

INTISARI

Danau Lido Bogor adalah danau yang digunakan sebagai sentra wisata daerah Cigombong Bogor, Jawa barat. Adanya eksploitasi wisata terhadap danau ini menyebabkan penurunan kualitas air danau yang menyebabkan tingginya kandungan (timbal) Pb di air. Hal ini membuat penduduk sekitar khawatir jika sumber airtanah yang digunakan sebagai pemenuhan kebutuhan sehari-hari, baik dari sumur bor, gali atau mata air memiliki interkoneksi hidrolik dengan Danau Lido. Kekhawatiran tersebut menimbulkan dugaan bahwa pencemaran air yang ada di Danau Lido akan dapat mencemari airtanah di kawasan Cigombong.

Metode aplikasi isotop alam deuterium dan oksigen-18 dalam air digunakan untuk menentukan interkoneksi air danau dengan air sekitarnya sedangkan untuk mengetahui indikasi adanya pencemaran air, dilakukan pengukuran temperatur, pH dan kandungan timbal (Pb) pada sampel air.

Hasil analisis komposisi isotop (δD , $\delta^{18}O$) menunjukkan bahwa dari 15 sampel yang diambil di lima kelurahan di Kecamatan Cigombong, hanya sampel S7 ($106^{\circ}48'163''$ E dan $06^{\circ}44'363''$ S) dengan rasio isotop δD ($-36,78823 \pm 0,97$) ‰ dan $\delta^{18}O$ ($-3,43538 \pm 0,22$) ‰ dan sampel S14 ($106^{\circ}50'762''$ E dan $06^{\circ}45'903''$ S) dengan rasio isotop δD ($-39,47589 \pm 0,59$) ‰ dan $\delta^{18}O$ ($-3,42558 \pm 0,38$) ‰, yang memiliki interkoneksi hidrolik dengan Danau Lido ($106^{\circ}48'410''$ E dan $06^{\circ}44'656''$ S) yang memiliki nilai rasio isotop δD ($-37,72547 \pm 1,42$) ‰ dan $\delta^{18}O$ ($-4,05621 \pm 0,29$) ‰. Indikasi adanya pencemaran timbal hanya terdapat pada mata air Ciwaluh Wates Jaya (S14) dengan kadar timbal yang melebihi 0,05 mg/L, yaitu sebesar 0,0746 mg/L.

Kata Kunci : Danau Lido, deuterium, oksigen-18, dan Pb

**ENVIRONMENTAL ISOTOPE APPLICATION FOR DETERMINATION
OF THE HYDRAULIC INTERCONNECTION BETWEEN LIDO LAKE
WATER AND THE SURROUNDING GROUNDWATER AS THE
PRELIMINARY STUDY FOR GROUNDWATER POLLUTION IN LIDO
BOGOR AREA, WEST JAVA**

ABSTRACT

Bogor Lido Lake is a lake that is used as the tourist center of Cigombong Bogor, West Java region. The tourism exploitation against this lake causes a decrease in water quality that causes high content of lead (Pb) in water. It becomes the public concern as the groundwater used for their daily needs, not only from drilled wells, dug wells but also springs has hydraulic interconnections with Lido Lake. This concern leads to speculation that the water pollution in Lido Lake will be able to contaminate the groundwater in the Cigombong area.

Environmental isotope application methods of deuterium and oxygen-18 in the water was used to determine interconnection between groundwater and lido lake water while analysis of temperature and pH as well as analysis of Pb content in water were used to detect the water pollution.

The analysis results of the isotope composition (δD , $\delta^{18}O$) shown that among 15 samples taken at five village in the Cigombong District, only samples S7 ($106^{\circ}48'163''$ E and $06^{\circ}44'363''$ S) with ratio of isotope δD (-36.78823 ± 0.97) ‰ and $\delta^{18}O$ (-3.43538 ± 0.22) ‰ and samples S14 ($106^{\circ}50'762''$ E and $06^{\circ}45'903''$ S) with ratio of isotope δD (-39.47589 ± 0.59) ‰ and $\delta^{18}O$ (-3.42558 ± 0.38) ‰ had hydraulic interconnections with Lido Lake S12 ($106^{\circ}48'410''$ E and $06^{\circ}44'656''$ S) with ratio of isotope δD (-37.72547 ± 1.42) ‰ and $\delta^{18}O$ (-4.05621 ± 0.29) ‰. The indication of Pb pollution in water was only in sample Ciwaluh springs at Wates jaya (S14). The lead content in sample was quite high compared to 0.05 mg/L, that was 0.0746 mg/L.

Keywords : Lido Lake, deuterium, oksigen-18, and Pb