



Survey TOEWS 2629 1-28H

123 Robert S. Kerr Ave.
Oklahoma City, OK 73102

Step #1 - Create a Deviation Survey

Step

#2 - Attach the survey "Description" to the Wellbore - Deviation Survey

Wellbores - Step #2

Actual Deviation Survey Rig Wireline, Proposed? No	Wellbore Name Original Hole
---	--------------------------------

Deviation Surveys - Step #1

Description Rig Wireline	Date	VS Dir (°)	Comment
-----------------------------	------	------------	---------

Tie-in Data

Azimuth North Type	Convergence (°)	Declination (°)	MD Tie In (ftKB)	Azimuth Tie In (°)	Inclination Tie In (°)	TVDTie In (ftKB)	NSTie In (ft)	EWTie In (ft)
--------------------	-----------------	-----------------	------------------	--------------------	------------------------	------------------	---------------	---------------

Survey Data

MD (ftKB)	Incl (°)	Azm (°)	Survey Company	Method	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (*/100ft)
245	0.3	349.00		RIG WIRELI	245	1	0.52	-0.10	0.10
547	0.3	349.00		RIG WIRELI	547	2	1.82	-0.35	0.00
732	0.5	349.00		RIG WIRELI	732	3	3.01	-0.58	0.14
1,008	0.3	349.00		RIG WIRELI	1,008	5	4.78	-0.93	0.09
1,300	0.5	349.00		RIG WIRELI	1,300	7	6.66	-1.29	0.09
1,636	0.8	349.70	ARCHER	MWD	1,636	10	10.40	-1.99	0.09
1,827	1.3	19.90	ARCHER	MWD	1,827	14	13.75	-1.49	0.38
2,016	1.6	24.00	ARCHER	MWD	2,016	18	18.18	0.31	0.17
2,207	1.4	24.30	ARCHER	MWD	2,207	23	22.74	2.35	0.10
2,398	1.1	21.40	ARCHER	MWD	2,398	27	26.57	3.98	0.16
2,588	0.9	0.20	ARCHER	MWD	2,588	30	29.76	4.65	0.22
2,779	0.8	348.90	ARCHER	MWD	2,779	33	32.57	4.40	0.10
2,968	0.8	348.90	ARCHER	MWD	2,968	35	35.16	3.89	0.00
3,159	1.1	347.60	ARCHER	MWD	3,159	38	38.26	3.24	0.16
3,350	1.0	358.00	ARCHER	MWD	3,350	42	41.72	2.79	0.11
3,593	1.1	5.80	ARCHER	MWD	3,593	46	46.16	2.95	0.07
3,726	1.0	358.40	ARCHER	MWD	3,726	49	48.59	3.05	0.13
3,916	1.1	358.60	ARCHER	MWD	3,916	52	52.07	2.96	0.05
4,019	1.0	7.70	ARCHER	MWD	4,019	54	53.95	3.06	0.19
4,041	1.3	4.20	ARCHER	MWD	4,041	54	54.39	3.10	1.40
4,072	1.2	1.90	ARCHER	MWD	4,072	55	55.06	3.14	0.36
4,104	1.8	1.50	ARCHER	MWD	4,103	56	55.90	3.16	1.88
4,135	3.9	5.00	ARCHER	MWD	4,134	58	57.44	3.27	6.79
4,167	6.1	5.70	ARCHER	MWD	4,166	60	60.21	3.53	6.88
4,199	8.2	4.40	ARCHER	MWD	4,198	64	64.18	3.87	6.58
4,230	9.8	1.50	ARCHER	MWD	4,229	69	69.02	4.11	5.36
4,262	11.6	0.60	ARCHER	MWD	4,260	75	74.96	4.22	5.65
4,294	13.7	0.30	ARCHER	MWD	4,291	82	81.97	4.27	6.57
4,325	16.0	1.00	ARCHER	MWD	4,321	90	89.91	4.36	7.44
4,357	18.1	359.40	ARCHER	MWD	4,352	99	99.29	4.39	6.72
4,388	20.4	358.60	ARCHER	MWD	4,381	110	109.51	4.21	7.47
4,420	22.9	358.20	ARCHER	MWD	4,411	121	121.31	3.87	7.83
4,451	24.8	358.30	ARCHER	MWD	4,439	134	133.84	3.49	6.13
4,482	26.4	358.50	ARCHER	MWD	4,467	147	147.23	3.12	5.17
4,514	27.6	359.30	ARCHER	MWD	4,496	162	161.75	2.84	3.92
4,545	29.9	359.30	ARCHER	MWD	4,523	177	176.66	2.66	7.42
4,577	32.6	359.50	ARCHER	MWD	4,550	193	193.26	2.49	8.44
4,609	34.4	359.60	ARCHER	MWD	4,577	211	210.92	2.35	5.63
4,640	35.9	0.10	ARCHER	MWD	4,602	229	228.77	2.30	4.93
4,672	37.9	1.70	ARCHER	MWD	4,628	248	247.98	2.61	6.93
4,703	39.1	2.80	ARCHER	MWD	4,652	267	267.26	3.37	4.46
4,734	40.3	3.60	ARCHER	MWD	4,676	287	287.03	4.48	4.21
4,766	43.1	3.90	ARCHER	MWD	4,700	308	308.27	5.87	8.77
4,797	46.3	3.40	ARCHER	MWD	4,722	330	330.03	7.26	10.38
4,829	49.4	3.40	ARCHER	MWD	4,743	354	353.71	8.66	9.69



123 Robert S. Kerr Ave.
Oklahoma City, OK 73102

Survey TOEWS 2629 1-28H

Step #1 - Create a Deviation Survey

Step

#2 - Attach the survey "Description" to the Wellbore - Deviation Survey

Survey Data

MD (ftKB)	Incl (°)	Azm (°)	Survey Company	Method	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)
4,860	50.9	3.70	ARCHER	MWD	4,763	378	377.46	10.14	4.90
4,892	50.8	3.30	ARCHER	MWD	4,783	402	402.23	11.65	1.02
4,923	50.6	2.80	ARCHER	MWD	4,803	426	426.18	12.93	1.41
4,955	50.2	1.80	ARCHER	MWD	4,823	451	450.82	13.92	2.71
4,986	49.5	0.70	ARCHER	MWD	4,843	475	474.51	14.44	3.53
5,017	48.8	0.00	ARCHER	MWD	4,864	498	497.96	14.58	2.83
5,049	49.8	359.30	ARCHER	MWD	4,885	522	522.22	14.43	3.54
5,080	53.0	359.80	ARCHER	MWD	4,904	547	546.44	14.25	10.40
5,112	56.4	0.00	ARCHER	MWD	4,922	573	572.55	14.20	10.64
5,143	59.5	0.50	ARCHER	MWD	4,939	599	598.82	14.32	10.09
5,175	62.1	0.80	ARCHER	MWD	4,955	627	626.75	14.63	8.17
5,207	64.2	1.50	ARCHER	MWD	4,969	655	655.30	15.21	6.85
5,239	67.5	2.20	ARCHER	MWD	4,982	685	684.47	16.15	10.50
5,270	70.7	3.00	ARCHER	MWD	4,993	713	713.40	17.47	10.60
5,302	73.8	3.60	ARCHER	MWD	5,003	744	743.82	19.23	9.85
5,333	77.8	3.10	ARCHER	MWD	5,010	774	773.82	20.98	13.00
5,365	80.4	3.10	ARCHER	MWD	5,017	805	805.19	22.68	8.12
5,397	82.8	4.40	ARCHER	MWD	5,021	837	836.78	24.75	8.51
5,428	85.8	5.10	ARCHER	MWD	5,024	868	867.52	27.31	9.93
5,450	87.4	5.10	ARCHER	MWD	5,026	890	889.39	29.26	7.27
5,558	90.6	6.20	ARCHER	MWD	5,027	998	996.83	39.89	3.13
5,590	90.4	6.50	ARCHER	MWD	5,027	1,030	1,028.63	43.43	1.13
5,622	90.3	6.30	ARCHER	MWD	5,027	1,061	1,060.43	46.99	0.70
5,654	90.8	6.60	ARCHER	MWD	5,027	1,093	1,092.23	50.59	1.82
5,685	92.5	5.80	ARCHER	MWD	5,026	1,124	1,123.04	53.93	6.06
5,717	93.0	5.80	ARCHER	MWD	5,024	1,156	1,154.83	57.16	1.56
5,749	93.1	5.90	ARCHER	MWD	5,023	1,188	1,186.62	60.42	0.44
5,781	92.0	4.40	ARCHER	MWD	5,021	1,220	1,218.46	63.29	5.81
5,812	91.8	4.50	ARCHER	MWD	5,020	1,251	1,249.35	65.69	0.72
5,844	92.2	4.30	ARCHER	MWD	5,019	1,283	1,281.24	68.15	1.40
5,875	91.8	3.50	ARCHER	MWD	5,018	1,314	1,312.15	70.26	2.88
5,908	90.4	2.70	ARCHER	MWD	5,017	1,347	1,345.09	72.04	4.89
5,939	90.3	2.40	ARCHER	MWD	5,017	1,378	1,376.06	73.42	1.02
5,971	90.6	2.90	ARCHER	MWD	5,017	1,410	1,408.02	74.90	1.82
6,003	90.6	3.00	ARCHER	MWD	5,016	1,442	1,439.98	76.55	0.31
6,035	90.9	3.10	ARCHER	MWD	5,016	1,474	1,471.93	78.25	0.99
6,066	89.7	2.80	ARCHER	MWD	5,016	1,505	1,502.89	79.84	3.99
6,098	88.8	1.90	ARCHER	MWD	5,016	1,537	1,534.86	81.15	3.98
6,130	88.6	1.60	ARCHER	MWD	5,017	1,569	1,566.84	82.13	1.13
6,162	88.7	2.00	ARCHER	MWD	5,018	1,601	1,598.81	83.14	1.29
6,193	88.9	2.00	ARCHER	MWD	5,018	1,632	1,629.79	84.22	0.65
6,224	89.2	2.10	ARCHER	MWD	5,019	1,663	1,660.76	85.33	1.02
6,256	89.5	2.30	ARCHER	MWD	5,019	1,695	1,692.74	86.56	1.13
6,288	88.5	2.10	ARCHER	MWD	5,020	1,727	1,724.71	87.78	3.19
6,319	88.5	2.10	ARCHER	MWD	5,021	1,758	1,755.67	88.92	0.00
6,352	88.6	2.00	ARCHER	MWD	5,022	1,791	1,788.64	90.10	0.43
6,383	88.9	2.20	ARCHER	MWD	5,022	1,822	1,819.61	91.24	1.16
6,415	89.2	2.30	ARCHER	MWD	5,023	1,854	1,851.59	92.49	0.99
6,447	87.8	1.50	ARCHER	MWD	5,024	1,886	1,883.56	93.55	5.04
6,478	87.8	1.50	ARCHER	MWD	5,025	1,917	1,914.52	94.36	0.00
6,510	87.9	1.60	ARCHER	MWD	5,026	1,949	1,946.49	95.23	0.44
6,541	88.2	1.20	ARCHER	MWD	5,027	1,980	1,977.46	95.98	1.61



123 Robert S. Kerr Ave.
Oklahoma City, OK 73102

Survey TOEWS 2629 1-28H

Step #1 - Create a Deviation Survey

Step

#2 - Attach the survey "Description" to the Wellbore - Deviation Survey

Survey Data

MD (ftKB)	Incl (°)	Azm (°)	Survey Company	Method	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (*/100ft)
6,573	88.3	1.00	ARCHER	MWD	5,028	2,012	2,009.44	96.60	0.70
6,605	88.4	1.40	ARCHER	MWD	5,029	2,044	2,041.42	97.27	1.29
6,669	89.7	1.40	ARCHER	MWD	5,030	2,108	2,105.39	98.83	2.03
6,733	90.2	1.90	ARCHER	MWD	5,030	2,172	2,169.36	100.67	1.10
6,796	90.8	1.50	ARCHER	MWD	5,029	2,235	2,232.33	102.54	1.14
6,859	91.1	1.50	ARCHER	MWD	5,028	2,298	2,295.30	104.19	0.48
6,922	91.2	1.90	ARCHER	MWD	5,027	2,361	2,358.26	106.06	0.65
6,985	91.4	2.10	ARCHER	MWD	5,026	2,424	2,421.21	108.26	0.45
7,048	91.3	1.70	ARCHER	MWD	5,024	2,487	2,484.16	110.35	0.65
7,112	91.1	1.30	ARCHER	MWD	5,023	2,551	2,548.12	112.02	0.70
7,144	91.2	1.50	ARCHER	MWD	5,022	2,583	2,580.10	112.80	0.70
7,177	91.2	1.40	ARCHER	MWD	5,022	2,616	2,613.09	113.64	0.30
7,208	91.2	1.20	ARCHER	MWD	5,021	2,647	2,644.07	114.34	0.65
7,240	91.0	1.50	ARCHER	MWD	5,020	2,679	2,676.06	115.10	1.13
7,271	90.8	1.20	ARCHER	MWD	5,020	2,710	2,707.04	115.83	1.16
7,303	90.6	1.20	ARCHER	MWD	5,019	2,742	2,739.03	116.50	0.62
7,334	90.9	1.50	ARCHER	MWD	5,019	2,772	2,770.02	117.23	1.37
7,367	90.9	1.00	ARCHER	MWD	5,019	2,805	2,803.01	117.95	1.51
7,398	91.4	1.50	ARCHER	MWD	5,018	2,836	2,834.00	118.62	2.28
7,428	92.0	1.20	ARCHER	MWD	5,017	2,866	2,863.98	119.33	2.24
7,460	92.3	1.50	ARCHER	MWD	5,016	2,898	2,895.94	120.08	1.33
7,524	91.3	1.60	ARCHER	MWD	5,014	2,962	2,959.89	121.81	1.57
7,652	90.3	2.20	ARCHER	MWD	5,012	3,090	3,087.80	126.06	0.91
7,716	89.8	2.70	ARCHER	MWD	5,012	3,154	3,151.74	128.79	1.10
7,780	89.2	2.50	ARCHER	MWD	5,013	3,218	3,215.68	131.69	0.99
7,843	89.1	3.10	ARCHER	MWD	5,013	3,281	3,278.59	134.77	0.97
7,906	89.6	2.60	ARCHER	MWD	5,014	3,344	3,341.51	137.90	1.12
7,970	90.4	3.10	ARCHER	MWD	5,014	3,408	3,405.43	141.09	1.47
8,034	90.5	3.20	ARCHER	MWD	5,014	3,472	3,469.33	144.60	0.22
8,096	89.5	3.20	ARCHER	MWD	5,014	3,534	3,531.23	148.06	1.61
8,159	89.9	3.70	ARCHER	MWD	5,014	3,597	3,594.12	151.86	1.02
8,191	88.8	3.70	ARCHER	MWD	5,014	3,629	3,626.05	153.92	3.44
8,256	89.5	3.30	ARCHER	MWD	5,015	3,694	3,690.92	157.89	1.24
8,274	88.9	2.90	ARCHER	MWD	5,016	3,712	3,708.89	158.86	4.01
8,319	89.5	3.60	ARCHER	MWD	5,016	3,757	3,753.82	161.41	2.05
8,383	90.0	2.70	ARCHER	MWD	5,016	3,821	3,817.72	164.93	1.61
8,447	90.7	2.10	ARCHER	MWD	5,016	3,885	3,881.66	167.61	1.44
8,510	91.0	2.50	ARCHER	MWD	5,015	3,948	3,944.60	170.14	0.79
8,573	89.7	2.90	ARCHER	MWD	5,015	4,011	4,007.53	173.10	2.16
8,637	89.8	2.20	ARCHER	MWD	5,015	4,075	4,071.46	175.95	1.10
8,700	89.8	2.80	ARCHER	MWD	5,015	4,138	4,134.40	178.70	0.95
8,764	90.1	3.10	ARCHER	MWD	5,015	4,202	4,198.32	181.99	0.66
8,827	90.3	2.70	ARCHER	MWD	5,015	4,265	4,261.24	185.18	0.71
8,890	90.2	3.40	ARCHER	MWD	5,015	4,328	4,324.15	188.53	1.12
8,954	89.9	2.60	ARCHER	MWD	5,015	4,392	4,388.06	191.88	1.33
9,017	89.7	3.20	ARCHER	MWD	5,015	4,455	4,450.98	195.07	1.00
9,080	89.4	3.10	ARCHER	MWD	5,015	4,518	4,513.88	198.53	0.50
9,143	89.6	2.10	ARCHER	MWD	5,016	4,581	4,576.81	201.39	1.62
9,208	89.2	2.90	ARCHER	MWD	5,017	4,646	4,641.75	204.22	1.38
9,325	88.9	2.90	ARCHER	MWD	5,019	4,763	4,758.58	210.14	0.26