Environment Protection Engineering

Vol. 4 1978 No. 4

# BOOK REVIEW

C. G. DOWN, J. STOCKS: "*ENVIRONMENTAL IMPACT OF MINING*"
Applied Science Publishers, Ltd; London 1977, 370 pp., 108 fig., 81 tables, subject index.

Finally the technical reader receives a book on impact of mining activities on external environment written in precise environmental engineering terms and thus well understood and easy to apply by environmentalists. The conflict between mining and the environment is world-wide, and the need for a coordinated approach in a textbook, like the one reviewed here, is evident when one looks through literature full of papers on individual facets.

Most of the previous books failed, because the borderline between two or three specialized fields is always slippery for the writer. This book is general, although correct and exhausting in its treatment of ecological effects and goes into greater detail both in theory and in engineering of reclamation practices.

The book begins with discussion of range and importance of environmental problems caused by mining. Direct hazard to the safety of man is exemplified by tragic cases of Aberfan disaster and failure of tailings dams in the Chilean mining district of El Cobre. Indirect hazards to man are stressed as, although less spectacular having a significant economical, health and safety effects on human environment.

The first detrimental effect detailed in the book is the visual impact. The aesthetic aspects are controlled to a large extent by sociological factors outside the control of the engineer. The discussion is then confined to practical interpretation of landscaping, with delineation of principles of: landscape analysis, the sources of visual impact, landscape planning and environment development through concealment, and improvement of existing features.

Next chapter is devoted to air pollution. Mining pollutants are depicted; methods for monitoring and control are given. Superficial discussion of the treatment equipment, gives the reader an introductory orientation as to the applicability and expected efficiences of individual unit processes.

The next chapter is on pollution and is well written since in its concise form it manages to give the principles of water pollution control against the principal sources of mining effluents, both of point and non-point origin. The description of water pollutants is confined to those that are characteristic for the industry, e.g. the mine drainage inorganics, acids, heavy metals, sulfides and cyanides. Discussion of the ecological impact of these pollutants and methods of monitoring surface and underground waters is followed by description of control methods that are unique to the industry. This part is the best in the chapter since it orients the reader towards specific methods for controlling mine pollution through preplanning, controlled mining techniques — techniques for infiltration control, regrading, revegetation, mine sealing, as well as by conventional methods of wastewater treatment.

By far the most thorugh is the chapter on restoration i.e. recreation of original topography and re-establishment of the previous land use; and on reclamation, i.e. various redevelopment of the derilict land. Reclamation of excavations is usually more difficult than reclamation of tips. The authors dwell on the topic of excellent reclamation effects through flooding the shallow pits (i.e. with depts below 30 m). Subsequent discussion presents benefits of water storage in very deep pits and of agricultural development in

deep wide — area pits. Revegetation of the disturbed land is, in an overwhelming majority of cases, one of principal tools for efficient restoration. No other medium can achieve rapid visual reintegration, surface stabilization, or reductions in air and water pollution, nor offer a wide variety of land use possibilities which can be achieved at acceptable cost. In-depth description of revegetation practices and problems, coupled with numerous case studies provides both general and specific design data for engineers and planners.

One of the last chapters is devoted to a timely topic of waste utilization. The practice serves to reduce the environmental problems of conventional disposal and at the same time conserves the resources, by partly replacing natural materials. The quantities of wastes are significant, e.g. for 22 million tons of china clay (annual production) the backlog of waste amount to 300 million tons in the United Kingdom. Existing "Waste resources" are evaluated followed by discussion of possibilities for upgrading the main categories: colliery wastes (sedimentary mudstones, limestones, etc.), china clay waste, slate wastes, aluminium red mud waste; phosphate wastes, iron ore wastes, non-ferrous metal tailings. Economics of recovery and transport in conjunction with demand are presented.

The last chapters are devoted to characterization and control of subsidence damage and to legislation and control of mining activities in pre-operational, operational and post-operational stage of mining.

In summary, the book stresses two things. The decreasing contents of pure metal in ores that are becoming economical to excavate, results in magnification of pollution problems because of greatly increased quantity of the overburden material. On the other hand the long-time experience and the present day technology is currently available to efficiently cope with the problems of those activities detrimental to the environment.

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