

DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name		Target Direction		Slot	N / S	E / W	Hole Size	Calculation by		Date
Minet 2629 1-33H		181.47		Coordinate						12/27/12
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 >>		
250	0	218	250	250.00	0.53	-0.52	-0.40	0.12	0.12	87.08
515	1	218	265	514.99	2.02	-1.98	-1.53	0.08	0.08	0.00
761	1	218	246	760.98	4.27	-4.19	-3.24	0.12	0.12	0.00
1006	1	218	245	1,005.95	7.38	-7.23	-5.59	0.08	0.08	0.00
1253	1	218	247	1,252.91	10.85	-10.65	-8.23	0.00	0.00	0.00
1645	1	218	392	1,644.84	16.65	-16.33	-12.62	0.03	0.03	0.00
1834	1	213	189	1,833.80	19.80	-19.42	-14.81	0.07	0.05	-2.38
2024	1	186	190	2,023.78	22.64	-22.24	-16.02	0.35	-0.26	-14.47
2210	0	184	186	2,209.77	24.43	-24.02	-16.17	0.16	-0.16	-1.02
2398	0	221	188	2,397.77	25.59	-25.17	-16.65	0.14	0.00	19.84
2587	0	231	189	2,586.76	26.52	-26.08	-17.60	0.04	0.00	5.29
2865	0	193	278	2,864.75	28.10	-27.64	-18.56	0.10	0.00	-13.88
3147	1	168	282	3,146.75	30.27	-29.80	-18.52	0.08	0.04	-8.65
3430	0	202	283	3,429.74	32.39	-31.92	-18.64	0.10	-0.04	12.12
3714	0	247	284	3,713.73	33.72	-33.22	-19.94	0.11	0.00	15.85
3997	0	290	283	3,996.73	33.81	-33.26	-21.78	0.10	0.00	15.05
4089	1	278	92	4,088.72	33.67	-33.10	-22.48	0.15	0.11	-13.48
4118	1	272	29	4,117.72	33.65	-33.08	-22.73	0.17	0.00	-18.97
4150	1	207	32	4,149.72	33.95	-33.37	-23.02	3.41	2.19	-204.06
4181	3	200	31	4,180.69	35.09	-34.50	-23.47	6.82	6.77	-22.26
4212	6	195	31	4,211.60	37.41	-36.80	-24.15	7.53	7.42	-17.10
4243	8	187	31	4,242.38	41.01	-40.38	-24.81	7.90	7.42	-23.55
4274	10	182	31	4,272.99	45.90	-45.26	-25.18	8.18	7.74	-16.77
4306	13	178	32	4,304.35	52.24	-51.61	-25.16	7.62	7.19	-12.81
4338	15	176	32	4,335.45	59.74	-59.13	-24.77	6.39	6.25	-5.63
4369	16	178	31	4,365.35	67.90	-67.29	-24.38	4.83	4.52	6.45
4401	18	176	32	4,395.94	77.28	-76.69	-23.92	7.09	6.88	-5.94
4432	21	175	31	4,425.13	87.65	-87.09	-23.15	9.42	9.35	-3.23
4464	24	175	32	4,454.72	99.74	-99.21	-22.09	7.83	7.81	-1.56
4495	26	174	31	4,482.91	112.55	-112.05	-20.86	6.50	6.45	-1.94
4526	28	174	31	4,510.61	126.34	-125.89	-19.46	6.78	6.77	0.32
4558	30	175	32	4,538.67	141.62	-141.21	-18.02	6.62	6.56	1.87
4589	32	175	31	4,565.32	157.35	-156.98	-16.67	5.84	5.81	1.29
4621	33	176	32	4,592.37	174.36	-174.02	-15.36	4.49	4.38	1.87
4652	36	176	31	4,617.97	191.75	-191.45	-14.09	8.39	8.39	-0.32
4684	38	176	32	4,643.61	210.81	-210.55	-12.79	7.27	7.19	1.87
4716	40	177	32	4,668.52	230.83	-230.60	-11.58	6.28	6.25	0.94
4748	42	178	32	4,692.72	251.70	-251.51	-10.53	6.16	5.94	2.50
4777	44	179	29	4,713.96	271.40	-271.24	-9.86	8.01	7.59	3.79
4808	47	180	31	4,735.79	293.39	-293.25	-9.52	8.38	8.06	3.23
4840	50	179	32	4,757.17	317.17	-317.04	-9.25	9.76	9.69	-1.56
4872	51	179	32	4,777.64	341.75	-341.64	-8.75	4.24	4.06	-1.56
4903	51	179	31	4,797.21	365.76	-365.67	-8.21	0.60	-0.32	0.65
4935	50	179	32	4,817.54	390.44	-390.37	-7.62	1.72	-1.56	-0.94
4967	50	178	32	4,838.11	414.92	-414.88	-6.92	2.01	-1.87	-0.94
4997	49	177	30	4,857.67	437.61	-437.60	-6.03	3.50	-2.67	-3.00
5028	48	177	31	4,878.28	460.71	-460.74	-4.88	3.62	-3.55	-0.97
5058	48	177	30	4,898.43	482.87	-482.93	-3.71	0.00	0.00	0.00
5089	50	178	31	4,918.87	506.11	-506.21	-2.64	6.36	6.13	2.26
5119	52	179	30	4,937.74	529.39	-529.51	-1.93	9.12	8.67	3.67
5150	55	180	31	4,956.16	554.30	-554.44	-1.56	8.27	8.06	2.26
5180	57	180	30	4,972.89	579.19	-579.34	-1.50	8.88	8.67	2.33
5211	60	181	31	4,988.93	605.71	-605.87	-1.71	9.46	9.35	1.61
5241	63	181	30	5,003.08	632.16	-632.31	-2.20	10.54	10.33	2.33
5271	67	182	30	5,015.61	659.41	-659.55	-2.89	12.67	12.67	0.33
5302	71	182	31	5,026.69	688.36	-688.49	-3.67	11.94	11.94	0.32
5332	74	181	30	5,035.79	716.94	-717.06	-4.39	9.71	9.67	-1.00

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MINIMUM CURVATURE METHOD

Well Name		Target Direction		Slot Coordinate		N / S		E / W		Hole Size		Calculation by		Date	
Minet 2629 1-33H		181.47												12/27/12	
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 >>			
5363	77	182	31	5,043.71	746.91	-747.02	-5.15	9.08	9.03	0.97					
5393	80	182	30	5,049.79	776.28	-776.38	-6.00	11.34	11.33	0.33					
5424	83	181	31	5,054.32	806.94	-807.04	-6.72	10.56	10.32	-2.26					
5449	87	181	25	5,056.52	831.84	-831.93	-7.11	14.02	14.00	-0.80					
5547	92	182	98	5,057.89	929.80	-929.87	-9.25	5.18	5.10	0.92					
5577	92	182	30	5,056.94	959.78	-959.84	-10.24	1.49	0.67	1.33					
5607	92	182	30	5,055.97	989.77	-989.81	-11.26	1.05	-0.33	-1.00					
5638	92	182	31	5,055.05	1,020.75	-1,020.78	-12.21	0.72	-0.65	-0.32					
5668	91	182	30	5,054.37	1,050.75	-1,050.76	-13.12	2.03	-2.00	0.33					
5698	91	181	30	5,053.80	1,080.74	-1,080.74	-13.93	1.79	0.67	-1.67					
5728	93	182	30	5,052.80	1,110.72	-1,110.71	-14.85	5.55	4.67	3.00					
5758	93	182	30	5,051.31	1,140.68	-1,140.65	-15.97	1.70	1.67	-0.33					
5788	93	182	30	5,049.66	1,170.64	-1,170.59	-16.92	2.02	0.33	-2.00					
5819	93	182	31	5,047.88	1,201.58	-1,201.52	-17.89	2.04	0.65	1.94					
5849	92	182	30	5,046.36	1,231.54	-1,231.46	-18.96	3.35	-3.33	-0.33					
5878	92	182	29	5,045.17	1,260.52	-1,260.42	-20.02	0.77	-0.34	0.69					
5909	93	182	31	5,043.82	1,291.49	-1,291.37	-21.21	1.29	1.29	0.00					
5939	92	183	30	5,042.49	1,321.45	-1,321.31	-22.44	1.41	-1.00	1.00					
5969	93	183	30	5,041.02	1,351.41	-1,351.24	-23.90	3.33	2.67	2.00					
5999	92	183	30	5,039.61	1,381.36	-1,381.16	-25.58	3.40	-3.33	0.67					
6029	91	184	30	5,038.69	1,411.33	-1,411.09	-27.38	3.16	-3.00	1.00					
6058	89	184	29	5,038.59	1,440.30	-1,440.02	-29.40	8.07	-7.59	2.76					
6088	89	184	30	5,039.22	1,470.25	-1,469.93	-31.68	2.03	-2.00	-0.33					
6118	88	184	30	5,040.11	1,500.21	-1,499.83	-33.87	1.49	-1.33	-0.67					
6149	88	185	31	5,041.14	1,531.15	-1,530.73	-36.20	1.29	0.00	1.29					
6179	88	184	30	5,042.10	1,561.10	-1,560.62	-38.52	0.47	0.33	-0.33					
6209	88	184	30	5,043.07	1,591.05	-1,590.52	-40.75	1.05	-0.33	-1.00					
6239	88	184	30	5,044.09	1,621.00	-1,620.43	-42.86	0.47	-0.33	-0.33					
6270	88	185	31	5,045.15	1,651.94	-1,651.32	-45.24	2.60	0.32	2.58					
6300	88	184	30	5,046.06	1,681.88	-1,681.21	-47.62	1.94	1.00	-1.67					
6330	88	184	30	5,046.93	1,711.83	-1,711.12	-49.87	0.33	-0.33	0.00					
6361	88	184	31	5,047.82	1,742.78	-1,742.02	-52.19	0.32	0.32	0.00					
6391	88	184	30	5,048.66	1,772.74	-1,771.93	-54.26	2.33	0.00	-2.33					
6421	88	183	30	5,049.52	1,802.71	-1,801.87	-56.06	1.05	-0.33	-1.00					
6451	89	183	30	5,050.33	1,832.69	-1,831.81	-57.79	1.00	1.00	0.00					
6481	87	182	30	5,051.41	1,862.66	-1,861.75	-59.25	5.47	-4.33	-3.33					
6512	87	182	31	5,052.95	1,893.62	-1,892.69	-60.41	1.37	-0.97	-0.97					
6542	88	182	30	5,054.34	1,923.58	-1,922.64	-61.33	2.87	2.33	-1.67					
6573	88	180	31	5,055.42	1,954.56	-1,953.62	-61.79	4.62	1.94	-4.19					
6603	88	181	30	5,056.28	1,984.54	-1,983.61	-62.00	1.37	0.33	1.33					
6634	89	180	31	5,056.90	2,015.53	-2,014.60	-62.24	3.06	2.90	-0.97					
6664	89	180	30	5,057.24	2,045.52	-2,044.60	-62.35	0.75	0.33	-0.67					
6694	90	180	30	5,057.51	2,075.51	-2,074.60	-62.37	0.75	0.67	-0.33					
6725	90	180	31	5,057.75	2,106.50	-2,105.59	-62.45	1.02	-0.32	0.97					
6755	90	180	30	5,057.96	2,136.49	-2,135.59	-62.50	1.49	0.67	-1.33					
6785	90	180	30	5,058.12	2,166.48	-2,165.59	-62.45	0.00	0.00	0.00					
6815	90	180	30	5,058.22	2,196.47	-2,195.59	-62.40	0.67	0.67	0.00					
6845	90	180	30	5,058.17	2,226.46	-2,225.59	-62.45	1.89	1.33	1.33					
6876	90	180	31	5,057.98	2,257.45	-2,256.59	-62.53	1.02	0.32	-0.97					
6906	90	181	30	5,057.90	2,287.45	-2,286.59	-62.66	2.36	-1.67	1.67					
6938	90	181	32	5,057.87	2,319.44	-2,318.59	-63.00	1.13	0.94	0.62					
6970	91	181	32	5,057.68	2,351.44	-2,350.59	-63.45	1.13	0.94	0.63					
7002	91	181	32	5,057.34	2,383.44	-2,382.58	-64.00	0.88	0.63	0.62					
7034	91	181	32	5,056.95	2,415.43	-2,414.57	-64.51	1.25	0.00	-1.25					
7065	90	180	31	5,056.71	2,446.43	-2,445.57	-64.81	1.88	-1.61	-0.97					
7095	91	180	30	5,056.52	2,476.42	-2,475.57	-64.81	2.85	1.00	-2.67					
7127	90	179	32	5,056.30	2,508.40	-2,507.57	-64.47	1.40	-0.63	-1.25					

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Minet 2629 1-33H		181.47		Coordinate										12/27/12	
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 >>				
7159	91	179	32	5,056.08	2,540.37	-2,539.56	-64.00	0.70	0.63	-0.31					
7190	91	179	31	5,055.72	2,571.34	-2,570.56	-63.48	1.02	0.97	-0.32					
7222	91	179	32	5,055.33	2,603.30	-2,602.55	-62.81	1.40	-0.63	-1.25					
7254	91	179	32	5,054.97	2,635.26	-2,634.53	-62.00	0.44	0.31	-0.31					
7286	91	178	32	5,054.61	2,667.21	-2,666.52	-61.11	0.70	-0.31	-0.62					
7318	90	178	32	5,054.44	2,699.15	-2,698.50	-60.08	2.10	-1.87	-0.94					
7349	90	178	31	5,054.55	2,730.10	-2,729.48	-58.99	1.29	-1.29	0.00					
7381	90	178	32	5,054.55	2,762.04	-2,761.46	-57.82	2.58	2.50	-0.62					
7412	91	179	31	5,054.09	2,792.98	-2,792.44	-56.82	3.68	2.90	2.26					
7443	92	179	31	5,053.22	2,823.93	-2,823.42	-56.20	2.97	1.94	2.26					
7475	93	179	32	5,051.99	2,855.89	-2,855.40	-55.81	1.98	1.87	0.63					
7506	92	180	31	5,050.89	2,886.85	-2,886.38	-55.54	2.97	-2.90	0.65					
7538	92	180	32	5,049.99	2,918.82	-2,918.36	-55.40	0.94	0.00	0.94					
7570	92	180	32	5,049.02	2,950.80	-2,950.35	-55.40	1.13	0.94	0.62					
7601	90	179	31	5,048.45	2,981.77	-2,981.34	-55.21	6.20	-5.48	-2.90					
7633	90	180	32	5,048.47	3,013.75	-3,013.34	-54.93	2.44	-1.56	1.88					
7665	90	179	32	5,048.56	3,045.74	-3,045.34	-54.71	1.56	0.94	-1.25					
7697	90	179	32	5,048.59	3,077.72	-3,077.34	-54.37	0.31	-0.31	0.00					
7729	90	180	32	5,048.59	3,109.70	-3,109.33	-54.09	0.88	0.62	0.62					
7760	90	179	31	5,048.51	3,140.68	-3,140.33	-53.82	0.72	0.32	-0.65					
7791	90	181	31	5,048.37	3,171.67	-3,171.33	-54.04	6.46	0.32	6.45					
7823	90	183	32	5,048.34	3,203.67	-3,203.31	-55.21	4.65	-1.56	4.38					
7855	89	183	32	5,048.57	3,235.66	-3,235.27	-56.77	1.25	-1.25	0.00					
7887	89	183	32	5,048.90	3,267.65	-3,267.23	-58.34	0.00	0.00	0.00					
7918	90	183	31	5,049.12	3,298.64	-3,298.19	-59.80	1.44	1.29	-0.65					
7950	90	183	32	5,049.23	3,330.63	-3,330.16	-61.25	0.00	0.00	0.00					
7996	89	183	46	5,049.59	3,376.63	-3,376.11	-63.29	1.11	-1.09	-0.22					
8045	90	182	49	5,050.10	3,425.62	-3,425.07	-65.22	1.10	0.41	-1.02					
8092	90	182	47	5,050.43	3,472.61	-3,472.04	-66.94	0.60	0.43	0.43					
8140	89	182	48	5,050.85	3,520.61	-3,520.00	-68.74	0.86	-0.83	-0.21					
8187	89	181	47	5,051.55	3,567.60	-3,566.98	-70.18	1.62	-0.64	-1.49					
8235	89	182	48	5,052.22	3,615.60	-3,614.95	-71.64	1.68	0.83	1.46					
8282	89	182	47	5,052.79	3,662.59	-3,661.91	-73.40	0.48	-0.43	0.21					
8331	90	182	49	5,053.35	3,711.58	-3,710.88	-75.07	1.19	0.61	-1.02					
8377	90	183	46	5,053.51	3,757.58	-3,756.84	-76.92	2.92	1.30	2.61					
8426	91	183	49	5,053.25	3,806.56	-3,805.78	-79.35	0.84	0.82	-0.20					
8472	91	183	46	5,052.77	3,852.55	-3,851.73	-81.52	0.61	0.43	-0.43					
8521	91	182	49	5,052.09	3,901.54	-3,900.68	-83.57	0.91	0.41	-0.82					
8567	90	182	46	5,051.93	3,947.54	-3,946.65	-85.22	3.11	-3.04	-0.65					
8615	90	182	48	5,052.22	3,995.53	-3,994.62	-86.89	0.75	0.62	0.42					
8662	90	182	47	5,052.30	4,042.53	-4,041.58	-88.70	0.60	0.43	0.43					
8710	90	182	48	5,052.22	4,090.53	-4,089.55	-90.46	0.93	0.42	-0.83					
8757	91	182	47	5,051.77	4,137.52	-4,136.52	-92.06	1.50	1.49	0.21					
8805	91	182	48	5,050.84	4,185.51	-4,184.48	-93.86	1.04	0.83	0.63					
8834	91	182	29	5,050.26	4,214.50	-4,213.46	-94.87	2.31	-1.03	-2.07					
8880	91	181	46	5,049.34	4,260.49	-4,259.43	-96.11	0.92	0.65	-0.65					
8929	89	182	49	5,049.13	4,309.49	-4,308.40	-97.69	4.66	-4.29	1.84					
8975	89	182	46	5,049.97	4,355.47	-4,354.35	-99.58	1.11	-1.09	0.22					
9024	88	183	49	5,051.42	4,404.44	-4,403.29	-101.72	1.68	-1.63	0.41					
9071	88	183	47	5,053.19	4,451.40	-4,450.20	-103.89	0.30	-0.21	0.21					
9119	88	183	48	5,054.94	4,499.36	-4,498.12	-106.06	0.59	0.42	-0.42					
9166	88	183	47	5,056.42	4,546.33	-4,545.04	-108.32	1.36	0.85	1.06					
9214	89	182	48	5,057.72	4,594.30	-4,592.97	-110.54	1.47	0.21	-1.46					
9261	89	182	47	5,058.78	4,641.28	-4,639.92	-112.46	0.88	0.85	0.21					
9309	89	183	48	5,059.62	4,689.27	-4,687.87	-114.51	0.47	0.42	0.21					
9355	89	182	46	5,060.26	4,735.26	-4,733.83	-116.36	0.97	0.43	-0.87					
9404	90	183	49	5,060.65	4,784.25	-4,782.78	-118.45	1.76	1.02	1.43					

