



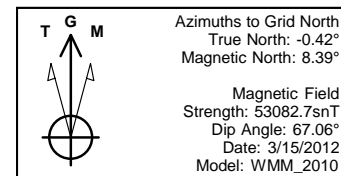
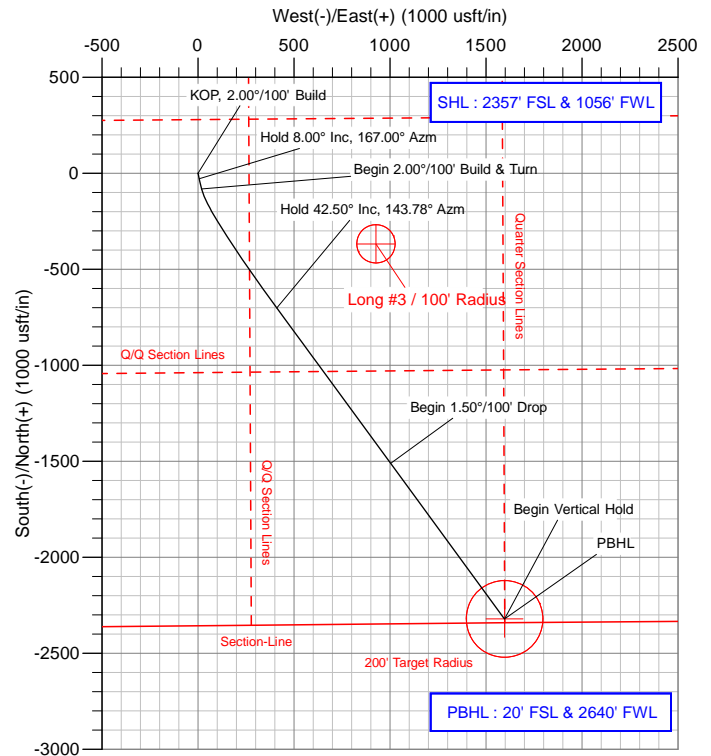
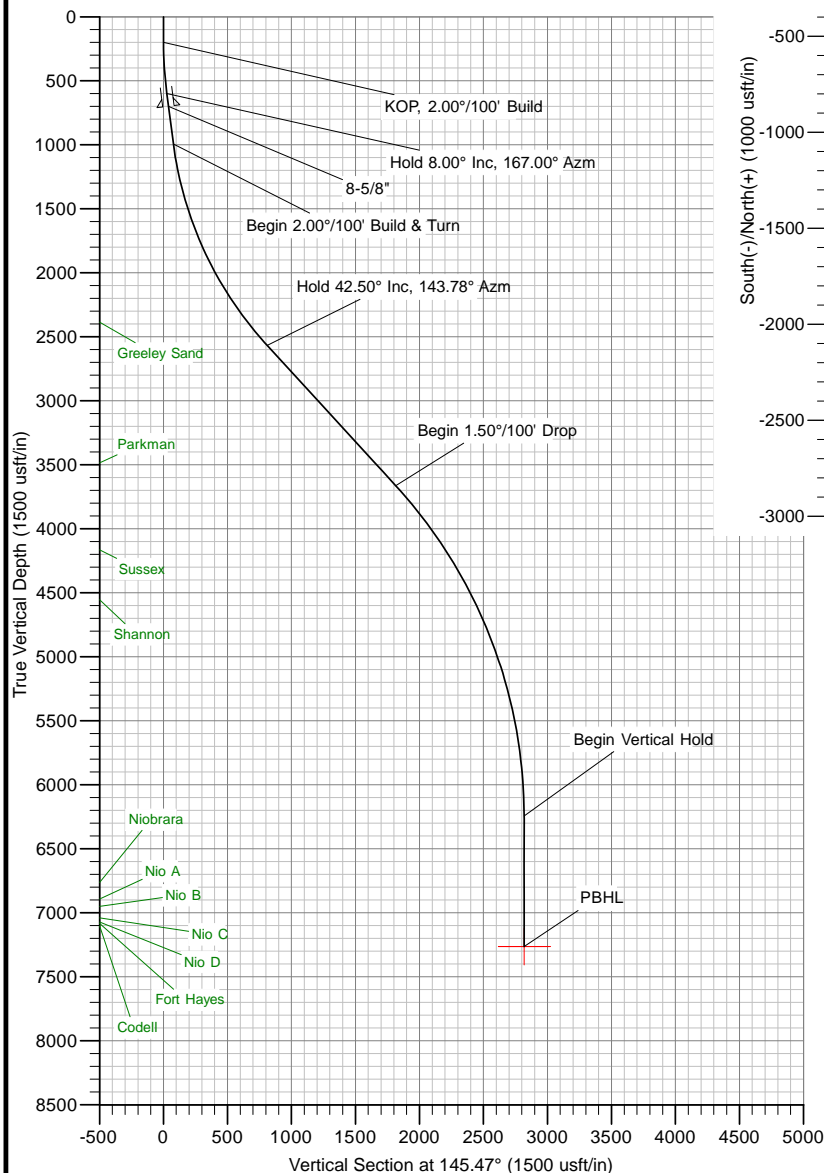
Company: Great Western  
Site: Great Western  
Well: 25-24-23  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



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	167.00	598.70	-27.17	6.27	25.93	27.88	Hold 8.00° Inc, 167.00° Azm
1000.00	8.00	167.00	994.81	-81.41	18.79	77.72	83.55	Begin 2.00°/100' Build & Turn
2763.11	42.50	143.78	2567.71	-701.13	410.73	810.43	818.97	Hold 42.50° Inc, 143.78° Azm
4248.98	42.50	143.78	3663.22	-1510.99	1003.85	1813.82	1822.80	Begin 1.50°/100' Drop
7082.27	0.00	0.00	6243.75	-2320.59	1596.77	2816.88	2826.29	Begin Vertical Hold
8101.52	0.00	0.00	7263.00	-2320.59	1596.77	2816.88	2826.29	PBHL



US State Plane 1983  
Colorado Northern Zone

Created By: Allen Slack  
Date: 13:02, March 16 2012  
Plan: Design #1

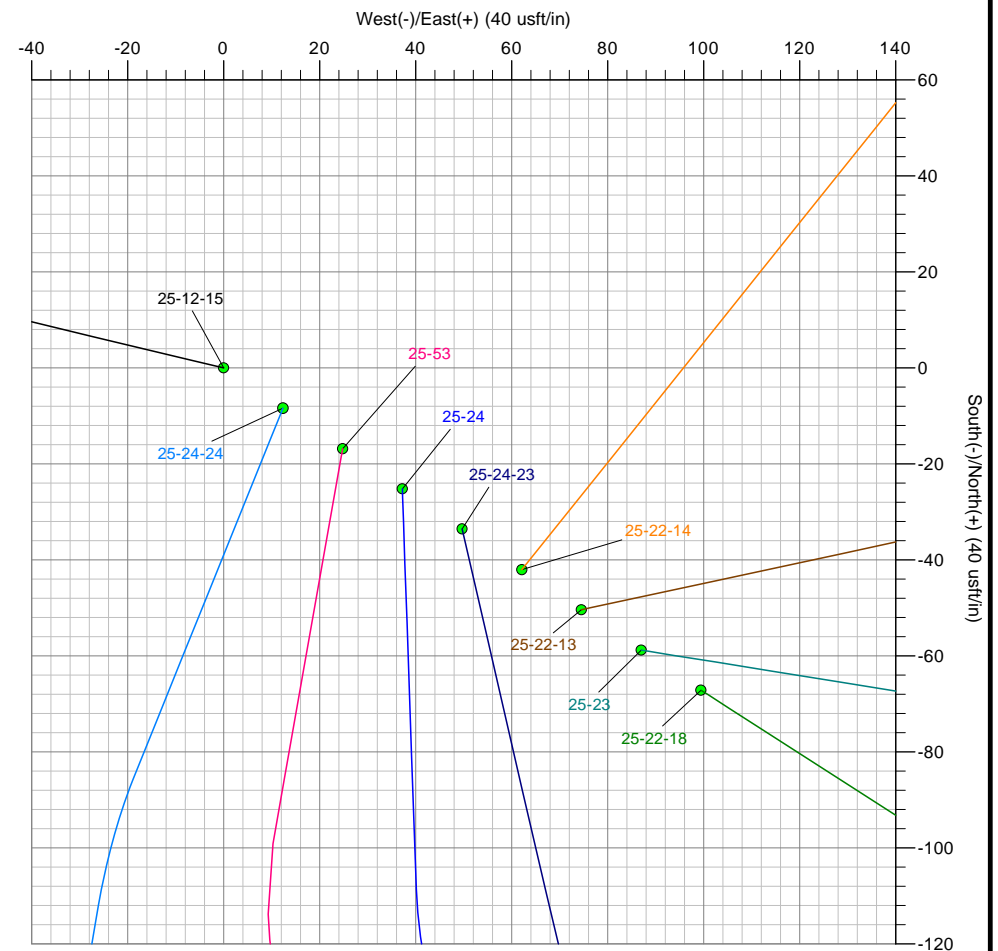
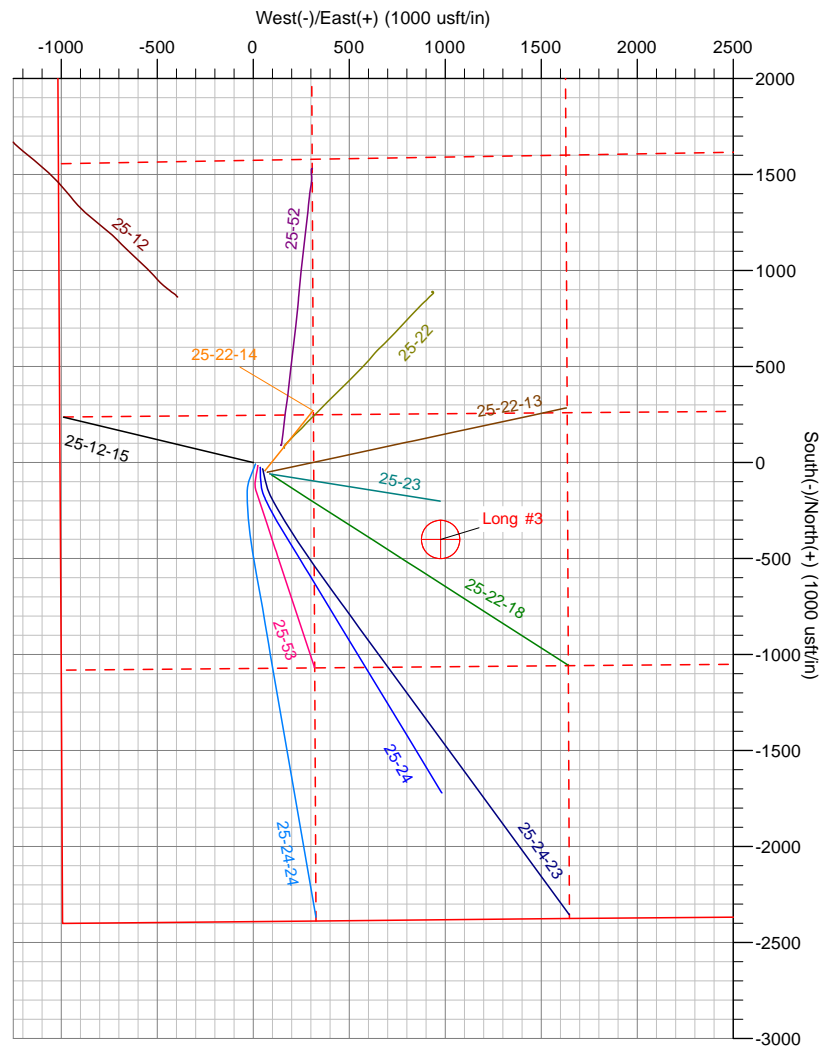
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Company: Great Western  
Site: Great Western  
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Rig Name: Cade 22



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



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# **Great Western**

**Weld County, Colorado (NAD 83)**

**Great Western**

**25-24-23**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**16 March, 2012**

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-24-23
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-24-23	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Weld County, Colorado (NAD 83)		
<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		

<b>Well</b>	25-24-23			
<b>Well Position</b>	<b>+N/-S</b>	1,410,051.40 usft	<b>Northing:</b>	1,410,051.40 usft
	<b>+E/-W</b>	3,181,536.68 usft	<b>Easting:</b>	3,181,536.68 usft
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	
			<b>Latitude:</b>	40° 27' 25.7749 N
			<b>Longitude:</b>	104° 50' 51.472 W
			<b>Ground Level:</b>	4,751.00 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	3/15/2012	8.81	67.06	53,083

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<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	145.47

<b>Plan Sections</b>										
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	167.00	598.70	-27.17	6.27	2.00	2.00	0.00	167.00	
1,000.00	8.00	167.00	994.81	-81.41	18.79	0.00	0.00	0.00	0.00	
2,763.11	42.50	143.78	2,567.71	-701.13	410.73	2.00	1.96	-1.32	-27.47	
4,248.98	42.50	143.78	3,663.22	-1,510.99	1,003.85	0.00	0.00	0.00	0.00	
7,082.27	0.00	0.00	6,243.75	-2,320.59	1,596.77	1.50	-1.50	0.00	180.00	
8,101.52	0.00	0.00	7,263.00	-2,320.59	1,596.77	0.00	0.00	0.00	0.00	0.00 PBHL v1 - Great W

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-24-23
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-24-23	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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
<b>KOP, 2.00°/100' Build</b>									
300.00	2.00	167.00	299.98	-1.70	0.39	1.62	2.00	2.00	0.00
400.00	4.00	167.00	399.84	-6.80	1.57	6.49	2.00	2.00	0.00
500.00	6.00	167.00	499.45	-15.29	3.53	14.60	2.00	2.00	0.00
600.00	8.00	167.00	598.70	-27.17	6.27	25.93	2.00	2.00	0.00
<b>Hold 8.00° Inc, 167.00° Azm</b>									
700.00	8.00	167.00	697.73	-40.73	9.40	38.88	0.00	0.00	0.00
702.29	8.00	167.00	700.00	-41.04	9.47	39.18	0.00	0.00	0.00
<b>8-5/8"</b>									
800.00	8.00	167.00	796.76	-54.29	12.53	51.83	0.00	0.00	0.00
900.00	8.00	167.00	895.78	-67.85	15.66	64.77	0.00	0.00	0.00
1,000.00	8.00	167.00	994.81	-81.41	18.79	77.72	0.00	0.00	0.00
<b>Begin 2.00°/100' Build &amp; Turn</b>									
1,100.00	9.82	161.58	1,093.60	-96.28	23.05	92.38	2.00	1.82	-5.42
1,200.00	11.69	157.86	1,191.84	-113.76	29.57	110.47	2.00	1.88	-3.72
1,300.00	13.61	155.17	1,289.41	-133.82	38.33	131.97	2.00	1.91	-2.69
1,400.00	15.54	153.13	1,386.19	-156.45	49.32	156.84	2.00	1.93	-2.04
1,500.00	17.49	151.54	1,482.06	-181.61	62.53	185.06	2.00	1.95	-1.59
1,600.00	19.45	150.26	1,576.91	-209.27	77.95	216.59	2.00	1.96	-1.28
1,700.00	21.41	149.20	1,670.61	-239.41	95.56	251.40	2.00	1.97	-1.06
1,800.00	23.38	148.31	1,763.06	-271.98	115.33	289.44	2.00	1.97	-0.89
1,900.00	25.36	147.56	1,854.15	-306.94	137.25	330.66	2.00	1.98	-0.76
2,000.00	27.34	146.91	1,943.76	-344.25	161.27	375.02	2.00	1.98	-0.65
2,100.00	29.32	146.33	2,031.78	-383.87	187.39	422.46	2.00	1.98	-0.57
2,200.00	31.30	145.83	2,118.10	-425.74	215.55	472.92	2.00	1.98	-0.50
2,300.00	33.29	145.38	2,202.63	-469.83	245.74	526.35	2.00	1.99	-0.45
2,400.00	35.28	144.97	2,285.25	-516.06	277.91	582.67	2.00	1.99	-0.41
2,500.00	37.26	144.61	2,365.87	-564.39	312.02	641.82	2.00	1.99	-0.37
2,524.11	37.74	144.52	2,385.00	-576.35	320.53	656.50	2.00	1.99	-0.35
<b>Greeley Sand</b>									
2,600.00	39.25	144.27	2,444.39	-614.76	348.03	703.73	2.00	1.99	-0.33
2,700.00	41.24	143.96	2,520.71	-667.10	385.90	768.32	2.00	1.99	-0.31
2,763.11	42.50	143.78	2,567.71	-701.13	410.73	810.43	2.00	1.99	-0.29
<b>Hold 42.50° Inc, 143.78° Azm</b>									
2,800.00	42.50	143.78	2,594.90	-721.23	425.46	835.34	0.00	0.00	0.00
2,900.00	42.50	143.78	2,668.63	-775.74	465.38	902.86	0.00	0.00	0.00
3,000.00	42.50	143.78	2,742.36	-830.24	505.29	970.39	0.00	0.00	0.00
3,100.00	42.50	143.78	2,816.09	-884.74	545.21	1,037.92	0.00	0.00	0.00
3,200.00	42.50	143.78	2,889.82	-939.25	585.13	1,105.45	0.00	0.00	0.00
3,300.00	42.50	143.78	2,963.55	-993.75	625.04	1,172.98	0.00	0.00	0.00
3,400.00	42.50	143.78	3,037.28	-1,048.26	664.96	1,240.51	0.00	0.00	0.00
3,500.00	42.50	143.78	3,111.00	-1,102.76	704.88	1,308.04	0.00	0.00	0.00
3,600.00	42.50	143.78	3,184.73	-1,157.27	744.79	1,375.57	0.00	0.00	0.00
3,700.00	42.50	143.78	3,258.46	-1,211.77	784.71	1,443.10	0.00	0.00	0.00
3,800.00	42.50	143.78	3,332.19	-1,266.28	824.63	1,510.63	0.00	0.00	0.00
3,900.00	42.50	143.78	3,405.92	-1,320.78	864.55	1,578.15	0.00	0.00	0.00
4,000.00	42.50	143.78	3,479.65	-1,375.28	904.46	1,645.68	0.00	0.00	0.00
4,007.26	42.50	143.78	3,485.00	-1,379.24	907.36	1,650.59	0.00	0.00	0.00
<b>Parkman</b>									
4,100.00	42.50	143.78	3,553.37	-1,429.79	944.38	1,713.21	0.00	0.00	0.00

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-24-23
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<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-24-23	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)	
4,200.00	42.50	143.78	3,627.10	-1,484.29	984.30	1,780.74	0.00	0.00	0.00	
4,248.98	42.50	143.78	3,663.22	-1,510.99	1,003.85	1,813.82	0.00	0.00	0.00	
<b>Begin 1.50°/100' Drop</b>										
4,300.00	41.73	143.78	3,701.06	-1,538.59	1,024.07	1,848.02	1.50	-1.50	0.00	
4,400.00	40.23	143.78	3,776.55	-1,591.51	1,062.82	1,913.57	1.50	-1.50	0.00	
4,500.00	38.73	143.78	3,853.73	-1,642.80	1,100.38	1,977.13	1.50	-1.50	0.00	
4,600.00	37.23	143.78	3,932.54	-1,692.46	1,136.75	2,038.65	1.50	-1.50	0.00	
4,700.00	35.73	143.78	4,012.94	-1,740.43	1,171.88	2,098.08	1.50	-1.50	0.00	
4,800.00	34.23	143.78	4,094.87	-1,786.68	1,205.75	2,155.39	1.50	-1.50	0.00	
4,884.20	32.97	143.78	4,165.00	-1,824.28	1,233.29	2,201.97	1.50	-1.50	0.00	
<b>Sussex</b>										
4,900.00	32.73	143.78	4,178.27	-1,831.19	1,238.35	2,210.53	1.50	-1.50	0.00	
5,000.00	31.23	143.78	4,263.09	-1,873.92	1,269.65	2,263.48	1.50	-1.50	0.00	
5,100.00	29.73	143.78	4,349.26	-1,914.85	1,299.62	2,314.18	1.50	-1.50	0.00	
5,200.00	28.23	143.78	4,436.74	-1,953.94	1,328.25	2,362.62	1.50	-1.50	0.00	
5,300.00	26.73	143.78	4,525.45	-1,991.17	1,355.52	2,408.75	1.50	-1.50	0.00	
5,333.02	26.24	143.78	4,555.00	-2,003.05	1,364.22	2,423.46	1.50	-1.50	0.00	
<b>Shannon</b>										
5,400.00	25.23	143.78	4,615.34	-2,026.52	1,381.40	2,452.54	1.50	-1.50	0.00	
5,500.00	23.73	143.78	4,706.34	-2,059.95	1,405.89	2,493.96	1.50	-1.50	0.00	
5,600.00	22.23	143.78	4,798.40	-2,091.46	1,428.96	2,532.99	1.50	-1.50	0.00	
5,700.00	20.73	143.78	4,891.45	-2,121.00	1,450.60	2,569.60	1.50	-1.50	0.00	
5,800.00	19.23	143.78	4,985.43	-2,148.57	1,470.79	2,603.76	1.50	-1.50	0.00	
5,900.00	17.73	143.78	5,080.26	-2,174.15	1,489.52	2,635.45	1.50	-1.50	0.00	
6,000.00	16.23	143.78	5,175.90	-2,197.72	1,506.78	2,664.65	1.50	-1.50	0.00	
6,100.00	14.73	143.78	5,272.27	-2,219.26	1,522.56	2,691.33	1.50	-1.50	0.00	
6,200.00	13.23	143.78	5,369.30	-2,238.75	1,536.83	2,715.48	1.50	-1.50	0.00	
6,300.00	11.73	143.78	5,466.93	-2,256.19	1,549.61	2,737.09	1.50	-1.50	0.00	
6,400.00	10.23	143.78	5,565.10	-2,271.56	1,560.86	2,756.14	1.50	-1.50	0.00	
6,500.00	8.73	143.78	5,663.73	-2,284.86	1,570.60	2,772.61	1.50	-1.50	0.00	
6,600.00	7.23	143.78	5,762.76	-2,296.06	1,578.81	2,786.49	1.50	-1.50	0.00	
6,700.00	5.73	143.78	5,862.11	-2,305.17	1,585.48	2,797.78	1.50	-1.50	0.00	
6,800.00	4.23	143.78	5,961.73	-2,312.18	1,590.61	2,806.46	1.50	-1.50	0.00	
6,900.00	2.73	143.78	6,061.55	-2,317.08	1,594.20	2,812.54	1.50	-1.50	0.00	
7,000.00	1.23	143.78	6,161.48	-2,319.88	1,596.25	2,816.00	1.50	-1.50	0.00	
7,082.27	0.00	0.00	6,243.75	-2,320.59	1,596.77	2,816.88	1.50	-1.50	0.00	
<b>Begin Vertical Hold</b>										
7,100.00	0.00	0.00	6,261.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,200.00	0.00	0.00	6,361.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,300.00	0.00	0.00	6,461.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,400.00	0.00	0.00	6,561.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,500.00	0.00	0.00	6,661.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,600.00	0.00	0.00	6,761.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,601.52	0.00	0.00	6,763.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
<b>Niobrara</b>										
7,700.00	0.00	0.00	6,861.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,730.52	0.00	0.00	6,892.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
<b>Nio A</b>										
7,788.52	0.00	0.00	6,950.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
<b>Nio B</b>										
7,800.00	0.00	0.00	6,961.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
7,878.52	0.00	0.00	7,040.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00	
<b>Nio C</b>										

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<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-24-23	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)
7,900.00	0.00	0.00	7,061.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00
7,910.52	0.00	0.00	7,072.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00
<b>Nio D</b>									
7,921.52	0.00	0.00	7,083.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00
<b>Fort Hayes</b>									
7,941.52	0.00	0.00	7,103.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00
<b>Codell</b>									
8,000.00	0.00	0.00	7,161.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00
8,100.00	0.00	0.00	7,261.48	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00
8,101.52	0.00	0.00	7,263.00	-2,320.59	1,596.77	2,816.88	0.00	0.00	0.00
<b>PBHL</b>									

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									
PBHL v1 - Great Wes	0.00	0.00	7,263.00	-2,320.59	1,596.77	1,407,730.81	3,183,133.45	40° 27' 2.7270 N	104° 50' 31.038 W
- plan hits target center									
- Circle (radius 200.00)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
702.29	700.00	8-5/8"	8-5/8	12-1/4	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,524.11	2,385.00	Greeley Sand		0.00		
4,007.26	3,485.00	Parkman		0.00		
4,884.20	4,165.00	Sussex		0.00		
5,333.02	4,555.00	Shannon		0.00		
7,601.52	6,763.00	Niobrara		0.00		
7,730.52	6,892.00	Nio A		0.00		
7,788.52	6,950.00	Nio B		0.00		
7,878.52	7,040.00	Nio C		0.00		
7,910.52	7,072.00	Nio D		0.00		
7,921.52	7,083.00	Fort Hayes		0.00		
7,941.52	7,103.00	Codell		0.00		

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-24-23
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-24-23	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

**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	-27.17	6.27	Hold 8.00° Inc, 167.00° Azm
1,000.00	994.81	-81.41	18.79	Begin 2.00°/100' Build & Turn
2,763.11	2,567.71	-701.13	410.73	Hold 42.50° Inc, 143.78° Azm
4,248.98	3,663.22	-1,510.99	1,003.85	Begin 1.50°/100' Drop
7,082.27	6,243.75	-2,320.59	1,596.77	Begin Vertical Hold
8,101.52	7,263.00	-2,320.59	1,596.77	PBHL