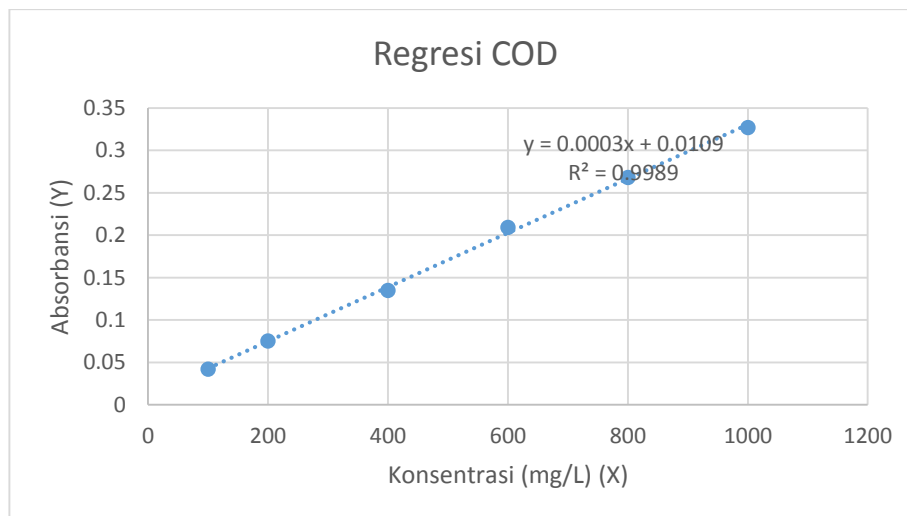


## Lampiran 2

(Hasil Pengujian Regresi COD dan Warna, Uji COD, Uji BOD, Uji TSS, Uji Warna, pH, Tempertaur)

### → Pengujian Regresi COD

No	Konsentrasi (mg/L) (X)	Absorbansi (Y)
1	100	0.042
2	200	0.075
3	400	0.135
4	600	0.209
5	800	0.268
6	1000	0.327
Jumlah	3100	1.056
Rata-rata	516.6667	0.176



## → Pengujian COD

### ➤ Tahap Aklimatisasi

Hari ke-	Sampel	Absorbansi	RPD	Faktor Pengenceran	COD (mg/L)	COD Rerata (mg/L)	%Removal
0	1	0.206	3%	10	6503	6403	
	2	0.200		10	6303		
4	1	0.204	3%	10	6437	6337	1%
	2	0.198		10	6237		
5	1	0.174	0%	10	5437	5437	15%
	2	0.174		10	5437		
6	1	0.14	1%	10	4303	4287	33%
	2	0.139		10	4270		
9	1	0.133	0%	10	4070	4070	36%
	2	0.133		10	4070		
10	1	0.115	1%	10	3470	3453	46%
	2	0.114		10	3437		
11	1	0.102	1%	10	3037	3020	53%
	2	0.101		10	3003		
12	1	0.108	1%	10	3237	3220	50%
	2	0.107		10	3203		
15	1	0.119	1%	10	3603	3587	44%
	2	0.118		10	3570		
16	1	0.125	2%	10	3803	3770	41%
	2	0.123		10	3737		
17	1	0.12	9%	10	3637	3470	46%
	2	0.11		10	3303		

- Contoh perhitungan COD hari ke- 0 pada tahap aklimatisasi:

Nilai absorbansi hari ke 0 : Sampel 1 = 0,206 dan Sampel 2 = 0,200

Faktor pengenceran (fp) adalah 10 kali

Persamaan regresi  $y = 0.0003x + 0.0109$

➤ Sampel 1

$$\text{Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.206-0.0109}{0.0003} \times 10 = 6503$$

➤ Sampel 2

$$\text{➤ Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.200-0.0109}{0.0003} \times 10 = 6303$$

$$\text{Kadar COD hari ke-0} = \frac{\text{Sampel 1} + \text{sampel 2}}{2} = \frac{6503 + 6303}{2} = 6403 \text{ mg/L}$$

$$\text{Pengendalian mutu (RPD)} = \frac{X1 - X2}{(X1 + X2)/2} \times 100\% = \frac{0.206 - 0.200}{(0.206 + 0.200)/2} \times 100\% = 3\%$$

➤ Tahap Running

Perlakuan	COD Influen (mg/L)	COD Anaerob (mg/L)	COD Anaerob-Aerob (mg/L)
Anaerob1 hari+Aerob 1 Hari (R1)	3937	1770	1437
Anaerob 2 hari+Aerob 1 Hari (R2-1)	3937	1453	1310
Anaerob 2 hari + Aerob 2 Hari (R2-2)	3937	1453	1181
Anaerob 3 hari + Aerob 1 Hari (R3-1)	3937	1293	1211
Anaerob 3 hari+ Aerob 2 Hari (R3-2)	3937	1293	1094
Anaerob 3 hari +Aerob 3 Hari (R3-3)	3937	1293	1037
Anaerob 3 hari+Aerob 39 hari (R3-4)	3937	1293	697

- Contoh perhitungan COD perlakuan R1 pada tahap running:

➔ Influen

Nilai absorbansi pada R1 : Sampel 1 = 0,130 dan Sampel 2 = 0,128

Faktor pengenceran (fp) adalah 10 kali

Persamaan regresi  $y = 0.0003x + 0.0109$

➤ Sampel 1

$$\text{Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.130-0.0109}{0.0003} \times 10 = 3970$$

➤ Sampel 2

$$\text{➤ Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.128-0.0109}{0.0003} \times 10 = 3903$$

$$\text{Kadar COD hari ke-0} = \frac{\text{Sampel 1} + \text{sampel 2}}{2} = \frac{3970 + 3903}{2} = 3937 \text{ mg/L}$$

➔ Anaerob

Nilai absorbansi pada R1 : Sampel 1 = 0,064 dan Sampel 2 = 0,064

Faktor pengenceran (fp) adalah 10 kali

Persamaan regresi  $y = 0.0003x + 0.0109$

➤ Sampel 1

$$\text{Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.064-0.0109}{0.0003} \times 10 = 1770$$

➤ Sampel 2

$$\text{Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.064-0.0109}{0.0003} \times 10 = 1770$$

$$\text{Kadar COD Anaerob} = \frac{\text{Sampel 1} + \text{sampel 2}}{2} = \frac{1770 + 1770}{2} = 1770 \text{ mg/L}$$

➔ Anaerob-Aerob

Nilai absorbansi pada R1 : Sampel 1 = 0,056 dan Sampel 2 = 0,056

Faktor pengenceran (fp) adalah 10 kali

Persamaan regresi  $y = 0.0003x + 0.0109$

➤ Sampel 1

$$\text{Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.056-0.0109}{0.0003} \times 10 = 1503$$

➤ Sampel 2

$$\text{Nilai COD (mg/L)} = \frac{y-0.0109}{0.0003} \times fp = \frac{0.052-0.0109}{0.0003} \times 10 = 1370$$

$$\text{Kadar COD R1 Anaerob-aerob} = \frac{\text{Sampel 1} + \text{sampel 2}}{2} = \frac{1503 + 1370}{2} = 1437 \text{ mg/L}$$

➔ Pengujian BOD

➤ Tahap Running

Perlakuan	BOD Influen (mg/L)	BOD Anaerob (mg/L)	BOD Anaerob-Aerob (mg/L)
Anaerob 1 hari + Aerob 1 Hari (R1)	501.4	366	231
Anaerob 2 hari + Aerob 1 Hari (R2-1)	501.4	212	193
Anaerob 2 hari + Aerob 2 Hari (R2-2)	501.4	212	174

Anaerob 3 hari + Aerob 1 Hari (R3-1)	501.4	193	174
Anaerob 3 hari+ Aerob 2 Hari (R3-2)	501.4	193	154
Anaerob 3 hari +Aerob 3 Hari (R3-3)	501.4	193	135

- Contoh perhitungan BOD perlakuan R1 pada tahap running:

➔ Influen

mL titrasi  $\text{Na}_2\text{S}_2\text{O}_3$  blanko 0 hari = 2,3 ml, sampel 0 hari = 2.2, sampel 2 0 hari = 2.1

mL titrasi  $\text{Na}_2\text{S}_2\text{O}_3$  blanko 5 hari = 2,3 ml, sampel 1 5 hari = 0.8, sampel 2 5 hari = 0.9

Normalitas  $\text{Na}_2\text{S}_2\text{O}_3 = 0.0243$

$$F = \frac{250}{250-2} = 1.008065$$

➤ DO (*Dissolved Oxygen*)

- Blanko

$$\text{Nilai DO}_0 = \frac{1000 \times A_0 \times N \times 8 \times F}{50} = \frac{1000 \times 2.3 \times 0.0243 \times 8 \times 1.008065}{50} = 8.87$$

$$\text{Nilai DO}_5 = \frac{1000 \times A_5 \times N \times 8 \times F}{50} = \frac{1000 \times 2.3 \times 0.0243 \times 8 \times 1.008065}{50} = 8.87$$

- Sampel 1

$$\text{Nilai DO}_0 = \frac{1000 \times A_0 \times N \times 8 \times F}{50} = \frac{1000 \times 2.2 \times 0.0243 \times 8 \times 1.008065}{50} = 8.49$$

$$\text{Nilai DO}_5 = \frac{1000 \times A_5 \times N \times 8 \times F}{50} = \frac{1000 \times 0.8 \times 0.0243 \times 8 \times 1.008065}{50} = 3.09$$

- Sampel 2

$$\text{Nilai DO}_0 = \frac{1000 \times A_0 \times N \times 8 \times F}{50} = \frac{1000 \times 2.1 \times 0.0243 \times 8 \times 1.008065}{50} = 8.1$$

$$\text{Nilai DO}_5 = \frac{1000 \times A_5 \times N \times 8 \times F}{50} = \frac{1000 \times 0.9 \times 0.0243 \times 8 \times 1.008065}{50} = 3.47$$

➤ BOD<sub>5</sub>

- Sampel 1

$$\text{Nilai BOD} = \frac{(A1-A2) - \left(\frac{B1-B2}{VB}\right)Vc}{P} = \frac{(8.49-3.09) - \left(\frac{8.87-8.87}{1}\right)1}{0.01} = 539,97 \text{ mg/L}$$

- Sampel 2

$$\text{Nilai BOD} = \frac{(A1-A2) - \left(\frac{B1-B2}{VB}\right)Vc}{P} = \frac{(8.1-3.47) - \left(\frac{8.87-8.87}{1}\right)1}{0.01} = 462.83 \text{ mg/L}$$

➤ Kadar BOD<sub>5</sub> Influen

$$= \frac{\text{BOD Sampel 1} + \text{BOD sampel 2}}{2} = \frac{539.97 + 462.83}{2} = 501.4 \text{ mg/L}$$

➔ Pengujian TSS

Perlakuan	TSS Influen (mg/L)	TSS Anaerob (mg/L)	TSS Anaerob-Aerob (mg/L)
Anaerob 1 hari + Aerob 1 Hari (R1)	1462	1406	506
Anaerob 2 hari + Aerob 1 Hari (R2-1)	1462	1224	972
Anaerob 2 hari + Aerob 2 Hari (R2-2)	1462	1224	608
Anaerob 3 hari + Aerob 1 Hari (R3-1)	1462	1222	528
Anaerob 3 hari + Aerob 2 Hari (R3-2)	1462	1222	470
Anaerob 3 hari + Aerob 3 Hari (R3-3)	1462	1222	452

• Contoh perhitungan TSS perlakuan R1 pada tahap running:

➤ Influen

Berat kosong sampel 1 = 1127.1 mg , sampel 2 = 1135.8 mg

Berat kosong+isi sampel 1 = 1159.8 mg, sampel 2 = 1176.2 mg

Volume contoh uji = 25 mL

- Sampel 1

$$\text{Mg TSS per liter} = \frac{(A-B) \times 1000}{\text{Volume contoh uji mL}} = \frac{(1159.8 - 1127.1) \times 1000}{25} = 1308 \text{ mg/L}$$

- Sampel 2

$$\text{Mg TSS per liter} = \frac{(A-B) \times 1000}{\text{Volume contoh uji mL}} = \frac{(1176.2 - 1135.8) \times 1000}{25} = 1616 \text{ mg/L}$$

$$\text{TSS Influen} = \frac{\text{TSS Sampel 1} + \text{TSS sampel 2}}{2} = \frac{1308 + 1616}{2} = 1462 \text{ mg/L}$$

➤ Anaerob

Berat kosong sampel 1 = 1110.1 mg , sampel 2 = 1103.3 mg

Berat kosong+isi sampel 1 = 1147.3 mg, sampel 2 = 1136.4 mg

Volume contoh uji = 25 mL

- Sampel 1

$$\text{Mg TSS per liter} = \frac{(A-B) \times 1000}{\text{Volume contoh uji mL}} = \frac{(1147.3-1110.1) \times 1000}{25} = 1488 \text{ mg/L}$$

- Sampel 2

$$\text{Mg TSS per liter} = \frac{(A-B) \times 1000}{\text{Volume contoh uji mL}} = \frac{(1136.4-1103.3) \times 1000}{25} = 1324 \text{ mg/L}$$

$$\text{TSS Anaerob} = \frac{\text{TSS Sampel 1} + \text{TSS sampel 2}}{2} = \frac{1488 + 1324}{2} = 1406 \text{ mg/L}$$

➤ Anaerob-Aerob

Berat kosong sampel 1 = 1075.3 mg , sampel 2 = 1076.7mg

Berat kosong+isi sampel 1 = 1089.1 mg, sampel 2 = 1088.2 mg

Volume contoh uji = 25 mL

- Sampel 1

$$\text{Mg TSS per liter} = \frac{(A-B) \times 1000}{\text{Volume contoh uji mL}} = \frac{(1089.1-1075.3) \times 1000}{25} = 552 \text{ mg/L}$$

- Sampel 2

$$\text{Mg TSS per liter} = \frac{(A-B) \times 1000}{\text{Volume contoh uji mL}} = \frac{(1088.2-1076.7) \times 1000}{25} = 460 \text{ mg/L}$$

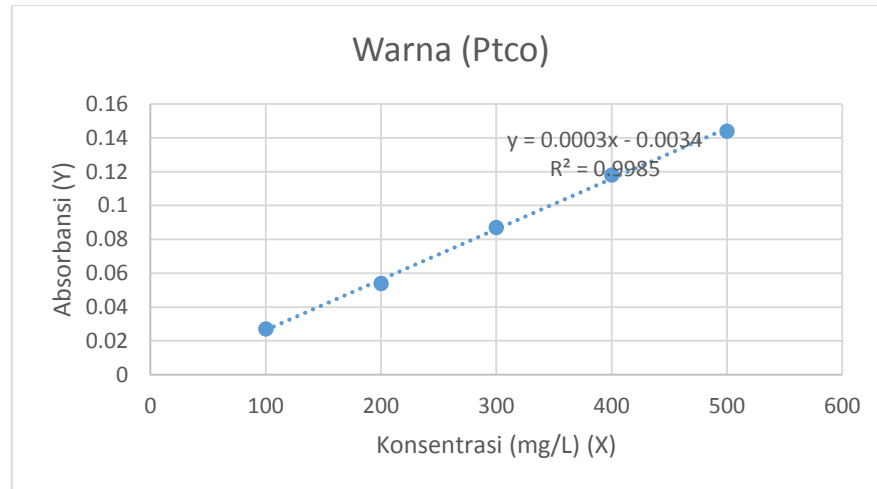
$$\text{TSS Anaerob-Aerob} = \frac{\text{TSS Sampel 1} + \text{TSS sampel 2}}{2} = \frac{552 + 460}{2} = 506 \text{ mg/L}$$

➔ Pengujian Warna (PtCo)

Pengujian Regresi Warna (PtCo)

No	Konsentrasi	Absorbansi
1	100	0.027
2	200	0.054
3	300	0.087
4	400	0.118
5	500	0.144
Jumlah	1500	0.43

Rata-rata	300	0.086
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➤ Tahap Running

Perlakuan	Warna (PtCo) Influen (mg/L)	Warna (PtCo) Anaerob (mg/L)	Warna (PtCo) Anaerob-Aerob (mg/L)
Anaerob1 hari+Aerob 1 Hari (R1)	2180	1213	1180
Anaerob 2 hari+Aerob 1 Hari (R2-1)	2180	1113	1080
Anaerob 2 hari + Aerob 2 Hari (R2-2)	2180	1113	1030
Anaerob 3 hari + Aerob 1 Hari (R3-1)	2180	1063	1047
Anaerob 3 hari+ Aerob 2 Hari (R3-2)	2180	1063	865
Anaerob 3 hari +Aerob 3 Hari (R3-3)	2180	1063	1015

- Contoh perhitungan Warna (PtCo) perlakuan R1 pada tahap running:

➔ Influen

Nilai absorbansi pada R1 : Sampel 1 = 0,062 dan Sampel 2 = 0,062

Faktor pengenceran (fp) adalah 10 kali

Persamaan regresi  $y = 0.0003x - 0.0034$

➤ Sampel 1

$$\text{Nilai Warna (PtCo) (mg/L)} = \frac{y+0.0034}{0.0003} \times fp = \frac{0.062+0.0034}{0.0003} \times 10 = 2180$$



➤ Sampel 2

$$\text{Nilai Warna (PtCo) (mg/L)} = \frac{y+0.0034}{0.0003} xfp = \frac{0.062+0.0034}{0.0003} x10 = 2180$$

$$\begin{aligned} \text{Warna (PtCo) Influen} &= \frac{\text{WarnaSampel 1}+\text{Warna sampel 2}}{2} \\ &= \frac{2180+2180}{2} = 1213 \text{ mg/L} \end{aligned}$$

➔ Anaerob

Nilai absorbansi pada R1 : Sampel 1 = 0,034 dan Sampel 2 = 0,032

Faktor pengenceran (fp) adalah 10 kali

Persamaan regresi  $y = 0.0003x - 0.0034$

➤ Sampel 1

$$\text{Nilai Warna (PtCo) (mg/L)} = \frac{y+0.0034}{0.0003} xfp = \frac{0.034+0.0034}{0.0003} x10 = 1247$$

➤ Sampel 2

$$\text{Nilai Warna (PtCo) (mg/L)} = \frac{y+0.0034}{0.0003} xfp = \frac{0.032+0.0034}{0.0003} x10 = 1180$$

$$\begin{aligned} \text{Warna (PtCo) Anaerob} &= \frac{\text{WarnaSampel 1}+\text{Warna sampel 2}}{2} \\ &= \frac{1247+1180}{2} = 1213 \text{ mg/L} \end{aligned}$$

➔ Anaerob-Aerob

Nilai absorbansi pada R1 : Sampel 1 = 0,033 dan Sampel 2 = 0,031

Faktor pengenceran (fp) adalah 10 kali

Persamaan regresi  $y = 0.0003x - 0.0034$

➤ Sampel 1

$$\text{Nilai Warna (PtCo) (mg/L)} = \frac{y+0.0034}{0.0003} xfp = \frac{0.033+0.0034}{0.0003} x10 = 1213$$

➤ Sampel 2

$$\text{Nilai Warna (PtCo) (mg/L)} = \frac{y+0.0034}{0.0003} xfp = \frac{0.031+0.0034}{0.0003} x10 = 1147$$

$$\begin{aligned} \text{Warna (PtCo) Anaerob} &= \frac{\text{Warna Sampel 1} + \text{Warna sampel 2}}{2} \\ &= \frac{1213 + 1147}{2} = 1180 \text{ mg/L} \end{aligned}$$

➔ Pengukuran pH dan Temperatur

➤ Tahap Seeding

Tanggal	pH	Temperatur (Celcius)
19-Apr-18	2.9	27-28
20-Apr-18	3.1	27-28
21-Apr-18	3.2	27-28
22-Apr-18	3.4	27-28
23-Apr-18	3.5	27-28
24-Apr-18	3.6	27-28
25-Apr-18	3.7	27-28
26-Apr-18	3.9	27-28
27-Apr-18	4.1	27-28
28-Apr-18	4.3	27-28

➤ Tahap Aklimatisasi

Waktu	pH	Temperatur	Keterangan
30-Apr	5.7	28.8	Sudah terbentuk biofilm
1-May	5.7	28.8	Sudah terbentuk biofilm
2-May	5.6	28.8	Sudah terbentuk biofilm
3-May	5.6	28.8	Sudah terbentuk biofilm
4-May	5.5	28.7	Sudah terbentuk biofilm
5-May	5.5	28.8	Sudah terbentuk biofilm
6-May	5.5	28.7	Sudah terbentuk biofilm
7-May	5.6	28.7	Sudah terbentuk biofilm
8-May	5.6	28.8	Sudah terbentuk biofilm
9-May	5.6	28.8	Sudah terbentuk biofilm
10-May	5.6	28.8	Sudah terbentuk biofilm
11-May	5.6	28.8	Sudah terbentuk biofilm
14-May	4.3	27.6	Sudah terbentuk biofilm
15-May	4.7	27.8	Sudah terbentuk biofilm
16-May	5.1	27.4	Sudah terbentuk biofilm