

# Chevron USA

Piceance

SKR-598-36-AV

SKR-598-36-AV-16 - slot 16

598-36-40

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

02 December, 2008

Well Coordinates (NAD83): 1,645,985.04 N, 2,199,539.65 E (39° 34' 21.60" N, 108° 20' 24.18" W)

Ground Level: 6,342.00 ft

Local Coordinate Origin: Centered on Well SKR-598-36-AV-16 - Slot slot 16

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

# Chevron USA

HALLIBURTON

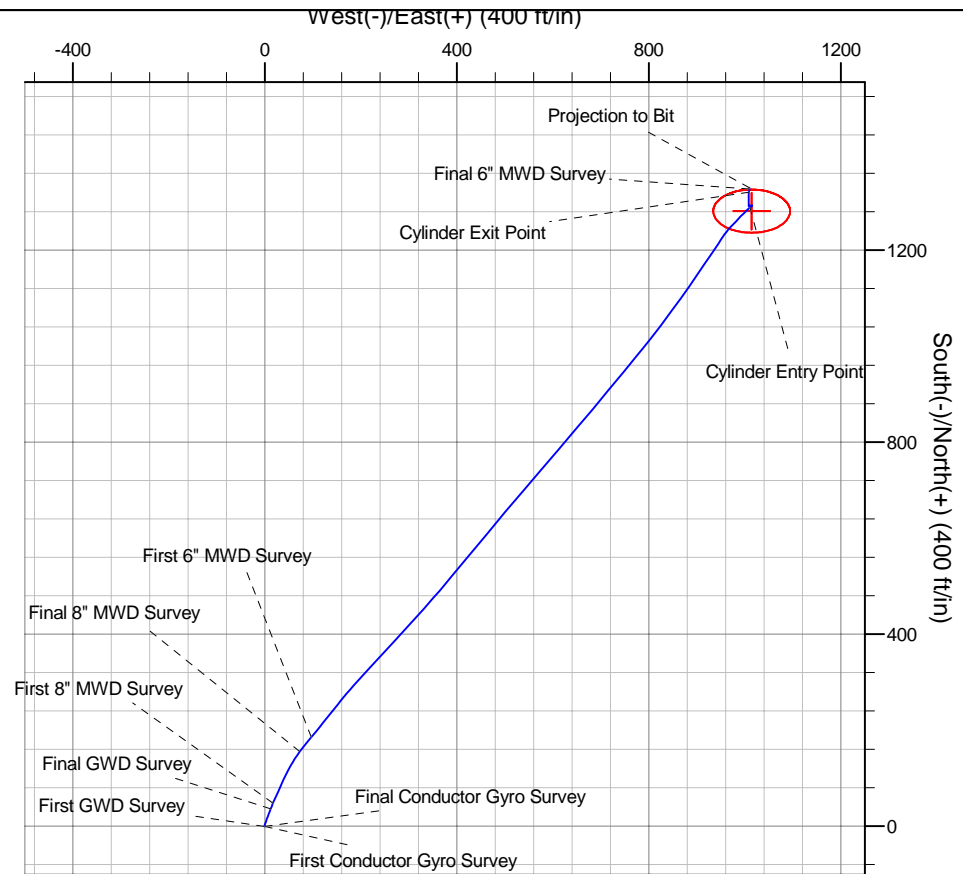
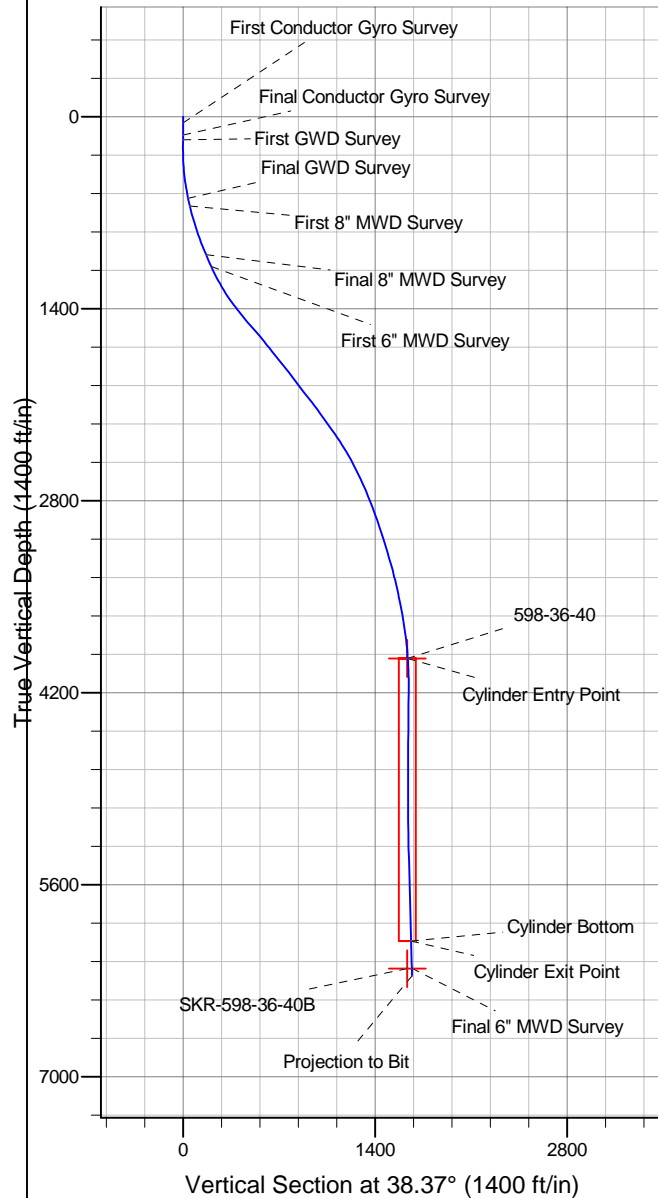
Drilling and Formation  
Evaluation

## WELL DETAILS: SKR-598-36-AV-16

+N/-S	+E/-W	Northing	Ground Level: 6342.0	Easting	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-16 - 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	0.29	201.32	45.0	-0.1	0.0	-0.1	0.64
<b>First Conductor Gyro Survey</b>							
65.0	0.25	233.44	65.0	-0.2	-0.1	-0.2	0.77
85.0	0.17	242.89	85.0	-0.2	-0.2	-0.3	0.43
105.0	0.27	234.06	105.0	-0.3	-0.2	-0.3	0.53
125.0	0.35	245.04	125.0	-0.3	-0.3	-0.4	0.50
135.0	0.35	253.77	135.0	-0.3	-0.4	-0.5	0.53
<b>Final Conductor Gyro Survey</b>							
168.0	0.44	223.97	168.0	-0.5	-0.6	-0.7	0.67
<b>First GWD Survey</b>							
230.0	0.26	326.17	230.0	-0.5	-0.8	-0.9	0.90
291.0	2.03	16.57	291.0	0.6	-0.6	0.2	3.07
353.0	3.79	20.62	352.9	3.6	0.5	3.1	2.86
414.0	6.08	18.15	413.7	8.6	2.2	8.1	3.77
475.0	8.28	19.56	474.2	15.8	4.7	15.3	3.62
537.0	10.57	22.56	535.3	25.2	8.3	25.0	3.78
598.0	12.16	19.03	595.2	36.5	12.6	36.4	2.84
<b>Final GWD Survey</b>							
656.0	14.11	24.40	651.6	48.7	17.5	49.0	3.96
<b>First 8" MWD Survey</b>							
749.0	16.64	24.85	741.3	71.1	27.8	73.0	2.72
843.0	18.66	23.87	830.9	97.1	39.5	100.6	2.17
937.0	21.11	28.96	919.3	125.6	53.8	131.9	3.19
1,032.0	22.89	37.08	1,007.4	155.4	73.2	167.3	3.71
<b>Final 8" MWD Survey</b>							
1,126.0	25.09	40.05	1,093.2	185.2	97.1	205.5	2.67
<b>First 6" MWD Survey</b>							
1,220.0	27.36	38.24	1,177.6	217.4	123.3	247.0	2.56
1,315.0	31.04	38.65	1,260.5	253.7	152.1	293.3	3.88
1,409.0	35.45	42.01	1,339.1	292.9	185.5	344.8	5.08
1,492.0	39.20	42.79	1,405.1	330.1	219.4	395.0	4.55
1,608.0	39.18	42.42	1,495.0	384.0	269.1	468.1	0.20
1,702.0	41.50	42.10	1,566.6	429.1	310.0	528.8	2.48
1,797.0	40.00	41.04	1,638.6	475.4	351.1	590.7	1.74
1,891.0	37.81	39.65	1,711.7	520.4	389.3	649.7	2.51
1,985.0	38.35	39.90	1,785.7	565.0	426.4	707.7	0.60
2,080.0	38.53	39.71	1,860.1	610.3	464.2	766.7	0.23
2,174.0	36.66	39.74	1,934.6	654.4	500.9	824.0	1.99
2,268.0	37.45	40.44	2,009.6	697.8	537.4	880.6	0.95
2,363.0	38.38	40.74	2,084.6	742.1	575.4	939.0	1.00
2,457.0	35.65	40.52	2,159.6	785.1	612.2	995.5	2.91
2,551.0	35.84	40.46	2,235.9	826.8	647.9	1,050.4	0.21
2,646.0	34.84	39.84	2,313.4	868.8	683.3	1,105.3	1.12
2,740.0	32.46	39.57	2,391.7	908.9	716.6	1,157.4	2.54
2,834.0	29.74	39.55	2,472.1	946.3	747.5	1,205.9	2.89
2,929.0	27.59	39.34	2,555.5	981.5	776.4	1,251.5	2.27
3,023.0	24.72	38.02	2,639.9	1,013.8	802.4	1,292.9	3.12
3,117.0	23.05	37.31	2,725.8	1,043.9	825.6	1,331.0	1.80
3,212.0	21.15	36.35	2,813.8	1,072.5	847.0	1,366.7	2.04

## Design Report for SKR-598-36-AV-16 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,306.0	19.67	35.51	2,901.9	1,099.1	866.3	1,399.4	1.60
3,400.0	18.66	34.92	2,990.7	1,124.3	884.1	1,430.3	1.09
3,495.0	17.69	34.26	3,081.0	1,148.7	900.9	1,459.8	1.04
3,589.0	17.00	34.66	3,170.7	1,171.8	916.8	1,487.8	0.74
3,683.0	15.70	34.08	3,260.9	1,193.6	931.7	1,514.2	1.39
3,778.0	14.61	33.31	3,352.6	1,214.3	945.5	1,538.9	1.17
3,872.0	12.47	34.95	3,444.0	1,232.5	957.8	1,560.9	2.31
3,966.0	11.01	43.04	3,536.0	1,247.4	969.8	1,579.9	2.34
4,061.0	9.69	43.51	3,629.5	1,259.8	981.5	1,597.0	1.39
4,155.0	8.75	45.24	3,722.2	1,270.6	992.0	1,611.9	1.04
4,250.0	7.06	43.49	3,816.3	1,279.9	1,001.1	1,624.9	1.80
4,344.0	4.99	51.18	3,909.8	1,286.7	1,008.3	1,634.7	2.36
4,385.2	4.12	50.23	3,950.9	1,288.7	1,010.8	1,637.9	2.13
<b>598-36-40</b>							
4,385.3	4.11	50.22	3,951.0	1,288.7	1,010.8	1,637.9	2.13
<b>Cylinder Entry Point</b>							
4,438.0	3.00	48.19	4,003.6	1,290.9	1,013.3	1,641.1	2.13
4,533.0	1.01	40.37	4,098.5	1,293.2	1,015.7	1,644.4	2.11
4,627.0	0.88	230.27	4,192.5	1,293.3	1,015.7	1,644.5	2.00
4,721.0	0.78	256.70	4,286.5	1,292.7	1,014.5	1,643.3	0.42
4,816.0	1.14	274.61	4,381.5	1,292.7	1,012.9	1,642.2	0.49
4,910.0	0.71	287.58	4,475.5	1,292.9	1,011.5	1,641.5	0.51
5,004.0	0.50	270.78	4,569.5	1,293.1	1,010.5	1,641.1	0.29
5,099.0	0.38	208.95	4,664.5	1,292.8	1,009.9	1,640.5	0.49
5,193.0	0.43	215.50	4,758.5	1,292.3	1,009.6	1,639.8	0.07
5,288.0	0.34	259.54	4,853.5	1,291.9	1,009.1	1,639.3	0.32
5,382.0	0.31	281.73	4,947.5	1,291.9	1,008.6	1,638.9	0.14
5,476.0	0.93	351.83	5,041.5	1,292.7	1,008.2	1,639.4	0.93
5,571.0	1.23	359.96	5,136.4	1,294.5	1,008.1	1,640.7	0.35
5,665.0	1.23	7.20	5,230.4	1,296.5	1,008.2	1,642.3	0.17
5,759.0	1.38	355.61	5,324.4	1,298.7	1,008.3	1,644.0	0.32
5,854.0	1.91	358.58	5,419.4	1,301.4	1,008.1	1,646.1	0.56
5,948.0	2.09	359.26	5,513.3	1,304.7	1,008.1	1,648.6	0.19
6,043.0	2.13	2.70	5,608.2	1,308.1	1,008.1	1,651.4	0.14
6,137.0	1.82	359.20	5,702.2	1,311.4	1,008.2	1,654.0	0.35
6,231.0	1.73	354.04	5,796.1	1,314.3	1,008.0	1,656.1	0.20
6,326.0	1.61	12.03	5,891.1	1,317.0	1,008.2	1,658.4	0.56
6,420.0	1.97	9.42	5,985.0	1,319.9	1,008.7	1,661.0	0.39
6,447.0	1.98	8.07	6,012.0	1,320.8	1,008.8	1,661.8	0.17
<b>Cylinder Bottom - Cylinder Exit Point</b>							
6,515.0	2.00	4.73	6,080.0	1,323.2	1,009.1	1,663.8	0.17
6,609.0	2.12	0.72	6,173.9	1,326.5	1,009.3	1,666.5	0.20
6,644.0	2.28	1.64	6,208.9	1,327.9	1,009.3	1,667.6	0.47
<b>Final 6" MWD Survey - SKR-598-36-40B</b>							
6,700.0	2.28	1.64	6,264.9	1,330.1	1,009.3	1,669.4	0.00
<b>Projection to Bit</b>							

**Design Report for SKR-598-36-AV-16 - 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
135.0	135.0	-0.3	-0.4	Final Conductor Gyro Survey
168.0	168.0	-0.5	-0.6	First GWD Survey
598.0	595.2	36.5	12.6	Final GWD Survey
656.0	651.6	48.7	17.5	First 8" MWD Survey
1,032.0	1,007.4	155.4	73.2	Final 8" MWD Survey
1,126.0	1,093.2	185.2	97.1	First 6" MWD Survey
4,385.3	3,951.0	1,288.7	1,010.8	Cylinder Entry Point
6,447.0	6,012.0	1,320.8	1,008.8	Cylinder Bottom
6,447.0	6,012.0	1,320.8	1,008.8	Cylinder Exit Point
6,644.0	6,208.9	1,327.9	1,009.3	Final 6" MWD Survey
6,700.0	6,264.9	1,330.1	1,009.3	Projection to Bit

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
User	598-36-40	38.37	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	598.0	GWD Surveys	GYD_GWD_SS
656.0	1,032.0	8" MWD Surveys	MWD
1,126.0	6,700.0	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
598-36-40	0.00	0.00	3,951.0	1,281.4	1,014.5	1,647,266.41	2,200,554.14	39° 34' 34.569 N	108° 20' 11.745 W
- actual wellpath misses by 8.2ft at 4385.2ft MD (3950.9 TVD, 1288.7 N, 1010.8 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									
SKR-598-36-40B	0.00	0.00	6,212.0	1,281.4	1,014.5	1,647,266.41	2,200,554.14	39° 34' 34.569 N	108° 20' 11.745 W
- actual wellpath misses by 46.9ft at 6644.0ft MD (6208.9 TVD, 1327.9 N, 1009.3 E)									
- Point									