

Great Western

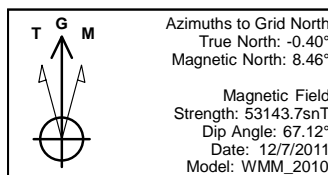
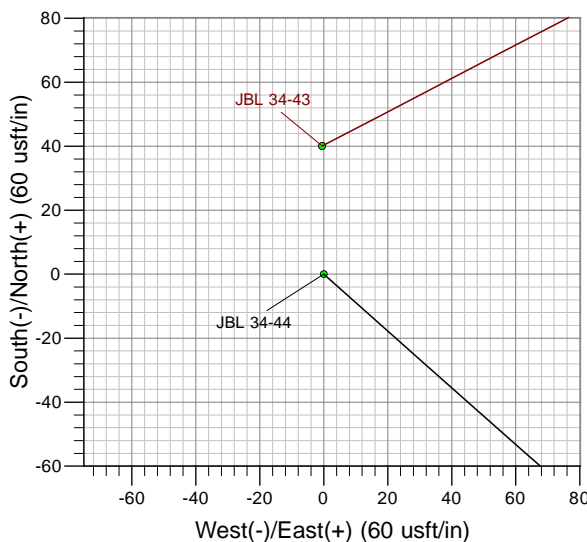
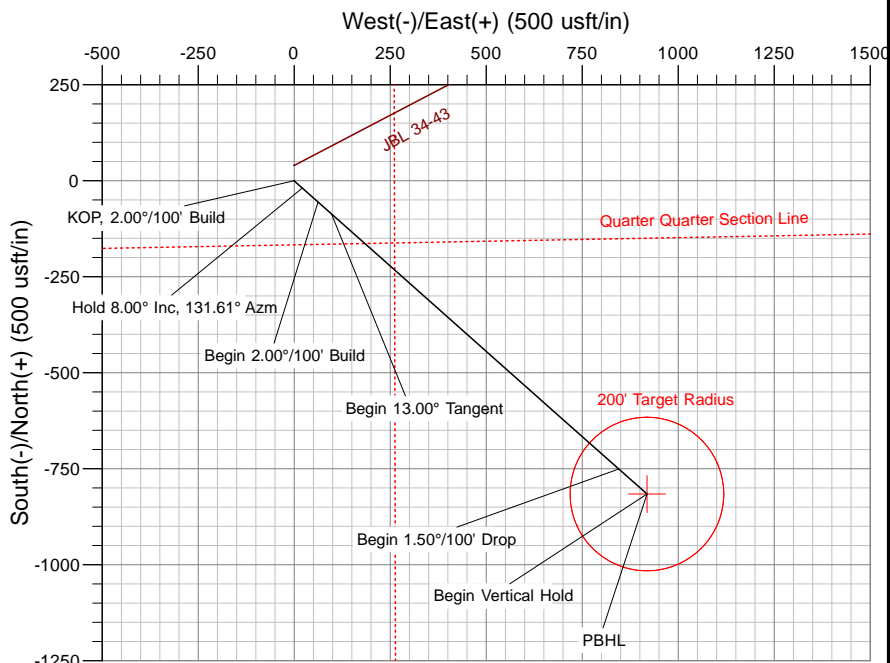
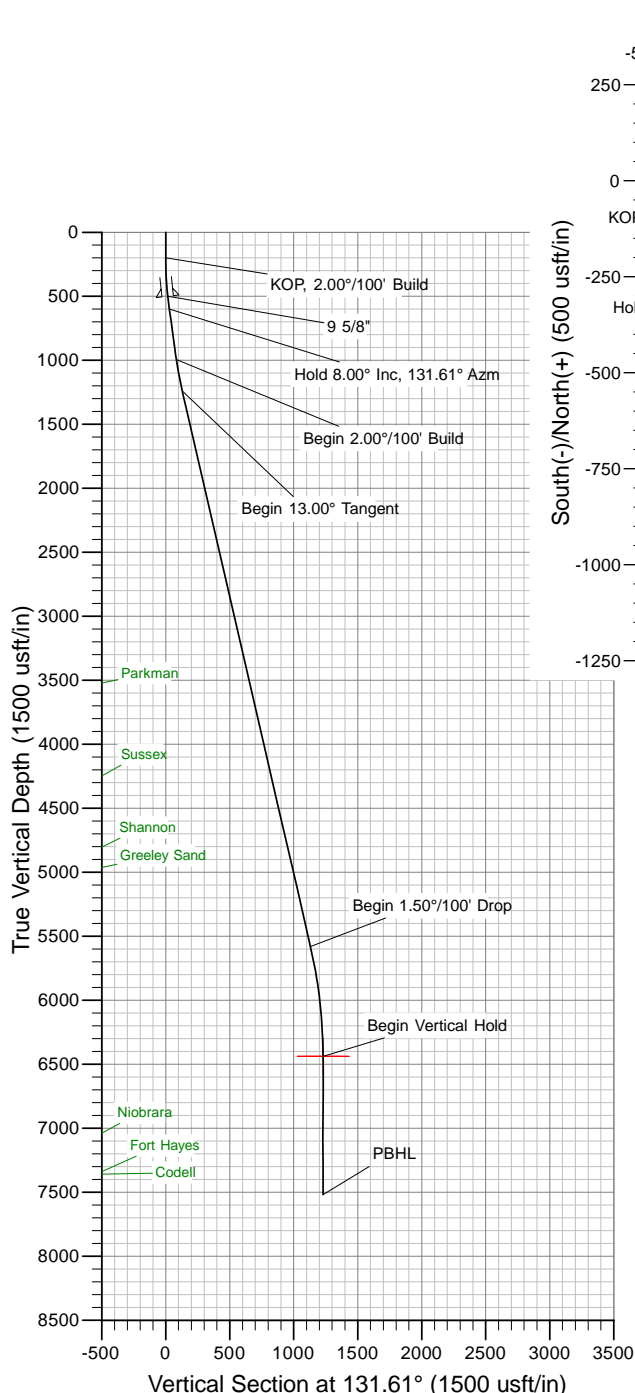
Company: Great Western
 Site: JBL
 Well: 34-44
 Project: Weld County, Colorado (NAD 83)
 Rig Name: Cade 22



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	Vsect	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	131.61	598.70	-18.51	20.85	27.88	27.88	Hold 8.00° Inc, 131.61° Azm
1000.00	8.00	131.61	994.81	-55.48	62.47	83.55	83.55	Begin 2.00°/100' Build
1249.95	13.00	131.61	1240.49	-85.71	96.52	129.08	129.08	Begin 13.00° Tangent
5702.37	13.00	131.61	5578.82	-750.73	845.35	1130.58	1130.58	Begin 1.50°/100' Drop
6568.97	0.00	0.00	6438.00	-815.73	918.54	1228.46	1228.46	Begin Vertical Hold
7648.97	0.00	0.00	7518.00	-815.73	918.54	1228.46	1228.46	PBHL



US State Plane 1983
 Colorado Northern Zone

Created By: Allen Slack
 Date: 9:10, December 08 2011
 Plan: Design #1

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Great Western

Weld County, Colorado (NAD 83)

JBL

34-44

Wellbore #1

Plan: Design #1

Standard Planning Report

08 December, 2011

Database:	Southern Region	Local Co-ordinate Reference:	Well 34-44
Company:	Great Western	TVD Reference:	WELL @ 4962.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4962.00usft (Cade 22)
Site:	JBL	North Reference:	Grid
Well:	34-44	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	34-44			
Well Position	+N/-S	1,435,554.69 usft	Northing:	1,435,554.69 usft
	+E/-W	3,173,536.26 usft	Easting:	3,173,536.26 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	
			Latitude:	40° 31' 38.3567 N
			Longitude:	104° 52' 32.646 W
			Ground Level:	4,948.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	12/7/2011	8.87	67.12	53,144

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	131.61

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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	8.00	131.61	598.70	-18.51	20.85	2.00	2.00	0.00	131.61	Vert. v1 - JBL 34-44
1,000.00	8.00	131.61	994.81	-55.48	62.47	0.00	0.00	0.00	0.00	
1,249.95	13.00	131.61	1,240.49	-85.71	96.52	2.00	2.00	0.00	0.00	
5,702.37	13.00	131.61	5,578.82	-750.73	845.35	0.00	0.00	0.00	0.00	
6,568.97	0.00	0.00	6,438.00	-815.73	918.54	1.50	-1.50	0.00	180.00	Vert. v1 - JBL 34-44
7,648.97	0.00	0.00	7,518.00	-815.73	918.54	0.00	0.00	0.00	0.00	

Database:	Southern Region	Local Co-ordinate Reference:	Well 34-44
Company:	Great Western	TVD Reference:	WELL @ 4962.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4962.00usft (Cade 22)
Site:	JBL	North Reference:	Grid
Well:	34-44	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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 2.00°/100' Build									
300.00	2.00	131.61	299.98	-1.16	1.30	1.75	2.00	2.00	0.00
400.00	4.00	131.61	399.84	-4.63	5.22	6.98	2.00	2.00	0.00
500.00	6.00	131.61	499.45	-10.42	11.73	15.69	2.00	2.00	0.00
500.55	6.01	131.61	500.00	-10.46	11.78	15.75	2.00	2.00	0.00
9 5/8"									
600.00	8.00	131.61	598.70	-18.51	20.85	27.88	2.00	2.00	0.00
Hold 8.00° Inc, 131.61° Azm									
700.00	8.00	131.61	697.73	-27.75	31.25	41.80	0.00	0.00	0.00
800.00	8.00	131.61	796.76	-37.00	41.66	55.71	0.00	0.00	0.00
900.00	8.00	131.61	895.78	-46.24	52.06	69.63	0.00	0.00	0.00
1,000.00	8.00	131.61	994.81	-55.48	62.47	83.55	0.00	0.00	0.00
Begin 2.00°/100' Build									
1,100.00	10.00	131.61	1,093.57	-65.87	74.17	99.19	2.00	2.00	0.00
1,200.00	12.00	131.61	1,191.73	-78.54	88.43	118.27	2.00	2.00	0.00
1,249.95	13.00	131.61	1,240.49	-85.71	96.52	129.08	2.00	2.00	0.00
Begin 13.00° Tangent									
1,300.00	13.00	131.61	1,289.26	-93.19	104.93	140.34	0.00	0.00	0.00
1,400.00	13.00	131.61	1,386.70	-108.13	121.75	162.83	0.00	0.00	0.00
1,500.00	13.00	131.61	1,484.14	-123.06	138.57	185.33	0.00	0.00	0.00
1,600.00	13.00	131.61	1,581.58	-138.00	155.39	207.82	0.00	0.00	0.00
1,700.00	13.00	131.61	1,679.01	-152.93	172.21	230.31	0.00	0.00	0.00
1,800.00	13.00	131.61	1,776.45	-167.87	189.03	252.81	0.00	0.00	0.00
1,900.00	13.00	131.61	1,873.89	-182.81	205.85	275.30	0.00	0.00	0.00
2,000.00	13.00	131.61	1,971.33	-197.74	222.66	297.79	0.00	0.00	0.00
2,100.00	13.00	131.61	2,068.76	-212.68	239.48	320.29	0.00	0.00	0.00
2,200.00	13.00	131.61	2,166.20	-227.61	256.30	342.78	0.00	0.00	0.00
2,300.00	13.00	131.61	2,263.64	-242.55	273.12	365.27	0.00	0.00	0.00
2,400.00	13.00	131.61	2,361.07	-257.49	289.94	387.77	0.00	0.00	0.00
2,500.00	13.00	131.61	2,458.51	-272.42	306.76	410.26	0.00	0.00	0.00
2,600.00	13.00	131.61	2,555.95	-287.36	323.57	432.75	0.00	0.00	0.00
2,700.00	13.00	131.61	2,653.39	-302.30	340.39	455.25	0.00	0.00	0.00
2,800.00	13.00	131.61	2,750.82	-317.23	357.21	477.74	0.00	0.00	0.00
2,900.00	13.00	131.61	2,848.26	-332.17	374.03	500.23	0.00	0.00	0.00
3,000.00	13.00	131.61	2,945.70	-347.10	390.85	522.73	0.00	0.00	0.00
3,100.00	13.00	131.61	3,043.14	-362.04	407.67	545.22	0.00	0.00	0.00
3,200.00	13.00	131.61	3,140.57	-376.98	424.49	567.71	0.00	0.00	0.00
3,300.00	13.00	131.61	3,238.01	-391.91	441.30	590.21	0.00	0.00	0.00
3,400.00	13.00	131.61	3,335.45	-406.85	458.12	612.70	0.00	0.00	0.00
3,500.00	13.00	131.61	3,432.89	-421.78	474.94	635.19	0.00	0.00	0.00
3,592.48	13.00	131.61	3,523.00	-435.60	490.50	656.00	0.00	0.00	0.00
Parkman									
3,600.00	13.00	131.61	3,530.32	-436.72	491.76	657.69	0.00	0.00	0.00
3,700.00	13.00	131.61	3,627.76	-451.66	508.58	680.18	0.00	0.00	0.00
3,800.00	13.00	131.61	3,725.20	-466.59	525.40	702.67	0.00	0.00	0.00
3,900.00	13.00	131.61	3,822.64	-481.53	542.22	725.17	0.00	0.00	0.00
4,000.00	13.00	131.61	3,920.07	-496.47	559.03	747.66	0.00	0.00	0.00
4,100.00	13.00	131.61	4,017.51	-511.40	575.85	770.15	0.00	0.00	0.00
4,200.00	13.00	131.61	4,114.95	-526.34	592.67	792.65	0.00	0.00	0.00
4,300.00	13.00	131.61	4,212.39	-541.27	609.49	815.14	0.00	0.00	0.00

Database:	Southern Region	Local Co-ordinate Reference:	Well 34-44
Company:	Great Western	TVD Reference:	WELL @ 4962.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4962.00usft (Cade 22)
Site:	JBL	North Reference:	Grid
Well:	34-44	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)
4,335.52	13.00	131.61	4,247.00	-546.58	615.46	823.13	0.00	0.00	0.00
Sussex									
4,400.00	13.00	131.61	4,309.82	-556.21	626.31	837.63	0.00	0.00	0.00
4,500.00	13.00	131.61	4,407.26	-571.15	643.13	860.13	0.00	0.00	0.00
4,600.00	13.00	131.61	4,504.70	-586.08	659.95	882.62	0.00	0.00	0.00
4,700.00	13.00	131.61	4,602.14	-601.02	676.76	905.11	0.00	0.00	0.00
4,800.00	13.00	131.61	4,699.57	-615.95	693.58	927.61	0.00	0.00	0.00
4,900.00	13.00	131.61	4,797.01	-630.89	710.40	950.10	0.00	0.00	0.00
4,906.15	13.00	131.61	4,803.00	-631.81	711.43	951.48	0.00	0.00	0.00
Shannon									
5,000.00	13.00	131.61	4,894.45	-645.83	727.22	972.59	0.00	0.00	0.00
5,070.36	13.00	131.61	4,963.00	-656.34	739.05	988.42	0.00	0.00	0.00
Greeley Sand									
5,100.00	13.00	131.61	4,991.88	-660.76	744.04	995.09	0.00	0.00	0.00
5,200.00	13.00	131.61	5,089.32	-675.70	760.86	1,017.58	0.00	0.00	0.00
5,300.00	13.00	131.61	5,186.76	-690.64	777.68	1,040.07	0.00	0.00	0.00
5,400.00	13.00	131.61	5,284.20	-705.57	794.49	1,062.57	0.00	0.00	0.00
5,500.00	13.00	131.61	5,381.63	-720.51	811.31	1,085.06	0.00	0.00	0.00
5,600.00	13.00	131.61	5,479.07	-735.44	828.13	1,107.55	0.00	0.00	0.00
5,700.00	13.00	131.61	5,576.51	-750.38	844.95	1,130.05	0.00	0.00	0.00
5,702.37	13.00	131.61	5,578.82	-750.73	845.35	1,130.58	0.00	0.00	0.00
Begin 1.50°/100' Drop									
5,800.00	11.53	131.61	5,674.22	-764.51	860.86	1,151.32	1.50	-1.50	0.00
5,900.00	10.03	131.61	5,772.45	-776.93	874.85	1,170.03	1.50	-1.50	0.00
6,000.00	8.53	131.61	5,871.14	-787.64	886.91	1,186.17	1.50	-1.50	0.00
6,100.00	7.03	131.61	5,970.21	-796.64	897.04	1,199.71	1.50	-1.50	0.00
6,200.00	5.53	131.61	6,069.61	-803.91	905.22	1,210.66	1.50	-1.50	0.00
6,300.00	4.03	131.61	6,169.26	-809.45	911.46	1,219.00	1.50	-1.50	0.00
6,400.00	2.53	131.61	6,269.09	-813.25	915.74	1,224.73	1.50	-1.50	0.00
6,500.00	1.03	131.61	6,369.04	-815.32	918.07	1,227.84	1.50	-1.50	0.00
6,568.97	0.00	0.00	6,438.00	-815.73	918.54	1,228.46	1.50	-1.50	0.00
Begin Vertical Hold									
6,600.00	0.00	0.00	6,469.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
6,700.00	0.00	0.00	6,569.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
6,800.00	0.00	0.00	6,669.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
6,900.00	0.00	0.00	6,769.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,000.00	0.00	0.00	6,869.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,100.00	0.00	0.00	6,969.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,168.97	0.00	0.00	7,038.00	-815.73	918.54	1,228.46	0.00	0.00	0.00
Niobrara									
7,200.00	0.00	0.00	7,069.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,300.00	0.00	0.00	7,169.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,400.00	0.00	0.00	7,269.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,468.97	0.00	0.00	7,338.00	-815.73	918.54	1,228.46	0.00	0.00	0.00
Fort Hayes									
7,488.97	0.00	0.00	7,358.00	-815.73	918.54	1,228.46	0.00	0.00	0.00
Codell									
7,500.00	0.00	0.00	7,369.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,600.00	0.00	0.00	7,469.03	-815.73	918.54	1,228.46	0.00	0.00	0.00
7,648.97	0.00	0.00	7,518.00	-815.73	918.54	1,228.46	0.00	0.00	0.00
PBHL									

Database:	Southern Region	Local Co-ordinate Reference:	Well 34-44
Company:	Great Western	TVD Reference:	WELL @ 4962.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4962.00usft (Cade 22)
Site:	JBL	North Reference:	Grid
Well:	34-44	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
Vert. v1 - JBL 34-44	0.00	0.00	6,438.00	-815.73	918.54	1,434,738.95	3,174,454.80	40° 31' 30.2320 N	104° 52' 20.826 W
- plan hits target center									
- Circle (radius 200.00)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
500.55	500.00	9 5/8"	9-5/8	12-1/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,592.48	3,523.00	Parkman		0.00	
4,335.52	4,247.00	Sussex		0.00	
4,906.15	4,803.00	Shannon		0.00	
5,070.36	4,963.00	Greeley Sand		0.00	
7,168.97	7,038.00	Niobrara		0.00	
7,468.97	7,338.00	Fort Hayes		0.00	
7,488.97	7,358.00	Codell		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.00	200.00	0.00	0.00	KOP, 2.00°/100' Build
600.00	598.70	-18.51	20.85	Hold 8.00° Inc, 131.61° Azm
1,000.00	994.81	-55.48	62.47	Begin 2.00°/100' Build
1,249.95	1,240.49	-85.71	96.52	Begin 13.00° Tangent
5,702.37	5,578.82	-750.73	845.35	Begin 1.50°/100' Drop
6,568.97	6,438.00	-815.73	918.54	Begin Vertical Hold
7,648.97	7,518.00	-815.73	918.54	PBHL