

Studies of the Effectiveness of Wastewater Treatment Systems at Local Companies Waste Water Management of the City of Banjarmasin

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ABSTRACT

Wastewater disposal is a major problem in this developing country. The largest source of liquid waste in this country is the result of household activities. This study aims to analyze the effectiveness of the Pekauran Raya and Basirih wastewater treatment plant (IPAL) at the Banjarmasin Municipal Wastewater Management Company. This type of research is quantitative descriptive. The technique of collecting data is by observing WWTP and measuring the effectiveness of wastewater treatment on BOD, COD, and TSS parameters. The research location uses the purposive sampling technique. Data analysis used the calculation of the effectiveness of the parameters on the WWTP. The results showed that the concentrations of BOD and COD decreased from inlet to outlet, namely BOD from 20.4 mg/l to 18.4 mg/l at Pekapuran Raya WWTP, while Basirih WWTP from 23.5 mg/l to 18.4 mg/l. COD parameter in Pekapuran Raya WWTP from 57 mg/l to 53 mg/l while Basirih WWTP from 60 mg/l to 52 mg/l. The TSS parameter was still above the threshold of the two WWTPs, namely the Pekapuran Raya WWTP from 71.6 mg/l to 63.2 mg/l and the Basirih WWTP from 79.2 mg/l to 64.2 mg/l. The effectiveness level of the two WWTPs, namely Pekapuran Raya and Basirih WWTPs with BOD, COD, and TSS parameters showed that the concentration of the average effectiveness level decreased in each parameter. In reducing the concentration of WWTP Basirih, it was higher seen from the effectiveness of reducing BOD, which was 21.7%. Suggestions need to be done again to check the TSS concentration in the WWTP does not exceed the quality standard threshold, so that it is useful for determining the effectiveness of wastewater treatment.

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INTRODUCTION

Waste water disposal is a major problem in developing countries is because many people in general do not have access to sanitary conditions and clean water. The source generating the waste liquid of the largest in the country this is from the results of the activities of the household. This is because the number of population in Indonesia is very large. Therefore the volume of waste generated is also great. Domestic activities in the household, industrial, and agricultural produce wastewater that can cause pollution to the water bodies in

which lakes, rivers, and the sea (Fidyan,H, 2017).

Some of the parameters of the pollutant in the waste water in Waste Water Treatment plants (WWTP) are the levels of BOD, COD, suspended solids, dissolved solids, and turbidity. Suspended solids are all solid substances (sand, silt, and clay) or particles are suspended in water and can be a component of living (biotic) such as phytoplankton, zooplankton, bacteria, and fungi. While the content of dissolved solids consist of ion-ion solutes such as mercury, lead, arsenic, cadmium, chromium, nickel, and magnesium salts and calcium. While turbidity consists of a variety of dissolved solids and suspended which

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can inhibit the penetration of oxygen and the light of the sun is thus less favorable for aquatic ecosystems (Effendi, 2003 in Widya, 2013).

Public awareness of the City of Banjarmasin to the disposal of household waste water seems to have increased quite significantly. The increase was evidenced by the constantly increasing number of customers, current customers PD PAL Banjarmasin City've been through about 5000 more. Related to the increasing number of customers, PD PAL will continue to improve services such as doing repairs to leaking pipes that had been complained of. One way travel through menumbuhkan public awareness by providing real-life examples, in addition to requiring the office or any kind of business subscription in the disposal of waste through the WWTP.

The purpose of this study is to Determine the Effectiveness of wastewater treatment pthere is a Local Company Waste Water Management of the City of Banjarmasin in Pekauran Kingdom and Basirih di Banjarmasin.

METHOD

This study uses the method of observation on the process of wastewater treatment in the WWTP and pengukuran the effectiveness of wastewater treatment. Determining the location of the research using the method of Purposive Sampling , namely the determination of the sample (the study area) based on certain considerations, namely the characteristics of the raw materials of waste that goes to the WWTP, the effectiveness on each of the wastewater treatment process, and the result after processing the waste goes. Determination of this research at the WWTP Pekapuran Raya and WWTP Basirih.

RESULTS AND DISCUSSION

PD PAL is a company regional manager of waste water in the City of Banjarmasin, South Kalimantan Province. PD PAL Banjarmasin City is located in jalan Pasar Morning No. 89 RT 02, Kelayan Outside, Kecamatan Banjarmasin Tengah.

Waste Water Treatment plant (WWTP) in the Hallway and Waste Water Treatment plant (WWTP) in Basirih Banjarmasin City using the system of the biological Reactor swivel

(Rotating Biological Contactor), abbreviated as RBC, RBC (Rotating Biological Contactor) is a unit that uses the disk (a disk) that rotates as a media place to grow a sticky bacteria.

1. The results of the Test of the Quality of Wastewater in the Waste Water Treatment plant (WWTP) Pekapuran Raya and Waste Water Treatment plant (WWTP) Basirih

a. IPAL Pekapuran Raya

The results of the laboratory analysis of the parameters of TSS, BOD, and COD In the WASTEWATER Pekapuran Raya of the inlet and the outlet obtained a decline in levels of TSS from 71,6 (mg/L) into 63,2 (mg/L). Also there is a decrease in the levels of BOD from 20.4 (mg/L) to 18.4 (mg/L), as well as decreased levels of COD from 57 (mg/L) to 53 (mg/L).

Table 1. Sump Inlet of the WWTP Pekapuran Raya

| No | Parameters Examined | Results Examination | Levels Maximum | Unit | Test Method |
|----|---------------------|---------------------|----------------|------|---------------|
| 1 | TSS | 71,6 | 30 | Mg/l | E-Instruments |
| 2 | BOD ₅ | 20,4 | 30 | Mg/l | Photometric |
| 3 | COD | 57 | 100 | Mg/l | Photometric |

The value of the maximum level based on:Candy of Environment and Forestry republic of INDONESIA No.P.68/Menlhk-Secretariat/Kum.1/8/2016 about the Quality of the Raw Domestic Sewage

Table 2. Sump Outlet of the WWTP Pekapuran Raya

| No | Parameters Examined | Results Examination | Levels Maximum | Unit | Test Method |
|----|---------------------|---------------------|----------------|------|---------------|
| 1 | TSS | 63.2 | 30 | Mg/l | E-Instruments |
| 2 | BOD ₅ | 18.4 | 30 | Mg/l | Photometric |
| 3 | COD | 53 | 100 | Mg/l | Photometric |

The value of the maximum level based on:Candy of Environment and Forestry republic of INDONESIA No.P.68/Menlhk-Secretariat/Kum. 1/8/2016 about the Quality of the Raw Domestic Sewage.

b. IPAL Basirih

The results of the laboratory analysis of the parameters of TSS, BOD, and COD In the WASTEWATER Basirih of the *inlet* and *the outlet* obtained a decline in levels of TSS from of 79.2 (mg/L) to 64.2 (mg/L). Also there is a decrease in the levels of BOD than 23.5 (mg/L)

to 18.4 (mg/L), as well as decreased levels of COD of 60 (mg/L) to 52 (mg/L).

Table 3. Sump Inlet of the WWTP Basirih

| No | Parameters Examined | Results Examination | Levels Maximum | Unit | Test Method |
|----|---------------------|---------------------|----------------|------|---------------|
| 1 | TSS | 79,2 | 30 | Mg/l | E-Instruments |
| 2 | BOD ₅ | 23,5 | 30 | Mg/l | Photometric |
| 3 | COD | 60 | 100 | Mg/l | Photometric |

The value of the maximum level based on: Candy of Environment and Forestry republic of INDONESIA No.P.68/Menlhk-Secretariat/Kum. 1/8/2016 about the Quality of the Raw Domestic Sewage

Table 4. Sump Outlet of the WWTP Basirih

| No | Parameters Examined | Results Examination | Levels Maximum | Unit | Test Method |
|----|---------------------|---------------------|----------------|------|---------------|
| 1 | TSS | 43,2 | 30 | Mg/l | E-Instruments |
| 2 | BOD ₅ | 18,4 | 30 | Mg/l | Photometric |
| 3 | COD | 52 | 100 | Mg/l | Photometric |

The value of the maximum level based on: Candy of Environment and Forestry republic of INDONESIA No.P.68/Menlhk-Secretariat/Kum. 1/8/2016 about the Quality of the Raw Domestic Sewage

2. Chart Diagram Decline In Water Treatment Of Liquid Waste From The Laboratory Test Results Of The City Of Banjarmasin

a. Parameter BOD

The parameters of the BOD is to determine the amount of dissolved oxygen needed by microorganisms to decompose organic matter under aerobic conditions on the material of the water proofing. From the influence of which is estimated to occur in the receiving water bodies associated with the reduction of the oxygen content.

1) IPAL Pekapuran Raya

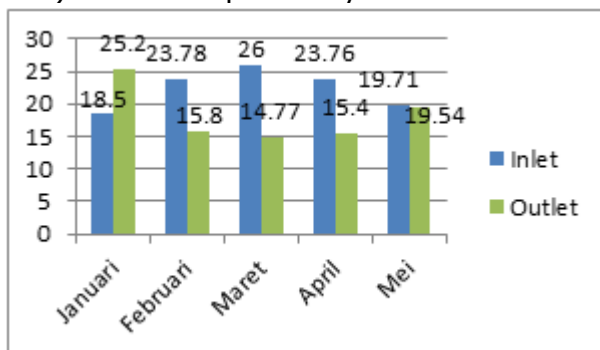


Figure 1. Diagram of the Decrease in the Parameters of the BOD of Waste Water WWTP Pekapuran Raya (Secondary Data)

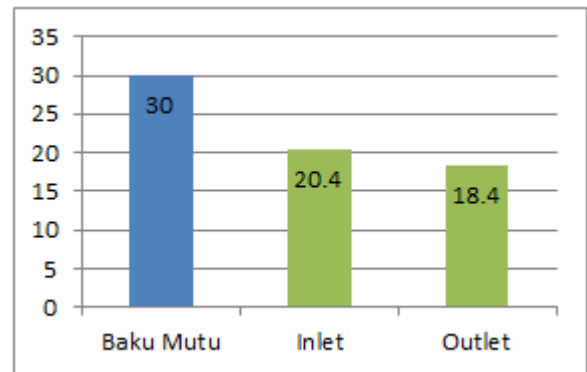


Figure 2. Chart the Decline of the Parameters of the BOD of Waste Water WWTP Pekapuran Raya (Primary Data)

Second garifik above, shows a decrease in the parameters of the BOD of the *inlet* and *the outlet* of the WWTP Pekapuran Raya. According to data from the WWTP Pekapuran Raya average BOD experienced a significant decline in the month of February-May, but in January the parameters of BOD in the reservoir, and *the outlet* has increased but remains below a threshold quality standards. This happens because in the month of January in the City of Banjarmasin is experiencing natural disasters including Flood, which causes the quality of the waste water to be not as usual.

On the chart 4.2, shows a decrease in the levels of the parameters of the BOD of the waste water *inlet* and *the outlet* of the WWTP Pekapuran Raya. The quality of wastewater at the *inlet* and *the outlet* of the WWTP compared to the raw waste water quality PermenLHK No. 68 of 2016 under the threshold. So with a concentration parameter BOD is already under or decreased, which is where the concentration of the parameter BOD with an average of 20.4 mg/l at *the inlet* and *the outlet* with an average of 18.4 mg/l, while according to the planning of the quality of the BOD of *the inlet* and *the outlet* of 30 mg/l.

2) IPAL Basirih

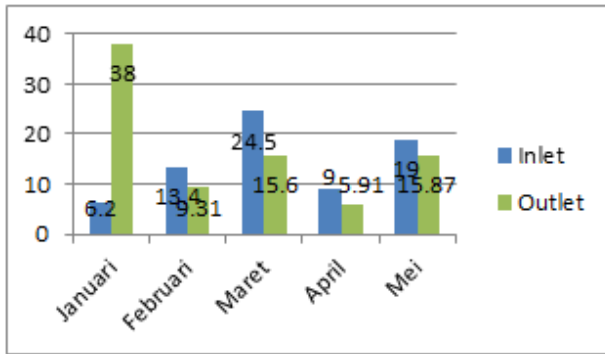


Figure 3. Diagram of the Decrease in the Parameters of the BOD of Waste Water WWTP Basirih (Secondary Data)

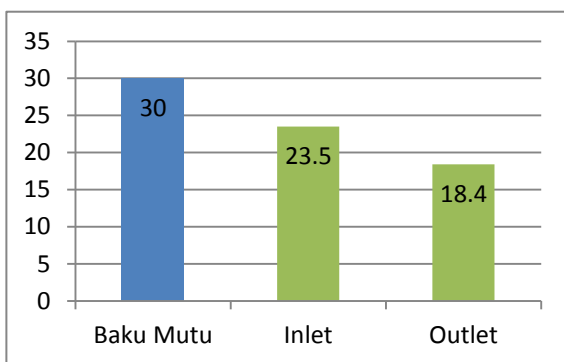


Figure 4. Chart the Decline of the Parameters of the BOD of Waste Water WWTP Basirih (Secondary Data)

Second garifik above, shows a decrease in the parameters of the BOD of the *inlet* and *the outlet* of the WWTP Basirih. According to data from the WWTP Basirih average BOD experienced a significant decline in the month of February-May, but in January the parameters of BOD in the reservoir, and *the outlet* has increased above the threshold limit of quality. This happens because in the month of January in the City of Banjarmasin is experiencing natural disasters including Flood, which causes the quality of the waste water to be not as usual.

On the chart 4.4, shows a decrease in the levels of the parameters of the BOD of the waste water *inlet* and *outlet* of the WWTP Basirih. The quality of wastewater at the *inlet* and *the outlet* of the WWTP compared to the raw waste water quality PermenLHK No. 68 of 2016 under the threshold. So with a concentration parameter BOD is already under or decreased, which is where the concentration of the parameter BOD with an average of 23.5

mg/l at *the inlet* and *outlet* with an average of 18.4 mg/l, while according to the planning of the quality of the BOD of *the inlet* and *outlet* of 30 mg/l.

b. Parameters COD

The parameters of COD is to determine the amount of oxygen needed to decompose all the organic matter contained in the materials of examination of water for chemical.

1) IPAL Pekapuran Raya

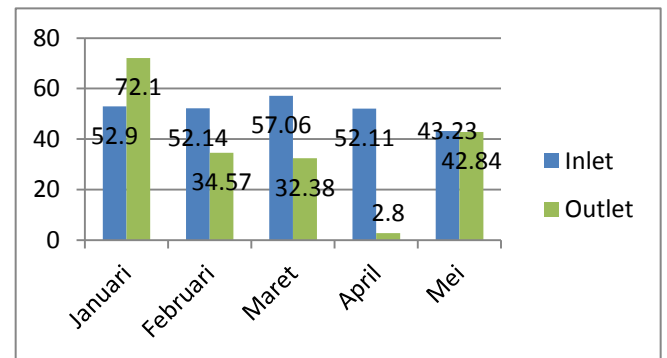


Figure 5. Diagram of the Decrease in the Parameters of the COD of Wastewater WWTP Pekapuran Raya (Secondary Data)

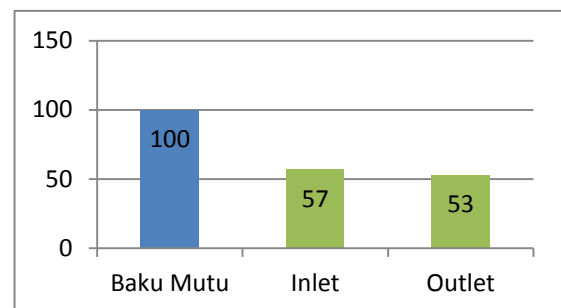


Figure 6. Chart the Decline of the Parameters of the COD of Wastewater WWTP Pekapuran Raya (Primary Data)

Second garifik above, shows a decrease in the COD parameters of the *inlet* and *the outlet* of the WWTP Pekapuran Raya. According to data from the WWTP Pekapuran Raya average COD experienced a significant decline in the month of February-May, but in January the parameters of COD in the reservoir, and *the outlet* has increased above the threshold limit of quality. This happens because in the month of January in the City of Banjarmasin is experiencing natural disasters including Flood, which causes the quality of the waste water to be not as usual.

On the chart 4.6, shows a decrease in the levels of the parameters of the COD of the waste water *inlet* and *outlet* of the WWTP Pekapuran Raya. The quality of wastewater at the *inlet* and *the outlet of the WWTP* compared to the raw waste water quality PermenLHK No. 68 of 2016 under the threshold. So with a concentration parameter COD already under or decreased, where the concentration of the parameters of COD with an average of 57 mg/l at *the inlet* and *outlet* with an average of 53 mg/l, while according to quality planning COD *the inlet* and *outlet* of 100 mg/l.

2) IPAL Basirih

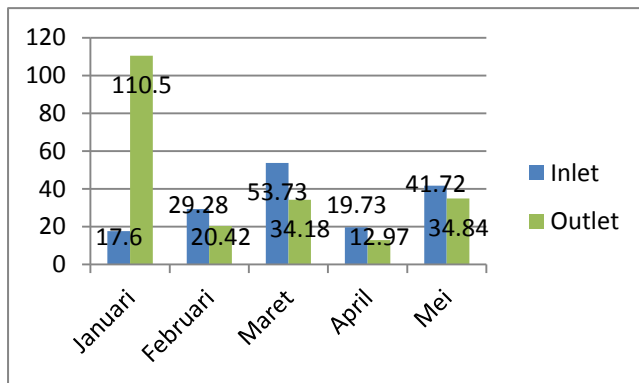


Figure 7. Diagram of the Decrease in the Parameters of the COD of Wastewater WWTP Basirih (Secondary Data)

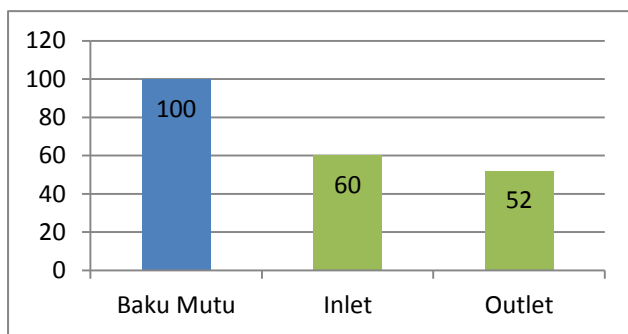


Figure 8. Chart the Decline of the Parameters of the COD of Wastewater WWTP Basirih (Primary Data)

Second garifik above, shows a decrease in the COD parameters of the *inlet* and *the outlet* of the WWTP Basirih. According to data from the WWTP Basirih average COD experienced a significant decline in the month of February-May, but in January the parameters of COD in the reservoir, and *the*

outlet has increased above the threshold limit of quality. This happens because in the month of January in the City of Banjarmasin is experiencing natural disasters including Flood, which causes the quality of the waste water to be not as usual and conditions of the WWTP Basirih that are not optimal.

On the chart 4.8, shows a decrease in the levels of the parameters of the COD of the waste water *inlet* and *outlet* of the WWTP Basirih. The quality of wastewater at the *inlet* and *the outlet of the WWTP* compared to the raw waste water quality PermenLHK No. 68 of 2016 under the threshold. So with a concentration parameter COD already under or decreased, where the concentration of the parameters of COD with an average of 60 mg/l at *the inlet* and *outlet* with an average of 52 mg/l, while according to quality planning COD *the inlet* and *outlet* of 100 mg/l.

c. Parameter TSS

Parameter TSS is for the measurement of solids the total held by the strainer with the size of the particles.

1) Pekapuran Raya

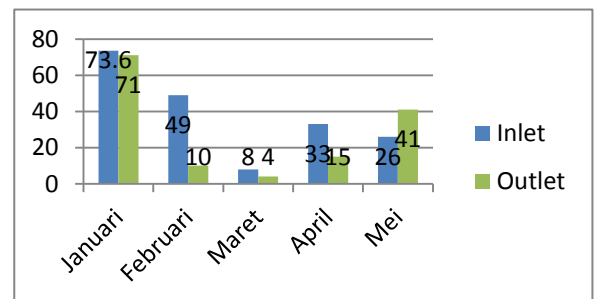


Figure 9. Diagram of the Decrease in the Parameters of the TSS of Wastewater WWTP Pekapuran Raya (Secondary Data)

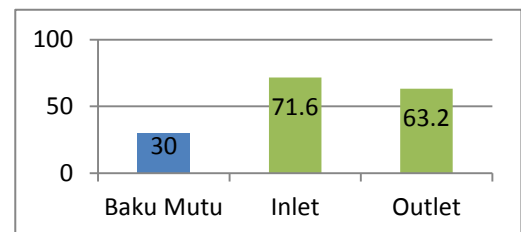


Figure 10. Chart the Decline of the Parameters of the TSS of Wastewater WWTP Pekapuran Raya

Second garifik above, shows a decrease in the parameters of the TSS of the *inlet* and *the outlet* of the WWTP Pekapuran Raya. According to data from the WWTP Pekapuran Raya average TSS experienced a significant decline in February-april and in may in the tub shelter *outlets* has increased above the threshold limit of quality, but in January the parameters of TSS in the reservoir *inlet* and *outlet* increased above a threshold quality standards. This happens because in the month of January in the City of Banjarmasin is experiencing natural disasters including Flood, which causes the quality of the waste water to be not as usual.

Based on the chart 4.10 above, shows the differences in the level of concentration levels of TSS on the *inlet* and *outlet*. On the *inlet* level of concentration levels of TSS tend to be higher than at the *outlet*, the concentration of TSS at the *inlet* is equal 71,6 mg/l which exceeded the water quality standard of domestic waste according to the PermenLHK No. 68 of 2016 and the concentration of TSS in the *outlet* that is equal to 63,2 although there was a decrease in the *outlet* but the levels of concentration of TSS still exceeded the water quality standard of domestic waste according to the PermenLHK No. 68 of 2016.

2) IPAL Basirih

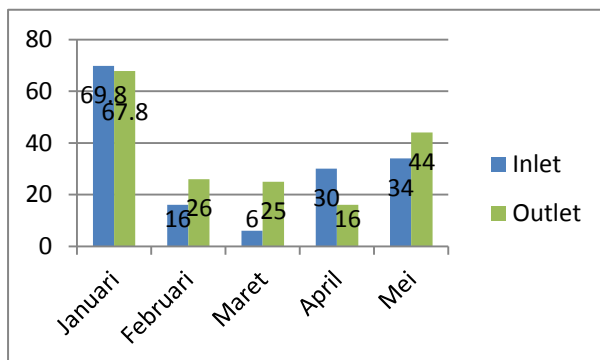


Figure 11. Diagram of the Decrease in the Parameters of the TSS of Wastewater WWTP Basirih (Secondary Data)

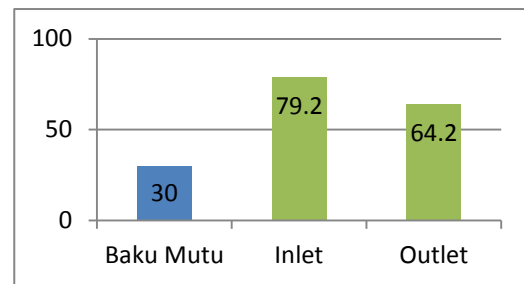


Figure 12. Chart the Decline of the Parameters of the TSS of Wastewater WWTP Basirih (Primary Data)

Second garifik above, shows a decrease in the parameters of the TSS of the *inlet* and *the outlet* of the WWTP Basirih. According to data from the WWTP Basirih average TSS decreased significantly in the month of april, and in February, march, and may increase the reservoir *outlet* and still be below the threshold quality standards in February and march, while in the month of may in the reservoir, and *the outlet* is above the threshold limit of quality. But in January the parameters of TSS in the reservoir *inlet* and *outlet* increased above a threshold quality standards. This happens because in the month of January in the City of Banjarmasin is experiencing natural disasters including Flood, which causes the quality of the waste water to be not as usual.

Based on the chart 4.12 above, shows the differences in the level of concentration levels of TSS on the *inlet* and *outlet*. On the *inlet* level of concentration levels of TSS tend to be higher than at the *outlet*, the concentration of TSS in the *inlet* that is equal to of 79.2 mg/l which exceeded the water quality standard of domestic waste according to the PermenLHK No. 68 of 2016 and the concentration of TSS in the *outlet* that is equal 64,2 although there is a decrease in *the outlet* but the levels of concentration of TSS still exceeded the water quality standard of domestic waste according to the PermenLHK No. 68 of 2016.

3. The level of Effectiveness of the WWTP Pekapuran Raya and WWTP Basirih

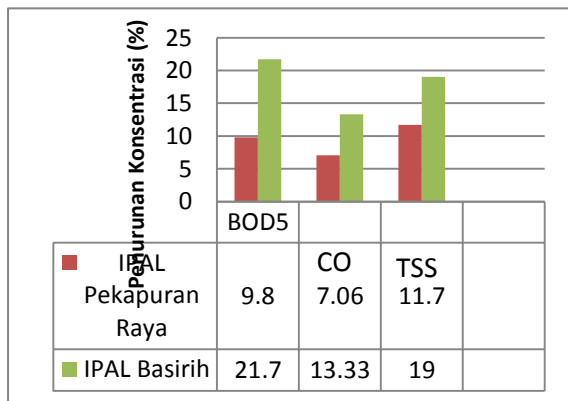


Figure 13. The level of the Calculation of the Effectiveness of the Reduction of BOD, COD, and TSS of WASTEWATER Pekapuran Raya and WWTP Basirih City Banjarmasin

In the picture above shows that the level of effectiveness of the Wastewater Treatment plant (WWTP) Pekapuran Raya and Basirih Banjarmasin City, in lowering the concentration level of the highest effectiveness that is contained in a decrease in the concentration parameter BOD₅ 21.7%, the general level of effectiveness of the performance of the WWTP Basirih the highest of some of the parameters that exist.

4. The criteria of the Effectiveness of the WWTP Pekapuran Raya And WWTP Basirih

Table 5. The criteria of the Effectiveness of the WWTP Pekapuran Raya and WWTP Basirih

| Variable | Pekapuran Raya | | Basirih | |
|------------------|----------------|----|---------|----|
| | E | TE | E | TE |
| BOD ₅ | √ | | √ | |
| COD | √ | | √ | |
| TSS | | √ | | √ |

Description :

E : Effective

TE : Not Effective

DISCUSSION

1. The quality of the Waste Water Treatment plant (WWTP) Pekapuran Raya and Waste Water Treatment plant (WWTP) Basirih with the Analysis of the Parameters of BOD, COD, and TSS

Based on the results of this study, show that the quality of the WWTP Pekapuran Raya and WWTP Basirih of the parameters BOD, COD, and TSS. From the results of the analysis to the three parameters, the BOD decreased and in accordance with the Quality standard of Waste Water Domestic Regulation of the Minister of Environment No. 68 of 2016 with the results of the analysis using laboratory tests. Thus, also on the COD decreased and in accordance with the Quality standard of Waste Water Domestic Regulation of the Minister of Environment No. 68 of 2016 with the results of the analysis using the laboratory test, the quality on both WWTP bagusmengalami decline and in accordance with the Quality standard of Waste Water Domestic Regulation of the Minister of Environment No. 68 of 2016 with . But on the parameters of the TSS, the results of the analysis showed that the Levels of TSS still exceeds the Quality standard of Waste Water Domestic Regulation of the Minister of Environment No. 68 of 2016 on both WWTP such.

2. The effectiveness of Processed Before (*inlet*) and After (*outlet*) with the Parameters of BOD in the Wastewater Treatment plant (WWTP) Pekapuran Raya and Waste Water Treatment plant (WWTP) Basirih
 - a. Waste Water Treatment plant (WWTP) Pekapuran Raya with the Parameters of the BOD

The results of the research of the WWTP Pekapuran Raya on the parameters BODsudah carried out with a laboratory test and the calculation of the effectiveness of the parameters obtained results that the Levels of BOD or effective to be discharged into the river.

On the parameters of BOD in this study before processing that goes from the *inlet* and then to decrease in the *outlet*. This happens because it is influenced by domestic waste household can be effectively treated with the help of the technology the RBC on the IPAL system Pekapuran Raya. with the result

of decreased levels of BOD, which by 9.84% with the effectiveness on the quality of the sample liquid waste on the *inlet* and *outlet*.

b. Waste Water Treatment plant (WWTP) Basirih with the Parameters of the BOD

The results of the research of the WWTP Basirih on the parameters BODsudah carried out with a laboratory test and the calculation of the effectiveness of the parameters obtained results that the Levels of BOD or effective to be discharged into the river.

On the parameters of BOD in this study before dilakukanpengolahan the entrance of the *inlet* then there is a decrease in *the outlet*. This happens because it is influenced by domestic waste household can be effectively treated with the help of the technology the RBC system IPALBasirih. with the result of decreased levels of BOD, 21.7% with the effectiveness on the quality of the sample liquid waste on the *inlet* and *outlet*.

3. The effectiveness of Processed Before (*inlet*) and After (*outlet*) with the Parameters of the COD in the Wastewater Treatment plant (WWTP) Pekapuran Raya and Waste Water Treatment plant (WWTP) Basirih

a. Waste Water Treatment plant (WWTP) Pekapuran Raya with the Parameters of the COD

The results of the research of the WWTP Pekapuran Raya on the parameters CODsudah carried out with a laboratory test and the calculation of the effectiveness of the parameters obtained results that the Levels of COD good or effective to be discharged into the river.

On the parameters of the COD in this study before processing that goes from the *inlet* and then to decrease in the *outlet*. This happens because it is influenced by domestic waste household can be effectively treated with the help

of the technology the RBC on the IPAL system Pekapuran Raya. with the result of decreased levels of COD, amounting 7,06% with the effectiveness on the quality of the sample liquid waste on the *inlet* and *outlet*.

b. Waste Water Treatment plant (WWTP) Basirih with the Parameters of the COD

The results of the research of the WWTP Basirih on the parameters CODsudah carried out with a laboratory test and the calculation of the effectiveness of the parameters obtained results that the Levels of COD good or effective to be discharged into the river.

On the parameters of the COD in this study before processing that goes from the *inlet* and then to decrease in the *outlet*. This happens because it is influenced by domestic waste household can be effectively treated with the help of the technology the RBC on the IPAL system Basirih. with the result of decreased levels of COD, i.e. of 13.33% with the effectiveness on the quality of the sample liquid waste on the *inlet* and *outlet*.

4. The effectiveness of Processed Before (*inlet*) and After (*outlet*) with the Parameters of the TSS in the Wastewater Treatment plant (WWTP) Pekapuran Raya and Waste Water Treatment plant (WWTP) Basirih

a. Waste Water Treatment plant (WWTP) Pekapuran Raya with the Parameters of TSS (*Total Suspended Solid*)

The results of the research of the WWTP Pekapuran Raya on the parameters of the TSS has been done with laboratory tests and the calculation of the effectiveness of the parameters obtained results that the Levels of TSS is not effective.

On the parameters of TSS in this study before processing that goes from *the inlet of the* levels of TSS is high enough to exceed the Quality standards on the Regulation of Minister of

Environment No. 68 of 2016, but then there is a decrease in *the outlet* but still above the Quality standard on the Regulation of Minister of Environment No. 68 of 2016 . This happens because it is influenced by domestic waste household can be effectively treated with the help of the technology the RBC on the IPAL system Pekapuran Raya. with the result of decreased levels of TSS, which amounted to 11.7% with the effectiveness on the quality of the sample liquid waste on the *inlet* and *outlet*.

- b. Waste Water Treatment plant (WWTP) Basirih with the Parameters of TSS (*Total Suspended Solid*)

The results of the research of the WWTP Basirih on the parameters of the TSS has been done with laboratory tests and the calculation of the effectiveness of the parameters obtained results that the Levels of TSS is not effective.

On parameter TSS in this study before processing that goes from *the inlet of the* levels of TSS is high enough to exceed the Quality standards on the Regulation of Minister of Environment No. 68 of 2016, but then there is a decrease in *the outlet* but still above the Quality standard on the Regulation of Minister of Environment No. 68 of 2016 . This happens because it is influenced by domestic waste household can be effectively treated with the help of the technology the RBC on the IPAL system Basirih. With the result of decreased levels of TSS, which amounted to 19% with the effectiveness on the quality of the sample liquid waste on the *inlet* and *outlet*.

CONCLUSIONS

From the results of the discussion and analysis as well as refer to the purpose of the research, related studies of the effectiveness of wastewater treatment systems at the company's regional management of the waste water of the city of Banjarmasin in WWTP

Pekapuran Raya and WWTP Basirih, it can be concluded several things as follows :

1. The quality on both of the IPAL IPAL Pekapuran Raya and WWTP Basirih through the laboratory test is good BOD and COD meets and is still below the Quality standard according to Regulation Menteri Environment No. 68 of 2016, except on the levels of TSS, which is still above and has not yet meet the Quality standards according to the Regulations Menteri Environment No. 68 of 2016.
2. From the results of the analysis and discussion the concentration of BOD, COD, and TSS. Concentration of BOD and COD decreased significantly from *inlet* to *outlet* that BOD from 20.4 mg/l to 18.4 mg/l in WWTP Hallway and BOD in the WASTEWATER Basirih than 23.5 mg/l to 18.4 mg/l and COD in the WASTEWATER Pekapuran Raya of 57 mg/l to 53 mg/l and COD in the WASTEWATER Basirih of 60 mg/l to 52 mg/l, but TSS is still above the threshold of the second WWTP, namely TSS in the WASTEWATER Pekapuran Raya from 71,6 mg/l to 63,2 mg/l and at the WWTP Basirih of of 79.2 mg/l to 64.2 mg/l. Meanwhile, the BOD and COD of both the WWTP is already below the threshold.
3. The effectiveness of the reduction of BOD, COD, and TSS better on the whole have been effective, although TSS is still above the threshold Quality standards after the calculation of the effectiveness of the parameters of the levels of TSS is not effective from the second WWTP.

The level of effectiveness on both the IPAL IPAL Pekapuran Raya and WWTP Basirih with the parameters of BOD, COD, and TSS showed that the concentration level of effectiveness of the average decrease in each parameter. In lowering the concentration of the processing of IPAL Basirih higher views of the effectiveness of the BOD 21.7% of the WWTP Pekapuran Raya.

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