

Bunjob Kitikard 2012: Influence of Rainfall Intensity on the Prediction of Pollutant Contamination and Dispersion in Groundwater using Visual MODFLOW Premium 2009. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Assistant Professor Sanya Sirivithayapakorn, Ph.D. 91 pages.

Rainfall pattern is direct variation with recharge rate to the groundwater aquifer that is an important factor for groundwater flow model and dispersion of pollutant in groundwater. The Study area is in Map Ta Phut Municipality, Muang District, Rayong Province. This research study used the mathematical models is Visual MODFLOW Premium 2009 software, both in the steady and transient state with input recharge rate, which varies according to 3 different rainfall patterns in 1 to 10 year and with simulation of the contamination size of source area about 0.5, 5 and 9 square kilometers. Three groups of pollutants were considered in the simulations, taking into account the properties of advective – dispersive transport, the sorption process and different of reaction property for studied the contaminant area and mass together with compare the percentage different with control state.

The results showed that the rainfall intensity did not affect the groundwater flow in all cases of study. The influence of rainfall intensity on groundwater model in study area found that in the worst case, when consider the plume area, the result showed that the behavior of advective – dispersive transport, no sorption and reaction is in the steady state, time period of 10 years and from 0.5 square kilometers. A case study of advective – dispersive transport, sorption and no reaction is in the transient state, time period of 1 year and from 9 square kilometers. And a case study of a advective – dispersive transport, sorption and reaction are possible in all cases of study.

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Thesis Advisor's signature