

Helmer Directional Drilling Inc.

S.G. Interests Federal 11-90-9 Well #3 Gunnison County, CO Rev. #2		Page: 1 Minimum of Curvature Slot Location: 1473433.82', 2444447.10' Plane of Vertical Section: 140.34°
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Measured Depth Feet	BORE Inc Degrees	HOLE Direction Degrees	True Vertical Depth Feet	RECTANGULAR COORDINATES		LAMBERT COORDINATES		Vertical Section Feet	CLOSURES		Dogleg Severity Deg/100'
				North(-South) Feet	East(-West) Feet	Y Feet	X Feet		Distance Feet	Direction Deg	
1000.00	0.00	0.00	1000.00	0.00	0.00	1473433.82	2444447.10	0.00	0.00	0.00	0.00
Start Build											
1100.00	1.50	14.54	1099.99	1.27	0.33	1473435.09	2444447.43	-0.77	1.31	14.54	1.50
1200.00	3.00	14.54	1199.91	5.07	1.31	1473438.89	2444448.41	-3.06	5.23	14.54	1.50
1300.00	4.50	14.54	1299.69	11.40	2.96	1473445.22	2444450.05	-6.89	11.77	14.54	1.50
1400.00	6.00	14.54	1399.27	20.25	5.25	1473454.07	2444452.35	-12.24	20.92	14.54	1.50
1500.00	7.50	14.54	1498.57	31.63	8.20	1473465.45	2444455.30	-19.12	32.68	14.54	1.50
1517.44	7.76	14.54	1515.85	33.87	8.79	1473467.69	2444455.88	-20.47	34.99	14.54	1.50
End of Build											
2017.44	7.76	14.54	2011.27	99.24	25.74	1473533.06	2444472.84	-59.98	102.52	14.54	0.00
2517.44	7.76	14.54	2506.69	164.61	42.69	1473598.43	2444489.79	-99.48	170.05	14.54	0.00
3017.44	7.76	14.54	3002.11	229.97	59.65	1473663.79	2444506.74	-138.99	237.58	14.54	0.00
3517.44	7.76	14.54	3497.53	295.34	76.60	1473729.16	2444523.70	-178.49	305.11	14.54	0.00
4017.44	7.76	14.54	3992.95	360.70	93.55	1473794.52	2444540.65	-218.00	372.64	14.54	0.00
4517.43	7.76	14.54	4488.37	426.07	110.51	1473859.89	2444557.60	-257.51	440.17	14.54	0.00
5017.43	7.76	14.54	4983.79	491.44	127.46	1473925.26	2444574.56	-297.01	507.70	14.54	0.00
5517.43	7.76	14.54	5479.20	556.80	144.41	1473990.62	2444591.51	-336.52	575.23	14.54	0.00
6017.43	7.76	14.54	5974.62	622.17	161.37	1474055.99	2444608.47	-376.02	642.76	14.54	0.00
6517.43	7.76	14.54	6470.04	687.54	178.32	1474121.36	2444625.42	-415.53	710.29	14.54	0.00
7017.43	7.76	14.54	6965.46	752.90	195.27	1474186.72	2444642.37	-455.03	777.81	14.54	0.00
7517.43	7.76	14.54	7460.88	818.27	212.23	1474252.09	2444659.33	-494.54	845.34	14.54	0.00
8001.20	7.76	14.54	7940.21	881.51	228.63	1474315.33	2444675.73	-532.76	910.68	14.54	0.00
Start Drop											
8101.20	6.76	14.54	8039.41	893.75	231.81	1474327.57	2444678.90	-540.16	923.32	14.54	1.00
8201.20	5.76	14.54	8138.81	904.31	234.54	1474338.13	2444681.64	-546.54	934.23	14.54	1.00
8301.20	4.76	14.54	8238.39	913.18	236.85	1474347.00	2444683.94	-551.90	943.40	14.54	1.00
8401.20	3.76	14.54	8338.11	920.38	238.71	1474354.20	2444685.81	-556.25	950.83	14.54	1.00
8501.20	2.76	14.54	8437.95	925.89	240.14	1474359.71	2444687.24	-559.58	956.52	14.54	1.00

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Measured Depth Feet	BORE Inc Degrees	HOLE Direction Degrees	True Vertical Depth Feet	RECTANGULAR COORDINATES		LAMBERT COORDINATES		Vertical Section Feet	CLOSURES		Dogleg Severity Deg/100'
				North(-South) Feet	East(-West) Feet	Y Feet	X Feet		Distance Feet	Direction Deg	
8601.20	1.76	14.54	8537.87	929.71	241.13	1474363.53	2444688.23	-561.89	960.47	14.54	1.00
8701.20	0.76	14.54	8637.84	931.84	241.68	1474365.66	2444688.78	-563.18	962.67	14.54	1.00
8774.00	0.00	14.54	8710.64	932.31	241.81	1474366.13	2444688.90	-563.46	963.15	14.54	1.05
KOP-2 / Vertical											
8804.00	3.00	148.44	8740.63	931.64	242.22	1474365.46	2444689.31	-562.68	962.61	14.57	10.00
8834.00	6.00	148.44	8770.53	929.63	243.45	1474363.45	2444690.55	-560.35	960.98	14.67	10.00
8864.00	9.00	148.44	8800.27	926.30	245.50	1474360.12	2444692.60	-556.48	958.28	14.84	10.00
8894.00	12.00	148.44	8829.76	921.64	248.36	1474355.46	2444695.46	-551.06	954.52	15.08	10.00
8924.00	15.00	148.44	8858.93	915.67	252.02	1474349.49	2444699.12	-544.13	949.72	15.39	10.00
8954.00	18.00	148.44	8887.69	908.41	256.48	1474342.23	2444703.58	-535.70	943.93	15.77	10.00
8984.00	21.00	148.44	8915.97	899.88	261.72	1474333.70	2444708.82	-525.78	937.17	16.22	10.00
9014.00	24.00	148.44	8943.68	890.10	267.73	1474323.92	2444714.83	-514.42	929.49	16.74	10.00
9044.00	27.00	148.44	8970.76	879.10	274.49	1474312.92	2444721.59	-501.63	920.95	17.34	10.00
9074.00	30.00	148.44	8997.12	866.90	281.98	1474300.72	2444729.08	-487.46	911.61	18.02	10.00
9104.00	33.00	148.44	9022.70	853.54	290.19	1474287.36	2444737.28	-471.95	901.52	18.78	10.00
9134.00	36.00	148.44	9047.42	839.07	299.08	1474272.89	2444746.18	-455.12	890.78	19.62	10.00
9164.00	39.00	148.44	9071.21	823.51	308.64	1474257.33	2444755.73	-437.05	879.44	20.55	10.00
9194.00	42.00	148.44	9094.02	806.91	318.83	1474240.73	2444765.93	-417.76	867.61	21.56	10.00
9224.00	45.00	148.44	9115.78	789.31	329.64	1474223.13	2444776.74	-397.32	855.38	22.67	10.00
9254.00	48.00	148.44	9136.43	770.77	341.03	1474204.59	2444788.13	-375.77	842.85	23.87	10.00
9284.00	51.00	148.44	9155.91	751.34	352.97	1474185.16	2444800.06	-353.19	830.12	25.16	10.00
9314.00	54.00	148.44	9174.17	731.06	365.42	1474164.88	2444812.52	-329.63	817.30	26.56	10.00
9344.00	57.00	148.44	9191.16	709.99	378.36	1474143.81	2444825.46	-305.16	804.52	28.05	10.00
9374.00	60.00	148.44	9206.84	688.20	391.75	1474122.02	2444838.84	-279.84	791.89	29.65	10.00
9404.00	63.00	148.44	9221.15	665.74	405.54	1474099.56	2444852.64	-253.74	779.53	31.35	10.00
9434.00	66.00	148.44	9234.06	642.67	419.71	1474076.49	2444866.81	-226.93	767.58	33.15	10.00
9464.00	69.00	148.44	9245.54	619.05	434.22	1474052.87	2444881.32	-199.50	756.16	35.05	10.00

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Measured Depth Feet	B O R E Inc Degrees	H O L E Direction Degrees	True Vertical Depth Feet	RECTANGULAR COORDINATES		L A M B E R T COORDINATES		Vertical Section Feet	C L O S U R E S		Dogleg Severity Deg/100'
				North(-South) Feet	East(-West) Feet	Y Feet	X Feet		Distance Feet	Direction Deg	
9494.00	72.00	148.44	9255.56	594.96	449.02	1474028.78	2444896.12	-171.50	745.38	37.04	10.00
9524.00	75.00	148.44	9264.08	570.45	464.07	1474004.27	2444911.17	-143.03	735.38	39.13	10.00
9554.00	78.00	148.44	9271.08	545.60	479.34	1473979.42	2444926.44	-114.15	726.25	41.30	10.00
9584.00	81.00	148.44	9276.54	520.47	494.77	1473954.29	2444941.87	-84.95	718.11	43.55	10.00
9614.00	84.00	148.44	9280.46	495.13	510.34	1473928.95	2444957.44	-55.51	711.05	45.87	10.00
9644.00	87.00	148.44	9282.81	469.65	525.99	1473903.47	2444973.09	-25.90	705.15	48.24	10.00
9674.00	90.00	148.44	9283.60	444.09	541.69	1473877.91	2444988.78	3.79	700.46	50.65	10.00
Landing / Adjust Angle											
9774.00	93.00	148.44	9280.98	358.92	594.00	1473792.74	2445041.10	102.75	694.02	58.86	3.00
9874.00	96.00	148.44	9273.14	273.98	646.17	1473707.80	2445093.27	201.43	701.85	67.02	3.00
9892.11	96.54	148.44	9271.16	258.64	655.59	1473692.46	2445102.69	219.26	704.76	68.47	3.00
Lock-In											
10392.11	96.54	148.44	9214.18	-164.65	915.54	1473269.17	2445362.64	711.04	930.23	100.20	0.00
10892.11	96.54	148.44	9157.21	-587.95	1175.50	1472845.87	2445622.60	1202.83	1314.33	116.57	0.00
11392.11	96.54	148.44	9100.23	-1011.24	1435.45	1472422.58	2445882.55	1694.61	1755.88	125.16	0.00
11892.11	96.54	148.44	9043.26	-1434.53	1695.41	1471999.29	2446142.50	2186.40	2220.87	130.24	0.00
12392.11	96.54	148.44	8986.29	-1857.83	1955.36	1471575.99	2446402.46	2678.19	2697.21	133.53	0.00
12892.11	96.54	148.44	8929.31	-2281.12	2215.31	1471152.70	2446662.41	3169.97	3179.80	135.84	0.00
13392.11	96.54	148.44	8872.34	-2704.41	2475.27	1470729.41	2446922.37	3661.76	3666.17	137.53	0.00
13892.11	96.54	148.44	8815.36	-3127.71	2735.22	1470306.11	2447182.32	4153.55	4155.00	138.83	0.00
14392.11	96.54	148.44	8758.39	-3551.00	2995.18	1469882.82	2447442.27	4645.33	4645.50	139.85	0.00
14676.12	96.54	148.44	8726.02	-3791.44	3142.83	1469642.38	2447589.93	4924.68	4924.68	140.34	0.00
Target											

Final Station Closure Distance: 4924.68' Direction: 140.34°