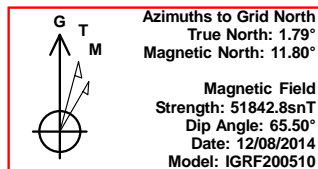


Company Name: Black Hills Production Co.

Black Hills Production Co.
Project: Garfield Co., CO.
Site: Sec.9-T8S-R98W
Well: HDU 9-11AH
Wellbore: Wellbore #1
Design: Design #3
Lat: 39° 22' 48.891 N
Long: 108° 20' 22.962 W
Pad GL: 5521.00
KB: WELL @ 5536.00usft (Orig

Archer



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6533.32	0.00	0.00	6533.32	0.00	0.00	0.00	0.00	0.00	Start Build 8.00
7470.82	75.00	235.00	7225.11	-304.47	-434.83	8.00	235.00	18.53	Start 372.00 hold at 7470.82 MD
7842.82	75.00	235.00	7321.39	-510.57	-729.17	0.00	0.00	31.07	Start DLS 8.00 TFO -88.67
8946.33	90.84	147.00	7491.14	-1478.50	-900.65	8.00	-88.67	749.44	Start 10157.02 hold at 8946.33 MD
19103.35	90.84	147.00	7343.00	-9996.39	4630.06	0.00	0.00	10905.38	TD at 19103.35

WELL DETAILS: HDU 9-11AH

+N/-S	+E/-W	Northing	Ground Level: Easting	5521.00 Latitude	Longitude	Slot
0.00	0.00	1575930.190	2197444.872	39° 22' 48.891 N	108° 20' 22.962 W	

WELLBORE TARGET DETAILS (LAT/LONG)

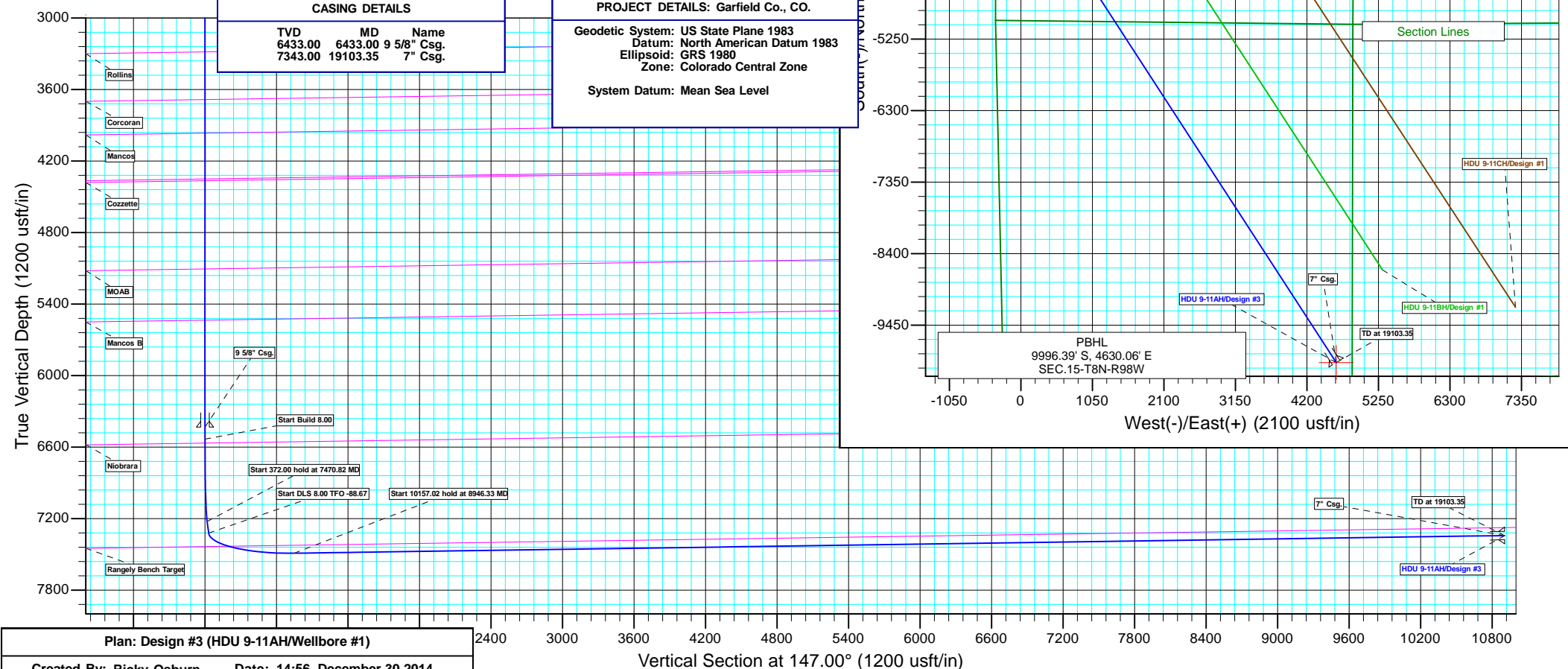
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape Point
HDU 9-11AH Tgt	7343.00	-9996.39	4630.06	39° 21' 11.561 N	108° 19' 20.068 W	

CASING DETAILS

TVD	MD	Name
6433.00	6433.00	9 5/8" Csg.
7343.00	19103.35	7" Csg.

PROJECT DETAILS: Garfield Co., CO.

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Central Zone
System Datum: Mean Sea Level



Database:	EDMDBBW	Local Co-ordinate Reference:	Well HDU 9-11AH
Company:	Black Hills Production Co.	TVD Reference:	WELL @ 5536.00usft (Original Well Elev)
Project:	Garfield Co., CO.	MD Reference:	WELL @ 5536.00usft (Original Well Elev)
Site:	Sec.9-T8S-R98W	North Reference:	Grid
Well:	HDU 9-11AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Project	Garfield Co., CO.		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		Sec.9-T8S-R98W			
Site Position:		Northing:	1,575,537.582 usft	Latitude:	39° 22' 46.452 N
From:	Lat/Long	Easting:	2,202,119.135 usft	Longitude:	108° 19' 23.304 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.78 °

Well	HDU 9-11AH					
Well Position	+N/-S	392.61 usft	Northing:	1,575,930.190 usft	Latitude:	39° 22' 48.891 N
	+E/-W	-4,674.26 usft	Easting:	2,197,444.872 usft	Longitude:	108° 20' 22.962 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,521.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2014/12/08	10.01	65.50	51,843

Design	Design #3			
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	147.00

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	
6,533.32	0.00	0.00	6,533.32	0.00	0.00	0.00	0.00	0.00	0.00	
7,470.82	75.00	235.00	7,225.11	-304.47	-434.83	8.00	8.00	0.00	235.00	
7,842.82	75.00	235.00	7,321.39	-510.57	-729.17	0.00	0.00	0.00	0.00	
8,946.33	90.84	147.00	7,491.14	-1,478.50	-900.65	8.00	1.44	-7.97	-88.67	HDU 9-11AH Tgt
19,103.35	90.84	147.00	7,343.00	-9,996.39	4,630.06	0.00	0.00	0.00	0.00	HDU 9-11AH Tgt

Database:	EDMDBBW	Local Co-ordinate Reference:	Well HDU 9-11AH
Company:	Black Hills Production Co.	TVD Reference:	WELL @ 5536.00usft (Original Well Elev)
Project:	Garfield Co., CO.	MD Reference:	WELL @ 5536.00usft (Original Well Elev)
Site:	Sec.9-T8S-R98W	North Reference:	Grid
Well:	HDU 9-11AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	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
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
Mesaverde									
1,013.00	0.00	0.00	1,013.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
Cameo									
2,956.00	0.00	0.00	2,956.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollins									
3,285.00	0.00	0.00	3,285.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
Corcoran									
3,685.00	0.00	0.00	3,685.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
Mancos									
3,967.00	0.00	0.00	3,967.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00

Database:	EDMDBBW	Local Co-ordinate Reference:	Well HDU 9-11AH
Company:	Black Hills Production Co.	TVD Reference:	WELL @ 5536.00usft (Original Well Elev)
Project:	Garfield Co., CO.	MD Reference:	WELL @ 5536.00usft (Original Well Elev)
Site:	Sec.9-T8S-R98W	North Reference:	Grid
Well:	HDU 9-11AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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)
Mancos A									
4,352.00	0.00	0.00	4,352.00	0.00	0.00	0.00	0.00	0.00	0.00
Cozzette									
4,366.00	0.00	0.00	4,366.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
MOAB									
5,106.00	0.00	0.00	5,106.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Mancos B									
5,536.00	0.00	0.00	5,536.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8" Csg.									
6,433.00	0.00	0.00	6,433.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 8.00									
6,533.32	0.00	0.00	6,533.32	0.00	0.00	0.00	0.00	0.00	0.00
6,550.00	1.33	235.00	6,550.00	-0.11	-0.16	0.01	8.00	8.00	0.00
Niobrara									
6,567.01	2.70	235.00	6,567.00	-0.45	-0.65	0.03	8.00	8.00	0.00
6,600.00	5.33	235.00	6,599.90	-1.78	-2.54	0.11	8.00	8.00	0.00
6,650.00	9.33	235.00	6,649.48	-5.44	-7.77	0.33	8.00	8.00	0.00
6,700.00	13.33	235.00	6,698.50	-11.07	-15.82	0.67	8.00	8.00	0.00
6,750.00	17.33	235.00	6,746.71	-18.66	-26.65	1.14	8.00	8.00	0.00
6,800.00	21.33	235.00	6,793.88	-28.15	-40.20	1.71	8.00	8.00	0.00
6,850.00	25.33	235.00	6,839.78	-39.51	-56.42	2.40	8.00	8.00	0.00
6,900.00	29.33	235.00	6,884.19	-52.67	-75.23	3.20	8.00	8.00	0.00
6,950.00	33.33	235.00	6,926.89	-67.58	-96.52	4.11	8.00	8.00	0.00
7,000.00	37.33	235.00	6,967.67	-84.17	-120.20	5.12	8.00	8.00	0.00
7,050.00	41.33	235.00	7,006.33	-102.34	-146.16	6.23	8.00	8.00	0.00
7,100.00	45.33	235.00	7,042.69	-122.02	-174.26	7.42	8.00	8.00	0.00
7,150.00	49.33	235.00	7,076.57	-143.10	-204.37	8.71	8.00	8.00	0.00
7,200.00	53.33	235.00	7,107.81	-165.49	-236.35	10.07	8.00	8.00	0.00
7,250.00	57.33	235.00	7,136.24	-189.07	-270.03	11.50	8.00	8.00	0.00
7,300.00	61.33	235.00	7,161.74	-213.74	-305.25	13.00	8.00	8.00	0.00
7,350.00	65.33	235.00	7,184.17	-239.36	-341.84	14.56	8.00	8.00	0.00

Database:	EDMDBBW	Local Co-ordinate Reference:	Well HDU 9-11AH
Company:	Black Hills Production Co.	TVD Reference:	WELL @ 5536.00usft (Original Well Elev)
Project:	Garfield Co., CO.	MD Reference:	WELL @ 5536.00usft (Original Well Elev)
Site:	Sec.9-T8S-R98W	North Reference:	Grid
Well:	HDU 9-11AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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)	
7,400.00	69.33	235.00	7,203.43	-265.82	-379.63	16.17	8.00	8.00	0.00	
7,450.00	73.33	235.00	7,219.43	-292.98	-418.42	17.83	8.00	8.00	0.00	
Start 372.00 hold at 7470.82 MD										
7,470.82	75.00	235.00	7,225.11	-304.47	-434.83	18.53	8.00	8.00	0.00	
7,500.00	75.00	235.00	7,232.67	-320.64	-457.92	19.51	0.00	0.00	0.00	
7,600.00	75.00	235.00	7,258.55	-376.04	-537.04	22.88	0.00	0.00	0.00	
7,700.00	75.00	235.00	7,284.43	-431.45	-616.17	26.25	0.00	0.00	0.00	
7,800.00	75.00	235.00	7,310.31	-486.85	-695.29	29.62	0.00	0.00	0.00	
Start DLS 8.00 TFO -88.67										
7,842.82	75.00	235.00	7,321.39	-510.57	-729.17	31.07	0.00	0.00	0.00	
7,850.00	75.01	234.41	7,323.25	-514.58	-734.83	31.34	8.00	0.20	-8.28	
7,900.00	75.15	230.27	7,336.13	-544.09	-773.07	35.27	8.00	0.28	-8.27	
7,950.00	75.37	226.14	7,348.85	-576.32	-809.11	42.67	8.00	0.43	-8.26	
8,000.00	75.66	222.02	7,361.37	-611.09	-842.78	53.49	8.00	0.57	-8.24	
8,050.00	76.01	217.91	7,373.61	-648.23	-873.91	67.69	8.00	0.72	-8.22	
8,100.00	76.44	213.81	7,385.51	-687.58	-902.35	85.20	8.00	0.85	-8.19	
8,150.00	76.93	209.73	7,397.03	-728.94	-927.96	105.93	8.00	0.99	-8.16	
8,200.00	77.49	205.67	7,408.10	-772.10	-950.62	129.79	8.00	1.11	-8.12	
8,250.00	78.11	201.63	7,418.67	-816.86	-970.22	156.65	8.00	1.23	-8.09	
8,300.00	78.78	197.60	7,428.69	-862.99	-986.66	186.39	8.00	1.35	-8.05	
Rangely Bench Target										
8,322.75	79.11	195.78	7,433.06	-884.37	-993.07	200.83	8.00	1.43	-8.02	
8,350.00	79.51	193.60	7,438.11	-910.28	-999.87	218.86	8.00	1.48	-8.00	
8,400.00	80.29	189.61	7,446.88	-958.48	-1,009.77	253.89	8.00	1.56	-7.97	
8,450.00	81.11	185.65	7,454.97	-1,007.38	-1,016.31	291.33	8.00	1.65	-7.93	
8,500.00	81.98	181.70	7,462.32	-1,056.72	-1,019.48	330.99	8.00	1.73	-7.90	
8,550.00	82.88	177.77	7,468.91	-1,106.28	-1,019.25	372.68	8.00	1.81	-7.86	
8,600.00	83.82	173.85	7,474.70	-1,155.80	-1,015.62	416.19	8.00	1.87	-7.83	
8,650.00	84.78	169.95	7,479.67	-1,205.04	-1,008.61	461.30	8.00	1.93	-7.80	
8,700.00	85.77	166.06	7,483.78	-1,253.78	-998.26	507.81	8.00	1.98	-7.78	
8,750.00	86.78	162.18	7,487.03	-1,301.76	-984.62	555.49	8.00	2.02	-7.76	
8,800.00	87.80	158.31	7,489.40	-1,348.75	-967.74	604.09	8.00	2.05	-7.74	
8,850.00	88.84	154.45	7,490.87	-1,394.54	-947.72	653.39	8.00	2.07	-7.73	
8,900.00	89.87	150.58	7,491.43	-1,438.88	-924.65	703.15	8.00	2.08	-7.73	
Start 10157.02 hold at 8946.33 MD										
8,946.33	90.84	147.00	7,491.14	-1,478.50	-900.65	749.44	8.00	2.08	-7.73	
9,000.00	90.84	147.00	7,490.36	-1,523.51	-871.42	803.11	0.00	0.00	0.00	
9,100.00	90.84	147.00	7,488.90	-1,607.37	-816.97	903.10	0.00	0.00	0.00	
9,200.00	90.84	147.00	7,487.44	-1,691.23	-762.52	1,003.09	0.00	0.00	0.00	
9,300.00	90.84	147.00	7,485.98	-1,775.09	-708.07	1,103.08	0.00	0.00	0.00	
9,400.00	90.84	147.00	7,484.53	-1,858.96	-653.62	1,203.07	0.00	0.00	0.00	
9,500.00	90.84	147.00	7,483.07	-1,942.82	-599.16	1,303.06	0.00	0.00	0.00	
9,600.00	90.84	147.00	7,481.61	-2,026.68	-544.71	1,403.05	0.00	0.00	0.00	
9,700.00	90.84	147.00	7,480.15	-2,110.54	-490.26	1,503.03	0.00	0.00	0.00	
9,800.00	90.84	147.00	7,478.69	-2,194.40	-435.81	1,603.02	0.00	0.00	0.00	
9,900.00	90.84	147.00	7,477.23	-2,278.27	-381.36	1,703.01	0.00	0.00	0.00	
10,000.00	90.84	147.00	7,475.77	-2,362.13	-326.90	1,803.00	0.00	0.00	0.00	
10,100.00	90.84	147.00	7,474.32	-2,445.99	-272.45	1,902.99	0.00	0.00	0.00	
10,200.00	90.84	147.00	7,472.86	-2,529.85	-218.00	2,002.98	0.00	0.00	0.00	
10,300.00	90.84	147.00	7,471.40	-2,613.71	-163.55	2,102.97	0.00	0.00	0.00	
10,400.00	90.84	147.00	7,469.94	-2,697.58	-109.10	2,202.96	0.00	0.00	0.00	
10,500.00	90.84	147.00	7,468.48	-2,781.44	-54.64	2,302.95	0.00	0.00	0.00	
10,600.00	90.84	147.00	7,467.02	-2,865.30	-0.19	2,402.94	0.00	0.00	0.00	
10,700.00	90.84	147.00	7,465.56	-2,949.16	54.26	2,502.93	0.00	0.00	0.00	

Database:	EDMDBBW	Local Co-ordinate Reference:	Well HDU 9-11AH
Company:	Black Hills Production Co.	TVD Reference:	WELL @ 5536.00usft (Original Well Elev)
Project:	Garfield Co., CO.	MD Reference:	WELL @ 5536.00usft (Original Well Elev)
Site:	Sec.9-T8S-R98W	North Reference:	Grid
Well:	HDU 9-11AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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)
10,800.00	90.84	147.00	7,464.11	-3,033.02	108.71	2,602.92	0.00	0.00	0.00
10,900.00	90.84	147.00	7,462.65	-3,116.89	163.16	2,702.91	0.00	0.00	0.00
11,000.00	90.84	147.00	7,461.19	-3,200.75	217.62	2,802.90	0.00	0.00	0.00
11,100.00	90.84	147.00	7,459.73	-3,284.61	272.07	2,902.89	0.00	0.00	0.00
11,200.00	90.84	147.00	7,458.27	-3,368.47	326.52	3,002.88	0.00	0.00	0.00
11,300.00	90.84	147.00	7,456.81	-3,452.34	380.97	3,102.86	0.00	0.00	0.00
11,400.00	90.84	147.00	7,455.35	-3,536.20	435.42	3,202.85	0.00	0.00	0.00
11,500.00	90.84	147.00	7,453.90	-3,620.06	489.88	3,302.84	0.00	0.00	0.00
11,600.00	90.84	147.00	7,452.44	-3,703.92	544.33	3,402.83	0.00	0.00	0.00
11,700.00	90.84	147.00	7,450.98	-3,787.78	598.78	3,502.82	0.00	0.00	0.00
11,800.00	90.84	147.00	7,449.52	-3,871.65	653.23	3,602.81	0.00	0.00	0.00
11,900.00	90.84	147.00	7,448.06	-3,955.51	707.68	3,702.80	0.00	0.00	0.00
12,000.00	90.84	147.00	7,446.60	-4,039.37	762.14	3,802.79	0.00	0.00	0.00
12,100.00	90.84	147.00	7,445.14	-4,123.23	816.59	3,902.78	0.00	0.00	0.00
12,200.00	90.84	147.00	7,443.69	-4,207.09	871.04	4,002.77	0.00	0.00	0.00
12,300.00	90.84	147.00	7,442.23	-4,290.96	925.49	4,102.76	0.00	0.00	0.00
12,400.00	90.84	147.00	7,440.77	-4,374.82	979.95	4,202.75	0.00	0.00	0.00
12,500.00	90.84	147.00	7,439.31	-4,458.68	1,034.40	4,302.74	0.00	0.00	0.00
12,600.00	90.84	147.00	7,437.85	-4,542.54	1,088.85	4,402.73	0.00	0.00	0.00
12,700.00	90.84	147.00	7,436.39	-4,626.40	1,143.30	4,502.72	0.00	0.00	0.00
12,800.00	90.84	147.00	7,434.93	-4,710.27	1,197.75	4,602.70	0.00	0.00	0.00
12,900.00	90.84	147.00	7,433.48	-4,794.13	1,252.21	4,702.69	0.00	0.00	0.00
13,000.00	90.84	147.00	7,432.02	-4,877.99	1,306.66	4,802.68	0.00	0.00	0.00
13,100.00	90.84	147.00	7,430.56	-4,961.85	1,361.11	4,902.67	0.00	0.00	0.00
13,200.00	90.84	147.00	7,429.10	-5,045.71	1,415.56	5,002.66	0.00	0.00	0.00
13,300.00	90.84	147.00	7,427.64	-5,129.58	1,470.01	5,102.65	0.00	0.00	0.00
13,400.00	90.84	147.00	7,426.18	-5,213.44	1,524.47	5,202.64	0.00	0.00	0.00
13,500.00	90.84	147.00	7,424.72	-5,297.30	1,578.92	5,302.63	0.00	0.00	0.00
13,600.00	90.84	147.00	7,423.27	-5,381.16	1,633.37	5,402.62	0.00	0.00	0.00
13,700.00	90.84	147.00	7,421.81	-5,465.02	1,687.82	5,502.61	0.00	0.00	0.00
13,800.00	90.84	147.00	7,420.35	-5,548.89	1,742.27	5,602.60	0.00	0.00	0.00
13,900.00	90.84	147.00	7,418.89	-5,632.75	1,796.73	5,702.59	0.00	0.00	0.00
14,000.00	90.84	147.00	7,417.43	-5,716.61	1,851.18	5,802.58	0.00	0.00	0.00
14,100.00	90.84	147.00	7,415.97	-5,800.47	1,905.63	5,902.57	0.00	0.00	0.00
14,200.00	90.84	147.00	7,414.51	-5,884.34	1,960.08	6,002.56	0.00	0.00	0.00
14,300.00	90.84	147.00	7,413.06	-5,968.20	2,014.53	6,102.55	0.00	0.00	0.00
14,400.00	90.84	147.00	7,411.60	-6,052.06	2,068.99	6,202.53	0.00	0.00	0.00
14,500.00	90.84	147.00	7,410.14	-6,135.92	2,123.44	6,302.52	0.00	0.00	0.00
14,600.00	90.84	147.00	7,408.68	-6,219.78	2,177.89	6,402.51	0.00	0.00	0.00
14,700.00	90.84	147.00	7,407.22	-6,303.65	2,232.34	6,502.50	0.00	0.00	0.00
14,800.00	90.84	147.00	7,405.76	-6,387.51	2,286.79	6,602.49	0.00	0.00	0.00
14,900.00	90.84	147.00	7,404.30	-6,471.37	2,341.25	6,702.48	0.00	0.00	0.00
15,000.00	90.84	147.00	7,402.85	-6,555.23	2,395.70	6,802.47	0.00	0.00	0.00
15,100.00	90.84	147.00	7,401.39	-6,639.09	2,450.15	6,902.46	0.00	0.00	0.00
15,200.00	90.84	147.00	7,399.93	-6,722.96	2,504.60	7,002.45	0.00	0.00	0.00
15,300.00	90.84	147.00	7,398.47	-6,806.82	2,559.05	7,102.44	0.00	0.00	0.00
15,400.00	90.84	147.00	7,397.01	-6,890.68	2,613.51	7,202.43	0.00	0.00	0.00
15,500.00	90.84	147.00	7,395.55	-6,974.54	2,667.96	7,302.42	0.00	0.00	0.00
15,600.00	90.84	147.00	7,394.09	-7,058.40	2,722.41	7,402.41	0.00	0.00	0.00
15,700.00	90.84	147.00	7,392.64	-7,142.27	2,776.86	7,502.40	0.00	0.00	0.00
15,800.00	90.84	147.00	7,391.18	-7,226.13	2,831.31	7,602.39	0.00	0.00	0.00
15,900.00	90.84	147.00	7,389.72	-7,309.99	2,885.77	7,702.38	0.00	0.00	0.00
16,000.00	90.84	147.00	7,388.26	-7,393.85	2,940.22	7,802.36	0.00	0.00	0.00
16,100.00	90.84	147.00	7,386.80	-7,477.71	2,994.67	7,902.35	0.00	0.00	0.00

Database:	EDMDBBW	Local Co-ordinate Reference:	Well HDU 9-11AH
Company:	Black Hills Production Co.	TVD Reference:	WELL @ 5536.00usft (Original Well Elev)
Project:	Garfield Co., CO.	MD Reference:	WELL @ 5536.00usft (Original Well Elev)
Site:	Sec.9-T8S-R98W	North Reference:	Grid
Well:	HDU 9-11AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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)
16,200.00	90.84	147.00	7,385.34	-7,561.58	3,049.12	8,002.34	0.00	0.00	0.00
16,300.00	90.84	147.00	7,383.88	-7,645.44	3,103.57	8,102.33	0.00	0.00	0.00
16,400.00	90.84	147.00	7,382.43	-7,729.30	3,158.03	8,202.32	0.00	0.00	0.00
16,500.00	90.84	147.00	7,380.97	-7,813.16	3,212.48	8,302.31	0.00	0.00	0.00
16,600.00	90.84	147.00	7,379.51	-7,897.02	3,266.93	8,402.30	0.00	0.00	0.00
16,700.00	90.84	147.00	7,378.05	-7,980.89	3,321.38	8,502.29	0.00	0.00	0.00
16,800.00	90.84	147.00	7,376.59	-8,064.75	3,375.84	8,602.28	0.00	0.00	0.00
16,900.00	90.84	147.00	7,375.13	-8,148.61	3,430.29	8,702.27	0.00	0.00	0.00
17,000.00	90.84	147.00	7,373.67	-8,232.47	3,484.74	8,802.26	0.00	0.00	0.00
17,100.00	90.84	147.00	7,372.22	-8,316.34	3,539.19	8,902.25	0.00	0.00	0.00
17,200.00	90.84	147.00	7,370.76	-8,400.20	3,593.64	9,002.24	0.00	0.00	0.00
17,300.00	90.84	147.00	7,369.30	-8,484.06	3,648.10	9,102.23	0.00	0.00	0.00
17,400.00	90.84	147.00	7,367.84	-8,567.92	3,702.55	9,202.22	0.00	0.00	0.00
17,500.00	90.84	147.00	7,366.38	-8,651.78	3,757.00	9,302.20	0.00	0.00	0.00
17,600.00	90.84	147.00	7,364.92	-8,735.65	3,811.45	9,402.19	0.00	0.00	0.00
17,700.00	90.84	147.00	7,363.46	-8,819.51	3,865.90	9,502.18	0.00	0.00	0.00
17,800.00	90.84	147.00	7,362.01	-8,903.37	3,920.36	9,602.17	0.00	0.00	0.00
17,900.00	90.84	147.00	7,360.55	-8,987.23	3,974.81	9,702.16	0.00	0.00	0.00
18,000.00	90.84	147.00	7,359.09	-9,071.09	4,029.26	9,802.15	0.00	0.00	0.00
18,100.00	90.84	147.00	7,357.63	-9,154.96	4,083.71	9,902.14	0.00	0.00	0.00
18,200.00	90.84	147.00	7,356.17	-9,238.82	4,138.16	10,002.13	0.00	0.00	0.00
18,300.00	90.84	147.00	7,354.71	-9,322.68	4,192.62	10,102.12	0.00	0.00	0.00
18,400.00	90.84	147.00	7,353.26	-9,406.54	4,247.07	10,202.11	0.00	0.00	0.00
18,500.00	90.84	147.00	7,351.80	-9,490.40	4,301.52	10,302.10	0.00	0.00	0.00
18,600.00	90.84	147.00	7,350.34	-9,574.27	4,355.97	10,402.09	0.00	0.00	0.00
18,700.00	90.84	147.00	7,348.88	-9,658.13	4,410.42	10,502.08	0.00	0.00	0.00
18,800.00	90.84	147.00	7,347.42	-9,741.99	4,464.88	10,602.07	0.00	0.00	0.00
18,900.00	90.84	147.00	7,345.96	-9,825.85	4,519.33	10,702.06	0.00	0.00	0.00
19,000.00	90.84	147.00	7,344.50	-9,909.71	4,573.78	10,802.05	0.00	0.00	0.00
TD at 19103.35									
19,103.35	90.84	147.00	7,343.00	-9,996.39	4,630.06	10,905.38	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
HDU 9-11AH Tgt	0.00	1.78	7,343.00	-9,996.39	4,630.06	1,565,933.804	2,202,074.929	39° 21' 11.561 N	108° 19' 20.068 W
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,433.00	6,433.00	9 5/8" Csg.	9-5/8	12-1/4	
19,103.35	7,343.00	7" Csg.	7	8-3/4	

Database:	EDMDBBW	Local Co-ordinate Reference:	Well HDU 9-11AH
Company:	Black Hills Production Co.	TVD Reference:	WELL @ 5536.00usft (Original Well Elev)
Project:	Garfield Co., CO.	MD Reference:	WELL @ 5536.00usft (Original Well Elev)
Site:	Sec.9-T8S-R98W	North Reference:	Grid
Well:	HDU 9-11AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,013.00	1,013.00	Mesaverde		-0.84	147.00	
2,956.00	2,956.00	Cameo		-0.84	147.00	
3,285.00	3,285.00	Rollins		-0.84	147.00	
3,685.00	3,685.00	Corcoran		-0.84	147.00	
3,967.00	3,967.00	Mancos		-0.84	147.00	
4,352.00	4,352.00	Mancos A		-0.84	147.00	
4,366.00	4,366.00	Cozzette		-0.84	147.00	
5,106.00	5,106.00	MOAB		-0.84	147.00	
5,536.00	5,536.00	Mancos B		-0.84	147.00	
6,567.01	6,567.00	Niobrara		-0.84	147.00	
8,322.75	7,436.00	Rangely Bench Target		-0.84	147.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
6,533.32	6,533.32	0.00	0.00	Start Build 8.00	
7,470.82	7,225.11	-304.47	-434.83	Start 372.00 hold at 7470.82 MD	
7,842.82	7,321.39	-510.57	-729.17	Start DLS 8.00 TFO -88.67	
8,946.33	7,491.14	-1,478.50	-900.65	Start 10157.02 hold at 8946.33 MD	
19,103.35	7,343.00	-9,996.39	4,630.06	TD at 19103.35	