

Inspections of water and thermal wells

(Gábor Szongoth geophysicist)

Introduction

The drilled wells are similar to the swimming icebergs in the ocean a little bit: the most part of their structure remain hidden from sight. However the subsurface parts of the wells are especially important and can be subject of inspection. All water-utilizing project (water boards, bottlers of mineral water, thermal spas, irrigation systems, geothermal energy exploitations, etc.) are based on a properly working water well. The technically good conditions of water wells are very important requirement in such cases. As the years go the wells are change, growing old, getting damaged. The flaws have a lot of signs: the water becomes polluted, static water level changes, specific yield and chemical composition change, etc. The flaws are caused by the damage casing, failed sealing box, tore screen, clogged water producing stratas, polluted well, etc.

The poster displays some flaws illustrated with clear examples.

Colour well camera to 500 m depth



Head of well camera

The camera is applicable advantageously to the following cases:
- controlling investigation of the new well before the putting into operation
- status test of operating and out of blast wells
- clearing up of well flaws.

The records provide direct, easily interpretable informations about the discernible elements of well's structure. The shootings can throw light on the other way no recognizable or only indirectly, in a roundabout way distinguishable particulars for example execution defects (wrongly connected casing units, cement influencing into the screen), damages (fractures, cracks) fallen objects (drilling tools, spanners, etc.) clogged screens.

The quality of shootings depend on the clean of water basically. In case of new wells is not every time clear the water, in case of out of blast or sandy water producing wells the visibility is medium or poor generally. However if we have only a not excellent quality shooting, either the status of a well or a position of fallen tools can we determine.



borehole camera



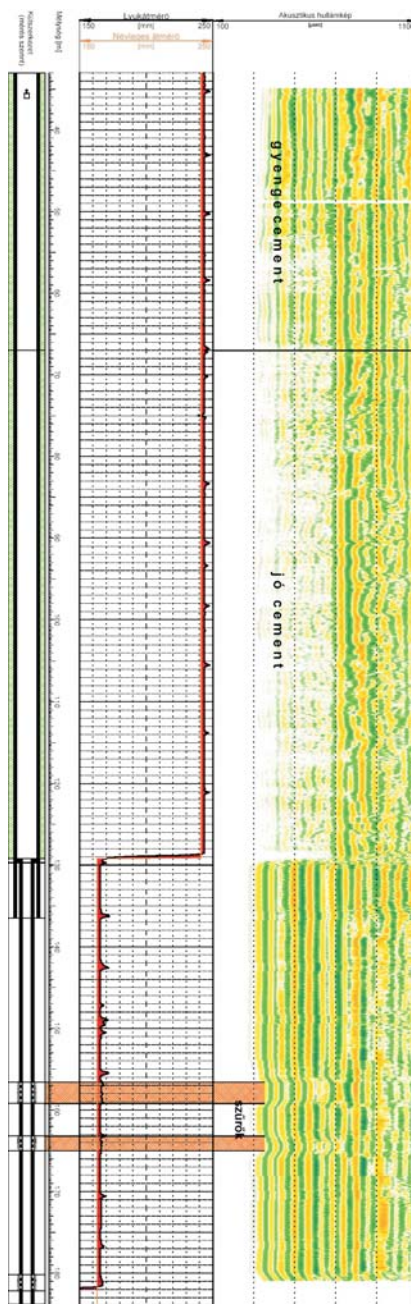
Screen with clear, throughface perforations



Clogged screen

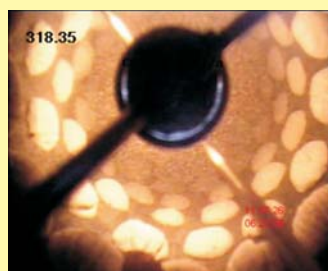


Fallen tool

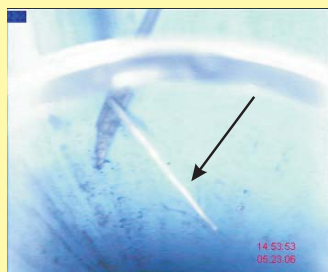


Cement sheath logging

The cementing prevent from spreading of pollution in the annulus of well. The logging of cementing's quality with the help of full wave sonic measurement is an important factor of the well inspections. The full wave sonic measurement shows the screens, the caliper log determines the places of appendages.



Calcit incrustation in screen



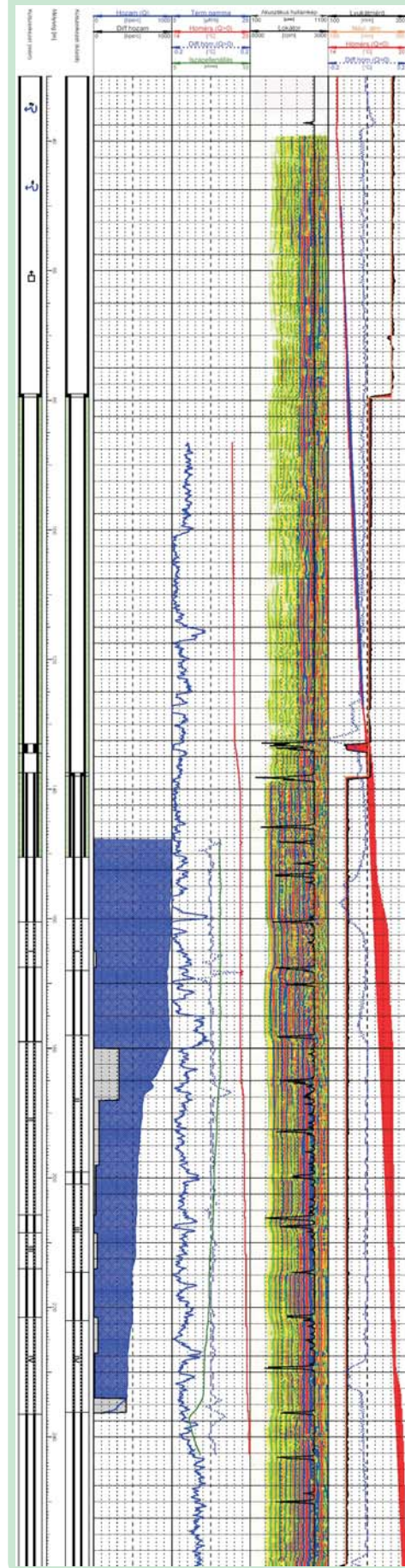
A welding electrode sticks out of the damaged plastic pipe?

Damaged sealing box

The well was producing sandy water and the water was colder than the prospective, because of this we made a total well inspection.

According to full wave sonic measurement the 2nd and 3rd screens were not in the provided places. The Gamma Ray measurement informed us about the geophysical column and the fluid flow log showed the distribution of yield.

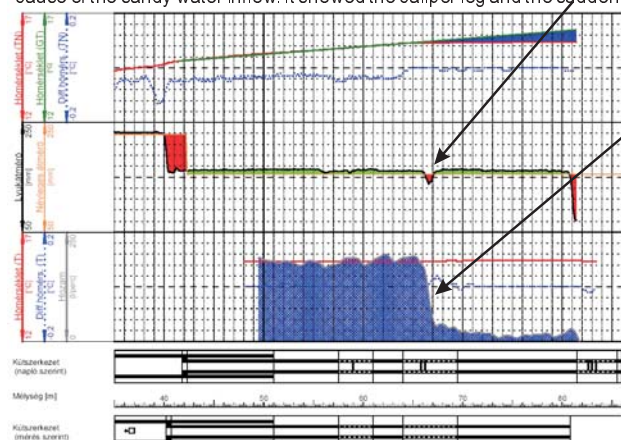
The caliper log showed the sealing box is in 132 m depth. The decrease of the temperature documented just here the punctured pipe near the sealing box. Here got in the sand and colder water in the inside of the well.



Sediment accumulation in plastic screen pipe

Tore screen

In this well we made a total well inspection to reveal the causes of sandy water and yield decreasing. According to measurements the well was partially filling up with sand. The clogged 3rd screen is the cause of decreasing yield. The in 67,5 m depth tore screen was the cause of the sandy water inflow. It showed the caliper log and the sudden increasing yield too.



Damaged screen

Summary

This goes to show that there are many kinds flaws, but the most of them can be identified well inspection.

Our company make well inspections in 2-300 occasions from the 15 m depth monitoring wells to 2500 m depth thermal water wells, from Kaprun to Vilnius. From Beograd to Tatraska Lomnica. In the last few years in the Central and East European Region the wells of Coca-Cola Company were inspected by our company.