



IBERIA Demonstration in Copper

Several procedures to determine ore grades are in use in exploration as well as during mining. In accordance with international standards, core samples will be drilled and analyzed in the laboratory. Furthermore, drill debris can be collected and sent to the laboratory in order to gain average information for drilled distances of 1 or 5 meters. A fast method to get an idea about the ore grades utilizes hand held XRF devices to perform measurements on the drill debris around the hole. Although representativity is an issue, this method delivers fast information directly in the field.

The IBERIA probes combine XRF technology with the advantages of continuous logging. The whole XRF unit is integrated in a borehole probe which can be connected to a standard winch with a four conductor rope. While the probe is fed down quickly the borehole wall is scanned and the operator gets an elemental log of the hole. Then, when the probe is lifted, lower speed is chosen to increase resolution. The down log may indicate areas which are of lower and those which are of high interest; the speed can be adapted accordingly and the probe will generate a log corresponding to the actual depth. Typical speeds are >1 meter per minute; blast holes can be logged in 15 to 20 minutes. Exploration holes will take more time according to the depth.

IBERIA is designed to scan elements with ordinary numbers starting at 20 (Calcium). Depending on the element, scan speed and the matrix of the ore concentration down to 30 ppm can be measured.

So IBERIA offers immediate results about ore grades without representativity issues; use of IBERIA allows to reduce the amount of required laboratory samples or even the amount of holes to be drilled.



J&C Bachmann has demonstrated the IBERIA system in the South African copper belt. There an IBERIA version with a diameter of 53 mm was used to survey NQ holes. The probe was deployed from a Mount Sopris MXB winch and supplied by the J&C Bachmann operator unit.

Existing exploration holes at various places were surveyed.



Logging was performed from a bakkie with a logging tripod. Power was supplied by a Diesel generator; the power consumption of winch and logging system is less than 600 Watts. Due to the ideal measurement conditions these holes were optimal for verification of accuracy and repeatability. Repeatability was tested by comparison of logs acquired on the way down and way up while the accuracy was checked using the analyses of existing laboratory samples which were taken in the field.



The image shows on the left the operator unit while the winch is located on the right side; space consumption of the equipment is minimal. The tablet inside of the operator unit is connected to the system wirelessly; therefore it is portable. The display is used to control the measurement and to review the ore grades in real time.

The diagrams below show the logs for Iron and Copper. The iron graph clearly shows the casing which was approximately 7 meters long. The copper mineralisation starts at a depth of 30 meters.

Using IBERIA, the relevant parts of the cores can be identified directly after drilling; this way the amount of lab samples can be reduced drastically.

