



Well Name: HCW FD 24-20D

Surface Location: HCW FD 24-20D Pad Sec.24-T6N-R67W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4744.0
Northing 1413056.70 Easting 3182817.07 Latitude 40.465383 Longitude -104.842950 Slot
Original Well Elev WELL @ 4758.0ft (Original Well Elev)

+N/-S +E/-W
0.0 0.0

Northing
1413056.70

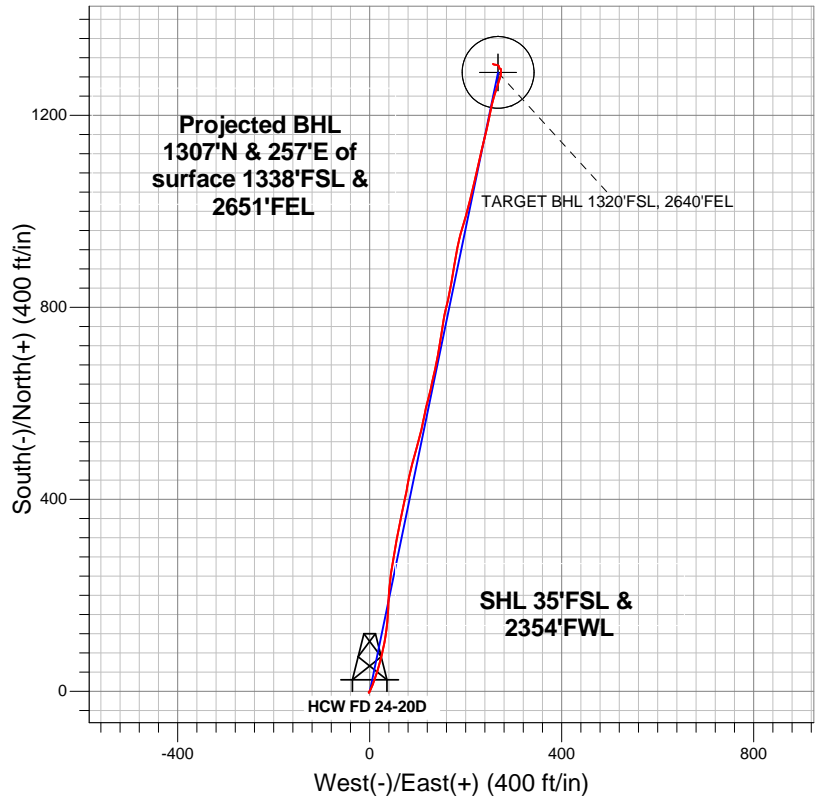
Easting
3182817.07

Latitude
40.465383

Longitude
-104.842950

Slot

Great Western



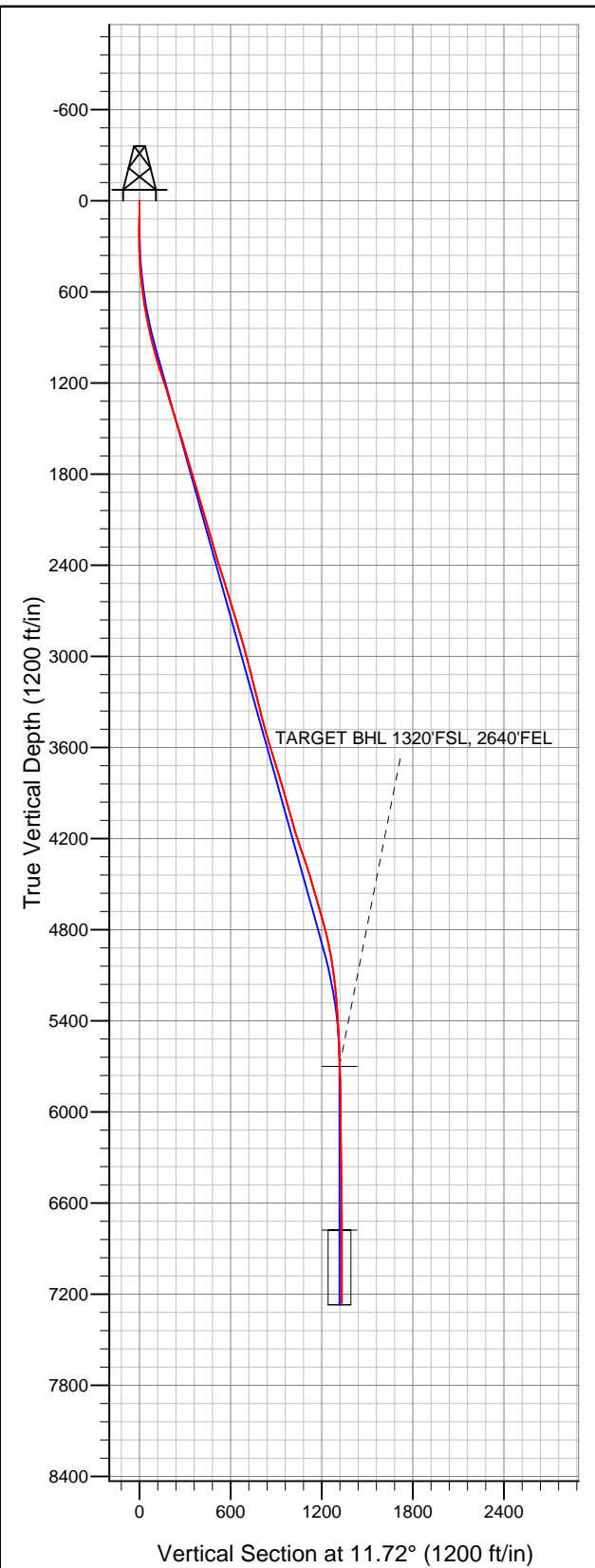
LEGEND

- HCW FD 24-20D, Wellbore #1, Plan #2 (10-24-12) R V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7439'MD & 7259'TVD @ 1332'VS
0.70 deg Inc 300.50 deg AZ

Project: SEC.24-T6N-R67W
Site: HCW FD 24-20D Pad Sec.24-T6N-R67W
Well: HCW FD 24-20D
Plan: Wellbore #1





Directional

Great Western

SEC.24-T6N-R67W

HCW FD 24-20D Pad Sec.24-T6N-R67W

HCW FD 24-20D

Wellbore #1

Survey: Survey #1

Standard Survey Report

01 November, 2012

Company:	Great Western	Local Co-ordinate Reference:	Well HCW FD 24-20D
Project:	SEC.24-T6N-R67W	TVD Reference:	WELL @ 4758.0ft (Original Well Elev)
Site:	HCW FD 24-20D Pad Sec.24-T6N-R67W	MD Reference:	WELL @ 4758.0ft (Original Well Elev)
Well:	HCW FD 24-20D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
1,172.0	18.50	5.00	1,155.3	143.8	36.4	148.2	1.71	1.37	-3.37	
1,266.0	17.80	3.60	1,244.7	173.0	38.6	177.2	0.88	-0.74	-1.49	
1,361.0	17.10	2.80	1,335.3	201.5	40.2	205.4	0.78	-0.74	-0.84	
1,456.0	17.30	6.00	1,426.0	229.5	42.3	233.3	1.02	0.21	3.37	
1,550.0	17.10	8.00	1,515.8	257.0	45.7	261.0	0.66	-0.21	2.13	
1,645.0	16.80	11.20	1,606.7	284.3	50.3	288.6	1.03	-0.32	3.37	
1,739.0	16.80	10.30	1,696.7	311.0	55.4	315.8	0.28	0.00	-0.96	
1,834.0	16.40	11.20	1,787.7	337.7	60.4	342.9	0.50	-0.42	0.95	
1,929.0	16.40	11.50	1,878.9	364.0	65.7	369.8	0.09	0.00	0.32	
2,026.0	17.00	12.20	1,971.8	391.3	71.4	397.6	0.65	0.62	0.72	
2,121.0	16.60	10.70	2,062.7	418.2	76.9	425.1	0.62	-0.42	-1.58	
2,215.0	16.00	12.40	2,152.9	444.0	82.2	451.5	0.82	-0.64	1.81	
2,310.0	15.70	11.90	2,244.3	469.4	87.6	477.4	0.35	-0.32	-0.53	
2,405.0	16.10	16.10	2,335.7	494.6	93.9	503.4	1.28	0.42	4.42	
2,499.0	17.50	16.10	2,425.7	520.7	101.5	530.5	1.49	1.49	0.00	
2,594.0	18.50	12.40	2,516.0	549.2	108.7	559.8	1.60	1.05	-3.89	
2,689.0	17.10	11.20	2,606.5	577.6	114.6	588.8	1.52	-1.47	-1.26	
2,783.0	16.10	14.20	2,696.6	603.8	120.5	615.7	1.40	-1.06	3.19	
2,878.0	17.00	14.00	2,787.6	630.0	127.1	642.7	0.95	0.95	-0.21	
2,972.0	16.50	10.70	2,877.7	656.5	132.9	669.8	1.14	-0.53	-3.51	
3,067.0	14.70	13.70	2,969.2	681.5	138.3	695.3	2.08	-1.89	3.16	
3,162.0	15.20	8.70	3,060.9	705.5	143.0	719.8	1.46	0.53	-5.26	
3,256.0	13.50	8.90	3,152.0	728.5	146.6	743.1	1.81	-1.81	0.21	
3,351.0	14.20	10.00	3,244.2	750.9	150.3	765.8	0.79	0.74	1.16	
3,445.0	14.10	8.40	3,335.4	773.6	154.0	788.8	0.43	-0.11	-1.70	
3,540.0	14.10	13.10	3,427.5	796.3	158.3	811.9	1.20	0.00	4.95	
3,635.0	16.40	12.90	3,519.2	820.7	163.9	836.9	2.42	2.42	-0.21	
3,729.0	17.10	10.80	3,609.2	847.2	169.5	863.9	0.98	0.74	-2.23	
3,824.0	17.40	9.30	3,699.9	874.9	174.4	892.1	0.56	0.32	-1.58	
3,919.0	17.00	8.40	3,790.7	902.7	178.7	920.2	0.51	-0.42	-0.95	
4,013.0	16.30	11.90	3,880.7	929.2	183.4	947.1	1.30	-0.74	3.72	
4,108.0	15.10	16.10	3,972.2	954.1	189.6	972.7	1.74	-1.26	4.42	
4,203.0	15.90	16.80	4,063.7	978.5	196.8	998.0	0.86	0.84	0.74	
4,297.0	17.10	15.10	4,153.9	1,004.1	204.1	1,024.7	1.38	1.28	-1.81	
4,392.0	18.70	13.70	4,244.3	1,032.4	211.4	1,053.8	1.74	1.68	-1.47	
4,487.0	19.80	13.10	4,333.9	1,062.9	218.6	1,085.1	1.18	1.16	-0.63	
4,581.0	16.10	12.10	4,423.4	1,091.1	225.0	1,114.1	3.95	-3.94	-1.06	
4,676.0	16.40	12.90	4,514.6	1,117.1	230.7	1,140.7	0.39	0.32	0.84	
4,770.0	16.30	14.70	4,604.8	1,142.8	237.0	1,167.1	0.55	-0.11	1.91	
4,865.0	16.40	11.90	4,695.9	1,168.8	243.2	1,193.8	0.84	0.11	-2.95	
4,960.0	14.80	11.70	4,787.4	1,193.8	248.4	1,219.4	1.69	-1.68	-0.21	
5,054.0	11.80	12.40	4,878.9	1,215.0	252.9	1,241.0	3.20	-3.19	0.74	
5,149.0	10.50	15.80	4,972.1	1,232.8	257.3	1,259.4	1.53	-1.37	3.58	
5,244.0	8.00	16.50	5,065.8	1,247.5	261.6	1,274.6	2.63	-2.63	0.74	
5,339.0	6.10	18.00	5,160.1	1,258.6	265.0	1,286.2	2.01	-2.00	1.58	
5,434.0	5.20	19.20	5,254.7	1,267.5	268.0	1,295.5	0.96	-0.95	1.26	
5,528.0	3.80	19.50	5,348.4	1,274.4	270.4	1,302.8	1.49	-1.49	0.32	
5,623.0	3.10	11.00	5,443.2	1,279.9	272.0	1,308.5	0.91	-0.74	-8.95	
5,718.0	2.30	11.70	5,538.1	1,284.3	272.8	1,312.9	0.84	-0.84	0.74	
5,880.0	1.73	4.07	5,700.0	1,289.9	273.7	1,318.6	0.39	-0.35	-4.71	
TARGET BHL 1320'FSL, 2640'FEL										
5,918.0	1.60	1.50	5,738.0	1,291.0	273.7	1,319.7	0.39	-0.34	-6.75	
6,095.0	1.30	356.60	5,914.9	1,295.5	273.7	1,324.1	0.18	-0.17	-2.77	
6,286.0	1.30	257.70	6,105.9	1,297.2	271.4	1,325.3	1.03	0.00	-51.78	

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Well:	HCW FD 24-20D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
6,475.0	1.30	6.60	6,294.9	1,298.9	269.6	1,326.5	1.12	0.00	57.62	
6,664.0	1.00	327.80	6,483.8	1,302.4	269.0	1,329.9	0.43	-0.16	-20.53	
6,854.0	1.40	288.20	6,673.8	1,304.5	265.9	1,331.3	0.47	0.21	-20.84	
6,958.1	1.12	282.25	6,777.9	1,305.1	263.7	1,331.5	0.30	-0.27	-5.71	
TARGET CIRCLE 1320'FSL & 2640'FEL										
7,043.0	0.90	274.70	6,862.7	1,305.4	262.2	1,331.4	0.30	-0.26	-8.90	
7,232.0	0.90	281.40	7,051.7	1,305.8	259.3	1,331.2	0.06	0.00	3.54	
7,389.0	0.70	300.50	7,208.7	1,306.5	257.2	1,331.5	0.21	-0.13	12.17	
7,439.0	0.70	300.50	7,258.7	1,306.8	256.7	1,331.7	0.00	0.00	0.00	

Wellbore Targets										
Target Name										
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N-S (ft)	+E-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude	
- Shape										
TARGET BHL 1320'F:	0.00	0.00	5,700.0	1,289.3	267.4	1,414,347.91	3,183,074.88	40.468922	-104.841989	
- survey misses target center by 6.3ft at 5880.0ft MD (5700.0 TVD, 1289.9 N, 273.7 E)										
- Point										
TARGET CIRCLE 1320'F:	0.00	0.00	6,778.0	1,289.3	267.4	1,414,347.91	3,183,074.88	40.468922	-104.841989	
- survey misses target center by 16.2ft at 6958.1ft MD (6777.9 TVD, 1305.1 N, 263.7 E)										
- Circle (radius 75.0)										

Checked By: _____ Approved By: _____ Date: _____