



Gyroscopic Survey Report  
for  
EAST CHEYENNE GAS STORAGE  
10901 W. TOLLER DRIVE  
LITTLETON, CO 80127

Well Location	LOGAN, CO
Well Name	GILLHAM #1
Rig Name	NA
Survey Date	10/7/2011
Latitude	40.96 deg
North Reference	True North
Grid Correction	0.00 deg
Depth Reference	GL
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 39.18Azim (deg)
Definitive Survey	Computed from ECGS G1.BIN's HighSpeed: OutRun
Operator	P HOLBROOK

**Comments**



## Survey Report

Well Name: GILLHAM #1  
 Survey: Computed from ECGS G1.BIN's HighSpeed: OutRun  
 Survey Date: 10/7/2011

MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
101.64	0.17	141.60	101.64	-0.03	-0.12	0.10	0.17	0.16	141.60
149.99	0.23	158.69	149.99	-0.10	-0.27	0.18	0.17	0.32	146.71
177.80	0.33	204.55	177.80	-0.20	-0.40	0.17	0.84	0.43	157.28
208.57	0.36	219.66	208.57	-0.38	-0.55	0.07	0.32	0.55	173.02
239.00	0.36	223.31	239.00	-0.57	-0.69	-0.06	0.08	0.70	184.92
269.47	0.36	216.54	269.47	-0.77	-0.84	-0.18	0.14	0.86	192.24
299.96	0.30	186.63	299.96	-0.93	-1.00	-0.25	0.58	1.03	193.98
329.90	0.26	200.33	329.89	-1.06	-1.14	-0.28	0.26	1.17	193.86
359.44	0.21	230.37	359.44	-1.18	-1.24	-0.35	0.45	1.29	195.65
389.24	0.44	323.84	389.24	-1.20	-1.18	-0.46	1.67	1.27	201.11
419.35	0.37	306.03	419.35	-1.18	-1.03	-0.60	0.47	1.19	210.26
449.38	0.48	293.76	449.37	-1.22	-0.92	-0.79	0.48	1.22	220.68
479.69	0.53	250.56	479.68	-1.37	-0.92	-1.04	1.23	1.39	228.57
507.80	0.70	224.87	507.79	-1.65	-1.08	-1.28	1.13	1.68	229.84
539.88	0.43	233.32	539.87	-1.96	-1.29	-1.52	0.87	1.99	229.57
568.29	0.28	272.90	568.28	-2.10	-1.35	-1.67	0.97	2.15	231.01
598.96	0.41	249.20	598.95	-2.24	-1.39	-1.85	0.61	2.31	233.09
629.44	0.32	241.43	629.43	-2.42	-1.47	-2.02	0.31	2.50	234.06
659.65	0.40	224.63	659.64	-2.60	-1.58	-2.17	0.44	2.69	233.92
689.08	0.39	253.40	689.07	-2.79	-1.69	-2.34	0.67	2.89	234.25
719.13	0.39	239.88	719.12	-2.97	-1.77	-2.53	0.30	3.08	235.05
748.75	0.37	254.31	748.73	-3.14	-1.84	-2.71	0.33	3.27	235.76
779.89	0.37	268.34	779.88	-3.29	-1.87	-2.90	0.29	3.46	237.18
809.20	0.35	285.09	809.19	-3.38	-1.85	-3.08	0.36	3.60	239.00
839.22	0.30	281.43	839.21	-3.46	-1.81	-3.25	0.16	3.72	240.82
869.73	0.25	281.34	869.72	-3.53	-1.78	-3.39	0.16	3.83	242.25
898.23	0.36	297.86	898.21	-3.57	-1.73	-3.53	0.49	3.93	243.91
928.29	0.35	286.52	928.28	-3.63	-1.66	-3.70	0.24	4.06	245.87
959.49	0.35	293.79	959.47	-3.69	-1.59	-3.88	0.14	4.20	247.68
989.51	0.39	324.83	989.50	-3.69	-1.47	-4.03	0.67	4.29	249.90
1018.11	0.32	307.12	1018.10	-3.66	-1.35	-4.15	0.45	4.36	252.03
1048.45	0.26	301.59	1048.44	-3.67	-1.26	-4.27	0.22	4.45	253.60
1079.64	0.32	305.89	1079.62	-3.69	-1.17	-4.40	0.21	4.56	255.13
1109.67	0.31	294.01	1109.65	-3.72	-1.09	-4.55	0.22	4.68	256.55
1139.14	0.27	322.49	1139.12	-3.72	-1.00	-4.66	0.50	4.77	257.91
1168.53	0.31	337.26	1168.51	-3.67	-0.87	-4.74	0.28	4.82	259.60
1199.46	0.32	344.20	1199.44	-3.58	-0.71	-4.79	0.13	4.84	261.57
1229.55	0.47	350.88	1229.53	-3.45	-0.51	-4.83	0.54	4.86	264.01



## Survey Report

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Survey:		Computed from ECGS G1.BIN's HighSpeed: OutRun							
Survey Date:		10/7/2011							
MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
1259.16	0.27	3.36	1259.14	-3.31	-0.32	-4.85	0.74	4.86	266.27
1289.82	0.27	11.27	1289.80	-3.19	-0.17	-4.83	0.12	4.83	267.93
1318.44	0.21	18.14	1318.41	-3.08	-0.06	-4.80	0.21	4.80	269.29
1348.91	0.24	5.87	1348.89	-2.97	0.06	-4.78	0.19	4.78	270.70
1379.35	0.28	5.13	1379.33	-2.86	0.20	-4.76	0.13	4.77	272.37
1409.62	0.24	21.04	1409.60	-2.74	0.33	-4.74	0.28	4.75	273.98
1438.36	0.25	33.94	1438.33	-2.62	0.44	-4.68	0.19	4.70	275.32
1468.74	0.24	50.36	1468.72	-2.49	0.53	-4.59	0.23	4.63	276.59
1499.11	0.21	74.07	1499.09	-2.38	0.59	-4.49	0.32	4.53	277.45
1529.46	0.15	65.16	1529.43	-2.30	0.62	-4.40	0.21	4.44	278.01
1559.80	0.22	62.66	1559.77	-2.21	0.66	-4.31	0.23	4.36	278.76
1589.02	0.20	52.89	1588.99	-2.11	0.72	-4.22	0.15	4.28	279.69
1617.81	0.13	56.53	1617.78	-2.03	0.77	-4.15	0.25	4.22	280.49
1649.92	0.27	72.06	1649.89	-1.93	0.81	-4.05	0.46	4.13	281.33
1678.43	0.22	71.50	1678.40	-1.83	0.85	-3.93	0.17	4.03	282.19
1709.43	0.24	97.03	1709.40	-1.74	0.86	-3.81	0.34	3.91	282.72
1738.61	0.34	100.53	1738.58	-1.67	0.84	-3.67	0.35	3.76	282.87
1769.57	0.28	125.93	1769.54	-1.62	0.78	-3.51	0.48	3.60	282.46
1799.17	0.29	117.68	1799.15	-1.60	0.70	-3.39	0.15	3.46	281.65
1828.23	0.38	116.95	1828.20	-1.56	0.62	-3.24	0.31	3.29	280.84
1859.58	0.27	101.38	1859.55	-1.51	0.56	-3.07	0.46	3.12	280.30
1888.73	0.32	100.43	1888.71	-1.44	0.53	-2.92	0.20	2.97	280.27
1919.02	0.40	99.14	1918.99	-1.34	0.50	-2.74	0.24	2.78	280.30
1949.80	0.39	97.64	1949.77	-1.23	0.47	-2.53	0.04	2.57	280.46
1979.73	0.40	103.71	1979.69	-1.14	0.43	-2.32	0.14	2.36	280.44
2009.24	0.44	111.44	2009.21	-1.06	0.36	-2.12	0.22	2.15	279.71
2038.96	0.43	103.86	2038.93	-0.97	0.29	-1.90	0.19	1.92	278.79
2069.34	0.50	122.52	2069.31	-0.91	0.19	-1.68	0.55	1.69	276.62
2098.09	0.45	115.28	2098.05	-0.87	0.08	-1.47	0.29	1.47	273.09
2128.44	0.44	114.28	2128.40	-0.81	-0.02	-1.26	0.03	1.26	269.15
2159.83	0.44	111.52	2159.79	-0.74	-0.11	-1.04	0.07	1.04	263.78
2189.06	0.44	113.99	2189.02	-0.68	-0.20	-0.83	0.07	0.85	256.36
2218.68	0.43	102.67	2218.65	-0.60	-0.27	-0.61	0.30	0.67	246.12
2249.75	0.58	98.33	2249.71	-0.46	-0.32	-0.34	0.51	0.47	227.02
2279.10	0.55	92.49	2279.05	-0.30	-0.35	-0.05	0.23	0.35	188.96
2308.42	0.61	82.48	2308.38	-0.11	-0.33	0.24	0.40	0.41	144.22
2337.77	0.73	86.51	2337.72	0.13	-0.30	0.58	0.45	0.66	117.39
2369.06	0.89	79.00	2369.01	0.46	-0.24	1.02	0.60	1.05	103.40



## Survey Report

Well Name: GILLHAM #1  
 Survey: Computed from ECGS G1.BIN's HighSpeed: OutRun  
 Survey Date: 10/7/2011

MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
2399.17	0.91	80.06	2399.12	0.82	-0.16	1.48	0.08	1.49	96.05
2428.59	1.15	75.35	2428.54	1.23	-0.04	2.00	0.88	2.00	91.21
2459.93	1.19	71.69	2459.87	1.76	0.14	2.61	0.27	2.62	86.94
2488.56	1.27	74.54	2488.49	2.27	0.32	3.20	0.35	3.22	84.33
2519.74	1.24	72.87	2519.67	2.83	0.51	3.86	0.17	3.89	82.48
2549.30	1.33	74.31	2549.22	3.38	0.70	4.49	0.34	4.55	81.19
2578.57	1.51	75.43	2578.48	3.97	0.88	5.19	0.62	5.27	80.33
2608.08	1.45	74.68	2607.98	4.58	1.08	5.93	0.21	6.03	79.66
2639.39	1.46	74.62	2639.28	5.23	1.29	6.70	0.03	6.82	79.08
2668.17	1.67	77.76	2668.05	5.86	1.48	7.46	0.78	7.60	78.79
2698.58	1.64	75.90	2698.45	6.55	1.68	8.31	0.20	8.48	78.59
2729.82	1.65	76.11	2729.67	7.27	1.89	9.18	0.04	9.38	78.34
2759.22	1.62	76.13	2759.06	7.94	2.10	10.00	0.09	10.21	78.16
2788.59	1.48	77.31	2788.42	8.57	2.28	10.77	0.48	11.01	78.05
2819.82	1.56	76.04	2819.63	9.23	2.47	11.58	0.27	11.84	77.96
2849.51	1.69	73.05	2849.32	9.92	2.70	12.39	0.53	12.68	77.73
2878.30	1.46	74.76	2878.09	10.57	2.92	13.15	0.84	13.47	77.50
2908.66	1.64	69.99	2908.45	11.25	3.17	13.93	0.73	14.29	77.20
2939.81	1.64	69.30	2939.58	12.02	3.48	14.76	0.06	15.17	76.76
2969.49	1.73	74.93	2969.24	12.75	3.74	15.59	0.63	16.04	76.51
2998.87	1.63	58.10	2998.62	13.51	4.08	16.38	1.71	16.88	76.02
3028.38	1.73	65.31	3028.12	14.31	4.49	17.14	0.80	17.72	75.33
3059.60	1.88	66.92	3059.32	15.18	4.88	18.04	0.50	18.69	74.85
3089.85	1.89	46.44	3089.55	16.12	5.42	18.86	2.22	19.62	73.96
3118.33	1.88	47.90	3118.02	17.05	6.06	19.55	0.17	20.46	72.77
3149.31	1.90	50.85	3148.98	18.05	6.73	20.32	0.32	21.41	71.69
3179.64	2.21	40.31	3179.28	19.13	7.49	21.09	1.61	22.38	70.45
3209.83	2.28	42.58	3209.45	20.32	8.38	21.88	0.36	23.43	69.04
3237.72	2.22	44.07	3237.33	21.41	9.17	22.63	0.31	24.42	67.93
3269.47	2.28	37.09	3269.05	22.65	10.12	23.43	0.88	25.53	66.65
3298.54	2.47	37.52	3298.09	23.85	11.07	24.16	0.66	26.58	65.38
3329.07	2.62	35.05	3328.59	25.20	12.17	24.96	0.62	27.77	64.02
3359.31	2.40	31.59	3358.80	26.52	13.27	25.69	0.89	28.92	62.68
3389.79	2.56	31.68	3389.26	27.83	14.40	26.39	0.53	30.06	61.38
3418.70	2.39	29.59	3418.14	29.07	15.47	27.02	0.67	31.14	60.21
3448.87	2.49	29.46	3448.29	30.33	16.59	27.66	0.34	32.25	59.04
3478.79	2.54	28.16	3478.17	31.62	17.74	28.29	0.25	33.39	57.91
3509.72	2.48	28.24	3509.08	32.95	18.93	28.93	0.19	34.57	56.79



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Well Name:		GILLHAM #1								
Survey:		Computed from ECGS G1.BIN's HighSpeed: OutRun								
Survey Date:		10/7/2011								
MD	Inc	Azim	TVD	VS	Northing	Easting	DLS	Closure Distance	Closure Angle	
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	deg	
3538.73	2.19	30.21	3538.06	34.12	19.97	29.50	1.05	35.63	55.91	
3569.12	2.15	27.24	3568.43	35.25	20.97	30.06	0.39	36.65	55.09	
3599.02	2.06	30.17	3598.31	36.33	21.94	30.59	0.48	37.64	54.35	
3628.94	2.30	33.72	3628.20	37.46	22.90	31.19	0.94	38.69	53.71	
3659.59	2.26	30.15	3658.84	38.67	23.94	31.83	0.49	39.83	53.06	
3689.87	2.17	17.70	3689.09	39.79	25.00	32.31	1.61	40.85	52.27	
3719.67	1.94	20.95	3718.88	40.80	26.01	32.66	0.86	41.75	51.47	
3748.75	2.01	25.20	3747.94	41.76	26.93	33.05	0.56	42.64	50.83	
3779.49	2.31	25.38	3778.65	42.88	27.98	33.55	0.97	43.69	50.17	
3809.86	2.36	19.50	3808.99	44.07	29.12	34.02	0.80	44.78	49.44	
3839.84	2.26	17.69	3838.96	45.20	30.27	34.41	0.41	45.82	48.66	
3869.66	2.00	17.77	3868.75	46.23	31.32	34.74	0.88	46.78	47.97	
3899.12	1.44	8.11	3898.20	47.02	32.18	34.95	2.12	47.51	47.37	
3929.27	1.09	15.71	3928.34	47.61	32.83	35.08	1.30	48.04	46.90	
3959.83	0.72	346.98	3958.89	47.99	33.29	35.12	1.87	48.39	46.53	
3988.62	0.68	303.65	3987.69	48.08	33.56	34.93	1.80	48.44	46.15	
4019.82	0.93	331.89	4018.89	48.16	33.89	34.66	1.48	48.47	45.64	
4049.37	1.12	354.07	4048.43	48.46	34.39	34.52	1.47	48.72	45.11	
4079.64	0.65	330.93	4078.69	48.73	34.83	34.40	1.91	48.96	44.65	
4109.88	0.63	273.63	4108.93	48.70	34.99	34.15	2.03	48.90	44.31	
4138.76	0.58	317.31	4137.81	48.63	35.11	33.90	1.56	48.80	43.99	
4169.76	0.56	316.61	4168.81	48.67	35.33	33.69	0.06	48.82	43.63	
4198.42	0.86	316.05	4197.46	48.72	35.59	33.44	1.04	48.84	43.21	
4228.79	0.86	328.23	4227.84	48.82	35.95	33.16	0.60	48.91	42.69	
4259.91	0.87	30.46	4258.95	49.13	36.35	33.16	2.88	49.20	42.37	
4288.67	1.50	40.02	4287.71	49.72	36.83	33.51	2.29	49.79	42.30	
4318.92	1.40	34.33	4317.95	50.48	37.44	33.97	0.58	50.55	42.22	
4348.29	1.41	34.27	4347.31	51.20	38.03	34.38	0.03	51.27	42.11	
4378.67	1.01	44.38	4377.68	51.84	38.53	34.77	1.49	51.90	42.07	
4409.03	0.96	45.08	4408.04	52.35	38.90	35.14	0.14	52.42	42.09	
4438.31	1.10	41.04	4437.31	52.88	39.29	35.50	0.53	52.95	42.10	
4468.58	1.30	34.92	4467.57	53.51	39.79	35.89	0.79	53.58	42.05	
4498.85	1.26	34.58	4497.84	54.19	40.34	36.27	0.15	54.25	41.96	
4529.85	0.78	28.05	4528.83	54.74	40.81	36.57	1.58	54.80	41.86	
4558.38	0.88	17.09	4557.36	55.13	41.19	36.72	0.65	55.18	41.72	
4589.64	1.05	31.57	4588.61	55.64	41.66	36.94	0.94	55.68	41.56	
4619.90	1.14	29.60	4618.87	56.21	42.16	37.24	0.32	56.25	41.45	
4648.06	0.57	34.61	4647.03	56.62	42.52	37.45	2.04	56.66	41.38	
4679.13	0.69	42.12	4678.09	56.96	42.78	37.66	0.49	57.00	41.36	



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MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
4709.45	0.24	57.42	4708.41	57.20	42.95	37.84	1.55	57.24	41.38
4738.91	0.51	296.76	4737.88	57.23	43.05	37.77	2.26	57.27	41.27
4769.34	0.33	4.47	4768.30	57.27	43.19	37.66	1.62	57.30	41.08
4798.87	0.53	16.38	4797.83	57.47	43.41	37.70	0.75	57.50	40.98
4829.87	0.92	3.14	4828.83	57.80	43.79	37.76	1.36	57.82	40.77
4858.48	0.59	338.71	4857.43	58.06	44.16	37.72	1.59	58.08	40.50
4889.44	0.59	350.17	4888.39	58.25	44.47	37.63	0.38	58.26	40.24
4919.53	0.72	0.12	4918.48	58.49	44.81	37.61	0.56	58.50	40.00
4949.51	0.40	4.37	4948.46	58.73	45.10	37.61	1.08	58.73	39.83
4978.93	0.62	348.33	4977.88	58.91	45.36	37.59	0.90	58.91	39.65
5008.45	0.59	333.39	5007.39	59.07	45.65	37.49	0.54	59.07	39.39
5038.69	0.45	27.38	5037.63	59.25	45.90	37.47	1.63	59.25	39.23
5068.20	0.23	43.46	5067.14	59.43	46.05	37.57	0.81	59.43	39.21
5099.04	0.33	358.23	5097.98	59.56	46.18	37.61	0.75	59.56	39.16
5129.37	0.10	140.17	5128.32	59.62	46.25	37.62	1.35	59.62	39.13
5158.64	0.06	148.34	5157.59	59.61	46.21	37.65	0.16	59.61	39.17
5178.25	0.06	148.94	5177.19	59.60	46.20	37.66	0.00	59.60	39.18