

# Chevron USA

Piceance

SKR-698-04-AV

SKR-698-04-AV-14 - Slot 14

698-4-15

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

16 February, 2009

Well Coordinates (NAD83): 1,641,082.19 N, 2,199,859.19 E (39° 33' 33.26" N, 108° 20' 18.15" W)

Ground Level: 5,959.00 ft

Local Coordinate Origin: Centered on Well SKR-698-04-AV-14 (Slot 14) - Slot

Viewing Datum: RFE @ 5984.0ft (RFE)

TVDs to System: N

North Reference: Grid

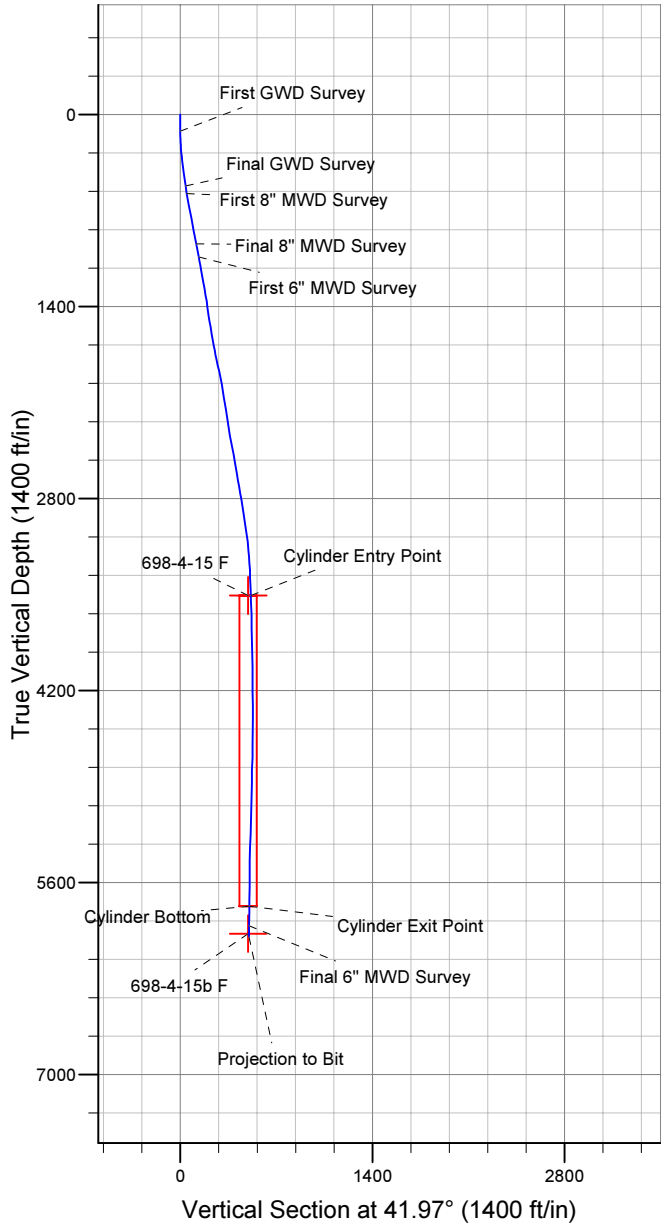
Unit System: API - US Survey Feet

Version: 2003.16 Build: 431

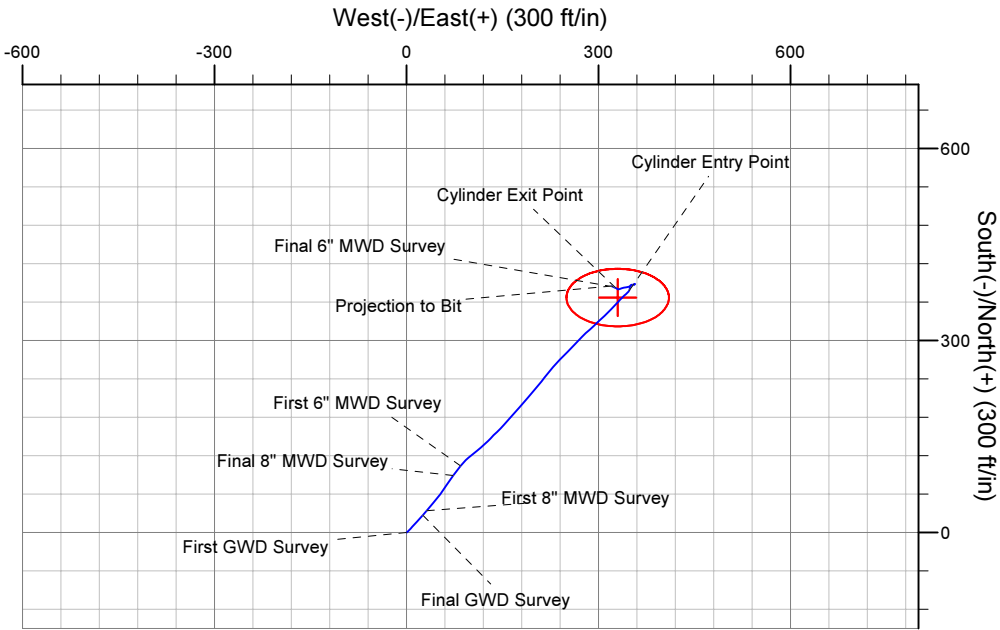
**HALLIBURTON**

Project: Piceance  
Site: SKR-698-04-AV  
Well: SKR-698-04-AV-14  
Wellbore: 698-4-15  
Plan: Actual Field Surveys

Chevron USA



WELL DETAILS: SKR-698-04-AV-14							
+N/-S	+E/-W	Northing	Ground Level: 5959.0	Easting	Latitude	Longitude	Slot
0.0	0.0	1641082.19	2199859.19	39° 33' 33.263 N	108° 20' 18.149 W	Slot 14	
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape	
698-4-15 F	3507.0	367.0	330.1	1641449.20	2200189.30	Ellipse (Radii: L45.0 W80.0)	
698-4-15b F	5972.0	367.0	330.1	1641449.20	2200189.30	Point	



## Design Report for SKR-698-04-AV-14 - 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
122.0	0.18	168.43	122.0	-0.2	0.0	-0.1	0.15
<b>First GWD Survey</b>							
183.0	1.76	53.89	183.0	0.3	0.8	0.7	3.02
245.0	4.14	44.73	244.9	2.4	3.2	3.9	3.90
337.0	6.70	42.61	336.5	8.7	9.1	12.6	2.79
429.0	7.40	42.61	427.8	17.0	16.8	23.9	0.76
521.0	9.16	41.38	518.8	26.9	25.6	37.1	1.92
<b>Final GWD Survey</b>							
578.0	9.93	40.37	575.0	34.0	31.8	46.6	1.38
<b>First 8" MWD Survey</b>							
670.0	10.54	40.23	665.6	46.5	42.4	62.9	0.66
762.0	10.63	36.43	756.0	59.8	52.9	79.8	0.76
856.0	10.93	32.15	848.4	74.3	62.7	97.2	0.91
951.0	10.80	37.28	941.7	89.0	72.9	114.9	1.03
<b>Final 8" MWD Survey</b>							
1,050.0	11.50	38.80	1,038.8	104.1	84.7	134.0	0.77
<b>First 6" MWD Survey</b>							
1,144.0	10.26	50.07	1,131.1	116.7	97.0	151.7	2.61
1,238.0	10.23	50.50	1,223.6	127.4	109.9	168.2	0.09
1,333.0	9.02	47.43	1,317.3	137.8	121.9	184.0	1.38
1,427.0	7.63	44.47	1,410.3	147.3	131.7	197.6	1.55
1,522.0	9.40	45.81	1,504.2	157.2	141.7	211.6	1.87
1,616.0	10.53	42.78	1,596.8	168.8	153.0	227.8	1.32
1,711.0	10.13	40.59	1,690.3	181.6	164.3	244.9	0.59
1,805.0	12.60	40.91	1,782.4	195.6	176.4	263.4	2.63
1,900.0	11.26	41.33	1,875.4	210.4	189.3	283.0	1.41
1,994.0	10.27	39.80	1,967.7	223.7	200.8	300.6	1.10
2,088.0	9.41	40.04	2,060.3	236.0	211.1	316.6	0.92
2,183.0	8.45	37.06	2,154.2	247.5	220.3	331.4	1.12
2,277.0	9.19	40.72	2,247.1	258.7	229.3	345.7	0.99
2,371.0	9.84	44.68	2,339.8	270.1	239.9	361.3	0.98
2,466.0	11.15	44.49	2,433.2	282.5	252.0	378.6	1.38
2,560.0	9.81	44.06	2,525.6	294.7	264.0	395.6	1.43
2,654.0	9.23	43.83	2,618.3	305.9	274.8	411.2	0.62
2,749.0	10.62	48.53	2,711.9	317.2	286.6	427.5	1.69
2,843.0	9.59	46.51	2,804.4	328.3	298.8	443.9	1.16
2,937.0	8.79	46.92	2,897.2	338.6	309.7	458.9	0.85
3,032.0	8.15	45.15	2,991.2	348.3	319.8	472.8	0.73
3,126.0	7.33	41.11	3,084.3	357.5	328.4	485.5	1.05
3,221.0	5.08	44.63	3,178.8	365.1	335.4	495.7	2.40
3,315.0	3.92	46.95	3,272.5	370.3	340.6	503.1	1.25
3,410.0	2.71	49.01	3,367.3	373.9	344.7	508.5	1.28
3,504.0	1.98	32.74	3,461.2	376.8	347.3	512.4	1.04
3,549.2	1.91	26.87	3,506.4	378.1	348.0	513.8	0.47
<b>698-4-15 F</b>							
3,549.8	1.91	26.78	3,507.0	378.1	348.0	513.9	0.47
<b>Cylinder Entry Point</b>							
3,598.0	1.85	20.07	3,555.2	379.6	348.7	515.4	0.47
3,692.0	1.21	6.62	3,649.1	382.0	349.3	517.6	0.78

**Design Report for SKR-698-04-AV-14 - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,787.0	1.22	22.59	3,744.1	383.9	349.8	519.4	0.36
3,881.0	1.24	10.00	3,838.1	385.8	350.4	521.2	0.29
3,975.0	1.45	78.23	3,932.1	387.1	351.7	523.0	1.62
4,069.0	1.23	90.81	4,026.1	387.3	353.9	524.6	0.39
4,164.0	0.67	90.63	4,121.0	387.3	355.5	525.6	0.59
4,258.0	0.77	49.34	4,215.0	387.7	356.5	526.6	0.55
4,353.0	0.38	32.71	4,310.0	388.4	357.1	527.6	0.44
4,447.0	0.33	258.26	4,404.0	388.6	357.0	527.7	0.70
4,636.0	0.78	234.20	4,593.0	387.7	355.5	526.0	0.26
4,730.0	1.28	230.55	4,687.0	386.7	354.1	524.3	0.54
4,824.0	1.23	241.10	4,781.0	385.5	352.4	522.3	0.25
4,918.0	1.60	252.56	4,875.0	384.6	350.3	520.2	0.49
5,013.0	1.40	253.80	4,969.9	383.9	347.9	518.1	0.21
5,107.0	1.26	260.00	5,063.9	383.4	345.8	516.3	0.21
5,201.0	1.97	262.39	5,157.9	383.0	343.2	514.3	0.76
5,296.0	2.54	256.07	5,252.8	382.3	339.5	511.3	0.65
5,390.0	1.90	252.05	5,346.7	381.3	336.0	508.2	0.70
5,485.0	1.39	257.06	5,441.7	380.6	333.4	505.9	0.56
5,579.0	0.90	256.43	5,535.7	380.1	331.6	504.4	0.52
5,674.0	1.00	294.70	5,630.6	380.3	330.1	503.5	0.66
5,768.0	1.72	305.68	5,724.6	381.5	328.2	503.1	0.81
5,815.4	1.77	295.47	5,772.0	382.2	327.0	502.8	0.67
<b>Cylinder Bottom - Cylinder Exit Point</b>							
5,863.0	1.88	286.10	5,819.6	382.7	325.5	502.3	0.67
5,957.0	2.01	293.79	5,913.5	383.8	322.6	501.1	0.31
<b>Final 6" MWD Survey</b>							
6,015.0	2.01	293.79	5,971.4	384.7	320.7	500.4	0.00
<b>698-4-15b F</b>							
6,040.0	2.01	293.79	5,996.5	385.0	319.9	500.2	0.00
<b>Projection to Bit</b>							

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
122.0	122.0	-0.2	0.0	First GWD Survey
521.0	518.8	26.9	25.6	Final GWD Survey
578.0	575.0	34.0	31.8	First 8" MWD Survey
951.0	941.7	89.0	72.9	Final 8" MWD Survey
1,050.0	1,038.8	104.1	84.7	First 6" MWD Survey
3,549.8	3,507.0	378.1	348.0	Cylinder Entry Point
5,815.4	5,772.0	382.2	327.0	Cylinder Bottom
5,815.4	5,772.0	382.2	327.0	Cylinder Exit Point
5,957.0	5,913.5	383.8	322.6	Final 6" MWD Survey
6,040.0	5,996.5	385.0	319.9	Projection to Bit

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	698-4-15 F	41.97	Slot	0.0	0.0	0.0

**Design Report for SKR-698-04-AV-14 - Actual Field Surveys****Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
122.0	521.0	GWD Surveys	GYD_GWD_SS
578.0	951.0	8" MWD Surveys	MWD
1,050.0	6,040.0	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
698-4-15 F	0.00	0.00	3,507.0	367.0	330.1	1,641,449.20	2,200,189.30	39° 33' 36.991 N	108° 20' 14.083 W
- actual wellpath misses target center by 21.1ft at 3549.2ft MD (3506.4 TVD, 378.1 N, 348.0 E)									
- Ellipse (radii L45.0 W80.0 on 0.00 azi) - Target Cylinder 100% Intersected									
698-4-15b F	0.00	0.00	5,972.0	367.0	330.1	1,641,449.20	2,200,189.30	39° 33' 36.991 N	108° 20' 14.083 W
- actual wellpath misses target center by 20.0ft at 6015.0ft MD (5971.4 TVD, 384.7 N, 320.7 E)									
- Point									