

**CURRENT RESEARCH  
AND DEVELOPMENT IN  
BIOTECHNOLOGY  
ENGINEERING  
AT IIUM**

**VOLUME I**

Editors:

Suleyman Aremu Muyibi  
Mohammed Saedi Jami  
Zaki Zainudin



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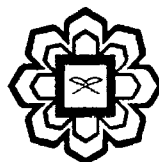
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## CHAPTER 17

### AN EXPERT SYSTEM FOR DESIGN OF WATER TREATMENT PLANT

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#### ABSTRACT

It is generally believed that techniques other than straightforward application of control theory will be necessary to achieve effective operation of surface water treatment processes. This paper focus more to the development of an integrated Expert System (ES) which is believed can overcome most of the problems usually encountered in a typical wastewater treatment plant. The purposes of the study includes understanding water treatment generated in Gombak and service provided for water treatment management; a water treatment plant in Gombak will be developed by using JAVA Expert System and finally; and a new approach for integration of water treatment plant system in Gombak is recommended. It is found that the project is considered as success as the integrated program for water treatment plant management system using Water Treatment Expert System (WTES) had been developed based on four types integration which are year, population, comments and recommendations.

**Keywords:** expert system, java, water treatment expert system (WTES)

#### INTRODUCTION

During the last decade, the research of water treatment has been concentrated mainly on the operation rather than the design and construction of the treatment plants. This is due to the fact that the management and operation of the plants is the key step for the efficiency of water pollution control. It is generally believed that techniques other than straightforward application of control theory will be necessary to achieve effective operation of surface water treatment processes. Expert system is a form of artificial intelligence that provides expert knowledge to a user through an interactive environment. They are especially useful for projects that cover a broad field of knowledge (Ignizio, 1991). Expert systems have been built for solving environmental problems. These works concluded by identifying promising tools for the application of expert systems in water treatment management.

Expert System (ES) is both process and a tool for solving problems that are too complex for human alone, but usually too qualitative for only computers. Multiple objectives can complicate the task of decision making, especially the objectives conflict. As a process, an ES is a systematic method of leading decision makers and other stakeholders through the