



Grade Control and Reconciliation

2 Day Professional Development Course

Course Leaders: Scott Dunham and Mike Stewart

Objectives of the Course

The task of grade control lies at the heart of a mine geologist's role. Successful modern grade control has the objective of minimising misclassification of material types in an operation: not just 'ore' versus waste, but the allocation of various categories of materials to destinations based on grade, deleterious material content, physical properties or mineralogy (e.g. fibres or sulphide content). This two day professional development program addresses the purpose of grade control and the concept of improving decision making progressively as more data becomes available. The practicalities and operational limitations that impact the grade control process are discussed and pragmatic solutions to dealing with time and production pressures are presented. Integration of the grade control process with the broader mining value chain is emphasised. Participants are introduced to grade control practices including sampling and assaying, local estimation, ore/waste delineation (markup), drill and blast and load and haul interaction, stockpiling and ore treatment. The program does not focus on any particular software implementation of a grade control system; instead participants are introduced to the underlying concepts and strategies required for any grade control process to be successful.

The role of reconciliation as a tool for monitoring the performance of grade control and the resource estimate is presented within a broader framework of the entire mining value chain. Participants will gain an appreciation of the potential value of reconciliation for improving business decisions and identifying potential value opportunities. The basic framework and design of a meaningful reconciliation system is presented. Data requirements and the collection and analysis of reconciliation data are discussed with many practical examples of good and bad reconciliation practices. Participants are led through the grade control and reconciliation process using a practical, hands-on example.

Grade control and reconciliation is a broad topic and time is devoted to impromptu lectures and discussions based on participant interaction and input. The course materials and examples cover issues faced for a range of commodities. Issues such as the use and abuse of conditional simulation,

the importance of a geological basis for grade control and how sampling impacts on the decision making process are covered.

Who Should Attend?

This program is designed for professionals working directly in the grade control and reconciliation processes as well as those they interact with. It is particularly aimed at people with the responsibility of day-to-day ore/waste decision making and those responsible for monitoring and reporting the performance of the resource model and grade control processes. Mining and metallurgical personnel who work with the data provided from grade control and reconciliation will also benefit from the program as they will be introduced to concepts such as the information effect and the use of control charts for identifying reconciliation trends.

Operational managers and supervisors seeking simple and effective ways to improve and optimise production performance should also attend.

Program

Day 1	Grade Control <ul style="list-style-type: none">▪ Grade control in a business context▪ Ore vs. waste and material type allocations – making a decision▪ Language and definitions▪ The importance of sampling▪ Local estimation for grade control▪ Estimation vs. Simulation▪ Ore block delineation▪ Selective mining units▪ Cut-off grade in grade control – strategy and tactics▪ Interactions and communication
Day 2	Reconciliation <ul style="list-style-type: none">▪ Why reconcile?▪ Types of reconciliation and potential benefits▪ The links between grade control, resource estimation and reconciliation▪ Problem identification and solving▪ Limitations and problems▪ Spatial vs. Temporal reconciliation▪ Analysing and interpreting reconciliation data▪ Using reconciliation for decision making▪ Action planning and Improvement▪ Examples and case studies

A full set of PowerPoint slides will be provided to each participant. Additional reference materials including examples and test cases will be provided electronically at the completion of the program.



Course Leaders: Scott Dunham and Mike Stewart

Scott Dunham is a geologist and technical management specialist with over 20 years experience in open pit and underground mining and geology. His expertise includes the development, implementation and management of grade control and reconciliation system for a variety of commodities and deposit styles including gold, copper-gold, copper-uranium, nickel, tin, zinc-lead-silver, coal and sub-level caving, open stoping, cut-and-fill and conventional open pits. Scott has run a number of public and in-house courses on grade control, reconciliation, geometallurgy and management in Australia and North America. He has more than five years consulting experience covering all aspects of the resource-reserve value chain, audits, due diligence and operational performance improvement.

Scott is a Principal and Director with QG and holds a Bachelor of Science (Geology) and Graduate Diploma (Information Technology). He is a member of the AusIMM.

Mike Stewart is a geologist and geostatistician with over 18 years experience of nickel, gold and copper projects, for a variety of deposit types. He has run a number of courses in geostatistics and sampling in Australia and Africa. Mike has particular strengths in mining geology and the application of geostatistics to mining operations. He has been consulting in all aspects of resource estimation and applied mining geostatistics since 2004, particularly focusing on skill transfer (“co-pilot training”) with mine geology and resource teams.

Mike is Principal Consultant with QG and holds both B.Sc and M.Sc (first class honours) degrees in geology from the University of Canterbury, NZ. In addition he holds the CFSG post-graduate Diploma in Geostatistics from the Paris School of Mines (Fontainebleau). He is a member of the AIG and the AusIMM.

Participant Feedback

Participants are invited to provide feedback and rate the performance for every QG course. We use a 1 (poor) to 5 (excellent) rating system to evaluate the quality, relevance and clarity of our programs.

The Grade Control and Reconciliation program received an overall rating of 4.8 in its last session. Some of the participant feedback includes:

“All very relevant and will be revising some of our practices to see if there is room for improvement”

“It's scary to think we model from such a low % of data and then some insane people expect it to = 100% of what the mine produces, and that it should be 100% every day.”

Reconciliation is very important, interesting to see how erroneous our current reconciliation is.”

Real life examples of the importance of these issues lends credit to our persuading others in the future”

“Very relevant as this is what my job is all about!!”

Further enquiries: info@qgroup.net.au and see also www.qgroup.net.au