

Shell Exploration & Production Co. Inc.

Barber Co. KS (NAD-27)

Sec 16 T35S R10W

Schupbach Ranch 3510 16-1H

API# 15-007-23927/ Job# 9507255/ Nabors 180

Wellbore #1

Plan: Plan #1 101612 RevA0

Sperry Drilling Services Combo Report

18 October, 2012

Surface UWI : API# 15-007-23927/ Job# 9507255/ Nabors 180

Well Coordinates: 121,102.84 N, 2,026,199.53 E (36° 59' 57.19" N, 098° 24' 37.06" W)

Ground Level: 1,330.00 ft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well Schupbach Ranch 3510 16-1H

WELL @ 1353.00ft (Original Well Elev+23'KB)

N

Grid

API-US-new

Version: 2003.21 Build: 46

HALLIBURTON

Plan Report for Schupbach Ranch 3510 16-1H - Plan #1 101612 RevA0

Measured Depth (ft)	Inclination (°)	Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
					Northing (ft)	Easting (ft)	Northing (ft)	Easting (ft)			
0.00	0.00	0.00	-1,353.00	0.00	0.00 N	0.00 E	121,102.84	2,026,199.53	0.00	0.00	
100.00	0.00	0.00	-1,253.00	100.00	0.00 N	0.00 E	121,102.84	2,026,199.53	0.00	0.00	
200.00	0.00	0.00	-1,153.00	200.00	0.00 N	0.00 E	121,102.84	2,026,199.53	0.00	0.00	Start Build 2.50
300.00	2.50	2.16	-1,053.03	299.97	2.18 N	0.08 E	121,105.02	2,026,199.61	2.50	2.18	
400.00	5.00	2.16	-953.25	399.75	8.71 N	0.33 E	121,111.55	2,026,199.86	2.50	8.72	
440.00	6.00	2.16	-913.44	439.56	12.55 N	0.47 E	121,115.39	2,026,200.00	2.50	12.55	Start 300.00 hold at 440.00 MD
500.00	6.00	2.16	-853.77	499.23	18.81 N	0.71 E	121,121.65	2,026,200.24	0.00	18.82	
600.00	6.00	2.16	-754.31	598.69	29.26 N	1.10 E	121,132.10	2,026,200.63	0.00	29.27	
700.00	6.00	2.16	-654.86	698.14	39.70 N	1.50 E	121,142.54	2,026,201.03	0.00	39.72	
740.00	6.00	2.16	-615.08	737.92	43.88 N	1.66 E	121,146.72	2,026,201.19	0.00	43.91	Start Drop -2.50
800.00	4.50	2.16	-555.34	797.66	49.37 N	1.86 E	121,152.21	2,026,201.39	2.50	49.39	
900.00	2.00	2.16	-455.50	897.50	55.03 N	2.08 E	121,157.87	2,026,201.61	2.50	55.06	
980.00	0.00	0.00	-375.52	977.48	56.43 N	2.13 E	121,159.27	2,026,201.66	2.50	56.46	Start 3280.52 hold at 980.00 MD
1,000.00	0.00	0.00	-355.52	997.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,100.00	0.00	0.00	-255.52	1,097.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,105.52	0.00	0.00	-250.00	1,103.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Hutchinson Salt Top
1,200.00	0.00	0.00	-155.52	1,197.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,300.00	0.00	0.00	-55.52	1,297.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,400.00	0.00	0.00	44.48	1,397.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,486.52	0.00	0.00	131.00	1,484.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Hutchinson Salt Base
1,500.00	0.00	0.00	144.48	1,497.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,600.00	0.00	0.00	244.48	1,597.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,700.00	0.00	0.00	344.48	1,697.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,800.00	0.00	0.00	444.48	1,797.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
1,900.00	0.00	0.00	544.48	1,897.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,000.00	0.00	0.00	644.48	1,997.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,100.00	0.00	0.00	744.48	2,097.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,200.00	0.00	0.00	844.48	2,197.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,300.00	0.00	0.00	944.48	2,297.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,400.00	0.00	0.00	1,044.48	2,397.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,500.00	0.00	0.00	1,144.48	2,497.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,564.52	0.00	0.00	1,209.00	2,562.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Onaga Shale
2,600.00	0.00	0.00	1,244.48	2,597.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,700.00	0.00	0.00	1,344.48	2,697.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,800.00	0.00	0.00	1,444.48	2,797.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
2,900.00	0.00	0.00	1,544.48	2,897.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,000.00	0.00	0.00	1,644.48	2,997.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,100.00	0.00	0.00	1,744.48	3,097.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,200.00	0.00	0.00	1,844.48	3,197.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	

Plan Report for Schupbach Ranch 3510 16-1H - Plan #1 101612 RevA0

Measured Depth (ft)	Inclination (°)	Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
					Northing (ft)	Easting (ft)	Northing (ft)	Easting (ft)			
3,300.00	0.00	0.00	1,944.48	3,297.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,391.52	0.00	0.00	2,036.00	3,389.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Techumseh Shale
3,400.00	0.00	0.00	2,044.48	3,397.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,481.52	0.00	0.00	2,126.00	3,479.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Lecompton Limestone
3,500.00	0.00	0.00	2,144.48	3,497.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,600.00	0.00	0.00	2,244.48	3,597.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,666.52	0.00	0.00	2,311.00	3,664.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Oread Limestone
3,700.00	0.00	0.00	2,344.48	3,697.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,718.52	0.00	0.00	2,363.00	3,716.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Toronto Limestone
3,800.00	0.00	0.00	2,444.48	3,797.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
3,900.00	0.00	0.00	2,544.48	3,897.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
4,000.00	0.00	0.00	2,644.48	3,997.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
4,040.52	0.00	0.00	2,685.00	4,038.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Stalnaker Top
4,100.00	0.00	0.00	2,744.48	4,097.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
4,115.52	0.00	0.00	2,760.00	4,113.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Stalnaker Base
4,200.00	0.00	0.00	2,844.48	4,197.48	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	
4,260.52	0.00	0.00	2,905.00	4,258.00	56.43 N	2.13 E	121,159.27	2,026,201.66	0.00	56.46	Start Build 10.00
4,300.00	3.95	3.29	2,944.45	4,297.45	57.79 N	2.21 E	121,160.63	2,026,201.74	10.00	57.82	
4,304.56	4.40	3.29	2,949.00	4,302.00	58.12 N	2.23 E	121,160.96	2,026,201.76	10.00	58.15	Iola Limestone
4,400.00	13.95	3.29	3,043.11	4,396.11	73.29 N	3.10 E	121,176.13	2,026,202.63	10.00	73.35	
4,486.32	22.58	3.29	3,125.00	4,478.00	100.28 N	4.65 E	121,203.12	2,026,204.18	10.00	100.38	Hushpuckney Shale
4,500.00	23.95	3.29	3,137.57	4,490.57	105.67 N	4.96 E	121,208.51	2,026,204.49	10.00	105.78	
4,569.24	30.87	3.29	3,199.00	4,552.00	137.47 N	6.79 E	121,240.31	2,026,206.32	10.00	137.64	Marmaton Group
4,600.00	33.95	3.29	3,224.96	4,577.96	153.93 N	7.74 E	121,256.77	2,026,207.27	10.00	154.12	
4,688.12	42.76	3.29	3,294.00	4,647.00	208.47 N	10.87 E	121,311.31	2,026,210.40	10.00	208.75	Pawnee Limestone
4,700.00	43.95	3.29	3,302.64	4,655.64	216.61 N	11.34 E	121,319.45	2,026,210.87	10.00	216.90	
4,751.41	49.09	3.29	3,338.00	4,691.00	253.84 N	13.48 E	121,356.68	2,026,213.01	10.00	254.19	Cherokee
4,800.00	53.95	3.29	3,368.23	4,721.23	291.80 N	15.67 E	121,394.64	2,026,215.20	10.00	292.22	
4,900.00	63.95	3.29	3,419.74	4,772.74	377.22 N	20.58 E	121,480.06	2,026,220.11	10.00	377.78	
4,974.42	71.39	3.29	3,448.00	4,801.00	445.90 N	24.53 E	121,548.74	2,026,224.06	10.00	446.57	MS Limestone
5,000.00	73.95	3.29	3,455.62	4,808.62	470.27 N	25.94 E	121,573.11	2,026,225.47	10.00	470.99	
5,100.00	83.95	3.29	3,474.77	4,827.77	568.13 N	31.57 E	121,670.97	2,026,231.10	10.00	569.01	
5,160.52	90.00	3.29	3,477.96	4,830.96	628.44 N	35.03 E	121,731.28	2,026,234.56	10.00	629.42	Start 4735.90 hold at 5160.52 MD
5,200.00	90.00	3.29	3,477.96	4,830.96	667.85 N	37.30 E	121,770.69	2,026,236.83	0.00	668.89	
5,300.00	90.00	3.29	3,477.96	4,830.96	767.69 N	43.05 E	121,870.53	2,026,242.58	0.00	768.89	
5,400.00	90.00	3.29	3,477.96	4,830.96	867.52 N	48.79 E	121,970.36	2,026,248.32	0.00	868.89	
5,500.00	90.00	3.29	3,477.96	4,830.96	967.36 N	54.53 E	122,070.20	2,026,254.06	0.00	968.89	
5,600.00	90.00	3.29	3,477.96	4,830.96	1,067.19 N	60.28 E	122,170.03	2,026,259.81	0.00	1,068.89	
5,700.00	90.00	3.29	3,477.96	4,830.96	1,167.03 N	66.02 E	122,269.87	2,026,265.55	0.00	1,168.89	

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
					Northing (ft)	Easting (ft)	Northing (ft)	Easting (ft)			
5,800.00	90.00	3.29	3,477.96	4,830.96	1,266.86 N	71.76 E	122,369.70	2,026,271.29	0.00	1,268.89	
5,900.00	90.00	3.29	3,477.96	4,830.96	1,366.70 N	77.51 E	122,469.54	2,026,277.04	0.00	1,368.89	
6,000.00	90.00	3.29	3,477.96	4,830.96	1,466.53 N	83.25 E	122,569.37	2,026,282.78	0.00	1,468.89	
6,100.00	90.00	3.29	3,477.96	4,830.96	1,566.37 N	88.99 E	122,669.21	2,026,288.52	0.00	1,568.89	
6,200.00	90.00	3.29	3,477.96	4,830.96	1,666.20 N	94.74 E	122,769.04	2,026,294.26	0.00	1,668.89	
6,300.00	90.00	3.29	3,477.96	4,830.96	1,766.04 N	100.48 E	122,868.88	2,026,300.01	0.00	1,768.89	
6,400.00	90.00	3.29	3,477.96	4,830.96	1,865.87 N	106.22 E	122,968.71	2,026,305.75	0.00	1,868.89	
6,500.00	90.00	3.29	3,477.96	4,830.96	1,965.71 N	111.96 E	123,068.54	2,026,311.49	0.00	1,968.89	
6,600.00	90.00	3.29	3,477.96	4,830.96	2,065.54 N	117.71 E	123,168.38	2,026,317.24	0.00	2,068.89	
6,700.00	90.00	3.29	3,477.96	4,830.96	2,165.38 N	123.45 E	123,268.21	2,026,322.98	0.00	2,168.89	
6,800.00	90.00	3.29	3,477.96	4,830.96	2,265.21 N	129.19 E	123,368.05	2,026,328.72	0.00	2,268.89	
6,900.00	90.00	3.29	3,477.96	4,830.96	2,365.05 N	134.94 E	123,467.88	2,026,334.47	0.00	2,368.89	
7,000.00	90.00	3.29	3,477.96	4,830.96	2,464.88 N	140.68 E	123,567.72	2,026,340.21	0.00	2,468.89	
7,100.00	90.00	3.29	3,477.96	4,830.96	2,564.72 N	146.42 E	123,667.55	2,026,345.95	0.00	2,568.89	
7,200.00	90.00	3.29	3,477.96	4,830.96	2,664.55 N	152.17 E	123,767.39	2,026,351.70	0.00	2,668.89	
7,300.00	90.00	3.29	3,477.96	4,830.96	2,764.39 N	157.91 E	123,867.22	2,026,357.44	0.00	2,768.89	
7,400.00	90.00	3.29	3,477.96	4,830.96	2,864.22 N	163.65 E	123,967.06	2,026,363.18	0.00	2,868.89	
7,500.00	90.00	3.29	3,477.96	4,830.96	2,964.06 N	169.40 E	124,066.89	2,026,368.93	0.00	2,968.89	
7,600.00	90.00	3.29	3,477.96	4,830.96	3,063.89 N	175.14 E	124,166.73	2,026,374.67	0.00	3,068.89	
7,700.00	90.00	3.29	3,477.96	4,830.96	3,163.73 N	180.88 E	124,266.56	2,026,380.41	0.00	3,168.89	
7,800.00	90.00	3.29	3,477.96	4,830.96	3,263.56 N	186.63 E	124,366.40	2,026,386.16	0.00	3,268.89	
7,900.00	90.00	3.29	3,477.96	4,830.96	3,363.40 N	192.37 E	124,466.23	2,026,391.90	0.00	3,368.89	
8,000.00	90.00	3.29	3,477.96	4,830.96	3,463.23 N	198.11 E	124,566.07	2,026,397.64	0.00	3,468.89	
8,100.00	90.00	3.29	3,477.96	4,830.96	3,563.07 N	203.86 E	124,665.90	2,026,403.39	0.00	3,568.89	
8,200.00	90.00	3.29	3,477.96	4,830.96	3,662.90 N	209.60 E	124,765.74	2,026,409.13	0.00	3,668.89	
8,300.00	90.00	3.29	3,477.96	4,830.96	3,762.74 N	215.34 E	124,865.57	2,026,414.87	0.00	3,768.89	
8,400.00	90.00	3.29	3,477.96	4,830.96	3,862.57 N	221.09 E	124,965.40	2,026,420.62	0.00	3,868.89	
8,500.00	90.00	3.29	3,477.96	4,830.96	3,962.41 N	226.83 E	125,065.24	2,026,426.36	0.00	3,968.89	
8,600.00	90.00	3.29	3,477.96	4,830.96	4,062.24 N	232.57 E	125,165.07	2,026,432.10	0.00	4,068.89	
8,700.00	90.00	3.29	3,477.96	4,830.96	4,162.08 N	238.32 E	125,264.91	2,026,437.85	0.00	4,168.89	
8,800.00	90.00	3.29	3,477.96	4,830.96	4,261.91 N	244.06 E	125,364.74	2,026,443.59	0.00	4,268.89	
8,900.00	90.00	3.29	3,477.96	4,830.96	4,361.75 N	249.80 E	125,464.58	2,026,449.33	0.00	4,368.89	
9,000.00	90.00	3.29	3,477.96	4,830.96	4,461.58 N	255.55 E	125,564.41	2,026,455.08	0.00	4,468.89	
9,100.00	90.00	3.29	3,477.96	4,830.96	4,561.42 N	261.29 E	125,664.25	2,026,460.82	0.00	4,568.89	
9,200.00	90.00	3.29	3,477.96	4,830.96	4,661.25 N	267.03 E	125,764.08	2,026,466.56	0.00	4,668.89	
9,300.00	90.00	3.29	3,477.96	4,830.96	4,761.09 N	272.78 E	125,863.92	2,026,472.31	0.00	4,768.89	
9,400.00	90.00	3.29	3,477.96	4,830.96	4,860.92 N	278.52 E	125,963.75	2,026,478.05	0.00	4,868.89	
9,500.00	90.00	3.29	3,477.96	4,830.96	4,960.76 N	284.26 E	126,063.59	2,026,483.79	0.00	4,968.89	
9,600.00	90.00	3.29	3,477.96	4,830.96	5,060.59 N	290.01 E	126,163.42	2,026,489.54	0.00	5,068.89	

Plan Report for Schupbach Ranch 3510 16-1H - Plan #1 101612 RevA0

Measured Depth (ft)	Inclination (°)	Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates Northing (ft)	Local Coordinates Easting (ft)	Map Coordinates Northing (ft)	Map Coordinates Easting (ft)	Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
9,700.00	90.00	3.29	3,477.96	4,830.96	5,160.43 N	295.75 E	126,263.26	2,026,495.28	0.00	5,168.89	
9,800.00	90.00	3.29	3,477.96	4,830.96	5,260.26 N	301.49 E	126,363.09	2,026,501.02	0.00	5,268.89	
9,896.42	90.00	3.29	3,477.96	4,830.96	5,356.52 N	307.03 E	126,459.35	2,026,506.56	0.00	5,365.31	TD at 9896.42

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
200.00	200.00	0.00	0.00	Start Build 2.50
440.00	439.56	12.55	0.47	Start 300.00 hold at 440.00 MD
740.00	737.92	43.88	1.66	Start Drop -2.50
980.00	977.48	56.43	2.13	Start 3280.52 hold at 980.00 MD
4,260.52	4,258.00	56.43	2.13	Start Build 10.00
5,160.52	4,830.96	628.44	35.03	Start 4735.90 hold at 5160.52 MD
9,896.42	4,830.96	5,356.52	307.03	TD at 9896.42

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
TD	No Target (Freehand)	3.28	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	9,896.42	Plan #1 101612 RevA0	MWD+SC

Plan Report for Schupbach Ranch 3510 16-1H - Plan #1 101612 RevA0**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	TVDSS (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,105.52	1,103.00	-250.00	Hutchinson Salt Top		0.00	
1,486.52	1,484.00	131.00	Hutchinson Salt Base		0.00	
2,564.52	2,562.00	1,209.00	Onaga Shale		0.00	
3,391.52	3,389.00	2,036.00	Techumseh Shale		0.00	
3,481.52	3,479.00	2,126.00	Lecompton Limestone		0.00	
3,666.52	3,664.00	2,311.00	Oread Limestone		0.00	
3,718.52	3,716.00	2,363.00	Toronto Limestone		0.00	
4,040.52	4,038.00	2,685.00	Stalnaker Top		0.00	
4,115.52	4,113.00	2,760.00	Stalnaker Base		0.00	
4,304.56	4,302.00	2,949.00	Iola Limestone		0.00	
4,486.32	4,478.00	3,125.00	Hushpuckney Shale		0.00	
4,569.24	4,552.00	3,199.00	Marmaton Group		0.00	
4,688.12	4,647.00	3,294.00	Pawnee Limestone		0.00	
4,751.41	4,691.00	3,338.00	Cherokee		0.00	
4,974.42	4,801.00	3,448.00	MS Limestone		0.00	

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Schupbach Ranch 351 - hit/miss target - Shape	0.00	0.00	4,831.00	5,356.52	307.03	126,459.35	2,026,506.56	37° 0' 50.151 N	98° 24' 33.211 W
- plan misses target center by 0.04ft at 9896.42ft MD (4830.96 TVD, 5356.52 N, 307.03 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.03 °/100ft	Maximum Dogleg over Survey:	10.00 °/100ft at 5,160.52 ft
Net Tortosity applicable to Plans:	1.03 °/100ft	Directional Difficulty Index:	6.201

Audit Info

North Reference Sheet for Sec 16 T35S R10W - Schupbach Ranch 3510 16-1H - Wellbore #1

All data is in Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to WELL @ 1353.00ft (Original Well Elev+23'KB). Northing and Easting are relative to Schupbach Ranch 3510 16-1H

Coordinate System is US State Plane 1927 (Exact solution), Kansas South 1502 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 98° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:37° 16' 0.000 N°

False Easting: 2,000,000.00ft, False Northing: 0.00ft, Scale Reduction: 1.00006332

Grid Coordinates of Well: 121,102.84 ft N, 2,026,199.53 ft E

Geographical Coordinates of Well: 36° 59' 57.19" N, 098° 24' 37.06" W

Grid Convergence at Surface is: 0.06°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,896.42ft

the Bottom Hole Displacement is 5,365.31ft in the Direction of 3.28° (Grid).

Magnetic Convergence at surface is: -4.80° (16 October 2012, , BGGM2012)

