

Chevron USA

Piceance

SKR-598-36-AV

SKR-598-36-AV-17 - slot 17

598-36-46

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

02 December, 2008

Well Coordinates (NAD83): 1,645,978.29 N, 2,199,550.17 E (39° 34' 21.53" N, 108° 20' 24.05" W)

Ground Level: 6,342.00 ft

Local Coordinate Origin: Centered on Well SKR-598-36-AV-17 - Slot slot 17

Viewing Datum: RFE @ 6367.0ft (Original Well Elev)

TVDs to System: N

North Reference: Grid

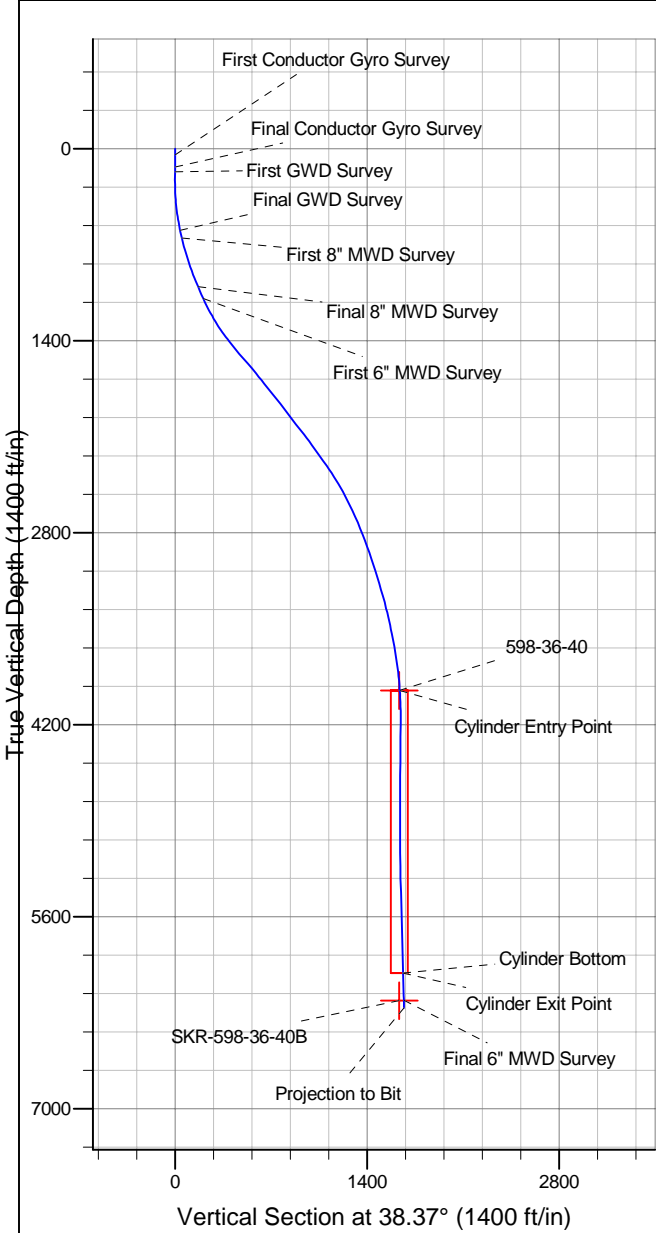
Unit System: API - US Survey Feet

Version: 2003.16 Build: 42B

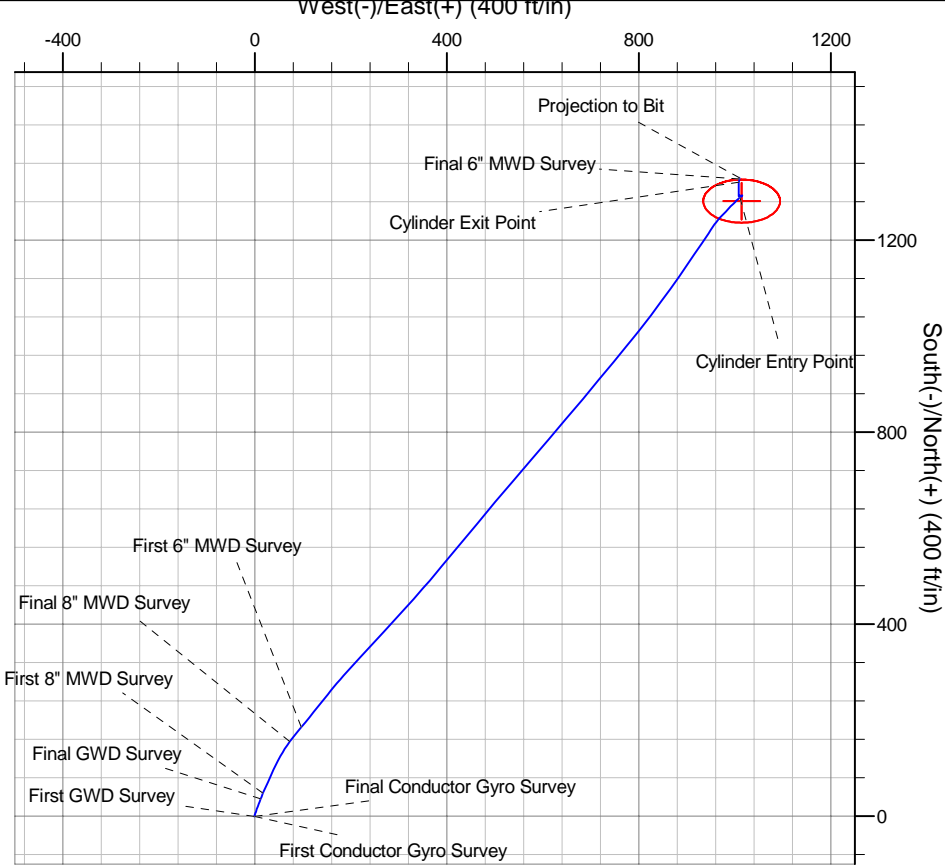
HALLIBURTON

Project: Piceance
Site: SKR-598-36-AV
Well: SKR-598-36-AV-16
Wellbore: 598-36-40
Plan: Actual Field Surveys

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WELL DETAILS: SKR-598-36-AV-16							
+N/-S	+E/-W	Northing	Easting	Ground Level: 6342.0	Latitude	Longitude	Slot
0.0	0.0	1645985.04	2199539.65	39° 34' 21.598 N	108° 20' 24.184 W	slot 16	
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape	
598-36-40	3951.0	1281.4	1014.5	1647266.41	2200554.14	Ellipse (Radii: L45.0 W80.0)	
SKR-598-36-40B	6212.0	1281.4	1014.5	1647266.41	2200554.14	Point	



Design Report for SKR-598-36-AV-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
45.0	0.03	47.23	45.0	0.0	0.0	0.0	0.07
First Conductor Gyro Survey							
65.0	0.07	97.03	65.0	0.0	0.0	0.0	0.28
85.0	0.11	230.70	85.0	0.0	0.0	0.0	0.83
105.0	0.22	248.65	105.0	0.0	0.0	0.0	0.60
125.0	0.35	245.76	125.0	-0.1	-0.1	-0.1	0.65
135.0	0.41	253.95	135.0	-0.1	-0.2	-0.2	0.81
Final Conductor Gyro Survey							
168.0	0.35	137.10	168.0	-0.2	-0.2	-0.2	1.96
First GWD Survey							
199.0	1.32	130.75	199.0	-0.5	0.1	0.2	3.14
230.0	2.20	127.58	230.0	-1.1	0.8	1.1	2.85
261.0	3.44	117.01	260.9	-1.9	2.1	2.6	4.32
291.0	4.14	108.20	290.9	-2.6	4.0	4.5	3.03
322.0	5.11	103.44	321.8	-3.3	6.4	7.0	3.36
353.0	5.46	105.20	352.6	-4.0	9.2	9.9	1.24
383.0	6.17	104.32	382.5	-4.8	12.1	12.9	2.39
414.0	6.70	96.92	413.3	-5.4	15.5	16.4	3.17
445.0	6.70	102.21	444.1	-6.0	19.1	20.0	1.99
476.0	6.78	95.51	474.9	-6.6	22.7	23.6	2.55
506.0	7.31	100.80	504.6	-7.1	26.3	27.2	2.79
537.0	8.37	96.39	535.4	-7.7	30.5	31.4	3.93
567.0	8.81	102.38	565.0	-8.5	34.9	35.9	3.32
598.0	9.60	108.37	595.6	-9.8	39.7	40.8	4.00
629.0	10.66	105.55	626.1	-11.4	44.9	46.3	3.77
Final GWD Survey							
687.0	11.96	110.40	683.0	-14.9	55.7	57.6	2.78
First 8" MWD Survey							
733.0	13.23	110.39	727.9	-18.4	65.1	67.6	2.76
779.0	14.97	108.55	772.5	-22.1	75.6	78.8	3.91
826.0	16.00	106.52	817.8	-25.9	87.6	91.3	2.48
874.0	17.16	106.64	863.8	-29.8	100.7	105.0	2.42
921.0	18.78	106.98	908.5	-34.0	114.6	119.5	3.45
968.0	20.26	106.75	952.8	-38.5	129.6	135.2	3.15
1,015.0	21.49	106.07	996.7	-43.3	145.7	152.0	2.67
1,062.0	21.99	105.68	1,040.4	-48.0	162.5	169.4	1.11
1,110.0	22.50	104.36	1,084.8	-52.7	180.0	187.6	1.49
1,157.0	23.24	104.26	1,128.1	-57.3	197.7	205.8	1.58
1,204.0	24.33	104.05	1,171.1	-61.9	216.1	224.8	2.33
1,251.0	25.54	102.83	1,213.7	-66.5	235.4	244.6	2.80
1,298.0	26.35	102.85	1,256.0	-71.1	255.4	265.1	1.72
1,345.0	27.47	104.02	1,297.9	-76.0	276.1	286.4	2.64
1,402.0	30.01	105.55	1,347.9	-83.0	302.6	313.8	4.64
Final 8" MWD Survey							
1,513.0	30.82	105.39	1,443.6	-98.0	356.7	370.0	0.73
First 6" MWD Survey							
1,607.0	31.08	105.14	1,524.2	-110.7	403.4	418.3	0.31
1,701.0	30.02	104.61	1,605.2	-123.0	449.6	466.1	1.16
1,796.0	29.05	103.27	1,687.8	-134.3	495.0	512.9	1.24

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

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
1,890.0	28.16	102.69	1,770.4	-144.4	538.9	557.8	0.99
1,984.0	28.04	105.08	1,853.3	-155.0	581.8	602.1	1.20
2,079.0	28.59	104.92	1,936.9	-166.7	625.4	647.1	0.58
2,173.0	29.06	105.42	2,019.3	-178.5	669.1	692.4	0.56
2,267.0	28.98	105.84	2,101.5	-190.8	713.0	738.0	0.23
2,362.0	29.35	105.44	2,184.4	-203.3	757.6	784.3	0.44
2,456.0	30.18	105.40	2,266.0	-215.7	802.6	831.0	0.88
2,550.0	30.56	104.86	2,347.1	-228.1	848.5	878.5	0.50
2,645.0	31.44	106.17	2,428.6	-241.2	895.6	927.4	1.17
2,739.0	29.81	105.62	2,509.4	-254.3	941.6	975.3	1.76
2,833.0	27.32	104.52	2,592.0	-266.0	985.0	1,020.3	2.71
2,928.0	25.61	103.92	2,677.0	-276.4	1,026.1	1,062.6	1.82
3,022.0	23.68	103.58	2,762.5	-285.8	1,064.1	1,101.8	2.06
3,116.0	21.50	103.62	2,849.3	-294.2	1,099.2	1,137.8	2.32
3,211.0	20.05	106.67	2,938.1	-303.0	1,131.8	1,171.5	1.90
3,305.0	18.82	108.72	3,026.7	-312.5	1,161.6	1,202.8	1.50
3,399.0	17.61	109.62	3,116.0	-322.2	1,189.3	1,232.1	1.32
3,494.0	16.67	110.56	3,206.8	-331.8	1,215.6	1,260.0	1.03
3,588.0	15.41	110.65	3,297.1	-340.9	1,239.9	1,285.9	1.34
3,682.0	14.20	107.05	3,388.0	-348.7	1,262.6	1,309.9	1.62
3,777.0	11.35	99.91	3,480.6	-353.7	1,283.0	1,330.8	3.42
3,871.0	9.19	104.36	3,573.1	-357.2	1,299.4	1,347.5	2.45
3,965.0	6.08	109.25	3,666.3	-360.7	1,311.3	1,360.0	3.38
4,060.0	3.95	108.46	3,760.9	-363.4	1,319.2	1,368.3	2.24
4,154.0	2.68	115.03	3,854.8	-365.3	1,324.3	1,373.7	1.41
4,249.0	1.95	122.24	3,949.7	-367.1	1,327.6	1,377.4	0.83
4,343.0	1.68	133.49	4,043.6	-368.9	1,330.0	1,380.2	0.47
4,349.4	1.66	134.71	4,050.0	-369.1	1,330.1	1,380.4	0.65
Cylinder Entry Point							
4,349.7	1.66	134.78	4,050.4	-369.1	1,330.1	1,380.4	0.65
SKR-598-36-46							
4,437.0	1.45	154.52	4,137.6	-370.9	1,331.5	1,382.2	0.65
4,532.0	1.45	166.59	4,232.6	-373.2	1,332.3	1,383.6	0.32
4,626.0	1.71	175.88	4,326.5	-375.8	1,332.7	1,384.6	0.39
4,720.0	1.56	177.05	4,420.5	-378.4	1,332.8	1,385.5	0.16
4,815.0	1.65	174.66	4,515.5	-381.1	1,333.0	1,386.4	0.12
4,909.0	1.33	181.71	4,609.4	-383.5	1,333.1	1,387.2	0.39
5,003.0	1.33	184.85	4,703.4	-385.7	1,333.0	1,387.6	0.08
5,098.0	1.16	182.63	4,798.4	-387.8	1,332.9	1,388.1	0.19
5,192.0	0.39	213.43	4,892.4	-389.0	1,332.6	1,388.2	0.90
5,287.0	0.52	286.22	4,987.4	-389.1	1,332.1	1,387.7	0.58
5,381.0	0.79	336.67	5,081.4	-388.4	1,331.4	1,386.8	0.65
5,475.0	1.17	343.40	5,175.4	-386.9	1,330.9	1,385.9	0.42
5,570.0	1.57	340.01	5,270.3	-384.7	1,330.1	1,384.6	0.43
5,664.0	1.70	327.64	5,364.3	-382.4	1,328.9	1,382.8	0.40
5,758.0	1.77	320.99	5,458.2	-380.1	1,327.3	1,380.6	0.23
5,853.0	2.04	321.93	5,553.2	-377.6	1,325.3	1,378.1	0.29
5,947.0	2.13	334.71	5,647.1	-374.7	1,323.5	1,375.6	0.50
6,042.0	2.21	339.38	5,742.1	-371.4	1,322.1	1,373.3	0.20
6,136.0	2.07	347.14	5,836.0	-368.0	1,321.1	1,371.4	0.34
6,230.0	2.47	346.62	5,929.9	-364.4	1,320.3	1,369.6	0.43

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

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,325.0	2.66	341.45	6,024.8	-360.3	1,319.1	1,367.4	0.31
6,343.2	2.69	341.43	6,043.0	-359.5	1,318.8	1,366.9	0.15
Cylinder Exit Point - Cylinder Bottom							
6,419.0	2.80	341.37	6,118.7	-356.1	1,317.7	1,364.9	0.15
6,514.0	2.80	338.09	6,213.6	-351.7	1,316.1	1,362.1	0.17
6,541.7	2.89	337.97	6,241.3	-350.4	1,315.6	1,361.3	0.31
SKR-598-36-46B							
6,543.0	2.89	337.96	6,242.6	-350.4	1,315.5	1,361.3	0.31
Final 6" MWD Survey							
6,600.0	2.89	337.96	6,299.5	-347.7	1,314.5	1,359.5	0.00
Projection to Bit							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
45.0	45.0	0.0	0.0	First Conductor Gyro Survey
135.0	135.0	-0.1	-0.2	Final Conductor Gyro Survey
168.0	168.0	-0.2	-0.2	First GWD Survey
629.0	626.1	-11.4	44.9	Final GWD Survey
687.0	683.0	-14.9	55.7	First 8" MWD Survey
1,402.0	1,347.9	-83.0	302.6	Final 8" MWD Survey
1,513.0	1,443.6	-98.0	356.7	First 6" MWD Survey
4,349.4	4,050.0	-369.1	1,330.1	Cylinder Entry Point
6,343.2	6,043.0	-359.5	1,318.8	Cylinder Exit Point
6,343.2	6,043.0	-359.5	1,318.8	Cylinder Bottom
6,543.0	6,242.6	-350.4	1,315.5	Final 6" MWD Survey
6,600.0	6,299.5	-347.7	1,314.5	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	SKR-598-36-46	105.72	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
45.0	135.0	Conductor Gyros	NS-GYRO-MS
168.0	629.0	GWD Surveys	GYD_GWD_SS
687.0	1,402.0	8" MWD Surveys	MWD
1,513.0	6,600.0	6" MWD Surveys	MWD



Design Report for SKR-598-36-AV-17 - 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
SKR-598-36-46B	0.00	0.00	6,243.0	-377.6	1,341.8	1,645,600.70	2,200,892.00	39° 34' 18.218 N	108° 20' 6.769 W
- actual wellpath misses by 37.8ft at 6541.7ft MD (6241.3 TVD, -350.4 N, 1315.6 E)									
- Point									
SKR-598-36-46	0.00	0.00	4,050.0	-377.6	1,341.8	1,645,600.70	2,200,892.00	39° 34' 18.218 N	108° 20' 6.769 W
- actual wellpath misses by 14.5ft at 4349.7ft MD (4050.4 TVD, -369.1 N, 1330.1 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									