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## Assessment of Spatial Variation of Groundwater Quality and Its Relationship With Land Use in Perth Metropolitan

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### ABSTRACT

To determine the effects of land use on groundwater quality in Western Australia, a quantitative analysis is carried out using groundwater quality data supplied by the Department of Water from over 500 groundwater wells across the Perth metropolitan area. We analyzed four main groundwater quality indicators; nutrients, physical parameters, inorganic non metals and trace metals. We found that groundwater beneath agricultural land was found to be particularly susceptible to nutrient loading due to the application of fertilizers. Nutrient levels were found to be rising over time due to increasing agriculture and urban development. Industrial areas were also found to have numerous contamination plumes that continue to migrate with the groundwater flow. According to Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines and the Australian Drinking Water Guidelines (ADWG), several areas including rural areas like Carabooda lake, Gngangara and Jandakot Mounds, Cockburn Sound, Forrestdale, Joondalup, and Ellenbrook and high density urban areas like Balcatta and Neerabup, industrial areas like North Fremantle, Welshpool and Kwinana are indentified as the vulnerable areas for groundwater quality.

### KEYWORDS

Groundwater, Quality, Land use, Perth

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