MATHEMATICAL MODELLING DISTRIBUTION SOIL WATER POLLUTANT FOR GEOGRAPHIC INFORMATION SYSTEM IN EAST SURABAYA (case study : Kecamatan Rungkut)

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ABSTRACT

As the amount of population grows, it is inevitable that human needs and activities conducted by all people become more various due to the development of increasingly advanced technology industry. The development of industrial zones in agricultural areas and the surrounding area led to reduced agricultural pollution of soil and bodies of water which can degrade the quality and quantity of agricultural products as well as disruption of comfort and health of humans or other living creatures. Meanwhile, mining activities causes soil damage, erosion and sedimentation, as well as drought.

In Indonesia there were some explosions due to gas pipeline leak on pipelines owned by Pertamina caused by contamination of the tube by sufficiently high concentration of pollutants. The explosions happened in the area of Mojokerto dated March 26, 1999, in Gresik dated February 27, 2003, on the coast Indramayu dated January 7, 2003 and December 4, 2004.

Rungkut district in Eastern Surabaya is chosen for there are a variety of industries, where the waste disposal plant affects the concentration levels of ground water. In this case, it needs a mathematical modeling of ground water salinity concentration distribution with finite element method based into a Geographic Information System so it can be known dispersal patterns of the area.

Have Result this cases is map salinity soil water distribution in Distric-Rungkut for DHL 1000 < DHL < 10.000 µhos/cm with salinity value 0.5 < salinity < 30 0/00 as known saltish groundwater.

Key words: groundwater salinity, finite element method, Geographic Information Systems