

**5D Survey Report****Forge Energy****Field Name:** *Forge-Ward Co, TX Nad 27 TCZ***Site Name:** *UL 18 DYK 1H***Well Name:** *UL 18 DYK 1H***Survey:** *Definitive survey*

21 January 2017





UL 18 DYK 1H

Field Name: Forge-Ward Co, TX Nad 27 TCZ	Map Units: US ft		Company Name: Forge Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD27 / Texas Central			
	Comment:			
Site: UL 18 DYK 1H	Units: US ft	North Reference: Grid	Convergence Angle: -1.51	
	Position:	Northing: 694144.63 US ft	Latitude: 31° 32' 32.63"	
		Easting: 1089703.73 US ft	Longitude: -103° 15' 20.49"	
	Elevation above MSL:2716.00 US ft		Comment:	
Slot: UL 18 DYK 1H	Position (Relative to Site Centre)			
	+N/-S: 0.00 US ft	Northing: 694144.63 US ft	Latitude: 31°32'32.63"	
	+E/-W: 0.00 US ft	Easting: 1089703.73 US ft	Longitude: -103°15'20.49"	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 2716.00 US ft			
	Comment:			
Well: UL 18 DYK 1H	Type:Main well		UWI:	
	File Number:	Comment:		
	Closure Distance:7464.74US ft		Closure Azimuth:343.90°	
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: -0.00 US ft		+E/-W: 0.00 US ft	Az: 343.69°
Drill floor: Survey Name: Definitive Survey				
Rig Height (Drill Floor): 25.00us ft		Elevation above MSL: 2741.00us ft	Inclination: 0.00°	Azimuth: 0.00°

Survey Name:Definitive Survey									
Date: 04/Nov/2016		Survey Tool: See Survey Tool Ranges below.			Comment:		Company:		
Magnetic Model:									
Model Name: bggm2016		Date: 25/Dec/2016		Field Strength: 47687.9nT		Declination: 6.94°		Dip: 59.51°	
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	5200.00	Wft MWD Svy (1)
MWD	5200.00	10413.00	Wft MWD Svy (2)
MWD	10413.00	10698.00	Wft MWD Svy (3)
MWD	10698.00	11623.00	Wft MWD Svy (4) C-1

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Survey Tool Ranges:			
Name	Start MD(USFt)	End MD(USFt)	Source Survey
MWD	11623.00	15857.00	Wft MWD Svy (5) L-1
MWD	15857.00	17183.00	Wft MWD Svy (6) L-2
MWD	17183.00	18588.00	Wft MWD Svy (7) L-3

Wellpath created using minimum curvature.

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										Comment
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	
0.00	0.00	0.00	0.00	0.00	-0.00	0.00	694144.63	1089703.73	0.00	
25.00	0.00	0.00	25.00	0.00	-0.00	0.00	694144.63	1089703.73	0.00	
503.00	0.69	329.30	502.99	2.79	2.48	-1.47	694147.11	1089702.26	0.14	13 3/8 in
578.00	0.80	329.30	577.98	3.74	3.32	-1.97	694147.95	1089701.76	0.14	
729.00	0.84	318.24	728.97	5.76	5.05	-3.25	694149.68	1089700.48	0.11	
910.00	0.96	302.43	909.94	8.10	6.85	-5.41	694151.48	1089698.32	0.15	
1091.00	0.31	199.11	1090.94	8.84	7.20	-6.85	694151.83	1089696.88	0.59	
1242.00	0.88	327.67	1241.93	9.62	7.80	-7.60	694152.43	1089696.13	0.73	
1431.00	0.63	330.82	1430.91	12.03	9.93	-8.89	694154.56	1089694.84	0.13	
1620.00	0.93	10.12	1619.90	14.41	12.35	-9.12	694156.98	1089694.61	0.32	
1810.00	1.42	30.68	1809.86	17.40	15.89	-7.65	694160.52	1089696.08	0.34	
1999.00	1.56	34.96	1998.79	20.61	20.01	-4.98	694164.64	1089698.75	0.09	
2193.00	1.91	35.89	2192.70	24.24	24.80	-1.57	694169.43	1089702.16	0.18	
2377.00	2.22	42.01	2376.59	27.99	29.93	2.61	694174.56	1089706.34	0.21	
2567.00	2.59	46.59	2566.42	31.88	35.61	8.19	694180.24	1089711.92	0.22	
2757.00	3.03	49.11	2756.19	35.93	41.85	15.10	694186.48	1089718.83	0.24	
2946.00	0.31	140.91	2945.10	37.53	44.73	19.20	694189.36	1089722.93	1.62	
3136.00	0.14	124.29	3135.10	36.88	44.20	19.72	694188.83	1089723.45	0.09	
3325.00	0.06	323.52	3324.10	36.79	44.15	19.85	694188.78	1089723.58	0.10	
3515.00	0.49	51.80	3514.10	37.19	44.73	20.43	694189.36	1089724.16	0.26	
3705.00	0.44	61.76	3704.09	37.64	45.58	21.71	694190.21	1089725.44	0.05	
3894.00	1.15	83.32	3893.07	37.48	46.14	24.24	694190.77	1089727.97	0.40	
4084.00	2.48	77.65	4082.97	36.87	47.24	30.15	694191.87	1089733.88	0.71	
4273.00	4.55	186.08	4271.75	29.65	40.66	33.35	694185.29	1089737.08	3.08	
4463.00	2.52	198.74	4461.38	19.26	29.20	31.21	694173.83	1089734.94	1.14	
4652.00	1.62	188.18	4650.25	13.43	22.63	29.49	694167.26	1089733.22	0.52	
4841.00	1.56	178.91	4839.18	8.52	17.41	29.16	694162.04	1089732.89	0.14	
5007.00	1.59	170.82	5005.12	4.05	12.88	29.57	694157.51	1089733.30	0.14	
5072.00	1.57	170.90	5070.09	2.27	11.10	29.86	694155.73	1089733.59	0.03	9 5/8 in
5200.00	1.54	171.06	5198.05	-1.18	7.67	30.40	694152.30	1089734.13	0.03	
5390.00	1.51	171.20	5387.98	-6.19	2.67	31.18	694147.30	1089734.91	0.02	
5579.00	1.44	171.63	5576.92	-11.01	-2.14	31.91	694142.49	1089735.64	0.04	
5768.00	1.54	172.61	5765.85	-15.87	-7.00	32.58	694137.63	1089736.31	0.05	
5958.00	1.55	172.89	5955.78	-20.93	-12.09	33.23	694132.54	1089736.96	0.01	
6148.00	1.66	177.52	6145.71	-26.14	-17.39	33.66	694127.24	1089737.39	0.09	
6337.00	1.61	313.28	6334.68	-26.51	-18.30	31.85	694126.33	1089735.58	1.60	
6527.00	1.77	316.00	6524.59	-21.61	-14.36	27.87	694130.27	1089731.60	0.09	
6717.00	1.98	312.01	6714.49	-16.22	-10.05	23.39	694134.58	1089727.12	0.13	
6906.00	1.92	304.03	6903.38	-11.00	-6.09	18.34	694138.54	1089722.07	0.15	
7096.00	1.92	299.98	7093.28	-6.25	-2.72	12.95	694141.91	1089716.68	0.07	
7285.00	2.07	291.92	7282.16	-1.85	0.13	7.04	694144.76	1089710.77	0.17	
7475.00	2.13	238.33	7472.05	-0.66	-0.44	0.85	694144.19	1089704.58	1.00	
7664.00	2.62	235.12	7660.89	-2.97	-4.75	-5.68	694139.88	1089698.05	0.27	
7854.00	3.10	234.97	7850.65	-6.00	-10.19	-13.45	694134.44	1089690.28	0.25	
8044.00	0.41	146.50	8040.56	-8.30	-13.70	-17.29	694130.93	1089686.44	1.64	
8233.00	0.94	185.12	8229.54	-10.39	-15.81	-17.05	694128.82	1089686.68	0.35	
8423.00	1.75	185.73	8419.49	-14.53	-20.25	-17.48	694124.38	1089686.25	0.43	
8612.00	3.17	176.72	8608.31	-22.29	-28.34	-17.47	694116.29	1089686.26	0.78	
8802.00	0.91	135.33	8798.19	-28.74	-34.66	-16.11	694109.97	1089687.62	1.35	
8991.00	2.08	181.10	8987.12	-33.33	-39.15	-15.12	694105.48	1089688.61	0.84	

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Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
9181.00	1.04	0.61	9177.09	-34.97	-40.88	-15.17	694103.75	1089688.56	1.64	
9370.00	1.35	324.64	9366.05	-31.23	-37.35	-16.44	694107.28	1089687.29	0.42	
9560.00	2.28	322.29	9555.96	-25.59	-32.53	-20.04	694112.10	1089683.69	0.49	
9750.00	2.93	319.78	9745.76	-17.64	-25.83	-25.49	694118.80	1089678.24	0.35	
9939.00	1.76	0.07	9934.61	-10.43	-19.24	-28.61	694125.39	1089675.12	1.03	
10129.00	1.84	324.87	10124.52	-4.75	-13.83	-30.36	694130.80	1089673.37	0.57	
10318.00	1.28	2.74	10313.46	0.12	-9.24	-32.00	694135.39	1089671.73	0.60	
10413.00	1.57	64.46	10408.43	1.33	-7.62	-30.78	694137.01	1089672.95	1.56	
10603.00	0.82	77.61	10598.39	1.66	-6.21	-27.10	694138.42	1089676.63	0.42	
10698.00	0.22	45.14	10693.38	1.70	-5.93	-26.31	694138.70	1089677.42	0.68	
10708.00	0.43	4.59	10703.38	1.74	-5.88	-26.29	694138.75	1089677.44	2.99	
10740.00	0.44	335.57	10735.38	1.97	-5.65	-26.33	694138.98	1089677.40	0.68	
10771.00	1.96	358.54	10766.38	2.60	-5.01	-26.40	694139.62	1089677.33	5.05	
10803.00	4.52	358.54	10798.32	4.35	-3.20	-26.44	694141.43	1089677.29	8.00	
10834.00	7.34	354.48	10829.15	7.48	-0.01	-26.66	694144.62	1089677.07	9.19	
10866.00	10.77	357.81	10860.75	12.39	5.01	-26.98	694149.64	1089676.75	10.84	
10897.00	14.13	359.54	10891.02	18.84	11.69	-27.12	694156.32	1089676.61	10.90	
10929.00	17.40	359.77	10921.81	27.20	20.39	-27.17	694165.02	1089676.56	10.22	
10960.00	20.19	358.40	10951.15	36.83	30.37	-27.34	694175.00	1089676.39	9.11	
10992.00	22.37	355.28	10980.97	48.13	41.96	-27.99	694186.59	1089675.74	7.67	
11023.00	24.45	351.67	11009.42	60.27	54.19	-29.41	694198.82	1089674.32	8.15	
11055.00	27.49	349.20	11038.19	74.18	68.00	-31.75	694212.63	1089671.98	10.08	
11087.00	30.27	348.10	11066.20	89.58	83.15	-34.80	694227.78	1089668.93	8.84	
11118.00	32.55	347.29	11092.66	105.69	98.93	-38.24	694243.56	1089665.49	7.48	
11150.00	35.60	347.08	11119.16	123.59	116.41	-42.22	694261.04	1089661.51	9.54	
11181.00	38.91	347.15	11143.83	142.32	134.71	-46.40	694279.34	1089657.33	10.68	
11213.00	42.53	346.61	11168.08	163.16	155.03	-51.15	694299.66	1089652.58	11.37	
11244.00	45.45	344.68	11190.38	184.67	175.88	-56.49	694320.51	1089647.24	10.36	
11276.00	47.53	342.66	11212.41	207.88	198.15	-63.02	694342.78	1089640.71	7.95	
11307.00	49.48	342.52	11232.95	231.09	220.30	-69.97	694364.93	1089633.76	6.30	
11339.00	51.49	343.34	11253.31	255.77	243.90	-77.21	694388.53	1089626.52	6.58	
11371.00	53.83	344.95	11272.72	281.21	268.38	-84.16	694413.01	1089619.57	8.33	
11402.00	57.59	345.43	11290.18	306.81	293.13	-90.70	694437.76	1089613.03	12.20	
11434.00	60.92	344.95	11306.54	334.30	319.72	-97.73	694464.35	1089606.00	10.49	
11465.00	64.11	344.68	11320.85	361.79	346.25	-104.94	694490.88	1089598.79	10.32	
11497.00	67.25	345.05	11334.02	390.94	374.40	-112.55	694519.03	1089591.18	9.87	
11528.00	69.69	345.23	11345.40	419.77	402.27	-119.94	694546.90	1089583.79	7.89	
11560.00	71.49	344.60	11356.03	449.94	431.41	-127.80	694576.04	1089575.93	5.92	
11591.00	74.06	344.63	11365.21	479.54	459.96	-135.65	694604.59	1089568.08	8.29	
11623.00	77.03	345.16	11373.20	510.52	489.87	-143.73	694634.50	1089560.00	9.42	
11697.00	83.27	346.02	11385.85	583.35	560.45	-161.85	694705.08	1089541.88	8.51	7 in
11716.00	84.87	346.24	11387.82	602.23	578.80	-166.38	694723.43	1089537.35	8.51	
11747.00	87.28	346.03	11389.94	633.13	608.82	-173.79	694753.45	1089529.94	7.80	
11779.00	87.53	346.32	11391.39	665.06	639.86	-181.43	694784.49	1089522.30	1.20	
11811.00	88.40	346.22	11392.52	697.01	670.93	-189.02	694815.56	1089514.71	2.74	
11842.00	90.68	345.87	11392.77	727.98	701.01	-196.50	694845.64	1089507.23	7.44	
11874.00	90.80	346.16	11392.36	759.95	732.06	-204.23	694876.69	1089499.50	0.98	
11968.00	87.72	340.40	11393.57	853.89	822.03	-231.26	694966.66	1089472.47	6.95	
12063.00	90.80	344.00	11394.80	948.83	912.45	-260.29	695057.08	1089443.44	4.99	
12158.00	90.68	341.97	11393.57	1043.80	1003.28	-288.08	695147.91	1089415.65	2.14	
12253.00	91.17	339.69	11392.04	1138.67	1092.99	-319.27	695237.62	1089384.46	2.45	
12348.00	92.28	342.05	11389.18	1233.50	1182.70	-350.39	695327.33	1089353.34	2.74	
12443.00	88.15	342.20	11388.82	1328.44	1273.09	-379.54	695417.72	1089324.19	4.35	
12537.00	86.67	342.23	11393.07	1422.31	1362.50	-408.22	695507.13	1089295.51	1.57	
12632.00	88.46	343.61	11397.11	1517.21	1453.23	-436.10	695597.86	1089267.63	2.38	
12727.00	87.09	343.42	11400.80	1612.14	1544.25	-463.03	695688.88	1089240.70	1.46	
12821.00	93.52	345.56	11400.29	1706.07	1634.77	-488.15	695779.40	1089215.58	7.21	
12916.00	90.12	345.02	11397.28	1800.98	1726.60	-512.26	695871.23	1089191.47	3.62	
13011.00	89.01	344.84	11398.00	1895.95	1818.33	-536.96	695962.96	1089166.77	1.18	

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Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
13106.00	91.05	343.89	11397.95	1990.94	1909.81	-562.56	696054.44	1089141.17	2.37	
13201.00	92.12	344.12	11395.32	2085.90	2001.09	-588.73	696145.72	1089115.00	1.15	
13296.00	90.25	344.45	11393.36	2180.87	2092.52	-614.45	696237.15	1089089.28	2.00	
13390.00	92.10	345.76	11391.43	2274.81	2183.33	-638.61	696327.96	1089065.12	2.41	
13485.00	92.16	347.71	11387.90	2369.61	2275.73	-660.39	696420.36	1089043.34	2.05	
13580.00	92.59	348.11	11383.96	2464.27	2368.54	-680.27	696513.17	1089023.46	0.62	
13675.00	90.56	349.01	11381.35	2558.88	2461.62	-699.11	696606.25	1089004.62	2.34	
13770.00	90.93	346.64	11380.12	2653.62	2554.46	-719.14	696699.09	1088984.59	2.52	
13865.00	90.37	344.14	11379.04	2748.57	2646.38	-743.10	696791.01	1088960.63	2.70	
13960.00	88.52	340.60	11379.96	2843.52	2736.90	-771.86	696881.53	1088931.87	4.20	
14055.00	90.12	339.81	11381.09	2938.33	2826.27	-804.03	696970.90	1088899.70	1.88	
14149.00	89.63	340.84	11381.29	3032.17	2914.78	-835.68	697059.41	1088868.05	1.21	
14244.00	91.23	340.38	11380.58	3127.02	3004.39	-867.22	697149.02	1088836.51	1.75	
14339.00	90.80	340.74	11378.89	3221.87	3093.96	-898.83	697238.59	1088804.90	0.59	
14434.00	90.74	342.18	11377.62	3316.78	3184.02	-929.03	697328.65	1088774.70	1.52	
14529.00	88.46	343.66	11378.28	3411.76	3274.82	-956.93	697419.45	1088746.80	2.86	
14624.00	90.25	344.94	11379.35	3506.75	3366.26	-982.63	697510.89	1088721.10	2.32	
14718.00	89.88	344.48	11379.24	3600.73	3456.93	-1007.42	697601.56	1088696.31	0.63	
14813.00	90.44	344.65	11378.98	3695.72	3548.51	-1032.71	697693.14	1088671.02	0.62	
14908.00	90.37	345.25	11378.31	3790.69	3640.24	-1057.37	697784.87	1088646.36	0.64	
15003.00	89.45	345.55	11378.46	3885.65	3732.18	-1081.32	697876.81	1088622.41	1.02	
15098.00	89.63	345.80	11379.22	3980.59	3824.22	-1104.82	697968.85	1088598.91	0.32	
15193.00	89.75	347.12	11379.73	4075.48	3916.58	-1127.07	698061.21	1088576.66	1.40	
15288.00	90.79	344.83	11379.29	4170.39	4008.73	-1150.09	698153.36	1088553.64	2.65	
15383.00	90.62	344.46	11378.12	4265.37	4100.34	-1175.24	698244.97	1088528.49	0.43	
15478.00	90.79	346.06	11376.95	4360.33	4192.20	-1199.41	698336.83	1088504.32	1.69	
15572.00	90.80	343.26	11375.64	4454.29	4282.83	-1224.27	698427.46	1088479.46	2.98	
15668.00	91.42	343.68	11373.78	4550.27	4374.85	-1251.58	698519.48	1088452.15	0.78	
15763.00	91.11	344.24	11371.69	4645.25	4466.13	-1277.82	698610.76	1088425.91	0.67	
15857.00	88.40	342.52	11372.09	4739.23	4556.19	-1304.70	698700.82	1088399.03	3.41	
15952.00	91.41	342.36	11372.25	4834.20	4646.75	-1333.36	698791.38	1088370.37	3.17	
16047.00	91.36	343.81	11369.95	4929.17	4737.61	-1360.99	698882.24	1088342.74	1.53	
16141.00	89.51	342.57	11369.24	5023.15	4827.59	-1388.18	698972.22	1088315.55	2.37	
16236.00	88.46	340.07	11370.92	5118.05	4917.56	-1418.60	699062.19	1088285.13	2.85	
16331.00	91.36	341.91	11371.07	5212.93	5007.36	-1449.54	699151.99	1088254.19	3.62	
16426.00	91.23	342.03	11368.92	5307.86	5097.68	-1478.93	699242.31	1088224.80	0.19	
16520.00	88.46	340.84	11369.18	5401.78	5186.77	-1508.86	699331.40	1088194.87	3.21	
16615.00	89.45	341.73	11370.91	5496.68	5276.73	-1539.33	699421.36	1088164.40	1.40	
16710.00	90.55	341.70	11370.91	5591.62	5366.94	-1569.14	699511.57	1088134.59	1.16	
16804.00	91.23	338.91	11369.45	5685.43	5455.42	-1600.81	699600.05	1088102.92	3.05	
16899.00	90.00	338.18	11368.43	5780.04	5543.83	-1635.55	699688.46	1088068.18	1.51	
16994.00	92.03	339.45	11366.74	5874.68	5632.39	-1669.88	699777.02	1088033.85	2.52	
17088.00	92.65	341.92	11362.91	5968.46	5721.01	-1700.94	699865.64	1088002.79	2.71	
17183.00	92.90	345.87	11358.31	6063.33	5812.16	-1727.26	699956.79	1087976.47	4.16	
17268.00	92.24	345.79	11354.49	6148.19	5894.49	-1748.05	700039.12	1087955.68	0.78	
17363.00	90.20	344.30	11352.47	6243.13	5986.24	-1772.55	700130.87	1087931.18	2.66	
17458.00	89.79	342.01	11352.48	6338.12	6077.16	-1800.08	700221.79	1087903.65	2.45	
17553.00	89.44	340.72	11353.12	6433.04	6167.18	-1830.44	700311.81	1087873.29	1.41	
17648.00	91.19	342.13	11352.60	6527.95	6257.22	-1860.70	700401.85	1087843.03	2.37	
17743.00	89.44	342.99	11352.07	6622.93	6347.85	-1889.17	700492.48	1087814.56	2.05	
17838.00	87.83	344.62	11354.34	6717.90	6439.05	-1915.65	700583.68	1087788.08	2.41	
17933.00	90.00	349.04	11356.14	6812.71	6531.50	-1937.29	700676.13	1087766.44	5.18	
18028.00	91.54	350.21	11354.86	6907.19	6624.94	-1954.39	700769.57	1087749.34	2.04	
18124.00	92.31	351.59	11351.63	7002.37	6719.67	-1969.57	700864.30	1087734.16	1.65	
18218.00	88.46	347.99	11351.00	7095.80	6812.15	-1986.22	700956.78	1087717.51	5.61	
18313.00	86.78	346.35	11354.95	7190.54	6904.69	-2007.30	701049.32	1087696.43	2.47	
18409.00	87.06	346.76	11360.11	7286.28	6997.92	-2029.59	701142.55	1087674.14	0.52	
18504.00	86.71	347.01	11365.27	7380.99	7090.31	-2051.11	701234.94	1087652.62	0.45	
18513.00	86.50	347.04	11365.80	7389.96	7099.06	-2053.13	701243.69	1087650.60	2.36	Last Wft Svy

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment
18588.00	86.50	347.04	11370.38	7464.69	7172.02	-2069.92	701316.65	1087633.81	0.00	PTB