



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

## Survey BRANDT 2230 1-31H

**Step #1 - Create a Deviation Survey**

**Step**

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

**Wellbores - Step #2**

Actual Deviation Survey SURVEYS, Proposed? No	Wellbore Name Original Hole
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**Deviation Surveys - Step #1**

Description SURVEYS	Date	VS Dir (°)	Comment
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**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)
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**Survey Data**

MD (ftKB)	Incl (°)	Azm (°)	Survey Company	Method	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)
285	0.6	11.60		Incl	285	-2	1.56	0.32	0.22
474	0.4	11.60		Incl	474	-3	3.21	0.66	0.14
724	0.2	11.60		Incl	724	-4	4.49	0.92	0.06
1,032	0.5	11.60		Incl	1,032	-6	6.41	1.32	0.09
1,312	0.5	11.60		Incl	1,312	-9	8.85	1.82	0.00
1,843	0.5	11.60		Incl	1,843	-13	13.44	2.76	0.00
1,884	0.3	11.60	DRILLRIGHT	MWD	1,884	-14	13.72	2.82	0.49
2,108	0.6	73.80	DRILLRIGHT	MWD	2,108	-15	14.62	4.06	0.24
2,586	0.3	12.50	DRILLRIGHT	MWD	2,586	-17	16.54	6.73	0.11
3,084	0.5	1.90	DRILLRIGHT	MWD	3,084	-20	19.98	7.09	0.04
3,543	0.3	273.20	DRILLRIGHT	MWD	3,543	-22	22.05	5.96	0.13
3,735	0.3	292.30	DRILLRIGHT	MWD	3,735	-22	22.27	4.99	0.05
3,799	0.1	356.30	DRILLRIGHT	MWD	3,799	-22	22.39	4.83	0.42
3,831	0.3	311.30	DRILLRIGHT	MWD	3,831	-23	22.47	4.76	0.75
3,863	0.5	212.40	DRILLRIGHT	MWD	3,863	-22	22.41	4.63	1.94
3,895	1.5	194.10	DRILLRIGHT	MWD	3,895	-22	21.89	4.45	3.24
3,927	3.1	188.70	DRILLRIGHT	MWD	3,927	-21	20.63	4.22	5.04
3,958	5.1	185.00	DRILLRIGHT	MWD	3,958	-18	18.42	3.97	6.50
3,990	6.8	186.10	DRILLRIGHT	MWD	3,990	-15	15.12	3.65	5.32
4,022	8.6	187.30	DRILLRIGHT	MWD	4,021	-11	10.87	3.14	5.65
4,054	11.0	185.80	DRILLRIGHT	MWD	4,053	-5	5.45	2.53	7.54
4,086	13.4	183.70	DRILLRIGHT	MWD	4,084	1	-1.28	1.98	7.63
4,117	15.3	183.80	DRILLRIGHT	MWD	4,114	9	-8.95	1.48	6.13
4,149	17.6	183.70	DRILLRIGHT	MWD	4,145	18	-17.99	0.88	7.19
4,180	19.9	182.80	DRILLRIGHT	MWD	4,174	28	-27.94	0.32	7.48
4,212	22.7	182.70	DRILLRIGHT	MWD	4,204	40	-39.55	-0.23	8.75
4,244	24.9	181.80	DRILLRIGHT	MWD	4,233	52	-52.45	-0.74	6.97
4,276	27.4	181.20	DRILLRIGHT	MWD	4,262	67	-66.55	-1.10	7.86
4,308	29.8	180.40	DRILLRIGHT	MWD	4,290	82	-81.86	-1.31	7.59
4,339	31.8	181.80	DRILLRIGHT	MWD	4,317	98	-97.73	-1.62	6.85
4,371	33.5	182.10	DRILLRIGHT	MWD	4,344	115	-114.99	-2.21	5.34
4,403	36.1	181.50	DRILLRIGHT	MWD	4,370	133	-133.24	-2.78	8.20
4,434	38.4	180.90	DRILLRIGHT	MWD	4,395	152	-152.00	-3.17	7.51
4,466	40.3	180.60	DRILLRIGHT	MWD	4,419	172	-172.28	-3.44	5.97
4,497	42.3	181.40	DRILLRIGHT	MWD	4,443	193	-192.74	-3.80	6.67
4,529	44.9	181.30	DRILLRIGHT	MWD	4,466	215	-214.80	-4.31	8.13
4,560	47.6	181.80	DRILLRIGHT	MWD	4,487	237	-237.18	-4.92	8.79
4,592	49.6	181.80	DRILLRIGHT	MWD	4,508	261	-261.17	-5.68	6.25
4,623	50.1	181.90	DRILLRIGHT	MWD	4,528	285	-284.86	-6.44	1.63
4,655	49.9	182.00	DRILLRIGHT	MWD	4,549	309	-309.35	-7.28	0.67
4,687	49.8	181.20	DRILLRIGHT	MWD	4,570	334	-333.80	-7.96	1.94
4,718	49.7	181.60	DRILLRIGHT	MWD	4,590	358	-357.46	-8.54	1.04
4,750	49.7	181.10	DRILLRIGHT	MWD	4,610	382	-381.86	-9.11	1.19
4,782	49.7	181.30	DRILLRIGHT	MWD	4,631	406	-406.26	-9.62	0.48
4,813	51.5	180.60	DRILLRIGHT	MWD	4,651	430	-430.21	-10.02	6.06



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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)
4,845	54.5	180.70	DRILLRIGHT	MWD	4,670	456	-455.76	-10.31	9.38
4,877	57.2	180.60	DRILLRIGHT	MWD	4,688	482	-482.24	-10.61	8.44
4,909	60.3	180.00	DRILLRIGHT	MWD	4,705	510	-509.59	-10.75	9.82
4,941	63.6	179.60	DRILLRIGHT	MWD	4,720	538	-537.83	-10.65	10.37
4,973	66.8	179.80	DRILLRIGHT	MWD	4,733	567	-566.87	-10.50	10.02
5,004	69.7	180.30	DRILLRIGHT	MWD	4,744	596	-595.66	-10.52	9.47
5,036	71.9	180.10	DRILLRIGHT	MWD	4,755	626	-625.88	-10.63	6.90
5,068	74.0	180.30	DRILLRIGHT	MWD	4,764	657	-656.47	-10.74	6.59
5,100	76.2	180.90	DRILLRIGHT	MWD	4,773	687	-687.39	-11.06	7.11
5,132	79.2	181.50	DRILLRIGHT	MWD	4,779	719	-718.65	-11.72	9.55
5,163	81.3	181.50	DRILLRIGHT	MWD	4,785	749	-749.19	-12.52	6.77
5,195	83.7	181.80	DRILLRIGHT	MWD	4,789	781	-780.90	-13.43	7.56
5,220	86.5	181.90	DRILLRIGHT	MWD	4,791	806	-805.79	-14.23	11.21
5,292	90.2	182.50	DRILLRIGHT	MWD	4,793	878	-877.69	-17.00	5.21
5,323	90.2	182.80	DRILLRIGHT	MWD	4,793	909	-908.66	-18.43	0.97
5,353	90.2	182.50	DRILLRIGHT	MWD	4,793	939	-938.63	-19.82	1.00
5,387	90.9	182.70	DRILLRIGHT	MWD	4,793	973	-972.59	-21.36	2.14
5,417	90.8	183.50	DRILLRIGHT	MWD	4,792	1,003	-1,002.54	-22.98	2.69
5,458	90.8	183.20	DRILLRIGHT	MWD	4,792	1,044	-1,043.47	-25.38	0.73
5,480	90.4	182.30	DRILLRIGHT	MWD	4,791	1,066	-1,065.44	-26.43	4.48
5,511	90.3	181.80	DRILLRIGHT	MWD	4,791	1,097	-1,096.42	-27.54	1.64
5,542	90.4	181.80	DRILLRIGHT	MWD	4,791	1,128	-1,127.41	-28.52	0.32
5,573	90.4	182.20	DRILLRIGHT	MWD	4,791	1,159	-1,158.39	-29.60	1.29
5,604	90.7	181.50	DRILLRIGHT	MWD	4,790	1,190	-1,189.37	-30.60	2.46
5,635	89.7	180.70	DRILLRIGHT	MWD	4,790	1,221	-1,220.36	-31.19	4.13
5,666	89.6	180.50	DRILLRIGHT	MWD	4,790	1,252	-1,251.36	-31.52	0.72
5,698	88.2	180.30	DRILLRIGHT	MWD	4,791	1,284	-1,283.35	-31.74	4.42
5,729	88.1	180.30	DRILLRIGHT	MWD	4,792	1,315	-1,314.34	-31.90	0.32
5,760	88.0	179.70	DRILLRIGHT	MWD	4,793	1,346	-1,345.32	-31.90	1.96
5,791	88.1	179.60	DRILLRIGHT	MWD	4,794	1,377	-1,376.30	-31.71	0.46
5,822	88.1	179.40	DRILLRIGHT	MWD	4,795	1,408	-1,407.28	-31.44	0.64
5,853	88.2	179.70	DRILLRIGHT	MWD	4,796	1,439	-1,438.26	-31.20	1.02
5,885	88.0	179.60	DRILLRIGHT	MWD	4,797	1,470	-1,470.25	-31.00	0.70
5,916	87.9	179.40	DRILLRIGHT	MWD	4,798	1,501	-1,501.22	-30.73	0.72
5,947	87.8	179.30	DRILLRIGHT	MWD	4,800	1,532	-1,532.20	-30.38	0.46
5,979	88.6	179.60	DRILLRIGHT	MWD	4,801	1,564	-1,564.18	-30.08	2.67
6,010	88.7	179.20	DRILLRIGHT	MWD	4,801	1,595	-1,595.17	-29.75	1.33
6,041	88.5	179.20	DRILLRIGHT	MWD	4,802	1,626	-1,626.16	-29.32	0.65
6,072	88.6	179.40	DRILLRIGHT	MWD	4,803	1,657	-1,657.15	-28.94	0.72
6,102	88.7	180.50	DRILLRIGHT	MWD	4,804	1,687	-1,687.14	-28.91	3.68
6,133	88.9	180.80	DRILLRIGHT	MWD	4,804	1,718	-1,718.13	-29.27	1.16
6,164	89.0	180.80	DRILLRIGHT	MWD	4,805	1,749	-1,749.12	-29.70	0.32
6,195	89.3	180.60	DRILLRIGHT	MWD	4,805	1,780	-1,780.12	-30.08	1.16
6,227	89.5	180.40	DRILLRIGHT	MWD	4,806	1,812	-1,812.11	-30.36	0.88
6,258	89.4	180.70	DRILLRIGHT	MWD	4,806	1,843	-1,843.11	-30.65	1.02
6,289	88.3	180.30	DRILLRIGHT	MWD	4,806	1,874	-1,874.10	-30.92	3.78
6,320	88.1	180.50	DRILLRIGHT	MWD	4,807	1,905	-1,905.09	-31.14	0.91
6,351	88.7	180.30	DRILLRIGHT	MWD	4,808	1,936	-1,936.07	-31.36	2.04
6,381	89.0	180.80	DRILLRIGHT	MWD	4,809	1,966	-1,966.07	-31.64	1.94
6,412	89.6	180.70	DRILLRIGHT	MWD	4,809	1,997	-1,997.06	-32.05	1.96
6,443	89.5	181.00	DRILLRIGHT	MWD	4,810	2,028	-2,028.06	-32.51	1.02
6,473	89.3	180.90	DRILLRIGHT	MWD	4,810	2,058	-2,058.05	-33.01	0.75



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Step

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Survey Data									
MD (ft)	Incl (°)	Azm (°)	Survey Company	Method	TVD (ft)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)
6,504	90.7	181.00	DRILLRIGHT	MWD	4,810	2,089	-2,089.05	-33.52	4.53
6,534	91.9	181.70	DRILLRIGHT	MWD	4,809	2,119	-2,119.03	-34.23	4.63
6,565	91.9	181.90	DRILLRIGHT	MWD	4,808	2,150	-2,150.00	-35.20	0.64
6,596	92.2	181.70	DRILLRIGHT	MWD	4,807	2,181	-2,180.96	-36.17	1.16
6,627	92.4	182.00	DRILLRIGHT	MWD	4,806	2,212	-2,211.92	-37.17	1.16
6,658	92.5	181.50	DRILLRIGHT	MWD	4,804	2,243	-2,242.88	-38.12	1.64
6,689	92.7	181.80	DRILLRIGHT	MWD	4,803	2,274	-2,273.83	-39.01	1.16
6,720	92.9	181.30	DRILLRIGHT	MWD	4,802	2,305	-2,304.78	-39.85	1.74
6,750	91.8	180.70	DRILLRIGHT	MWD	4,800	2,335	-2,334.75	-40.37	4.18
6,782	91.5	180.80	DRILLRIGHT	MWD	4,799	2,367	-2,366.74	-40.79	0.99
6,814	90.2	180.40	DRILLRIGHT	MWD	4,799	2,399	-2,398.73	-41.13	4.25
6,846	90.3	180.50	DRILLRIGHT	MWD	4,799	2,431	-2,430.73	-41.38	0.44
6,878	90.7	180.40	DRILLRIGHT	MWD	4,798	2,463	-2,462.73	-41.63	1.29
6,910	90.9	180.30	DRILLRIGHT	MWD	4,798	2,495	-2,494.72	-41.82	0.70
6,942	90.4	179.60	DRILLRIGHT	MWD	4,798	2,527	-2,526.72	-41.80	2.69
6,973	90.1	179.60	DRILLRIGHT	MWD	4,798	2,558	-2,557.72	-41.58	0.97
7,006	90.2	179.40	DRILLRIGHT	MWD	4,797	2,591	-2,590.72	-41.29	0.68
7,037	90.2	178.80	DRILLRIGHT	MWD	4,797	2,622	-2,621.72	-40.81	1.94
7,069	90.1	178.60	DRILLRIGHT	MWD	4,797	2,654	-2,653.71	-40.08	0.70
7,101	90.3	179.30	DRILLRIGHT	MWD	4,797	2,686	-2,685.70	-39.49	2.28
7,133	90.0	179.50	DRILLRIGHT	MWD	4,797	2,718	-2,717.70	-39.16	1.13
7,165	90.0	179.40	DRILLRIGHT	MWD	4,797	2,750	-2,749.70	-38.85	0.31
7,197	89.9	179.70	DRILLRIGHT	MWD	4,797	2,782	-2,781.70	-38.60	0.99
7,230	89.5	179.60	DRILLRIGHT	MWD	4,797	2,815	-2,814.70	-38.40	1.25
7,261	89.7	180.10	DRILLRIGHT	MWD	4,797	2,846	-2,845.69	-38.32	1.74
7,293	90.0	180.00	DRILLRIGHT	MWD	4,798	2,878	-2,877.69	-38.34	0.99
7,325	90.0	180.50	DRILLRIGHT	MWD	4,798	2,910	-2,909.69	-38.48	1.56
7,357	89.0	179.40	DRILLRIGHT	MWD	4,798	2,942	-2,941.69	-38.46	4.65
7,389	89.4	179.70	DRILLRIGHT	MWD	4,798	2,974	-2,973.69	-38.20	1.56
7,421	90.5	180.90	DRILLRIGHT	MWD	4,798	3,006	-3,005.69	-38.37	5.09
7,453	90.6	181.00	DRILLRIGHT	MWD	4,798	3,038	-3,037.68	-38.90	0.44
7,485	91.9	181.60	DRILLRIGHT	MWD	4,797	3,070	-3,069.66	-39.63	4.47
7,517	89.4	181.10	DRILLRIGHT	MWD	4,797	3,102	-3,101.65	-40.38	7.97
7,549	89.6	181.50	DRILLRIGHT	MWD	4,797	3,134	-3,133.64	-41.11	1.40
7,580	90.4	182.20	DRILLRIGHT	MWD	4,797	3,165	-3,164.62	-42.11	3.43
7,612	91.6	182.50	DRILLRIGHT	MWD	4,797	3,197	-3,196.59	-43.42	3.87
7,644	92.6	183.50	DRILLRIGHT	MWD	4,796	3,229	-3,228.53	-45.09	4.42
7,676	93.1	182.50	DRILLRIGHT	MWD	4,794	3,261	-3,260.44	-46.77	3.49
7,708	93.3	182.50	DRILLRIGHT	MWD	4,792	3,293	-3,292.36	-48.16	0.62
7,739	93.1	182.10	DRILLRIGHT	MWD	4,790	3,324	-3,323.29	-49.40	1.44
7,771	93.0	182.10	DRILLRIGHT	MWD	4,789	3,356	-3,355.22	-50.57	0.31
7,803	93.0	182.40	DRILLRIGHT	MWD	4,787	3,388	-3,387.15	-51.83	0.94
7,835	91.3	182.20	DRILLRIGHT	MWD	4,786	3,419	-3,419.10	-53.11	5.35
7,867	90.4	181.70	DRILLRIGHT	MWD	4,785	3,451	-3,451.08	-54.20	3.22
7,899	90.7	181.20	DRILLRIGHT	MWD	4,785	3,483	-3,483.07	-55.01	1.82
7,931	91.1	181.70	DRILLRIGHT	MWD	4,785	3,515	-3,515.05	-55.82	2.00
7,963	92.3	182.60	DRILLRIGHT	MWD	4,784	3,547	-3,547.02	-57.02	4.69
7,995	91.7	181.60	DRILLRIGHT	MWD	4,782	3,579	-3,578.98	-58.19	3.64
8,027	90.9	181.60	DRILLRIGHT	MWD	4,782	3,611	-3,610.95	-59.08	2.50
8,058	90.7	181.00	DRILLRIGHT	MWD	4,781	3,642	-3,641.94	-59.79	2.04
8,091	90.3	180.40	DRILLRIGHT	MWD	4,781	3,675	-3,674.94	-60.19	2.19
8,122	90.2	180.30	DRILLRIGHT	MWD	4,781	3,706	-3,705.94	-60.38	0.46



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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)
8,154	90.0	179.80	DRILLRIGHT	MWD	4,781	3,738	-3,737.94	-60.41	1.68
8,186	90.1	179.50	DRILLRIGHT	MWD	4,781	3,770	-3,769.94	-60.21	0.99
8,218	90.2	179.60	DRILLRIGHT	MWD	4,781	3,802	-3,801.94	-59.96	0.44
8,250	90.3	179.20	DRILLRIGHT	MWD	4,781	3,834	-3,833.93	-59.63	1.29
8,282	90.5	179.20	DRILLRIGHT	MWD	4,780	3,866	-3,865.93	-59.18	0.62
8,313	90.5	178.70	DRILLRIGHT	MWD	4,780	3,897	-3,896.92	-58.61	1.61
8,345	90.9	178.40	DRILLRIGHT	MWD	4,780	3,929	-3,928.91	-57.80	1.56
8,377	89.5	179.00	DRILLRIGHT	MWD	4,780	3,961	-3,960.90	-57.08	4.76
8,408	88.4	177.90	DRILLRIGHT	MWD	4,780	3,992	-3,991.88	-56.24	5.02
8,439	89.3	178.80	DRILLRIGHT	MWD	4,781	4,023	-4,022.86	-55.35	4.11
8,471	90.0	179.60	DRILLRIGHT	MWD	4,781	4,055	-4,054.86	-54.90	3.32
8,503	90.0	179.20	DRILLRIGHT	MWD	4,781	4,087	-4,086.86	-54.56	1.25
8,535	90.6	179.40	DRILLRIGHT	MWD	4,781	4,119	-4,118.86	-54.17	1.98
8,567	90.6	179.00	DRILLRIGHT	MWD	4,780	4,151	-4,150.85	-53.73	1.25
8,599	90.8	180.50	DRILLRIGHT	MWD	4,780	4,183	-4,182.85	-53.59	4.73
8,631	90.9	179.10	DRILLRIGHT	MWD	4,780	4,215	-4,214.84	-53.47	4.39
8,663	90.7	179.30	DRILLRIGHT	MWD	4,779	4,247	-4,246.84	-53.03	0.88
8,694	90.5	179.00	DRILLRIGHT	MWD	4,779	4,278	-4,277.83	-52.57	1.16
8,726	90.5	178.80	DRILLRIGHT	MWD	4,779	4,310	-4,309.82	-51.95	0.62
8,758	91.6	179.20	DRILLRIGHT	MWD	4,778	4,342	-4,341.81	-51.40	3.66
8,790	91.6	179.30	DRILLRIGHT	MWD	4,777	4,374	-4,373.80	-50.98	0.31
8,822	90.9	179.40	DRILLRIGHT	MWD	4,776	4,406	-4,405.79	-50.61	2.21
8,854	91.1	179.50	DRILLRIGHT	MWD	4,776	4,438	-4,437.78	-50.31	0.70
8,885	90.8	179.10	DRILLRIGHT	MWD	4,775	4,469	-4,468.78	-49.93	1.61
8,917	89.0	179.60	DRILLRIGHT	MWD	4,775	4,501	-4,500.77	-49.56	5.84
8,949	88.7	178.70	DRILLRIGHT	MWD	4,776	4,533	-4,532.76	-49.09	2.96
8,981	89.6	179.20	DRILLRIGHT	MWD	4,776	4,565	-4,564.75	-48.50	3.22
9,077	91.1	180.00	DRILLRIGHT	MWD	4,776	4,661	-4,660.74	-47.83	1.77
9,153	92.9	180.70	DRILLRIGHT	MWD	4,773	4,737	-4,736.69	-48.30	2.54