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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.

Vicki Donaghey 11/03/09

Signature Date

Vicki Donaghey
Printed Name

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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

MAY 14, 2008

Date of Survey

Original Survey Conducted and Recorded By David Russell

10201

Certificate Number

REV'D NOV 4 '09
DL CANS.DV.
DIST. 3

Energen Resources

Rio Arriba County, NM

Sec. 24-T32N-R6W

San Juan 32-5 Unit #112S

Wellbore #1

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

29 September, 2009

Well Coordinates: 2,173,281.10 N, 1,302,944.74 E (36° 58' 00.73" N, 107° 24' 18.68" W)
Ground Level: 6,315.00 ft

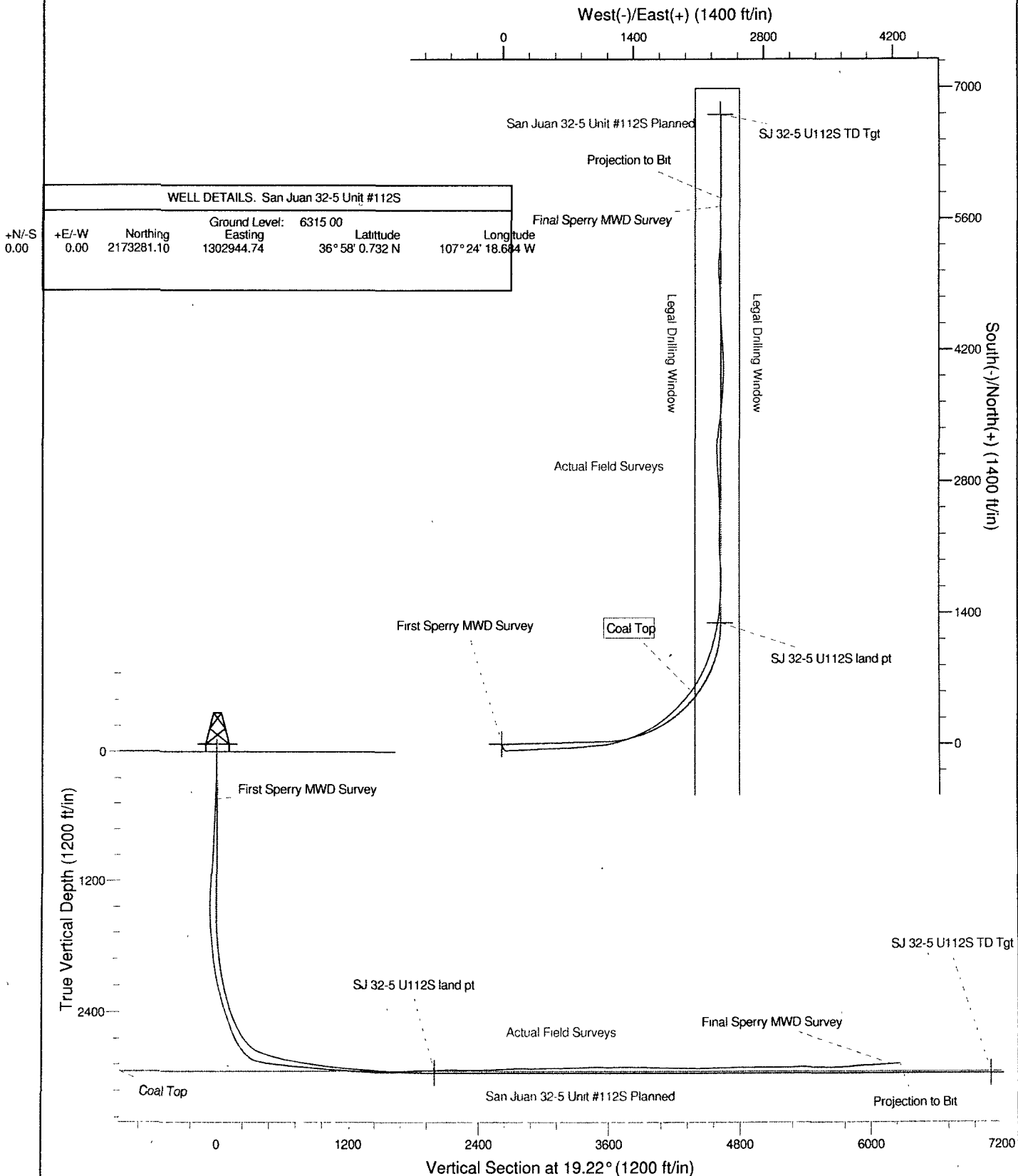
Local Coordinate Origin:	Centered on Well San Juan 32-5 Unit #112S
Viewing Datum:	RKB @ 6330.00ft (Original Well Elev)
TVDs to System:	N
North Reference:	True
Unit System:	API- Alt
Geodetic Scale Factor Applied	
Version: 2003.16 Build. 43I	

HALLIBURTON

Project: Rio Arriba County, NM
 Site: Sec. 24-T32N-R6W
 Well: San Juan 32-5 Unit #112S
 Wellbore: Wellbore #1
 Plan: Actual Field Surveys

Energen Resources

HALLIBURTON
 Drilling and Formation
 Evaluation



Design Report for San Juan 32-5 Unit #112S - Actual Field Surveys

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
SJ 32-5 U112S E Line - SJ 32-5 U112S N Line - SJ 32-5 U112S S Line - SJ 32-5 U112S W Line							
437.00	3.00	158.20	436.80	-10.62	4.25	-8.63	0.69
First Sperry MWD Survey							
499.00	3.00	158.20	498.72	-13.63	5.45	-11.08	0.00
591.00	3.10	163.80	590.59	-18.26	7.04	-14.92	0.34
650.00	3.00	163.70	649.50	-21.27	7.92	-17.48	0.17
710.00	3.10	163.50	709.42	-24.33	8.82	-20.07	0.17
740.00	3.00	165.50	739.37	-25.87	9.25	-21.38	0.49
803.00	3.10	166.50	802.28	-29.12	10.06	-24.19	0.18
833.00	3.00	163.90	832.24	-30.67	10.47	-25.51	0.57
923.00	3.30	159.70	922.11	-35.36	12.02	-29.43	0.42
1,014.00	4.30	152.90	1,012.91	-40.85	14.48	-33.81	1.20
1,104.00	5.10	151.40	1,102.60	-47.37	17.93	-38.82	0.90
1,165.00	5.60	146.40	1,163.34	-52.23	20.88	-42.44	1.12
1,225.00	5.70	144.40	1,223.05	-57.09	24.23	-45.93	0.37
1,255.00	5.90	139.40	1,252.89	-59.47	26.10	-47.56	1.81
1,286.00	6.00	135.00	1,283.73	-61.83	28.28	-49.07	1.51
1,316.00	5.80	130.00	1,313.57	-63.91	30.55	-50.28	1.84
1,336.00	6.00	126.30	1,333.46	-65.18	32.17	-50.95	2.15
1,427.00	6.10	123.60	1,423.95	-70.67	40.03	-53.55	0.33
1,488.00	6.70	102.40	1,484.58	-73.23	46.21	-53.93	3.97
1,549.00	7.60	86.60	1,545.11	-73.75	53.71	-51.95	3.53
1,581.00	7.50	87.20	1,576.84	-73.52	57.91	-50.36	0.40
1,642.00	9.80	88.30	1,637.14	-73.18	67.08	-47.01	3.78
1,705.00	10.30	79.70	1,699.17	-72.01	77.98	-42.32	2.51
1,767.00	11.00	85.90	1,760.11	-70.60	89.33	-37.25	2.16
1,830.00	13.60	93.70	1,821.66	-70.64	102.72	-32.88	4.89
1,893.00	16.30	90.20	1,882.52	-71.15	118.96	-28.02	4.52
1,956.00	19.60	87.40	1,942.45	-70.70	138.36	-21.20	5.41
2,019.00	23.00	86.80	2,001.14	-69.54	161.21	-12.58	5.41
2,082.00	25.80	86.60	2,058.51	-68.04	187.19	-2.61	4.45
2,143.00	27.80	87.90	2,112.95	-66.73	214.66	7.67	3.42
2,203.00	30.30	87.30	2,165.40	-65.50	243.77	18.41	4.19
2,266.00	33.40	85.50	2,218.91	-63.39	276.94	31.33	5.15
2,328.00	35.10	86.60	2,270.15	-61.00	311.74	45.05	2.92
2,391.00	37.30	86.10	2,320.99	-58.62	348.87	59.52	3.52
2,453.00	39.60	85.60	2,369.54	-55.83	387.32	74.82	3.74
2,493.00	41.00	86.80	2,400.05	-54.12	413.14	84.93	4.00
2,553.00	42.10	87.40	2,444.95	-52.11	452.88	99.92	1.95
2,613.00	43.50	88.10	2,488.97	-50.51	493.62	114.84	2.46
2,666.00	44.90	88.20	2,526.97	-49.32	530.54	128.12	2.64
2,727.00	47.70	87.20	2,569.11	-47.54	574.60	144.31	4.74
2,788.00	50.70	87.00	2,608.96	-45.20	620.72	161.70	4.92
2,849.00	53.20	87.50	2,646.56	-42.90	668.69	179.67	4.15
2,909.00	55.60	87.90	2,681.48	-40.95	717.44	197.57	4.04
2,968.00	59.20	86.50	2,713.27	-38.51	767.07	216.22	6.42
3,028.00	61.70	85.90	2,742.86	-35.04	819.15	236.63	4.26
3,088.00	65.20	85.30	2,769.67	-30.92	872.65	258.14	5.90
3,149.00	69.20	84.50	2,793.30	-25.92	928.65	281.30	6.67

HALLIBURTON**Design Report for San Juan 32-5 Unit #112S - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,209.00	72.60	84.50	2,812.93	-20.49	985.08	305.01	5.67
3,270.00	77.90	84.80	2,828.46	-14.99	1,043.79	329.54	8.70
3,331.00	81.70	82.70	2,839.26	-8.45	1,103.45	355.36	7.09
3,392.00	82.30	80.10	2,847.75	0.58	1,163.18	383.55	4.33
3,453.00	82.90	75.90	2,855.61	13.16	1,222.33	414.90	6.90
3,514.00	84.10	74.20	2,862.52	28.80	1,280.88	448.95	3.40
3,575.00	84.90	70.60	2,868.37	47.15	1,338.75	485.34	6.02
3,634.00	85.30	69.40	2,873.41	67.26	1,393.99	522.51	2.14
3,695.00	86.10	65.90	2,877.98	90.39	1,450.24	562.87	5.87
3,756.00	86.00	65.70	2,882.18	115.33	1,505.75	604.70	0.37
3,817.00	85.40	61.90	2,886.76	142.18	1,560.31	648.02	6.29
3,878.00	85.80	60.10	2,891.44	171.67	1,613.51	693.38	3.01
3,939.00	85.90	55.30	2,895.86	204.17	1,664.92	740.99	7.85
4,000.00	86.00	53.20	2,900.16	239.72	1,714.30	790.82	3.44
4,063.00	84.90	51.10	2,905.16	278.25	1,763.88	843.53	3.75
4,123.00	84.60	47.60	2,910.65	317.16	1,809.21	895.20	5.83
4,185.00	84.90	46.30	2,916.33	359.31	1,854.32	949.85	2.14
4,247.00	85.70	43.80	2,921.41	402.96	1,898.05	1,005.46	4.22
4,310.00	85.70	41.80	2,926.13	449.05	1,940.73	1,063.04	3.17
4,372.00	86.30	39.50	2,930.46	495.97	1,981.02	1,120.61	3.83
4,442.00	86.30	36.50	2,934.98	551.01	2,024.02	1,186.74	4.28
4,457.75	86.25	35.71	2,936.00	563.71	2,033.28	1,201.78	5.00
Coal Top							
4,504.00	86.10	33.40	2,939.09	601.71	2,059.46	1,246.28	5.00
4,565.00	87.40	31.00	2,942.54	653.24	2,091.91	1,305.62	4.47
4,628.00	87.40	27.90	2,945.40	708.04	2,122.84	1,367.55	4.92
4,691.00	89.10	26.00	2,947.33	764.17	2,151.38	1,429.94	4.05
4,753.00	89.70	23.70	2,947.98	820.42	2,177.43	1,491.64	3.83
4,785.00	90.50	22.30	2,947.92	849.88	2,189.94	1,523.57	5.04
4,816.00	90.70	21.30	2,947.60	878.66	2,201.45	1,554.53	3.29
4,847.00	91.00	20.10	2,947.14	907.65	2,212.40	1,585.52	3.99
4,877.00	91.00	19.40	2,946.61	935.88	2,222.54	1,615.51	2.33
4,907.00	91.70	18.00	2,945.91	964.29	2,232.15	1,645.50	5.22
4,938.00	92.60	17.00	2,944.74	993.83	2,241.47	1,676.47	4.34
4,968.00	93.30	15.60	2,943.20	1,022.59	2,249.88	1,706.39	5.21
4,999.00	93.40	15.30	2,941.39	1,052.42	2,258.12	1,737.27	1.02
5,019.00	93.50	15.30	2,940.18	1,071.67	2,263.39	1,757.18	0.50
5,051.00	92.70	15.00	2,938.45	1,102.52	2,271.74	1,789.05	2.67
5,082.00	93.80	15.00	2,936.70	1,132.41	2,279.75	1,819.92	3.55
5,129.00	91.30	12.10	2,934.60	1,178.05	2,290.75	1,866.63	8.14
5,160.00	90.60	12.00	2,934.09	1,208.36	2,297.22	1,897.39	2.28
5,190.00	90.40	11.70	2,933.83	1,237.72	2,303.38	1,927.14	1.20
5,220.00	90.60	12.10	2,933.57	1,267.08	2,309.57	1,956.89	1.49
5,251.00	91.50	11.30	2,933.00	1,297.43	2,315.85	1,987.62	3.88
5,256.69	91.63	10.97	2,932.84	1,303.01	2,316.95	1,993.25	6.23
SJ 32-5 U112S land pt							
5,282.00	92.20	9.50	2,932.00	1,327.90	2,321.44	2,018.24	6.23
5,313.00	93.00	7.70	2,930.59	1,358.52	2,326.08	2,048.67	6.35
5,344.00	93.60	5.40	2,928.81	1,389.26	2,329.61	2,078.86	7.66
5,375.00	92.50	4.10	2,927.16	1,420.11	2,332.17	2,108.84	5.49
5,406.00	89.30	4.60	2,926.67	1,451.01	2,334.52	2,138.79	10.45

7' C.S. 9' set

4631

2945

mid(est)

2123

Design Report for San Juan 32-5 Unit #112S - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,437.00	88.10	4.60	2,927.37	1,481.91	2,337.00	2,168.78	3.87
5,467.00	88.00	4.60	2,928.39	1,511.79	2,339.41	2,197.79	0.33
5,498.00	88.00	4.70	2,929.48	1,542.67	2,341.92	2,227.77	0.32
5,528.00	88.80	4.00	2,930.31	1,572.57	2,344.20	2,256.75	3.54
5,559.00	90.70	3.30	2,930.45	1,603.51	2,346.17	2,286.61	6.53
5,590.00	91.00	2.90	2,929.99	1,634.46	2,347.85	2,316.39	1.61
5,621.00	91.30	2.80	2,929.37	1,665.41	2,349.39	2,346.13	1.02
5,651.00	90.20	1.80	2,928.98	1,695.39	2,350.59	2,374.83	4.96
5,682.00	90.30	0.30	2,928.84	1,726.38	2,351.16	2,404.28	4.85
5,712.00	90.50	0.00	2,928.63	1,756.38	2,351.24	2,432.63	1.20
5,743.00	91.40	359.40	2,928.12	1,787.37	2,351.07	2,461.84	3.49
5,774.00	91.30	359.30	2,927.39	1,818.36	2,350.72	2,490.99	0.46
5,805.00	92.00	358.50	2,926.49	1,849.34	2,350.13	2,520.05	3.43
5,835.00	92.20	356.80	2,925.39	1,879.30	2,348.90	2,547.92	5.70
5,864.00	92.50	354.80	2,924.20	1,908.19	2,346.78	2,574.51	6.97
5,894.00	93.10	354.50	2,922.74	1,938.03	2,343.98	2,601.76	2.24
5,925.00	92.30	354.90	2,921.28	1,968.86	2,341.12	2,629.93	2.88
5,955.00	91.80	355.40	2,920.21	1,998.73	2,338.59	2,657.31	2.36
5,985.00	93.30	357.40	2,918.87	2,028.64	2,336.71	2,684.93	8.33
6,016.00	93.30	358.60	2,917.09	2,059.57	2,335.63	2,713.78	3.86
6,047.00	92.30	359.20	2,915.57	2,090.53	2,335.03	2,742.81	3.76
6,078.00	90.60	359.60	2,914.79	2,121.52	2,334.71	2,771.96	5.63
6,109.00	89.10	359.90	2,914.87	2,152.51	2,334.57	2,801.19	4.93
6,137.00	88.60	0.10	2,915.43	2,180.51	2,334.57	2,827.62	1.92
6,170.00	88.60	0.00	2,916.24	2,213.50	2,334.60	2,858.78	0.30
6,201.00	90.10	0.60	2,916.59	2,244.49	2,334.76	2,888.10	5.21
6,232.00	91.70	1.20	2,916.10	2,275.49	2,335.25	2,917.53	5.51
6,261.00	92.20	1.40	2,915.12	2,304.46	2,335.91	2,945.10	1.86
6,292.00	93.30	1.80	2,913.63	2,335.41	2,336.77	2,974.61	3.78
6,323.00	92.60	0.60	2,912.03	2,366.36	2,337.42	3,004.05	4.48
6,353.00	92.00	0.20	2,910.83	2,396.34	2,337.63	3,032.42	2.40
6,384.00	90.60	0.30	2,910.13	2,427.33	2,337.76	3,061.73	4.53
6,415.00	89.90	359.80	2,909.99	2,458.33	2,337.79	3,091.01	2.77
6,446.00	90.70	358.70	2,909.83	2,489.33	2,337.39	3,120.14	4.39
6,477.00	91.00	358.40	2,909.37	2,520.31	2,336.60	3,149.14	1.37
6,508.00	91.40	358.40	2,908.72	2,551.29	2,335.74	3,178.11	1.29
6,538.00	91.50	357.90	2,907.96	2,581.27	2,334.77	3,206.10	1.70
6,568.00	91.10	357.70	2,907.28	2,611.24	2,333.62	3,234.02	1.49
6,599.00	91.20	357.60	2,906.66	2,642.21	2,332.35	3,262.84	0.46
6,629.00	91.50	357.40	2,905.95	2,672.17	2,331.04	3,290.70	1.20
6,660.00	91.20	356.90	2,905.22	2,703.12	2,329.50	3,319.42	1.88
6,691.00	91.90	358.00	2,904.38	2,734.08	2,328.12	3,348.20	4.20
6,721.00	93.00	357.40	2,903.10	2,764.03	2,326.92	3,376.08	4.18
6,752.00	92.50	357.30	2,901.61	2,794.96	2,325.48	3,404.81	1.64
6,783.00	93.00	356.80	2,900.12	2,825.88	2,323.89	3,433.49	2.28
6,814.00	92.10	354.90	2,898.74	2,856.77	2,321.65	3,461.91	6.78
6,843.00	90.60	355.00	2,898.06	2,885.65	2,319.10	3,488.34	5.18
6,874.00	88.30	356.30	2,898.36	2,916.55	2,316.75	3,516.75	8.52
6,905.00	87.00	356.50	2,899.63	2,947.47	2,314.80	3,545.30	4.24
6,935.00	88.10	357.00	2,900.91	2,977.39	2,313.10	3,572.99	4.03
6,965.00	89.90	358.20	2,901.44	3,007.36	2,311.85	3,600.88	7.21

HALLIBURTON**Design Report for San Juan 32-5 Unit #112S - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,997.00	90.80	358.60	2,901.24	3,039.34	2,310.95	3,630.79	3.08
7,029.00	91.70	358.40	2,900.54	3,071.32	2,310.11	3,660.71	2.88
7,060.00	92.90	359.10	2,899.30	3,102.29	2,309.44	3,689.72	4.48
7,092.00	92.50	359.50	2,897.79	3,134.25	2,309.05	3,719.78	1.77
7,124.00	90.40	0.20	2,896.98	3,166.24	2,308.96	3,749.95	6.92
7,155.00	89.10	1.30	2,897.12	3,197.24	2,309.37	3,779.35	5.49
7,187.00	88.50	2.90	2,897.79	3,229.21	2,310.54	3,809.93	5.34
7,218.00	89.10	4.80	2,898.44	3,260.13	2,312.62	3,839.81	6.43
7,250.00	90.10	5.90	2,898.66	3,291.99	2,315.61	3,870.87	4.65
7,282.00	88.70	6.20	2,898.99	3,323.81	2,318.98	3,902.03	4.47
7,313.00	87.60	6.00	2,899.99	3,354.61	2,322.27	3,932.20	3.61
7,344.00	87.70	7.10	2,901.27	3,385.39	2,325.81	3,962.42	3.56
7,376.00	88.00	7.30	2,902.47	3,417.11	2,329.81	3,993.70	1.13
7,408.00	88.50	7.70	2,903.44	3,448.82	2,333.99	4,025.02	2.00
7,440.00	88.40	6.90	2,904.31	3,480.55	2,338.05	4,056.31	2.52
7,471.00	88.70	6.40	2,905.09	3,511.33	2,341.64	4,086.56	1.88
7,504.00	88.20	6.20	2,905.99	3,544.12	2,345.26	4,118.71	1.63
7,521.00	88.50	6.50	2,906.48	3,561.01	2,347.14	4,135.28	2.50
7,552.00	89.10	6.20	2,907.13	3,591.81	2,350.57	4,165.49	2.16
7,583.00	90.20	5.90	2,907.31	3,622.64	2,353.84	4,195.67	3.68
7,615.00	90.20	5.00	2,907.20	3,654.49	2,356.88	4,226.75	2.81
7,647.00	89.60	3.60	2,907.26	3,686.40	2,359.27	4,257.67	4.76
7,678.00	89.30	4.30	2,907.56	3,717.33	2,361.41	4,287.58	2.46
7,710.00	88.10	3.70	2,908.28	3,749.24	2,363.64	4,318.44	4.19
7,741.00	88.30	3.70	2,909.26	3,780.16	2,365.64	4,348.30	0.65
7,773.00	89.00	3.20	2,910.01	3,812.09	2,367.57	4,379.09	2.69
7,805.00	89.60	2.70	2,910.40	3,844.05	2,369.21	4,409.80	2.44
7,837.00	90.20	2.70	2,910.46	3,876.01	2,370.72	4,440.48	1.87
7,855.00	91.20	2.50	2,910.24	3,893.99	2,371.54	4,457.72	5.67
7,887.00	91.70	2.70	2,909.43	3,925.95	2,372.99	4,488.38	1.68
7,919.00	91.70	2.50	2,908.48	3,957.90	2,374.44	4,519.03	0.62
7,951.00	92.50	0.60	2,907.31	3,989.87	2,375.30	4,549.49	6.44
7,983.00	92.20	359.20	2,905.99	4,021.84	2,375.25	4,579.66	4.47
8,014.00	92.30	359.40	2,904.78	4,052.81	2,374.87	4,608.79	0.72
8,046.00	92.00	356.70	2,903.58	4,084.77	2,373.78	4,638.60	8.48
8,078.00	90.70	357.00	2,902.82	4,116.71	2,372.02	4,668.18	4.17
8,110.00	91.80	357.50	2,902.12	4,148.67	2,370.49	4,697.85	3.78
8,141.00	91.50	356.40	2,901.23	4,179.61	2,368.84	4,726.53	3.68
8,173.00	91.30	356.60	2,900.45	4,211.54	2,366.89	4,756.03	0.88
8,205.00	91.20	357.10	2,899.75	4,243.48	2,365.13	4,785.62	1.59
8,236.00	90.70	356.30	2,899.24	4,274.43	2,363.34	4,814.25	3.04
8,269.00	90.40	356.30	2,898.92	4,307.36	2,361.22	4,844.64	0.91
8,300.00	90.40	356.90	2,898.70	4,338.30	2,359.38	4,873.25	1.94
8,332.00	90.10	356.70	2,898.56	4,370.25	2,357.59	4,902.83	1.13
8,364.00	90.40	356.50	2,898.42	4,402.19	2,355.69	4,932.37	1.13
8,396.00	90.10	356.50	2,898.28	4,434.13	2,353.74	4,961.89	0.94
8,428.00	89.70	355.70	2,898.34	4,466.06	2,351.56	4,991.31	2.80
8,460.00	89.50	355.70	2,898.56	4,497.97	2,349.16	5,020.65	0.62
8,491.00	89.60	356.20	2,898.81	4,528.89	2,346.97	5,049.13	1.64
8,523.00	89.90	356.40	2,898.95	4,560.82	2,344.91	5,078.60	1.13
8,555.00	89.50	357.20	2,899.11	4,592.77	2,343.12	5,108.18	2.80

Design Report for San Juan 32-5 Unit #112S - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,586.00	90.60	358.60	2,899.09	4,623.75	2,341.99	5,137.06	5.74
8,618.00	91.00	359.70	2,898.64	4,655.74	2,341.51	5,167.11	3.66
8,650.00	91.20	0.00	2,898.03	4,687.74	2,341.43	5,197.29	1.13
8,682.00	91.50	0.20	2,897.27	4,719.73	2,341.48	5,227.52	1.13
8,714.00	91.00	358.50	2,896.57	4,751.72	2,341.12	5,257.60	5.54
8,745.00	91.10	358.60	2,896.01	4,782.70	2,340.34	5,286.60	0.46
8,777.00	91.20	357.80	2,895.36	4,814.68	2,339.33	5,316.47	2.52
8,809.00	91.20	357.50	2,894.69	4,846.65	2,338.02	5,346.22	0.94
8,841.00	90.00	355.90	2,894.36	4,878.59	2,336.18	5,375.77	6.25
8,872.00	88.40	354.80	2,894.79	4,909.48	2,333.67	5,404.12	6.26
8,904.00	88.80	354.80	2,895.57	4,941.34	2,330.77	5,433.24	1.25
8,936.00	89.50	355.40	2,896.05	4,973.22	2,328.03	5,462.45	2.88
8,967.00	89.40	356.60	2,896.35	5,004.14	2,325.87	5,490.93	3.88
8,999.00	88.80	358.20	2,896.85	5,036.11	2,324.42	5,520.63	5.34
9,031.00	88.30	359.50	2,897.66	5,068.09	2,323.78	5,550.62	4.35
9,063.00	88.60	1.10	2,898.52	5,100.08	2,323.94	5,580.88	5.09
9,095.00	89.10	2.70	2,899.17	5,132.05	2,325.01	5,611.42	5.24
9,127.00	89.60	4.90	2,899.53	5,163.98	2,327.13	5,642.26	7.05
9,159.00	91.90	6.20	2,899.11	5,195.82	2,330.22	5,673.35	8.26
9,190.00	92.70	6.70	2,897.87	5,226.60	2,333.70	5,703.56	3.04
9,222.00	92.50	6.50	2,896.41	5,258.35	2,337.37	5,734.75	0.88
9,254.00	93.40	5.80	2,894.77	5,290.13	2,340.80	5,765.88	3.56
9,286.00	93.50	5.00	2,892.84	5,321.93	2,343.80	5,796.90	2.51
9,317.00	94.50	3.50	2,890.68	5,352.76	2,346.10	5,826.77	5.81
9,348.00	95.00	2.00	2,888.11	5,383.62	2,347.58	5,856.40	5.08
9,380.00	93.60	1.40	2,885.71	5,415.52	2,348.52	5,886.82	4.76
9,412.00	93.60	1.40	2,883.70	5,447.44	2,349.30	5,917.23	0.00
9,444.00	92.00	359.20	2,882.14	5,479.40	2,349.47	5,947.46	8.49
9,476.00	91.00	357.20	2,881.30	5,511.37	2,348.47	5,977.32	6.99
9,508.00	91.40	357.00	2,880.63	5,543.33	2,346.85	6,006.95	1.40
9,539.00	92.60	357.60	2,879.55	5,574.27	2,345.39	6,035.69	4.33
9,571.00	92.70	357.70	2,878.07	5,606.21	2,344.08	6,065.42	0.44
9,603.00	92.60	358.20	2,876.59	5,638.16	2,342.93	6,095.21	1.59
9,635.00	93.40	358.50	2,874.92	5,670.10	2,342.01	6,125.07	2.67
9,667.00	94.50	359.60	2,872.71	5,702.02	2,341.49	6,155.03	4.86
9,699.00	94.20	359.80	2,870.29	5,733.92	2,341.32	6,185.10	1.13
Final Sperry MWD Survey							
9,783.00	94.20	359.80	2,864.13	5,817.70	2,341.03	6,264.11	0.00
Projection to Bit - SJ 32-5 U112S TD Tgt							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
437.00	436.80	-10.62	4.25	First Sperry MWD Survey
9,699.00	2,870.29	5,733.92	2,341.32	Final Sperry MWD Survey
9,783.00	2,864.13	5,817.70	2,341.03	Projection to Bit

HALLIBURTON**Design Report for San Juan 32-5 Unit #112S - Actual Field Surveys****Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	SJ 32-5 U112S TD Tgt	19.22	Slot	0.00	0.00	2,951.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
437.00	9,783.00	Sperry MWD Surveys	MWD

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	TVDSS (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,457.75	2,936.00	-3,394.00	Coal Top		0.00	

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
SJ 32-5 U112S W Line	0.00	0.00	0.00	0.00	0.00	2,173,281.10	1,302,944.74	36° 58' 0.732 N	107° 24' 18.684 W
- actual wellpath hits target center									
- Polygon									
Point 1				2,546.78	6,993.00	2,180,242.91	1,305,576.21		
Point 2				2,546.78	-2,892.00	2,170,358.34	1,305,456.34		
SJ 32-5 U112S E Line	0.00	0.00	0.00	0.00	0.00	2,173,281.10	1,302,944.74	36° 58' 0.732 N	107° 24' 18.684 W
- actual wellpath hits target center									
- Polygon									
Point 1				2,073.00	6,993.00	2,180,248.66	1,305,102.45		
Point 2				2,073.00	-2,892.00	2,170,364.08	1,304,982.58		
SJ 32-5 U112S TD Tgt	0.00	0.00	2,951.00	6,714.60	2,341.50	2,179,967.01	1,305,367.56	36° 59' 7.121 N	107° 23' 49.825 W
- actual wellpath misses target center by 901.10ft at 9783.00ft MD (2864.13 TVD, 5817.70 N, 2341.03 E)									
- Point									
SJ 32-5 U112S N Line	0.00	0.00	0.00	0.00	0.00	2,173,281.10	1,302,944.74	36° 58' 0.732 N	107° 24' 18.684 W
- actual wellpath hits target center									
- Polygon									
Point 1				2,073.00	6,993.00	2,180,248.66	1,305,102.45		
Point 2				2,546.78	6,993.00	2,180,242.91	1,305,576.21		
SJ 32-5 U112S land pt	0.00	0.00	2,951.00	1,299.10	2,341.50	2,174,551.75	1,305,301.89	36° 58' 13.576 N	107° 23' 49.831 W
- actual wellpath misses target center by 30.78ft at 5256.69ft MD (2932.84 TVD, 1303.01 N, 2316.95 E)									
- Point									
SJ 32-5 U112S S Line	0.00	0.00	0.00	0.00	0.00	2,173,281.10	1,302,944.74	36° 58' 0.732 N	107° 24' 18.684 W
- actual wellpath hits target center									
- Polygon									
Point 1				2,073.00	-2,892.00	2,170,364.08	1,304,982.58		
Point 2				2,546.78	-2,892.00	2,170,358.34	1,305,456.34		