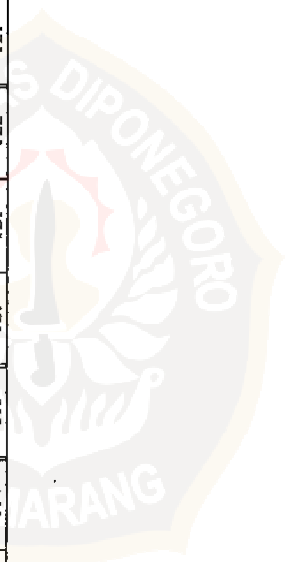


LAMPIRAN



Lamp. 1
Populasi *Chlorella sp* pada Uji Pendahuluan

Periakan Hari ke	A (0,0702 ppm)			B (1,0702 ppm)			C (1,5702 ppm)			D (2,0702 ppm)			E (2,5702 ppm)			rata rata			
	A1	A2	A3	B1	B2	B3	rata - rata	C1	C2	C3	rata - rata	D1	D2	D3	rata - rata		E1	E2	E3
1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2	30	32	25	29	31	32	32	24	26	22	24	26	30	28	28	28	28	32	30
3	40	50	45	45	44	45	44	45	46	44	45	44	43	45	44	44	46	45	45
4	45	55	50	48	49	50	49	50	56	44	50	53	51	55	53	48	51	49	49
5	57	60	54	57	47	53	50	59	55	63	59	56	55	57	56	45	55	50	50
6	58	62	60	60	55	59	57	60	66	54	60	59	58	60	59	50	56	53	53
7	63	65	64	64	69	67	65	68	69	67	68	63	59	65	62	53	59	56	56
8	81	82	80	81	88	90	92	88	102	96	99	71	68	74	71	55	63	59	59
9	93	95	91	93	114	114	115	114	121	115	118	79	77	81	79	61	62	63	62
10	108	116	109	111	116	118	119	118	135	127	131	83	81	85	83	69	73	71	71
11	118	125	120	121	134	146	140	140	147	150	144	97	94	100	97	76	82	79	79
12	126	128	127	127	141	143	145	143	150	152	148	104	102	106	104	81	85	83	83
13	135	136	134	135	148	149	150	149	166	169	163	114	110	118	114	94	100	97	97
14	118	125	120	121	141	141	140	141	157	160	154	110	111	110	110	91	95	93	93
15	117	118	116	117	140	140	140	140	152	153	151	108	107	109	108	91	93	92	92
16	116	118	117	116	134	134	135	134	141	144	138	102	99	105	102	85	89	87	87
17	115	114	117	115	127	130	133	130	139	141	137	101	100	102	101	77	55	81	81
18	104	108	103	105	119	122	125	122	132	135	129	99	98	100	99	67	75	71	71
19	104	109	102	105	117	119	120	119	129	131	127	96	95	97	96	51	50	50	50
20	95	95	96	95	113	115	117	115	122	125	119	93	92	95	93	42	44	43	43
21	87	93	90	90	111	113	114	113	121	121	122	85	86	85	55	35	36	35	35



Lamp. 2
Populasi *Chlorella* S1 pada Uji Utara

Perolehan Uji ke-	A (0,0702 ppm)			B (1,0702 ppm)			C (1,5702 ppm)			D (2,0702 ppm)			E (2,5702 ppm)			F (2,0702 ppm)			rata-rata
	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	F1	F2	F3	
1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2	18	20	12	15	25	15	17	19	14	14	10	11	18	10	20	15	20	10	14
3	35	43	19	31	26	32	30	24	32	26	29	23	27	25	25	25	22	15	23
4	43	48	40	44	38	41	45	41	38	50	40	34	36	50	38	33	34	34	51
5	46	47	48	50	54	46	50	51	51	59	51	51	59	55	55	54	53	59	51
6	57	50	56	54	66	59	53	56	57	59	57	61	63	62	62	61	60	61	59
7	63	65	57	65	93	70	62	66	69	73	69	65	67	67	64	64	60	64	61
8	77	80	83	80	111	98	88	93	89	101	98	97	103	78	76	78	69	73	71
9	91	95	99	95	114	109	93	101	98	113	113	45	123	91	90	90	81	73	73
10	110	111	110	110	108	113	105	108	119	123	119	126	138	109	108	107	82	84	84
11	115	120	125	120	123	125	121	123	140	134	140	145	149	147	115	115	95	99	97
12	125	125	131	128	130	136	124	130	150	141	150	150	160	155	116	117	100	108	104
13	135	140	145	140	145	147	143	145	165	166	170	164	176	170	123	122	102	118	119
14	118	121	124	121	130	136	124	130	141	136	146	153	161	157	120	115	108	110	109
15	115	117	119	117	126	129	123	126	140	137	143	148	156	152	116	122	111	108	105
16	114	116	118	116	120	121	119	120	134	135	136	137	147	142	114	116	111	104	102
17	113	115	118	115	121	123	119	121	150	127	134	137	143	140	109	108	98	101	107
18	105	108	110	108	115	119	111	115	122	116	126	122	129	137	101	93	101	87	99
19	101	105	109	105	109	112	106	109	119	115	123	119	127	131	100	102	106	86	96
20	96	98	100	98	104	108	100	104	115	113	117	118	126	122	95	96	20	93	85
21	91	95	99	95	98	99	97	98	113	113	114	117	125	121	90	85	87	33	85



Lampiran 3. Data Rata – rata Faktor Fisika dan Kimia Air Media pada Uji Utama

Hari Ke	Temperatur (°C)	pH	DO (ppm)
1	28	7,03	6,5
2	29	7,02	6,9
3	29	7,05	6,9
4	27	7,02	6,8
5	27	7,07	6,9
6	27	7,02	7,3
7	27	7,01	7,8
8	27	6,89	8,3
9	28	6,86	8,5
10	28	6,77	8,9
11	28	6,62	9,1
12	29	6,25	9,3
13	28	6,06	9,6
14	30	6,31	5,5
15	28	6,63	5,4
16	28	6,87	5,4
17	27	6,99	5,4
18	28	6,97	5,3
19	26	6,98	5,0
20	28	6,97	4,9
21	28	6,97	4,5

Lampiran 4. Transformasi Persentase Penurunan Konsentrasi Logam Berat Cd oleh *Chlorella* sp dengan Arc sin dan analisis dengan Anova

Perlakuan	Ulangan			Total	Rata -rata
	U1	U2	U3		
A	27,3	26,7	27,3	81,3	27,1
B	27,5	27,5	27,5	82,5	27,5
C	32	31,7	32	95,7	31,90
D	33,44	33,88	33,44	100,76	33,59
E	26,80	26,80	27,15	80,75	26,92
F	26,14	26,14	25,93	78,21	26,07
Total				519,22	

Perhitungan Anova Persentase Penurunan Konsentrasi Logam Berat Cd oleh *Chlorella* sp yang telah ditransformasi.

$$FK = \frac{Y^2}{n}$$

$$= \frac{(519,22)^2}{18} = 14977,18936$$

$$JKT = \sum_{ij} y_{ij}^2 - FK$$

$$= \{ (27,3)^2 + \dots + (25,93)^2 \} - 14977,18936$$

$$= 144,80884$$

$$\begin{aligned}
 JKP &= \frac{\sum x_{ij}^2}{n} - FK \\
 &= \frac{(81,3)^2}{3} + \dots + \frac{(78,21)^2}{3} - 14977,18936 \\
 &= 144,26
 \end{aligned}$$

$$\begin{aligned}
 JKG &= JKT - JKP \\
 &= 144,80884 - 144,26 \\
 &= 0,54884
 \end{aligned}$$

$$\text{db Total} = n-1 = 17$$

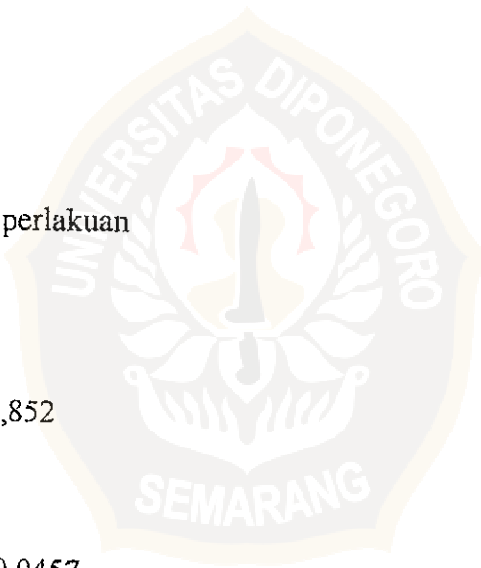
$$\text{db perlakuan} = t-1 = 5$$

$$\begin{aligned}
 \text{db Galat} &= \text{db total} - \text{db perlakuan} \\
 &= 17-5 = 12
 \end{aligned}$$

$$KTP = \frac{JKP}{dbP} = \frac{144,26}{5} = 28,852$$

$$KTG = \frac{JKG}{dbG} = \frac{0,54884}{12} = 0,0457$$

$$F_{hitung} = \frac{KTP}{KTG} = \frac{28,852}{0,0457} = 631,33$$



Tabel 06. ANOVA

Sumber Keragaman	db	JK	KT	F. hit	F. tabel
Perlakuan	5	144,26	28,852	631,33**	5% 1%
Galat	12	0,54884	0,0457		
Total	17	144,8088			3,11 5,06

Keterangan : ** : berbeda sangat nyata

$$\begin{aligned}
 KK &= \sqrt{\frac{KTG}{rata-rata\ total}} \times 100\% \\
 &= \sqrt{\frac{0,0457}{28,84}} \times 100\% \\
 &= 3,9\%
 \end{aligned}$$



Lampiran 05. Uji Lanjut Beda Nyata Jujur (BNJ)

$$S_x = \sqrt{\frac{KTG}{n}}$$

$$= 0,1234$$

$$\text{Nilai } W = q(t, dbG, S_x)$$

$$= 6,10 \times 0,1234$$

$$= 0,7798$$

Tabel Perbandingan Antar Perlakuan

Perlakuan	Nilai Tengah	Selisih Nilai Tengah					
D	33,59	-					
C	31,90	1,69**	-				
B	27,50	6,09**	4,4**	-			
A	27,1	6,49**	4,18**	0,4	-		
E	26,92	6,67**	4,98**	0,58	0,18	-	
F	26,07	7,52**	5,83**	1,43**	1,03**	0,85**	-

Keterangan : ** = Berbeda sangat nyata

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.960946978
R Square	0.923419094
Adjusted R Square	0.918632787
Standard Error	1.221882832
Observations	18

ANOVA

	df	SS	MS	F	Significance F
Regression	1	288.0430875	288.0430875	192.92936	2.40648E-10
Residual	16	23.88796248	1.492997655		
Total	17	311.93105			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-7.504947647	2.243198813	-3.345645337	0.0041048	-12.26031562	-2.749579671	-12.26031562	-2.74958
X Variable 1	0.307802467	0.022160162	13.8899015	2.406E-10	0.260825033	0.354779901	0.260825033	0.35478



Lampiran 07. Perhitungan Persentase Penurunan Konsentrasi Logam Berat

Cd

Cd awal (ppm)	Cd akhir (ppm)	Penurunan	Persentase penurunan	Rata-rata % penurunan
A1(0,0702)	0,0554	0,0148	21,15 %	21,06 %
A2(0,0702)	0,0556	0,0146	20,90 %	
A3(0,0702)	0,0554	0,0148	21,13 %	
B1(1,0702)	0,8410	0,2292	21,41 %	21,38 %
B2(1,0702)	0,8420	0,2282	21,32 %	
B3(1,0702)	0,8410	0,2292	21,41 %	
C1(1,3202)	0,9494	0,3708	28,09 %	27,5 %
C2(1,3202)	0,9552	0,3650	27,65 %	
C3(1,3202)	0,9670	0,3532	26,76 %	
D1(1,5702)	1,0932	0,4771	30,38 %	30,61 %
D2(1,5702)	1,0822	0,4881	31,08 %	
D3(1,5702)	1,0932	0,4771	30,38 %	
E1(1,8202)	1,4500	0,3702	20,33 %	20,49 %
E2(1,5702)	1,4500	0,3702	20,33 %	
E3(1,8202)	1,4410	0,3792	20,83 %	
F1(2,0702)	1,6680	0,4022	19,42 %	19,32 %
F2(2,0702)	1,6682	0,4020	19,41 %	
F3(2,0702)	1,6740	0,3962	19,13 %	



DEPARTEMEN KESEHATAN R.I.
DIREKTORAT JENDERAL PEMBERANTASAN PENYAKIT MENULAR DAN
PENYEHATAN LINGKUNGAN PEMUKIMAN
BALAI TEKNIK KESEHATAN LINGKUNGAN

JALAN POLOWIJAN NO. 11, TELP. (0274) 376288, FAX. 384637, YOGYAKARTA 55133

PEMERIKSAAN KIMIA DI LABORATORIUM PPAC

Jenis air : Air Laut.

Asal sample : Kusrinah

Mhs.UNDIP Semarang.

Dikirim/diambil oleh : Kusrinah

Mhs.MIPA UNDIP Semarang.

Diambil/diterima tgl : 18/19 -12-2000

Kode no.lab :

9236 C. Kode A1

9237 C. Kode A2

9238 C. Kode A3

9239 C. Kode B1

9240 C. Kode B2

9241 C. Kode B3

9242 C. Kode C1

9243 C. Kode C2

9244 C. Kode C3

9245 C. Kode D1

9246 C. Kode D2

9247 C. Kode D3

9248 C. Kode E1

9249 C. Kode E2

9250 C. Kode E3

9251 C. Kode F1

9252 C. Kode F2

9253 C. Kode F3

9276 C. Kode Air laut

Pemeriksaan air Laut (parameter permintaan)

No	No.Lab. Kode	Hasil analisa Kadmium (Cd) (mg/l)	No	No.Lab. Kode	Hasil analisa Kadmium (Cd) (mg/l)
1.	9236 C	0,0554	11.	9246 C	1,0822
2.	9237 C	0,0556	12.	9247 C	1,0932
3.	9238 C	0,0554	13.	9248 C	1,4500
4.	9239 C	0,8410	14.	9249 C	1,4500
5.	9240 C	0,8420	15.	9250 C	1,4410
6.	9241 C	0,8410	16.	9251 C	1,6680
7.	9242 C	0,9494	17.	9252 C	1,6682
8.	9243 C	0,9552	18.	9253 C	1,6740
9.	9244 C	0,9670			
10.	9245 C	1,0932	19.	9276 C	0,0702

Yogyakarta, 4 Januari 2001

Mengetahui
Kepala Balai Teknik Kesehatan
Lingkungan Yogyakarta

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