

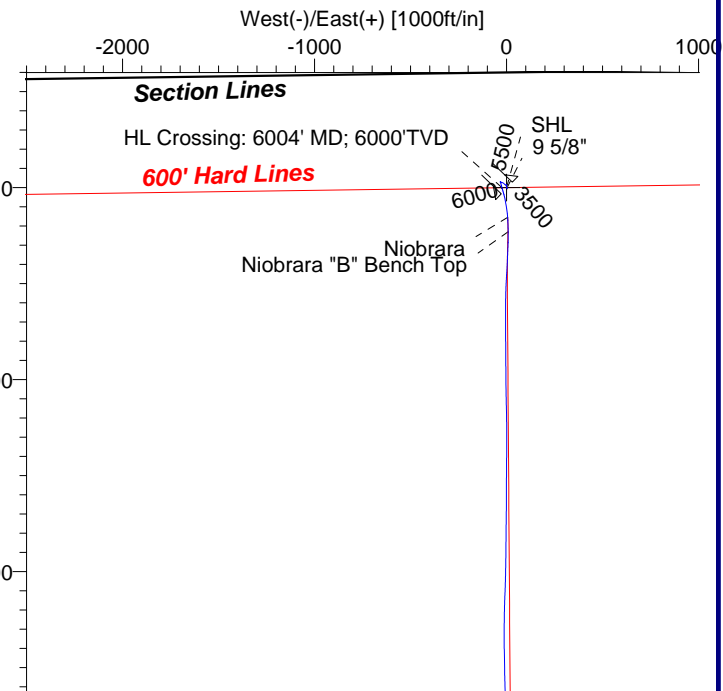
# CHESAPEAKE OPERATING

Field: Weld County, CO  
Site: Hoff 6-62 15  
Well: 1H  
Wellpath: OH



Azimuths to Grid North  
True North: -0.77°  
Magnetic North: 7.82°

Magnetic Field  
Strength: 53241nT  
Dip Angle: 67.19°  
Date: 9/19/2011  
Model: IGRF2010



## PROPOSED CASING DETAILS

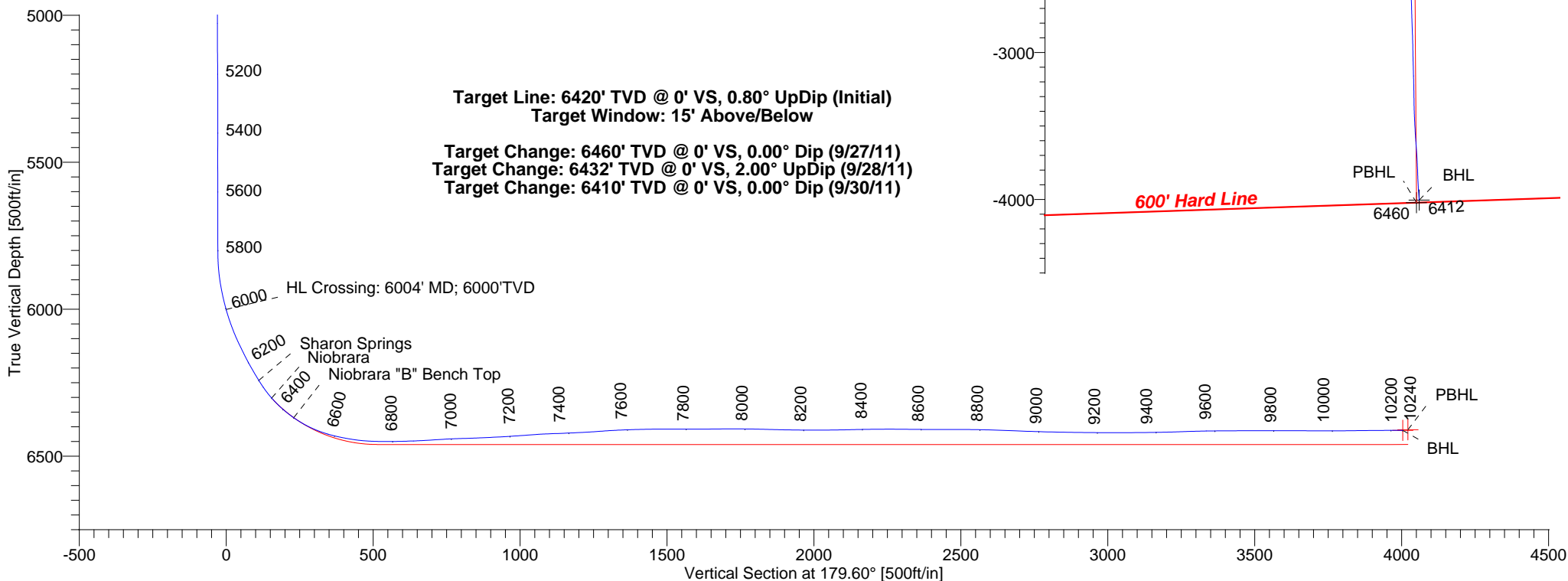
No.	TVD	MD	Name	Size
1	950.00	950.00	9 5/8"	9.625

## FORMATION TOP DETAILS

No.	TVDPath	MDPath	Formation
1	3392.00	3392.14	Richard Sandstone
2	6242.00	6271.92	Sharon Springs
3	6302.00	6346.42	Niobrara
4	6369.00	6447.32	Niobrara "B" Bench Top
5	6407.65	7711.24	Target Line

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
SHL	0.00	0.00	0.00	424600.06	2332335.65	40°29'34.089N	104°18'18.355W	Point
PBHL	6410.00	-4021.06	28.35	420579.00	2332364.00	40°28'54.353N	104°18'18.689W	Rectangle (2841x0)
BHL	6411.86	-4003.60	46.35	420596.46	2332382.00	40°28'54.523N	104°18'18.453W	Point



LEAM DRILLING SYSTEMS, INC.  
2010 East Davis, Conroe, Texas 77301  
Phone: 936-756-7577 Fax: 936-756-7595

Wellpath: (1H/OH)

Created By: Mike Moreno Date: 10/21/2011

Checked: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# LEAM Drilling Systems, Inc

## Survey Report

<b>Company:</b> CHESAPEAKE OPERATING				<b>Date:</b> 10/21/2011		<b>Time:</b> 15:45:47		<b>Page:</b> 1	
<b>Field:</b> Weld County, CO				<b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North					
<b>Site:</b> Hoff 6-62 15				<b>Vertical (TVD) Reference:</b> GE 4737' + KB 20' 4757.0					
<b>Well:</b> 1H				<b>Section (VS) Reference:</b> Well (0.00N,0.00E,179.60Azi)					
<b>Wellpath:</b> OH				<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase			

<b>Field:</b> Weld County, CO			
<b>Map System:</b> US State Plane Coordinate System 1927		<b>Map Zone:</b> Colorado, Northern Zone	
<b>Geo Datum:</b> NAD27 (Clarke 1866)		<b>Coordinate System:</b> Well Centre	
<b>Sys Datum:</b> Mean Sea Level		<b>Geomagnetic Model:</b> IGRF2010	

<b>Site:</b> Hoff 6-62 15			
<b>Site Position:</b>		<b>Northing:</b> 424600.06 ft	
<b>From:</b> Map		<b>Easting:</b> 2332335.65 ft	
<b>Position Uncertainty:</b> 0.00 ft		<b>Latitude:</b> 40 29 34.089 N	
<b>Ground Level:</b> 4737.00 ft		<b>Longitude:</b> 104 18 18.355 W	
		<b>North Reference:</b> Grid	
		<b>Grid Convergence:</b> 0.77 deg	

<b>Well:</b> 1H				<b>Slot Name:</b>			
<b>Well Position:</b> +N/-S 0.00 ft		<b>Northing:</b> 424600.06 ft		<b>Latitude:</b> 40 29 34.089 N			
+E/-W 0.00 ft		<b>Easting :</b> 2332335.65 ft		<b>Longitude:</b> 104 18 18.355 W			
<b>Position Uncertainty:</b> 0.00 ft							

<b>Wellpath:</b> OH				<b>Drilled From:</b> Surface			
<b>Current Datum:</b> GE 4737' + KB 20'				<b>Tie-on Depth:</b> 0.00 ft			
<b>Magnetic Data:</b> 9/19/2011				<b>Above System Datum:</b> Mean Sea Level			
<b>Field Strength:</b> 53241 nT				<b>Declination:</b> 8.59 deg			
<b>Vertical Section:</b> Depth From (TVD)				<b>Mag Dip Angle:</b> 67.19 deg			
		ft		+N/-S ft		+E/-W ft	
0.00		0.00		0.00		179.60	

<b>Survey Program for Definitive Wellpath</b>					
<b>Date:</b> 10/21/2011		<b>Validated:</b> No		<b>Version:</b> 0	
<b>Actual From</b>	<b>To</b>	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>	
ft	ft				
0.00	5725.00	Survey #1 (0.00-5725.80)	Gyroscope	Gyroscope	
5725.00	10189.00	Survey #2 (5725.00-10189.00)	MWD	Std MWD	
10189.00	10240.00	Survey #3 (10189.00-10240.00)	Project	Projection	

Survey										
MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
950.00	0.29	133.90	950.00	-1.68	1.75	1.69	0.03	0.03	0.00	9 5/8"
973.80	0.30	133.90	973.80	-1.77	1.84	1.78	0.03	0.03	0.00	Gyroscope
1112.50	0.10	198.70	1112.49	-2.13	2.06	2.15	0.20	-0.14	46.72	Gyroscope
1300.10	0.30	113.50	1300.09	-2.49	2.46	2.50	0.16	0.11	-45.42	Gyroscope
1397.90	0.10	179.40	1397.89	-2.67	2.69	2.69	0.28	-0.20	67.38	Gyroscope
1582.40	0.40	346.30	1582.39	-2.21	2.54	2.23	0.27	0.16	90.46	Gyroscope
1769.10	1.10	331.20	1769.07	0.00	1.52	0.01	0.39	0.37	-8.09	Gyroscope
2198.70	0.50	10.10	2198.63	5.45	-0.13	-5.46	0.18	-0.14	9.05	Gyroscope
2578.20	1.00	351.40	2578.10	10.36	-0.34	-10.36	0.14	0.13	-4.93	Gyroscope
2866.20	0.70	14.00	2866.07	14.55	-0.29	-14.55	0.15	-0.10	7.85	Gyroscope
3056.50	0.20	40.80	3056.36	15.93	0.21	-15.93	0.28	-0.26	14.08	Gyroscope
3248.80	0.30	258.30	3248.66	16.08	-0.06	-16.08	0.25	0.05	-74.10	Gyroscope
3438.90	0.80	226.40	3438.75	15.07	-1.51	-15.08	0.30	0.26	-16.78	Gyroscope
3534.30	0.60	231.00	3534.15	14.29	-2.38	-14.31	0.22	-0.21	4.82	Gyroscope
3629.80	0.60	260.10	3629.64	13.89	-3.26	-13.91	0.32	0.00	30.47	Gyroscope
3724.30	0.80	279.00	3724.13	13.91	-4.40	-13.94	0.32	0.21	20.00	Gyroscope
3932.20	0.90	304.50	3932.01	15.06	-7.18	-15.11	0.19	0.05	12.27	Gyroscope
4102.80	1.40	313.60	4102.58	17.26	-9.80	-17.33	0.31	0.29	5.33	Gyroscope
4249.00	1.70	320.40	4248.72	20.16	-12.47	-20.25	0.24	0.21	4.65	Gyroscope
4390.90	2.10	305.80	4390.55	23.30	-15.92	-23.41	0.44	0.28	-10.29	Gyroscope

# LEAM Drilling Systems, Inc

## Survey Report

<b>Company:</b> CHESAPEAKE OPERATING <b>Field:</b> Weld County, CO <b>Site:</b> Hoff 6-62 15 <b>Well:</b> 1H <b>Wellpath:</b> OH	<b>Date:</b> 10/21/2011 <b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North <b>Vertical (TVD) Reference:</b> GE 4737' + KB 20' 4757.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,179.60Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 15:45:47 <b>Page:</b> 2 <b>Db:</b> Sybase
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### Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
4487.10	2.70	296.50	4486.66	25.35	-19.38	-25.48	0.74	0.62	-9.67	Gyroscope
4577.80	3.10	285.10	4577.25	26.94	-23.66	-27.10	0.77	0.44	-12.57	Gyroscope
4677.70	2.30	289.10	4677.03	28.30	-28.16	-28.49	0.82	-0.80	4.00	Gyroscope
4773.20	1.20	282.00	4772.49	29.13	-30.95	-29.35	1.17	-1.15	-7.43	Gyroscope
4869.80	0.70	292.70	4869.08	29.57	-32.48	-29.80	0.55	-0.52	11.08	Gyroscope
4964.70	0.10	302.60	4963.97	29.84	-33.09	-30.07	0.63	-0.63	10.43	Gyroscope
5060.30	0.20	100.80	5059.57	29.85	-32.99	-30.08	0.31	0.10	165.48	Gyroscope
5153.80	1.00	128.70	5153.07	29.31	-32.20	-29.54	0.89	0.86	29.84	Gyroscope
5346.30	0.20	41.60	5345.56	28.51	-30.66	-28.73	0.52	-0.42	-45.25	Gyroscope
5440.00	0.20	55.60	5439.26	28.73	-30.42	-28.94	0.05	0.00	14.94	Gyroscope
5538.20	0.10	166.80	5537.46	28.74	-30.26	-28.95	0.26	-0.10	113.24	Gyroscope
5599.80	0.10	204.90	5599.06	28.64	-30.27	-28.85	0.11	0.00	61.85	Gyroscope
5725.00	0.30	254.30	5724.25	28.45	-30.63	-28.66	0.20	0.16	39.46	MWD
5775.00	0.40	247.90	5774.25	28.35	-30.92	-28.57	0.21	0.20	-12.80	MWD
5814.00	0.40	186.20	5813.25	28.16	-31.06	-28.38	1.05	0.00	-158.21	MWD
5862.00	4.80	167.40	5861.19	26.04	-30.64	-26.25	9.22	9.17	-39.17	MWD
5909.00	9.20	168.10	5907.83	20.44	-29.43	-20.64	9.36	9.36	1.49	MWD
5957.00	12.80	164.00	5954.94	11.57	-27.18	-11.76	7.67	7.50	-8.54	MWD
6004.00	16.13	164.89	6000.44	0.26	-24.04	-0.43	7.10	7.08	1.88	HL Crossing: 6004' MD; 60
6005.00	16.20	164.90	6001.41	-0.01	-23.97	-0.16	7.10	7.09	1.50	MWD
6037.00	19.10	163.20	6031.90	-9.33	-21.29	9.18	9.20	9.06	-5.31	MWD
6068.00	21.20	164.20	6061.00	-19.58	-18.30	19.46	6.86	6.77	3.23	MWD
6099.00	23.70	164.60	6089.65	-30.99	-15.12	30.88	8.08	8.06	1.29	MWD
6131.00	26.50	165.50	6118.62	-44.10	-11.62	44.02	8.83	8.75	2.81	MWD
6162.00	26.60	168.10	6146.35	-57.59	-8.46	57.53	3.76	0.32	8.39	MWD
6194.00	28.10	170.40	6174.78	-72.03	-5.72	71.99	5.73	4.69	7.19	MWD
6225.00	30.40	170.40	6201.82	-86.96	-3.20	86.94	7.42	7.42	0.00	MWD
6259.00	31.30	170.90	6231.01	-104.17	-0.37	104.16	2.75	2.65	1.47	MWD
6291.00	33.50	172.00	6258.03	-121.12	2.18	121.13	7.12	6.87	3.44	MWD
6320.00	37.60	174.10	6281.62	-137.85	4.20	137.88	14.75	14.14	7.24	MWD
6351.00	42.10	176.40	6305.41	-157.64	5.83	157.68	15.27	14.52	7.42	MWD
6382.00	46.30	177.60	6327.63	-179.22	6.95	179.27	13.81	13.55	3.87	MWD
6413.00	50.50	178.50	6348.21	-202.38	7.73	202.43	13.72	13.55	2.90	MWD
6445.00	54.60	179.40	6367.66	-227.78	8.19	227.83	13.01	12.81	2.81	MWD
6476.00	59.00	180.10	6384.63	-253.71	8.30	253.76	14.32	14.19	2.26	MWD
6508.00	63.80	180.90	6399.95	-281.80	8.05	281.85	15.16	15.00	2.50	MWD
6539.00	68.60	182.40	6412.46	-310.14	7.23	310.18	16.10	15.48	4.84	MWD
6570.00	72.70	182.50	6422.72	-339.36	5.98	339.39	13.23	13.23	0.32	MWD
6602.00	76.70	182.20	6431.17	-370.19	4.71	370.21	12.53	12.50	-0.94	MWD
6633.00	79.30	182.90	6437.61	-400.48	3.37	400.49	8.67	8.39	2.26	MWD
6665.00	81.20	183.20	6443.03	-431.97	1.69	431.97	6.01	5.94	0.94	MWD
6696.00	84.90	183.60	6446.78	-462.68	-0.14	462.67	12.00	11.94	1.29	MWD
6727.00	87.40	183.10	6448.86	-493.56	-1.95	493.53	8.22	8.06	-1.61	MWD
6752.00	89.10	182.00	6449.63	-518.52	-3.06	518.49	8.10	6.80	-4.40	MWD
6850.00	92.00	180.30	6448.68	-616.48	-5.02	616.43	3.43	2.96	-1.73	MWD
6881.00	92.20	180.10	6447.55	-647.46	-5.13	647.41	0.91	0.65	-0.65	MWD
6912.00	93.40	179.90	6446.03	-678.42	-5.13	678.37	3.92	3.87	-0.65	MWD
6944.00	93.60	179.90	6444.08	-710.36	-5.08	710.31	0.62	0.62	0.00	MWD
6975.00	93.60	179.70	6442.13	-741.30	-4.97	741.25	0.64	0.00	-0.65	MWD
7007.00	92.00	179.70	6440.57	-773.26	-4.80	773.21	5.00	-5.00	0.00	MWD
7038.00	91.70	179.40	6439.57	-804.25	-4.56	804.19	1.37	-0.97	-0.97	MWD
7069.00	92.00	179.40	6438.57	-835.23	-4.23	835.18	0.97	0.97	0.00	MWD
7101.00	92.60	179.90	6437.29	-867.20	-4.04	867.15	2.44	1.87	1.56	MWD
7132.00	92.60	179.70	6435.88	-898.17	-3.93	898.12	0.64	0.00	-0.65	MWD

# LEAM Drilling Systems, Inc

## Survey Report

**Company:** CHESAPEAKE OPERATING  
**Field:** Weld County, CO  
**Site:** Hoff 6-62 15  
**Well:** 1H  
**Wellpath:** OH

**Date:** 10/21/2011      **Time:** 15:45:47      **Page:** 3

**Co-ordinate(NE) Reference:** Well: 1H, Grid North

**Vertical (TVD) Reference:** GE 4737' + KB 20' 4757.0

**Section (VS) Reference:** Well (0.00N,0.00E,179.60Azi)

**Survey Calculation Method:** Minimum Curvature      **Db:** Sybase

## Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
7163.00	92.90	179.70	6434.39	-929.13	-3.77	929.08	0.97	0.97	0.00	MWD
7195.00	93.70	179.60	6432.55	-961.08	-3.57	961.03	2.52	2.50	-0.31	MWD
7226.00	93.90	179.40	6430.50	-992.01	-3.30	991.96	0.91	0.65	-0.65	MWD
7258.00	94.30	179.40	6428.21	-1023.93	-2.97	1023.88	1.25	1.25	0.00	MWD
7289.00	94.20	179.40	6425.91	-1054.84	-2.64	1054.79	0.32	-0.32	0.00	MWD
7320.00	92.30	179.00	6424.15	-1085.78	-2.21	1085.74	6.26	-6.13	-1.29	MWD
7352.00	92.20	178.70	6422.90	-1117.75	-1.57	1117.71	0.99	-0.31	-0.94	MWD
7383.00	92.10	178.90	6421.73	-1148.72	-0.92	1148.69	0.72	-0.32	0.65	MWD
7415.00	92.60	178.90	6420.42	-1180.69	-0.31	1180.66	1.56	1.56	0.00	MWD
7446.00	92.90	178.90	6418.93	-1211.65	0.29	1211.62	0.97	0.97	0.00	MWD
7478.00	93.80	179.70	6417.06	-1243.59	0.68	1243.57	3.76	2.81	2.50	MWD
7509.00	94.20	180.10	6414.90	-1274.52	0.73	1274.49	1.82	1.29	1.29	MWD
7603.00	92.00	180.10	6409.82	-1368.37	0.57	1368.34	2.34	-2.34	0.00	MWD
7698.00	90.50	180.60	6407.75	-1463.35	-0.01	1463.31	1.66	-1.58	0.53	MWD
7792.00	89.60	180.10	6407.66	-1557.34	-0.59	1557.30	1.10	-0.96	-0.53	MWD
7886.00	90.70	180.40	6407.42	-1651.34	-1.00	1651.29	1.21	1.17	0.32	MWD
7981.00	89.80	180.80	6407.00	-1746.33	-1.99	1746.28	1.04	-0.95	0.42	MWD
8075.00	88.30	180.30	6408.56	-1840.31	-2.89	1840.25	1.68	-1.60	-0.53	MWD
8169.00	89.20	180.80	6410.61	-1934.28	-3.80	1934.21	1.10	0.96	0.53	MWD
8263.00	90.30	181.30	6411.02	-2028.27	-5.52	2028.18	1.29	1.17	0.53	MWD
8357.00	91.40	182.40	6409.63	-2122.20	-8.55	2122.09	1.65	1.17	1.17	MWD
8452.00	90.50	181.00	6408.05	-2217.15	-11.37	2217.01	1.75	-0.95	-1.47	MWD
8546.00	89.30	180.40	6408.22	-2311.14	-12.52	2310.99	1.43	-1.28	-0.64	MWD
8640.00	89.80	179.00	6408.96	-2405.13	-12.03	2404.99	1.58	0.53	-1.49	MWD
8734.00	90.10	179.00	6409.04	-2499.12	-10.39	2498.98	0.32	0.32	0.00	MWD
8829.00	88.40	178.30	6410.28	-2594.08	-8.15	2593.96	1.94	-1.79	-0.74	MWD
8923.00	87.60	178.30	6413.56	-2687.98	-5.36	2687.87	0.85	-0.85	0.00	MWD
9017.00	88.50	178.00	6416.76	-2781.87	-2.33	2781.79	1.01	0.96	-0.32	MWD
9112.00	89.20	178.00	6418.67	-2876.80	0.99	2876.73	0.74	0.74	0.00	MWD
9206.00	89.60	179.00	6419.65	-2970.76	3.45	2970.71	1.15	0.43	1.06	MWD
9300.00	90.30	178.50	6419.73	-3064.73	5.50	3064.70	0.92	0.74	-0.53	MWD
9394.00	90.80	178.30	6418.83	-3158.69	8.12	3158.67	0.57	0.53	-0.21	MWD
9489.00	92.20	179.00	6416.34	-3253.63	10.36	3253.62	1.65	1.47	0.74	MWD
9582.00	90.70	179.20	6413.99	-3346.59	11.82	3346.59	1.63	-1.61	0.22	MWD
9677.00	90.10	177.40	6413.33	-3441.54	14.64	3441.56	2.00	-0.63	-1.89	MWD
9771.00	90.00	176.70	6413.25	-3535.41	19.47	3535.46	0.75	-0.11	-0.74	MWD
9865.00	90.00	175.50	6413.25	-3629.19	25.87	3629.29	1.28	0.00	-1.28	MWD
9959.00	89.60	176.90	6413.57	-3722.98	32.10	3723.12	1.55	-0.43	1.49	MWD
10054.00	90.80	178.00	6413.24	-3817.89	36.32	3818.05	1.71	1.26	1.16	MWD
10148.00	90.40	176.90	6412.26	-3911.79	40.51	3911.97	1.25	-0.43	-1.17	MWD
10189.00	90.20	176.20	6412.04	-3952.71	42.97	3952.91	1.78	-0.49	-1.71	MWD
10240.00	90.20	176.20	6411.86	-4003.60	46.35	4003.82	0.00	0.00	0.00	Project

## Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
950.00	950.00	9.625	12.250	9 5/8"

# LEAM Drilling Systems, Inc

## Survey Report

**Company:** CHESAPEAKE OPERATING  
**Field:** Weld County, CO  
**Site:** Hoff 6-62 15  
**Well:** 1H  
**Wellpath:** OH

**Date:** 10/21/2011  
**Co-ordinate(NE) Reference:** Well: 1H, Grid North  
**Vertical (TVD) Reference:** GE 4737' + KB 20' 4757.0  
**Section (VS) Reference:** Well (0.00N,0.00E,179.60Azi)  
**Survey Calculation Method:** Minimum Curvature  
**Page:** 4  
**Db:** Sybase

### Annotation

MD ft	TVD ft	
6004.00	6000.44	HL Crossing: 6004' MD; 6000'TVD

# LEAM Drilling Systems, Inc

## Survey Report - Geographic

<b>Company:</b> CHESAPEAKE OPERATING				<b>Date:</b> 10/21/2011		<b>Time:</b> 15:46:51		<b>Page:</b> 1	
<b>Field:</b> Weld County, CO				<b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North					
<b>Site:</b> Hoff 6-62 15				<b>Vertical (TVD) Reference:</b> GE 4737' + KB 20' 4757.0					
<b>Well:</b> 1H				<b>Section (VS) Reference:</b> Well (0.00N,0.00E,179.60Azi)					
<b>Wellpath:</b> OH				<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase			

<b>Field:</b> Weld County, CO			
<b>Map System:</b> US State Plane Coordinate System 1927		<b>Map Zone:</b> Colorado, Northern Zone	
<b>Geo Datum:</b> NAD27 (Clarke 1866)		<b>Coordinate System:</b> Well Centre	
<b>Sys Datum:</b> Mean Sea Level		<b>Geomagnetic Model:</b> IGRF2010	

<b>Site:</b> Hoff 6-62 15			
<b>Site Position:</b>		<b>Northing:</b> 424600.06 ft	
<b>From:</b> Map		<b>Easting:</b> 2332335.65 ft	
<b>Position Uncertainty:</b> 0.00 ft		<b>Latitude:</b> 40 29 34.089 N	
<b>Ground Level:</b> 4737.00 ft		<b>Longitude:</b> 104 18 18.355 W	
		<b>North Reference:</b> Grid	
		<b>Grid Convergence:</b> 0.77 deg	

<b>Well:</b> 1H				<b>Slot Name:</b>			
<b>Well Position:</b> +N/-S 0.00 ft		<b>Northing:</b> 424600.06 ft		<b>Latitude:</b> 40 29 34.089 N			
+E/-W 0.00 ft		<b>Easting :</b> 2332335.65 ft		<b>Longitude:</b> 104 18 18.355 W			
<b>Position Uncertainty:</b> 0.00 ft							

<b>Wellpath:</b> OH				<b>Drilled From:</b> Surface			
<b>Current Datum:</b> GE 4737' + KB 20'				<b>Tie-on Depth:</b> 0.00 ft			
<b>Magnetic Data:</b> 9/19/2011				<b>Above System Datum:</b> Mean Sea Level			
<b>Field Strength:</b> 53241 nT				<b>Declination:</b> 8.59 deg			
<b>Vertical Section:</b> Depth From (TVD)				<b>Mag Dip Angle:</b> 67.19 deg			
		ft		+N/-S ft		+E/-W ft	
0.00		0.00		0.00		179.60	

<b>Survey Program for Definitive Wellpath</b>					
<b>Date:</b> 10/21/2011		<b>Validated:</b> No		<b>Version:</b> 0	
<b>Actual From</b> ft		<b>To</b> ft		<b>Toolcode</b>	
				<b>Tool Name</b>	
0.00	5725.00	Survey #1 (0.00-5725.80)		Gyroscope	Gyroscope
5725.00	10189.00	Survey #2 (5725.00-10189.00)		MWD	Std MWD
10189.00	10240.00	Survey #3 (10189.00-10240.00)		Project	Projection

Survey															
MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ----> Deg Min Sec			<--- Longitude ---> Deg Min Sec				
0.00	0.00	0.00	0.00	0.00	0.00	424600.06	2332335.65	40	29	34.089	N	104	18	18.355	W
950.00	0.29	133.90	950.00	-1.68	1.75	424598.38	2332337.40	40	29	34.073	N	104	18	18.332	W
973.80	0.30	133.90	973.80	-1.77	1.84	424598.29	2332337.49	40	29	34.072	N	104	18	18.331	W
1112.50	0.10	198.70	1112.49	-2.13	2.06	424597.93	2332337.71	40	29	34.068	N	104	18	18.328	W
1300.10	0.30	113.50	1300.09	-2.49	2.46	424597.57	2332338.11	40	29	34.065	N	104	18	18.323	W
1397.90	0.10	179.40	1397.89	-2.67	2.69	424597.39	2332338.34	40	29	34.063	N	104	18	18.320	W
1582.40	0.40	346.30	1582.39	-2.21	2.54	424597.85	2332338.19	40	29	34.067	N	104	18	18.322	W
1769.10	1.10	331.20	1769.07	0.00	1.52	424600.06	2332337.17	40	29	34.089	N	104	18	18.335	W
2198.70	0.50	10.10	2198.63	5.45	-0.13	424605.51	2332335.52	40	29	34.143	N	104	18	18.355	W
2578.20	1.00	351.40	2578.10	10.36	-0.34	424610.42	2332335.31	40	29	34.192	N	104	18	18.357	W
2866.20	0.70	14.00	2866.07	14.55	-0.29	424614.61	2332335.36	40	29	34.233	N	104	18	18.356	W
3056.50	0.20	40.80	3056.36	15.93	0.21	424615.99	2332335.86	40	29	34.247	N	104	18	18.349	W
3248.80	0.30	258.30	3248.66	16.08	-0.06	424616.14	2332335.59	40	29	34.248	N	104	18	18.353	W
3438.90	0.80	226.40	3438.75	15.07	-1.51	424615.13	2332334.14	40	29	34.239	N	104	18	18.372	W
3534.30	0.60	231.00	3534.15	14.29	-2.38	424614.35	2332333.27	40	29	34.231	N	104	18	18.383	W
3629.80	0.60	260.10	3629.64	13.89	-3.26	424613.95	2332332.39	40	29	34.227	N	104	18	18.394	W
3724.30	0.80	279.00	3724.13	13.91	-4.40	424613.97	2332331.25	40	29	34.228	N	104	18	18.409	W
3932.20	0.90	304.50	3932.01	15.06	-7.18	424615.12	2332328.47	40	29	34.239	N	104	18	18.445	W
4102.80	1.40	313.60	4102.58	17.26	-9.80	424617.32	2332325.85	40	29	34.261	N	104	18	18.478	W
4249.00	1.70	320.40	4248.72	20.16	-12.47	424620.22	2332323.18	40	29	34.290	N	104	18	18.513	W

# LEAM Drilling Systems, Inc

## Survey Report - Geographic

<b>Company:</b> CHESAPEAKE OPERATING <b>Field:</b> Weld County, CO <b>Site:</b> Hoff 6-62 15 <b>Well:</b> 1H <b>Wellpath:</b> OH	<b>Date:</b> 10/21/2011 <b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North <b>Vertical (TVD) Reference:</b> GE 4737' + KB 20' 4757.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,179.60Azi) <b>Survey Calculation Method:</b> Minimum Curvature
	<b>Page:</b> 2 <b>Db:</b> Sybase

### Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ---->			<--- Longitude --->		
								Deg	Min	Sec	Deg	Min	Sec
4390.90	2.10	305.80	4390.55	23.30	-15.92	424623.36	2332319.73	40	29	34.322 N	104	18	18.557 W
4487.10	2.70	296.50	4486.66	25.35	-19.38	424625.41	2332316.27	40	29	34.342 N	104	18	18.601 W
4577.80	3.10	285.10	4577.25	26.94	-23.66	424627.00	2332311.99	40	29	34.359 N	104	18	18.656 W
4677.70	2.30	289.10	4677.03	28.30	-28.16	424628.36	2332307.49	40	29	34.373 N	104	18	18.714 W
4773.20	1.20	282.00	4772.49	29.13	-30.95	424629.19	2332304.70	40	29	34.381 N	104	18	18.750 W
4869.80	0.70	292.70	4869.08	29.57	-32.48	424629.63	2332303.17	40	29	34.386 N	104	18	18.770 W
4964.70	0.10	302.60	4963.97	29.84	-33.09	424629.90	2332302.56	40	29	34.389 N	104	18	18.778 W
5060.30	0.20	100.80	5059.57	29.85	-32.99	424629.91	2332302.66	40	29	34.389 N	104	18	18.776 W
5153.80	1.00	128.70	5153.07	29.31	-32.20	424629.37	2332303.45	40	29	34.383 N	104	18	18.766 W
5346.30	0.20	41.60	5345.56	28.51	-30.66	424628.57	2332304.99	40	29	34.375 N	104	18	18.747 W
5440.00	0.20	55.60	5439.26	28.73	-30.42	424628.79	2332305.23	40	29	34.377 N	104	18	18.743 W
5538.20	0.10	166.80	5537.46	28.74	-30.26	424628.80	2332305.39	40	29	34.377 N	104	18	18.741 W
5599.80	0.10	204.90	5599.06	28.64	-30.27	424628.70	2332305.38	40	29	34.376 N	104	18	18.741 W
5725.00	0.30	254.30	5724.25	28.45	-30.63	424628.51	2332305.02	40	29	34.375 N	104	18	18.746 W
5775.00	0.40	247.90	5774.25	28.35	-30.92	424628.41	2332304.73	40	29	34.374 N	104	18	18.750 W
5814.00	0.40	186.20	5813.25	28.16	-31.06	424628.22	2332304.59	40	29	34.372 N	104	18	18.752 W
5862.00	4.80	167.40	5861.19	26.04	-30.64	424626.10	2332305.01	40	29	34.351 N	104	18	18.747 W
5909.00	9.20	168.10	5907.83	20.44	-29.43	424620.50	2332306.22	40	29	34.295 N	104	18	18.732 W
5957.00	12.80	164.00	5954.94	11.57	-27.18	424611.63	2332308.47	40	29	34.207 N	104	18	18.704 W
6004.00	16.13	164.89	6000.44	0.26	-24.04	424600.32	2332311.61	40	29	34.095 N	104	18	18.666 W
6005.00	16.20	164.90	6001.41	-0.01	-23.97	424600.05	2332311.68	40	29	34.093 N	104	18	18.665 W
6037.00	19.10	163.20	6031.90	-9.33	-21.29	424590.73	2332314.36	40	29	34.000 N	104	18	18.632 W
6068.00	21.20	164.20	6061.00	-19.58	-18.30	424580.48	2332317.35	40	29	33.898 N	104	18	18.595 W
6099.00	23.70	164.60	6089.65	-30.99	-15.12	424569.07	2332320.53	40	29	33.785 N	104	18	18.556 W
6131.00	26.50	165.50	6118.62	-44.10	-11.62	424555.96	2332324.03	40	29	33.655 N	104	18	18.513 W
6162.00	26.60	168.10	6146.35	-57.59	-8.46	424542.47	2332327.19	40	29	33.522 N	104	18	18.474 W
6194.00	28.10	170.40	6174.78	-72.03	-5.72	424528.03	2332329.93	40	29	33.378 N	104	18	18.441 W
6225.00	30.40	170.40	6201.82	-86.96	-3.20	424513.10	2332332.45	40	29	33.231 N	104	18	18.411 W
6259.00	31.30	170.90	6231.01	-104.17	-0.37	424495.89	2332335.28	40	29	33.060 N	104	18	18.378 W
6291.00	33.50	172.00	6258.03	-121.12	2.18	424478.94	2332337.83	40	29	32.892 N	104	18	18.348 W
6320.00	37.60	174.10	6281.62	-137.85	4.20	424462.21	2332339.85	40	29	32.727 N	104	18	18.324 W
6351.00	42.10	176.40	6305.41	-157.64	5.83	424442.42	2332341.48	40	29	32.531 N	104	18	18.307 W
6382.00	46.30	177.60	6327.63	-179.22	6.95	424420.84	2332342.60	40	29	32.318 N	104	18	18.296 W
6413.00	50.50	178.50	6348.21	-202.38	7.73	424397.68	2332343.38	40	29	32.089 N	104	18	18.290 W
6445.00	54.60	179.40	6367.66	-227.78	8.19	424372.28	2332343.84	40	29	31.838 N	104	18	18.288 W
6476.00	59.00	180.10	6384.63	-253.71	8.30	424346.35	2332343.95	40	29	31.581 N	104	18	18.291 W
6508.00	63.80	180.90	6399.95	-281.80	8.05	424318.26	2332343.70	40	29	31.304 N	104	18	18.300 W
6539.00	68.60	182.40	6412.46	-310.14	7.23	424289.92	2332342.88	40	29	31.024 N	104	18	18.315 W
6570.00	72.70	182.50	6422.72	-339.36	5.98	424260.70	2332341.63	40	29	30.735 N	104	18	18.336 W
6602.00	76.70	182.20	6431.17	-370.19	4.71	424229.87	2332340.36	40	29	30.431 N	104	18	18.358 W
6633.00	79.30	182.90	6437.61	-400.48	3.37	424199.58	2332339.02	40	29	30.132 N	104	18	18.381 W
6665.00	81.20	183.20	6443.03	-431.97	1.69	424168.09	2332337.34	40	29	29.821 N	104	18	18.408 W
6696.00	84.90	183.60	6446.78	-462.68	-0.14	424137.38	2332335.51	40	29	29.518 N	104	18	18.437 W
6727.00	87.40	183.10	6448.86	-493.56	-1.95	424106.50	2332333.70	40	29	29.213 N	104	18	18.466 W
6752.00	89.10	182.00	6449.63	-518.52	-3.06	424081.54	2332332.59	40	29	28.966 N	104	18	18.485 W
6850.00	92.00	180.30	6448.68	-616.48	-5.02	423983.58	2332330.63	40	29	27.999 N	104	18	18.527 W
6881.00	92.20	180.10	6447.55	-647.46	-5.13	423952.60	2332330.52	40	29	27.693 N	104	18	18.534 W
6912.00	93.40	179.90	6446.03	-678.42	-5.13	423921.64	2332330.52	40	29	27.387 N	104	18	18.539 W
6944.00	93.60	179.90	6444.08	-710.36	-5.08	423889.70	2332330.57	40	29	27.071 N	104	18	18.544 W
6975.00	93.60	179.70	6442.13	-741.30	-4.97	423858.76	2332330.68	40	29	26.765 N	104	18	18.548 W
7007.00	92.00	179.70	6440.57	-773.26	-4.80	423826.80	2332330.85	40	29	26.449 N	104	18	18.552 W
7038.00	91.70	179.40	6439.57	-804.25	-4.56	423795.81	2332331.09	40	29	26.143 N	104	18	18.554 W
7069.00	92.00	179.40	6438.57	-835.23	-4.23	423764.83	2332331.42	40	29	25.837 N	104	18	18.555 W

# LEAM Drilling Systems, Inc

## Survey Report - Geographic

<b>Company:</b> CHESAPEAKE OPERATING <b>Field:</b> Weld County, CO <b>Site:</b> Hoff 6-62 15 <b>Well:</b> 1H <b>Wellpath:</b> OH	<b>Date:</b> 10/21/2011 <b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North <b>Vertical (TVD) Reference:</b> GE 4737' + KB 20' 4757.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,179.60Azi) <b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Sybase
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### Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ----> Deg Min Sec			<--- Longitude ---> Deg Min Sec		
7101.00	92.60	179.90	6437.29	-867.20	-4.04	423732.86	2332331.61	40	29	25.521 N	104	18	18.558 W
7132.00	92.60	179.70	6435.88	-898.17	-3.93	423701.89	2332331.72	40	29	25.215 N	104	18	18.562 W
7163.00	92.90	179.70	6434.39	-929.13	-3.77	423670.93	2332331.88	40	29	24.909 N	104	18	18.565 W
7195.00	93.70	179.60	6432.55	-961.08	-3.57	423638.98	2332332.08	40	29	24.593 N	104	18	18.568 W
7226.00	93.90	179.40	6430.50	-992.01	-3.30	423608.05	2332332.35	40	29	24.288 N	104	18	18.570 W
7258.00	94.30	179.40	6428.21	-1023.93	-2.97	423576.13	2332332.68	40	29	23.972 N	104	18	18.572 W
7289.00	94.20	179.40	6425.91	-1054.84	-2.64	423545.22	2332333.01	40	29	23.667 N	104	18	18.573 W
7320.00	92.30	179.00	6424.15	-1085.78	-2.21	423514.28	2332333.44	40	29	23.361 N	104	18	18.573 W
7352.00	92.20	178.70	6422.90	-1117.75	-1.57	423482.31	2332334.08	40	29	23.045 N	104	18	18.570 W
7383.00	92.10	178.90	6421.73	-1148.72	-0.92	423451.34	2332334.73	40	29	22.739 N	104	18	18.567 W
7415.00	92.60	178.90	6420.42	-1180.69	-0.31	423419.37	2332335.34	40	29	22.423 N	104	18	18.565 W
7446.00	92.90	178.90	6418.93	-1211.65	0.29	423388.41	2332335.94	40	29	22.117 N	104	18	18.562 W
7478.00	93.80	179.70	6417.06	-1243.59	0.68	423356.47	2332336.33	40	29	21.801 N	104	18	18.563 W
7509.00	94.20	180.10	6414.90	-1274.52	0.73	423325.54	2332336.38	40	29	21.496 N	104	18	18.567 W
7603.00	92.00	180.10	6409.82	-1368.37	0.57	423231.69	2332336.22	40	29	20.568 N	104	18	18.586 W
7698.00	90.50	180.60	6407.75	-1463.35	-0.01	423136.71	2332335.64	40	29	19.630 N	104	18	18.610 W
7792.00	89.60	180.10	6407.66	-1557.34	-0.59	423042.72	2332335.06	40	29	18.701 N	104	18	18.634 W
7886.00	90.70	180.40	6407.42	-1651.34	-1.00	422948.72	2332334.65	40	29	17.773 N	104	18	18.656 W
7981.00	89.80	180.80	6407.00	-1746.33	-1.99	422853.73	2332333.66	40	29	16.834 N	104	18	18.685 W
8075.00	88.30	180.30	6408.56	-1840.31	-2.89	422759.75	2332332.76	40	29	15.906 N	104	18	18.713 W
8169.00	89.20	180.80	6410.61	-1934.28	-3.80	422665.78	2332331.85	40	29	14.977 N	104	18	18.741 W
8263.00	90.30	181.30	6411.02	-2028.27	-5.52	422571.79	2332330.13	40	29	14.049 N	104	18	18.780 W
8357.00	91.40	182.40	6409.63	-2122.20	-8.55	422477.86	2332327.10	40	29	13.121 N	104	18	18.835 W
8452.00	90.50	181.00	6408.05	-2217.15	-11.37	422382.91	2332324.28	40	29	12.183 N	104	18	18.888 W
8546.00	89.30	180.40	6408.22	-2311.14	-12.52	422288.92	2332323.13	40	29	11.255 N	104	18	18.920 W
8640.00	89.80	179.00	6408.96	-2405.13	-12.03	422194.93	2332323.62	40	29	10.326 N	104	18	18.930 W
8734.00	90.10	179.00	6409.04	-2499.12	-10.39	422100.94	2332325.26	40	29	9.397 N	104	18	18.925 W
8829.00	88.40	178.30	6410.28	-2594.08	-8.15	422005.98	2332327.50	40	29	8.458 N	104	18	18.912 W
8923.00	87.60	178.30	6413.56	-2687.98	-5.36	421912.08	2332330.29	40	29	7.530 N	104	18	18.893 W
9017.00	88.50	178.00	6416.76	-2781.87	-2.33	421818.19	2332333.32	40	29	6.602 N	104	18	18.870 W
9112.00	89.20	178.00	6418.67	-2876.80	0.99	421723.26	2332336.64	40	29	5.663 N	104	18	18.844 W
9206.00	89.60	179.00	6419.65	-2970.76	3.45	421629.30	2332339.10	40	29	4.735 N	104	18	18.828 W
9300.00	90.30	178.50	6419.73	-3064.73	5.50	421535.33	2332341.15	40	29	3.806 N	104	18	18.818 W
9394.00	90.80	178.30	6418.83	-3158.69	8.12	421441.37	2332343.77	40	29	2.877 N	104	18	18.800 W
9489.00	92.20	179.00	6416.34	-3253.63	10.36	421346.43	2332346.01	40	29	1.939 N	104	18	18.788 W
9582.00	90.70	179.20	6413.99	-3346.59	11.82	421253.47	2332347.47	40	29	1.020 N	104	18	18.785 W
9677.00	90.10	177.40	6413.33	-3441.54	14.64	421158.52	2332350.29	40	29	0.081 N	104	18	18.765 W
9771.00	90.00	176.70	6413.25	-3535.41	19.47	421064.65	2332355.12	40	28	59.153 N	104	18	18.719 W
9865.00	90.00	175.50	6413.25	-3629.19	25.87	420970.87	2332361.52	40	28	58.226 N	104	18	18.653 W
9959.00	89.60	176.90	6413.57	-3722.98	32.10	420877.08	2332367.75	40	28	57.298 N	104	18	18.589 W
10054.00	90.80	178.00	6413.24	-3817.89	36.32	420782.17	2332371.97	40	28	56.360 N	104	18	18.550 W
10148.00	90.40	176.90	6412.26	-3911.79	40.51	420688.27	2332376.16	40	28	55.431 N	104	18	18.513 W
10189.00	90.20	176.20	6412.04	-3952.71	42.97	420647.35	2332378.62	40	28	55.027 N	104	18	18.488 W
10240.00	90.20	176.20	6411.86	-4003.60	46.35	420596.46	2332382.00	40	28	54.523 N	104	18	18.453 W

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
950.00	950.00	9.625	12.250	9 5/8"



# LEAM Drilling Systems, Inc

## Survey Report - Geographic

**Company:** CHESAPEAKE OPERATING  
**Field:** Weld County, CO  
**Site:** Hoff 6-62 15  
**Well:** 1H  
**Wellpath:** OH

**Date:** 10/21/2011  
**Co-ordinate(NE) Reference:** Well: 1H, Grid North  
**Vertical (TVD) Reference:** GE 4737' + KB 20' 4757.0  
**Section (VS) Reference:** Well (0.00N,0.00E,179.60Azi)  
**Survey Calculation Method:** Minimum Curvature  
**Page:** 4  
**Db:** Sybase

### Annotation

MD ft	TVD ft	
6004.00	6000.44	HL Crossing: 6004' MD; 6000'TVD