

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

There are many methods of obtaining hydraulic information from aquifers, but perhaps the most common and best is the pumping test or aquifer test. Without an estimate of the hydraulic properties of an aquifer, calculation of groundwater movement cannot be performed with any level of confidence. Saying that pumping tests are the best method of obtaining hydraulic information presumes that the test has been designed properly and was run for an adequate period of time.

In order for pumping tests to effectively stress the aquifer, a proper pumping rate must be established. Even though the wells are properly placed and developed, if the pumping rate is too slow, a small cone of depression will result and the drawdown in observation well may not be detected. Conversely, if pumping rates are too high, then the test will not run very long because the pumping level will reach the pump, possibly causing cavitations.

The experiment was set up with coarse sand as the model catchment and set horizontally. The portholes are removed from both end weirs to allow the flow of water into the sand. Then, adjustable overflows at each end of the apparatus were set with 3 different heights that control the groundwater level in the sand. The pump was started up and flows through the sharp edge weir. Thus, it is necessary to measure the flow of water

3.2 FLOW CHART OF THE STUDY

Figure 3.1 shows the methodology of chart for this study. There are 7 procedures during this study. Start with the objective and continuously understood the groundwater flow movement. The procedure was described detail in flow chart.

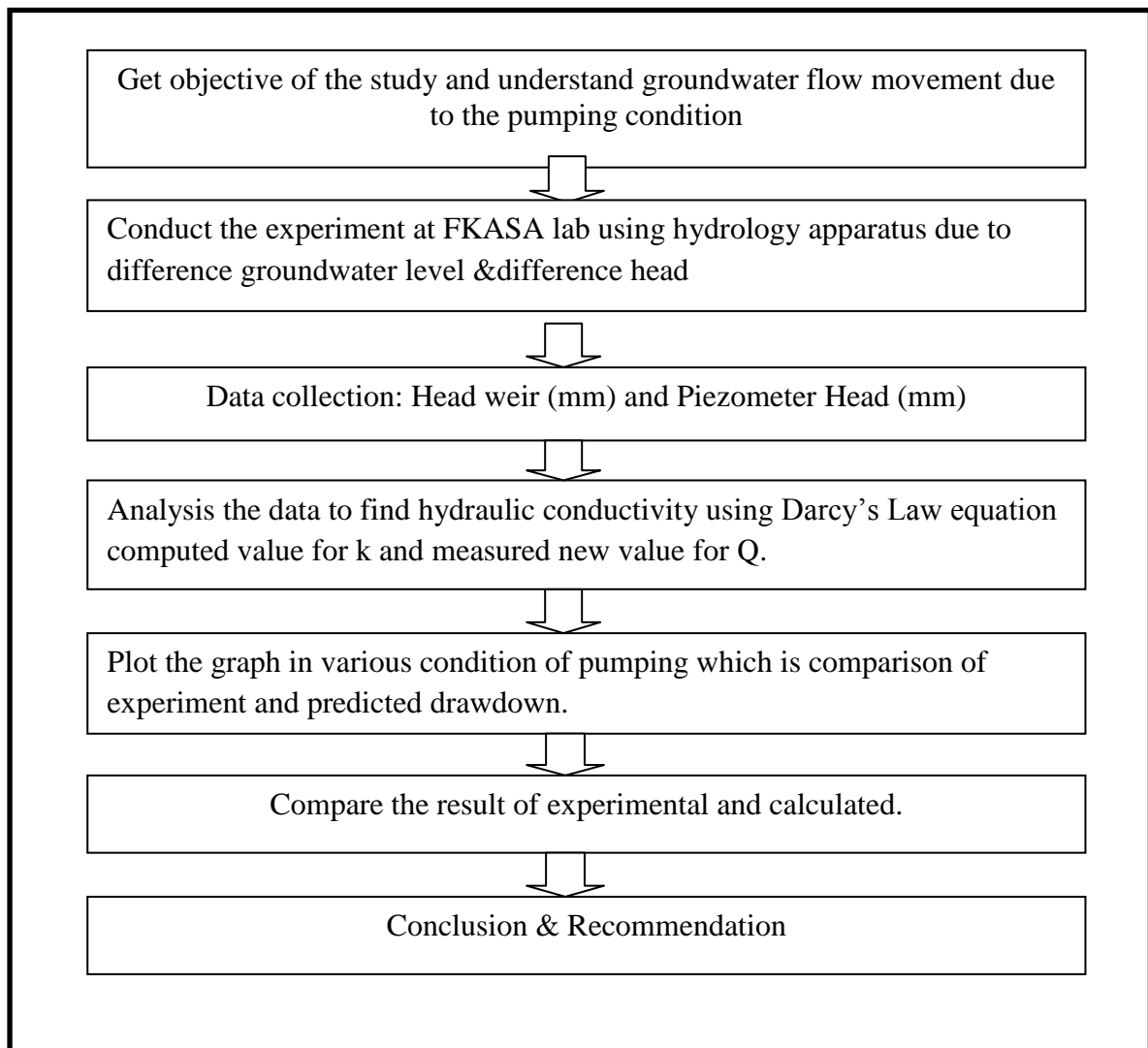


Figure 3.1: Methodology of study

3.3 HYDROLOGY APPARATUS

The hydrology apparatus was used to study the hydrology process like a groundwater movement in confined and unconfined aquifers. This experiment were set up with coarse sand as the model catchment and set horizontally. There are a lot of experiment that be done using this apparatus which are investigation of rainfall and runoff relationship for dry, saturated and impermeable catchments of various slopes, stimulation of multiple and moving storms, de-watering of excavation sites by use of wells and demonstration of watersheds for a simulated island with rainfall and well flows. But for this study only focused on groundwater flow at confined and unconfined aquifer. The hydrology apparatus also was used to study the drawdown effect of cones depression and interaction due to pumping activities.

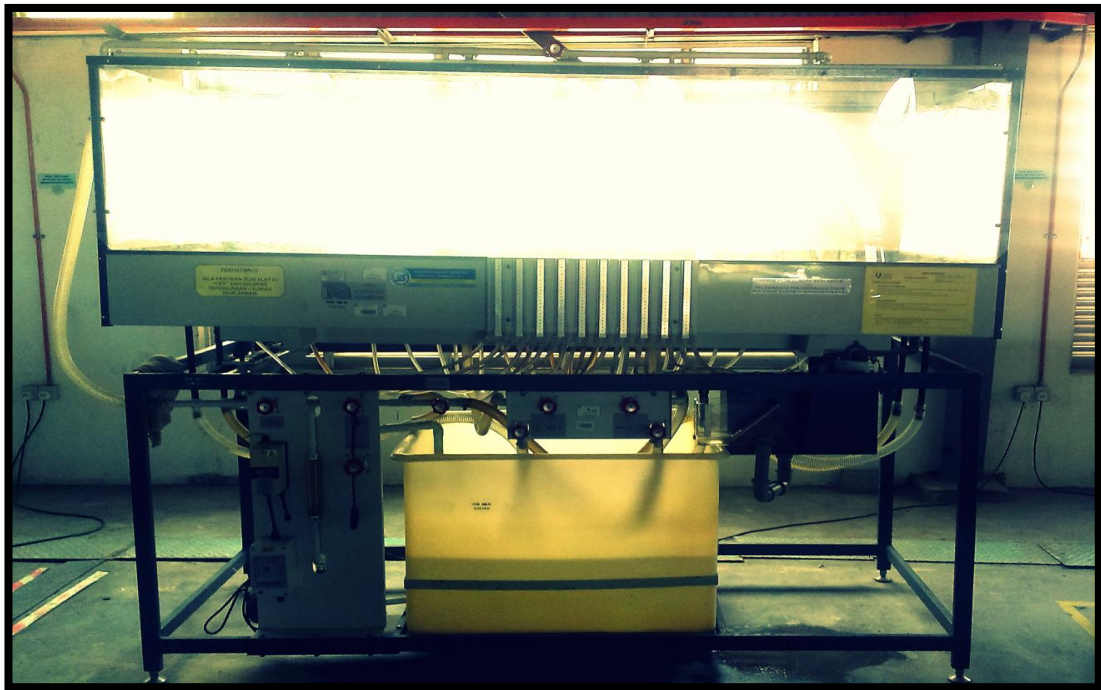


Figure 3.2: Hydrology Apparatus in laboratory UMP

The hydrology apparatus was shown in Figure 3.2 was used to study the head of water table when water is pumped out. Before this study was conducted the calibration of apparatus were done to ensure that the apparatus are prevented from leakage.