Jurnal Fiqh, Vol. 21 No. 1 (2024) 123-150

Received: 2024-01-12 **Accepted:** 2024-06-24 **Published:** 2024-06-30

SEWAGE WATER TREATMENT AND ITS EFFECT ON THE CLEANLINESS OF WATER: A REVIEW FROM ISLAMIC AND SCIENCE PERSPECTIVE*

Mohd Mahyeddin Mohd Salleh**
Yasmin Hanani Mohd Safian***
Syaza Azhari****
Hussein Azemi Ahmad Thaidi*****

ABSTRACT

Due to the water combining with feces, sewage water found in the Sewage Treatment Plant (STP) is classified as mutanajjis. However, the wastewater cleaned with current technology in STP has created concerns, particularly among Muslims, over whether

* This study is funded by the Research Management and Innovation Center, Universiti Sains Islam Malaysia (USIM) under Grant PPPI/FSU/0122/USIM/15622.

** Deputy Director, Institute of Fatwa and Halal, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai. mahyeddin@usim.edu.my (corresponding author)

*** Associate Professor, Faculty of Syariah and Law, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai. yasmin@usim.edu.my

**** Senior Lecturer, Faculty of Science and Technology, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai. syaza@usim.edu.my

***** Senior Lecturer, Faculty of Syariah and Law, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai. hussein@usim.edu.my

it can be classified as muṭlaq water or not. The purpose of this study is to compare the cleaning mechanism from an Islamic perspective with the sewage water treatment technique in Indah Water Konsortium (IWK) Malaysia. Next, to examine the treated sewage water and its impact on the law of ṭahārah in Islam. This study uses a qualitative approach using data collection techniques by document analysis, observations at the Regional Sewage Water Treatment Plant (RSTP) KL-Titiwangsa 2 owned by Indah Water Konsortium (IWK) Malaysia, interviews with Shariah and water experts, and laboratory analysis. The results of the study revealed that the wastewater treatment technology at RSTP Serantau KL-Titiwangsa 2 can change the status of water from mutanajjis to muṭlaq because it meets all the criteria for muṭlaq water set by the fuqaha. Through the results of laboratory analysis, the treated sewage water is categorized in the same category as muṭlaq water. Therefore, the water can be used for ṭahārah purposes. It also sheds light on the aspects of environmental sustainability from an Islamic perspective.

Keywords: *mutanajjis, sewage water treatment, ṭahārah (purification), Malaysia*

INTRODUCTION

Water is a basic human right in both aspects, quality and quantity according to Agenda 21, Millennium Declaration & Political Declaration of Johannesburg (Scanlon, Cassar, & Nemes, 2004). In fact, water is essential for human development both socially and economically. On this earth, there is 70% water; 97.5% from it is salt water and 2.5% is fresh water. However, only 0.3% of the existing 2.5% can be used in daily activities which is from the

lakes and rivers.[1] Due to this, the areas need to be preserved so that they will not be polluted by man-made wastes.[2]

In the early days, sanitation problems were never a concern to society. During those times, nature took care of the problem due to the small population in the world. However, with the progression in human civilization and the outgrowing number of people, the need for proper sanitation management has become a significant issue.[3] In Malaysia, one of the approaches adopted to prevent water pollution is by treating the sewage water before releasing it into rivers. This is in line with the United Nations' 6th Sustainable Development Goals (SDG), which aims to ensure that everyone has access to clean water and sanitation.[4]

The sewage water consists of both black water (sewage wastes) and grey water (from kitchens and bathrooms), as well as wastewater from institutions and businesses, such as hospitals, and industrial deposits, which can be either dissolved or suspended. The recycling of water from sewage waste has been proven successful in overcoming the risks of the community not having any water supply, albeit in drought. For example, the Orange Country Water District (OCWD) in California, United States of America, has applied this system to 850,000 residents with a water production capacity of 70-100 million gallons every day. One of the closest examples to Malaysia is through the NEWater

1 Mokhtar, Mohd Istajib, Raihanah Abdullah, and Azizan Baharuddin. "An Islamic perspective on water quality: a case of Malaysia." *Water Policy* 17, no. 3 (2015): 454,

2 Sukarni, Sukarni. "Air Dalam Perspektif Islam." *Tarjih: Jurnal Tarjih dan Pengembangan Pemikiran Islam* 12, no. 1 (2014), 116.

3 Akademi Sains Malaysia, "Study on the Current Issues and Needs for Water Supply and Wastewater Management in Malaysia", Academy of Sciences Malaysia, last modified Dis 2, 2015, https://www.akademisains.gov.my/asm-publication/wswm_volume_2/.

4 "The 17 Goals," United Nations, accessed Sep 2, 2022, https://sdgs.un.org/goals.

technology in Singapore, which is said to be contributing of 30% water based on the demand of the country.[5]

The process of treating the sewage water in Malaysia is carried out by the Indah Water Konsortium (IWK). Examples of sewage products are bio-effluents that are beneficial for use in the industrial and farming sectors.[6] Additionally, treated sewage produces bio-solid with fertilizer properties, as they improve the land structure and the content of organic materials, and also act as a good nutrient supplier for plants.[7] The sludge waste is able to produce methane gas that can be processed as biogas to generate power, heat and biofuels.[8]

Sewage wastewater found in the Sewage Treatment Plant (STP) is categorized as *mutanajjis* due to mixing with faeces, including excrement products such as human feces and urine. However, through IWK's sewage treatment technology at the Regional Sewage Treatment Plant (RSTP) Serantau KL-Titiwangsa 2, the sewage is removed, enabling the production of clear and clean effluent before being discharged into the river. Therefore, the Sharia's issues that need to be analyzed is whether the treated wastewater can change its status from its original state of *mutanajjis* to *muṭlaq*? The results of this study can provide a *fiqh* solution regarding *ṭahārah* for Muslim plant workers who are constantly wallowing in this water. If the status changes to *muṭlaq* water, it means they can perform prayers without having to change their clothes when exposed to water splashes.

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5 Wan Hanna Melini Wan Mohtar, "Kitar Semula Water Kumbahan Sebagai Sumber Air Alternatif", *Majalah Sains*, 2017, https://www.majalahsains.com-kitar-semula-waterkumbahan-sebagai-sumber-water-alternatif

6 Wan Mohtar, "Air Alternatif."

7 Roslan, Siti Noorain, Siti Salmi Ghazali, and Norfadhlina Muhamed Asli, "Study on the characteristics and utilization of sewage sludge at Indah Water Konsortium (IWK) Sungai Udang, Melaka," *International Journal of Environmental and Ecological Engineering* 7, no. 8 (2013): 545.

8 Mariyappan, Raman, "Level of Sustainable Green Practices at Pantai 2 Sewage Treatment Plant, Klang Valley, Malaysia," *European Journal of Sustainable Development* 8, no. 5 (2019): 337.

LITERATURE REVIEW

The Cleaning Mechanism of *Mutanajjis* Water According to Fiqh

Water is the primary natural resource for all creatures on this earth, including human beings, animals, and plants. Clean water is important to ensure good health and basic needs for all living beings.[9] In Islam, water holds a very important role.[10] Thus, the discussion on the water issue is placed at the beginning of the *fiqh* books in the chapter of *ṭahārah*.[11] Previous studies has suggested the permission for water to be treated and recycled for human daily life use such as drinking, bathing and for religious purposes like ablution and *ghusl wajib*. Specifically, the study was conducted on the treatment of used water *(musta'mal)* using membrane technology.[12]

The word 'water' has been mentioned in the Quran 63 times.[13] Al-Quran also mentions about the benefit and use of water for humans, for example, through the decree of Allah:

وَيُنَزِّلُ عَلَيكُم مِّنَ ٱلسَّمَآءِ مَآءً لِّيُطَهِّرَكُم بِهِۦ

"He caused rain to descend on you from heaven, to clean you therewith"

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9 Irwan M. Subri et al., "Water Treatment from Fiqh and Science Perspectives," In *Enhancing Halal Sustainability: Selected Papers from the 4th International Halal Conference 2019*, Springer Singapore, 2021: 312.

10 Zahari, Wan Ainaa Mardhiah Wan, "Water Treatment and Purification in Fiqh Perspective," *Turkish Journal of Computer and Mathematics Education (TURCOMAT)* 12, no. 2 (2021): 594.

11 Mohd Mahyeddin Mohd Salleh et al, "The Use Of Ceramic Product Derived From Non-Halal Animal Bone: Is It Permissible From The Perspective Of Islamic Law?," *International Journal of Asian Social Science* 7, no. 3 (2017): 193.

12 Subri, "Water Treatment," 313.

13 Mohd Mahyeddin Mohd Salleh et al, "Analisis Fatwa Air Sisa Kumbahan Dari Sumber Mutanajjis," *Journal of Fatwa Management and Research* 25, no.1 (2021): 78.

(Surah al-Anfal 8:11)

Based on the sect of *Shāfi'ī* , water can be divided into four types. The first is *muṭlaq* water which is purified and purifying, and it is not *makrūh* (dislike) to be used. *Muṭlaq* water can be used in *ḥadath* (*wuḍū'* and *ghusl*), and when removing the faeces.[14]

Secondly, *mushammas* water, which is water in easily corroded containers (like metal) that become hot when exposed to sunlight, in typically hot-weathered countries. This water is pure and purifying but *makrūh* for use on the body as it can cause skin diseases, like vitiligo. However, if the hot water cools down, it is no longer *makrūh* to be used.[15]

Thirdly, *musta'mal* water refers to the excess water that has been used for ablution and to cleanse oneself from filth. The water is pure, but it does not purify. However, the issue of whether the *musta'mal* water waste, when present in great amounts and unchange characteristics (color, smell and taste), can be used for ablution is still being discussed among the scholars. According to the strongest view in the *Shāfi'ī* sect, this water is not purifying. This leans on the debate that the companions of the Prophet had never gathered *musta'mal* water excess to be reused for *wuḍū'*.[16]

The fourth is the *mutanajjis* water, which is water that has been polluted with excrements *(najs)*, when the quantity of the water is less than two *qullah* or exactly two *qullah* but one of the characteristics (color, smell and taste) has changed. In the current measurement, two *qullah* equals about 500 *rithlin* Baghdadi or 160.5 liters.[17] The *fuqaha* of the sect are in a consensus *(ijmā')* that water that is contaminated with *najs*, thus changing one of the characteristics of *muṭlaq* water, is dictated to unfit for use in taking ablution *(wuḍū')* and to cleanse off the excrement.[18]

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14 Taqi al-Din Abu Bakr Al-Hishni, *Kifayah al-Akhyar fi Halli Ghayah al-Ikhtisar* (Beirut: Dar al-Kutub al- Ilmiyyah, 2001), 40.

15 Al-Hishni, *Kifayah al-Akhyar*, 41.

16 Al-Hishni, *Kifayah al-Akhyar*, 41.

17 Mokhtar, Mohd Istajib, Raihanah Abdullah, and Azizan Baharuddin, "An Islamic perspective on water quality: a case of Malaysia." *Water Policy* 17, no. 3 (2015): 460, https://doi.org/10.2166/wp.2014.167.

18 Dibyan bin Muhammad Al-Dibyan, *Mausū'ah Aḥkām Al-Ṭahārah* (Riyadh: Maktabah al-Rusyd, 2005), 35.

Meanwhile, excrements *(najs)* are divided into two types of excrements namely *aini* and *hukmi. Aini* excrement refers to the following- human faeces, blood, pig and anything not permissible by law or *nas.* Meanwhile, *hukmī* excrement refers to objects that become excrement when mixed with excrement, such as *mutanajjis* water and *mutanajjis* cloth. In the context of excrement-polluted water, it is more appropriate to categorize it as *hukmī* excrement according to a more accurate standpoint.[19]

Although the previous scholars almost agreed that *mutanajjis* water can be purified when treated or cleaned, they still disputed the mechanism for cleaning *munatanajjis* water. The details of the mechanisms used in every sect are given below in Table 1:

Table 1. The cleaning mechanism of the excrement water according to four sects

Sect	**Mechanism**	**Quantity 2 *qullah***
Hanafi	The addition of muṭlaq water *(mukatsarah)* The removal of excrement and disposal of water *(nazh)*	Not conditioned
Mālikī	The addition of muṭlaq water *(mukatsarah)* The removal of excrement and disposal of water *(nazh)* The addition of materials that can remove excrement	Not conditioned
Shāfi'ī	The addition of water *(mukatsarah) muṭlaq* or *mutanajjis* The removal of excrement and the disposal of water *(nazh)* Natural change *(taghyīr)*	Conditioned
Hanbali	The addition of water *(mukatsarah) muṭlaq* or *mutanajjis* The removal of excrement and the disposal of water *(nazh)* Natural change *(taghyīr)*	Conditioned

According to the *Hanafi* Sect, based on consensus**,** *mutanajjis* water can be cleaned using the *mukatsarah* approach, that is by

adding new *muṭlaq* water. However, there has been an argument among the *Hanafiyyah* about using materials other than *muṭlaq* water to remove excrement. Some argue that cleaning with *mutanajjis* water after it has been treated with other materials will render it pure. *Mutanajjis* water can also be cleaned using *nazh* technique, which is the removal of excrement where some of the water is disposed of and the excess water is dictated as clean. However, the amount of water that needs to be removed depends on the type and nature of the excrement. *Hanafiyyah* scholars provided an example of cleaning a well polluted with animal carcasses. The proposed rate of water to be discarded *(nazh)* is 20 dippers of water if it is polluted with rat or pigeon carcasses, 40 dippers for chicken carcasses, and all the water is to be discarded for goat carcasses or human corpses.[20] The determination of the amount of water that needs to be discarded is based on the size of the excrement.

Under the *Mālikī* sect, *mutanajjis* water can be cleaned in three ways. Firstly, by using *mukatsarah,* which involves adding *muṭlaq* water. Secondly, through *nazh,* which means removing the excrement before discarding some of the water. Meanwhile, the third method is to use other materials that can remove the stain of the excrement and this is one of the views held by *Mālikīyyah*. The *Mālikī* sect also does not require the measurement of two *qullah* to determine the amount of *mutanajjis* water. In other words, water, whether less than or more than two *qullah,* can become *mutanajjis* water if any of its original characteristics (color, smell and taste) changed.[21]

Meanwhile, the *Shāfi'ī* sect scholars distinguish the water purification mechanisms according to the water quantity. Other than that, the aspect of change in the characteristics of the water is also observed. For water exceeding two *qullah*, the water is defined as *mutanajjis* if the excrement has changed one of the water's characteristics (color, smell and taste). However, *mutanajjis* water can be cleaned in three ways: 1) *Taghyīr (natural change):*

[20] Ali bin Abi Bakr Al-Marghinani, *al-Hidāyah fi Syarh Bidāyat al-Mubtadi (*Beirut: Dar Ihyā' al-Turath al-Arabiy, 1985), 85.

[21] Muhammad bin Muhammad bin Abdul Rahman al-Ru'aini Al-Hattab, *Mawāhib al-Jalil fi Syarhi Mukhtasar al-Khalil* (Beirut: Dar al-Fikr, 1992), 1:84.

allowing water to change naturally due to sunlight, the wind or the passing of time) until the *'illah* (reason of the excrement) is gone; 2) *Mukatsarah* (addition of water): The addition of the water whether using *muṭlaq* water or *mutanajjis* water until the *'illah* of the excrement is gone; and 3) *Nazh* (removal and disposal): excrement discarded and some of the water is disposed, leaving the remaining water at two *qullah*. Thus, if the *'illah* of the excrement is gone, the water is dictated as clean (Al-Nawawi, n.d).[22]

The scholars of *Hambali* sect share the view of the *Shāfi'ī yyah* as they categorize the water purification methods based on the quantity of water. For water exceeding two qullah, there are two conditions*;* Firstly, the excrement does not change the characteristics of the water (color, smell and taste), so it has to be cleaned through *mukatsarah.* Secondly: the excrement changes the characteristics of the water: so, it has to be cleaned in three ways: 1) M*ukatsarah* (addition of *muṭlaq* water)*, 2) Taghyīr* (natural change): by leaving it for a long period until the stain of the excrement is gone), and 3) *Nazh* (removing the excrement and some of the water discarded until the stain is gone and the remaining water is two *qullah* or more.[23] Some of the *Hambali* scholars like Ibn Taimiyyah allow the purification of *mutanajjis* water based on the argument that the change of the legal ruling on alcohol depends on its *'illah* (reason of *hukm*), based on the *fiqh* maxim:

الْحُكْمُ إِذَا ثَبَتَ لِعِلَّةٍ زَالَ بِزَوَالِهَا

> *"When a ruling (hukm) is determined based on a certain 'illah, it will be gone (back to its original ruling) with the absence of the 'illah"* [24]

As the conclusion of the views of the fuqaha above, the *mutanajjis* water cleaning mechanism can be done, be it through

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22 Yahya bin Syaraf Al-Nawawi, *al-Majmū' Syarh al-Muhazzab* (Beirut: Dar al-Fikr, n.d.), 1:149.

23 Abdullah bin Muhammad Ibn Qudamah, *Al-Mughni* (Riyadh: Dar 'Alam al-Kutub, 1997), 1:52.

24 Ahmad bin Abdel Halim Ibn Taimiyyah, *Majmū' al-Fatāwa* (Madinah: Majma' al-Malik Fahd, 1995), 21:476.

mukatsarah, *nazh* or *taghyīr*. The *fuqaha* are also found to have given different requirements according to their respective sects.

The Sewage Water Treatment Process in Indah Water Konsortium (IWK) Malaysia

The biological treatment process of sewage water at the mechanical plant of Indah Water Konsortium (IWK) generally has three stages of process, namely preliminary, secondary and tertiary.

The first stage in the mechanical plant of the sewage water treatment process is preliminary treatment. It handles the sewage waste or influents taken directly from the inlets to the existing distribution chamber. The waste comes from the catchment area through 3 pumps; Semarak (KLR030), Setapak (KLR289) and PULAPOL. Sewage flow by gravity from the distribution chamber to preliminary treatment works for screening and grit/ grease removal, prior to flow splitting and treatment in eight Sequential Batch Reactor (SBR) basins. This area is equipped with secondary fine screen channels and grit removal system to remove smaller objects or other debris that have escaped through the coarse screen, to further protect downstream equipment from damaging. Degritted sewage then flows to grease removal channels. Fine-bubbles diffusers are utilized to aerate and to trap or capture grease to form scum or foam on the surface. This scum or foam will be scrapped using a scraper skimmer and collected in a concrete launder.[25]

The secondary treatment of sewage water is also known as the biological phase. It takes place in a special water Sequential Batch Reactor (SBR) functioning to treat water in the proper stages. The SBR is a sequentially operated, fill, aerate, settle and draw activated-sludge system. It is a vital part of the treatment system since the biodegradation of organic matters occurs in this tank. The process of aeration and sedimentation in SBR tank are carried out sequentially in the same tank. Settled waste sludge will be pumped to the sludge holding tank.[26]

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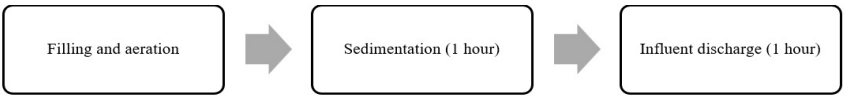
[25] Indah Water Konsortium [IWK], *Regional Sewage Treatment Plant (RSTP) KL-Titiwangsa 1-KLR403, IWK Report* (Kuala Lumpur: IWK Sdn Bhd, 2020).

[26] Indah Water Konsortium, *IWK Report.*

Each SBR tank has one compartment complete with 100 sets of diffusers, 3 units of supernatant decanters, and 2 units Returned Activated Sludge pumps to bio-selector. The supply of air for aeration process is done by 12 Nos. of blower with the capacity of 250m^3/ min/ unit. Raw sewage enters the SBR tanks and the four steps of SBR process started. The operation, as illustrated in Table 2, will involve water filling and aeration process for 2 hours, the sedimentation process for one hour and the influent discharge to the next stage for another hour.[27]

Table 2: Water treatment process in SBR chamber



After all the treatment processes are completed, the treated effluent is decanted using an individual skimming decanter. The excess sludge produced during the treatment process will be drawn out from the SBR tank via waste sludge pumps to the sludge holding tank for thickening and dewatering.[28]

For tertiary treatment, the clarified treated effluent from the SBR tanks then flows into the Tertiary Treatment Building (TTB) and filtered by Variable Pore Membrane Filter (VPMF). After achieving the required standards (see Table 3), the effluent is then discharged into the Gombak River. A portion of the effluent is recycled and used as utility water within the plant such as for polymer preparation, desulfurizing, and general cleaning works.[29]

Table 3: Effluent design (modified standard A) IWK

Item/Parameter	Design Discharge Standard of Alternative Effluents	
	Standard A (mg/l)	Design Target
BOD_5	5	2
Supernatant Solid (SS)	50	20
Chemical Oxygen (COD)	50	50

[28] Indah Water Konsortium, *IWK Report.*
[29] Indah Water Konsortium, *IWK Report.*

Nitrogen Ammonia	2	1
Nitrogen Nitrate	20	10
O&G	5	2

Standard A: for discharge at the mouth of the river, or water collection point, or sensitive areas like recreational areas, coastal areas with tourism in mind, and areas with high ecological value like sea parks or wetlands.

Methodology

This study adopts a qualitative approach, with the aim of examining in further detail a phenomenon that takes place before making a conclusion. Two data collection methods have been used which are; document analysis and observation.

Document analysis is used to look closely into the views of the *fuqaha* concerning the concept of *mutanajjis* water, the cleaning mechanism of the *mutanajjis* water, and the laws related to *mutanajjis* water. Some of the documents referred to are the works of fiqh *turath* crossing the four sects of Islam, namely Hanafi, Maliki, Syafi'e and Hambali. The works of *hadith* have also become sources of reference.

The observation technique took place on 7 September 2021 at the Regional Sewage Treatment Plant, or *Loji Rawatan Kumbahan Serantau* Indah Water Konsortium KL-Titiwangsa 2. The purpose of the observation is to investigate the treatment processes that can help researchers conduct the study analysis and the subsequent outcome.

The focused interview technique was carried out online on 16 December 2021 with experts in *Shari'a*, water chemical and sewage waste management. This aims to obtain their opinions on the issue of sewage water management and further the findings.

As for the laboratory analysis, influent and effluent water samples taken on 7 September 2021 from IWK's LRK Serantau KL-Titiwangsa 2 were sent to a certified laboratory, SaniChem Resources Sdn. Bhd. to be analyzed. The analysis was based on 22 physical, biological and chemical parameters like dissolved

oxygen test (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids (SS), ammonia nitrogen (AN), pH, temperature (T), nitrate, phosphate and others to determine the water quality level based on the Water Quality Index (WQI), National Water Quality Standard (NWQS) and the Environment Quality Regulations (Industrial Effluent) 2009. The sample of water from the pipe was also sent to be tested so that it could be used as an indicator of *mutlaq* water.

RESULTS/FINDINGS

The results of the analysis and observation have been concluded through Table 4 which is the comparison made between the *mutanajjis* water treatment mechanism in *fiqh* based on *Shāfi'ī* sect and the sewage water treatment practiced in STP Serantau KL-Titiwangsa 2 by Indah Water Konsortium (IWK).

Table 4. The comparison of the sewage water treatment in Islam and Indah Water Konsortium (IWK)

Treatment Stage	Mechanism- IWK	Mechanism-Fiqh	*'Illah* of excrement (Color, smell, taste)	Category
Preliminary	The collection of sewage wastewater from the sewage pipe (influent)	*Mukatsarah*	Present	*Mutanajjis*
	Sewage waste screening (rough)	*Nazh*	Present	*Mutanajjis*
	Sewage waste screening (fine)	*Nazh*	Present	*Mutanajjis*
Secondary	Biological treatment-aeration for 2 hours (oxygen + microbe)	*Taghyīr*	Present	*Mutanajjis*
	Clarifier chamber-sludge scraper	*Taghyīr-Nazh*	Present	*Muṭlaq*

Tertiary	Membrane filter	*Nazh*	-	-
	Chemical phase-chlorination	Material addition	Absent	Muṭlaq
	Effluent Discharge		Absent	*Muṭlaq*

At the preliminary treatment stage, the sewage water collected in the distribution chamber can be categorized as *mutanajjis* water due to the mixture of water and excrement from commercial and domestic premises channelled through the underground sewage pipe. Some of the examples of excrement found are faeces and urine. The water quantity at this stage is more than two *qullah* as the average rate of daily water flowing into the plant amounts to 168,750 m^2 .[30] In terms of *fiqh*, this is similar to the *mukatsarah* technique, or by adding water from *mutanajjis* source. According to the *Shāfi'ī* sect, using *mukatsarah* method with *mutanajjis* water is permissible.[31] From the observation done on the distribution chamber (Fig. 1), it was found that there is excrement *(najs)* that changes the original characteristics of the water- namely color, smell and taste.

Fig. 1. Distribution chamber

(Picture taken at the LRK Serantau KL-Titiwangsa 2 owned by Indah Water Consortium (IWK) on 7 September 2021)

30 Indah Water Konsortium, *IWK Report.*

31 Al-Nawawi, *al-Majmū',* 1:149.

Next, the sewage water is channeled through gravity to the grit removal chamber equipped with fine screening. In the next step, the influent will go through the fat, oil and grease separation process in the last chamber before moving on to the secondary treatment using a grease trap that will produce bubbles.[32] In the *fiqh* debate, this process resembles that of *nazh* which is a method of removing and separating the excrement contained in the water.[33] From the observation, in this second chamber, the *'illah* of the excrement is still present, involving color, smell and taste. Thus, it can be categorized as *mutanajjis* water.

The secondary treatment of the sewage water process is also known as the biological phase, commonly referred to as activated sludge. During this phase, the influent is directed to the aeration chamber (see Fig. 2), aiming to activate the microorganism, and facilitate the production of flocculent microbes. The treatment period in the aeration chamber typically lasts 2-3 hours depending on the type of plant process. In the fiqh debate, this method resembles *taghyīr* which is the natural process of change using air.[34] However, the collected water can still be classified as *mutanajjis* since the *'illah* of the excrement persists in terms of the color, smell and taste.

Fig. 2. Aeration Chamber

[32] Indah Water Konsortium, *IWK Report.*
[33] Al-Nawawi, *al-Majmū',* 1:149.
[34] Al-Nawawi, *al-Majmū',* 1:148.

Fig. 3. Clarifier chamber

(Pictures taken at STP Serantau KL-Titiwangsa 2 owned by Indah Water Consortium (IWK) on 7 September 2021)

With the aeration period coming to an end, the suspended solid waste will be put into the clarifier chamber equipped with the sludge scraper to separate clean water (supernatant) from the sludge (see Fig. 3). This process aligns with the *nazh* method stated by the *fiqh* scholars as there is a separation between clean water and other suspended solid wastes. Based on rough observation, the water in this chamber is clear compared to its previous condition. The smell and color of the excrement are no longer present, as now it is declared to be *muṭlaq* water.

In the *fiqh* debate, water that exceeds two *qullah* will not be affected by floating excrement or the surrounding excrement, and it is declared clean *(ṭahūr)* through the consensus (*ijmā')* of *fuqaha.* One of the classic examples stated by an-Nawawi[35] is the condition of river water or a pond that changes its smell because of surrounding carcasses.

During the tertiary treatment, the treated influent from the clarifier chamber will be channelled to the Tertiary Treatment Building (TTB). Here, the influent will be filtered using the variable-pore membrane filter. The total number of filters available in TTB is 106 units. The chlorination process occurs after the

[35] Al-Nawawi, *al-Majmū',* 1:148.

filtering process is complete, at TTB. However, at RSTP Serantau KL-Titiwangsa 2, the chlorination facility is not activated at this stage, as the influent is not being reused for processing by Selangor Water. The deodorizing process is also not specifically done on the influent, but IWK has deodorizing facilities throughout the treatment process from the preliminary treatment to the sludge facility.[36]

As a comparison, the influent treatment process at TTB is similar to *nazh* according to *fiqh* as there is a separation process between the water and supernatants through the use of various filters. Meanwhile, the chlorination process (if itoccurs) can be similar to *taghyīr* using soil as stated by previous fuqaha, and it is permissible according to the *Mālikī* sect and it is one of the views of the *Shāfi'ī* sect.[37] The addition of modern materials like chlorine is permissible as one of the water cleaning methods. Hence, it is required that the cleaning is done properly and that it returns to its original condition, which means there is no stain of excrement in terms of the color, smell and taste.

[36] Nor Suhamiza Mohd Supar (IWK officer) in discussion with the author, August 19, 2021

[37] Mohd Mahyeddin Mohd Salleh et al, "Mekanisma Pembersihan Air Mutanajjis Menurut Fiqah Dan Aplikasinya Dalam Rawatan Air Kumbahan Oleh Indah Water Konsortium: Ke Arah Mencapai Kelestarian Sumber Air," *E-Prosiding Seminar Antarabangsa Islam Dan Sains (*Nilai: Penerbit USIM, 2021), 232.

Fig. 4. The Comparison Between Treated Effluent (left) and Influent (right) (left diagram)

(Picture taken at RSTP Serantau KL-Titiwangsa 2 owned by Indah Water Consortium (IWK) on 7 September 2021)

From an observation, it is found that the effluent (water that has been treated) at the final stage is clear, without any smell of excrement, compared to the influent (water before being treated) (Fig. 4). The treated water has to be safe and achieve the standard before it is discharged to the river for public use. The water also has to be at Standard A (pH 6.0-90) according to the standard set by the Environmental Department of Malaysia.[38]

DISCUSSION

The treatment method carried out at Sewage Treatment Plant (STP) KL-Titiwangsa 2 in treating sewage water clearly applies all the methods that have been emphasized by the *fuqaha* namely *mukatsarah*, *nazh* and *taghyīr*. Apart from that, modern materials and methods have also been used, like the Variable Pore Membrane Filter, to yield clean and safe effluents. This modern method is

[38] Indah Water Konsortium, *IWK Report.*

more accurate, as stated by the Indonesian Scholar Council or *Majlis Ulama Indonesia*[39] concerning the method of *taghyīr* or *istiḥālah istiṣnāi'e* adopted by *Hanafiyyah* scholars, when there is a proper transformation due to the outcome received through intricate and costly modern methods and processes.

The Fiqh Analysis of the Use of Treated Sewage Water for *Ṭahārah* Purpose

The *mukatsarah* method used in the treatment of sewage water at IWK closely resembles the views held by the *Shāfi'ī* sect as the quantity of water is more than two *qullah* and the source is from *mutanajjis* water. Meanwhile, the *nazh* method removes the filth of the excrement and thus, it is used in every process of the water treatment. The combination of all these processes- *mukatsarah, nazh* and *taghyīr* has removed the *'illah* of excrement and returned the characteristics of *mutanajjis* to the *muṭlaq* water.[40]

The sewage water at the preliminary stage of the treatment and at the early stage of the secondary treatment remains to be the *mutanajjis* water as there is still *'illah* excrement in the content of the water (color, smell and taste). Meanwhile, after the final stage of the secondary treatment and tertiary process, all the stains of the excrement have disappeared, including the color, smell and taste. Thus, the *mutanajjis* water has transformed into *muṭlaq* water.[41]

Within the context of *fiqh*, the quantity of water exceeding two *qullah* is one of the important criteria that determines the extent to which the excrement has an impact on the purity of the water. The researcher seeks to conclude the outcome of this study by citing hadiths from Abdullah bin Umar RA: I heard Rasulullah

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39 Majelis Ulama Indonesia, "Air Daur Ulang,*"* last modified January 27, 2010, http://halalmui.org/images/stories/Fatwa/fatwa-airdaurulang.pdf.

40 Salleh et al, "Analisis Fatwa Air Sisa Kumbahan," 85.

41 Mohd Mahyeddin Mohd Salleh et al, "Penggunaan Semula Air Kumbahan Mutanajjis Untuk Tujuan Taharah: Satu Analisa Fiqah dan Kajian Sains Berdasarkan Amalan Rawatan Kumbahan oleh Indah Water Konsortium (IWK)," *Ulum Islamiyyah The Malaysian Journal Of Islamic Sciences* 35, no. 1 (2023): 33.

SAW when he was asked about water in the desert that was always drunk by wild animals and other kinds of animals. He dictated:

إِذا كانَ الماءُ قُلَّتَيْنِ لَمْ يَحْمِلِ الخَبَثَ[42]

Meaning: "If the water amounts to two qullah, it will not carry any excrement."

Imam al-Syirazi who was one of the greatest scholars in the *Shāfi'ī* sect., opined that when *mutanajjis* water was treated until the stain of the excrement had disappeared, the water was deemed clean and could be used for the purpose of *ṭahārah*.[43] The same law is asserted by al-Dibyan through his work *Mausū'ah Aḥkām Ṭahārah* that the stronger view among scholars on this issue is that when the mark of excrement has gone, through any treatment method, the status changes to clean water *(muṭlaq)*.[44] This is because every law is based on *'illah*. Thus, when the *'illah* excrement is gone, it goes back to the original law and it can be used for *ṭahārah.*

This is also mentioned in the Fiqh Encyclopaedia published by Kuwait Waqf Ministry that the *mutanajjis* water that has undergone the treatment process, including one that uses modern methods, is clean, regardless of the quantity. This is also a view held by *Majma' Fiqh Islāmī*.[45]

The same decision found in contemporary *fatwa*s which stated that the sewage water that has been treated and with the absence of characteristics of excrement, will become clean again and can be used for *ṭahārah*.[46] In this situation, the water can return to its

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42 Abu Daud Sulaiman bin Al-Asy'ath al-Sijistaniy al-Azdiy, Sunan Abi Daud, Kitab al-Taharah, Bab Ma Yanjusu al-Ma', no.hadith 63 (Beirut: Dar al-Fikr, 1984M), 1:46.

43 Al-Nawawi, *al-Majmū',* 1:149.

44 Al-Dibyan, *Mausū'ah Aḥkām Al-Ṭahārah*, 36.

45 Muassasah Durar Sunniyyah, "Al-Ma' al-Mukhtalith bi Najasah". *Mausū'ah Fiqhiyyah*, accessed date April 2, 2022, https://www.dorar.net/feqhia/13

46 Salleh et al, "Mekanisma Pembersihan Air Mutanajjis," 233.

original nature, which is pure and purifying *(mutlaq)*. [47]Similar decisions also can be seen in the *fatwa*s by the Federal Territory Mufti Office or *Pejabat Mufti Wilayah Persekutuan Malaysia* (JAKIM, 2017)[48], the opinion of *Muzakarah Jawatankuasa Fatwa Majlis Kebangsaaan (Malaysia)* (JAKIM, 2015),[49] fatwa by *Darul Iftā'* Egypt (2018),[50] Islamic Council Singapore (Majlis Ugama Islam Singapura, 2001),[51] and Indonesian Scholars Council (Majelis Ulama Indonesia, 2010).[52]

Laboratory Analysis and Expert Interview

The water quality analysis on the influent and effluent samples uses the Water Quality Index (WQI) in evaluating the level of cleanliness and quality of the water. All the samples have undergone lab testing, by considering six major parameters, which is dissolved oxygen (DO), bio-chemical oxygen demand (BOD), chemical oxygen demand (COD), nitrogen ammonia (AN), total suspended solids (TSS) and pH. The readings obtained from all six parameters have been used to calculate the water quality index value through the formulas that have been determined.

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47 Mohd Mahyeddin Mohd, "Analisis Fatwa Air Sisa Kumbahan Dari Sumber Mutanajjis: Fatwa Analysis of Waste Water from Mutanajjis Sources," *INSLA E-Proceedings* 3, no. 1 (2020): 530.

48 Jabatan Kemajuan Islam Malaysia [JAKIM], "Penggunaan Semula Bioefluen Terawat Dan Biopepejal Dari Loji Rawatan Kumbahan (LRK) IWK,*"* JAKIM, 2017, http://e-smaf.islam.gov.my/e-smaf/index.php/main/mainv1/fatwa/pr/15524

49 Jabatan Kemajuan Islam Malaysia [JAKIM], "Hukum Penggunaan Air Baru (Newater)," *Kompilasi Pandangan Hukum Muzakarah Jawatankuasa Fatwa Majlis Kebangsaan Hal Ehwal Ugama Islam Malaysia* (Shah Alam: Crystal Creative Empire, 2015), 46.

50 Darul Iftā' al-Misriyyah, "Hukm al-Ṭahārah bi Miyāh al-Sarfi al-Muā'lajah,*"* last modified Mei 13, 2018, http://dar-alifta.org/home/viewfatwa?ID=14414.

51 Majlis Ugama Islam Singapura, "Fatwa Penggunaan Air Yang Di Kitar Semula – Newater*",* Nombor fatwa: FAT00001-2003, accessed date Jun 20, 2021. http://www.muis.gov.sg/rservices/index2.asp.

52 Majelis Ulama Indonesia, "Air Daur Ulang,*"* last modified January 27, 2010

Table 3 shows a summary of the data analysis outcome for both influent and effluent samples in Sewage Treatment Plant (STP) Serantau KL-Titiwangsa 2 owned by IWK. The comparison with the pipe water as the indicator for the Muṭlaq water has been drawn. There is a remarkable difference between the influent water sample which is 15.43% and 67.24% for the effluent water sample based on the percentage of the WQI value. Meanwhile, the WQI category and class for influent water sample fall under Class V and are categorized as highly polluted. The effluent water sample is in Class III and categorized as moderate. This demonstrates that the water treatment process has successfully removed pollutants from the raw water (influent) to produce water that is safe for humans chemically and biologically. The comparison with the *muṭlaq* water which is pipe water has also been done, and the outcome reveals that the percentage of the WQI value for effluent water sample (67.24%) which is close to the percentage of the WQI value fot the pipe water (72.18%). Both samples are also under Class III and the same WQI category, which is moderate.

The study outcome has also been analyzed based on the National Water Quality Standard (NWQS) by taking into account 22 parameters encompassing chemical, biological and physical parameters as given in Appendix 1. Following this standard, each parameter with a certain limitation will ascertain the quality of the water based on the respective classes of use (Appendix 2). All in all, from the 22 parameters analyzed, there was a significant change for the influent and effluent water samples, where 9 parameters for the influent samples fall under Category IV (polluted) and V, which is highly polluted. Meanwhile, for effluent water samples, 16 parameters are under Category I (very clean) and Category II (clean). The comparison of all 22 parameters with the pipe water sample is also carried out and the outcome finds that the effluent water sample is in the same category as the pipe water sample which is Category 1.

The water sample analysis based on the (Sewage) Environmental Quality Regulations, 2009 is also conducted. Under the standards ruled out, the rate of effluent discharged upstream must meet Standard A, while the effluent released downstream must fulfil Standard B. Sewage water has to be treated properly to comply with Standard A. As a whole, as referred to in the Table in Appendix

3, clearly there are differences between the influent water sample and the effluent water sample whereby, after the water treatment process, the effluent water sample has been found to have fulfilled the requirements of both Standards A and B. Also, effluent water can be categorized in the same category as the pipe water sample (*muṭlaq* water).

Table 3: Summary of the data analysis for influent and effluent samples at RSTP Serantau KL-Titiwangsa 2 owned by IWK.

Parameter	Influent	Effluent	Pipe Water-*Muṭlaq* water
WQI Value (%)	15.43	67.24	72.18
WQI Class	V	III	III
WQI Category	Very polluted	Moderate	Moderate
A Standard*	Not following the standard	Following the standard	Following the standard
B Standard*	Not following the standard	Following the standard	Following the standard

* Standard of Effluent Sewage and Discharge of Malaysian Industrialization

Finally, the outcome of the study has been confirmed by the panel of experts in the fields of Shari'a and water chemical science. According to the Shari'a experts, *mutanajjis* water that has lost its excrement characteristics is purified and can be categorized as *muṭlaq* water. The suspended solids found on the surface of the water can also be treated under the same law as flowing water *(al-mā' al-jāri)* near the excrement area, if it is mixed with a large quantity of clean water, thereby becoming *muṭlaq* water.[53] However, the experts suggested that the water is not suitable for drinking as there is a possibility that there is some foreign matter that may be harmful to health.[54] This is also supported by water chemical experts who point to its similarity with the river water.

[53] Mohd Hapiz Mahaiyadin (Shari'a expert). in discussion with the author, August 19, 2021.

[54] Miszairi Haji Sitiris (Shari'a expert) in discussion with the author, August 19, 2021.

Although the water is categorized as *muṭlaq*, it must be boiled before drinking, to eliminate possible harmful bacteria.[55]

CONCLUSION

The sewage water treatment technology in RSTP Serantau KL-Titiwangsa 2, has been found to have applied all the methods of *mutanajjis* water cleaning raised by *fuqaha*; including *mukatsarah*, *nazh* and *taghyīr*. As an outcome, the treated effluents are clean and with no remaining stain of excrement in terms of color, smell and taste. Physically, this condition fulfills the characteristics of *muṭlaq* water. In terms of the sustainability of the water resource, the treated effluents also support the 6th goal outlined in the Sustainable Development Goals (SDG) by the United Nations (UN). This is because the effluents have certainly met Standard A for water standard by the Environmental Department of Malaysia, before being discharged into the river. It is hoped that this study can provide a *fiqh* solution to officers and managers of IWK treated water in terms of facilitating their matters of *tahārah*. In other words, when the treated water comes into contact with the clothes, the clothes do not have to be changed or cleaned. In fact, it can directly be used to perform prayers *(ṣolāh)*, provided it is free from other types of excrement *(najs)*. The use of treated effluents also serves as an alternative. However, if there is any other form of water not sourced from the sewage, that would be a better choice *(afḍal)*.

REFERENCES

Akademi Sains Malaysia. "Study on the Current Issues and Needs for Water Supply and Wastewater Management in Malaysia". Academy of Sciences Malaysia. 2015. https://www.akademisains.gov.my/asm-publication/wswm_volume_2/.

Al-Dibyan, Dibyan bin Muhammad. *Mausūʿah Aḥkām Al-Ṭahārah*. Riyadh: Maktabah al-Rusyd, 2005.

[55] Musa Ahmad (water chemical science expert) in discussion with the author, August 19, 2021.

Al-Hattab, Muhammad bin Muhammad bin Abdul Rahman al-Ru'aini. *Mawāhib al-Jalil fi Sharh Mukhtasar al-Khalil*. Beirut: Dar al-Fikr, 1992.

Al-Hishni, Taqiyuddin Abu Bakr. *Kifayah al-Akhyar fi Halli Ghayah al-Ikhtisar.* Beirut: Dar al-Kutub al- Ilmiyyah, 2001.

Al-Khin, Mustafa, Al-Bugha, Mustafa & Al-Syarbaji, Ali. *Al-Fiqh al-Manhaji ala Mazhab al-Imam al-Syafi'i*. Dimashq: Dar al-Qalam, 2007.

Al-Marghinani, Ali bin Abi Bakr. *al-Hidāyah fi Syarh Bidāyat al-Mubtadi.* Beirut: Dar Ihyā' al-Turath al-Arabiy, 1985.

Al-Nawawi, Yahya bin Syaraf. *al-Majmū' Syarh al-Muhazzab*. Beirut: Dar al-Fikr, n.d.

Darul Iftā' al-Misriyyah. "Hukm al-Ṭahārah bi Miyāh al-Sarfi al-Muā'lajah*"*. Last modified Mei 13, 2018. http://dar-alifta.org/home/viewfatwa?ID=14414.

Ibn Qudamah, Abdullah bin Muhammad. *Al-Mughni*. Riyadh: Dar 'Alam al-Kutub, 1997.

Ibn Taimiyyah, Ahmad bin Abdel Halim. *Majmū' al-Fatāwa*. Madinah: Majma' al-Malik Fahd, 1995.

Indah Water Konsortium [IWK]. "Regional Sewage Treatment Plant (RSTP) KL-Titiwangsa 1-KLR403, IWK Report*"*. Kuala Lumpur: IWK Sdn Bhd, 2020.

Jabatan Kemajuan Islam Malaysia [JAKIM]. "Hukum Penggunaan Air Baru (Newater)". *Kompilasi Pandangan Hukum Muzakarah Jawatankuasa Fatwa Majlis Kebangsaan Hal Ehwal Ugama Islam Malaysia.* Shah Alam: Crystal Creative Empire, 2015.

Jabatan Kemajuan Islam Malaysia [JAKIM]. "Penggunaan Semula Bioefluen Terawat Dan Biopepejal Dari Loji Rawatan Kumbahan (LRK) IWK*"*. JAKIM, 2017. http://e-smaf.islam.gov.my/e-smaf/index.php/main/mainv1/fatwa/pr/15524

Majelis Ulama Indonesia. "Air Daur Ulang*"*. Last modified January 27, 2010. https://halalmui.org/wp-content/uploads/2023/06/Fatwa-Air-Daur-Ulang.pdf

Majlis Ugama Islam Singapura. "Fatwa Penggunaan Air Yang Di Kitar Semula – Newater*"*. Nombor fatwa: FAT00001-2003. Accessed date Jun 20, 2021. http://www.muis.gov.sg/rservices/index2.asp.

Mariyappan, Raman. "Level of Sustainable Green Practices at Pantai 2 Sewage Treatment Plant, Klang Valley, Malaysia." *European Journal of Sustainable Development* 8, no. 5 (2019), 337-337.

Ministry of Health. "Ebola: Information for the public". Kuala Lumpur: MOH, 2014. http://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/ebolainformation-public

Mokhtar, Mohd Istajib, and Raihanah Abdullah. "Undang-Undang Air Islam: Analisis Komparatif Terhadap Aspek Kualiti Air: Islamic Law of Water: Comparative Analysis of The Quality Aspects of Water." *Jurnal Syariah* 20, no. 2 (2012), 185-218.

Mokhtar, Mohd Istajib, Raihanah Abdullah, and Azizan Baharuddin. "An Islamic perspective on water quality: a case of Malaysia." *Water Policy* 17, no. 3 (2015), 454-471.

Muassasah Durar Sunniyyah. "Al-Ma' al-Mukhtalith bi Najasah". *Mausū'ah Fiqhiyyah*. Muassasah Durar Sunniyyah, 2 April 2022. https://www.dorar.net/feqhia/13

Roslan, Siti Noorain, Siti Salmi Ghazali, and Norfadhlina Muhamed Asli. "Study on the characteristics and utilization of sewage sludge at Indah Water Konsortium (IWK) Sungai Udang, Melaka." *International Journal of Environmental and Ecological Engineering* 7, no. 8 (2013), 544-548.

Salleh, Mohd Mahyeddin Mohd, Nurdeng Deuraseh, Irwan Mohd Subri, Suhaimi Ab Rahman, Shuhaimi Mustafa, Mohammad AizatJamaludin, and Yasmin Hanani Mohd Safian. "The Use Of Ceramic Product Derived From Non-Halal Animal Bone: Is It Permissible From The Perspective Of Islamic Law?." *International Journal of Asian Social Science* 7, no. 3 (2017), 192-198.

Salleh, Mohd Mahyeddin Mohd, Yasmin Hanani Mohd Safian, Hussein'Azeemi Abdullah Thaidi, Syaza Azhari, and Khadijah Amira Abdul Rashid. "Analisis Fatwa Air Sisa Kumbahan Dari Sumber Mutanajjis: Fatwa Analysis of Waste Water from Mutanajjis Sources." *INSLA E-Proceedings* 3, no. 1 (2020), 525-534.

Salleh, Mohd Mahyeddin Mohd, Yasmin Hanani Mohd Safian, Hussein'Azeemi Abdullah Thaidi, Syaza Azhari, and Khadijah Amira Abdul Rashid. "Analisis Fatwa Air Sisa Kumbahan Dari Sumber Mutanajjis." *Journal of Fatwa Management and Research* 25, no.1 (2021), 77-92.

Salleh, Mohd Mahyeddin Mohd, Yasmin Hanani Mohd Safian, Syaza Azhari, and Hussein Azemi Abdullah Thaidi. "Penggunaan Semula Air Kumbahan Mutanajjis Untuk Tujuan Taharah: Satu Analisa Fiqah dan Kajian Sains Berdasarkan Amalan Rawatan Kumbahan oleh Indah Water Konsortium (IWK)." *Ulum Islamiyyah: The Malaysian Journal of Islamic Sciences* 35, no. 1 (2023), 19-36.

Salleh, Mohd Mahyeddin Mohd, Yasmin Hanani Mohd Safian, Syaza Azhari, Hussein Azemi Abdullah Thaidi, and Muhammad Abdul Rahman Sevanathan. "Mekanisma Pembersihan Air Mutanajjis Menurut Fiqah Dan Aplikasinya Dalam Rawatan Air Kumbahan Oleh Indah Water Konsortium: Ke Arah Mencapai Kelestarian Sumber Air." *E-Prosiding Seminar Antarabangsa Islam Dan Sains.* Nilai: Penerbit USIM. 2021.

Scanlon, John, Angela Cassar, and Noémi Nemes. *Water as a human right?*. No. 51. United Kingdom: International Union for Conservation of Nature (IUCN) Publications Services Unit, 2004. https://books.google.com.my/