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Lampiran 1. Hasil analisis sidik ragam terhadap parameter SVI

Kombinasi	Ulangan			TOTAL	RERATA
	I	II	III		
A1B1C1	47	51	50	148	49,3
A1B1C2	37	42	40	119	39,7
A1B1C3	36	37	38	111	37
A1B2C1	40	39	41	120	40
A1B2C2	37	37	38	112	37,5
A1B2C3	36	34	33	103	34,3
A1B3C1	38	40	39	117	39
A1B3C2	34	33	37	104	34,7
A1B3C3	29	31	29	89	29,7
A2B1C1	35	34	35	104	34,7
A2B1C2	34	34	33	101	33,7
A2B1C3	31	30	32	93	31
A2B2C1	32	33	33	98	32,5
A2B2C2	25	32	30	87	29
A2B2C3	20	19	17	57	19
A2B3C1	31	30	30	91	30,3
A2B3C2	22	21	19	62	20,7
A2B3C3	16	18	17	51	17
A3B1C1	45	46	47	138	46
A3B1C2	40	40	42	122	40,7
A3B1C3	39	38	40	117	39
A3B2C1	38	40	40	118	39,3
A3B2C2	38	40	37	115	38,3
A3B2C3	36	37	36	109	36,3
A3B3C1	39	35	37	111	37
A3B3C2	35	35	36	106	35,3
A3B3C3	34	32	35	101	33,7
A4B1C1	38	35	37	110	36,7
A4B1C2	30	32	31	93	31
A4B1C3	28	28	26	82	27,3
A4B2C1	32	35	37	104	34,7
A4B2C2	32	29	28	89	29,7
A4B2C3	25	24	26	75	25
A4B3C1	36	34	30	100	33,3
A4B3C2	27	25	24	76	25,3
A4B3C3	23	22	23	68	22,7
TOTAL	1195,6	1201,8	1203,4	3600,83	33,3

SK	DB	JK	KT	F. HITUNG	F. TABEL		
					0,05	0,01	
PERLAKUAN	35	5213,9163	148,97	63,68	1,59	1,92	**
A	3	2560,08	853,36	364,79	2,73	4,07	**
B	2	960,31	480,15	205,25	3,12	4,91	**
C	2	1280,86	640,43	273,77	3,12	4,91	**
A x B	6	88,97	14,83	6,34	2,23	3,06	**
A x C	6	106,26	17,71	7,57	2,23	3,06	**
B x C	4	34,28	8,57	3,66	2,5	3,59	**
A x B x C	12	183,17	15,26	6,52	1,89	2,44	**
ACAK	72	168,43	2,34				
TOTAL	107	5.382,35					

KK = 4,58%

Lampiran 2. Persentase penurunan SVI dari nilai uji awal dengan nilai uji akhir penelitian

Kombinasi	Nilai Awal (ml/gr)	Nilai Akhir (ml/gr)	Persentase Penurunan (%)	Penurunan
A1B1C1	109	49,3	-54,77	-0,55
A1B1C2	109	39,7	-63,58	-0,64
A1B1C3	109	37	-66,06	-0,66
A1B2C1	109	40	-63,30	-0,63
A1B2C2	109	37,5	-65,60	-0,66
A1B2C3	109	34,3	-68,53	-0,69
A1B3C1	109	39	-64,22	-0,64
A1B3C2	109	34,7	-68,17	-0,68
A1B3C3	109	29,7	-72,75	-0,73
A2B1C1	109	34,7	-68,17	-0,68
A2B1C2	109	33,7	-69,08	-0,69
A2B1C3	109	31	-71,56	-0,72
A2B2C1	109	32,5	-70,18	-0,70
A2B2C2	109	29	-73,39	-0,73
A2B2C3	109	19	-82,57	-0,83
A2B3C1	109	30,3	-72,20	-0,72
A2B3C2	109	20,7	-81,01	-0,81
A2B3C3	109	17	-84,40	-0,84
A3B1C1	109	46	-57,80	-0,58
A3B1C2	109	40,7	-62,66	-0,63
A3B1C3	109	39	-64,22	-0,64
A3B2C1	109	39,3	-63,94	-0,64
A3B2C2	109	38,3	-64,86	-0,65
A3B2C3	109	36,3	-66,70	-0,67
A3B3C1	109	37	-66,06	-0,66
A3B3C2	109	35,3	-67,61	-0,68
A3B3C3	109	33,7	-69,08	-0,69
A4B1C1	109	36,7	-66,33	-0,66
A4B1C2	109	31	-71,56	-0,72
A4B1C3	109	27,3	-74,95	-0,75
A4B2C1	109	34,7	-68,17	-0,68
A4B2C2	109	29,7	-72,75	-0,73
A4B2C3	109	25	-77,06	-0,77
A4B3C1	109	33,3	-69,45	-0,69
A4B3C2	109	25,3	-76,79	-0,77
A4B3C3	109	22,7	-79,17	-0,79

Lampiran 3. Hasil analisis sidik ragam terhadap parameter DO

Kombinasi	Ulangan			TOTAL	RERATA
	I	II	III		
A1B1C1	0,83	0,8	0,85	2,48	0,83
A1B1C2	0,73	0,74	0,71	2,18	0,73
A1B1C3	0,69	0,7	0,72	2,11	0,7
A1B2C1	0,87	0,87	0,87	2,61	0,87
A1B2C2	0,83	0,84	0,83	2,5	0,83
A1B2C3	0,73	0,75	0,72	2,2	0,73
A1B3C1	0,97	0,96	0,98	2,91	0,97
A1B3C2	0,87	0,86	0,88	2,61	0,87
A1B3C3	0,77	0,74	0,79	2,3	0,77
A2B1C1	1,3	1,29	1,31	3,9	1,3
A2B1C2	1,2	1,22	1,19	3,61	1,2
A2B1C3	1	1,03	1,02	3,05	1,02
A2B2C1	1,4	1,42	1,39	4,21	1,4
A2B2C2	1,27	1,27	1,28	3,82	1,27
A2B2C3	1,1	1,16	1,05	3,31	1,1
A2B3C1	1,47	1,41	1,52	4,4	1,47
A2B3C2	1,37	1,35	1,39	4,11	1,37
A2B3C3	1,13	1,11	1,14	3,38	1,13
A3B1C1	1,64	1,63	1,61	4,88	1,63
A3B1C2	1,43	1,41	1,45	4,29	1,43
A3B1C3	1,2	1,22	1,19	3,61	1,2
A3B2C1	2	2,05	2,07	6,12	2,04
A3B2C2	1,63	1,64	1,61	4,88	1,63
A3B2C3	1,43	1,42	1,45	4,3	1,43
A3B3C1	2,1	2,11	2,09	6,3	2,1
A3B3C2	1,83	1,87	1,8	5,5	1,83
A3B3C3	1,77	1,8	1,75	5,32	1,77
A4B1C1	2,16	2,17	2,18	6,51	2,17
A4B1C2	1,87	1,91	1,83	5,61	1,87
A4B1C3	1,6	1,61	1,59	4,8	1,6
A4B2C1	2,5	2,59	2,4	7,49	2,5
A4B2C2	2,3	2,33	2,28	6,91	2,3
A4B2C3	2	2,1	2,05	6,15	2,05
A4B3C1	2,75	2,79	2,7	8,24	2,75
A4B3C2	2,67	2,68	2,66	8,01	2,67
A4B3C3	2,6	2,63	2,58	7,81	2,6
TOTAL	54,01	54,48	53,93	162,42	1,5

SK	DB	JK	KT	F. HITUNG	F. TABEL		
					0,05	0,01	
PERLAKUAN	35	38,135	1,09	1262,6	**1,59**	**1,92**	**
A	3	31,68	10,56	12236	**2,73**	**4,07**	**
B	2	2,67	1,34	1549	**3,12**	**4,91**	**
C	2	1,91	0,95	1103,8	**3,12**	**4,91**	**
A x B	6	1,38	0,23	265,56	**2,23**	**3,06**	**
A x C	6	0,26	0,04	50,36	**2,23**	**3,06**	**
B x C	4	0,05	0,01	14,07	**2,5**	**3,59**	**
A x B x C	12	0,19	0,02	18,79	**1,89**	**2,44**	**
ACAK	72	0,06	0				
TOTAL	107	38,197					

KK = 1,95 %

Lampiran 4. Persentase kenaikan DO dari nilai uji awal dengan nilai uji akhir penelitian

Kombinasi	Nilai Awal (ml/gr)	Nilai Akhir (ml/gr)	Persentase Kenaikan (%)	Kenaikan
A1B1C1	0,4	0,83	107,5	1,08
A1B1C2	0,4	0,73	82,5	0,83
A1B1C3	0,4	0,7	75,0	0,75
A1B2C1	0,4	0,87	117,5	1,18
A1B2C2	0,4	0,83	107,5	1,08
A1B2C3	0,4	0,73	82,5	0,83
A1B3C1	0,4	0,97	142,5	1,43
A1B3C2	0,4	0,87	117,5	1,18
A1B3C3	0,4	0,77	92,5	0,93
A2B1C1	0,4	1,3	225,0	2,25
A2B1C2	0,4	1,2	200,0	2,00
A2B1C3	0,4	1,02	155,0	1,55
A2B2C1	0,4	1,4	250,0	2,50
A2B2C2	0,4	1,27	217,5	2,18
A2B2C3	0,4	1,1	175,0	1,75
A2B3C1	0,4	1,47	267,5	2,68
A2B3C2	0,4	1,37	242,5	2,43
A2B3C3	0,4	1,13	182,5	1,83
A3B1C1	0,4	1,63	307,5	3,08
A3B1C2	0,4	1,43	257,5	2,58
A3B1C3	0,4	1,2	200,0	2,00
A3B2C1	0,4	2,04	410,0	4,10
A3B2C2	0,4	1,63	307,5	3,08
A3B2C3	0,4	1,43	257,5	2,58
A3B3C1	0,4	2,1	425,0	4,25
A3B3C2	0,4	1,83	357,5	3,58
A3B3C3	0,4	1,77	342,5	3,43
A4B1C1	0,4	2,17	442,5	4,43
A4B1C2	0,4	1,87	367,5	3,68
A4B1C3	0,4	1,6	300,0	3,00
A4B2C1	0,4	2,5	525,0	5,25
A4B2C2	0,4	2,3	475,0	4,75
A4B2C3	0,4	2,05	412,5	4,13
A4B3C1	0,4	2,75	587,5	5,88
A4B3C2	0,4	2,67	567,5	5,68
A4B3C3	0,4	2,6	550,0	5,50

Lampiran 5. Hasil analisis sidik ragam terhadap parameter MLSS

Kombinasi	Ulangan			TOTAL	RERATA
	I	II	III		
A1B1C1	2.940	2.926	2.350	8.216	2.739
A1B1C2	4.320	3.374	3.360	11.054	3.685
A1B1C3	7.284	6.718	6.328	20.330	6.777
A1B2C1	2.688	3.358	3.888	9.934	3.311
A1B2C2	4.992	4.906	4.418	14.316	4.772
A1B2C3	7.204	7.034	7.212	21.450	7.150
A1B3C1	2.458	2.378	2.248	7.084	2.361
A1B3C2	5.208	4.718	4.756	14.682	4.894
A1B3C3	7.792	5.818	6.986	20.596	6.865
A2B1C1	2.918	3.850	2.884	9.652	3.217
A2B1C2	9.970	10.396	10.330	30.696	10.232
A2B1C3	11.022	11.790	11.040	33.852	11.284
A2B2C1	3.077	3.076	3.074	9.227	3.076
A2B2C2	6.776	5.634	5.004	17.414	5.805
A2B2C3	12.480	12.396	12.586	37.462	12.487
A2B3C1	2.908	3.148	2.612	8.668	2.889
A2B3C2	5.200	5.422	4.258	14.880	4.960
A2B3C3	7.748	7.422	7.122	22.292	7.431
A3B1C1	2.824	3.368	2.870	9.062	3.021
A3B1C2	4.512	5.456	5.292	15.260	5.087
A3B1C3	7.496	8.878	8.432	24.806	8.269
A3B2C1	2.602	3.560	2.912	9.074	3.025
A3B2C2	5.609	5.610	5.611	16.830	5.610
A3B2C3	8.124	8.908	8.614	25.646	8.549
A3B3C1	2.818	3.540	3.116	9.474	3.158
A3B3C2	5.326	5.406	5.734	16.466	5.489
A3B3C3	7.684	8.774	8.900	25.358	8.453
A4B1C1	2.976	2.284	3.220	8.480	2.827
A4B1C2	4.602	4.978	5.108	14.688	4.896
A4B1C3	7.802	7.822	7.781	23.405	7.802
A4B2C1	2.770	2.763	2.766	8.299	2.766
A4B2C2	4.888	5.368	6.302	16.558	5.519
A4B2C3	8.184	8.182	8.192	24.558	8.186
A4B3C1	2.664	2.530	2.980	8.174	2.725
A4B3C2	4.880	5.448	6.656	16.984	5.661
A4B3C3	9.438	8.892	8.172	26.502	8.834
TOTAL	202.184	206.131	203.114	611.429	5.661

SK	DB	JK	KT	F. HITUNG	F. TABEL		
					0,05	0,01	
PERLAKUAN	35	745153468,8	21290099,11	95,04	**1,59**	**1,92**	**
A	3	60796728,25	20265576,08	90,47	**2,73**	**4,07**	**
B	2	6689548,46	3344774,23	14,93	**3,12**	**4,91**	**
C	2	561299924,7	280649962,3	1252,85	**3,12**	**4,91**	**
A x B	6	43139714,94	7189952,49	32,1	**2,23**	**3,06**	**
A x C	6	25407000,5	4234500,08	18,9	**2,23**	**3,06**	**
B x C	4	11116436,7	2779109,18	12,41	**2,5**	**3,59**	**
A x B x C	12	36704115,22	3058676,27	13,65	**1,89**	**2,44**	**
ACAK	72	16128602,67	224008,37				
TOTAL	107	761.282.071,44					

KK = 8,36%

Lampiran 6. Persentase kenaikan MLSS dari nilai uji awal dengan nilai uji akhir penelitian

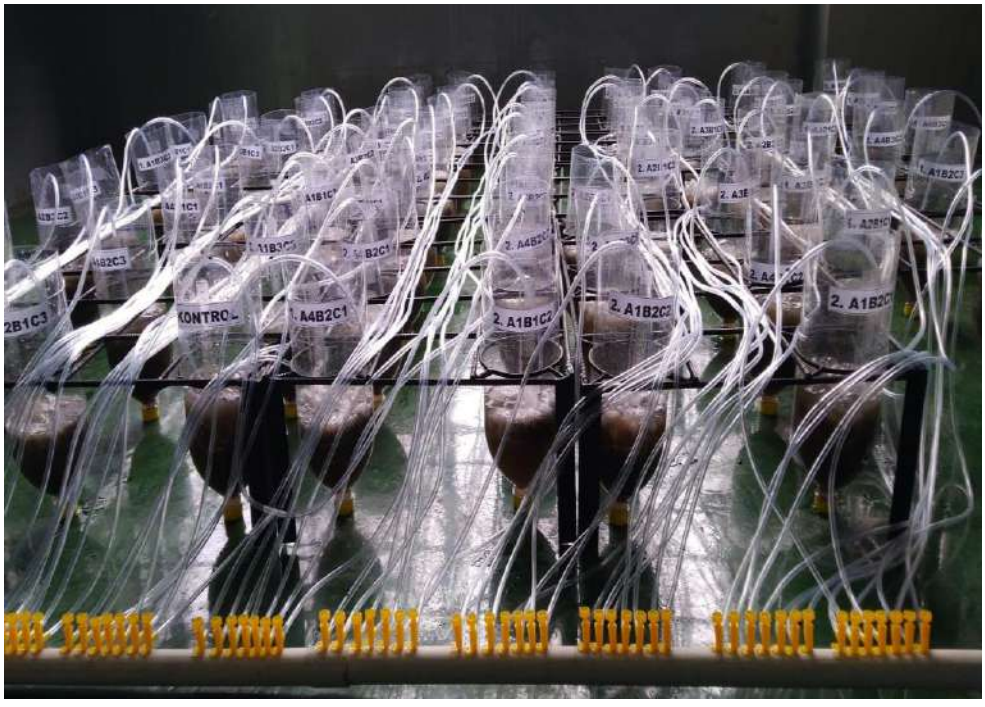
Kombinasi	Nilai Awal (mg/lt)	Nilai Akhir (mg/lt)	Persentase Kenaikan (%)	Kenaikan
A1B1C1	46	2739	5.854	58,54
A1B1C2	46	3685	7.911	79,11
A1B1C3	46	6777	14.633	146,33
A1B2C1	46	3311	7.098	70,98
A1B2C2	46	4772	10.274	102,74
A1B2C3	46	7150	15.443	154,43
A1B3C1	46	2361	5.033	50,33
A1B3C2	46	4894	10.539	105,39
A1B3C3	46	6865	14.824	148,24
A2B1C1	46	3217	6.893	68,93
A2B1C2	46	10232	22.143	221,43
A2B1C3	46	11284	24.430	244,30
A2B2C1	46	3076	6.587	65,87
A2B2C2	46	5805	12.520	125,20
A2B2C3	46	12487	27.046	270,46
A2B3C1	46	2889	6.180	61,80
A2B3C2	46	4960	10.683	106,83
A2B3C3	46	7431	16.054	160,54
A3B1C1	46	3021	6.467	64,67
A3B1C2	46	5087	10.959	109,59
A3B1C3	46	8269	17.876	178,76
A3B2C1	46	3025	6.476	64,76
A3B2C2	46	5610	12.096	120,96
A3B2C3	46	8549	18.485	184,85
A3B3C1	46	3158	6.765	67,65
A3B3C2	46	5489	11.833	118,33
A3B3C3	46	8453	18.276	182,76
A4B1C1	46	2827	6.046	60,46
A4B1C2	46	4896	10.543	105,43
A4B1C3	46	7802	16.861	168,61
A4B2C1	46	2766	5.913	59,13
A4B2C2	46	5519	11.898	118,98
A4B2C3	46	8186	17.696	176,96
A4B3C1	46	2725	5.824	58,24
A4B3C2	46	5661	12.207	122,07
A4B3C3	46	8834	19.104	191,04

Lampiran 7. Data hasil pengamatan terhadap parameter BOD mg/l), pH dan suhu (°C) rata-rata.

Kombinasi	Parameter		
	BOD (mg/l)	pH	Suhu (°C)
A1B1C1	263	7,9	27
A1B1C2	290	7,8	27
A1B1C3	296	7,7	27
A1B2C1	252	7,8	27
A1B2C2	264	7,7	27
A1B2C3	293	7,7	27
A1B3C1	231	7,8	27
A1B3C2	252	7,6	27
A1B3C3	285	7,6	27
A2B1C1	195	7,8	28
A2B1C2	205	7,7	28
A2B1C3	213	7,7	28
A2B2C1	191	7,8	28
A2B2C2	199	7,6	28
A2B2C3	211	7,6	28
A2B3C1	187	7,7	28
A2B3C2	193	7,6	28
A2B3C3	204	7,6	28
A3B1C1	173	7,8	29
A3B1C2	187	7,7	29
A3B1C3	198	7,7	29
A3B2C1	154	7,8	29
A3B2C2	175	7,8	29
A3B2C3	190	7,7	29
A3B3C1	152	7,8	29
A3B3C2	158	7,7	29
A3B3C3	171	7,7	29
A4B1C1	144	7,9	27
A4B1C2	153	7,7	27
A4B1C3	173	7,6	27
A4B2C1	128	7,8	27
A4B2C2	137	7,7	27
A4B2C3	145	7,6	27
A4B3C1	119	7,7	27
A4B3C2	121	7,7	27
A4B3C3	124	7,6	27

Lampiran 8. Dokumentasi Penelitian

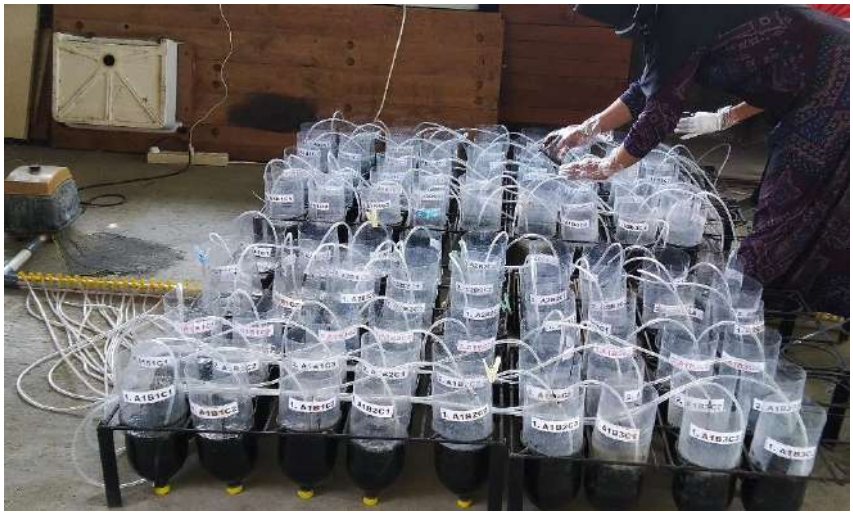
Gambar 35. Proses pengambilan *mixed liquor*



Gambar 36. Proses perendaman biofilter / seeding

Gambar 37. Proses aerasi pada bioreaktor

Gambar 38. Proses pengambilan RAS



Gambar 39. Proses penambahan RAS pada biofilter

Gambar 40. Proses penyaringan untuk MLSS