

WATER QUALITY STUDY AT TASIK CHINI IN 2013 AND 2016
DURING WET AND DRY SEASON

MUNIRAH BINTI CHE NORDIN

Thesis submitted in fulfillment of the requirements
for the award of the
Bachelor Degree in Civil Engineering

Faculty of Civil Engineering and Earth Resources
UNIVERSITI MALAYSIA PAHANG

JUNE 2017

ABSTRAK

Tujuan Kajian ini adalah untuk menganalisis kualiti air di Tasik Chini pada tahun 2013 dan 2016. Kajian ini dijalankan di lima stesen persampelan yang berada di Sg. Gumum, Sg. Jerangking, Sg. Kenawar, Sg. Melai dan Sg. Chini. Sebanyak tiga belas parameter kualiti air dan dua belas logam berat telah diuji dan berdasarkan Indeks Kualiti Air, Jabatan Alam Sekitar (DOE-WQI) telah dikira dan dikelaskan mengikut Piawaian Standard kualiti Air Negara (INWQS). Antara parameter fizikal dan kimia seperti pH, kekonduksian elektrik (EC), kekeruhan, Suhu, Jumlah Pepejal Terampai (TSS), pepejal terampai (SS), permintaan oksigen biokimia (BOD), permintaan oksigen kimia (COD), oksigen terlarut (DO), nitrogen ammonia (NH₃-N), nitrat (N), Kalium (K), Fosforus (P) adalah analisis in-situ dan ujian makmal. Dua belas parameter untuk mengenalpasti kepekatan logam berat seperti Iron (III) oksida (Fe₂O₃), Silicon Dioxide (SiO₂), Aluminium Oksida (Al₂O₃), Mangan Oksida (MnO), Kalium Oksida (K₂O), Titanium Dioxide (TiO₂), Fosforus pentoksida (P₂O₅), Barium Oxide (BaO) Lead Oksida (PbO), Kalsium oksida (CaO), trioksida Sulphur (SO₃), dan zink oksida (ZnO) juga dianalisis dengan menggunakan ujian ICP-MS. Menurut Indeks Kualiti Air Malaysia (WQI), air di Tasik Chini diklasifikasikan sebagai kelas II, yang sesuai untuk aktiviti rekreasi dan selamat untuk sentuhan air pada badan. Menurut Standard Kualiti Air Negara bagi Malaysia, kekonduksian elektrik (EC), nitrat (NO₃) dan nitrogen ammonia (NH₃-N), Kelas I, manakala suhu dan kekeruhan telah dikelaskan ke dalam Kelas II. Untuk permintaan biokimia oksigen (BOD), keperluan oksigen kimia (COD), oksigen terlarut (DO), pH, dan Jumlah Pepejal Terampai (TSS) yang diklasifikasikan ke dalam Kelas III. Walau bagaimanapun, berdasarkan keputusan, pembalakan haram, perlombongan besi, aktiviti perindustrian dan pertanian telah berlaku di sekitar tasik seterusnya memberi kesan kepada pencemaran air di Tasik Chini.

ABSTRACT

The purpose of this study is to analyse water quality at Tasik Chini in 2013 and 2016. This study was conducted at five sampling stations which are at Sg. Gumum, Sg. Jerangking, Sg. Kenawar, Sg. Melai and Sg. Chini. A total of thirteen water quality parameters and twelve heavy metals were measured and Malaysian Department of Environment Water Quality Index (DOE-WQI) was calculated and classified according to the Interim National Water Quality Standard, Malaysia (INWQS). The physical and chemical variable such as pH, Electrical Conductivity (EC), Turbidity, Temperature, Total Suspended Solids (TSS), Suspended Solid (SS), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Dissolved Oxygen (DO), Ammoniacal Nitrogen ($\text{NH}_3\text{-N}$), Nitrate (N), Potassium (K), Phosphorus (P) was analysis in-situ and laboratory experiments. Twelve parameters to identify heavy metals concentration are Iron (III) Oxide (Fe_2O_3), Silicon Dioxide (SiO_2), Aluminium Oxide (Al_2O_3), Manganese Oxide (MnO), Potassium Oxide (K_2O), Titanium Dioxide (TiO_2), Phosphorus pentoxide (P_2O_5), Barium Oxide (BaO) Lead Oxide (PbO), Calcium Oxide (CaO), Sulphur Trioxide (SO_3), and Zinc Oxide (ZnO) also had test by run ICP-MS. Result show that base on Malaysian WQI, the water in Tasik Chini is classified as class II, which suitable for recreational activities and body contact. According to the National Water Quality Standard for Malaysia, electrical conductivity (EC), Nitrate (NO_3) and ammoniacal nitrogen ($\text{NH}_3\text{-N}$), Class I, While temperature, and turbidity into Class II. For biochemical oxygen demand (BOD), chemical oxygen demand (COD), dissolved oxygen (DO), pH, and Total Suspended Solids (TSS) classified into Class III. However, based on result, illegal logging, iron mining, industrial and agriculture activities have taken place in surrounding of the lake consequently affected the pollution of water at Tasik Chini.