

# CERAMAH TEKNIK TECHNICAL TALK

## Groundwater investigation: Fundamental and application

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Date: 1 March 2023

Platform: Microsoft Teams

Accounting for approximately 99% of all liquid freshwater on Earth, groundwater has the potential to provide societies with tremendous social, economic and environmental benefits and opportunities. Excessive groundwater withdrawal has led to land subsidence or seawater intrusion in many areas of the world. However approximately around four billion people live in areas that suffer from severe physical water scarcity for at least one month per year. Increasing water demand has led to an increase in groundwater investigation and exploration and a strong increase in groundwater withdrawal. In this regard the field of hydrogeophysics has emerged in the late 1990 demonstrating the benefits hydrogeophysical studies can bring for subsurface investigation. This presentation will discuss the importance of groundwater and go through fundamentals of groundwater investigation, defining key properties before presenting case studies in Brunei Darussalam using geophysical techniques.

Organized by:

Geophysics Working Group

Geological Society of Malaysia

## Characterizing weathering profiles in Peninsular Malaysia

Dr John Kuna Raj

Date: 15 March 2023

Platform: Zoom

The above talk was delivered by P. Geol. Dr John Kuna Raj (Consultant) on 15th March, 2023, via Zoom. Some 65 members participated. An abstract of the talk is given below:

Characterization of weathering profiles has usually involved their differentiation into weathering zones based on morphological criteria, akin to descriptions of pedological soil profiles. Several criteria have been employed and include colour, degree of preservation of original bedrock minerals, textures and structures, and the shape and percentage occurrence of litho-relicts (core-stones and core-boulders). The weathering zones can serve as engineering geological mapping units and can also assist site investigations through the assignment of engineering characteristics to each zone and the possibility of reducing the number of boreholes and in situ and laboratory tests.

The use of weathering zones for geotechnical purposes, however, has been criticized on the grounds that their recognition is based on qualitative or pedological criteria, criteria that are not quantitative nor related to mechanical properties or engineering behavior of material. It was thus proposed that different grades of weathered rock be recognized; each grade representing a different stage, or combination of stages of weathering of both rock material and rock mass. Recognition of distinct weathering grades in the rock mass was to be based on the degree of discoloration, the rock/soil ratio and the presence or absence of original rock texture.

A review of several classifications of weathering profiles pointed out that core-boulders were not present in all profiles and was critical of the way in which the term 'grade' was used both to describe a stage of weathering of rock material as well as classify a zone of weathered heterogeneous rock mass. It was thus proposed that the term "weathering zone" be used to distinguish the character of material en-masse, while the term "weathering grade" is used to describe material from which the mass is formed.