

Technology for Mine Water Management GENERAL REPORT

By COLIN BARTON

PAPERS :

- 1 COMPUTER AIDED DESIGN OF MINE WATER MANAGEMENT - Z KESSERU
- 2 THE HYDROGEOLOGICAL PROBLEMS OF GROUNDWATER PROTECTION IN MINING REGIONS - V A MIRONENKO
- 3 WATER MANAGEMENT OF THE MAE MOH PROJECT - SIRI CHITCHOB
- 4 WATER MANAGEMENT AND WATER TREATMENT AT GOLDEN CROSS - M P A WILLIAMS

1 The Paper by Kesseru provides a very useful outline of the computing work of the Central Institute of Mining Development in Hungary. It is particularly useful in that, from practical necessity, favour is given to software designs which are capable of operating through relatively small computers.

The use of finite difference programs on IBM type PC AT machines, to give interactive modelling of systems which are not overly complex, provides a good example of this approach. Above all, it demonstrates that the author tailors his programs to meet the needs of the practical geologist and engineer.

The collection of software described in the Paper is impressive and contains some novel and unusual programs. For example, the finite difference programs for rock freezing and seepage as well as the predictive programs for evaluating water inrush and compressed air-supported drainage.

It is noted that the presented applications are in COMECON countries and it is to be hoped that presentation of this Paper in the Conference will expand the lines of communication between a wide range of countries.

2 The Paper by Mironenko provides an excellent example of a management system for groundwater investigations in a mining regime, with a particular accent on application of the methods to solving mining problems.

The methodology is soundly based and, in a nutshell, the author is stressing the use of a multi-faceted study aimed at establishing an integral model covering disciplines which are not always combined in the one study.

In covering the components of the model, the author places emphasis on the value of data gathering from field observations combined with analysis and back checking of forecasts and protective measures, as a basis for creating a better model. The result is, of course, a progressive improvement in

water management practise. Mathematical modelling fits well within this scheme, where it finds its place as an integral part of the modelling.

Within this well conceived review, the author has slotted in some actual examples to whet the appetite. In particular, the possibility of injecting fresh water to form a natural frozen barrier to the up-coning of saline waters beneath a mining excavation is a novel approach to a difficult problem.

There are also several side comments which deserve attention such as the observation that heterogeneity is commonly underestimated in western approaches to modelling. The example of the effect of dispersion into porous chalk blocks outweighing the advance of the main contamination front illustrates this point. Another comment, that care should be taken to realise that there may be a significant difference between the tracer concentration in boreholes, as distinct from the surrounding strata, is also well placed.

Only one small critical comment is made - namely, that the Paper would be enhanced by the inclusion of references to the methods and examples shown in the text. This would allow readers interested in pursuing these aspects to delve more deeply.

In conclusion, I think that the author deserves congratulations for a well presented practically oriented account of hydrogeological problems associated with mining. The Paper clearly demonstrates the extensive practical experience and sound methodology adopted by the author.

3 The Paper by Williams and Goldstone is very timely in view of the recent expansion in gold mining and of the difficulties in managing water systems related to gold mining and cyanide treatment. Indeed, the Paper can be used as a guide to control methods and standards and could become obligatory reading for many mine planners and designers of mines where water quality and environmental concerns are intermixed.

The approach to consolidation modelling through TAIL STORE may be seen as an advance in methodology over commonly adopted practices. Nevertheless, eventual back analyses, comparing the expected against the actual consolidation flows both for this and other future projects should help confirm or fine up the models. The author obviously has this in mind in describing the "evolutionary" handling of the overall WATER PLAN model.

Little mention is made of the sub-surface conditions in terms of the stratigraphy and hydrogeology. Naturally, these factors are liable to exert considerable influence in the water balance and water plan. Indeed, it may be appropriate to consider another paper in the future to incorporate these considerations.

I would like to take minor issue with the statement that "the priority task of water management is to minimise the environmental impact of any discharges", by adding the words - "so that acceptable standards can be attained for mining to proceed". I think and hope, that the author would concur.

In rounding up, I believe that the Paper is well prepared and presented and adds considerably to the value of the Conference.

4 The Paper by Mr Chitchob provides a clear and well laid out description of water management of a lignite mine in Northern Thailand. The Paper focusses on the importance of securing an adequate water supply to avoid constraining electricity generation output. As is so often the case in lignite mining, water management is crucial to the project.

The complex factors of influence weighing, for example, agricultural and town land values against water supply are well presented.

The author has essentially restricted the Paper to surface water management. The influence of any underground water extraction for pit stability and/or for use in the project is another story and could warrant another paper in the future. This is meant as a constructive comment and in no way detracts from this excellent case study paper which does credit to the Conference.

Report on paper WATER INRUSH PROTECTION CRITERIA AND DEWATERING SCHEME AT SAKOG BROWN COAL MINE, TRIMMELKAM, AUSTRIA, has been reported in the General Report by Peter Netchaef - Technical Session 5 (MINE WATER MANAGEMENT OBJECTIVES)