A study of some clay soils in South Wales and their potential use as landfill liners

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Laporan (Report)

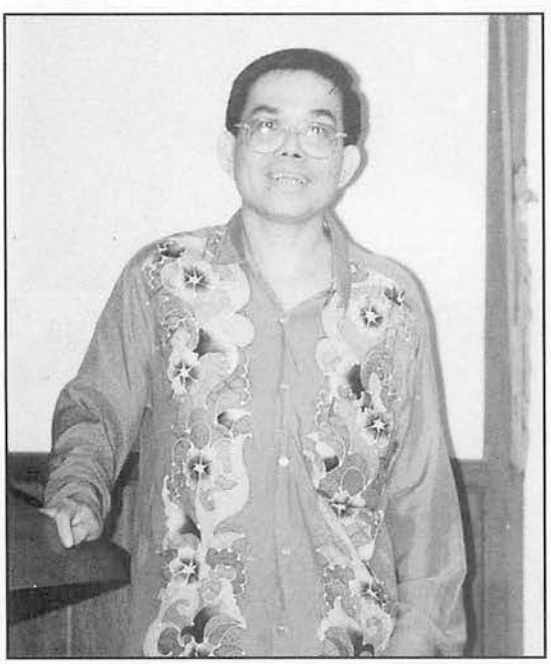
The talk on *"Attenuation characteristics of some clay soils from landfill sites in South Wales, U.K."* was presented by Mr. Tan, B.K. (UKM) at the Dept. of Geology, University of Malaya on Friday, 19th December 1997. It was chaired by Dr. C.P. Lee, who stood in for Mr. Muhinder Singh who had prior commitment in Singapore.

An abstract for the talk is enclosed below.

Unfortunately, response to the talk in terms of audience/attendance was rather disappointing. This **may** perhaps be due to the coming festive/X'mas holidays, nature of the talk, the speaker, current economic slow-down, etc., etc.?? In any case, for those who attended, they were also taken on a "quick tour" of Wales through a series of colour slides showing the scenic coastal landforms, beaches, mountains and plenty of castles at the end of the talk.

Abstrak (Abstract)

A comprehensive laboratory study of some clay soils from several landfill sites in South Wales was completed recently, with the primary objective of evaluating the suitability of these soils as potential landfill liner or sub-base materials. Materials investigated include estuarine alluvium, weathered Coal Measures mudrocks and glacial till. By virtue of their widespread occurrence, these materials are of vital importance in the strategic planning of landfill sites in South Wales. The laboratory tests conducted include detailed physico-chemical and mineralogical properties of the soils, batch-equilibrium and leaching column tests, the latter two tests involving heavy metal species (Zn^{2+}, Pb^{2+}, Cu^{2+}) representing common contaminants in landfill sites. Results of the various tests are reported in this paper. Among others, the test results show: distinct differences in characteristics and behaviours due to different geologic materials (alluvium versus mudrocks versus glacial till); estuarine alluvia from two different sites have strikingly similar properties; greater fines contents and hence plasticities for the alluvium compared to mudrock soils and glacial till; higher compacted densities and permeabilities for the mudrocks and glacial till (compared to alluvium) due to greater coarse fractions; higher specific surface areas and cation exchange capacities for the alluvial soils; relatively higher organics contents for the alluvium; very high ionic contents for the alluvium (estuarine); poor attenuation and buffering capacities of the mudrock soils compared to the glacial till which is far superior in these respects. Clay mineralogical compositions of all soil types tested are by-and-large similar and are more akin to illite (predominant) + kaolinite. The test results, in particular from the leaching column tests, indicate that the glacial till would be a suitable landfill liner material with high retention capabilities for heavy metals and high buffering capacity against change in pH.



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