

ABSTRACT

Groundwater resource is an essential for various purposes in Bantul district, Yogyakarta province, Indonesia. The study area are located in the southern part of Bantul district, in Samas area, Poncosari village where the water supply are depending on groundwater which is quite shallow (0.35-4.5m). Groundwater contamination by nitrate is the main factors that could be found in the shallow groundwater and it can deteriorate the groundwater quality. Therefore this research aims in term of 3 main objectives which are (1) to know the level of nitrate concentration in groundwater, (2) to assess groundwater vulnerability in the study area and (3) to know the level of groundwater contaminant hazard. As the result, groundwater concentration of nitrate range from 0.09- 74.80 mg/L. For groundwater vulnerability was assessed by SVV method, the result was classified as moderate, moderate high and high classes of vulnerability due to shallow groundwater level and the overlying material in the study area were almost dominated by sand. Combination of groundwater vulnerability map and contaminant loading assessment map reveals the groundwater contaminant hazard map, as results groundwater contaminant hazard range from low to high class, where the high class are represent in some part of settlement area due to the failure on-site sanitation system and the dug wells are located near to the toilet where human activity on surface are practice every day. In addition, moderate to moderate high class are represented in the settlement area where septik tank and infiltration well were applied. Moderate low class are found in the non-irrigation agricultural area, sand dune area and some part of settlement area where the septik system and infiltration well were applied but less surface activity from human. Moreover low class are found in the rice field where there's lack of human activities comparing to another landuse type.

Keywords: *nitrate concentration, groundwater vulnerability, groundwater contaminant loading and groundwater contaminant hazard.*

ABSTRAK

Sumber air tanah sangat penting untuk berbagai keperluan, tidak terkecuali di Kabupaten Bantul, Provinsi Yogyakarta, Indonesia. Penulis melakukan penelitian di bagian selatan Kabupaten Bantul, daerah Samas, Desa Poncosari dimana persediaan air wilayah tersebut bergantung pada air tanah yang cukup dangkal (0.35-4.5m). Pencemaran air tanah oleh nitrat adalah faktor utama yang dapat ditemukan pada air tanah dangkal dan dapat menurunkan kualitas air tanah. Oleh karena itu penelitian ini memiliki 3 tujuan utama yaitu: (1) mengetahui tingkat konsentrasi nitrat dalam air tanah, (2) menilai kerentanan air tanah di wilayah penelitian, dan (3) mengetahui tingkat bahaya pencemaran air tanah. Hasilnya, konsentrasi air tanah berkisar antara 0,09- 74,80 mg / L. Adapun kerentanan air tanah dinilai dengan metode SVV, dengan hasil diklasifikasikan sebagai kelompok kerentanan sedang, sedang tinggi dan tinggi karena tingkat air tanah dangkal dan bahan penutup di wilayah penelitian hampir didominasi oleh pasir. Kombinasi peta kerentanan air tanah dan peta penilaian pengisian pencemar menunjukkan peta bahaya pencemaran air tanah. Melalui peta bahaya pencemaran air tanah dapat dilihat bahwa tingkat bahaya pencemaran air tanah berkisar dari kelas rendah sampai kelas tinggi, dimana tingkat kelas tinggi mencakup beberapa bagian kawasan pemukiman karena kegagalan sistem sanitasi setempat, serta letak sumur galian yang berada di dekat kamar mandi yang merupakan tempat masyarakat beraktivitas sehari-hari. Selain itu, kelas menengah hingga menengah tinggi mencakup daerah pemukiman dimana tangki septik dan sumur resapan diaplikasikan. Kelas menengah rendah mencakup daerah pertanian non-irigasi, daerah gundukan pasir dan beberapa daerah pemukiman dimana sistem septik dan sumur resapan diaplikasikan namun tidak banyak terdapat aktivitas manusia. Sedangkan kelas rendah ditemukan di area sawah dimana terdapat sedikit aktivitas manusia dibandingkan pada jenis lahan lain.

Kata kunci: konsentrasi nitrat, kerentanan air tanah, pengisian pencemar air tanah dan bahaya pencemaran air tanah.