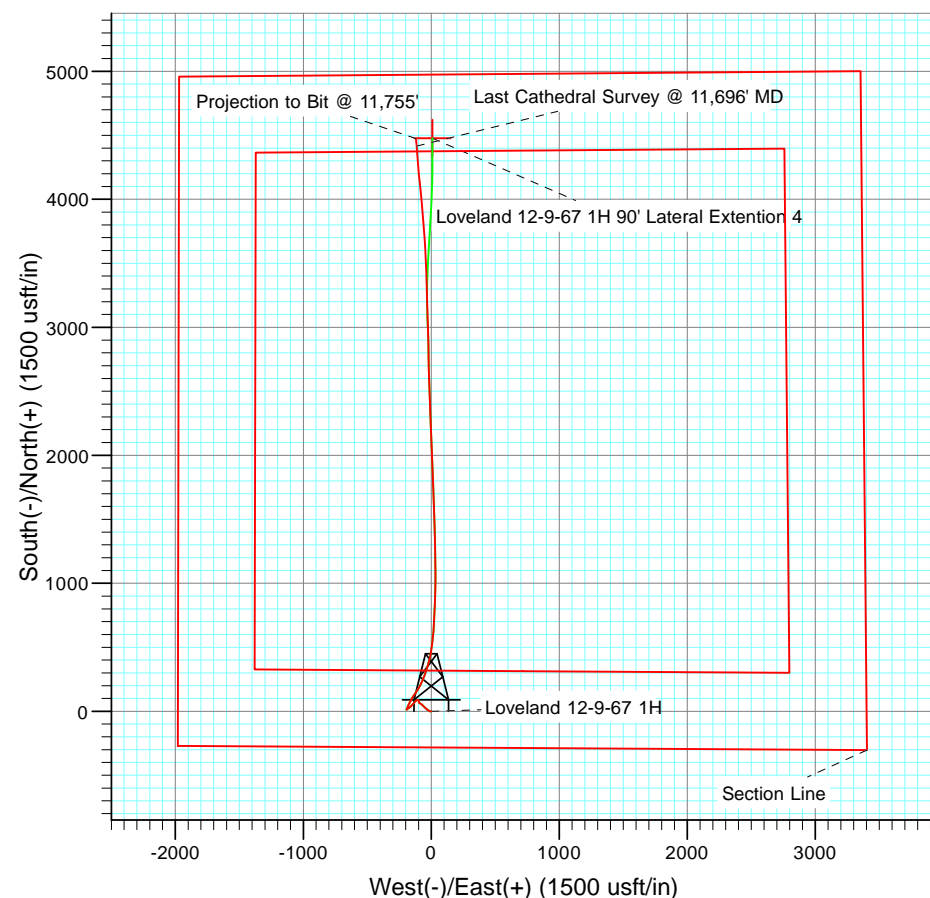
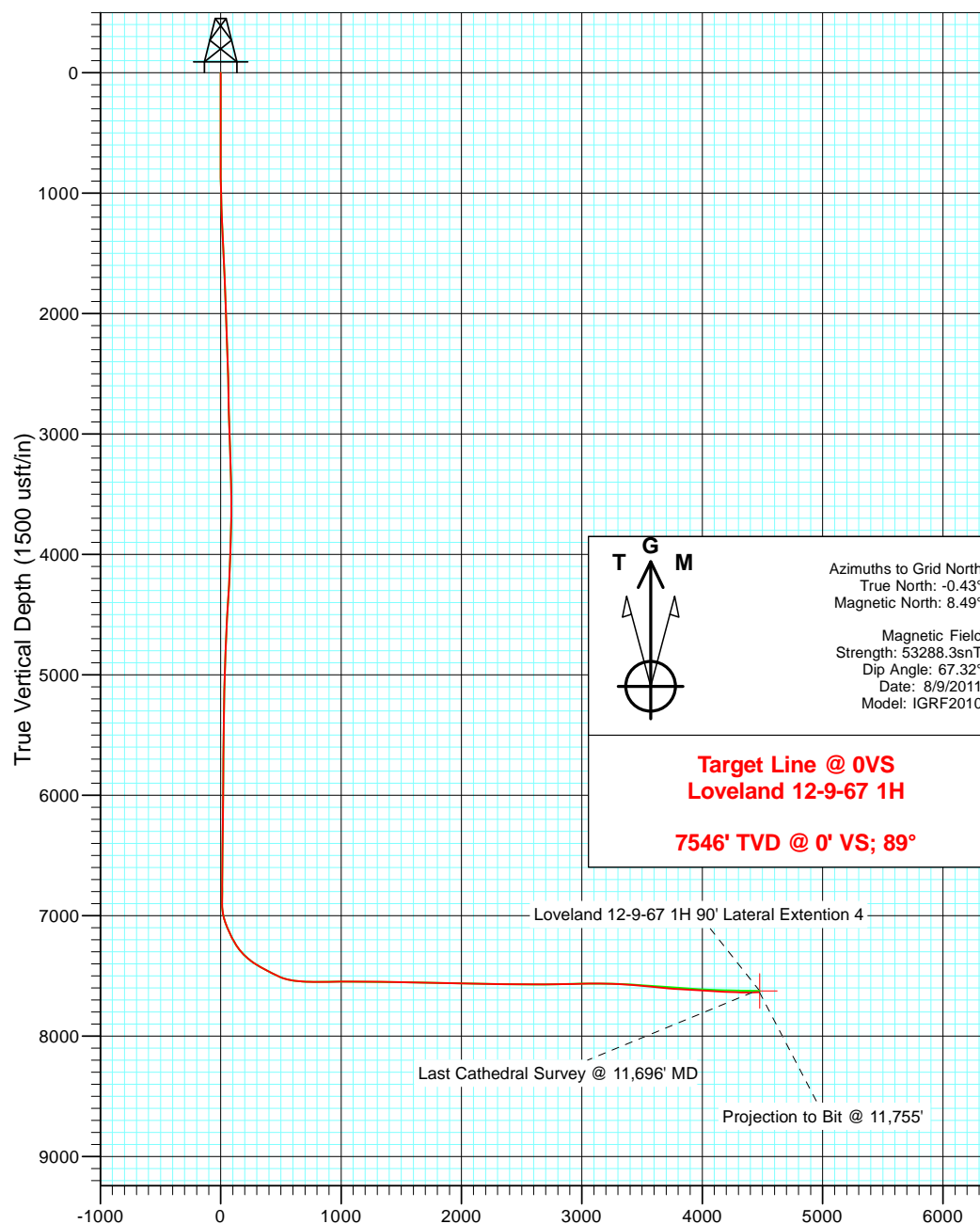




Project: Weld County, CO  
 Site: Loveland Pad  
 Well: Loveland 12-9-67 1H  
 Wellbore: OH  
 Design: FINAL



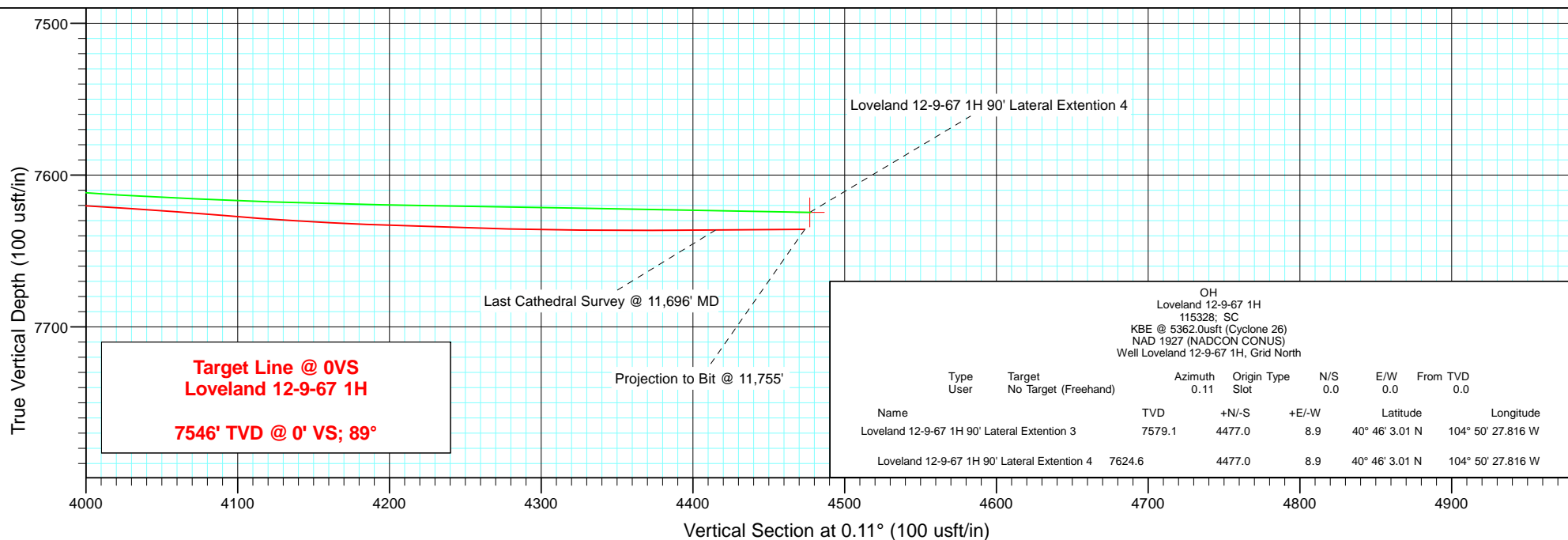
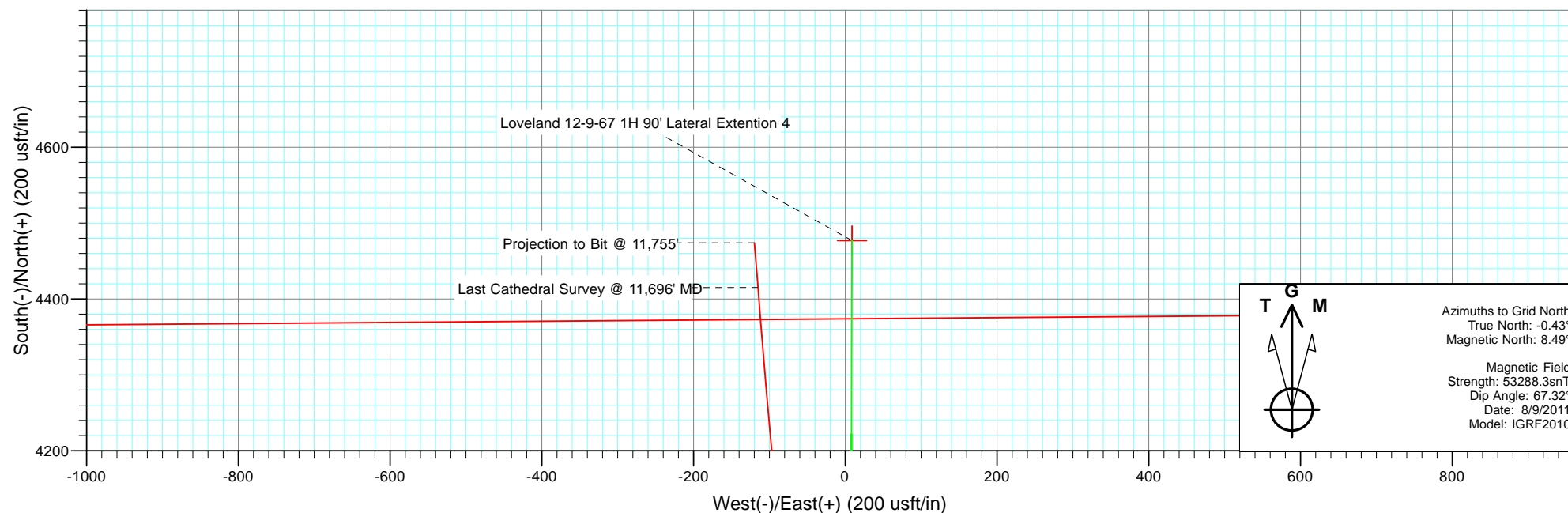
OH  
 Loveland 12-9-67 1H  
 115328; SC  
 KBE @ 5362.0usft (Cyclone 26)  
 NAD 1927 (NADCON CONUS)  
 Well Loveland 12-9-67 1H, Grid North

Type	Target	Azimuth	Origin	Type	N/S	E/W	From	TVD
User	No Target (Freehand)	0.11	Slot		0.0	0.0	0.0	
Name	TVD	+N/-S	+E/-W	Latitude	Longitude			
Loveland 12-9-67 1H 90' Lateral Extension 3	7579.1	4477.0	8.9	40° 46' 3.01 N	104° 50' 27.816 W			
Loveland 12-9-67 1H 90' Lateral Extension 4	7624.6	4477.0	8.9	40° 46' 3.01 N	104° 50' 27.816 W			

Vertical Section at 0.11° (1500 usft/in)



Project: Weld County, CO  
 Site: Loveland Pad  
 Well: Loveland 12-9-67 1H  
 Wellbore: OH  
 Design: FINAL



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Loveland 12-9-67 1H
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Site:</b>	Loveland Pad	<b>MD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Well:</b>	Loveland 12-9-67 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	Weld County, CO		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Colorado North 501		

Site		Loveland Pad			
Site Position:		Northing:	518,638.83 usft	Latitude:	40° 45' 18.77 N
From:	Lat/Long	Easting:	2,182,521.07 usft	Longitude:	104° 50' 28.363 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.43 °

Well	Loveland 12-9-67 1H					
Well Position	+N/-S	0.0 usft	Northing:	518,638.83 usft	Latitude:	40° 45' 18.77 N
	+E/-W	0.0 usft	Easting:	2,182,521.07 usft	Longitude:	104° 50' 28.363 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	5,342.0 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	8/9/2011	8.92	67.32	53,288

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	0.11	

<b>Survey Program</b>	<b>Date</b>	8/28/2011			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
232.0	5,684.0	Survey #1 (OH)	MWD	Geolink MWD	
5,905.0	11,755.0	Survey #2 (OH)	MWD	Geolink MWD	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usf)</b>	<b>Build Rate (°/100u)</b>	<b>Formations / Comments</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
232.0	0.26	255.05	232.0	-0.1	-0.5	-0.1	0.11	0.11		
560.0	0.79	264.68	560.0	-0.5	-3.5	-0.5	0.16	0.16		
748.0	1.41	270.26	747.9	-0.6	-7.1	-0.7	0.33	0.33		
1,241.0	4.31	306.69	1,240.3	10.5	-28.0	10.4	0.67	0.59		
1,697.0	3.69	315.39	1,695.2	31.1	-52.1	31.0	0.19	-0.14		
1,960.0	3.16	315.39	1,957.7	42.3	-63.1	42.2	0.20	-0.20		
2,251.0	3.08	309.46	2,248.3	53.0	-74.8	52.9	0.11	-0.03		
2,537.0	2.46	304.36	2,534.0	61.3	-85.8	61.2	0.23	-0.22		
2,824.0	2.11	295.57	2,820.7	67.1	-95.6	66.9	0.17	-0.12		
3,110.0	2.81	24.65	3,106.6	75.8	-97.4	75.6	1.22	0.24		
3,398.0	2.81	298.07	3,394.3	85.5	-100.7	85.3	1.34	0.00		

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Loveland 12-9-67 1H
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Site:</b>	Loveland Pad	<b>MD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Well:</b>	Loveland 12-9-67 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
3,684.0	1.76	258.57	3,680.1	87.9	-111.2	87.7	0.64	-0.37	
3,970.0	3.16	227.19	3,965.8	81.7	-121.3	81.5	0.66	0.49	
4,257.0	3.87	216.95	4,252.3	68.6	-132.9	68.3	0.33	0.25	
4,538.0	4.39	223.67	4,532.6	53.2	-146.1	52.9	0.25	0.19	
4,824.0	3.60	227.45	4,817.9	39.2	-160.2	38.9	0.29	-0.28	
5,138.0	1.41	227.98	5,131.6	30.0	-170.4	29.6	0.70	-0.70	
5,397.0	1.49	243.67	5,390.5	26.4	-175.7	26.0	0.16	0.03	
5,684.0	1.23	228.77	5,677.4	22.7	-181.4	22.3	0.15	-0.09	
5,905.0	0.70	253.80	5,898.4	20.7	-184.5	20.4	0.30	-0.24	
6,192.0	1.00	227.90	6,185.3	18.6	-188.0	18.2	0.17	0.10	
6,474.0	0.80	223.70	6,467.3	15.5	-191.2	15.1	0.07	-0.07	
6,757.0	0.70	205.20	6,750.3	12.5	-193.3	12.1	0.09	-0.04	
6,851.0	0.60	201.50	6,844.3	11.5	-193.7	11.1	0.12	-0.11	
6,883.0	0.60	213.80	6,876.3	11.2	-193.9	10.8	0.40	0.00	
6,914.0	0.70	337.20	6,907.3	11.3	-194.1	10.9	3.70	0.32	
6,945.0	5.30	22.10	6,938.2	12.8	-193.6	12.4	15.58	14.84	
6,977.0	9.60	24.80	6,969.9	16.6	-191.9	16.2	13.48	13.44	
7,008.0	14.10	20.00	7,000.3	22.5	-189.5	22.1	14.85	14.52	
7,039.0	16.90	21.60	7,030.1	30.2	-186.6	29.8	9.14	9.03	
7,071.0	20.70	23.60	7,060.4	39.7	-182.6	39.3	12.04	11.88	
7,102.0	23.80	26.70	7,089.1	50.3	-177.6	50.0	10.69	10.00	
7,134.0	26.00	26.90	7,118.1	62.3	-171.5	62.0	6.88	6.88	
7,165.0	27.30	24.80	7,145.8	74.9	-165.5	74.5	5.18	4.19	
7,196.0	29.90	26.90	7,173.1	88.2	-159.0	87.9	8.99	8.39	
7,228.0	32.80	31.30	7,200.4	102.7	-150.9	102.4	11.54	9.06	
7,259.0	35.30	35.70	7,226.1	117.2	-141.3	116.9	11.31	8.06	
7,291.0	37.80	34.80	7,251.8	132.7	-130.3	132.5	7.99	7.81	
7,322.0	42.30	34.20	7,275.5	149.2	-119.0	148.9	14.57	14.52	
7,353.0	46.90	32.70	7,297.6	167.3	-107.0	167.1	15.22	14.84	
7,385.0	48.70	30.30	7,319.1	187.6	-94.6	187.4	7.91	5.62	
7,416.0	50.10	26.10	7,339.3	208.3	-83.5	208.1	11.23	4.52	
7,448.0	51.90	22.90	7,359.4	230.9	-73.2	230.8	9.59	5.62	
7,479.0	55.00	21.60	7,377.9	254.0	-63.8	253.8	10.55	10.00	
7,510.0	58.10	20.40	7,394.9	278.1	-54.5	278.0	10.51	10.00	
7,542.0	60.50	19.80	7,411.3	304.0	-45.1	303.9	7.67	7.50	
7,573.0	62.10	18.90	7,426.2	329.6	-36.1	329.5	5.76	5.16	
7,604.0	63.60	17.50	7,440.3	355.8	-27.5	355.8	6.29	4.84	
7,636.0	63.60	15.30	7,454.5	383.3	-19.4	383.3	6.16	0.00	
7,667.0	62.80	12.40	7,468.5	410.2	-12.7	410.1	8.74	-2.58	
7,699.0	62.20	10.80	7,483.3	438.0	-7.0	438.0	4.82	-1.87	
7,730.0	64.10	9.30	7,497.3	465.2	-2.2	465.2	7.50	6.13	
7,761.0	68.00	8.50	7,509.9	493.2	2.2	493.2	12.80	12.58	
7,793.0	72.10	6.90	7,520.8	523.0	6.2	523.0	13.65	12.81	
7,824.0	76.60	6.00	7,529.2	552.6	9.5	552.7	14.78	14.52	
7,856.0	80.10	5.20	7,535.6	583.8	12.6	583.9	11.21	10.94	
7,887.0	82.20	4.30	7,540.4	614.4	15.1	614.4	7.36	6.77	
7,917.0	84.50	3.70	7,543.9	644.1	17.2	644.1	7.92	7.67	
7,948.0	87.10	3.50	7,546.1	674.9	19.1	674.9	8.41	8.39	
7,980.0	87.30	3.20	7,547.7	706.8	21.0	706.9	1.13	0.63	
8,074.0	89.50	3.00	7,550.3	800.6	26.1	800.7	2.35	2.34	
8,168.0	91.70	1.70	7,549.3	894.5	30.0	894.6	2.72	2.34	
8,262.0	91.00	0.90	7,547.1	988.5	32.1	988.6	1.13	-0.74	
8,357.0	89.90	359.80	7,546.4	1,083.5	32.7	1,083.6	1.64	-1.16	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Loveland 12-9-67 1H
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Site:</b>	Loveland Pad	<b>MD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Well:</b>	Loveland 12-9-67 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
8,451.0	89.10	359.30	7,547.2	1,177.5	31.9	1,177.5	1.00	-0.85	
8,545.0	88.90	358.60	7,548.8	1,271.4	30.2	1,271.5	0.77	-0.21	
8,639.0	88.50	358.30	7,551.0	1,365.4	27.7	1,365.4	0.53	-0.43	
8,733.0	89.20	357.90	7,552.8	1,459.3	24.5	1,459.4	0.86	0.74	
8,827.0	89.70	358.30	7,553.8	1,553.3	21.4	1,553.3	0.68	0.53	
8,922.0	89.40	358.30	7,554.5	1,648.2	18.6	1,648.3	0.32	-0.32	
9,016.0	89.40	358.40	7,555.5	1,742.2	15.9	1,742.2	0.11	0.00	
9,110.0	88.70	357.20	7,557.0	1,836.1	12.3	1,836.1	1.48	-0.74	
9,204.0	88.20	357.40	7,559.6	1,930.0	7.9	1,930.0	0.57	-0.53	
9,299.0	88.10	357.40	7,562.7	2,024.8	3.6	2,024.8	0.11	-0.11	
9,393.0	88.80	357.30	7,565.2	2,118.7	-0.8	2,118.7	0.75	0.74	
9,487.0	89.80	359.10	7,566.3	2,212.6	-3.7	2,212.6	2.19	1.06	
9,581.0	88.80	357.90	7,567.5	2,306.6	-6.2	2,306.6	1.66	-1.06	
9,675.0	88.80	357.70	7,569.5	2,400.5	-9.8	2,400.5	0.21	0.00	
9,769.0	89.50	357.70	7,570.9	2,494.4	-13.6	2,494.4	0.74	0.74	
9,864.0	89.80	357.90	7,571.4	2,589.3	-17.2	2,589.3	0.38	0.32	
9,958.0	90.50	359.30	7,571.2	2,683.3	-19.5	2,683.3	1.67	0.74	
10,051.0	91.30	359.00	7,569.7	2,776.3	-20.9	2,776.2	0.92	0.86	
10,146.0	91.90	358.20	7,567.1	2,871.2	-23.2	2,871.1	1.05	0.63	
10,240.0	91.60	358.50	7,564.2	2,965.1	-25.9	2,965.1	0.45	-0.32	
10,334.0	89.80	358.30	7,563.1	3,059.1	-28.5	3,059.0	1.93	-1.91	
10,429.0	89.10	358.50	7,564.0	3,154.0	-31.2	3,154.0	0.77	-0.74	
10,523.0	88.10	358.60	7,566.3	3,248.0	-33.6	3,247.9	1.07	-1.06	
10,617.0	86.80	358.10	7,570.4	3,341.8	-36.3	3,341.8	1.48	-1.38	
10,712.0	85.90	357.90	7,576.5	3,436.6	-39.6	3,436.5	0.97	-0.95	
10,806.0	83.80	357.20	7,584.9	3,530.1	-43.6	3,530.0	2.35	-2.24	
10,900.0	84.20	356.60	7,594.8	3,623.4	-48.6	3,623.3	0.76	0.43	
10,994.0	85.30	355.80	7,603.4	3,716.8	-54.8	3,716.7	1.44	1.17	
11,088.0	86.40	355.80	7,610.2	3,810.3	-61.7	3,810.2	1.17	1.17	
11,183.0	87.10	355.70	7,615.5	3,904.9	-68.7	3,904.8	0.74	0.74	
11,277.0	87.00	355.00	7,620.4	3,998.5	-76.4	3,998.3	0.75	-0.11	
11,371.0	85.20	353.10	7,626.8	4,091.8	-86.1	4,091.6	2.78	-1.91	
11,465.0	87.80	355.00	7,632.5	4,185.1	-95.8	4,184.9	3.42	2.77	
11,559.0	88.50	355.10	7,635.5	4,278.7	-103.9	4,278.4	0.75	0.74	
11,654.0	90.40	355.60	7,636.5	4,373.3	-111.6	4,373.1	2.07	2.00	
11,696.0	90.30	355.30	7,636.2	4,415.2	-114.9	4,415.0	0.75	-0.24	Last Cathedral Survey @ 11,696' MD
11,755.0	90.30	355.30	7,635.9	4,474.0	-119.8	4,473.8	0.00	0.00	Projection to Bit @ 11,755'

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Loveland 12-9-67 1H
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Site:</b>	Loveland Pad	<b>MD Reference:</b>	KBE @ 5362.0usft (Cyclone 26)
<b>Well:</b>	Loveland 12-9-67 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Loveland 12-9-67 1H PE	0.00	359.57	7,462.4	4,387.0	8.7	523,025.88	2,182,529.75	40° 46' 2.12 N	104° 50' 27.827 W
- actual wellpath misses target center by 212.0usft at 11659.1usft MD (7636.4 TVD, 4378.5 N, -112.0 E)									
- Point									
Loveland 12-9-67 1H 90	0.00	0.00	7,624.6	4,477.0	8.9	523,115.87	2,182,529.92	40° 46' 3.01 N	104° 50' 27.816 W
- actual wellpath misses target center by 128.9usft at 11747.5usft MD (7635.9 TVD, 4466.6 N, -119.2 E)									
- Point									
Loveland 12-9-67 1H 90	0.00	0.00	7,579.1	4,477.0	8.9	523,115.87	2,182,529.92	40° 46' 3.01 N	104° 50' 27.816 W
- actual wellpath misses target center by 140.5usft at 11747.7usft MD (7635.9 TVD, 4466.8 N, -119.2 E)									
- Point									
Loveland 12-9-67 1H 90	0.00	0.00	7,546.0	4,477.0	8.9	523,115.87	2,182,529.92	40° 46' 3.01 N	104° 50' 27.816 W
- actual wellpath misses target center by 156.8usft at 11747.9usft MD (7635.9 TVD, 4467.0 N, -119.2 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)	Comment	
11,696.0	7,636.2	4,415.2	-114.9	Last Cathedral Survey @ 11,696' MD	
11,755.0	7,635.9	4,474.0	-119.8	Projection to Bit @ 11,755'	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_