

Max Tool Temp (degF) / Source	116.00 / PCG	116.00 / PCG	175.00 / PCG		69-00066
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Yamen Domat	Yamen Domat	Yamen Domat		
Customer Representative	Pat Tim	Pat Tim	Pat Tim		

SENSOR INFORMATION

Directional Sensor Information

Tool Type	PCD	PCD	PCD		
Distance From Bit (ft)	52.00	52.00	50.00		
Software Version	3.32	3.32	3.32		
Sub Serial Number	230729	230729	230729		
Sonde Serial Number	10706187	10706187	2706163		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	177.58	34.89	200.61		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	55.57	55.55	53.18		
Recorded Sample Period (sec)	15	15	15		
Software Version	8.11	8.11	8.11		
Sub Serial Number	230729	230729	230729		
Insert/Sonde Serial Number	10834837	10834837	10882329		

REMARKS

1. All depths are measured bit depths referenced to the drillers pipe tally.
2. All gamma data is recorded data unless otherwise specified.
3. Temperature data is the circulating temperature recorded at EMT sensor while logging.

Log Smoothing: 2" TVD Interval Resolution: 1 ft
Interval Distance : 3 ft
Gap Fill : 3 ft

Log Smoothing: 5" TVD Interval Resolution: .5 ft
Interval Distance : .6 ft
Gap Fill : 3 ft

WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

Rate Of Penetration
SROP

05/23/2014

500 feet per hr 0

69-00066

Gamma Dgr Style
SGRD

Temperature
STEM

Surveys

0 api 200

TVD

0 fahrenheit 300

1:600

STARTED DRILLING 8.75" HOLE
WITH 6.50" LOGGING TOOLS
AT 4712.00' MD / 4712.25' TVD

RUN 100

SGRD

STEM

4700

4800

4900

5000

5100

4694.00' MD 1.0° INC -33.3' VS
4693.77' TVD 323.2° AZI 2.3° DL

4726.00' MD 1.0° INC -33.7' VS
4725.76' TVD 280.4° AZI 2.3° DL

4758.00' MD 3.0° INC -33.9' VS
4757.74' TVD 253.2° AZI 6.7° DL

4789.00' MD 4.9° INC -34.3' VS
4788.67' TVD 269.0° AZI 7.2° DL

4821.00' MD 5.6° INC -35.6' VS
4820.54' TVD 284.6° AZI 5.0° DL

4853.00' MD 8.4° INC -37.9' VS
4852.29' TVD 287.9° AZI 8.7° DL

4884.00' MD 8.8° INC -40.7' VS
4882.95' TVD 289.7° AZI 1.8° DL

4916.00' MD 10.9° INC -44.2' VS
4914.47' TVD 291.8° AZI 6.5° DL

4947.00' MD 13.3° INC -48.4' VS
4944.78' TVD 291.3° AZI 7.7° DL

4979.00' MD 15.6° INC -53.7' VS
4975.77' TVD 293.8° AZI 7.3° DL

5011.00' MD 17.6° INC -60.0' VS
5006.43' TVD 295.5° AZI 6.7° DL

5042.00' MD 19.6° INC -67.0' VS
5035.81' TVD 296.6° AZI 6.4° DL

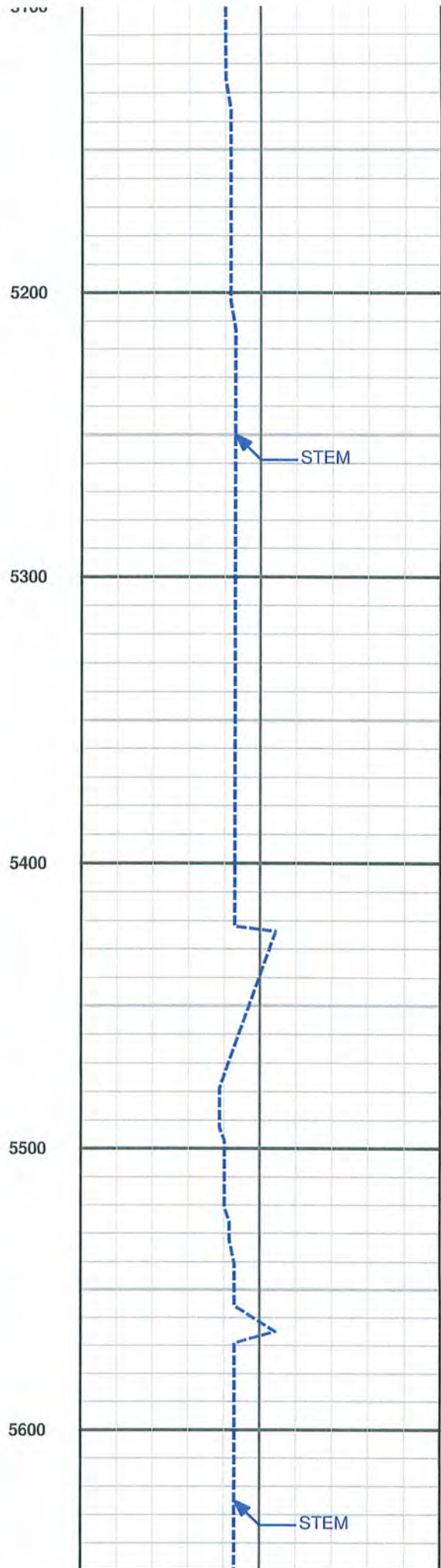
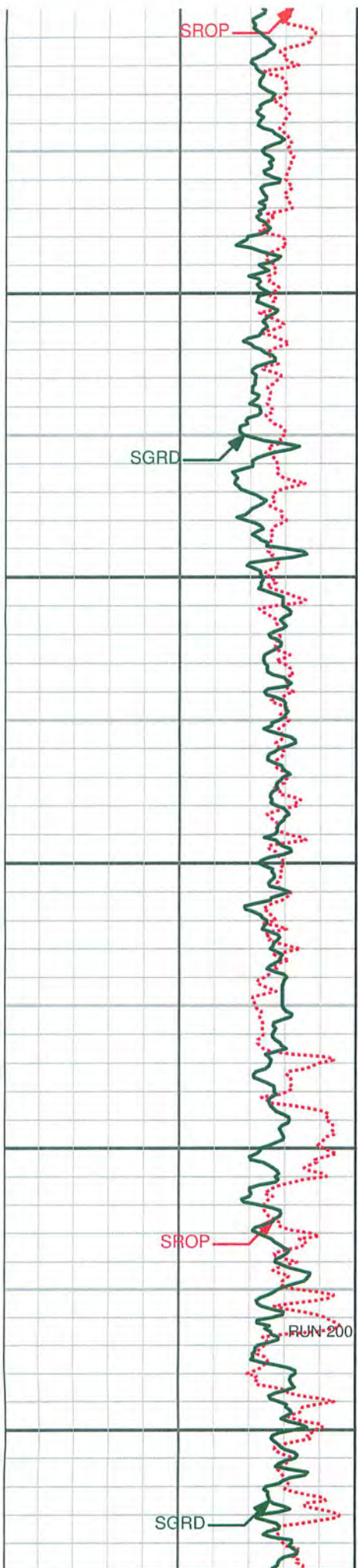
5074.00' MD 21.6° INC -75.0' VS
5065.76' TVD 295.8° AZI 6.4° DL

5105.00' MD 23.2° INC -83.3' VS
5094.42' TVD 296.6° AZI 5.3° DL

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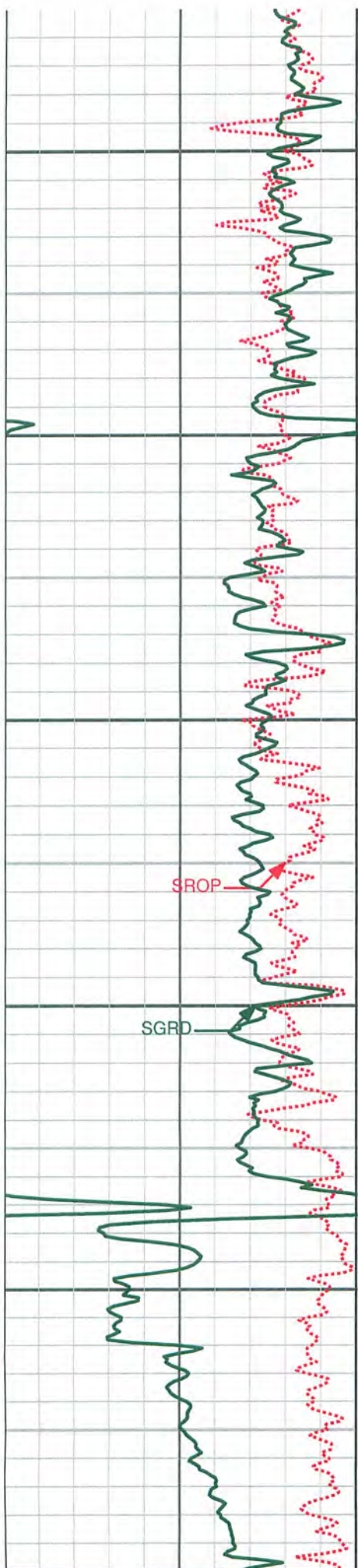
05/23/2014



69-00066

5136.00' MD	24.9° INC	-92.5' VS
5122.73' TVD	298.5° AZI	5.9° DL
5167.00' MD	26.9° INC	-102.5' VS
5150.62' TVD	299.6° AZI	6.7° DL
5199.00' MD	28.7° INC	-113.6' VS
5178.93' TVD	297.9° AZI	6.2° DL
5230.00' MD	30.9° INC	-124.7' VS
5205.83' TVD	296.6° AZI	7.6° DL
5261.00' MD	32.3° INC	-136.2' VS
5232.22' TVD	296.5° AZI	4.5° DL
5292.00' MD	33.9° INC	-148.4' VS
5258.18' TVD	297.3° AZI	5.3° DL
5324.00' MD	35.6° INC	-161.6' VS
5284.46' TVD	297.2° AZI	5.4° DL
5356.00' MD	37.7° INC	-175.4' VS
5310.12' TVD	298.0° AZI	6.7° DL
5387.00' MD	37.3° INC	-189.3' VS
5334.70' TVD	298.8° AZI	2.0° DL
5418.00' MD	38.1° INC	-203.5' VS
5359.22' TVD	300.3° AZI	3.8° DL
5448.00' MD	39.9° INC	-217.9' VS
5382.53' TVD	301.6° AZI	6.7° DL
5480.00' MD	41.9° INC	-234.2' VS
5406.71' TVD	302.4° AZI	6.2° DL
5543.00' MD	43.0° INC	-267.5' VS
5453.47' TVD	303.2° AZI	4.4° DL
5575.00' MD	46.4° INC	-285.3' VS
5476.20' TVD	303.4° AZI	10.5° DL
5606.00' MD	47.3° INC	-303.3' VS
5497.39' TVD	304.3° AZI	3.5° DL
5638.00' MD	48.6° INC	-322.5' VS
5518.83' TVD	305.1° AZI	4.3° DL
5701.00' MD	50.3° INC	-361.8' VS
5559.80' TVD	307.7° AZI	4.1° DL
5732.00' MD	53.4° INC	-382.0' VS
5578.94' TVD	306.7° AZI	10.5° DL
5764.00' MD	56.1° INC	-403.8' VS
5597.41' TVD	308.6° AZI	9.5° DL
5796.00' MD	58.9° INC	-426.3' VS
5614.60' TVD	306.5° AZI	10.5° DL
5827.00' MD	58.6° INC	-447.7' VS
5630.67' TVD	303.4° AZI	9.7° DL
5858.00' MD	59.2° INC	-468.3' VS
5646.68' TVD	300.4° AZI	8.5° DL

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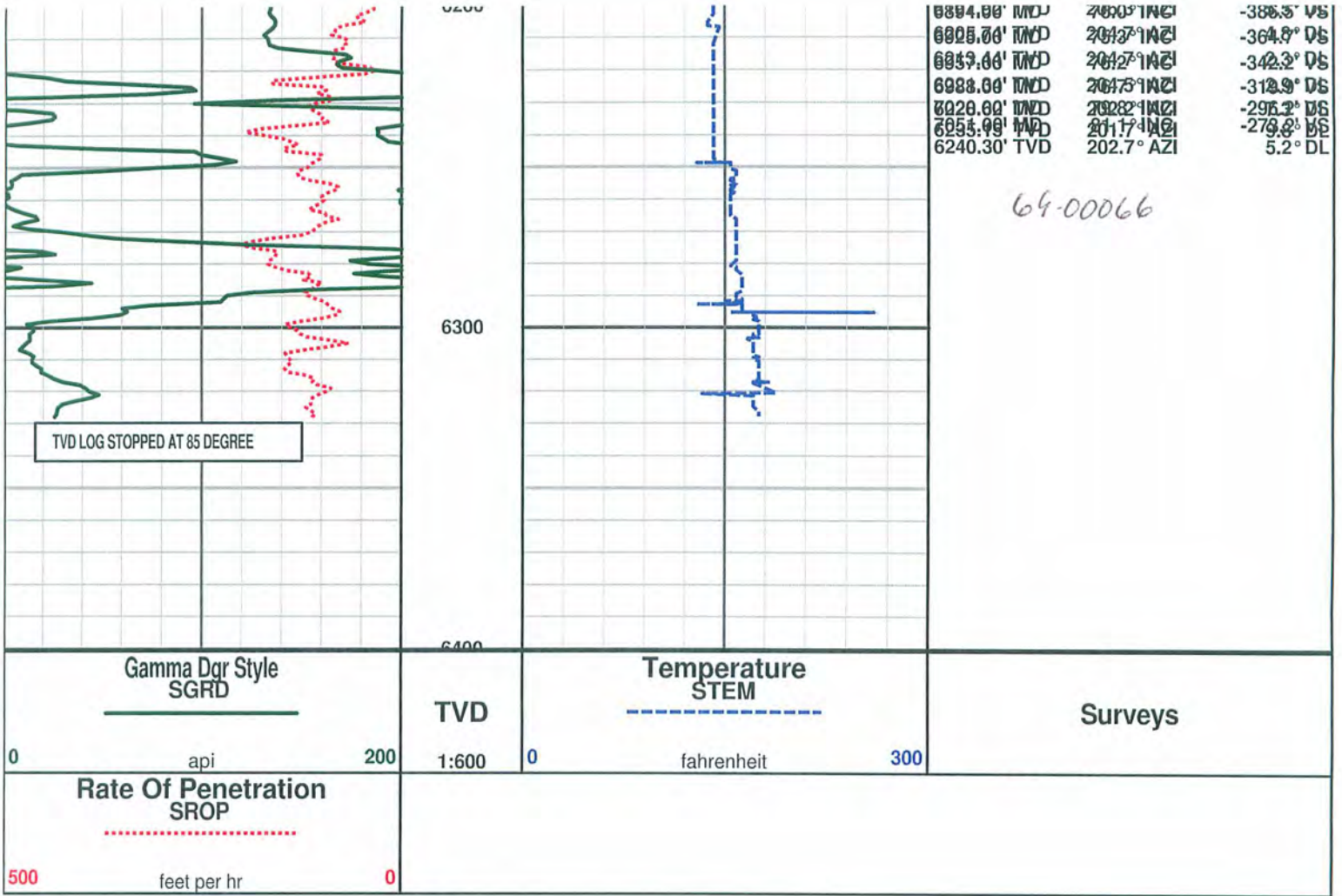


5700
5800
5900
6000
6100
6200



MD	TVD	INC	AZI	VS	DL
5889.00	5889.00	58.5	298.8	-488.1	5.0
5662.70	5662.70	298.8	298.8	5.0	DL
5921.00	5921.00	54.3	296.4	-507.5	14.6
5680.40	5680.40	296.4	296.4	14.6	DL
5952.00	5952.00	50.9	295.6	-524.8	11.3
5699.23	5699.23	295.6	295.6	11.3	DL
5984.00	5984.00	47.2	292.7	-541.3	13.5
5720.21	5720.21	292.7	292.7	13.5	DL
6015.00	6015.00	45.2	287.3	-555.4	14.2
5741.69	5741.69	287.3	287.3	14.2	DL
6047.00	6047.00	44.2	280.7	-567.6	14.7
5764.45	5764.45	280.7	280.7	14.7	DL
6079.00	6079.00	44.4	276.2	-577.8	10.0
5787.36	5787.36	276.2	276.2	10.0	DL
6110.00	6110.00	44.1	271.4	-586.2	10.8
5809.56	5809.56	271.4	271.4	10.8	DL
6142.00	6142.00	44.3	265.8	-592.9	12.2
5832.51	5832.51	265.8	265.8	12.2	DL
6174.00	6174.00	45.4	261.4	-597.7	10.1
5855.21	5855.21	261.4	261.4	10.1	DL
6206.00	6206.00	45.1	261.9	-601.9	1.4
5877.74	5877.74	261.9	261.9	1.4	DL
6237.00	6237.00	46.4	256.2	-604.9	13.7
5899.38	5899.38	256.2	256.2	13.7	DL
6268.00	6268.00	48.2	257.7	-607.3	6.9
5920.40	5920.40	257.7	257.7	6.9	DL
6299.00	6299.00	47.6	252.6	-608.9	12.4
5941.18	5941.18	252.6	252.6	12.4	DL
6331.00	6331.00	48.9	248.5	-608.7	10.5
5962.48	5962.48	248.5	248.5	10.5	DL
6362.00	6362.00	49.7	243.9	-606.6	11.5
5982.70	5982.70	243.9	243.9	11.5	DL
6393.00	6393.00	52.1	239.4	-602.6	13.7
6002.24	6002.24	239.4	239.4	13.7	DL
6424.00	6424.00	54.6	237.8	-597.2	9.0
6020.73	6020.73	237.8	237.8	9.0	DL
6455.00	6455.00	55.2	235.5	-590.9	6.5
6038.55	6038.55	235.5	235.5	6.5	DL
6487.00	6487.00	56.3	233.0	-583.2	7.2
6056.57	6056.57	233.0	233.0	7.2	DL
6518.00	6518.00	57.2	232.9	-575.1	2.8
6073.58	6073.58	232.9	232.9	2.8	DL
6548.00	6548.00	59.3	230.7	-566.7	9.4
6089.38	6089.38	230.7	230.7	9.4	DL
6579.00	6579.00	62.9	228.7	-556.8	13.0
6104.35	6104.35	228.7	228.7	13.0	DL
6611.00	6611.00	65.4	226.6	-545.3	9.7
6118.30	6118.30	226.6	226.6	9.7	DL
6642.00	6642.00	66.8	223.2	-532.8	10.8
6130.88	6130.88	223.2	223.2	10.8	DL
6674.00	6674.00	68.4	220.5	-518.3	9.5
6143.07	6143.07	220.5	220.5	9.5	DL
6705.00	6705.00	70.6	217.5	-502.9	11.3
6153.92	6153.92	217.5	217.5	11.3	DL
6737.00	6737.00	71.8	217.2	-486.1	3.9
6168.26	6168.26	217.2	217.2	3.9	DL
6768.00	6768.00	73.6	214.6	-469.0	10.0
6179.00	6179.00	214.6	214.6	10.0	DL
6800.00	6800.00	75.9	209.9	-458.2	5.5
6189.00	6189.00	209.9	209.9	5.5	DL
6832.00	6832.00	78.7	208.0	-408.9	5.5
6199.00	6199.00	208.0	208.0	5.5	DL

05/23/2014



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Chesapeake
LarryBall6H
Bethany (Marcellus)
Ohio County, West Virginia WV
USA
NE-XX-0007889708

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
4678.00	0.68	312.02	4677.77	25.84 N	26.75 W	-33.11	TIE-IN
4694.00	1.01	323.23	4693.77	26.02 N	26.90 W	-33.32	2.29
4726.00	0.96	280.37	4725.76	26.29 N	27.34 W	-33.72	2.26
4758.00	2.96	253.16	4757.74	26.10 N	28.39 W	-33.88	6.72
4789.00	4.92	268.99	4788.67	25.84 N	30.49 W	-34.32	7.17
4821.00	5.62	284.58	4820.54	26.21 N	33.38 W	-35.60	4.97
4853.00	8.37	287.87	4852.29	27.32 N	37.11 W	-37.86	8.68
4884.00	8.85	289.66	4882.95	28.82 N	41.51 W	-40.70	1.76
4916.00	10.90	291.78	4914.47	30.77 N	46.63 W	-44.20	6.52
4947.00	13.30	291.26	4944.78	33.15 N	52.68 W	-48.41	7.73

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Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
4979.00	15.56	293.81	4975.77	36.22 N	60.04 W	-53.70	7.34
5011.00	17.63	295.55	5006.43	40.04 N	68.34 W	-60.00	6.67
5042.00	19.59	296.65	5035.81	44.40 N	77.22 W	-66.99	6.40
5074.00	21.61	295.80	5065.76	49.37 N	87.32 W	-74.97	6.40
5105.00	23.21	296.57	5094.42	54.58 N	97.92 W	-83.33	5.26
5136.00	24.87	298.54	5122.73	60.43 N	109.11 W	-92.49	5.93
5167.00	26.88	299.65	5150.62	67.01 N	120.93 W	-102.54	6.65
5199.00	28.69	297.90	5178.93	74.19 N	134.01 W	-113.56	6.22
5230.00	30.94	296.57	5205.83	81.24 N	147.72 W	-124.66	7.57
5261.00	32.34	296.50	5232.22	88.50 N	162.27 W	-136.25	4.52
5292.00	33.92	297.30	5258.18	96.17 N	177.37 W	-148.39	5.26
5324.00	35.65	297.21	5284.46	104.53 N	193.60 W	-161.55	5.41
5356.00	37.74	298.04	5310.12	113.40 N	210.54 W	-175.42	6.71
5387.00	37.34	298.83	5334.70	122.39 N	227.15 W	-189.31	2.00
5418.00	38.10	300.34	5359.22	131.75 N	243.64 W	-203.50	3.84
5448.00	39.95	301.62	5382.53	141.48 N	259.83 W	-217.94	6.73
5480.00	41.86	302.39	5406.71	152.59 N	277.60 W	-234.20	6.20
5511.00	41.69	303.72	5429.83	163.85 N	294.91 W	-250.46	2.92
5543.00	43.05	303.24	5453.47	175.75 N	312.89 W	-267.54	4.35
5575.00	46.42	303.44	5476.20	188.12 N	331.71 W	-285.34	10.54
5606.00	47.32	304.29	5497.39	200.73 N	350.49 W	-303.35	3.54
5638.00	48.57	305.12	5518.83	214.26 N	370.02 W	-322.47	4.34
5701.00	50.29	307.70	5559.80	242.67 N	408.52 W	-361.81	4.14
5732.00	53.44	306.70	5578.94	257.41 N	427.94 W	-382.04	10.49
5764.00	56.06	308.58	5597.41	273.37 N	448.63 W	-403.83	9.49
5796.00	58.95	306.51	5614.60	289.81 N	470.03 W	-426.31	10.53
5827.00	58.60	303.39	5630.67	305.00 N	491.75 W	-447.71	8.69
5858.00	59.23	300.40	5646.68	319.02 N	514.29 W	-468.27	8.51
5889.00	58.54	298.77	5662.70	332.12 N	537.37 W	-488.14	5.02
5921.00	54.31	296.40	5680.40	344.47 N	560.98 W	-507.47	14.59
5952.00	50.87	295.65	5699.23	355.28 N	583.10 W	-524.85	11.26
5984.00	47.17	292.69	5720.21	365.18 N	605.13 W	-541.35	13.49
6015.00	45.19	287.27	5741.69	372.84 N	626.13 W	-555.38	14.15
6047.00	44.17	280.74	5764.45	378.29 N	647.93 W	-567.60	14.69
6079.00	44.42	276.15	5787.36	381.56 N	670.03 W	-577.85	10.04
6110.00	44.15	271.36	5809.56	382.98 N	691.61 W	-586.17	10.83
6142.00	44.26	265.76	5832.51	382.42 N	713.90 W	-592.85	12.20
6174.00	45.39	261.44	5855.21	379.90 N	736.30 W	-597.72	10.14
6206.00	45.09	261.90	5877.74	376.61 N	758.78 W	-601.88	1.38
6237.00	46.41	256.25	5899.38	372.39 N	780.57 W	-604.94	13.73
6268.00	48.23	257.74	5920.40	367.26 N	802.77 W	-607.27	6.86
6299.00	47.63	252.62	5941.18	361.39 N	825.00 W	-608.91	12.40
6331.00	48.90	248.46	5962.48	353.43 N	847.51 W	-608.66	10.47
6362.00	49.73	243.88	5982.70	343.93 N	869.00 W	-606.63	11.52
6393.00	52.13	239.36	6002.24	332.49 N	890.15 W	-602.64	13.72
6424.00	54.63	237.83	6020.73	319.52 N	911.39 W	-597.24	8.96
6455.00	55.19	235.47	6038.55	305.58 N	932.57 W	-590.90	6.51
6487.00	56.28	232.99	6056.57	290.12 N	954.02 W	-583.22	7.24
6518.00	57.16	232.87	6073.58	274.50 N	974.70 W	-575.13	2.84
6548.00	59.31	230.74	6089.38	258.72 N	994.74 W	-566.69	9.39
6579.00	62.92	228.68	6104.35	241.17 N	1015.44 W	-556.78	13.01
6611.00	65.38	226.56	6118.30	221.76 N	1036.70 W	-545.29	9.74
6642.00	66.77	223.23	6130.88	201.69 N	1056.70 W	-532.77	10.78
6674.00	68.44	220.49	6143.07	179.65 N	1076.44 W	-518.31	9.49
6705.00	70.58	217.53	6153.92	157.09 N	1094.71 W	-502.87	11.29

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Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
6737.00	71.79	217.25	6164.25	133.03 N	1113.10 W	-486.06	3.87
6768.00	73.64	214.64	6173.46	109.06 N	1130.47 W	-469.00	10.02
6799.00	75.00	209.88	6181.84	83.83 N	1146.39 W	-450.28	15.42
6830.00	75.06	207.96	6189.85	57.62 N	1160.87 W	-430.16	5.97
6862.00	75.71	206.28	6197.92	30.06 N	1174.99 W	-408.66	5.47
6894.00	75.98	204.72	6205.74	2.06 N	1188.35 W	-386.48	4.82
6925.00	75.27	204.72	6213.44	25.22 S	1200.91 W	-364.74	2.32
6957.00	76.16	204.50	6221.34	53.41 S	1213.82 W	-342.24	2.86
6988.00	76.68	202.25	6228.62	81.07 S	1225.78 W	-319.94	7.27
7020.00	79.77	201.69	6235.15	110.12 S	1237.50 W	-296.24	9.80
7051.00	81.07	202.69	6240.30	138.42 S	1249.04 W	-273.20	5.25
7082.00	83.36	200.03	6244.50	167.02 S	1260.22 W	-249.75	11.26
7114.00	86.98	199.33	6247.20	197.04 S	1270.96 W	-224.82	11.52
7146.00	89.48	199.53	6248.19	227.21 S	1281.59 W	-199.73	7.83
7177.00	89.85	199.58	6248.37	256.42 S	1291.97 W	-175.44	1.20
7209.00	89.35	195.96	6248.59	286.89 S	1301.73 W	-149.77	11.41
7240.00	90.15	191.57	6248.73	316.99 S	1309.10 W	-123.68	14.39
7271.00	90.96	187.75	6248.43	347.54 S	1314.30 W	-96.45	12.60
7302.00	93.30	186.47	6247.27	378.28 S	1318.14 W	-68.61	8.62
7334.00	94.46	183.67	6245.11	410.08 S	1320.96 W	-39.43	9.47
7366.00	94.59	179.51	6242.58	441.96 S	1321.84 W	-9.55	12.95
7397.00	93.82	175.29	6240.30	472.83 S	1320.44 W	20.12	13.81
7428.00	93.12	170.09	6238.43	503.51 S	1316.50 W	50.42	16.89
7460.00	92.65	166.18	6236.81	534.78 S	1309.93 W	82.13	12.27
7491.00	92.50	161.56	6235.42	564.53 S	1301.33 W	113.06	14.92
7523.00	92.47	157.06	6234.03	594.43 S	1290.04 W	145.01	14.04
7552.00	91.63	151.97	6233.00	620.58 S	1277.57 W	173.78	17.77
7583.00	91.48	149.97	6232.15	647.67 S	1262.54 W	204.29	6.47
7614.00	90.71	149.33	6231.56	674.42 S	1246.88 W	234.66	3.23
7646.00	90.43	148.15	6231.24	701.77 S	1230.27 W	265.92	3.78
7677.00	90.15	148.26	6231.08	728.12 S	1213.94 W	296.13	0.96
7709.00	89.11	147.28	6231.29	755.19 S	1196.88 W	327.27	4.47
7741.00	88.21	146.98	6232.04	782.06 S	1179.51 W	358.31	2.95
7804.00	88.46	147.50	6233.87	835.02 S	1145.44 W	419.44	0.91
7867.00	88.71	147.80	6235.43	888.22 S	1111.73 W	480.69	0.62
7930.00	89.66	148.03	6236.33	941.59 S	1078.27 W	542.02	1.56
7993.00	89.20	147.39	6236.95	994.85 S	1044.62 W	603.30	1.25
8055.00	89.63	147.90	6237.59	1047.22 S	1011.45 W	663.59	1.07
8118.00	89.78	147.71	6237.91	1100.53 S	977.88 W	724.89	0.39
8181.00	87.20	146.94	6239.57	1153.54 S	943.89 W	786.05	4.28
8244.00	87.60	146.62	6242.43	1206.19 S	909.41 W	847.02	0.81
8306.00	87.93	146.87	6244.85	1258.00 S	875.44 W	907.04	0.67
8369.00	88.49	147.50	6246.82	1310.92 S	841.31 W	968.15	1.34
8432.00	88.52	147.88	6248.46	1364.14 S	807.65 W	1029.41	0.60
8495.00	88.80	147.55	6249.93	1417.39 S	774.00 W	1090.67	0.68
8558.00	87.97	148.39	6251.71	1470.78 S	740.61 W	1152.00	1.88
8621.00	88.49	148.81	6253.66	1524.53 S	707.80 W	1213.47	1.06
8684.00	88.06	150.12	6255.56	1578.77 S	675.81 W	1275.14	2.18
8747.00	89.66	152.12	6256.81	1633.91 S	645.39 W	1337.17	4.07
8807.00	90.71	153.42	6256.62	1687.26 S	617.94 W	1396.53	2.79
8869.00	88.89	152.46	6256.84	1742.47 S	589.73 W	1457.89	3.32
8932.00	88.43	152.57	6258.31	1798.34 S	560.66 W	1520.17	0.76
8995.00	89.01	154.38	6259.72	1854.70 S	532.54 W	1582.59	3.02
9058.00	89.04	155.65	6260.79	1911.79 S	505.93 W	1645.22	2.02
9121.00	88.86	156.05	6261.94	1969.27 S	480.16 W	1707.94	0.69

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Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
9183.00	89.78	157.71	6262.67	2026.28 S	455.82 W	1769.77	3.07
9246.00	88.49	156.63	6263.62	2084.34 S	431.37 W	1832.61	2.68
9310.00	86.73	155.88	6266.29	2142.86 S	405.63 W	1896.32	2.99
9373.00	86.61	155.44	6269.95	2200.17 S	379.71 W	1958.93	0.73
9437.00	86.67	155.72	6273.71	2258.34 S	353.29 W	2022.52	0.45
9499.00	86.95	155.67	6277.16	2314.76 S	327.81 W	2084.14	0.45
9562.00	86.76	155.83	6280.61	2372.11 S	301.98 W	2146.77	0.38
9625.00	87.66	155.43	6283.68	2429.43 S	276.01 W	2209.41	1.55
9688.00	88.09	155.18	6286.02	2486.63 S	249.72 W	2272.04	0.79
9751.00	88.71	155.45	6287.78	2543.85 S	223.42 W	2334.69	1.07
9812.00	88.21	153.86	6289.42	2598.96 S	197.31 W	2395.28	2.72
9875.00	89.20	153.17	6290.84	2655.33 S	169.22 W	2457.71	1.91
9938.00	89.04	153.34	6291.81	2711.58 S	140.87 W	2520.11	0.36
10001.00	89.75	154.27	6292.47	2768.11 S	113.06 W	2582.59	1.86
10059.00	90.12	155.50	6292.53	2820.62 S	88.45 W	2640.25	2.22
10122.00	89.20	155.04	6292.91	2877.85 S	62.10 W	2702.92	1.64
10185.00	89.26	155.99	6293.75	2935.17 S	35.99 W	2765.61	1.50
10248.00	89.54	157.16	6294.41	2992.98 S	10.94 W	2828.41	1.92
10311.00	89.44	158.01	6294.97	3051.21 S	13.08 E	2891.29	1.36
10374.00	89.88	158.47	6295.35	3109.73 S	36.43 E	2954.20	1.00
10436.00	93.02	159.38	6293.78	3167.55 S	58.71 E	3016.13	5.28
10499.00	92.99	161.30	6290.47	3226.80 S	79.88 E	3079.04	3.03
10561.00	92.87	161.71	6287.30	3285.52 S	99.52 E	3140.95	0.70
10624.00	92.71	162.94	6284.24	3345.47 S	118.63 E	3203.86	1.96
10686.00	92.13	163.04	6281.62	3404.70 S	136.75 E	3265.77	0.96
10749.00	92.40	163.36	6279.13	3464.97 S	154.94 E	3328.68	0.66
10812.00	90.71	163.56	6277.42	3525.33 S	172.88 E	3391.61	2.71
10874.00	90.34	164.18	6276.85	3584.89 S	190.10 E	3453.53	1.17
10937.00	88.03	164.14	6277.75	3645.49 S	207.29 E	3516.43	3.67
11000.00	87.81	164.45	6280.03	3706.10 S	224.33 E	3579.29	0.59
11063.00	87.97	164.75	6282.35	3766.79 S	241.05 E	3642.13	0.54
11127.00	88.40	165.31	6284.39	3828.59 S	257.58 E	3705.95	1.10
11190.00	88.83	165.07	6285.91	3889.48 S	273.68 E	3768.78	0.78
11253.00	89.04	165.02	6287.08	3950.33 S	289.93 E	3831.62	0.35
11316.00	88.06	163.41	6288.67	4010.94 S	307.06 E	3894.50	2.99
11379.00	87.87	162.54	6290.91	4071.14 S	325.50 E	3957.43	1.42
11442.00	88.24	162.25	6293.05	4131.15 S	344.54 E	4020.38	0.75
11505.00	89.20	163.25	6294.46	4191.30 S	363.22 E	4083.33	2.20
11568.00	90.40	161.81	6294.68	4251.39 S	382.13 E	4146.31	2.98
11631.00	90.68	161.09	6294.08	4311.12 S	402.17 E	4209.31	1.22
11695.00	90.71	161.70	6293.31	4371.77 S	422.59 E	4273.30	0.95
11757.00	88.95	160.32	6293.49	4430.39 S	442.77 E	4335.30	3.60
11820.00	87.84	159.62	6295.26	4489.55 S	464.34 E	4398.26	2.08
11883.00	88.24	159.70	6297.41	4548.59 S	486.22 E	4461.20	0.65
11945.00	88.30	160.06	6299.28	4606.78 S	507.54 E	4523.16	0.59
12008.00	88.61	160.19	6300.98	4666.00 S	528.95 E	4586.13	0.54
12070.00	89.11	160.34	6302.21	4724.35 S	549.88 E	4648.11	0.83
12133.00	89.51	160.73	6302.97	4783.75 S	570.87 E	4711.10	0.89
12195.00	89.72	161.21	6303.39	4842.36 S	591.08 E	4773.10	0.84
12258.00	88.03	160.06	6304.63	4901.78 S	611.97 E	4836.08	3.25
12321.00	87.59	159.86	6307.03	4960.92 S	633.54 E	4899.02	0.76
12384.00	87.97	160.41	6309.48	5020.13 S	654.93 E	4961.96	1.05
12447.00	88.43	160.17	6311.46	5079.41 S	676.17 E	5024.93	0.83
12509.00	88.24	159.92	6313.26	5137.66 S	697.32 E	5086.89	0.51
12572.00	88.73	160.10	6314.92	5196.84 S	718.85 E	5149.85	0.84

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Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
12635.00	89.29	160.72	6316.01	5256.19 S	739.97 E	5212.84	1.32
12698.00	89.54	160.53	6316.65	5315.62 S	760.87 E	5275.83	0.50
12762.00	89.78	160.10	6317.03	5375.87 S	782.43 E	5339.83	0.76
12825.00	90.03	160.63	6317.13	5435.21 S	803.59 E	5402.82	0.93
12888.00	90.46	160.62	6316.86	5494.64 S	824.49 E	5465.82	0.69
12951.00	90.71	160.47	6316.22	5554.04 S	845.47 E	5528.81	0.46
13014.00	89.08	160.72	6316.34	5613.46 S	866.40 E	5591.81	2.62
13077.00	89.17	160.78	6317.30	5672.93 S	887.17 E	5654.80	0.17
13139.00	87.74	159.84	6318.97	5731.28 S	908.05 E	5716.77	2.75
13202.00	87.75	159.90	6321.45	5790.39 S	929.72 E	5779.70	0.10
13266.00	87.93	160.28	6323.86	5850.52 S	951.50 E	5843.65	0.66
13329.00	88.55	160.14	6325.79	5909.77 S	972.82 E	5906.61	1.01
13391.00	89.20	160.73	6327.01	5968.18 S	993.58 E	5968.59	1.41
13454.00	89.54	160.68	6327.70	6027.64 S	1014.40 E	6031.59	0.54
13473.00	89.44	160.43	6327.87	6045.55 S	1020.72 E	6050.58	1.41
13523.00	89.44	160.43	6328.36	6092.66 S	1037.47 E	6100.58	0.01

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
 TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
 VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 161.12 DEGREES (GRID)
 A TOTAL CORRECTION OF -8.10 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
 HORIZONTAL DISPLACEMENT(CLOSURE) AT 13523.00 FEET
 IS 6180.36 FEET ALONG 170.34 DEGREES (GRID)

SURVEYS CALCULATED USING LONG COLLAR METHOD.
 TIE ON SURVEY @ 4678' MD PROVIDED BY GYRO FROM SINGLE SHOT SURVEYS.
 SURVEY AT 13473 MD' HAS BEEN PROJECTED TO TD AT 13523 MD'.
 SPERRY ENGINEERS: Y.DOMAT, F.Nkansah