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# How to use WASDA to Design Wastewater Treatment Plant?

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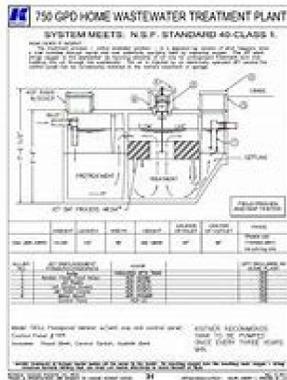
## ABSTRACT

Wastewater Treatment Plant Design Advisor (WASDA) is an interactive computer system that could support users for designing wastewater treatment plant (WWTP) construction facilities. It is consisting of computerized tools and information management capabilities, developed to aid decision maker's especially engineers in solving problem on wastewater treatment process. For design purposes, WASDA can be used to construct wastewater treatment plant where it uses lab and design data and information to produce results and decisions to users. This paper describes on how to apply WASDA to perform process design for conventional wastewater, preliminary, primary, secondary and sludge treatments in a minimum time. Design example of conventional activated sludge will be used as a guideline in using WASDA effectively. This module is part of various applications in WASDA that can be a useful tool to design new plants and to assess performance of existing plants. Furthermore, WASDA that was blended with Graphical User Interface (GUI) could be a simple and realistic decision support tool to design municipal and industrial wastewater treatment plants based on standard criteria and also requirements from Malaysian Department of Environment (DOE) and Department of Sewerage Services (DSS).

**Keywords:** Decision support system, municipal and industrial wastewater treatment, GUIs and WASDA.

## INTRODUCTION

Decision support tool for designing wastewater treatment plant (Decision Support System (DSS)) is the most successful application of Management Support System (MSS) recently and have been used widely in wastewater management field. Since 1970s, previous studies showed that most of researchers developed DSS to using various concepts such as spreadsheets, databases, networks, hypermedia, expert systems (ES), neural programming, intelligent agents, neural networks, etc. (Rayson et al., 2002). DSS was proven to facilitate the user to consider many factors at the same time, thereby making it possible derive the optimal economic solution whilst at the same time, ensuring the decision is environmentally sensitive (Lutz Froyen, 2007). For that reason, the development of WASDA is valuable in designing wastewater treatment plant since the design process of a wastewater treatment plant involving complex tasks, such as synthesis and analysis, which consecutively involve decision-making process.



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Are you looking to buy plants for your house and garden online? Whether you want to buy some vibrant flowers for your suspended baskets or grow pears, shrubs or bee-friendly vines, there are many websites that offer viable plant delivery options. It's also a great way to support local nurseries and garden centres. Below is a list of online garden centres and markets across the UK that can deliver plants to your doorstep. But if you want to make smaller and more local purchases for yourself, CL's gardening editor Paula McWaters recommends using the following websites to look for the nearest independent nursery that needs your order: (download to a virtual map) GARDENING EXPRESS The Online Nursery Gardening Express can provide quality and valuable plants through 6 days of delivery. You can shop online, however delivery times may vary when the demand is met. © During these periods, you can expect a maximum period of 10-15 days delivery service. A statement on your website explains: "With regard to our deliveries to your door, our postal services were instructed to always wear gloves, and to keep your orders safe for you if you are not at home. Or if you are inside, to simply make you know that they love them to you and sign C-19." Some of the plants sold at the Gardening Express include beautiful spring floral bulbs, house plants, roses and fruit trees. BUY PLANTS AT GARDENING EXPRESS THOMPSON MORGAN Thompson Morgan announced that they closed their reservation line because they had been flooded with orders. They continue to accept enco pans of all seeds, gallons, articles for life in the open air and fences through 6 is from your website. Whether you are looking for fertilizer, vegetable seeds or routines furniture for Your outdoor space, Thompson & Morgan can help. Drive to your website and discover daily offers, day seeds and more. Spring flowers are from afar a few some Our favorites, then why not consider planting some colorful plants this season. Online Shop at Thompson & Morgan Wilko across The UK, Wilko Stores are still open to customers as they count as an "essential" store. From vegetable seeds to herbs and beautiful flowers, you can get your hands in accessible packages both in stores and online. Online Shop at Wilko Primrose.co.uk Retailer Online Primrose is still receiving and delivering orders. Like other nurseries, orders may take longer to arrive than usual. Choose from a range of own cultivation vegetables, garden mobile pieces, pure heaters and water resources. Do you want to refresh your garden before the months of summer? Now it's the perfect time ... online shop at primrose b & q from plants to bulbs and seeds, B & q has a wide range of essential gardenants available to order online from the comfort of their own home. Check before you buy, since the actions are ending. Shop Online At B & Q Waitrose Gardenin An online statement, Waitrose Garden announced that they have temporarily paused all orders online until new warning, a release that you can not access Waitrosegarden.com. During this exceptionally busy time, we have temporarily paused the service to focus on delivering existing orders to our customers, explains the statement. "If you have already placed an order, please note that this can take up to three weeks from the day it was ordered." If you were hoping to buy plants from Waitrose Garden, it's worth checking back every few days to see if any changes was made. SHOP ONLINE AT WAITROSE GARDEN PRIMROSE Hall Peonies RHS Chelsea Flower Show Golden Medal Beach and Specialist, Primrose Hall Peonies, has one of the widest selection of rare and unusual pebbles for sale in the Kingdom United. Living in five hectares fields in The beautiful peonies are ready for delivery at home across the country. "Peonies are growing beautifully at the moment and are ready to be sent to their new Wherever it is, the baby explains. "So much time and effort" placed in these beautiful plants to grow them, so they are at their best to plant in the spring. "Looking to add a little color to your garden space? Why don't you put your hands on some of these beautiful peonies? SHOP ONLINE AT PRIMROSE HALL PEONIES SUTTONS Due to increasing demand, Suttons are placing customers in queues to access the site. Once you have entered the site you can find many seeds, plants, flowers and garden accesses to order online. The delivery as well as m may be slower than usual. SHOP ONLINE AT SUTTONS ROYAL HORTICULTURAL SOCIETY PLANTS From a selection of houseplants to colorful blooms, the Royal Horticultural Society online shop has something for each type of garden. Due to high demand, delivery waiting time can take longer than usual. While their shops are currently closed in line with government restrictions, customers can still get their hands on a multitude of plants, seeds, climbers and artificial styles on their website. The customer service team is working remotely, so the answers can be slow. After making the request, it is worth knowing that the delivery times have been extended. Shopping plants in the DOBBIES mikroman6 Getty Images PLANTSON in the canyon for some plants that steal scenes to light their inner space? Patch Plants is a loved destination for stylish plants as well as practical tips on how to keep them alive. Over on their website, they explained: "We are still delivering as normal, but in the light of COVID-19 propagation we are taking all the precautions needed to keep our customers and colleagues safe. We switched to zero contact until second order. You will not be invited to sign for your application. BUY PLANTS AT PATCH PLANTS information in this story © needs from the date Publication. While we try to keep our contents as possible as possible, the situation around the pandemic continues to develop rapidly, so it is possible that some information and recommendations may have changed since the publication. For any recent concerns and advice, visit the World Health Organization. If you are in the UK, the National Saude Service can also provide useful information and support, while US users can contact the disease control and prevention center The need for any positivity, field news and spring gardening advice? Sign up for your free life newsletter for your weekly dose of escapism.sign This content is created and maintained by third parties and imported into this page to help users provide their addresses of e-Mail. You can find more information about this and similar contents at the piano.io piano.io

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