

Chevron USA

Piceance

SKR-598-36-AV

SKR-598-36-AV-22 - slot 22

598-36-43

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

02 December, 2008

Well Coordinates (NAD83): 1,645,992.86 N, 2,199,560.61 E (39° 34' 21.68" N, 108° 20' 23.92" W)

Ground Level: 6,342.00 ft

Local Coordinate Origin: Centered on Well SKR-598-36-AV-22 - Slot slot 22

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-22
Wellbore: 598-36-43
Plan: Actual Field Surveys

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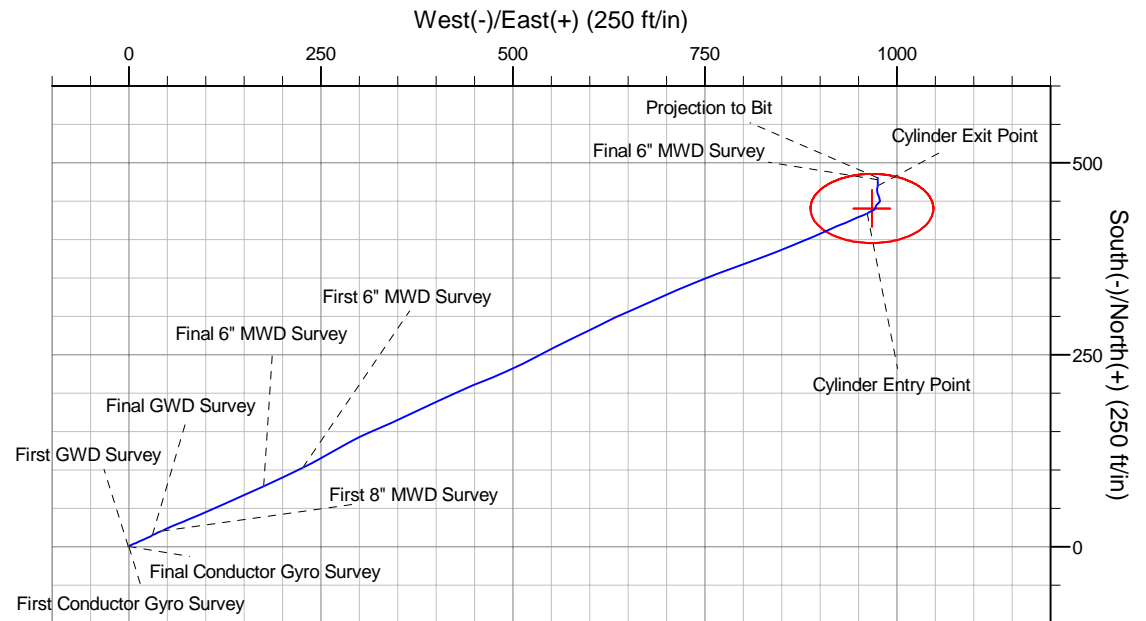
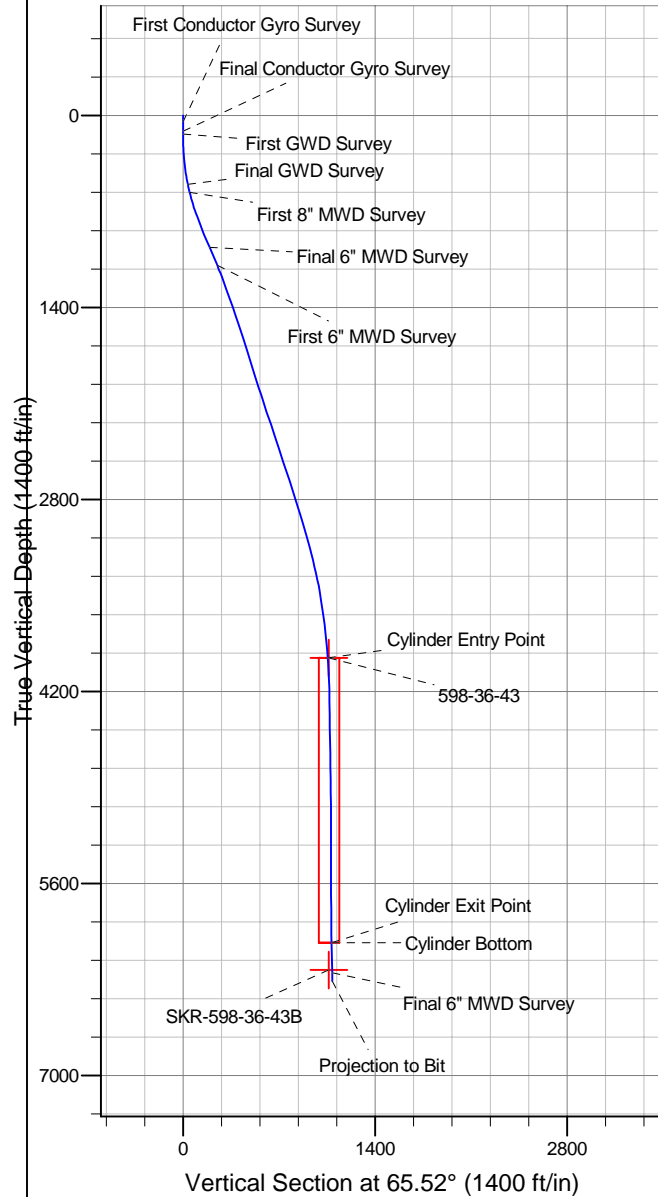
Drilling and Formation
Evaluation

WELL DETAILS: SKR-598-36-AV-22

+N/-S	+E/-W	Northing	Ground Level: 6342.0	Easting	Latitude	Longitude	Slot
0.0	0.0	1645992.86		2199560.61	39° 34' 21.681 N	108° 20' 23.919 W	slot 22

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
598-36-43	3957.0	440.5	967.6	1646433.40	2200528.22	Ellipse (Radii: L45.0 W80.0)
SKR-598-36-43B	6232.0	440.5	967.6	1646433.40	2200528.22	Point



Design Report for SKR-598-36-AV-22 - 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	0.30	2.28	45.0	0.1	0.0	0.1	0.67
First Conductor Gyro Survey							
65.0	0.28	314.21	65.0	0.2	0.0	0.1	1.18
85.0	0.23	311.45	85.0	0.3	-0.1	0.0	0.26
105.0	0.35	325.37	105.0	0.3	-0.2	0.0	0.69
115.0	0.29	315.07	115.0	0.4	-0.2	0.0	0.83
Final Conductor Gyro Survey							
137.0	0.53	331.99	137.0	0.5	-0.3	0.0	1.21
First GWD Survey							
199.0	1.41	53.04	199.0	1.2	0.2	0.7	2.30
260.0	3.61	67.32	259.9	2.4	2.6	3.3	3.72
321.0	5.02	69.96	320.8	4.1	6.8	7.9	2.33
383.0	7.14	65.91	382.4	6.6	12.9	14.5	3.49
444.0	9.25	65.91	442.8	10.1	20.8	23.2	3.46
505.0	11.72	62.03	502.8	15.0	30.8	34.3	4.21
Final GWD Survey							
564.0	13.97	65.94	560.3	20.7	42.6	47.4	4.09
First 8" MWD Survey							
656.0	17.12	67.97	648.9	30.4	65.3	72.0	3.47
748.0	20.33	66.10	736.0	41.9	92.5	101.5	3.55
843.0	21.60	66.34	824.7	55.6	123.6	135.5	1.34
937.0	22.81	65.67	911.8	70.1	156.0	171.0	1.32
992.0	23.60	65.86	962.3	79.0	175.8	192.7	1.44
Final 6" MWD Survey							
1,135.0	22.80	63.33	1,093.7	103.1	226.7	249.0	0.89
First 6" MWD Survey							
1,229.0	20.25	60.00	1,181.2	119.4	257.0	283.4	3.01
1,324.0	19.52	61.97	1,270.5	135.1	285.3	315.6	1.04
1,418.0	20.12	66.12	1,359.0	149.0	313.9	347.5	1.63
1,512.0	19.10	65.30	1,447.5	162.0	342.7	379.0	1.12
1,606.0	18.50	65.44	1,536.5	174.6	370.2	409.3	0.64
1,701.0	17.76	64.80	1,626.8	187.1	397.0	438.9	0.81
1,795.0	16.66	65.63	1,716.6	198.7	422.3	466.7	1.20
1,889.0	17.22	66.82	1,806.5	209.8	447.4	494.1	0.70
1,984.0	17.67	67.87	1,897.1	220.7	473.6	522.5	0.58
2,078.0	18.77	65.49	1,986.4	232.4	500.6	551.9	1.41
2,172.0	17.76	62.13	2,075.7	245.3	527.1	581.3	1.55
2,267.0	18.64	62.31	2,165.9	259.2	553.3	611.0	0.93
2,361.0	19.02	64.99	2,254.9	272.6	580.5	641.3	1.00
2,455.0	17.69	62.73	2,344.1	285.7	607.1	670.9	1.60
2,550.0	18.21	64.55	2,434.5	298.6	633.3	700.1	0.81
2,644.0	18.25	66.91	2,523.8	310.7	660.1	729.5	0.79
2,738.0	18.30	65.72	2,613.0	322.6	687.1	759.0	0.40
2,833.0	17.17	66.68	2,703.5	334.3	713.6	787.9	1.23
2,927.0	17.79	67.64	2,793.2	345.2	739.6	816.1	0.73
3,021.0	17.65	69.84	2,882.7	355.6	766.2	844.7	0.73
3,116.0	16.56	69.79	2,973.5	365.2	792.5	872.6	1.15
3,210.0	15.85	69.83	3,063.8	374.3	817.1	898.7	0.76
3,304.0	15.06	68.92	3,154.4	383.1	840.5	923.7	0.88

Design Report for SKR-598-36-AV-22 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,398.0	13.70	68.07	3,245.4	391.6	862.3	947.0	1.46
3,493.0	12.58	67.11	3,337.9	399.9	882.2	968.6	1.20
3,587.0	10.87	65.50	3,430.0	407.5	899.7	987.7	1.85
3,682.0	8.94	66.18	3,523.5	414.2	914.6	1,004.1	2.04
3,776.0	7.91	67.92	3,616.5	419.6	927.3	1,017.8	1.13
3,870.0	6.88	66.41	3,709.7	424.3	938.5	1,029.9	1.11
3,965.0	6.25	67.46	3,804.1	428.6	948.4	1,040.8	0.68
4,059.0	5.43	67.04	3,897.6	432.2	957.3	1,050.3	0.87
4,118.6	4.07	61.34	3,957.0	434.4	961.7	1,055.3	2.41
Cylinder Entry Point							
4,119.1	4.06	61.27	3,957.5	434.4	961.8	1,055.3	2.41
598-36-43							
4,153.0	3.32	55.95	3,991.4	435.5	963.6	1,057.5	2.41
4,248.0	2.62	71.67	4,086.2	437.7	968.0	1,062.3	1.12
4,342.0	0.87	42.81	4,180.2	438.9	970.5	1,065.1	2.03
4,437.0	1.04	32.02	4,275.2	440.2	971.4	1,066.5	0.26
4,531.0	1.17	16.66	4,369.2	441.8	972.2	1,067.9	0.34
4,625.0	1.27	28.93	4,463.1	443.7	972.9	1,069.3	0.30
4,720.0	1.23	36.40	4,558.1	445.4	974.1	1,071.1	0.18
4,814.0	0.98	37.50	4,652.1	446.9	975.1	1,072.6	0.27
4,908.0	1.05	52.37	4,746.1	448.0	976.3	1,074.2	0.29
5,003.0	1.25	33.01	4,841.1	449.4	977.6	1,075.9	0.46
5,097.0	0.76	357.99	4,935.0	450.9	978.1	1,077.0	0.81
5,192.0	0.75	338.89	5,030.0	452.1	977.9	1,077.3	0.26
5,286.0	0.72	346.74	5,124.0	453.3	977.5	1,077.4	0.11
5,380.0	0.87	341.67	5,218.0	454.5	977.1	1,077.6	0.18
5,475.0	1.14	339.74	5,313.0	456.1	976.6	1,077.8	0.29
5,569.0	1.05	336.91	5,407.0	457.8	975.9	1,077.9	0.11
5,663.0	0.97	326.55	5,501.0	459.2	975.1	1,077.8	0.21
5,758.0	0.86	355.08	5,596.0	460.6	974.6	1,077.9	0.49
5,852.0	0.71	356.20	5,690.0	461.9	974.5	1,078.3	0.16
5,947.0	1.26	352.29	5,784.9	463.5	974.4	1,078.8	0.58
6,041.0	1.50	10.94	5,878.9	465.7	974.5	1,079.8	0.54
6,135.0	1.57	9.20	5,972.9	468.2	974.9	1,081.3	0.09
6,194.1	1.84	5.08	6,032.0	470.0	975.1	1,082.2	0.49
Cylinder Exit Point - Cylinder Bottom							
6,230.0	2.00	3.12	6,067.8	471.1	975.2	1,082.8	0.49
6,324.0	2.16	1.97	6,161.8	474.6	975.3	1,084.3	0.18
6,392.9	2.27	356.92	6,230.6	477.2	975.3	1,085.4	0.33
SKR-598-36-43B							
6,415.0	2.31	355.40	6,252.7	478.1	975.3	1,085.7	0.33
Final 6" MWD Survey							
6,475.0	2.31	355.40	6,312.7	480.5	975.1	1,086.5	0.00
Projection to Bit							

Design Report for SKR-598-36-AV-22 - Actual Field Surveys**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
45.0	45.0	0.1	0.0	First Conductor Gyro Survey
115.0	115.0	0.4	-0.2	Final Conductor Gyro Survey
137.0	137.0	0.5	-0.3	First GWD Survey
505.0	502.8	15.0	30.8	Final GWD Survey
564.0	560.3	20.7	42.6	First 8" MWD Survey
992.0	962.3	79.0	175.8	Final 6" MWD Survey
1,135.0	1,093.7	103.1	226.7	First 6" MWD Survey
4,118.6	3,957.0	434.4	961.7	Cylinder Entry Point
6,194.1	6,032.0	470.0	975.1	Cylinder Exit Point
6,194.1	6,032.0	470.0	975.1	Cylinder Bottom
6,415.0	6,252.7	478.1	975.3	Final 6" MWD Survey
6,475.0	6,312.7	480.5	975.1	Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	598-36-43	65.52	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
45.0	115.0	Conductor Gyros	NS-GYRO-MS
137.0	505.0	GWD Surveys	GYD_GWD_SS
564.0	992.0	8" MWD Surveys	MWD
1,135.0	6,475.0	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
SKR-598-36-43B	0.00	0.00	6,232.0	440.5	967.6	1,646,433.40	2,200,528.22	39° 34' 26.332 N	108° 20' 11.744 W
- actual wellpath misses by 37.5ft at 6392.9ft MD (6230.6 TVD, 477.2 N, 975.3 E)									
- Point									
598-36-43	0.00	0.00	3,957.0	440.5	967.6	1,646,433.40	2,200,528.22	39° 34' 26.332 N	108° 20' 11.744 W
- actual wellpath misses by 8.5ft at 4119.1ft MD (3957.5 TVD, 434.4 N, 961.8 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									