

# Chevron USA

Piceance

SKR-598-36-BV (New)

SKR-598-36-BV-11 - Slot 11

598-35-76

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

12 February, 2009

Well Coordinates (NAD83): 1,643,854.62 N, 2,197,622.97 E (39° 33' 59.96" N, 108° 20' 47.80" W)

Ground Level: 6,032.60 ft

Local Coordinate Origin: Centered on Well SKR-598-36-BV-11 (Slot 11) - Slot

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-11  
 Wellbore: 598-35-76  
 Plan: Actual Field Surveys

# Chevron USA

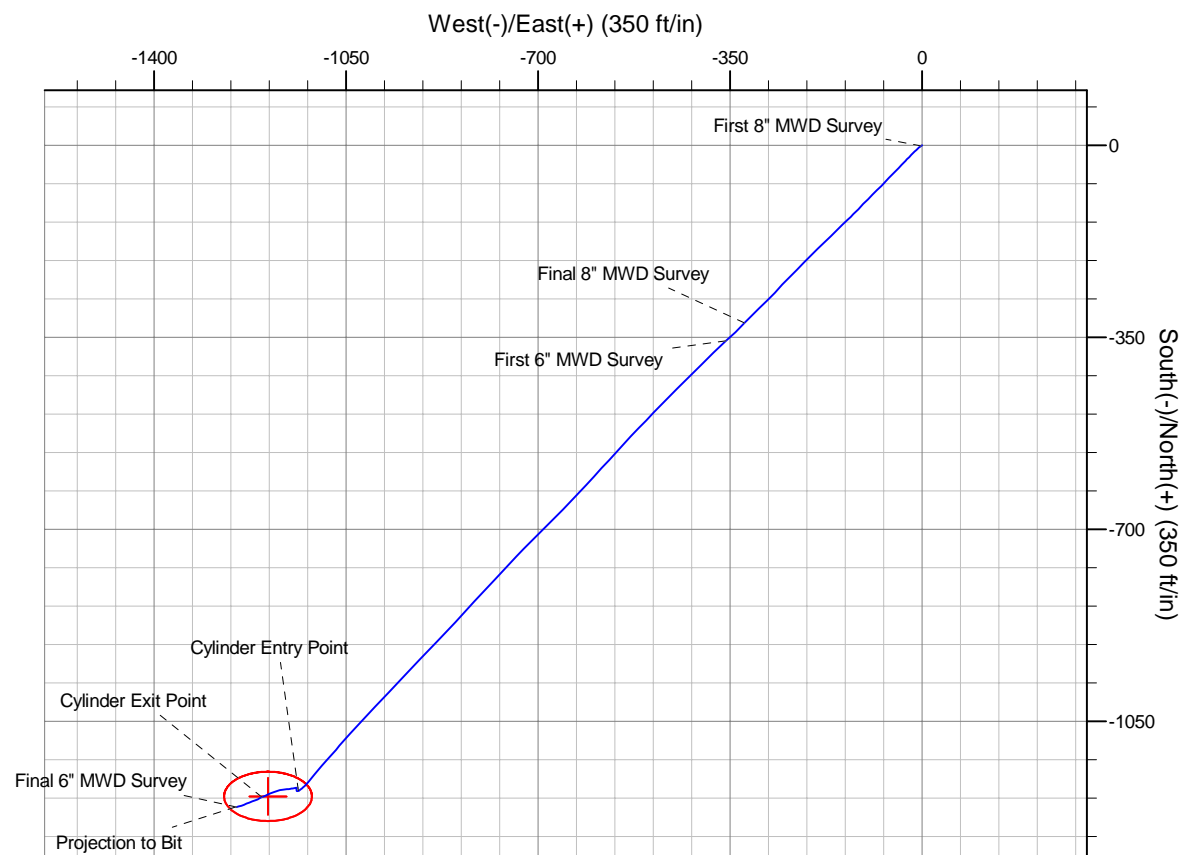
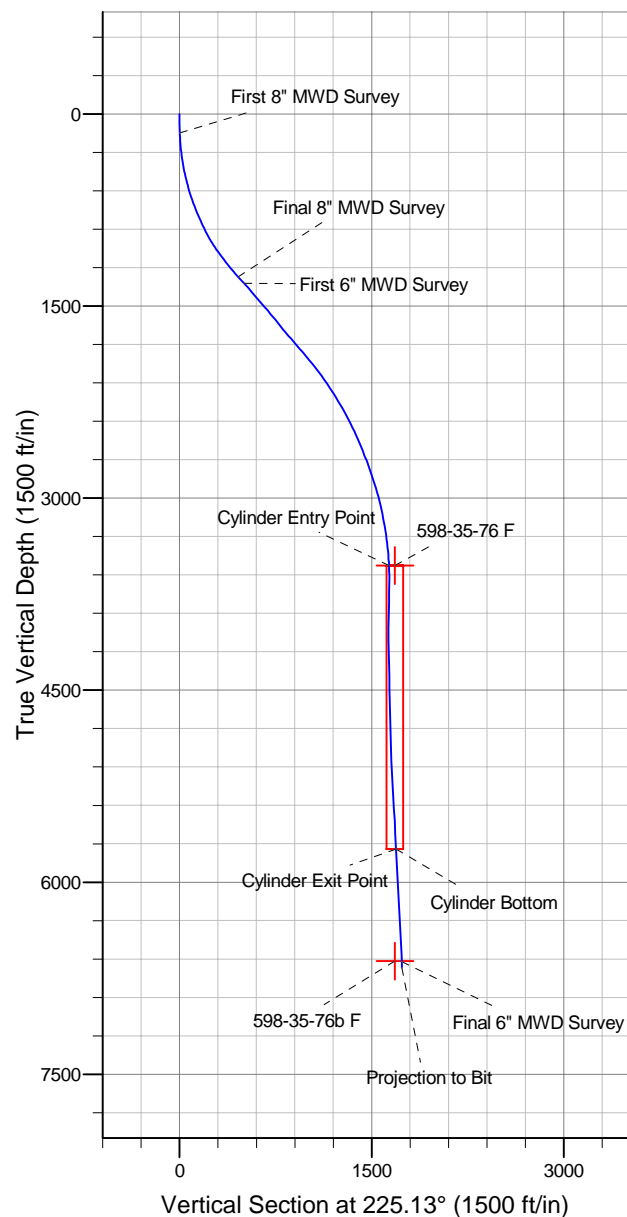
**HALLIBURTON**  
 Drilling and Formation  
 Evaluation

## WELL DETAILS: SKR-598-36-BV-11

+N/-S	+E/-W	Northing	Easting	Ground Level: 6032.6	Latitude	Longitude	Slot
0.0	0.0	1643854.62	2197622.97		39° 33' 59.959 N	108° 20' 47.797 W	Slot 11

## WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-35-76 F	3527.0	-1186.8	-1192.4	1642667.84	2196430.60	Ellipse (Radii: L45.0 W80.0)
598-35-76b F	6616.0	-1186.8	-1192.4	1642667.84	2196430.60	Point



## Design Report for SKR-598-36-BV-11 - 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
146.0	1.70	243.30	146.0	-1.0	-1.9	2.1	1.16
<b>First 8" MWD Survey</b>							
177.0	2.70	234.70	177.0	-1.6	-2.9	3.2	3.39
208.0	4.00	230.50	207.9	-2.7	-4.4	5.0	4.26
238.0	5.00	226.60	237.8	-4.3	-6.1	7.4	3.48
269.0	5.80	227.60	268.7	-6.3	-8.3	10.3	2.60
300.0	6.60	226.50	299.5	-8.5	-10.7	13.6	2.61
331.0	7.50	225.50	330.3	-11.2	-13.5	17.4	2.93
361.0	8.60	223.70	360.0	-14.2	-16.4	21.6	3.76
392.0	9.70	224.80	390.6	-17.7	-19.8	26.6	3.59
423.0	10.70	225.70	421.1	-21.6	-23.7	32.0	3.27
453.0	11.80	225.00	450.5	-25.7	-27.9	37.9	3.69
484.0	13.00	223.50	480.8	-30.5	-32.5	44.6	4.01
515.0	13.90	223.40	510.9	-35.7	-37.5	51.8	2.90
546.0	14.70	223.50	541.0	-41.3	-42.8	59.4	2.58
576.0	15.80	223.80	569.9	-47.0	-48.2	67.3	3.68
607.0	16.80	223.80	599.7	-53.2	-54.2	76.0	3.23
638.0	18.00	224.80	629.2	-59.9	-60.7	85.3	3.99
668.0	19.10	224.50	657.7	-66.7	-67.4	94.8	3.68
699.0	19.90	224.80	686.9	-74.0	-74.7	105.2	2.60
731.0	20.90	224.90	716.9	-81.9	-82.6	116.3	3.13
762.0	21.80	224.80	745.8	-89.9	-90.5	127.6	2.91
794.0	22.70	224.70	775.4	-98.5	-99.0	139.7	2.81
825.0	23.30	224.70	803.9	-107.1	-107.6	151.8	1.94
857.0	24.20	224.40	833.2	-116.3	-116.6	164.7	2.84
888.0	24.90	224.40	861.4	-125.5	-125.6	177.6	2.26
920.0	26.00	225.50	890.3	-135.3	-135.3	191.3	3.74
951.0	27.00	225.80	918.0	-144.9	-145.2	205.2	3.25
983.0	28.20	226.10	946.4	-155.2	-155.9	220.0	3.78
1,014.0	29.60	226.20	973.5	-165.6	-166.7	235.0	4.52
1,045.0	31.60	226.10	1,000.2	-176.6	-178.1	250.8	6.45
1,077.0	33.00	225.80	1,027.3	-188.4	-190.4	267.9	4.40
1,108.0	34.50	225.20	1,053.0	-200.5	-202.6	285.1	4.96
1,140.0	35.80	224.80	1,079.2	-213.5	-215.7	303.5	4.13
1,171.0	36.60	224.40	1,104.2	-226.6	-228.5	321.8	2.69
1,203.0	37.40	223.80	1,129.8	-240.4	-241.9	341.1	2.74
1,234.0	38.30	223.50	1,154.3	-254.2	-255.1	360.1	2.96
1,266.0	39.20	224.00	1,179.2	-268.6	-268.9	380.1	2.98
1,297.0	40.10	224.60	1,203.1	-282.8	-282.7	399.9	3.15
1,329.0	40.70	224.90	1,227.5	-297.5	-297.3	420.6	1.97
1,360.0	41.10	225.20	1,250.9	-311.9	-311.7	440.9	1.44
1,386.0	41.80	225.20	1,270.4	-324.0	-323.9	458.1	2.69
<b>Final 8" MWD Survey</b>							
1,456.0	42.20	226.70	1,322.4	-356.6	-357.6	505.0	1.54
<b>First 6" MWD Survey</b>							
1,551.0	40.60	225.50	1,393.7	-400.1	-402.8	567.8	1.88
1,646.0	39.90	224.60	1,466.2	-443.5	-446.3	629.1	0.96
1,740.0	41.00	224.70	1,537.7	-486.9	-489.1	690.1	1.17
1,834.0	38.80	223.20	1,609.8	-530.2	-531.0	750.4	2.55

**Design Report for SKR-598-36-BV-11 - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
1,928.0	39.00	221.80	1,683.0	-573.8	-570.9	809.4	0.96
2,023.0	41.00	223.20	1,755.7	-618.8	-612.1	870.4	2.31
2,117.0	41.20	224.40	1,826.6	-663.4	-654.9	932.1	0.87
2,212.0	40.20	225.10	1,898.6	-707.4	-698.5	994.1	1.16
2,306.0	37.50	223.40	1,971.8	-749.6	-739.7	1,053.0	3.09
2,401.0	36.90	223.20	2,047.5	-791.4	-779.1	1,110.4	0.64
2,495.0	33.80	222.60	2,124.1	-831.2	-816.1	1,164.8	3.32
2,590.0	31.60	223.00	2,204.1	-868.9	-850.9	1,216.1	2.33
2,684.0	30.40	223.80	2,284.6	-904.0	-884.2	1,264.4	1.35
2,778.0	27.30	223.40	2,367.0	-936.9	-915.5	1,309.8	3.30
2,873.0	25.70	223.60	2,452.0	-967.6	-944.7	1,352.1	1.69
2,967.0	23.40	223.20	2,537.5	-996.0	-971.5	1,391.2	2.45
3,062.0	22.50	223.20	2,624.9	-1,023.0	-996.9	1,428.2	0.95
3,156.0	20.70	222.80	2,712.3	-1,048.3	-1,020.5	1,462.8	1.92
3,251.0	19.30	222.70	2,801.6	-1,072.2	-1,042.5	1,495.2	1.47
3,345.0	17.60	219.70	2,890.8	-1,094.5	-1,062.1	1,524.9	2.07
3,440.0	15.00	223.10	2,982.0	-1,114.5	-1,079.7	1,551.5	2.91
3,534.0	12.30	220.20	3,073.3	-1,131.1	-1,094.5	1,573.6	2.96
3,629.0	10.60	220.10	3,166.4	-1,145.5	-1,106.6	1,592.4	1.79
3,723.0	9.00	218.10	3,259.0	-1,157.9	-1,116.7	1,608.3	1.74
3,818.0	7.10	226.00	3,353.1	-1,167.8	-1,125.6	1,621.6	2.31
3,912.0	4.50	234.40	3,446.6	-1,174.0	-1,132.7	1,631.0	2.90
3,992.6	2.69	244.54	3,527.0	-1,176.7	-1,137.0	1,635.9	2.38
<b>Cylinder Entry Point</b>							
3,995.0	2.63	245.06	3,529.4	-1,176.7	-1,137.1	1,636.0	2.38
<b>598-35-76 F</b>							
4,006.0	2.40	247.70	3,540.4	-1,176.9	-1,137.6	1,636.5	2.38
4,101.0	1.20	320.00	3,635.4	-1,176.9	-1,140.0	1,638.2	2.46
4,196.0	1.50	356.80	3,730.4	-1,174.9	-1,140.7	1,637.3	0.95
4,290.0	1.40	59.30	3,824.3	-1,173.1	-1,139.8	1,635.4	1.60
4,384.0	0.80	40.90	3,918.3	-1,172.0	-1,138.4	1,633.6	0.73
4,479.0	0.40	354.40	4,013.3	-1,171.2	-1,138.0	1,632.8	0.63
4,573.0	1.00	278.50	4,107.3	-1,170.7	-1,138.8	1,633.0	1.05
4,667.0	1.10	250.60	4,201.3	-1,170.9	-1,140.5	1,634.3	0.55
4,762.0	1.30	257.20	4,296.3	-1,171.4	-1,142.4	1,636.1	0.26
4,856.0	1.50	258.70	4,390.2	-1,171.9	-1,144.7	1,638.0	0.22
4,951.0	1.60	258.70	4,485.2	-1,172.4	-1,147.2	1,640.2	0.11
5,045.0	1.30	274.70	4,579.2	-1,172.6	-1,149.5	1,641.9	0.53
5,140.0	1.50	254.80	4,674.1	-1,172.8	-1,151.8	1,643.7	0.55
5,234.0	1.80	256.90	4,768.1	-1,173.5	-1,154.4	1,646.0	0.33
5,329.0	2.30	267.10	4,863.0	-1,173.9	-1,157.8	1,648.7	0.65
5,423.0	2.60	268.60	4,957.0	-1,174.1	-1,161.8	1,651.7	0.33
5,518.0	2.80	258.60	5,051.9	-1,174.6	-1,166.2	1,655.2	0.54
5,612.0	2.80	255.60	5,145.7	-1,175.6	-1,170.7	1,659.1	0.16
5,707.0	3.70	250.10	5,240.6	-1,177.2	-1,175.8	1,663.9	1.00
5,801.0	3.80	251.90	5,334.4	-1,179.2	-1,181.7	1,669.4	0.16
5,896.0	3.60	247.40	5,429.2	-1,181.3	-1,187.4	1,675.0	0.37
5,990.0	3.50	245.30	5,523.0	-1,183.7	-1,192.7	1,680.4	0.17
6,085.0	3.20	245.80	5,617.9	-1,186.0	-1,197.8	1,685.6	0.32
6,179.0	2.50	248.30	5,711.7	-1,187.8	-1,202.1	1,689.9	0.76
6,208.3	2.69	246.90	5,741.0	-1,188.3	-1,203.3	1,691.1	0.67

## Design Report for SKR-598-36-BV-11 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
<b>Cylinder Bottom - Cylinder Exit Point</b>							
6,273.0	3.10	244.40	5,805.6	-1,189.7	-1,206.3	1,694.2	0.67
6,368.0	3.10	244.70	5,900.5	-1,191.9	-1,210.9	1,699.0	0.02
6,462.0	3.20	249.20	5,994.3	-1,193.9	-1,215.7	1,703.8	0.28
6,557.0	3.60	249.00	6,089.2	-1,195.9	-1,220.9	1,709.0	0.42
6,651.0	3.40	250.40	6,183.0	-1,197.9	-1,226.3	1,714.2	0.23
6,745.0	3.30	246.70	6,276.8	-1,199.9	-1,231.4	1,719.2	0.25
6,840.0	3.10	246.10	6,371.7	-1,202.0	-1,236.3	1,724.2	0.21
6,934.0	3.10	252.20	6,465.6	-1,203.8	-1,241.0	1,728.8	0.35
7,029.0	3.10	256.70	6,560.4	-1,205.2	-1,246.0	1,733.3	0.26
7,081.4	3.27	259.12	6,612.7	-1,205.8	-1,248.8	1,735.7	0.42
<b>598-35-76b F</b>							
7,090.0	3.30	259.50	6,621.3	-1,205.9	-1,249.3	1,736.2	0.42
<b>Final 6" MWD Survey</b>							
7,137.0	3.30	259.50	6,668.2	-1,206.4	-1,252.0	1,738.4	0.00
<b>Projection to Bit</b>							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
146.0	146.0	-1.0	-1.9	First 8" MWD Survey
1,386.0	1,270.4	-324.0	-323.9	Final 8" MWD Survey
1,456.0	1,322.4	-356.6	-357.6	First 6" MWD Survey
3,992.6	3,527.0	-1,176.7	-1,137.0	Cylinder Entry Point
6,208.3	5,741.0	-1,188.3	-1,203.3	Cylinder Bottom
6,208.3	5,741.0	-1,188.3	-1,203.3	Cylinder Exit Point
7,090.0	6,621.3	-1,205.9	-1,249.3	Final 6" MWD Survey
7,137.0	6,668.2	-1,206.4	-1,252.0	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	598-35-76 F	225.13	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
146.0	1,386.0	8" EM Surveys	MWD
1,456.0	7,137.0	6" EM Surveys	MWD

**Design Report for SKR-598-36-BV-11 - 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
598-35-76 F	0.00	360.00	3,527.0	-1,186.8	-1,192.4	1,642,667.84	2,196,430.60	39° 33' 47.866 N	108° 21' 2.540 W
- actual wellpath misses target center by 56.2ft at 3995.0ft MD (3529.4 TVD, -1176.7 N, -1137.1 E)									
- Ellipse (radii L45.0 W80.0 on 360.00 azi) - Target Cylinder 100% Intersected									
598-35-76b F	0.00	360.00	6,616.0	-1,186.8	-1,192.4	1,642,667.84	2,196,430.60	39° 33' 47.866 N	108° 21' 2.540 W
- actual wellpath misses target center by 59.7ft at 7081.4ft MD (6612.7 TVD, -1205.8 N, -1248.8 E)									
- Point									