



Company: B.P.
Project: La Plata County, CO NAD83
Site: Marquez A2
Well: Marquez A2

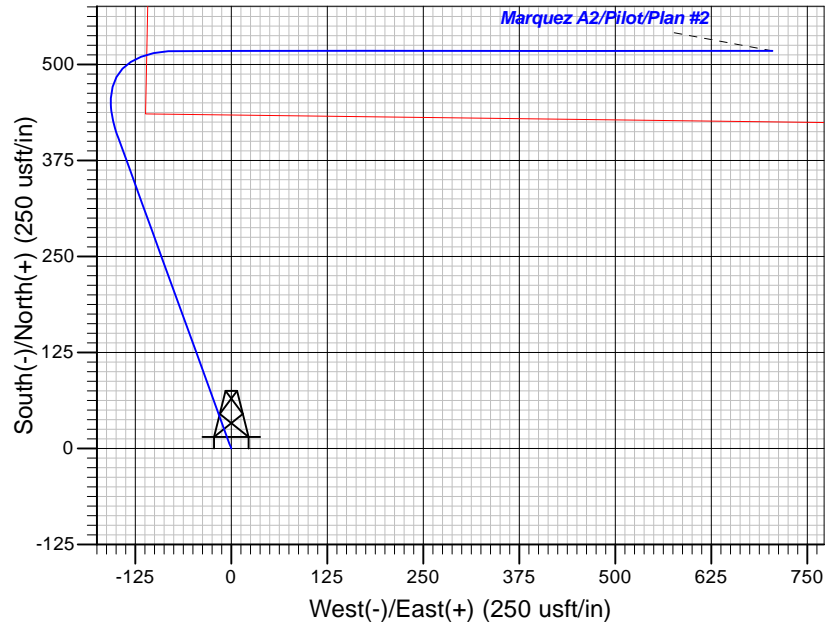
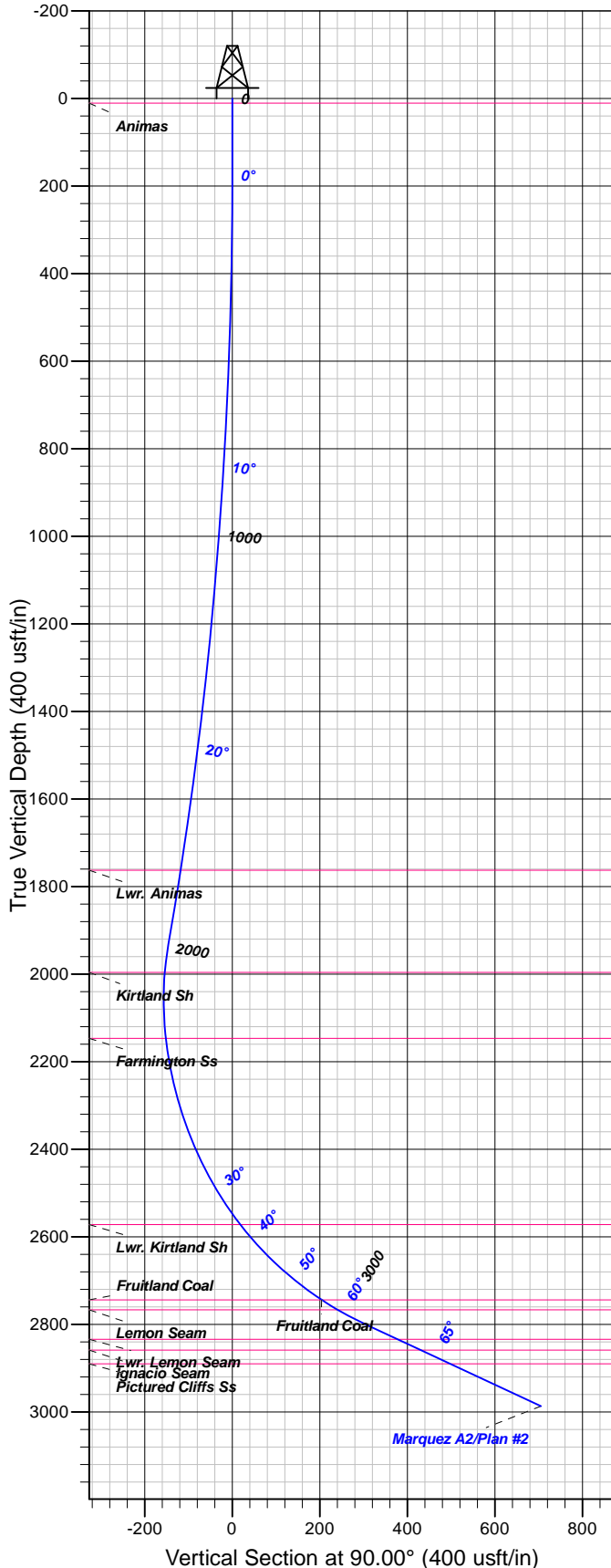


Well Details: Marquez A2

GL 6260' & RKB 11' @ 6271.00usft (Aztec 507)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1139297.43	2433779.38	37.0330750	-107.4397939	

Azimuths to Grid North
True North: 1.19°
Magnetic North: 10.31°
Magnetic Field
Strength: 50093.6snT
Dip Angle: 63.60°
Date: 8/15/2017
Model: HDGM



FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
11.00	11.00	Animas
1763.00	1812.72	Lwr. Animas
1996.00	2070.42	Kirtland Sh
2147.00	2229.82	Farmington Ss
2572.00	2696.57	Lwr. Kirtland Sh
2744.00	2951.02	Fruitland Coal
2767.00	2994.63	Lemon Seam
2834.00	3146.31	Lwr. Lemon Seam
2859.00	3205.46	Ignacio Seam
2890.00	3278.81	Pictured Cliffs Ss

Plan: Plan #2

18:46, September 06 2017
Created By: Mel Mireles Jr.

PROJECT DETAILS: La Plata County, CO NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone

System Datum: Mean Sea Level

CASING DETAILS

No casing data is available

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	175.00	0.00	0.00	175.00	0.00	0.00	0.00	0.00	0.00	
3	1908.33	26.00	340.00	1849.45	363.26	-132.22	1.50	340.00	-132.22	
4	2008.33	26.00	340.00	1939.33	404.46	-147.21	0.00	0.00	-147.21	
5	2534.45	26.00	90.00	2434.68	517.97	-67.73	8.00	142.08	-67.73	
6	3065.86	65.00	90.00	2800.00	517.97	304.03	7.34	0.00	304.03	
7	3508.00	65.00	90.00	2986.86	517.97	704.74	0.00	0.00	704.74	

DESIGN TARGET DETAILS

No target data is available.



B.P.

La Plata County, CO NAD83

Marquez A2

Marquez A2

Pilot

Plan: Plan #2

Standard Planning Report

06 September, 2017



www.scientificdrilling.com





Database:	Grand Junction District	Local Co-ordinate Reference:	Well Marquez A2
Company:	B.P.	TVD Reference:	GL 6260' & RKB 11' @ 6271.00usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6260' & RKB 11' @ 6271.00usft (Aztec 507)
Site:	Marquez A2	North Reference:	Grid
Well:	Marquez A2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #2		

Project	La Plata County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site	Marquez A2			
Site Position:		Northing:	1,139,297.43 usft	Latitude: 37.0330749
From: Map		Easting:	2,433,779.38 usft	Longitude: -107.4397939
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: -1.19 °

Well	Marquez A2			
Well Position	+N/-S	0.00 usft	Northing:	1,139,297.43 usft
	+E/-W	0.00 usft	Easting:	2,433,779.38 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft
			Ground Level:	6,260.00 usft

Wellbore	Pilot				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/15/2017	9.12	63.60	50,094

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	90.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
175.00	0.00	0.00	175.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,908.33	26.00	340.00	1,849.45	363.26	-132.22	1.50	1.50	0.00	340.00	
2,008.33	26.00	340.00	1,939.33	404.46	-147.21	0.00	0.00	0.00	0.00	
2,534.45	26.00	90.00	2,434.68	517.97	-67.73	8.00	0.00	20.91	142.08	
3,065.86	65.00	90.00	2,800.00	517.97	304.03	7.34	7.34	0.00	0.00	
3,508.00	65.00	90.00	2,986.86	517.97	704.74	0.00	0.00	0.00	0.00	



Database:	Grand Junction District	Local Co-ordinate Reference:	Well Marquez A2
Company:	B.P.	TVD Reference:	GL 6260' & RKB 11' @ 6271.00usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6260' & RKB 11' @ 6271.00usft (Aztec 507)
Site:	Marquez A2	North Reference:	Grid
Well:	Marquez A2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #2		

Planned 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	
11.00	0.00	0.00	11.00	0.00	0.00	0.00	0.00	0.00	0.00	
Animas										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
175.00	0.00	0.00	175.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.38	340.00	200.00	0.08	-0.03	-0.03	1.50	1.50	0.00	
300.00	1.88	340.00	299.98	1.92	-0.70	-0.70	1.50	1.50	0.00	
400.00	3.38	340.00	399.87	6.23	-2.27	-2.27	1.50	1.50	0.00	
500.00	4.88	340.00	499.61	12.98	-4.73	-4.73	1.50	1.50	0.00	
600.00	6.38	340.00	599.12	22.19	-8.08	-8.08	1.50	1.50	0.00	
700.00	7.88	340.00	698.35	33.85	-12.32	-12.32	1.50	1.50	0.00	
800.00	9.38	340.00	797.21	47.94	-17.45	-17.45	1.50	1.50	0.00	
900.00	10.88	340.00	895.65	64.46	-23.46	-23.46	1.50	1.50	0.00	
1,000.00	12.38	340.00	993.60	83.40	-30.35	-30.35	1.50	1.50	0.00	
1,100.00	13.88	340.00	1,090.99	104.73	-38.12	-38.12	1.50	1.50	0.00	
1,200.00	15.38	340.00	1,187.74	128.46	-46.76	-46.76	1.50	1.50	0.00	
1,300.00	16.88	340.00	1,283.81	154.56	-56.25	-56.25	1.50	1.50	0.00	
1,400.00	18.38	340.00	1,379.11	183.01	-66.61	-66.61	1.50	1.50	0.00	
1,500.00	19.88	340.00	1,473.59	213.79	-77.81	-77.81	1.50	1.50	0.00	
1,600.00	21.38	340.00	1,567.17	246.89	-89.86	-89.86	1.50	1.50	0.00	
1,700.00	22.88	340.00	1,659.81	282.28	-102.74	-102.74	1.50	1.50	0.00	
1,800.00	24.38	340.00	1,751.42	319.94	-116.45	-116.45	1.50	1.50	0.00	
1,812.72	24.57	340.00	1,763.00	324.89	-118.25	-118.25	1.50	1.50	0.00	
Lwr. Animas										
1,900.00	25.88	340.00	1,841.96	359.84	-130.97	-130.97	1.50	1.50	0.00	
1,908.33	26.00	340.00	1,849.45	363.26	-132.22	-132.22	1.50	1.50	0.00	
2,000.00	26.00	340.00	1,931.84	401.03	-145.96	-145.96	0.00	0.00	0.00	
2,008.33	26.00	340.00	1,939.33	404.46	-147.21	-147.21	0.00	0.00	0.00	
2,070.42	22.28	348.07	1,996.00	428.78	-154.30	-154.30	8.00	-6.00	13.00	
Kirtland Sh										
2,100.00	20.68	352.84	2,023.52	439.44	-156.11	-156.11	8.00	-5.41	16.12	
2,200.00	16.62	14.63	2,118.37	470.85	-154.70	-154.70	8.00	-4.06	21.80	
2,229.82	15.97	22.83	2,147.00	478.75	-152.03	-152.03	8.00	-2.16	27.48	
Farmington Ss										
2,300.00	15.79	43.44	2,214.55	494.60	-141.71	-141.71	8.00	-0.25	29.37	
2,400.00	18.64	68.97	2,310.20	510.24	-117.40	-117.40	8.00	2.85	25.53	
2,500.00	23.88	85.81	2,403.44	517.46	-82.24	-82.24	8.00	5.24	16.84	
2,534.45	26.00	90.00	2,434.68	517.97	-67.73	-67.73	8.00	6.15	12.15	
2,600.00	30.81	90.00	2,492.32	517.97	-36.55	-36.55	7.34	7.34	0.00	
2,696.57	37.90	90.00	2,572.00	517.97	17.91	17.91	7.34	7.34	0.00	
Lwr. Kirtland Sh										
2,700.00	38.15	90.00	2,574.70	517.97	20.02	20.02	7.34	7.34	0.00	
2,800.00	45.49	90.00	2,649.17	517.97	86.65	86.65	7.34	7.34	0.00	
Top Prod										
2,900.00	52.83	90.00	2,714.53	517.97	162.25	162.25	7.34	7.34	0.00	
2,951.02	56.57	90.00	2,744.00	517.97	203.88	203.88	7.34	7.34	0.00	
Fruitland Coal - Fruitland Coal										
2,994.64	59.77	90.00	2,767.00	517.97	240.94	240.94	7.34	7.34	0.00	
Lemon Seam										
3,000.00	60.17	90.00	2,769.69	517.97	245.58	245.58	7.34	7.34	0.00	
3,065.86	65.00	90.00	2,800.00	517.97	304.03	304.03	7.34	7.34	0.00	



Database:	Grand Junction District	Local Co-ordinate Reference:	Well Marquez A2
Company:	B.P.	TVD Reference:	GL 6260' & RKB 11' @ 6271.00usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6260' & RKB 11' @ 6271.00usft (Aztec 507)
Site:	Marquez A2	North Reference:	Grid
Well:	Marquez A2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #2		

Planned 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)	
3,100.00	65.00	90.00	2,814.43	517.97	334.97	334.97	0.00	0.00	0.00	
3,146.31	65.00	90.00	2,834.00	517.97	376.94	376.94	0.00	0.00	0.00	
Lwr. Lemon Seam										
3,200.00	65.00	90.00	2,856.69	517.97	425.60	425.60	0.00	0.00	0.00	
3,205.46	65.00	90.00	2,859.00	517.97	430.55	430.55	0.00	0.00	0.00	
Ignacio Seam										
3,278.81	65.00	90.00	2,890.00	517.97	497.03	497.03	0.00	0.00	0.00	
Pictured Cliffs Ss										
3,300.00	65.00	90.00	2,898.95	517.97	516.23	516.23	0.00	0.00	0.00	
3,400.00	65.00	90.00	2,941.22	517.97	606.86	606.86	0.00	0.00	0.00	
3,500.00	65.00	90.00	2,983.48	517.97	697.49	697.49	0.00	0.00	0.00	
3,508.00	65.00	90.00	2,986.86	517.97	704.74	704.74	0.00	0.00	0.00	

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Top Prod	0.00	0.00	2,744.00	534.44	-9.65	1,139,831.87	2,433,769.73	37.0345418	-107.4398650
- plan misses target center by 136.15usft at 2800.00usft MD (2649.17 TVD, 517.97 N, 86.65 E)									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
11.00	682.00	Animas		0.00	0.00	
1,812.72	2,434.00	Lwr. Animas		0.00	0.00	
2,070.42	2,667.00	Kirtland Sh		0.00	0.00	
2,229.82	2,818.00	Farmington Ss		0.00	0.00	
2,696.57	3,243.00	Lwr. Kirtland Sh		0.00	0.00	
2,951.02	3,415.00	Fruitland Coal		0.00	0.00	
2,994.64	3,438.00	Lemon Seam		0.00	0.00	
3,146.31	3,505.00	Lwr. Lemon Seam		0.00	0.00	
3,205.46	3,530.00	Ignacio Seam		0.00	0.00	
3,278.81	3,561.00	Pictured Cliffs Ss		0.00	0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
2,951.02	2,744.00	517.97	203.88	Fruitland Coal	