

DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name		Target Direction	Slot Coordinate	N / S	E / W	Hole Size	Calculation by	Date			
Bleumer 2630 1-13		1.60						1/28/13			
Job Number		Type of Survey	Tie-in Point				Directional Co.				
0											
Measured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate		Dogleg Severity	Build Up %/100 ft	Walk/ %/100 ft	
						N + / S -	E + / W -				
0	0	0	0	0.00	0.00					<< TIE-IN POINT >>	
0	0	0		0.00	0.00	0.00	0.00				
250	0	189	250	250.00	-0.87	-0.86	-0.14	0.16	0.16	75.64	
500	1	189	250	499.98	-3.89	-3.88	-0.62	0.24	0.24	0.00	
750	1	189	250	749.95	-7.79	-7.75	-1.24	0.08	-0.08	0.00	
1050	1	189	300	1,049.91	-12.46	-12.41	-1.99	0.07	0.07	0.00	
1250	0	189	200	1,249.90	-14.71	-14.65	-2.35	0.35	-0.35	0.00	
1622	1	189	372	1,621.89	-17.28	-17.21	-2.76	0.05	0.05	0.00	
1739	1	189	117	1,738.88	-18.40	-18.32	-2.93	0.09	0.09	0.00	
2017	1	97	278	2,016.87	-19.99	-19.96	-1.48	0.34	0.04	-33.20	
2482	1	76	465	2,481.79	-18.76	-18.96	6.86	0.17	0.15	-4.39	
2955	1	85	473	2,954.68	-16.75	-17.23	17.00	0.08	-0.06	1.88	
3421	1	104	466	3,420.59	-17.23	-17.96	25.80	0.08	0.00	4.06	
3894	1	96	473	3,893.53	-18.42	-19.35	33.08	0.09	-0.08	-1.84	
4080	1	88	186	4,079.52	-18.43	-19.42	35.18	0.07	-0.05	-4.14	
4141	1	48	61	4,140.52	-18.08	-19.09	35.86	0.95	0.49	-64.75	
4172	3	24	31	4,171.50	-17.24	-18.26	36.33	6.19	5.81	-79.68	
4204	5	1	32	4,203.44	-15.26	-16.29	36.66	7.31	5.94	-69.69	
4235	7	359	31	4,234.28	-12.13	-13.15	36.66	7.77	7.74	1,154.52	
4266	10	360	31	4,264.93	-7.52	-8.55	36.62	10.00	10.00	1.61	
4297	12	2	31	4,295.37	-1.69	-2.71	36.71	5.02	4.84	#####	
4329	12	4	32	4,326.68	4.91	3.88	37.06	2.31	1.88	6.56	
4360	14	3	31	4,356.89	11.88	10.84	37.46	5.25	5.16	-4.19	
4391	17	1	31	4,386.81	19.98	18.93	37.70	8.84	8.71	-5.81	
4422	19	360	31	4,416.31	29.47	28.43	37.73	8.82	8.71	1,156.77	
4454	22	359	32	4,446.27	40.70	39.66	37.58	8.46	8.44	-1.56	
4484	24	359	30	4,473.86	52.48	51.46	37.37	8.33	8.33	0.00	
4516	27	358	32	4,502.75	66.21	65.20	37.03	6.65	6.56	-2.50	
4547	29	358	31	4,530.22	80.54	79.55	36.49	7.17	7.10	-2.26	
4578	31	357	31	4,557.12	95.90	94.94	35.72	7.18	7.10	-2.26	
4609	34	357	31	4,583.26	112.49	111.56	34.76	10.33	10.32	-0.65	
4641	37	358	32	4,609.29	131.04	130.15	33.86	9.32	9.06	3.75	
4672	39	359	31	4,633.76	150.05	149.18	33.30	6.14	5.81	3.23	
4703	40	360	31	4,657.78	169.63	168.77	33.08	3.42	2.58	3.55	
4734	42	1	31	4,681.32	189.79	188.94	33.24	6.85	6.45	#####	
4766	45	1	32	4,704.60	211.74	210.88	33.66	10.63	10.63	0.63	
4797	49	0	31	4,725.82	234.33	233.47	33.97	11.76	11.61	-2.58	
4827	51	359	30	4,745.24	257.18	256.33	33.89	7.63	7.00	1,196.00	
4858	52	358	31	4,764.69	281.29	280.47	33.32	4.01	2.90	-3.55	
4888	52	358	30	4,783.34	304.74	303.95	32.50	0.62	-0.33	-0.67	
4920	51	357	32	4,803.39	329.61	328.86	31.45	2.38	-1.88	-1.87	
4951	50	357	31	4,823.11	353.46	352.75	30.22	2.87	-2.58	-1.61	
4981	49	356	30	4,842.50	376.26	375.61	28.83	2.79	-2.33	-2.00	
5013	49	356	32	4,863.43	400.36	399.76	27.18	1.63	-1.56	-0.62	
5045	49	355	32	4,884.44	424.36	423.82	25.35	1.68	0.31	-2.19	
5076	52	356	31	4,904.16	448.14	447.66	23.43	9.69	9.68	0.65	
5108	56	356	32	4,922.94	473.90	473.48	21.47	12.83	12.81	0.94	
5139	59	357	31	4,939.60	499.93	499.57	19.79	9.43	9.03	3.23	
5170	61	358	31	4,955.14	526.68	526.36	18.57	7.27	6.45	3.87	
5202	63	359	32	4,970.11	554.91	554.63	17.73	7.68	7.50	1.88	
5233	65	358	31	4,983.63	582.76	582.51	16.91	5.75	5.48	-1.94	
5265	67	358	32	4,996.54	611.98	611.77	15.96	7.55	7.50	0.94	
5295	70	359	30	5,007.42	639.90	639.72	15.23	9.09	9.00	1.33	
5326	74	359	31	5,017.04	669.33	669.18	14.72	11.76	11.61	1.94	
5358	77	1	32	5,025.03	700.30	700.16	14.75	12.42	11.56	#####	
5389	80	2	31	5,031.02	730.71	730.56	15.52	10.22	9.35	4.19	
5421	83	3	32	5,035.73	762.36	762.18	16.82	7.96	7.81	1.56	
5452	85	3	31	5,038.94	793.18	792.98	18.35	8.22	8.06	1.61	

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0											
Measured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate		Dogleg Severity	Build Up %/100 ft	Walk/ %/100 ft	
						N + / S -	E + / W -				
0	0	0	0	0.00	0.00			<< TIE-IN POINT >>			
5518	90	3	66	5,041.59	859.09	858.82	21.63	7.31	7.27	-0.76	
5550	91	3	32	5,041.36	891.09	890.79	23.08	1.87	1.88	0.00	
5595	91	2	45	5,040.73	936.08	935.74	24.96	0.99	0.44	-0.89	
5640	91	2	45	5,039.95	981.07	980.71	26.50	1.20	0.44	-1.11	
5686	91	2	46	5,038.95	1,027.06	1,026.68	27.82	0.69	0.65	-0.22	
5731	92	1	45	5,037.65	1,072.04	1,071.65	29.00	1.20	1.11	-0.44	
5776	92	1	45	5,036.16	1,117.01	1,116.61	30.06	0.22	0.00	-0.22	
5822	90	360	46	5,035.31	1,162.99	1,162.60	30.46	5.07	-3.70	779.13	
5867	91	360	45	5,034.69	1,207.97	1,207.59	30.26	2.68	2.67	0.22	
5912	92	360	45	5,033.35	1,252.92	1,252.57	30.07	1.35	1.33	-0.22	
5957	91	360	45	5,032.02	1,297.88	1,297.55	29.91	1.41	-1.33	0.44	
6003	92	360	46	5,030.73	1,343.84	1,343.53	29.75	0.97	0.87	-0.43	
6048	92	1	45	5,029.32	1,388.80	1,388.51	29.90	2.22	0.00	-797.78	
6093	92	1	45	5,027.83	1,433.77	1,433.48	30.42	0.50	0.44	-0.22	
6139	91	2	46	5,026.46	1,479.75	1,479.45	31.34	2.72	-1.30	2.39	
6185	91	3	46	5,025.62	1,525.74	1,525.40	33.22	3.21	-1.52	2.83	
6228	89	4	43	5,025.62	1,568.71	1,568.31	35.96	4.44	-3.26	3.02	
6273	90	4	45	5,025.85	1,613.66	1,613.19	39.30	1.79	1.78	-0.22	
6319	91	4	46	5,025.29	1,659.61	1,659.06	42.62	2.62	2.61	-0.22	
6364	92	5	45	5,024.04	1,704.52	1,703.89	46.35	3.18	1.33	2.89	
6409	92	5	45	5,022.70	1,749.40	1,748.67	50.58	0.89	-0.89	0.00	
6455	93	5	46	5,021.02	1,795.28	1,794.45	54.79	2.69	2.61	-0.65	
6500	92	5	45	5,019.25	1,840.15	1,839.23	58.86	2.05	-2.00	0.44	
6546	91	5	46	5,018.13	1,886.04	1,885.02	63.11	1.74	-1.74	0.00	
6593	90	6	47	5,017.92	1,932.93	1,931.79	67.66	3.36	-3.19	1.06	
6637	88	5	44	5,019.03	1,976.82	1,975.59	71.76	4.78	-4.32	-2.05	
6683	87	5	46	5,021.16	2,022.69	2,021.37	75.68	1.09	-1.09	0.00	
6728	88	5	45	5,023.08	2,067.58	2,066.17	79.48	2.01	2.00	-0.22	
6773	89	5	45	5,024.46	2,112.49	2,110.98	83.29	1.13	1.11	0.22	
6818	89	3	45	5,025.52	2,157.44	2,155.87	86.31	4.71	0.67	-4.67	
6863	88	2	45	5,026.77	2,202.41	2,200.81	88.15	2.68	-1.78	-2.00	
6908	88	1	45	5,028.42	2,247.38	2,245.77	89.21	2.48	-0.44	-2.44	
6956	88	0	48	5,030.14	2,295.34	2,293.73	89.71	1.04	0.62	-0.83	
7003	89	1	47	5,031.45	2,342.32	2,340.71	90.08	1.29	1.28	0.21	
7051	90	0	48	5,032.21	2,390.30	2,388.71	90.42	1.72	1.67	-0.42	
7098	90	0	47	5,032.29	2,437.29	2,435.71	90.70	1.72	1.70	0.21	
7147	91	0	49	5,031.82	2,486.27	2,484.70	91.05	1.02	1.02	0.00	
7194	92	1	47	5,030.88	2,533.26	2,531.69	91.42	1.50	1.49	0.21	
7242	92	0	48	5,029.45	2,581.22	2,579.67	91.75	0.93	0.83	-0.42	
7289	90	0	47	5,028.67	2,628.20	2,626.66	92.04	4.05	-4.04	0.21	
7337	90	1	48	5,028.80	2,676.20	2,674.65	92.79	2.18	-0.62	2.08	
7384	91	2	47	5,028.68	2,723.20	2,721.63	94.06	2.02	1.91	0.64	
7432	92	2	48	5,027.71	2,771.19	2,769.61	95.40	2.33	2.29	-0.42	
7478	89	2	46	5,027.43	2,817.18	2,815.58	96.77	5.93	-5.87	0.87	
7526	89	3	48	5,028.48	2,865.17	2,863.52	98.82	2.52	-1.04	2.29	
7573	89	3	47	5,029.46	2,912.14	2,910.45	101.28	1.28	1.28	0.00	
7621	90	3	48	5,029.80	2,960.13	2,958.39	103.62	2.24	2.08	-0.83	
7668	91	3	47	5,029.43	3,007.12	3,005.34	105.75	1.49	1.49	0.00	
7716	92	3	48	5,028.38	3,055.10	3,053.28	107.89	1.89	1.88	-0.21	
7763	90	2	47	5,027.81	3,102.09	3,100.24	109.69	4.44	-4.26	-1.28	
7811	90	2	48	5,027.76	3,150.09	3,148.22	111.12	1.68	1.46	-0.83	
7858	91	1	47	5,027.27	3,197.09	3,195.20	112.27	0.95	0.85	-0.43	
7922	90	1	64	5,027.05	3,261.08	3,259.19	113.55	1.93	-1.88	-0.47	
7953	91	1	31	5,027.00	3,292.08	3,290.18	114.04	3.29	3.23	-0.65	
8001	92	1	48	5,026.12	3,340.07	3,338.17	114.83	1.98	1.88	0.63	
8048	92	0	47	5,024.89	3,387.05	3,385.15	115.45	1.49	0.00	-1.49	
8096	91	360	48	5,023.96	3,435.02	3,433.14	115.45	2.36	-1.67	748.33	

