

Chevron USA

Piceance

SKR-698-04-AV

SKR-698-04-AV-03 - Slot 3

698-4-5

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

03 March, 2009

Well Coordinates (NAD83): 1,641,095.40 N, 2,199,822.70 E (39° 33' 33.38" N, 108° 20' 18.62" W)

Ground Level: 5,959.00 ft

Local Coordinate Origin: Centered on Well SKR-698-04-AV-03 (Slot 3) - Slot S

Viewing Datum: RFE @ 5984.0ft (RFE)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet

Version: 2003.16 Build: 431

HALLIBURTON

Project: Piceance
Site: SKR-698-04-AV
Well: SKR-698-04-AV-03
Wellbore: 698-4-5
Plan: Actual Field Surveys

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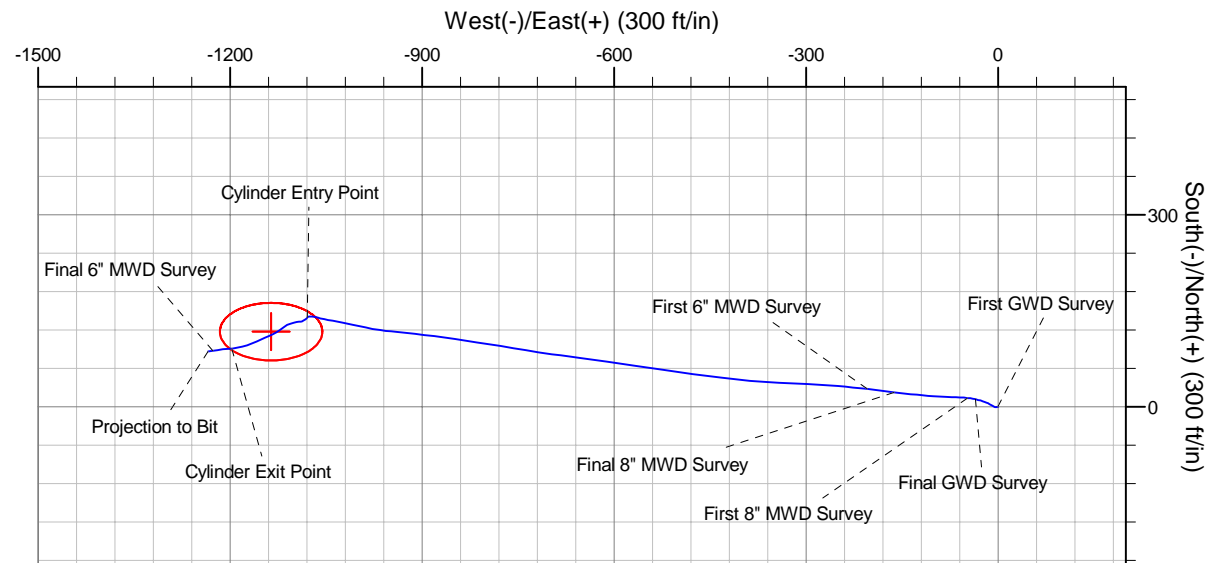
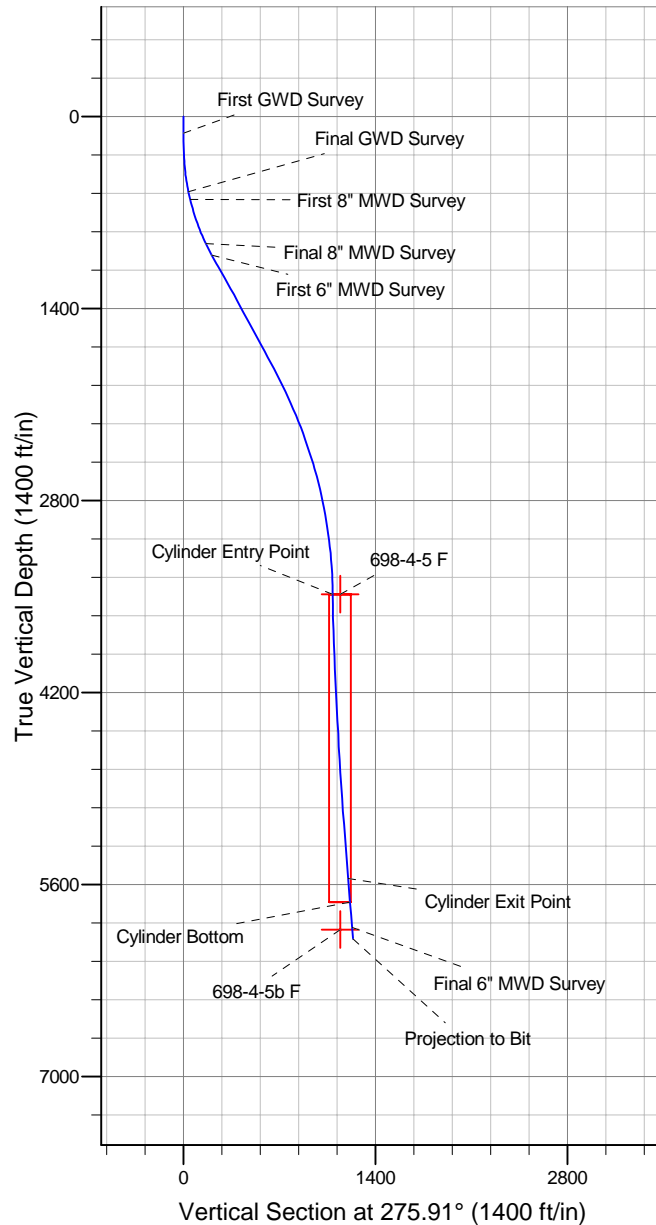
Drilling and Formation
Evaluation

WELL DETAILS: SKR-698-04-AV-03

+N/-S	+E/-W	Northing	Ground Level: 5959.0	Easting	Latitude	Longitude	Slot
0.0	0.0	1641095.40		2199822.70	39° 33' 33.382 N	108° 20' 18.620 W	Slot 3

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
698-4-5 F	3483.0	117.5	-1135.7	1641212.94	2198687.05	Ellipse (Radii: L45.0 W80.0)
698-4-5b F	5928.0	117.5	-1135.7	1641212.94	2198687.05	Point



Design Report for SKR-698-04-AV-03 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
122.0	0.09	311.34	122.0	0.1	-0.1	0.1	0.07
First GWD Survey							
181.0	1.59	266.40	181.0	0.0	-0.9	0.9	2.59
243.0	2.56	251.78	243.0	-0.4	-3.1	3.0	1.77
304.0	3.00	302.35	303.9	0.0	-5.7	5.7	3.95
365.0	5.11	301.82	364.7	2.3	-9.4	9.6	3.46
427.0	7.58	294.60	426.3	5.4	-15.5	15.9	4.18
488.0	9.69	289.13	486.7	8.8	-24.0	24.7	3.71
550.0	11.98	283.14	547.5	12.0	-35.2	36.2	4.11
Final GWD Survey							
608.0	13.49	275.00	604.1	13.9	-47.8	49.0	4.04
First 8" MWD Survey							
700.0	17.27	271.66	692.8	15.2	-72.1	73.3	4.22
792.0	19.68	273.79	780.1	16.7	-101.2	102.4	2.72
887.0	23.32	276.23	868.4	19.8	-135.9	137.2	3.94
950.0	26.22	276.62	925.6	22.7	-162.1	163.6	4.61
Final 8" MWD Survey							
1,044.0	27.47	277.26	1,009.5	27.9	-204.3	206.0	1.36
First 6" MWD Survey							
1,139.0	30.17	274.20	1,092.7	32.4	-249.8	251.8	3.24
1,233.0	29.54	273.32	1,174.3	35.5	-296.5	298.6	0.82
1,327.0	29.19	272.61	1,256.2	37.8	-342.5	344.6	0.53
1,422.0	27.84	274.93	1,339.7	40.8	-387.8	389.9	1.84
1,516.0	28.24	277.32	1,422.6	45.5	-431.7	434.1	1.27
1,611.0	28.98	277.52	1,506.0	51.4	-476.8	479.6	0.79
1,705.0	28.23	278.44	1,588.6	57.6	-521.4	524.6	0.93
1,800.0	29.18	278.37	1,671.9	64.3	-566.5	570.1	1.00
1,894.0	27.60	277.37	1,754.6	70.4	-610.8	614.8	1.76
1,988.0	28.19	278.50	1,837.7	76.5	-654.4	658.8	0.84
2,083.0	26.06	277.08	1,922.2	82.4	-697.3	702.0	2.34
2,177.0	25.48	280.20	2,006.9	88.5	-737.7	742.8	1.57
2,271.0	24.17	279.08	2,092.2	95.1	-776.6	782.2	1.48
2,366.0	22.81	278.69	2,179.3	101.0	-814.0	820.0	1.44
2,460.0	21.05	277.83	2,266.5	106.0	-848.7	855.1	1.90
2,554.0	19.06	277.57	2,354.8	110.4	-880.6	887.3	2.12
2,649.0	18.08	276.15	2,444.8	114.0	-910.7	917.6	1.14
2,743.0	17.27	275.55	2,534.4	116.9	-939.1	946.1	0.88
2,838.0	14.97	277.89	2,625.7	120.0	-965.3	972.5	2.52
2,932.0	13.35	282.35	2,716.8	123.9	-987.9	995.4	2.08
3,026.0	11.39	281.77	2,808.6	128.2	-1,007.6	1,015.4	2.09
3,121.0	9.48	281.70	2,902.0	131.7	-1,024.4	1,032.5	2.01
3,215.0	9.12	279.88	2,994.8	134.5	-1,039.3	1,047.7	0.49
3,310.0	7.50	281.39	3,088.8	137.0	-1,052.8	1,061.4	1.72
3,404.0	5.87	285.39	3,182.2	139.5	-1,063.5	1,072.2	1.80
3,498.0	4.15	276.84	3,275.8	141.2	-1,071.5	1,080.3	1.99
3,593.0	2.38	252.82	3,370.6	141.0	-1,076.8	1,085.6	2.32
3,687.0	1.11	196.19	3,464.6	139.6	-1,078.9	1,087.6	2.12
3,705.4	1.08	204.66	3,483.0	139.2	-1,079.0	1,087.6	0.90
Cylinder Entry Point							

Design Report for SKR-698-04-AV-03 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,706.4	1.07	205.15	3,484.0	139.2	-1,079.1	1,087.6	0.90
698-4-5 F							
3,781.0	1.19	239.06	3,558.6	138.2	-1,080.0	1,088.5	0.90
3,876.0	1.97	233.31	3,653.6	136.7	-1,082.2	1,090.5	0.84
3,970.0	2.80	240.65	3,747.5	134.6	-1,085.5	1,093.6	0.94
4,064.0	1.93	259.47	3,841.4	133.2	-1,089.0	1,096.9	1.23
4,158.0	1.74	270.55	3,935.3	132.9	-1,092.0	1,099.9	0.43
4,253.0	2.40	260.15	4,030.3	132.6	-1,095.4	1,103.2	0.80
4,347.0	2.98	254.57	4,124.2	131.6	-1,099.7	1,107.4	0.68
4,442.0	3.48	255.31	4,219.0	130.2	-1,104.9	1,112.4	0.53
4,536.0	3.89	242.35	4,312.8	128.0	-1,110.5	1,117.7	0.98
4,630.0	3.89	233.88	4,406.6	124.7	-1,115.9	1,122.8	0.61
4,724.0	4.32	234.69	4,500.4	120.7	-1,121.3	1,127.8	0.46
4,819.0	4.12	236.27	4,595.1	116.8	-1,127.1	1,133.1	0.24
4,913.0	3.97	242.71	4,688.9	113.4	-1,132.8	1,138.4	0.51
5,007.0	4.18	248.88	4,782.6	110.7	-1,138.9	1,144.2	0.52
5,102.0	4.09	244.68	4,877.4	108.0	-1,145.2	1,150.2	0.33
5,196.0	4.35	244.73	4,971.1	105.0	-1,151.4	1,156.1	0.28
5,290.0	4.64	247.62	5,064.9	102.1	-1,158.2	1,162.5	0.39
5,385.0	5.04	249.19	5,159.5	99.1	-1,165.6	1,169.6	0.44
5,479.0	4.75	251.87	5,253.2	96.4	-1,173.2	1,176.9	0.39
5,574.0	4.68	255.74	5,347.9	94.3	-1,180.7	1,184.1	0.34
5,668.0	4.67	255.88	5,441.5	92.4	-1,188.1	1,191.3	0.02
5,763.0	4.60	264.74	5,536.2	91.1	-1,195.6	1,198.7	0.76
5,781.8	4.64	265.35	5,555.0	91.0	-1,197.1	1,200.1	0.32
Cylinder Exit Point							
5,857.0	4.78	267.69	5,629.9	90.6	-1,203.3	1,206.2	0.32
5,951.0	4.74	262.38	5,723.6	89.9	-1,211.1	1,213.9	0.47
5,956.4	4.75	262.31	5,729.0	89.8	-1,211.5	1,214.3	0.22
Cylinder Bottom							
6,046.0	4.92	261.14	5,818.3	88.8	-1,219.0	1,221.6	0.22
6,140.0	4.85	261.37	5,911.9	87.5	-1,226.9	1,229.4	0.08
Final 6" MWD Survey - 698-4-5b F							
6,225.0	4.85	261.37	5,996.6	86.5	-1,234.0	1,236.3	0.00
Projection to Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
122.0	122.0	0.1	-0.1	First GWD Survey
550.0	547.5	12.0	-35.2	Final GWD Survey
608.0	604.1	13.9	-47.8	First 8" MWD Survey
950.0	925.6	22.7	-162.1	Final 8" MWD Survey
1,044.0	1,009.5	27.9	-204.3	First 6" MWD Survey
3,705.4	3,483.0	139.2	-1,079.0	Cylinder Entry Point
5,781.8	5,555.0	91.0	-1,197.1	Cylinder Exit Point
5,956.4	5,729.0	89.8	-1,211.5	Cylinder Bottom
6,140.0	5,911.9	87.5	-1,226.9	Final 6" MWD Survey
6,225.0	5,996.6	86.5	-1,234.0	Projection to Bit

Design Report for SKR-698-04-AV-03 - Actual Field Surveys**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	698-4-5 F	275.91	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
122.0	550.0	GWD Surveys	GYD_GWD_SS
608.0	950.0	8" EM Surveys	MWD
1,044.0	6,225.0	6" EM Surveys	MWD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
698-4-5b F	0.00	0.00	5,928.0	117.5	-1,135.7	1,641,212.94	2,198,687.05	39° 33' 34.193 N	108° 20' 33.160 W
- actual wellpath misses target center by 97.4ft at 6140.0ft MD (5911.9 TVD, 87.5 N, -1226.9 E)									
- Point									
698-4-5 F	0.00	0.00	3,483.0	117.5	-1,135.7	1,641,212.94	2,198,687.05	39° 33' 34.193 N	108° 20' 33.160 W
- actual wellpath misses target center by 60.6ft at 3706.2ft MD (3483.8 TVD, 139.2 N, -1079.0 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 92.25% Intersected									