

# Geophysical and Video Logging Capabilities

USGS Idaho Water Science Center

## Why Use Geophysical and Video Logging?

Drilling a well is expensive, so it's important to collect the best possible information about the well's geology and the groundwater system. Geophysical well logging provides continuous, objective records with values that are consistent from well to well and from time to time if calibrated correctly and standardized. In contrast, driller or geologist logs can be subjective and limited in detail.

The continuous point data obtained by geophysical logging is processed and displayed with specialized software, as shown at right. Usually, as here, multiple logs are collected and displayed together in a vertical data profile to take advantage of synergies.

Video logging provides the ability to visually inspect wells. Drillers use video to decide how to complete wells. Hydrologists use the visual information to learn more about how water moves in an aquifer.

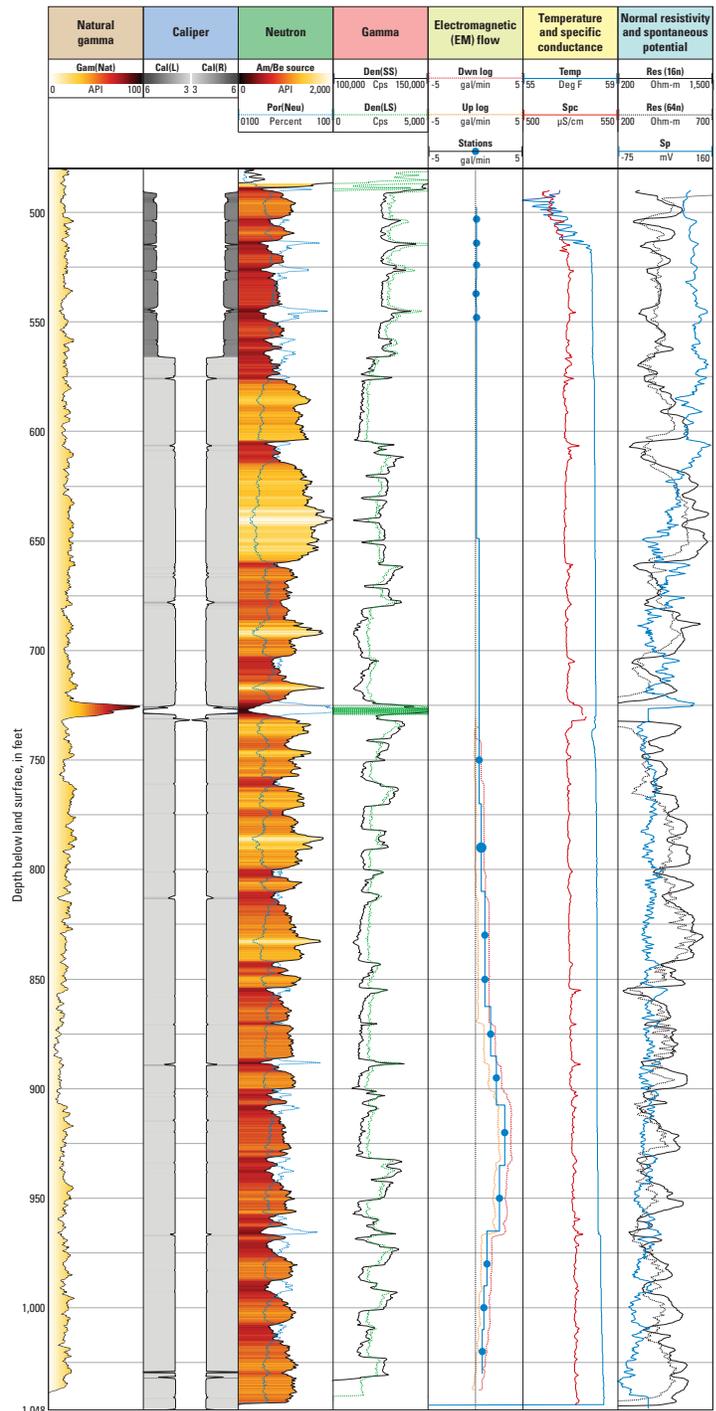
## Why Work with the USGS?

### Expertise



USGS scientist conducting geophysical logging of a well at the Idaho National Laboratory

Our hydrologists have extensive experience with geophysical and video well logging. They have logged hundreds of wells at the U.S. Department of Energy's Idaho National Laboratory. Other researchers also call on us to apply our geophysical logging expertise to their projects, such as Project Hotspot, a geothermal research effort led by Utah State University.



Example of a vertical data profile comparing various types of logging information

## Equipment

### Geophysical Logging

- Century™ logging probes
- 3,100-ft cable drawworks
- power and processing modules
- data recording units
- 4-wheel drive logging van to transport equipment

### Video Logging

- Aries™ and Laval™ downhole cameras (various diameters and light sources), including dual-view system
- 2,000-ft cable drawworks
- power supply
- digital recording unit
- transport trailer equipped with operator room

### Other Tools

Century™ logging probes include natural gamma, neutron, gamma-gamma, flow meter, temperature, normal resistivity, spontaneous potential, single-point resistance, caliper, gyroscopic borehole deviation, and downhole fluid sampler. Additional Century™ logging probes can be rented through the USGS Office of Groundwater and include acoustic televiewer, electromagnetic induction, and magnetic susceptibility.

### Available Data Formats

Geophysical data is collected in LOG format and converted to ASCII text. Video logs are available in various digital formats. The USGS archives all geophysical and video data collected.

### What's Required?

Logging tools are generally run inside of cased and/or uncased wells greater than 2 inches in diameter. For the greatest benefit, plan your logging program ahead of time, preferably before drilling starts. Proper planning avoids scheduling conflicts and minimizes standby time. Borehole conditions can alter logging tool response, so it is best to know those conditions prior to data processing. Before logging, total depth and possible obstructions should be noted. Our downhole camera equipment is one option available for recording the well condition prior to logging. Well completion and/or geologist notes are also useful to note changes in well diameter, casing type, casing thickness, well screen intervals, annular seal, depth to water, and geology. Running source logs (neutron and gamma-gamma) entails some special requirements. For details, please contact us.

### Contacts



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For more information, including a complete list of equipment, history, and publications, please visit our website at <http://id.water.usgs.gov/projects/INL/drillLog4.html>

