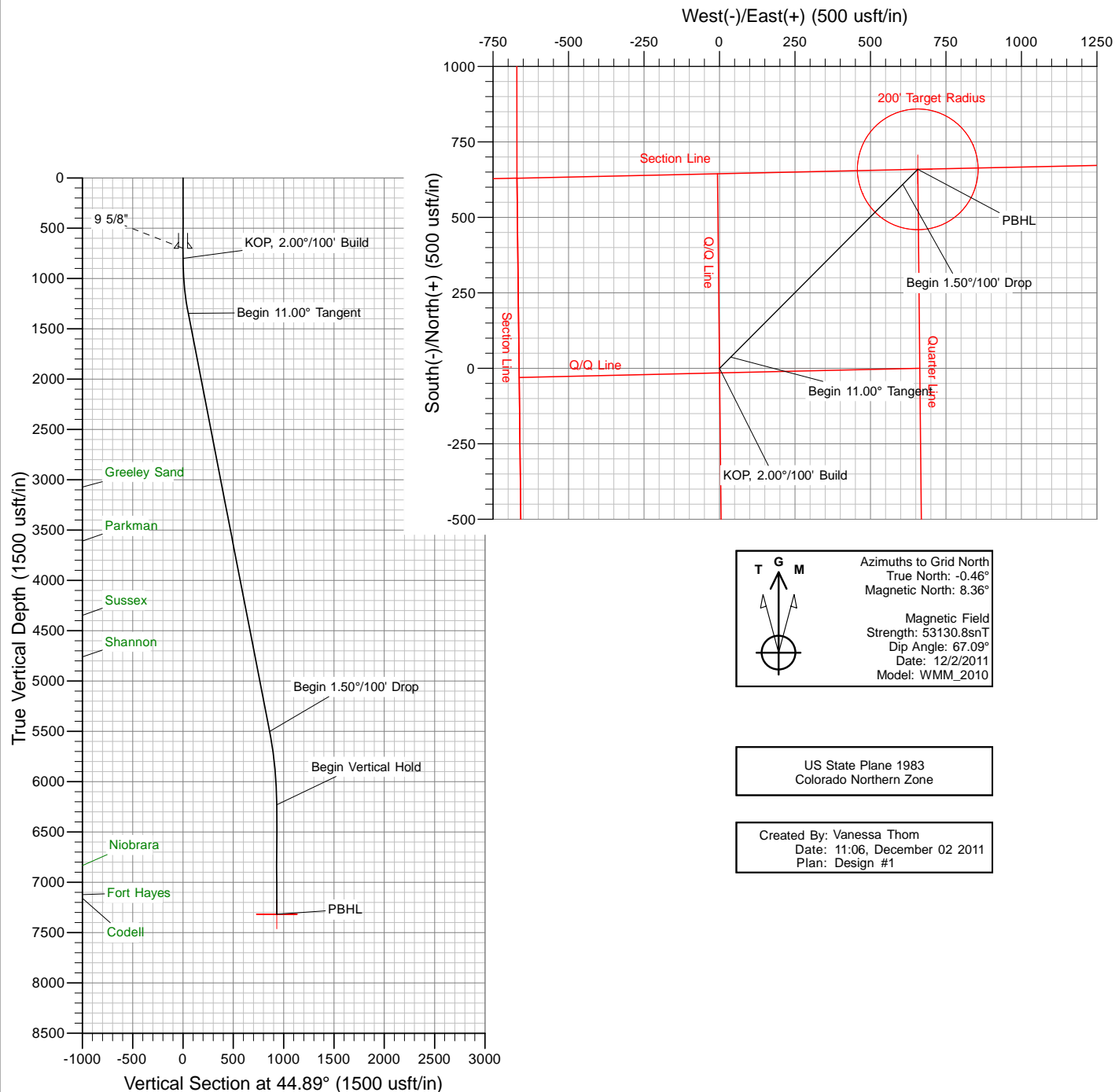


Planning: 936.442.2510 Fax: 936.442.2515
Operations: 936.442.2500 Fax: 936.442.2599

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	KOP, 2.00"/100' Build
1350.09	11.00	44.89	1346.72	37.30	37.16	52.65	52.65	Begin 11.00° Tangent
5582.20	11.00	44.89	5501.05	609.47	607.18	860.31	860.31	Begin 1.50"/100' Drop
6315.65	0.00	0.00	6230.00	659.21	656.73	930.51	930.51	Begin Vertical Hold
7403.65	0.00	0.00	7318.00	659.21	656.73	930.51	930.51	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.

Great Western

Weld County, Colorado (NAD 83)

Fritzler

11-21-4

Wellbore #1

Plan: Design #1

Standard Planning Report

02 December, 2011

Database:	Southern Region	Local Co-ordinate Reference:	Well 11-21-4
Company:	Great Western	TVD Reference:	WELL @ 4768.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4768.00usft (Cade 22)
Site:	Fritzler	North Reference:	Grid
Well:	11-21-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Weld County, Colorado (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	11-21-4			
Well Position	+N/-S	1,418,189.72 usft	Northing:	1,418,189.72 usft
	+E/-W	3,197,493.86 usft	Easting:	3,197,493.86 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	Latitude: 40° 28' 44.9832 N
				Longitude: 104° 47' 24.200 W
				Ground Level: 4,754.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	12/2/2011	8.82	67.09	53,131

Design	Design #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	44.89

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	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,350.09	11.00	44.89	1,346.72	37.30	37.16	2.00	2.00	0.00	44.89	
5,582.20	11.00	44.89	5,501.05	609.47	607.18	0.00	0.00	0.00	0.00	
6,315.65	0.00	0.00	6,230.00	659.21	656.73	1.50	-1.50	0.00	180.00	
7,403.65	0.00	0.00	7,318.00	659.21	656.73	0.00	0.00	0.00	0.00	PBHL v1 - Fritzler 11-

Database:	Southern Region	Local Co-ordinate Reference:	Well 11-21-4
Company:	Great Western	TVD Reference:	WELL @ 4768.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4768.00usft (Cade 22)
Site:	Fritzler	North Reference:	Grid
Well:	11-21-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 2.00°/100' Build									
900.00	2.00	44.89	899.98	1.24	1.23	1.75	2.00	2.00	0.00
1,000.00	4.00	44.89	999.84	4.94	4.93	6.98	2.00	2.00	0.00
1,100.00	6.00	44.89	1,099.45	11.12	11.08	15.69	2.00	2.00	0.00
1,200.00	8.00	44.89	1,198.70	19.75	19.68	27.88	2.00	2.00	0.00
1,300.00	10.00	44.89	1,297.47	30.83	30.72	43.52	2.00	2.00	0.00
1,350.09	11.00	44.89	1,346.72	37.30	37.16	52.65	2.00	2.00	0.00
Begin 11.00° Tangent									
1,400.00	11.00	44.89	1,395.71	44.05	43.88	62.18	0.00	0.00	0.00
1,500.00	11.00	44.89	1,493.87	57.57	57.35	81.26	0.00	0.00	0.00
1,600.00	11.00	44.89	1,592.03	71.09	70.82	100.34	0.00	0.00	0.00
1,700.00	11.00	44.89	1,690.19	84.61	84.29	119.43	0.00	0.00	0.00
1,800.00	11.00	44.89	1,788.36	98.13	97.76	138.51	0.00	0.00	0.00
1,900.00	11.00	44.89	1,886.52	111.65	111.23	157.60	0.00	0.00	0.00
2,000.00	11.00	44.89	1,984.68	125.17	124.70	176.68	0.00	0.00	0.00
2,100.00	11.00	44.89	2,082.84	138.69	138.16	195.76	0.00	0.00	0.00
2,200.00	11.00	44.89	2,181.01	152.21	151.63	214.85	0.00	0.00	0.00
2,300.00	11.00	44.89	2,279.17	165.73	165.10	233.93	0.00	0.00	0.00
2,400.00	11.00	44.89	2,377.33	179.25	178.57	253.02	0.00	0.00	0.00
2,500.00	11.00	44.89	2,475.49	192.77	192.04	272.10	0.00	0.00	0.00
2,600.00	11.00	44.89	2,573.65	206.29	205.51	291.18	0.00	0.00	0.00
2,700.00	11.00	44.89	2,671.82	219.81	218.98	310.27	0.00	0.00	0.00
2,800.00	11.00	44.89	2,769.98	233.33	232.45	329.35	0.00	0.00	0.00
2,900.00	11.00	44.89	2,868.14	246.85	245.92	348.44	0.00	0.00	0.00
3,000.00	11.00	44.89	2,966.30	260.37	259.38	367.52	0.00	0.00	0.00
3,100.00	11.00	44.89	3,064.46	273.89	272.85	386.60	0.00	0.00	0.00
3,108.70	11.00	44.89	3,073.00	275.06	274.02	388.26	0.00	0.00	0.00
Greeley Sand									
3,200.00	11.00	44.89	3,162.63	287.41	286.32	405.69	0.00	0.00	0.00
3,300.00	11.00	44.89	3,260.79	300.92	299.79	424.77	0.00	0.00	0.00
3,400.00	11.00	44.89	3,358.95	314.44	313.26	443.86	0.00	0.00	0.00
3,500.00	11.00	44.89	3,457.11	327.96	326.73	462.94	0.00	0.00	0.00
3,600.00	11.00	44.89	3,555.28	341.48	340.20	482.02	0.00	0.00	0.00
3,653.71	11.00	44.89	3,608.00	348.75	347.43	492.27	0.00	0.00	0.00
Parkman									
3,700.00	11.00	44.89	3,653.44	355.00	353.67	501.11	0.00	0.00	0.00
3,800.00	11.00	44.89	3,751.60	368.52	367.14	520.19	0.00	0.00	0.00
3,900.00	11.00	44.89	3,849.76	382.04	380.60	539.28	0.00	0.00	0.00
4,000.00	11.00	44.89	3,947.92	395.56	394.07	558.36	0.00	0.00	0.00
4,100.00	11.00	44.89	4,046.09	409.08	407.54	577.44	0.00	0.00	0.00
4,200.00	11.00	44.89	4,144.25	422.60	421.01	596.53	0.00	0.00	0.00
4,300.00	11.00	44.89	4,242.41	436.12	434.48	615.61	0.00	0.00	0.00
4,400.00	11.00	44.89	4,340.57	449.64	447.95	634.69	0.00	0.00	0.00
4,407.57	11.00	44.89	4,348.00	450.67	448.97	636.14	0.00	0.00	0.00
Sussex									
4,500.00	11.00	44.89	4,438.73	463.16	461.42	653.78	0.00	0.00	0.00
4,600.00	11.00	44.89	4,536.90	476.68	474.89	672.86	0.00	0.00	0.00
4,700.00	11.00	44.89	4,635.06	490.20	488.36	691.95	0.00	0.00	0.00
4,800.00	11.00	44.89	4,733.22	503.72	501.83	711.03	0.00	0.00	0.00

Database:	Southern Region	Local Co-ordinate Reference:	Well 11-21-4
Company:	Great Western	TVD Reference:	WELL @ 4768.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4768.00usft (Cade 22)
Site:	Fritzler	North Reference:	Grid
Well:	11-21-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)	
4,827.28	11.00	44.89	4,760.00	507.41	505.50	716.24	0.00	0.00	0.00	
Shannon										
4,900.00	11.00	44.89	4,831.38	517.24	515.29	730.11	0.00	0.00	0.00	
5,000.00	11.00	44.89	4,929.55	530.76	528.76	749.20	0.00	0.00	0.00	
5,100.00	11.00	44.89	5,027.71	544.28	542.23	768.28	0.00	0.00	0.00	
5,200.00	11.00	44.89	5,125.87	557.80	555.70	787.37	0.00	0.00	0.00	
5,300.00	11.00	44.89	5,224.03	571.32	569.17	806.45	0.00	0.00	0.00	
5,400.00	11.00	44.89	5,322.19	584.84	582.64	825.53	0.00	0.00	0.00	
5,500.00	11.00	44.89	5,420.36	598.36	596.11	844.62	0.00	0.00	0.00	
5,582.20	11.00	44.89	5,501.05	609.47	607.18	860.31	0.00	0.00	0.00	
Begin 1.50°/100' Drop										
5,600.00	10.73	44.89	5,518.53	611.85	609.55	863.66	1.50	-1.50	0.00	
5,700.00	9.23	44.89	5,617.01	624.14	621.78	881.00	1.50	-1.50	0.00	
5,800.00	7.73	44.89	5,715.91	634.59	632.20	895.75	1.50	-1.50	0.00	
5,900.00	6.23	44.89	5,815.17	643.20	640.78	907.91	1.50	-1.50	0.00	
6,000.00	4.73	44.89	5,914.71	649.97	647.53	917.47	1.50	-1.50	0.00	
6,100.00	3.23	44.89	6,014.46	654.90	652.43	924.42	1.50	-1.50	0.00	
6,200.00	1.73	44.89	6,114.36	657.97	655.49	928.76	1.50	-1.50	0.00	
6,300.00	0.23	44.89	6,214.35	659.19	656.70	930.48	1.50	-1.50	0.00	
6,315.65	0.00	0.00	6,230.00	659.21	656.73	930.51	1.50	-1.50	-286.78	
Begin Vertical Hold										
6,918.65	0.00	0.00	6,833.00	659.21	656.73	930.51	0.00	0.00	0.00	
Niobrara										
7,208.65	0.00	0.00	7,123.00	659.21	656.73	930.51	0.00	0.00	0.00	
Fort Hayes										
7,243.65	0.00	0.00	7,158.00	659.21	656.73	930.51	0.00	0.00	0.00	
Codell										
7,403.65	0.00	0.00	7,318.00	659.21	656.73	930.51	0.00	0.00	0.00	
PBHL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude		Longitude
PBHL v1 - Fritzler 11-21	0.00	0.00	7,318.00	659.21	656.73	1,418,848.93	3,198,150.59	40° 28' 51.4452 N		104° 47' 15.633 W
- hit/miss target										
- Shape										
- plan hits target center										
- Circle (radius 200.00)										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
700.00	700.00	9 5/8"		9-5/8	12-1/4

Database:	Southern Region	Local Co-ordinate Reference:	Well 11-21-4
Company:	Great Western	TVD Reference:	WELL @ 4768.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4768.00usft (Cade 22)
Site:	Fritzler	North Reference:	Grid
Well:	11-21-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,108.70	3,073.00	Greeley Sand		0.00		
3,653.71	3,608.00	Parkman		0.00		
4,407.57	4,348.00	Sussex		0.00		
4,827.28	4,760.00	Shannon		0.00		
6,918.65	6,833.00	Niobrara		0.00		
7,208.65	7,123.00	Fort Hayes		0.00		
7,243.65	7,158.00	Codell		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
800.00	800.00	0.00	0.00	KOP, 2.00°/100' Build	
1,350.09	1,346.72	37.30	37.16	Begin 11.00° Tangent	
5,582.20	5,501.05	609.47	607.18	Begin 1.50°/100' Drop	
6,315.65	6,230.00	659.21	656.73	Begin Vertical Hold	
7,403.65	7,318.00	659.21	656.73	PBHL	