CHAPTER 1

INTRODUCTION

1.1 General

Bangkok, the capital city of Thailand, is one of the fastest growing cities in Southeast Asia. Similar to other cities in the region, Bangkok is encountering a broad array of environmental problems, especially urban pollution issue.

Pollution Control Department (PCD), a Thai government agency, reported that the particulate level with aerodynamic diameter of less than 10 microns (PM_{10}) measured at certain Bangkok roadsides have exceeded the Thai air quality standard. This may affect human respiratory system. The Department of Medical Service (DMS) of Bangkok Metropolitan Administration (BMA) also reported that the number of patients in respiratory diseases were increasing exponentially. In 1997, there were 132,849 cases of respiratory diseases reported in Bangkok (DMS 1997). The total medical expenses incurred from urban air pollution were approximately one hundred million bahts annually.

In order to devise an effective method for controlling urban ambient air pollution levels, major emission sources and their characteristics such as critical time period must be known. Emission sources can be obtained by factor analysis method and decomposition method is used to analyze for other factors influencing urban air pollutant levels at critical time periods.

1.2 Objectives

1) Investigate variations of five major types of air pollutants in Bangkok with respect to seasonal and atmospheric conditions in a year.

2) Assess degree of air pollution problems at selected sites.

3) Identify interrelation of five selected air pollutants.

4) Identify possible sources impacting certain receptor sites.

5) Analyze characteristics of major sources.

6) Suggest possible method for controlling air pollution level at the sites.

1.3 Scope of Study

1) Plot annual daily average time series of five selected pollutants which are NO_2, SO_2, CO, O_3, and PM_{10} to analyze for;

1.1) Trend and variation of data with respect to seasonal or sporadic factors for individual pollutant variable. Correlation analysis among all five variables will also be performed.

1.2) Concentration characteristics of each parameters with respect to one another.

2) Use Factor Analysis technique to identify possible sources impacting the receptor site.

3) Use Decomposition technique to obtain time periods which affect pollutant levels significantly (critical time periods) and, possible influences from other factors.