

Chevron USA

Piceance

SKR-598-36-BV (New)

SKR-598-36-BV-13 - Slot 13

598-36-17

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

12 February, 2009

Well Coordinates (NAD83): 1,643,847.55 N, 2,197,625.48 E (39° 33' 59.89" N, 108° 20' 47.76" W)

Ground Level: 6,032.60 ft

Local Coordinate Origin: Centered on Well SKR-598-36-BV-13 (Slot 13) - 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-13
Wellbore: 598-36-17
Plan: Actual Field Surveys

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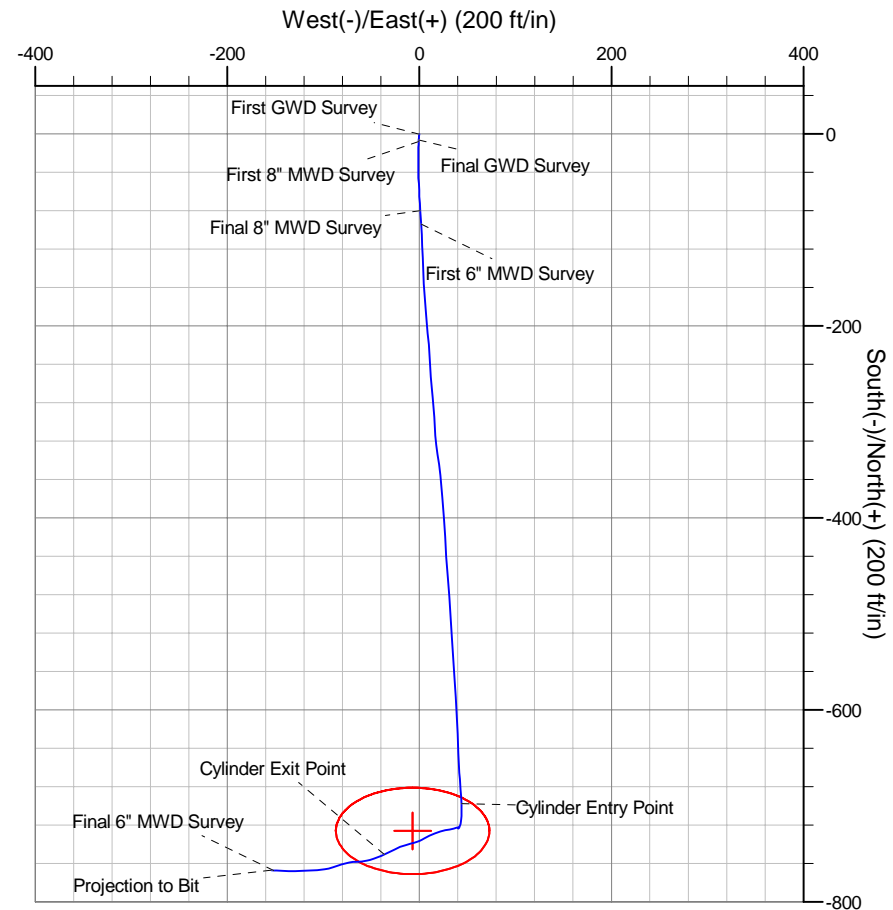
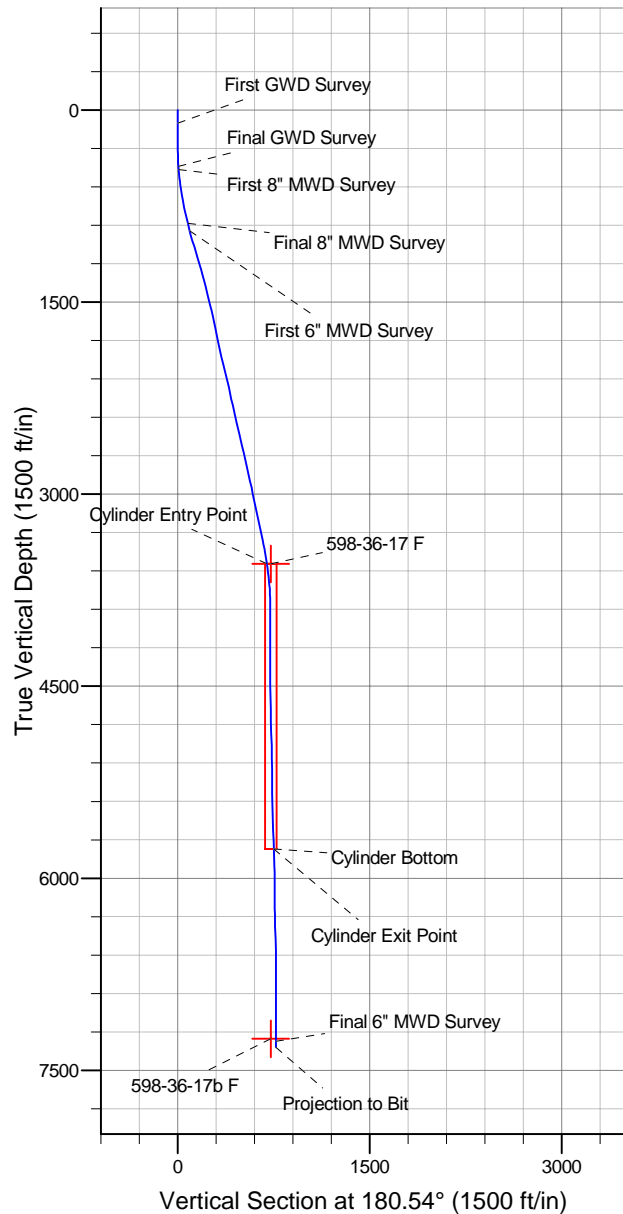
Drilling and Formation
Evaluation

WELL DETAILS: SKR-598-36-BV-13

+N/-S	+E/-W	Northing	Ground Level: 6032.6	Easting	Latitude	Longitude	Slot
0.0	0.0	1643847.55		2197625.48	39° 33' 59.890 N	108° 20' 47.762 W	Slot 13

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-17 F	3545.0	-726.1	-6.9	1643121.50	2197618.58	Ellipse (Radii: L45.0 W80.0)
598-36-17b F	7254.0	-726.1	-6.9	1643121.50	2197618.58	Point



Design Report for SKR-598-36-BV-13 - 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	0.26	188.00	101.0	-0.2	0.0	0.2	0.26
First GWD Survey							
133.0	0.35	199.45	133.0	-0.4	-0.1	0.4	0.34
164.0	0.09	67.64	164.0	-0.5	-0.1	0.5	1.34
194.0	0.09	131.96	194.0	-0.5	0.0	0.5	0.32
225.0	0.18	153.64	225.0	-0.5	0.0	0.5	0.33
256.0	0.09	161.92	256.0	-0.6	0.0	0.6	0.30
286.0	0.53	211.08	286.0	-0.7	0.0	0.7	1.59
317.0	1.15	191.17	317.0	-1.2	-0.2	1.2	2.18
348.0	1.76	189.05	348.0	-1.9	-0.3	2.0	1.98
379.0	2.38	185.35	379.0	-3.1	-0.4	3.1	2.04
409.0	3.08	184.82	408.9	-4.5	-0.6	4.5	2.33
440.0	3.88	182.53	439.9	-6.4	-0.7	6.4	2.62
Final GWD Survey							
464.0	4.81	180.97	463.8	-8.2	-0.7	8.2	3.91
First 8" MWD Survey							
494.0	5.50	180.42	493.7	-10.9	-0.8	10.9	2.31
525.0	6.33	181.07	524.5	-14.1	-0.8	14.1	2.69
556.0	7.10	181.79	555.3	-17.7	-0.9	17.7	2.50
586.0	7.82	180.42	585.0	-21.6	-1.0	21.6	2.47
617.0	8.54	178.64	615.7	-26.0	-0.9	26.0	2.46
648.0	9.31	180.21	646.4	-30.8	-0.9	30.8	2.60
679.0	10.10	180.04	676.9	-36.0	-0.9	36.0	2.55
703.0	10.40	180.30	700.5	-40.3	-0.9	40.3	1.26
735.0	10.80	178.20	732.0	-46.2	-0.8	46.2	1.74
766.0	11.50	176.40	762.4	-52.2	-0.6	52.2	2.52
798.0	11.90	177.10	793.7	-58.7	-0.2	58.7	1.33
829.0	12.80	176.40	824.0	-65.3	0.2	65.3	2.94
861.0	13.40	175.60	855.2	-72.5	0.7	72.5	1.96
892.0	13.90	177.10	885.3	-79.8	1.2	79.8	1.98
Final 8" MWD Survey							
949.0	14.60	177.00	940.6	-93.8	1.9	93.8	1.23
First 6" MWD Survey							
1,078.0	17.20	178.00	1,064.6	-129.1	3.4	129.1	2.03
1,173.0	16.40	176.50	1,155.6	-156.5	4.7	156.5	0.96
1,267.0	15.90	175.40	1,245.8	-182.6	6.6	182.6	0.62
1,362.0	14.90	174.40	1,337.4	-207.8	8.8	207.7	1.09
1,456.0	13.40	177.10	1,428.6	-230.7	10.5	230.6	1.74
1,551.0	14.30	175.40	1,520.8	-253.4	12.0	253.2	1.04
1,645.0	12.40	173.70	1,612.3	-275.0	14.1	274.8	2.06
1,740.0	12.10	177.20	1,705.1	-295.0	15.7	294.9	0.84
1,834.0	11.70	176.10	1,797.1	-314.4	16.8	314.2	0.49
1,928.0	12.60	171.40	1,889.0	-334.0	19.0	333.8	1.42
2,023.0	14.00	172.90	1,981.4	-355.7	21.9	355.5	1.52
2,117.0	14.20	176.50	2,072.6	-378.5	24.1	378.2	0.96
2,212.0	12.20	175.60	2,165.1	-400.1	25.5	399.9	2.12
2,306.0	11.90	176.80	2,257.0	-419.7	26.8	419.4	0.42
2,401.0	13.10	176.40	2,349.8	-440.2	28.1	439.9	1.27
2,495.0	12.70	175.10	2,441.4	-461.1	29.6	460.8	0.53

Design Report for SKR-598-36-BV-13 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,590.0	13.10	176.00	2,534.0	-482.3	31.3	482.0	0.47
2,684.0	13.90	176.00	2,625.4	-504.2	32.8	503.8	0.85
2,778.0	12.20	176.60	2,717.0	-525.4	34.2	525.0	1.81
2,873.0	12.80	177.30	2,809.7	-545.9	35.3	545.5	0.65
2,967.0	12.80	176.10	2,901.4	-566.7	36.5	566.3	0.28
3,062.0	11.50	175.80	2,994.2	-586.6	37.9	586.2	1.37
3,156.0	11.80	176.30	3,086.3	-605.6	39.2	605.2	0.34
3,251.0	12.00	179.40	3,179.3	-625.1	39.9	624.7	0.70
3,345.0	12.70	177.40	3,271.1	-645.2	40.5	644.8	0.87
3,440.0	12.10	175.30	3,363.9	-665.6	41.8	665.2	0.79
3,534.0	9.60	176.50	3,456.2	-683.2	43.0	682.8	2.67
3,623.9	8.65	177.44	3,545.0	-697.5	43.8	697.0	1.07
Cylinder Entry Point							
3,627.9	8.61	177.49	3,548.9	-698.1	43.8	697.6	1.07
598-36-17 F							
3,629.0	8.60	177.50	3,550.0	-698.2	43.8	697.8	1.07
3,723.0	6.50	181.90	3,643.2	-710.6	44.0	710.1	2.32
3,818.0	3.90	197.20	3,737.8	-719.0	42.8	718.6	3.08
3,912.0	0.90	213.80	3,831.7	-722.7	41.5	722.3	3.24
4,006.0	0.50	251.20	3,925.7	-723.4	40.7	723.0	0.62
4,101.0	0.50	10.10	4,020.7	-723.2	40.4	722.8	0.91
4,196.0	0.40	41.50	4,115.7	-722.5	40.7	722.1	0.28
4,290.0	0.40	254.70	4,209.7	-722.4	40.6	721.9	0.82
4,384.0	1.50	256.30	4,303.7	-722.7	39.0	722.3	1.17
4,479.0	2.40	255.90	4,398.6	-723.5	35.9	723.1	0.95
4,573.0	2.80	259.60	4,492.5	-724.4	31.7	724.1	0.46
4,667.0	3.00	259.00	4,586.4	-725.3	27.1	725.0	0.22
4,762.0	3.50	252.40	4,681.2	-726.6	21.9	726.4	0.66
4,856.0	3.60	247.60	4,775.1	-728.6	16.4	728.4	0.33
4,951.0	3.80	244.90	4,869.9	-731.1	10.8	731.0	0.28
5,045.0	3.90	241.20	4,963.6	-734.0	5.2	733.9	0.28
5,140.0	2.10	242.20	5,058.5	-736.3	0.8	736.3	1.90
5,234.0	1.40	259.00	5,152.5	-737.4	-1.9	737.3	0.92
5,329.0	2.40	251.80	5,247.4	-738.2	-4.9	738.2	1.08
5,423.0	2.90	256.50	5,341.3	-739.4	-9.1	739.4	0.58
5,518.0	3.80	253.20	5,436.2	-740.8	-14.4	740.9	0.97
5,612.0	3.60	249.20	5,530.0	-742.8	-20.2	743.0	0.35
5,707.0	4.10	242.00	5,624.7	-745.4	-25.9	745.7	0.73
5,801.0	4.50	244.70	5,718.5	-748.6	-32.2	748.9	0.48
5,854.7	4.84	246.43	5,772.0	-750.4	-36.2	750.7	0.68
Cylinder Bottom - Cylinder Exit Point							
5,896.0	5.10	247.60	5,813.1	-751.8	-39.5	752.1	0.68
5,990.0	5.30	249.00	5,906.8	-755.0	-47.4	755.4	0.25
6,085.0	3.60	258.20	6,001.5	-757.1	-54.5	757.6	1.94
6,179.0	3.30	264.10	6,095.3	-758.0	-60.0	758.6	0.49
6,273.0	3.80	271.30	6,189.1	-758.2	-65.8	758.8	0.71
6,368.0	4.90	258.60	6,283.8	-759.0	-73.0	759.6	1.53
6,462.0	5.50	252.30	6,377.5	-761.1	-81.2	761.9	0.88
6,557.0	5.70	251.40	6,472.0	-764.0	-90.0	764.8	0.23
6,651.0	5.00	262.10	6,565.6	-766.1	-98.5	767.0	1.29
6,745.0	4.90	266.00	6,659.2	-766.9	-106.5	767.9	0.37

Design Report for SKR-598-36-BV-13 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,840.0	4.80	268.60	6,753.9	-767.3	-114.6	768.3	0.25
6,934.0	4.40	267.30	6,847.6	-767.5	-122.1	768.7	0.44
7,029.0	4.30	268.20	6,942.3	-767.8	-129.3	769.0	0.13
7,123.0	4.00	270.90	7,036.1	-767.9	-136.1	769.1	0.38
7,218.0	3.90	272.00	7,130.9	-767.7	-142.6	769.0	0.13
7,312.0	3.50	274.30	7,224.7	-767.4	-148.7	768.8	0.45
7,332.9	3.46	273.63	7,245.5	-767.3	-150.0	768.7	0.28
598-36-17b F							
7,361.0	3.40	272.70	7,273.6	-767.2	-151.6	768.6	0.28
Final 6" MWD Survey							
7,408.0	3.40	272.70	7,320.5	-767.1	-154.4	768.5	0.00
Projection to Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
101.0	101.0	-0.2	0.0	First GWD Survey
440.0	439.9	-6.4	-0.7	Final GWD Survey
464.0	463.8	-8.2	-0.7	First 8" MWD Survey
892.0	885.3	-79.8	1.2	Final 8" MWD Survey
949.0	940.6	-93.8	1.9	First 6" MWD Survey
3,623.9	3,545.0	-697.5	43.8	Cylinder Entry Point
5,854.7	5,772.0	-750.4	-36.2	Cylinder Bottom
5,854.7	5,772.0	-750.4	-36.2	Cylinder Exit Point
7,361.0	7,273.6	-767.2	-151.6	Final 6" MWD Survey
7,408.0	7,320.5	-767.1	-154.4	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	598-36-17 F	180.54	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
101.0	440.0	GWD Surveys	GYD_GWD_SS
464.0	892.0	8" EM Surveys	MWD
949.0	7,408.0	6" EM Surveys	MWD



Design Report for SKR-598-36-BV-13 - 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
598-36-17 F	0.00	360.00	3,545.0	-726.1	-6.9	1,643,121.50	2,197,618.58	39° 33' 52.716 N	108° 20' 47.560 W
- actual wellpath misses target center by 58.1ft at 3627.9ft MD (3548.9 TVD, -698.1 N, 43.8 E)									
- Ellipse (radii L45.0 W80.0 on 360.00 azi) - Target Cylinder 100% Intersected									
598-36-17b F	0.00	360.00	7,254.0	-726.1	-6.9	1,643,121.50	2,197,618.58	39° 33' 52.716 N	108° 20' 47.560 W
- actual wellpath misses target center by 149.1ft at 7332.9ft MD (7245.5 TVD, -767.3 N, -150.0 E)									
- Point									