

Great Western

Company: Great Western
Site: Fritzler
Well: 11-21-4
Project: Weld County, Colorado (NAD 83)
Rig Name: Cade 22

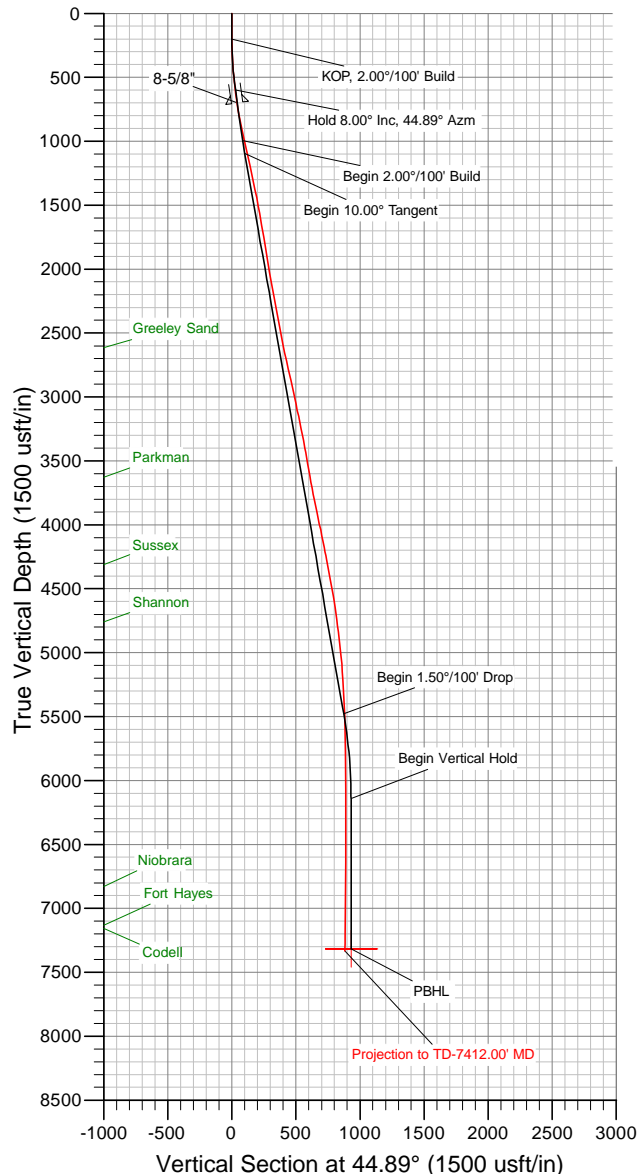
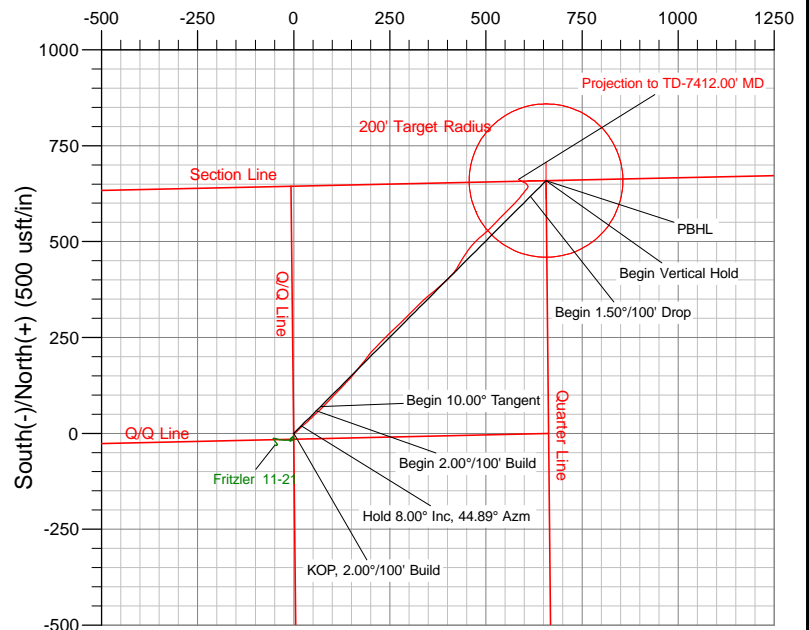


Planning: 936.442.2510 Fax: 936.442.2515
Operations: 936.442.2500 Fax: 936.442.2599

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	V/Sect	Departure	Annotation
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
600.00	8.00	44.89	598.70	19.75	19.68	27.88	27.88	Hold 8.00° Inc, 44.89° Azm
1000.00	8.00	44.89	994.81	59.19	58.97	83.55	83.55	Begin 2.00°/100' Build
1100.15	10.00	44.89	1093.72	70.29	70.03	99.22	99.22	Begin 10.00° Tangent
5551.61	10.00	44.89	5477.51	618.07	615.74	872.44	872.44	Begin 1.50°/100' Drop
6218.48	0.00	0.00	6141.00	659.21	656.73	930.51	930.51	Begin Vertical Hold
7393.48	0.00	0.00	7316.00	659.21	656.73	930.51	930.51	PBHL

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



Azimuths to Grid North
True North: -0.46°
Magnetic North: 8.32°

Magnetic Field
Strength: 53097.1snT
Dip Angle: 67.08°
Date: 2012/03/26
Model: WMM_2010

US State Plane 1983
Colorado Northern Zone

Created By: Megan Pope
Date: 11:48, March 29 2012
Plan: Design #2

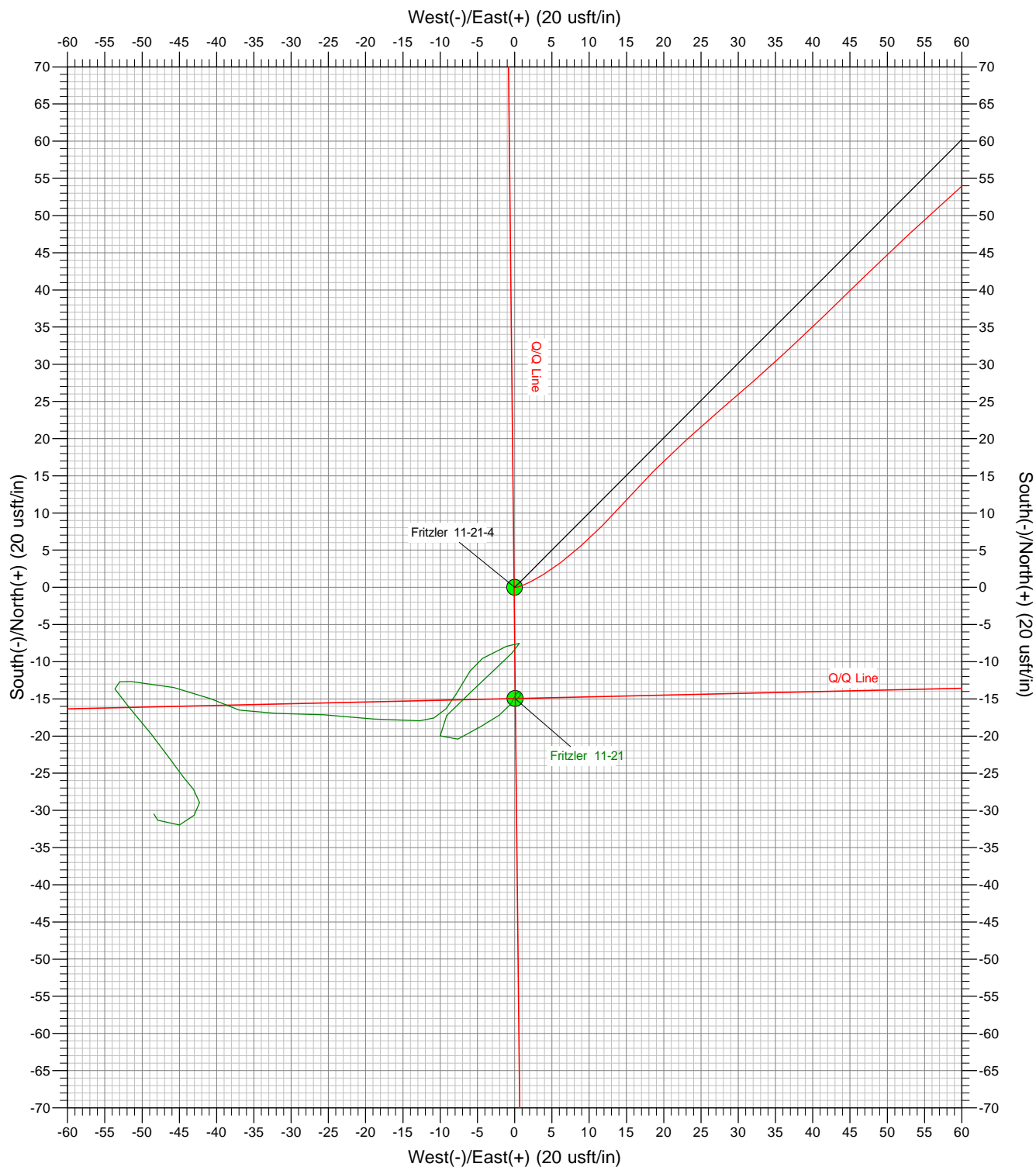
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Great Western

Weld County, Colorado (NAD 83)

Fritzler

11-21-4

Wellbore #1

Survey: MS MWD

Standard Survey Report

29 March, 2012

Company:	Great Western	Local Co-ordinate Reference:	Well 11-21-4
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4770.00usft (Cade 22)
Site:	Fritzler	MD Reference:	WELL @ 4770.00usft (Cade 22)
Well:	11-21-4	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

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

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	2012/03/26	8.78	67.08	53,097

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	44.89	

Survey Program	Date	2012/03/29			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
172.00	7,412.00	MS 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	
172.00	0.04	202.50	172.00	-0.06	-0.02	-0.06	0.02	0.02	0.00	
262.00	1.20	72.80	261.99	0.19	0.87	0.75	1.36	1.29	-144.11	
352.00	3.10	58.90	351.93	1.73	3.85	3.94	2.17	2.11	-15.44	
444.00	4.80	48.80	443.71	5.55	8.88	10.20	1.99	1.85	-10.98	
534.00	6.20	41.50	533.29	11.67	14.93	18.81	1.74	1.56	-8.11	
630.00	7.50	47.50	628.60	19.79	22.98	30.24	1.54	1.35	6.25	
679.00	7.90	49.80	677.16	24.12	27.91	36.79	1.03	0.82	4.69	
832.00	11.30	45.30	828.00	41.46	46.61	62.26	2.27	2.22	-2.94	
918.00	12.30	48.50	912.18	53.45	59.46	79.83	1.39	1.16	3.72	
1,014.00	12.40	43.00	1,005.96	67.77	74.14	100.34	1.23	0.10	-5.73	
1,205.00	11.80	43.50	1,192.72	96.93	101.57	140.36	0.32	-0.31	0.26	
1,394.00	12.30	45.20	1,377.56	125.14	129.16	179.81	0.32	0.26	0.90	
1,584.00	9.80	39.50	1,564.02	151.88	153.81	216.15	1.43	-1.32	-3.00	
1,679.00	10.40	36.60	1,657.55	165.00	164.07	232.69	0.83	0.63	-3.05	

Company:	Great Western	Local Co-ordinate Reference:	Well 11-21-4
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Site:	Fritzler	MD Reference:	WELL @ 4770.00usft (Cade 22)
Well:	11-21-4	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)	
1,773.00	9.60	38.60	1,750.12	177.94	174.02	248.87	0.93	-0.85	2.13	
1,868.00	9.50	41.90	1,843.81	189.96	184.19	264.58	0.59	-0.11	3.47	
1,963.00	9.40	35.50	1,937.52	202.12	193.93	280.06	1.11	-0.11	-6.74	
2,059.00	9.70	42.20	2,032.19	214.49	203.92	295.87	1.20	0.31	6.98	
2,154.00	10.00	44.20	2,125.79	226.33	215.05	312.12	0.48	0.32	2.11	
2,249.00	10.40	45.40	2,219.29	238.27	226.90	328.94	0.48	0.42	1.26	
2,345.00	10.50	44.20	2,313.70	250.62	239.17	346.35	0.25	0.10	-1.25	
2,440.00	11.50	46.40	2,406.95	263.36	252.06	364.47	1.14	1.05	2.32	
2,630.00	10.50	46.90	2,593.46	288.25	278.42	400.71	0.53	-0.53	0.26	
2,820.00	13.20	44.00	2,779.39	315.69	306.14	439.71	1.45	1.42	-1.53	
3,010.00	11.60	46.00	2,964.96	344.56	334.95	480.50	0.87	-0.84	1.05	
3,105.00	12.60	50.30	3,057.85	357.82	349.79	500.37	1.42	1.05	4.53	
3,200.00	11.30	49.00	3,150.79	370.54	364.79	519.97	1.40	-1.37	-1.37	
3,295.00	11.80	49.40	3,243.86	382.97	379.19	538.93	0.53	0.53	0.42	
3,391.00	11.40	48.80	3,337.90	395.61	393.78	558.18	0.44	-0.42	-0.63	
3,486.00	9.90	40.90	3,431.27	407.97	406.19	575.70	2.20	-1.58	-8.32	
3,581.00	10.50	41.20	3,524.77	420.65	417.24	592.49	0.63	0.63	0.32	
3,677.00	9.50	29.00	3,619.32	434.17	426.85	608.84	2.43	-1.04	-12.71	
3,772.00	10.80	29.30	3,712.83	448.79	435.00	624.95	1.37	1.37	0.32	
3,867.00	11.80	33.60	3,805.99	464.64	444.73	643.05	1.38	1.05	4.53	
3,963.00	12.30	37.50	3,899.87	480.93	456.39	662.82	0.99	0.52	4.06	
4,058.00	12.10	42.50	3,992.73	496.30	469.28	682.80	1.13	-0.21	5.26	
4,153.00	11.00	48.00	4,085.81	509.70	482.74	701.80	1.64	-1.16	5.79	
4,248.00	12.30	49.80	4,178.85	522.30	497.21	720.93	1.42	1.37	1.89	
4,343.00	10.40	46.10	4,271.99	534.78	511.12	739.59	2.14	-2.00	-3.89	
4,439.00	10.80	43.50	4,366.35	547.31	523.55	757.24	0.65	0.42	-2.71	
4,534.00	10.10	41.80	4,459.77	559.98	535.23	774.46	0.81	-0.74	-1.79	
4,629.00	9.50	46.70	4,553.39	571.56	546.49	790.61	1.08	-0.63	5.16	
4,724.00	8.00	42.60	4,647.28	581.81	556.67	805.06	1.71	-1.58	-4.32	
4,819.00	8.10	47.90	4,741.35	591.16	566.11	818.35	0.79	0.11	5.58	
4,915.00	7.00	44.40	4,836.51	599.87	575.22	830.95	1.24	-1.15	-3.65	
5,104.00	5.80	37.40	5,024.34	615.69	589.08	851.94	0.76	-0.63	-3.70	
5,294.00	3.40	38.40	5,213.71	627.73	598.41	867.05	1.26	-1.26	0.53	
5,579.00	1.90	39.80	5,498.40	637.99	606.69	880.16	0.53	-0.53	0.49	
5,864.00	0.60	20.80	5,783.32	643.01	610.24	886.23	0.47	-0.46	-6.67	
6,151.00	0.70	310.20	6,070.31	645.55	609.43	887.46	0.26	0.03	-24.60	
6,437.00	0.80	332.20	6,356.29	648.44	607.17	887.91	0.11	0.03	7.69	
6,723.00	1.10	318.10	6,642.25	652.25	604.40	888.65	0.13	0.10	-4.93	
7,010.00	1.70	279.60	6,929.17	655.01	598.37	886.35	0.38	0.21	-13.41	
7,296.00	2.80	309.90	7,214.95	660.20	588.82	883.29	0.55	0.38	10.59	
7,358.00	2.30	302.20	7,276.89	661.84	586.61	882.89	0.98	-0.81	-12.42	
7,412.00	2.30	302.20	7,330.85	662.99	584.78	882.41	0.00	0.00	0.00	
Projection to TD-7412.00' MD										



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Well:	11-21-4	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,412.00	7,330.85	662.99	584.78	Projection to TD-7412.00' MD