



# POTENSI AIRTANAH BEBAS ANTARA KALI SOMOKATON DAN KALI SORAN PADA LERENG TENGGARA GUNUNGAPI MERAPI KABUPATEN KLATEN JAWA TENGAH

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## INTISARI

Airtanah merupakan kebutuhan yang sangat vital bagi manusia. Airtanah pada suatu daerah dipengaruhi oleh kondisi batuan yang menyusun daerah tersebut. Daerah penelitian terletak pada kaki Gunungapi Merapi bagian tenggara. Tujuan penelitian ini untuk mengetahui tipe akuifer, karakteristik dan potensi airtanah bebas.

Metode penelitian ini adalah (1) metode geolistrik, (2) metode uji pompa dan (3) survei pemetaan airtanah bebas. Teknik pengambilan sampel untuk pengukuran geolistrik secara *purposive sampling*. Data tahanan jenis dari pengukuran geolistrik dianalisis dengan menggunakan program IP2Win. Teknik pengambilan sampel sumur untuk uji pompa dengan *stratified purposive method*. Teknik pengambilan sampel untuk survei pemetaan airtanah bebas dengan *systematic sampling*. Kontur airtanah bebas diperoleh dari pengukuran kedalaman muka airtanah bebas kemudian diinterpolasi dan diperoleh arah aliran airtanah bebas (*flownets*).

Hasil *penelitian* menunjukkan bahwa tipe akuifer di daerah penelitian adalah akuifer bebas, semi tertekan dan tertekan. Akuifer tersusun oleh pasir mengandung lempung dengan tahanan jenis (3,95-38,89 $\Omega$ m), pasir dan kerikil (48,88-355,47 $\Omega$ m) dan breksi tuff (362,27-1125,06 $\Omega$ m). Daerah penelitian mempunyai potensi airtanah bebas rendah hingga sedang. Potensi airtanah bebas sedang mempunyai karakteristik airtanah bebas sebagai berikut: debit dinamis 6,4-8,75 Lt/detik, DHL <1500  $\mu$ mhos/cm, permeabilitas (0,03-0,29 m/hari), kedalaman muka airtanah <7 m dan tebal akuifer (21-150 m). Potensi airtanah rendah mempunyai karakteristik airtanah bebas sebagai berikut: debit dinamis 0,019-4,44 Lt/detik, DHL <1500  $\mu$ mhos/cm, permeabilitas (0,03-0,29 m/hari), kedalaman muka airtanah (1-30 m) dan tebal akuifer (9-72 m).

**Kata kunci:** potensi airtanah, akuifer bebas, Gunungapi Merapi

**POTENCY OF UNCONFINED GROUNDWATER  
BETWEEN SOMOKATON AND SORAN RIVERS  
OF THE SOUTHEASTERN SLOPE OF MERAPI VOLCANO  
KLATEN SUB DISTRICT  
CENTRAL JAVA**

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**ABSTRACT**

Groundwater is the most vital needs of human being. Groundwater areas are effected by rock compisition that construct the area. Research area located on the southeastern foot of Merapi Volcano. The aims of this research are to identify the types aquifer, characteristic and potency of unconfined groundwater.

Method of this research was survey method by using of: (1) geoelectric method, (2) pumping test method and (3) groundwater mapping survey. The technique of sample collection for geoelectric was purposive sampling technique. The electrical conductivity of rock data was used measured and analyze from geoelectric masurement by IP2Win program. The well samples for pumping test was defined by stratified purposive sampling technique. Well groundwater mapping survey was defined by systematic sampling. Unconfined groundwater contour defined from the data was interpolated to defined the direction of flownets.

The result shows in the area study consist of three aquifer types, are unconfined, semi-confined and confined aquifer. The aquifer is composed of Sand containing clay with resistivity value between (3.95-38.89 $\Omega$ m), sand and gravel (48.88-355.47 $\Omega$ m) and breccia tuff (362.27-1125.06 $\Omega$ m). The potency of unconfined groundwater in the area has low to medium potention. The medium potency of unconfined groundwater has certain characterictic as follow: dynamical dishcharge (6.4-8.75 Lt/detik), electric conductivity DHL <1500  $\mu$ mhos/cm, permeability (0.03-0.29 m/day), surface depth of groundwater <7 m and the aquifer thickness (21-150 m). The low potency unconfined groundwater has certain characterictic as follow: dynamical dishcharge 0.019-4.44 Lt/detik, electric conductivity <1500 $\mu$ mhos/cm, permeability (0.03-0.29 m/hari), surface depth of groundwater (1-30m) and the aquifer thickness (9-72 m).

**Key word:** potency of groundwater, unconfined aquifer, Merapi Volcano