

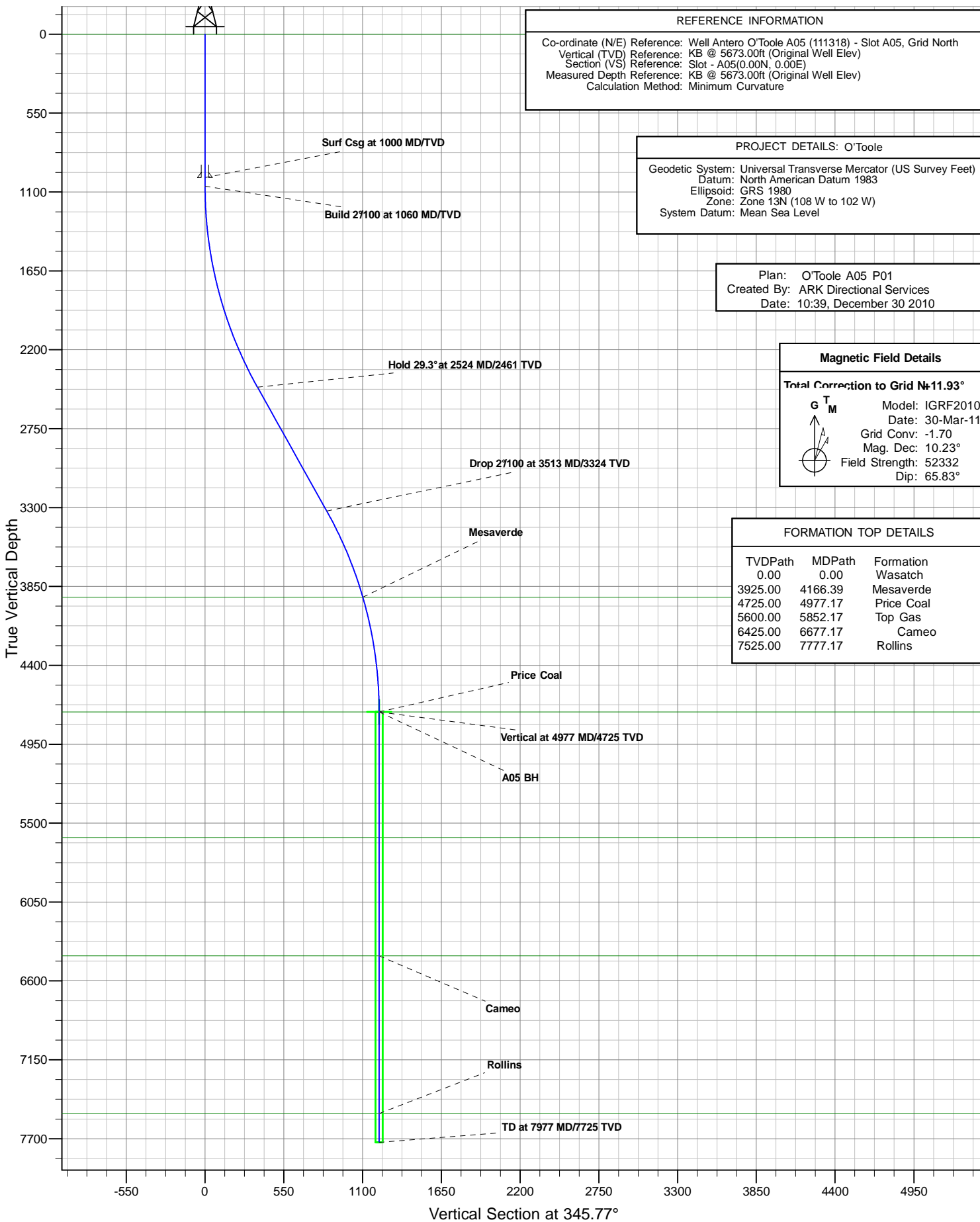


# Antero Resources

Antero O'Toole A05 (111318)



## VERTICAL SECTION VIEW



### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Antero O'Toole A05 (111318) - Slot A05, Grid North  
Vertical (TVD) Reference: KB @ 5673.00ft (Original Well Elev)  
Section (VS) Reference: Slot - A05(0.00N, 0.00E)  
Measured Depth Reference: KB @ 5673.00ft (Original Well Elev)  
Calculation Method: Minimum Curvature

### 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

Plan: O'Toole A05 P01  
Created By: ARK Directional Services  
Date: 10:39, December 30 2010

### Magnetic Field Details

#### Total Correction to Grid N=11.93°

**G T M** Model: IGRF2010  
Date: 30-Mar-11  
Grid Conv: -1.70  
Mag. Dec: 10.23°  
Field Strength: 52332  
Dip: 65.83°

### FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
0.00	0.00	Wasatch
3925.00	4166.39	Mesaverde
4725.00	4977.17	Price Coal
5600.00	5852.17	Top Gas
6425.00	6677.17	Cameo
7525.00	7777.17	Rollins



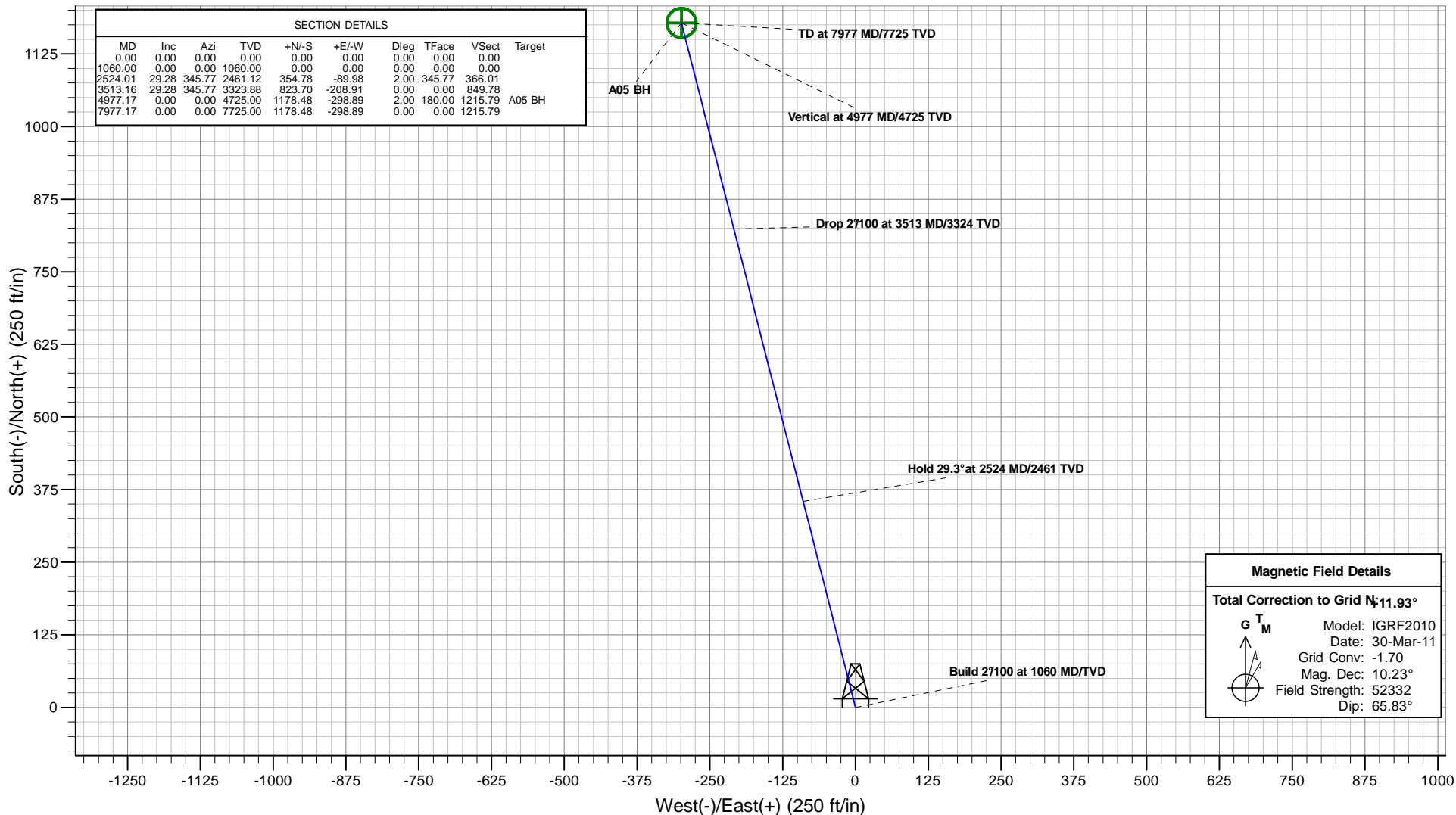
# Antero Resources

## Antero O'Toole A05 (111318)



### PLAN VIEW

Project: O'Toole  
Site: O'Toole A Pad  
Well: Antero O'Toole A05 (111318)  
Wellbore: O'Toole A05  
Design: O'Toole A05 P01



Plan: O'Toole A05 P01  
Created By: ARK Directional Services  
Date: 10:35, December 30 2010

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 A05 (111318) - Slot A05, Grid North  
Vertical (TVD) Reference: KB @ 5673.00ft (Original Well Elev)  
Section (VS) Reference: Slot - A05(0.00N, 0.00E)  
Measured Depth Reference: KB @ 5673.00ft (Original Well Elev)  
Calculation Method: Minimum Curvature

# **Antero Resources**

**O'Toole**

**O'Toole A Pad**

**Antero O'Toole A05 (111318) - Slot A05**

**O'Toole A05**

**Plan: O'Toole A05 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 A05 (111318) - Slot A05
<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 A05 (111318)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A05		
<b>Design:</b>	O'Toole A05 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 A05 (111318) - Slot A05					
Well Position	+N/-S	0.00 ft	Northing:	14,364,077.596 usft	Latitude:	39.522767837°N
	+E/-W	0.00 ft	Easting:	889,233.328 usft	Longitude:	107.663673626°W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,649.00 ft

<b>Wellbore</b>	O'Toole A05				
<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 A05 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	345.77	

<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	
2,524.01	29.28	345.77	2,461.12	354.78	-89.98	2.00	2.00	0.00	345.77	
3,513.16	29.28	345.77	3,323.88	823.70	-208.91	0.00	0.00	0.00	0.00	
4,977.17	0.00	0.00	4,725.00	1,178.48	-298.89	2.00	-2.00	0.00	180.00	A05 BH
7,977.17	0.00	0.00	7,725.00	1,178.48	-298.89	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 A05 (111318) - Slot A05
<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 A05 (111318)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A05		
<b>Design:</b>	O'Toole A05 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	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
<b>Wasatch</b>									
100.00	0.00	0.00	100.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
200.00	0.00	0.00	200.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
300.00	0.00	0.00	300.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
400.00	0.00	0.00	400.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
500.00	0.00	0.00	500.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
600.00	0.00	0.00	600.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
700.00	0.00	0.00	700.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
800.00	0.00	0.00	800.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
900.00	0.00	0.00	900.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
<b>Surf Csg at 1000 MD/TVD</b>									
1,060.00	0.00	0.00	1,060.00	0.00	0.00	14,364,077.596	889,233.328	39.522767837°N	107.663673626°W
<b>Build 2°/100 at 1060 MD/TVD</b>									
1,100.00	0.80	345.77	1,100.00	0.27	-0.07	14,364,077.866	889,233.259	39.522768575°N	107.663673897°W
1,200.00	2.80	345.77	1,199.94	3.32	-0.84	14,364,080.911	889,232.487	39.522776864°N	107.663676952°W
1,300.00	4.80	345.77	1,299.72	9.74	-2.47	14,364,087.335	889,230.858	39.522794355°N	107.663683397°W
1,400.00	6.80	345.77	1,399.20	19.53	-4.95	14,364,097.130	889,228.374	39.522821025°N	107.663693224°W
1,500.00	8.80	345.77	1,498.27	32.69	-8.29	14,364,110.284	889,225.037	39.522856842°N	107.663706422°W
1,600.00	10.80	345.77	1,596.81	49.19	-12.47	14,364,126.782	889,220.853	39.522901763°N	107.663722974°W
1,700.00	12.80	345.77	1,694.69	69.01	-17.50	14,364,146.603	889,215.826	39.522955733°N	107.663742860°W
1,800.00	14.80	345.77	1,791.80	92.13	-23.37	14,364,169.723	889,209.963	39.523018685°N	107.663766056°W
1,900.00	16.80	345.77	1,888.02	118.52	-30.06	14,364,196.114	889,203.269	39.523090544°N	107.663792534°W
2,000.00	18.80	345.77	1,983.22	148.15	-37.57	14,364,225.744	889,195.755	39.523171221°N	107.663822262°W
2,100.00	20.80	345.77	2,077.31	180.98	-45.90	14,364,258.576	889,187.428	39.523260619°N	107.663855203°W
2,200.00	22.80	345.77	2,170.15	216.98	-55.03	14,364,294.571	889,178.299	39.523358628°N	107.663891317°W
2,300.00	24.80	345.77	2,261.64	256.09	-64.95	14,364,333.685	889,168.379	39.523465130°N	107.663930561°W
2,400.00	26.80	345.77	2,351.67	298.28	-75.65	14,364,375.871	889,157.680	39.523579994°N	107.663972886°W
2,500.00	28.80	345.77	2,440.12	343.48	-87.11	14,364,421.076	889,146.215	39.523703080°N	107.664018241°W
2,524.01	29.28	345.77	2,461.12	354.78	-89.98	14,364,432.374	889,143.349	39.523733843°N	107.664029577°W
<b>Hold 29.3° at 2524 MD/2461 TVD</b>									
2,600.00	29.28	345.77	2,527.40	390.80	-99.11	14,364,468.398	889,134.213	39.523831930°N	107.664065720°W
2,700.00	29.28	345.77	2,614.62	438.21	-111.14	14,364,515.805	889,122.190	39.523961012°N	107.664113285°W
2,800.00	29.28	345.77	2,701.84	485.62	-123.16	14,364,563.212	889,110.166	39.524090094°N	107.664160850°W
2,900.00	29.28	345.77	2,789.07	533.02	-135.18	14,364,610.619	889,098.143	39.524219176°N	107.664208415°W
3,000.00	29.28	345.77	2,876.29	580.43	-147.21	14,364,658.026	889,086.120	39.524348258°N	107.664255981°W
3,100.00	29.28	345.77	2,963.51	627.84	-159.23	14,364,705.433	889,074.096	39.524477340°N	107.664303546°W
3,200.00	29.28	345.77	3,050.74	675.25	-171.26	14,364,752.841	889,062.073	39.524606422°N	107.664351112°W
3,300.00	29.28	345.77	3,137.96	722.65	-183.28	14,364,800.248	889,050.050	39.524735504°N	107.664398678°W
3,400.00	29.28	345.77	3,225.19	770.06	-195.30	14,364,847.655	889,038.026	39.524864586°N	107.664446244°W
3,500.00	29.28	345.77	3,312.41	817.47	-207.33	14,364,895.062	889,026.003	39.524993668°N	107.664493811°W
3,513.16	29.28	345.77	3,323.88	823.70	-208.91	14,364,901.299	889,024.421	39.525010649°N	107.664500068°W
<b>Drop 2°/100 at 3513 MD/3324 TVD</b>									
3,600.00	27.54	345.77	3,400.27	863.76	-219.06	14,364,941.350	889,014.264	39.525119703°N	107.664540254°W
3,700.00	25.54	345.77	3,489.72	907.07	-230.05	14,364,984.664	889,003.278	39.525237639°N	107.664583714°W
3,800.00	23.54	345.77	3,580.68	947.33	-240.26	14,365,024.925	888,993.067	39.525347264°N	107.664624111°W
3,900.00	21.54	345.77	3,673.04	984.49	-249.69	14,365,062.085	888,983.643	39.525448443°N	107.664661396°W
4,000.00	19.54	345.77	3,766.67	1,018.50	-258.31	14,365,096.098	888,975.017	39.525541055°N	107.664695524°W
4,100.00	17.54	345.77	3,861.47	1,049.33	-266.13	14,365,126.922	888,967.199	39.525624985°N	107.664726452°W
4,166.39	16.22	345.77	3,925.00	1,068.01	-270.87	14,365,145.607	888,962.460	39.525675859°N	107.664745200°W
<b>Mesaverde</b>									
4,200.00	15.54	345.77	3,957.33	1,076.93	-273.13	14,365,154.521	888,960.199	39.525700132°N	107.664754144°W
4,300.00	13.54	345.77	4,054.12	1,101.27	-279.30	14,365,178.861	888,954.026	39.525766404°N	107.664778566°W

# Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A05 (111318) - Slot A05
<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 A05 (111318)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A05		
<b>Design:</b>	O'Toole A05 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	11.54	345.77	4,151.73	1,122.32	-284.64	14,365,199.911	888,948.688	39.525823720°N	107.664799688°W
4,500.00	9.54	345.77	4,250.04	1,140.05	-289.14	14,365,217.646	888,944.190	39.525872011°N	107.664817483°W
4,600.00	7.54	345.77	4,348.92	1,154.45	-292.79	14,365,232.045	888,940.538	39.525911217°N	107.664831931°W
4,700.00	5.54	345.77	4,448.26	1,165.50	-295.59	14,365,243.091	888,937.736	39.525941291°N	107.664843014°W
4,800.00	3.54	345.77	4,547.95	1,173.18	-297.54	14,365,250.768	888,935.789	39.525962197°N	107.664850718°W
4,900.00	1.54	345.77	4,647.84	1,177.48	-298.63	14,365,255.070	888,934.698	39.525973908°N	107.664855033°W
4,977.17	0.00	0.00	4,725.00	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
Vertical at 4977 MD/4725 TVD - Price Coal									
5,000.00	0.00	0.00	4,747.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,100.00	0.00	0.00	4,847.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,200.00	0.00	0.00	4,947.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,300.00	0.00	0.00	5,047.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,400.00	0.00	0.00	5,147.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,500.00	0.00	0.00	5,247.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,600.00	0.00	0.00	5,347.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,700.00	0.00	0.00	5,447.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,800.00	0.00	0.00	5,547.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
5,852.17	0.00	0.00	5,600.00	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
Top Gas									
5,900.00	0.00	0.00	5,647.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,000.00	0.00	0.00	5,747.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,100.00	0.00	0.00	5,847.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,200.00	0.00	0.00	5,947.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,300.00	0.00	0.00	6,047.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,400.00	0.00	0.00	6,147.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,500.00	0.00	0.00	6,247.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,600.00	0.00	0.00	6,347.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,677.17	0.00	0.00	6,425.00	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
Cameo									
6,700.00	0.00	0.00	6,447.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,800.00	0.00	0.00	6,547.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
6,900.00	0.00	0.00	6,647.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,000.00	0.00	0.00	6,747.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,100.00	0.00	0.00	6,847.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,200.00	0.00	0.00	6,947.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,300.00	0.00	0.00	7,047.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,400.00	0.00	0.00	7,147.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,500.00	0.00	0.00	7,247.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,600.00	0.00	0.00	7,347.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,700.00	0.00	0.00	7,447.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,777.17	0.00	0.00	7,525.00	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
Rollins									
7,800.00	0.00	0.00	7,547.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,900.00	0.00	0.00	7,647.83	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
7,977.17	0.00	0.00	7,725.00	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°W
TD at 7977 MD/7725 TVD									

# Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A05 (111318) - Slot A05
<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 A05 (111318)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A05		
<b>Design:</b>	O'Toole A05 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									
A05 BH	0.00	360.00	4,725.00	1,178.48	-298.89	14,365,256.077	888,934.443	39.525976651°N	107.664856044°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				
4,166.39	3,925.00	Mesaverde				
4,977.17	4,725.00	Price Coal				
5,852.17	5,600.00	Top Gas				
6,677.17	6,425.00	Cameo				
7,777.17	7,525.00	Rollins				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)		
1,060.00	1,060.00	0.00	0.00	Build 2°/100 at 1060 MD/TVD	
2,524.01	2,461.12	354.78	-89.98	Hold 29.3° at 2524 MD/2461 TVD	
3,513.16	3,323.88	823.70	-208.91	Drop 2°/100 at 3513 MD/3324 TVD	
4,977.17	4,725.00	1,178.48	-298.89	Vertical at 4977 MD/4725 TVD	
7,977.17	7,725.00	1,178.48	-298.89	TD at 7977 MD/7725 TVD	