

ENERGEN

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Corrected Survey

Carracas

Energen Resources

Fr#105

RIO ARRIBA COUNTY NEW MEXICO

CARRACAS UNIT FR #105

OH

H
9-24-07

Survey: Sidetrack 1

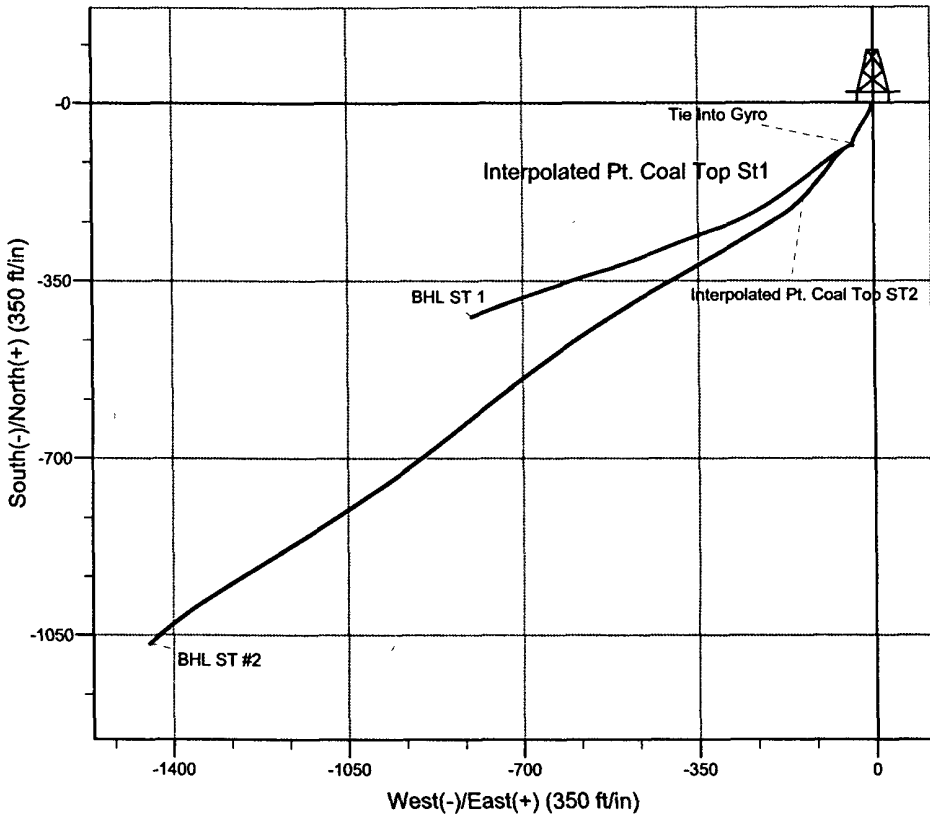
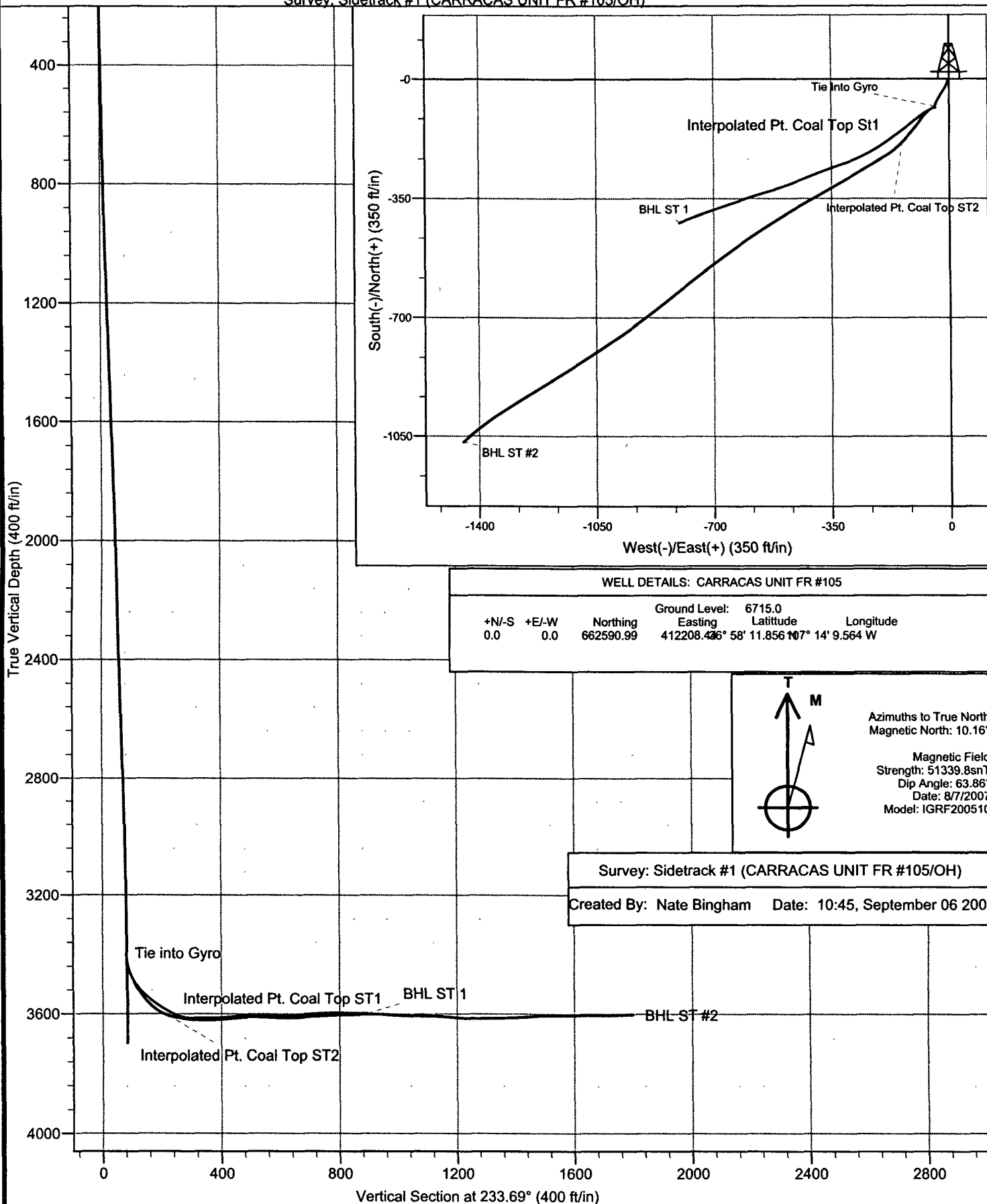
RCVD SEP 24 '07
OIL CONS. DIV.
DIST. 3

End of Well Survey

06 September, 2007

PATHFINDER
ENERGY SERVICES

Survey: Sidetrack #1 (CARRACAS UNIT FR #105/OH)



WELL DETAILS: CARRACAS UNIT FR #105

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude
0.0	0.0	662590.99	6715.0	412208.426° 58'	11.856107° 14'	9.564 W



Azimuths to True North
Magnetic North: 10.16°

Magnetic Field
Strength: 51339.8snT
Dip Angle: 63.86°
Date: 8/7/2007
Model: IGRF200510

Survey: Sidetrack #1 (CARRACAS UNIT FR #105/OH)

Created By: Nate Bingham Date: 10:45, September 06 2007



Pathfinder Energy Services

End of Well Survey



Company: Energen Resources
 Project: Fr#105
 Site: RIO ARRIBA COUNTY NEW MEXICO
 Well: CARRACAS UNIT FR #105
 Wellbore: OH
 Design: Surveys

Local Co-ordinate Reference: Well CARRACAS UNIT FR #105
 TVD Reference: Well @ 6728.0ft (13 Ft RKB)
 MD Reference: Well @ 6728.0ft (13 Ft RKB)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Database: EDM 2003.16 Single User Db

Project	Fr#105		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	RIO ARRIBA COUNTY NEW MEXICO		
Site Position:		Northing:	662,590.99 m
From:	Lat/Long	Easting:	412,208.44 m
Position Uncertainty:	0.0 ft	Slot Radius:	in
		Latitude:	36° 58' 11.856 N
		Longitude:	107° 14' 9.564 W
		Grid Convergence:	-0.59

Well	CARRACAS UNIT FR #105		
Well Position	+N/-S 0.0 ft	Northing:	662,590.99 m
	+E/-W 0.0 ft	Easting:	412,208.44 m
Position Uncertainty	0.0 ft	Wellhead Elevation:	6,728.0 ft
		Ground Level:	6,715.0 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	8/7/2007	10.16
		Dip Angle (°)	63.86
		Field Strength (nT)	51,340

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.0	0.0	0.0
		Direction (°)	233.69

Survey Program	Date 9/6/2007		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
200.0	3,400.0	Gyrodata (OH)	Pathfinder
3,476.0	4,353.0	Sidetrack 1 (OH)	Pathfinder
			Description
			Pathfinder MWD
			Pathfinder MWD

Survey							
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
3,400.0	0.96	181.37	3,398.6	-80.8	-42.3	0.00	82.0
Tie Into Gyro							
3,476.0	24.01	239.47	3,472.4	-89.5	-55.8	30.94	98.0
3,507.0	33.85	239.07	3,499.5	-97.1	-68.7	31.75	112.9
3,539.0	43.00	232.72	3,524.5	-108.3	-85.1	31.11	132.7
3,571.0	51.18	231.67	3,546.3	-122.7	-103.6	25.67	156.1
3,602.0	55.22	232.79	3,564.9	-137.9	-123.2	13.35	180.9
3,648.0	60.50	234.32	3,589.3	-161.0	-154.5	11.82	219.9
3,680.0	67.27	235.47	3,603.4	-177.5	-178.0	21.40	248.6
3,687.0	70.14	235.84	3,606.0	-181.2	-183.4	41.33	255.1
Interpolated Pt. Coal Top							

Company: Energen Resources
Project: Fr#105
Site: RIO ARRIBA COUNTY NEW MEXICO
Well: CARRACAS UNIT FR #105
Wellbore: OH
Design: Surveys

Local Co-ordinate Reference: Well CARRACAS UNIT FR #105
TVD Reference: Well @ 6728.0ft (13 Ft RKB)
MD Reference: Well @ 6728.0ft (13 Ft RKB)
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)
3,701.0	75.89	236.54	3,610.0	-188.6	-194.5	41.33	268.5
3,727.0	89.08	240.10	3,613.4	-202.1	-216.4	52.51	294.1
3,759.0	90.66	242.79	3,613.5	-217.4	-244.5	9.75	325.8
3,788.0	89.94	245.89	3,613.4	-230.0	-270.7	10.97	354.3
3,820.0	91.89	250.59	3,612.8	-241.8	-300.4	15.90	385.2
3,851.0	93.39	251.08	3,611.4	-252.0	-329.6	5.09	414.8
3,881.0	95.67	250.42	3,609.0	-261.9	-357.8	7.91	443.4
3,912.0	93.30	249.50	3,606.6	-272.5	-386.9	8.20	473.1
3,944.0	90.22	246.61	3,605.6	-284.4	-416.5	13.19	504.1
3,975.0	88.29	248.30	3,606.0	-296.3	-445.2	8.27	534.2
4,005.0	88.81	249.95	3,606.8	-307.0	-473.2	5.76	563.1
4,036.0	90.04	250.04	3,607.1	-317.6	-502.3	3.98	592.8
4,067.0	91.98	252.39	3,606.6	-327.6	-531.6	9.83	622.4
4,098.0	94.35	253.59	3,604.9	-336.6	-561.2	8.57	651.6
4,129.0	95.23	252.15	3,602.3	-345.7	-590.8	5.43	680.8
4,160.0	93.56	250.51	3,599.9	-355.6	-620.0	7.54	710.2
4,191.0	92.68	251.24	3,598.2	-365.8	-649.3	3.69	739.8
4,220.0	90.84	251.21	3,597.3	-375.1	-676.7	6.35	767.4
4,251.0	91.36	251.27	3,596.7	-385.0	-706.1	1.69	797.0
4,281.0	88.81	249.51	3,596.7	-395.1	-734.3	10.33	825.7
4,353.0	88.81	249.51	3,598.2	-420.3	-801.8	0.00	895.0

BHL ST 1

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (m)	Easting (m)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL ST 2	0.00	0.00	3,612.0	-970.0	-1,320.0	662,299.51	411,803.06	36° 58' 2.265 N	107° 14' 25.829 W
- survey misses by 755.6ft at 4353.0ft MD (3598.2 TVD, -420.3 N, -801.8 E)									
- Point									

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,400.0	3,398.6	-80.8	-42.3	Tie Into Gyro
3,687.0	3,606.0	-181.2	-183.4	Interpolated Pt. Coal Top
4,353.0	3,598.2	-420.3	-801.8	BHL ST 1

Checked By: _____ Approved By: _____ Date: _____