The Geostatistical Association of Southern Africa
in conjunction with
The School of Mining Engineering -University of the Witwatersrand
are pleased to present a 5 FIVE DAY Short Course on

**MNNN 7061**
Modern Sampling Theory and Methods

Dr D.François-Bongarçon, PhD

27 – 31 August 2007

Venue: University of the Witwatersrand, Johannesburg

**ABOUT THE COURSE**
The objective of the course is to reach a modern understanding of the theory of sampling of particulate materials (such as crushed drill core and reverse circulation samples) and the practice, scope, limitations and appropriate applications of sampling.

The theory and practice of sampling of mineral particulate material have been the focus of continuous attention on part of the mining industry for more than a century. This is due to its paramount importance at all the stages of a mining project, from exploration to production. Widely acclaimed and admirable works by Pierre Gy (from 1968 to 1982) have paradoxically met with limited success in low-grade types of mineralization, due to difficulties in the proper implementation of its variance prediction formula. These difficulties have been addressed by the course instructor who has developed simple and effective tools for the practical implementation of Gy’s theory.

The course is accompanied with practical application exercises, and series of practical recommendations on equipment and methods, as well as practical implementation of techniques for the numerical control of sampling procedures. It develops around three major themes:

**FIRST UNIT ("Why ?")**: Introduction, importance of sampling (including economics), course objectives.

**SECOND UNIT ("How ?")**: General practical recommendations; audits of equipment and methods; philosophy of sampling; improvement techniques. Definitions, terminology, practical examples, discussion. Representativeness, concepts involved in the non-bias conditions. Evaluation and control of the segregation factor.

**THIRD UNIT ("How Much ?")**:  
**THEORETICAL BASIS** - Evaluation and Control of the sampling fundamental error. Minimum sample size  
**PRACTICAL IMPLEMENTATION** - Difficulties and solutions; calibration experiments; building sampling charts (nomograms); graphical representation and optimization of sample preparation protocols.

**WHAT YOU WILL LEARN**

- Eye-opening facts you may have overlooked or ignored until now about the consequences of bad sampling and the difficulties of good sampling
- The unsuspected amplitude of economic ramifications of poor sampling
- How to control the manner in which samples are to be taken to achieve the highest degree of representativeness and avoid common pitfalls
- How to control the sample mass requirements, and avoid devastating errors in the design of sampling and sample preparation protocols
- How to identify those unfavourable factors that can be completely eliminated.
- How to identify those unfavourable factors that cannot be eliminated, but should be minimized
- The meaning and significance of the factors used in sample variance numerical control formulas
- The tools available for the best experimental customization of control parameters to your own mineralization type
- What can and what cannot be achieved with sampling experiments
- The general philosophy that underlines the practice of ‘good sampling’ and the modelling of sampling parameters
- How to audit sampling equipment and procedures
- How to tackle seemingly untreatable sampling problems
- The important difference between sampling and interpolating

**WHO SHOULD ATTEND**
This course is for all professionals involved in, or contributing to, decisions regarding a mining project at the exploration or production phases, whether in the geology, mining, metallurgy or geochemistry fields, and particularly those persons responsible for the consequences that can derive from the use of sample grades. You should attend this course if you are a:

- Manager of operations or technical services in a mining company
- Exploration geologist
- Mine geologist
- Mining engineer
- Ore grade control engineer
- Geostatistician
- Project manager
- Metallurgist
- Laboratory manager or operator

A scientific calculator with basic univariate statistical functions, or a laptop computer is recommended, along with a ruler
COURSE LEADER
Dominique François-Bongarçon was awarded a degree in Mining Engineering from the Nancy School of Mines, France, in 1974. In 1978 he obtained his PhD in Mining Sciences and Techniques from the Paris School of Mines and Nancy University.

From 1974 to 1981, he worked as a Research Engineer at the Geostatistics Centre of the Paris School of Mines in Fontainebleau. Since 1981, Dr. François-Bongarçon worked for various consulting firms and mining companies, including INCO Ltd. in Copper Cliff, Ontario, Canada, where he was in charge of geostatistics. Dr. François-Bongarçon now runs his own consulting company, AGORATEK International, after spending seven years working for MINERAL RESOURCES DEVELOPMENT, Inc., (now Amec) in San Mateo, California, USA, as Vice President Geostatistics and Sampling.

Dr. François-Bongarçon, an acknowledged mining industry expert in sampling, has been responsible for a number of advances and clarifications in the field of sampling theory, especially in its application to low-grade metals. He has run sampling courses in North America, South America, Africa and Australia, to both open and in-house audiences.
# MODERN SAMPLING THEORY & METHODS

27TH – 31ST August 2007, University of the Witwatersrand, Johannesburg

## REGISTRATION FORM

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Please fax this form to 011 728 1675 or email to GASA@rca.co.za. Please pay the course fee into the GASA account before the 13th August 2007 and fax confirmation of payment to 011 728-1675 or email gasa@rca.co.za. If GASA does not receive confirmation of payment by this date you will be dropped from the course.

CANCELLATION OF THIS REGISTRATION
Cancellations within 2 to 3 weeks of the course commencement – 20% cancellation fee.
Cancellations within 1 to 2 weeks of the course commencement – 50% cancellation fee.
No refunds for cancellations less than a week before the course commences.

GASA, P O Box 72147 Parkview 2122 Tel 011 728 8173 Fax 011 728 1675

*GDE students must be currently registered for this course at the University of the Witwatersrand. These forms must be completed and sent to GASA even though the student is registered at the university.

As spaces are limited, registration will be accommodated on a first come first served basis. If GASA does not receive confirmation of payment by this date your provisional registration will be reallocated to the next applicant.