



Azimuths to Gnd North  
 True North: 0.12°  
 Magnetic North: -8.03°  
 Magnetic Field  
 Strength: 52171.3nT  
 Dip Angle: 66.64°  
 Date: 10/28/2014  
 Model: IGRF2010\_14

**HG Energy, LLC**  
**900 Unit 1H**  
**7' RKB - 1116.5' GL @ 1123.5usft (Highlands 7)**  
**Longitude: 81° 11' 28.428 W**  
**Latitude: 39° 2' 51.106 N**  
**Northing: 14179303.40**  
**Easting: 1586124.50**  
**ST01 Design #1**

<b>SITE DETAILS: 900 Unit - Ritchie County, WV</b>
Grid Convergence: -0.12
North Reference: Grid
Magnetic Declination: -8.15°

**SECTION DETAILS**

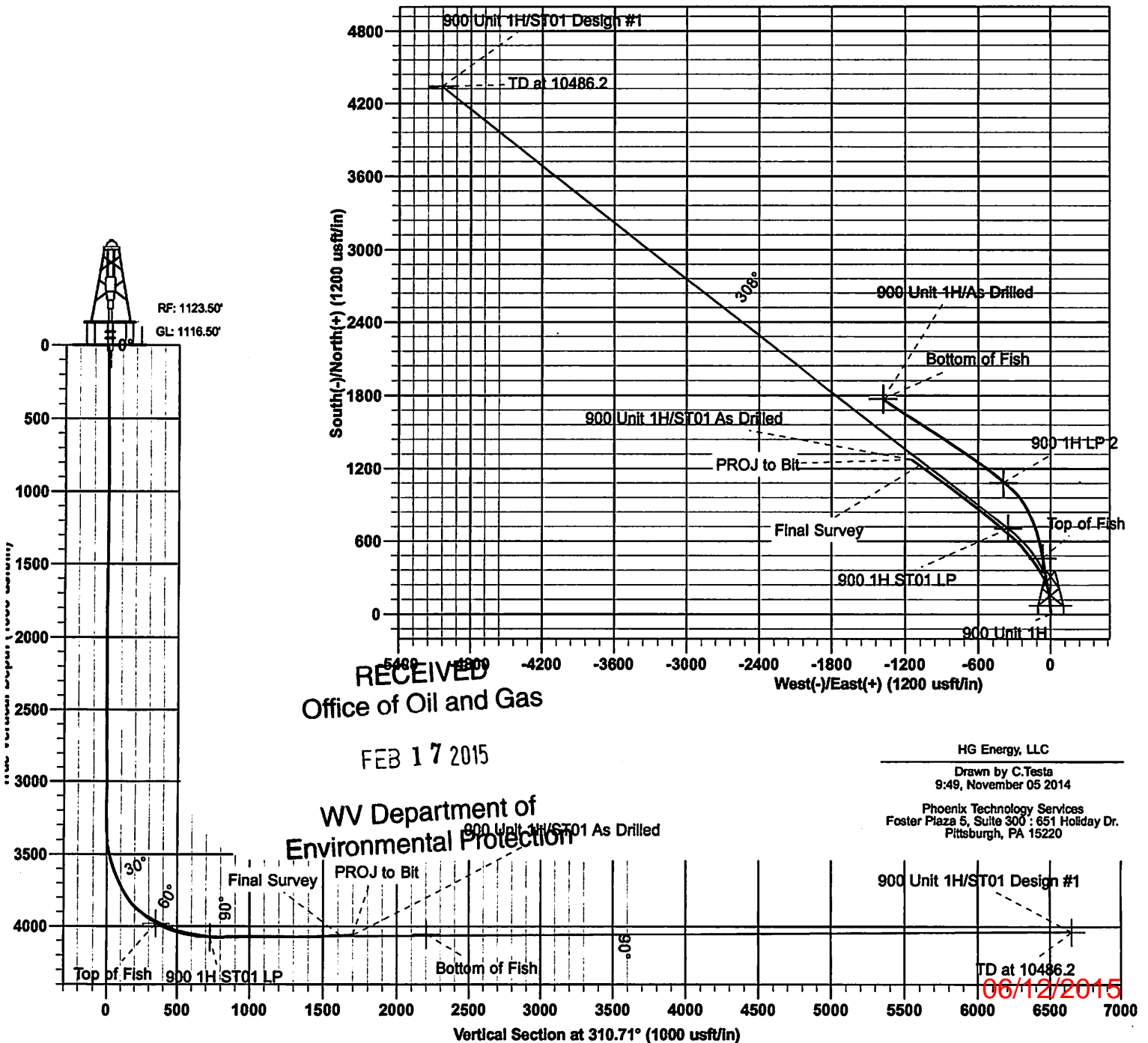
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	3900.0	46.05	349.40	3832.8	236.8	-25.0	0.00	0.00	173.4	
2	3901.0	46.05	349.40	3833.5	237.5	-25.1	0.00	0.00	173.9	
3	4553.0	90.38	307.75	4078.0	707.1	-353.5	8.86	-51.78	729.1	
4	10486.2	90.38	307.75	4038.4	4339.8	-5044.4	0.00	0.00	6654.3	900 1H BHL

**PROJECT DETAILS: Heartwood Forestland**

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD 1927 - Eastern US  
 Ellipsoid: Clarke 1886  
 Zone: Zone 17N (84 W to 78 W)  
 System Datum: Mean Sea Level

**DESIGN TARGET DETAILS**

Name	TVD	+N/-S	+E/-W	Northing	Easting
Top of Fish	3982.8	460.6	-86.0	14179763.96	1586058.48
900 1H BHL	4038.4	4339.8	-5044.4	14183643.20	1581080.10
Bottom of Fish	4057.7	1773.5	-1380.7	14181076.87	1584743.76
900 1H ST01 LP	4078.0	707.1	-353.5	14180010.47	1585770.99



H HEADER INFORMATION -----

H COMPANY : HG Energy, LLC  
 H FIELD : Heartwood Forestland  
 H SITE : 900 Unit - Ritchie County, WV  
 H WELL : 900 Unit 1H  
 H WELLPATH : ST01  
 H DEPTH UNIT: usft

H WELL & MAP INFORMATION

H GeodeticDatum: NAD 1927 - Eastern US  
 H WELL EW MAP : 1586124.50  
 H WELL NS MAP : 14179303.40  
 H DATUM ELEVN (KB-MSL) : 1123.50  
 H VSECT ANGLE : 321.16  
 H Azimuth Reference: Grid  
 H Magnetic Declination: -8.152  
 H Grid Convergence: -0.120

H SURVEY TYPE INFORMATION

H 100.00 - 3256.00 DDC SURVEYS : NS-GYRO-MS  
 H 3288.00 - 5505.00 PHOENIX MWD 2 : MWD+IGRF

H SURVEY LIST

MD	INC	AZI	TVD	VSEC	DLS	N/-S	E/-W	EASTING(X)	NORTHING(Y)	TOOL
0	0	0	0	0	0	0	0	1586124.5	14179303.4	UNDEFINED
100	0.12	318.88	100	0.1	0.12	0.08	-0.07	1586124.43	14179303.48	Gyro Survey
200	0.06	295.02	200	0.3	0.07	0.18	-0.19	1586124.31	14179303.58	Gyro Survey
300	0.17	330.67	300	0.4	0.13	0.33	-0.31	1586124.19	14179303.73	Gyro Survey
400	0.24	272.13	400	0.7	0.21	0.47	-0.59	1586123.91	14179303.87	Gyro Survey
500	0.28	262.81	500	1	0.06	0.45	-1.04	1586123.46	14179303.85	Gyro Survey
600	0.36	259.98	600	1.3	0.08	0.36	-1.59	1586122.91	14179303.76	Gyro Survey
700	0.15	269.5	700	1.5	0.21	0.3	-2.03	1586122.47	14179303.7	Gyro Survey
800	0.02	235.66	800	1.6	0.13	0.29	-2.18	1586122.32	14179303.69	Gyro Survey

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900	0.29	135.83	900	1.3	0.29	0.1	-2.01	1586122.49	14179303.5	Gyro Survey
1000	0.22	152.1	1000	0.9	0.1	-0.25	-1.75	1586122.75	14179303.15	Gyro Survey
1100	0.22	104.54	1100	0.6	0.18	-0.47	-1.47	1586123.03	14179302.93	Gyro Survey
1200	0.56	71.12	1200	0.2	0.4	-0.36	-0.82	1586123.68	14179303.04	Gyro Survey
1300	0.78	96.83	1300	-0.4	0.37	-0.28	0.31	1586124.81	14179303.12	Gyro Survey
1400	1.01	73.38	1400	-1.2	0.43	-0.11	1.83	1586126.33	14179303.29	Gyro Survey
1500	1.56	72.33	1499.9	-2.1	0.55	0.56	3.98	1586128.48	14179303.96	Gyro Survey
1600	1.74	77.02	1599.9	-3.2	0.22	1.31	6.75	1586131.25	14179304.71	Gyro Survey
1700	0.88	58.75	1699.9	-4	0.95	2.05	8.89	1586133.39	14179305.45	Gyro Survey
1800	0.54	57.83	1799.9	-4.1	0.34	2.7	9.94	1586134.44	14179306.1	Gyro Survey
1900	0.33	134.72	1899.9	-4.5	0.57	2.75	10.55	1586135.05	14179306.15	Gyro Survey
2000	0.3	125.82	1999.9	-5	0.06	2.39	10.96	1586135.46	14179305.79	Gyro Survey
2100	0.11	99.57	2099.9	-5.3	0.21	2.22	11.27	1586135.77	14179305.62	Gyro Survey
2200	0.25	271.43	2199.9	-5.3	0.36	2.21	11.15	1586135.65	14179305.61	Gyro Survey
2300	0.33	279.72	2299.9	-4.9	0.09	2.27	10.65	1586135.15	14179305.67	Gyro Survey
2400	0.43	267.4	2399.9	-4.5	0.13	2.3	9.99	1586134.49	14179305.7	Gyro Survey
2500	0.56	256.04	2499.9	-4	0.16	2.16	9.14	1586133.64	14179305.56	Gyro Survey
2600	0.49	247.71	2599.9	-3.7	0.1	1.88	8.27	1586132.77	14179305.28	Gyro Survey
2700	0.55	236.39	2699.9	-3.6	0.12	1.46	7.47	1586131.97	14179304.86	Gyro Survey
2800	0.35	244.57	2799.8	-3.4	0.21	1.06	6.8	1586131.3	14179304.46	Gyro Survey
2900	0.57	247.74	2899.8	-3.2	0.22	0.74	6.06	1586130.56	14179304.14	Gyro Survey
3000	0.4	237.84	2999.8	-3	0.19	0.36	5.3	1586129.8	14179303.76	Gyro Survey
3100	0.35	253.24	3099.8	-2.9	0.11	0.09	4.72	1586129.22	14179303.49	Gyro Survey
3200	0.16	279.12	3199.8	-2.7	0.22	0.02	4.29	1586128.79	14179303.42	Gyro Survey
3256	0.02	15.28	3255.8	-2.6	0.29	0.05	4.21	1586128.71	14179303.45	Gyro Survey
3288	0.3	334.1	3287.8	-2.5	0.89	0.13	4.18	1586128.68	14179303.53	Phoenix MWD
3320	2	0.7	3319.8	-2	5.43	0.76	4.15	1586128.65	14179304.16	Phoenix MWD
3351	4.2	4.4	3350.8	-0.8	7.12	2.43	4.24	1586128.74	14179305.83	Phoenix MWD
3383	6.1	5	3382.7	1.3	5.94	5.3	4.48	1586128.98	14179308.7	Phoenix MWD
3414	7.9	349.2	3413.4	4.4	8.45	9.03	4.22	1586128.72	14179312.43	Phoenix MWD
3445	10.6	347.3	3444	8.8	8.76	13.91	3.2	1586127.7	14179317.31	Phoenix MWD
3477	RECEIVED	347.9	3475.2	15.1	12.82	20.75	1.7	1586126.2	14179324.15	Phoenix MWD
Office of	3514	3505	22.8	11.73	29.39	0.15	1586124.65	14179332.79	Phoenix MWD	
3540	21.3	354.8	3535.1	32	10.33	40.12	-1.13	1586123.37	14179343.52	Phoenix MWD

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3571	23.9	357	3563.7	41.7	8.82	52	-1.96	1586122.54	14179355.4	Phoenix MWD
3603	26.6	357.7	3592.6	52.7	8.49	65.63	-2.59	1586121.91	14179369.03	Phoenix MWD
3634	29.2	356.9	3620	64.5	8.47	80.12	-3.28	1586121.22	14179383.52	Phoenix MWD
3665	31.6	356.3	3646.8	77.2	7.8	95.78	-4.21	1586120.29	14179399.18	Phoenix MWD
3697	33.1	355.5	3673.8	91.3	4.87	112.86	-5.44	1586119.06	14179416.26	Phoenix MWD
3728	34.3	353	3699.6	105.7	5.92	129.97	-7.17	1586117.33	14179433.37	Phoenix MWD
3759	35.4	350.4	3725	121	5.96	147.49	-9.73	1586114.77	14179450.89	Phoenix MWD
3791	36.9	350.8	3750.9	137.4	4.75	166.11	-12.81	1586111.69	14179469.51	Phoenix MWD
3822	39.2	350.9	3775.3	154	7.42	184.98	-15.85	1586108.65	14179488.38	Phoenix MWD
3856	39	348.1	3801.7	172.9	5.23	206.05	-19.75	1586104.75	14179509.45	Phoenix MWD
3887	40.7	340.6	3825.5	191.1	16.44	225.15	-25.13	1586099.37	14179528.55	Phoenix MWD
3918	44.8	337.2	3848.2	211.2	15.17	244.76	-32.72	1586091.78	14179548.16	Phoenix MWD
3950	49.9	335	3869.9	233.9	16.72	266.26	-42.27	1586082.23	14179569.66	Phoenix MWD
3981	54	333.2	3889	257.7	13.99	288.21	-52.94	1586071.56	14179591.61	Phoenix MWD
4012	56.7	331.1	3906.6	282.7	10.34	310.75	-64.86	1586059.64	14179614.15	Phoenix MWD
4044	57.4	328.9	3924	309.3	6.17	334	-78.28	1586046.22	14179637.4	Phoenix MWD
4075	58.8	327.9	3940.4	335.4	5.28	356.41	-92.07	1586032.43	14179659.81	Phoenix MWD
4106	62	326.4	3955.7	362.2	11.15	379.05	-106.7	1586017.8	14179682.45	Phoenix MWD
4138	64.7	324.8	3970.1	390.7	9.55	402.64	-122.86	1586001.64	14179706.04	Phoenix MWD
4169	66	324.2	3983	418.8	4.55	425.58	-139.22	1585985.28	14179728.98	Phoenix MWD
4201	66.2	323.7	3996	448	1.56	449.23	-156.44	1585968.06	14179752.63	Phoenix MWD
4232	67.4	323.3	4008.2	476.5	4.05	472.14	-173.38	1585951.12	14179775.54	Phoenix MWD
4264	69.4	322.6	4020	506.2	6.57	495.88	-191.31	1585933.19	14179799.28	Phoenix MWD
4295	72	321.5	4030.2	535.5	9.03	518.95	-209.3	1585915.2	14179822.35	Phoenix MWD
4326	75.4	320.1	4038.9	565.2	11.79	542	-228.11	1585896.39	14179845.4	Phoenix MWD
4357	77.3	319.1	4046.2	595.3	6.88	564.94	-247.63	1585876.87	14179868.34	Phoenix MWD
4389	78.8	316.2	4052.9	626.6	10.03	588.07	-268.72	1585855.78	14179891.47	Phoenix MWD
4420	79.8	312.2	4058.6	656.8	13.08	609.3	-290.55	1585833.95	14179912.7	Phoenix MWD
4454	80.3	310.6	4064.5	689.8	4.86	631.45	-315.67	1585808.83	14179934.85	Phoenix MWD
4485	79.8	309.9	4069.9	719.8	2.75	651.18	-338.98	1585785.52	14179954.58	Phoenix MWD
4517	81.8	309.8	4075	750.8	6.26	671.42	-363.23	1585761.27	14179974.82	Phoenix MWD
4548	RECEIVED	309.6	4078.5	781	10.34	691.08	-386.92	1585737.58	14179994.48	Phoenix MWD
4580	Office of Oil and Gas	310.1	4079.6	812.3	19.44	711.57	-411.46	1585713.04	14180014.97	Phoenix MWD
4611	92.6	309.4	4078.6	842.7	5.05	731.38	-435.28	1585689.22	14180034.78	Phoenix MWD

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4642	92.2	309.7	4077.3	873	1.61	751.1	-459.16	1585665.34	14180054.5	Phoenix MWD
4673	92.3	309.8	4076.1	903.4	0.46	770.91	-482.98	1585641.52	14180074.31	Phoenix MWD
4704	90.8	309.8	4075.2	933.7	4.84	790.74	-506.79	1585617.71	14180094.14	Phoenix MWD
4735	89.6	309.6	4075.1	964.1	3.92	810.55	-530.64	1585593.86	14180113.95	Phoenix MWD
4767	89.6	308.7	4075.3	995.4	2.81	830.75	-555.45	1585569.05	14180134.15	Phoenix MWD
4859	90.2	307.9	4075.5	1085.1	1.09	887.77	-627.65	1585496.85	14180191.17	Phoenix MWD
4954	89.6	307.2	4075.7	1177.4	0.97	945.66	-702.97	1585421.53	14180249.06	Phoenix MWD
5048	89.1	307.2	4076.7	1268.7	0.53	1002.49	-777.84	1585346.66	14180305.89	Phoenix MWD
5142	90.8	307.1	4076.8	1359.9	1.81	1059.26	-852.76	1585271.74	14180362.66	Phoenix MWD
5236	91.4	306.5	4075	1450.9	0.9	1115.55	-928.01	1585196.49	14180418.95	Phoenix MWD
5330	92.5	306.3	4071.8	1541.7	1.19	1171.3	-1003.63	1585120.87	14180474.7	Phoenix MWD
5424	93.4	307.1	4067	1632.6	1.28	1227.4	-1078.89	1585045.61	14180530.8	Final Survey
5505	93.4	307.1	4062.2	1711.1	0	1276.18	-1143.38	1584981.12	14180579.58	PROJ to Bit

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