



Energen Resources

SJBR-S24, 32N, 6W

Eul Canyon

San Juan 32-5 Unit #102S

San Juan 32-5 Unit #102 S ST

30-089-27268

Survey: EOW Survey

RCVD NOV 13 '07

OIL CONS. DIV.

DIST. 3

End of Well Survey

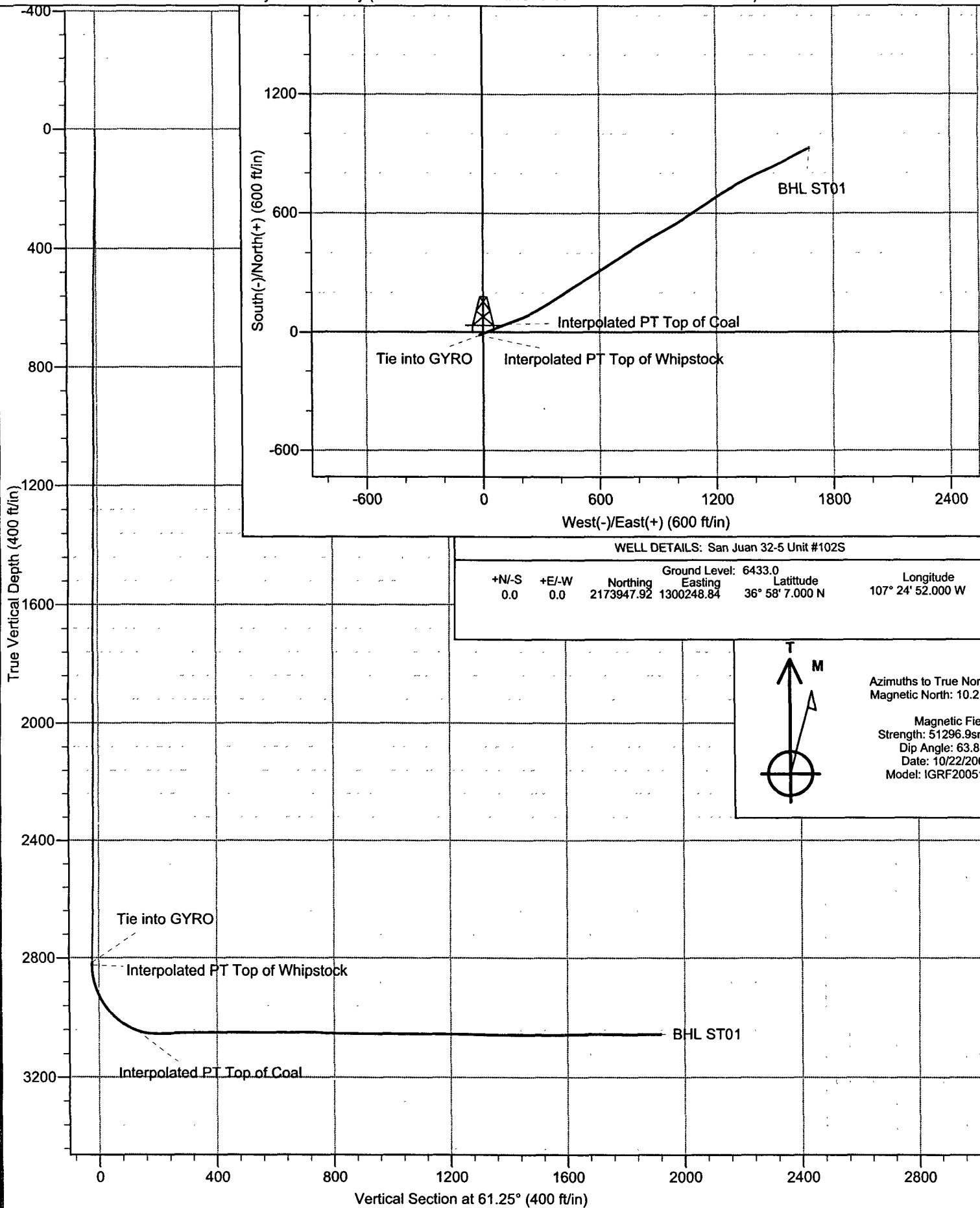
02 November, 2007

Surface 1690/N 835/W
md 3114 Tvd 3046 Top of coal 1645/N 964/W
md 4903 Tvd 3055 BHL 760/N 2514/W

P.A.

PATHFINDER
ENERGY SERVICES

Survey: EOW Survey (San Juan 32-5 Unit #102S/San Juan 32-5 Unit #102 S ST)





Pathfinder Energy Services
End of Well Survey



Company: Energen Resources
Project: SJBR-S24, 32N, 6W
Site: Eul Canyon
Well: San Juan 32-5 Unit #102S
Wellbore: San Juan 32-5 Unit #102 S ST
Design: San Juan 32-5 Unit #102 S ST

Local Co-ordinate Reference: Well San Juan 32-5 Unit #102S
TVD Reference: WELL @ 6448.0ft (Patterson #754 (RKB 15'))
MD Reference: WELL @ 6448.0ft (Patterson #754 (RKB 15'))
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Project	SJBR-S24, 32N, 6W		
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:	2,173,947.92 ft
From:	Lat/Long	Easting:	1,300,248.84 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	36° 58' 7.000 N
		Longitude:	107° 24' 52.000 W
		Grid Convergence:	-0.70 °

Well	San Juan 32-5 Unit #102S		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	0.0 ft	Easting:
Position Uncertainty	0.0 ft	Wellhead Elevation:	6,433.0 ft
		Latitude:	36° 58' 7.000 N
		Longitude:	107° 24' 52.000 W
		Ground Level:	6,433.0 ft

Wellbore	San Juan 32-5 Unit #102 S ST				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF200510	10/22/2007	10.21	63.82	51,297

Design	San Juan 32-5 Unit #102 S ST			
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	61.25

Survey Program	Date 11/2/2007				
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
215.0	2,815.0	GYRO (San Juan 32-5 Unit #102 S ST)	Pathfinder	Pathfinder MWD	
2,825.0	4,903.0	EOW Survey (San Juan 32-5 Unit #102 S	Pathfinder	Pathfinder MWD	

Survey	MD	Inc	Azi	TVD	N/S	E/W	DLeg	V. Sec
	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(ft)
	2,815.0	0.89	249.96	2,814.8	-14.6	-16.2	0.00	-21.2
Tie into GYRO								
	2,825.0	0.87	251.63	2,824.8	-14.6	-16.4	0.33	-21.4
Interpolated PT Top of Whipstock								
	2,860.0	9.85	67.23	2,859.7	-13.6	-13.8	30.62	-18.7
	2,892.0	16.97	67.62	2,890.8	-10.7	-7.0	22.25	-11.3
	2,923.0	24.18	66.86	2,919.8	-6.5	3.0	23.27	-0.5
	2,954.0	31.48	66.97	2,947.2	-0.8	16.3	23.55	13.9
	2,986.0	38.87	67.48	2,973.3	6.3	33.3	23.11	32.2
	3,020.0	46.60	68.20	2,998.3	15.0	54.7	22.78	55.1
	3,051.0	54.61	67.08	3,017.9	24.1	76.8	25.99	78.9



Pathfinder Energy Services
End of Well Survey



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Survey								
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)	
3,082.0	63.05	67.50	3,033.9	34.3	101.3	27.25	105.3	
3,107.0	70.19	68.44	3,043.9	42.9	122.5	28.77	128.1	
Interpolated PT Top of Coal								
<u>3,114.0</u>	72.19	68.69	<u>3,046.1</u>	<u>45.3</u>	<u>128.7</u>	28.77	134.6	
3,143.0	82.31	69.80	3,052.5	55.3	155.1	35.10	162.6	
3,174.0	90.04	69.79	3,054.6	66.0	184.1	24.94	193.2	
3,204.0	91.45	66.72	3,054.2	77.1	212.0	11.26	222.9	
3,235.0	92.77	63.96	3,053.0	90.1	240.1	9.86	253.8	
3,267.0	91.80	61.45	3,051.8	104.7	268.5	8.40	285.8	
3,298.0	91.36	60.00	3,050.9	119.9	295.6	4.89	316.8	
3,329.0	90.22	58.81	3,050.5	135.6	322.2	5.32	347.8	
3,361.0	90.40	57.52	3,050.3	152.5	349.4	4.07	379.7	
3,392.0	89.87	57.92	3,050.2	169.1	375.6	2.14	410.7	
3,423.0	90.31	57.54	3,050.2	185.6	401.9	1.88	441.6	
3,454.0	89.69	57.58	3,050.2	202.3	428.0	2.00	472.5	
3,485.0	89.78	57.83	3,050.3	218.8	454.2	0.86	503.5	
3,517.0	89.69	59.10	3,050.5	235.6	481.5	3.98	535.4	
3,548.0	90.40	59.67	3,050.5	251.3	508.2	2.94	566.4	
3,579.0	89.69	58.87	3,050.4	267.2	534.8	3.45	597.4	
3,610.0	89.16	57.55	3,050.7	283.5	561.2	4.59	628.4	
3,641.0	90.92	57.95	3,050.7	300.1	587.4	5.82	659.3	
3,672.0	92.07	57.94	3,049.9	316.5	613.6	3.71	690.2	
3,704.0	89.16	57.99	3,049.6	333.5	640.8	9.10	722.2	
3,735.0	86.79	57.11	3,050.7	350.1	666.9	8.15	753.1	
3,766.0	87.41	56.62	3,052.2	367.0	692.8	2.55	784.0	
3,797.0	88.64	55.89	3,053.3	384.2	718.6	4.61	814.8	
3,828.0	89.69	57.24	3,053.8	401.3	744.5	5.52	845.7	
3,860.0	89.87	58.09	3,053.9	418.4	771.5	2.72	877.7	
3,891.0	89.08	58.91	3,054.2	434.6	797.9	3.67	908.6	
3,922.0	90.13	59.48	3,054.4	450.5	824.6	3.85	939.6	
3,953.0	89.78	60.09	3,054.4	466.1	851.3	2.27	970.6	
3,985.0	89.16	60.28	3,054.7	482.0	879.1	2.03	1,002.6	
4,016.0	90.04	60.88	3,054.9	497.2	906.1	3.44	1,033.6	
4,047.0	90.66	60.32	3,054.7	512.5	933.1	2.70	1,064.6	
4,078.0	90.31	59.59	3,054.5	528.0	959.9	2.61	1,095.6	
4,108.0	89.34	59.47	3,054.6	543.2	985.8	3.26	1,125.5	
4,140.0	89.60	59.23	3,054.8	559.5	1,013.3	1.11	1,157.5	
4,171.0	89.87	58.66	3,055.0	575.5	1,039.9	2.03	1,188.5	
4,202.0	89.16	56.37	3,055.3	592.1	1,066.0	7.73	1,219.4	
4,233.0	88.72	56.21	3,055.8	609.3	1,091.8	1.51	1,250.3	
4,265.0	89.60	57.41	3,056.3	626.9	1,118.6	4.65	1,282.2	
4,296.0	88.29	56.10	3,056.9	643.8	1,144.5	5.98	1,313.1	
4,328.0	88.64	54.65	3,057.7	662.0	1,170.8	4.66	1,344.9	
4,359.0	89.69	56.15	3,058.2	679.6	1,196.4	5.91	1,375.8	

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Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V: Sec (ft)
4,390.0	90.48	59.09	3,058.1	696.2	1,222.5	9.82	1,406.7
4,421.0	90.40	60.18	3,057.9	711.9	1,249.3	3.53	1,437.7
4,453.0	88.72	61.33	3,058.1	727.5	1,277.2	6.36	1,469.7
4,484.0	89.60	60.38	3,058.6	742.6	1,304.3	4.18	1,500.7
4,515.0	90.48	61.93	3,058.6	757.6	1,331.4	5.75	1,531.7
4,547.0	90.57	62.39	3,058.3	772.5	1,359.7	1.46	1,563.7
4,578.0	91.80	64.29	3,057.6	786.4	1,387.4	7.30	1,594.6
4,609.0	91.54	65.47	3,056.7	799.6	1,415.5	3.90	1,625.6
4,641.0	91.71	66.55	3,055.8	812.6	1,444.7	3.42	1,657.4
4,672.0	90.04	66.02	3,055.4	825.0	1,473.1	5.65	1,688.3
4,703.0	89.08	63.53	3,055.6	838.3	1,501.1	8.61	1,719.3
4,734.0	89.87	63.11	3,055.9	852.2	1,528.8	2.89	1,750.2
4,766.0	89.96	62.81	3,055.9	866.7	1,557.3	0.98	1,782.2
4,797.0	89.60	63.04	3,056.0	880.8	1,584.9	1.38	1,813.2
4,828.0	90.84	62.29	3,055.9	895.1	1,612.4	4.67	1,844.2
4,903.0	90.84	62.29	3,054.8	929.9	1,678.8	0.00	1,919.2

BHL ST01

Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
Drill Window	0.00	0.00	3,052.0	0.0	0.0	2,173,947.92	1,300,248.84	36° 58' 7.000 N	107° 24' 52.000 W
- survey misses by 78.1ft at 3020.0ft MD (2998.3 TVD, 15.0 N, 54.7 E)									
- Rectangle (sides W1,970.0 H2,620.0 D0.0)									
PBHL ST 01	0.00	0.00	3,060.0	929.8	1,695.0	2,174,856.93	1,301,955.08	36° 58' 16.193 N	107° 24' 31.114 W
- survey misses by 17.0ft at 4903.0ft MD (3054.8 TVD, 929.9 N, 1678.8 E)									
- Point									
KOP	0.00	0.00	2,840.0	-14.7	-16.6	2,173,933.42	1,300,232.06	36° 58' 6.855 N	107° 24' 52.205 W
- survey hits target									
- Point									
Land Curve	0.00	0.00	3,060.0	90.7	173.2	2,174,036.49	1,300,423.13	36° 58' 7.897 N	107° 24' 49.866 W
- survey misses by 27.5ft at 3172.6ft MD (3054.6 TVD, 65.6 N, 182.8 E)									
- Point									

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
2,815.0	2,814.8	-14.6	-16.2	Tie into GYRO
2,825.0	2,824.8	-14.6	-16.4	Interpolated PT Top of Whipstock
3,107.0	3,043.9	42.9	122.5	Interpolated PT Top of Coal
4,903.0	3,054.8	929.9	1,678.8	BHL ST01

Checked By: _____ Approved By: _____ Date: _____