

# Chevron USA

Piceance

SKR-598-36-BV (New)

SKR-598-36-BV-09 - Slot 9

598-35-75

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

30 January, 2009

Well Coordinates (NAD83): 1,643,861.61 N, 2,197,620.49 E (39° 34' 00.03" N, 108° 20' 47.83" W)

Ground Level: 6,032.60 ft

Local Coordinate Origin: Centered on Well SKR-598-36-BV-09 (Slot 9) - Slot S

Viewing Datum: RFE @ 6057.6ft (Original Well Elev)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet

Version: 2003.16 Build: 431

**HALLIBURTON**

Project: Piceance  
 Site: SKR-598-36-BV (New)  
 Well: SKR-598-36-BV-09  
 Wellbore: 598-35-75  
 Plan: Actual Field Surveys

# Chevron USA

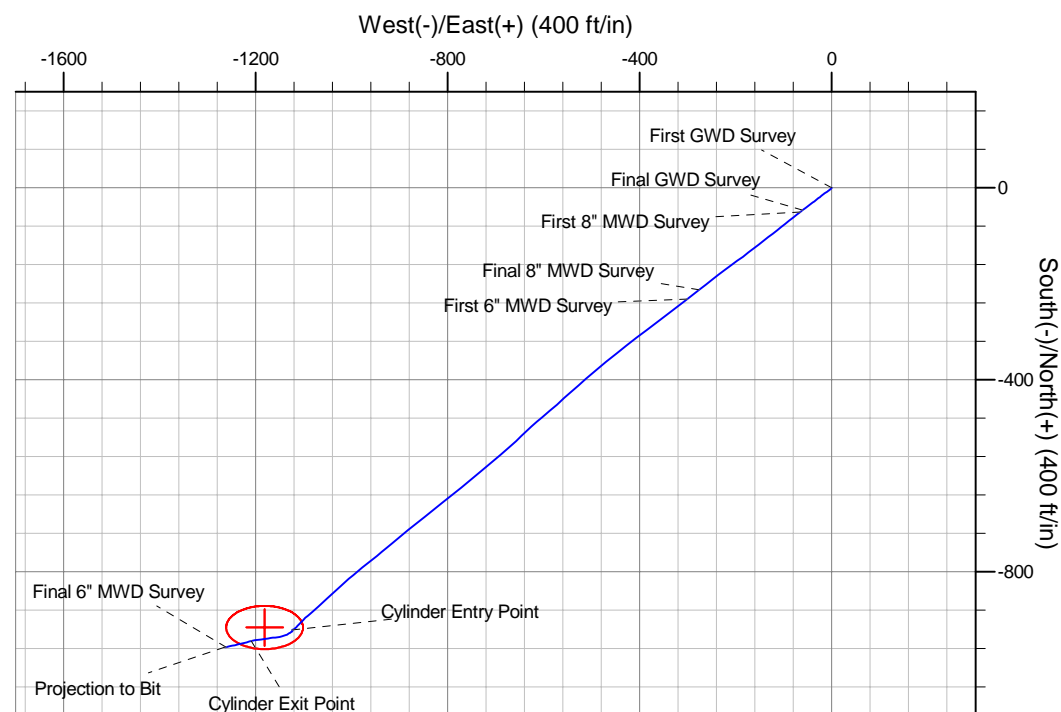
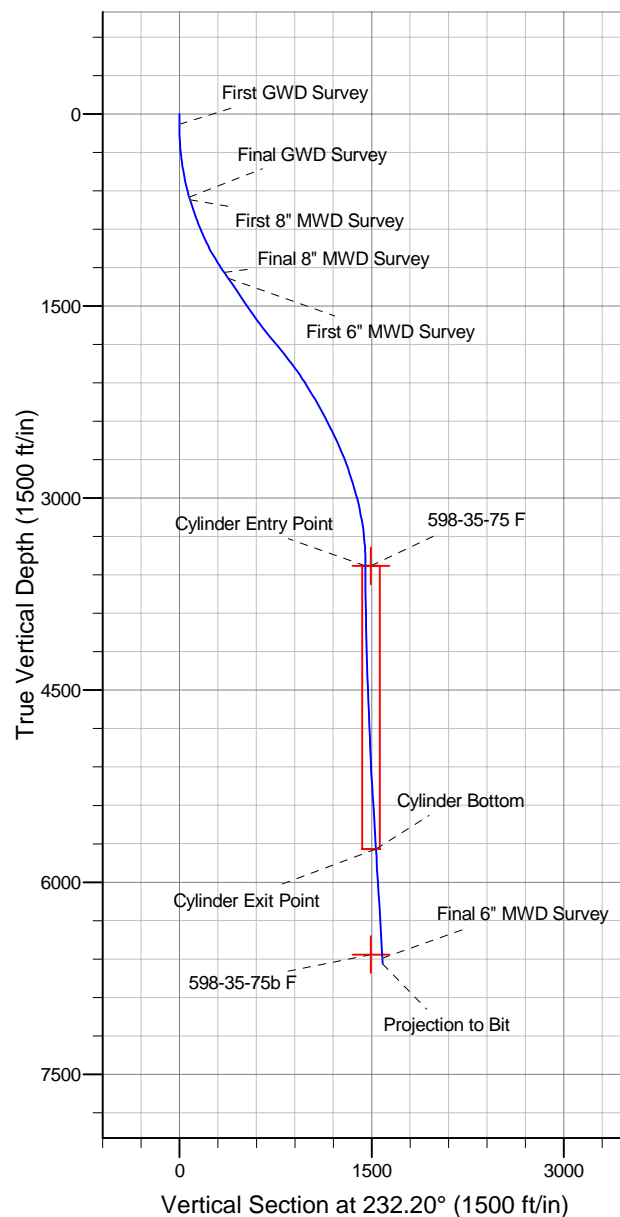
**HALLIBURTON**  
 Drilling and Formation  
 Evaluation

## WELL DETAILS: SKR-598-36-BV-09

			Ground Level: 6032.6				
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot	
0.0	0.0	1643861.61	2197620.49	39° 34' 0.028 N 108° 20' 47.831 W	Slot 9		

## WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-35-75 F	3529.0	-916.2	-1181.1	1642945.46	2196439.36	Ellipse (Radii: L45.0 W80.0)
598-35-75b F	6566.0	-916.2	-1181.1	1642945.46	2196439.36	Point



## Design Report for SKR-598-36-BV-09 - 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
78.0	0.26	190.99	78.0	-0.2	0.0	0.1	0.33
<b>First GWD Survey</b>							
101.0	0.26	143.06	101.0	-0.3	0.0	0.2	0.92
133.0	0.70	188.35	133.0	-0.5	0.0	0.3	1.72
164.0	1.59	213.19	164.0	-1.1	-0.3	0.9	3.22
195.0	2.38	223.41	195.0	-1.9	-0.9	1.9	2.78
225.0	3.61	229.41	224.9	-3.0	-2.1	3.5	4.23
256.0	4.67	231.70	255.9	-4.4	-3.8	5.7	3.46
286.0	5.55	230.64	285.7	-6.1	-5.9	8.4	2.95
317.0	6.52	236.98	316.6	-8.0	-8.5	11.6	3.79
348.0	7.22	236.45	347.3	-10.0	-11.6	15.3	2.27
378.0	7.93	235.04	377.1	-12.2	-14.9	19.3	2.45
409.0	8.90	231.52	407.7	-14.9	-18.5	23.8	3.54
440.0	9.69	232.93	438.3	-18.0	-22.5	28.8	2.65
471.0	10.66	231.52	468.8	-21.4	-26.8	34.3	3.23
501.0	11.54	230.99	498.3	-25.0	-31.3	40.1	2.95
532.0	12.42	232.05	528.6	-29.0	-36.4	46.5	2.93
563.0	13.30	234.52	558.8	-33.1	-41.9	53.4	3.35
594.0	14.01	233.28	589.0	-37.4	-47.8	60.7	2.48
624.0	15.07	233.46	618.0	-41.9	-53.8	68.2	3.54
655.0	15.77	232.75	647.9	-46.9	-60.4	76.5	2.34
<b>Final GWD Survey</b>							
678.0	16.80	232.54	670.0	-50.8	-65.6	82.9	4.49
<b>First 8" MWD Survey</b>							
709.0	17.72	231.96	699.6	-56.4	-72.8	92.1	3.02
741.0	18.48	231.05	730.0	-62.6	-80.6	102.1	2.53
772.0	19.10	231.83	759.3	-68.8	-88.4	112.0	2.16
804.0	19.50	232.35	789.5	-75.3	-96.8	122.6	1.36
835.0	19.89	232.00	818.7	-81.7	-105.0	133.1	1.31
866.0	20.90	231.17	847.8	-88.4	-113.5	143.9	3.39
898.0	21.88	231.34	877.6	-95.7	-122.6	155.5	3.07
929.0	23.37	232.37	906.2	-103.1	-132.0	167.5	4.97
961.0	23.84	232.60	935.5	-110.9	-142.1	180.3	1.50
992.0	24.14	231.52	963.8	-118.7	-152.1	192.9	1.72
1,024.0	24.88	231.71	992.9	-126.9	-162.5	206.2	2.33
1,055.0	26.00	233.00	1,020.9	-135.0	-173.0	219.5	4.03
1,087.0	27.65	233.95	1,049.5	-143.6	-184.6	233.9	5.33
1,118.0	29.63	233.81	1,076.7	-152.4	-196.6	248.8	6.39
1,150.0	30.72	233.96	1,104.4	-161.9	-209.6	264.8	3.41
1,181.0	31.12	232.84	1,130.9	-171.4	-222.4	280.8	2.26
1,213.0	31.63	232.69	1,158.3	-181.4	-235.7	297.4	1.61
1,244.0	32.60	232.11	1,184.5	-191.5	-248.7	313.9	3.28
1,276.0	33.32	231.28	1,211.4	-202.3	-262.4	331.3	2.66
1,307.0	34.31	232.11	1,237.1	-213.0	-275.9	348.6	3.52
<b>Final 8" MWD Survey</b>							
1,362.0	35.40	232.10	1,282.3	-232.3	-300.7	380.0	1.98
<b>First 6" MWD Survey</b>							
1,456.0	34.10	232.60	1,359.5	-265.0	-343.1	433.6	1.42
1,551.0	33.20	233.40	1,438.6	-296.7	-385.2	486.2	1.06

## Design Report for SKR-598-36-BV-09 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
1,645.0	34.80	231.90	1,516.5	-328.6	-427.0	538.8	1.92
1,740.0	35.70	230.40	1,594.1	-363.0	-469.6	593.6	1.31
1,834.0	37.70	229.70	1,669.5	-399.1	-512.7	649.7	2.17
1,928.0	40.00	227.30	1,742.7	-438.2	-556.8	708.5	2.92
2,023.0	39.30	230.70	1,815.8	-477.9	-602.6	769.0	2.40
2,117.0	38.90	225.60	1,888.8	-517.4	-646.7	828.1	3.45
2,212.0	36.60	230.00	1,963.9	-556.5	-689.7	886.1	3.73
2,306.0	34.30	230.00	2,040.5	-591.6	-731.5	940.6	2.45
2,401.0	31.50	230.90	2,120.2	-624.4	-771.3	992.1	2.99
2,495.0	31.90	231.70	2,200.2	-655.3	-809.8	1,041.5	0.62
2,590.0	29.60	231.10	2,281.8	-685.6	-847.8	1,090.1	2.44
2,684.0	26.70	230.70	2,364.7	-713.6	-882.2	1,134.4	3.09
2,778.0	27.20	230.50	2,448.5	-740.6	-915.1	1,177.0	0.54
2,873.0	24.90	231.60	2,533.9	-766.8	-947.5	1,218.7	2.47
2,967.0	23.80	230.80	2,619.5	-791.1	-977.7	1,257.5	1.22
3,062.0	21.20	229.20	2,707.3	-814.5	-1,005.6	1,293.8	2.81
3,156.0	18.60	227.60	2,795.6	-835.7	-1,029.5	1,325.7	2.83
3,251.0	16.70	227.20	2,886.2	-855.2	-1,050.7	1,354.4	2.00
3,345.0	15.00	226.80	2,976.6	-872.7	-1,069.5	1,380.0	1.81
3,440.0	12.70	229.80	3,068.8	-887.8	-1,086.5	1,402.6	2.54
3,534.0	10.30	225.40	3,160.9	-900.4	-1,100.3	1,421.3	2.72
3,629.0	7.20	223.50	3,254.8	-910.7	-1,110.5	1,435.6	3.28
3,723.0	4.60	228.60	3,348.3	-917.5	-1,117.4	1,445.2	2.82
3,818.0	2.50	251.10	3,443.1	-920.7	-1,122.2	1,451.0	2.61
3,903.9	0.38	154.15	3,529.0	-921.5	-1,123.8	1,452.8	3.00
Cylinder Entry Point - 598-35-75 F							
3,912.0	0.50	126.30	3,537.1	-921.6	-1,123.8	1,452.8	3.00
4,006.0	0.70	153.70	3,631.1	-922.3	-1,123.2	1,452.8	0.37
4,101.0	0.60	182.70	3,726.1	-923.3	-1,123.0	1,453.3	0.36
4,196.0	0.80	234.20	3,821.1	-924.2	-1,123.5	1,454.2	0.67
4,290.0	1.10	240.90	3,915.1	-925.0	-1,124.9	1,455.8	0.34
4,384.0	1.00	228.70	4,009.0	-926.0	-1,126.3	1,457.5	0.26
4,479.0	1.20	243.10	4,104.0	-927.0	-1,127.8	1,459.3	0.36
4,573.0	1.40	240.10	4,198.0	-928.0	-1,129.7	1,461.4	0.22
4,667.0	1.80	241.10	4,292.0	-929.3	-1,131.9	1,464.0	0.43
4,762.0	1.80	239.50	4,386.9	-930.8	-1,134.5	1,467.0	0.05
4,856.0	2.30	249.90	4,480.9	-932.2	-1,137.6	1,470.2	0.66
4,951.0	2.30	253.00	4,575.8	-933.4	-1,141.2	1,473.8	0.13
5,045.0	2.70	253.50	4,669.7	-934.6	-1,145.1	1,477.6	0.43
5,140.0	3.00	256.90	4,764.6	-935.8	-1,149.7	1,482.0	0.36
5,234.0	2.90	262.40	4,858.4	-936.7	-1,154.4	1,486.3	0.32
5,329.0	2.80	267.90	4,953.3	-937.1	-1,159.1	1,490.2	0.31
5,423.0	2.90	262.80	5,047.2	-937.4	-1,163.8	1,494.1	0.29
5,518.0	3.00	262.00	5,142.1	-938.1	-1,168.6	1,498.4	0.11
5,612.0	3.70	262.40	5,235.9	-938.8	-1,174.1	1,503.1	0.75
5,707.0	4.50	259.70	5,330.7	-939.9	-1,180.8	1,509.1	0.87
5,801.0	4.60	261.20	5,424.4	-941.1	-1,188.1	1,515.7	0.17
5,896.0	4.20	264.00	5,519.1	-942.1	-1,195.4	1,521.9	0.48
5,990.0	3.80	265.40	5,612.9	-942.7	-1,201.9	1,527.5	0.44
6,085.0	3.20	255.10	5,707.7	-943.6	-1,207.6	1,532.5	0.91
6,118.4	3.30	253.75	5,741.0	-944.1	-1,209.4	1,534.3	0.39

## Design Report for SKR-598-36-BV-09 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Cylinder Bottom - Cylinder Exit Point							
6,179.0	3.50	251.50	5,801.5	-945.2	-1,212.8	1,537.7	0.39
6,273.0	3.70	252.40	5,895.4	-947.0	-1,218.5	1,543.2	0.22
6,368.0	3.70	257.70	5,990.2	-948.6	-1,224.4	1,548.9	0.36
6,462.0	3.80	255.80	6,084.0	-950.0	-1,230.4	1,554.5	0.17
6,557.0	4.00	256.80	6,178.7	-951.6	-1,236.6	1,560.4	0.22
6,651.0	3.70	258.40	6,272.5	-952.9	-1,242.8	1,566.1	0.34
6,745.0	3.60	256.10	6,366.3	-954.2	-1,248.6	1,571.5	0.19
6,840.0	3.30	257.80	6,461.2	-955.5	-1,254.2	1,576.7	0.33
6,934.0	3.20	260.50	6,555.0	-956.5	-1,259.4	1,581.4	0.19
6,940.3	3.20	260.06	6,561.3	-956.6	-1,259.8	1,581.7	0.40
598-35-75b F							
6,972.0	3.20	257.80	6,592.9	-956.9	-1,261.5	1,583.3	0.40
Final 6" MWD Survey							
7,019.0	3.20	257.80	6,639.9	-957.5	-1,264.1	1,585.7	0.00
Projection to Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
78.0	78.0	-0.2	0.0	First GWD Survey
655.0	647.9	-46.9	-60.4	Final GWD Survey
678.0	670.0	-50.8	-65.6	First 8" MWD Survey
1,307.0	1,237.1	-213.0	-275.9	Final 8" MWD Survey
1,362.0	1,282.3	-232.3	-300.7	First 6" MWD Survey
3,903.9	3,529.0	-921.5	-1,123.8	Cylinder Entry Point
6,118.4	5,741.0	-944.1	-1,209.4	Cylinder Bottom
6,118.4	5,741.0	-944.1	-1,209.4	Cylinder Exit Point
6,972.0	6,592.9	-956.9	-1,261.5	Final 6" MWD Survey
7,019.0	6,639.9	-957.5	-1,264.1	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	598-35-75 F	232.20	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
78.0	655.0	GWD Surveys	GYD_GWD_SS
678.0	1,307.0	8" EM Surveys	MWD
1,362.0	7,019.0	6" EM Surveys	MWD

**Design Report for SKR-598-36-BV-09 - Actual Field Surveys****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
598-35-75 F	0.00	0.00	3,529.0	-916.2	-1,181.1	1,642,945.46	2,196,439.36	39° 33' 50.611 N	108° 21' 2.540 W
- actual wellpath misses target center by 57.5ft at 3903.9ft MD (3529.0 TVD, -921.5 N, -1123.8 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									
598-35-75b F	0.00	0.00	6,566.0	-916.2	-1,181.1	1,642,945.46	2,196,439.36	39° 33' 50.611 N	108° 21' 2.540 W
- actual wellpath misses target center by 88.6ft at 6940.3ft MD (6561.3 TVD, -956.6 N, -1259.8 E)									
- Point									