



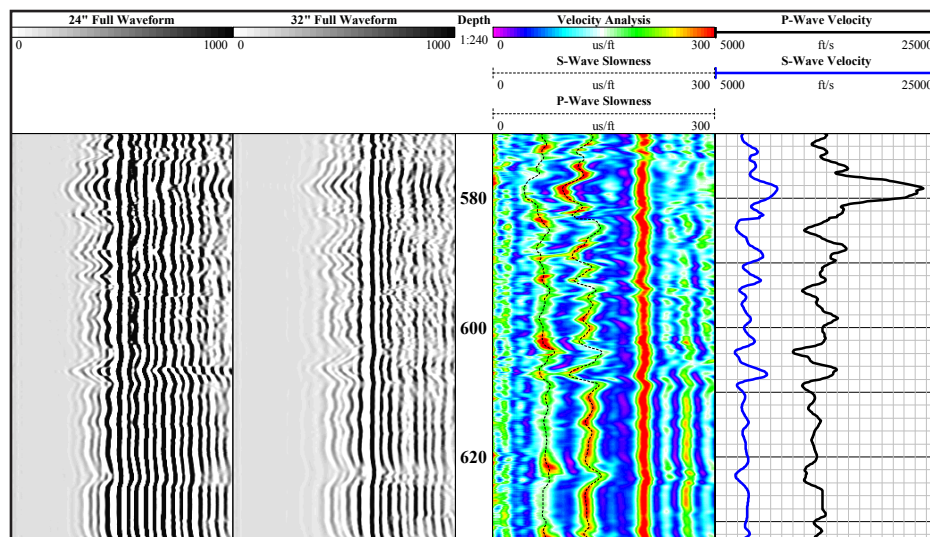
FULL WAVEFORM SONIC (FWS) CASING BOND LOG (CBL)

Full Waveform Sonic (FWS) is a geophysical measurement of sound properties in open-hole, fluid filled formations. Designed specifically for mining and geotechnical applications, acoustic energy is transmitted through borehole fluid into the surrounding rock from the piezoelectric transducer. The acoustic signals are then sensed by the receivers, digitized and transmitted to the surface electronics. Acoustic waveforms can be viewed and processed for amplitude and travel time (velocity) information.

This same device can be run in the fluid portion of cased wells and the results evaluated as a Cement or Casing Bond Log (CBL).

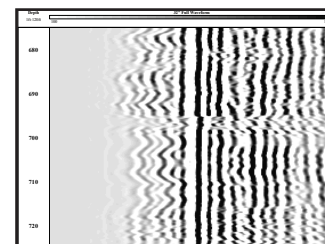
APPLICATIONS:

- + Well completion evaluation in fluid filled cased holes
- + Formation rock strength properties
- + Fracturing / fracture zone identification
- + Lithologic analysis and porosity calculations
- + Permeability determination using tube wave analysis
- + Compressional, shear, tube wave analysis

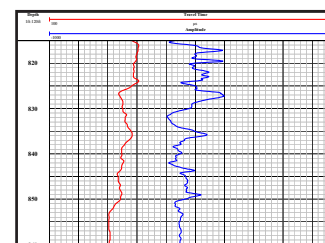


PROBE SPECIFICATIONS:

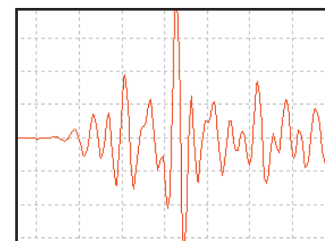
Diameter:	45mm (1.8")
Length:	2.55m (8.4')
Weight:	8kg (17.6 lbs)
Transmitter/Receiver Spacing:	60cm (24"), 80cm (32"), 100cm (40")
Maximum Operating Temperature:	70°C (158°F)
Maximum Pressure:	200 bar (2900 psi)
Borehole Diameter:	5-50cm (2-20")
Transducer Frequency:	23 kHz
Logging Speed:	3.5m/min (12-15ft/min)



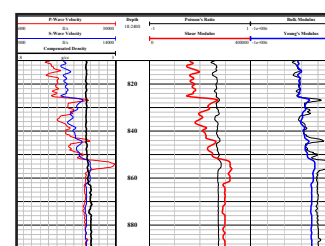
Variable Density Display



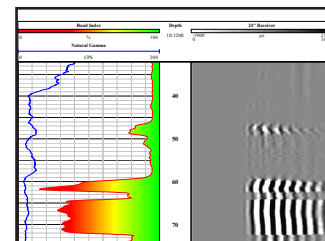
Amplitude and Travel Time



Compression, Shear, Tube Wave



Engineering Properties



Cement Bond Log

COLOG Regional Offices

corporate offices
810 Quail Street, Suite E
Lakewood, Colorado 80215
303-279-0171

southeast region
Madison, Alabama
256-325-1504

western region
Elko, Nevada
775-777-3433

southwest region
Chandler, Arizona
480-236-6815

www.colog.com