Polaris Guidance Systems LLC

Harold 6Y-304

MD 5":100'

Company: Petroleum Development Corp.
Well Name: Harold 6y-304
API: 05123574800
County/Parish: Weld
State: Colorado
Country: United States
Job number: 161-163
Field: Wattenburg
Rig Id: Ensign 161
Survey Company: Ensign
Operator: Petroleum Development Corp.
Company Man: Brady Sharp / John Falton
Daylight DD: Zach Gentry
Swing Shift DD: Tony Callow
Night DD: Eric Mays
Daylight MWD: Ryan Prue
Night MWD: Bobby blevins

Log measurements: Gamma, ROP
Depth measured from: 2556 ft
Maximum temperature: 190

Depth	Date
Start: 0 ft	2-3-2019
End: 11852 ft	2-7-2019

Casing	Depth	Size
Surface:	2556 ft	9 5/8"
Intermediate:		

Mud Type: H2O
Density:
Viscosity:
Rm: **Rmf:** **Rmc:**

Elevations
KB: 23 ft
GL: 4787 ft
DF: 4810 ft

Run	Bit Size	Offsets Gamma	Offsets Survey	Depths Start	Depths End	Dates Start	Dates End
1	12.25"		60.00 ft	0 ft	2576 ft	2-3-2019	2-3-2019
2	8.5"	60.45 ft	57.95 ft	2576 ft	11852 ft	2-4-2019	2-7-2019
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Ensign uses its best efforts to provide its customers with accurate information and interpretations in conjunction with services performed but will not be held liable or responsible for the accuracy of such information or interpretation.

Gamma
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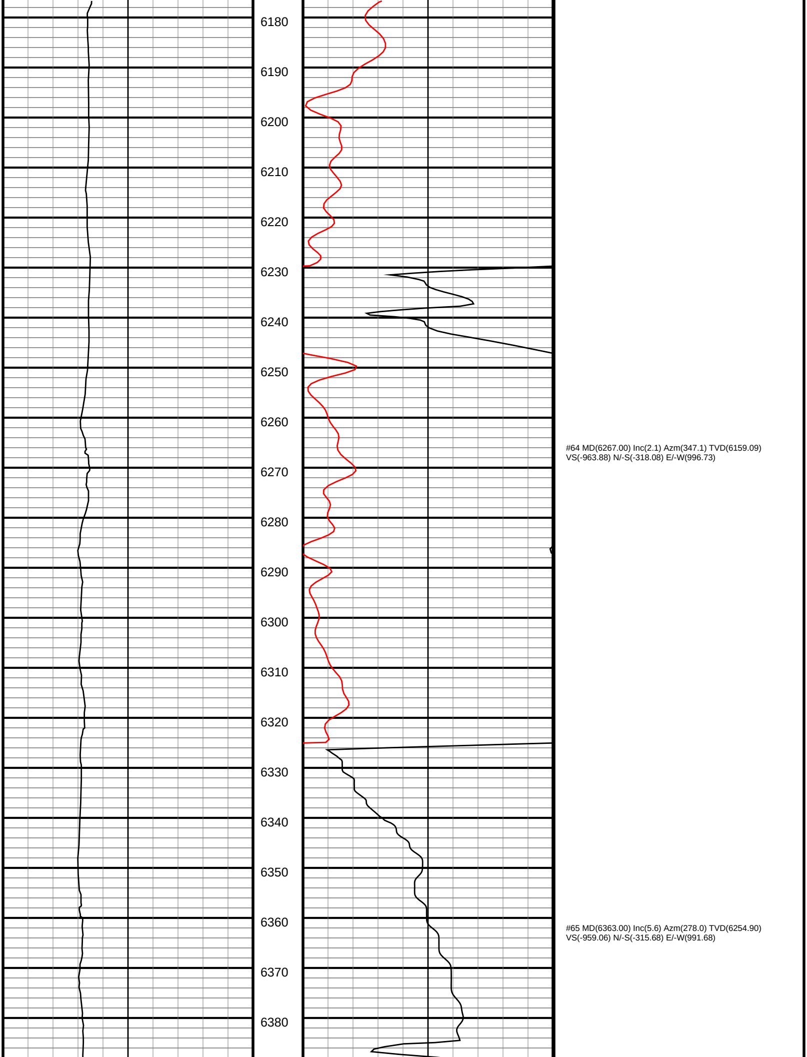
#27 MD(2733.00) Inc(11.9) Azm(123.6) TVD(2686.78) VS(-411.94) N/-S(-146.98) E/-W(426.99)
#28 MD(2828.00) Inc(12.5) Azm(121.2) TVD(2779.64) VS(-427.84) N/-S(-157.72) E/-W(443.93)
#29 MD(2924.00) Inc(13.6) Azm(124.2) TVD(2873.16) VS(-444.93) N/-S(-169.45) E/-W(462.15)
#30 MD(3019.00) Inc(13.5) Azm(118.6) TVD(2965.50) VS(-462.81) N/-S(-181.07) E/-W(481.16)
#31 MD(3115.00) Inc(12.9) Azm(112.8) TVD(3058.97) VS(-481.59) N/-S(-190.59) E/-W(500.88)
#32 MD(3210.00) Inc(12.0) Azm(113.1) TVD(3151.74) VS(-499.64) N/-S(-198.58) E/-W(519.73)
#33 MD(3306.00) Inc(10.4) Azm(112.1) TVD(3245.90) VS(-516.17) N/-S(-205.77) E/-W(536.99)
#34 MD(3401.00) Inc(11.2) Azm(109.5) TVD(3339.20) VS(-532.25) N/-S(-212.10) E/-W(553.71)
#35 MD(3496.00) Inc(11.6) Azm(107.9) TVD(3432.31) VS(-549.49) N/-S(-218.13) E/-W(571.57)
#36 MD(3592.00) Inc(10.7) Azm(106.6) TVD(3526.48) VS(-566.70) N/-S(-223.66) E/-W(589.35)
#37 MD(3688.00) Inc(11.4) Azm(104.8) TVD(3620.70) VS(-583.93) N/-S(-228.64) E/-W(607.10)
#38 MD(3783.00) Inc(10.7) Azm(104.1) TVD(3713.93) VS(-601.08) N/-S(-233.19) E/-W(624.74)
#39 MD(3878.00) Inc(11.6) Azm(104.5) TVD(3807.15) VS(-618.35) N/-S(-237.73) E/-W(642.49)
#40 MD(3974.00) Inc(12.5) Azm(105.3) TVD(3901.03) VS(-637.16) N/-S(-242.88) E/-W(661.85)
#41 MD(4070.00) Inc(11.8) Azm(102.3) TVD(3994.88) VS(-656.29) N/-S(-247.72) E/-W(681.49)
#42 MD(4165.00) Inc(11.9) Azm(108.9) TVD(4087.85) VS(-674.52) N/-S(-252.97) E/-W(700.27)
#43 MD(4260.00) Inc(10.9) Azm(108.0) TVD(4180.97) VS(-691.76) N/-S(-258.93) E/-W(718.12)
#44 MD(4356.00) Inc(12.1) Azm(105.8) TVD(4275.04) VS(-709.51) N/-S(-264.48) E/-W(736.45)
#45 MD(4452.00) Inc(11.6) Azm(103.9) TVD(4368.99) VS(-728.00) N/-S(-269.53) E/-W(755.48)
#46 MD(4547.00) Inc(12.8) Azm(104.7) TVD(4461.85) VS(-746.89) N/-S(-274.50) E/-W(774.90)
#47 MD(4642.00) Inc(14.6) Azm(106.3) TVD(4554.16) VS(-767.90) N/-S(-280.52) E/-W(796.54)
#48 MD(4738.00) Inc(12.9) Azm(104.9) TVD(4647.40) VS(-789.23) N/-S(-286.66) E/-W(818.52)
#49 MD(4833.00) Inc(14.0) Azm(103.6) TVD(4739.79) VS(-810.10) N/-S(-292.10) E/-W(839.97)
#50 MD(4929.00) Inc(13.7) Azm(102.3) TVD(4832.99) VS(-831.95) N/-S(-297.26) E/-W(862.38)
#51 MD(5025.00) Inc(12.3) Azm(98.9) TVD(4926.53) VS(-852.73) N/-S(-301.27) E/-W(883.60)
#52 MD(5120.00) Inc(12.1) Azm(98.9) TVD(5019.39) VS(-872.16) N/-S(-304.37) E/-W(903.40)
#53 MD(5216.00) Inc(11.3) Azm(97.5) TVD(5113.40) VS(-891.05) N/-S(-307.16) E/-W(922.61)
#54 MD(5312.00) Inc(9.5) Azm(104.5) TVD(5207.83) VS(-907.68) N/-S(-310.37) E/-W(939.61)
#55 MD(5407.00) Inc(8.7) Azm(96.3) TVD(5301.63) VS(-922.15) N/-S(-313.13) E/-W(954.38)
#56 MD(5502.00) Inc(7.3) Azm(104.0) TVD(5395.69) VS(-934.96) N/-S(-315.40) E/-W(967.46)
#57 MD(5598.00) Inc(6.2) Azm(101.1) TVD(5491.02) VS(-945.74) N/-S(-317.88) E/-W(978.51)
#58 MD(5693.00) Inc(4.8) Azm(105.2) TVD(5585.58) VS(-954.39) N/-S(-319.91) E/-W(987.38)
#59 MD(5789.00) Inc(3.8) Azm(129.8) TVD(5681.31) VS(-960.43) N/-S(-323.02) E/-W(993.73)
#60 MD(5885.00) Inc(1.4) Azm(101.3) TVD(5777.21) VS(-963.81) N/-S(-325.31) E/-W(997.33)
#61 MD(5980.00) Inc(0.5) Azm(14.7) TVD(5872.20) VS(-965.05) N/-S(-325.11) E/-W(998.55)
#62 MD(6076.00) Inc(1.2) Azm(356.0) TVD(5968.19) VS(-965.22) N/-S(-323.68) E/-W(998.60)
#63 MD(6172.00) Inc(1.9) Azm(334.1) TVD(6064.15) VS(-964.68) N/-S(-321.24) E/-W(997.83)



#64 MD(6267.00) Inc(2.1) Azm(347.1) TVD(6159.09)
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#65 MD(6363.00) Inc(5.6) Azm(278.0) TVD(6254.90)
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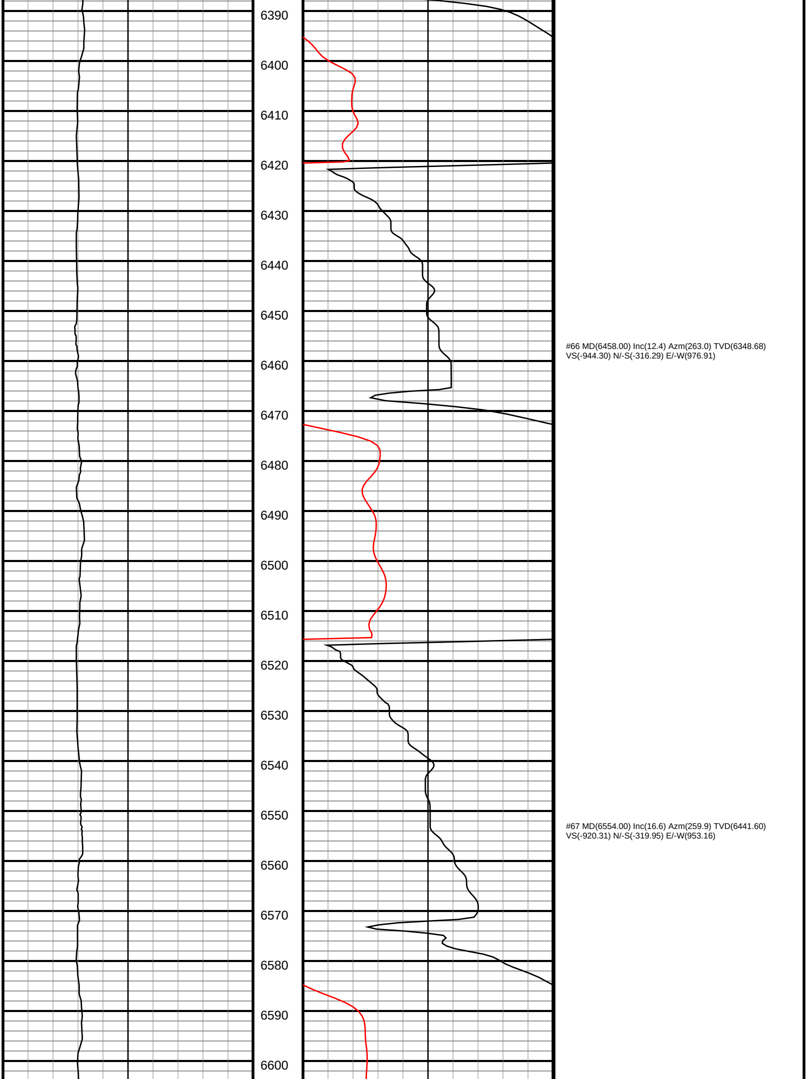
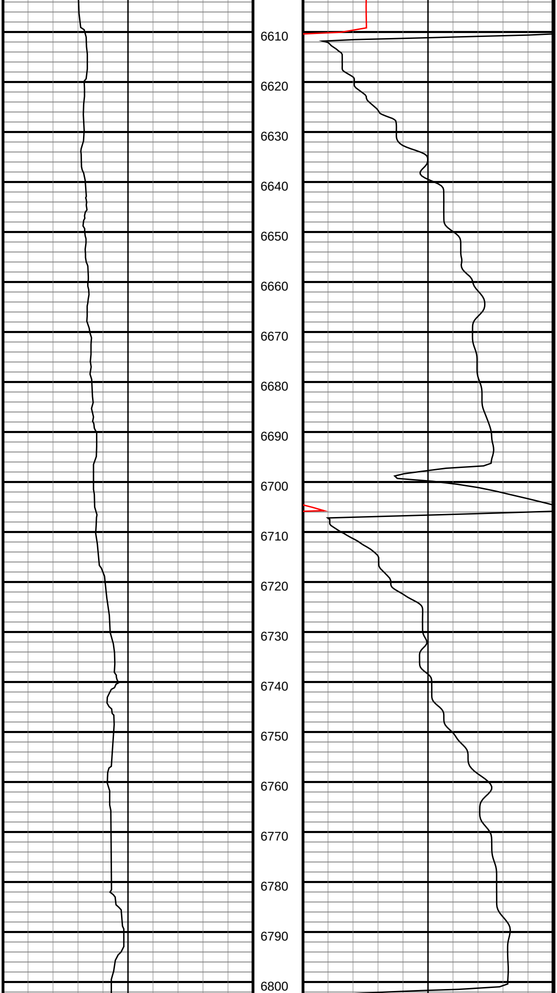


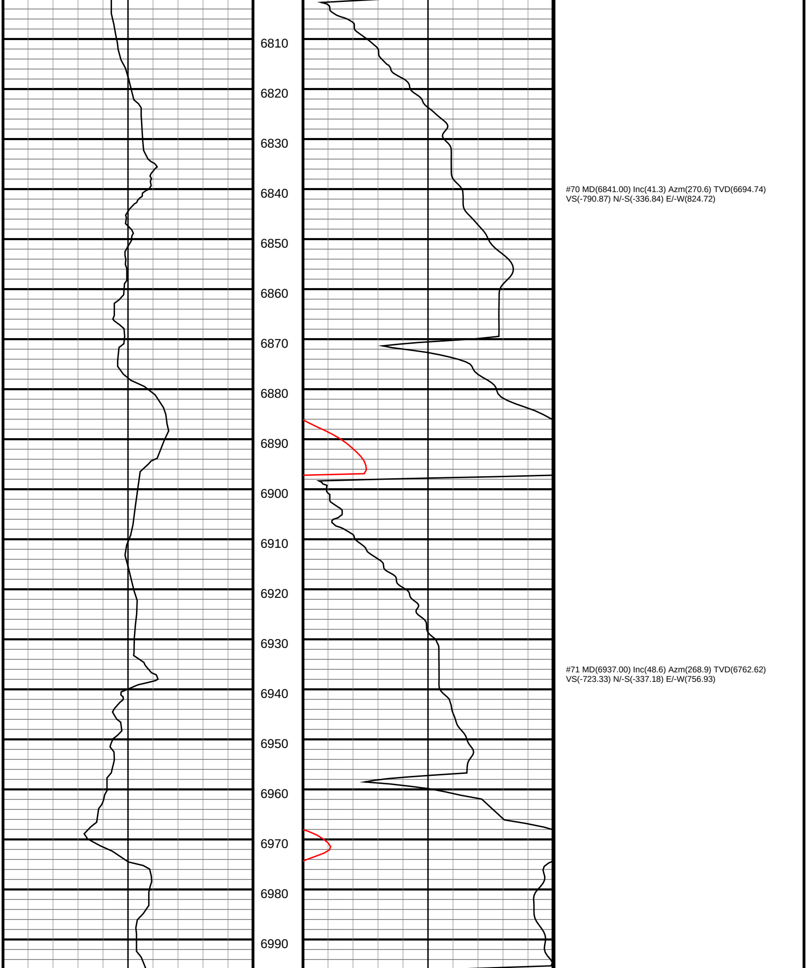
#66 MD(6458.00) Inc(12.4) Azm(263.0) TVD(6348.68)
VS(-944.30) N/-S(-316.29) E/-W(976.91)

#67 MD(6554.00) Inc(16.6) Azm(259.9) TVD(6441.60)
VS(-920.31) N/-S(-319.95) E/-W(953.16)



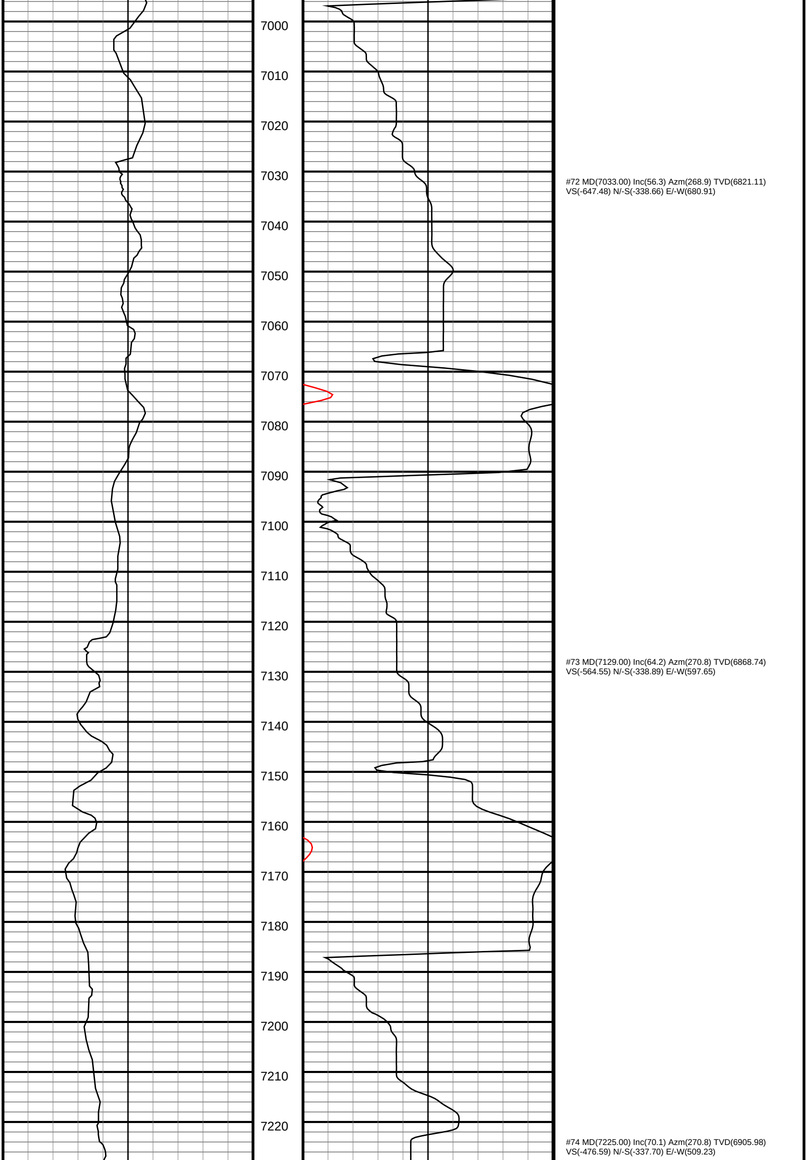
#68 MD(6650.00) Inc(21.2) Azm(258.1) TVD(6532.40)
VS(-889.40) N/-S(-325.92) E/-W(922.66)

#69 MD(6746.00) Inc(31.5) Azm(261.2) TVD(6618.32)
VS(-847.01) N/-S(-333.37) E/-W(880.78)



#70 MD(6841.00) Inc(41.3) Azm(270.6) TVD(6694.74)
VS(-790.87) N/-S(-336.84) E/-W(824.72)

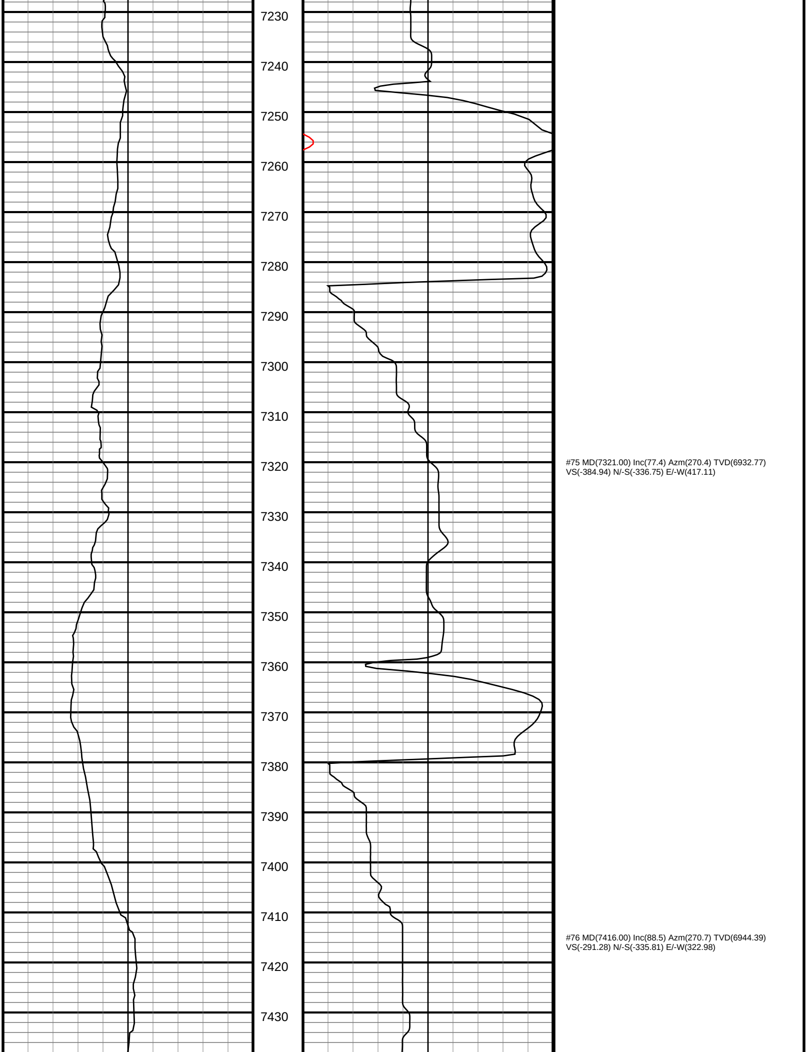
#71 MD(6937.00) Inc(48.6) Azm(268.9) TVD(6762.62)
VS(-723.33) N/-S(-337.18) E/-W(756.93)



#72 MD(7033.00) Inc(56.3) Azm(268.9) TVD(6821.11)
VS(-647.48) N/-S(-338.66) E/-W(680.91)

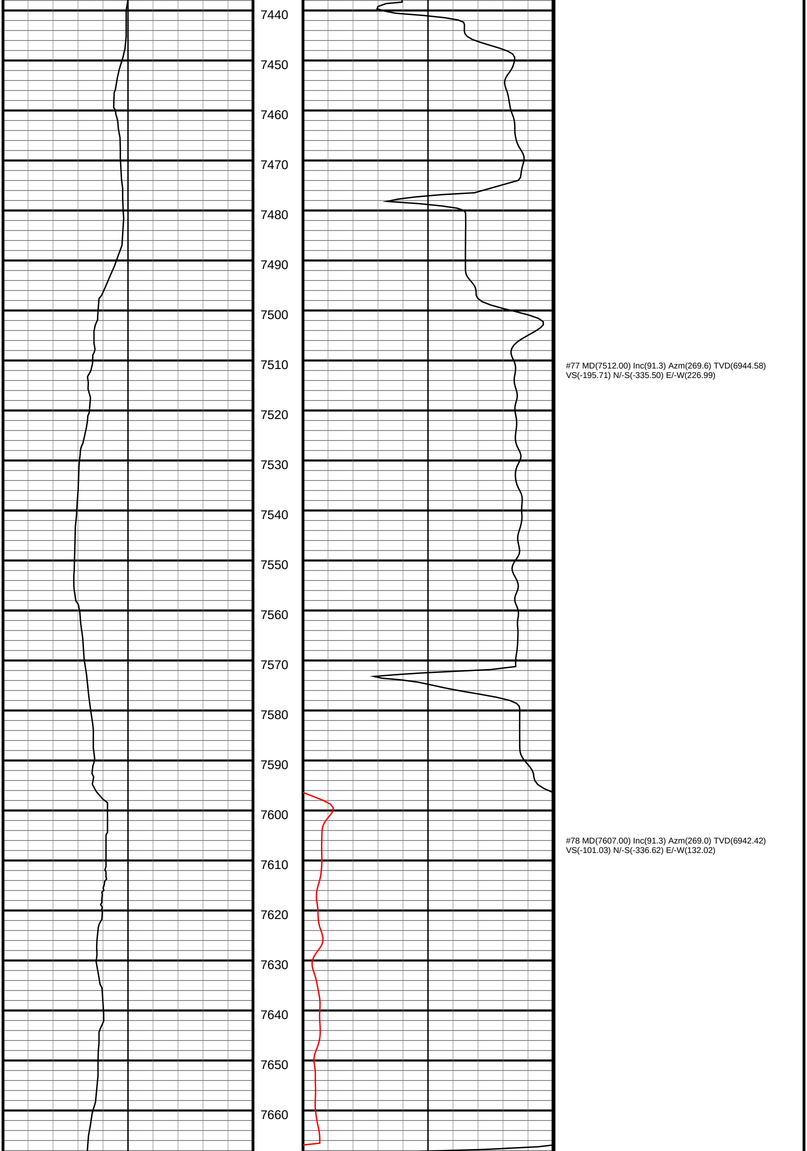
#73 MD(7129.00) Inc(64.2) Azm(270.8) TVD(6868.74)
VS(-564.55) N/-S(-338.89) E/-W(597.65)

#74 MD(7225.00) Inc(70.1) Azm(270.8) TVD(6905.98)
VS(-476.59) N/-S(-337.70) E/-W(509.23)



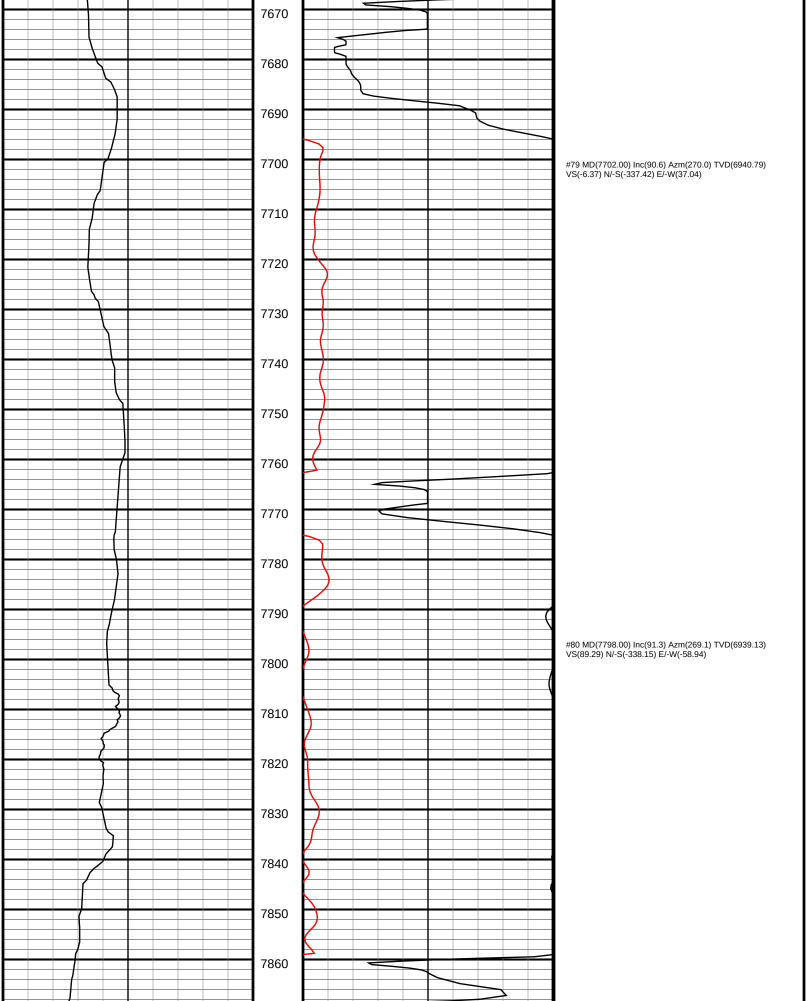
#75 MD(7321.00) Inc(77.4) Azm(270.4) TVD(6932.77)
VS(-384.94) N/-S(-336.75) E/-W(417.11)

#76 MD(7416.00) Inc(88.5) Azm(270.7) TVD(6944.39)
VS(-291.28) N/-S(-335.81) E/-W(322.98)



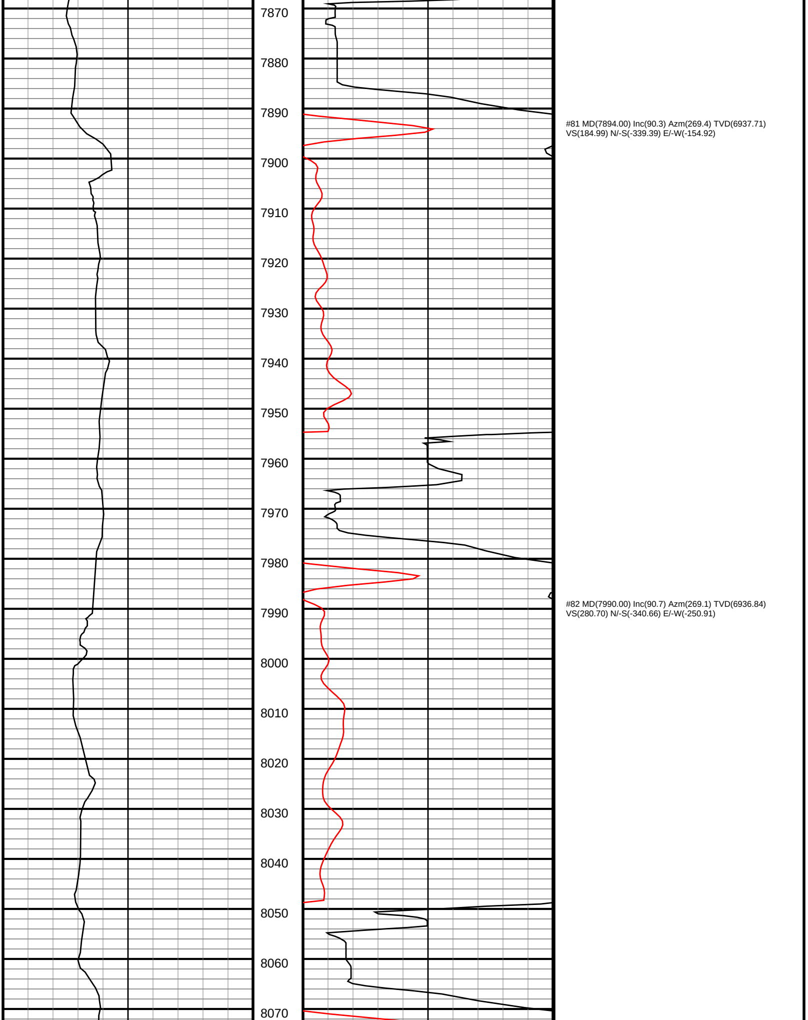
#77 MD(7512.00) Inc(91.3) Azm(269.6) TVD(6944.58)
VS(-195.71) N/-S(-335.50) E/-W(226.99)

#78 MD(7607.00) Inc(91.3) Azm(269.0) TVD(6942.42)
VS(-101.03) N/-S(-336.62) E/-W(132.02)



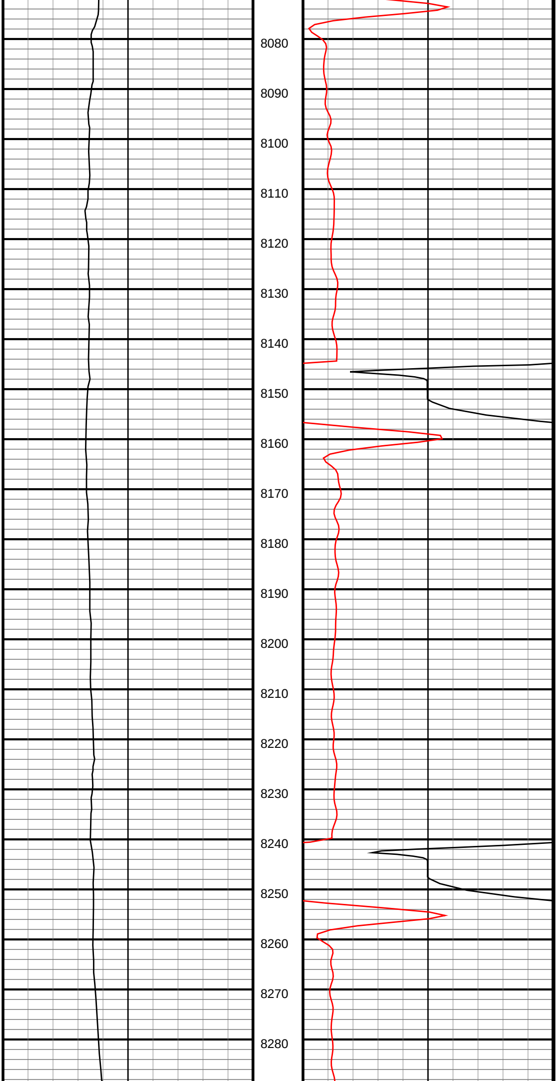
#79 MD(7702.00) Inc(90.6) Azm(270.0) TVD(6940.79)
VS(-6.37) N/-S(-337.42) E/-W(37.04)

#80 MD(7798.00) Inc(91.3) Azm(269.1) TVD(6939.13)
VS(89.29) N/-S(-338.15) E/-W(-58.94)



#81 MD(7894.00) Inc(90.3) Azm(269.4) TVD(6937.71)
VS(184.99) N/-S(-339.39) E/-W(-154.92)

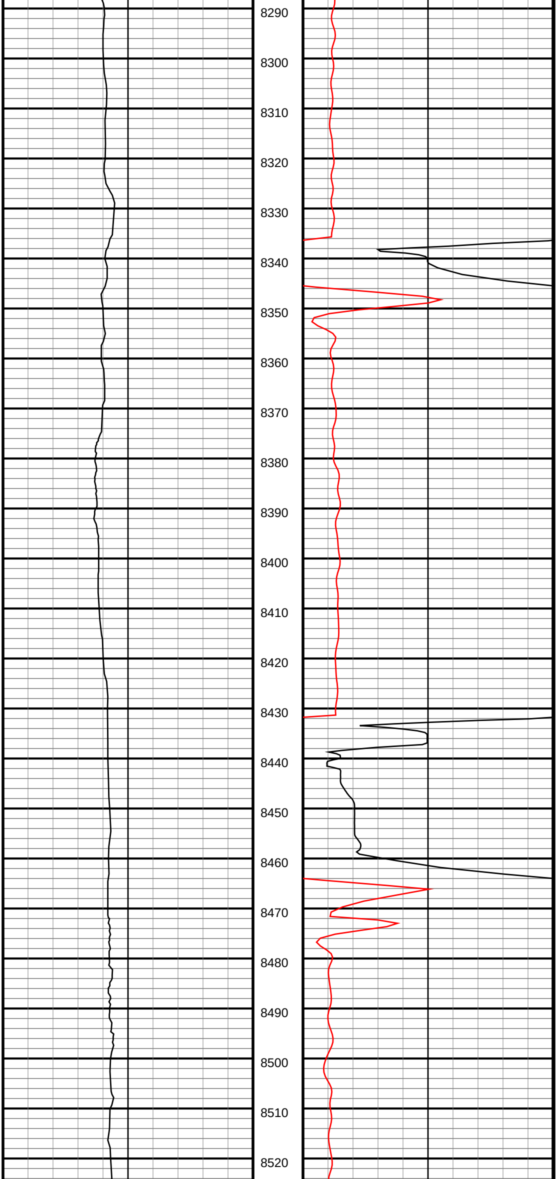
#82 MD(7990.00) Inc(90.7) Azm(269.1) TVD(6936.84)
VS(280.70) N/-S(-340.66) E/-W(-250.91)



#83 MD(8085.00) Inc(89.4) Azm(269.7) TVD(6936.77)
VS(375.39) N/-S(-341.70) E/-W(-345.90)

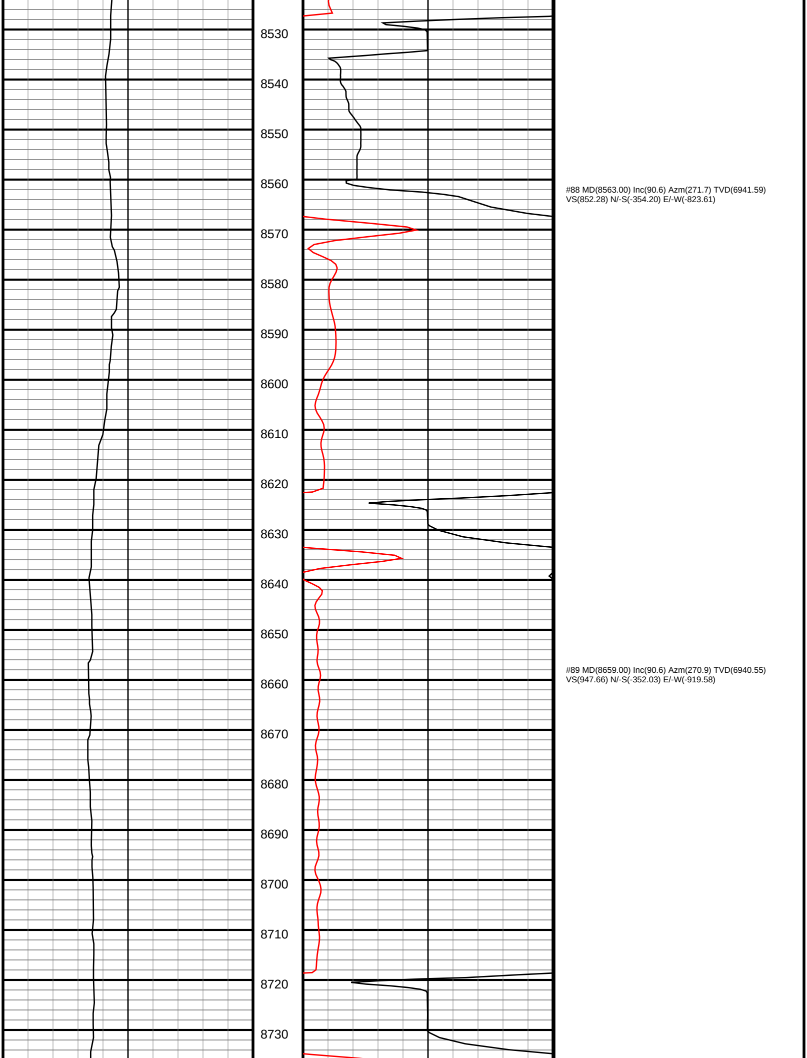
#84 MD(8180.00) Inc(89.3) Azm(268.2) TVD(6937.81)
VS(470.13) N/-S(-343.42) E/-W(-440.88)

#85 MD(8276.00) Inc(89.4) Azm(267.7) TVD(6938.88)
VS(565.98) N/-S(-346.79) E/-W(-536.81)



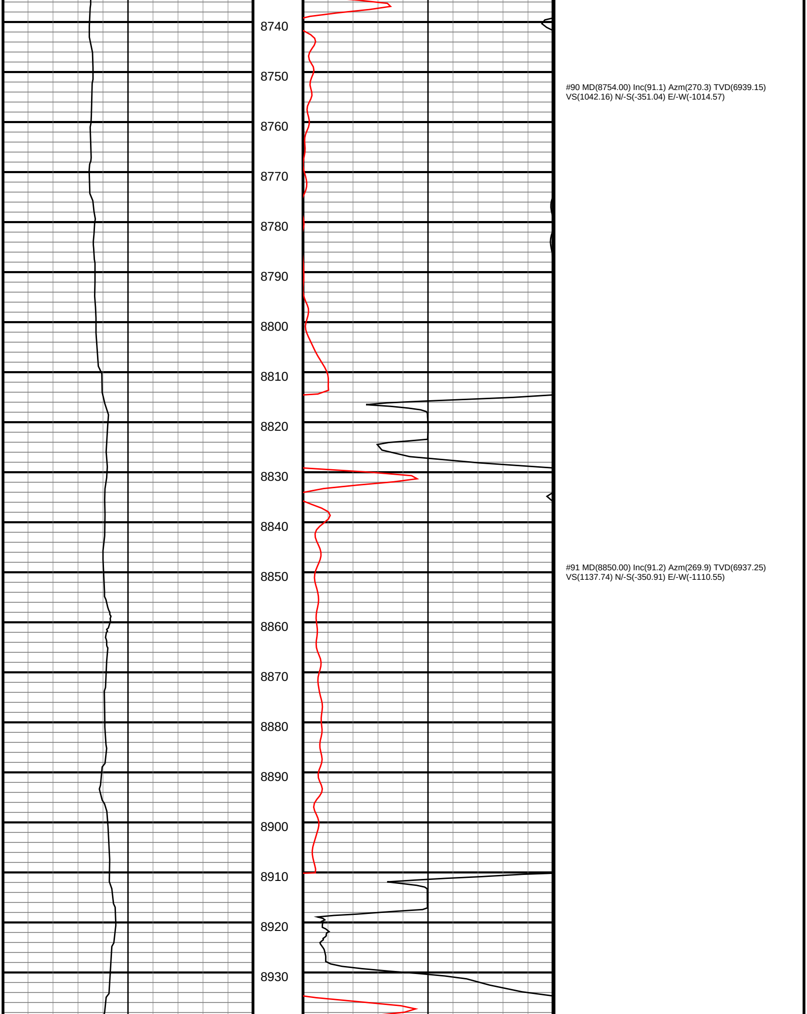
#86 MD(8372.00) Inc(89.4) Azm(267.0) TVD(6939.89)
VS(661.88) N/-S(-351.17) E/-W(-632.71)

#87 MD(8468.00) Inc(89.0) Azm(268.8) TVD(6941.25)
VS(757.72) N/-S(-354.63) E/-W(-728.63)



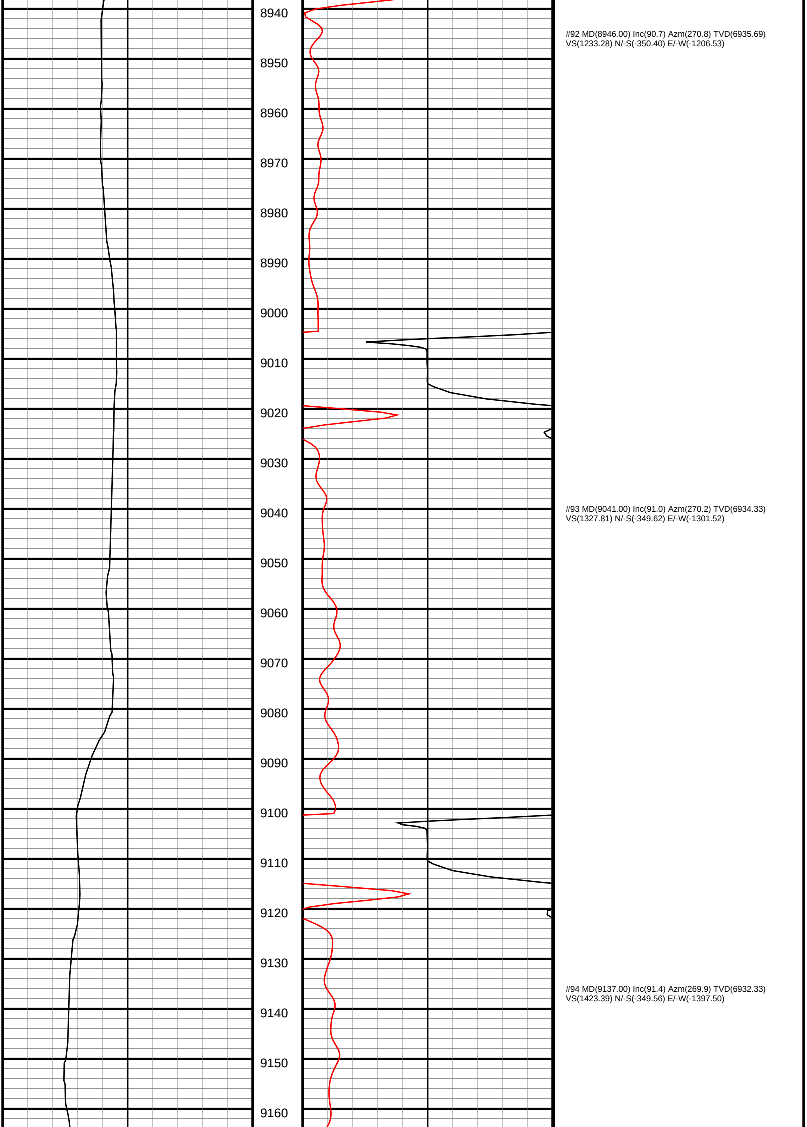
#88 MD(8563.00) Inc(90.6) Azm(271.7) TVD(6941.59)
VS(852.28) N/-S(-354.20) E/-W(-823.61)

#89 MD(8659.00) Inc(90.6) Azm(270.9) TVD(6940.55)
VS(947.66) N/-S(-352.03) E/-W(-919.58)



#90 MD(8754.00) Inc(91.1) Azm(270.3) TVD(6939.15)
VS(1042.16) N/-S(-351.04) E/-W(-1014.57)

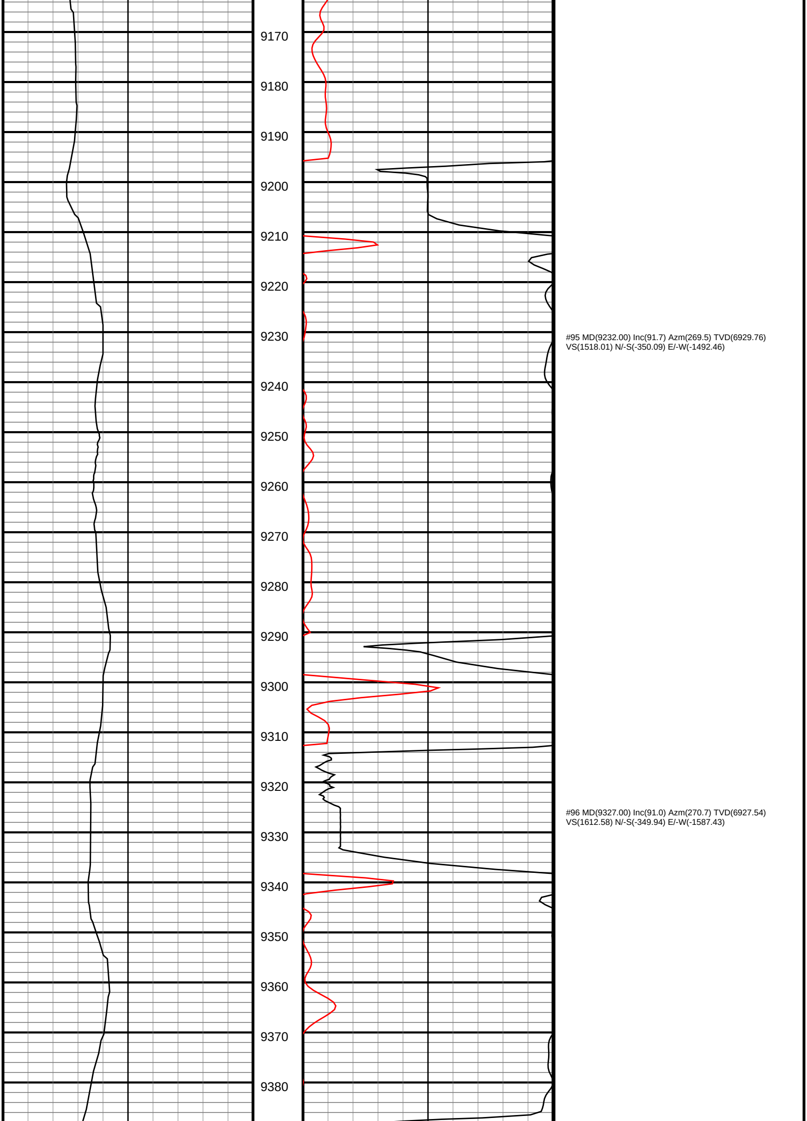
#91 MD(8850.00) Inc(91.2) Azm(269.9) TVD(6937.25)
VS(1137.74) N/-S(-350.91) E/-W(-1110.55)



#92 MD(8946.00) Inc(90.7) Azm(270.8) TVD(6935.69)
VS(1233.28) N/-S(-350.40) E/-W(-1206.53)

#93 MD(9041.00) Inc(91.0) Azm(270.2) TVD(6934.33)
VS(1327.81) N/-S(-349.62) E/-W(-1301.52)

#94 MD(9137.00) Inc(91.4) Azm(269.9) TVD(6932.33)
VS(1423.39) N/-S(-349.56) E/-W(-1397.50)



#95 MD(9232.00) Inc(91.7) Azm(269.5) TVD(6929.76)
VS(1518.01) N/-S(-350.09) E/-W(-1492.46)

#96 MD(9327.00) Inc(91.0) Azm(270.7) TVD(6927.54)
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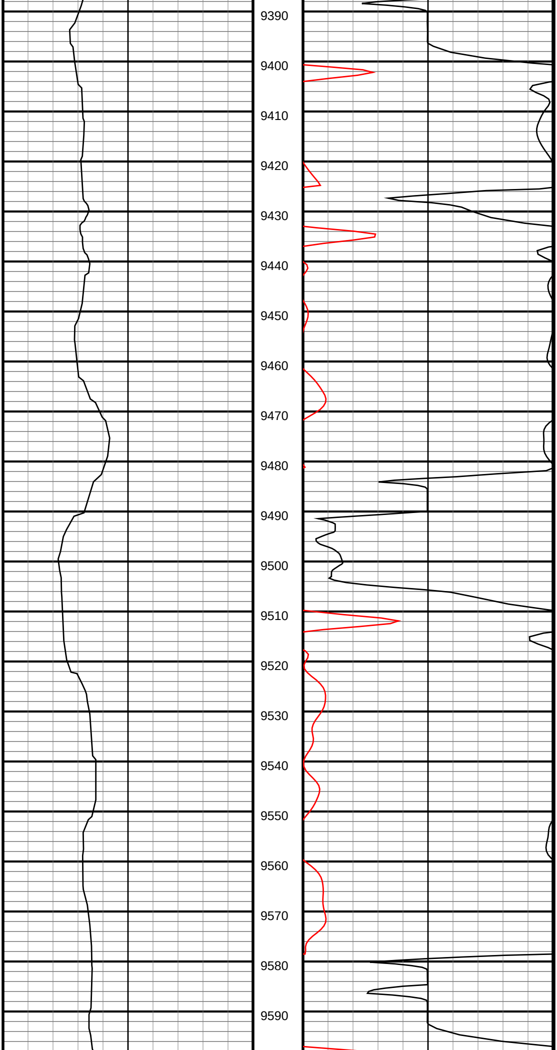
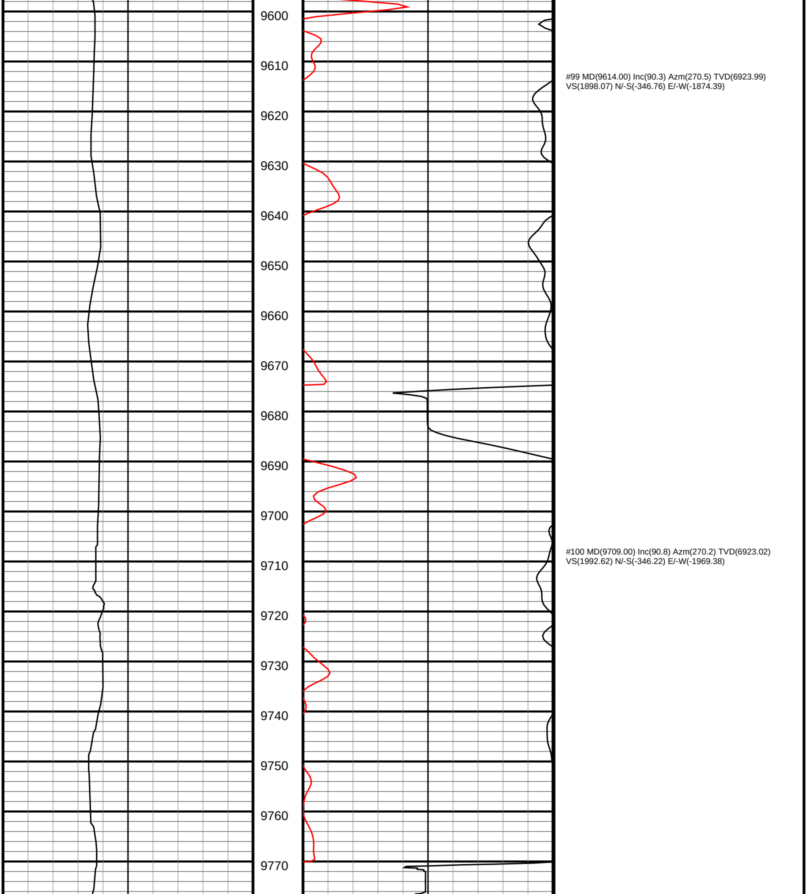


#97 MD(9423.00) Inc(91.2) Azm(270.4) TVD(6925.74)
VS(1708.08) N/-S(-349.04) E/-W(-1683.41)

#98 MD(9518.00) Inc(90.3) Azm(271.0) TVD(6924.52)
VS(1802.58) N/-S(-347.95) E/-W(-1778.40)



#99 MD(9614.00) Inc(90.3) Azm(270.5) TVD(6923.99)
VS(1898.07) N/-S(-346.76) E/-W(-1874.39)

#100 MD(9709.00) Inc(90.8) Azm(270.2) TVD(6923.02)
VS(1992.62) N/-S(-346.22) E/-W(-1969.38)

#101 MD(9805.00) Inc(89.2) Azm(271.4) TVD(6923.02)
VS(2088.10) N/-S(-344.91) E/-W(-2065.37)

#102 MD(9899.00) Inc(89.5) Azm(271.5) TVD(6924.13)
VS(2181.47) N/-S(-342.57) E/-W(-2159.33)

#103 MD(9995.00) Inc(89.3) Azm(271.1) TVD(6925.14)
VS(2276.84) N/-S(-340.38) E/-W(-2255.30)

#104 MD(10090.00) Inc(88.8) Azm(270.4) TVD(6926.67)
VS(2371.32) N/-S(-339.09) E/-W(-2350.28)

#105 MD(10184.00) Inc(88.4) Azm(270.5) TVD(6928.96)
VS(2464.84) N/-S(-338.38) E/-W(-2444.25)

#106 MD(10280.00) Inc(87.9) Azm(269.7) TVD(6932.10)
VS(2560.38) N/-S(-338.21) E/-W(-2540.19)

#107 MD(10375.00) Inc(89.9) Azm(267.9) TVD(6933.91)
VS(2655.11) N/-S(-340.13) E/-W(-2635.15)

#108 MD(10471.00) Inc(90.4) Azm(267.3) TVD(6933.64)
VS(2751.00) N/-S(-344.08) E/-W(-2731.07)

#109 MD(10566.00) Inc(91.7) Azm(269.1) TVD(6931.87)
VS(2845.81) N/-S(-347.04) E/-W(-2826.00)

#110 MD(10662.00) Inc(92.7) Azm(268.7) TVD(6928.21)
VS(2941.49) N/-S(-348.89) E/-W(-2921.91)

#111 MD(10757.00) Inc(92.1) Azm(269.6) TVD(6924.28)
VS(3036.14) N/-S(-350.35) E/-W(-3016.82)

#112 MD(10853.00) Inc(92.1) Azm(269.1) TVD(6920.75)
VS(3131.78) N/-S(-351.48) E/-W(-3112.74)

#113 MD(10949.00) Inc(90.2) Azm(270.0) TVD(6918.81)
VS(3227.43) N/-S(-352.26) E/-W(-3208.72)

#114 MD(11044.00) Inc(90.3) Azm(269.2) TVD(6918.38)
VS(3322.09) N/-S(-352.95) E/-W(-3303.71)

#115 MD(11140.00) Inc(90.8) Azm(268.8) TVD(6917.41)
VS(3417.83) N/-S(-354.63) E/-W(-3399.69)

#116 MD(11235.00) Inc(91.3) Azm(268.3) TVD(6915.64)
VS(3512.61) N/-S(-357.02) E/-W(-3494.64)

#117 MD(11331.00) Inc(89.9) Azm(270.0) TVD(6914.61)
VS(3608.33) N/-S(-358.44) E/-W(-3590.62)

#118 MD(11427.00) Inc(90.6) Azm(269.6) TVD(6914.15)
VS(3703.97) N/-S(-358.84) E/-W(-3686.62)

#119 MD(11523.00) Inc(90.4) Azm(269.6) TVD(6913.28)
VS(3799.63) N/-S(-359.57) E/-W(-3782.61)

#120 MD(11619.00) Inc(91.4) Azm(269.1) TVD(6911.76)
VS(3895.32) N/-S(-360.67) E/-W(-3878.59)

#121 MD(11715.00) Inc(91.8) Azm(268.3) TVD(6909.10)
VS(3991.06) N/-S(-362.84) E/-W(-3974.53)

#122 MD(11792.00) Inc(91.8) Azm(267.8) TVD(6906.70)
VS(4067.90) N/-S(-365.46) E/-W(-4051.45)