

Energen Resources Corporation

PATHFINDER

Field: Carracas Canyon
 Site: Carracas 23A-10
 Well: Carracas 23A-10
 Wellpath: Original Hole
 Survey: Pathfinder MWD

Surface 1350/S 1975/E
 Start Lateral 164/S 1400/E m 04128 TVD 3764
 end Lateral 191/S 158/E 4826 3779

30-039-27549

COMPANY DETAILS

Energen Resources Corporation
 2198 Bloomfield Hwy
 Farmington, NM 87401

Calculation Method: Minimum Curvature
 Error System: Systematic Ellipse
 Scan Method: Closest Approach 3D
 Error Surface: Elliptical Conic
 Warning Method: Error Ratio

FIELD DETAILS

Carracas Canyon
 Rio Arriba County, NM

Geodetic System: US State Plane Coordinate System 1927
 Ellipsoid: NAD27 (Clarke 1866)
 Zone: New Mexico, Western Zone
 Magnetic Model: igr2005

System Datum: Mean Sea Level
 Local North: Grid North

SITE DETAILS

Carracas 23A-10
 S-23, T-32N, R-5W

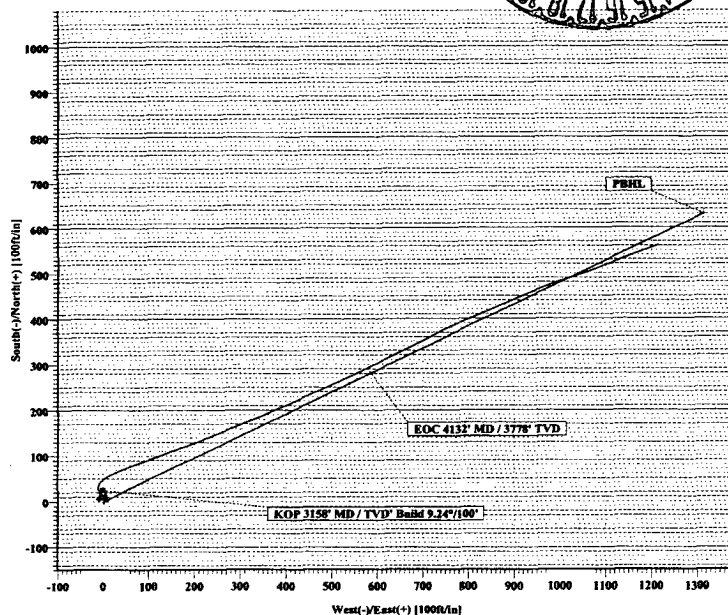
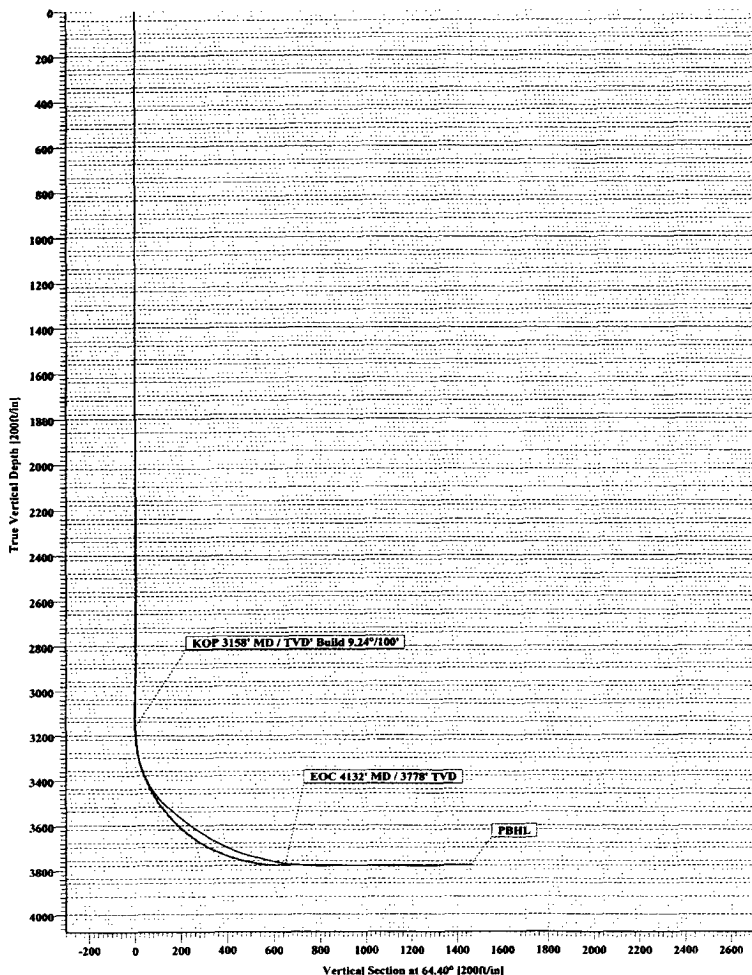
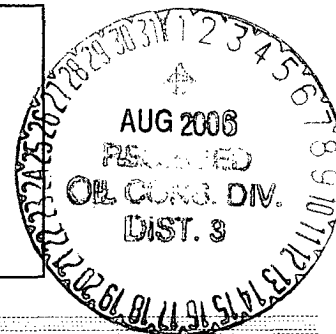
Ground Level: 7167.00
 Positional Uncertainty: 0.00
 Convergence: 0.30

WELL DETAILS

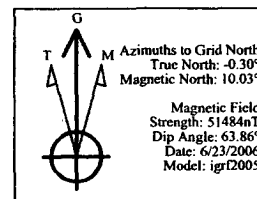
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
Carracas 23A-10	0.00	0.00	2169906.86	647459.99	36°57'44.000N	107°19'43.000W	N/A

Survey: Pathfinder MWD (Carracas 23A-10/Original Hole)

No	MD	Inc	Az	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
55	4525.00	89.16	66.94	3779.92	456.90	935.17	4.64	28.12	1040.79
56	4556.00	89.87	68.96	3780.18	468.54	963.90	6.91	70.64	1071.72
57	4588.00	89.87	70.81	3780.26	479.54	993.95	5.78	90.00	1103.58
58	4619.00	89.52	71.42	3780.42	489.57	1023.28	2.27	119.85	1134.36
59	4650.00	89.16	71.16	3780.78	499.52	1052.64	1.43	-144.17	1165.14
60	4681.00	88.55	69.58	3781.40	509.93	1081.83	5.46	-111.13	1195.96
61	4713.00	90.57	68.61	3781.64	521.35	1111.72	7.00	-25.65	1227.85
62	4745.00	91.63	69.40	3781.03	532.81	1141.59	4.13	36.68	1259.74
63	4756.00	91.36	69.31	3780.74	536.69	1151.88	2.59	-161.57	1270.70
64	4826.00	91.36	69.31	3779.08	561.41	1217.35	0.00	0.00	1340.42



ANNOTATIONS			
No.	TVD	MD	Annotation
1	3157.35	3158.00	KOP 3158' MD / TVD Build 9.34°/100'
2	3770.05	4131.89	EOC 4132' MD / 3778' TVD



Pathfinder Energy

Survey Report

Company: Energen Resources Corporation		Date: 7/26/2006		Time: 15:41:55		Page: 1	
Field: Carracas Canyon		Co-ordinate(NE) Reference: Well: Carracas 23A-10, Grid North					
Site: Carracas 23A-10		Vertical (TVD) Reference: SITE 7167.0					
Well: Carracas 23A-10		Section (VS) Reference: Well (0.00N,0.00E,64.40Azi)					
Wellpath: Original Hole		Survey Calculation Method: Minimum Curvature				Db: Sybase	

Field: Carracas Canyon Rio Arriba County, NM	
Map System: US State Plane Coordinate System 1927	Map Zone: New Mexico, Western Zone
Geo Datum: NAD27 (Clarke 1866)	Coordinate System: Well Centre
Sys Datum: Mean Sea Level	Geomagnetic Model: igrf2005

Site: Carracas 23A-10	
S-23, T-32N, R-5W	
Site Position:	Northing: ft
From: Lease Line	Easting: ft
Position Uncertainty: 0.00 ft	Latitude:
Ground Level: 7167.00 ft	Longitude:
	North Reference: Grid
	Grid Convergence: 0.30 deg

Well: Carracas 23A-10		Slot Name:	
Well Position: +N-S 0.00 ft	Northing: 2169906.86 ft	Latitude: 36 57 44.000 N	
+E-W 0.00 ft	Easting: 647459.99 ft	Longitude: 107 19 43.000 W	
Position Uncertainty: 0.00 ft			

Wellpath: Original Hole		Drilled From: Surface	
Current Datum: SITE	Height: 7167.00 ft	Tie-on Depth: 0.00 ft	
Magnetic Data: 6/23/2006		Above System Datum: Mean Sea Level	
Field Strength: 51484 nT		Declination: 10.34 deg	
Vertical Section: Depth From (TVD)	+N-S	Mag Dip Angle: 63.86 deg	
ft	ft	+E-W	Direction
		ft	deg
0.00	0.00	0.00	64.40

Survey: Pathfinder MWD		Start Date: 7/11/2006	
Company: Pathfinder Energy		Engineer: Midwellplan	
Tool:		Tied-to: From Surface	

Survey: Pathfinder MWD										
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	
439.00	0.18	105.79	439.00	-0.19	0.66	0.52	0.04	0.04	0.00	
876.00	0.26	173.73	876.00	-1.36	1.43	0.70	0.06	0.02	15.55	
1305.00	0.44	145.08	1304.99	-3.68	2.48	0.65	0.06	0.04	-6.68	
1706.00	0.53	346.17	1705.98	-3.14	2.92	1.28	0.24	0.02	-39.63	
2174.00	0.97	32.31	2173.95	2.31	4.52	5.07	0.15	0.09	9.86	
2514.00	0.44	337.03	2513.92	5.94	5.55	7.57	0.24	-0.16	-16.26	
3006.00	3.25	321.39	3005.62	18.58	-3.89	4.52	0.57	0.57	-3.18	
3083.00	3.08	322.44	3082.50	21.93	-6.52	3.60	0.23	-0.22	1.36	
3112.00	3.17	325.69	3111.46	23.21	-7.44	3.32	0.69	0.31	11.21	
3141.00	4.13	335.98	3140.40	24.83	-8.32	3.22	3.99	3.31	35.48	
3172.00	5.80	351.00	3171.28	27.39	-9.02	3.70	6.78	5.39	48.45	
3202.00	7.39	2.69	3201.09	30.82	-9.17	5.05	6.91	5.30	38.97	
3233.00	8.53	15.97	3231.79	35.02	-8.44	7.52	6.96	3.68	42.84	
3264.00	9.67	29.94	3262.40	39.49	-6.51	11.19	7.99	3.68	45.06	
3294.00	12.57	41.72	3291.84	44.11	-3.08	16.28	12.23	9.67	39.27	
3324.00	16.00	50.95	3320.91	49.15	2.31	23.32	13.69	11.43	30.77	
3355.00	20.14	57.98	3350.38	54.68	10.16	32.78	15.07	13.35	22.68	
3385.00	24.09	63.78	3378.17	60.12	20.03	44.04	15.03	13.17	19.33	
3416.00	28.40	67.91	3405.97	65.69	32.55	57.74	15.09	13.90	13.32	
3447.00	32.89	69.05	3432.63	71.48	47.25	73.49	14.60	14.48	3.68	
3478.00	37.64	69.40	3457.94	77.82	63.98	91.32	15.34	15.32	1.13	
3510.00	41.59	70.11	3482.58	84.88	83.12	111.63	12.42	12.34	2.22	
3541.00	45.11	69.67	3505.12	92.19	103.10	132.81	11.40	11.35	-1.42	

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Section (VS) Reference: Well (0.00N,0.00E,64.40Azi)
Survey Calculation Method: Minimum Curvature **Db:** Sybase

Survey: Pathfinder MWD

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
3573.00	48.28	69.40	3527.07	100.34	124.91	156.00	9.93	9.91	-0.84	
3604.00	49.42	69.93	3547.47	108.45	146.80	179.24	3.90	3.68	1.71	
3635.00	49.77	69.84	3567.56	116.57	168.96	202.74	1.15	1.13	-0.29	
3666.00	52.32	68.79	3587.05	125.08	191.51	226.76	8.64	8.23	-3.39	
3696.00	55.13	68.00	3604.80	133.99	214.00	250.88	9.60	9.37	-2.63	
3726.00	55.93	68.35	3621.78	143.18	236.95	275.56	2.83	2.67	1.17	
3757.00	56.01	68.17	3639.13	152.70	260.82	301.19	0.55	0.26	-0.58	
3788.00	58.04	67.64	3656.00	162.48	284.91	327.15	6.70	6.55	-1.71	
3818.00	58.65	67.91	3671.74	172.14	308.55	352.64	2.17	2.03	0.90	
3850.00	62.00	67.91	3687.58	182.60	334.31	380.39	10.47	10.47	0.00	
3883.00	64.54	66.94	3702.42	193.91	361.52	409.82	8.13	7.70	-2.94	
3914.00	67.62	66.24	3714.99	205.17	387.52	438.13	10.15	9.94	-2.26	
3944.00	71.05	65.71	3725.58	216.60	413.16	466.19	11.55	11.43	-1.77	
3973.00	74.39	65.18	3734.19	228.11	438.34	493.87	11.65	11.52	-1.83	
4004.00	76.06	65.71	3742.10	240.56	465.60	523.84	5.64	5.39	1.71	
4036.00	75.97	65.97	3749.83	253.27	493.93	554.88	0.84	-0.28	0.81	
4067.00	75.80	65.62	3757.39	265.60	521.35	584.94	1.22	-0.55	-1.13	
4098.00	78.60	64.74	3764.26	278.29	548.79	615.16	9.45	9.03	-2.84	
4128.00	81.34	63.78	3769.48	291.12	575.40	644.70	9.66	9.13	-3.20	
4160.00	84.68	63.87	3773.38	305.12	603.90	676.45	10.44	10.44	0.28	
4190.00	85.21	63.87	3776.02	318.29	630.73	706.34	1.77	1.77	0.00	
4222.00	85.12	63.87	3778.72	332.33	659.35	738.22	0.28	-0.28	0.00*	
4252.00	87.23	63.95	3780.72	345.49	686.23	768.15	7.04	7.03	0.27	
4305.00	91.19	62.02	3781.45	369.56	733.44	821.12	8.31	7.47	-3.64	
4336.00	93.83	67.03	3780.09	382.87	761.38	852.07	18.25	8.52	16.16	
4368.00	92.24	68.26	3778.39	395.03	790.93	883.98	6.28	-4.97	3.84	
4399.00	90.66	67.12	3777.61	406.79	819.60	914.91	6.28	-5.10	-3.68	
4431.00	89.69	66.88	3777.51	419.29	849.06	946.88	3.12	-3.03	-0.75	
4463.00	88.29	66.06	3778.08	432.07	878.39	978.85	5.07	-4.37	-2.56	
4493.00	87.85	66.24	3779.09	444.19	905.82	1008.82	1.58	-1.47	0.60	
4525.00	89.16	66.94	3779.92	456.90	935.17	1040.79	4.64	4.09	2.19	
4556.00	89.87	68.96	3780.18	468.54	963.90	1071.72	6.91	2.29	6.52	
4588.00	89.87	70.81	3780.26	479.54	993.95	1103.58	5.78	0.00	5.78	
4619.00	89.52	71.42	3780.42	489.57	1023.28	1134.36	2.27	-1.13	1.97	
4650.00	89.16	71.16	3780.78	499.52	1052.64	1165.14	1.43	-1.16	-0.84	
4681.00	88.55	69.58	3781.40	509.93	1081.83	1195.96	5.46	-1.97	-5.10	
4713.00	90.57	68.61	3781.64	521.35	1111.72	1227.85	7.00	6.31	-3.03	
4745.00	91.63	69.40	3781.03	532.81	1141.59	1259.74	4.13	3.31	2.47	
4756.00	91.36	69.31	3780.74	536.69	1151.88	1270.70	2.59	-2.45	-0.82	
4826.00	91.36	69.31	3779.08	561.41	1217.35	1340.42	0.00	0.00	0.00	