

# Chevron USA

Piceance

SKR-598-36-BV (New)

SKR-598-36-BV-12 - Slot 12

598-36-34

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

09 April, 2009

Well Coordinates (NAD83): 1,643,857.97 N, 2,197,632.39 E (39° 33' 60.00" N, 108° 20' 47.68" W)

Ground Level: 6,032.60 ft

Local Coordinate Origin: Centered on Well SKR-598-36-BV-12 (Slot 12) - 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-12  
 Wellbore: 598-36-34  
 Plan: Actual Field Surveys

# Chevron USA

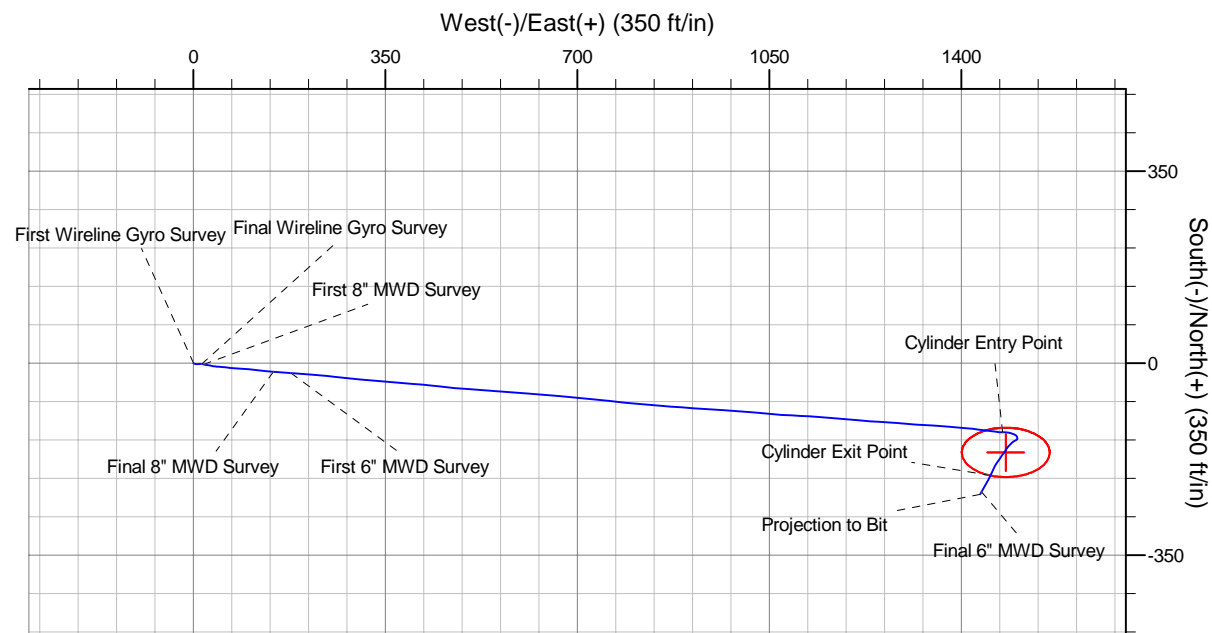
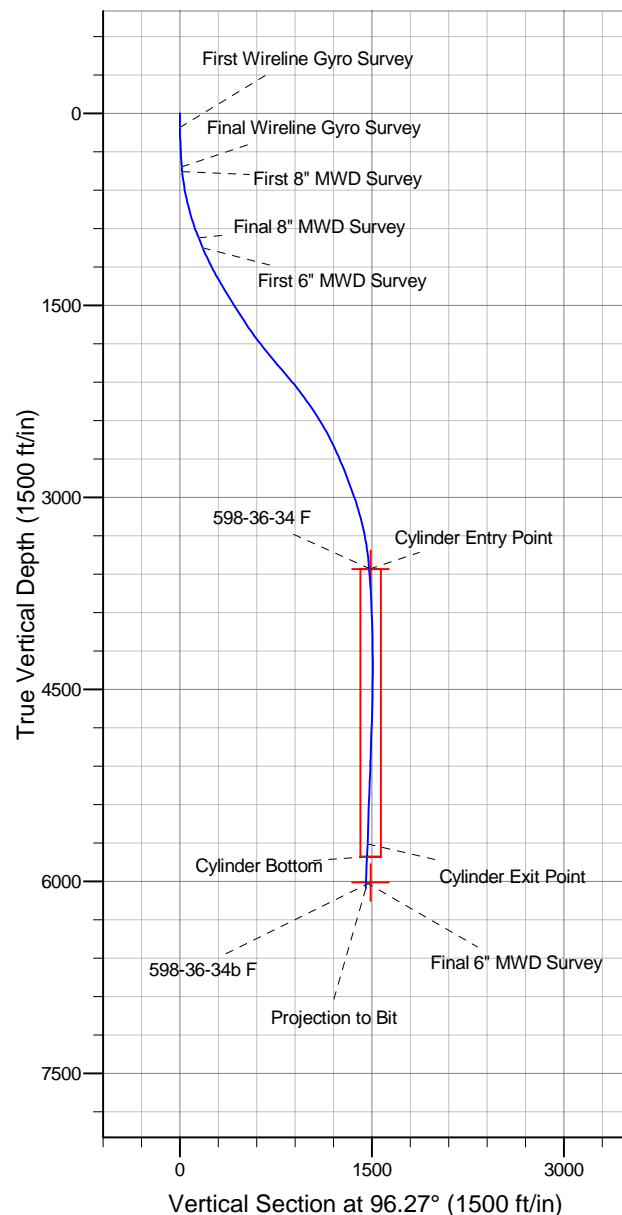
**HALLIBURTON**  
 Drilling and Formation  
 Evaluation

## WELL DETAILS: SKR-598-36-BV-12

+N/-S	+E/-W	Northing	Easting	Ground Level: 6032.6	Latitude	Longitude	Slot
0.0	0.0	1643857.97	2197632.39		39° 33' 59.995 N	108° 20' 47.678 W	Slot 12

## WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-34 F	3559.0	-162.6	1480.9	1643695.34	2199113.34	Ellipse (Radii: L45.0 W80.0)
598-36-34b F	6007.0	-162.6	1480.9	1643695.34	2199113.34	Point



## Design Report for SKR-598-36-BV-12 - 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
110.0	0.81	127.88	110.0	-0.5	0.6	0.7	0.74
<b>First Wireline Gyro Survey</b>							
140.0	1.71	102.75	140.0	-0.7	1.2	1.3	3.45
173.0	2.21	99.01	173.0	-0.9	2.3	2.4	1.56
204.0	2.66	94.77	203.9	-1.1	3.6	3.7	1.56
234.0	3.11	105.09	233.9	-1.3	5.1	5.2	2.29
265.0	2.74	102.68	264.9	-1.7	6.6	6.8	1.26
296.0	2.91	84.11	295.8	-1.8	8.2	8.3	2.99
327.0	2.88	79.06	326.8	-1.6	9.7	9.8	0.83
357.0	3.17	82.51	356.7	-1.3	11.3	11.3	1.14
388.0	3.89	89.80	387.7	-1.2	13.2	13.2	2.73
419.0	4.63	98.28	418.6	-1.4	15.5	15.5	3.13
<b>Final Wireline Gyro Survey</b>							
455.0	5.80	105.60	454.5	-2.1	18.6	18.8	3.73
<b>First 8" MWD Survey</b>							
486.0	6.60	103.40	485.3	-2.9	21.9	22.1	2.69
517.0	7.50	99.40	516.0	-3.7	25.6	25.9	3.31
548.0	8.60	99.90	546.7	-4.4	29.9	30.2	3.56
578.0	9.40	99.00	576.4	-5.2	34.5	34.9	2.71
609.0	10.70	96.60	606.9	-5.9	39.9	40.3	4.40
639.0	11.70	95.40	636.3	-6.5	45.7	46.1	3.42
670.0	12.90	95.40	666.6	-7.1	52.3	52.7	3.87
701.0	13.80	95.80	696.8	-7.8	59.4	59.9	2.92
733.0	14.40	95.80	727.8	-8.6	67.1	67.7	1.87
764.0	15.00	94.60	757.8	-9.3	75.0	75.5	2.17
796.0	15.70	94.10	788.6	-10.0	83.4	84.0	2.23
827.0	17.00	94.00	818.4	-10.6	92.1	92.7	4.19
859.0	17.90	94.80	848.9	-11.3	101.7	102.3	2.91
890.0	18.70	96.00	878.3	-12.2	111.4	112.0	2.85
922.0	19.50	95.40	908.6	-13.3	121.8	122.5	2.57
953.0	20.80	94.70	937.7	-14.2	132.4	133.2	4.27
991.0	22.00	94.60	973.1	-15.3	146.2	147.0	3.16
<b>Final 8" MWD Survey</b>							
1,074.0	23.20	94.80	1,049.7	-17.9	178.0	178.9	1.45
<b>First 6" MWD Survey</b>							
1,169.0	25.10	94.60	1,136.4	-21.1	216.8	217.8	2.00
1,263.0	27.60	95.60	1,220.6	-24.8	258.3	259.5	2.70
1,357.0	30.70	96.20	1,302.7	-29.6	303.9	305.3	3.31
1,452.0	30.90	94.60	1,384.3	-34.1	352.3	353.9	0.89
1,546.0	31.20	94.20	1,464.8	-37.9	400.6	402.4	0.39
1,641.0	32.90	96.40	1,545.3	-42.5	450.8	452.8	2.17
1,735.0	33.20	94.40	1,624.1	-47.4	501.8	504.0	1.20
1,830.0	35.20	94.20	1,702.7	-51.4	555.1	557.4	2.11
1,924.0	36.90	94.20	1,778.7	-55.4	610.3	612.7	1.81
2,018.0	39.50	94.70	1,852.6	-59.9	668.2	670.8	2.79
2,113.0	39.70	96.50	1,925.8	-65.8	728.5	731.3	1.23
2,207.0	40.90	95.40	1,997.5	-72.1	788.9	792.1	1.48
2,302.0	40.20	94.70	2,069.6	-77.6	850.5	853.8	0.88
2,397.0	38.30	93.40	2,143.2	-81.8	910.4	913.9	2.18

## Design Report for SKR-598-36-BV-12 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,491.0	36.30	94.20	2,218.0	-85.6	967.2	970.8	2.19
2,586.0	34.30	95.00	2,295.5	-90.0	1,022.0	1,025.7	2.16
2,680.0	32.30	94.10	2,374.1	-94.1	1,073.4	1,077.3	2.19
2,775.0	30.00	93.00	2,455.4	-97.1	1,122.4	1,126.3	2.49
2,869.0	27.20	95.20	2,537.9	-100.3	1,167.3	1,171.3	3.18
2,964.0	25.30	94.80	2,623.1	-104.0	1,209.2	1,213.3	2.01
3,058.0	22.90	93.80	2,708.9	-106.9	1,247.4	1,251.6	2.59
3,152.0	21.40	93.80	2,795.9	-109.2	1,282.8	1,287.1	1.60
3,247.0	20.70	94.00	2,884.6	-111.6	1,316.8	1,321.1	0.74
3,341.0	20.10	93.40	2,972.7	-113.7	1,349.5	1,353.9	0.68
3,436.0	17.10	95.10	3,062.7	-115.9	1,379.8	1,384.2	3.21
3,530.0	15.00	95.10	3,153.1	-118.2	1,405.6	1,410.1	2.23
3,625.0	12.60	97.00	3,245.3	-120.5	1,428.2	1,432.8	2.57
3,719.0	10.70	97.80	3,337.4	-123.0	1,447.0	1,451.8	2.03
3,813.0	7.80	96.70	3,430.1	-124.9	1,462.0	1,466.9	3.09
3,908.0	4.90	90.10	3,524.6	-125.7	1,472.4	1,477.4	3.14
3,942.6	4.57	90.49	3,559.0	-125.7	1,475.3	1,480.2	0.96
<b>Cylinder Entry Point</b>							
3,943.0	4.56	90.49	3,559.5	-125.7	1,475.3	1,480.2	0.96
<b>598-36-34 F</b>							
4,002.0	4.00	91.30	3,618.3	-125.8	1,479.7	1,484.6	0.96
4,097.0	3.20	100.50	3,713.1	-126.3	1,485.7	1,490.6	1.04
4,192.0	2.60	109.70	3,808.0	-127.5	1,490.3	1,495.3	0.80
4,286.0	2.20	107.70	3,901.9	-128.8	1,494.0	1,499.1	0.43
4,380.0	2.00	116.90	3,995.8	-130.1	1,497.2	1,502.4	0.42
4,475.0	1.70	131.00	4,090.8	-131.8	1,499.7	1,505.2	0.57
4,569.0	1.70	154.20	4,184.7	-133.9	1,501.4	1,507.0	0.73
4,664.0	1.90	181.10	4,279.7	-136.8	1,502.0	1,507.9	0.90
4,758.0	0.80	222.30	4,373.7	-138.8	1,501.5	1,507.7	1.49
4,852.0	0.80	243.70	4,467.6	-139.6	1,500.5	1,506.7	0.32
4,947.0	1.20	235.80	4,562.6	-140.4	1,499.1	1,505.4	0.44
5,042.0	2.00	235.00	4,657.6	-141.9	1,496.9	1,503.4	0.84
5,136.0	2.90	234.20	4,751.5	-144.3	1,493.6	1,500.4	0.96
5,230.0	3.20	227.90	4,845.4	-147.4	1,489.7	1,496.9	0.48
5,325.0	3.50	218.00	4,940.2	-151.5	1,486.0	1,493.6	0.68
5,419.0	3.70	215.00	5,034.0	-156.2	1,482.5	1,490.7	0.29
5,514.0	4.70	215.20	5,128.8	-161.9	1,478.5	1,487.3	1.05
5,608.0	4.60	215.70	5,222.5	-168.1	1,474.1	1,483.6	0.11
5,703.0	4.50	213.60	5,317.2	-174.3	1,469.8	1,480.0	0.20
5,797.0	4.60	212.60	5,410.9	-180.6	1,465.7	1,476.6	0.14
5,892.0	4.90	211.70	5,505.5	-187.2	1,461.5	1,473.2	0.33
5,986.0	5.50	205.40	5,599.2	-194.7	1,457.5	1,470.0	0.88
6,081.0	6.00	202.80	5,693.7	-203.4	1,453.6	1,467.1	0.59
6,094.4	6.10	203.61	5,707.0	-204.7	1,453.0	1,466.7	0.96
<b>Cylinder Exit Point</b>							
6,175.0	6.70	208.00	5,787.1	-212.8	1,449.1	1,463.7	0.96
6,196.0	6.61	208.65	5,808.0	-214.9	1,448.0	1,462.8	0.56
<b>Cylinder Bottom</b>							
6,270.0	6.30	211.10	5,881.5	-222.1	1,443.8	1,459.4	0.56
6,364.0	6.50	208.30	5,974.9	-231.2	1,438.6	1,455.3	0.39
6,387.0	6.28	208.01	5,997.8	-233.5	1,437.4	1,454.3	0.98

**Design Report for SKR-598-36-BV-12 - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
<b>598-36-34b F</b>							
6,395.0	6.20	207.90	6,005.7	-234.3	1,437.0	1,454.0	0.98
<b>Final 6" MWD Survey</b>							
6,445.0	6.20	207.90	6,055.4	-239.0	1,434.5	1,452.0	0.00
<b>Projection to Bit</b>							

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
110.0	110.0	-0.5	0.6	First Wireline Gyro Survey
419.0	418.6	-1.4	15.5	Final Wireline Gyro Survey
455.0	454.5	-2.1	18.6	First 8" MWD Survey
991.0	973.1	-15.3	146.2	Final 8" MWD Survey
1,074.0	1,049.7	-17.9	178.0	First 6" MWD Survey
3,942.6	3,559.0	-125.7	1,475.3	Cylinder Entry Point
6,094.4	5,707.0	-204.7	1,453.0	Cylinder Exit Point
6,196.0	5,808.0	-214.9	1,448.0	Cylinder Bottom
6,395.0	6,005.7	-234.3	1,437.0	Final 6" MWD Survey
6,445.0	6,055.4	-239.0	1,434.5	Projection to Bit

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	598-36-34 F	96.27	Slot	0.0	0.0	0.0

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
110.0	419.0	Wireline Gyro Surveys	GYD_DP_MS
455.0	991.0	8" MWD Surveys	MWD
1,074.0	6,445.0	6" MWD Surveys	MWD

**Targets**

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
598-36-34b F	0.00	0.00	6,007.0	-162.6	1,480.9	1,643,695.34	2,199,113.34	39° 33' 58.847 N	108° 20' 28.711 W
- actual wellpath misses target center by 83.7ft at 6387.2ft MD (5997.9 TVD, -233.5 N, 1437.4 E)									
- Point									
598-36-34 F	0.00	0.00	3,559.0	-162.6	1,480.9	1,643,695.34	2,199,113.34	39° 33' 58.847 N	108° 20' 28.711 W
- actual wellpath misses target center by 37.4ft at 3943.0ft MD (3559.5 TVD, -125.7 N, 1475.3 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 95.5% Intersected									