# ABSTRAK

Pada instalasi pengolahan air limbah PT Maligi Permata Industrial Estate ada penambahan bahan enzim di tengki aerasi, hal ini bertujuan untuk menurunkan kandungan COD, namun penambahan enzim ini belum diketahui seberapa besar pengaruhnya terhadap penurunan kandungan COD. Oleh sebab itu berdasarkan masalah tersebut dan kewajiban peneliti untuk menyelesaikan kewajiban akademik yaitu melakukan penelitian, maka peneliti akan melakukan penelitian tersebut. Dan penelitian ini di setujui oleh pihak managemen perusahaan. Peneliti akan mengambil judul penelitian "Pengaruh penambahan enzim dan waktu aerasi terhadap penurunan kandungan COD". Metode perencanaan penelitianakan menggukakan metode Design Of Exsperimen (DOE) Variabel tetap kandungan COD Variabel tidak tetap yairu dosis enzim dengan level 0 ppm, 50 ppm, 100 ppm dan 150 ppm dan waktu aerasi dengan level 0 jam, 1 jam, 2 jam dan 3 jam, untuk pengumpulan data akan dilakukan secara langsung berdasarkan hasil pengambilan sampel yang akan dianalisa kandungan COD. Sedangkan analisis data menggunakan metode ANOVA dan Regresi Linear berganda.

Berdasarkan hasil penelitian Dosis enzim berpengaruh secara positif dan signifikan terhadap penurunan kandungan COD. Dilihat dari nilai F-hitung > f-tabel ANOVA RAL Factorial = 43 177,30 > 2,82 dan nilai uji parsial (uji t) nilai F-hitung > f-tabel = -3,115 > 2,010 dan nilai signifikan sebesar 0,003 < 0,05.

Waktu Aerasi berpengaruh secara positif dan signifikan terhadap penurunan kandungan COD. Dilihat dari nilai F-hitung > f-tabel ANOVA RAL Factorial = 838,63 > 2,82 dan nilai uji parsial (uji t) nilai F-hitung > f-tabel = -21,953 > 2,010 dan nilai signifikan sebesar 0,000 < 0,05.

Dosis enzim dan waktu kontak berpengaruh secara positif dan signifikan terhadap penurunan kandungan COD. Dilihat dari nilai F-hitung > f-tabel ANOVA RAL Factorial yaitu 289,10 > 2,82.

Regresi Linear Berganda yaitu $Y = 101{,}303 - 0{,}055X_1 - 19{,}442X_2 + e$ atau COD Hasil = 103,303 – 0,055(Dosis Enzim) – 19,442 (Waktu Aerasi) + e

Angka koefisien korelasi 95,7% dan angka koefisien determinasi sebesar 91,6%

*Kata kunci : COD, Enzim, DOE, ANOVA* dan *RLB.*

# ABSTRACT

In the PT Maligi Permata Industrial Estate wastewater treatment plant, there was the addition of enzyme material in the aeration stage, this was intended to reduce the COD content, but the addition of this enzyme was not yet known how much effect it had on the decrease in COD content. Therefore based on these problems and the obligation of researchers to complete academic obligations, namely conducting research, the researcher will conduct the research. And this research was approved by the company management. The researcher will take the research title "Effects of enzyme addition and aeration time on decreasing COD content". The research planning method will use the Design of Examination (DOE) method. Fixed variable content of COD. Variable non-fixed doses of enzymes with levels of 0 ppm, 50 ppm, 100 ppm and 150 ppm and aeration time with level 0 hours, 1 hour, 2 hours and 3 hours , for data collection it will be carried out directly based on the results of sampling which will be analyzed for COD content. While data analysis uses ANOVA and multiple linear regression methods.

Based on the results of the study, the enzyme dose had a positive and significant effect on the decrease in COD content. It is proven by the value of F-count> f-table ANOVA RAL Factorial which is 43 177.30> 2.82 and the partial test value (t test) obtained F-count> f-table which is -3.115> 2.010 and a significant value of 0.003 < 0.05.

Aeration time has a positive and significant effect on decreasing COD content. It is proven by the F-count> f-table RAL ANOVA Factorial which is 838.63> 2.82 and the partial test value (t test) obtained F-count> f-table which is -21,953> 2.010 and significant value of 0,000 <0 , 05.

The enzyme dose and contact time have a positive and significant effect on the decrease in COD content. It is proven by the F-count value> f-table RAL ANOVA Factorial which is 289.10> 2.82.

Multiple Linear Regression namely Y = 101,303 - 0,055X1 - 19,442X2 + e or COD Result = 103,303 - 0,055 (Enzyme Dosage) - 19,442 (Aeration Time) + e

The number of the correlation coefficient is 95.7% and the number of the coefficient of determination is 91.6%



Keywords: COD, Enzymes, DOE, ANOVA and RLB