

Chevron USA

Piceance

SKR-598-36-BV (New)

SKR-598-36-BV-02 - Slot 2

598-36-14

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

21 April, 2009

Well Coordinates (NAD83): 1,643,893.29 N, 2,197,619.87 E (39° 34' 00.34" N, 108° 20' 47.85" W)

Ground Level: 6,032.60 ft

Local Coordinate Origin: Centered on Well SKR-598-36-BV-02 (Slot 2) - 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-02
 Wellbore: 598-36-14
 Plan: Actual Field Surveys

Chevron USA

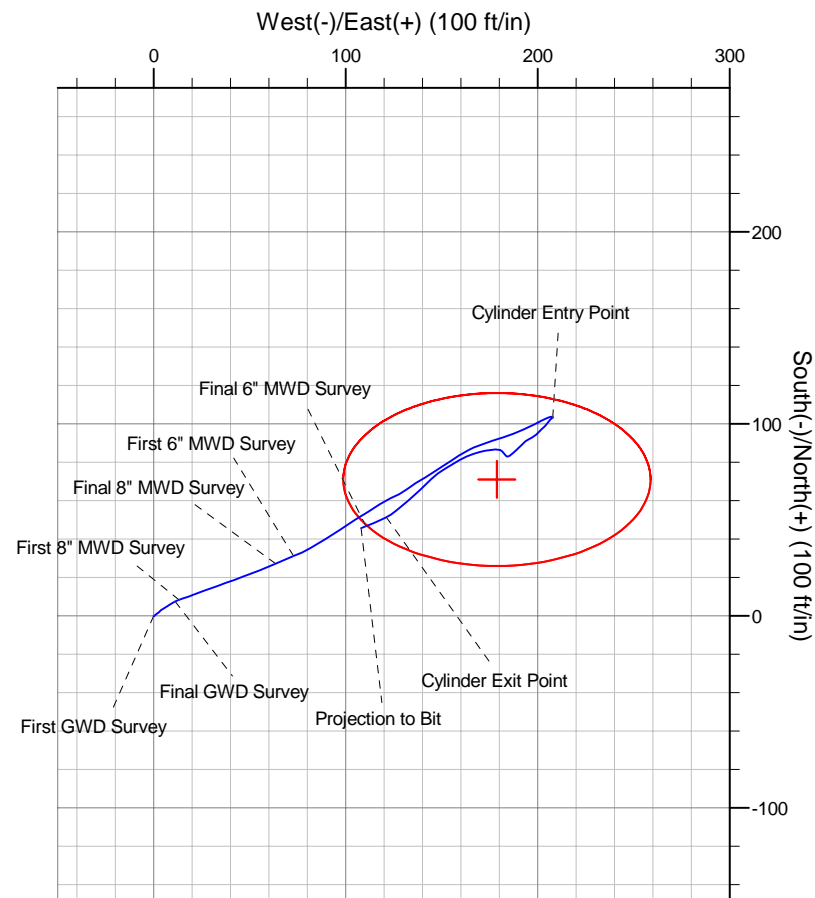
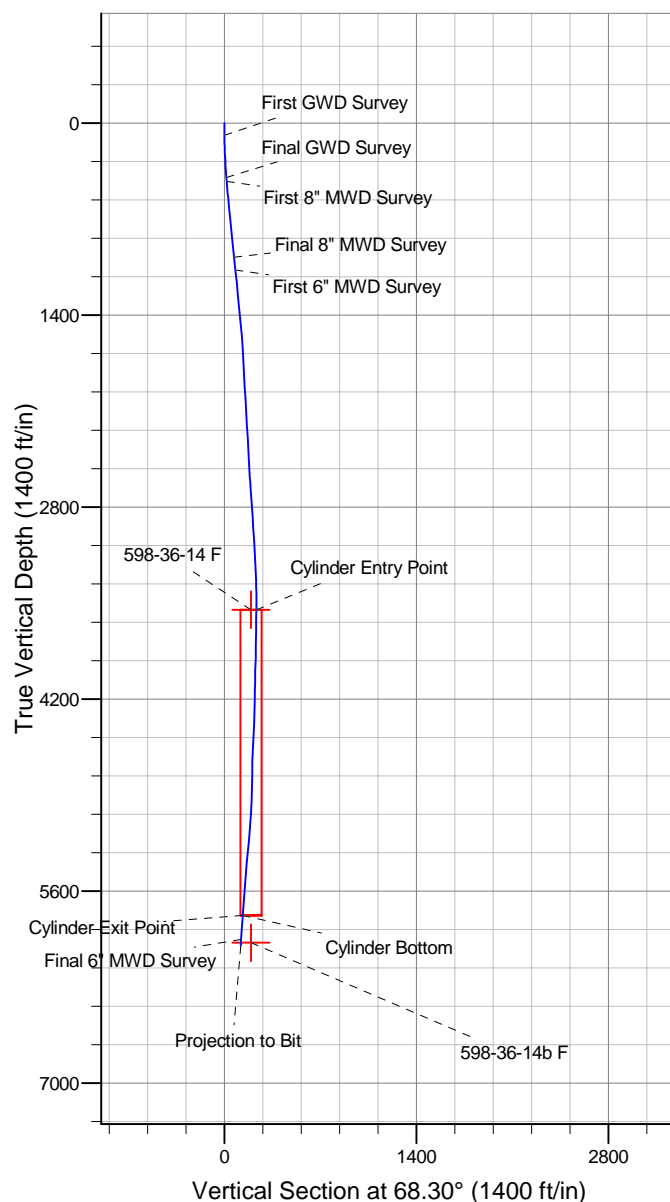
HALLIBURTON
 Drilling and Formation
 Evaluation

WELL DETAILS: SKR-598-36-BV-02

+N/-S	+E/-W	Northing	Easting	Ground Level: 6032.6	Latitude	Longitude	Slot
0.0	0.0	1643893.29	2197619.87		39° 34' 0.340 N	108° 20' 47.852 W	Slot 2

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-14 F	3549.0	71.1	178.7	1643964.40	2197798.60	Ellipse (Radii: L45.0 W80.0)
598-36-14b F	5976.0	71.1	178.7	1643964.39	2197798.57	Point



Design Report for SKR-598-36-BV-02 - 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
90.0	0.00	51.44	90.0	0.0	0.0	0.0	0.00
First GWD Survey							
120.0	0.26	252.14	120.0	0.0	-0.1	-0.1	0.87
151.0	0.53	47.38	151.0	0.1	0.0	0.0	2.50
183.0	1.76	61.30	183.0	0.4	0.5	0.6	3.91
214.0	2.47	51.97	214.0	1.0	1.5	1.7	2.54
245.0	3.00	50.73	244.9	2.0	2.6	3.1	1.72
275.0	3.35	50.91	274.9	3.0	3.9	4.7	1.17
306.0	3.96	55.31	305.8	4.2	5.5	6.6	2.16
337.0	4.14	58.13	336.7	5.4	7.3	8.8	0.87
367.0	4.14	61.66	366.7	6.5	9.2	10.9	0.85
398.0	4.58	63.95	397.6	7.5	11.3	13.3	1.53
Final GWD Survey							
425.0	4.60	69.34	424.5	8.4	13.3	15.4	1.60
First 8" MWD Survey							
455.0	4.90	70.05	454.4	9.3	15.6	17.9	1.02
486.0	5.00	69.57	485.3	10.2	18.1	20.6	0.35
517.0	5.17	69.79	516.2	11.1	20.7	23.3	0.55
548.0	5.35	69.29	547.0	12.1	23.3	26.2	0.60
578.0	5.48	69.57	576.9	13.1	26.0	29.0	0.44
609.0	5.63	70.40	607.7	14.2	28.8	32.0	0.55
655.0	5.76	70.87	653.5	15.7	33.1	36.6	0.30
701.0	5.98	69.88	699.3	17.3	37.6	41.3	0.53
747.0	6.01	70.20	745.0	18.9	42.1	46.1	0.10
796.0	5.48	69.41	793.8	20.6	46.7	51.0	1.09
890.0	5.67	68.43	887.3	23.9	55.2	60.1	0.23
980.0	5.92	65.92	976.9	27.4	63.6	69.2	0.40
Final 8" MWD Survey							
1,076.0	6.10	69.40	1,072.3	31.2	72.9	79.2	0.42
First 6" MWD Survey							
1,170.0	5.80	59.10	1,165.8	35.4	81.6	88.9	1.18
1,264.0	5.50	58.50	1,259.4	40.2	89.5	98.0	0.33
1,359.0	5.70	56.30	1,353.9	45.2	97.3	107.1	0.31
1,453.0	5.20	58.30	1,447.5	50.0	104.8	115.9	0.57
1,548.0	4.70	57.90	1,542.2	54.4	111.8	124.0	0.53
1,642.0	4.10	57.40	1,635.9	58.2	117.9	131.1	0.64
1,737.0	3.40	64.40	1,730.7	61.3	123.3	137.2	0.88
1,831.0	2.80	65.50	1,824.5	63.4	127.9	142.3	0.64
1,925.0	3.20	50.60	1,918.4	66.0	132.0	147.1	0.93
2,020.0	3.50	57.10	2,013.2	69.3	136.5	152.4	0.51
2,114.0	3.40	61.20	2,107.1	72.2	141.3	158.0	0.28
2,209.0	3.10	54.50	2,201.9	75.0	145.9	163.3	0.51
2,304.0	3.30	59.00	2,296.8	77.9	150.3	168.5	0.34
2,398.0	2.80	55.30	2,390.6	80.6	154.6	173.4	0.57
2,493.0	3.70	58.90	2,485.5	83.5	159.1	178.7	0.97
2,587.0	3.30	61.20	2,579.3	86.4	164.1	184.4	0.45
2,681.0	4.40	69.90	2,673.1	89.0	169.8	190.7	1.32
2,776.0	3.90	72.00	2,767.8	91.2	176.3	197.5	0.55
2,871.0	3.50	73.10	2,862.7	93.1	182.2	203.6	0.43

Design Report for SKR-598-36-BV-02 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,965.0	3.10	65.90	2,956.5	94.9	187.2	209.0	0.61
3,059.0	3.80	67.90	3,050.3	97.1	192.4	214.7	0.76
3,154.0	3.40	61.40	3,145.1	99.7	197.8	220.6	0.60
3,248.0	2.60	66.30	3,239.0	101.9	202.2	225.5	0.89
3,342.0	2.00	68.20	3,332.9	103.3	205.7	229.3	0.64
3,437.0	0.60	106.70	3,427.9	103.8	207.7	231.4	1.66
3,531.0	0.30	224.40	3,521.9	103.5	208.0	231.5	0.84
3,558.1	0.38	229.64	3,549.0	103.4	207.9	231.4	0.33
Cylinder Entry Point							
3,558.5	0.38	229.64	3,549.4	103.4	207.9	231.4	0.00
598-36-14 F							
3,626.0	0.60	236.20	3,616.9	103.0	207.4	230.8	0.33
3,720.0	0.90	227.00	3,710.9	102.2	206.5	229.6	0.34
3,815.0	1.70	215.10	3,805.9	100.6	205.1	227.8	0.88
3,909.0	1.10	224.10	3,899.8	98.8	203.7	225.8	0.68
4,004.0	1.40	234.20	3,994.8	97.5	202.1	223.8	0.39
4,098.0	0.90	215.40	4,088.8	96.2	200.7	222.1	0.66
4,193.0	2.00	226.80	4,183.8	94.4	199.1	219.9	1.19
4,287.0	1.20	244.90	4,277.7	92.9	197.0	217.4	1.00
4,382.0	1.80	240.70	4,372.7	91.8	194.8	214.9	0.64
4,476.0	2.70	226.20	4,466.6	89.5	191.9	211.4	1.13
4,571.0	3.10	225.10	4,561.5	86.1	188.5	207.0	0.43
4,665.0	2.00	238.20	4,655.4	83.5	185.3	203.0	1.32
4,759.0	1.40	328.10	4,749.4	83.6	183.3	201.2	2.59
4,854.0	2.00	314.00	4,844.3	85.7	181.5	200.3	0.77
4,948.0	2.90	266.70	4,938.3	86.7	177.9	197.4	2.27
5,043.0	3.50	260.00	5,033.1	86.1	172.7	192.3	0.74
5,137.0	4.40	252.00	5,126.9	84.5	166.4	185.9	1.12
5,232.0	5.00	239.90	5,221.6	81.3	159.4	178.1	1.22
5,326.0	5.80	239.10	5,315.2	76.8	151.8	169.4	0.85
5,421.0	4.90	225.70	5,409.7	71.5	144.7	160.9	1.61
5,515.0	5.40	225.60	5,503.4	65.6	138.7	153.1	0.53
5,610.0	5.00	231.50	5,598.0	59.9	132.3	145.0	0.70
5,704.0	4.40	228.90	5,691.7	55.0	126.3	137.7	0.68
5,788.6	4.12	243.58	5,776.0	51.5	121.2	131.6	1.33
Cylinder Bottom - Cylinder Exit Point							
5,799.0	4.10	245.50	5,786.4	51.2	120.5	130.9	1.33
5,893.0	3.80	244.90	5,880.2	48.4	114.6	124.4	0.32
5,965.0	3.20	249.60	5,952.0	46.7	110.6	120.0	0.92
Final 6" MWD Survey - 598-36-14b F							
6,015.0	3.20	249.60	6,002.0	45.8	108.0	117.2	0.00
Projection to Bit							

Design Report for SKR-598-36-BV-02 - Actual Field Surveys**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
90.0	90.0	0.0	0.0	First GWD Survey
398.0	397.6	7.5	11.3	Final GWD Survey
425.0	424.5	8.4	13.3	First 8" MWD Survey
980.0	976.9	27.4	63.6	Final 8" MWD Survey
1,076.0	1,072.3	31.2	72.9	First 6" MWD Survey
3,558.1	3,549.0	103.4	207.9	Cylinder Entry Point
5,788.6	5,776.0	51.5	121.2	Cylinder Bottom
5,788.6	5,776.0	51.5	121.2	Cylinder Exit Point
5,965.0	5,952.0	46.7	110.6	Final 6" MWD Survey
6,015.0	6,002.0	45.8	108.0	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	598-36-14 F	68.30	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
90.0	398.0	GWD Surveys	GYD_DP_MS
425.0	980.0	8" MWD Surveys	MWD
1,076.0	6,015.0	6" MWD 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
598-36-14 F	0.00	0.00	3,549.0	71.1	178.7	1,643,964.40	2,197,798.60	39° 34' 1.098 N	108° 20' 45.599 W
- actual wellpath misses target center by 43.5ft at 3558.4ft MD (3549.3 TVD, 103.4 N, 207.9 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									
598-36-14b F	0.00	0.00	5,976.0	71.1	178.7	1,643,964.39	2,197,798.57	39° 34' 1.098 N	108° 20' 45.600 W
- actual wellpath misses target center by 76.2ft at 5965.0ft MD (5952.0 TVD, 46.7 N, 110.6 E)									
- Point									