

Chevron USA

Piceance

SKR-598-36-BV (New)

SKR-598-36-BV-20 - Slot 20

598-36-37

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

19 March, 2009

Well Coordinates (NAD83): 1,643,829.69 N, 2,197,642.42 E (39° 33' 59.72" N, 108° 20' 47.54" W)

Ground Level: 6,032.60 ft

Local Coordinate Origin: Centered on Well SKR-598-36-BV-20 (Slot 20) - 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

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Project: Piceance
 Site: SKR-598-36-BV (New)
 Well: SKR-598-36-BV-20
 Wellbore: 598-36-37
 Plan: Actual Field Surveys

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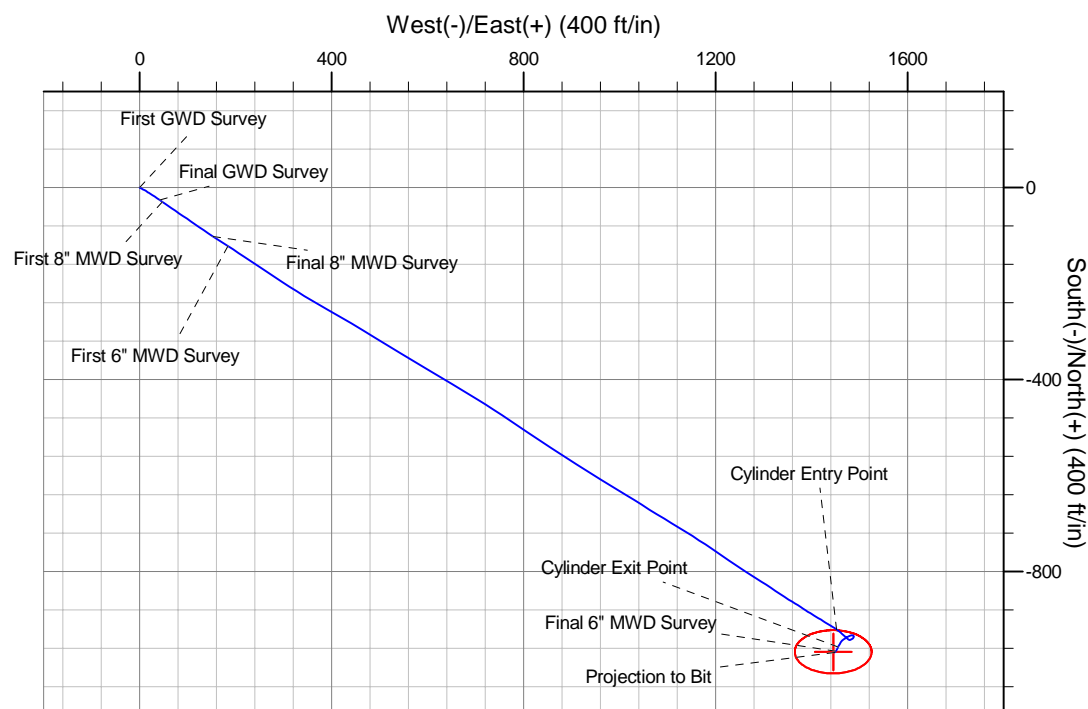
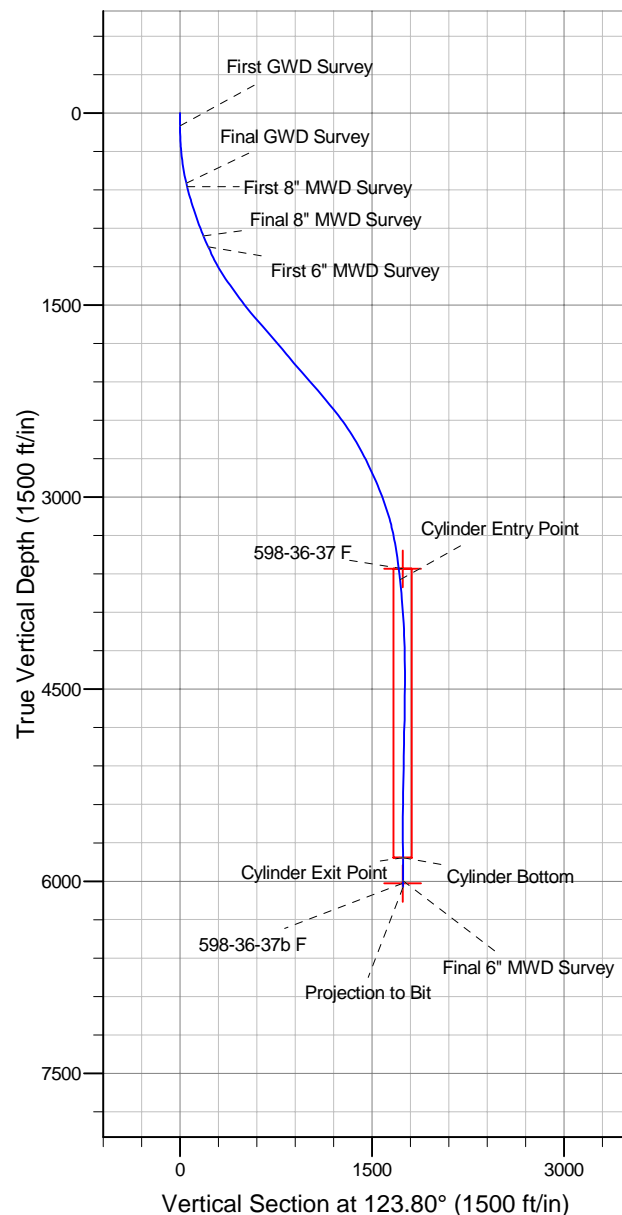
Drilling and Formation
Evaluation

WELL DETAILS: SKR-598-36-BV-20

+N/-S	+E/-W	Northing	Easting	Ground Level: 6032.6	Latitude	Longitude	Slot
0.0	0.0	1643829.69	2197642.42		39° 33' 59.719 N	108° 20' 47.539 W	Slot 20

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-37 F	3560.0	-967.2	1444.9	1642862.49	2199087.29	Ellipse (Radii: L45.0 W80.0)
598-36-37b F	6017.0	-967.2	1444.9	1642862.49	2199087.29	Point



Design Report for SKR-598-36-BV-20 - 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
99.0	0.35	118.57	99.0	-0.1	0.3	0.3	0.35
First GWD Survey							
120.0	0.70	108.18	120.0	-0.2	0.4	0.5	1.72
151.0	2.03	114.17	151.0	-0.5	1.1	1.2	4.31
183.0	2.38	114.87	183.0	-1.0	2.2	2.4	1.10
214.0	3.08	118.75	213.9	-1.7	3.6	3.9	2.33
245.0	3.88	123.68	244.9	-2.7	5.2	5.8	2.75
275.0	5.11	121.57	274.8	-3.9	7.1	8.1	4.14
306.0	5.73	122.10	305.6	-5.5	9.6	11.0	2.01
337.0	6.26	120.34	336.5	-7.1	12.4	14.3	1.81
367.0	6.96	121.57	366.3	-8.9	15.4	17.7	2.38
398.0	7.93	119.28	397.0	-11.0	18.8	21.7	3.27
429.0	9.07	121.74	427.7	-13.3	22.8	26.3	3.86
460.0	9.87	124.39	458.2	-16.1	27.0	31.4	2.94
490.0	11.10	124.21	487.7	-19.1	31.6	36.9	4.10
521.0	12.07	122.80	518.1	-22.6	36.7	43.1	3.26
552.0	13.04	123.51	548.4	-26.3	42.4	49.8	3.17
Final GWD Survey							
578.0	13.81	124.91	573.7	-29.7	47.4	55.9	3.21
First 8" MWD Survey							
609.0	14.40	124.91	603.7	-34.0	53.6	63.4	1.90
640.0	15.38	125.34	633.7	-38.6	60.1	71.4	3.18
670.0	16.44	124.59	662.5	-43.3	66.8	79.6	3.60
701.0	17.53	124.22	692.2	-48.4	74.3	88.7	3.53
733.0	17.88	124.29	722.7	-53.9	82.3	98.4	1.10
764.0	18.43	125.14	752.1	-59.4	90.3	108.1	1.97
796.0	18.60	124.66	782.5	-65.2	98.6	118.2	0.71
827.0	18.99	124.77	811.8	-70.9	106.8	128.2	1.26
858.0	19.82	124.38	841.1	-76.7	115.3	138.5	2.71
890.0	20.19	123.81	871.1	-82.9	124.4	149.4	1.31
921.0	20.64	123.72	900.2	-88.9	133.4	160.3	1.46
953.0	21.82	123.81	930.0	-95.3	143.0	171.8	3.69
984.0	22.94	122.96	958.7	-101.8	152.8	183.6	3.76
Final 8" MWD Survey							
1,078.0	24.00	122.70	1,044.9	-122.1	184.3	221.1	1.13
First 6" MWD Survey							
1,172.0	26.20	124.20	1,130.0	-144.1	217.6	260.9	2.44
1,267.0	30.50	123.30	1,213.6	-169.1	255.1	306.0	4.55
1,361.0	34.40	123.60	1,292.9	-196.9	297.1	356.5	4.15
1,455.0	35.60	120.80	1,369.9	-225.6	342.8	410.4	2.13
1,550.0	36.30	119.90	1,446.8	-253.8	390.9	466.0	0.92
1,644.0	38.90	120.60	1,521.3	-282.7	440.4	523.3	2.80
1,739.0	40.50	121.70	1,594.4	-314.1	492.4	583.9	1.84
1,833.0	41.00	121.50	1,665.6	-346.3	544.6	645.2	0.55
1,928.0	40.90	120.20	1,737.3	-378.2	598.1	707.4	0.90
2,022.0	41.00	121.10	1,808.3	-409.6	651.1	768.9	0.64
2,117.0	39.50	121.30	1,880.8	-441.4	703.6	830.2	1.58
2,211.0	40.80	123.90	1,952.7	-474.1	754.6	890.8	2.26
2,306.0	40.60	123.80	2,024.7	-508.6	806.1	952.7	0.22

Design Report for SKR-598-36-BV-20 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,400.0	41.50	123.10	2,095.6	-542.6	857.6	1,014.5	1.08
2,495.0	40.90	122.50	2,167.1	-576.5	910.2	1,077.0	0.76
2,589.0	40.00	121.80	2,238.6	-608.9	961.8	1,138.0	1.07
2,684.0	38.70	121.30	2,312.1	-640.5	1,013.1	1,198.2	1.41
2,778.0	36.70	122.60	2,386.4	-670.9	1,061.9	1,255.6	2.29
2,872.0	34.00	121.10	2,463.1	-699.6	1,108.1	1,310.0	3.02
2,967.0	31.20	121.80	2,543.1	-726.3	1,151.7	1,361.1	2.97
3,061.0	29.00	124.30	2,624.5	-751.9	1,191.3	1,408.2	2.69
3,156.0	26.80	123.80	2,708.4	-776.8	1,228.1	1,452.7	2.33
3,250.0	24.90	123.80	2,793.0	-799.6	1,262.1	1,493.7	2.02
3,345.0	23.50	122.10	2,879.7	-820.8	1,294.8	1,532.6	1.65
3,439.0	21.20	124.60	2,966.6	-840.4	1,324.7	1,568.3	2.65
3,534.0	19.50	121.50	3,055.7	-858.5	1,352.3	1,601.3	2.12
3,628.0	16.40	123.10	3,145.1	-873.9	1,376.8	1,630.3	3.34
3,722.0	12.70	120.80	3,236.0	-886.5	1,396.8	1,653.9	3.98
3,817.0	11.60	122.90	3,328.9	-897.0	1,413.8	1,673.9	1.25
3,911.0	8.70	120.70	3,421.4	-905.8	1,427.9	1,690.4	3.11
4,006.0	7.50	120.90	3,515.5	-912.6	1,439.4	1,703.8	1.26
4,054.3	6.98	122.67	3,563.4	-915.8	1,444.6	1,709.9	1.17
598-36-37 F							
4,100.0	6.50	124.60	3,608.8	-918.8	1,449.0	1,715.2	1.17
4,135.4	6.16	125.38	3,644.0	-921.0	1,452.2	1,719.1	0.98
Cylinder Entry Point							
4,195.0	5.60	126.90	3,703.3	-924.6	1,457.2	1,725.2	0.98
4,289.0	4.50	133.10	3,796.9	-929.9	1,463.5	1,733.5	1.30
4,384.0	3.80	131.60	3,891.6	-934.5	1,468.6	1,740.3	0.75
4,478.0	3.90	131.00	3,985.4	-938.7	1,473.3	1,746.5	0.11
4,573.0	2.50	126.40	4,080.3	-942.1	1,477.4	1,751.8	1.50
4,667.0	2.40	61.10	4,174.2	-942.3	1,480.8	1,754.7	2.81
4,762.0	1.90	59.60	4,269.1	-940.6	1,483.9	1,756.3	0.53
4,856.0	1.40	38.40	4,363.1	-938.9	1,486.0	1,757.1	0.83
4,951.0	1.20	23.00	4,458.1	-937.0	1,487.1	1,757.0	0.42
5,045.0	1.10	9.10	4,552.1	-935.3	1,487.6	1,756.5	0.31
5,140.0	0.90	323.10	4,647.0	-933.8	1,487.3	1,755.4	0.85
5,234.0	1.20	290.40	4,741.0	-932.8	1,485.9	1,753.7	0.70
5,328.0	1.70	262.80	4,835.0	-932.7	1,483.6	1,751.7	0.90
5,423.0	1.80	246.30	4,930.0	-933.4	1,480.9	1,749.8	0.54
5,517.0	2.10	246.90	5,023.9	-934.7	1,477.9	1,748.1	0.32
5,612.0	1.60	247.40	5,118.9	-935.9	1,475.1	1,746.4	0.53
5,706.0	1.70	236.40	5,212.8	-937.2	1,472.7	1,745.2	0.35
5,801.0	2.30	233.10	5,307.8	-939.1	1,470.0	1,744.0	0.64
5,895.0	2.70	234.70	5,401.7	-941.5	1,466.7	1,742.6	0.43
5,989.0	2.70	225.30	5,495.6	-944.3	1,463.3	1,741.4	0.47
6,084.0	2.30	214.60	5,590.5	-947.5	1,460.7	1,740.9	0.65
6,178.0	2.70	207.90	5,684.4	-951.0	1,458.6	1,741.1	0.53
6,273.0	3.20	205.80	5,779.3	-955.4	1,456.4	1,741.7	0.54
6,310.8	3.20	207.21	5,817.0	-957.2	1,455.4	1,741.9	0.21
Cylinder Exit Point - Cylinder Bottom							
6,367.0	3.20	209.30	5,873.1	-960.0	1,453.9	1,742.2	0.21
6,462.0	3.50	213.70	5,967.9	-964.7	1,451.0	1,742.5	0.42
6,490.0	3.50	217.70	5,995.9	-966.1	1,450.0	1,742.4	0.87

Design Report for SKR-598-36-BV-20 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Final 6" MWD Survey - 598-36-37b F							
6,540.0	3.50	217.70	6,045.8	-968.5	1,448.2	1,742.2	0.00
Projection to Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
99.0	99.0	-0.1	0.3	First GWD Survey
552.0	548.4	-26.3	42.4	Final GWD Survey
578.0	573.7	-29.7	47.4	First 8" MWD Survey
984.0	958.7	-101.8	152.8	Final 8" MWD Survey
1,078.0	1,044.9	-122.1	184.3	First 6" MWD Survey
4,135.4	3,644.0	-921.0	1,452.2	Cylinder Entry Point
6,310.8	5,817.0	-957.2	1,455.4	Cylinder Exit Point
6,310.8	5,817.0	-957.2	1,455.4	Cylinder Bottom
6,490.0	5,995.9	-966.1	1,450.0	Final 6" MWD Survey
6,540.0	6,045.8	-968.5	1,448.2	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	598-36-37 F	123.80	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
99.0	552.0	GWD Surveys	GYD_DP_MS
578.0	984.0	8" EM Surveys	MWD
1,078.0	6,540.0	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									
598-36-37 F	0.00	0.00	3,560.0	-967.2	1,444.9	1,642,862.49	2,199,087.29	39° 33' 50.611 N	108° 20' 28.711 W
- actual wellpath misses target center by 51.5ft at 4054.3ft MD (3563.4 TVD, -915.8 N, 1444.6 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 96.3% Intersected									
598-36-37b F	0.00	0.00	6,017.0	-967.2	1,444.9	1,642,862.49	2,199,087.29	39° 33' 50.611 N	108° 20' 28.711 W
- actual wellpath misses target center by 21.8ft at 6490.0ft MD (5995.9 TVD, -966.1 N, 1450.0 E)									
- Point									