5D Survey Report

Forge Energy

Field Name: *Forge-Ward Co, TX Nad 27 TCZ*
Site Name: *UL 18 DYK 2H*
Well Name: *UL 18 DYK 2H*
Survey: *Definitive survey*

25 May 2017

UL 18 DYK 2H

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 2H	**Units:** US ft	**North Reference:** Grid	**Convergence Angle:** -1.50
	Position:	**Northing:** 694685.97 US ft	**Latitude:** 31° 32' 38.45"
		Easting: 1091460.99 US ft	**Longitude:** -103° 15' 0.35"
	Elevation above MSL: 2709.00 US ft		
	Comment:		

Slot: UL 18 DYK 2H	**Position (Relative to Site Centre)**		
	+N/-S: 0.00 US ft	**Northing:** 694685.97 US ft	**Latitude:** 31°32'38.45"
	+E/-W: 0.00 US ft	**Easting:** 1091460.99 US ft	**Longitude:** -103°15'0.35"
	Elevation above MSL: 2709.00 US ft		
	Comment:		

Well: UL 18 DYK 2H	**Type:** Main well		**UWI:**
	File Number:	**Comment:**	
	Closure Distance: 4896.69 US ft		**Closure Azimuth:** 343.78°
	Vertical Section: Position of Origin (Relative to Slot centre)		
	+N/-S: 0.00 US ft	**+E/-W:** 0.00 US ft	**Az:** 343.72°

Drill floor: Survey Name: Definitive Survey

Rig Height (Drill Floor):	**Elevation above MSL:**	**Inclination:**	**Azimuth:**
25.00 US ft	2734.00 US ft	0.00°	0.00°

Survey Name: Definitive Survey

Date:	**Survey Tool:**	**Comment:**	**Company:**
17/Apr/2017	*See Survey Tool Ranges below.*		

Magnetic Model:

Model Name:	**Date:**	**Field Strength:**	**Declination:**	**Dip:**
bggm2016	07/May/2017	47655.3nT	6.90°	59.51°

Tie Point:

MD:	**Inclination:**	**Azimuth:**	**TVD:**	**North Offset:**	**East Offset:**
0.00 US ft	0.00°	0.00°	0.00 US ft	0.00 US ft	0.00 US ft

Survey Tool Ranges:

Name	Start MD (USFt)	End MD (USFt)	Source Survey
GYRO-NS_OW	0.00	515.00	Gyro
MWD	515.00	4558.00	Wft Svy (1)
MWD	4558.00	9077.00	Wfty Svy (2)
MWD	9077.00	11418.00	Wfty Svy (3)
MWD	11418.00	16213.00	Wfty Svy (4)

Casing Points: (Relative to Slot centre)(TVD relative to Drill Floor)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name
566.00	0.65	252.68	565.98	-1.17	-4.76	694684.80	1091456.23	13 3/8 in
5017.00	0.27	208.48	5016.23	29.71	23.45	694715.68	1091484.44	9 5/8 in
11490.00	43.44	342.31	11433.64	244.00	-67.66	694929.97	1091393.33	7 in

Wellpath created using minimum curvature.

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	694685.97	1091460.99	0.00	
25.00	0.00	0.00	25.00	0.00	0.00	0.00	694685.97	1091460.99	0.00	
102.00	0.43	244.31	102.00	-0.05	-0.13	-0.26	694685.84	1091460.73	0.56	
132.00	0.45	244.83	132.00	-0.08	-0.22	-0.47	694685.75	1091460.52	0.07	
165.00	0.42	252.95	165.00	-0.11	-0.31	-0.70	694685.66	1091460.29	0.21	
196.00	0.48	261.35	196.00	-0.09	-0.37	-0.94	694685.60	1091460.05	0.29	
226.00	0.64	259.64	226.00	-0.06	-0.42	-1.23	694685.55	1091459.76	0.54	
257.00	0.71	253.82	256.99	-0.04	-0.50	-1.58	694685.47	1091459.41	0.32	
287.00	0.66	265.01	286.99	-0.00	-0.57	-1.93	694685.40	1091459.06	0.48	
347.00	0.51	260.19	346.99	0.09	-0.64	-2.54	694685.33	1091458.45	0.26	
377.00	0.66	269.29	376.99	0.16	-0.67	-2.84	694685.30	1091458.15	0.59	
407.00	0.58	249.08	406.98	0.19	-0.72	-3.16	694685.25	1091457.83	0.77	
437.00	0.61	270.29	436.98	0.22	-0.78	-3.46	694685.19	1091457.53	0.74	
467.00	0.46	252.34	466.98	0.27	-0.81	-3.74	694685.16	1091457.25	0.74	
497.00	0.62	248.72	496.98	0.25	-0.91	-4.00	694685.06	1091456.99	0.55	
515.00	0.68	250.54	514.98	0.23	-0.98	-4.19	694684.99	1091456.80	0.35	Tie On Gyro
566.00	0.65	252.68	565.98	0.21	-1.17	-4.76	694684.80	1091456.23	0.07	13 3/8 in
698.00	0.59	259.06	697.97	0.26	-1.52	-6.14	694684.45	1091454.85	0.07	First Wft Svy
879.00	0.45	279.79	878.96	0.66	-1.58	-7.76	694684.39	1091453.23	0.13	
1060.00	0.53	276.52	1059.95	1.30	-1.36	-9.29	694684.61	1091451.70	0.05	
1245.00	0.43	287.01	1244.95	2.01	-1.06	-10.80	694684.91	1091450.19	0.07	
1434.00	0.31	303.54	1433.94	2.79	-0.57	-11.91	694685.40	1091449.08	0.08	
1623.00	0.58	11.31	1622.94	4.03	0.65	-12.15	694686.62	1091448.84	0.29	
1813.00	1.11	30.13	1812.92	6.15	3.18	-11.03	694689.15	1091449.96	0.31	
1907.00	1.26	31.40	1906.90	7.47	4.85	-10.04	694690.82	1091450.95	0.16	
2096.00	1.53	29.49	2095.84	10.63	8.82	-7.71	694694.79	1091453.28	0.14	
2286.00	2.07	37.04	2285.75	14.45	13.77	-4.40	694699.74	1091456.59	0.31	
2475.00	2.33	38.89	2474.61	18.68	19.49	0.07	694705.46	1091461.06	0.14	
2664.00	0.31	252.73	2663.56	20.87	22.32	1.99	694708.29	1091462.98	1.37	
2854.00	0.14	359.23	2853.56	21.09	22.40	1.50	694708.37	1091462.49	0.20	
3043.00	0.20	2.44	3042.56	21.62	22.96	1.51	694708.93	1091462.50	0.03	
3233.00	0.30	11.21	3232.56	22.38	23.78	1.62	694709.75	1091462.61	0.06	
3422.00	0.44	17.05	3421.55	23.42	24.96	1.93	694710.93	1091462.92	0.08	
3612.00	1.23	64.57	3611.53	24.35	26.54	3.99	694712.51	1091464.98	0.52	
3707.00	1.14	67.22	3706.51	24.62	27.34	5.78	694713.31	1091466.77	0.11	
3896.00	2.04	75.18	3895.44	24.75	28.93	10.76	694714.90	1091471.75	0.49	
3991.00	2.80	75.03	3990.35	24.65	29.96	14.64	694715.93	1091475.63	0.80	
4180.00	0.47	124.00	4179.27	23.95	30.72	19.74	694716.69	1091480.73	1.33	
4369.00	0.29	84.32	4368.26	23.27	30.33	20.86	694716.30	1091481.85	0.16	
4558.00	0.84	70.74	4557.25	23.25	30.84	22.65	694716.81	1091483.64	0.30	
4653.00	0.72	52.63	4652.24	23.50	31.43	23.78	694717.40	1091484.77	0.29	
4843.00	0.75	207.32	4842.24	23.03	31.05	24.16	694717.02	1091485.15	0.75	
4935.00	0.47	208.48	4934.23	22.33	30.18	23.70	694716.15	1091484.69	0.30	
5017.00	0.27	208.48	5016.23	21.95	29.71	23.45	694715.68	1091484.44	0.24	9 5/8 in
5132.00	0.00	0.00	5131.23	21.76	29.47	23.31	694715.44	1091484.30	0.24	
5290.00	0.21	208.67	5289.23	21.55	29.22	23.18	694715.19	1091484.17	0.13	
5479.00	0.25	281.70	5478.23	21.50	29.00	22.61	694714.97	1091483.60	0.15	
5668.00	0.29	274.39	5667.23	21.86	29.12	21.73	694715.09	1091482.72	0.03	
5857.00	0.35	221.76	5856.22	21.72	28.72	20.86	694714.69	1091481.85	0.15	
6047.00	0.38	262.49	6046.22	21.51	28.21	19.85	694714.18	1091480.84	0.13	

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
6236.00	0.30	272.40	6235.22	21.77	28.15	18.74	694714.12	1091479.73	0.05	
6426.00	0.50	279.16	6425.21	22.28	28.30	17.42	694714.27	1091478.41	0.11	
6615.00	0.47	273.85	6614.21	22.90	28.48	15.83	694714.45	1091476.82	0.03	
6805.00	0.63	274.56	6804.20	23.54	28.62	14.02	694714.59	1091475.01	0.08	
6995.00	0.47	268.32	6994.19	24.11	28.68	12.20	694714.65	1091473.19	0.09	
7183.00	0.47	257.36	7182.18	24.35	28.49	10.67	694714.46	1091471.66	0.05	
7372.00	0.35	175.39	7371.18	23.84	27.74	9.96	694713.71	1091470.95	0.29	
7561.00	0.56	62.25	7560.18	23.46	27.60	10.83	694713.57	1091471.82	0.41	
7751.00	0.28	103.77	7750.17	23.41	27.92	12.10	694713.89	1091473.09	0.21	
7940.00	0.76	138.87	7939.16	22.04	26.87	13.37	694712.84	1091474.36	0.29	
8130.00	1.07	160.84	8129.14	19.13	24.24	14.78	694710.21	1091475.77	0.24	
8320.00	0.91	196.36	8319.11	16.08	21.12	14.94	694707.09	1091475.93	0.33	
8509.00	0.82	183.38	8508.09	13.55	18.33	14.44	694704.30	1091475.43	0.11	
8698.00	0.53	188.77	8697.08	11.48	16.11	14.22	694702.08	1091475.21	0.16	
8888.00	0.49	76.34	8887.07	10.65	15.44	14.88	694701.41	1091475.87	0.45	
9077.00	1.89	27.60	9076.03	12.86	18.39	17.11	694704.36	1091478.10	0.85	
9266.00	1.42	68.61	9264.96	15.31	22.01	20.73	694707.98	1091481.72	0.66	
9456.00	0.16	14.77	9454.94	15.75	23.12	22.99	694709.09	1091483.98	0.70	
9645.00	1.83	339.71	9643.90	18.99	26.21	22.01	694712.18	1091483.00	0.90	
9740.00	2.08	333.55	9738.85	22.20	29.17	20.72	694715.14	1091481.71	0.34	
9929.00	1.07	271.83	9927.78	26.12	32.30	17.43	694718.27	1091478.42	0.97	
10119.00	2.17	264.30	10117.71	27.33	32.00	12.08	694717.97	1091473.07	0.59	
10308.00	1.96	324.99	10306.60	31.05	34.29	6.66	694720.26	1091467.65	1.11	
10497.00	1.47	318.53	10495.52	36.30	38.76	3.20	694724.73	1091464.19	0.28	
10687.00	0.97	324.31	10685.48	40.03	41.89	0.65	694727.86	1091461.64	0.27	
10862.00	1.14	339.97	10860.45	43.16	44.73	-0.81	694730.70	1091460.18	0.19	
10893.00	1.25	333.95	10891.44	43.80	45.32	-1.07	694731.29	1091459.92	0.54	
10924.00	1.66	334.65	10922.43	44.58	46.03	-1.41	694732.00	1091459.58	1.32	
10956.00	2.73	320.71	10954.41	45.74	47.04	-2.09	694733.01	1091458.90	3.71	
10987.00	4.90	326.19	10985.33	47.68	48.71	-3.29	694734.68	1091457.70	7.09	
11019.00	7.67	333.04	11017.14	51.08	51.75	-5.02	694737.72	1091455.97	8.95	
11050.00	10.31	335.85	11047.76	55.86	56.13	-7.09	694742.10	1091453.90	8.63	
11082.00	12.63	339.34	11079.12	62.19	62.01	-9.50	694747.98	1091451.49	7.56	
11114.00	14.87	339.19	11110.20	69.77	69.13	-12.19	694755.10	1091448.80	7.00	
11145.00	17.14	337.93	11139.99	78.28	77.08	-15.32	694763.05	1091445.67	7.41	
11177.00	19.93	338.75	11170.33	88.41	86.53	-19.07	694772.50	1091441.92	8.76	
11208.00	22.33	341.28	11199.24	99.56	97.04	-22.88	694783.01	1091438.11	8.28	
11240.00	24.55	343.34	11228.60	112.28	109.16	-26.74	694795.13	1091434.25	7.39	
11272.00	26.95	343.38	11257.42	126.18	122.48	-30.72	694808.45	1091430.27	7.50	
11303.00	29.74	342.06	11284.70	140.90	136.53	-35.10	694822.50	1091425.89	9.22	
11335.00	32.06	341.86	11312.16	157.32	152.16	-40.18	694838.13	1091420.81	7.26	
11366.00	34.95	343.50	11338.01	174.43	168.49	-45.27	694854.46	1091415.72	9.77	
11398.00	37.62	344.13	11363.80	193.36	186.68	-50.54	694872.65	1091410.45	8.42	
11418.00	38.99	344.12	11379.49	205.76	198.60	-53.94	694884.57	1091407.05	6.85	
11490.00	43.44	342.31	11433.64	253.18	244.00	-67.66	694929.97	1091393.33	6.40	7 in
11500.00	44.06	342.08	11440.87	260.09	250.58	-69.78	694936.55	1091391.21	6.40	
11532.00	44.24	342.85	11463.83	282.38	271.83	-76.49	694957.80	1091384.50	1.77	
11564.00	46.63	344.95	11486.28	305.17	293.74	-82.81	694979.71	1091378.18	8.81	
11595.00	49.03	345.77	11507.09	328.14	315.97	-88.61	695001.94	1091372.38	7.99	
11627.00	51.21	345.66	11527.61	352.68	339.76	-94.67	695025.73	1091366.32	6.82	
11659.00	53.71	345.28	11547.10	378.04	364.32	-101.04	695050.29	1091359.95	7.87	
11690.00	55.98	344.72	11564.95	403.37	388.80	-107.60	695074.77	1091353.39	7.47	
11722.00	58.27	344.42	11582.32	430.24	414.71	-114.75	695100.68	1091346.24	7.20	
11753.00	61.25	343.60	11597.93	457.02	440.45	-122.13	695126.42	1091338.86	9.88	
11785.00	64.10	343.10	11612.62	485.45	467.68	-130.27	695153.65	1091330.72	9.01	
11817.00	66.55	342.84	11625.98	514.52	495.48	-138.79	695181.45	1091322.20	7.69	
11848.00	68.89	342.37	11637.73	543.20	522.85	-147.37	695208.82	1091313.62	7.68	
11880.00	70.25	341.96	11648.90	573.17	551.40	-156.55	695237.37	1091304.44	4.42	
11911.00	71.41	342.05	11659.08	602.44	579.25	-165.60	695265.22	1091295.39	3.75	

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
11943.00	73.34	341.81	11668.77	632.92	608.24	-175.06	695294.21	1091285.93	6.07	
11974.00	75.84	342.30	11677.01	662.79	636.67	-184.26	695322.64	1091276.73	8.21	
12006.00	77.67	342.58	11684.34	693.93	666.36	-193.66	695352.33	1091267.33	5.78	
12037.00	79.51	342.78	11690.47	724.31	695.37	-202.70	695381.34	1091258.29	5.97	
12069.00	81.32	342.97	11695.80	755.86	725.53	-212.00	695411.50	1091248.99	5.69	
12100.00	82.60	343.19	11700.13	786.56	754.89	-220.93	695440.86	1091240.06	4.19	
12132.00	83.52	343.03	11704.00	818.32	785.29	-230.16	695471.26	1091230.83	2.92	
12164.00	84.44	343.31	11707.36	850.14	815.75	-239.37	695501.72	1091221.62	3.00	
12196.00	85.86	343.35	11710.06	882.02	846.29	-248.52	695532.26	1091212.47	4.44	
12227.00	87.71	343.89	11711.80	912.97	875.98	-257.25	695561.95	1091203.74	6.22	
12259.00	88.46	343.46	11712.87	944.96	906.68	-266.23	695592.65	1091194.76	2.70	
12291.00	89.65	343.89	11713.40	976.95	937.38	-275.23	695623.35	1091185.76	3.95	
12386.00	91.54	344.54	11712.41	1071.94	1028.79	-301.07	695714.76	1091159.92	2.10	
12480.00	91.36	344.72	11710.03	1165.90	1119.40	-325.98	695805.37	1091135.01	0.27	
12576.00	89.81	343.68	11709.05	1261.88	1211.76	-352.11	695897.73	1091108.88	1.94	
12671.00	91.17	342.67	11708.24	1356.87	1302.69	-379.61	695988.66	1091081.38	1.78	
12766.00	90.37	342.66	11706.96	1451.85	1393.37	-407.91	696079.34	1091053.08	0.84	
12860.00	90.31	342.66	11706.40	1545.83	1483.09	-435.93	696169.06	1091025.06	0.06	
12956.00	89.01	343.36	11706.97	1641.82	1574.90	-463.98	696260.87	1090997.01	1.54	
13050.00	90.43	343.56	11707.43	1735.81	1665.01	-490.74	696350.98	1090970.25	1.53	
13145.00	89.57	343.54	11707.43	1830.81	1756.12	-517.64	696442.09	1090943.35	0.91	
13240.00	90.49	344.69	11707.38	1925.81	1847.49	-543.64	696533.46	1090917.35	1.55	
13335.00	90.19	345.37	11706.82	2020.78	1939.26	-568.18	696625.23	1090892.81	0.78	
13430.00	90.12	343.98	11706.56	2115.76	2030.88	-593.29	696716.85	1090867.70	1.47	
13525.00	89.32	341.96	11707.03	2210.75	2121.71	-621.11	696807.68	1090839.88	2.29	
13619.00	93.88	342.48	11704.40	2304.65	2211.16	-649.79	696897.13	1090811.20	4.88	
13714.00	93.46	342.06	11698.32	2399.43	2301.46	-678.66	696987.43	1090782.33	0.62	
13809.00	93.76	342.67	11692.34	2494.21	2391.81	-707.39	697077.78	1090753.60	0.71	
13904.00	93.64	344.28	11686.21	2589.01	2482.70	-734.35	697168.67	1090726.64	1.70	
13999.00	92.90	345.09	11680.79	2683.84	2574.17	-759.40	697260.14	1090701.59	1.15	
14094.00	89.88	344.93	11678.49	2778.78	2665.90	-783.96	697351.87	1090677.03	3.18	
14189.00	90.74	344.80	11677.97	2873.76	2757.61	-808.77	697443.58	1090652.22	0.92	
14283.00	90.49	344.70	11676.96	2967.74	2848.29	-833.49	697534.26	1090627.50	0.29	
14378.00	89.65	344.25	11676.85	3062.73	2939.82	-858.92	697625.79	1090602.07	1.00	
14473.00	90.12	345.57	11677.04	3157.70	3031.54	-883.65	697717.51	1090577.34	1.47	
14568.00	87.04	344.57	11679.39	3252.64	3123.30	-908.11	697809.27	1090552.88	3.41	
14663.00	89.29	346.72	11682.43	3347.52	3215.27	-931.65	697901.24	1090529.34	3.27	
14757.00	90.18	347.61	11682.87	3441.35	3306.92	-952.53	697992.89	1090508.46	1.34	
14852.00	90.97	345.83	11681.92	3536.21	3399.37	-974.35	698085.34	1090486.64	2.05	
14947.00	90.62	344.18	11680.60	3631.17	3491.13	-998.93	698177.10	1090462.06	1.78	
15017.00	90.49	343.24	11679.92	3701.17	3558.31	-1018.56	698244.28	1090442.43	1.36	
15041.00	90.12	342.87	11679.79	3725.17	3581.27	-1025.56	698267.24	1090435.43	2.18	
15137.00	90.49	341.95	11679.28	3821.14	3672.78	-1054.57	698358.75	1090406.42	1.03	
15231.00	91.11	341.63	11677.97	3915.08	3762.06	-1083.94	698448.03	1090377.05	0.74	
15326.00	89.94	341.31	11677.10	4010.00	3852.13	-1114.13	698538.10	1090346.86	1.28	
15421.00	90.06	341.09	11677.10	4104.91	3942.06	-1144.74	698628.03	1090316.25	0.26	
15516.00	91.05	342.81	11676.18	4199.85	4032.38	-1174.18	698718.35	1090286.81	2.09	
15610.00	88.76	344.76	11676.33	4293.84	4122.63	-1200.42	698808.60	1090260.57	3.20	
15704.00	89.56	344.60	11677.71	4387.82	4213.28	-1225.25	698899.25	1090235.74	0.87	
15799.00	88.64	343.94	11679.20	4482.80	4304.71	-1251.01	698990.68	1090209.98	1.19	
15893.00	89.82	343.01	11680.47	4576.79	4394.81	-1277.74	699080.78	1090183.25	1.60	
15989.00	90.74	342.07	11680.00	4672.76	4486.39	-1306.54	699172.36	1090154.45	1.37	
16084.00	90.93	343.67	11678.61	4767.74	4577.16	-1334.52	699263.13	1090126.47	1.70	
16180.00	89.14	345.85	11678.55	4863.71	4669.77	-1359.75	699355.74	1090101.24	2.94	
16190.00	89.38	345.80	11678.68	4873.71	4679.47	-1362.20	699365.44	1090098.79	2.45	Last Wft Svy
16213.00	89.38	345.80	11678.93	4896.69	4701.77	-1367.84	699387.74	1090093.15	0.00	PTB

Formation Points: (Relative to Slot centre)(TVD relative to Drill Floor)									
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name	Comment
11343.10	32.81	342.31	11319.00	156.29	-41.52	694842.26	1091419.47	Y Sand	
11470.04	42.20	342.78	11419.00	231.05	-63.59	694917.02	1091397.40	Bentonite Marker	