



Energen Resources

SJBR-S22, T32N, R6W

Eul Canyon

San Juan 32-5 Unit #110

San Juan 32-5 Unit #110 ST

Survey: OH

30-039-26721

RCVD OCT 30 '07

OIL CONS. DIV.

DIST. 3

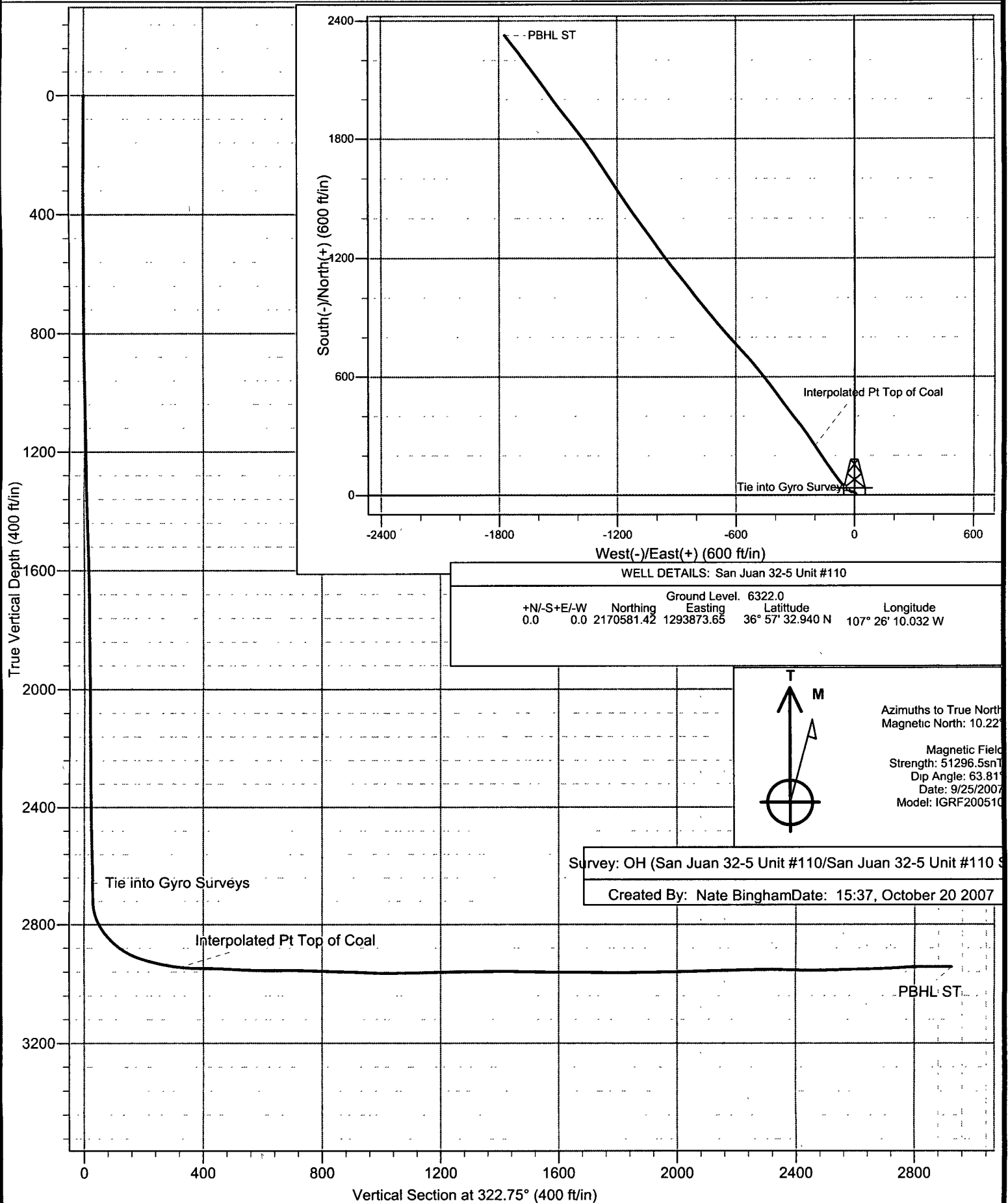
End of Well Survey

20 October, 2007

PA Surface 155/S 65/E
Lateral origin 413/S 269/E - 3135m 2947T
B/H L 2482/S 1835/E 5731 2944

PATHFINDER
ENERGY SERVICES

Survey: OH (San Juan 32-5 Unit #110/San Juan 32-5 Unit #110 ST)



Company:	Energen Resources	Local Co-ordinate Reference:	Well San Juan 32-5 Unit #110
Project:	SJBR-S22, T32N, R6W	TVD Reference:	W @ 6337.0ft (AWS #289)
Site:	Eul Canyon	MD Reference:	W @ 6337.0ft (AWS #289)
Well:	San Juan 32-5 Unit #110	North Reference:	True
Wellbore:	San Juan 32-5 Unit #110 ST	Survey Calculation Method:	Minimum Curvature
Design:	San Juan 32-5 Unit #110 ST	Database:	EDM 2003.16 Single User Db

Project:	SJBR-S22, T32N, R6W		
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:	2,170,581.42 ft
From:	Lat/Long	Easting:	1,293,873.65 ft
Position Uncertainty:	0 0 ft	Slot Radius:	"
		Latitude:	36° 57' 32.940 N
		Longitude:	107° 26' 10.032 W
		Grid Convergence:	-0.71

Well:	San Juan 32-5 Unit #110		
Well Position	+N/-S	0.0 ft	Northing: 2,170,581.42 ft
	+E/-W	0.0 ft	Easting: 1,293,873.65 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	6,322.0 ft
		Ground Level:	6,322.0 ft

Wellbore:	San Juan 32-5 Unit #110 ST		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	9/25/2007	10.22
			Dip Angle (°)
			63.81
			Field Strength (nT)
			51,296

Design:	San Juan 32-5 Unit #110 ST		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)
	0.0	0.0	0.0
			Direction (°)
			322.75

Survey Program	Date 10/20/2007		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
100.0	2,659.0	Gyro Survey (San Juan 32-5 Unit #110 ST)	Pathfinder
2,717.0	5,731.0	OH (San Juan 32-5 Unit #110 ST)	Pathfinder
			Description
			Pathfinder MWD
			Pathfinder MWD

Survey							
MD (ft)	Incl (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
2,659.0	1.49	340.46	2,658.6	19.7	-21.2	0.00	28.5
Tie into Gyro Surveys							
2,717.0	2.59	307.08	2,716.5	21.2	-22.5	2.72	30.5
2,725.0	2.63	303.89	2,724.5	21.4	-22.8	1.88	30.9
2,764.0	15.39	304.24	2,763.0	24.9	-27.8	32.72	36.6
2,793.0	24.53	309.37	2,790.2	30.8	-35.7	32.06	46.2
2,823.0	32.80	313.10	2,816.5	40.4	-46.5	28.19	60.3
2,855.0	40.36	316.97	2,842.2	53.9	-59.9	24.69	79.1
2,886.0	47.57	321.36	2,864.5	70.2	-73.9	25.24	100.6
2,917.0	54.69	324.00	2,883.9	89.4	-88.5	23.90	124.7
2,948.0	61.55	324.68	2,900.3	110.8	-103.8	22.21	151.0



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Site:	Eul Canyon	MD Reference:	W @ 6337.0ft (AWS #289)
Well:	San Juan 32-5 Unit #110	North Reference:	True
Wellbore:	San Juan 32-5 Unit #110 ST	Survey Calculation Method:	Minimum Curvature
Design:	San Juan 32-5 Unit #110 ST	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)
2,977.0	69.20	324.69	2,912.4	132.3	-119.1	26.38	177.3
3,008.0	73.51	324.90	2,922.3	156.2	-136.0	13.92	206.7
3,039.0	76.06	326.09	2,930.4	180.9	-152.9	9.02	236.6
3,070.0	78.88	326.54	2,937.1	206.1	-169.7	9.21	266.8
3,102.0	81.34	326.20	2,942.6	232.3	-187.2	7.76	298.2
3,124.0	83.53	326.40	2,945.5	250.5	-199.3	10.00	320.0
Interpolated Pt Top of Coal							
3,133.0	84.42	326.48	2,946.5	257.9	-204.2	9.93	328.9
3,164.0	87.05	326.45	2,948.8	283.7	-221.3	8.48	359.8
3,195.0	89.69	325.73	2,949.6	309.4	-238.6	8.83	390.7
3,226.0	89.69	323.95	2,949.8	334.7	-256.4	5.74	421.7
3,257.0	87.67	322.50	2,950.5	359.6	-275.0	8.02	452.7
3,289.0	86.61	322.00	2,952.1	384.8	-294.6	3.66	484.6
3,320.0	87.14	321.61	2,953.8	409.2	-313.7	2.12	515.6
3,351.0	87.85	321.86	2,955.2	433.5	-332.9	2.43	546.5
3,382.0	87.76	322.22	2,956.4	457.9	-351.9	1.20	577.5
3,414.0	89.96	324.15	2,957.0	483.5	-371.1	9.14	609.5
3,445.0	90.75	324.74	2,956.8	508.7	-389.1	3.18	640.5
3,476.0	90.31	323.91	2,956.5	533.9	-407.2	3.03	671.5
3,507.0	90.04	323.37	2,956.4	558.9	-425.6	1.95	702.5
3,539.0	87.93	322.04	2,957.0	584.3	-445.0	7.79	734.5
3,570.0	88.37	321.82	2,958.0	608.7	-464.1	1.59	765.4
3,601.0	87.41	320.46	2,959.1	632.8	-483.5	5.37	796.4
3,632.0	88.11	320.25	2,960.3	656.7	-503.3	2.36	827.4
3,663.0	88.99	319.51	2,961.1	680.4	-523.2	3.71	858.3
3,694.0	89.16	318.56	2,961.6	703.8	-543.6	3.11	889.2
3,725.0	87.05	317.40	2,962.7	726.8	-564.3	7.77	920.1
3,756.0	87.14	316.95	2,964.2	749.5	-585.3	1.48	950.9
3,788.0	88.46	317.62	2,965.5	773.0	-607.0	4.63	982.8
3,819.0	89.87	318.89	2,965.9	796.1	-627.7	6.12	1,013.7
3,850.0	90.66	318.45	2,965.8	819.4	-648.1	2.92	1,044.6
3,882.0	90.75	318.53	2,965.4	843.4	-669.3	0.38	1,076.5
3,913.0	91.10	320.28	2,964.9	866.9	-689.5	5.76	1,107.4
3,944.0	91.45	320.41	2,964.2	890.8	-709.3	1.20	1,138.4
3,975.0	91.54	320.46	2,963.4	914.7	-729.0	0.33	1,169.4
4,007.0	91.45	320.40	2,962.5	939.3	-749.4	0.34	1,201.3
4,038.0	90.92	319.69	2,961.9	963.1	-769.3	2.86	1,232.3
4,069.0	90.22	321.52	2,961.6	987.0	-789.0	6.32	1,263.3
4,101.0	90.48	321.51	2,961.4	1,012.1	-808.9	0.81	1,295.2
4,132.0	91.63	322.33	2,960.8	1,036.5	-828.0	4.56	1,326.2
4,163.0	90.57	321.96	2,960.2	1,061.0	-847.0	3.62	1,357.2
4,194.0	90.04	321.39	2,960.1	1,085.3	-866.3	2.51	1,388.2
4,226.0	89.96	320.75	2,960.1	1,110.2	-886.4	2.02	1,420.2
4,257.0	89.34	321.10	2,960.2	1,134.2	-905.9	2.30	1,451.2
4,289.0	88.64	320.65	2,960.8	1,159.1	-926.1	2.60	1,483.2



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Site:	Eul Canyon	MD Reference:	W @ 6337.0ft (AWS #289)
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Wellbore:	San Juan 32-5 Unit #110 ST	Survey Calculation Method:	Minimum Curvature
Design:	San Juan 32-5 Unit #110 ST	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)
4,320.0	89.25	321.99	2,961.4	1,183.3	-945.5	4.75	1,514.2
4,351.0	89.34	324.25	2,961.8	1,208.0	-964.1	7.30	1,545.1
4,382.0	89.78	325.04	2,962.0	1,233.3	-982.0	2.92	1,576.1
4,414.0	89.69	324.34	2,962.1	1,259.4	-1,000.5	2.21	1,608.1
4,445.0	90.13	325.29	2,962.2	1,284.8	-1,018.4	3.38	1,639.1
4,476.0	89.25	324.07	2,962.4	1,310.1	-1,036.3	4.85	1,670.1
4,508.0	89.08	323.67	2,962.8	1,335.9	-1,055.1	1.36	1,702.1
4,539.0	89.43	323.15	2,963.2	1,360.8	-1,073.6	2.02	1,733.1
4,570.0	89.60	323.92	2,963.5	1,385.7	-1,092.0	2.54	1,764.1
4,602.0	90.31	324.27	2,963.5	1,411.6	-1,110.8	2.47	1,796.0
4,633.0	90.48	325.49	2,963.3	1,437.0	-1,128.6	3.97	1,827.0
4,664.0	90.57	325.12	2,963.0	1,462.5	-1,146.3	1.23	1,858.0
4,694.0	90.84	325.38	2,962.7	1,487.1	-1,163.4	1.25	1,888.0
4,726.0	91.36	326.67	2,962.0	1,513.7	-1,181.3	4.35	1,919.9
4,757.0	90.75	326.68	2,961.5	1,539.6	-1,198.3	1.97	1,950.8
4,788.0	90.84	327.23	2,961.0	1,565.6	-1,215.2	1.80	1,981.7
4,820.0	91.28	327.31	2,960.4	1,592.5	-1,232.5	1.40	2,013.6
4,851.0	91.89	326.21	2,959.6	1,618.4	-1,249.5	4.06	2,044.5
4,882.0	92.68	325.99	2,958.4	1,644.1	-1,266.8	2.65	2,075.5
4,913.0	91.36	325.99	2,957.3	1,669.8	-1,284.1	4.26	2,106.4
4,944.0	91.01	326.68	2,956.6	1,695.6	-1,301.3	2.50	2,137.3
4,975.0	91.28	326.84	2,956.0	1,721.5	-1,318.3	1.01	2,168.2
5,007.0	91.98	326.15	2,955.1	1,748.2	-1,335.9	3.07	2,200.2
5,038.0	91.19	324.69	2,954.2	1,773.7	-1,353.5	5.35	2,231.1
5,069.0	91.01	323.71	2,953.6	1,798.8	-1,371.6	3.21	2,262.1
5,101.0	90.40	322.42	2,953.2	1,824.4	-1,390.9	4.46	2,294.1
5,132.0	90.22	322.54	2,953.1	1,849.0	-1,409.7	0.70	2,325.1
5,163.0	88.90	322.29	2,953.3	1,873.5	-1,428.6	4.33	2,356.1
5,194.0	88.02	321.84	2,954.1	1,898.0	-1,447.7	3.19	2,387.1
5,225.0	87.93	321.98	2,955.2	1,922.4	-1,466.8	0.54	2,418.1
5,257.0	90.40	322.40	2,955.7	1,947.6	-1,486.4	7.83	2,450.1
5,288.0	91.19	322.93	2,955.3	1,972.3	-1,505.2	3.07	2,481.0
5,319.0	91.63	323.93	2,954.5	1,997.2	-1,523.7	3.52	2,512.0
5,350.0	91.71	324.18	2,953.6	2,022.3	-1,541.9	0.85	2,543.0
5,382.0	91.71	324.10	2,952.7	2,048.2	-1,560.6	0.25	2,575.0
5,413.0	90.84	323.59	2,952.0	2,073.2	-1,578.9	3.25	2,606.0
5,445.0	91.01	323.21	2,951.5	2,098.9	-1,598.0	1.30	2,638.0
5,476.0	91.98	323.02	2,950.6	2,123.7	-1,616.6	3.19	2,669.0
5,507.0	92.24	323.80	2,949.5	2,148.6	-1,635.0	2.65	2,699.9
5,539.0	93.65	324.30	2,947.9	2,174.4	-1,653.8	4.67	2,731.9
5,570.0	93.91	323.85	2,945.8	2,199.5	-1,672.0	1.67	2,762.8
5,601.0	91.80	323.44	2,944.3	2,224.4	-1,690.3	6.93	2,793.8
5,632.0	89.96	322.28	2,943.8	2,249.1	-1,709.0	7.02	2,824.8



Company:	Energen Resources	Local Co-ordinate Reference:	Well San Juan 32-5 Unit #110
Project:	SJBR-S22, T32N, R6W	TVD Reference:	W @ 6337.0ft (AWS #289)
Site:	Eul Canyon	MD Reference:	W @ 6337.0ft (AWS #289)
Well:	San Juan 32-5 Unit #110	North Reference:	True
Wellbore:	San Juan 32-5 Unit #110 ST	Survey Calculation Method:	Minimum Curvature
Design:	San Juan 32-5 Unit #110 ST	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)
5,731.0	89.96	322.28	2,943.9	2,327.4	-1,769.6	0.00	2,923.8
PBHL ST							

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	3.0	0.0	0.0	2,170,581.42	1,293,873.65	36° 57' 32.940 N	107° 26' 10.032 W
- survey misses by 2655.7ft at 2659.0ft MD (2658.6 TVD, 19.7 N, -21.2 E)									
- Rectangle (sides W2,434.7 H1,956.6 D0.0)									
Land Curve	0.00	0.00	2,952.0	162.5	-124.3	2,170,745.46	1,293,751.38	36° 57' 34.547 N	107° 26' 11.563 W
- survey misses by 31.8ft at 3014.4ft MD (2924.0 TVD, 161.3 N, -139.5 E)									
- Point									
KOP	0.00	0.00	2,747.0	0.0	0.0	2,170,581.42	1,293,873.65	36° 57' 32.940 N	107° 26' 10.032 W
- survey misses by 33.3ft at 2742.4ft MD (2741.8 TVD, 22.4 N, -24.2 E)									
- Point									
PBHL ST	0.00	0.00	2,952.0	2,374.6	-1,815.5	2,172,978.44	1,292,087.85	36° 57' 56.417 N	107° 26' 32.401 W
- survey misses by 66.3ft at 5731.0ft MD (2943.9 TVD, 2327.4 N, -1769.6 E)									
- Point									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,659.0	2,658.6	19.7	-21.2	Tie into Gyro Surveys
3,124.0	2,945.5	250.5	-199.3	Interpolated Pt Top of Coal
5,731.0	2,943.9	2,327.4	-1,769.6	PBHL ST

Checked By: _____ Approved By: _____ Date: _____