



Job Number: SVGJ-141369 / SVGJ-141375

Company: PDC

Lease/Well: Bettale 34-1

Location: Weld County, CO

Rig Name: MS Energy Wireline

RKB: 0'

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

State/Country: Colorado/USA

Declination: 8.27°

Grid: East To True North

File name: Y:\WINSER~1\2014SU~1\PDC\GJ\BETTALE\341.SVY

Date/Time: 05-Dec-14 / 13:14

Curve Name: Surface - 6776' M.D. (Composite)

### MS Survey

#### WINSERVE SURVEY CALCULATIONS

*Minimum Curvature Method*

*Vertical Section Plane .00*

*Vertical Section Referenced to Wellhead*

*Rectangular Coordinates Referenced to Wellhead*

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>True Vertical Depth</i>	<i>N-S FT</i>	<i>E-W FT</i>	<i>Vertical Section FT</i>	<i>C L O S U R E</i>		<i>Dogleg Severity Deg/100</i>
							<i>Distance FT</i>	<i>Direction Deg</i>	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.30	270.27	100.00	.00	-.26	.00	.26	270.27	.30
200.00	.25	278.17	200.00	.03	-.74	.03	.74	272.59	.06
300.00	.16	230.61	300.00	-.02	-1.06	-.02	1.06	268.70	.18
400.00	.22	359.91	400.00	.08	-1.17	.08	1.17	273.87	.34
500.00	.42	335.51	500.00	.60	-1.32	.60	1.46	294.55	.24
600.00	.30	311.42	599.99	1.11	-1.67	1.11	2.01	303.61	.19
700.00	.19	332.96	699.99	1.43	-1.94	1.43	2.41	306.39	.14
800.00	.17	319.93	799.99	1.69	-2.11	1.69	2.71	308.69	.05
900.00	.16	340.79	899.99	1.94	-2.26	1.94	2.97	310.68	.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	.21	5.65	999.99	2.25	-2.28	2.25	3.21	314.61	.09
1100.00	.43	341.93	1099.99	2.79	-2.38	2.79	3.67	319.53	.25
1200.00	.53	339.99	1199.99	3.58	-2.66	3.58	4.46	323.45	.10
1300.00	.63	343.91	1299.98	4.55	-2.97	4.55	5.43	326.87	.11
1400.00	.70	349.61	1399.97	5.68	-3.23	5.68	6.53	330.35	.10
1500.00	.72	358.78	1499.97	6.90	-3.35	6.90	7.68	334.09	.12
1600.00	.67	28.01	1599.96	8.05	-3.09	8.05	8.62	338.98	.35
1700.00	.69	55.00	1699.95	8.91	-2.32	8.91	9.21	345.38	.32
1800.00	.79	68.57	1799.95	9.51	-1.19	9.51	9.58	352.87	.20
1900.00	1.03	87.11	1899.93	9.80	.35	9.80	9.81	2.04	.38
2000.00	1.09	78.24	1999.92	10.04	2.18	10.04	10.28	12.24	.17
2100.00	1.08	92.59	2099.90	10.20	4.05	10.20	10.97	21.67	.27
2200.00	1.01	110.79	2199.88	9.84	5.82	9.84	11.43	30.59	.34
2300.00	1.05	123.57	2299.87	9.02	7.40	9.02	11.67	39.38	.23
2400.00	.90	132.25	2399.85	7.99	8.75	7.99	11.85	47.61	.21
2500.00	.83	134.36	2499.84	6.95	9.85	6.95	12.05	54.78	.08
2600.00	.74	139.61	2599.83	5.95	10.78	5.95	12.32	61.10	.12
2700.00	.46	146.30	2699.82	5.13	11.43	5.13	12.52	65.83	.29
2800.00	.68	149.07	2799.82	4.28	11.95	4.28	12.70	70.28	.22
2900.00	.65	143.87	2899.81	3.32	12.59	3.32	13.02	75.24	.07
3000.00	.60	148.51	2999.81	2.41	13.20	2.41	13.42	79.64	.07
3100.00	.50	158.25	3099.80	1.56	13.64	1.56	13.72	83.47	.14
3200.00	.76	173.39	3199.80	.50	13.87	.50	13.88	87.95	.31
3300.00	1.05	197.27	3299.78	-1.04	13.68	-1.04	13.72	94.34	.47
3400.00	1.32	207.31	3399.76	-2.94	12.88	-2.94	13.21	102.84	.34
3500.00	1.36	208.66	3499.74	-5.00	11.78	-5.00	12.80	113.00	.05
3600.00	1.33	218.31	3599.71	-6.95	10.49	-6.95	12.59	123.53	.23
3700.00	1.26	221.97	3699.68	-8.68	9.04	-8.68	12.53	133.85	.11
3800.00	1.38	220.68	3799.66	-10.41	7.52	-10.41	12.84	144.17	.12

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	1.22	234.95	3899.63	-11.94	5.86	-11.94	13.30	153.85	.36
4000.00	1.38	248.42	3999.60	-12.99	3.87	-12.99	13.55	163.41	.34
4100.00	1.43	267.26	4099.58	-13.49	1.50	-13.49	13.58	173.65	.46
4200.00	1.35	277.81	4199.55	-13.39	-.91	-13.39	13.42	183.89	.27
4300.00	1.62	291.51	4299.51	-12.71	-3.39	-12.71	13.16	194.94	.44
4400.00	1.54	293.40	4399.47	-11.66	-5.94	-11.66	13.09	207.00	.10
4500.00	1.11	301.84	4499.45	-10.62	-8.00	-10.62	13.29	216.99	.47
4600.00	.98	303.90	4599.43	-9.63	-9.53	-9.63	13.55	224.70	.14
4700.00	.90	304.86	4699.42	-8.70	-10.88	-8.70	13.94	231.35	.08
4800.00	.83	315.16	4799.41	-7.74	-12.04	-7.74	14.31	237.26	.17
4900.00	.88	328.00	4899.40	-6.58	-12.96	-6.58	14.53	243.09	.20
5000.00	.71	343.92	4999.39	-5.33	-13.54	-5.33	14.55	248.51	.28
5100.00	.87	328.76	5099.38	-4.08	-14.10	-4.08	14.68	253.84	.26
5200.00	.79	328.56	5199.37	-2.85	-14.85	-2.85	15.12	259.15	.08
5300.00	1.05	345.89	5299.35	-1.37	-15.44	-1.37	15.50	264.93	.38
5400.00	.98	9.95	5399.34	.36	-15.51	.36	15.52	271.33	.43
Tied Rate Gyro Surveys Into Previous Rate Gyro Surveys									
5500.00	1.09	14.44	5499.32	2.12	-15.13	2.12	15.28	277.99	.14
5600.00	.91	26.02	5599.31	3.76	-14.54	3.76	15.02	284.49	.27
5700.00	.57	17.82	5699.30	4.95	-14.04	4.95	14.89	289.40	.36
5800.00	.45	15.72	5799.29	5.80	-13.78	5.80	14.95	292.81	.12
5900.00	.09	62.05	5899.29	6.21	-13.61	6.21	14.96	294.54	.39
6000.00	.15	258.70	5999.29	6.22	-13.67	6.22	15.02	294.48	.24
6100.00	.31	202.31	6099.29	5.95	-13.90	5.95	15.12	293.17	.26
6200.00	.42	180.82	6199.29	5.33	-14.01	5.33	14.99	290.84	.17
6300.00	.58	96.88	6299.29	4.90	-13.51	4.90	14.37	289.95	.68
6400.00	.52	122.87	6399.28	4.60	-12.62	4.60	13.44	290.01	.25

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	
6500.00	.85	125.92	6499.28	3.91	-11.64	3.91	12.28	288.59	.33
6600.00	1.33	130.70	6599.26	2.72	-10.16	2.72	10.52	285.00	.49
6700.00	.87	130.70	6699.24	1.47	-8.71	1.47	8.83	279.59	.46
<b>Last Survey Depth Recorded</b>									
6776.00	.61	130.28	6775.23	.83	-7.96	.83	8.00	275.98	.34