Chevron USA

Piceance
SKR-598-36-BV (New)
SKR-598-36-BV-17 - Slot 17

598-36-19

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

19 February, 2009

Well Coordinates (NAD83): 1,643,833.30 N, 2,197,630.53 E (39° 33' 59.75" N, 108° 20' 47.69" W)
Ground Level: 6,032.60 ft

Local Coordinate Origin:	Centered on Well SKR-598-36-BV-17 (Slot 17) - 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: 43I

HALLIBURTON

Project: Piceance
Site: SKR-598-36-BV (New)
Well: SKR-598-36-BV-17
Wellbore: 598-36-19
Plan: Actual Field Surveys

Chevron USA

HALLIBURTON
Drilling and Formation Evaluation

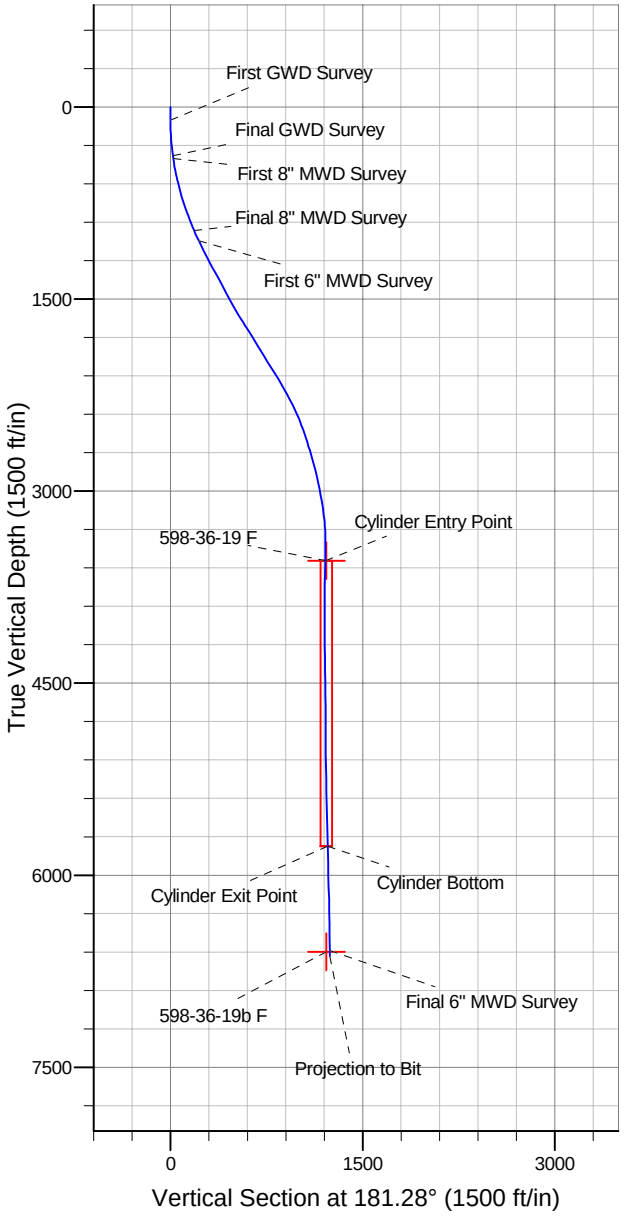
WELL DETAILS: SKR-598-36-BV-17

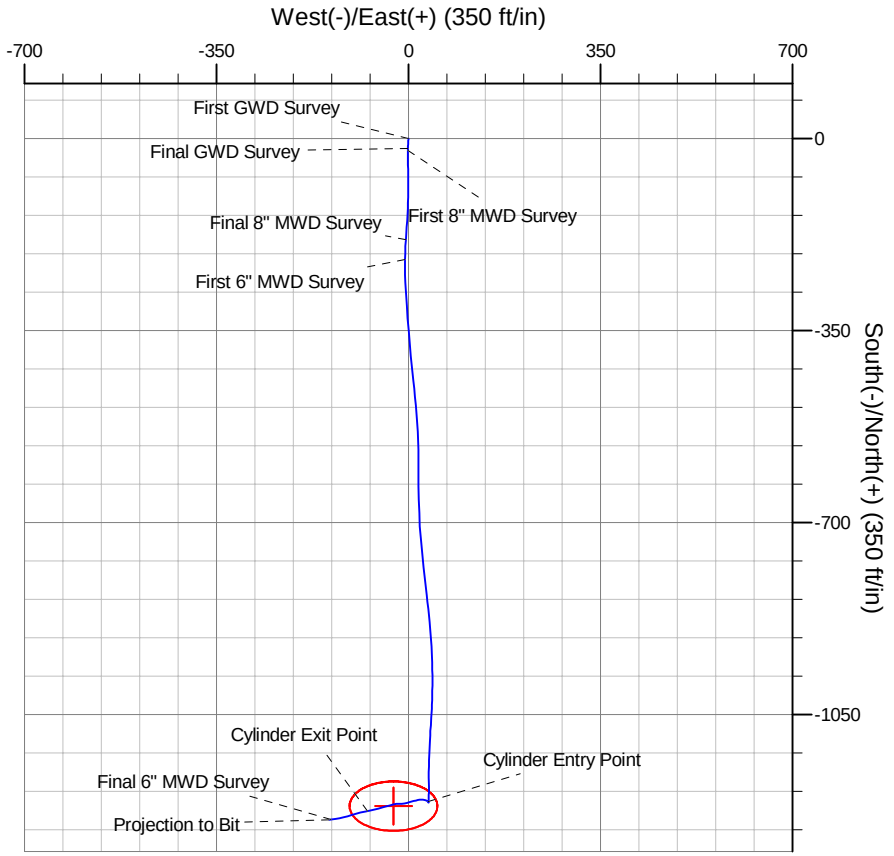
Ground Level: 6032.6

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1643833.30	2197630.53	39° 33' 59.751 N	108° 20' 47.692 W	Slot 17

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-19 F	3543.0	-1217.0	-27.2	1642616.30	2197603.33	Ellipse (Radii: L45.0 W80.0)
598-36-19b F	6599.0	-1217.0	-27.2	1642616.30	2197603.33	Point





Design Report for SKR-598-36-BV-17 - 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
101.0	0.44	173.02	101.0	-0.4	0.0	0.4	0.44
First GWD Survey							
132.0	0.44	171.26	132.0	-0.6	0.1	0.6	0.04
164.0	1.23	181.48	164.0	-1.1	0.1	1.1	2.50
194.0	2.29	183.59	194.0	-2.0	0.0	2.0	3.54
225.0	3.35	184.12	224.9	-3.5	-0.1	3.5	3.42
256.0	4.05	183.94	255.9	-5.5	-0.2	5.5	2.26
286.0	4.85	184.12	285.8	-7.8	-0.4	7.9	2.67
317.0	6.17	182.71	316.6	-10.8	-0.5	10.8	4.28
348.0	7.05	184.82	347.4	-14.4	-0.8	14.4	2.94
379.0	7.84	180.77	378.2	-18.4	-1.0	18.4	3.06
Final GWD Survey							
402.0	8.23	182.10	400.9	-21.6	-1.0	21.6	1.88
First 8" MWD Survey							
433.0	8.69	179.57	431.6	-26.2	-1.1	26.2	1.91
464.0	9.65	180.36	462.2	-31.1	-1.1	31.1	3.12
494.0	10.61	179.37	491.7	-36.4	-1.1	36.4	3.25
525.0	11.62	177.73	522.2	-42.3	-0.9	42.4	3.41
555.0	12.60	179.36	551.5	-48.6	-0.8	48.6	3.46
586.0	13.71	178.66	581.7	-55.7	-0.7	55.7	3.62
617.0	14.53	178.24	611.7	-63.3	-0.5	63.2	2.67
648.0	15.40	178.22	641.7	-71.3	-0.2	71.2	2.81
679.0	16.27	179.84	671.5	-79.7	-0.1	79.7	3.15
709.0	17.00	180.71	700.3	-88.3	-0.1	88.3	2.57
741.0	17.68	181.31	730.8	-97.8	-0.3	97.8	2.20
772.0	18.38	181.47	760.3	-107.4	-0.5	107.4	2.26
804.0	19.08	181.40	790.6	-117.7	-0.8	117.7	2.19
835.0	19.73	182.91	819.8	-128.0	-1.2	128.0	2.65
867.0	20.57	182.83	849.9	-139.0	-1.7	139.0	2.63
898.0	21.06	184.01	878.8	-150.0	-2.4	150.0	2.08
930.0	21.60	184.26	908.7	-161.6	-3.2	161.6	1.71
961.0	22.14	183.91	937.4	-173.1	-4.0	173.2	1.79
990.0	23.21	183.01	964.2	-184.3	-4.7	184.3	3.88
Final 8" MWD Survey							
1,078.0	25.80	181.50	1,044.3	-220.7	-6.1	220.8	3.03
First 6" MWD Survey							
1,173.0	26.60	176.60	1,129.5	-262.7	-5.4	262.7	2.43
1,267.0	28.10	176.80	1,213.0	-305.8	-2.9	305.8	1.60
1,362.0	29.70	174.80	1,296.2	-351.5	0.5	351.4	1.97
1,456.0	28.30	175.50	1,378.4	-397.0	4.3	396.8	1.53
1,551.0	27.50	172.80	1,462.3	-441.2	8.8	440.9	1.57
1,645.0	30.30	174.90	1,544.6	-486.3	13.7	485.9	3.17
1,740.0	30.80	177.10	1,626.4	-534.5	17.0	534.0	1.29
1,834.0	32.60	180.10	1,706.4	-583.9	18.2	583.3	2.54
1,928.0	31.60	179.20	1,786.0	-633.8	18.5	633.2	1.18
2,023.0	30.70	178.00	1,867.3	-682.9	19.7	682.3	1.15
2,117.0	31.50	174.70	1,947.8	-731.4	22.8	730.7	2.00
2,212.0	32.70	173.80	2,028.3	-781.6	27.9	780.8	1.36
2,306.0	32.90	173.40	2,107.3	-832.2	33.6	831.2	0.31

Design Report for SKR-598-36-BV-17 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,401.0	29.60	174.80	2,188.5	-881.2	38.6	880.1	3.56
2,495.0	27.70	176.60	2,271.0	-926.1	42.0	925.0	2.22
2,590.0	25.40	179.00	2,356.0	-968.6	43.7	967.3	2.67
2,684.0	22.20	181.20	2,442.0	-1,006.5	43.7	1,005.2	3.53
2,778.0	19.20	182.60	2,529.9	-1,039.7	42.6	1,038.5	3.23
2,873.0	18.10	184.20	2,619.9	-1,070.0	40.8	1,068.8	1.28
2,968.0	16.10	182.60	2,710.7	-1,097.9	39.1	1,096.7	2.16
3,062.0	14.20	181.90	2,801.5	-1,122.4	38.2	1,121.3	2.03
3,156.0	12.90	183.10	2,892.8	-1,144.4	37.2	1,143.3	1.41
3,251.0	11.60	178.50	2,985.7	-1,164.6	36.9	1,163.5	1.71
3,345.0	9.90	179.50	3,078.0	-1,182.1	37.2	1,181.0	1.82
3,440.0	7.70	181.80	3,171.9	-1,196.6	37.1	1,195.5	2.34
3,534.0	4.30	179.20	3,265.4	-1,206.4	36.9	1,205.3	3.63
3,629.0	0.60	185.20	3,360.3	-1,210.5	36.9	1,209.4	3.90
3,723.0	1.00	341.80	3,454.3	-1,210.2	36.6	1,209.1	1.67
3,811.8	1.18	323.65	3,543.0	-1,208.7	35.9	1,207.6	0.44
Cylinder Entry Point							
3,812.4	1.19	323.54	3,543.6	-1,208.7	35.9	1,207.6	0.44
598-36-19 F							
3,818.0	1.20	322.60	3,549.2	-1,208.6	35.8	1,207.5	0.44
3,912.0	1.60	293.70	3,643.2	-1,207.3	34.0	1,206.3	0.85
4,007.0	1.40	288.20	3,738.2	-1,206.4	31.7	1,205.4	0.26
4,101.0	1.80	284.30	3,832.1	-1,205.7	29.1	1,204.8	0.44
4,196.0	1.60	276.90	3,927.1	-1,205.2	26.4	1,204.3	0.31
4,290.0	1.80	266.60	4,021.1	-1,205.1	23.6	1,204.3	0.39
4,384.0	2.00	262.80	4,115.0	-1,205.4	20.5	1,204.6	0.25
4,479.0	2.30	262.00	4,209.9	-1,205.9	17.0	1,205.2	0.32
4,573.0	2.20	252.90	4,303.9	-1,206.7	13.4	1,206.1	0.39
4,667.0	2.70	253.30	4,397.8	-1,207.8	9.5	1,207.3	0.53
4,762.0	2.50	256.40	4,492.7	-1,209.0	5.4	1,208.5	0.26
4,856.0	2.30	252.80	4,586.6	-1,210.0	1.6	1,209.7	0.27
4,951.0	2.70	259.10	4,681.5	-1,211.0	-2.4	1,210.7	0.51
5,045.0	3.00	257.80	4,775.4	-1,211.9	-7.0	1,211.8	0.33
5,140.0	3.10	264.70	4,870.3	-1,212.7	-12.0	1,212.7	0.40
5,234.0	3.00	268.50	4,964.1	-1,213.0	-17.0	1,213.1	0.24
5,329.0	3.20	267.70	5,059.0	-1,213.2	-22.1	1,213.4	0.22
5,423.0	3.70	258.20	5,152.8	-1,213.9	-27.7	1,214.2	0.81
5,518.0	4.00	253.50	5,247.6	-1,215.5	-33.9	1,215.9	0.46
5,612.0	4.10	255.90	5,341.4	-1,217.2	-40.3	1,217.8	0.21
5,707.0	4.50	251.60	5,436.1	-1,219.2	-47.1	1,220.0	0.54
5,801.0	4.90	255.30	5,529.8	-1,221.4	-54.5	1,222.3	0.53
5,896.0	4.60	255.90	5,624.5	-1,223.4	-62.1	1,224.4	0.32
5,990.0	4.90	256.70	5,718.1	-1,225.2	-69.7	1,226.4	0.33
6,046.1	5.31	257.57	5,774.0	-1,226.3	-74.6	1,227.7	0.75
Cylinder Bottom - Cylinder Exit Point							
6,085.0	5.60	258.10	5,812.7	-1,227.1	-78.2	1,228.5	0.75
6,179.0	5.60	259.10	5,906.3	-1,228.9	-87.2	1,230.5	0.10
6,273.0	5.20	256.90	5,999.9	-1,230.7	-95.8	1,232.6	0.48
6,368.0	4.80	250.60	6,094.5	-1,233.0	-103.8	1,235.0	0.71
6,462.0	4.40	253.80	6,188.2	-1,235.3	-110.9	1,237.5	0.51
6,557.0	4.60	251.10	6,282.9	-1,237.6	-118.0	1,239.9	0.31

Design Report for SKR-598-36-BV-17 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,651.0	4.40	261.40	6,376.6	-1,239.3	-125.2	1,241.8	0.88
6,746.0	4.50	264.40	6,471.3	-1,240.3	-132.5	1,242.9	0.27
6,863.0	4.30	260.90	6,588.0	-1,241.4	-141.4	1,244.2	0.29
Final 6" MWD Survey - 598-36-19b F							
6,910.0	4.30	260.90	6,634.9	-1,242.0	-144.9	1,244.9	0.00
Projection to Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
101.0	101.0	-0.4	0.0	First GWD Survey
379.0	378.2	-18.4	-1.0	Final GWD Survey
402.0	400.9	-21.6	-1.0	First 8" MWD Survey
990.0	964.2	-184.3	-4.7	Final 8" MWD Survey
1,078.0	1,044.3	-220.7	-6.1	First 6" MWD Survey
3,811.8	3,543.0	-1,208.7	35.9	Cylinder Entry Point
6,046.1	5,774.0	-1,226.3	-74.6	Cylinder Bottom
6,046.1	5,774.0	-1,226.3	-74.6	Cylinder Exit Point
6,863.0	6,588.0	-1,241.4	-141.4	Final 6" MWD Survey
6,910.0	6,634.9	-1,242.0	-144.9	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	598-36-19 F	181.28	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
101.0	379.0	GWD Surveys	GYD_GWD_SS
402.0	990.0	8" EM Surveys	MWD
1,078.0	6,910.0	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
598-36-19b F	0.00	0.00	6,599.0	-1,217.0	-27.2	1,642,616.30	2,197,603.33	39° 33' 47.720 N	108° 20' 47.552 W
- actual wellpath misses target center by 117.3ft at 6863.0ft MD (6588.0 TVD, -1241.4 N, -141.4 E) - Point									
598-36-19 F	0.00	0.00	3,543.0	-1,217.0	-27.2	1,642,616.30	2,197,603.33	39° 33' 47.720 N	108° 20' 47.552 W
- actual wellpath misses target center by 63.6ft at 3812.4ft MD (3543.6 TVD, -1208.7 N, 35.9 E) - Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									