

## INTISARI

### Analisis Kualitas Air Sungai Garang Bagian Hilir, Kota Semarang Menggunakan Metode IKA-INA

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Penelitian ini menganalisis kualitas air Sungai Garang bagian hilir pada segmen VI di Kota Semarang yang memiliki standar mutu air kelas I sesuai dengan Peraturan Gubernur Provinsi Jawa Tengah Nomor 156 Tahun 2010 tentang Peruntukan Air dan Pengelolaan Kualitas Air Sungai Garang. Sungai Garang dimanfaatkan oleh Perusahaan Umum Daerah (Perumda) Air Minum Tirta Moedal Kota Semarang sebagai sumber air baku air minum. Namun, Sungai Garang berada dalam tekanan dari berbagai sumber pencemar, termasuk aktivitas antropogenik dari kawasan permukiman dan industri, seperti Kawasan Industri Simongan.

Penilaian kualitas air dilakukan berdasarkan baku mutu air pada sungai kelas I sesuai dengan Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup. Parameter yang digunakan meliputi 2 (dua) parameter fisika (*Total Dissolved Solids* (TDS) dan *Total Suspended Solids* (TSS)), 7 (tujuh) parameter kimia (*potential of Hydrogen* (pH), *Biochemical Oxygen Demand* (BOD), *Chemical Oxygen Demand* (COD), *Dissolved Oxygen* (DO), nitrat sebagai N ( $\text{NO}_3\text{-N}$ ), amonia sebagai N ( $\text{NH}_3\text{-N}$ ), dan fosfat total sebagai P (T- $\text{PO}_4\text{-P}$ )), serta 1 (satu) parameter mikrobiologi (*Fecal coliform*). Hasil penelitian menunjukkan bahwa beberapa parameter masih memenuhi baku mutu meliputi TDS, TSS, pH, DO (STA 4 & 5),  $\text{NO}_3\text{-N}$ , dan  $\text{NH}_3\text{-N}$  (STA 4). Sebaliknya, beberapa parameter tidak memenuhi baku mutu meliputi BOD, COD, DO (STA 1, 2, 3),  $\text{NH}_3\text{-N}$  (STA 1, 2, 3 & 5), T- $\text{PO}_4\text{-P}$ , serta *Fecal coliform* menandakan adanya pencemaran organik dan mikrobiologis yang signifikan akibat sumber pencemar baik domestik maupun non-domestik.

Penentuan status mutu air dilakukan berdasarkan metode IKA-INA. Status mutu air pada kelima STA menunjukkan rentang nilai IKA-INA berada antara 61,264 hingga 74,598, dengan rincian yaitu STA 1 (67,797: sedang (kelas III)), STA 2 (68,163: sedang (kelas III)), STA 3 (68,080: sedang (kelas III)), STA 4 (74,598: cukup baik (kelas II)), dan STA 5 (61,264: sedang (kelas III)). STA 4 memiliki status mutu air yang relatif paling baik karena berada di area pengawasan intensif Perumda Air Minum Tirta Moedal Kota Semarang, sedangkan STA 5 memiliki status mutu air yang relatif paling buruk karena posisinya di bagian hilir yang menjadi area akumulasi pencemaran. Dengan demikian, hasil penelitian menegaskan bahwa kualitas air Sungai Garang bagian hilir belum memenuhi standar sumber air baku air minum, sehingga diperlukan upaya pengelolaan terpadu dan pengendalian pencemaran secara berkelanjutan.

**Kata kunci:** Sungai Garang, hilir, segmen VI, Kota Semarang, kualitas air, status mutu air, IKA-INA, pencemaran, sumber pencemar, Perumda Air Minum Tirta Moedal Kota Semarang.

### **ABSTRACT**

*Water Quality Analysis of the Lower Garang River, Semarang City4  
Using the IKA-INA Method*

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*This study analyzes the water quality of the downstream Garang River, segment VI, in Semarang City, which has a Class I water quality standard in accordance with Central Java Governor Regulation Number 156 of 2010 concerning Water Allocation and Water Quality Management of the Garang River. The Garang River is utilized by the Semarang City Regional Public Company (Perumda) Tirta Moedal Drinking Water as a raw water source for drinking water. However, the Garang River is under pressure from various pollutant sources, including anthropogenic activities from residential and industrial areas, such as the Simongan Industrial Estate.*

*Water quality assessment was conducted based on the reference water quality standards for Class I rivers in accordance with Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Protection and Management. The parameters used include 2 (two) physical parameters (Total Dissolved Solids (TDS) and Total Suspended Solids (TSS)), 7 (seven) chemical parameters (potential of Hydrogen (pH), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Dissolved Oxygen (DO), nitrate as N (NO<sub>3</sub>-N), ammonia as N (NH<sub>3</sub>-N), and total phosphate as P (T-PO<sub>4</sub>-P)), as well as 1 (one) microbiological parameter (Fecal coliform). The results of the study showed that several parameters still met the quality standards including TDS, TSS, pH, DO (STA 4 & 5), NO<sub>3</sub>-N, and NH<sub>3</sub>-N (STA 4). Conversely, several parameters did not meet quality standards, including BOD, COD, DO (STA 1, 2, 3), NH<sub>3</sub>-N (STA 1, 2, 3 & 5), T-PO<sub>4</sub>-P, and fecal coliform, indicating significant organic and microbiological pollution due to both domestic and non-domestic sources.*

*Water quality status was determined using the IKA-INA method. The water quality status at the five STAs showed a range of IKA-INA values between 61.264 and 74.598, with the following breakdown: STA 1 (67.797: moderate (class III)), STA 2 (68.163: moderate (class III)), STA 3 (68.080: moderate (class III)), STA 4 (74.598: fair (class II)), and STA 5 (61.264: moderate (class III)). STA 4 has the relatively best water quality status because it is located within the intensive monitoring area of the Tirta Moedal Regional Drinking Water Company (Perumda Air Minum Tirta Moedal Semarang City), while STA 5 has the relatively worst water quality status due to its location downstream, which is an area of pollution accumulation. Thus, the research results confirm that the water quality of the downstream Garang River does not meet drinking water standards, necessitating integrated management efforts and sustainable pollution control.*

**Keywords:** *Garang River, downstream, segment VI, Semarang City, water quality, water quality status, IKA-INA, pollution, pollution sources, Tirta Moedal Regional Drinking Water Company (Perumda Air Minum Tirta Moedal Semarang City).*