



Energen Resources

SJ BR-S24, T32N, R6W
Eul Canyon
San Juan 32-5 Unit NP #103
Sidetrack

30-039-24269

RCVD NOV 21 '07

OIL CONS. DIV.

DIST. 3

Survey: EOW Survey

AS
11-21-07

End of Well Survey

25 October, 2007

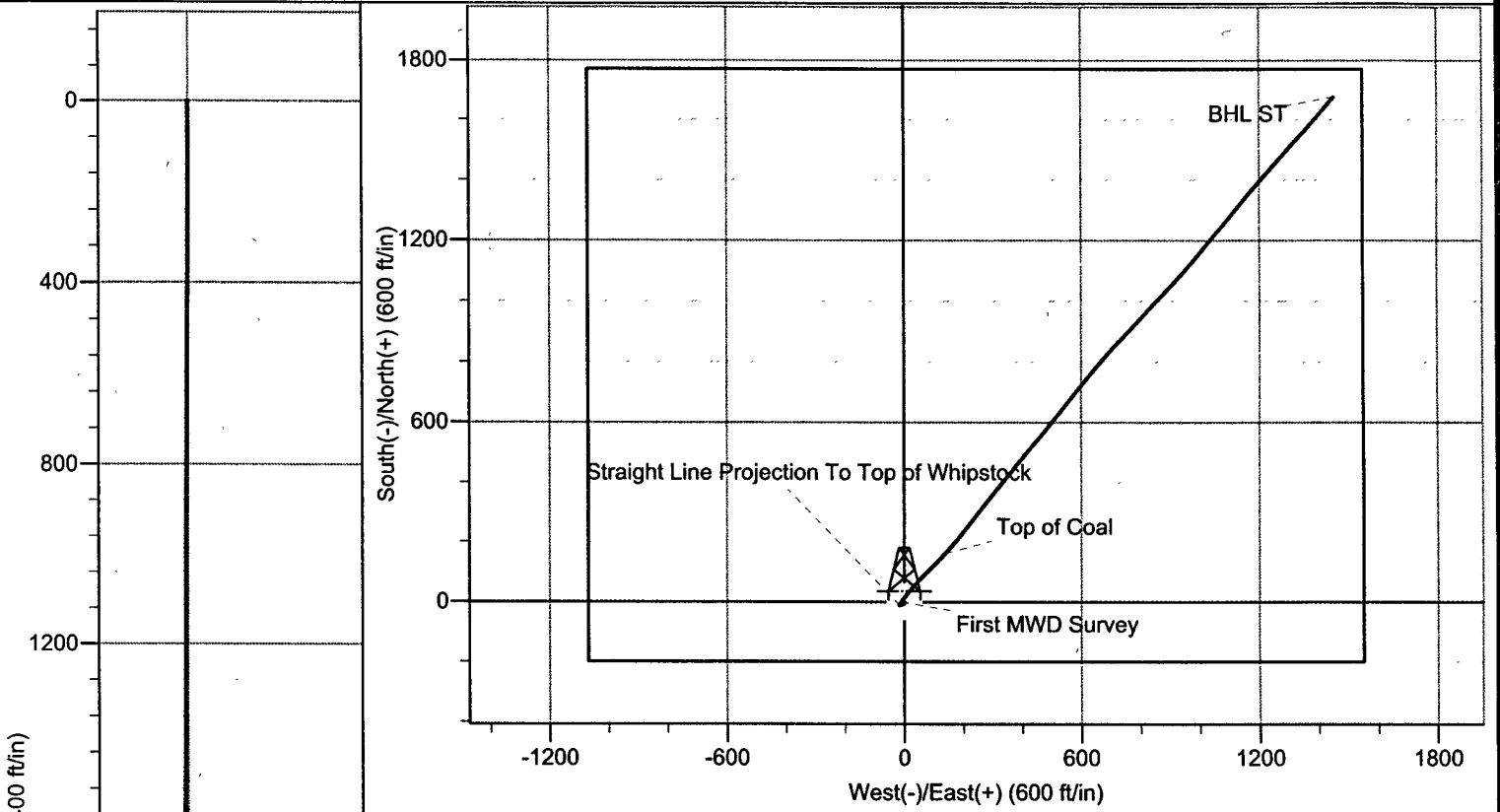
Surface 2430/N 1560/E
FC Entry 2246/N 1390/E MD 3101 TUD 2960
BHL 755/N 106/E MB 5075 TUD 2943
P.A.



↓
File subsequent "As Drilled" cross

B

Survey: EOW Survey (San Juan 32-5 Unit NP #103/Sidetrack)

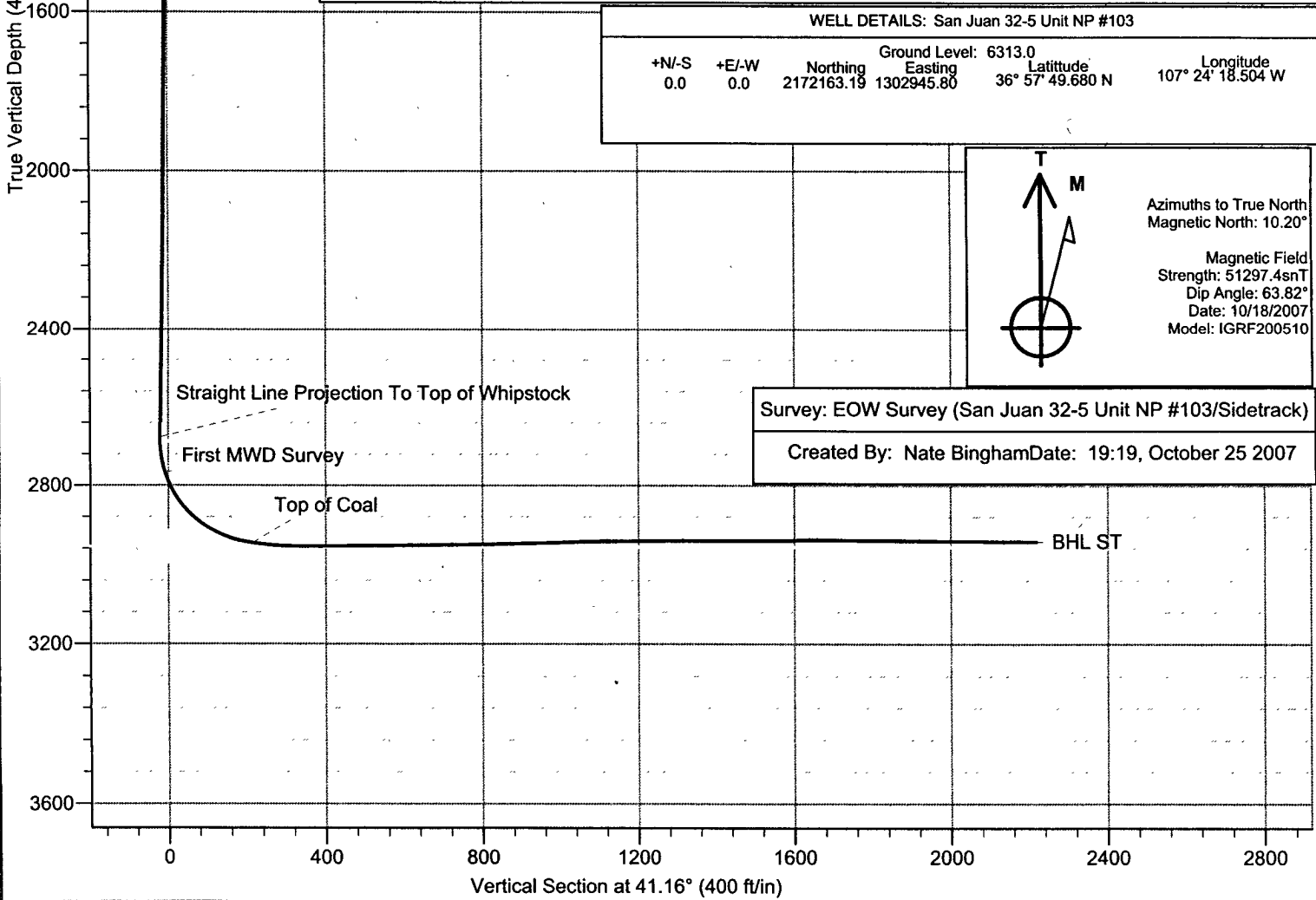


WELL DETAILS: San Juan 32-5 Unit NP #103

+N/-S	+E/-W	Ground Level: 6313.0	Longitude
0.0	0.0	2172163.19	1302945.80
		36° 57' 49.680 N	107° 24' 18.504 W

Azimuths to True North
 Magnetic North: 10.20°

Magnetic Field
 Strength: 51297.4snT
 Dip Angle: 63.82°
 Date: 10/18/2007
 Model: IGRF200510



Survey: EOW Survey (San Juan 32-5 Unit NP #103/Sidetrack)
 Created By: Nate Bingham Date: 19:19, October 25 2007



Company: Energen Resources
Project: SJ BR-S24, T32N, R6W
Site: Eul Canyon
Well: San Juan 32-5 Unit NP #103
Wellbore: Sidetrack
Design: OH

Local Co-ordinate Reference: Well San Juan 32-5 Unit NP #103
TVD Reference: Well @ 6324.0ft (AWS #580 (RKB 11Ft))
MD Reference: Well @ 6324.0ft (AWS #580 (RKB 11Ft))
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Project: SJ BR-S24, T32N, R6W
Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Central Zone

System Datum: Mean Sea Level

Site: Eul Canyon

Site Position: Northing: 2,172,163.19 ft Latitude: 36° 57' 49.680 N
From: Lat/Long Easting: 1,302,945.80 ft Longitude: 107° 24' 18.504 W
Position Uncertainty: 0.0 ft Slot Radius: " Grid Convergence: -0.69

Well: San Juan 32-5 Unit NP #103

Well Position: +N/-S 0.0 ft Northing: 2,172,163.19 ft Latitude: 36° 57' 49.680 N
+E/-W 0.0 ft Easting: 1,302,945.80 ft Longitude: 107° 24' 18.504 W
Position Uncertainty 0.0 ft Wellhead Elevation: 6,313.0 ft Ground Level: 6,313.0 ft

Wellbore: Sidetrack

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/18/2007	10.20	63.82	51,297

Design: OH

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	41.16

Survey Program Date: 10/25/2007

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
200.0	2,644.0	Gyro Surveys (Sidetrack)	Pathfinder	Pathfinder MWD
2,677.0	5,075.0	EOW Survey (Sidetrack)	Pathfinder	Pathfinder MWD

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	EW (ft)	DLog (°/100ft)	V. Sec (ft)
2,644.0	0.52	256.38	2,643.9	-11.8	-15.2	0.00	-18.9
2,677.0	0.52	256.38	2,676.9	-11.9	-15.5	0.00	-19.1
Straight Line Projection To Top of Whipstock							
2,769.0	16.80	32.78	2,767.6	-0.7	-8.7	18.67	-6.2
First MWD Survey							
2,799.0	23.30	37.95	2,795.8	7.6	-2.7	22.44	4.0
2,830.0	31.04	39.22	2,823.3	18.7	6.2	25.04	18.1
2,860.0	38.34	40.48	2,848.0	31.8	17.1	24.45	35.2
2,890.0	45.55	41.66	2,870.3	46.9	30.3	24.18	55.2
2,921.0	52.23	42.20	2,890.6	64.2	45.9	21.59	78.6
2,951.0	58.30	43.46	2,907.7	82.3	62.7	20.52	103.2



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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)
2,981.0	64.90	45.81	2,922.0	101.0	81.2	23.05	129.5
3,012.0	71.93	46.14	2,933.4	121.1	101.9	22.70	158.2
3,040.0	78.44	45.09	2,940.5	140.0	121.2	23.53	185.2
3,070.0	81.43	42.81	2,945.8	161.2	141.7	12.46	214.7
Top of Coal							
<u>3,101.0</u>	<u>83.19</u>	40.61	<u>2,949.9</u>	<u>184.2</u>	<u>162.2</u>	9.04	245.4
3,131.0	86.17	39.38	<u>2,952.7</u>	<u>207.1</u>	<u>181.4</u>	10.74	275.3
3,161.0	88.29	38.68	2,954.2	230.3	200.2	7.44	305.2
3,192.0	89.16	38.50	2,954.9	254.6	219.6	2.87	336.2
3,223.0	90.40	38.15	2,955.0	278.9	238.8	4.16	367.1
3,253.0	90.13	38.15	2,954.8	302.5	257.3	0.90	397.1
3,284.0	90.40	38.50	2,954.7	326.8	276.6	1.43	428.1
3,315.0	90.48	38.59	2,954.5	351.0	295.9	0.39	459.0
3,345.0	90.40	38.33	2,954.2	374.5	314.5	0.91	489.0
3,375.0	90.48	39.12	2,954.0	397.9	333.3	2.65	519.0
3,405.0	90.84	39.99	2,953.6	421.1	352.4	3.14	548.9
3,435.0	90.75	39.73	2,953.2	444.1	371.6	0.92	578.9
3,465.0	90.57	39.64	2,952.9	467.2	390.8	0.67	608.9
3,497.0	90.40	40.35	2,952.6	491.7	411.3	2.28	640.9
3,529.0	90.66	40.70	2,952.3	516.0	432.1	1.36	672.9
3,561.0	90.75	40.52	2,951.9	540.3	453.0	0.63	704.9
3,593.0	90.66	40.35	2,951.5	564.7	473.7	0.60	736.9
3,624.0	90.92	39.64	2,951.1	588.4	493.6	2.44	767.9
3,656.0	90.92	38.76	2,950.6	613.2	513.9	2.75	799.9
3,688.0	91.54	39.03	2,949.9	638.1	534.0	2.11	831.8
3,719.0	91.63	39.20	2,949.0	662.1	553.5	0.62	862.8
3,751.0	91.28	39.20	2,948.2	686.9	573.7	1.09	894.8
3,783.0	91.10	38.68	2,947.6	711.8	593.8	1.72	926.7
3,815.0	91.63	38.85	2,946.8	736.8	613.9	1.74	958.7
3,847.0	91.98	40.35	2,945.8	761.4	634.2	4.81	990.7
3,879.0	91.98	40.70	2,944.7	785.7	655.0	1.09	1,022.7
3,911.0	91.89	41.49	2,943.6	809.8	676.0	2.48	1,054.6
3,942.0	91.28	42.54	2,942.8	832.8	696.8	3.92	1,085.6
3,974.0	91.01	43.69	2,942.1	856.2	718.7	3.69	1,117.6
4,006.0	90.13	44.04	2,941.8	879.3	740.8	2.96	1,149.6
4,038.0	89.87	43.51	2,941.8	902.4	763.0	1.84	1,181.5
4,069.0	90.13	43.42	2,941.8	924.9	784.3	0.89	1,212.5
4,101.0	90.31	43.33	2,941.7	948.1	806.3	0.63	1,244.5
4,132.0	90.31	43.16	2,941.5	970.7	827.5	0.55	1,275.5
4,164.0	90.31	43.16	2,941.3	994.0	849.4	0.00	1,307.4
4,196.0	90.31	43.60	2,941.2	1,017.3	871.4	1.37	1,339.4
4,228.0	89.69	43.69	2,941.2	1,040.5	893.5	1.96	1,371.4
4,260.0	90.31	43.42	2,941.2	1,063.7	915.5	2.11	1,403.4
4,291.0	90.22	41.75	2,941.0	1,086.5	936.5	5.39	1,434.3



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Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
4,323.0	89.96	41.23	2,941.0	1,110.4	957.7	1.82	1,466.3
4,354.0	89.87	40.79	2,941.0	1,133.8	978.0	1.45	1,497.3
4,386.0	90.22	40.52	2,941.0	1,158.1	998.9	1.38	1,529.3
4,418.0	90.40	39.99	2,940.8	1,182.5	1,019.6	1.75	1,561.3
4,449.0	91.19	40.17	2,940.4	1,206.3	1,039.5	2.61	1,592.3
4,481.0	91.89	40.79	2,939.5	1,230.6	1,060.3	2.92	1,624.3
4,513.0	90.84	41.14	2,938.8	1,254.7	1,081.2	3.46	1,656.3
4,544.0	88.72	39.56	2,938.9	1,278.4	1,101.3	8.53	1,687.3
4,576.0	89.69	39.38	2,939.3	1,303.1	1,121.7	3.08	1,719.3
4,608.0	89.69	39.47	2,939.5	1,327.8	1,142.0	0.28	1,751.3
4,640.0	89.43	39.99	2,939.7	1,352.4	1,162.4	1.82	1,783.3
4,672.0	89.96	41.23	2,939.9	1,376.7	1,183.3	4.21	1,815.2
4,704.0	89.60	41.40	2,940.0	1,400.7	1,204.4	1.24	1,847.2
4,735.0	89.60	41.58	2,940.3	1,423.9	1,224.9	0.58	1,878.2
4,767.0	88.81	42.02	2,940.7	1,447.8	1,246.2	2.83	1,910.2
4,799.0	89.60	42.28	2,941.1	1,471.5	1,267.7	2.60	1,942.2
4,831.0	89.78	42.46	2,941.3	1,495.2	1,289.3	0.80	1,974.2
4,863.0	89.87	43.33	2,941.4	1,518.6	1,311.1	2.73	2,006.2
4,895.0	90.13	43.07	2,941.4	1,541.9	1,333.0	1.15	2,038.2
4,926.0	89.34	43.07	2,941.6	1,564.6	1,354.1	2.55	2,069.2
4,958.0	89.43	42.72	2,941.9	1,588.0	1,375.9	1.13	2,101.2
4,989.0	89.96	42.63	2,942.1	1,610.8	1,396.9	1.73	2,132.1
5,011.0	89.60	41.75	2,942.1	1,627.1	1,411.7	4.32	2,154.1
5,075.0	89.60	41.75	2,942.6	1,674.8	1,454.3	0.00	2,218.1

BHL ST



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Targets

Target Name	hit/miss target Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Drill Window		0.00	0.00	2,956.0	0.0	0.0	2,172,163.19	1,302,945.80	36° 57' 49.680 N	107° 24' 18.504 W
				- survey misses by 100.8ft at 2904.9ft MD (2880.4 TVD, 55.0 N, 37.6 E) - Rectangle (sides W1,970.0 H2,620.0 D0.0)						
KOP		0.00	0.00	2,688.0	-11.9	-15.6	2,172,151.48	1,302,930.05	36° 57' 49.562 N	107° 24' 18.696 W
				- survey hits target - Point						
PBHL Lat		0.00	0.00	2,956.0	1,669.8	1,459.9	2,173,815.17	1,304,425.84	36° 58' 6.189 N	107° 24' 0.515 W
				- survey misses by 15.4ft at 5075.0ft MD (2942.6 TVD, 1674.8 N, 1454.3 E) - Point						
Land Curve		0.00	0.00	2,956.0	188.2	158.3	2,172,349.46	1,303,106.37	36° 57' 51.541 N	107° 24' 16.554 W
				- survey misses by 8.2ft at 3102.1ft MD (2950.1 TVD, 185.0 N, 162.9 E) - Point						

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,677.0	2,676.9	-11.9	-15.5	Straight Line Projection To Top of Whipstock
2,769.0	2,767.6	-0.7	-8.7	First MWD Survey
3,070.0	2,945.8	161.2	141.7	Top of Coal
5,075.0	2,942.6	1,674.8	1,454.3	BHL ST

Checked By: _____ Approved By: _____ Date: _____