

District I

1625 N. French Dr., Hobbs, NM 88240

District II

1301 W. Grand Avenue, Artesia, NM 88210

District III

1000 Rio Brazos Rd., Aztec, NM 87410

District IV

1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102

Revised July 16, 2010

Submit one copy to appropriate

District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-30823	² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL
⁴ Property Code 35667	⁵ Property Name CARRACAS 31B	⁶ Well Number 12H
⁷ OGRID No. 35667	⁸ Operator Name ENERGEN RESOURCES CORPORATION	⁹ Elevation 7247'

¹⁰ Surface Location

UL or lot no. P	Section 30	Township 32N	Range 4W	Lot Idn	Feet from the 994'	North/South line SOUTH	Feet from the 861'	East/West line EAST	County RIO ARRIBA
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¹¹ Bottom Hole Location If Different From Surface

UL or lot no. N	Section 31	Township 32N	Range 4W	Lot Idn	Feet from the 780	North/South line SOUTH	Feet from the 2043	East/West line West	County RIO ARRIBA
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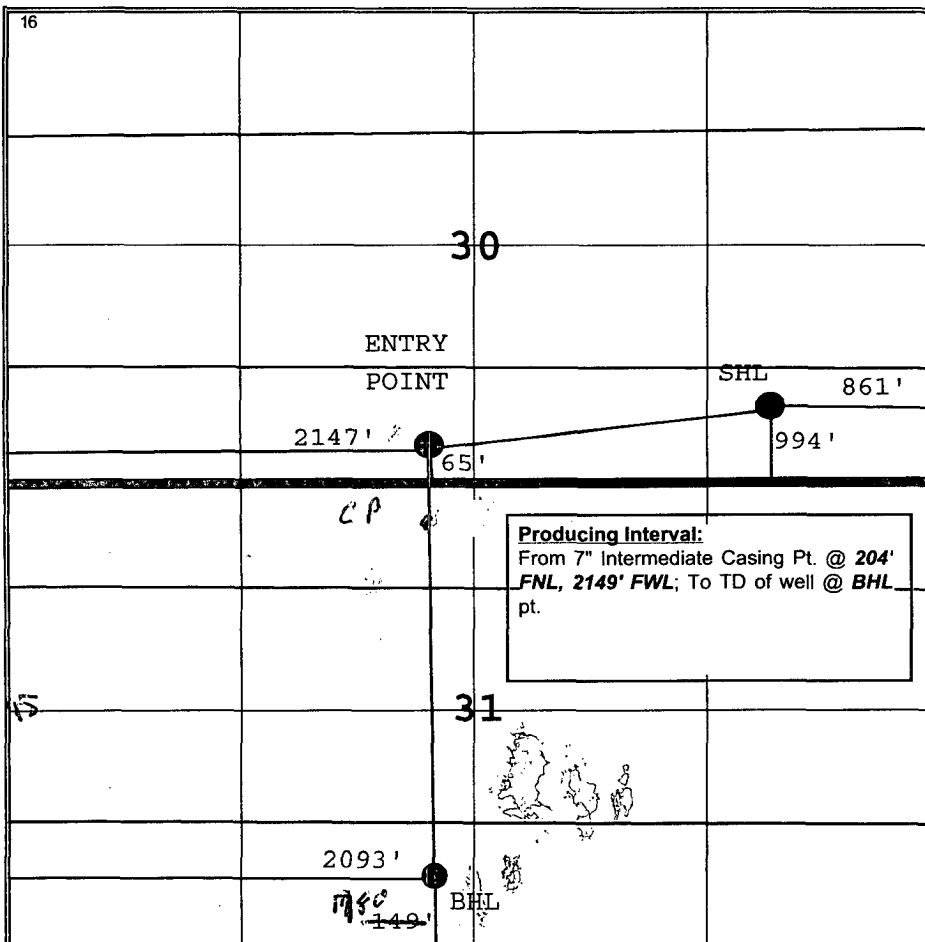
¹² Dedicated Acres 300.96 W/2	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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RCVD OCT 7 '10
OIL CONS. DIV.

DIST. 3

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

5120'

¹⁷ OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Devin Mills 10-4-2010
Signature Date

DEVIN MILLS

Printed Name
DMILLS@ENERGEN.COM

E-mail Address

¹⁸ SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

JULY 23, 2009

Date of Survey

Signature and Seal of Professional Surveyor:

DAVID RUSSELL

Certificate Number

5130'

Energen Resources

Rio Arriba County, NM

Sec. 30-T32N-R4W

Carracas 31B #12

Plan #1



Design: Pathfinder MWD and Sperry MWD Survey

Sperry Drilling Services Standard Report

14 September, 2010

Well Coordinates: 2,167,934.49 N, 1,336,557.40 E (36° 57' 11.70" N, 107° 17' 23.82" W)
Ground Level: 7,247.00 ft

Local Coordinate Origin:	Centered on Well Carracas 31B #12
Viewing Datum:	KB @ 7262.00ft (D&J 1)
TVDs to System:	N
North Reference:	True
Unit System:	API - US Survey Feet - Custom

Geodetic Scale Factor Applied
Version: 2003.16 Build: 431

HALLIBURTON

HALLIBURTON**Design Report for Carracas 31B #12 - Pathfinder MWD and Sperry MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
298.00	0.70	17.70	297.99	1.73	0.55	-1.82	0.23
Surveys from 298.00ft to 5589.00ft are Pathfinder MWD Surveys							
389.00	1.32	297.60	388.98	2.75	-0.21	-2.48	1.52
478.00	1.67	277.37	477.95	3.39	-2.40	-2.28	0.71
568.00	1.32	309.97	567.92	4.22	-4.50	-2.29	1.00
659.00	1.06	280.63	658.90	5.05	-6.13	-2.47	0.72
750.00	1.85	299.50	749.87	5.93	-8.23	-2.52	1.00
831.00	1.93	312.77	830.83	7.50	-10.37	-3.20	0.55
920.00	0.00	227.73	919.81	8.52	-11.47	-3.74	2.17
1,011.00	0.18	139.14	1,010.81	8.41	-11.38	-3.68	0.20
1,101.00	0.09	70.01	1,100.81	8.33	-11.22	-3.66	0.19
1,192.00	0.09	95.93	1,191.81	8.35	-11.08	-3.72	0.04
1,284.00	0.09	247.47	1,283.81	8.31	-11.08	-3.69	0.19
1,376.00	0.09	65.93	1,375.81	8.31	-11.08	-3.69	0.20
1,467.00	0.09	126.92	1,466.81	8.30	-10.95	-3.73	0.10
1,556.00	0.09	195.87	1,555.81	8.19	-10.92	-3.64	0.11
1,649.00	0.09	129.23	1,648.81	8.07	-10.88	-3.54	0.11
1,745.00	0.09	327.85	1,744.81	8.09	-10.86	-3.56	0.19
1,840.00	0.09	338.69	1,839.81	8.22	-10.93	-3.66	0.02
1,935.00	0.09	117.72	1,934.81	8.26	-10.89	-3.71	0.18
1,998.00	0.97	302.18	1,997.81	8.52	-11.30	-3.80	1.68
2,030.00	2.64	298.44	2,029.79	9.01	-12.18	-3.94	5.23
2,062.00	4.13	299.30	2,061.74	9.93	-13.83	-4.19	4.66
2,093.00	5.80	292.03	2,092.62	11.06	-16.25	-4.36	5.75
2,126.00	7.21	283.69	2,125.41	12.18	-19.81	-4.10	5.13
2,157.00	8.62	276.84	2,156.11	12.91	-24.01	-3.26	5.46
2,189.00	10.29	271.50	2,187.68	13.28	-29.25	-1.68	5.89
2,222.00	11.70	268.82	2,220.07	13.28	-35.54	0.61	4.54
2,254.00	13.45	265.92	2,251.30	12.95	-42.50	3.46	5.81
2,285.00	14.86	266.06	2,281.36	12.42	-50.06	6.71	4.55
2,316.00	16.27	265.90	2,311.22	11.84	-58.36	10.29	4.55
2,347.00	17.67	265.50	2,340.87	11.16	-67.38	14.21	4.53
2,379.00	19.08	265.19	2,371.24	10.34	-77.43	18.65	4.42
2,411.00	20.40	266.63	2,401.36	9.57	-88.21	23.30	4.40
2,442.00	21.98	266.45	2,430.26	8.90	-99.40	28.01	5.10
2,474.00	23.39	266.83	2,459.78	8.17	-111.72	33.18	4.43
2,506.00	24.62	267.17	2,489.02	7.49	-124.72	38.56	3.87
2,537.00	26.12	266.84	2,517.03	6.80	-137.98	44.05	4.86
2,569.00	28.40	267.66	2,545.47	6.10	-152.62	50.05	7.22
2,601.00	30.07	267.78	2,573.39	5.48	-168.23	56.33	5.22
2,633.00	32.10	267.63	2,600.80	4.82	-184.74	62.97	6.35
2,665.00	34.82	267.78	2,627.49	4.11	-202.37	70.07	8.50
2,697.00	36.49	267.76	2,653.49	3.38	-221.01	77.55	5.22
2,729.00	38.78	268.40	2,678.83	2.73	-240.54	85.29	7.26
2,761.00	41.06	268.96	2,703.37	2.26	-261.06	93.22	7.21
2,793.00	42.91	269.59	2,727.16	1.99	-282.47	101.29	5.93
2,825.00	44.76	269.76	2,750.24	1.87	-304.63	109.49	5.79
2,857.00	46.60	269.89	2,772.59	1.80	-327.52	117.92	5.76
2,889.00	48.36	270.04	2,794.22	1.78	-351.11	126.54	5.51

Design Report for Carracas 31B #12 - Pathfinder MWD and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
2,920.00	49.77	269.76	2,814.53	1.74	-374.52	135.13	4.60
2,952.00	51.18	269.35	2,834.90	1.55	-399.21	144.32	4.52
2,984.00	52.94	269.48	2,854.57	1.29	-424.44	153.78	5.51
3,016.00	54.69	269.60	2,873.46	1.09	-450.27	163.40	5.48
3,047.00	56.37	269.37	2,891.01	0.86	-475.82	172.95	5.45
3,079.00	57.77	269.61	2,908.40	0.62	-502.68	182.98	4.42
3,111.00	56.63	269.94	2,925.74	0.51	-529.58	192.90	3.67
3,142.00	55.57	270.22	2,943.03	0.55	-555.31	202.26	3.50
3,174.00	56.37	270.31	2,960.93	0.67	-581.83	211.83	2.51
3,206.00	56.37	270.11	2,978.66	0.77	-608.47	221.47	0.52
3,238.00	56.37	269.50	2,996.38	0.68	-635.11	231.28	1.59
3,269.00	56.54	269.15	3,013.51	0.37	-660.95	241.00	1.09
3,301.00	56.19	268.68	3,031.23	-0.13	-687.59	251.19	1.64
3,333.00	56.72	268.88	3,048.92	-0.70	-714.25	261.46	1.74
3,364.00	57.51	268.80	3,065.75	-1.23	-740.28	271.45	2.56
3,396.00	56.54	269.42	3,083.17	-1.64	-767.12	281.64	3.44
3,428.00	57.24	269.28	3,100.65	-1.95	-793.92	291.71	2.22
3,460.00	57.51	269.30	3,117.90	-2.28	-820.87	301.86	0.85
3,492.00	57.42	269.07	3,135.11	-2.67	-847.84	312.07	0.67
3,524.00	57.51	269.39	3,152.32	-3.03	-874.82	322.26	0.89
3,556.00	57.42	270.02	3,169.53	-3.17	-901.80	332.24	1.68
3,588.00	57.33	270.45	3,186.78	-3.06	-928.75	341.97	1.17
3,620.00	57.24	270.78	3,204.08	-2.77	-955.67	351.54	0.91
3,652.00	57.16	270.52	3,221.41	-2.46	-982.57	361.07	0.73
3,684.00	57.42	270.52	3,238.70	-2.22	-1,009.49	370.68	0.81
3,716.00	57.86	271.11	3,255.83	-1.83	-1,036.52	380.19	2.08
3,747.00	57.24	271.28	3,272.46	-1.29	-1,062.67	389.23	2.05
3,778.00	57.07	271.33	3,289.28	-0.70	-1,088.71	398.18	0.56
3,810.00	57.33	271.39	3,306.61	-0.06	-1,115.60	407.41	0.83
3,842.00	57.24	270.70	3,323.91	0.43	-1,142.52	416.78	1.84
3,874.00	57.24	270.06	3,341.22	0.61	-1,169.43	426.44	1.68
3,907.00	57.33	268.76	3,359.06	0.33	-1,197.19	436.84	3.33
3,938.00	57.51	267.60	3,375.75	-0.50	-1,223.30	447.15	3.21
3,969.00	58.04	265.68	3,392.28	-2.04	-1,249.48	458.14	5.51
4,000.00	58.48	263.26	3,408.59	-4.58	-1,275.72	470.09	6.79
4,032.00	58.48	260.40	3,425.32	-8.46	-1,302.71	483.55	7.62
4,064.00	58.48	258.38	3,442.06	-13.48	-1,329.52	498.02	5.38
4,096.00	58.30	256.11	3,458.83	-19.50	-1,356.10	513.32	6.07
4,127.00	57.95	255.11	3,475.20	-26.04	-1,381.60	528.72	2.96
4,159.00	57.60	252.50	3,492.27	-33.59	-1,407.59	545.24	6.99
4,190.00	57.33	250.48	3,508.94	-41.88	-1,432.37	562.01	5.56
4,222.00	57.60	248.58	3,526.15	-51.32	-1,457.65	580.03	5.08
4,254.00	57.95	246.84	3,543.22	-61.59	-1,482.69	598.73	4.73
4,286.00	58.30	245.17	3,560.11	-72.64	-1,507.52	618.08	4.56
4,318.00	58.21	244.09	3,576.95	-84.30	-1,532.10	637.91	2.88
4,381.00	58.04	240.19	3,610.23	-109.29	-1,579.39	678.45	5.26
4,413.00	57.86	238.22	3,627.21	-123.17	-1,602.69	699.88	5.25
4,445.00	58.74	236.40	3,644.03	-137.88	-1,625.60	721.93	5.57
4,509.00	60.15	232.25	3,676.57	-170.02	-1,670.34	768.20	6.00
4,540.00	60.76	230.54	3,691.86	-186.85	-1,691.42	791.56	5.19
4,572.00	61.73	228.79	3,707.25	-205.00	-1,712.80	816.27	5.67

HALLIBURTON**Design Report for Carracas 31B #12 - Pathfinder MWD and Sperry MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,604.00	62.87	227.44	3,722.13	-223.92	-1,733.89	841.58	5.16
4,636.00	64.19	226.39	3,736.39	-243.49	-1,754.81	867.43	5.06
4,670.00	65.42	226.16	3,750.87	-264.75	-1,777.04	895.35	3.67
4,701.00	66.65	225.75	3,763.46	-284.45	-1,797.40	921.12	4.15
4,764.00	66.65	223.67	3,788.43	-325.55	-1,838.09	974.24	3.03
4,795.00	68.32	222.50	3,800.30	-346.46	-1,857.65	1,000.85	6.42
4,827.00	69.12	221.27	3,811.91	-368.66	-1,877.56	1,028.79	4.37
4,858.00	69.64	219.73	3,822.83	-390.73	-1,896.40	1,056.21	4.94
4,890.00	69.82	217.43	3,833.92	-414.19	-1,915.12	1,084.88	6.77
4,922.00	70.61	215.15	3,844.75	-438.46	-1,932.93	1,113.98	7.14
4,953.00	71.40	212.81	3,854.84	-462.76	-1,949.31	1,142.59	7.58
4,985.00	72.46	211.26	3,864.77	-488.55	-1,965.45	1,172.49	5.67
5,016.00	73.69	209.73	3,873.79	-514.11	-1,980.50	1,201.78	6.17
5,048.00	75.10	208.20	3,882.40	-541.07	-1,995.42	1,232.33	6.37
5,080.00	76.59	206.66	3,890.23	-568.61	-2,009.71	1,263.18	6.59
5,112.00	77.65	204.49	3,897.36	-596.75	-2,023.18	1,294.29	7.39
5,144.00	78.35	202.62	3,904.02	-625.44	-2,035.68	1,325.57	6.12
5,176.00	78.88	200.76	3,910.33	-654.59	-2,047.28	1,356.94	5.93
5,208.00	79.32	198.85	3,916.39	-684.15	-2,057.92	1,388.35	6.02
5,239.00	80.02	196.59	3,921.94	-713.20	-2,067.20	1,418.78	7.52
5,271.00	81.25	195.30	3,927.15	-743.56	-2,075.88	1,450.21	5.53
5,302.00	82.75	193.98	3,931.47	-773.26	-2,083.63	1,480.69	6.42
5,334.00	84.06	192.40	3,935.14	-804.20	-2,090.89	1,512.15	6.39
5,366.00	84.68	190.92	3,938.28	-835.39	-2,097.32	1,543.53	4.99
5,397.00	85.38	189.58	3,940.97	-865.78	-2,102.82	1,573.83	4.86
5,429.00	84.86	188.60	3,943.69	-897.26	-2,107.86	1,604.98	3.46
5,445.00	84.64	187.33	3,945.15	-913.04	-2,110.06	1,620.48	8.02
Top of Target Coal (Interpolated Point - Not a Survey Station)							
5,461.00	84.42	186.06	3,946.68	-928.86	-2,111.92	1,635.88	8.02
5,493.00	85.03	184.47	3,949.62	-960.59	-2,114.84	1,666.49	5.30
5,524.00	86.09	183.38	3,952.02	-991.42	-2,116.96	1,695.96	4.90
5,557.00	87.67	182.17	3,953.82	-1,024.33	-2,118.55	1,727.18	6.03
5,589.00	88.81	181.56	3,954.80	-1,056.30	-2,119.59	1,757.32	4.04
Tie-On to Pathfinder MWD Survey							
5,637.00	89.46	180.51	3,955.52	-1,104.29	-2,120.46	1,802.31	2.58
7" Casing Point (Interpolated Point - Not a Survey Station)							
5,731.00	90.74	178.44	3,955.36	-1,198.28	-2,119.59	1,889.49	2.58
First Sperry MWD Survey							
5,762.00	92.35	178.76	3,954.52	-1,229.25	-2,118.84	1,918.06	5.30
5,794.00	92.35	178.68	3,953.21	-1,261.22	-2,118.12	1,947.55	0.25
5,826.00	90.68	177.30	3,952.36	-1,293.19	-2,117.00	1,976.90	6.77
5,858.00	89.20	179.01	3,952.40	-1,325.17	-2,115.97	2,006.30	7.07
5,889.00	89.44	179.48	3,952.77	-1,356.16	-2,115.56	2,035.01	1.70
5,921.00	89.32	179.41	3,953.11	-1,388.16	-2,115.25	2,064.68	0.43
5,953.00	89.38	179.05	3,953.47	-1,420.15	-2,114.82	2,094.31	1.14
5,985.00	89.38	178.55	3,953.82	-1,452.15	-2,114.15	2,123.85	1.56
6,017.00	89.51	178.48	3,954.13	-1,484.13	-2,113.32	2,153.32	0.46
6,048.00	89.63	178.09	3,954.36	-1,515.12	-2,112.40	2,181.83	1.32
6,080.00	89.51	178.35	3,954.60	-1,547.10	-2,111.40	2,211.24	0.89
6,112.00	87.96	178.55	3,955.31	-1,579.08	-2,110.54	2,240.70	4.88
6,144.00	87.90	177.85	3,956.47	-1,611.04	-2,109.53	2,270.09	2.19

Design Report for Carracas 31B #12 - Pathfinder MWD and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,175.00	87.96	177.61	3,957.59	-1,642.00	-2,108.30	2,298.46	0.80
6,207.00	89.14	178.36	3,958.40	-1,673.97	-2,107.18	2,327.81	4.37
6,239.00	90.00	178.17	3,958.64	-1,705.95	-2,106.21	2,357.23	2.75
6,270.00	90.74	180.39	3,958.44	-1,736.95	-2,105.82	2,385.94	7.55
6,301.00	90.00	181.43	3,958.23	-1,767.94	-2,106.31	2,414.98	4.12
6,332.00	89.88	182.21	3,958.27	-1,798.93	-2,107.30	2,444.18	2.55
6,363.00	89.94	181.36	3,958.32	-1,829.91	-2,108.26	2,473.38	2.75
6,393.00	90.00	180.56	3,958.33	-1,859.91	-2,108.77	2,501.49	2.67
6,435.00	88.64	180.81	3,958.83	-1,901.90	-2,109.27	2,540.76	3.29
6,466.00	88.77	181.29	3,959.53	-1,932.89	-2,109.84	2,569.82	1.60
6,496.00	88.95	181.32	3,960.13	-1,962.87	-2,110.52	2,597.98	0.61
6,527.00	89.26	181.43	3,960.61	-1,993.86	-2,111.26	2,627.10	1.06
6,558.00	89.38	181.18	3,960.98	-2,024.85	-2,111.97	2,656.21	0.89
6,589.00	89.63	181.37	3,961.25	-2,055.84	-2,112.66	2,685.31	1.01
6,619.00	90.43	181.51	3,961.23	-2,085.83	-2,113.41	2,713.51	2.71
6,649.00	90.49	181.63	3,960.99	-2,115.82	-2,114.24	2,741.73	0.45
6,680.00	90.68	181.16	3,960.67	-2,146.81	-2,114.99	2,770.85	1.64
6,711.00	90.56	181.16	3,960.34	-2,177.80	-2,115.62	2,799.93	0.39
6,741.00	90.74	180.71	3,960.00	-2,207.79	-2,116.11	2,828.03	1.62
6,772.00	90.68	180.84	3,959.61	-2,238.79	-2,116.53	2,857.04	0.46
6,801.00	90.56	180.69	3,959.30	-2,267.79	-2,116.91	2,884.18	0.66
6,832.00	90.19	180.20	3,959.10	-2,298.78	-2,117.15	2,913.12	1.98
6,863.00	90.12	179.91	3,959.01	-2,329.78	-2,117.18	2,941.99	0.96
6,893.00	89.88	180.00	3,959.01	-2,359.78	-2,117.16	2,969.91	0.85
6,924.00	89.63	181.55	3,959.15	-2,390.78	-2,117.58	2,998.92	5.06
6,955.00	90.00	181.95	3,959.25	-2,421.76	-2,118.53	3,028.11	1.76
6,985.00	90.12	181.74	3,959.22	-2,451.75	-2,119.49	3,056.38	0.81
7,016.00	89.81	181.65	3,959.23	-2,482.74	-2,120.41	3,085.56	1.04
7,047.00	89.69	181.95	3,959.37	-2,513.72	-2,121.38	3,114.76	1.04
7,077.00	90.06	182.53	3,959.44	-2,543.70	-2,122.56	3,143.10	2.29
7,107.00	89.69	182.42	3,959.50	-2,573.67	-2,123.85	3,171.47	1.29
7,138.00	88.27	182.91	3,960.05	-2,604.63	-2,125.29	3,200.82	4.85
7,169.00	88.15	182.90	3,961.02	-2,635.57	-2,126.86	3,230.20	0.39
7,198.00	87.40	183.18	3,962.15	-2,664.51	-2,128.40	3,257.70	2.76
7,229.00	87.41	183.13	3,963.55	-2,695.43	-2,130.10	3,287.11	0.16
7,260.00	87.47	183.00	3,964.93	-2,726.36	-2,131.76	3,316.50	0.46
7,291.00	86.79	182.44	3,966.49	-2,757.28	-2,133.23	3,345.83	2.84
7,321.00	86.97	181.93	3,968.12	-2,787.22	-2,134.37	3,374.12	1.80
7,352.00	87.59	181.67	3,969.59	-2,818.17	-2,135.34	3,403.28	2.17
7,383.00	87.47	181.36	3,970.93	-2,849.13	-2,136.16	3,432.40	1.07
7,413.00	84.93	180.71	3,972.91	-2,879.05	-2,136.70	3,460.46	8.74
7,444.00	85.49	181.20	3,975.50	-2,909.94	-2,137.22	3,489.40	2.40
7,475.00	85.98	182.30	3,977.81	-2,940.84	-2,138.16	3,518.52	3.88
7,505.00	86.72	183.10	3,979.72	-2,970.74	-2,139.57	3,546.87	3.63
7,536.00	87.53	183.29	3,981.27	-3,001.66	-2,141.30	3,576.28	2.68
7,567.00	87.84	182.93	3,982.53	-3,032.59	-2,142.98	3,605.69	1.53
7,597.00	88.83	182.98	3,983.40	-3,062.53	-2,144.52	3,634.13	3.30
7,626.00	89.07	182.79	3,983.93	-3,091.49	-2,145.98	3,661.62	1.06
7,657.00	89.26	182.02	3,984.38	-3,122.46	-2,147.28	3,690.93	2.56
7,688.00	89.38	182.26	3,984.75	-3,153.44	-2,148.44	3,720.19	0.87
7,718.00	89.75	182.15	3,984.98	-3,183.41	-2,149.60	3,748.52	1.29

Design Report for Carracas 31B #12 - Pathfinder MWD and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,749.00	90.56	182.31	3,984.89	-3,214.39	-2,150.80	3,777.79	2.66
7,780.00	91.67	183.13	3,984.29	-3,245.35	-2,152.27	3,807.15	4.45
7,809.00	93.21	182.96	3,983.05	-3,274.28	-2,153.81	3,834.65	5.34
7,840.00	93.89	183.15	3,981.14	-3,305.18	-2,155.46	3,864.01	2.28
7,871.00	93.03	183.64	3,979.26	-3,336.07	-2,157.29	3,893.44	3.19
7,902.00	93.28	183.48	3,977.56	-3,366.96	-2,159.22	3,922.90	0.96
7,932.00	93.46	183.91	3,975.79	-3,396.84	-2,161.15	3,951.43	1.55
7,962.00	93.58	183.94	3,973.95	-3,426.72	-2,163.20	3,979.98	0.41
7,993.00	92.47	184.76	3,972.32	-3,457.58	-2,165.54	4,009.58	4.45
8,024.00	91.48	184.62	3,971.25	-3,488.46	-2,168.08	4,039.25	3.23
8,055.00	90.99	183.94	3,970.58	-3,519.37	-2,170.39	4,068.86	2.70
8,087.00	90.99	183.52	3,970.03	-3,551.30	-2,172.47	4,099.35	1.31
8,118.00	89.63	183.12	3,969.86	-3,582.24	-2,174.27	4,128.81	4.57
8,150.00	89.63	182.78	3,970.07	-3,614.20	-2,175.91	4,159.16	1.06
8,182.00	90.06	182.63	3,970.15	-3,646.16	-2,177.42	4,189.47	1.42
8,214.00	90.19	182.24	3,970.08	-3,678.13	-2,178.78	4,219.73	1.28
8,245.00	90.31	182.26	3,969.95	-3,709.11	-2,180.00	4,249.01	0.39
8,277.00	90.80	182.15	3,969.64	-3,741.09	-2,181.23	4,279.23	1.57
8,309.00	90.99	180.75	3,969.14	-3,773.07	-2,182.04	4,309.30	4.41
8,340.00	89.94	180.69	3,968.89	-3,804.07	-2,182.43	4,338.30	3.39
8,372.00	89.63	180.88	3,969.01	-3,836.06	-2,182.87	4,368.25	1.14
8,404.00	89.51	180.33	3,969.25	-3,868.06	-2,183.21	4,398.16	1.76
8,435.00	89.38	180.51	3,969.55	-3,899.06	-2,183.43	4,427.10	0.72
8,467.00	89.14	180.52	3,969.96	-3,931.05	-2,183.72	4,456.99	0.75
8,499.00	89.26	180.75	3,970.41	-3,963.05	-2,184.08	4,486.91	0.81
8,531.00	89.26	180.66	3,970.82	-3,995.04	-2,184.47	4,516.84	0.28
8,563.00	89.01	180.63	3,971.30	-4,027.04	-2,184.83	4,546.75	0.79
8,594.00	89.69	179.95	3,971.66	-4,058.04	-2,184.99	4,575.67	3.10
8,626.00	89.63	179.89	3,971.84	-4,090.03	-2,184.94	4,605.44	0.27
8,657.00	89.75	179.31	3,972.01	-4,121.03	-2,184.73	4,634.22	1.91
8,689.00	90.25	179.08	3,972.01	-4,153.03	-2,184.28	4,663.84	1.72
8,720.00	90.12	179.22	3,971.91	-4,184.03	-2,183.82	4,692.53	0.62
8,752.00	90.56	179.13	3,971.72	-4,216.02	-2,183.36	4,722.15	1.40
8,784.00	90.37	179.34	3,971.46	-4,248.02	-2,182.93	4,751.78	0.88
8,815.00	88.83	179.05	3,971.68	-4,279.01	-2,182.49	4,780.48	5.06
8,847.00	88.58	179.00	3,972.40	-4,311.00	-2,181.95	4,810.06	0.80
8,879.00	88.52	178.68	3,973.21	-4,342.98	-2,181.30	4,839.59	1.02
8,911.00	88.58	178.43	3,974.02	-4,374.96	-2,180.49	4,869.07	0.80
8,943.00	88.77	178.45	3,974.76	-4,406.94	-2,179.62	4,898.52	0.60
8,974.00	88.83	178.00	3,975.41	-4,437.92	-2,178.66	4,927.01	1.46
9,006.00	88.64	177.23	3,976.12	-4,469.89	-2,177.33	4,956.28	2.48
9,038.00	88.52	177.04	3,976.91	-4,501.84	-2,175.73	4,985.44	0.70
9,070.00	88.83	177.15	3,977.65	-4,533.79	-2,174.11	5,014.60	1.03
9,102.00	89.01	177.14	3,978.25	-4,565.74	-2,172.52	5,043.76	0.56
9,133.00	88.21	178.51	3,979.01	-4,596.71	-2,171.34	5,072.16	5.12
9,165.00	87.96	178.92	3,980.08	-4,628.68	-2,170.62	5,101.67	1.50
9,197.00	87.71	179.53	3,981.28	-4,660.66	-2,170.19	5,131.28	2.06
9,229.00	88.46	180.46	3,982.35	-4,692.64	-2,170.19	5,161.05	3.73
9,261.00	88.21	179.77	3,983.28	-4,724.62	-2,170.25	5,190.85	2.29
9,292.00	88.64	179.92	3,984.14	-4,755.61	-2,170.17	5,219.67	1.47
9,324.00	90.25	180.23	3,984.45	-4,787.61	-2,170.21	5,249.47	5.12

Design Report for Carracas 31B #12 - Pathfinder MWD and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,356.00	90.56	180.82	3,984.22	-4,819.61	-2,170.50	5,279.37	2.08
9,388.00	90.68	180.96	3,983.87	-4,851.60	-2,171.00	5,309.33	0.58
9,420.00	91.30	181.02	3,983.32	-4,883.59	-2,171.55	5,339.32	1.95
9,451.00	91.91	180.75	3,982.45	-4,914.58	-2,172.03	5,368.33	2.15
9,483.00	90.62	180.85	3,981.75	-4,946.56	-2,172.48	5,398.28	4.04
9,515.00	90.86	180.46	3,981.33	-4,978.56	-2,172.85	5,428.20	1.43
9,547.00	91.17	180.73	3,980.77	-5,010.55	-2,173.18	5,458.10	1.28
9,579.00	90.99	180.71	3,980.16	-5,042.54	-2,173.58	5,488.03	0.57
9,610.00	89.01	180.01	3,980.16	-5,073.54	-2,173.77	5,516.96	6.77
9,642.00	90.12	180.76	3,980.40	-5,105.54	-2,173.99	5,546.83	4.19
9,674.00	92.72	181.74	3,979.61	-5,137.52	-2,174.69	5,576.85	8.68
9,706.00	93.64	181.90	3,977.84	-5,169.45	-2,175.70	5,606.95	2.92
9,737.00	94.08	181.64	3,975.75	-5,200.37	-2,176.66	5,636.08	1.65
9,769.00	92.41	180.95	3,973.94	-5,232.31	-2,177.38	5,666.08	5.65
9,801.00	90.86	180.78	3,973.03	-5,264.29	-2,177.86	5,696.03	4.87
9,833.00	90.80	180.62	3,972.56	-5,296.28	-2,178.25	5,725.96	0.53
9,865.00	90.80	179.60	3,972.12	-5,328.28	-2,178.31	5,755.77	3.19
9,897.00	91.05	179.41	3,971.60	-5,360.27	-2,178.04	5,785.45	0.98
9,929.00	91.42	179.40	3,970.91	-5,392.27	-2,177.71	5,815.11	1.16
9,960.00	91.24	179.19	3,970.19	-5,423.25	-2,177.32	5,843.82	0.89
9,992.00	91.54	179.35	3,969.41	-5,455.24	-2,176.92	5,873.45	1.06
Final Sperry MWD Survey							
10,034.00	91.54	179.35	3,968.28	-5,497.22	-2,176.44	5,912.36	0.00
Survey Projection to TD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
298.00	297.99	1.73	0.55	Surveys from 298.00ft to 5589.00ft are Pathfinder MWD Surveys
5,445.00	3,945.15	-913.04	-2,110.06	Top of Target Coal (Interpolated Point - Not a Survey Station)
5,589.00	3,954.80	-1,056.30	-2,119.59	Tie-On to Pathfinder MWD Survey
5,637.00	3,955.52	-1,104.29	-2,120.46	7" Casing Point (Interpolated Point - Not a Survey Station)
5,731.00	3,955.36	-1,198.28	-2,119.59	First Sperry MWD Survey
9,992.00	3,969.41	-5,455.24	-2,176.92	Final Sperry MWD Survey
10,034.00	3,968.28	-5,497.22	-2,176.44	Survey Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Carracas 31B #12_BHL Tgt	201.42	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
298.00	5,589.00	Pathfinder MWD Surveys	MWD
5,731.00	10,034.00	Sperry MWD Surveys	MWD

Design Report for Carracas 31B #12 - Pathfinder MWD and Sperry MWD Survey

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
Carracas 31B	0.00	0.00	3,973.00	-5,516.99	-2,163.91	2,162,441.41	1,334,333.39	36° 56' 17.150 N	107° 17' 50.474 W
- actual wellpath misses target center by 23.87ft at 10034.00ft MD (3968.28 TVD, -5497.22 N, -2176.44 E)									
- Point									

HALLIBURTON**North Reference Sheet for Sec. 30-T32N-R4W - Carracas 31B #12 - Plan #1**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to KB @ 7262.00ft (D&J 1). Northing and Easting are relative to Carracas 31B #12

Coordinate System is US State Plane 1983, New Mexico Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is 106° 15' 0.000 W°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 0° 0' 0.000 N°

False Easting: 1,640,416.67ft, False Northing: 0.00ft, Scale Reduction: 1.00000562

Grid Coordinates of Well: 2,167,934.49 ft N, 1,336,557.40 ft E

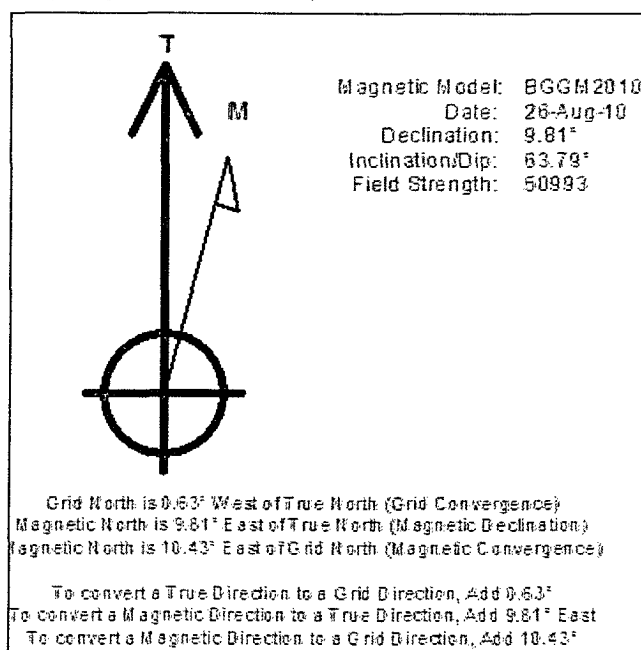
Geographical Coordinates of Well: 36° 57' 11.70" N, 107° 17' 23.82" W

Grid Convergence at Surface is: -0.63°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,034.00ft

the Bottom Hole Displacement is 5,912.39ft in the Direction of 201.60° (True).

Magnetic Convergence at surface is: -10.43° (26 August 2010, , BGGM2010)



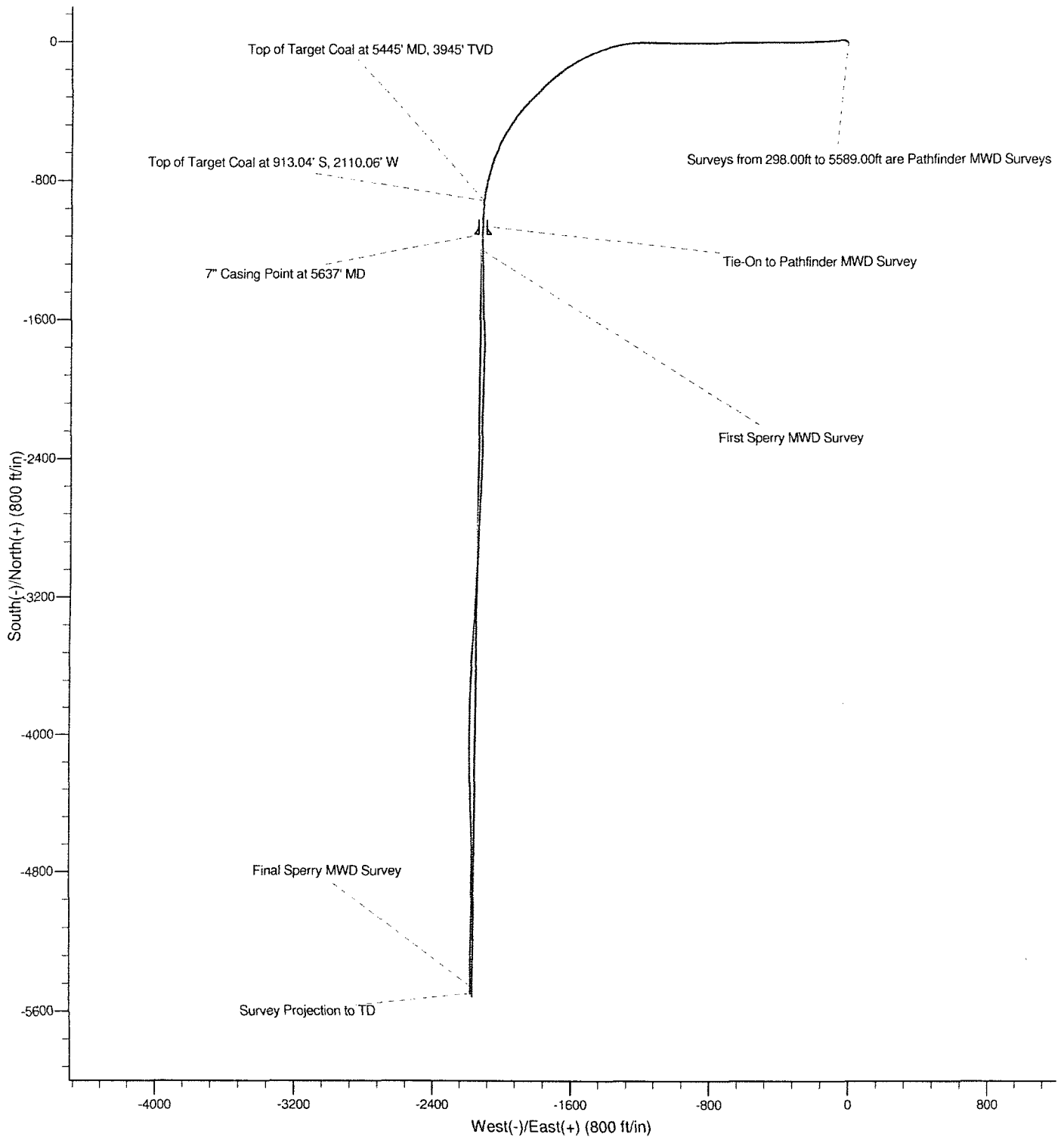
Energen Resources

HALLIBURTON

Sperry Drilling

LEGEND

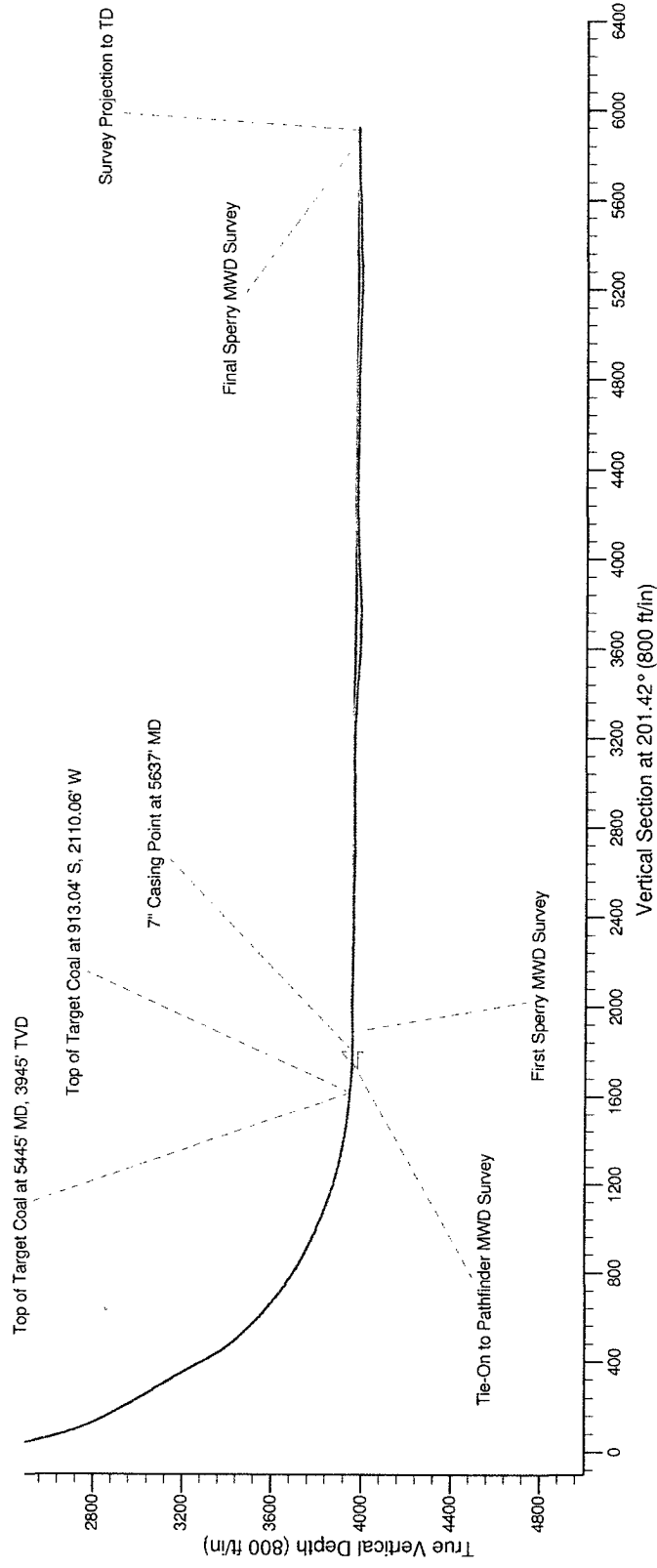
- Carracas 31B #12, Plan #1, Plan #1 - Revision 1 Proposal V0
- Pathfinder MWD and Sperry MWD Survey



Project: Rio Arriba County, NM
Site: Sec. 30-T32N-R4W
Well: Carracas 31B #12

Energen Resources

HALLIBURTON
Sperry Drilling



LEGEND

- Carracas 31B #12, Plan #1, Plan #1 - Revision 1 Proposal V0
- Pathfinder MWD and Sperry MWD Survey