

# Trilogy Resources LLC

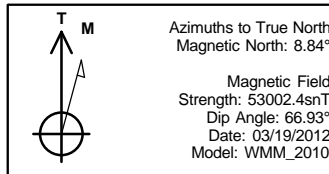
Company: Trilogy Resources LLC  
 Site: Keto  
 Well: 7-33  
 Project: Weld County, Colorado  
 Rig Name: Cade 21

**MS Energy Services**  
 WWW.MSENERGYSERVICES.COM

Planning: 936.442.2510 Fax: 936.442.2515  
 Operations: 936.442.2500 Fax: 936.442.2599

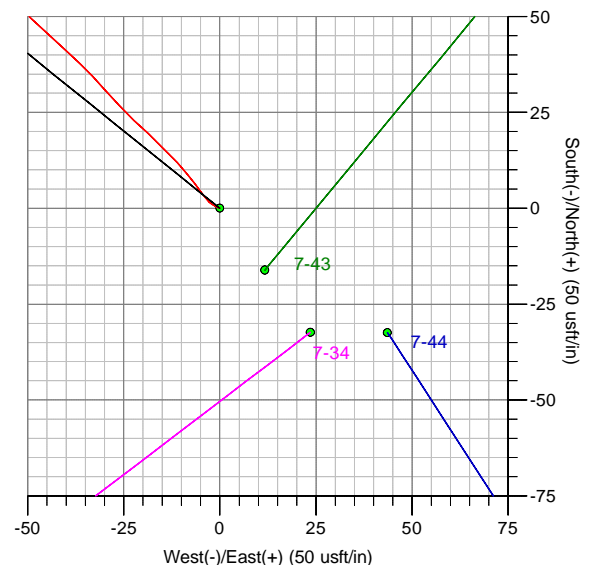
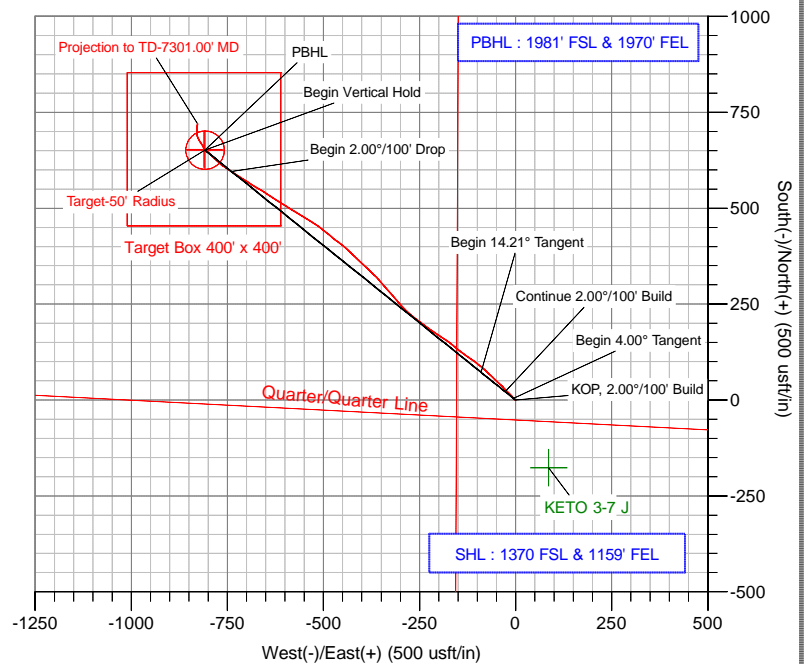
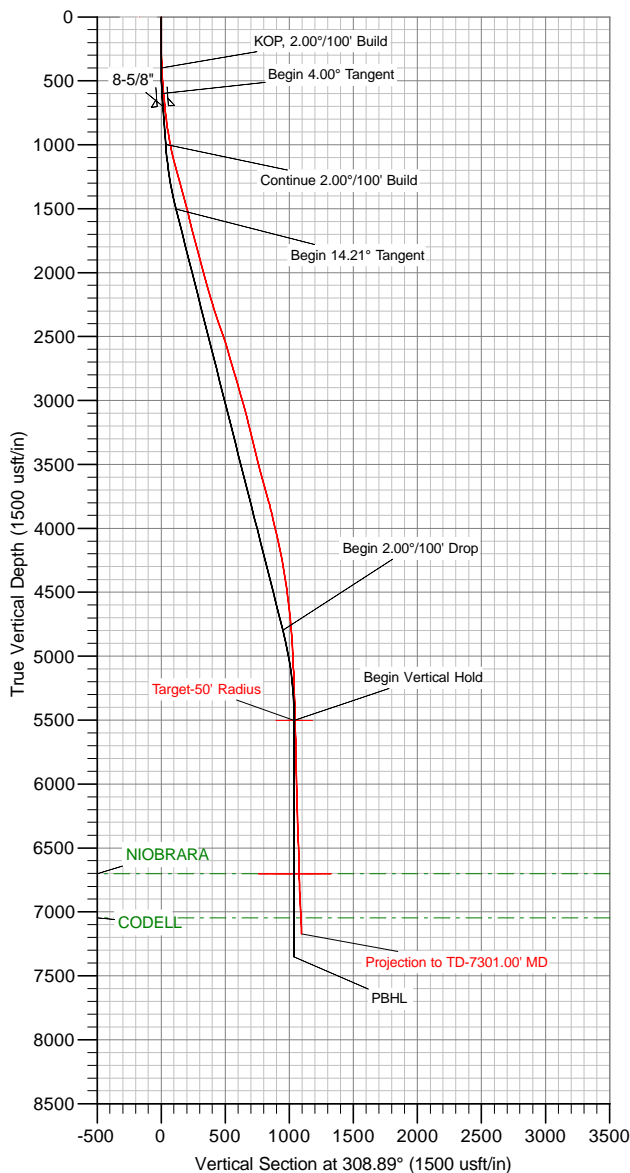
## ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
600.00	4.00	308.89	599.84	4.38	-5.43	6.98	6.98	Begin 4.00° Tangent
1000.00	4.00	308.89	998.86	21.90	-27.15	34.88	34.88	Continue 2.00°/100' Build
1510.55	14.21	308.89	1502.31	72.55	-89.96	115.57	115.57	Begin 14.21° Tangent
4909.98	14.21	308.89	4797.71	596.47	-739.55	950.11	950.11	Begin 2.00°/100' Drop
5620.53	0.00	0.00	5501.00	651.50	-807.79	1037.77	1037.77	Begin Vertical Hold
7470.53	0.00	0.00	7351.00	651.50	-807.79	1037.77	1037.77	PBHL



Created By: Megan Pope  
 Date: 11:45, April 02 2012  
 Plan: Design #1

US State Plane 1983  
 Colorado Northern Zone



The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented. Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer. MS Energy is not responsible for the accuracy of this schematic or the information contained herein.

# **Trilogy Resources LLC**

**Weld County, Colorado**

**Keto**

**7-33**

**Wellbore #1**

**Survey: MS MWD**

## **Standard Survey Report**

**02 April, 2012**

<b>Company:</b>	Trilogy Resources LLC	<b>Local Co-ordinate Reference:</b>	Well 7-33
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	Well @ 4852.00usft (Cade 21)
<b>Site:</b>	Keto	<b>MD Reference:</b>	Well @ 4852.00usft (Cade 21)
<b>Well:</b>	7-33	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	Southern Region

<b>Project</b>	Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Well</b>	7-33				
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,361,516.38 usft	<b>Latitude:</b> 40° 19' 27.6634 N
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	3,159,498.63 usft	<b>Longitude:</b> 104° 55' 40.619 W
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b> 4,838.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	WMM_2010	03/19/12	8.84	66.93	53,002

<b>Design</b>	Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		308.89

<b>Survey Program</b>	<b>Date</b>	04/02/12			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
202.00	7,301.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	

<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 (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
202.00	0.70	295.80	201.99	0.54	-1.11	1.20	0.35	0.35	0.00	
293.00	0.70	299.50	292.99	1.05	-2.10	2.29	0.05	0.00	4.07	
385.00	2.20	321.60	384.96	2.71	-3.68	4.57	1.71	1.63	24.02	
476.00	3.70	323.10	475.83	6.43	-6.53	9.12	1.65	1.65	1.65	
572.00	4.90	318.80	571.56	11.99	-11.09	16.16	1.29	1.25	-4.48	
692.00	5.50	311.20	691.07	19.64	-18.79	26.96	0.76	0.50	-6.33	
833.00	7.70	318.70	831.13	31.19	-30.11	43.02	1.67	1.56	5.32	
928.00	9.50	312.10	925.06	41.22	-40.13	57.12	2.16	1.89	-6.95	
1,024.00	11.90	312.80	1,019.38	53.26	-53.27	74.91	2.50	2.50	0.73	
1,119.00	14.20	314.00	1,111.92	68.01	-68.84	96.29	2.44	2.42	1.26	
1,214.00	15.00	311.20	1,203.86	84.21	-86.48	120.18	1.12	0.84	-2.95	
1,309.00	16.20	305.70	1,295.36	100.04	-106.49	145.69	2.00	1.26	-5.79	
1,404.00	14.50	305.80	1,386.97	114.73	-126.90	170.80	1.79	-1.79	0.11	
1,500.00	15.40	308.20	1,479.72	129.64	-146.67	195.55	1.14	0.94	2.50	

<b>Company:</b>	Trilogy Resources LLC	<b>Local Co-ordinate Reference:</b>	Well 7-33
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	Well @ 4852.00usft (Cade 21)
<b>Site:</b>	Keto	<b>MD Reference:</b>	Well @ 4852.00usft (Cade 21)
<b>Well:</b>	7-33	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	Southern Region

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,596.00	13.70	308.80	1,572.64	144.65	-165.54	219.67	1.78	-1.77	0.63
1,691.00	14.00	303.60	1,664.88	158.06	-183.88	242.36	1.35	0.32	-5.47
1,787.00	14.50	303.70	1,757.92	171.15	-203.55	265.89	0.52	0.52	0.10
1,883.00	15.40	304.80	1,850.67	185.10	-224.02	290.58	0.98	0.94	1.15
1,981.00	15.20	308.60	1,945.20	200.54	-244.75	316.40	1.04	-0.20	3.88
2,077.00	15.00	307.50	2,037.89	215.95	-264.44	341.41	0.36	-0.21	-1.15
2,172.00	15.80	314.10	2,129.48	232.44	-283.48	366.58	2.03	0.84	6.95
2,267.00	16.70	318.70	2,220.69	251.70	-301.78	392.91	1.65	0.95	4.84
2,363.00	18.90	318.90	2,312.09	273.78	-321.10	421.82	2.29	2.29	0.21
2,458.00	19.30	318.90	2,401.86	297.20	-341.54	452.43	0.42	0.42	0.00
2,553.00	18.80	316.90	2,491.66	320.21	-362.32	483.05	0.87	-0.53	-2.11
2,649.00	16.10	312.20	2,583.24	340.45	-382.75	511.66	3.17	-2.81	-4.90
2,744.00	16.50	315.30	2,674.42	358.89	-402.00	538.22	1.01	0.42	3.26
2,840.00	16.70	312.70	2,766.42	377.93	-421.73	565.53	0.80	0.21	-2.71
2,934.00	16.10	312.00	2,856.59	395.81	-441.34	592.02	0.67	-0.64	-0.74
3,030.00	16.00	305.70	2,948.86	412.44	-461.98	618.53	1.82	-0.10	-6.56
3,127.00	15.20	310.90	3,042.29	428.57	-482.45	644.58	1.66	-0.82	5.36
3,223.00	15.10	307.80	3,134.95	444.47	-501.84	669.66	0.85	-0.10	-3.23
3,318.00	13.30	304.40	3,227.05	458.23	-520.64	692.93	2.09	-1.89	-3.58
3,414.00	13.50	300.20	3,320.44	470.11	-539.43	715.02	1.03	0.21	-4.38
3,509.00	13.50	302.80	3,412.81	481.69	-558.34	737.00	0.64	0.00	2.74
3,605.00	15.50	300.80	3,505.75	494.33	-578.78	760.85	2.15	2.08	-2.08
3,700.00	15.40	302.70	3,597.32	507.65	-600.30	785.96	0.54	-0.11	2.00
3,794.00	15.50	302.70	3,687.92	521.18	-621.37	810.85	0.11	0.11	0.00
3,889.00	16.00	302.90	3,779.36	535.15	-643.04	836.49	0.53	0.53	0.21
3,983.00	13.00	301.00	3,870.35	547.63	-662.99	859.86	3.23	-3.19	-2.02
4,078.00	13.40	301.40	3,962.84	558.87	-681.54	881.35	0.43	0.42	0.42
4,172.00	12.70	303.20	4,054.41	570.20	-699.49	902.44	0.86	-0.74	1.91
4,267.00	12.00	302.00	4,147.22	581.15	-716.60	922.63	0.78	-0.74	-1.26
4,361.00	11.30	304.20	4,239.28	591.51	-732.50	941.51	0.88	-0.74	2.34
4,456.00	9.60	303.40	4,332.70	601.10	-746.82	958.67	1.80	-1.79	-0.84
4,550.00	8.40	302.10	4,425.54	609.06	-759.18	973.29	1.29	-1.28	-1.38
4,644.00	7.30	313.20	4,518.66	616.80	-769.35	986.07	1.99	-1.17	11.81
4,739.00	6.60	312.30	4,612.97	624.61	-777.78	997.54	0.75	-0.74	-0.95
4,832.00	5.60	315.10	4,705.44	631.42	-784.94	1,007.38	1.12	-1.08	3.01
4,926.00	4.60	318.30	4,799.06	637.48	-790.69	1,015.66	1.11	-1.06	3.40
5,022.00	2.90	314.60	4,894.86	642.06	-794.98	1,021.88	1.79	-1.77	-3.85
5,115.00	3.00	311.20	4,987.73	645.32	-798.48	1,026.65	0.22	0.11	-3.66
5,209.00	2.80	310.40	5,081.61	648.43	-802.08	1,031.40	0.22	-0.21	-0.85
5,302.00	1.70	312.90	5,174.54	650.84	-804.82	1,035.05	1.19	-1.18	2.69
5,397.00	1.80	304.60	5,269.49	652.64	-807.08	1,037.94	0.29	0.11	-8.74
5,491.00	2.00	305.80	5,363.44	654.44	-809.63	1,041.05	0.22	0.21	1.28
5,586.00	1.80	347.70	5,458.40	656.87	-811.29	1,043.87	1.44	-0.21	44.11
5,681.00	1.70	342.40	5,553.35	659.67	-812.03	1,046.21	0.20	-0.11	-5.58

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	Southern Region

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,775.00	1.60	323.80	5,647.31	662.06	-813.23	1,048.64	0.58	-0.11	-19.79	
5,868.00	1.40	332.50	5,740.28	664.11	-814.52	1,050.93	0.33	-0.22	9.35	
5,963.00	1.30	317.10	5,835.25	665.93	-815.79	1,053.06	0.39	-0.11	-16.21	
6,057.00	1.50	332.80	5,929.23	667.81	-817.08	1,055.24	0.46	0.21	16.70	
6,152.00	1.50	329.80	6,024.19	669.99	-818.27	1,057.54	0.08	0.00	-3.16	
6,246.00	1.60	327.50	6,118.16	672.16	-819.60	1,059.94	0.13	0.11	-2.45	
6,341.00	1.80	327.10	6,213.12	674.53	-821.12	1,062.61	0.21	0.21	-0.42	
6,436.00	1.50	330.30	6,308.08	676.86	-822.55	1,065.18	0.33	-0.32	3.37	
6,530.00	1.80	328.80	6,402.04	679.19	-823.92	1,067.72	0.32	0.32	-1.60	
6,624.00	1.80	325.80	6,495.99	681.68	-825.52	1,070.52	0.10	0.00	-3.19	
6,719.00	2.40	343.20	6,590.93	684.82	-826.93	1,073.59	0.91	0.63	18.32	
6,814.00	1.60	340.50	6,685.87	687.97	-827.95	1,076.36	0.85	-0.84	-2.84	
6,908.00	2.80	353.00	6,779.80	691.49	-828.67	1,079.13	1.37	1.28	13.30	
7,002.00	4.20	359.80	6,873.62	697.21	-828.96	1,082.95	1.55	1.49	7.23	
7,254.00	4.60	8.10	7,124.88	716.44	-827.57	1,093.94	0.30	0.16	3.29	
7,301.00	4.60	8.10	7,171.73	720.17	-827.03	1,095.87	0.00	0.00	0.00	
Projection to TD-7301.00' MD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
7,301.00	7,171.73	720.17	-827.03	Projection to TD-7301.00' MD	