



Shell

Reno County, Kansas (NAD27)

Preisser 2509

8-1H

Wellbore #1

Survey: MS MWD

Standard Survey Report

18 February, 2013



Company:	Shell	Local Co-ordinate Reference:	Well 8-1H
Project:	Reno County, Kansas (NAD27)	TVD Reference:	WELL @ 1731.00usft (Nabors 180)
Site:	Preisser 2509	MD Reference:	WELL @ 1731.00usft (Nabors 180)
Well:	8-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Well Planning Conroe

Project	Reno County, Kansas (NAD27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Kansas South 1502		

Well	8-1H				
Well Position	+N/-S	0.00 usft	Northing:	443,100.42 usft	Latitude: 37° 53' 0.5594 N
	+E/-W	0.00 usft	Easting:	2,045,547.34 usft	Longitude: 98° 20' 31.857 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 1,708.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	01/05/13	4.73	65.84	52,197

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	6.85	

Survey Program	Date	02/15/13			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
97.00	5,056.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97.00	0.50	274.10	97.00	0.03	-0.42	-0.02	0.52	0.52	0.00
174.00	0.70	282.30	173.99	0.15	-1.22	0.01	0.28	0.26	10.65
267.00	0.80	339.00	266.99	0.88	-2.00	0.64	0.77	0.11	60.97
298.00	1.00	354.80	297.98	1.35	-2.11	1.09	1.02	0.65	50.97
329.00	1.50	0.90	328.98	2.03	-2.12	1.76	1.67	1.61	19.68
360.00	1.80	4.50	359.96	2.92	-2.08	2.65	1.02	0.97	11.61
392.00	2.60	4.10	391.94	4.14	-1.99	3.88	2.50	2.50	-1.25
423.00	3.20	4.10	422.90	5.71	-1.88	5.44	1.94	1.94	0.00
454.00	3.80	9.40	453.84	7.59	-1.65	7.33	2.20	1.94	17.10
609.00	4.70	11.80	608.41	18.87	0.49	18.79	0.59	0.58	1.55
702.00	5.80	8.70	701.02	27.24	1.98	27.29	1.22	1.18	-3.33
795.00	5.90	356.10	793.54	36.66	2.37	36.68	1.38	0.11	-13.55
888.00	4.00	355.70	886.19	44.66	1.80	44.56	2.04	-2.04	-0.43
979.00	2.30	357.70	977.05	49.65	1.49	49.47	1.87	-1.87	2.20



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Site:	Preisser 2509	MD Reference:	WELL @ 1731.00usft (Nabors 180)
Well:	8-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Well Planning Conroe

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,073.00	1.20	356.20	1,071.01	52.52	1.35	52.30	1.17	-1.17	-1.60
1,198.00	0.90	20.40	1,195.98	54.74	1.60	54.54	0.42	-0.24	19.36
1,292.00	1.00	23.90	1,289.97	56.19	2.19	56.05	0.12	0.11	3.72
1,387.00	0.90	36.40	1,384.96	57.55	2.97	57.49	0.24	-0.11	13.16
1,481.00	0.70	24.80	1,478.95	58.66	3.65	58.68	0.27	-0.21	-12.34
1,576.00	0.80	9.20	1,573.94	59.84	4.00	59.89	0.24	0.11	-16.42
1,670.00	0.70	24.60	1,667.93	61.01	4.34	61.09	0.24	-0.11	16.38
1,765.00	0.70	10.90	1,762.93	62.11	4.69	62.23	0.18	0.00	-14.42
1,859.00	0.70	24.60	1,856.92	63.20	5.04	63.35	0.18	0.00	14.57
1,954.00	0.60	8.30	1,951.91	64.22	5.35	64.40	0.22	-0.11	-17.16
2,049.00	0.70	4.00	2,046.91	65.29	5.47	65.47	0.12	0.11	-4.53
2,143.00	0.70	5.90	2,140.90	66.43	5.57	66.62	0.02	0.00	2.02
2,238.00	0.80	14.80	2,235.89	67.65	5.79	67.86	0.16	0.11	9.37
2,332.00	0.70	8.10	2,329.88	68.85	6.04	69.08	0.14	-0.11	-7.13
2,427.00	0.50	25.50	2,424.88	69.80	6.30	70.05	0.28	-0.21	18.32
2,521.00	0.70	24.60	2,518.87	70.69	6.72	70.99	0.21	0.21	-0.96
2,616.00	0.60	10.40	2,613.87	71.71	7.05	72.04	0.20	-0.11	-14.95
2,710.00	0.40	26.20	2,707.86	72.49	7.28	72.84	0.26	-0.21	16.81
2,804.00	0.50	359.80	2,801.86	73.19	7.43	73.56	0.24	0.11	-28.09
2,899.00	0.40	27.10	2,896.86	73.90	7.58	74.28	0.25	-0.11	28.74
2,993.00	0.50	4.80	2,990.86	74.60	7.76	75.00	0.21	0.11	-23.72
3,088.00	0.60	13.60	3,085.85	75.50	7.91	75.90	0.14	0.11	9.26
3,182.00	0.30	356.40	3,179.85	76.22	8.01	76.63	0.35	-0.32	-18.30
3,245.00	0.30	12.50	3,242.85	76.55	8.04	76.96	0.13	0.00	25.56
3,280.00	0.30	8.30	3,277.85	76.73	8.07	77.14	0.06	0.00	-12.00
3,312.00	0.90	341.60	3,309.85	77.05	8.00	77.46	2.02	1.88	-83.44
3,343.00	3.60	2.90	3,340.82	78.25	7.98	78.65	8.97	8.71	68.71
3,375.00	5.90	7.40	3,372.71	80.89	8.24	81.29	7.28	7.19	14.06
3,406.00	8.30	10.80	3,403.47	84.67	8.86	85.12	7.86	7.74	10.97
3,437.00	10.60	11.70	3,434.04	89.66	9.86	90.19	7.43	7.42	2.90
3,468.00	13.10	12.50	3,464.38	95.88	11.20	96.53	8.08	8.06	2.58
3,500.00	15.80	12.40	3,495.37	103.68	12.92	104.48	8.44	8.44	-0.31
3,531.00	18.30	12.70	3,525.00	112.55	14.90	113.52	8.07	8.06	0.97
3,563.00	21.10	12.70	3,555.13	123.07	17.27	124.25	8.75	8.75	0.00
3,594.00	23.60	10.50	3,583.80	134.62	19.63	136.00	8.50	8.06	-7.10
3,626.00	26.20	8.50	3,612.82	147.90	21.84	149.45	8.54	8.13	-6.25
3,657.00	28.80	9.00	3,640.31	162.05	24.02	163.76	8.42	8.39	1.61
3,689.00	31.50	8.20	3,667.98	177.94	26.42	179.82	8.53	8.44	-2.50
3,720.00	34.40	7.20	3,693.99	194.65	28.67	196.68	9.52	9.35	-3.23
3,752.00	36.90	5.40	3,719.99	213.18	30.71	215.33	8.47	7.81	-5.63
3,783.00	39.50	4.40	3,744.35	232.28	32.34	234.48	8.62	8.39	-3.23
3,815.00	43.10	4.70	3,768.39	253.33	34.02	255.58	11.27	11.25	0.94
3,846.00	47.60	5.30	3,790.17	275.30	35.94	277.62	14.58	14.52	1.94
3,877.00	52.60	7.10	3,810.05	298.93	38.52	301.39	16.73	16.13	5.81



Company:	Shell	Local Co-ordinate Reference:	Well 8-1H
Project:	Reno County, Kansas (NAD27)	TVD Reference:	WELL @ 1731.00usft (Nabors 180)
Site:	Preisser 2509	MD Reference:	WELL @ 1731.00usft (Nabors 180)
Well:	8-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Well Planning Conroe

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,909.00	57.30	8.90	3,828.42	324.86	42.18	327.57	15.39	14.69	5.63	
3,940.00	60.40	11.20	3,844.46	350.98	46.82	354.05	11.84	10.00	7.42	
3,972.00	64.70	12.60	3,859.21	378.75	52.68	382.33	13.99	13.44	4.38	
4,003.00	69.20	12.80	3,871.34	406.57	58.95	410.70	14.53	14.52	0.65	
4,035.00	72.50	12.00	3,881.84	436.09	65.44	440.79	10.58	10.31	-2.50	
4,066.00	75.00	11.10	3,890.51	465.25	71.39	470.44	8.53	8.06	-2.90	
4,098.00	78.50	8.80	3,897.85	495.92	76.77	501.54	12.98	10.94	-7.19	
4,129.00	82.50	6.90	3,902.96	526.21	80.94	532.10	14.25	12.90	-6.13	
4,240.00	87.80	6.90	3,912.34	635.97	94.22	642.67	4.77	4.77	0.00	
4,303.00	88.60	6.70	3,914.32	698.49	101.68	705.63	1.31	1.27	-0.32	
4,398.00	88.60	6.50	3,916.64	792.84	112.60	800.61	0.21	0.00	-0.21	
4,490.00	89.00	5.60	3,918.57	884.30	122.29	892.57	1.07	0.43	-0.98	
4,584.00	91.70	5.70	3,918.00	977.83	131.54	986.54	2.87	2.87	0.11	
4,679.00	90.70	3.30	3,916.01	1,072.51	138.99	1,081.43	2.74	-1.05	-2.53	
4,773.00	91.00	2.80	3,914.61	1,166.37	144.00	1,175.22	0.62	0.32	-0.53	
4,868.00	89.50	2.70	3,914.20	1,261.26	148.55	1,269.97	1.58	-1.58	-0.11	
4,961.00	89.80	3.10	3,914.77	1,354.13	153.26	1,362.75	0.54	0.32	0.43	
5,056.00	91.80	3.80	3,913.44	1,448.95	158.97	1,457.57	2.23	2.11	0.74	
Projection to TD-5056.00' MD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
5,056.00	3,913.44	1,448.95	158.97	Projection to TD-5056.00' MD	



Shell

Reno County, Kansas (NAD27)

Preisser 2509

8-1H

Wellbore #2

Survey: MS MWD

Standard Survey Report

18 February, 2013



Company:	Shell	Local Co-ordinate Reference:	Well 8-1H
Project:	Reno County, Kansas (NAD27)	TVD Reference:	WELL @ 1731.00usft (Nabors 180)
Site:	Preisser 2509	MD Reference:	WELL @ 1731.00usft (Nabors 180)
Well:	8-1H	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Well Planning Conroe

Project	Reno County, Kansas (NAD27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Kansas South 1502		

Well	8-1H				
Well Position	+N/-S	0.00 usft	Northing:	443,100.42 usft	Latitude: 37° 53' 0.5594 N
	+E/-W	0.00 usft	Easting:	2,045,547.34 usft	Longitude: 98° 20' 31.857 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level: 1,708.00 usft

Wellbore	Wellbore #2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	01/05/13	4.73	65.84	52,197

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	4,240.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	6.85	

Survey Program	Date	02/18/13			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
97.00	4,240.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	
4,269.00	8,301.00	MS MWD (Wellbore #2)	MWD	MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,240.00	87.80	6.90	3,912.34	635.97	94.22	642.67	0.00	0.00	0.00	
Tie-In to MS MWD-4240.00' MD										
4,269.00	86.80	6.40	3,913.71	664.74	97.58	671.63	3.85	-3.45	-1.72	
4,304.00	87.30	6.70	3,915.51	699.47	101.57	706.59	1.67	1.43	0.86	
4,401.00	87.50	7.20	3,919.91	795.65	113.29	803.49	0.55	0.21	0.52	
4,496.00	87.90	8.00	3,923.72	889.74	125.85	898.40	0.94	0.42	0.84	
4,590.00	90.40	7.90	3,925.12	982.82	138.84	992.37	2.66	2.66	-0.11	
4,685.00	91.50	10.70	3,923.54	1,076.55	154.19	1,087.25	3.17	1.16	2.95	
4,780.00	92.60	10.00	3,920.14	1,169.94	171.25	1,182.01	1.37	1.16	-0.74	
4,874.00	93.10	10.20	3,915.47	1,262.37	187.71	1,275.75	0.57	0.53	0.21	
4,968.00	92.80	10.80	3,910.63	1,354.67	204.82	1,369.43	0.71	-0.32	0.64	
5,062.00	90.40	9.10	3,908.01	1,447.21	221.05	1,463.25	3.13	-2.55	-1.81	
5,157.00	88.10	9.00	3,909.25	1,541.02	235.99	1,558.16	2.42	-2.42	-0.11	
5,251.00	88.70	9.60	3,911.88	1,633.74	251.18	1,652.04	0.90	0.64	0.64	
5,345.00	88.70	6.90	3,914.01	1,726.74	264.66	1,745.98	2.87	0.00	-2.87	



Company:	Shell	Local Co-ordinate Reference:	Well 8-1H
Project:	Reno County, Kansas (NAD27)	TVD Reference:	WELL @ 1731.00usft (Nabors 180)
Site:	Preisser 2509	MD Reference:	WELL @ 1731.00usft (Nabors 180)
Well:	8-1H	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Well Planning Conroe

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,439.00	90.50	6.10	3,914.67	1,820.13	275.30	1,839.97	2.10	1.91	-0.85	
5,533.00	91.80	6.40	3,912.78	1,913.55	285.53	1,933.94	1.42	1.38	0.32	
5,626.00	90.60	5.50	3,910.83	2,006.02	295.17	2,026.91	1.61	-1.29	-0.97	
5,719.00	89.40	5.80	3,910.83	2,098.57	304.33	2,119.89	1.33	-1.29	0.32	
5,813.00	89.70	3.90	3,911.57	2,192.23	312.28	2,213.82	2.05	0.32	-2.02	
5,904.00	91.00	4.90	3,911.01	2,282.95	319.26	2,304.73	1.80	1.43	1.10	
5,996.00	92.10	5.10	3,908.53	2,374.57	327.27	2,396.65	1.22	1.20	0.22	
6,090.00	90.00	3.90	3,906.80	2,468.25	334.64	2,490.55	2.57	-2.23	-1.28	
6,184.00	88.20	3.10	3,908.28	2,562.06	340.38	2,584.37	2.10	-1.91	-0.85	
6,278.00	89.00	2.70	3,910.58	2,655.91	345.14	2,678.12	0.95	0.85	-0.43	
6,373.00	89.00	2.80	3,912.23	2,750.79	349.69	2,772.86	0.11	0.00	0.11	
6,468.00	88.60	2.90	3,914.22	2,845.65	354.42	2,867.61	0.43	-0.42	0.11	
6,562.00	89.50	3.40	3,915.78	2,939.50	359.58	2,961.40	1.10	0.96	0.53	
6,657.00	90.70	3.10	3,915.62	3,034.34	364.97	3,056.21	1.30	1.26	-0.32	
6,752.00	88.60	3.60	3,916.20	3,129.17	370.52	3,151.03	2.27	-2.21	0.53	
6,846.00	89.00	2.80	3,918.17	3,223.00	375.76	3,244.81	0.95	0.43	-0.85	
6,941.00	89.40	4.20	3,919.49	3,317.81	381.56	3,339.64	1.53	0.42	1.47	
7,036.00	90.90	5.40	3,919.24	3,412.48	389.51	3,434.57	2.02	1.58	1.26	
7,131.00	90.70	5.30	3,917.92	3,507.05	398.37	3,529.53	0.24	-0.21	-0.11	
7,225.00	91.10	5.30	3,916.44	3,600.64	407.05	3,623.49	0.43	0.43	0.00	
7,320.00	91.00	7.20	3,914.70	3,695.05	417.39	3,718.46	2.00	-0.11	2.00	
7,415.00	91.10	7.40	3,912.96	3,789.27	429.46	3,813.44	0.24	0.11	0.21	
7,510.00	90.60	7.50	3,911.55	3,883.46	441.78	3,908.43	0.54	-0.53	0.11	
7,605.00	91.00	6.70	3,910.22	3,977.72	453.52	4,003.41	0.94	0.42	-0.84	
7,700.00	89.90	8.70	3,909.48	4,071.85	466.24	4,098.39	2.40	-1.16	2.11	
7,794.00	90.20	9.30	3,909.39	4,164.69	480.95	4,192.33	0.71	0.32	0.64	
7,889.00	90.70	8.30	3,908.65	4,258.57	495.48	4,287.27	1.18	0.53	-1.05	
7,984.00	91.10	8.90	3,907.16	4,352.49	509.69	4,382.21	0.76	0.42	0.63	
8,079.00	89.60	7.60	3,906.58	4,446.50	523.32	4,477.18	2.09	-1.58	-1.37	
8,173.00	88.70	7.80	3,907.97	4,539.64	535.91	4,571.16	0.98	-0.96	0.21	
8,240.00	88.40	8.00	3,909.67	4,605.98	545.12	4,638.12	0.54	-0.45	0.30	
8,301.00	88.40	8.00	3,911.37	4,666.37	553.60	4,699.09	0.00	0.00	0.00	
Projection to TD-8301.00' MD/3911.37' TVD/88.40' Inc/8.00' Azm										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
4,240.00	3,912.34	635.97	94.22	Tie-In to MS MWD-4240.00' MD	
8,301.00	3,911.37	4,666.37	553.60	Projection to TD-8301.00' MD/3911.37' TVD/88.40' Inc/8.00' Azm	