



Energen Resources

SJ BR: S29, T32N, R5W

Eul Canyon

Elk Horn #101S

Lower Lateral

11-13-07

30-039-09812

Survey: Survey #1

RCVD NOV 2 '07

OIL CONS. DIV.

End of Well Survey

26 October, 2007

ML 4234 TVL 3537

ML 5945 TVL 3564

Surface 4201N T32N/E38Sec 32
Lateral origin 929/S 1301/E Sec 29
BHL 2528/S 1884/E

PATHFINDER
ENERGY SERVICES

DB



Pathfinder Energy Services
End of Well Survey



Company:	Energen Resources	Local Co-ordinate Reference:	Well Elk Horn #101S
Project:	SJ BR: S29, T32N, R5W	TVD Reference:	WELL @ 6828.0ft (Rig Floor)
Site:	Eul Canyon	MD Reference:	WELL @ 6828.0ft (Rig Floor)
Well:	Elk Horn #101S	North Reference:	True
Wellbore:	Lower Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Lower Lateral	Database:	EDM 2003.16 Single User Db

Project:	SJ BR: S29, T32N, R5W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site:	Eul Canyon				
Site Position:		Northing:	2,164,256.20 ft	Latitude:	36° 56' 32.388 N
From:	Lat/Long	Easting:	1,310,376.22 ft	Longitude:	107° 22' 45.804 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	-0.68 °

Well:	Elk Horn #101S					
Well Position	+N/-S	0.0 ft	Northing:	2,164,256.20 ft	Latitude:	36° 56' 32.388 N
	+E/-W	0.0 ft	Easting:	1,310,376.22 ft	Longitude:	107° 22' 45.804 W
Position Uncertainty	0.0 ft	Wellhead Elevation:	6,813.0 ft	Ground Level:	6,813.0 ft	

Wellbore:	Lower Lateral				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF200510	10/25/2007	(°)	(°)	(nT)
			10.19	63.81	51,283

Design:	Lower Lateral				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	341.20	

Survey Program	Date 10/25/2007				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
227.0	5,945.0	Survey #1 (Lower Lateral)	Pathfinder	Pathfinder MWD	

Survey	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)	
	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	
	227.0	0.07	254.36	227.0	0.0	-0.1	0.03	0.0	
	305.0	0.09	254.36	305.0	-0.1	-0.2	0.03	0.0	
	768.0	0.62	125.43	768.0	-1.6	1.5	0.15	-2.0	
	1,169.0	1.06	104.51	1,168.9	-3.8	6.8	0.13	-5.8	
	1,199.0	1.14	96.77	1,198.9	-3.9	7.4	0.56	-6.1	
	1,225.0	0.92	84.58	1,224.9	-3.9	7.8	1.19	-6.2	
Interpolated KOP									
	1,230.0	0.88	81.57	1,229.9	-3.9	7.9	1.24	-6.3	
	1,261.0	0.79	35.51	1,260.9	-3.7	8.3	2.12	-6.2	
	1,290.0	1.49	349.63	1,289.9	-3.2	8.3	3.79	-5.7	
	1,321.0	3.08	340.85	1,320.9	-2.0	8.0	5.24	-4.5	



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Local Co-ordinate Reference: Well Elk Horn #101S
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MD Reference: WELL @ 6828.0ft (Rig Floor)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Survey								
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	EW (ft)	DLeg (°/100ft)	V. Sec (ft)	
1,351.0	4.48	340.49	1,350.8	-0.1	7.3	4.67	-2.5	
1,383.0	5.63	342.87	1,382.7	2.6	6.4	3.65	0.3	
1,415.0	6.68	344.27	1,414.5	5.9	5.5	3.31	3.8	
1,447.0	7.83	342.87	1,446.3	9.7	4.3	3.64	7.8	
1,479.0	8.88	341.37	1,477.9	14.1	2.9	3.35	12.5	
1,510.0	9.76	340.93	1,508.5	18.9	1.3	2.85	17.5	
1,542.0	10.90	341.72	1,540.0	24.3	-0.6	3.59	23.2	
1,572.0	11.78	342.25	1,569.4	29.9	-2.4	2.95	29.1	
1,604.0	12.57	342.34	1,600.7	36.4	-4.4	2.47	35.9	
1,635.0	13.28	341.55	1,630.9	43.0	-6.6	2.36	42.8	
1,667.0	13.89	341.46	1,662.0	50.1	-9.0	1.91	50.3	
1,697.0	13.98	339.70	1,691.1	56.9	-11.4	1.44	57.5	
1,729.0	14.25	339.18	1,722.2	64.2	-14.1	0.93	65.3	
1,761.0	14.60	339.88	1,753.2	71.7	-16.9	1.22	73.3	
1,792.0	14.60	340.23	1,783.2	79.0	-19.6	0.28	81.1	
1,823.0	14.86	340.76	1,813.1	86.5	-22.2	0.94	89.0	
1,855.0	14.95	341.11	1,844.1	94.2	-24.9	0.40	97.2	
1,886.0	15.39	340.32	1,874.0	101.9	-27.6	1.57	105.3	
1,918.0	15.83	339.18	1,904.8	110.0	-30.5	1.68	113.9	
1,949.0	16.53	339.09	1,934.6	118.0	-33.6	2.26	122.6	
1,980.0	17.41	339.53	1,964.2	126.5	-36.8	2.87	131.6	
2,011.0	18.29	340.05	1,993.7	135.4	-40.1	2.88	141.1	
2,044.0	19.08	340.49	2,025.0	145.4	-43.7	2.43	151.7	
2,075.0	19.61	340.49	2,054.2	155.1	-47.1	1.71	162.0	
2,107.0	20.05	340.32	2,084.3	165.3	-50.7	1.39	172.8	
2,139.0	20.58	340.32	2,114.4	175.7	-54.5	1.66	183.9	
2,171.0	21.02	341.20	2,144.3	186.5	-58.2	1.69	195.3	
2,202.0	21.72	341.20	2,173.1	197.2	-61.9	2.26	206.6	
2,234.0	22.25	341.20	2,202.8	208.5	-65.7	1.66	218.6	
2,266.0	22.77	341.11	2,232.4	220.1	-69.7	1.63	230.8	
2,297.0	23.48	341.28	2,260.9	231.6	-73.6	2.30	243.0	
2,328.0	24.45	341.72	2,289.2	243.6	-77.6	3.18	255.6	
2,359.0	25.32	342.51	2,317.3	256.0	-81.6	3.00	268.6	
2,391.0	25.94	341.46	2,346.2	269.1	-85.9	2.40	282.5	
2,423.0	26.56	341.37	2,374.9	282.6	-90.4	1.94	296.6	
2,454.0	27.26	341.72	2,402.5	295.9	-94.8	2.32	310.6	
2,485.0	28.58	342.08	2,429.9	309.7	-99.3	4.29	325.2	
2,516.0	29.99	342.60	2,457.0	324.1	-103.9	4.62	340.3	
2,547.0	30.69	342.25	2,483.7	339.0	-108.7	2.33	356.0	
2,579.0	30.69	341.11	2,511.2	354.5	-113.8	1.82	372.3	
2,611.0	31.04	340.93	2,538.7	370.1	-119.1	1.13	388.7	
2,642.0	31.92	341.28	2,565.1	385.4	-124.4	2.90	404.9	
2,674.0	33.06	341.81	2,592.1	401.7	-129.8	3.67	422.1	
2,705.0	34.38	341.99	2,617.9	418.0	-135.2	4.27	439.3	



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North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
2,737.0	35.53	340.93	2,644.1	435.4	-141.0	4.06	457.6
2,768.0	36.67	340.23	2,669.2	452.7	-147.1	3.91	475.9
2,800.0	37.46	339.44	2,694.7	470.8	-153.7	2.88	495.2
2,831.0	38.43	339.18	2,719.2	488.6	-160.5	3.17	514.2
2,862.0	39.04	338.82	2,743.3	506.7	-167.4	2.10	533.6
2,894.0	39.92	338.65	2,768.0	525.7	-174.8	2.77	553.9
2,925.0	41.14	338.74	2,791.6	544.4	-182.1	3.94	574.1
2,957.0	41.77	338.73	2,815.6	564.2	-189.8	1.97	595.2
2,987.0	42.03	338.65	2,837.9	582.8	-197.1	0.88	615.3
3,018.0	42.74	338.65	2,860.8	602.3	-204.7	2.29	636.1
3,048.0	44.05	339.00	2,882.6	621.5	-212.1	4.44	656.7
3,079.0	45.20	339.99	2,904.7	641.9	-219.8	4.34	678.5
3,110.0	46.08	340.32	2,926.3	662.8	-227.3	2.94	700.6
3,142.0	46.78	340.67	2,948.4	684.6	-235.0	2.33	723.8
3,173.0	47.66	340.58	2,969.5	706.1	-242.6	2.85	746.6
3,204.0	48.28	340.93	2,990.2	727.8	-250.2	2.17	769.6
3,267.0	49.77	340.40	3,031.5	772.7	-265.9	2.45	817.2
3,298.0	50.91	340.85	3,051.3	795.2	-273.8	3.84	841.0
3,329.0	51.35	341.28	3,070.8	818.0	-281.7	1.78	865.2
3,361.0	51.44	341.55	3,090.7	841.7	-289.6	0.72	890.2
3,392.0	51.35	342.43	3,110.1	864.8	-297.1	2.24	914.4
3,423.0	51.70	342.78	3,129.4	887.9	-304.4	1.43	938.7
3,455.0	52.50	342.87	3,149.0	912.1	-311.8	2.51	963.9
3,487.0	53.55	343.04	3,168.3	936.5	-319.3	3.31	989.5
3,518.0	54.69	342.43	3,186.4	960.5	-326.8	4.01	1,014.6
3,549.0	55.40	341.90	3,204.2	984.7	-334.6	2.68	1,040.0
3,579.0	56.28	341.20	3,221.0	1,008.2	-342.4	3.51	1,064.8
3,611.0	56.72	341.11	3,238.7	1,033.5	-351.0	1.39	1,091.5
3,642.0	57.60	341.46	3,255.5	1,058.1	-359.4	2.99	1,117.5
3,674.0	58.04	341.46	3,272.6	1,083.8	-368.0	1.37	1,144.6
3,705.0	58.39	341.55	3,288.9	1,108.8	-376.4	1.16	1,170.9
3,737.0	58.65	341.22	3,305.6	1,134.7	-385.1	1.20	1,198.2
3,769.0	59.00	341.09	3,322.2	1,160.6	-393.9	1.15	1,225.6
3,800.0	58.92	340.44	3,338.1	1,185.7	-402.7	1.81	1,252.2
3,831.0	59.53	340.29	3,354.0	1,210.8	-411.6	2.01	1,278.8
3,863.0	60.50	340.12	3,370.0	1,236.8	-421.0	3.07	1,306.5
3,894.0	61.29	340.66	3,385.1	1,262.3	-430.1	2.97	1,333.6
3,925.0	62.08	341.13	3,399.8	1,288.1	-439.0	2.88	1,360.9
3,957.0	62.70	341.00	3,414.6	1,315.0	-448.2	1.97	1,389.3
3,988.0	63.14	341.88	3,428.7	1,341.1	-457.0	2.90	1,416.9
4,020.0	63.58	342.03	3,443.1	1,368.3	-465.9	1.44	1,445.5
4,052.0	63.84	341.35	3,457.2	1,395.6	-474.9	2.07	1,474.1
4,083.0	64.02	341.62	3,470.9	1,422.0	-483.7	0.97	1,502.0
4,116.0	64.28	340.74	3,485.3	1,450.1	-493.3	2.53	1,531.7
4,147.0	64.46	340.36	3,498.7	1,476.4	-502.6	1.25	1,559.6



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End of Well Survey



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MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V: Sec (ft)
4,160.0	64.17	339.74	3,504.3	1,487.4	-506.6	4.84	1,571.3
4,179.0	63.75	338.84	3,512.6	1,503.4	-512.6	4.80	1,588.4
4,205.0	63.82	338.95	3,524.1	1,525.2	-521.0	0.47	1,611.7
4,234.0	63.77	338.38	3,536.9	1,549.4	-530.5	1.77	1,637.7
4,256.0	65.16	338.38	3,546.4	1,567.9	-537.8	6.32	1,657.5
4,314.0	74.13	335.82	3,566.6	1,617.9	-559.0	16.01	1,711.7
4,344.0	82.31	338.11	3,572.7	1,644.9	-570.5	28.27	1,741.0
4,375.0	91.28	341.92	3,574.4	1,673.9	-581.0	31.43	1,771.9
4,405.0	92.15	345.92	3,573.5	1,702.7	-589.3	13.64	1,801.8
4,435.0	91.45	350.20	3,572.6	1,732.1	-595.5	14.45	1,831.6
4,465.0	91.54	350.09	3,571.8	1,761.6	-600.7	0.47	1,861.2
4,495.0	92.07	347.00	3,570.9	1,791.0	-606.6	10.45	1,890.9
4,527.0	91.98	343.73	3,569.7	1,821.9	-614.7	10.22	1,922.8
4,559.0	91.85	341.78	3,568.7	1,852.5	-624.2	6.10	1,954.8
4,590.0	91.63	342.70	3,567.7	1,882.0	-633.6	3.05	1,985.8
4,621.0	90.31	342.40	3,567.2	1,911.6	-642.9	4.37	2,016.8
4,652.0	90.13	342.64	3,567.1	1,941.1	-652.2	0.97	2,047.8
4,682.0	89.16	341.75	3,567.3	1,969.7	-661.4	4.39	2,077.8
4,713.0	89.60	341.04	3,567.6	1,999.1	-671.3	2.69	2,108.8
4,743.0	89.69	339.87	3,567.8	2,027.3	-681.3	3.91	2,138.8
4,775.0	90.22	338.89	3,567.8	2,057.3	-692.6	3.48	2,170.7
4,806.0	90.04	339.10	3,567.7	2,086.2	-703.7	0.89	2,201.7
4,837.0	89.60	338.11	3,567.8	2,115.1	-715.0	3.49	2,232.7
4,867.0	89.52	336.65	3,568.1	2,142.8	-726.6	4.87	2,262.6
4,898.0	89.78	337.33	3,568.2	2,171.3	-738.7	2.35	2,293.5
4,929.0	90.13	337.24	3,568.3	2,199.9	-750.7	1.17	2,324.5
4,960.0	90.31	336.00	3,568.2	2,228.4	-763.0	4.04	2,355.4
4,989.0	90.04	338.08	3,568.1	2,255.1	-774.3	7.23	2,384.3
5,021.0	88.81	339.62	3,568.4	2,284.9	-785.8	6.16	2,416.3
5,052.0	90.48	340.41	3,568.6	2,314.0	-796.4	5.96	2,447.2
5,084.0	88.81	339.68	3,568.8	2,344.1	-807.3	5.70	2,479.2
5,116.0	89.34	340.11	3,569.3	2,374.2	-818.3	2.13	2,511.2
5,146.0	89.08	339.96	3,569.7	2,402.4	-828.6	1.00	2,541.2
5,177.0	89.60	339.25	3,570.1	2,431.4	-839.4	2.84	2,572.2
5,208.0	90.75	339.44	3,570.0	2,460.4	-850.3	3.76	2,603.2
5,238.0	91.19	340.32	3,569.5	2,488.6	-860.6	3.28	2,633.2
5,270.0	89.96	340.17	3,569.1	2,518.7	-871.4	3.87	2,665.2
5,302.0	90.48	340.80	3,569.0	2,548.9	-882.1	2.55	2,697.2
5,333.0	90.40	339.87	3,568.8	2,578.1	-892.6	3.01	2,728.2
5,364.0	90.12	340.50	3,568.6	2,607.2	-903.1	2.22	2,759.1
5,395.0	90.04	340.86	3,568.6	2,636.5	-913.3	1.19	2,790.1
5,426.0	90.31	340.61	3,568.5	2,665.7	-923.6	1.19	2,821.1
5,456.0	88.46	339.14	3,568.8	2,693.9	-933.9	7.88	2,851.1
5,487.0	89.34	339.90	3,569.4	2,722.9	-944.7	3.75	2,882.1



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5,518.0	90.48	341.25	3,569.5	2,752.2	-955.0	5.70	2,913.1	
5,550.0	91.10	341.20	3,569.0	2,782.5	-965.3	1.94	2,945.1	
5,581.0	90.75	340.25	3,568.5	2,811.7	-975.6	3.27	2,976.1	
5,612.0	89.87	339.25	3,568.4	2,840.8	-986.3	4.30	3,007.1	
5,643.0	89.87	340.03	3,568.4	2,869.9	-997.1	2.52	3,038.1	
5,675.0	89.98	339.44	3,568.5	2,899.9	-1,008.2	1.88	3,070.1	
5,705.0	89.60	338.43	3,568.6	2,927.9	-1,018.9	3.60	3,100.0	
5,737.0	89.87	337.97	3,568.7	2,957.6	-1,030.8	1.67	3,132.0	
5,768.0	90.31	338.04	3,568.7	2,986.3	-1,042.4	1.44	3,163.0	
5,799.0	89.96	336.83	3,568.6	3,015.0	-1,054.3	4.06	3,193.9	
5,831.0	90.31	336.73	3,568.5	3,044.4	-1,066.9	1.14	3,225.8	
5,862.0	89.96	335.94	3,568.5	3,072.8	-1,079.4	2.79	3,256.7	
5,883.0	89.60	335.03	3,568.5	3,091.9	-1,088.1	4.66	3,277.6	
5,945.0	89.60	335.03	3,569.0	3,148.1	-1,114.3	0.00	3,339.2	
BHL LL								

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,225.0	1,224.9	-3.9	7.8	Interpolated KOP
5,945.0	3,569.0	3,148.1	-1,114.3	BHL LL

Checked By: _____ Approved By: _____ Date: _____