

02/15/2019



TUG HILL
OPERATING

Well: Greer 1S-04M
Site: Greer Unit N
Project: Marshall County, West Virginia
Design: rev7

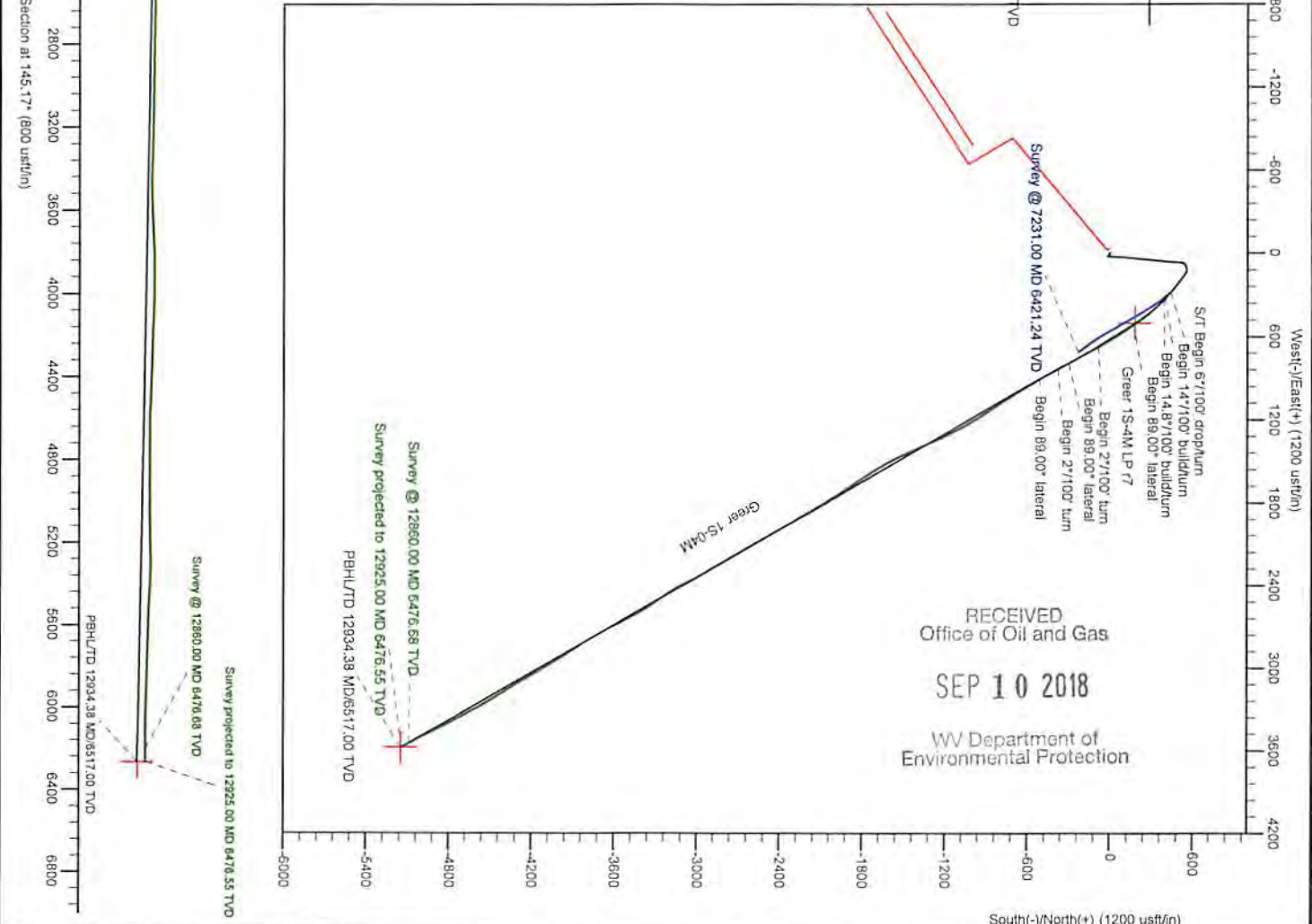
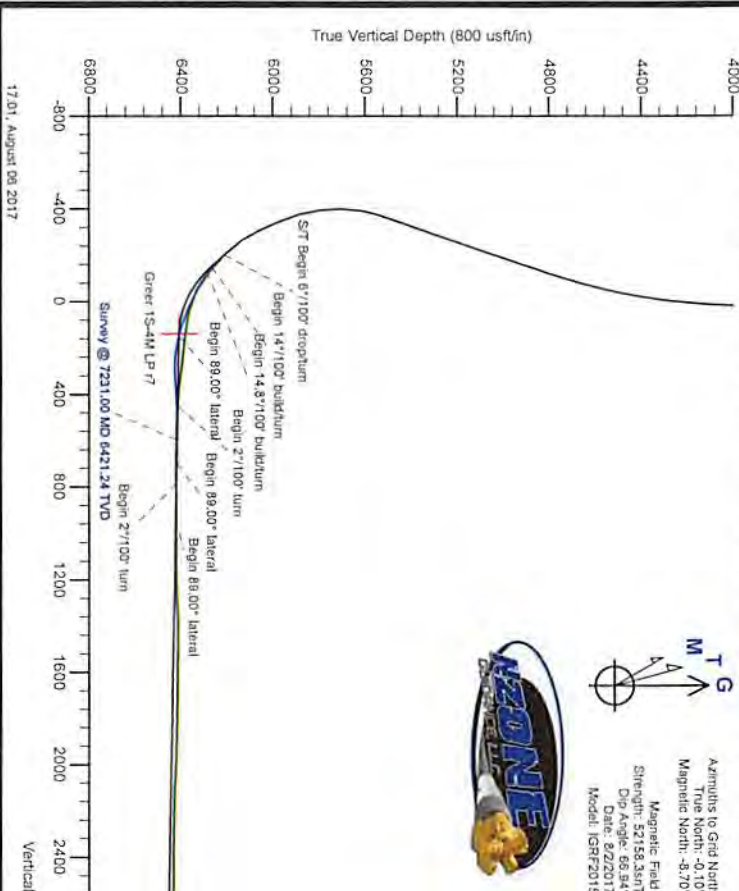
SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	TFace	Vsect	Annotation
6375.00	44.75	137.92	6212.84	438.60	280.91	0.00	0.00	S/T Begin 67100' droplum
6450.00	41.66	133.13	6287.52	401.94	316.71	6.00	-135.00	Begin 147100' bulldrum
6478.34	45.00	130.00	6288.13	389.05	331.27	14.00	-33.95	Begin 1487100' bulldrum
6794.46	89.00	148.00	6409.47	170.94	510.71	14.80	25.08	Begin 89.00' lateral
7094.46	89.00	148.00	6414.71	-83.44	669.66	2.00	0.00	Begin 27100' turn
7344.46	89.00	153.00	6418.07	-300.92	792.71	0.00	0.00	Begin 89.00' lateral
7594.68	89.00	153.00	6420.64	-381.10	833.56	2.00	0.00	Begin 27100' turn
7894.68	89.00	150.00	6423.21	-513.07	805.52	0.00	-90.10	Begin 89.00' lateral
12934.38	89.00	150.00	6517.00	-5149.14	3580.04	0.00	0.00	PBHL/TD 12934.38 MD/6517.00 TVD

ANNOTATIONS

MD	Inc	Azi	TVD	+N-S	+E-W	Vsect	Annotation
100.00	0.68	267.83	100.00	-0.02	-0.59	-0.32	Gyro
2644.00	1.35	156.71	2643.26	-15.38	20.67	24.43	MWD surveys
7231.00	83.56	144.08	6421.24	-229.78	714.25	596.55	Survey @ 7231.00 MD 6421.24 TVD

Surface Location: RKB=1254+26 @ 1280.00usft (Nabors B28)
 Universal Transverse Mercator (US Survey Feet)
 Zone 17N (84 W to 78 W)
 Northing 14438501.43
 Easting 16864287.8
 Latitude 39.75702784
 Longitude -80.85927975



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11.01, August 08 2017

Survey Report

Service Company:	Nzone Guidance, LLC	Location:	New Martinsville
Well:	Greer-1S-04HM	Rig:	Nabors B28
API or UWI:	47-051-01889	Job Number:	THO-17-016
State:	West Virginia	Operating Company:	Tug Hill Operating, LLC
County:	Marshall	Magnetic Declination:	0
Country:	USA	Proposed Azimuth:	145.17
Comment:		North Reference:	GRID
		Latitude:	39.75697
		Longitude:	-80.8364

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Tie-In Data

MD	Inclination	Azimuth	TVD	NS	EW
	0	0	0	0	0

Survey Data

MD	Inclination	Azimuth	TVD	NS	EW	CA	CD	VS	DLS
100	0.68	267.83	100	-0.02	-0.59	267.83	0.59	-0.32	0.68
200	0.75	253.19	199.99	-0.23	-1.81	262.64	1.83	-0.84	0.19
300	0.37	227.81	299.99	-0.64	-2.68	256.55	2.75	-1	0.44
400	0.18	291.05	399.98	-0.8	-3.06	255.35	3.17	-1.09	0.33
500	0.31	295.81	499.98	-0.63	-3.45	259.72	3.51	-1.46	0.13
600	0.23	238.57	599.98	-0.61	-3.87	260.99	3.92	-1.71	0.27
700	0.2	208.14	699.98	-0.87	-4.12	258.06	4.21	-1.64	0.12
800	0.43	145.17	799.98	-1.33	-3.99	251.52	4.21	-1.18	0.38
900	0.34	135.71	899.98	-1.85	-3.57	242.55	4.02	-0.52	0.11
1000	0.43	87.4	999.98	-2.05	-2.99	235.54	3.62	-0.02	0.33
1100	0.69	91.72	1099.97	-2.05	-2.01	224.43	2.87	0.54	0.26
1200	1.69	112.74	1199.95	-2.64	-0.05	181.05	2.64	2.14	1.07
1300	2.77	115.55	1299.87	-4.25	3.49	140.6	5.5	5.48	1.09
1400	3.49	118.3	1399.72	-6.74	8.35	128.89	10.73	10.3	0.74
1500	3.26	118.54	1499.55	-9.54	13.53	125.18	16.55	15.56	0.23
1600	2.21	116.18	1599.43	-11.75	17.76	123.48	21.29	19.78	1.06
1700	1.12	113.64	1699.39	-12.99	20.38	122.51	24.17	22.3	1.09
1800	0.48	359.1	1799.38	-12.96	21.27	121.36	24.91	22.79	1.39
1900	0.81	330.59	1899.38	-11.93	20.92	119.69	24.08	21.74	0.45
2000	1.44	321.09	1999.36	-10.33	19.78	117.58	22.32	19.78	0.65
2100	0.62	305.8	2099.34	-9.04	18.55	115.98	20.64	18.02	0.86
2200	0.25	348.28	2199.34	-8.51	18.07	115.22	19.97	17.31	0.47
2300	0.74	140.51	2299.33	-8.79	18.44	115.5	20.43	17.75	0.97
2400	1.02	150.62	2399.32	-10.07	19.28	117.57	21.76	19.28	0.32
2500	1.49	171.26	2499.3	-12.13	19.92	121.34	23.32	21.33	0.64
2518	1.32	175.41	2517.29	-12.57	19.97	122.18	23.6	21.72	1.1
2644	1.35	156.71	2643.26	-15.38	20.67	126.64	25.77	24.43	0.35
2707	1.31	169.27	2706.24	-16.77	21.1	128.47	26.95	25.81	0.47
2802	0.76	156.05	2801.23	-18.41	21.56	130.49	28.35	27.42	0.63
2896	0.55	164	2895.22	-19.41	21.94	131.51	29.29	28.46	0.24
2992	0.32	164	2991.22	-20.11	22.14	132.26	29.91	29.15	0.24
3181	0.46	25.95	3180.22	-19.94	22.62	131.4	30.15	29.28	0.39

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3276	0.63	0.79	3275.21	-19.07	22.79	129.93	29.72	28.67	0.3
3465	0.65	344.3	3464.2	-17	22.51	127.06	28.21	26.82	0.1
3544	0.53	343.5	3543.2	-16.22	22.29	126.05	27.57	26.04	0.15
3638	0.53	342.36	3637.19	-15.39	22.03	124.93	26.88	25.22	0.01
3732	0.53	343.94	3731.19	-14.56	21.78	123.76	26.2	24.39	0.02
3827	0.4	310.63	3826.19	-13.92	21.41	123.03	25.54	23.65	0.31
3921	1.63	10.57	3920.17	-12.39	21.4	120.07	24.73	22.4	1.56
4016	3.96	8.02	4015.05	-7.81	22.11	109.46	23.45	19.04	2.46
4109	6.2	7.49	4107.68	0.35	23.21	89.15	23.22	12.97	2.41
4203	7.52	6.09	4201	11.5	24.53	64.89	27.09	4.57	1.42
4298	9.05	4.33	4295.01	25.13	25.75	45.7	35.98	-5.92	1.63
4393	11.38	6.88	4388.5	41.89	27.44	33.23	50.07	-18.71	2.5
4487	14.07	0.29	4480.19	62.52	28.61	24.59	68.76	-34.98	3.25
4582	17.23	2.92	4571.65	88.13	29.38	18.44	92.9	-55.56	3.41
4676	19.65	6.53	4660.82	117.74	31.89	15.15	121.98	-78.43	2.85
4772	21.93	6.18	4750.57	151.6	35.66	13.23	155.74	-104.08	2.38
4867	24.22	4.77	4837.96	188.66	39.19	11.73	192.69	-132.48	2.48
4961	23.03	3.8	4924.08	226.23	42.01	10.52	230.09	-161.71	1.33
5055	23.08	4.95	5010.57	262.93	44.82	9.67	266.72	-190.23	0.48
5150	24.62	7.49	5097.46	301.1	49	9.24	305.07	-219.17	1.95
5244	24.57	7.58	5182.93	339.89	54.13	9.05	344.17	-248.08	0.07
5337	24.53	6.09	5267.53	378.25	58.73	8.83	382.79	-276.94	0.67
5432	24.75	4.51	5353.88	417.69	62.39	8.5	422.32	-307.23	0.73
5525	24.35	3.01	5438.47	456.24	64.93	8.1	460.84	-337.42	0.8
5620	21.8	1.87	5525.86	493.44	66.53	7.68	497.9	-367.04	2.72
5715	16.79	14.26	5615.54	524.4	70.49	7.66	529.11	-390.19	6.78
5810	16.53	61.46	5706.95	544.24	85.81	8.96	550.96	-397.73	13.88
5901	14.95	75.35	5794.57	553.4	108.55	11.1	563.94	-392.26	4.48
5996	19.69	109.8	5885.47	551.07	135.55	13.82	567.49	-374.93	11.67
6091	23.82	131.51	5973.82	532.9	165.03	17.21	557.86	-343.17	9.45
6185	25.67	126.76	6059.2	508.13	195.56	21.05	544.46	-305.4	2.89
6280	36.26	124.92	6140.55	479.65	235.19	26.12	534.21	-259.39	11.19
6375	44.75	137.92	6212.84	438.6	280.81	32.63	520.79	-199.64	12.57
6411	45.05	131.33	6238.36	420.77	298.87	35.39	516.11	-174.69	12.94
6474	51.12	130.54	6280.42	390.08	334.28	40.6	513.72	-129.27	9.68
6568	64.09	137.75	6330.72	334.72	390.81	49.42	514.55	-51.55	15.23
6663	76.48	143.29	6362.73	265.75	447.4	59.29	520.38	37.39	14.14
6758	83.34	145.66	6379.37	189.67	501.69	69.29	536.35	130.85	7.63
6852	84.35	146.98	6389.44	111.9	553.52	78.57	564.72	224.29	1.76
6947	81.67	147.24	6401	32.73	604.72	86.9	605.6	318.52	2.83
7042	84.44	149.26	6412.49	-47.45	654.33	94.15	656.05	412.67	3.6
7136	88.4	151.72	6418.36	-129.08	700.53	100.44	712.32	506.06	4.96
7231	89.27	151.63	6420.29	-212.69	745.59	105.92	775.33	600.42	0.92
7325	89.89	151.9	6420.98	-295.5	790.06	110.51	843.51	693.8	0.72
7420	90.24	151.28	6420.87	-379.06	835.26	114.41	917.25	788.2	0.75
7515	90.51	151.63	6420.25	-462.51	880.65	117.71	994.72	882.63	0.47
7609	89.41	149.44	6420.32	-544.34	926.89	120.42	1074.91	976.21	2.61

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7703	89.71	149.17	6421.04	-625.17	974.87	122.67	1158.11	1069.96	0.43
7798	90.68	148.91	6420.72	-706.63	1023.74	124.62	1243.94	1164.74	1.06
7892	92.35	146.36	6418.23	-785.99	1074.04	126.2	1330.92	1258.61	3.24
7987	91.74	145.92	6414.84	-864.83	1126.93	127.5	1420.53	1353.54	0.79
8082	90.15	147.77	6413.27	-944.35	1178.88	128.7	1510.48	1448.48	2.57
8176	88.79	150.67	6414.14	-1025.09	1226.97	129.88	1598.84	1542.23	3.41
8271	89.1	153.39	6415.89	-1108.98	1271.52	131.09	1687.18	1636.52	2.88
8365	88.92	153.39	6417.52	-1193.01	1313.62	132.25	1774.5	1729.54	0.19
8459	89.36	154.89	6418.93	-1277.58	1354.61	133.32	1862.04	1822.38	1.66
8553	90.33	157.61	6419.18	-1363.61	1392.46	134.4	1948.95	1914.62	3.07
8648	86.51	155.68	6421.8	-1450.77	1430.1	135.41	2037.14	2007.66	4.5
8743	87.52	153.48	6426.75	-1536.45	1470.82	136.25	2126.97	2101.25	2.55
8837	89.76	151.99	6428.98	-1619.98	1513.87	136.94	2217.23	2194.4	2.86
8932	88.53	146.98	6430.4	-1701.78	1562.08	137.45	2310.02	2289.08	5.43
9027	90.2	147.24	6431.45	-1781.55	1613.67	137.83	2403.71	2384.02	1.78
9122	89.45	146.71	6431.74	-1861.2	1665.44	138.18	2497.55	2478.97	0.97
9215	89.05	146.54	6432.96	-1938.86	1716.6	138.48	2589.57	2571.93	0.47
9310	88.97	147.94	6434.6	-2018.73	1767.99	138.79	2683.48	2666.85	1.48
9405	89.71	150.4	6435.7	-2100.29	1816.67	139.14	2776.97	2761.61	2.7
9500	88.57	149.17	6437.12	-2182.38	1864.47	139.49	2870.37	2856.29	1.77
9594	89.32	148.73	6438.85	-2262.89	1912.95	139.79	2963.12	2950.07	0.93
9689	89.32	150.49	6439.98	-2344.83	1961	140.09	3056.76	3044.77	1.85
9783	88.13	149.96	6442.07	-2426.4	2007.67	140.39	3149.31	3138.38	1.39
9878	89.76	150.93	6443.82	-2509.02	2054.52	140.69	3242.88	3232.96	2
9972	87.74	149.61	6445.87	-2590.62	2101.12	140.96	3335.57	3326.55	2.57
10067	88.4	149.17	6449.07	-2672.34	2149.47	141.19	3429.52	3421.24	0.83
10161	91.34	149.96	6449.28	-2753.38	2197.08	141.41	3522.53	3514.96	3.24
10256	92.4	150.4	6446.18	-2835.75	2244.29	141.64	3616.4	3609.54	1.21
10350	92.53	150.05	6442.14	-2917.27	2290.93	141.86	3709.29	3703.09	0.4
10445	92.97	150.93	6437.58	-2999.85	2337.67	142.07	3803.13	3797.57	1.03
10540	89.58	151.11	6435.47	-3082.92	2383.68	142.29	3896.96	3892.04	3.57
10635	89.93	149.44	6435.88	-3165.41	2430.78	142.48	3991.06	3986.66	1.8
10729	86.68	145.68	6438.66	-3244.69	2481.17	142.6	4084.63	4080.5	5.29
10824	87.82	145.31	6443.21	-3322.88	2534.92	142.66	4179.4	4175.39	1.26
10918	88.57	149.7	6446.18	-3402.11	2585.38	142.77	4273	4269.24	4.74
11013	87.96	152.07	6449.05	-3485.06	2631.58	142.94	4367.02	4363.72	2.57
11108	88.22	152.78	6452.22	-3569.22	2675.53	143.14	4460.69	4457.91	0.8
11203	87.47	151.72	6455.79	-3653.23	2719.73	143.33	4554.45	4552.11	1.37
11298	90.46	150.23	6457.51	-3736.28	2765.81	143.49	4648.6	4646.6	3.52
11393	89.67	148.12	6457.4	-3817.85	2814.49	143.6	4743.13	4741.36	2.37
11486	89.27	147.24	6458.26	-3896.44	2864.21	143.68	4835.9	4834.26	1.04
11581	90.59	147.59	6458.38	-3976.48	2915.37	143.75	4930.7	4929.19	1.44
11676	89.23	148.03	6458.53	-4056.88	2965.97	143.83	5025.46	5024.09	1.5
11772	91.6	149.61	6457.83	-4139	3015.67	143.92	5121.09	5119.88	2.97
11867	91.56	150.05	6455.21	-4221.1	3063.4	144.03	5215.56	5214.53	0.46
11962	90.46	149.7	6453.54	-4303.25	3111.07	144.13	5310.06	5309.19	1.22
12057	86.55	145.48	6456.02	-4383.4	3161.94	144.2	5404.82	5404.03	6.05

