UNIVERSITI TEKNOLOGI MARA

DETERMINATION OF HEAVY METALS IN BOTTLED WATER AND THE POTENTIAL HEALTH RISK

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Project submitted in fulfillment of the requirements for the degree of
Bachelor in Environmental Health and Safety (Hons.)

Faculty of Health Sciences

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DECLARATION BY STUDENT

Project entitled "Determination of Heavy Metals in Bottled Water and the Potential Health Risk" is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Assoc. Prof. Rodziah Ismail. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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In the name of Allah, The Most Gracious, The Most Merciful.

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ABSTRACT

The concentrations of heavy metals such as Cd, Fe, Zn and Ni were investigated in different types of bottled water samples (mineral and drinking) collected from Bentong, Pahang. The potential health risks of heavy metals to the local population were also studied. Heavy metals concentrations were analysed using atomic absorption spectrometer and compared with permissible limits set in Malaysian Food Regulation 1985 and World Health Organization Guideline. Heavy metals concentration was found in the order of with Fe>Zn>Cd>Ni. The concentration of Cd was higher than its respective permissible limits for both types of water, while Fe, Zn and Ni concentrations were observed within their respective limits. Health risk assessment such as Health Quotient (HQ) and Hazard Index (HI) were calculated. HI of the selected heavy metals in the drinking water was less than 1, indicating no health risk to the local people. Statistical analyses showed that geologic and anthropogenic activities were the possible sources of water contamination of heavy metals in the study area.

Keywords: *Mineral water, drinking water, heavy metals, Health Risk Assessment*