

PathFinder Survey Report

30-045-33332

Company: Energen Resources Corporation
Field: Bloomfield
Site: Bloomfield 10 #1S
Well: Bloomfield 10 #1S
Wellpath: Upper Lateral

Date: 2/1/2006
Co-ordinate(NE) Reference: Well: Bloomfield 10 #1S, True North
Vertical (TVD) Reference: Est RKB+GL 6205.0
Section (VS) Reference: Well (0.00N,0.00E,202.72Azi)
Survey Calculation Method: Minimum Curvature
Db: Sybase

Time: 13:40:01
Page: 1

Field: Bloomfield
 San Juan County, NM

Map System: US State Plane Coordinate System 1983
Geo Datum: GRS 1980
Sys Datum: Mean Sea Level

Map Zone: New Mexico, Western Zone
Coordinate System: Well Centre
Geomagnetic Model: igr2005

Site: Bloomfield 10 #1S
 Section 10, T32-N, R6-W
 San Juan County, NM

Surf: 1485/N 1715/W
 BHL: 1537/S 744/E

Site Position:
From: Map
Position Uncertainty: 0.00 ft
Ground Level: 6190.00 ft

Northing: 2182148.72 ft
Easting: 2835526.43 ft

Latitude: 36 59 46.000 N
Longitude: 107 26 54.000 W
North Reference: True
Grid Convergence: 0.23 deg

Well: Bloomfield 10 #1S

Slot Name:

Well Position: +N/-S 0.00 ft Northing: 2182148.72 ft Latitude: 36 59 46.000 N
 +E/-W 0.00 ft Easting: 2835526.43 ft Longitude: 107 26 54.000 W
Position Uncertainty: 0.00 ft

Wellpath: Upper Lateral *BHL in Ongard comments*
Current Datum: Est RKB+GL Height 6205.00 ft
Magnetic Data: 12/1/2005
Field Strength: 51540 nT
Vertical Section: Depth From (TVD) +N/-S
 ft ft
 0.00 0.00 0.00 202.72

Drilled From: Lower Lateral
Tie-on Depth: 2958.51 ft
Above System Datum: Mean Sea Level
Declination: 10.46 deg
Mag Dip Angle: 63.88 deg
+E/-W Direction
 ft deg

Survey: Pathfinder MWD Surveys

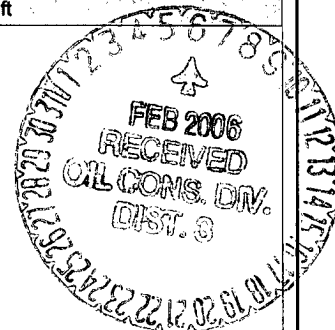
Start Date: 2/1/2006

Company: PathFinder Energy Services
Tool:

Engineer: Roger Ferderwisch
Tied-to: From Surface

Survey: Pathfinder MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.53	166.11	499.99	-2.24	0.56	1.86	0.11	0.11	0.00	
1000.00	0.18	171.65	999.98	-5.27	1.22	4.39	0.07	-0.07	1.11	
1480.00	0.26	139.13	1479.98	-6.84	2.05	5.52	0.03	0.02	-6.77	
1626.00	0.88	292.50	1625.97	-6.66	1.23	5.67	0.77	0.42	105.05	
1658.00	1.23	264.82	1657.97	-6.59	0.66	5.83	1.90	1.09	-86.50	
1689.00	1.49	248.03	1688.96	-6.78	-0.05	6.27	1.53	0.84	-54.16	
1720.00	1.93	241.17	1719.95	-7.18	-0.88	6.96	1.56	1.42	-22.13	
1752.00	2.55	230.63	1751.92	-7.89	-1.90	8.01	2.32	1.94	-32.94	
1782.00	3.08	222.80	1781.89	-8.90	-2.96	9.36	2.18	1.77	-26.10	
1813.00	3.87	218.15	1812.83	-10.34	-4.18	11.15	2.70	2.55	-15.00	
1844.00	4.57	213.22	1843.74	-12.19	-5.50	13.37	2.54	2.26	-15.90	
1876.00	5.72	211.29	1875.62	-14.62	-7.03	16.20	3.63	3.59	-6.03	
1907.00	7.12	207.86	1906.42	-17.64	-8.73	19.64	4.68	4.52	-11.06	
1939.00	8.79	205.75	1938.11	-21.60	-10.71	24.06	5.30	5.22	-6.59	
1970.00	10.29	204.44	1968.68	-26.25	-12.89	29.19	4.89	4.84	-4.23	
2001.00	11.87	202.32	1999.10	-31.72	-15.25	35.15	5.26	5.10	-6.84	
2032.00	13.81	200.04	2029.33	-38.15	-17.73	42.03	6.47	6.26	-7.35	
2063.00	17.15	197.76	2059.20	-45.98	-20.39	50.29	10.95	10.77	-7.35	
2095.00	20.75	197.05	2089.46	-55.90	-23.49	60.63	11.27	11.25	-2.22	
2125.00	24.18	197.58	2117.18	-66.84	-26.91	72.04	11.45	11.43	1.77	
2156.00	28.14	199.60	2145.00	-79.78	-31.28	85.67	13.09	12.77	6.52	
2187.00	31.57	200.83	2171.88	-94.26	-36.62	101.08	11.24	11.06	3.97	
2232.00	33.94	201.62	2209.72	-116.95	-45.43	125.42	5.35	5.27	1.76	



PathFinder

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 Well: Bloomfield 10 #1S
 Wellpath: Upper Lateral

Date: 2/1/2006 Time: 13:40:01 Page: 2
 Co-ordinate(NE) Reference: Well: Bloomfield 10 #1S, True North
 Vertical (TVD) Reference: Est RKB+GL 6205.0
 Section (VS) Reference: Well (0.00N,0.00E,202.72Azi)
 Survey Calculation Method: Minimum Curvature Db: Sybase

Survey: Pathfinder MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
2264.00	34.65	202.32	2236.16	-133.67	-52.18	143.45	2.54	2.22	2.19	
2293.00	36.32	203.38	2259.77	-149.18	-58.72	160.28	6.14	5.76	3.66	
2325.00	37.99	204.35	2285.28	-166.85	-66.54	179.61	5.53	5.22	3.03	
2356.00	39.75	205.05	2309.41	-184.52	-74.67	199.05	5.85	5.68	2.26	
2386.00	41.50	205.49	2332.18	-202.19	-83.01	218.56	5.91	5.83	1.47	
2418.00	42.56	205.67	2355.95	-221.51	-92.26	239.96	3.33	3.31	0.56	
2449.00	43.97	204.96	2378.52	-240.72	-101.35	261.18	4.81	4.55	-2.29	
2480.00	43.97	205.40	2400.83	-260.19	-110.50	282.68	0.99	0.00	1.42	
2512.00	45.64	205.14	2423.54	-280.59	-120.13	305.21	5.25	5.22	-0.81	
2543.00	47.66	204.79	2444.81	-301.02	-129.64	327.74	6.57	6.52	-1.13	
2575.00	49.24	204.87	2466.04	-322.76	-139.70	351.67	4.94	4.94	0.25	
2607.00	50.74	204.70	2486.61	-345.01	-149.97	376.16	4.71	4.69	-0.53	
2638.00	51.62	204.52	2506.04	-366.97	-160.03	400.30	2.87	2.84	-0.58	
2669.00	50.83	204.26	2525.46	-388.98	-170.01	424.46	2.63	-2.55	-0.84	
2701.00	51.62	203.91	2545.50	-411.75	-180.19	449.40	2.61	2.47	-1.09	
2732.00	52.67	204.17	2564.52	-434.11	-190.16	473.87	3.45	3.39	0.84	
2763.00	53.90	204.08	2583.05	-456.78	-200.32	498.71	3.97	3.97	-0.29	
2795.00	55.13	204.00	2601.63	-480.58	-210.93	524.76	3.85	3.84	-0.25	
2826.00	56.19	203.29	2619.12	-504.03	-221.20	550.35	3.91	3.42	-2.29	
2858.00	56.98	203.03	2636.74	-528.59	-231.70	577.06	2.56	2.47	-0.81	
2889.00	58.12	203.38	2653.37	-552.63	-242.01	603.22	3.80	3.68	1.13	
2920.00	59.71	202.94	2669.38	-577.04	-252.45	629.76	5.27	5.13	-1.42	
2952.00	61.99	201.53	2684.96	-602.91	-263.02	657.71	8.10	7.12	-4.41	
2958.51	63.99	201.88	2687.92	-608.29	-265.17	663.51	31.02	30.66	5.35	Tie-in KOP @ 2959' MD/268
2993.00	74.57	203.56	2700.11	-638.00	-277.62	695.72	31.02	30.69	4.88	
3025.00	83.10	202.59	2706.30	-666.86	-289.91	727.08	26.82	26.66	-3.03	
3057.00	86.35	203.03	2709.24	-696.22	-302.26	758.94	10.25	10.16	1.37	
3085.42	87.44	202.48	2710.78	-722.39	-313.24	787.32	4.30	3.84	-1.94	End of Curve @ 3085' MD/2
3089.00	87.58	202.41	2710.94	-725.70	-314.61	790.90	4.30	3.84	-1.94	
3090.54	87.58	202.37	2711.00	-727.12	-315.19	792.43	2.75	0.00	-2.75	Top of Upper Coal @ 3025'
3121.00	87.58	201.53	2712.29	-755.35	-326.57	822.87	2.75	0.00	-2.75	
3152.00	88.11	202.15	2713.45	-784.10	-338.09	853.84	2.63	1.71	2.00	
3184.00	88.46	203.82	2714.41	-813.55	-350.58	885.82	5.33	1.09	5.22	
3216.00	87.85	203.91	2715.44	-842.80	-363.52	917.80	1.93	-1.91	0.28	
3247.00	88.64	203.73	2716.39	-871.14	-376.03	948.78	2.61	2.55	-0.58	
3279.00	90.57	202.94	2716.61	-900.52	-388.71	980.78	6.52	6.03	-2.47	
3311.00	89.87	202.50	2716.49	-930.04	-401.07	1012.78	2.58	-2.19	-1.37	
3342.00	89.87	202.41	2716.56	-958.69	-412.91	1043.77	0.29	0.00	-0.29	
3374.00	88.99	201.45	2716.88	-988.37	-424.86	1075.77	4.07	-2.75	-3.00	
3406.00	88.55	200.74	2717.56	-1018.22	-436.37	1107.75	2.61	-1.37	-2.22	
3438.00	88.90	199.95	2718.27	-1048.22	-447.50	1139.71	2.70	1.09	-2.47	
3469.00	90.04	199.16	2718.56	-1077.43	-457.87	1170.66	4.47	3.68	-2.55	
3501.00	90.13	199.60	2718.51	-1107.61	-468.49	1202.61	1.40	0.28	1.37	
3533.00	89.60	200.13	2718.59	-1137.71	-479.36	1234.57	2.34	-1.66	1.66	
3565.00	89.43	200.13	2718.86	-1167.75	-490.38	1266.54	0.53	-0.53	0.00	
3597.00	88.83	200.83	2719.35	-1197.73	-501.57	1298.51	2.88	-1.87	2.19	
3629.00	88.99	201.62	2719.95	-1227.55	-513.15	1330.49	2.52	0.50	2.47	
3661.00	90.04	202.41	2720.23	-1257.21	-525.15	1362.49	4.11	3.28	2.47	
3693.00	91.89	203.47	2719.69	-1286.68	-537.62	1394.48	6.66	5.78	3.31	
3725.00	91.71	204.96	2718.68	-1315.85	-550.74	1426.45	4.69	-0.56	4.66	
3756.00	91.01	205.58	2717.95	-1343.87	-563.97	1457.41	3.02	-2.26	2.00	
3788.00	89.78	205.49	2717.73	-1372.75	-577.76	1489.37	3.85	-3.84	-0.28	
3820.00	89.25	205.40	2718.00	-1401.64	-591.51	1521.33	1.68	-1.66	-0.28	

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Company: Energen Resources Corporation	Date: 2/1/2006	Time: 13:40:01	Page: 3
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Site: Bloomfield 10 #1S	Vertical (TVD) Reference:	Est RKB+GL 6205.0	
Well: Bloomfield 10 #1S	Section (VS) Reference:	Well (0.00N,0.00E,202.72Azi)	
Wellpath: Upper Lateral	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Survey: Pathfinder MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
3852.00	88.55	204.61	2718.61	-1430.64	-605.03	1553.30	3.30	-2.19	-2.47	
3884.00	88.11	203.03	2719.54	-1459.90	-617.95	1585.28	5.12	-1.37	-4.94	
3916.00	88.64	201.97	2720.45	-1489.45	-630.19	1617.27	3.70	1.66	-3.31	
3948.00	89.16	201.97	2721.06	-1519.12	-642.16	1649.26	1.62	1.62	0.00	
3979.00	89.43	202.32	2721.45	-1547.83	-653.84	1680.26	1.43	0.87	1.13	
4011.00	89.96	203.20	2721.62	-1577.34	-666.22	1712.25	3.21	1.66	2.75	
4043.00	90.48	203.73	2721.49	-1606.69	-678.96	1744.25	2.32	1.62	1.66	
4075.00	89.78	202.94	2721.42	-1636.07	-691.64	1776.25	3.30	-2.19	-2.47	
4106.00	89.96	202.15	2721.49	-1664.70	-703.53	1807.25	2.61	0.58	-2.55	
4138.00	90.31	202.24	2721.42	-1694.33	-715.61	1839.25	1.13	1.09	0.28	
4170.00	89.69	202.68	2721.42	-1723.90	-727.84	1871.25	2.38	-1.94	1.37	
4202.00	88.99	202.85	2721.78	-1753.41	-740.22	1903.24	2.25	-2.19	0.53	
4234.00	89.08	202.68	2722.32	-1782.91	-752.60	1935.24	0.60	0.28	-0.53	
4265.00	89.60	202.68	2722.68	-1811.51	-764.55	1966.24	1.68	1.68	0.00	
4297.00	89.78	202.85	2722.85	-1841.02	-776.94	1998.24	0.77	0.56	0.53	
4329.00	89.16	203.12	2723.15	-1870.48	-789.43	2030.24	2.11	-1.94	0.84	
4361.00	89.52	204.35	2723.52	-1899.77	-802.31	2062.23	4.00	1.12	3.84	
4393.00	89.69	204.61	2723.74	-1928.89	-815.57	2094.21	0.97	0.53	0.81	
4425.00	89.96	204.26	2723.84	-1958.02	-828.81	2126.20	1.38	0.84	-1.09	
4456.00	89.96	203.82	2723.86	-1986.34	-841.44	2157.19	1.42	0.00	-1.42	
4488.00	90.22	203.64	2723.81	-2015.63	-854.31	2189.18	0.99	0.81	-0.56	
4520.00	90.31	204.17	2723.66	-2044.88	-867.28	2221.18	1.68	0.28	1.66	
4552.00	89.87	203.20	2723.61	-2074.19	-880.13	2253.17	3.33	-1.37	-3.03	
4584.00	90.31	203.03	2723.56	-2103.62	-892.70	2285.17	1.47	1.37	-0.53	
4615.00	90.92	204.17	2723.23	-2132.02	-905.11	2316.16	4.17	1.97	3.68	
4647.00	91.54	205.66	2722.54	-2161.04	-918.58	2348.13	5.04	1.94	4.66	
4679.00	91.80	206.46	2721.61	-2189.77	-932.64	2380.06	2.63	0.81	2.50	
4755.00	91.80	206.46	2719.22	-2257.78	-966.48	2455.87	0.00	0.00	0.00	

Annotation

MD ft	TVD ft	
2958.51	2687.92	Tie-in KOP @ 2959' MD/2688' TVD
3090.54	2711.00	Top of Upper Coal @ 3025' MD/2711' TVD
3085.42	2710.78	End of Curve @ 3085' MD/2718' TVD