PRELIMINARY EVALUATION OF TOXIC HEAVY METALS AND FLOURIDE IN DRINKING WATER AT MEDHAWACHCHIYA

A PROJECT REPORT PRESENTED BY

ARULAIYAH SHIVAKUMAR

to the Board of Study in Chemical Sciences of the

POSTGRADUATE INSTITUTE OF SCIENCE

in partial fulfillment of the requirement

for the award of the degree of

MASTER OF SCIENCE IN ANALYTICAL CHEMISTRY

of the

UNIVERSITY OF PERADENIYA

SRI LANKA

2008

PRELIMINARY EVALUATION OF TOXIC HEAVY METALS AND FLUORIDE IN DRINKING WATER AT MEDAWACHCHIYA

A Shivakumar
Department of Chemistry
Postgraduate Institute of Science
University of Peradeniya
Peradeniya.
Sri Lanka

Chronic renal failure is one of the major health problems faced by the people living in North Central Province (NCP) of Sri Lanka. There are 200 in every one million of the population in Sri Lanka, who are affected with renal failure and this proportion is much higher in North Central, North Western and Uva provinces. There are 8000 identified partients with renal failure in three provinces. The objective of this study is to investigate possible contribution to the renal failure due to the inorganic chemical toxins in drinking water in Medawachiya, Sri Lanka. The investigation conducted on four heavy metals (Cr, Cd, Pb, and As) and fluoride in drinking water. The main equipments used for this work involved in Graphite Furnace Atomic Absorption Spectrometry (GF-AAS) and Ion analyzer. GF-AAS is an electro thermal technique sensitive enough to "ppb" concentrations. The mean concentration of contaminants from two visits within February 2006 and April 2006 was increased form 5.58 ppb to 8.37 ppb for lead, and 0.62 ppm to 0.84 ppm for fluoride. Previous studies have shown that, presence of Cd in water reservoirs in NCP of Sri Lanka. However there was no significant level of Cd in well water samples of current study area at Medawschchiya.

The planed sampling program to conduct minimum of six sampling visit to obtained statistically acceptable data. But the sampling has to be abandoned due to the prevailed fair security conditions in the area. The study area is located in dry zone of Sri Lanka and therefore the water levels of the wells drastically decrease over the period form July to September. As a result, these contaminants may exceed the WHO standards for drinking water at dry season.