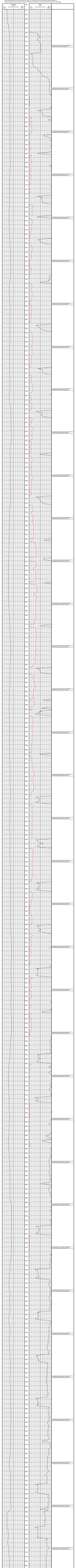

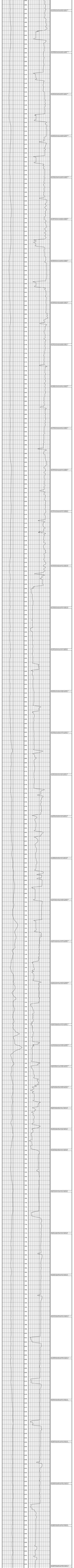

ENSIGN Directional

Spaur 10L-241

MD
5":100'

Company: Petroleum Development Corp.
Well Name: Spaur 10L-241
API: 05123423700
County/Parish: Weld
State: Colorado
Country: USA
Job number: 207-121-257
Field: DJ Basin
Rig Id: Ensign 121
Survey Company: Ensign Directional Services
Company Man 1 Dean Haight

Lead Directional Driller Breven Williams
Rotating Directional Driller Dave Van Dorin
Night Directional Driller Pete Moriarty

MWD Ensign Directional Services

Log measurements: gamma, ROP
Depth measured from: Rig Floor
Maximum temperature: -------

	Depth	**Date**
Start:	0 ft	2-23-2016
End:	11466 ft	2-28-2016

Casing	**Depth**	**Size**
Surface:	1369	9 5/8
Intermediate:		7

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

Elevations
KB: 4853.5
GL: 4840
DF: 4853.5

Run	**Bit Size**	**Offsets**		**Depths**		**Dates**	
		Gamma	**Survey**	**Start**	**End**	**Start**	**End**
1	12.25		52.03	0	1390	2-23-2016	2-23-2016
2	8.5	50.20	45.20	1390	11466	2-24-2016	2028-2016
3							
4							
5							
6							
7							
8							
9							
10							

Ensign Directional Services 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.

#15 MD(1422.00) Inc(6.7) Azm(248.1) TVD(1420.06)
VS(-9.85) NS(-15.18) EW(-32.62) TEMP(0.0)

#16 MD(1517.00) Inc(7.7) Azm(250.7) TVD(1514.31)
VS(-12.21) NS(-19.35) EW(-43.77) TEMP(0.0)

#17 MD(1613.00) Inc(9.4) Azm(254.0) TVD(1609.24)
VS(-14.30) NS(-23.63) EW(-57.37) TEMP(0.0)

#18 MD(1709.00) Inc(8.8) Azm(248.8) TVD(1704.04)
VS(-16.80) NS(-28.45) EW(-71.76) TEMP(0.0)

#19 MD(1805.00) Inc(9.8) Azm(249.3) TVD(1798.77)
VS(-19.99) NS(-33.99) EW(-86.24) TEMP(0.0)

#20 MD(1901.00) Inc(9.5) Azm(254.2) TVD(1893.42)
VS(-22.57) NS(-39.04) EW(-101.51) TEMP(0.0)

#21 MD(1997.00) Inc(9.2) Azm(250.9) TVD(1988.14)
VS(-24.84) NS(-43.71) EW(-116.39) TEMP(0.0)

#22 MD(2093.00) Inc(9.4) Azm(253.2) TVD(2082.88)
VS(-27.23) NS(-48.48) EW(-131.14) TEMP(0.0)

#23 MD(2188.00) Inc(9.9) Azm(248.9) TVD(2176.54)
VS(-29.98) NS(-53.67) EW(-146.19) TEMP(0.0)

#24 MD(2284.00) Inc(9.6) Azm(253.2) TVD(2271.15)
VS(-32.78) NS(-58.95) EW(-161.55) TEMP(0.0)

#25 MD(2380.00) Inc(8.9) Azm(248.6) TVD(2365.90)
VS(-35.44) NS(-63.98) EW(-176.13) TEMP(0.0)

#26 MD(2475.00) Inc(10.8) Azm(254.9) TVD(2459.50)
VS(-37.95) NS(-68.98) EW(-191.57) TEMP(0.0)

#27 MD(2570.00) Inc(11.1) Azm(256.1) TVD(2552.77)
VS(-39.66) NS(-73.49) EW(-209.04) TEMP(0.0)

#28 MD(2666.00) Inc(11.0) Azm(254.0) TVD(2646.99)
VS(-41.54) NS(-78.24) EW(-226.81) TEMP(0.0)

#29 MD(2761.00) Inc(9.8) Azm(250.7) TVD(2740.43)
VS(-44.08) NS(-83.41) EW(-243.16) TEMP(0.0)

#30 MD(2857.00) Inc(10.5) Azm(252.5) TVD(2834.93)
VS(-46.81) NS(-88.74) EW(-259.21) TEMP(0.0)

#31 MD(2953.00) Inc(10.8) Azm(254.2) TVD(2929.27)
VS(-49.15) NS(-93.82) EW(-276.21) TEMP(0.0)

#32 MD(3048.00) Inc(9.4) Azm(250.5) TVD(3022.80)
VS(-51.60) NS(-98.83) EW(-292.08) TEMP(0.0)

#33 MD(3144.00) Inc(9.3) Azm(250.2) TVD(3117.52)
VS(-54.47) NS(-104.07) EW(-306.77) TEMP(0.0)

#34 MD(3240.00) Inc(10.1) Azm(245.4) TVD(3212.15)
VS(-58.17) NS(-110.21) EW(-321.73) TEMP(0.0)

#35 MD(3335.00) Inc(9.7) Azm(249.8) TVD(3305.74)
VS(-61.95) NS(-116.44) EW(-336.81) TEMP(0.0)

#36 MD(3431.00) Inc(9.4) Azm(250.9) TVD(3400.41)
VS(-64.88) NS(-121.80) EW(-351.81) TEMP(0.0)

#37 MD(3527.00) Inc(8.8) Azm(264.9) TVD(3495.21)
VS(-65.74) NS(-125.01) EW(-366.53) TEMP(0.0)

#38 MD(3623.00) Inc(6.9) Azm(265.5) TVD(3590.31)
VS(-64.77) NS(-126.12) EW(-379.60) TEMP(0.0)

#39 MD(3719.00) Inc(8.5) Azm(259.1) TVD(3685.44)
VS(-64.54) NS(-127.91) EW(-392.31) TEMP(0.0)

#40 MD(3815.00) Inc(9.9) Azm(257.2) TVD(3780.20)
VS(-65.31) NS(-131.08) EW(-407.33) TEMP(0.0)

#41 MD(3911.00) Inc(10.1) Azm(258.1) TVD(3874.75)
VS(-66.26) NS(-134.65) EW(-423.61) TEMP(0.0)

#42 MD(4006.00) Inc(8.2) Azm(257.9) TVD(3968.53)
VS(-67.03) NS(-137.79) EW(-438.39) TEMP(0.0)

#43 MD(4102.00) Inc(7.7) Azm(245.1) TVD(4063.62)
VS(-69.15) NS(-141.93) EW(-450.92) TEMP(0.0)

#44 MD(4198.00) Inc(8.9) Azm(254.6) TVD(4158.61)
VS(-71.73) NS(-146.61) EW(-463.91) TEMP(0.0)

#45 MD(4294.00) Inc(9.4) Azm(253.3) TVD(4253.39)
VS(-73.59) NS(-150.83) EW(-478.58) TEMP(0.0)

#46 MD(4390.00) Inc(9.9) Azm(251.7) TVD(4348.03)
VS(-75.96) NS(-155.68) EW(-493.93) TEMP(0.0)

#47 MD(4486.00) Inc(10.1) Azm(255.6) TVD(4442.58)
VS(-78.07) NS(-160.36) EW(-509.91) TEMP(0.0)

#48 MD(4582.00) Inc(8.1) Azm(252.3) TVD(4537.36)
VS(-79.87) NS(-164.51) EW(-524.51) TEMP(0.0)

#49 MD(4678.00) Inc(9.1) Azm(251.4) TVD(4632.28)
VS(-82.14) NS(-168.99) EW(-538.15) TEMP(0.0)

#50 MD(4773.00) Inc(11.7) Azm(249.5) TVD(4725.72)
VS(-85.30) NS(-174.76) EW(-554.30) TEMP(0.0)

#51 MD(4869.00) Inc(11.2) Azm(243.1) TVD(4819.81)
VS(-90.08) NS(-182.39) EW(-571.73) TEMP(0.0)

#52 MD(4964.00) Inc(9.8) Azm(250.9) TVD(4913.22)
VS(-94.32) NS(-189.21) EW(-587.60) TEMP(0.0)

#53 MD(5060.00) Inc(10.3) Azm(252.1) TVD(5007.75)
VS(-97.06) NS(-194.52) EW(-603.48) TEMP(0.0)

#54 MD(5156.00) Inc(9.9) Azm(260.5) TVD(5102.26)
VS(-98.45) NS(-198.52) EW(-619.79) TEMP(0.0)

#55 MD(5252.00) Inc(10.1) Azm(255.6) TVD(5196.81)
VS(-99.29) NS(-201.98) EW(-636.09) TEMP(0.0)

#56 MD(5347.00) Inc(10.2) Azm(254.0) TVD(5290.32)
VS(-101.08) NS(-206.37) EW(-652.24) TEMP(0.0)

#57 MD(5443.00) Inc(7.4) Azm(255.4) TVD(5385.18)
VS(-102.71) NS(-210.27) EW(-666.40) TEMP(0.0)

#58 MD(5539.00) Inc(7.5) Azm(255.4) TVD(5480.37)
VS(-103.91) NS(-213.41) EW(-678.44) TEMP(0.0)

#59 MD(5635.00) Inc(6.9) Azm(248.6) TVD(5575.62)
VS(-105.75) NS(-217.09) EW(-689.87) TEMP(0.0)

#60 MD(5731.00) Inc(4.8) Azm(248.6) TVD(5671.11)
VS(-107.84) NS(-220.66) EW(-698.98) TEMP(0.0)

#61 MD(5827.00) Inc(3.5) Azm(241.7) TVD(5766.86)
VS(-109.66) NS(-223.51) EW(-705.30) TEMP(0.0)

#62 MD(5923.00) Inc(2.0) Azm(247.2) TVD(5862.74)
VS(-111.03) NS(-225.55) EW(-709.43) TEMP(0.0)

#63 MD(6019.00) Inc(1.6) Azm(216.2) TVD(5958.70)
VS(-112.37) NS(-227.28) EW(-711.76) TEMP(0.0)

#64 MD(6114.00) Inc(1.0) Azm(228.9) TVD(6053.67)
VS(-113.74) NS(-228.90) EW(-713.17) TEMP(208.5)

#65 MD(6239.00) Inc(0.5) Azm(228.7) TVD(6178.66)
VS(-114.61) NS(-229.98) EW(-714.40) TEMP(134.5)

#66 MD(6335.00) Inc(5.3) Azm(352.8) TVD(6274.53)
VS(-110.40) NS(-225.85) EW(-715.27) TEMP(134.5)

#67 MD(6431.00) Inc(14.1) Azm(0.6) TVD(6369.07)
VS(-94.41) NS(-209.73) EW(-715.71) TEMP(134.5)

#68 MD(6527.00) Inc(20.4) Azm(359.0) TVD(6460.71)
VS(-66.29) NS(-181.28) EW(-715.88) TEMP(134.5)

#69 MD(6622.00) Inc(28.8) Azm(356.0) TVD(6547.01)
VS(-27.03) NS(-141.82) EW(-717.77) TEMP(149.3)

#70 MD(6718.00) Inc(37.5) Azm(0.9) TVD(6627.32)
VS(24.90) NS(-89.43) EW(-718.92) TEMP(149.3)

#71 MD(6814.00) Inc(40.0) Azm(0.6) TVD(6702.18)
VS(84.10) NS(-29.35) EW(-718.14) TEMP(149.3)

#72 MD(6910.00) Inc(48.5) Azm(2.3) TVD(6770.89)
VS(149.89) NS(37.55) EW(-716.37) TEMP(149.3)

#73 MD(7006.00) Inc(55.5) Azm(359.9) TVD(6829.96)
VS(224.31) NS(113.13) EW(-715.00) TEMP(149.3)

#74 MD(7101.00) Inc(57.7) Azm(359.0) TVD(6882.25)
VS(302.74) NS(192.43) EW(-715.77) TEMP(149.3)

#75 MD(7197.00) Inc(61.7) Azm(357.9) TVD(6930.68)
VS(384.90) NS(275.27) EW(-718.02) TEMP(149.3)

#76 MD(7292.00) Inc(67.1) Azm(357.9) TVD(6971.71)
VS(469.91) NS(360.85) EW(-721.16) TEMP(149.3)

#77 MD(7340.00) Inc(72.3) Azm(358.3) TVD(6988.36)
VS(514.56) NS(405.83) EW(-722.65) TEMP(149.3)

#78 MD(7388.00) Inc(77.1) Azm(358.4) TVD(7001.02)
VS(560.46) NS(452.10) EW(-723.98) TEMP(149.3)

#79 MD(7436.00) Inc(80.2) Azm(359.0) TVD(7010.47)
VS(607.09) NS(499.14) EW(-725.05) TEMP(149.3)

#80 MD(7484.00) Inc(82.6) Azm(1.1) TVD(7017.65)
VS(653.94) NS(546.59) EW(-725.01) TEMP(149.3)

#81 MD(7532.00) Inc(86.1) Azm(1.8) TVD(7022.37)
VS(700.90) NS(594.34) EW(-723.80) TEMP(149.3)

#82 MD(7580.00) Inc(89.8) Azm(1.6) TVD(7024.09)
VS(748.02) NS(642.28) EW(-722.37) TEMP(149.3)

#83 MD(7675.00) Inc(91.5) Azm(2.3) TVD(7023.01)
VS(841.26) NS(737.21) EW(-719.14) TEMP(149.3)

#84 MD(7771.00) Inc(90.2) Azm(1.6) TVD(7021.59)
VS(935.48) NS(833.14) EW(-715.87) TEMP(149.3)

#85 MD(7867.00) Inc(89.9) Azm(0.0) TVD(7021.50)
VS(1030.06) NS(929.13) EW(-714.53) TEMP(164.1)

#86 MD(7962.00) Inc(89.8) Azm(357.7) TVD(7021.75)
VS(1124.15) NS(1024.10) EW(-716.44) TEMP(164.1)

#87 MD(8058.00) Inc(90.2) Azm(358.3) TVD(7021.75)
VS(1219.42) NS(1120.05) EW(-719.79) TEMP(164.1)

#88 MD(8154.00) Inc(90.5) Azm(0.0) TVD(7021.16)
VS(1314.43) NS(1216.03) EW(-721.22) TEMP(164.1)

#89 MD(8250.00) Inc(89.7) Azm(0.9) TVD(7021.00)
VS(1409.11) NS(1312.02) EW(-720.46) TEMP(164.1)

#90 MD(8346.00) Inc(89.5) Azm(359.7) TVD(7021.67)
VS(1503.82) NS(1408.02) EW(-719.96) TEMP(164.1)

#91 MD(8442.00) Inc(90.1) Azm(0.4) TVD(7022.00)
VS(1598.61) NS(1504.02) EW(-719.87) TEMP(164.1)

#92 MD(8538.00) Inc(90.2) Azm(359.9) TVD(7021.75)
VS(1693.37) NS(1600.02) EW(-719.62) TEMP(164.1)

#93 MD(8634.00) Inc(90.6) Azm(359.3) TVD(7021.08)
VS(1788.28) NS(1696.01) EW(-720.29) TEMP(164.1)

#94 MD(8730.00) Inc(91.8) Azm(0.7) TVD(7019.07)
VS(1883.05) NS(1791.99) EW(-720.29) TEMP(164.1)

#95 MD(8826.00) Inc(91.5) Azm(1.3) TVD(7016.31)
VS(1977.54) NS(1887.93) EW(-718.62) TEMP(164.1)

#96 MD(8922.00) Inc(90.7) Azm(1.4) TVD(7014.46)
VS(2071.94) NS(1983.89) EW(-716.36) TEMP(164.1)

#97 MD(9018.00) Inc(89.6) Azm(0.4) TVD(7014.21)
VS(2166.49) NS(2079.87) EW(-714.85) TEMP(178.9)

#98 MD(9114.00) Inc(90.3) Azm(0.2) TVD(7014.30)
VS(2261.21) NS(2175.87) EW(-714.35) TEMP(178.9)

#99 MD(9210.00) Inc(89.6) Azm(359.9) TVD(7014.38)
VS(2356.00) NS(2271.87) EW(-714.26) TEMP(178.9)

#100 MD(9306.00) Inc(89.5) Azm(359.0) TVD(7015.13)
VS(2450.94) NS(2367.86) EW(-715.19) TEMP(178.9)

#101 MD(9402.00) Inc(90.3) Azm(0.0) TVD(7015.30)
VS(2545.87) NS(2463.85) EW(-716.02) TEMP(178.9)

#102 MD(9498.00) Inc(90.0) Azm(0.4) TVD(7015.05)
VS(2640.61) NS(2559.85) EW(-715.69) TEMP(178.9)

#103 MD(9593.00) Inc(89.3) Azm(0.2) TVD(7015.63)
VS(2734.35) NS(2654.85) EW(-715.19) TEMP(178.9)

#104 MD(9689.00) Inc(90.2) Azm(359.7) TVD(7016.05)
VS(2829.16) NS(2750.85) EW(-715.27) TEMP(178.9)

#105 MD(9785.00) Inc(89.9) Azm(0.4) TVD(7015.96)
VS(2923.95) NS(2846.85) EW(-715.19) TEMP(178.9)

#106 MD(9881.00) Inc(91.6) Azm(0.0) TVD(7014.71)
VS(3018.69) NS(2942.83) EW(-714.86) TEMP(178.9)

#107 MD(9976.00) Inc(91.5) Azm(359.9) TVD(7012.14)
VS(3112.48) NS(3037.80) EW(-714.94) TEMP(178.9)

#108 MD(10071.00) Inc(89.6) Azm(0.2) TVD(7011.23)
VS(3206.27) NS(3132.79) EW(-714.86) TEMP(178.9)

#109 MD(10168.00) Inc(90.4) Azm(0.4) TVD(7011.23)
VS(3301.98) NS(3229.79) EW(-714.35) TEMP(178.9)

#110 MD(10264.00) Inc(89.6) Azm(0.6) TVD(7011.23)
VS(3396.65) NS(3325.78) EW(-713.51) TEMP(178.9)

#111 MD(10360.00) Inc(88.9) Azm(1.3) TVD(7012.48)
VS(3491.18) NS(3421.76) EW(-711.92) TEMP(178.9)

#112 MD(10456.00) Inc(91.4) Azm(0.9) TVD(7012.23)
VS(3585.66) NS(3517.74) EW(-710.08) TEMP(178.9)

#113 MD(10552.00) Inc(90.0) Azm(0.6) TVD(7011.06)
VS(3680.25) NS(3613.72) EW(-708.82) TEMP(178.9)

#114 MD(10648.00) Inc(89.1) Azm(0.2) TVD(7011.81)
VS(3774.94) NS(3709.71) EW(-708.15) TEMP(178.9)

#115 MD(10744.00) Inc(88.0) Azm(359.7) TVD(7014.24)
VS(3869.72) NS(3805.68) EW(-708.23) TEMP(178.9)

#116 MD(10840.00) Inc(89.9) Azm(359.1) TVD(7016.00)
VS(3964.66) NS(3901.65) EW(-709.24) TEMP(193.7)

#117 MD(10936.00) Inc(89.0) Azm(359.5) TVD(7016.92)
VS(4059.63) NS(3997.64) EW(-710.41) TEMP(193.7)

#118 MD(11031.00) Inc(89.0) Azm(359.3) TVD(7018.58)
VS(4153.58) NS(4092.62) EW(-711.41) TEMP(193.7)

#119 MD(11127.00) Inc(89.7) Azm(359.0) TVD(7019.67)
VS(4248.59) NS(4188.60) EW(-712.83) TEMP(193.7)

#120 MD(11223.00) Inc(89.0) Azm(359.0) TVD(7020.76)
VS(4343.64) NS(4284.58) EW(-714.50) TEMP(193.7)

#121 MD(11319.00) Inc(89.9) Azm(358.1) TVD(7021.68)
VS(4438.79) NS(4380.54) EW(-716.93) TEMP(193.7)

#122 MD(11421.00) Inc(91.0) Azm(357.6) TVD(7020.88)
VS(4540.04) NS(4482.47) EW(-720.76) TEMP(193.7)