

## BAB V

### KESIMPULAN DAN SARAN

#### 5.1 Kesimpulan

Berdasarkan analisis yang telah dilakukan maka kesimpulan hasil penelitian adalah sebagai berikut:

1. Terdapat perbedaan hasil perhitungan dengan metode Rasional, metode Haspers, metode HSS Gama I, metode HSS Nakayasu dan metode HSS Snyder dapat dilihat dalam gambar 4.10 dan dalam tabel 5.1 berikut:

**Tabel 5.1** Tabel Perhitungan Debit Banjir

Tahun	Metode				
	Rasional	Haspers	Gama I	Nakayasu	Snyder
2	41.603	131.187	70.479	216.344	883.967
5	50.833	160.292	124.276	283.715	1227.984
10	57.223	180.443	147.654	330.358	1467.775
25	65.166	205.489	176.711	388.334	1765.827
50	70.999	223.883	198.050	430.911	1984.717
100	76.812	242.213	219.315	473.339	2202.838

2. Metode yang sesuai dan dapat digunakan pada Sungai Wertamrian, dalam perhitungan debit banjir rencana adalah metode Gama I, pada periode 2 tahun yang mempunyai nilai =  $70.479 \text{ m}^3/\text{dtk}$  dimana dilihat dari grafik debit banjir rencana periode 2 tahun mendekati debit banjir terukur =  $65 \text{ m}^3/\text{dtk}$ .

3. Pembangunan Bendung Tamrian pada tahun 2009 dan hancur pada tahun 2011 karena terjadi debit banjir yang berlebihan, sehingga dengan hancurnya Bendung Tamrian maka dapat disimpulkan bahwa pembangunannya hanya menggunakan periode kala ulang 2 tahun.

## 5.2 Saran

Saran yang dapat disampaikan dalam penelitian adalah :

1. Hendaknya dilakukan analisis hidrolika agar dapat mengetahui dengan pasti kegagalan Bendung Tamrian, karena kegagalan suatu bendung bukan semata-mata hanya dapat diketahui dengan menggunakan analisis hidrologi saja.
2. Diharapkan instansi – instansi yang terkait agar lebih teliti dalam merencanakan serta membangun bangunan air dan juga data-data lebih dilengkapi lagi.
3. Pembangunan bendung yang benar ialah dengan menggunakan periode kala ulang minimal 25 tahun agar secara minimal dapat masuk dalam Break Even point (BEP).

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LAMPIRAN 1

Perhitungan Debit Banjir Rencana Metode Gama I ( 5 Tahun)

periode Ulang 5 tahun								
T	UH	51.98513	32.74101	24.98269	20.62078	17.76913	Qb	Q
		Φ = 10.488						
		Distribusi jam-jam						
jam	m3/det	41.49713	22.25301	14.49469	10.13278	7.281129	m3/det	m3/det
0.0	0.00	0					3.068	3.068
0.3	0.20	8.299426	0				3.068	11.36743
0.5	0.40	16.59885	4.450603	0			3.068	24.11745
0.7	0.60	24.89828	8.901205	2.898939	0		3.068	39.76642
1.0	0.80	33.1977	13.35181	5.797877	2.026556	0	3.068	57.44194
1.3	1.00	41.49713	17.80241	8.696816	4.053112	1.456226	3.068	76.57369
1.6	1.20	49.79655	22.25301	11.59575	6.079669	2.912451	3.068	95.70544
1.8	1.38	57.39469	26.70362	14.49469	8.106225	4.368677	3.068	114.1359
1.9	1.34	55.61168	30.77815	17.39363	10.13278	5.824903	3.068	122.8091
2.2	1.25	51.89834	29.822	20.04761	12.15934	7.281129	3.068	124.2764
2.5	1.17	48.43295	27.83071	19.42482	14.01465	8.737354	3.068	121.5085
2.8	1.09	45.19895	25.97238	18.12777	13.57928	10.07053	3.068	116.0169
3.1	1.02	42.1809	24.23813	16.91733	12.67255	9.757682	3.068	108.8346
3.4	0.95	39.36437	22.61969	15.78772	11.82637	9.106136	3.068	101.7723
3.7	0.89	36.73591	21.10931	14.73353	11.03669	8.498095	3.068	95.18154
4.0	0.83	34.28295	19.69979	13.74973	10.29974	7.930655	3.068	89.03088
4.3	0.77	31.99379	18.38438	12.83163	9.612003	7.401104	3.068	83.29091
4.6	0.72	29.85748	17.15681	11.97483	8.970185	6.906913	3.068	77.93421
4.9	0.67	27.86382	16.0112	11.17524	8.371222	6.44572	3.068	72.9352
5.2	0.63	26.00328	14.94209	10.42904	7.812253	6.015322	3.068	68.26998
5.5	0.58	24.26697	13.94437	9.732661	7.290608	5.613663	3.068	63.91627
5.8	0.55	22.6466	13.01327	9.082785	6.803795	5.238824	3.068	59.85327
6.1	0.51	21.13443	12.14434	8.476304	6.349488	4.889014	3.068	56.06157
6.4	0.48	19.72323	11.33343	7.910319	5.925516	4.562562	3.068	52.52305
6.7	0.44	18.40625	10.57666	7.382126	5.529853	4.257907	3.068	49.2208
7.0	0.41	17.17722	9.870433	6.889202	5.160611	3.973596	3.068	46.13906
7.3	0.39	16.03025	9.211358	6.429192	4.816023	3.708268	3.068	43.26309
7.6	0.36	14.95987	8.596291	5.999898	4.494444	3.460657	3.068	40.57916
7.9	0.34	13.96096	8.022294	5.599269	4.194339	3.22958	3.068	38.07444
8.2	0.31	13.02875	7.486624	5.225391	3.914271	3.013933	3.068	35.73697
8.5	0.29	12.15879	6.986723	4.876478	3.652905	2.812684	3.068	33.55557
8.8	0.27	11.34691	6.520201	4.550862	3.408991	2.624874	3.068	31.51984

9.1	0.26	10.58925	6.08483	4.246989	3.181364	2.449604	3.068	29.62003
9.4	0.24	9.882176	5.67853	3.963406	2.968936	2.286038	3.068	27.84709
9.7	0.22	9.222317	5.299359	3.698759	2.770692	2.133393	3.068	26.19252
10.0	0.21	8.606518	4.945507	3.451783	2.585686	1.990941	3.068	24.64844
10.3	0.19	8.031838	4.615282	3.221299	2.413033	1.858	3.068	23.20745
10.6	0.18	7.495531	4.307108	3.006204	2.251908	1.733937	3.068	21.86269
10.9	0.17	6.995035	4.019511	2.805472	2.101542	1.618157	3.068	20.60772
11.2	0.16	6.527958	3.751118	2.618143	1.961217	1.510109	3.068	19.43654
11.5	0.15	6.092069	3.500646	2.443323	1.830261	1.409275	3.068	18.34357
11.8	0.14	5.685286	3.266898	2.280176	1.70805	1.315174	3.068	17.32358
12.1	0.13	5.305664	3.048759	2.127922	1.593999	1.227356	3.068	16.3717
12.4	0.12	4.951391	2.845185	1.985835	1.487563	1.145402	3.068	15.48338
12.7	0.11	4.620773	2.655205	1.853236	1.388235	1.068921	3.068	14.65437
13.0	0.10	4.312232	2.47791	1.72949	1.295539	0.997546	3.068	13.88072
13.3	0.10	4.024293	2.312453	1.614008	1.209032	0.930937	3.068	13.15872
13.6	0.09	3.75558	2.158044	1.506236	1.128302	0.868776	3.068	12.48494
13.9	0.08	3.50481	2.013946	1.405661	1.052962	0.810766	3.068	11.85615
14.2	0.08	3.270785	1.87947	1.311801	0.982653	0.756629	3.068	11.26934
14.5	0.07	3.052386	1.753972	1.224209	0.917039	0.706107	3.068	10.72171
14.8	0.07	2.84857	1.636855	1.142465	0.855806	0.658958	3.068	10.21065
15.1	0.06	2.658364	1.527558	1.06618	0.798661	0.614958	3.068	9.73372
15.4	0.06	2.480858	1.425559	0.994988	0.745332	0.573895	3.068	9.288632
15.7	0.06	2.315204	1.330371	0.92855	0.695565	0.535575	3.068	8.873264
16.0	0.05	2.160612	1.241538	0.866548	0.64912	0.499813	3.068	8.485631
16.3	0.05	2.016342	1.158637	0.808687	0.605777	0.466439	3.068	8.123882
16.6	0.05	1.881706	1.081272	0.754688	0.565327	0.435294	3.068	7.786287
16.9	0.04	1.756059	1.009073	0.704296	0.527579	0.406228	3.068	7.471235
17.2	0.04	1.638802	0.941694	0.657268	0.492351	0.379103	3.068	7.177219
17.5	0.04	1.529375	0.878815	0.613381	0.459475	0.353789	3.068	6.902836
17.8	0.03	1.427255	0.820134	0.572424	0.428795	0.330166	3.068	6.646774
18.1	0.03	1.331953	0.765372	0.534201	0.400163	0.30812	3.068	6.40781
18.4	0.03	1.243015	0.714266	0.498531	0.373443	0.287546	3.068	6.184802
18.7	0.03	1.160016	0.666572	0.465243	0.348508	0.268346	3.068	5.976685
19.0	0.03	1.082559	0.622063	0.434178	0.325237	0.250428	3.068	5.782464
19.3	0.02	1.010273	0.580527	0.405186	0.30352	0.233706	3.068	5.601212
19.6	0.02	0.942815	0.541763	0.378131	0.283253	0.218101	3.068	5.432063
19.9	0.02	0.87986	0.505588	0.352882	0.264339	0.203538	3.068	5.274208
20.2	0.02	0.82111	0.471829	0.329319	0.246689	0.189947	3.068	5.126894
20.5	0.02	0.766282	0.440324	0.30733	0.230217	0.177264	3.068	4.989416
20.8	0.02	0.715115	0.410922	0.286809	0.214845	0.165427	3.068	4.861118
21.1	0.02	0.667365	0.383484	0.267658	0.200499	0.154381	3.068	4.741387

21.4	0.02	0.622804	0.357878	0.249785	0.187111	0.144073	3.068	4.62965
21.7	0.01	0.581217	0.333981	0.233107	0.174617	0.134453	3.068	4.525375
22.0	0.01	0.542408	0.31168	0.217541	0.162957	0.125475	3.068	4.428062
22.3	0.01	0.50619	0.290869	0.203016	0.152076	0.117097	3.068	4.337247
22.6	0.01	0.47239	0.271447	0.18946	0.141922	0.109278	3.068	4.252496
22.9	0.01	0.440848	0.253321	0.176809	0.132445	0.101981	3.068	4.173404
23.2	0.01	0.411411	0.236406	0.165003	0.123602	0.095171	3.068	4.099593
23.5	0.01	0.38394	0.220621	0.153985	0.115348	0.088817	3.068	4.030711
23.8	0.01	0.358303	0.205889	0.143703	0.107646	0.082886	3.068	3.966428
24.0	0.01	0.34217	0.192142	0.134108	0.100458	0.077352	3.068	3.91423
		0	0.18349	0.125153	0.093751	0.072187	3.068	3.542581
			0	0.119518	0.087491	0.067367	3.068	3.342375
				0	0.083551	0.062868	3.068	3.21442
					0	0.060038	3.068	3.128038
						0	3.068	3.068

## LAMPIRAN 2

## Perhitungan Debit Banjir Rencana Metode Gama I ( 10 Tahun)

periode Ulang 10 tahun								
T	UH	58.52024	36.85692	28.12329	23.21304	20.00291	Qb	Q
		$\Phi = 10.488$						
		Distribusi jam-jam						
jam	m3/det	48.03224	26.36892	17.63529	12.72504	9.514905	m3/det	m3/det
0.0	0.00	0					3.068	3.068
0.3	0.20	9.606447	0				3.068	12.67445
0.5	0.40	19.21289	5.273784	0			3.068	27.55468
0.7	0.60	28.81934	10.54757	3.527059	0		3.068	45.96197
1.0	0.80	38.42579	15.82135	7.054118	2.545008	0	3.068	66.91427
1.3	1.00	48.03224	21.09514	10.58118	5.090017	1.902981	3.068	89.76955
1.6	1.20	57.63868	26.36892	14.10824	7.635025	3.805962	3.068	112.6248
1.8	1.38	66.4334	31.64271	17.63529	10.18003	5.708943	3.068	134.6684
1.9	1.34	64.36959	36.47086	21.16235	12.72504	7.611924	3.068	145.4078
2.2	1.25	60.07146	35.33787	24.39138	15.27005	9.514905	3.068	147.6537
2.5	1.17	56.06033	32.97826	23.63364	17.60001	11.41789	3.068	144.7581
2.8	1.09	52.31704	30.77622	22.05556	17.05325	13.16007	3.068	138.4301
3.1	1.02	48.82369	28.72121	20.58285	15.91456	12.75124	3.068	129.8616
3.4	0.95	45.5636	26.80342	19.20848	14.8519	11.89981	3.068	121.3952
3.7	0.89	42.5212	25.01368	17.92588	13.8602	11.10522	3.068	113.4942
4.0	0.83	39.68195	23.34345	16.72892	12.93472	10.3637	3.068	106.1207
4.3	0.77	37.03228	21.78475	15.61189	12.07103	9.671688	3.068	99.23964
4.6	0.72	34.55954	20.33012	14.56944	11.26502	9.025884	3.068	92.81801
4.9	0.67	32.25191	18.97263	13.5966	10.51282	8.423202	3.068	86.82516
5.2	0.63	30.09836	17.70578	12.68872	9.810855	7.860762	3.068	81.23247
5.5	0.58	28.08861	16.52351	11.84146	9.155759	7.335878	3.068	76.01323
5.8	0.55	26.21306	15.4202	11.05078	8.544405	6.846042	3.068	71.14248
6.1	0.51	24.46275	14.39055	10.31289	7.973872	6.388914	3.068	66.59697
6.4	0.48	22.82931	13.42965	9.624267	7.441436	5.962309	3.068	62.35497
6.7	0.44	21.30493	12.53292	8.98163	6.944551	5.56419	3.068	58.39622
7.0	0.41	19.88235	11.69606	8.381903	6.480845	5.192655	3.068	54.70181
7.3	0.39	18.55475	10.91509	7.822221	6.048102	4.845927	3.068	51.25409
7.6	0.36	17.3158	10.18626	7.299911	5.644254	4.522352	3.068	48.03657
7.9	0.34	16.15958	9.506094	6.812476	5.267373	4.220383	3.068	45.0339
8.2	0.31	15.08056	8.871347	6.357589	4.915656	3.938577	3.068	42.23173
8.5	0.29	14.07359	8.278984	5.933076	4.587425	3.675587	3.068	39.61666
8.8	0.27	13.13386	7.726175	5.536909	4.28111	3.430159	3.068	37.17621

9.1	0.26	12.25688	7.210277	5.167195	3.995249	3.201118	3.068	34.89872
9.4	0.24	11.43845	6.728828	4.822168	3.728476	2.987371	3.068	32.7733
9.7	0.22	10.67468	6.279527	4.500179	3.479516	2.787896	3.068	30.7898
10.0	0.21	9.961902	5.860226	4.19969	3.247179	2.601741	3.068	28.93874
10.3	0.19	9.296719	5.468923	3.919266	3.030357	2.428016	3.068	27.21128
10.6	0.18	8.675953	5.103749	3.657566	2.828012	2.265891	3.068	25.59917
10.9	0.17	8.096637	4.762958	3.413341	2.639178	2.114591	3.068	24.0947
11.2	0.16	7.556003	4.444923	3.185423	2.462953	1.973395	3.068	22.6907
11.5	0.15	7.051469	4.148124	2.972724	2.298495	1.841626	3.068	21.38044
11.8	0.14	6.580623	3.871142	2.774227	2.145019	1.718656	3.068	20.15767
12.1	0.13	6.141218	3.612656	2.588985	2.00179	1.603896	3.068	19.01654
12.4	0.12	5.731153	3.371429	2.416111	1.868125	1.4968	3.068	17.95162
12.7	0.11	5.348468	3.14631	2.254781	1.743386	1.396855	3.068	16.9578
13.0	0.10	4.991337	2.936223	2.104224	1.626975	1.303583	3.068	16.03034
13.3	0.10	4.658052	2.740163	1.963719	1.518338	1.216539	3.068	15.16481
13.6	0.09	4.347022	2.557195	1.832596	1.416954	1.135308	3.068	14.35708
13.9	0.08	4.05676	2.386445	1.710229	1.322341	1.0595	3.068	13.60327
14.2	0.08	3.785879	2.227096	1.596032	1.234044	0.988755	3.068	12.89981
14.5	0.07	3.533086	2.078387	1.489461	1.151644	0.922733	3.068	12.24331
14.8	0.07	3.297173	1.939607	1.390006	1.074746	0.86112	3.068	11.63065
15.1	0.06	3.077012	1.810094	1.297192	1.002982	0.80362	3.068	11.0589
15.4	0.06	2.871551	1.68923	1.210575	0.93601	0.749961	3.068	10.52533
15.7	0.06	2.67981	1.576435	1.129741	0.87351	0.699884	3.068	10.02738
16.0	0.05	2.500872	1.471173	1.054306	0.815184	0.653151	3.068	9.562685
16.3	0.05	2.333882	1.372939	0.983907	0.760752	0.609538	3.068	9.129018
16.6	0.05	2.178043	1.281264	0.918209	0.709954	0.568838	3.068	8.724308
16.9	0.04	2.032609	1.19571	0.856898	0.662549	0.530855	3.068	8.346621
17.2	0.04	1.896887	1.11587	0.79968	0.618309	0.495408	3.068	7.994154
17.5	0.04	1.770227	1.04136	0.746283	0.577023	0.462328	3.068	7.665221
17.8	0.03	1.652024	0.971826	0.696452	0.538493	0.431458	3.068	7.358253
18.1	0.03	1.541714	0.906934	0.649948	0.502537	0.402648	3.068	7.071781
18.4	0.03	1.43877	0.846376	0.606549	0.468981	0.375762	3.068	6.804438
18.7	0.03	1.342699	0.789861	0.566049	0.437666	0.350672	3.068	6.554946
19.0	0.03	1.253044	0.73712	0.528252	0.408442	0.327256	3.068	6.322114
19.3	0.02	1.169374	0.687901	0.492979	0.381169	0.305404	3.068	6.104828
19.6	0.02	1.091292	0.641968	0.460062	0.355717	0.285012	3.068	5.902051
19.9	0.02	1.018424	0.599102	0.429342	0.331965	0.265981	3.068	5.712814
20.2	0.02	0.950421	0.559098	0.400674	0.309799	0.248221	3.068	5.536213
20.5	0.02	0.886959	0.521766	0.37392	0.289113	0.231646	3.068	5.371404
20.8	0.02	0.827734	0.486926	0.348952	0.269808	0.216179	3.068	5.217599
21.1	0.02	0.772464	0.454413	0.325652	0.251792	0.201744	3.068	5.074065

21.4	0.02	0.720885	0.42407	0.303907	0.234979	0.188273	3.068	4.940115
21.7	0.01	0.672749	0.395754	0.283614	0.219289	0.175701	3.068	4.815109
22.0	0.01	0.627828	0.369329	0.264677	0.204647	0.163969	3.068	4.698449
22.3	0.01	0.585906	0.344668	0.247004	0.190982	0.153021	3.068	4.58958
22.6	0.01	0.546784	0.321653	0.23051	0.17823	0.142803	3.068	4.48798
22.9	0.01	0.510274	0.300176	0.215119	0.166329	0.133268	3.068	4.393164
23.2	0.01	0.476201	0.280132	0.200755	0.155222	0.124369	3.068	4.30468
23.5	0.01	0.444404	0.261427	0.18735	0.144858	0.116065	3.068	4.222103
23.8	0.01	0.41473	0.243971	0.17484	0.135185	0.108315	3.068	4.145041
24.0	0.01	0.396057	0.22768	0.163165	0.126159	0.101082	3.068	4.082143
		0	0.217429	0.15227	0.117735	0.094333	3.068	3.649766
			0	0.145414	0.109873	0.088034	3.068	3.411321
				0	0.104926	0.082156	3.068	3.255082
					0	0.078456	3.068	3.146456
						0	3.068	3.068

## LAMPIRAN 3

## Perhitungan Debit Banjir Rencana Metode Gama I ( 25 Tahun)

periode Ulang 25 tahun								
T	UH	66.64316	41.97286	32.02696	26.43514	22.77942	Qb	Q
		$\Phi = 10.488$						
		Distribusi jam-jam						
jam	m3/det	56.15516	31.48486	21.53896	15.94714	12.29142	m3/det	m3/det
0.0	0.00	0					3.068	3.068
0.3	0.20	11.23103	0				3.068	14.29903
0.5	0.40	22.46207	6.296973	0			3.068	31.82704
0.7	0.60	33.6931	12.59395	4.307792	0		3.068	53.66284
1.0	0.80	44.92413	18.89092	8.615584	3.189428	0	3.068	78.68806
1.3	1.00	56.15516	25.18789	12.92338	6.378855	2.458283	3.068	106.1716
1.6	1.20	67.3862	31.48486	17.23117	9.568283	4.916567	3.068	133.6551
1.8	1.38	77.66822	37.78184	21.53896	12.75771	7.37485	3.068	160.1896
1.9	1.34	75.2554	43.54672	25.84675	15.94714	9.833134	3.068	173.4971
2.2	1.25	70.23039	42.19391	29.79054	19.13657	12.29142	3.068	176.7108
2.5	1.17	65.54093	39.37651	28.86508	22.05649	14.7497	3.068	173.6567
2.8	1.09	61.16459	36.74724	26.93768	21.37129	17.00026	3.068	166.2891
3.1	1.02	57.08046	34.29353	25.13898	19.94427	16.47214	3.068	155.9974
3.4	0.95	53.26905	32.00366	23.46038	18.61254	15.37225	3.068	145.7859
3.7	0.89	49.71214	29.86669	21.89387	17.36973	14.3458	3.068	136.2562
4.0	0.83	46.39273	27.87241	20.43196	16.20991	13.3879	3.068	127.3629
4.3	0.77	43.29496	26.0113	19.06766	15.12753	12.49395	3.068	119.0634
4.6	0.72	40.40404	24.27445	17.79447	14.11743	11.6597	3.068	111.3181
4.9	0.67	37.70616	22.65358	16.60628	13.17477	10.88115	3.068	104.0899
5.2	0.63	35.18842	21.14094	15.49744	12.29505	10.15458	3.068	97.34444
5.5	0.58	32.83879	19.72931	14.46263	11.47408	9.476536	3.068	91.04935
5.8	0.55	30.64606	18.41193	13.49692	10.70793	8.843763	3.068	85.1746
6.1	0.51	28.59974	17.18252	12.5957	9.992929	8.253241	3.068	79.69213
6.4	0.48	26.69006	16.0352	11.75465	9.325675	7.702151	3.068	74.57573
6.7	0.44	24.9079	14.96448	10.96976	8.702975	7.187858	3.068	69.80097
7.0	0.41	23.24473	13.96526	10.23728	8.121854	6.707906	3.068	65.34504
7.3	0.39	21.69262	13.03277	9.553711	7.579537	6.260001	3.068	61.18663
7.6	0.36	20.24415	12.16253	8.915785	7.073431	5.842004	3.068	57.3059
7.9	0.34	18.89239	11.35041	8.320454	6.601119	5.451918	3.068	53.68429
8.2	0.31	17.6309	10.59251	7.764875	6.160345	5.087879	3.068	50.30451
8.5	0.29	16.45363	9.885223	7.246394	5.749003	4.748148	3.068	47.1504
8.8	0.27	15.35498	9.225161	6.762533	5.365127	4.431102	3.068	44.2069

9.1	0.26	14.32969	8.609173	6.310981	5.006883	4.135225	3.068	41.45995
9.4	0.24	13.37286	8.034315	5.88958	4.67256	3.859105	3.068	38.89642
9.7	0.22	12.47992	7.497843	5.496318	4.360561	3.601423	3.068	36.50406
10.0	0.21	11.6466	6.997192	5.129314	4.069395	3.360946	3.068	34.27145
10.3	0.19	10.86893	6.529971	4.786816	3.797671	3.136527	3.068	32.18791
10.6	0.18	10.14318	6.093948	4.467188	3.54409	2.927093	3.068	30.2435
10.9	0.17	9.465892	5.687039	4.168902	3.307442	2.731643	3.068	28.42892
11.2	0.16	8.833829	5.3073	3.890533	3.086595	2.549244	3.068	26.7355
11.5	0.15	8.243971	4.952918	3.630752	2.880495	2.379024	3.068	25.15516
11.8	0.14	7.6935	4.622198	3.388317	2.688157	2.220171	3.068	23.68034
12.1	0.13	7.179784	4.313562	3.16207	2.508662	2.071924	3.068	22.304
12.4	0.12	6.700371	4.025534	2.95093	2.341152	1.933576	3.068	21.01956
12.7	0.11	6.25297	3.756739	2.753889	2.184827	1.804466	3.068	19.82089
13.0	0.10	5.835442	3.505891	2.570005	2.03894	1.683977	3.068	18.70226
13.3	0.10	5.445794	3.271794	2.398399	1.902795	1.571534	3.068	17.65831
13.6	0.09	5.082164	3.053327	2.238251	1.77574	1.466598	3.068	16.68408
13.9	0.08	4.742815	2.849449	2.088797	1.657169	1.36867	3.068	15.7749
14.2	0.08	4.426125	2.659183	1.949323	1.546516	1.27728	3.068	14.92643
14.5	0.07	4.130581	2.481623	1.819161	1.443251	1.191992	3.068	14.13461
14.8	0.07	3.854771	2.315918	1.697691	1.346881	1.1124	3.068	13.39566
15.1	0.06	3.597378	2.161278	1.584332	1.256946	1.038122	3.068	12.70606
15.4	0.06	3.357171	2.016964	1.478542	1.173017	0.968804	3.068	12.0625
15.7	0.06	3.133004	1.882286	1.379816	1.094691	0.904114	3.068	11.46191
16.0	0.05	2.923805	1.756601	1.287682	1.021596	0.843744	3.068	10.90143
16.3	0.05	2.728575	1.639308	1.2017	0.953381	0.787405	3.068	10.37837
16.6	0.05	2.546381	1.529847	1.121459	0.889721	0.734828	3.068	9.890236
16.9	0.04	2.376352	1.427695	1.046576	0.830312	0.685762	3.068	9.434698
17.2	0.04	2.217677	1.332364	0.976694	0.77487	0.639972	3.068	9.009576
17.5	0.04	2.069597	1.243399	0.911477	0.72313	0.597239	3.068	8.612842
17.8	0.03	1.931404	1.160374	0.850616	0.674845	0.55736	3.068	8.242598
18.1	0.03	1.802439	1.082892	0.793818	0.629784	0.520143	3.068	7.897076
18.4	0.03	1.682086	1.010585	0.740812	0.587731	0.485412	3.068	7.574626
18.7	0.03	1.569768	0.943105	0.691346	0.548487	0.453	3.068	7.273707
19.0	0.03	1.464951	0.880132	0.645183	0.511863	0.422752	3.068	6.992881
19.3	0.02	1.367132	0.821363	0.602103	0.477685	0.394524	3.068	6.730806
19.6	0.02	1.275845	0.766518	0.561899	0.445788	0.36818	3.068	6.486231
19.9	0.02	1.190654	0.715336	0.524379	0.416022	0.343596	3.068	6.257987
20.2	0.02	1.111151	0.667571	0.489365	0.388243	0.320653	3.068	6.044983
20.5	0.02	1.036956	0.622996	0.456689	0.362319	0.299242	3.068	5.846202
20.8	0.02	0.967716	0.581397	0.426195	0.338126	0.279261	3.068	5.660694
21.1	0.02	0.903099	0.542575	0.397736	0.315548	0.260614	3.068	5.487573

21.4	0.02	0.842797	0.506346	0.371179	0.294478	0.243212	3.068	5.326012
21.7	0.01	0.786521	0.472536	0.346394	0.274815	0.226972	3.068	5.175238
22.0	0.01	0.734003	0.440983	0.323264	0.256465	0.211817	3.068	5.034532
22.3	0.01	0.684991	0.411538	0.301679	0.23934	0.197673	3.068	4.903222
22.6	0.01	0.639253	0.384058	0.281535	0.223359	0.184474	3.068	4.780679
22.9	0.01	0.596568	0.358414	0.262736	0.208445	0.172156	3.068	4.666319
23.2	0.01	0.556734	0.334482	0.245193	0.194526	0.160661	3.068	4.559595
23.5	0.01	0.519559	0.312147	0.228821	0.181537	0.149933	3.068	4.459997
23.8	0.01	0.484867	0.291304	0.213542	0.169415	0.139922	3.068	4.36705
24.0	0.01	0.463035	0.271853	0.199283	0.158103	0.130579	3.068	4.290853
		0	0.259613	0.185976	0.147546	0.12186	3.068	3.782995
			0	0.177603	0.137694	0.113723	3.068	3.497019
				0	0.131494	0.106129	3.068	3.305624
					0	0.101351	3.068	3.169351
						0	3.068	3.068

## LAMPIRAN 4

## Perhitungan Debit Banjir Rencana Metode Gama I ( 50 Tahun)

periode Ulang 50 tahun								
T	UH	72.60864	45.73001	34.89381	28.80144	24.81849	Qb	Q
		Φ = 10.488						
		Distribusi jam-jam						
jam	m3/det	62.12064	35.24201	24.40581	18.31344	14.33049	m3/det	m3/det
0.0	0.00	0					3.068	3.068
0.3	0.20	12.42413	0				3.068	15.49213
0.5	0.40	24.84825	7.048401	0			3.068	34.96466
0.7	0.60	37.27238	14.0968	4.881162	0		3.068	59.31835
1.0	0.80	49.69651	21.1452	9.762324	3.662689	0	3.068	87.33473
1.3	1.00	62.12064	28.19361	14.64349	7.325378	2.866097	3.068	118.2172
1.6	1.20	74.54476	35.24201	19.52465	10.98807	5.732194	3.068	149.0997
1.8	1.38	85.91907	42.29041	24.40581	14.65076	8.598292	3.068	178.9323
1.9	1.34	83.24992	48.74323	29.28697	18.31344	11.46439	3.068	194.126
2.2	1.25	77.69111	47.22898	33.75568	21.97613	14.33049	3.068	198.0504
2.5	1.17	72.50347	44.07538	32.70704	25.32933	17.19658	3.068	194.8798
2.8	1.09	67.66222	41.13235	30.5231	24.54245	19.8205	3.068	186.7486
3.1	1.02	63.14423	38.38583	28.48499	22.90369	19.20476	3.068	175.1915
3.4	0.95	58.92793	35.82271	26.58297	21.37435	17.92241	3.068	163.6984
3.7	0.89	54.99315	33.43073	24.80796	19.94713	16.72568	3.068	152.9727
4.0	0.83	51.32112	31.19848	23.15147	18.61521	15.60886	3.068	142.9631
4.3	0.77	47.89427	29.11527	21.60558	17.37222	14.56662	3.068	133.622
4.6	0.72	44.69624	27.17117	20.16292	16.21223	13.59397	3.068	124.9045
4.9	0.67	41.71176	25.35688	18.81659	15.1297	12.68626	3.068	116.7692
5.2	0.63	38.92655	23.66373	17.56016	14.11945	11.83917	3.068	109.1771
5.5	0.58	36.32732	22.08364	16.38762	13.17665	11.04863	3.068	102.0919
5.8	0.55	33.90165	20.60906	15.29337	12.29681	10.31089	3.068	95.47978
6.1	0.51	31.63795	19.23294	14.27219	11.47572	9.622402	3.068	89.30921
6.4	0.48	29.5254	17.9487	13.3192	10.70946	8.979889	3.068	83.55065
6.7	0.44	27.55391	16.75022	12.42984	9.99436	8.380278	3.068	78.17661
7.0	0.41	25.71406	15.63176	11.59987	9.32701	7.820705	3.068	73.16141
7.3	0.39	23.99707	14.58799	10.82532	8.704221	7.298496	3.068	68.48109
7.6	0.36	22.39472	13.61391	10.10248	8.123017	6.811156	3.068	64.11329
7.9	0.34	20.89937	12.70487	9.427912	7.580622	6.356357	3.068	60.03713
8.2	0.31	19.50386	11.85654	8.798386	7.074444	5.931926	3.068	56.23315
8.5	0.29	18.20154	11.06484	8.210894	6.602065	5.535836	3.068	52.68317
8.8	0.27	16.98617	10.32602	7.662631	6.161227	5.166194	3.068	49.37024

9.1	0.26	15.85196	9.63652	7.150977	5.749826	4.821233	3.068	46.27852
9.4	0.24	14.79348	8.993064	6.673487	5.365895	4.499307	3.068	43.39324
9.7	0.22	13.80568	8.392574	6.227881	5.0076	4.198876	3.068	40.70061
10.0	0.21	12.88384	7.832179	5.812029	4.673229	3.918506	3.068	38.18778
10.3	0.19	12.02355	7.309204	5.423944	4.361185	3.656857	3.068	35.84274
10.6	0.18	11.22071	6.821149	5.061773	4.069978	3.412679	3.068	33.65429
10.9	0.17	10.47147	6.365683	4.723785	3.798214	3.184805	3.068	31.61196
11.2	0.16	9.772264	5.94063	4.408366	3.544598	2.972148	3.068	29.706
11.5	0.15	9.119744	5.543958	4.114008	3.307916	2.773689	3.068	27.92732
11.8	0.14	8.510795	5.173773	3.839304	3.087037	2.588483	3.068	26.26739
12.1	0.13	7.942507	4.828307	3.582944	2.880908	2.415643	3.068	24.71831
12.4	0.12	7.412165	4.505908	3.343701	2.688542	2.254344	3.068	23.27266
12.7	0.11	6.917235	4.205037	3.120434	2.509021	2.103816	3.068	21.92354
13.0	0.10	6.455353	3.924255	2.912074	2.341487	1.963338	3.068	20.66451
13.3	0.10	6.024312	3.662222	2.717627	2.18514	1.832241	3.068	19.48954
13.6	0.09	5.622053	3.417686	2.536164	2.039232	1.709898	3.068	18.39303
13.9	0.08	5.246653	3.189478	2.366818	1.903067	1.595723	3.068	17.36974
14.2	0.08	4.89632	2.976508	2.208779	1.775994	1.489172	3.068	16.41477
14.5	0.07	4.56938	2.777759	2.061293	1.657407	1.389737	3.068	15.52358
14.8	0.07	4.264271	2.592281	1.923655	1.546737	1.29694	3.068	14.69188
15.1	0.06	3.979534	2.419187	1.795207	1.443457	1.21034	3.068	13.91573
15.4	0.06	3.71381	2.257652	1.675337	1.347074	1.129522	3.068	13.19139
15.7	0.06	3.465829	2.106902	1.56347	1.257126	1.054101	3.068	12.51543
16.0	0.05	3.234407	1.966219	1.459073	1.173185	0.983716	3.068	11.8846
16.3	0.05	3.018437	1.834929	1.361647	1.094848	0.918031	3.068	11.29589
16.6	0.05	2.816888	1.712406	1.270726	1.021742	0.856731	3.068	10.74649
16.9	0.04	2.628797	1.598064	1.185876	0.953518	0.799525	3.068	10.23378
17.2	0.04	2.453265	1.491357	1.106692	0.889849	0.746139	3.068	9.755302
17.5	0.04	2.289454	1.391776	1.032796	0.830431	0.696317	3.068	9.308774
17.8	0.03	2.136581	1.298843	0.963833	0.774981	0.649822	3.068	8.892061
18.1	0.03	1.993916	1.212116	0.899475	0.723234	0.606432	3.068	8.503173
18.4	0.03	1.860777	1.13118	0.839415	0.674941	0.565939	3.068	8.140252
18.7	0.03	1.736528	1.055648	0.783365	0.629874	0.52815	3.068	7.801564
19.0	0.03	1.620575	0.985159	0.731058	0.587815	0.492884	3.068	7.485492
19.3	0.02	1.512365	0.919378	0.682243	0.548565	0.459973	3.068	7.190524
19.6	0.02	1.411381	0.857988	0.636688	0.511936	0.429259	3.068	6.915252
19.9	0.02	1.317139	0.800698	0.594175	0.477753	0.400596	3.068	6.658361
20.2	0.02	1.22919	0.747234	0.5545	0.445852	0.373847	3.068	6.418623
20.5	0.02	1.147114	0.697339	0.517475	0.416081	0.348885	3.068	6.194893
20.8	0.02	1.070518	0.650776	0.482921	0.388299	0.325589	3.068	5.986102
21.1	0.02	0.999037	0.607322	0.450675	0.362371	0.303848	3.068	5.791253

21.4	0.02	0.932328	0.566769	0.420583	0.338174	0.283559	3.068	5.609414
21.7	0.01	0.870074	0.528925	0.392499	0.315594	0.264625	3.068	5.439717
22.0	0.01	0.811977	0.493607	0.366291	0.294521	0.246956	3.068	5.281351
22.3	0.01	0.757759	0.460647	0.341833	0.274855	0.230466	3.068	5.13356
22.6	0.01	0.707162	0.429889	0.319008	0.256502	0.215077	3.068	4.995637
22.9	0.01	0.659943	0.401184	0.297707	0.239375	0.200716	3.068	4.866924
23.2	0.01	0.615877	0.374396	0.277828	0.223391	0.187313	3.068	4.746805
23.5	0.01	0.574753	0.349396	0.259277	0.208474	0.174806	3.068	4.634707
23.8	0.01	0.536375	0.326066	0.241964	0.194554	0.163134	3.068	4.530094
24.0	0.01	0.512224	0.304294	0.225808	0.181563	0.152241	3.068	4.44413
		0	0.290593	0.21073	0.16944	0.142075	3.068	3.880838
			0	0.201242	0.158126	0.132589	3.068	3.559956
				0	0.151006	0.123735	3.068	3.342741
					0	0.118164	3.068	3.186164
						0	3.068	3.068

## LAMPIRAN 5

## Perhitungan Debit Banjir Rencana Metode Gama I ( 100 Tahun)

periode Ulang 100 tahun								
T	UH	78.55317	49.47396	37.7506	31.15944	26.8504	Qb	Q
		Φ = 10.488						
		Distribusi jam-jam						
jam	m3/det	68.06517	38.98596	27.2626	20.67144	16.3624	m3/det	m3/det
0.0	0.00	0					3.068	3.068
0.3	0.20	13.61303	0				3.068	16.68103
0.5	0.40	27.22607	7.797193	0			3.068	38.09126
0.7	0.60	40.8391	15.59439	5.45252	0		3.068	64.95401
1.0	0.80	54.45214	23.39158	10.90504	4.134289	0	3.068	95.95104
1.3	1.00	68.06517	31.18877	16.35756	8.268578	3.27248	3.068	130.2206
1.6	1.20	81.67821	38.98596	21.81008	12.40287	6.544959	3.068	164.4901
1.8	1.38	94.14096	46.78316	27.2626	16.53716	9.817439	3.068	197.6093
1.9	1.34	91.21639	53.9215	32.71512	20.67144	13.08992	3.068	214.6824
2.2	1.25	85.12563	52.24638	37.70691	24.80573	16.3624	3.068	219.3151
2.5	1.17	79.44157	48.75775	36.53551	28.59068	19.63488	3.068	216.0284
2.8	1.09	74.13705	45.50207	34.09594	27.70249	22.63084	3.068	207.1364
3.1	1.02	69.18672	42.46378	31.81926	25.85272	21.92779	3.068	194.3183
3.4	0.95	64.56694	39.62836	29.69461	24.12647	20.46362	3.068	181.548
3.7	0.89	60.25564	36.98227	27.71182	22.51548	19.09721	3.068	169.6304
4.0	0.83	56.23221	34.51287	25.86143	21.01206	17.82204	3.068	158.5086
4.3	0.77	52.47743	32.20835	24.13459	19.60903	16.63201	3.068	148.1294
4.6	0.72	48.97338	30.05771	22.52306	18.29968	15.52145	3.068	138.4433
4.9	0.67	45.7033	28.05068	21.01914	17.07776	14.48504	3.068	129.4039
5.2	0.63	42.65157	26.17766	19.61564	15.93744	13.51784	3.068	120.9681
5.5	0.58	39.80361	24.42971	18.30585	14.87325	12.61521	3.068	113.0956
5.8	0.55	37.14582	22.79847	17.08352	13.88013	11.77286	3.068	105.7488
6.1	0.51	34.66549	21.27616	15.94281	12.95331	10.98676	3.068	98.89253
6.4	0.48	32.35079	19.8555	14.87826	12.08839	10.25314	3.068	92.49407
6.7	0.44	30.19064	18.52969	13.8848	11.28121	9.568513	3.068	86.52286
7.0	0.41	28.17473	17.29241	12.95768	10.52794	8.929598	3.068	80.95036
7.3	0.39	26.29343	16.13775	12.09246	9.824959	8.333346	3.068	75.74995
7.6	0.36	24.53775	15.06019	11.28501	9.16892	7.776906	3.068	70.89678
7.9	0.34	22.8993	14.05459	10.53148	8.556687	7.257622	3.068	66.36767
8.2	0.31	21.37025	13.11612	9.828268	7.985335	6.773011	3.068	62.14099
8.5	0.29	19.9433	12.24033	9.172009	7.452133	6.320759	3.068	58.19653
8.8	0.27	18.61164	11.42301	8.55957	6.954534	5.898705	3.068	54.51545

9.1	0.26	17.36889	10.66026	7.988025	6.490162	5.504833	3.068	51.08017
9.4	0.24	16.20912	9.948448	7.454643	6.056796	5.137261	3.068	47.87427
9.7	0.22	15.1268	9.284164	6.956877	5.652368	4.794233	3.068	44.88244
10.0	0.21	14.11674	8.664236	6.492348	5.274944	4.474109	3.068	42.09038
10.3	0.19	13.17413	8.085702	6.058837	4.922723	4.175361	3.068	39.48475
10.6	0.18	12.29446	7.545799	5.654272	4.594019	3.896561	3.068	37.05311
10.9	0.17	11.47352	7.041946	5.276721	4.287265	3.636377	3.068	34.78383
11.2	0.16	10.70741	6.571736	4.924381	4.000993	3.393567	3.068	32.66608
11.5	0.15	9.992444	6.132924	4.595567	3.733836	3.166969	3.068	30.68974
11.8	0.14	9.325222	5.723413	4.288709	3.484518	2.955503	3.068	28.84536
12.1	0.13	8.702552	5.341245	4.00234	3.251847	2.758156	3.068	27.12414
12.4	0.12	8.12146	4.984596	3.735094	3.034713	2.573986	3.068	25.51785
12.7	0.11	7.579169	4.651762	3.485692	2.832077	2.402115	3.068	24.01881
13.0	0.10	7.073087	4.341151	3.252943	2.642972	2.241719	3.068	22.61987
13.3	0.10	6.600799	4.051281	3.035735	2.466494	2.092034	3.068	21.31434
13.6	0.09	6.160046	3.780766	2.833031	2.301799	1.952343	3.068	20.09599
13.9	0.08	5.748723	3.528315	2.643862	2.148102	1.82198	3.068	18.95898
14.2	0.08	5.364866	3.29272	2.467324	2.004668	1.700321	3.068	17.8979
14.5	0.07	5.00664	3.072856	2.302575	1.870811	1.586787	3.068	16.90767
14.8	0.07	4.672333	2.867673	2.148826	1.745892	1.480833	3.068	15.98356
15.1	0.06	4.360349	2.676191	2.005343	1.629314	1.381954	3.068	15.12115
15.4	0.06	4.069197	2.497495	1.871441	1.52052	1.289677	3.068	14.31633
15.7	0.06	3.797486	2.330731	1.74648	1.418991	1.203562	3.068	13.56525
16.0	0.05	3.543918	2.175102	1.629863	1.324241	1.123197	3.068	12.86432
16.3	0.05	3.307281	2.029864	1.521033	1.235818	1.048198	3.068	12.21019
16.6	0.05	3.086445	1.894325	1.419469	1.153299	0.978207	3.068	11.59975
16.9	0.04	2.880355	1.767836	1.324687	1.076291	0.912889	3.068	11.03006
17.2	0.04	2.688026	1.649793	1.236235	1.004424	0.851933	3.068	10.49841
17.5	0.04	2.50854	1.539632	1.153688	0.937356	0.795048	3.068	10.00226
17.8	0.03	2.341038	1.436826	1.076653	0.874766	0.74196	3.068	9.539244
18.1	0.03	2.184721	1.340886	1.004762	0.816356	0.692418	3.068	9.107142
18.4	0.03	2.038841	1.251351	0.937672	0.761845	0.646183	3.068	8.703892
18.7	0.03	1.902702	1.167795	0.875061	0.710975	0.603036	3.068	8.327569
19.0	0.03	1.775654	1.089818	0.816631	0.663501	0.562769	3.068	7.976374
19.3	0.02	1.657089	1.017048	0.762102	0.619198	0.525192	3.068	7.648629
19.6	0.02	1.546441	0.949137	0.711215	0.577852	0.490123	3.068	7.342768
19.9	0.02	1.443181	0.885761	0.663725	0.539267	0.457397	3.068	7.05733
20.2	0.02	1.346816	0.826616	0.619406	0.503259	0.426855	3.068	6.790952
20.5	0.02	1.256885	0.771421	0.578047	0.469655	0.398353	3.068	6.542361
20.8	0.02	1.17296	0.719911	0.539449	0.438295	0.371754	3.068	6.310369
21.1	0.02	1.094638	0.671841	0.503429	0.409029	0.346931	3.068	6.093867

21.4	0.02	1.021546	0.62698	0.469813	0.381717	0.323765	3.068	5.891822
21.7	0.01	0.953335	0.585115	0.438443	0.356229	0.302147	3.068	5.703268
22.0	0.01	0.889678	0.546045	0.409167	0.332442	0.281971	3.068	5.527304
22.3	0.01	0.830272	0.509585	0.381846	0.310244	0.263143	3.068	5.36309
22.6	0.01	0.774833	0.475558	0.356349	0.289529	0.245573	3.068	5.209841
22.9	0.01	0.723095	0.443804	0.332554	0.270196	0.229175	3.068	5.066824
23.2	0.01	0.674812	0.41417	0.310349	0.252154	0.213872	3.068	4.933358
23.5	0.01	0.629753	0.386515	0.289626	0.235317	0.199592	3.068	4.808803
23.8	0.01	0.587703	0.360706	0.270287	0.219604	0.186264	3.068	4.692565
24.0	0.01	0.561241	0.336621	0.252239	0.204941	0.173827	3.068	4.596869
		0	0.321464	0.235397	0.191256	0.16222	3.068	3.978337
			0	0.224798	0.178486	0.151388	3.068	3.622672
				0	0.170449	0.14128	3.068	3.379729
					0	0.134918	3.068	3.202918
						0	3.068	3.068



## Lampiran 7

### Perhitungan Debit Banjir Rencana Metode Nakayasu (10 Tahun)

10 tahun							
t	q	r1	r2	r3	r4	r5	qtot
		48.032	26.369	17.635	12.725	9.515	
0	0.000	0.000					0.000
1	0.480	23.079	0.000				23.079
2	2.536	121.811	12.670	0.000			134.480
2.721	5.309	255.012	66.872	8.473	0.000		330.358
3	2.213	106.314	139.998	44.723	6.114	0.000	297.149
4	1.943	93.343	58.364	93.629	32.271	4.572	282.180
5	1.754	84.239	51.244	39.034	67.560	24.130	266.206
6	1.621	77.848	46.246	34.271	28.165	50.516	237.047
6.123	1.607	77.207	42.737	30.929	24.729	21.060	196.662
7	1.308	62.804	42.385	28.582	22.317	18.491	174.580
8	1.307	62.799	34.479	28.347	20.624	16.687	162.936
9	1.307	62.798	34.476	23.059	20.454	15.421	156.208
10	1.307	62.798	34.475	23.057	16.639	15.294	152.263
11	1.307	62.797	34.475	23.057	16.637	12.441	149.407
11.226	1.307	62.797	34.475	23.056	16.637	12.440	149.406
12	1.307	62.797	34.475	23.056	16.637	12.440	149.405
13	1.307	62.797	34.475	23.056	16.637	12.440	149.405
14	1.307	62.797	34.475	23.056	16.637	12.440	149.405
15	1.307	62.797	34.475	23.056	16.637	12.440	149.405
16	1.307	62.797	34.475	23.056	16.637	12.440	149.405
17	1.307	62.797	34.475	23.056	16.637	12.440	149.405
		0.000	34.475	23.056	16.637	12.440	86.608
			0.000	23.056	16.637	12.440	52.133
				0.000	16.637	12.440	29.077
					0	12.440	12.440
						0.000	0.000





## Lampiran 10

### Perhitungan Debit Banjir Rencana Metode Nakayasu (100 Tahun)

100 tahun							
t	q	r1	r2	r3	r4	r5	qtot
		68.065	38.986	27.263	20.671	16.362	
0	0.000	0.000					0.000
1	0.480	32.704	0.000				32.704
2	2.536	172.614	18.732	0.000			191.347
2.721	5.309	361.371	98.869	13.099	0.000		473.339
3	2.213	150.654	206.984	69.138	9.932	0.000	436.709
4	1.943	132.274	86.291	144.742	52.423	7.862	423.592
5	1.754	119.373	75.763	60.342	109.749	41.495	406.722
6	1.621	110.316	68.374	52.981	45.754	86.871	364.296
6.123	1.607	109.408	63.186	47.813	40.172	36.216	296.795
7	1.308	88.998	62.666	44.186	36.254	31.798	263.902
8	1.307	88.991	50.976	43.822	33.503	28.696	245.989
9	1.307	88.989	50.972	35.647	33.227	26.519	235.355
10	1.307	88.989	50.971	35.644	27.029	26.301	228.934
11	1.307	88.988	50.970	35.643	27.027	21.395	224.024
11.226	1.307	88.988	50.970	35.643	27.026	21.393	224.021
12	1.307	88.988	50.970	35.643	27.026	21.392	224.020
13	1.307	88.988	50.970	35.643	27.026	21.392	224.020
14	1.307	88.988	50.970	35.643	27.026	21.392	224.020
15	1.307	88.988	50.970	35.643	27.026	21.392	224.020
16	1.307	88.988	50.970	35.643	27.026	21.392	224.020
17	1.307	88.988	50.970	35.643	27.026	21.392	224.020
		0.000	50.970	35.643	27.026	21.392	135.031
			0.000	35.643	27.026	21.392	84.061
				0.000	27.026	21.392	48.418
					0.000	21.392	21.392
						0.000	0.000

## Lampiran 11

### Perhitungan Debit Banjir Metode Snyder (5 Tahun)

5 tahun							
t	q	r1	r2	r3	r4	r5	Q
		41.49713	22.25301	14.49469	10.13278	7.281129	Q
0	0	0					0
1	6.187112	256.7474	0				256.7474
2	11.89855	493.7556	137.6819	0			631.4375
3	13.65065	566.4628	264.7786	89.68029	0		920.9217
4	13.76341	571.142	303.7681	172.4658	62.69265	0	1110.069
5	13.17844	546.8676	306.2774	197.862	120.5654	45.04916	1216.621
6	12.29659	510.2733	293.2601	199.4964	138.3191	86.63487	1227.984
7	11.30565	469.1521	273.6363	191.0175	139.4616	99.39215	1172.66
8	10.29912	427.384	251.5848	178.2353	133.5343	100.2132	1090.952
9	9.324682	386.9475	229.1865	163.8719	124.5987	95.95394	1000.559
10	8.406172	348.832	207.5023	149.2826	114.5577	89.53308	909.7077
11	7.55445	313.488	187.0627	135.1584	104.3587	82.3179	822.3857
12	6.773103	281.0643	168.1093	121.8449	94.48496	74.98923	740.4927
13	6.061611	251.5395	150.7219	109.4994	85.1779	67.89421	664.8329
14	5.417166	224.7968	134.8891	98.17405	76.54759	61.20642	595.614
15	4.835742	200.6694	120.5483	87.86119	68.63037	55.00492	532.7141
16	4.312742	178.9664	107.6098	78.52015	61.42098	49.31583	475.8332
17	3.843385	159.4895	95.9715	70.09259	54.89095	44.13537	424.5799
18	3.422941	142.0422	85.5269	62.51187	48.99951	39.44308	378.5236
19	3.046866	126.4362	76.17076	55.70869	43.70007	35.20966	337.2254
20	2.710882	112.4938	67.80196	49.61448	38.94418	31.40163	300.2561
21	2.411011	100.05	60.32529	44.16339	34.68391	27.98418	267.2068
22	2.143591	88.95288	53.65225	39.2934	30.87323	24.92287	237.6946
23	1.905277	79.06352	47.70136	34.94686	27.46877	22.18463	211.3651
24	1.693025	70.25568	42.39815	31.07069	24.43024	19.73828	187.8931
25	1.504081	62.41504	37.67491	27.6164	21.72054	17.55488	166.9818
26	1.335958	55.4384	33.47033	24.53988	19.30575	15.60776	148.3621
27	1.186417	49.23291	29.72908	21.80119	17.15505	13.87257	131.7908
28	1.05345	43.71513	26.40136	19.36429	15.24052	12.32713	117.0484
29	0.935252	38.81027	23.44243	17.19675	13.53697	10.95141	103.9378
30	0.830211	34.45136	20.81217	15.26943	12.02171	9.727279	92.28194
31	0.736882	30.57849	18.47469	13.55619	10.67437	8.638456	81.9222
32	0.653977	27.13817	16.39785	12.03365	9.476703	7.670302	72.71667
33	0.580345	24.08263	14.55296	10.68088	8.412342	6.80969	64.5385

34	0.514958	21.36928	12.91441	9.479197	7.466665	6.04487	57.27442
35	0.456902	18.96014	11.45937	8.411916	6.626606	5.365333	50.82336
36	0.405363	16.82138	10.16745	7.464158	5.880504	4.761691	45.09519
37	0.359613	14.92289	9.020538	6.622659	5.217956	4.225563	40.00961
38	0.319007	13.23786	8.002464	5.875605	4.629692	3.749475	35.49509
39	0.28297	11.74243	7.098858	5.212474	4.10745	3.326765	31.48797
40	0.25099	10.41539	6.296927	4.623902	3.643876	2.951497	27.93159
41	0.222615	9.237868	5.585295	4.101558	3.232424	2.618386	24.77553
42	0.197438	8.193107	4.953846	3.63803	2.867269	2.322728	21.97498
43	0.175101	7.2662	4.393589	3.226731	2.543232	2.060338	19.49009
44	0.155286	6.443905	3.896531	2.861802	2.255705	1.827494	17.28544
45	0.137707	5.714458	3.455571	2.538039	2.000595	1.620886	15.32955
		0	3.064403	2.250816	1.774263	1.437571	8.527053
			0	1.996025	1.573474	1.274935	4.844435
				0	1.395358	1.130654	2.526012
					0	1.002665	1.002665
						0	0

## Lampiran 12

### Perhitungan Debit Banjir Metode Snyder (10 Tahun)

10 tahun							
t	q	r1	r2	r3	r4	r5	Q
		48.03224	26.36892	17.63529	12.72504	9.514905	Q
0	0	0					0
1	6.187112	297.1808	0				297.1808
2	11.89855	571.5139	163.1475	0			734.6614
3	13.65065	655.6713	313.7519	109.1115	0		1078.535
4	13.76341	661.0874	359.953	209.8344	78.73126	0	1309.606
5	13.17844	632.9901	362.9263	240.7333	151.4095	58.86978	1446.929
6	12.29659	590.6329	347.5013	242.7218	173.7051	113.2136	1467.775
7	11.30565	543.0357	324.2479	232.4057	175.14	129.8847	1404.714
8	10.29912	494.6899	298.1178	216.854	167.6962	130.9576	1308.316
9	9.324682	447.8853	271.5767	199.3785	156.4747	125.3916	1200.707
10	8.406172	403.7672	245.8818	181.6281	143.8649	117.0009	1092.143
11	7.55445	362.8571	221.6617	164.4435	131.0568	107.5722	987.5913
12	6.773103	325.3273	199.2027	148.2453	118.657	97.99517	889.4274
13	6.061611	291.1527	178.5994	133.225	106.9689	88.72346	798.6695
14	5.417166	260.1986	159.8381	119.4457	96.13069	79.98393	715.597
15	4.835742	232.2715	142.8448	106.8983	86.18802	71.87988	640.0825
16	4.312742	207.1506	127.5133	95.53331	77.13426	64.44543	571.7769
17	3.843385	184.6064	113.7224	85.27973	68.93366	57.67566	510.2178
18	3.422941	164.4115	101.3459	76.05647	61.53502	51.54382	454.8928
19	3.046866	146.3478	90.25927	67.77923	54.87982	46.01163	405.2778
20	2.710882	130.2097	80.34258	60.36458	48.90724	41.03533	360.8595
21	2.411011	115.8062	71.48304	53.73239	43.55707	36.56945	321.1482
22	2.143591	102.9615	63.57575	47.8072	38.7715	32.56896	285.6849
23	1.905277	91.51471	56.52419	42.51888	34.49609	28.99065	254.0445
24	1.693025	81.31978	50.2401	37.80286	30.68021	25.79379	225.8367
25	1.504081	72.24437	44.64325	33.60012	27.27729	22.94054	200.7056
26	1.335958	64.16903	39.66099	29.857	24.24473	20.39607	178.3278
27	1.186417	56.98627	35.22776	26.52491	21.54382	18.12853	158.4113
28	1.05345	50.59954	31.28454	23.56	19.13949	16.10897	140.6926
29	0.935252	44.92224	27.77833	20.92282	17.00012	14.31119	124.9347
30	0.830211	39.87687	24.66159	18.57789	15.09721	12.71151	110.9251
31	0.736882	35.3941	21.89176	16.49344	13.40519	11.28865	98.47314
32	0.653977	31.41198	19.43079	14.64101	11.90112	10.02347	87.40837
33	0.580345	27.87525	17.24467	12.99513	10.56446	8.898834	77.57835

34	0.514958	24.73458	15.30306	11.53308	9.376856	7.899375	68.84695
35	0.456902	21.94604	13.57889	10.23455	8.321885	7.011363	61.09272
36	0.405363	19.47047	12.04802	9.081435	7.384908	6.22253	54.20736
37	0.359613	17.273	10.68897	8.057608	6.552862	5.521923	48.09436
38	0.319007	15.3226	9.482597	7.148687	5.814102	4.899776	42.66776
39	0.28297	13.59166	8.41186	6.341874	5.158255	4.347383	37.85104
40	0.25099	12.05563	7.461604	5.625775	4.576086	3.856986	33.57609
41	0.222615	10.69268	6.618349	4.990253	4.059372	3.42168	29.78233
42	0.197438	9.483385	5.870108	4.426291	3.6008	3.035317	26.4159
43	0.175101	8.410505	5.206225	3.925875	3.193865	2.692429	23.4289
44	0.155286	7.458712	4.617232	3.481876	2.832781	2.388151	20.77875
45	0.137707	6.61439	4.094713	3.087962	2.512406	2.118157	18.42763
		0	3.631193	2.738506	2.228171	1.878603	10.47647
			0	2.428509	1.976015	1.666072	6.070596
				0	1.752331	1.477527	3.229859
					0	1.310272	1.310272
						0	0

### Lampiran 13

#### Perhitungan Debit Banjir Metode Snyder (25 Tahun)

25 tahun							
t	q	r1	r2	r3	r4	r5	Q
		56.15516	31.48486	21.53896	15.94714	12.29142	Q
0	0	0					0
1	6.187112	347.4383	0				347.4383
2	11.89855	668.165	194.8004	0			862.9653
3	13.65065	766.5546	374.6242	133.264	0		1274.443
4	13.76341	772.8866	429.7889	256.2824	98.66673	0	1557.625
5	13.17844	740.0376	433.3391	294.0208	189.7478	76.04838	1733.194
6	12.29659	690.5172	414.9215	296.4496	217.6888	146.25	1765.827
7	11.30565	634.8707	387.1566	283.85	219.487	167.7859	1693.15
8	10.29912	578.3489	355.9569	264.8558	210.1585	169.1718	1578.492
9	9.324682	523.629	324.2665	243.512	196.0955	161.9817	1449.485
10	8.406172	472.05	293.5863	221.8324	180.2928	151.1426	1318.904
11	7.55445	424.2214	264.6672	200.844	164.2415	138.9625	1192.937
12	6.773103	380.3447	237.8508	181.0602	148.702	126.5908	1074.549
13	6.061611	340.3908	213.2502	162.715	134.0544	114.6136	965.0239
14	5.417166	304.2018	190.849	145.8856	120.4719	103.3238	864.7321
15	4.835742	271.5519	170.5587	130.5608	108.0116	92.8549	773.5379
16	4.312742	242.1827	152.2527	116.6801	96.66535	83.25104	691.0319
17	3.843385	215.8259	135.7861	104.1569	86.38829	74.50579	616.663
18	3.422941	192.2158	121.0085	92.89198	77.11625	66.58465	549.8172
19	3.046866	171.0973	107.7708	82.78253	68.77589	59.43812	489.8647
20	2.710882	152.23	95.93017	73.7266	61.291	53.00971	436.1875
21	2.411011	135.3907	85.35175	65.62634	54.58612	47.24065	388.1956
22	2.143591	120.3737	75.91034	58.38958	48.5888	42.0728	345.3352
23	1.905277	106.9911	67.49067	51.93066	43.23081	37.45031	307.0936
24	1.693025	95.07211	59.98738	46.17073	38.44872	33.32058	272.9995
25	1.504081	84.46191	53.30467	41.03768	34.18414	29.63474	242.6231
26	1.335958	75.02091	47.35578	36.466	30.38371	26.34777	215.5742
27	1.186417	66.62345	42.06244	32.39634	26.99891	23.41855	191.4997
28	1.05345	59.15663	37.35418	28.77514	23.98579	20.80968	170.0814
29	0.935252	52.51923	33.16771	25.55419	21.3047	18.48729	151.0331
30	0.830211	46.62061	29.44628	22.69021	18.91996	16.42081	134.0979
31	0.736882	41.37974	26.13907	20.14436	16.79951	14.58275	119.0454
32	0.653977	36.72419	23.20063	17.88187	14.91459	12.94839	105.6697
33	0.580345	32.58934	20.59038	15.87167	13.23948	11.49557	93.78645

34	0.514958	28.91755	18.27207	14.08599	11.75116	10.20447	83.23123
35	0.456902	25.65743	16.21338	12.50002	10.42906	9.057326	73.85721
36	0.405363	22.7632	14.38551	11.09166	9.254835	8.038305	65.53351
37	0.359613	20.1941	12.76278	9.841202	8.212106	7.133257	58.14345
38	0.319007	17.91387	11.32235	8.731087	7.286285	6.329563	51.58316
39	0.28297	15.89021	10.04388	7.745682	6.464372	5.615978	45.76012
40	0.25099	14.09441	8.90926	6.87107	5.734792	4.98248	40.59201
41	0.222615	12.50096	7.902402	6.094872	5.087242	4.420149	36.00563
42	0.197438	11.08716	7.008991	5.406075	4.512556	3.921043	31.93582
43	0.175101	9.83284	6.216306	4.794888	4.00258	3.478098	28.32471
44	0.155286	8.720086	5.51304	4.252608	3.550066	3.085029	25.12083
45	0.137707	7.732977	4.889144	3.771499	3.14857	2.736249	22.27844
		0	4.335696	3.344689	2.792364	2.426792	12.89954
			0	2.966072	2.47636	2.152243	7.594675
				0	2.196038	1.90868	4.104717
					0	1.692618	1.692618
						0	0

## Lampiran 14

### Perhitungan Debit Banjir Metode Snyder (50 Tahun)

50 tahun							
t	q	r1	r2	r3	r4	r5	Q
		62.12064	35.24201	24.40581	18.31344	14.33049	Q
0	0	0					0
1	6.187112	384.3473	0				384.3473
2	11.89855	739.1454	218.0462	0			957.1917
3	13.65065	847.9871	419.3288	151.0015	0		1418.317
4	13.76341	854.9918	481.0764	290.3937	113.3073	0	1739.769
5	13.17844	818.6533	485.0502	333.1552	217.9034	88.66432	1943.426
6	12.29659	763.8722	464.4348	335.9072	249.9904	170.512	1984.717
7	11.30565	702.3143	433.3566	321.6306	252.0555	195.6205	1904.977
8	10.29912	639.788	398.4339	300.1083	241.3427	197.2364	1776.909
9	9.324682	579.2552	362.9617	275.9236	225.193	188.8535	1632.187
10	8.406172	522.1968	328.6205	251.3584	207.0454	176.2162	1485.437
11	7.55445	469.2872	296.2504	227.5764	188.6124	162.0155	1343.742
12	6.773103	420.7495	266.234	205.1594	170.767	147.5914	1210.501
13	6.061611	376.5511	238.6977	184.3725	153.946	133.6272	1087.195
14	5.417166	336.5178	213.6233	165.3031	138.348	120.4645	974.2567
15	4.835742	300.3994	190.9118	147.9385	124.0388	108.2589	871.5475
16	4.312742	267.9103	170.4213	132.2103	111.009	97.06186	778.6127
17	3.843385	238.7535	151.9897	118.0202	99.20696	86.86583	694.8362
18	3.422941	212.6353	135.4486	105.256	88.55909	77.63062	619.5296
19	3.046866	189.2733	120.6313	93.80093	78.98116	69.29853	551.9852
20	2.710882	168.4017	107.3777	83.53965	70.38562	61.80369	491.5084
21	2.411011	149.7735	95.53692	74.36125	62.68584	55.07758	437.4351
22	2.143591	133.1612	84.96885	66.16127	55.79862	49.05241	389.1424
23	1.905277	118.357	75.54445	58.84267	49.64559	43.66308	346.0528
24	1.693025	105.1718	67.14578	52.31608	44.15391	38.84826	307.6358
25	1.504081	93.43446	59.66561	46.49983	39.25654	34.55095	273.4074
26	1.335958	82.99053	53.00683	41.31965	34.89218	30.7187	242.9279
27	1.186417	73.70099	47.08183	36.70831	31.00512	27.30354	215.7998
28	1.05345	65.44096	41.81172	32.60513	27.5449	24.26187	191.6646
29	0.935252	58.09845	37.12568	28.95547	24.46598	21.55421	170.1998
30	0.830211	51.57321	32.96016	25.71029	21.72739	19.14492	151.116
31	0.736882	45.77559	29.25829	22.82558	19.29229	17.00194	134.1537
32	0.653977	40.62547	25.9692	20.26196	17.12768	15.09644	119.0808
33	0.580345	36.05137	23.04746	17.98421	15.20402	13.40262	105.6897

34	0.514958	31.98952	20.45251	15.96084	13.49485	11.89732	93.79503
35	0.456902	28.38307	18.14815	14.16378	11.97657	10.55988	83.23145
36	0.405363	25.18138	16.10216	12.56797	10.62811	9.371809	73.85142
37	0.359613	22.33936	14.28579	11.15107	9.430654	8.316619	65.5235
38	0.319007	19.81689	12.67347	9.893201	8.367456	7.379598	58.13062
39	0.28297	17.57825	11.24243	8.776637	7.423584	6.547633	51.56854
40	0.25099	15.59169	9.972417	7.785614	6.585745	5.809042	45.74451
41	0.222615	13.82896	8.845409	6.906103	5.842109	5.153423	40.57601
42	0.197438	12.26497	7.845386	6.125627	5.182148	4.571519	35.98965
43	0.175101	10.8774	6.958109	5.433091	4.5965	4.055092	31.92019
44	0.155286	9.646437	6.17092	4.818633	4.076841	3.596816	28.30965
45	0.137707	8.554466	5.472575	4.273488	3.615768	3.190176	25.10647
		0	4.853082	3.78987	3.206707	2.829381	14.67904
			0	3.360859	2.843813	2.509286	8.713958
				0	2.521895	2.225317	4.747213
					0	1.973413	1.973413
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## Lampiran 15

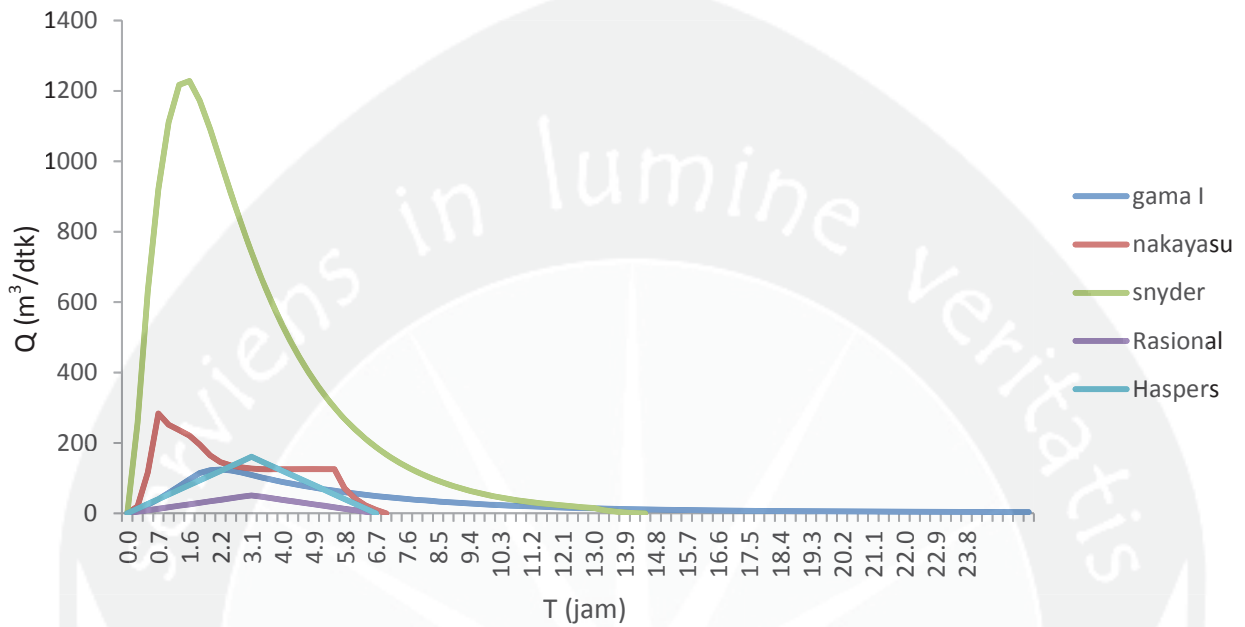
### Perhitungan Debit Banjir Metode Snyder (100 Tahun)

100 tahun							
t	q	r1	r2	r3	r4	r5	Q
		68.06517	38.98596	27.2626	20.67144	16.3624	Q
0	0	0					0
1	6.187112	421.1268	0				421.1268
2	11.89855	809.8768	241.2105	0			1051.087
3	13.65065	929.1339	463.8764	168.6768	0		1561.687
4	13.76341	936.8089	532.1838	324.3854	127.8965	0	1921.275
5	13.17844	896.993	536.5799	372.1522	245.9602	101.236	2152.921
6	12.29659	836.9697	513.7743	375.2264	282.1787	194.6888	2202.838
7	11.30565	769.5211	479.3946	359.2786	284.5096	223.3574	2116.061
8	10.29912	701.0115	440.7617	335.2371	272.4175	225.2024	1974.63
9	9.324682	634.6861	401.5212	308.2214	254.1883	215.6309	1814.248
10	8.406172	572.1675	363.5317	280.7808	233.7042	201.2018	1651.386
11	7.55445	514.1949	327.7227	254.2151	212.8977	184.9876	1494.018
12	6.773103	461.0124	294.5175	229.1741	192.7546	168.5183	1345.977
13	6.061611	412.5846	264.056	205.9539	173.7677	152.5742	1208.936
14	5.417166	368.7203	236.3178	184.6524	156.1614	137.5451	1083.397
15	4.835742	329.1456	211.1934	165.2553	140.0098	123.6089	969.213
16	4.312742	293.5475	188.5261	147.686	125.3023	110.8242	865.8861
17	3.843385	261.6007	168.1364	131.8349	111.9806	99.18249	772.7351
18	3.422941	232.9831	149.8381	117.5766	99.96177	88.63782	688.9973
19	3.046866	207.3855	133.4467	104.7807	89.15061	79.12433	613.8878
20	2.710882	184.5166	118.785	93.31827	79.44833	70.5668	546.6351
21	2.411011	164.1059	105.6863	83.0655	70.75714	62.887	486.5018
22	2.143591	145.9039	93.99557	73.90569	62.98313	56.00753	432.7958
23	1.905277	129.683	83.56997	65.73042	56.03785	49.85404	384.8753
24	1.693025	115.236	74.27906	58.43987	49.83907	44.35653	342.1506
25	1.504081	102.3755	66.00422	51.9428	44.31113	39.44992	304.0836
26	1.335958	90.93218	58.63804	46.15627	39.38483	35.07429	270.1856
27	1.186417	80.75369	52.08359	41.00515	34.99728	31.1749	240.0146
28	1.05345	71.70322	46.25362	36.42167	31.09152	27.70195	213.172
29	0.935252	63.65809	41.06975	32.34482	27.61617	24.61037	189.2992
30	0.830211	56.50843	36.4617	28.71977	24.52496	21.85947	168.0743
31	0.736882	50.15601	32.36656	25.4974	21.77632	19.41263	149.2089
32	0.653977	44.51306	28.72806	22.6337	19.33301	17.23696	132.4448
33	0.580345	39.50125	25.49593	20.08932	17.16165	15.30297	117.5511

34	0.514958	35.0507	22.62529	17.82911	15.23242	13.58424	104.3218
35	0.456902	31.09914	20.07613	15.8217	13.51865	12.05716	92.57278
36	0.405363	27.59107	17.81278	14.03909	11.99656	10.70063	82.14013
37	0.359613	24.47709	15.80345	12.45635	10.64493	9.495828	72.87764
38	0.319007	21.71324	14.01984	11.05124	9.444832	8.425947	64.6551
39	0.28297	19.26038	12.43678	9.803974	8.379429	7.476018	57.35658
40	0.25099	17.08371	11.03184	8.696948	7.433712	6.632703	50.87892
41	0.222615	15.1523	9.785107	7.714487	6.594327	5.884125	45.13035
42	0.197438	13.43865	8.678846	6.842653	5.849391	5.219713	40.02925
43	0.175101	11.9183	7.697308	6.069053	5.188336	4.630062	35.50306
44	0.155286	10.56954	6.826492	5.382671	4.601766	4.106806	31.48727
45	0.137707	9.373072	6.053957	4.773716	4.081327	3.642509	27.92458
		0	5.368652	4.233488	3.619596	3.230558	16.45229
			0	3.754259	3.209977	2.865077	9.829313
				0	2.846609	2.540844	5.387453
					0	2.253222	2.253222
						0	0

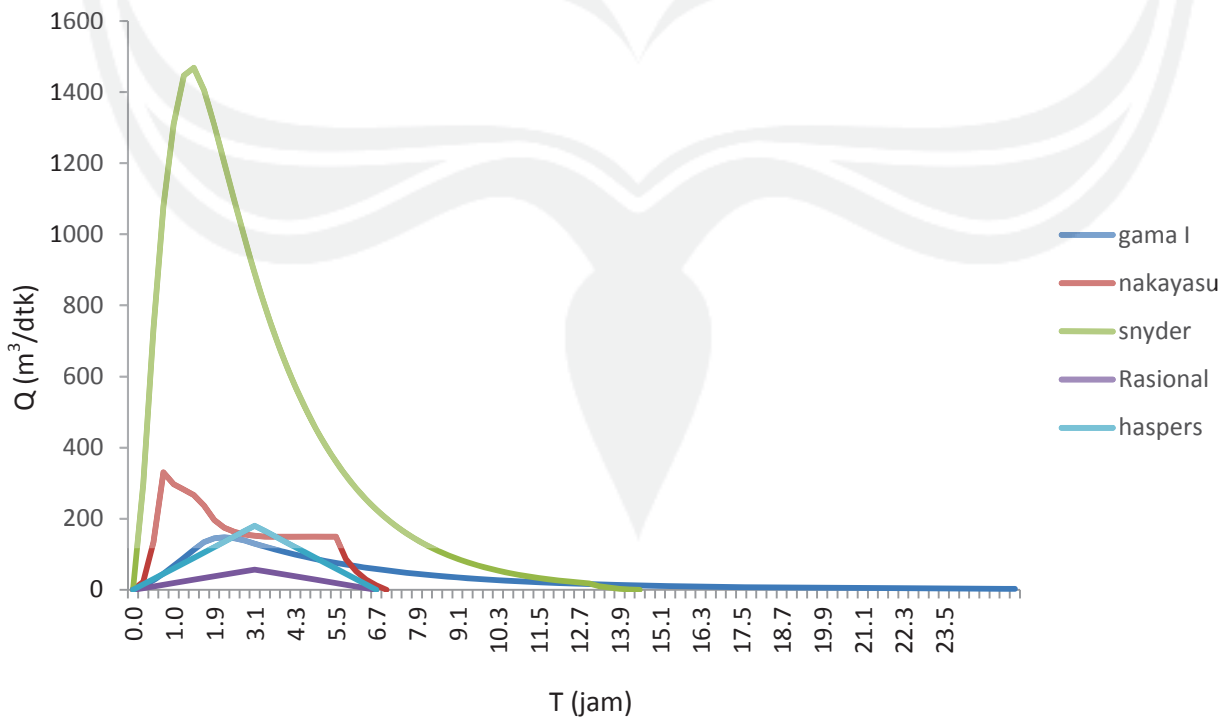
**Lampiran 16**

**Grafik Gabungan Periode 5 Tahun**



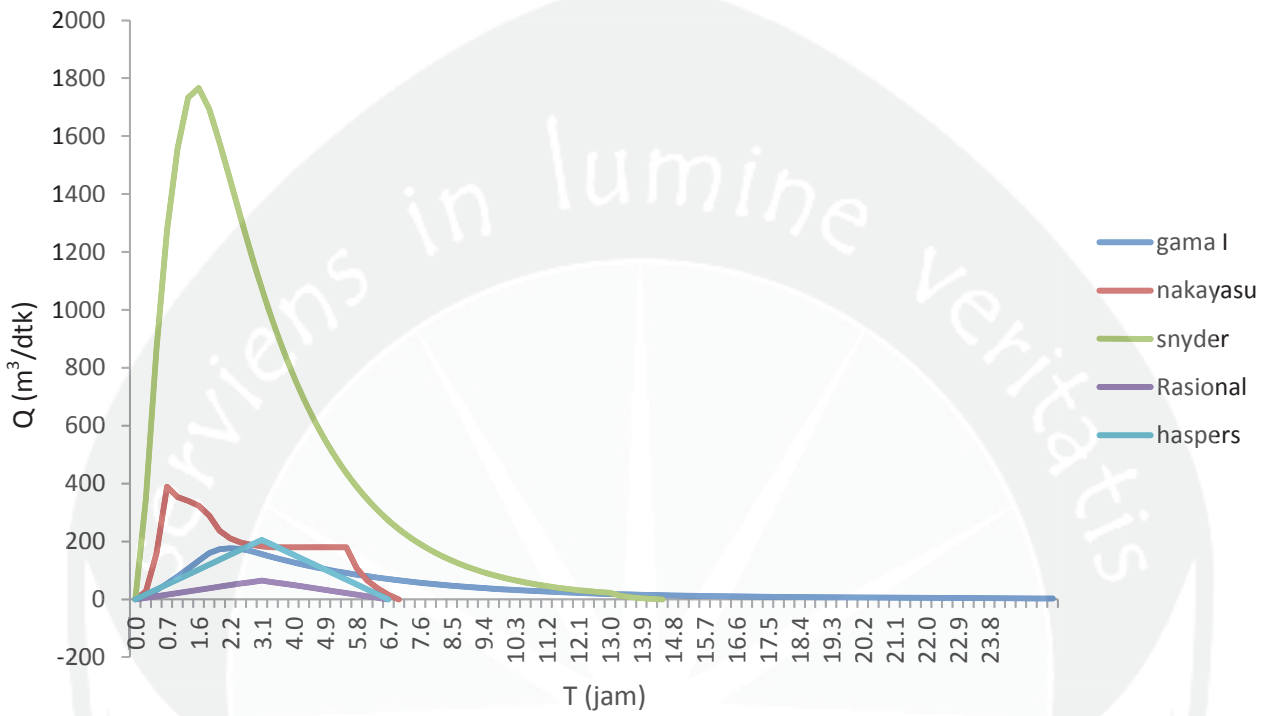
**Lampiran 17**

**Grafik Gabungan Periode 10 Tahun**



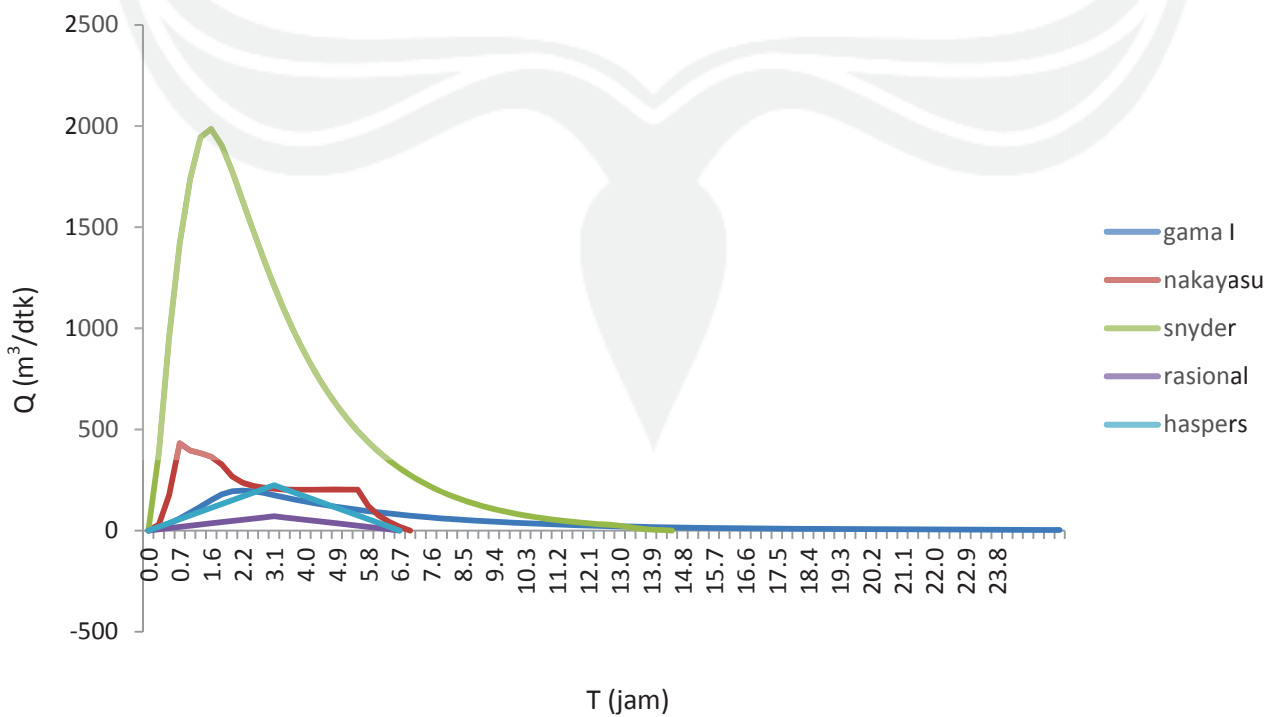
**Lampiran 18**

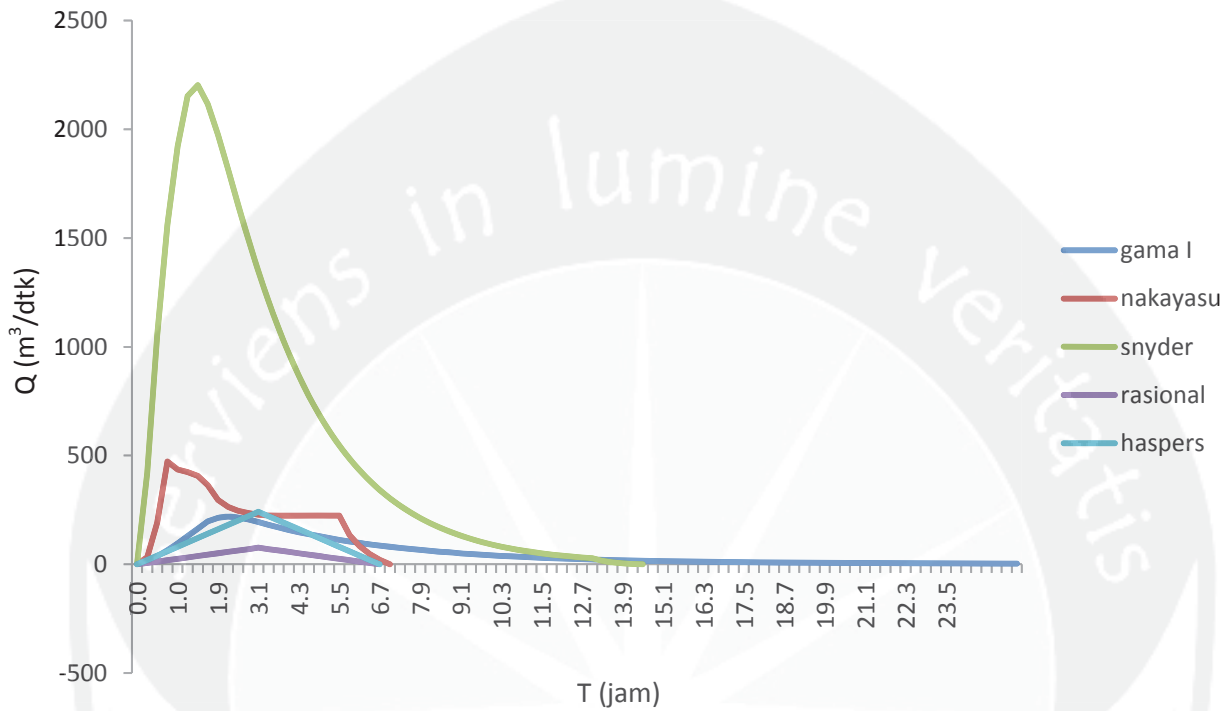
**Grafik Gabungan Periode 25 Tahun**



**Lampiran 19**

**Grafik Gabungan Periode 50 Tahun**



**Lampiran 20****Grafik Gabungan Periode 100 Tahun**



PEMERINTAH KABUPATEN MALUKU TENGGARA BARAT

DINAS PEKERJAAN UMUM PERTAMBANGAN DAN ENERGI

JL. Ir.SOEKARNO – SAUMLAKI

LABEL : 1

DATA DEBIT SUMBER AIR BAKU

NO	URAIAN SUMBER	LOKASI	DIBANGUN TAHUN	DEBIT MAX/MIN	KETERANGAN
1	2	3	4	5	6
1	WEIEMAR	BOMAKI	1988	15 m <sup>3</sup> /Det	BERFUNGSI
2	WEMOMOLIN	ILNGEI	2003	25 m <sup>3</sup> /Det	BERFUNGSI
3	OLILIT	OLILIT/SAUMLAKI	2004	5 m <sup>3</sup> /Det	BERFUNGSI
4	SUMUR NO,1	LARAT	1989	5 m <sup>3</sup> /Det	BERFUNGSI
5	SUMUR NO,2	LARAT	2005	5 m <sup>3</sup> /Det	BERFUNGSI
6	WERIAMRIAN	ALUSI	2011	65 m <sup>3</sup> /Det	BERFUNGSI
7	KANDAR	KANDARA	2012	75 m <sup>3</sup> /Det	BERFUNGSI
8	MAKAIIAN	MAKAIIAN	2008	10 m <sup>3</sup> /Det	BERFUNGSI
9	SEIRA	SEIRA	2011	25 m <sup>3</sup> /Det	BERFUNGSI