



Company: Carrizo Oil & Gas
Site: Nelson
Well: 17-44-9-60
Project: Weld County, Colorado (NAD83)
Rig Name: Cade 22



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



Azimuths to Grid North
True North: -0.90°
Magnetic North: 7.62°

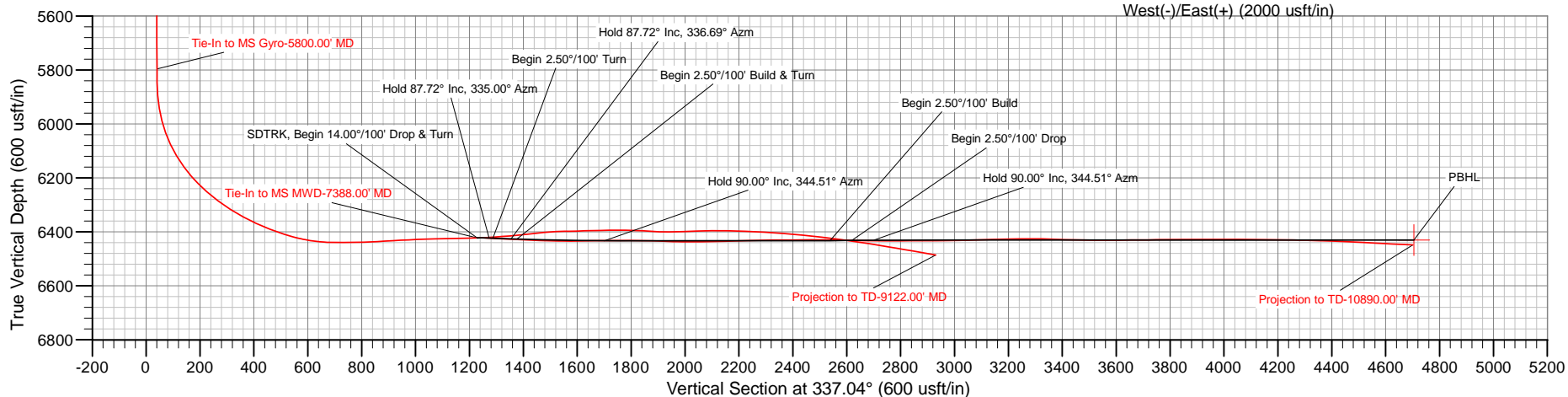
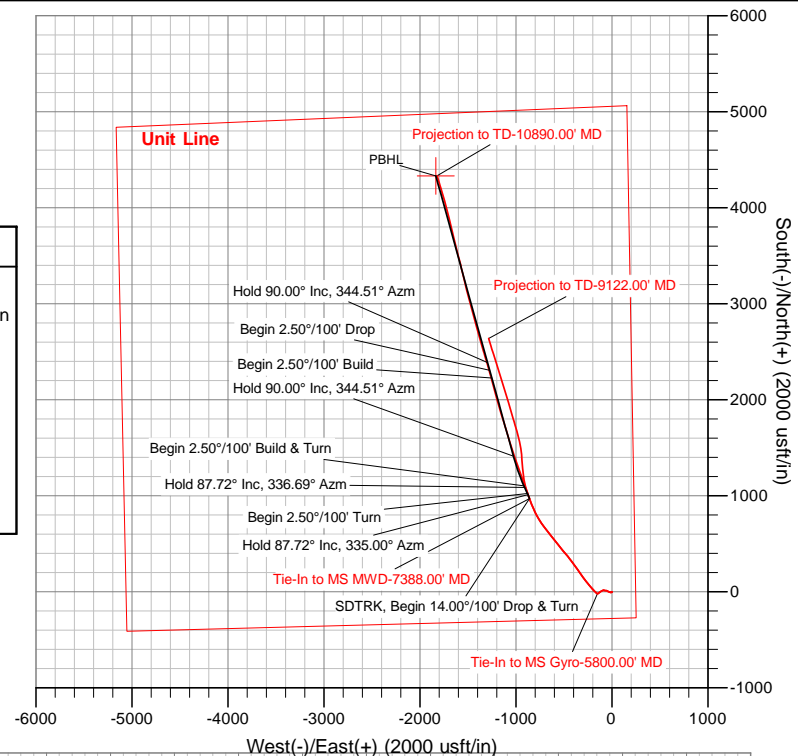
Magnetic Field
Strength: 53385.2snT
Dip Angle: 67.43°
Date: 06/23/2011
Model: WMM_2010

US State Plane 1983
Colorado Northern Zone

Created By: Megan Pope
Date: 9:21, June 27 2011
Plan: Design #13

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
7388.00	91.79	339.79	6422.25	969.94	-858.57	1228.02	0.00	SDTRK, Begin 14.00°/100' Drop & Turn
7432.89	87.72	335.00	6422.44	1011.37	-875.82	1272.89	44.88	Hold 87.72° Inc, 335.00° Azm
7447.02	87.72	335.00	6423.00	1024.16	-881.79	1287.00	59.00	Begin 2.50°/100' Turn
7514.45	87.72	336.69	6425.68	1085.63	-909.36	1354.36	126.37	Hold 87.72° Inc, 336.69° Azm
7535.18	87.72	336.69	6426.51	1104.66	-917.55	1375.07	147.09	Begin 2.50°/100' Build & Turn
7861.08	90.00	344.51	6433.00	1411.73	-1025.69	1700.00	472.90	Hold 90.00° Inc, 344.51° Azm
8705.48	90.00	344.51	6433.00	2225.46	-1251.21	2537.24	1317.30	Begin 2.50°/100' Build
8788.31	92.07	344.51	6431.50	2305.27	-1273.32	2619.35	1400.11	Begin 2.50°/100' Drop
8871.15	90.00	344.51	6430.00	2385.08	-1295.43	2701.46	1482.94	Hold 90.00° Inc, 344.51° Azm
10891.65	90.00	344.51	6430.00	4332.23	-1834.93	4704.80	3503.43	PBHL



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.



Carrizo Oil & Gas

Weld County, Colorado (NAD83)

Nelson

17-44-9-60

Wellbore #1

Survey: MS Gyro

Standard Survey Report

21 June, 2011

Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

Project	Weld County, Colorado (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	17-44-9-60					
Well Position	+N/-S	0.00 usft	Northing:	1,516,552.18 usft	Latitude:	40° 44' 34.8555 N
	+E/-W	0.00 usft	Easting:	3,385,673.43 usft	Longitude:	104° 6' 29.261 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,008.20 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	06/10/11	8.53	67.43	53,389

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00		337.04

Survey Program	Date	06/21/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	5,800.00	MS Gyro (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
5,895.00	6,752.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	
6,850.00	8,298.00	Weatherford MWD (Wellbore #1)	MWD	MWD - Standard	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.54	197.57	100.00	-0.45	-0.14	-0.36	0.54	0.54	0.00	
200.00	0.39	198.75	200.00	-1.22	-0.39	-0.97	0.15	-0.15	1.18	
300.00	0.47	188.14	299.99	-1.95	-0.56	-1.58	0.11	0.08	-10.61	
400.00	0.40	141.42	399.99	-2.63	-0.40	-2.26	0.35	-0.07	-46.72	
500.00	0.07	212.29	499.99	-2.95	-0.22	-2.63	0.38	-0.33	70.87	
600.00	0.32	285.47	599.99	-2.93	-0.52	-2.50	0.31	0.25	73.18	
700.00	0.09	252.91	699.99	-2.88	-0.86	-2.31	0.25	-0.23	-32.56	
800.00	0.28	208.06	799.99	-3.12	-1.05	-2.46	0.23	0.19	-44.85	
900.00	0.16	264.25	899.99	-3.35	-1.31	-2.57	0.23	-0.12	56.19	
1,000.00	0.15	293.63	999.99	-3.31	-1.57	-2.44	0.08	-0.01	29.38	
1,100.00	0.18	194.19	1,099.99	-3.41	-1.72	-2.47	0.25	0.03	-99.44	
1,200.00	0.46	264.48	1,199.98	-3.60	-2.16	-2.47	0.43	0.28	70.29	
1,300.00	0.81	230.33	1,299.98	-4.09	-3.11	-2.55	0.50	0.35	-34.15	

Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	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)
1,400.00	0.90	237.87	1,399.97	-4.96	-4.31	-2.88	0.14	0.09	7.54
1,500.00	0.87	267.48	1,499.96	-5.41	-5.74	-2.74	0.45	-0.03	29.61
1,600.00	0.84	252.51	1,599.95	-5.66	-7.20	-2.41	0.22	-0.03	-14.97
1,700.00	1.07	256.11	1,699.93	-6.11	-8.80	-2.19	0.24	0.23	3.60
1,800.00	0.93	279.00	1,799.92	-6.20	-10.51	-1.61	0.42	-0.14	22.89
1,900.00	0.96	259.27	1,899.90	-6.23	-12.13	-1.01	0.33	0.03	-19.73
2,000.00	1.04	263.51	1,999.89	-6.49	-13.86	-0.57	0.11	0.08	4.24
2,100.00	0.90	289.09	2,099.87	-6.34	-15.50	0.21	0.45	-0.14	25.58
2,200.00	1.18	285.03	2,199.86	-5.81	-17.24	1.37	0.29	0.28	-4.06
2,300.00	1.16	275.18	2,299.84	-5.45	-19.24	2.48	0.20	-0.02	-9.85
2,400.00	1.27	291.02	2,399.81	-4.97	-21.28	3.73	0.35	0.11	15.84
2,500.00	1.23	282.66	2,499.79	-4.33	-23.37	5.12	0.19	-0.04	-8.36
2,600.00	1.37	300.29	2,599.77	-3.50	-25.45	6.71	0.42	0.14	17.63
2,700.00	1.49	289.25	2,699.73	-2.46	-27.71	8.54	0.30	0.12	-11.04
2,800.00	1.78	299.17	2,799.69	-1.28	-30.29	10.64	0.40	0.29	9.92
2,900.00	2.09	294.28	2,899.64	0.23	-33.31	13.20	0.35	0.31	-4.89
3,000.00	2.59	301.87	2,999.55	2.17	-36.89	16.39	0.59	0.50	7.59
3,100.00	2.76	298.60	3,099.44	4.52	-40.92	20.12	0.23	0.17	-3.27
3,200.00	2.52	297.66	3,199.34	6.69	-44.98	23.70	0.24	-0.24	-0.94
3,300.00	2.07	293.41	3,299.26	8.43	-48.59	26.71	0.48	-0.45	-4.25
3,400.00	1.78	296.12	3,399.20	9.83	-51.64	29.19	0.30	-0.29	2.71
3,500.00	1.51	281.42	3,499.16	10.77	-54.32	31.11	0.50	-0.27	-14.70
3,600.00	1.84	278.24	3,599.12	11.27	-57.20	32.68	0.34	0.33	-3.18
3,700.00	2.02	276.60	3,699.06	11.70	-60.54	34.38	0.19	0.18	-1.64
3,800.00	2.58	276.58	3,798.98	12.16	-64.53	36.36	0.56	0.56	-0.02
3,900.00	2.85	283.37	3,898.87	12.99	-69.19	38.95	0.42	0.27	6.79
4,000.00	3.06	277.47	3,998.73	13.91	-74.25	41.77	0.37	0.21	-5.90
4,100.00	3.24	280.11	4,098.58	14.76	-79.68	44.66	0.23	0.18	2.64
4,200.00	2.84	276.42	4,198.44	15.53	-84.92	47.42	0.45	-0.40	-3.69
4,300.00	2.62	256.46	4,298.33	15.27	-89.61	49.01	0.97	-0.22	-19.96
4,400.00	2.67	251.82	4,398.23	14.01	-94.04	49.58	0.22	0.05	-4.64
4,500.00	2.91	238.98	4,498.11	11.97	-98.43	49.42	0.67	0.24	-12.84
4,600.00	3.63	241.87	4,597.94	9.17	-103.40	48.77	0.74	0.72	2.89
4,700.00	4.21	239.54	4,697.71	5.82	-109.35	48.01	0.60	0.58	-2.33
4,800.00	5.14	239.21	4,797.38	1.67	-116.37	46.92	0.93	0.93	-0.33
4,900.00	5.14	239.57	4,896.97	-2.90	-124.08	45.73	0.03	0.00	0.36
5,000.00	4.49	229.24	4,996.62	-7.72	-130.90	43.95	1.08	-0.65	-10.33
5,100.00	3.55	234.99	5,096.38	-12.05	-136.40	42.10	1.02	-0.94	5.75
5,200.00	2.85	234.62	5,196.22	-15.27	-140.97	40.92	0.70	-0.70	-0.37
5,300.00	1.91	239.45	5,296.13	-17.55	-144.43	40.17	0.96	-0.94	4.83
5,400.00	1.72	241.47	5,396.08	-19.12	-147.18	39.80	0.20	-0.19	2.02
5,500.00	0.85	237.42	5,496.06	-20.23	-149.13	39.53	0.87	-0.87	-4.05
5,600.00	0.69	263.24	5,596.05	-20.70	-150.35	39.57	0.38	-0.16	25.82

Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	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)
5,700.00	0.39	250.60	5,696.04	-20.89	-151.27	39.76	0.32	-0.30	-12.64
5,800.00	0.50	307.47	5,796.04	-20.74	-151.94	40.16	0.43	0.11	56.87
Final MS Gyro Survey-5800.00' MD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,800.00	5,796.04	-20.74	-151.94	Final MS Gyro Survey-5800.00' MD



Carrizo Oil & Gas

Weld County, Colorado (NAD83)

Nelson

17-44-9-60

Wellbore #1

Survey: MWD Surveys

Standard Survey Report

24 June, 2011



Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

Project	Weld County, Colorado (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	17-44-9-60				
Well Position	+N/-S	0.00 usft	Northing:	1,516,552.18 usft	Latitude: 40° 44' 34.8555 N
	+E/-W	0.00 usft	Easting:	3,385,673.43 usft	Longitude: 104° 6' 29.261 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 5,008.20 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	06/10/11	8.53	67.43	53,389

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	337.04	

Survey Program	Date	06/24/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	5,800.00	MS Gyro (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
5,895.00	9,122.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

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)	
5,800.00	0.50	307.47	5,796.04	-20.74	-151.94	40.16	0.00	0.00	0.00	
Tie-In to MS Gyro-5800.00' MD										
5,895.00	3.80	306.50	5,890.96	-18.61	-154.80	43.24	3.47	3.47	-1.02	
5,927.00	7.70	308.90	5,922.79	-16.63	-157.32	46.04	12.21	12.19	7.50	
5,959.00	11.70	311.40	5,954.33	-13.14	-161.42	50.86	12.57	12.50	7.81	
5,990.00	15.60	313.00	5,984.45	-8.22	-166.83	57.50	12.64	12.58	5.16	
6,022.00	19.30	313.90	6,014.97	-1.61	-173.79	66.30	11.59	11.56	2.81	
6,054.00	23.00	315.00	6,044.81	6.48	-182.02	76.96	11.63	11.56	3.44	
6,086.00	26.70	316.70	6,073.84	16.13	-191.38	89.50	11.77	11.56	5.31	
6,117.00	30.40	318.30	6,101.07	27.06	-201.38	103.46	12.19	11.94	5.16	
6,149.00	33.70	320.00	6,128.19	39.91	-212.47	119.62	10.69	10.31	5.31	
6,181.00	36.70	320.40	6,154.33	54.08	-224.28	137.27	9.40	9.38	1.25	
6,213.00	39.70	320.20	6,179.48	69.31	-236.92	156.22	9.38	9.38	-0.63	
6,244.00	43.20	320.10	6,202.71	85.06	-250.06	175.85	11.29	11.29	-0.32	
6,276.00	46.50	320.80	6,225.39	102.46	-264.43	197.48	10.43	10.31	2.19	

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Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	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)	
6,307.00	49.60	321.80	6,246.11	120.45	-278.84	219.67	10.28	10.00	3.23	
6,339.00	51.70	323.30	6,266.40	140.10	-293.88	243.62	7.50	6.56	4.69	
6,371.00	53.40	324.70	6,285.86	160.65	-308.81	268.37	6.35	5.31	4.38	
6,403.00	55.90	325.30	6,304.37	182.03	-323.77	293.89	7.96	7.81	1.88	
6,434.00	58.40	325.20	6,321.19	203.43	-338.62	319.38	8.07	8.06	-0.32	
6,466.00	61.60	325.10	6,337.19	226.17	-354.45	346.50	10.00	10.00	-0.31	
6,498.00	63.60	324.60	6,351.91	249.39	-370.81	374.27	6.40	6.25	-1.56	
6,530.00	65.70	324.40	6,365.61	272.94	-387.60	402.49	6.59	6.56	-0.63	
6,561.00	68.10	323.20	6,377.77	295.94	-404.44	430.24	8.52	7.74	-3.87	
6,593.00	68.70	322.80	6,389.55	319.70	-422.35	459.11	2.21	1.88	-1.25	
6,625.00	70.50	321.90	6,400.71	343.45	-440.67	488.12	6.21	5.63	-2.81	
6,657.00	72.80	321.20	6,410.78	367.23	-459.56	517.38	7.48	7.19	-2.19	
6,688.00	76.20	320.10	6,419.06	390.33	-478.50	546.04	11.49	10.97	-3.55	
6,720.00	78.20	320.20	6,426.15	414.28	-498.49	575.89	6.26	6.25	0.31	
6,752.00	81.30	320.30	6,431.85	438.49	-518.62	606.04	9.69	9.69	0.31	
6,850.00	90.19	321.86	6,439.11	514.45	-579.95	699.90	9.21	9.07	1.59	
6,882.00	90.25	321.70	6,438.99	539.59	-599.75	730.77	0.53	0.19	-0.50	
6,913.00	90.49	321.65	6,438.79	563.91	-618.97	760.66	0.79	0.77	-0.16	
6,945.00	90.19	321.33	6,438.60	588.95	-638.90	791.49	1.37	-0.94	-1.00	
6,977.00	92.22	322.00	6,437.93	614.05	-658.74	822.34	6.68	6.34	2.09	
7,008.00	93.08	322.47	6,436.49	638.53	-677.70	852.27	3.16	2.77	1.52	
7,040.00	93.17	322.32	6,434.75	663.84	-697.20	883.19	0.55	0.28	-0.47	
7,072.00	93.33	323.37	6,432.93	689.30	-716.50	914.16	3.31	0.50	3.28	
7,103.00	93.33	325.39	6,431.13	714.46	-734.52	944.35	6.51	0.00	6.52	
7,135.00	92.78	327.81	6,429.43	741.13	-752.11	975.77	7.74	-1.72	7.56	
7,167.00	92.53	329.73	6,427.95	768.47	-768.68	1,007.41	6.04	-0.78	6.00	
7,198.00	91.42	331.95	6,426.88	795.52	-783.78	1,038.20	8.00	-3.58	7.16	
7,230.00	91.48	334.05	6,426.07	824.02	-798.30	1,070.11	6.56	0.19	6.56	
7,262.00	91.11	336.27	6,425.34	853.05	-811.74	1,102.08	7.03	-1.16	6.94	
7,294.00	91.17	336.75	6,424.71	882.39	-824.49	1,134.08	1.51	0.19	1.50	
7,325.00	91.29	338.15	6,424.04	911.02	-836.37	1,165.07	4.53	0.39	4.52	
7,357.00	91.73	339.76	6,423.20	940.87	-847.86	1,197.04	5.21	1.38	5.03	
7,388.00	91.79	339.79	6,422.25	969.94	-858.57	1,227.99	0.22	0.19	0.10	
7,420.00	92.34	340.92	6,421.09	1,000.06	-869.32	1,259.91	3.93	1.72	3.53	
7,452.00	93.46	341.26	6,419.47	1,030.30	-879.68	1,291.79	3.66	3.50	1.06	
7,483.00	94.38	342.37	6,417.35	1,059.68	-889.33	1,322.61	4.64	2.97	3.58	
7,515.00	95.25	344.32	6,414.67	1,090.22	-898.47	1,354.30	6.65	2.72	6.09	
7,546.00	95.75	346.50	6,411.70	1,120.08	-906.24	1,384.83	7.18	1.61	7.03	
7,578.00	95.99	348.44	6,408.42	1,151.16	-913.15	1,416.14	6.08	0.75	6.06	
7,610.00	95.37	351.30	6,405.26	1,182.50	-918.75	1,447.18	9.10	-1.94	8.94	
7,642.00	95.25	353.81	6,402.29	1,214.09	-922.88	1,477.88	7.82	-0.38	7.84	
7,673.00	93.64	354.44	6,399.89	1,244.84	-926.04	1,507.42	5.57	-5.19	2.03	
7,705.00	91.48	355.47	6,398.46	1,276.68	-928.85	1,537.84	7.48	-6.75	3.22	



Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	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)	
7,737.00	91.23	355.54	6,397.71	1,308.57	-931.36	1,568.19	0.81	-0.78	0.22	
7,768.00	91.30	355.55	6,397.02	1,339.47	-933.77	1,597.58	0.23	0.23	0.03	
7,800.00	91.36	355.01	6,396.28	1,371.35	-936.40	1,627.96	1.70	0.19	-1.69	
7,831.00	91.36	355.00	6,395.54	1,402.22	-939.10	1,657.44	0.03	0.00	-0.03	
7,863.00	91.48	354.98	6,394.75	1,434.09	-941.89	1,687.88	0.38	0.38	-0.06	
7,895.00	91.48	352.96	6,393.92	1,465.90	-945.25	1,718.48	6.31	0.00	-6.31	
7,926.00	90.00	350.81	6,393.52	1,496.59	-949.63	1,748.44	8.42	-4.77	-6.94	
7,958.00	88.95	348.89	6,393.82	1,528.08	-955.27	1,779.64	6.84	-3.28	-6.00	
7,990.00	87.47	346.76	6,394.82	1,559.35	-962.01	1,811.06	8.10	-4.63	-6.66	
8,021.00	86.92	346.29	6,396.33	1,589.46	-969.22	1,841.60	2.33	-1.77	-1.52	
8,053.00	86.85	346.62	6,398.07	1,620.52	-976.71	1,873.12	1.05	-0.22	1.03	
8,085.00	87.78	345.57	6,399.57	1,651.55	-984.39	1,904.69	4.38	2.91	-3.28	
8,116.00	89.94	344.45	6,400.19	1,681.48	-992.41	1,935.38	7.85	6.97	-3.61	
8,148.00	91.73	343.41	6,399.72	1,712.23	-1,001.26	1,967.14	6.47	5.59	-3.25	
8,180.00	92.28	343.16	6,398.60	1,742.86	-1,010.46	1,998.93	1.89	1.72	-0.78	
8,212.00	92.34	343.19	6,397.31	1,773.46	-1,019.71	2,030.72	0.21	0.19	0.09	
8,243.00	90.74	343.75	6,396.48	1,803.17	-1,028.53	2,061.52	5.47	-5.16	1.81	
8,275.00	90.31	343.29	6,396.19	1,833.85	-1,037.61	2,093.31	1.97	-1.34	-1.44	
8,307.00	90.37	343.18	6,396.00	1,864.49	-1,046.84	2,125.12	0.39	0.19	-0.34	
8,338.00	88.83	343.30	6,396.21	1,894.18	-1,055.78	2,155.94	4.98	-4.97	0.39	
8,370.00	88.46	343.70	6,396.97	1,924.85	-1,064.86	2,187.73	1.70	-1.16	1.25	
8,402.00	88.27	343.67	6,397.88	1,955.55	-1,073.85	2,219.50	0.60	-0.59	-0.09	
8,433.00	87.22	343.69	6,399.10	1,985.28	-1,082.55	2,250.27	3.39	-3.39	0.06	
8,465.00	86.92	343.60	6,400.74	2,015.94	-1,091.55	2,282.02	0.98	-0.94	-0.28	
8,497.00	86.98	343.95	6,402.44	2,046.62	-1,100.48	2,313.75	1.11	0.19	1.09	
8,529.00	85.55	343.01	6,404.52	2,077.23	-1,109.56	2,345.48	5.34	-4.47	-2.94	
8,560.00	84.94	342.52	6,407.09	2,106.74	-1,118.71	2,376.22	2.52	-1.97	-1.58	
8,592.00	84.69	342.57	6,409.99	2,137.14	-1,128.27	2,407.94	0.80	-0.78	0.16	
8,624.00	84.50	342.50	6,413.00	2,167.53	-1,137.83	2,439.65	0.63	-0.59	-0.22	
8,655.00	84.44	342.74	6,415.99	2,196.98	-1,147.05	2,470.36	0.79	-0.19	0.77	
8,687.00	84.82	342.91	6,418.98	2,227.42	-1,156.46	2,502.06	1.30	1.19	0.53	
8,719.00	82.83	342.74	6,422.42	2,257.81	-1,165.85	2,533.71	6.24	-6.22	-0.53	
8,751.00	82.02	342.38	6,426.64	2,288.07	-1,175.36	2,565.29	2.77	-2.53	-1.13	
8,782.00	81.71	342.35	6,431.03	2,317.32	-1,184.66	2,595.84	1.00	-1.00	-0.10	
8,814.00	81.65	342.46	6,435.66	2,347.50	-1,194.23	2,627.37	0.39	-0.19	0.34	
8,846.00	81.33	342.60	6,440.40	2,377.69	-1,203.73	2,658.87	1.09	-1.00	0.44	
8,877.00	81.40	342.41	6,445.05	2,406.92	-1,212.94	2,689.38	0.65	0.23	-0.61	
8,909.00	80.71	342.59	6,450.02	2,437.07	-1,222.45	2,720.85	2.23	-2.16	0.56	
8,941.00	80.58	342.53	6,455.23	2,467.19	-1,231.91	2,752.27	0.45	-0.41	-0.19	
8,973.00	80.40	342.34	6,460.51	2,497.28	-1,241.44	2,783.69	0.81	-0.56	-0.59	
9,004.00	80.15	342.70	6,465.75	2,526.42	-1,250.61	2,814.11	1.40	-0.81	1.16	
9,036.00	80.02	342.83	6,471.26	2,556.53	-1,259.95	2,845.47	0.57	-0.41	0.41	
9,122.00	80.02	342.83	6,486.16	2,637.45	-1,284.96	2,929.74	0.00	0.00	0.00	
Projection to TD-9122.00' MD										



Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	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)

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,800.00	5,796.04	-20.74	-151.94	Tie-In to MS Gyro-5800.00' MD
9,122.00	6,486.16	2,637.45	-1,284.96	Projection to TD-9122.00' MD



Carrizo Oil & Gas

Weld County, Colorado (NAD83)

Nelson

17-44-9-60

Wellbore #2

Survey: Weatherford MWD

Standard Survey Report

27 June, 2011



Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys ST	Database:	Southern Region

Project	Weld County, Colorado (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	17-44-9-60				
Well Position	+N/-S	0.00 usft	Northing:	1,516,552.18 usft	Latitude: 40° 44' 34.8555 N
	+E/-W	0.00 usft	Easting:	3,385,673.43 usft	Longitude: 104° 6' 29.261 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 5,008.20 usft

Wellbore	Wellbore #2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	06/23/11	8.52	67.43	53,385

Design	Surveys ST				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	7,388.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00		337.04

Survey Program	Date	06/27/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	5,800.00	MS Gyro (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
5,895.00	7,388.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	
7,421.00	10,890.00	Weatherford MWD (Wellbore #2)	MWD	MWD - Standard	

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)
7,388.00	91.79	339.79	6,422.25	969.94	-858.57	1,228.02	0.00	0.00	0.00
Tie-In to MS MWD-7388.00' MD									
7,421.00	87.35	339.77	6,422.49	1,000.90	-869.97	1,260.98	13.45	-13.45	-0.06
7,453.00	87.04	339.61	6,424.06	1,030.88	-881.07	1,292.90	1.09	-0.97	-0.50
7,484.00	86.85	339.61	6,425.71	1,059.89	-891.85	1,323.83	0.61	-0.61	0.00
7,516.00	86.85	339.72	6,427.47	1,089.85	-902.96	1,355.75	0.34	0.00	0.34
7,548.00	86.61	340.08	6,429.30	1,119.86	-913.94	1,387.65	1.35	-0.75	1.13
7,579.00	88.09	340.86	6,430.73	1,149.04	-924.29	1,418.56	5.40	4.77	2.52
7,611.00	88.70	341.21	6,431.62	1,179.29	-934.68	1,450.47	2.20	1.91	1.09
7,643.00	88.70	340.91	6,432.35	1,209.55	-945.07	1,482.39	0.94	0.00	-0.94
7,675.00	88.15	340.74	6,433.23	1,239.76	-955.57	1,514.30	1.80	-1.72	-0.53
7,706.00	89.26	340.65	6,433.93	1,269.01	-965.82	1,545.23	3.59	3.58	-0.29
7,738.00	89.57	340.49	6,434.26	1,299.19	-976.46	1,577.17	1.09	0.97	-0.50
7,770.00	89.88	340.83	6,434.41	1,329.38	-987.06	1,609.11	1.44	0.97	1.06

Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys ST	Database:	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)
7,801.00	91.48	340.76	6,434.04	1,358.65	-997.26	1,640.04	5.17	5.16	-0.23
7,833.00	91.79	340.92	6,433.13	1,388.87	-1,007.76	1,671.95	1.09	0.97	0.50
7,865.00	91.73	340.83	6,432.15	1,419.09	-1,018.24	1,703.87	0.34	-0.19	-0.28
7,897.00	90.86	341.28	6,431.42	1,449.35	-1,028.62	1,735.78	3.06	-2.72	1.41
7,928.00	89.26	342.01	6,431.39	1,478.77	-1,038.38	1,766.68	5.67	-5.16	2.35
7,960.00	88.83	342.19	6,431.93	1,509.21	-1,048.22	1,798.55	1.46	-1.34	0.56
7,992.00	88.64	342.30	6,432.63	1,539.68	-1,057.97	1,830.41	0.69	-0.59	0.34
8,023.00	88.77	343.58	6,433.33	1,569.31	-1,067.07	1,861.24	4.15	0.42	4.13
8,055.00	88.46	344.01	6,434.11	1,600.03	-1,075.99	1,893.00	1.66	-0.97	1.34
8,087.00	88.27	343.64	6,435.02	1,630.75	-1,084.90	1,924.77	1.30	-0.59	-1.16
8,119.00	88.21	343.11	6,436.00	1,661.40	-1,094.06	1,956.56	1.67	-0.19	-1.66
8,150.00	89.26	343.20	6,436.69	1,691.06	-1,103.04	1,987.37	3.40	3.39	0.29
8,182.00	89.44	342.83	6,437.05	1,721.66	-1,112.38	2,019.20	1.29	0.56	-1.16
8,214.00	90.80	342.82	6,436.98	1,752.24	-1,121.83	2,051.03	4.25	4.25	-0.03
8,245.00	91.10	342.85	6,436.47	1,781.85	-1,130.98	2,081.87	0.97	0.97	0.10
8,277.00	91.36	342.30	6,435.78	1,812.38	-1,140.56	2,113.71	1.90	0.81	-1.72
8,309.00	91.54	343.13	6,434.97	1,842.92	-1,150.07	2,145.55	2.65	0.56	2.59
8,341.00	91.73	343.25	6,434.06	1,873.54	-1,159.32	2,177.35	0.70	0.59	0.38
8,372.00	92.03	342.61	6,433.04	1,903.16	-1,168.41	2,208.17	2.28	0.97	-2.06
8,404.00	91.30	343.68	6,432.11	1,933.77	-1,177.68	2,239.97	4.05	-2.28	3.34
8,436.00	91.11	344.02	6,431.44	1,964.50	-1,186.58	2,271.74	1.22	-0.59	1.06
8,467.00	90.43	343.94	6,431.02	1,994.29	-1,195.14	2,302.51	2.21	-2.19	-0.26
8,499.00	90.37	344.90	6,430.80	2,025.12	-1,203.73	2,334.24	3.01	-0.19	3.00
8,531.00	90.55	345.49	6,430.54	2,056.05	-1,211.91	2,365.92	1.93	0.56	1.84
8,563.00	90.99	345.19	6,430.11	2,087.01	-1,220.01	2,397.58	1.66	1.38	-0.94
8,594.00	91.05	345.16	6,429.56	2,116.97	-1,227.94	2,428.26	0.22	0.19	-0.10
8,626.00	89.88	344.83	6,429.30	2,147.88	-1,236.22	2,459.95	3.80	-3.66	-1.03
8,658.00	89.75	344.99	6,429.40	2,178.78	-1,244.55	2,491.65	0.64	-0.41	0.50
8,689.00	89.32	345.51	6,429.65	2,208.75	-1,252.45	2,522.33	2.18	-1.39	1.68
8,721.00	88.89	345.52	6,430.15	2,239.73	-1,260.45	2,553.98	1.34	-1.34	0.03
8,753.00	88.70	344.94	6,430.83	2,270.67	-1,268.60	2,585.65	1.91	-0.59	-1.81
8,784.00	88.21	343.62	6,431.66	2,300.50	-1,277.00	2,616.39	4.54	-1.58	-4.26
8,816.00	89.26	343.08	6,432.37	2,331.15	-1,286.17	2,648.19	3.69	3.28	-1.69
8,848.00	89.38	342.49	6,432.75	2,361.71	-1,295.64	2,680.02	1.88	0.38	-1.84
8,880.00	89.63	342.87	6,433.03	2,392.26	-1,305.16	2,711.87	1.42	0.78	1.19
8,912.00	90.00	344.11	6,433.13	2,422.94	-1,314.26	2,743.66	4.04	1.16	3.88
8,943.00	90.06	344.06	6,433.11	2,452.75	-1,322.76	2,774.43	0.25	0.19	-0.16
8,975.00	90.19	343.91	6,433.04	2,483.51	-1,331.59	2,806.19	0.62	0.41	-0.47
9,007.00	90.18	343.50	6,432.94	2,514.22	-1,340.56	2,837.98	1.28	-0.03	-1.28
9,038.00	90.12	342.96	6,432.86	2,543.90	-1,349.51	2,868.80	1.75	-0.19	-1.74
9,070.00	90.06	344.17	6,432.81	2,574.60	-1,358.56	2,900.59	3.79	-0.19	3.78
9,102.00	90.06	344.81	6,432.78	2,605.43	-1,367.12	2,932.32	2.00	0.00	2.00
9,134.00	89.94	344.26	6,432.78	2,636.27	-1,375.65	2,964.05	1.76	-0.38	-1.72

Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys ST	Database:	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)	
9,165.00	91.23	344.64	6,432.46	2,666.13	-1,383.96	2,994.78	4.34	4.16	1.23	
9,197.00	91.85	344.82	6,431.60	2,696.99	-1,392.39	3,026.48	2.02	1.94	0.56	
9,229.00	92.03	344.28	6,430.52	2,727.82	-1,400.91	3,058.19	1.78	0.56	-1.69	
9,260.00	92.16	343.98	6,429.38	2,757.62	-1,409.38	3,088.93	1.05	0.42	-0.97	
9,292.00	90.93	344.52	6,428.52	2,788.40	-1,418.06	3,120.67	4.20	-3.84	1.69	
9,324.00	90.80	344.78	6,428.04	2,819.26	-1,426.53	3,152.38	0.91	-0.41	0.81	
9,356.00	91.05	344.51	6,427.52	2,850.11	-1,435.00	3,184.10	1.15	0.78	-0.84	
9,388.00	91.05	343.84	6,426.93	2,880.89	-1,443.73	3,215.84	2.09	0.00	-2.09	
9,419.00	91.30	343.63	6,426.30	2,910.65	-1,452.41	3,246.63	1.05	0.81	-0.68	
9,451.00	90.25	344.49	6,425.86	2,941.41	-1,461.20	3,278.38	4.24	-3.28	2.69	
9,483.00	89.88	344.58	6,425.83	2,972.26	-1,469.73	3,310.11	1.19	-1.16	0.28	
9,514.00	88.50	345.42	6,426.27	3,002.19	-1,477.75	3,340.81	5.21	-4.45	2.71	
9,546.00	87.97	345.94	6,427.25	3,033.19	-1,485.66	3,372.43	2.32	-1.66	1.63	
9,578.00	87.60	345.79	6,428.49	3,064.19	-1,493.47	3,404.03	1.25	-1.16	-0.47	
9,610.00	88.58	346.15	6,429.56	3,095.22	-1,501.22	3,435.62	3.26	3.06	1.13	
9,642.00	88.64	346.21	6,430.33	3,126.29	-1,508.87	3,467.20	0.27	0.19	0.19	
9,673.00	89.38	346.06	6,430.87	3,156.38	-1,516.29	3,497.81	2.44	2.39	-0.48	
9,705.00	90.00	346.68	6,431.04	3,187.48	-1,523.83	3,529.39	2.74	1.94	1.94	
9,737.00	90.37	346.69	6,430.94	3,218.62	-1,531.20	3,560.93	1.16	1.16	0.03	
9,769.00	90.80	346.69	6,430.61	3,249.75	-1,538.57	3,592.48	1.34	1.34	0.00	
9,800.00	90.62	346.43	6,430.23	3,279.90	-1,545.77	3,623.05	1.02	-0.58	-0.84	
9,832.00	90.37	346.34	6,429.95	3,311.00	-1,553.31	3,654.62	0.83	-0.78	-0.28	
9,864.00	90.43	346.39	6,429.73	3,342.10	-1,560.85	3,686.20	0.24	0.19	0.16	
9,896.00	90.37	346.13	6,429.50	3,373.18	-1,568.45	3,717.79	0.83	-0.19	-0.81	
9,927.00	90.37	345.80	6,429.30	3,403.26	-1,575.97	3,748.41	1.06	0.00	-1.06	
9,959.00	90.37	345.79	6,429.10	3,434.28	-1,583.82	3,780.04	0.03	0.00	-0.03	
9,991.00	90.25	345.62	6,428.92	3,465.29	-1,591.72	3,811.67	0.65	-0.38	-0.53	
10,023.00	90.06	345.36	6,428.84	3,496.27	-1,599.74	3,843.32	1.01	-0.59	-0.81	
10,054.00	90.12	345.12	6,428.79	3,526.24	-1,607.64	3,874.01	0.80	0.19	-0.77	
10,086.00	90.12	344.79	6,428.72	3,557.15	-1,615.94	3,905.70	1.03	0.00	-1.03	
10,118.00	90.25	345.04	6,428.62	3,588.04	-1,624.27	3,937.40	0.88	0.41	0.78	
10,150.00	90.68	345.78	6,428.36	3,619.01	-1,632.33	3,969.06	2.67	1.34	2.31	
10,181.00	90.68	346.45	6,427.99	3,649.10	-1,639.77	3,999.67	2.16	0.00	2.16	
10,213.00	90.37	347.20	6,427.70	3,680.26	-1,647.06	4,031.20	2.54	-0.97	2.34	
10,245.00	90.25	347.92	6,427.52	3,711.51	-1,653.96	4,062.66	2.28	-0.38	2.25	
10,276.00	90.31	348.06	6,427.37	3,741.83	-1,660.41	4,093.10	0.49	0.19	0.45	
10,308.00	88.77	347.61	6,427.63	3,773.11	-1,667.15	4,124.53	5.01	-4.81	-1.41	
10,340.00	88.83	347.48	6,428.30	3,804.35	-1,674.05	4,155.98	0.45	0.19	-0.41	
10,371.00	88.95	347.08	6,428.90	3,834.58	-1,680.87	4,186.48	1.35	0.39	-1.29	
10,403.00	88.71	345.29	6,429.55	3,865.65	-1,688.51	4,218.07	5.64	-0.75	-5.59	
10,434.00	88.83	345.37	6,430.22	3,895.63	-1,696.36	4,248.74	0.47	0.39	0.26	
10,466.00	88.83	345.06	6,430.87	3,926.56	-1,704.53	4,280.41	0.97	0.00	-0.97	
10,498.00	88.89	345.03	6,431.51	3,957.47	-1,712.78	4,312.09	0.21	0.19	-0.09	
10,530.00	88.64	344.51	6,432.20	3,988.34	-1,721.19	4,343.79	1.80	-0.78	-1.63	



Company:	Carrizo Oil & Gas	Local Co-ordinate Reference:	Well 17-44-9-60
Project:	Weld County, Colorado (NAD83)	TVD Reference:	Well @ 5024.20usft (Cade 22)
Site:	Nelson	MD Reference:	Well @ 5024.20usft (Cade 22)
Well:	17-44-9-60	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys ST	Database:	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)
10,561.00	87.65	344.23	6,433.20	4,018.18	-1,729.54	4,374.52	3.32	-3.19	-0.90
10,593.00	87.72	344.35	6,434.49	4,048.96	-1,738.19	4,406.24	0.43	0.22	0.38
10,625.00	87.53	344.44	6,435.82	4,079.75	-1,746.79	4,437.95	0.66	-0.59	0.28
10,657.00	87.35	344.27	6,437.25	4,110.54	-1,755.42	4,469.66	0.77	-0.56	-0.53
10,689.00	87.29	344.24	6,438.75	4,141.30	-1,764.09	4,501.37	0.21	-0.19	-0.09
10,720.00	87.29	344.20	6,440.21	4,171.10	-1,772.51	4,532.09	0.13	0.00	-0.13
10,752.00	87.22	343.91	6,441.74	4,201.83	-1,781.29	4,563.81	0.93	-0.22	-0.91
10,784.00	87.35	343.58	6,443.26	4,232.52	-1,790.24	4,595.56	1.11	0.41	-1.03
10,809.00	87.29	343.34	6,444.43	4,256.46	-1,797.35	4,620.38	0.99	-0.24	-0.96
10,890.00	87.29	343.34	6,448.26	4,333.97	-1,820.54	4,700.80	0.00	0.00	0.00
Projection to TD-10890.00' MD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,388.00	6,422.25	969.94	-858.57	Tie-In to MS MWD-7388.00' MD
10,890.00	6,448.26	4,333.97	-1,820.54	Projection to TD-10890.00' MD