

A photograph of an open-pit coal mine, showing multiple levels of terraced earth and rock formations, with a large black conveyor belt structure in the foreground.

# INTEGRATED OPEN PIT COAL MINE PLANNING

## PROFESSIONAL DEVELOPMENT COURSE

### PURPOSE

The aim of this course is to illustrate the basic concepts that underpin efficient and effective mine planning for open cut coal mines. From the fundamentals of open pit mining to economic and operational analysis, this course will provide tools and techniques to support effective medium to long-term decision-making, based on managing cost and risk.

### WHO SHOULD ATTEND?

This course is recommended for technical and field staff involved in open pit coal planning and operations. Participants typically include mine planning engineers, senior field personnel, technical personnel, contract estimators and mine surveyors.

### PRE-REQUISITE SKILLS

There are no formal pre-requisites for this course, although some exposure to mining operations and analysis would be advantageous.

### DURATION

The 6 core modules are covered over 4 consecutive days with flexibility for clients to expand various modules with extra workshops based on their specific requirements.

### DATES & LOCATIONS

This course is delivered regularly at a variety of international venues including client sites. For further information please refer to the Calendar section of this website.

### LEARNING OUTCOMES

At the completion of this course participants will be able to:

- Undertake systematic open pit mine planning
- Evaluate the relative advantages of using draglines, trucks and loaders and other open cut mining methods
- Employ iterative mine planning scheduling methods pioneered by Runge that enable unforeseeable changes to be managed.
- Integrate economic considerations into planning and production decision-making through the use of discounted cash flow and other costing tools.
- Describe more specialised mining techniques

### DELIVERY METHOD

Classroom-style delivery with a heavy emphasis on workshops, participant involvement and case studies.



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### COURSE CONTENT

#### Module 1: Systematic Mine Planning

Mine planning is not an automated process and each mining study is unique. However, a standard approach can be used to maximise the effectiveness and efficiency of the process.

You will learn how to:

- Undertake a systematic analysis of your mine
- Understand which parts of the deposit should be included in the mining plan and why
- Develop a better mine plan which is less prone to interruption by unforeseen changes
- 📖 Workshop: Selection of mining layout - physical and economic limits
- 📖 Workshop: Elements of mine planning

#### Module 2: Draglines

The operating cost advantages of draglines need to be balanced against higher capital costs and constraints elsewhere in the operation. You will learn about:

- Key elements of draglines and dragline working methods
- Key guidelines for the efficient use of draglines
- How to calculate rehandle and productivity
- Rules-of-thumb to minimise tedious calculations
- 📖 Workshop: Dragline bucket selection
- 📖 Workshop: Interpreting specification sheets
- 📖 Workshop: Dragline rehandle calculations
- 📖 Workshop: Selection of prestrip depth

#### Module 3: Mining Economics

Mining economics should be integrated into every planning and production decision, so that the costs and benefits (and the timing of these) can be fully understood. You will learn about:

- Discounted cash flow calculations
- Basic tools for costing from first principles
- How to apply costing techniques to real-life challenges
- 📖 Workshop: Derivation of unit costs
- 📖 Workshop: Selection of new or reconditioned dragline
- 📖 Workshop: Marginal costs

#### Module 4: Trucks & Loaders

The relative economic advantages of using trucks over draglines for earthmoving depend on a number of factors. This section covers:

- The fundamentals of earthmoving using trucks, shovels, front-end loaders, hydraulic excavators and other equipment
- How to calculate truck and loader productivity
- When to use trucks and when not to
- 📖 Workshop: Specification sheet interpretation
- 📖 Workshop: Haul profile and travel time analysis
- 📖 Workshop: Economic analysis of options

#### Module 5: Mine Scheduling

Successful mine scheduling depends on anticipating future changes, but these are rarely predictable. In this module you will learn how to apply systematic, iterative scheduling methods that help you to manage the impact of unforeseen change and thereby maximise consistency.

- 📖 Workshop: Scheduling drivers
- 📖 Workshop: Broad brush schedule
- 📖 Workshop: Short term schedule

#### Module 6: Other Mining Techniques

A limited introduction is provided to unusual and specialised mining techniques including:

- Blasting and cast blasting
- Use of dozers for earth moving
- Crusher-conveyors