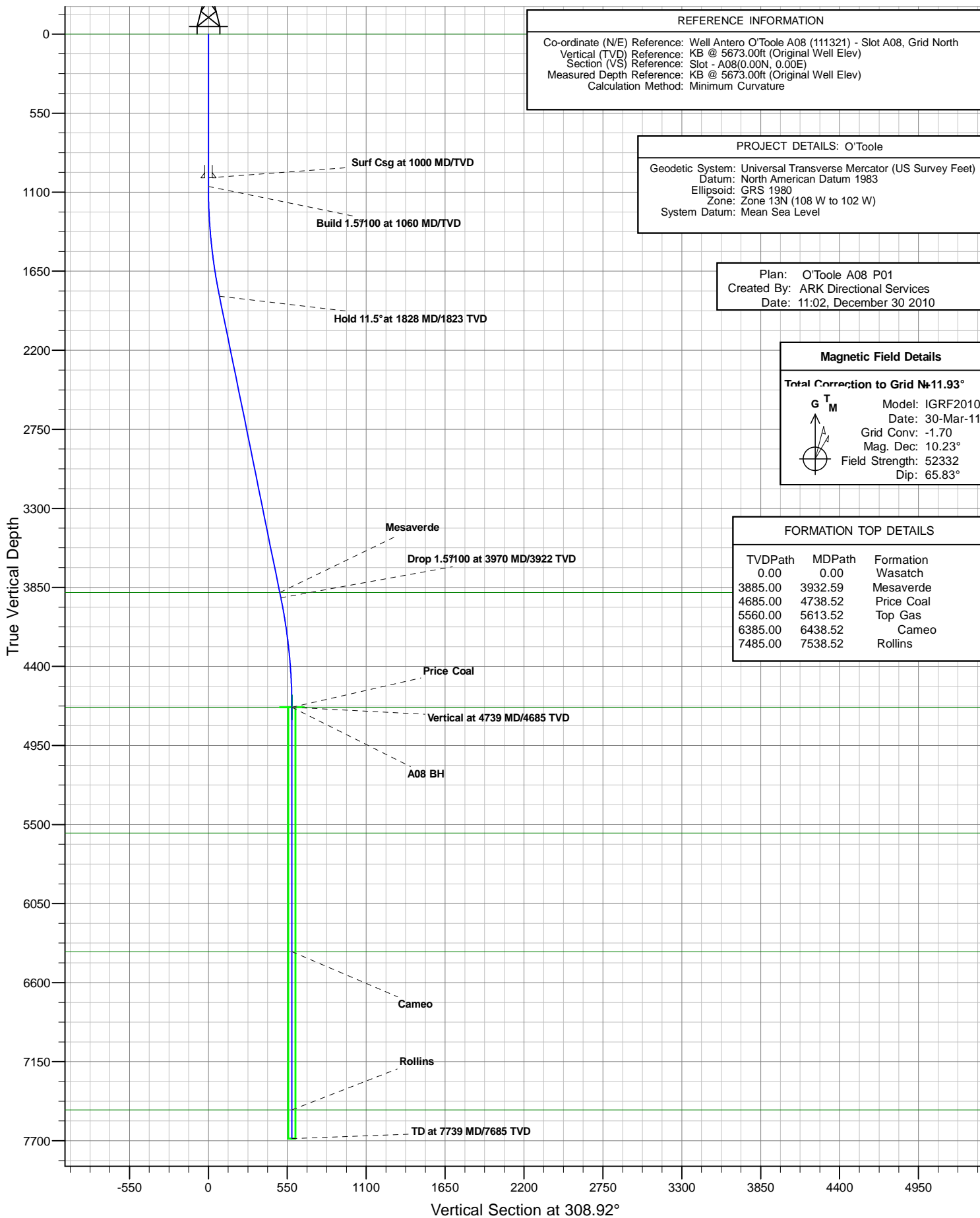


## Antero O'Toole A08 (111321)

### VERTICAL SECTION VIEW





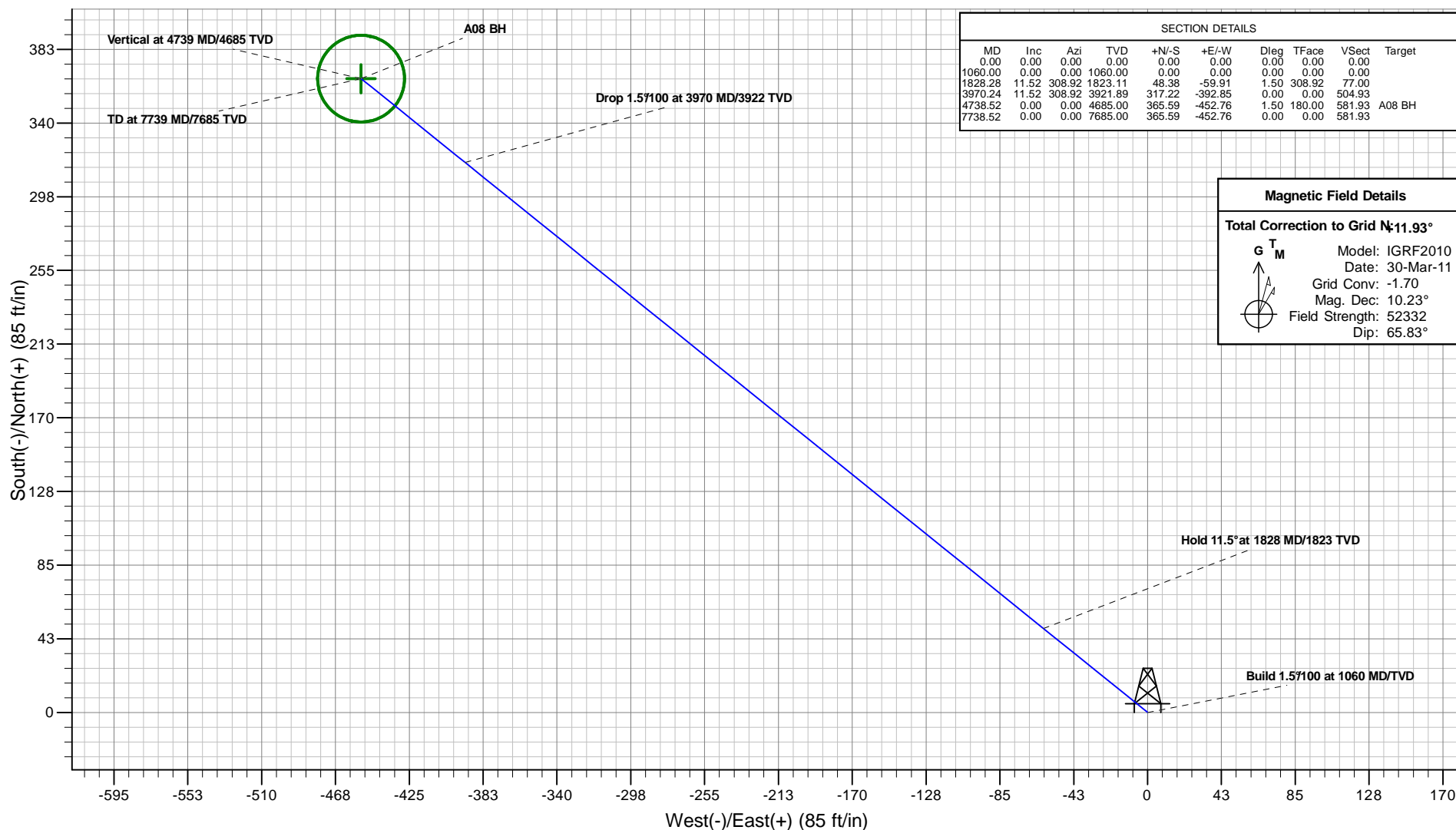
# Antero Resources

## Antero O'Toole A08 (111321)



### PLAN VIEW

Project: O'Toole  
Site: O'Toole A Pad  
Well: Antero O'Toole A08 (111321)  
Wellbore: O'Toole A08  
Design: O'Toole A08 P01



SECTION DETAILS										
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1060.00	0.00	0.00	1060.00	0.00	0.00	0.00	0.00	0.00		
1828.28	11.52	308.92	1823.11	48.38	-59.91	1.50	308.92	77.00		
3970.24	11.52	308.92	3921.89	317.22	-392.85	0.00	0.00	504.93		
4738.52	0.00	0.00	4685.00	365.59	-452.76	1.50	180.00	581.93	A08 BH	
7738.52	0.00	0.00	7685.00	365.59	-452.76	0.00	0.00	581.93		

### Magnetic Field Details

Total Correction to Grid  $N:11.93^{\circ}$



Model: IGRF2010  
Date: 30-Mar-11  
Grid Conv: -1.70  
Mag. Dec:  $10.23^{\circ}$   
Field Strength: 52332  
Dip:  $65.83^{\circ}$

### PROJECT DETAILS: O'Toole

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Zone 13N (108 W to 102 W)  
System Datum: Mean Sea Level

### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Antero O'Toole A08 (111321) - Slot A08, Grid North  
Vertical (TVD) Reference: KB @ 5673.00ft (Original Well Elev)  
Section (VS) Reference: Slot - A08(0.00N, 0.00E)  
Measured Depth Reference: KB @ 5673.00ft (Original Well Elev)  
Calculation Method: Minimum Curvature

Plan: O'Toole A08 P01  
Created By: ARK Directional Services  
Date: 11:05, December 30 2010

# **Antero Resources**

**O'Toole**

**O'Toole A Pad**

**Antero O'Toole A08 (111321) - Slot A08**

**O'Toole A08**

**Plan: O'Toole A08 P01**

## **Standard Planning Report - Geographic**

**30 December, 2010**

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A08 (111321) - Slot A08
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A08 (111321)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A08		
<b>Design:</b>	O'Toole A08 P01		

<b>Project</b>	O'Toole		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

Site		O'Toole A Pad			
Site Position:		Northing:	14,364,078.526 usft	Latitude:	39.522763688°N
From:	Map	Easting:	889,150.833 usft	Longitude:	107.663965951°W
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in	Grid Convergence:	-1.70 °

Well	Antero O'Toole A08 (111321) - Slot A08					
Well Position	+N/-S	0.00 ft	Northing:	14,364,078.666 usft	Latitude:	39.522763057°N
	+E/-W	0.00 ft	Easting:	889,138.334 usft	Longitude:	107.664010242°W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,649.00 ft

<b>Wellbore</b>	O'Toole A08				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	3/30/2011	10.23	65.83	52,332

<b>Design</b>	O'Toole A08 P01			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	308.92

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,060.00	0.00	0.00	1,060.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,828.28	11.52	308.92	1,823.11	48.38	-59.91	1.50	1.50	0.00	308.92	
3,970.24	11.52	308.92	3,921.89	317.22	-392.85	0.00	0.00	0.00	0.00	
4,738.52	0.00	0.00	4,685.00	365.59	-452.76	1.50	-1.50	0.00	180.00	A08 BH
7,738.52	0.00	0.00	7,685.00	365.59	-452.76	0.00	0.00	0.00	0.00	

# Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A08 (111321) - Slot A08
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A08 (111321)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A08		
<b>Design:</b>	O'Toole A08 P01		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
Wasatch										
100.00	0.00	0.00	100.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
200.00	0.00	0.00	200.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
300.00	0.00	0.00	300.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
400.00	0.00	0.00	400.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
500.00	0.00	0.00	500.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
600.00	0.00	0.00	600.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
700.00	0.00	0.00	700.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
800.00	0.00	0.00	800.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
900.00	0.00	0.00	900.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
Surf Csg at 1000 MD/TVD										
1,060.00	0.00	0.00	1,060.00	0.00	0.00	14,364,078.666	889,138.334	39.522763057°N	107.664010242°W	
Build 1.5°/100 at 1060 MD/TVD										
1,100.00	0.60	308.92	1,100.00	0.13	-0.16	14,364,078.797	889,138.171	39.522763404°N	107.664010833°W	
1,200.00	2.10	308.92	1,199.97	1.61	-2.00	14,364,080.277	889,136.338	39.522767316°N	107.664017481°W	
1,300.00	3.60	308.92	1,299.84	4.74	-5.86	14,364,083.401	889,132.470	39.522775571°N	107.664031512°W	
1,400.00	5.10	308.92	1,399.55	9.50	-11.77	14,364,088.166	889,126.569	39.522788164°N	107.664052916°W	
1,500.00	6.60	308.92	1,499.03	15.90	-19.69	14,364,094.569	889,118.639	39.522805087°N	107.664081677°W	
1,600.00	8.10	308.92	1,598.20	23.94	-29.65	14,364,102.606	889,108.686	39.522826327°N	107.664117777°W	
1,700.00	9.60	308.92	1,697.01	33.61	-41.62	14,364,112.271	889,096.717	39.522851870°N	107.664161191°W	
1,800.00	11.10	308.92	1,795.38	44.89	-55.59	14,364,123.558	889,082.739	39.522881699°N	107.664211888°W	
1,828.28	11.52	308.92	1,823.11	48.38	-59.91	14,364,127.043	889,078.423	39.522890910°N	107.664227544°W	
Hold 11.5° at 1828 MD/1823 TVD										
1,900.00	11.52	308.92	1,893.38	57.38	-71.06	14,364,136.044	889,067.276	39.522914699°N	107.664267976°W	
2,000.00	11.52	308.92	1,991.37	69.93	-86.60	14,364,148.595	889,051.732	39.522947869°N	107.664324354°W	
2,100.00	11.52	308.92	2,089.35	82.48	-102.15	14,364,161.146	889,036.189	39.522981040°N	107.664380731°W	
2,200.00	11.52	308.92	2,187.34	95.03	-117.69	14,364,173.698	889,020.645	39.523014210°N	107.664437109°W	
2,300.00	11.52	308.92	2,285.32	107.58	-133.23	14,364,186.249	889,005.102	39.523047380°N	107.664493487°W	
2,400.00	11.52	308.92	2,383.30	120.13	-148.78	14,364,198.800	888,989.558	39.523080551°N	107.664549864°W	
2,500.00	11.52	308.92	2,481.29	132.69	-164.32	14,364,211.351	888,974.015	39.523113721°N	107.664606242°W	
2,600.00	11.52	308.92	2,579.27	145.24	-179.86	14,364,223.902	888,958.471	39.523146891°N	107.664662620°W	
2,700.00	11.52	308.92	2,677.26	157.79	-195.41	14,364,236.453	888,942.928	39.523180062°N	107.664718998°W	
2,800.00	11.52	308.92	2,775.24	170.34	-210.95	14,364,249.004	888,927.384	39.523213232°N	107.664775376°W	
2,900.00	11.52	308.92	2,873.22	182.89	-226.49	14,364,261.555	888,911.841	39.523246402°N	107.664831754°W	
3,000.00	11.52	308.92	2,971.21	195.44	-242.04	14,364,274.107	888,896.297	39.523279572°N	107.664888132°W	
3,100.00	11.52	308.92	3,069.19	207.99	-257.58	14,364,286.658	888,880.754	39.523312742°N	107.664944510°W	
3,200.00	11.52	308.92	3,167.18	220.54	-273.12	14,364,299.209	888,865.211	39.523345913°N	107.665000888°W	
3,300.00	11.52	308.92	3,265.16	233.09	-288.67	14,364,311.760	888,849.667	39.523379083°N	107.665057267°W	
3,400.00	11.52	308.92	3,363.14	245.65	-304.21	14,364,324.311	888,834.124	39.523412253°N	107.665113645°W	
3,500.00	11.52	308.92	3,461.13	258.20	-319.75	14,364,336.862	888,818.580	39.523445423°N	107.665170023°W	
3,600.00	11.52	308.92	3,559.11	270.75	-335.30	14,364,349.413	888,803.037	39.523478593°N	107.665226401°W	
3,700.00	11.52	308.92	3,657.10	283.30	-350.84	14,364,361.964	888,787.493	39.523511763°N	107.665282780°W	
3,800.00	11.52	308.92	3,755.08	295.85	-366.38	14,364,374.516	888,771.950	39.523544933°N	107.665339158°W	
3,900.00	11.52	308.92	3,853.06	308.40	-381.93	14,364,387.067	888,756.406	39.523578103°N	107.665395537°W	
3,932.59	11.52	308.92	3,885.00	312.49	-386.99	14,364,391.157	888,751.340	39.523588913°N	107.665413912°W	
Mesaverde										
3,970.24	11.52	308.92	3,921.89	317.22	-392.85	14,364,395.882	888,745.489	39.523601400°N	107.665435136°W	
Drop 1.5°/100 at 3970 MD/3922 TVD										
4,000.00	11.08	308.92	3,951.07	320.88	-397.38	14,364,399.546	888,740.951	39.523611084°N	107.665451595°W	
4,100.00	9.58	308.92	4,049.45	332.14	-411.33	14,364,410.809	888,727.003	39.523640849°N	107.665502186°W	
4,200.00	8.08	308.92	4,148.26	341.79	-423.27	14,364,420.450	888,715.064	39.523666328°N	107.665545493°W	
4,300.00	6.58	308.92	4,247.44	349.80	-433.19	14,364,428.463	888,705.141	39.523687504°N	107.665581485°W	

# Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A08 (111321) - Slot A08
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A08 (111321)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A08		
<b>Design:</b>	O'Toole A08 P01		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,400.00	5.08	308.92	4,346.92	356.18	-441.09	14,364,434.842	888,697.241	39.523704362°N	107.665610139°W
4,500.00	3.58	308.92	4,446.63	360.92	-446.96	14,364,439.582	888,691.370	39.523716890°N	107.665631434°W
4,600.00	2.08	308.92	4,546.51	364.02	-450.80	14,364,442.682	888,687.532	39.523725081°N	107.665645356°W
4,700.00	0.58	308.92	4,646.48	365.47	-452.61	14,364,444.137	888,685.729	39.523728928°N	107.665651895°W
4,738.52	0.00	0.00	4,685.00	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
<b>Vertical at 4739 MD/4685 TVD - Price Coal</b>									
4,800.00	0.00	0.00	4,746.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
4,900.00	0.00	0.00	4,846.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,000.00	0.00	0.00	4,946.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,100.00	0.00	0.00	5,046.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,200.00	0.00	0.00	5,146.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,300.00	0.00	0.00	5,246.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,400.00	0.00	0.00	5,346.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,500.00	0.00	0.00	5,446.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,600.00	0.00	0.00	5,546.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,613.52	0.00	0.00	5,560.00	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
<b>Top Gas</b>									
5,700.00	0.00	0.00	5,646.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,800.00	0.00	0.00	5,746.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
5,900.00	0.00	0.00	5,846.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,000.00	0.00	0.00	5,946.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,100.00	0.00	0.00	6,046.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,200.00	0.00	0.00	6,146.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,300.00	0.00	0.00	6,246.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,400.00	0.00	0.00	6,346.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,438.52	0.00	0.00	6,385.00	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
<b>Cameo</b>									
6,500.00	0.00	0.00	6,446.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,600.00	0.00	0.00	6,546.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,700.00	0.00	0.00	6,646.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,800.00	0.00	0.00	6,746.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
6,900.00	0.00	0.00	6,846.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,000.00	0.00	0.00	6,946.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,100.00	0.00	0.00	7,046.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,200.00	0.00	0.00	7,146.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,300.00	0.00	0.00	7,246.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,400.00	0.00	0.00	7,346.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,500.00	0.00	0.00	7,446.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,538.52	0.00	0.00	7,485.00	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
<b>Rollins</b>									
7,600.00	0.00	0.00	7,546.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,700.00	0.00	0.00	7,646.48	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
7,738.52	0.00	0.00	7,685.00	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
<b>TD at 7739 MD/7685 TVD</b>									

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A08 (111321) - Slot A08
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A08 (111321)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A08		
<b>Design:</b>	O'Toole A08 P01		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
A08 BH	0.00	360.00	4,685.00	365.59	-452.76	14,364,444.260	888,685.578	39.523729251°N	107.665652443°W
- plan hits target center									
- Circle (radius 25.00)									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(in)	(in)
1,000.00	1,000.00	Surf Csg at 1000 MD/TVD		5.50	6.00

Formations						
Measured Depth	Vertical Depth	Name		Lithology	Dip	Dip Direction
(ft)	(ft)				(°)	(°)
0.00	0.00	Wasatch				
3,932.59	3,885.00	Mesaverde				
4,738.52	4,685.00	Price Coal				
5,613.52	5,560.00	Top Gas				
6,438.52	6,385.00	Cameo				
7,538.52	7,485.00	Rollins				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)		
1,060.00	1,060.00	0.00	0.00	Build 1.5°/100 at 1060 MD/TVD	
1,828.28	1,823.11	48.38	-59.91	Hold 11.5° at 1828 MD/1823 TVD	
3,970.24	3,921.89	317.22	-392.85	Drop 1.5°/100 at 3970 MD/3922 TVD	
4,738.52	4,685.00	365.59	-452.76	Vertical at 4739 MD/4685 TVD	
7,738.52	7,685.00	365.59	-452.76	TD at 7739 MD/7685 TVD	