



Energen Resources

SJ BR: S29, T32N, R5W

Eul Canyon

Elk Horn #101S

Upper Lateral

30-039 -09812

Survey: EOW UL

RCVD NOV 2 '07
OIL CONS. DIV.

DIST. 3

End of Well Survey

26 October, 2007

Surface 620/N 770/E Sec 32
md 4153 TVL 3496 Lateral origin 864/S 1274/E Sec 29
md 5924 TVL 3477 BHL 2528/S 1886/E

PATHFINDER
ENERGY SERVICES

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Pathfinder Energy Services
End of Well Survey



Company:	Energgen 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:	Upper Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Upper 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:	Upper Lateral				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF200510	10/25/2007	(°)	(°)	(nT)
			10.19	63.81	51,283

Design:	Upper 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	341.26	

Survey Program	Date	10/25/2007	
From	To		
(ft)	(ft)		
227.0	5,929.0	EOW UL (Upper Lateral)	
		Tool Name	Description
		Pathfinder	Pathfinder MWD

Survey	MD	Inc	Azi	TVD	N/S	E/W	DLeg	V' Sec
	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(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
	1,230.0	0.88	81.57	1,229.9	-3.9	7.9	1.24	-6.2
	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	-4.4
	1,351.0	4.48	340.49	1,350.8	-0.1	7.3	4.67	-2.5

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Local Co-ordinate Reference: Well Elk Horn #101S
 TVD Reference: WELL @ 6828.0ft (Rig Floor)
 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)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)	
1,383.0	5.63	342.87	1,382.7	2.6	6.4	3.65	0.4	
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	114.0	
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	310.7	
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	
2,737.0	35.53	340.93	2,644.1	435.4	-141.0	4.06	457.6	



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Design: Upper Lateral

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TVD Reference: WELL @ 6828.0ft (Rig Floor)
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)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
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	989.4
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	1,171.0
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
4,093.0	64.10	341.35	3,475.2	1,430.5	-486.6	2.56	1,511.0
Interpolated Top of Whipstock (KOP)							
4,153.0	74.48	341.60	3,496.4	1,483.6	-504.4	17.30	1,567.0

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Survey							
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4,166.0	77.56	341.65	3,499.6	1,495.6	-508.4	23.70	1,579.6
4,196.0	82.22	341.78	3,504.8	1,523.6	-517.6	15.54	1,609.2
4,227.0	85.82	341.52	3,508.1	1,552.9	-527.3	11.64	1,640.0
4,257.0	87.41	341.21	3,509.8	1,581.3	-536.9	5.40	1,669.9
4,287.0	87.23	341.32	3,511.2	1,609.7	-546.5	0.70	1,699.9
4,316.0	87.85	341.22	3,512.5	1,637.1	-555.8	2.17	1,728.9
4,347.0	90.04	341.60	3,513.1	1,666.5	-565.7	7.17	1,759.9
4,377.0	90.22	342.06	3,513.0	1,695.0	-575.1	1.65	1,789.9
4,408.0	90.22	341.04	3,512.9	1,724.4	-584.9	3.29	1,820.9
4,439.0	90.40	340.86	3,512.7	1,753.7	-595.0	0.82	1,851.9
4,469.0	90.31	341.51	3,512.5	1,782.1	-604.7	2.19	1,881.9
4,500.0	90.22	341.85	3,512.4	1,811.5	-614.4	1.13	1,912.9
4,531.0	89.34	341.88	3,512.5	1,841.0	-624.1	2.84	1,943.9
4,561.0	89.34	341.79	3,512.8	1,869.5	-633.4	0.30	1,973.9
4,591.0	89.16	341.13	3,513.2	1,897.9	-643.0	2.28	2,003.9
4,623.0	89.69	341.13	3,513.5	1,928.2	-653.3	1.66	2,035.9
4,654.0	91.10	340.78	3,513.3	1,957.5	-663.4	4.69	2,066.9
4,685.0	91.89	340.98	3,512.5	1,986.8	-673.6	2.63	2,097.8
4,716.0	92.68	339.81	3,511.3	2,015.9	-684.0	4.55	2,128.8
4,748.0	93.21	340.00	3,509.6	2,046.0	-694.9	1.76	2,160.8
4,777.0	93.39	339.23	3,508.0	2,073.1	-705.0	2.72	2,189.7
4,807.0	93.39	339.76	3,506.2	2,101.1	-715.5	1.76	2,219.6
4,839.0	93.39	338.94	3,504.3	2,131.0	-726.8	2.56	2,251.6
4,870.0	93.65	339.58	3,502.4	2,160.0	-737.7	2.22	2,282.5
4,902.0	93.65	339.30	3,500.4	2,189.9	-749.0	0.87	2,314.4
4,933.0	93.56	338.63	3,498.4	2,218.8	-760.1	2.18	2,345.3
4,964.0	93.39	338.38	3,496.5	2,247.5	-771.4	0.97	2,376.2
4,995.0	92.77	336.68	3,494.9	2,276.1	-783.2	5.83	2,407.1
5,027.0	92.07	337.09	3,493.5	2,305.5	-795.8	2.53	2,439.0
5,057.0	90.13	336.85	3,492.9	2,333.2	-807.5	6.52	2,468.9
5,089.0	89.52	336.44	3,493.0	2,362.5	-820.2	2.30	2,500.8
5,120.0	90.04	334.99	3,493.2	2,390.8	-832.9	4.97	2,531.6
5,151.0	91.36	335.55	3,492.8	2,418.9	-845.9	4.63	2,562.5
5,180.0	90.04	336.62	3,492.4	2,445.4	-857.7	5.86	2,591.4
5,211.0	89.34	337.61	3,492.6	2,474.0	-869.7	3.91	2,622.3
5,241.0	90.84	337.94	3,492.6	2,501.8	-881.1	5.12	2,652.2
5,272.0	91.36	337.41	3,492.0	2,530.4	-892.8	2.39	2,683.1
5,303.0	91.36	337.16	3,491.2	2,559.0	-904.8	0.81	2,714.1
5,335.0	90.66	338.35	3,490.7	2,588.6	-916.9	4.31	2,746.0
5,366.0	90.57	339.83	3,490.3	2,617.6	-928.0	4.78	2,777.0
5,397.0	89.96	340.55	3,490.2	2,646.8	-938.5	3.04	2,808.0
5,428.0	89.60	340.21	3,490.3	2,676.0	-948.9	1.60	2,839.0
5,460.0	89.52	340.23	3,490.5	2,706.1	-959.7	0.26	2,871.0
5,490.0	89.69	341.02	3,490.8	2,734.4	-969.7	2.69	2,901.0



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Design: Upper Lateral

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5,522.0	90.57	342.11	3,490.7	2,764.7	-979.8	4.38	2,933.0
5,553.0	91.45	341.72	3,490.1	2,794.2	-989.4	3.10	2,963.9
5,584.0	91.89	341.84	3,489.2	2,823.6	-999.1	1.47	2,994.9
5,615.0	92.77	342.48	3,488.0	2,853.1	-1,008.6	3.51	3,025.9
5,646.0	93.03	341.92	3,486.4	2,882.6	-1,018.1	1.99	3,056.9
5,676.0	93.21	341.68	3,484.8	2,911.1	-1,027.4	1.00	3,086.8
5,708.0	93.65	341.04	3,482.9	2,941.3	-1,037.6	2.42	3,118.8
5,739.0	92.86	340.94	3,481.1	2,970.6	-1,047.7	2.57	3,149.7
5,770.0	92.51	340.39	3,479.6	2,999.8	-1,058.0	2.10	3,180.7
5,801.0	91.63	339.53	3,478.5	3,028.9	-1,068.6	3.97	3,211.6
5,832.0	90.84	339.10	3,477.9	3,057.9	-1,079.5	2.90	3,242.6
5,866.0	90.48	338.02	3,477.5	3,089.5	-1,092.0	3.35	3,276.6
5,929.0	90.48	338.02	3,476.9	3,148.0	-1,115.5	0.00	3,339.5

BHL UL

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,093.0	3,475.2	1,430.5	-486.6	Interpolated Top of Whipstock (KOP)
5,929.0	3,476.9	3,148.0	-1,115.5	BHL UL

Checked By: _____ Approved By: _____ Date: _____