	10,945.81	125.08	-270.76	-195.97	0.35	-0.32	4.49	
11,062.00	2.62	199.55	11,049.75	122.85	-273.11	-194.49	2.52	0.87	-68.01	
11,151.00	9.22	167.21	11,138.24	113.97	-272.22	-185.71	8.03	7.42	-36.34	
11,240.00	16.64	162.62	11,224.93	94.83	-266.82	-165.82	8.41	8.34	-5.16	
11,330.00	25.10	163.46	11,308.95	64.17	-257.52	-133.79	9.41	9.40	0.93	
11,419.00	35.32	160.75	11,385.76	21.67	-243.63	-89.10	11.58	11.48	-3.04	
11,509.00	46.21	160.99	11,453.82	-33.77	-224.41	-30.50	12.10	12.10	0.27	
11,598.00	57.84	163.25	11,508.50	-100.45	-203.02	39.51	13.22	13.07	2.54	
11,688.00	63.63	163.63	11,552.47	-175.67	-180.66	117.99	6.44	6.43	0.42	
11,777.00	69.65	163.54	11,587.75	-254.01	-157.58	199.65	6.76	6.76	-0.10	
11,866.00	81.04	160.76	11,610.23	-335.81	-131.18	285.57	13.15	12.80	-3.12	
11,931.00	90.14	161.33	11,615.22	-397.04	-110.15	350.24	14.03	14.00	0.88	
11,996.00	90.67	164.93	11,614.77	-459.23	-91.29	415.23	5.60	0.82	5.54	
12,089.00	90.62	175.60	11,613.72	-550.75	-75.59	507.48	11.47	-0.05	11.47	
12,184.00	92.41	179.11	11,611.20	-645.60	-71.21	599.75	4.15	1.88	3.69	
12,279.00	93.38	173.17	11,606.40	-740.22	-64.82	692.37	6.33	1.02	-6.25	
12,374.00	90.47	169.43	11,603.21	-834.05	-50.46	786.46	4.99	-3.06	-3.94	
12,468.00	88.11	167.05	11,604.37	-926.05	-31.31	880.15	3.57	-2.51	-2.53	
12,562.00	87.59	164.33	11,607.90	-1,017.07	-8.10	974.01	2.94	-0.55	-2.89	
12,657.00	88.27	163.71	11,611.33	-1,108.33	18.04	1,068.95	0.97	0.72	-0.65	
12,752.00	89.36	164.52	11,613.30	-1,199.68	44.04	1,163.93	1.43	1.15	0.85	
12,847.00	89.50	163.88	11,614.24	-1,291.09	69.90	1,258.92	0.69	0.15	-0.67	
12,942.00	89.75	162.93	11,614.86	-1,382.13	97.03	1,353.91	1.03	0.26	-1.00	
13,037.00	90.36	161.13	11,614.77	-1,472.49	126.34	1,448.87	2.00	0.64	-1.89	
13,131.00	88.50	160.30	11,615.71	-1,561.21	157.38	1,542.73	2.17	-1.98	-0.88	
13,226.00	90.42	160.62	11,616.60	-1,650.73	189.15	1,637.57	2.05	2.02	0.34	
13,320.00	91.15	161.93	11,615.31	-1,739.74	219.33	1,731.47	1.60	0.78	1.39	
13,415.00	87.98	161.03	11,616.04	-1,829.81	249.50	1,826.38	3.47	-3.34	-0.95	
13,509.00	88.50	162.50	11,618.92	-1,919.04	278.90	1,920.28	1.66	0.55	1.56	
13,604.00	87.31	162.61	11,622.40	-2,009.61	307.36	2,015.19	1.26	-1.25	0.12	
13,699.00	87.71	162.69	11,626.52	-2,100.20	335.66	2,110.09	0.43	0.42	0.08	
13,794.00	86.67	162.08	11,631.18	-2,190.64	364.37	2,204.95	1.27	-1.09	-0.64	
13,889.00	86.76	160.59	11,636.62	-2,280.49	394.73	2,299.70	1.57	0.09	-1.57	



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13,983.00	90.01	159.25	11,639.27	-2,368.73	426.98	2,393.45	3.74	3.46	-1.43	
14,078.00	90.70	160.05	11,638.68	-2,457.79	460.02	2,488.20	1.11	0.73	0.84	
14,172.00	90.72	160.84	11,637.52	-2,546.37	491.48	2,582.04	0.84	0.02	0.84	
14,268.00	89.81	161.13	11,637.08	-2,637.12	522.76	2,677.93	0.99	-0.95	0.30	
14,362.00	89.52	159.82	11,637.63	-2,725.72	554.17	2,771.78	1.43	-0.31	-1.39	
14,457.00	89.50	150.99	11,638.44	-2,812.01	593.67	2,865.68	9.29	-0.02	-9.29	
14,551.00	89.26	149.13	11,639.46	-2,893.46	640.58	2,957.01	2.00	-0.26	-1.98	
14,646.00	89.16	142.60	11,640.77	-2,972.04	693.85	3,047.38	6.87	-0.11	-6.87	
14,740.00	89.44	144.12	11,641.92	-3,047.46	749.95	3,135.50	1.64	0.30	1.62	
14,835.00	89.48	148.18	11,642.81	-3,126.33	802.85	3,226.04	4.27	0.04	4.27	
14,929.00	88.35	155.85	11,644.60	-3,209.26	846.92	3,318.00	8.25	-1.20	8.16	
15,023.00	88.12	156.12	11,647.49	-3,295.09	885.16	3,411.10	0.38	-0.24	0.29	
15,117.00	90.30	158.26	11,648.79	-3,381.72	921.59	3,504.47	3.25	2.32	2.28	
15,212.00	89.24	162.85	11,649.17	-3,471.27	953.21	3,599.30	4.96	-1.12	4.83	
15,307.00	89.07	165.91	11,650.57	-3,562.74	978.78	3,694.27	3.23	-0.18	3.22	
15,401.00	88.95	166.27	11,652.19	-3,653.97	1,001.37	3,788.18	0.40	-0.13	0.38	
15,495.00	90.82	167.83	11,652.38	-3,745.57	1,022.44	3,882.01	2.59	1.99	1.66	
15,590.00	90.47	168.42	11,651.31	-3,838.53	1,041.98	3,976.72	0.72	-0.37	0.62	
15,684.00	89.93	168.29	11,650.98	-3,930.60	1,060.96	4,070.41	0.59	-0.57	-0.14	
15,778.00	90.04	168.84	11,651.01	-4,022.73	1,079.59	4,164.08	0.60	0.12	0.59	
15,872.00	90.58	169.66	11,650.50	-4,115.08	1,097.13	4,257.64	1.04	0.57	0.87	
15,967.00	90.22	168.06	11,649.84	-4,208.29	1,115.48	4,352.25	1.73	-0.38	-1.68	
16,061.00	90.39	168.06	11,649.34	-4,300.25	1,134.93	4,445.98	0.18	0.18	0.00	
16,156.00	90.36	169.25	11,648.72	-4,393.39	1,153.61	4,540.62	1.25	-0.03	1.25	
16,251.00	89.33	164.82	11,648.97	-4,485.94	1,174.92	4,635.44	4.79	-1.08	-4.66	
16,346.00	90.39	165.68	11,649.20	-4,577.81	1,199.11	4,730.40	1.44	1.12	0.91	
16,440.00	89.93	166.81	11,648.94	-4,669.11	1,221.46	4,824.31	1.30	-0.49	1.20	
16,534.00	90.52	166.95	11,648.57	-4,760.66	1,242.80	4,918.17	0.65	0.63	0.15	
16,629.00	90.07	167.35	11,648.08	-4,853.28	1,263.92	5,012.99	0.63	-0.47	0.42	
16,723.00	89.61	168.64	11,648.35	-4,945.22	1,283.47	5,106.73	1.46	-0.49	1.37	
16,818.00	90.56	168.62	11,648.21	-5,038.35	1,302.20	5,201.38	1.00	1.00	-0.02	
16,913.00	89.58	168.05	11,648.09	-5,131.39	1,321.41	5,296.07	1.19	-1.03	-0.60	
17,007.00	90.35	169.31	11,648.15	-5,223.56	1,339.86	5,389.72	1.57	0.82	1.34	
17,102.00	89.95	166.26	11,647.90	-5,316.40	1,359.96	5,484.47	3.24	-0.42	-3.21	
17,196.00	90.01	163.28	11,647.93	-5,407.08	1,384.65	5,578.44	3.17	0.06	-3.17	
17,290.00	89.78	164.83	11,648.10	-5,497.46	1,410.47	5,672.43	1.67	-0.24	1.65	
17,384.00	90.12	164.15	11,648.18	-5,588.04	1,435.61	5,766.42	0.81	0.36	-0.72	
17,479.00	90.44	165.26	11,647.72	-5,679.67	1,460.67	5,861.41	1.22	0.34	1.17	
17,573.00	90.38	162.78	11,647.05	-5,770.03	1,486.54	5,955.40	2.64	-0.06	-2.64	
17,668.00	89.50	160.83	11,647.15	-5,860.28	1,516.21	6,050.34	2.25	-0.93	-2.05	
17,762.00	90.50	161.48	11,647.15	-5,949.24	1,546.57	6,144.24	1.27	1.06	0.69	
17,856.00	89.64	162.18	11,647.03	-6,038.55	1,575.88	6,238.19	1.18	-0.91	0.74	
17,951.00	89.84	162.68	11,647.46	-6,129.11	1,604.56	6,333.16	0.57	0.21	0.53	
18,045.00	89.53	164.13	11,647.98	-6,219.19	1,631.40	6,427.16	1.58	-0.33	1.54	



Phoenix Technology Services LP

Survey Report



Company:	SWEPI	Local Co-ordinate Reference:	Well 1404H
Project:	Loving County, Texas (NAD27)	TVD Reference:	GL + KB @ 2800.10usft (Ensign 775)
Site:	University 19 PW Unit	MD Reference:	GL + KB @ 2800.10usft (Ensign 775)
Well:	1404H	North Reference:	Grid
Wellbore:	OH / Job #60916	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 775)	Database:	Compass 5000 GCR

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)
18,139.00	89.82	166.02	11,648.51	-6,310.02	1,655.61	6,521.13	2.03	0.31	2.01
18,234.00	89.81	166.77	11,648.82	-6,402.35	1,677.96	6,616.02	0.79	-0.01	0.79
18,328.00	90.04	167.46	11,648.94	-6,493.98	1,698.92	6,709.86	0.77	0.24	0.73
18,423.00	89.18	162.89	11,649.59	-6,585.79	1,723.22	6,804.80	4.89	-0.91	-4.81
18,517.00	89.99	162.94	11,650.27	-6,675.64	1,750.83	6,898.79	0.86	0.86	0.05
18,612.00	90.18	162.94	11,650.13	-6,766.46	1,778.70	6,993.78	0.20	0.20	0.00
18,707.00	89.55	163.27	11,650.35	-6,857.36	1,806.31	7,088.77	0.75	-0.66	0.35
18,801.00	89.79	163.10	11,650.90	-6,947.34	1,833.51	7,182.76	0.31	0.26	-0.18
18,895.00	90.08	163.35	11,651.00	-7,037.34	1,860.63	7,276.76	0.41	0.31	0.27
18,990.00	89.50	164.97	11,651.35	-7,128.73	1,886.56	7,371.75	1.81	-0.61	1.71
19,084.00	90.04	165.25	11,651.73	-7,219.57	1,910.72	7,465.72	0.65	0.57	0.30
19,179.00	89.96	165.52	11,651.73	-7,311.50	1,934.69	7,560.68	0.30	-0.08	0.28
19,273.00	90.47	165.30	11,651.38	-7,402.46	1,958.37	7,654.64	0.59	0.54	-0.23
19,368.00	90.10	165.34	11,650.90	-7,494.36	1,982.44	7,749.60	0.39	-0.39	0.04
19,463.00	89.84	166.43	11,650.95	-7,586.49	2,005.61	7,844.53	1.18	-0.27	1.15
19,557.00	88.67	164.68	11,652.17	-7,677.51	2,029.05	7,938.47	2.24	-1.24	-1.86
19,652.00	88.15	163.56	11,654.81	-7,768.85	2,055.04	8,033.43	1.30	-0.55	-1.18
19,746.00	88.53	163.85	11,657.53	-7,859.03	2,081.40	8,127.39	0.51	0.40	0.31
19,840.00	89.18	161.07	11,659.41	-7,948.63	2,109.72	8,221.34	3.04	0.69	-2.96
19,935.00	91.87	158.50	11,658.54	-8,037.76	2,142.54	8,316.10	3.92	2.83	-2.71
20,029.00	91.95	158.77	11,655.41	-8,125.25	2,176.77	8,409.67	0.30	0.09	0.29
20,124.00	91.64	158.80	11,652.43	-8,213.77	2,211.13	8,504.28	0.33	-0.33	0.03
20,218.00	91.31	159.37	11,650.01	-8,301.55	2,244.67	8,597.94	0.70	-0.35	0.61
20,313.00	92.16	159.21	11,647.14	-8,390.37	2,278.25	8,692.61	0.91	0.89	-0.17
20,407.00	91.79	157.66	11,643.90	-8,477.73	2,312.78	8,786.15	1.69	-0.39	-1.65
20,502.00	92.44	158.18	11,640.39	-8,565.71	2,348.47	8,880.60	0.88	0.68	0.55
20,596.00	92.76	158.27	11,636.13	-8,652.91	2,383.30	8,974.07	0.35	0.34	0.10
20,690.00	92.27	157.41	11,632.00	-8,739.88	2,418.72	9,067.48	1.05	-0.52	-0.91
20,785.00	92.61	158.59	11,627.96	-8,827.88	2,454.28	9,161.92	1.29	0.36	1.24
20,880.00	93.09	158.33	11,623.23	-8,916.14	2,489.11	9,256.41	0.57	0.51	-0.27
20,974.00	93.07	158.79	11,618.18	-9,003.51	2,523.42	9,349.89	0.49	-0.02	0.49
21,068.00	92.98	157.78	11,613.22	-9,090.71	2,558.15	9,443.34	1.08	-0.10	-1.07
21,091.00	92.43	158.08	11,612.14	-9,112.00	2,566.79	9,466.19	2.72	-2.39	1.30
Final Phoenix MWD Survey									
21,139.00	92.43	158.08	11,610.10	-9,156.49	2,584.69	9,513.92	0.00	0.00	0.00
Projection to TD									



Phoenix Technology Services LP

Survey Report



Company:	SWEPI	Local Co-ordinate Reference:	Well 1404H
Project:	Loving County, Texas (NAD27)	TVD Reference:	GL + KB @ 2800.10usft (Ensign 775)
Site:	University 19 PW Unit	MD Reference:	GL + KB @ 2800.10usft (Ensign 775)
Well:	1404H	North Reference:	Grid
Wellbore:	OH / Job #60916	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 775)	Database:	Compass 5000 GCR

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
245.00	244.98	2.39	0.49	First Phoenix MWD Survey
21,091.00	11,612.14	-9,112.00	2,566.79	Final Phoenix MWD Survey
21,139.00	11,610.10	-9,156.49	2,584.69	Projection to TD

SURVEY DATA CERTIFICATION



PHOENIX
TECHNOLOGY SERVICES

Job #: 60916
 Client: SWEPI
 County & State: Loving Cty, TX
 Well: UNIVERSITY 19 PW UNIT 1404H
 API No: 42-301-33215
 Proposed Direction: 163.72

TIE-IN DATA

MD	TVD	INC	AZM	N/-S	E/-W	DATA SOURCE
Data Source Company:						

SURVEY DATA

First Survey Date	First Survey Depth	INC	AZM
17-Jun-17	245 ft	1.14°	11.67°

Last Survey Date	Last Survey Depth	INC	AZM
24-Aug-17	21,091 ft	92.43°	158.08°

Survey Instrument Type
Phoenix Velocity

Projected TD Survey Date	Projected TD Survey Depth	INC	AZM
24-Aug-17	21,139 ft	92.43°	158.08°

CORRECTION INFORMATION

Magnetic Declination Used	7.02 degrees
Grid Convergence Used	-1.59 degrees

Corrected to True/Grid North
Grid North

Total Correction	8.61 degrees
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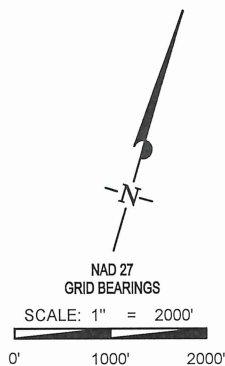
TO THE BEST OF MY KNOWLEDGE, I
 CERTIFY THIS SURVEY DATA TO BE TRUE
 AND CORRECT.

Jerad Steel 8/24/2017
 Field Engineer Signature Date

Well Planner/Supervisor Date

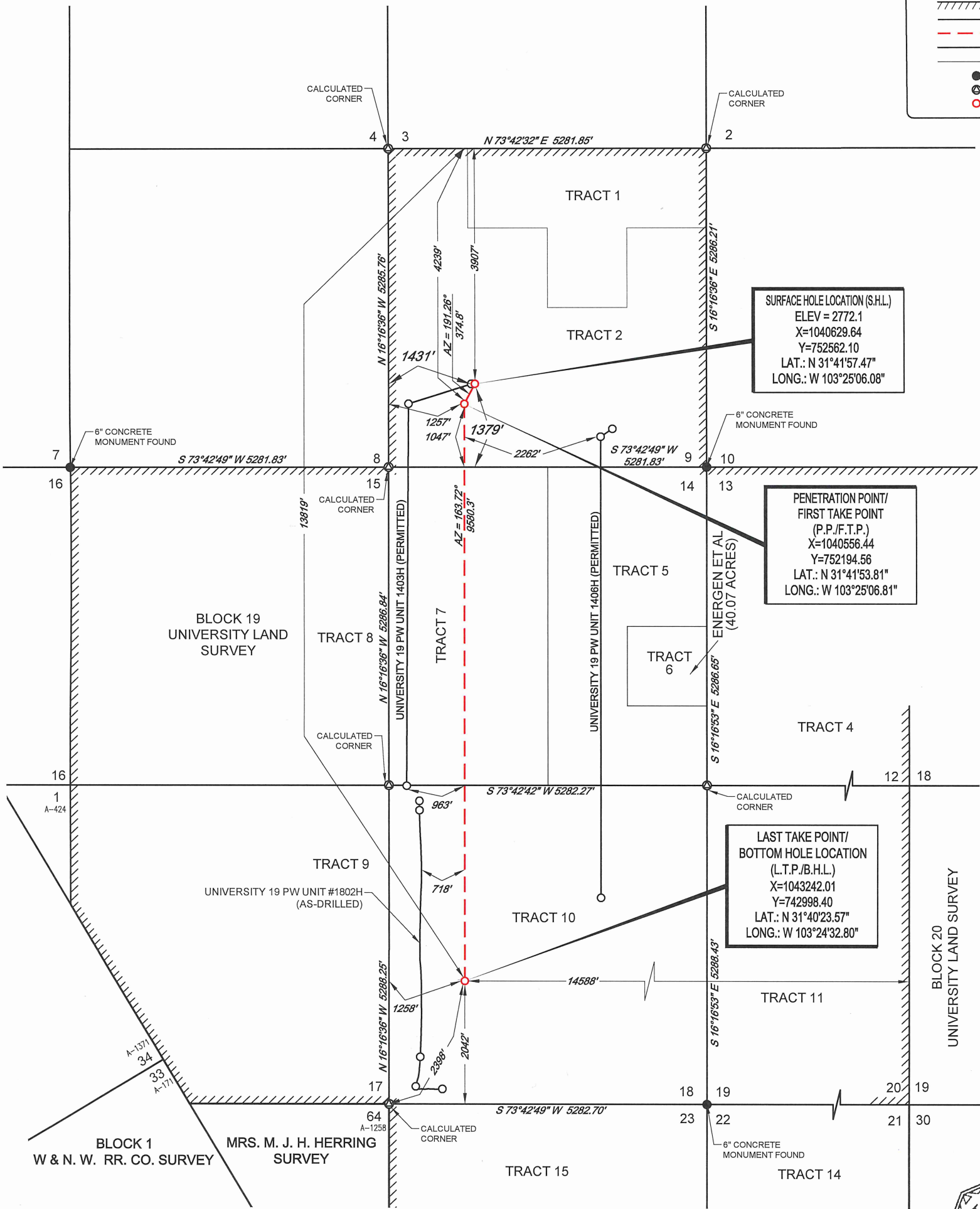


WELL LOCATION
LEASE NAME & WELL NO.:
UNIVERSITY 19 PW UNIT 1404H
UNIT/LEASE ACREAGE:
8588.11 ACRES
NEAREST TOWN IN COUNTY:
±10.6 MILES SOUTHEAST OF MENTONE, TEXAS
DESCRIPTION:
SECTIONS 9, 14 & 18, BLOCK 19, UNIVERSITY LAND SURVEY
LOVING COUNTY, TEXAS



LEGEND:

	Unit Boundary
	Survey/Section line
	Proposed Well Path
	Existing/Permitted Well Path
	Mineral Tract Boundary
	Monument Found
	Calculated Corner
	Well Point



TIES TABLE

POINT	UNIT	SURVEY/SECTION
S.H.L.	3907' FNWL	1431' FSWL & 1379' FSEL
	1431' FSWL	1257' FSWL & 1047' FSEL
P.P. / F.T.P.	4239' FNWL	1257' FSWL & 1047' FSEL
L.T.P. / B.H.L.	14588' FNEL	1258' FSWL & 2042' FSEL



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TEXAS FIRM REGISTRATION NO. 10042504
WWW.TOPOGRAPHIC.COM



John R. Anderson 2/7/17
John R. Anderson, R.P.L.S. No. 6442
FEBRUARY 7, 2017

UNIVERSITY 19 PW UNIT 1404H	REVISION:	
	INT	DATE
DATE: 02/07/2017		
FILE: LO_UNIVERSITY_19_PW_UNIT_1404H		
DRAWN BY: O.M.		
SHEET: 1 OF 1		

NOTES:

1. ORIGINAL DOCUMENT SIZE: 11" X 17"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, U.S. SURVEY FEET, NORTH AMERICAN DATUM 1927, UNLESS OTHERWISE NOTED.
3. THIS LOCATION AND/OR UNIT/LEASE BOUNDARY HAS BEEN CAREFULLY SURVEYED ON THE GROUND UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE ACCORDING TO THE EVIDENCE, OFFICIAL SURVEY RECORDS, MAPS, AND OTHER DATA PROVIDED BY SHELL WESTERN E&P. THIS PLAT WAS CREATED FOR THE SOLE PURPOSE OF FILING A PERMIT WITH THE RAILROAD COMMISSION OF TEXAS AND SHOULD NOT BE CONSTRUED AS A "BOUNDARY SURVEY" IN COMPLIANCE WITH T.B.P.L.S. MINIMUM STANDARDS OF PROCEDURES FOR BOUNDARY SURVEYS. THIS CERTIFICATION IF MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.
4. ALL ELEVATION VALUES CONTAINED HEREON ARE ORTHOMETRIC ONLY, BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), U.S. SURVEY FEET.
5. ALL MINERAL OWNERSHIP DATA SHOWN HEREIN IS BASED ON INFORMATION PROVIDED BY SHELL WESTERN E&P OR ITS SUBSIDIARIES & AFFILIATES.

NOTES CONT'D:

6. THE PRELIMINARY LOCATION HAS BEEN CAREFULLY SURVEYED ON THE GROUND DURING THE DATE OF NOVEMBER 3, 2016. AT A GROUND LEVEL ELEVATION OF 2772.1 SURVEY FEET.
7. S.H.L. = SURFACE HOLE LOCATION
8. P.P. = POINT OF PENETRATION
9. F.T.P. = FIRST TAKE POINT
10. L.T.P. = LAST TAKE POINT
11. B.H.L. = BOTTOM HOLE LOCATION