



Company: Anadarko

Site: Morton

Well: 41-12

Project: Weld County, Colorado (NAD83)

Rig Name: Xtreme 11



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
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
550.00	6.00	86.72	549.45	0.90	15.67	15.69	15.69	Begin 6.00° Tangent
967.84	6.00	86.72	965.00	3.40	59.27	59.37	59.37	Begin 2.00°/100' Build
1667.92	20.00	86.72	1645.44	12.39	216.12	216.47	216.47	Begin 20.00° Tangent
5370.27	20.00	86.72	5124.48	84.88	1480.42	1482.85	1482.85	Begin 1.50°/100' Drop
6703.71	0.00	0.00	6431.00	98.07	1710.43	1713.24	1713.24	Begin Vertical Hold
8307.71	0.00	0.00	8035.00	98.07	1710.43	1713.24	1713.24	PBHL



Azimuths to True North  
Magnetic North: 8.80°

Magnetic Field  
Strength: 52902.8nT  
Dip Angle: 66.75°  
Date: 12/21/2011  
Model: WMM\_2010

US State Plane 1983  
Colorado Northern Zone

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
PBHL v2 - Morton 41-12	8035.00	98.07	1710.43	40° 4' 8.8755 N	104° 49' 48.128 W

#### FORMATION TOP DETAILS

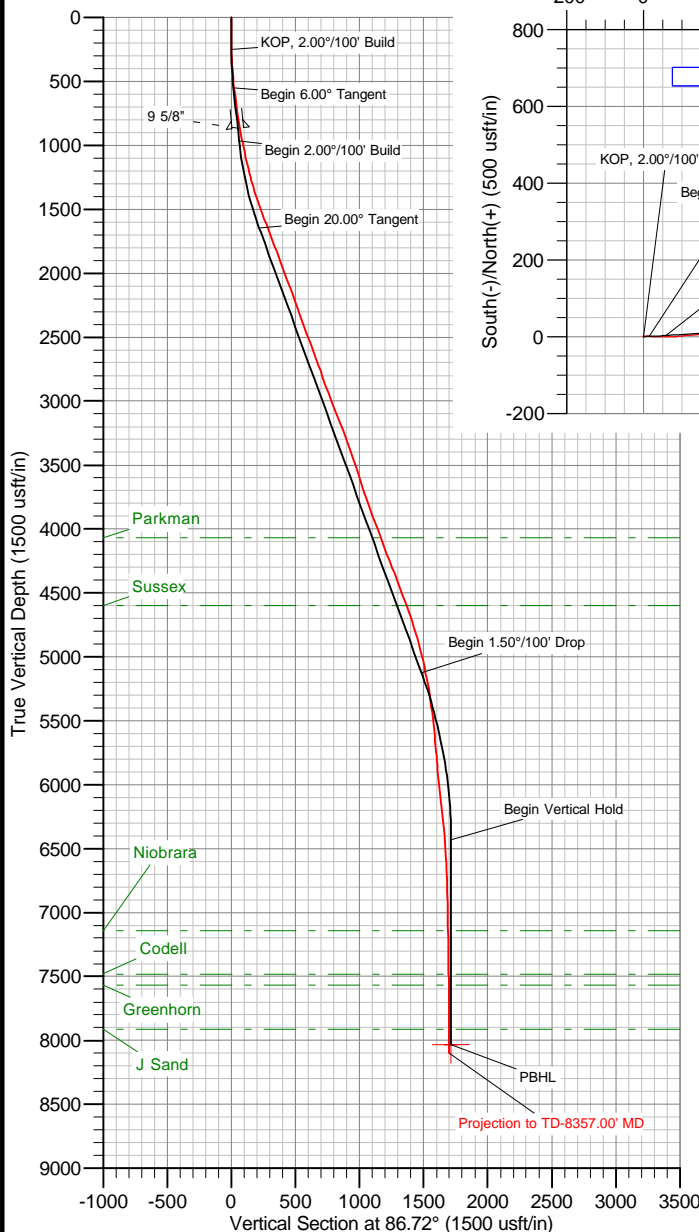
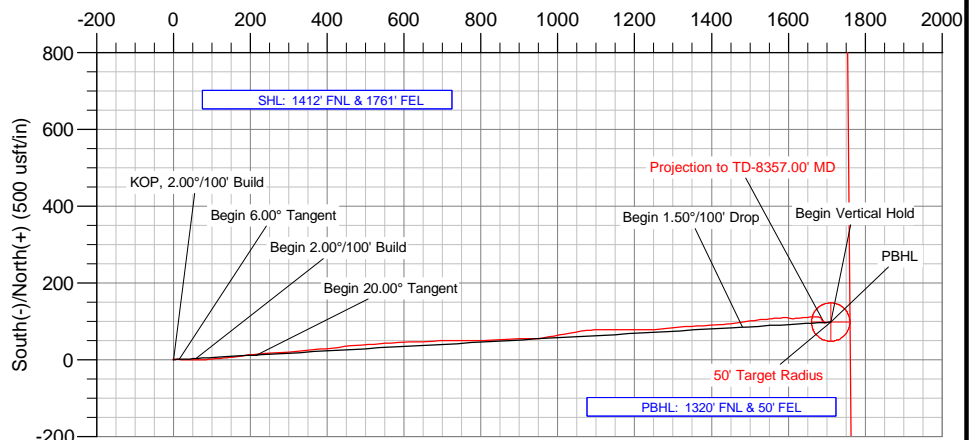
TVDPath	MDPath	Formation
4070.00	4248.11	Parkman
4600.00	4812.13	Sussex
7140.00	7412.71	Niobrara
7480.00	7752.71	Codell
7565.00	7837.71	Greenhorn
7915.00	8187.71	J Sand

Created By: Megan Pope  
Date: 12:37, December 27 2011  
Plan: Design #2

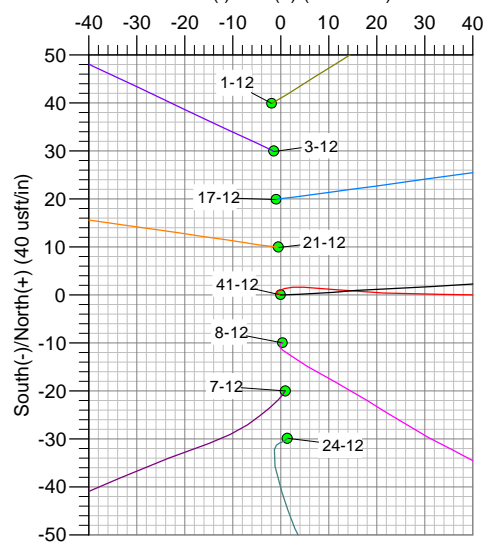
#### SURFACE LOCATION

Northing: 1268627.38  
Easting: 3185791.24  
Latitude: 40° 4' 7.9069 N  
Longitude: 104° 50' 10.130 W  
Ground Elevation: 4905.00  
WELL @ 4920.00usft (Xtreme 11)

West(-)/East(+) (500 usft/in)



West(-)/East(+) (40 usft/in)



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.



## **Anadarko**

**Weld County, Colorado (NAD83)**

**Morton**

**41-12**

**Wellbore #1**

**Survey: MS MWD**

## **Standard Survey Report**

**27 December, 2011**

<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 41-12
<b>Project:</b>	Weld County, Colorado (NAD83)	<b>TVD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Well:</b>	41-12	<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 (NAD83)		
<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		

Well	41-12					
Well Position	+N/-S	0.00 usft	Northing:	1,268,627.38 usft	Latitude:	40° 4' 7.9069 N
	+E/-W	0.00 usft	Easting:	3,185,791.24 usft	Longitude:	104° 50' 10.130 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,905.00 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	12/21/11	8.80	66.75	52,903

<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	86.72	

<b>Survey Program</b>	<b>Date</b>	12/27/11			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
103.00	8,357.00	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	
103.00	0.70	295.20	103.00	0.27	-0.57	-0.55	0.68	0.68	0.00	
192.00	0.40	39.20	191.99	0.74	-0.86	-0.82	1.00	-0.34	116.85	
282.00	1.90	74.20	281.97	1.39	0.77	0.85	1.77	1.67	38.89	
373.00	3.30	92.70	372.88	1.68	4.84	4.93	1.77	1.54	20.33	
463.00	5.50	95.60	462.61	1.13	11.72	11.76	2.46	2.44	3.22	
554.00	6.70	93.50	553.09	0.38	21.36	21.34	1.34	1.32	-2.31	
645.00	7.80	89.80	643.36	0.08	32.83	32.78	1.31	1.21	-4.07	
736.00	8.70	91.40	733.42	-0.06	45.89	45.81	1.02	0.99	1.76	
836.00	9.30	88.60	832.19	-0.05	61.53	61.42	0.74	0.60	-2.80	
923.00	9.50	91.10	918.02	-0.02	75.73	75.61	0.52	0.23	2.87	
1,014.00	11.30	84.70	1,007.53	0.66	92.12	92.01	2.35	1.98	-7.03	
1,105.00	12.80	83.50	1,096.52	2.63	111.01	110.98	1.67	1.65	-1.32	
1,196.00	13.80	86.70	1,185.08	4.39	131.87	131.90	1.36	1.10	3.52	
1,286.00	15.60	81.10	1,272.13	6.88	154.54	154.68	2.55	2.00	-6.22	

<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 41-12
<b>Project:</b>	Weld County, Colorado (NAD83)	<b>TVD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Well:</b>	41-12	<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)	
1,377.00	16.90	82.60	1,359.50	10.48	179.75	180.05	1.50	1.43	1.65	
1,468.00	19.10	84.70	1,446.04	13.56	207.69	208.13	2.52	2.42	2.31	
1,559.00	20.00	86.90	1,531.79	15.78	238.06	238.57	1.28	0.99	2.42	
1,650.00	21.10	86.50	1,617.00	17.62	269.95	270.51	1.22	1.21	-0.44	
1,740.00	20.80	86.20	1,701.05	19.67	302.06	302.69	0.35	-0.33	-0.33	
1,831.00	21.60	83.90	1,785.89	22.52	334.84	335.58	1.27	0.88	-2.53	
1,922.00	19.30	83.20	1,871.15	26.08	366.43	367.32	2.54	-2.53	-0.77	
2,013.00	20.40	86.00	1,956.75	28.96	397.19	398.19	1.60	1.21	3.08	
2,103.00	20.80	82.30	2,041.00	32.20	428.67	429.81	1.51	0.44	-4.11	
2,194.00	20.80	85.50	2,126.07	35.63	460.79	462.08	1.25	0.00	3.52	
2,285.00	19.20	84.60	2,211.58	38.31	491.80	493.18	1.79	-1.76	-0.99	
2,376.00	18.90	87.60	2,297.60	40.33	521.42	522.87	1.13	-0.33	3.30	
2,467.00	20.30	84.00	2,383.32	42.60	551.85	553.38	2.03	1.54	-3.96	
2,557.00	20.80	89.10	2,467.60	44.48	583.36	584.94	2.06	0.56	5.67	
2,648.00	20.60	87.00	2,552.73	45.58	615.50	617.10	0.84	-0.22	-2.31	
2,739.00	20.20	87.70	2,638.02	47.04	647.18	648.81	0.51	-0.44	0.77	
2,830.00	19.80	85.60	2,723.54	48.86	678.25	679.93	0.90	-0.44	-2.31	
2,921.00	18.60	90.40	2,809.48	49.94	708.13	709.83	2.18	-1.32	5.27	
3,011.00	20.60	89.50	2,894.26	49.98	738.32	739.97	2.25	2.22	-1.00	
3,102.00	21.90	89.50	2,979.07	50.26	771.30	772.91	1.43	1.43	0.00	
3,193.00	20.70	88.30	3,063.85	50.89	804.35	805.94	1.40	-1.32	-1.32	
3,284.00	21.20	87.70	3,148.84	52.03	836.86	838.47	0.60	0.55	-0.66	
3,375.00	20.30	87.60	3,233.93	53.35	869.08	870.71	0.99	-0.99	-0.11	
3,466.00	20.10	89.70	3,319.34	54.09	900.49	902.11	0.83	-0.22	2.31	
3,556.00	20.30	88.80	3,403.80	54.50	931.56	933.15	0.41	0.22	-1.00	
3,647.00	19.10	82.10	3,489.48	56.88	962.09	963.77	2.81	-1.32	-7.36	
3,738.00	18.00	78.10	3,575.76	61.82	990.60	992.52	1.85	-1.21	-4.40	
3,829.00	17.20	81.10	3,662.50	66.80	1,017.65	1,019.81	1.33	-0.88	3.30	
3,920.00	19.70	78.90	3,748.82	71.84	1,046.00	1,048.40	2.85	2.75	-2.42	
4,011.00	18.70	83.30	3,834.76	76.49	1,075.54	1,078.16	1.93	-1.10	4.84	
4,102.00	21.10	88.40	3,920.33	78.65	1,106.41	1,109.10	3.25	2.64	5.60	
4,192.00	20.30	91.10	4,004.52	78.81	1,138.22	1,140.86	1.38	-0.89	3.00	
4,283.00	20.00	89.50	4,089.95	78.64	1,169.56	1,172.14	0.69	-0.33	-1.76	
4,374.00	20.40	92.10	4,175.35	78.19	1,200.97	1,203.48	1.08	0.44	2.86	
4,465.00	22.20	88.30	4,260.14	78.12	1,234.01	1,236.46	2.49	1.98	-4.18	
4,556.00	20.80	85.80	4,344.80	79.82	1,267.31	1,269.80	1.84	-1.54	-2.75	
4,646.00	20.80	82.80	4,428.94	82.99	1,299.10	1,301.72	1.18	0.00	-3.33	
4,737.00	20.80	85.60	4,514.01	86.25	1,331.24	1,334.00	1.09	0.00	3.08	
4,828.00	20.60	88.60	4,599.14	87.88	1,363.36	1,366.15	1.19	-0.22	3.30	
4,919.00	19.10	86.00	4,684.73	89.31	1,394.21	1,397.04	1.91	-1.65	-2.86	
5,009.00	17.70	86.00	4,770.13	91.30	1,422.55	1,425.45	1.56	-1.56	0.00	
5,100.00	15.40	84.20	4,857.35	93.48	1,448.38	1,451.35	2.59	-2.53	-1.98	
5,190.00	13.60	81.20	4,944.48	96.31	1,470.73	1,473.83	2.17	-2.00	-3.33	
5,282.00	13.30	81.10	5,033.96	99.60	1,491.87	1,495.12	0.33	-0.33	-0.11	

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<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
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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)	
5,373.00	11.70	83.30	5,122.80	102.30	1,511.38	1,514.75	1.83	-1.76	2.42	
5,463.00	10.30	83.30	5,211.15	104.30	1,528.43	1,531.90	1.56	-1.56	0.00	
5,554.00	8.90	85.10	5,300.87	105.85	1,543.53	1,547.05	1.57	-1.54	1.98	
5,645.00	7.80	83.90	5,390.90	107.11	1,556.68	1,560.26	1.22	-1.21	-1.32	
5,736.00	6.30	88.10	5,481.21	107.93	1,567.81	1,571.42	1.74	-1.65	4.62	
5,827.00	5.10	85.10	5,571.76	108.44	1,576.83	1,580.45	1.36	-1.32	-3.30	
5,917.00	6.20	86.30	5,661.32	109.10	1,585.67	1,589.31	1.23	1.22	1.33	
6,008.00	5.80	90.20	5,751.83	109.40	1,595.17	1,598.81	0.63	-0.44	4.29	
6,099.00	4.00	107.00	5,842.49	108.45	1,602.80	1,606.38	2.51	-1.98	18.46	
6,190.00	5.60	93.40	5,933.17	107.26	1,610.27	1,613.77	2.15	1.76	-14.95	
6,281.00	6.00	80.70	6,023.71	107.77	1,619.40	1,622.91	1.47	0.44	-13.96	
6,371.00	6.10	85.10	6,113.21	108.94	1,628.80	1,632.37	0.53	0.11	4.89	
6,462.00	6.70	91.40	6,203.65	109.22	1,638.93	1,642.49	1.01	0.66	6.92	
6,553.00	5.50	78.20	6,294.13	109.98	1,648.50	1,652.10	2.02	-1.32	-14.51	
6,644.00	5.00	84.60	6,384.75	111.25	1,656.72	1,660.37	0.85	-0.55	7.03	
6,735.00	4.20	86.50	6,475.46	111.82	1,664.00	1,667.67	0.89	-0.88	2.09	
6,825.00	3.40	92.00	6,565.26	111.93	1,669.95	1,673.62	0.98	-0.89	6.11	
6,916.00	2.40	93.50	6,656.14	111.72	1,674.55	1,678.20	1.10	-1.10	1.65	
7,007.00	2.20	103.40	6,747.07	111.20	1,678.15	1,681.77	0.49	-0.22	10.88	
7,098.00	1.80	98.80	6,838.01	110.58	1,681.26	1,684.84	0.47	-0.44	-5.05	
7,189.00	1.10	108.10	6,928.98	110.09	1,683.51	1,687.05	0.81	-0.77	10.22	
7,279.00	0.70	121.50	7,018.97	109.53	1,684.80	1,688.30	0.50	-0.44	14.89	
7,370.00	0.60	131.30	7,109.97	108.93	1,685.63	1,689.10	0.16	-0.11	10.77	
7,461.00	0.90	151.00	7,200.96	107.99	1,686.33	1,689.75	0.43	0.33	21.65	
7,552.00	1.40	190.60	7,291.94	106.27	1,686.47	1,689.79	1.00	0.55	43.52	
7,643.00	2.10	145.00	7,382.90	103.81	1,687.23	1,690.40	1.65	0.77	-50.11	
7,734.00	3.20	132.00	7,473.80	100.74	1,690.07	1,693.07	1.37	1.21	-14.29	
7,825.00	1.80	133.40	7,564.72	98.06	1,693.00	1,695.83	1.54	-1.54	1.54	
7,915.00	1.40	127.10	7,654.68	96.43	1,694.90	1,697.64	0.48	-0.44	-7.00	
8,006.00	0.50	317.10	7,745.67	96.05	1,695.52	1,698.24	2.08	-0.99	-186.81	
8,097.00	1.10	305.70	7,836.66	96.85	1,694.54	1,697.30	0.68	0.66	-12.53	
8,188.00	0.80	275.80	7,927.65	97.42	1,693.20	1,696.00	0.63	-0.33	-32.86	
8,278.00	0.40	293.80	8,017.65	97.61	1,692.28	1,695.10	0.49	-0.44	20.00	
8,312.00	0.40	274.60	8,051.65	97.67	1,692.06	1,694.87	0.39	0.00	-56.47	
8,357.00	0.40	274.60	8,096.65	97.70	1,691.74	1,694.56	0.00	0.00	0.00	
Projection to TD-8357.00' MD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,357.00	8,096.65	97.70	1,691.74	Projection to TD-8357.00' MD	