



Job Number: SVGJ-121153

Company: PDC

Lease/Well: Buderus 12-23

Location: Weld County, CO

Rig Name: MS Wireline

RKB: 0'

G.L. or M.S.L.: GL

State/Country: Colorado/USA

Declination: 8.59°

Grid: East To True North

File name: F:\SURVEY\2012SU~1\PDC\GJ\BUDERUS\12-23.SVY

Date/Time: 26-Nov-12 / 15:22

Curve Name: Surface - 7000' M.D. (Rate Gyro)

# WINSERVE SURVEY CALCULATIONS

*Minimum Curvature Method*

*Vertical Section Plane .00*

*Vertical Section Referenced to Wellhead*

*Rectangular Coordinates Referenced to Wellhead*

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.13	26.77	100.00	.10	.05	.10	.11	26.77	.13
200.00	.13	41.69	200.00	.29	.18	.29	.34	31.73	.03
300.00	.22	23.60	300.00	.55	.33	.55	.64	31.06	.10
400.00	.19	13.30	400.00	.89	.44	.89	.99	26.69	.05
500.00	.16	27.10	500.00	1.17	.55	1.17	1.29	25.03	.05
600.00	.20	27.39	600.00	1.45	.69	1.45	1.61	25.47	.04
700.00	.27	28.24	700.00	1.81	.88	1.81	2.02	25.96	.07
800.00	.25	356.41	800.00	2.24	.98	2.24	2.44	23.65	.14
900.00	.26	344.05	899.99	2.67	.90	2.67	2.82	18.68	.06

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1000.00	.23	351.21	999.99	3.09	.81	3.09	3.20	14.71	.04
1100.00	.24	6.17	1099.99	3.50	.80	3.50	3.59	12.93	.06
1200.00	.28	354.48	1199.99	3.95	.80	3.95	4.03	11.48	.07
1300.00	.30	5.21	1299.99	4.45	.80	4.45	4.52	10.22	.06
1400.00	.31	.80	1399.99	4.98	.83	4.98	5.05	9.45	.03
1500.00	.32	353.22	1499.99	5.53	.80	5.53	5.59	8.24	.04
1600.00	.33	341.93	1599.99	6.08	.68	6.08	6.12	6.36	.06
1700.00	.39	337.26	1699.98	6.67	.46	6.67	6.69	3.92	.07
1800.00	.78	341.48	1799.98	7.63	.11	7.63	7.63	.82	.39
1900.00	1.03	358.67	1899.97	9.17	-.13	9.17	9.17	359.20	.37
2000.00	1.15	7.79	1999.95	11.07	-.01	11.07	11.07	359.94	.21
2100.00	1.16	21.39	2099.93	13.00	.49	13.00	13.01	2.17	.27
2200.00	1.21	38.92	2199.91	14.77	1.53	14.77	14.85	5.90	.36
2300.00	1.43	63.55	2299.88	16.14	3.31	16.14	16.48	11.57	.60
2400.00	1.51	67.89	2399.85	17.20	5.64	17.20	18.10	18.17	.14
2500.00	1.51	72.62	2499.81	18.09	8.12	18.09	19.83	24.18	.12
2600.00	1.43	75.82	2599.78	18.78	10.59	18.78	21.56	29.41	.11
2700.00	1.40	78.18	2699.75	19.34	12.99	19.34	23.30	33.90	.07
2800.00	1.25	83.62	2799.72	19.71	15.27	19.71	24.94	37.77	.20
2900.00	1.19	91.54	2899.70	19.81	17.40	19.81	26.36	41.30	.18
3000.00	1.19	92.18	2999.68	19.74	19.47	19.74	27.73	44.61	.01
3100.00	1.12	93.78	3099.66	19.63	21.48	19.63	29.10	47.58	.08
3200.00	.98	96.16	3199.64	19.48	23.31	19.48	30.38	50.12	.15
3300.00	.93	104.17	3299.63	19.19	24.95	19.19	31.47	52.44	.14
3400.00	.86	109.30	3399.62	18.74	26.44	18.74	32.41	54.67	.11
3500.00	.91	111.82	3499.60	18.20	27.89	18.20	33.30	56.87	.06
3600.00	.69	114.47	3599.59	17.65	29.17	17.65	34.10	58.82	.22
3700.00	.65	111.37	3699.59	17.20	30.25	17.20	34.80	60.38	.05
3800.00	.63	112.13	3799.58	16.78	31.29	16.78	35.50	61.79	.02

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
3900.00	.60	120.73	3899.58	16.31	32.25	16.31	36.14	63.17	.10
4000.00	.85	140.27	3999.57	15.47	33.17	15.47	36.60	65.00	.35
4100.00	1.29	147.77	4099.55	13.95	34.24	13.95	36.98	67.84	.46
4200.00	1.61	148.40	4199.52	11.80	35.58	11.80	37.49	71.65	.32
4300.00	1.74	151.02	4299.48	9.27	37.05	9.27	38.20	75.95	.15
4400.00	1.64	154.59	4399.43	6.65	38.40	6.65	38.97	80.17	.15
4500.00	1.55	159.70	4499.39	4.09	39.49	4.09	39.70	84.08	.17
4600.00	1.49	161.02	4599.36	1.59	40.38	1.59	40.41	87.74	.07
4700.00	1.49	160.34	4699.32	-.86	41.24	-.86	41.25	91.19	.02
4800.00	1.50	161.23	4799.29	-3.32	42.10	-3.32	42.23	94.51	.03
4900.00	1.32	152.04	4899.26	-5.58	43.06	-5.58	43.42	97.38	.29
5000.00	1.00	152.14	4999.24	-7.37	44.01	-7.37	44.62	99.51	.32
5100.00	.98	155.24	5099.22	-8.92	44.77	-8.92	45.65	101.26	.06
5200.00	.85	154.03	5199.21	-10.36	45.45	-10.36	46.62	102.84	.13
5300.00	.68	146.73	5299.20	-11.52	46.10	-11.52	47.52	104.03	.20
5400.00	.62	153.68	5399.20	-12.50	46.67	-12.50	48.32	105.00	.10
5500.00	.43	181.99	5499.19	-13.36	46.90	-13.36	48.76	105.91	.32
5600.00	.51	196.48	5599.19	-14.17	46.76	-14.17	48.86	106.85	.14
5700.00	.39	179.04	5699.19	-14.93	46.64	-14.93	48.97	107.75	.18
5800.00	.38	171.27	5799.18	-15.60	46.69	-15.60	49.23	108.47	.05
5900.00	.71	210.04	5899.18	-16.46	46.43	-16.46	49.27	109.52	.48
6000.00	.96	211.09	5999.17	-17.72	45.69	-17.72	49.01	111.20	.25
6100.00	1.27	203.36	6099.15	-19.45	44.82	-19.45	48.86	113.46	.34
6200.00	2.20	204.96	6199.10	-22.21	43.57	-22.21	48.90	117.01	.93
6300.00	3.05	201.48	6299.00	-26.43	41.79	-26.43	49.44	122.31	.86
6400.00	1.75	192.95	6398.91	-30.39	40.47	-30.39	50.61	126.90	1.34
6500.00	.99	176.25	6498.88	-32.74	40.18	-32.74	51.83	129.17	.85
6600.00	.54	149.73	6598.87	-34.01	40.48	-34.01	52.87	130.04	.56
6700.00	.67	117.70	6698.86	-34.69	41.23	-34.69	53.88	130.07	.36

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
6800.00	.67	75.69	6798.86	-34.82	42.32	-34.82	54.80	129.45	.48
6900.00	.75	70.50	6898.85	-34.45	43.50	-34.45	55.49	128.38	.10
Last Survey Depth Recorded									
7000.00	.59	71.14	6998.84	-34.07	44.60	-34.07	56.13	127.37	.16