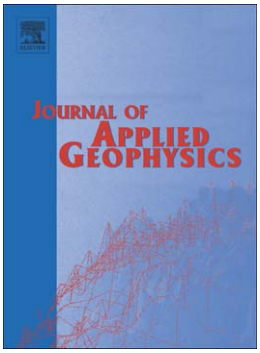
Accepted Manuscript



High-resolution gamma ray attenuation density measurements on mining exploration drill cores, including cut cores

P.-S. Ross, A. Bourke

PII: S0926-9851(16)30518-3
DOI: doi: 10.1016/j.jappgeo.2016.11.012
Reference: APPGEO 3139

To appear in: *Journal of Applied Geophysics*

Received date: 9 March 2015
Revised date: 9 November 2016
Accepted date: 10 November 2016

Please cite this article as: Ross, P.-S., Bourke, A., High-resolution gamma ray attenuation density measurements on mining exploration drill cores, including cut cores, *Journal of Applied Geophysics* (2016), doi: 10.1016/j.jappgeo.2016.11.012

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

High-resolution gamma ray attenuation density measurements on mining exploration drill cores, including cut cores

Ross, P.-S.*, Bourke, A.

Institut national de la recherche scientifique, centre Eau Terre Environnement, 490, rue de la Couronne, Québec (QC), G1K 9A9, Canada

* Corresponding author, rossps@ete.inrs.ca

Abstract

Physical property measurements are increasingly important in mining exploration. For density determinations on rocks, one method applicable on exploration drill cores relies on gamma ray attenuation. This non-destructive method is ideal because each measurement takes only ten seconds, making it suitable for high-resolution logging. However calibration has been problematic. In this paper we present new empirical, site-specific correction equations for whole NQ and BQ cores. The corrections force back the gamma densities to the "true" values established by the immersion method. For the NQ core caliber, the density range extends to high values (massive pyrite, ~5 g/cm^3) and the correction is thought to be very robust. We also present additional empirical correction factors for cut cores which take into account the missing material. These "cut core correction factors", which are *not* site-specific, were established by making gamma density measurements on truncated aluminum cylinders of various residual thicknesses. Finally we show two examples of application for the Abitibi Greenstone Belt in Canada. The gamma ray attenuation measurement system is part of a multi-sensor core logger which also determines magnetic susceptibility, geochemistry and mineralogy on rock cores, and performs line-scan imaging.

Highlights

See separate file.

Keywords

Density; rocks; core logging; mining exploration; gamma ray attenuation; sulfides

Download English Version:

https://daneshyari.com/en/article/8915592

Download Persian Version:

https://daneshyari.com/article/8915592

Daneshyari.com