Cased hole

AKTs-48 SonicLog and Cement Bond Log Tool

SCOPE OF APPLICATION

Designed for cement quality control and technical condition of oil and gas, hydrogeological and other wells, equipped with casing and tubing with an inside diameter from 73 to 200 mm, as well as for logging of open hole wells by travel time and dynamic parameters of elastic waves

FEATURES AND ADVANTAGES

- increased response to cement ring defects of bulk and contact type;
- detecting the location of the drilling tool sticking and the position of tubing shoe;
- the ability to work with digital stations (such as HECTOR and VULCAN).

SPECIFICATIONS

Probe scheme	$T_2$0,25$T_1$1,5R
Max.hydrostatic pressure, MPpa	80 (100)
Max.temperature rating, °C	120 (150)
Required power, W	30
Overall dimensions of tool, mm - diameter (without centralizers) - length	 48 3100
Number of cores used, pcs	1
Weight of downhole tool, kg	20

Note: The equipment of controlled radiating power is possible.

Designations in the figure:
t1 – near transmitter
t2 – far transmitter
SSR – sonic signal receiver

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Case Study No.1

Formation Properties Evaluation by AKTs-48 Tool

Challenge

Evaluation (calculation) of physical-mechanical properties of rocks in the natural state of stress in the near-wellbore space of pilot wells. The studies were carried out in the underground mine of the Gaisky copper-pyrite deposit to obtain the values of elastic wave velocities determined by variable density log (VDL) and rock density measured by the GGK-P tool of density logging.

Solution

It was proposed to perform borehole geophysical surveys by Wide Range Acoustics and Density (CBL-VDL) methods using AKTs-48 and PARK-1-36 equipment. Acoustic logging is based on the study of the ultrasonic elastic waves propagation in rocks. Physical-mechanical, elastic-deformation properties of rocks penetrated by research wells determine the velocities of longitudinal and transverse waves registered by CBL-VDL data.

Results

Based on the results of geophysical logging, geological -geophysical profiles were built characterizing the stress-strain and strength properties of rocks in formation conditions in the near-wellbore space. According to research the following main results are derived:

- by calculation parameters - Poisson's coefficient, Young, shear and bulk moduli- strength characteristics of rocks, strength categories were determined;

- in general, the stress-strain and strength properties of rocks in the studied areas mainly comply with the same range of values variation, except for individual intervals of well logs;

- high velocities of elastic waves are typical for all studied sections, except for some depth intervals. The average velocity of longitudinal waves is 5800 m/s, which, in accordance with the petrophysical characteristic of intrusive and effusive rocks, corresponds to effusive rocks of the basic and medium composition of amygdaloidal and massive structure.

Features and Advantages

- AKTs-48 tool is designed for cement bond log and integrity control of oil and gas, hydrogeological and other wells equipped with casing and tubing of inner diameter ranging from 73 to 200 mm, as well as for logging of open hole sections by kinematic and dynamic parameters of elastic waves;
- Increased sensitivity to cement ring defects of the volume-contact type;
- Detecting the location of drilling tool sticking and position of tubing shoe;

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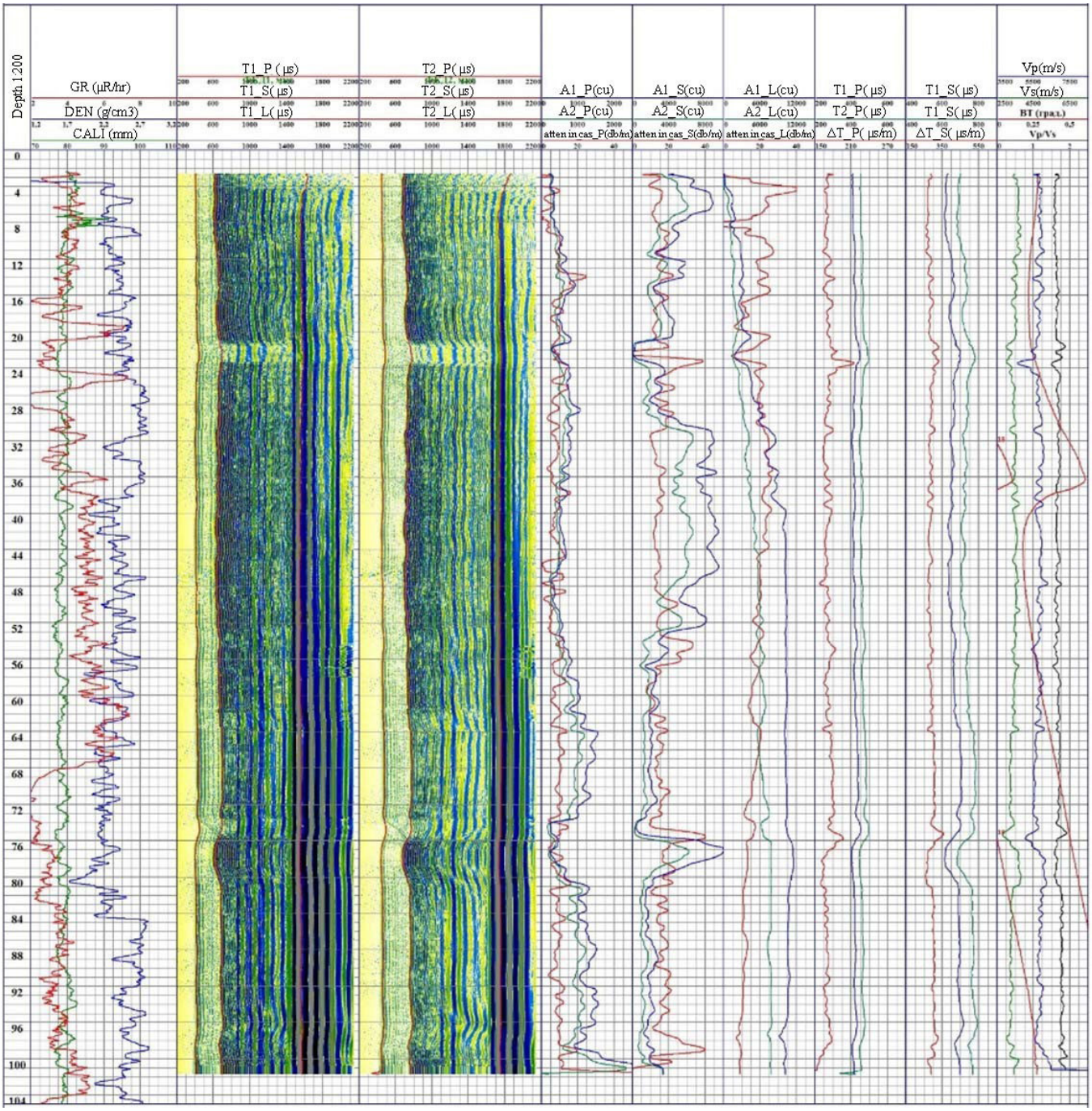
Open Hole Logging Results



Case Study No.2

Evaluation of the Cement-to-Casing and Cement-to-Formation Bond Quality with AKTs-48 Tool

Challenge

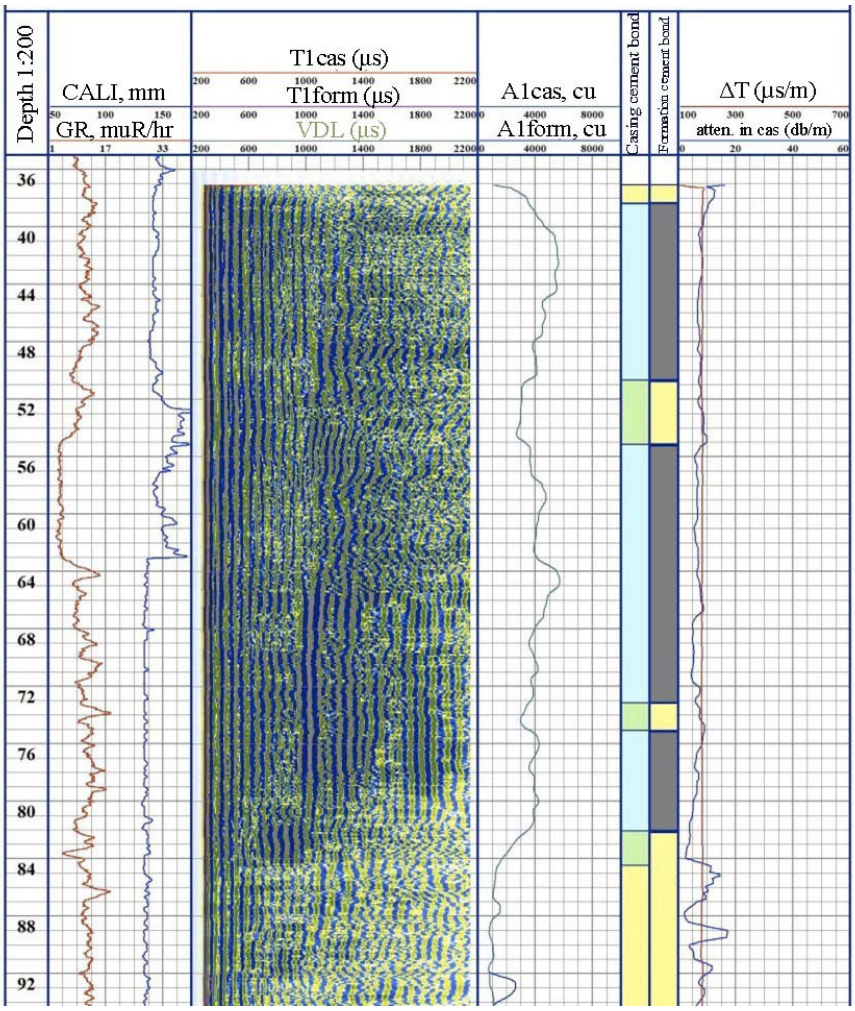
Cement-to-casing bond quality control in 146 mm casing and cement-to-formation bond control in the 215.9 mm borehole.

Solution

To evaluate the quality of cement bonding with the casing and the rock, it was proposed to conduct logging using AKTs-48 tool.

Results

As a result of the study, the intervals of poor, partial and good cement bond quality were determined.



Features and Advantages

- AKTs-48 tool is designed for cement bond log and integrity control of oil and gas, hydrogeological and other wells equipped with casing and tubing of inner diameter ranging from 73 to 200 mm, as well as for logging of open hole sections by kinematic and dynamic parameters of elastic waves;
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