Appendix G

Water Balance Analysis

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1 OBJECTIVES OF WATER BALANCE ANALYSIS

1.1 Objective River Basins

The water balance analysis is made to respectively evaluate water balance respectively in the following river basins:

(1) Bang Giang and Ky Cung

(2) Red River and Thai Binh

(3) Ma

(4) Ca

(5) Thach Han

(6) Huong

(7) Vu Gia-Thu Bon

(8) Tra Khuc

(9) Kone

(10) Ba

(11) Sesan

(12) Srepok

(13) Dong Nai

(14) Cuu Long Delta

1.2 Components Examined

The analysis is to evaluate water balance between available water resources (supply side) and respective water requirement (demand side) in present and future conditions. The evaluation incorporates the following components:

Water resources

(1) River runoff (surface water) in natural flow condition

(2) Reservoir storage water(as supplemental water resources during drought season and high irrigation demand period as well as resource for regular release for hydropower generation)

Water demand

(1) Agriculture including irrigation, fishery and livestock

(2) Domestic use

(3) Industrial water use

(4) Hydropower generation as minimum water release requirement

River maintenance flow

(1) To prevent saline water intrusion

(2) To keep river ecology

(3) To maintain river transportation course

2 METHODOLOGY

2.1 Basic Condition

(1) Water balance system

Water balance point is predetermined at the water demanding point of each sub-basin and river mouth. Runoff at the water demanding point is evaluated if it is in surplus or in deficit incorporating agricultural uses, domestic use and industry water use. Balance point at the river mouth is to evaluate sufficiency of river maintenance flow in a whole basin basis.

Water balance analysis is made in monthly basis. Water resources and water demand data are given as monthly basis for a duration of 13-25 years, respectively.

(2) Natural flow

Natural flow is defined in the Study as the river runoff in each river system assuming no intake water and no supply by the existing reservoir storage.

The river runoff without reservoir regulation effect was worked out in the hydrological study, and the natural flow has been estimated by removing present intake water as of year 2000 including irrigation use, domestic use and industrial use and others.

The monthly discharge in natural flow condition are respectively presented by each river basin in A. HYDROLOGY compiled in this Supporting Report.

(3) Reservoir operation

Simple assumption is applied for a reservoir operation in the analysis model that operation rule is controlled by a maximum storage capacity and monthly minimum outflow discharge in each dam, as stated below:

a) A minimum discharge is predetermined at each dam based on the power generation plan of EVN in order that a certain amount of discharge is firmly released for the hydropower generation purpose.

b) In case that reservoir storage exceeds its capacity, outflow discharge should be equal to the inflow or more to keep hydropower release.

c) As long as water storage is available in the reservoir, a minimum outflow (for hydropower release) should be released.

d) When a reservoir has vacant space and sufficient inflow is available, a part of inflow would be stored until its storage capacity.

e) If a reservoir is empty, inflow less than predetermined minimum outflow

would be directly discharged as outflow.

f) In case that flood control space is required during every flood period, the required space is assumed to be kept for the period.

(4) Return flow of irrigation water

a) Return flow from irrigation area is assumed to be 10 % of demand, respectively.

b) Return flow of the irrigation water would not come back to the river in case that the flow go directly to the sea.

(5) Return flow of domestic and industrial waters

Return flow from the domestic and industrial water uses is not incorporated in runoff at the balance point.

2.2 River Maintenance Flow

A river maintenance flow is considered at the balance point of river mouth, incorporating a concept to prevent excessive saline water intrusion issues as well as maintaining river ecology as mentioned in 1.7.6 of the Main Report.

3 WATER BALANCE SYSTEM OF RIVER BASIN

3.1 River Basin and Reservoirs Considered

(1) River Basin and Runoff

The natural runoff of each river basin is applied for the analysis as monthly runoff series with a certain duration. The following table shows the river basins and the long-term-annual averages calculated from the monthly runoff applied in the analysis.

River Basin			Annual Basin Runoff
	Name	Catchment Area (km^2)	Long-term-average (Million m3/year)
(1)	Bang Giang and Ky Cung	11,250	7,007
(2)	Red River and Thai Binh	169,040	113,282 at Son Tay (144,000 km^2)
(3)	Ma	31,060	18,107
(4)	Ca	29,850	22,980
(5)	Thack Han	2,550	3,909
(6)	Huong	3,300	6,731
(7)	Vu Gia-Thu Bon	11,510	24,185 excld. Tam Ky (1,130 km^2)
(8)	Tra Khuc	5,200	12,062
(9)	Kone	3,640	4,485
(10)	Ba	14,030	9,731
(11)	Sesan	11,530	13,039
(12)	Srepok	12,030	9,652
(13)	Dong Nai	39,580	29,990 (29,120 km^2)
(14)	Cuu Long Delta	37,870 (Vietnam)	437,799

Schematic diagram for the water balance analysis in the respective river basins are shown in Figures G.1 though G.12.

(2) Reservoirs Considered

In addition to the natural flow as basin runoff, reservoir storage is also considered as water resources during drought period. General feature of the reservoirs is as follows:

Reservoirs Considered in the Analysis

River Basin	Reservoir Considered				
Name	Reservoir	Status	Effective Storage (MCM)	Hydropower Minimum Release (MCM/month)	Required Flood Control Space (MCM)
(1) Bang Giang and Ky Cung	Ban Lai	Planned	310.5	16.6	96.2
(2) Red River and Thai Binh	Hoa Binh	Existing	5,650		
	Thac Ba	Existing	1,200		
	Dai Tri	Planned	1,091	261	
	Bac Me	Planned	1,055	233.4	
	Son La	Planned	14,900	1,430	
(3) Ma	Cua Dat	Planned	1,210	88.6	105.6
(4) Ca	Ban La	Planned	1,244	151.3	216.0
	Ban Mai	Planned	-		
(5) Thack Han	Rao Quan	Planned	291	23.5	104.7
(6) Huong	Ta Trach	Planned	460	44.7	390.0
	Huu Trach	Planned	-		(105.0)
	Co Bi	Planned	-		(44.0)
(7) Vu Gia-Thu Bon	Ho song Tranh II	Planned	945	237.5	800.0
	Son Cai	Planned	-		(550.0)
(8) Tra Khuc	Nuoc Trong	Planned	186	22.1	184.2
(9) Kone	Vin Son	Existing	102		
	Thuan Ninh	Existing	32		
	Nui Mot	Existing	90		
	Dinh Binh	Planned	209	8.8	97.2
(10) Ba	LaYun	Existing	201		
	Hinh	Existing	323		
	Song Ba Ha	Planned	484	198.1	38.1
	An Khe	Planned	357		
(11) Sesan	Dak Bla	Planned	873	84.8	78.0
(12) Srepok	Buon Kuop	Planned	315	136.5	
	Krong Boung	Planned	21.6		21.4
	Upper Krong Pach	Planned	72.0		26.2
	Upper Krong Buk	Planned	83.4		
	Lower Krong Buk	Existing	45.0		33.3
(13) Dong Nai	Dau Tieng	Existing			
	Thac Mo	Existing			
	Tri An	Existing			
	Ham Thuan /Da Mi	Existing			
(14) Cuu Long Delta	-	-			

In the analysis, the storage capacity mentioned above is considered to be available for water supply, while available storage volume was reduced as a flood control volume to accept flood inflow in some reservoirs during early and/or major flood seasons.

3.2 Water Demands

Water demands incorporated in the analysis are for the agriculture including irrigation, fishery and livestock as well as domestic water, industry. Water release for hydropower generation is incorporated as minimum water release from the reservoir. In case of several reservoirs, the flood control volume is assumed during a certain months as a restriction of water availability in the analysis.

River maintenance flow requirement is not a water demand but incorporated in the evaluation of the water balance analysis. Those demands and assumed maintenance flow are summarized in the following table:

		Water Demand					Maintenance Flow Requirement	
			Agriculture		Urban			
			Irrigation	Fishery/ Livestock	Domestic Water	Industrial Water	Saline Water Intrusion	River Ecology
	River Basin	Year	1,000 ha	MCM /month	MCM /month	MCM /month	m^3/sec	m^3/sec
1	Bang Giang & Ky Cung	Present	25.5	1.38	0.88	0.04		
		2010	54.5	2.01	1.42	0.04	0.04	29.3
		2020	67.5	2.42	2.21	0.10		
2	Red & Thai Binh	Present	1008.0	117.0	22.0	25.8		
		2010	1197.0	173.9	45.0	25.8	(-)	867.0
		2020	1291.0	193.3	79.4	46.8		
3	Ma	Present	112.0	18.1	1.93	0.34		
		2010	177.6	22.1	5.40	0.34	61.0	114.7
		2020	199.5	23.9	8.42	1.63		
4	Ca	Present	93.0	12.7	2.10	0.04		
		2010	150.0	17.9	4.60	0.04	72.3	173.0
		2020	203.0	19.6	7.78	0.13		
5	Thach Han	Present	5.00	0.96	0.57	0.01		
		2010	12.3	1.30	0.89	0.01	(-)	10.9
		2020	15.4	1.52	1.40	0.02		
6	Huong	Present	21.2	1.55	1.19	0.53		
		2010	21.2	4.28	2.03	0.53	61.0	31.0
		2020	21.2	5.90	3.62	1.96		
7	Vu Gia -Thu Bon	Present	30.9	6.49	2.83	8.58		
		2010	69.0	5.87	4.76	8.58	28.9	147.1
		2020	77.0	6.04	7.34	17.0		
8	Tra Khuc	Present	33.0	0.60	0.70	0.18		
		2010	42.0	0.73	1.13	0.18	24.1	52.0
		2020	54.0	0.95	1.85	0.46		
9	Kone	Present	25.0	1.52	1.42	0.17		
		2010	36.5	1.80	2.35	0.17	15.3	13.5
		2020	49.0	2.09	3.95	3.94		
10	Ba	Present	41.0	1.75	1.67	0.04		
		2010	129.0	2.20	3.32	0.04	17.1	28.7
		2020	186.0	2.72	5.19	0.11		
11	Sesan	Present	22.5	0.72	0.75	0.05		
		2010	35.4	0.95	1.19	0.05	(-)	96.1
		2020	50.0	1.24	1.92	0.13		
12	Srepok	Present	29.0	2.66	1.66	0.05		
		2010	35.0	3.10	3.37	0.05	(-)	40.5
		2020	91.0	3.64	6.86	0.14		
13	Dong Nai	Present	115.0	39.8	18.9	77.0		
		2010	224.0	45.9	36.8	77.0	(-)	97.5
		2020	362.0	51.0	59.9	102.9		
14	Mekong	Present	1,487.0	307.2	12.8	0.64		
		2010	1,891.0	475.4	26.8	0.64	(-)	2,075.0
		2020	2,242.0	612.3	42.2	1.97		

4 RESULTS OF WATER BALANCE ANALYSIS

The following table shows the result of the water balance analysis as well as the proposed new reservoir schemes in the 14 basins, respectively. The detailed calculation results are compiled in Tables G.1 through G.12 ((1) for the present condition as well as (2) for the future demand in 2020(with the proposed dam)).

(1) River Basin : **Bang Giang and Ky Cung**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1960	14.6	16.8	0.0	18.7
1961	0.0	0.0	0.0	0.9
1962	0.0	2.4	0.0	15.0
1963	93.4	125.9	0.0	143.1
1964	0.0	0.0	0.0	0.0
1965	15.7	25.3	0.0	34.9
1966	42.2	65.2	0.0	88.2
1967	43.9	57.5	0.0	71.7
1968	20.8	30.4	0.0	38.9
1969	22.6	31.2	0.0	39.7
1970	43.4	57.0	0.0	69.1
1971	40.1	55.9	0.0	69.4
1972	52.8	68.6	0.0	82.2
1972	3.0	7.5	0.0	11.5
1974	22.4	31.0	0.0	38.5
1975				
1976				
1977				
1978				
1979				
1980				
Duration of runoff series(Year)	15			
Drought Years -water deficit - caused (Nos. of year)	12	12	0	14
-do above- (No maintenance flow considered)	0	2	0	5
Design Drought Year (Rank from the most of severe drought)			12/15	
Lowest Reservoir Storage in the Year (MCM)			100.5	

Present water demand cause water deficit almost every year as well as in case of 2020 demand. Implementation of Ban Lai Dam would eliminate projected 2020 demand completely.

(2) River Basin : **Red and Thai Binh**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1960				
1961				
1962				
1963				
1964				
1965				
1966				
1967	0.0	0.0	0.0	0.0
1968	0.0	0.0	0.0	0.0
1969	0.0	1,736.7	0.0	507.9
1970	0.0	839.9	0.0	1,033.5
1971	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.0	0.0
1978	0.0	0.0	0.0	0.0
1979	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	1,330.2
1981	0.0	0.0	0.0	0.0
1982	0.0	0.0	0.0	0.0
1983	0.0	0.0	0.0	0.0
1984	0.0	0.0	0.0	0.0
1985	0.0	179.5	0.0	0.0
1986	0.0	0.0	0.0	0.0
1987				
1988				
1989				
1990				

Duration of runoff series(Year)	20			
Drought Years -water deficit - caused (Nos. of year)	0	3	0	3
-do above- (No maintenance flow considered)	0	0	0	0
Design Drought Year (Rank from the most of severe drought)			-	
Lowest Reservoir Storage in the Year (MCM)			-	

Present demand is satisfied by the existing dams, but some deficit will be caused against 2010 demand if no dam is additionally constructed. However, projected 2020 demand would be completely satisfied by additional three dams under planning.

(3) River Basin : **Ma**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1981	22.2	120.5	0.0	199.0
1982	40.9	128.1	0.0	174.1
1983	76.4	199.3	0.0	270.9
1984	156.9	282.8	0.0	355.6
1985	17.0	103.7	0.0	161.0
1986	21.3	120.5	0.0	166.4
1987	73.1	224.2	0.0	330.5
1988	276.9	473.6	0.0	560.6
1989	690.5	939.8	0.0	1035.6
1990	153.0	322.4	0.0	389.6
1991	415.9	723.7	0.0	846.0
1992	870.2	1249.0	165.3	1381.1
1993	958.0	1305.6	363.9	1425.1
1994	718.6	976.5	215.0	1079.3
1995	368.1	580.9	0.0	673.6
1996	141.4	313.3	0.0	392.2
1997	0.0	0.0	0.0	38.6
1998	89.2	292.0	0.0	370.0
1999	666.0	878.1	0.0	963.1
2000	65.4	239.7	0.0	336.1
Duration of runoff series(Year)	20			
Drought Years -water deficit - caused (Nos. of year)	19	19	3	20
-do above- (No maintenance flow considered)	1	5	1	6
Design Drought Year (Rank from the most of severe drought)			16/20	
Lowest Reservoir Storage in the Year (MCM)			122.0	

Serious water deficit is observed in the present condition which has no water regulating dam. Construction of one dam which is assumed to be Cua Dat Dam is quite necessary against the projected 2020 demand.

(4) River Basin : **Ca**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1971				
1972				
1972				
1974				
1975				
1976	746.2	461.8	0.0	363.3
1977	1239.4	792.4	0.0	624.2
1978	438.4	206.9	0.0	104.2
1979	245.7	155.4	0.0	136.6
1980	1495.6	1251.6	72.1	784.6
1981	470.1	247.7	0.0	206.9
1982	28.1	0.0	0.0	0.0
1983	214.3	151.2	0.0	116.8
1984	895.6	632.7	0.0	469.2
1985	784.1	534.7	0.0	430.8
1986	826.5	576.1	0.0	418.8
1987	1158.2	822.5	0.0	527.9
1988	1604.3	1138.0	0.0	811.8
1989	251.9	71.6	0.0	46.7
1990	150.3	84.1	0.0	52.8
1991	136.8	26.8	0.0	0.0
1992	839.8	692.2	0.0	617.4
1993	1384.3	1068.9	0.0	672.0
1994	1220.4	968.7	0.0	555.9
1995	401.3	271.3	0.0	210.7
1996	378.3	158.8	0.0	54.9
1997	0.0	0.0	0.0	0.0
1998	1339.8	867.1	0.0	553.6
1999	1561.0	1246.8	0.0	925.9
2000	429.4	200.4	0.0	101.4
Duration of runoff series(Year)	25			
Drought Years -water deficit - caused (Nos. of year)	24	23	1	22
-do above- (No maintenance flow considered)	7	4	0	1
Design Drought Year (Rank from the most of severe drought)			19/25	
Lowest Reservoir Storage in the Year (MCM)			595.0	

Present and future condition is similar to the Ma River case. To meet with the water supply demand in 2020, the Ban La Dam will be necessary and it would have rather sufficient capacity for water supply exceeding estimated 2020 requirement.

(5) River Basin : **Thach Han**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1971				
1972				
1972				
1974				
1975				
1976				
1977	9.7	35.9	0.0	46.1
1978	0.0	0.0	0.0	0.0
1979	0.0	5.6	0.0	9.9
1980	0.0	0.8	0.0	2.5
1981	0.0	0.0	0.0	0.0
1982	12.6	36.4	0.0	49.0
1983	19.1	37.7	45.5	46.7
1984	0.0	0.0	0.0	0.0
1985	2.1	14.4	0.0	21.9
1986	7.5	22.6	0.0	29.7
1987	8.7	28.8	37.2	37.2
1988	57.8	111.2	131.8	131.8
1989	0.0	0.0	0.0	0.0
1990	0.0	1.8	0.0	4.8
1991	27.9	56.6	0.0	70.4
1992	2.8	14.7	0.0	20.4
1993	24.2	59.7	53.2	72.3
1994	0.0	3.2	0.0	6.8
1995	24.6	54.5	65.3	65.3
1996	0.0	0.0	0.0	0.0
1997	2.3	18.2	0.0	22.6
1998	30.9	64.4	0.0	80.0
1999	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0
Duration of runoff series(Year)	24			
Drought Years -water deficit - caused (Nos. of year)	13	17	5	17
-do above- (No maintenance flow considered)	1	6	5	8
Design Drought Year (Rank from the most of severe drought)			19/24	
Lowest Reservoir Storage in the Year (MCM)			0.0	

Present water deficit will become severe in 2010 and 2020 without a dam. The proposed Rao Quan Dam would satisfy the projected 2020 demand only and no spare capacity is anticipated against demand exceeding 2020.

(6) River Basin : **Huong**

	Annual Water Deficit (MCM/year)			
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1971				
1972				
1972				
1974				
1975				
1976				
1977	1260.2	646.1	274.9	752.1
1978	833.5	300.3	149.6	384.0
1979	432.6	136.2	0.0	166.6
1980	876.1	322.5	164.6	408.9
1981	389.4	68.3	0.0	106.4
1982	682.3	230.3	0.0	299.4
1983	726.4	293.0	0.0	332.8
1984	284.6	54.7	0.0	69.9
1985	532.2	125.6	0.0	189.6
1986	424.5	103.1	0.0	152.4
1987	701.7	286.4	0.0	354.5
1988	969.5	471.8	185.4	557.5
1989	211.7	32.1	0.0	47.7
1990	832.9	338.2	199.1	413.6
1991	490.9	120.9	0.0	177.6
1992	629.0	193.3	0.0	242.1
1993	950.2	367.4	0.0	449.0
1994	649.7	197.7	0.0	276.3
1995	771.4	308.3	0.0	387.3
1996	308.6	38.6	0.0	71.3
1997	424.6	125.8	0.0	175.6
1998	716.9	197.0	0.0	272.3
1999	243.6	57.6	0.0	93.7
2000	55.1	0.0	0.0	0.0
Duration of runoff series(Year)	24			
Drought Years -water deficit - caused (Nos. of year)	24	23	5	23
-do above- (No maintenance flow considered)	9	9	2	13
Design Drought Year (Rank from the most of severe drought)			19/24	
Lowest Reservoir Storage in the Year (MCM)			0.0	

Present condition of water deficit will be similar in 2010 even though the Thao Long Barrage would be available as well as in 2020 without a dam. The proposed Ta Trach Dam would satisfy the projected 2020 demand only and no spare capacity is anticipated against demand exceeding 2020.

(7) River Basin : **Vu Gia – Thu Bon**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1981				
1982				
1983				
1984	41.9	139.7	0.0	172.8
1985	70.1	174.3	0.0	193.7
1986	186.6	311.0	0.0	347.3
1987	111.1	170.8	0.0	195.9
1988	56.7	110.6	121.3	135.9
1989	0.0	7.0	0.0	20.8
1990	55.5	129.8	0.0	161.5
1991	0.0	0.0	0.0	0.0
1992	146.9	251.2	0.0	283.8
1993	146.9	251.0	0.0	283.2
1994	23.6	85.0	0.0	96.4
1995	197.3	307.1	221.9	365.9
1996	0.0	0.0	0.0	0.0
1997	7.4	34.8	0.0	45.6
1998	883.3	1144.9	1069.9	1227.0
1999	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0
Duration of runoff series(Year)	17			
Drought Years -water deficit - caused (Nos. of year)	12	13	3	13
-do above- (No maintenance flow considered)	10	12	3	13
Design Drought Year (Rank from the most of severe drought)			13/17	
Lowest Reservoir Storage in the Year (MCM)			0.0	

Present condition of water deficit will be similar in 2010 as well as in 2020 without a dam. The proposed Ho Song Tran II Dam would satisfy the projected 2020 demand only and no spare capacity is anticipated against demand exceeding 2020. The proposed Song Cai Dam may not be required for water supply purposes until 2020.

(8) River Basin : **Tra Khuc**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1981	4.2	7.5	0.0	6.4
1982	116.2	136.4	0.0	140.0
1983	284.9	327.9	241.3	332.9
1984	50.0	66.1	0.0	64.8
1985	130.1	143.1	0.0	153.2
1986	116.7	134.0	0.0	132.5
1987	43.4	37.2	0.0	37.2
1988	29.8	37.9	0.0	45.9
1989	0.0	0.0	0.0	0.0
1990	22.9	29.3	0.0	23.3
1991	0.0	0.0	0.0	0.0
1992	61.0	83.7	0.0	82.3
1993	104.8	114.0	0.0	129.0
1994	56.6	65.5	0.0	68.3
1995	216.1	258.1	81.8	266.5
1996	5.2	12.4	0.0	18.9
1997	0.0	0.0	0.0	0.0
1998	232.8	275.6	103.6	283.8
1999	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0
Duration of runoff series(Year)	20			
Drought Years -water deficit - caused (Nos. of year)	15	15	3	15
-do above- (No maintenance flow considered)	1	1	0	2
Design Drought Year (Rank from the most of severe drought)			16/20	31.0
Lowest Reservoir Storage in the Year (MCM)				

Similar situations to present water availability for water supply will be applicable for the future one. The proposed Nuoc Trong would much improve such condition even though water deficit would be anticipated for a few years.

(9) River Basin : **Kone**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1971				
1972				
1972				
1974				
1975				
1976	0.0	0.0	0.0	0.0
1977	93.3	284.2	80.2	330.2
1978	0.0	0.0	0.0	0.0
1979	0.0	145.7	0.0	161.1
1980	0.0	0.0	0.0	0.0
1981	70.8	87.9	0.0	61.5
1982	51.3	35.0	0.0	49.6
1983	223.8	435.3	407.3	513.9
1984	125.9	92.8	0.0	71.9
1985	129.1	129.3	0.0	94.5
1986	84.8	107.8	0.0	123.9
1987	168.2	223.5	0.0	249.4
1988	48.7	187.4	0.0	204.1
1989	0.0	0.0	0.0	0.0
1990	0.0	43.1	0.0	2.7
1991	0.0	77.2	135.7	78.9
1992	0.0	205.8	0.0	259.5
1993	142.3	325.2	133.8	334.2
1994	0.0	83.5	0.0	33.5
1995	0.0	51.4	0.0	56.9
1996	0.0	0.0	0.0	0.0
1997	0.0	0.0	0.0	0.0
1998	4.4	241.3	0.0	258.7
1999	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0
Duration of runoff series(Year)	25			
Drought Years -water deficit - caused (Nos. of year)	11	17	4	17
-do above- (No maintenance flow considered)	10	15	4	15
Design Drought Year (Rank from the most of severe drought)			20/25	
Lowest Reservoir Storage in the Year (MCM)			0.0	

Present condition of water deficit with three existing dams will be more serious to meet increasing water requirement to attain the future development plan in the Kone River basin. The proposed Dinh Binh Dam will meet such demand in 2020. However another water resource development might be necessary in case water demand after 2020 will be still increasing.

(10) River Basin : **Ba**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1971				
1972				
1972				
1974				
1975				
1976	0.0	0.0	0.0	0.0
1977	0.0	219.1	562.9	1055.5
1978	0.0	0.0	0.0	0.0
1979	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0
1981	0.0	0.0	0.0	0.0
1982	0.0	0.0	0.0	0.0
1983	0.0	51.9	306.7	855.9
1984	0.0	0.0	0.0	0.0
1985	0.0	0.0	0.0	0.0
1986	0.0	0.0	0.0	305.9
1987	0.0	0.0	0.0	202.4
1988	0.0	0.0	0.0	412.7
1989	0.0	0.0	0.0	0.0
1990				

Duration of runoff series(Year)	13			
Drought Years -water deficit - caused (Nos. of year)	0	2	2	5
-do above- (No maintenance flow considered)	0	1	2	5
Design Drought Year (Rank from the most of severe drought)			10/13	
Lowest Reservoir Storage in the Year (MCM)			0.0	

As long as the present water requirement is concerned, no water deficit is observed through the analysis owing to the storage capacity of the existing two dams. However, due to sharply demand increase projected in the analysis, water deficit will be increasingly expected. To meet water demand to be increased by 2020, the proposed Song Ba Ha Dam would be necessary in addition to the existing dams.

(11) River Basin : **Sesan**

River Basin	Sesan			
	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1971				
1972				
1972				
1974				
1975				
1976	103.0	128.0	0.0	143.7
1977	29.0	49.8	0.0	66.6
1978	191.6	217.7	0.0	234.2
1979	16.7	0.0	0.0	49.0
1980	0.0	0.0	0.0	0.0
1981	0.0	0.0	0.0	0.0
1982	0.0	0.0	0.0	0.0
1983	39.7	48.6	0.0	54.4
1984	0.0	0.0	0.0	0.0
1985	0.0	0.0	0.0	0.0
1986	0.0	0.0	0.0	0.0
1987	0.0	0.0	0.0	0.0
1988	0.0	0.0	0.0	0.0
1989	0.0	0.0	0.0	0.0
1990	0.0	0.0	0.0	0.0
1991	0.0	0.0	0.0	0.0
1992	0.0	0.0	0.0	0.0
1993	0.0	0.0	0.0	0.0
1994	34.1	46.4	0.0	54.0
1995	47.6	57.8	0.0	64.1
1996	0.0	0.0	0.0	0.0
1997	0.0	0.0	0.0	0.0
1998				
1999				
2000				
Duration of runoff series(Year)	22			
Drought Years -water deficit - caused (Nos. of year)	7	6	0	7
-do above- (No maintenance flow considered)	0	0	0	0
Design Drought Year (Rank from the most of severe drought)			18/22	
Lowest Reservoir Storage in the Year (MCM)			790.0	

In Sesan River basin case, water supply will be covered yet even in 2020 by the river runoff itself. However responsible minimum flow to be secured for Cambodia requires additional discharge. To attain water requirement and minimum flow requirement, the Dak Bla Dam is proposed, which storage capacity would have much surplus against the projected 2020demand.

(12) River Basin : **Srepok**

	Annual Water Deficit (MCM/year)			
	Present	2010	2020	2020 w/o Dam
Planned Dam	Not considered	Not considered	Considered	Not considered
Existing Dam	Considered	Considered	Considered	Considered
1976				
1977	130.5	220.7	99.7	290.1
1978	101.4	177.0	25.1	225.8
1979	36.6	135.7	0.0	198.7
1980	17.1	80.9	0.0	129.4
1981	0.0	38.0	0.0	74.4
1982	0.0	0.0	0.0	0.0
1983	112.3	217.0	55.3	280.7
1984	26.6	93.7	0.0	149.8
1985	0.0	25.8	0.0	59.7
1986	43.7	111.1	0.0	165.4
1987	28.5	91.0	0.0	146.7
1988	30.2	96.3	0.0	153.5
1989	0.0	15.3	0.0	54.9
1990	89.2	177.4	0.0	231.7
1991	0.0	9.4	0.0	45.4
1992	134.7	227.4	70.7	284.4
1993	7.7	64.4	0.0	119.3
1994	0.0	0.0	0.0	8.2
1995	84.0	188.3	10.9	251.2
1996	19.5	58.0	0.0	91.7
1997	0.0	0.0	0.0	0.2
1998	178.1	271.2	100.5	334.7
1999	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0
Duration of runoff series(Year)	24			
Drought Years -water deficit - caused (Nos. of year)	22	22	22	23
-do above- (No maintenance flow considered)	17	19	5	20
Design Drought Year (Rank from the most of severe drought)			19/24	
Lowest Reservoir Storage in the Year (MCM)			0.0	

Due to irrigation water requirement in the sub-basin where benefit of water regulation by the proposed Buon Kuop Dam will not cover, very severe water deficit is anticipated including present and future conditions, as long as river surface water is available for irrigation. To ease such deficit, some small-medium scale dams are considered in the analysis, a conceivable measure is not found except assuming much less water demand.

Table G.1 (1) Water Balance Analysis Bang Giang and Ky Cung River Basins (1) : Present Condition

		Ky Cung River										Bang Giang River						Whole Basin											
		Water Resources					Water Demand			Balance (W/O M.Flow Req.)		Water Resources	Water Demand			Balance (W/O M.Flow Req.)		4680			0.19706	0.009765	0.001244	75.9456		Balance(W/ M.Flow Req.) Whole Basin	
		Ban Lai Reservoir			1010 Remnant Flow	Total to Lang Son	0.48304						0.900957	TOTAL				River Outflow	Remnant Flow Ky Cung	TOTAL	Water Supply		Industry	Mainte-nance Flow	TOTAL	Surplus		Deficit	
		Inflow	Storage	Outflow			Irr-2 Net dmnd	Fishery /Live S	Total	Surplus Volume	Deficit Volume	River Outflow	Irr-1 Net dmnd	Fishery /Live S		Surplus Volume	Deficit Volume	Both			Urban	Others				Volume	Discharge	Volume	Discharge
		(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(M^3/sec)	(Mill. M3)	(M^3/sec)
1960	Jan	7.0	0.0	7.0	12.8	19.8	6.2	0.5	6.7	13.1	-	56.7	11.6	0.9	12.5	44.2	-	76.6	59.5	136.1	6.1	0.3	0.0	75.9	101.7	34.4	12.9	-	-
	Feb	5.3	0.0	5.3	9.7	14.9	3.9	0.5	4.4	10.6	-	42.7	7.2	0.9	8.1	34.6	-	57.6	44.8	102.4	5.5	0.3	0.0	75.9	94.3	8.2	3.1	-	-
	Mar	9.1	0.0	9.1	16.7	25.8	4.4	0.5	4.9	20.8	-	73.7	8.3	0.9	9.2	64.5	-	99.4	77.3	176.7	6.1	0.3	0.0	75.9	96.5	80.2	29.9	-	-
	Apr	4.2	0.0	4.2	7.7	11.8	4.3	0.5	4.8	7.1	-	33.9	8.0	0.9	8.9	25.0	-	45.7	35.5	81.2	5.9	0.3	0.0	75.9	95.9	-	-	14.6	5.5
	May	13.5	0.0	13.5	24.9	38.4	10.3	0.5	10.8	27.6	-	109.7	19.2	0.9	20.1	89.6	-	148.1	115.1	263.3	6.1	0.3	0.0	75.9	113.3	149.9	56.0	-	-
	Jun	19.9	0.0	19.9	36.6	56.6	0.6	0.5	1.0	55.5	-	161.7	1.0	0.9	1.9	159.8	-	218.3	169.7	388.1	5.9	0.3	0.0	75.9	85.2	302.9	113.1	-	-
	Jul	99.5	0.0	99.5	182.7	282.1	19.8	0.5	20.3	261.9	-	806.6	36.9	0.9	37.8	768.8	-	1,088.8	846.4	1,935.2	6.1	0.3	0.0	75.9	140.5	1,794.7	670.1	-	-
	Aug	121.0	0.0	121.0	222.2	343.2	5.5	0.5	6.0	337.3	-	981.3	10.2	0.9	11.1	970.2	-	1,324.6	1,029.7	2,354.3	6.1	0.3	0.0	75.9	99.5	2,254.8	841.9	-	-
	Sep	75.0	0.0	75.0	137.7	212.7	23.8	0.5	24.3	188.5	-	608.2	44.4	0.9	45.3	562.9	-	821.0	638.2	1,459.2	5.9	0.3	0.0	75.9	151.8	1,307.4	488.1	-	-
	Oct	33.0	0.0	33.0	60.7	93.7	20.3	0.5	20.8	72.9	-	267.8	37.8	0.9	38.7	229.1	-	361.5	281.0	642.6	6.1	0.3	0.0	75.9	141.9	500.7	186.9	-	-
	Nov	14.4	0.0	14.4	26.4	40.8	12.7	0.5	13.2	27.5	-	116.5	23.8	0.9	24.7	91.9	-	157.3	122.3	279.5	5.9	0.3	0.0	75.9	120.1	159.5	59.5	-	-
	Dec	11.8	0.0	11.8	21.8	33.6	0.2	0.5	0.7	32.9	-	96.1	0.4	0.9	1.3	94.8	-	129.7	100.8	230.5	6.1	0.3	0.0	75.9	84.4	146.1	54.5	-	-
1961	Jan	6.1	0.0	6.1	11.3	17.4	6.2	0.5	6.7	10.7	-	49.7	11.6	0.9	12.5	37.2	-	67.1	52.2	119.3	6.1	0.3	0.0	75.9	101.7	17.6	6.6	-	-
	Feb	5.2	0.0	5.2	9.6	14.9	3.9	0.5	4.4	10.5	-	42.5	7.2	0.9	8.1	34.3	-	57.3	44.6	101.9	5.5	0.3	0.0	75.9	94.3	7.6	2.8	-	-
	Mar	9.8	0.0	9.8	17.9	27.7	4.4	0.5	4.9	22.8	-	79.2	8.3	0.9	9.2	70.1	-	107.0	83.2	190.1	6.1	0.3	0.0	75.9	96.5	93.6	35.0	-	-
	Apr	22.9	0.0	22.9	42.1	65.1	4.3	0.5	4.8	60.3	-	186.0	8.0	0.9	8.9	177.1	-	251.1	195.2	446.3	5.9	0.3	0.0	75.9	95.9	350.4	130.8	-	-
	May	9.1	0.0	9.1	16.6	25.7	10.3	0.5	10.8	14.9	-	73.4	19.2	0.9	20.1	53.3	-	99.1	77.0	176.1	6.1	0.3	0.0	75.9	113.3	62.8	23.4	-	-
	Jun	49.3	0.0	49.3	90.6	140.0	0.6	0.5	1.0	138.9	-	400.1	1.0	0.9	1.9	398.2	-	540.1	419.9	960.0	5.9	0.3	0.0	75.9	85.2	874.8	326.6	-	-
	Jul	27.6	0.0	27.6	50.7	78.3	19.8	0.5	20.3	58.0	-	223.9	36.9	0.9	37.8	186.0	-	302.2	234.9	537.1	6.1	0.3	0.0	75.9	140.5	396.6	148.1	-	-
	Aug	55.7	0.0	55.7	102.4	158.1	5.5	0.5	6.0	152.2	-	452.0	10.2	0.9	11.1	440.9	-	610.1	474.3	1,084.5	6.1	0.3	0.0	75.9	99.5	985.0	367.8	-	-
	Sep	64.9	0.0	64.9	119.1	184.0	23.8	0.5	24.3	159.7	-	526.1	44.4	0.9	45.3	480.8	-	710.1	552.1	1,262.2	5.9	0.3	0.0	75.9	151.8	1,110.4	414.6	-	-
	Oct	29.0	0.0	29.0	53.2	82.2	20.3	0.5	20.8	61.4	-	234.9	37.8	0.9	38.7	196.2	-	317.1	246.5	563.5	6.1	0.3	0.0	75.9	141.9	421.7	157.4	-	-
	Nov	22.3	0.0	22.3	40.9	63.1	12.7	0.5	13.2	49.9	-	180.5	23.8	0.9	24.7	155.9	-	243.7	189.4	433.1	5.9	0.3	0.0	75.9	120.1	313.1	116.9	-	-
	Dec	13.8	0.0	13.8	25.3	39.1	0.2	0.5	0.7	38.4	-	111.9	0.4	0.9	1.3	110.6	-	151.0	117.4	268.4	6.1	0.3	0.0	75.9	84.4	184.0	68.7	-	-
1962	Jan	12.0	0.0	12.0	22.1	34.1	6.2	0.5	6.7	27.4	-	97.6	11.6	0.9	12.5	85.1	-	131.7	102.4	234.2	6.1	0.3	0.0	75.9	101.7	132.5	49.5	-	-
	Feb	5.9	0.0	5.9	10.9	16.8	3.9	0.5	4.4	12.5	-	48.1	7.2	0.9	8.1	40.0	-	64.9	50.5	115.4	5.5	0.3	0.0	75.9	94.3	21.1	7.9	-	-
	Mar	5.5	0.0	5.5	10.1	15.6	4.4	0.5	4.9	10.7	-	44.6	8.3	0.9	9.2	35.4	-	60.2	46.8	107.0	6.1	0.3	0.0	75.9	96.5	10.5	3.9	-	-
	Apr	6.1	0.0	6.1	11.2	17.3	4.3	0.5	4.8	12.6	-	49.6	8.0	0.9	8.9	40.7	-	66.9	52.0	119.0	5.9	0.3	0.0	75.9	95.9	23.1	8.6	-	-
	May	11.3	0.0	11.3	20.7	32.0	10.3	0.5	10.8	21.2	-	91.6	19.2	0.9	20.1	71.5	-	123.7	96.1	219.8	6.1	0.3	0.0	75.9	113.3	106.5	39.7	-	-
	Jun	67.3	0.0	67.3	123.5	190.8	0.6	0.5	1.0	189.7	-	545.4	1.0	0.9	1.9	543.5	-	736.2	572.3	1,308.5	5.9	0.3	0.0	75.9	85.2	1,223.4	456.8	-	-
	Jul	69.2	0.0	69.2	127.1	196.3	19.8	0.5	20.3	176.0	-	561.2	36.9	0.9	37.8	523.4	-	757.6	588.9	1,346.5	6.1	0.3	0.0	75.9	140.5	1,206.0	450.3	-	-
	Aug	78.1	0.0	78.1	143.4	221.4	5.5	0.5	6.0	215.5	-	633.1	10.2	0.9	11.1	622.0	-	854.5	664.3	1,518.8	6.1	0.3	0.0	75.9	99.5	1,419.4	529.9	-	-
	Sep	23.7	0.0	23.7	43.4	67.1	23.8	0.5	24.3	42.8	-	191.8	44.4	0.9	45.3	146.5	-	258.9	201.3	460.2	5.9	0.3	0.0	75.9	151.8	308.5	115.2	-	-
	Oct	14.3	0.0	14.3	26.3	40.5	20.3	0.5	20.8	19.8	-	115.9	37.8	0.9	38.7	77.2	-	156.5	121.6	278.1	6.1	0.3	0.0	75.9	141.9	136.2	50.9	-	-
	Nov	6.7	0.0	6.7	12.3	19.0	12.7	0.5	13.2	5.7	-	54.2	23.8	0.9	24.7	29.5	-	73.1	56.9	130.0	5.9	0.3	0.0	75.9	120.1	10.0	3.7	-	-
	Dec	4.8	0.0	4.8	8.8	13.5	0.2	0.5	0.7	12.9	-	38.7	0.4	0.9	1.3	37.4	-	52.3	40.6	92.9	6.1	0.3	0.0	75.9	84.4	8.5	3.2	-	-
1963	Jan	3.7	0.0	3.7	6.8	10.4	6.2	0.5	6.7	3.7	-	29.9	11.6	0.9	12.5	17.3	-	40.3	31.3	71.6	6.1	0.3	0.0	75.9	101.7	-	-	30.0	11.2
	Feb	3.7	0.0	3.7	6.8	10.4	3.9	0.5	4.4	6.1	-	29.8	7.2	0.9	8.1	21.7	-	40.2	31.3	71.5	5.5	0.3	0.0	75.9	94.3	-	-	22.7	8.5
	Mar	4.1	0.0	4.1	7.5	11.6	4.4	0.5	4.9	6.7	-	33.3	8.3	0.9	9.2	24.1	-	44.9	34.9	79.9	6.1	0.3	0.0	75.9	96.5	-	-	16.6	6.2
	Apr	4.1	0.0	4.1	7.5	11.6	4.3	0.5	4.8	6.8	-	33.1	8.0	0.9	8.9	24.2	-	44.7	34.7	79.4	5.9	0.3	0.0	75.9	95.9	-	-	16.4	6.1
	May	5.4	0.0	5.4	10.0	15.4	10.3	0.5	10.8	4.6	-	44.1	19.2	0.9	20.1	23.9	-	59.5	46.3	105.8	6.1	0.3	0.0	75.9	113.3	-	-	7.6	2.8
	Jun	9.1	0.0	9.1	16.8	25.9	0.6	0.5	1.0	24.9	-	74.0	1.0	0.9	1.9	72.1	-	99.9	77.7	177.6	5.9	0.3	0.0	75.9	85.2	92.4	34.5	-	-
	Jul	61.7	0.0	61.7	113.3	174.9	19.8	0.5	20.3	154.7	-	500.2	36.9	0.9	37.8	462.3	-	675.1	524.8	1,199.9	6.1	0.3	0.0	75.9	140.5	1,059.4	395.5	-	-
	Aug	59.5	0.0	59.5	109.3	168.8	5.5	0.5	6.0	162.8	-	482.6	10.2	0.9	11.1	471.4	-	651.3	506.4	1,157.7	6.1	0.3	0.0	75.9	99.5	1,058.2	395.1	-	-
	Sep	37.5	0.0	37.5	68.9	106.4	23.8	0.5	24.3	82.1	-	304.3	44.4	0.9	45.3	259.0	-	410.7	319.3	730.0	5.9	0.3	0.0	75.9	151.8	578.2	215.9	-	-
	Oct	16.6	0.0	16.6	30.5	47.1	20.3	0.5	20.8	26.4	-	134.8	37.8	0.9	38.7	96.0	-	181.9	141.4	323.3	6.1	0.3	0.0	75.9	141.9	181.4	67.7	-	-
	Nov	17.7	0.0	17.7	32.5	50.1	12.7	0.5	13.2	36.9	-	143.3	23.8	0.9	24.7	118.7	-	193.4	150.4	343.8	5.9	0.3	0.0	75.9	120.1	223.8	83.5	-	-
	Dec	9.1	0.0	9.1	16.7	25.8	0.2	0.5	0.7	25.1	-	73.8	0.4	0.9	1.3	72.5	-	99.6	77.5	177.1	6.1	0.3	0.0	75.9	84.4	92.7	34.6	-	-
1964	Jan	6.5	0.0	6.5	12.0	18.5	6.2	0.5	6.7	11.8	-	53.0	11.6	0.9	12.5	40.5	-	71.5	55.6	127.2	6.1	0.3	0.0	75.9	101.7	25.5	9.5	-	-
	Feb	5.5	0.0	5.5	10.2	15.7	3.9	0.5	4.4	11.3	-	44.9	7.2	0.9	8.1	36.7	-	60.6	47.1	107.7	5.5	0.3	0.0	75.9	94.3	13.4	5.0	-	-
	Mar	6.4	0.0	6.4	11.8	18.2	4.4	0.5	4.9	13.3	-	52.0	8.3	0.9	9.2	42.8	-	70.2	54.6	124.8	6.1	0.3	0.0	75.9	96.5	28.3	10.6	-	-
	Apr	14.7	0.0	14.7	27.0	41.6	4.3	0.5	4.8	36.9	-	119.0	8.0	0.9	8.9	110.1	-	160.6	124.9	285.5	5.9	0.3	0.0	75.9	95.9	189.7	70.8	-	-
	May	17.3	0.0	17.3	31.8	49.2	10.3	0.5	10.8	38.4	-	140.5	19.2	0.9	20.1	120.4	-	189.7	147.5	337.2	6.1	0.3	0.0	75.9	113.3	223.8	83.6	-	-
	Jun	42.1	0.0	42.1	77.3	119.4	0.6	0.5	1.0	118.4	-	341.5	1.0	0.9	1.9	339.5	-	460.9	358.3	819.2	5.9	0.3	0.0	75.9	85.2	734.0	274.1	-	-
	Jul	65.7	0.0	65.7	120.7	186.5	19.8	0.5	20.3	166.2	-	533.1	36.9	0.9	37.8	495.3	-	719.6	559.4	1,279.0	6.1	0.3	0.0	75.9	140.5	1,138.4	425.0	-	-
	Aug	58.3	0.0	58.3	107.1	165.5	5.5	0.5	6.0	159.5	-	473.1	10.2	0.9	11.1	462.0	-	638.5	496.4	1,135.0	6.1	0.3	0.0	75.9	99.5	1,035.5	386.6	-	-
	Sep	39.9	0.0	39.9	73.3	113.2	23.8	0.5	24.3	88.9	-	323.5	44.4	0.9	45.3	278.2	-	436.7	339.5	776.1	5.9	0.3	0.0	75.9	151.8	624.3	233.1	-	-
	Oct	46.1	0.0	46.1	84.6	130.6	20.3	0.5	20.8	109.9	-	373.5	37.8	0.9	38.7	334.8	-	504.1	391.9	896.0	6.1	0.3	0.0	75.9	141.9	754.2	281.6	-	-
	Nov	12.0	0.0	12.0	22.0	34.0	12.7	0.5	13.2	20.7	-	97.1	23.8	0.9	24.7	72.4	-	131.0	101.9	232.9	5.9	0.3	0.0	75.9	120.1	112.9	42.1	-	-
	Dec	8.0	0.0	8.0	14.7	22.7	0.2	0.5	0.7	22.0	-	64.9	0.4	0.9	1.3	63.6	-	87.5	68.1	155.6	6.1	0.3	0.0	75.9	84.4	71.2	26.6	-	-

Table G.1 (1) Water Balance Analysis Bang Giang and Ky Cung River Basins (1) : Present Condition

		Ky Cung River										Bang Giang River						Whole Basin											
		Water Resources					Water Demand			Balance (W/O M.Flow Req.)		Water Resources	Water Demand			Balance (W/O M.Flow Req.)		4680			0.19706	0.009765	0.001244	75.9456		Balance(W/ M.Flow Req.) Whole Basin			
		Ban Lai Reservoir			1010 Remnant Flow	Total to Lang Son	0.48304						0.900957	TOTAL				River Outflow	Remnant Flow Ky Cung	TOTAL	Water Supply		Industry	Mainte-nance Flow	TOTAL	Surplus		Deficit	
		Inflow	Storage	Outflow			Irr-2 Net dmnd	Fishery /Live S	Total	Surplus Volume	Deficit Volume	River Outflow	Irr-1 Net dmnd	Fishery /Live S		Surplus Volume	Deficit Volume	Both			Urban	Others				Volume	Discharge	Volume	Discharge
		(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(M^3/sec)	(Mill. M3)	(M^3/sec)
1965	Jan	5.2	0.0	5.2	9.6	14.8	6.2	0.5	6.7	8.0	-	42.2	11.6	0.9	12.5	29.7	-	57.0	44.3	101.3	6.1	0.3	0.0	75.9	101.7	-	-	0.4	0.1
	Feb	4.1	0.0	4.1	7.5	11.5	3.9	0.5	4.4	7.2	-	32.9	7.2	0.9	8.1	24.8	-	44.4	34.5	78.9	5.5	0.3	0.0	75.9	94.3	-	-	15.3	5.7
	Mar	5.3	0.0	5.3	9.7	15.0	4.4	0.5	4.9	10.1	-	42.9	8.3	0.9	9.2	33.7	-	57.9	45.0	102.9	6.1	0.3	0.0	75.9	96.5	6.4	2.4	-	-
	Apr	29.3	0.0	29.3	53.9	83.2	4.3	0.5	4.8	78.4	-	237.8	8.0	0.9	8.9	228.9	-	321.0	249.6	570.6	5.9	0.3	0.0	75.9	95.9	474.7	177.2	-	-
	May	16.0	0.0	16.0	29.4	45.4	10.3	0.5	10.8	34.6	-	129.8	19.2	0.9	20.1	109.6	-	175.1	136.2	311.3	6.1	0.3	0.0	75.9	113.3	198.0	73.9	-	-
	Jun	97.8	0.0	97.8	179.6	277.5	0.6	0.5	1.0	276.4	-	793.2	1.0	0.9	1.9	791.3	-	1,070.7	832.4	1,903.1	5.9	0.3	0.0	75.9	85.2	1,817.9	678.7	-	-
	Jul	81.3	0.0	81.3	149.3	230.6	19.8	0.5	20.3	210.3	-	659.3	36.9	0.9	37.8	621.5	-	889.9	691.8	1,581.8	6.1	0.3	0.0	75.9	140.5	1,441.3	538.1	-	-
	Aug	31.7	0.0	31.7	58.2	89.8	5.5	0.5	6.0	83.9	-	256.8	10.2	0.9	11.1	245.7	-	346.6	269.5	616.1	6.1	0.3	0.0	75.9	99.5	516.7	192.9	-	-
	Sep	17.4	0.0	17.4	32.0	49.5	23.8	0.5	24.3	25.2	-	141.4	44.4	0.9	45.3	96.1	-	190.9	148.4	339.3	5.9	0.3	0.0	75.9	151.8	187.5	70.0	-	-
	Oct	11.1	0.0	11.1	20.4	31.4	20.3	0.5	20.8	10.7	-	89.9	37.8	0.9	38.7	51.2	-	121.3	94.3	215.6	6.1	0.3	0.0	75.9	141.9	73.7	27.5	-	-
	Nov	12.5	0.0	12.5	23.0	35.5	12.7	0.5	13.2	22.3	-	101.5	23.8	0.9	24.7	76.8	-	137.0	106.5	243.5	5.9	0.3	0.0	75.9	120.1	123.4	46.1	-	-
	Dec	6.6	0.0	6.6	12.1	18.7	0.2	0.5	0.7	18.0	-	53.6	0.4	0.9	1.3	52.3	-	72.3	56.2	128.5	6.1	0.3	0.0	75.9	84.4	44.1	16.5	-	-
1966	Jan	5.5	0.0	5.5	10.0	15.5	6.2	0.5	6.7	8.8	-	44.3	11.6	0.9	12.5	31.8	-	59.8	46.5	106.3	6.1	0.3	0.0	75.9	101.7	4.7	1.7	-	-
	Feb	4.1	0.0	4.1	7.6	11.7	3.9	0.5	4.4	7.3	-	33.4	7.2	0.9	8.1	25.3	-	45.1	35.1	80.2	5.5	0.3	0.0	75.9	94.3	-	-	14.1	5.3
	Mar	3.5	0.0	3.5	6.5	10.0	4.4	0.5	4.9	5.0	-	28.5	8.3	0.9	9.2	19.3	-	38.5	29.9	68.4	6.1	0.3	0.0	75.9	96.5	-	-	28.1	10.5
	Apr	7.3	0.0	7.3	13.4	20.7	4.3	0.5	4.8	15.9	-	59.2	8.0	0.9	8.9	50.3	-	79.9	62.2	142.1	5.9	0.3	0.0	75.9	95.9	46.2	17.3	-	-
	May	6.2	0.0	6.2	11.4	17.6	10.3	0.5	10.8	6.8	-	50.4	19.2	0.9	20.1	30.3	-	68.1	52.9	121.0	6.1	0.3	0.0	75.9	113.3	7.6	2.9	-	-
	Jun	84.3	0.0	84.3	154.8	239.1	0.6	0.5	1.0	238.1	-	683.6	1.0	0.9	1.9	681.7	-	922.7	717.4	1,640.1	5.9	0.3	0.0	75.9	85.2	1,554.9	580.5	-	-
	Jul	99.7	0.0	99.7	183.1	282.8	19.8	0.5	20.3	262.5	-	808.4	36.9	0.9	37.8	770.6	-	1,091.2	848.3	1,939.5	6.1	0.3	0.0	75.9	140.5	1,799.0	671.7	-	-
	Aug	38.9	0.0	38.9	71.4	110.3	5.5	0.5	6.0	104.3	-	315.3	10.2	0.9	11.1	304.2	-	425.6	330.8	756.4	6.1	0.3	0.0	75.9	99.5	657.0	245.3	-	-
	Sep	20.1	0.0	20.1	37.0	57.1	23.8	0.5	24.3	32.8	-	163.3	44.4	0.9	45.3	118.0	-	220.4	171.4	391.8	5.9	0.3	0.0	75.9	151.8	240.0	89.6	-	-
	Oct	12.4	0.0	12.4	22.8	35.2	20.3	0.5	20.8	14.4	-	100.5	37.8	0.9	38.7	61.8	-	135.7	105.5	241.2	6.1	0.3	0.0	75.9	141.9	99.3	37.1	-	-
	Nov	7.6	0.0	7.6	14.0	21.6	12.7	0.5	13.2	8.4	-	61.9	23.8	0.9	24.7	37.2	-	83.5	64.9	148.5	5.9	0.3	0.0	75.9	120.1	28.4	10.6	-	-
	Dec	4.4	0.0	4.4	8.1	12.5	0.2	0.5	0.7	11.8	-	35.7	0.4	0.9	1.3	34.4	-	48.2	37.4	85.6	6.1	0.3	0.0	75.9	84.4	1.2	0.5	-	-
1967	Jan	4.0	0.0	4.0	7.3	11.2	6.2	0.5	6.7	4.5	-	32.1	11.6	0.9	12.5	19.6	-	43.3	33.7	77.0	6.1	0.3	0.0	75.9	101.7	-	-	24.6	9.2
	Feb	4.8	0.0	4.8	8.9	13.7	3.9	0.5	4.4	9.3	-	39.1	7.2	0.9	8.1	31.0	-	52.8	41.1	93.9	5.5	0.3	0.0	75.9	94.3	-	-	0.4	0.1
	Mar	4.0	0.0	4.0	7.3	11.3	4.4	0.5	4.9	6.4	-	32.3	8.3	0.9	9.2	23.2	-	43.7	33.9	77.6	6.1	0.3	0.0	75.9	96.5	-	-	18.9	7.1
	Apr	6.2	0.0	6.2	11.3	17.4	4.3	0.5	4.8	12.7	-	49.9	8.0	0.9	8.9	41.0	-	67.3	52.3	119.6	5.9	0.3	0.0	75.9	95.9	23.8	8.9	-	-
	May	17.0	0.0	17.0	31.2	48.1	10.3	0.5	10.8	37.3	-	137.6	19.2	0.9	20.1	117.4	-	185.7	144.4	330.0	6.1	0.3	0.0	75.9	113.3	216.7	80.9	-	-
	Jun	22.3	0.0	22.3	40.9	63.2	0.6	0.5	1.0	62.2	-	180.7	1.0	0.9	1.9	178.8	-	243.9	189.6	433.5	5.9	0.3	0.0	75.9	85.2	348.4	130.1	-	-
	Jul	19.0	0.0	19.0	34.9	53.9	19.8	0.5	20.3	33.6	-	154.0	36.9	0.9	37.8	116.1	-	207.8	161.6	369.4	6.1	0.3	0.0	75.9	140.5	228.9	85.5	-	-
	Aug	59.8	0.0	59.8	109.9	169.7	5.5	0.5	6.0	163.7	-	485.1	10.2	0.9	11.1	474.0	-	654.8	509.1	1,163.9	6.1	0.3	0.0	75.9	99.5	1,064.4	397.4	-	-
	Sep	52.1	0.0	52.1	95.7	147.7	23.8	0.5	24.3	123.5	-	422.4	44.4	0.9	45.3	377.1	-	570.2	443.2	1,013.4	5.9	0.3	0.0	75.9	151.8	861.6	321.7	-	-
	Oct	9.6	0.0	9.6	17.6	27.2	20.3	0.5	20.8	6.4	-	77.6	37.8	0.9	38.7	38.9	-	104.8	81.5	186.2	6.1	0.3	0.0	75.9	141.9	44.3	16.6	-	-
	Nov	7.1	0.0	7.1	13.0	20.1	12.7	0.5	13.2	6.9	-	57.4	23.8	0.9	24.7	32.8	-	77.5	60.3	137.8	5.9	0.3	0.0	75.9	120.1	17.8	6.6	-	-
	Dec	5.4	0.0	5.4	9.8	15.2	0.2	0.5	0.7	14.5	-	43.5	0.4	0.9	1.3	42.2	-	58.7	45.6	104.3	6.1	0.3	0.0	75.9	84.4	19.9	7.4	-	-
1968	Jan	4.2	0.0	4.2	7.8	12.0	6.2	0.5	6.7	5.3	-	34.3	11.6	0.9	12.5	21.7	-	46.3	36.0	82.3	6.1	0.3	0.0	75.9	101.7	-	-	19.4	7.2
	Feb	4.8	0.0	4.8	8.8	13.5	3.9	0.5	4.4	9.2	-	38.7	7.2	0.9	8.1	30.6	-	52.2	40.6	92.8	5.5	0.3	0.0	75.9	94.3	-	-	1.4	0.5
	Mar	6.4	0.0	6.4	11.7	18.1	4.4	0.5	4.9	13.2	-	51.7	8.3	0.9	9.2	42.5	-	69.8	54.3	124.1	6.1	0.3	0.0	75.9	96.5	27.6	10.3	-	-
	Apr	15.4	0.0	15.4	28.3	43.7	4.3	0.5	4.8	38.9	-	124.9	8.0	0.9	8.9	116.0	-	168.6	131.1	299.7	5.9	0.3	0.0	75.9	95.9	203.8	76.1	-	-
	May	25.3	0.0	25.3	46.5	71.8	10.3	0.5	10.8	61.0	-	205.4	19.2	0.9	20.1	185.3	-	277.2	215.5	492.8	6.1	0.3	0.0	75.9	113.3	379.4	141.7	-	-
	Jun	56.7	0.0	56.7	104.1	160.8	0.6	0.5	1.0	159.8	-	459.8	1.0	0.9	1.9	457.9	-	620.6	482.5	1,103.1	5.9	0.3	0.0	75.9	85.2	1,017.9	380.1	-	-
	Jul	70.8	0.0	70.8	130.1	200.9	19.8	0.5	20.3	180.7	-	574.5	36.9	0.9	37.8	536.6	-	775.4	602.8	1,378.3	6.1	0.3	0.0	75.9	140.5	1,237.7	462.1	-	-
	Aug	215.3	0.0	215.3	395.3	610.6	5.5	0.5	6.0	604.6	-	1,745.7	10.2	0.9	11.1	1,734.6	-	2,356.3	1,831.8	4,188.1	6.1	0.3	0.0	75.9	99.5	4,088.7	1,526.5	-	-
	Sep	72.4	0.0	72.4	132.9	205.2	23.8	0.5	24.3	180.9	-	586.7	44.4	0.9	45.3	541.4	-	791.9	615.6	1,407.5	5.9	0.3	0.0	75.9	151.8	1,255.8	468.8	-	-
	Oct	24.1	0.0	24.1	44.3	68.4	20.3	0.5	20.8	47.6	-	195.4	37.8	0.9	38.7	156.7	-	263.8	205.1	468.9	6.1	0.3	0.0	75.9	141.9	327.0	122.1	-	-
	Nov	13.1	0.0	13.1	24.1	37.3	12.7	0.5	13.2	24.1	-	106.6	23.8	0.9	24.7	81.9	-	143.8	111.8	255.7	5.9	0.3	0.0	75.9	120.1	135.6	50.6	-	-
	Dec	7.3	0.0	7.3	13.4	20.7	0.2	0.5	0.7	20.0	-	59.3	0.4	0.9	1.3	58.0	-	80.0	62.2	142.2	6.1	0.3	0.0	75.9	84.4	57.8	21.6	-	-
1969	Jan	7.6	0.0	7.6	14.0	21.7	6.2	0.5	6.7	15.0	-	62.0	11.6	0.9	12.5	49.5	-	83.7	65.1	148.8	6.1	0.3	0.0	75.9	101.7	47.1	17.6	-	-
	Feb	4.2	0.0	4.2	7.8	12.0	3.9	0.5	4.4	7.6	-	34.3	7.2	0.9	8.1	26.2	-	46.3	36.0	82.4	5.5	0.3	0.0	75.9	94.3	-	-	11.9	4.4
	Mar	4.4	0.0	4.4	8.1	12.5	4.4	0.5	4.9	7.6	-	35.8	8.3	0.9	9.2	26.6	-	48.3	37.5	85.8	6.1	0.3	0.0	75.9	96.5	-	-	10.7	4.0
	Apr	8.7	0.0	8.7	16.0	24.6	4.3	0.5	4.8	19.9	-	70.4	8.0	0.9	8.9	61.5	-	95.1	73.9	169.0	5.9	0.3	0.0	75.9	95.9	73.1	27.3	-	-
	May	13.9	0.0	13.9	25.6	39.5	10.3	0.5	10.8	28.7	-	113.1	19.2	0.9	20.1	92.9	-	152.6	118.6	271.3	6.1	0.3	0.0	75.9	113.3	157.9	59.0	-	-
	Jun	33.6	0.0	33.6	61.7	95.2	0.6	0.5	1.0	94.2	-	272.3	1.0	0.9	1.9	270.3	-	367.5	285.7	653.2	5.9	0.3	0.0	75.9	85.2	568.1	212.1	-	-
	Jul	34.3	0.0	34.3	63.0	97.3	19.8	0.5	20.3	77.0	-	278.2	36.9	0.9	37.8	240.3	-	375.5	291.9	667.4	6.1	0.3	0.0	75.9	140.5	526.9	196.7	-	-
	Aug	104.5	0.0	104.5	191.9	296.5	5.5	0.5	6.0	290.5	-	847.6	10.2	0.9	11.1	836.4	-	1,144.0	889.4	2,033.4	6.1	0.3	0.0	75.9	99.5	1,933.9	722.0	-	-
	Sep	29.3	0.0	29.3	53.9	83.2	23.8	0.5	24.3	59.0	-	238.0	44.4	0.9	45.3	192.7	-	321.2	249.7	571.0	5.9	0.3	0.0	75.9	151.8	419.2	156.5	-	-
	Oct	13.8	0.0	13.8	25.3	39.1	20.3	0.5	20.8	18.3	-	111.7	37.8	0.9	38.7	73.0	-	150.7	117.2	267.9	6.1	0.3	0.0	75.9	141.9	126.0	47.1	-	-
	Nov	11.4	0.0	11.4	20.9	32.3	12.7	0.5	13.2	19.1	-	92.3	23.8	0.9	24.7	67.6	-	124.6	96.8	221.4	5.9	0.3	0.0	75.9	120.1	101.4	37.8	-	-
	Dec	5.0	0.0	5.0	9.1	14.1	0.2	0.5	0.7	13.4	-	40.4	0.4	0.9	1.3	39.1	-	54.5	42.4	96.9	6.1	0.3	0.0	75.9	84.4	12.5	4.7	-	-

Table G.1 (1) Water Balance Analysis Bang Giang and Ky Cung River Basins (1) : Present Condition

		Ky Cung River										Bang Giang River						Whole Basin											
		Water Resources					Water Demand			Balance (W/O M.Flow Req.)		Water Resources	Water Demand			Balance (W/O M.Flow Req.)		4680			0.19706	0.009765	0.001244	75.9456		Balance(W/ M.Flow Req.) Whole Basin	
		Ban Lai Reservoir			1010 Remnant Flow	Total to Lang Son	0.48304						0.900957	TOTAL				River Outflow	Remnant Flow Ky Cung	TOTAL	Water Supply		Industry	Mainte-nance Flow	TOTAL				
		Inflow	Storage	Outflow			Irr-2 Net dmnd	Fishery /Live S	Total	Surplus Volume	Deficit Volume	River Outflow	Irr-1 Net dmnd	Fishery /Live S		Surplus Volume	Deficit Volume	Both			Urban	Others				Surplus Volume	Surplus Discharge	Deficit Volume	Deficit Discharge
		(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(M^3/sec)	(Mill. M3)	(M^3/sec)
1970	Jan	4.8	0.0	4.8	8.9	13.7	6.2	0.5	6.7	7.0	-	39.2	11.6	0.9	12.5	26.7	-	52.9	41.1	94.1	6.1	0.3	0.0	75.9	101.7	-	-	7.6	2.8
	Feb	4.0	0.0	4.0	7.3	11.3	3.9	0.5	4.4	6.9	-	32.3	7.2	0.9	8.1	24.2	-	43.6	33.9	77.5	5.5	0.3	0.0	75.9	94.3	-	-	16.7	6.3
	Mar	4.0	0.0	4.0	7.3	11.3	4.4	0.5	4.9	6.4	-	32.3	8.3	0.9	9.2	23.1	-	43.6	33.9	77.4	6.1	0.3	0.0	75.9	96.5	-	-	19.1	7.1
	Apr	14.8	0.0	14.8	27.2	42.0	4.3	0.5	4.8	37.2	-	120.0	8.0	0.9	8.9	111.1	-	162.0	126.0	288.0	5.9	0.3	0.0	75.9	95.9	192.1	71.7	-	-
	May	34.0	0.0	34.0	62.4	96.4	10.3	0.5	10.8	85.6	-	275.6	19.2	0.9	20.1	255.4	-	372.0	289.2	661.1	6.1	0.3	0.0	75.9	113.3	547.8	204.5	-	-
	Jun	58.0	0.0	58.0	106.6	164.6	0.6	0.5	1.0	163.5	-	470.5	1.0	0.9	1.9	468.6	-	635.1	493.8	1,128.9	5.9	0.3	0.0	75.9	85.2	1,043.7	389.7	-	-
	Jul	74.2	0.0	74.2	136.3	210.5	19.8	0.5	20.3	190.2	-	601.9	36.9	0.9	37.8	564.0	-	812.4	631.6	1,444.0	6.1	0.3	0.0	75.9	140.5	1,303.4	486.7	-	-
	Aug	79.1	0.0	79.1	145.3	224.5	5.5	0.5	6.0	218.5	-	641.7	10.2	0.9	11.1	630.6	-	866.2	673.4	1,539.6	6.1	0.3	0.0	75.9	99.5	1,440.1	537.7	-	-
	Sep	53.6	0.0	53.6	98.5	152.1	23.8	0.5	24.3	127.8	-	434.8	44.4	0.9	45.3	389.5	-	586.9	456.3	1,043.2	5.9	0.3	0.0	75.9	151.8	891.4	332.8	-	-
	Oct	20.5	0.0	20.5	37.7	58.2	20.3	0.5	20.8	37.4	-	166.3	37.8	0.9	38.7	127.6	-	224.5	174.5	399.0	6.1	0.3	0.0	75.9	141.9	257.1	96.0	-	-
	Nov	8.8	0.0	8.8	16.1	24.8	12.7	0.5	13.2	11.6	-	71.0	23.8	0.9	24.7	46.4	-	95.9	74.5	170.4	5.9	0.3	0.0	75.9	120.1	50.4	18.8	-	-
	Dec	7.4	0.0	7.4	13.6	21.0	0.2	0.5	0.7	20.3	-	60.1	0.4	0.9	1.3	58.8	-	81.1	63.0	144.1	6.1	0.3	0.0	75.9	84.4	59.7	22.3	-	-
1971	Jan	5.1	0.0	5.1	9.3	14.4	6.2	0.5	6.7	7.6	-	41.1	11.6	0.9	12.5	28.5	-	55.4	43.1	98.5	6.1	0.3	0.0	75.9	101.7	-	-	3.1	1.2
	Feb	4.4	0.0	4.4	8.0	12.4	3.9	0.5	4.4	8.0	-	35.3	7.2	0.9	8.1	27.2	-	47.7	37.1	84.7	5.5	0.3	0.0	75.9	94.3	-	-	9.5	3.6
	Mar	4.6	0.0	4.6	8.5	13.1	4.4	0.5	4.9	8.2	-	37.4	8.3	0.9	9.2	28.2	-	50.5	39.3	89.8	6.1	0.3	0.0	75.9	96.5	-	-	6.7	2.5
	Apr	3.9	0.0	3.9	7.1	11.0	4.3	0.5	4.8	6.2	-	31.3	8.0	0.9	8.9	22.4	-	42.3	32.9	75.1	5.9	0.3	0.0	75.9	95.9	-	-	20.7	7.7
	May	19.2	0.0	19.2	35.3	54.6	10.3	0.5	10.8	43.8	-	156.1	19.2	0.9	20.1	135.9	-	210.7	163.8	374.5	6.1	0.3	0.0	75.9	113.3	261.1	97.5	-	-
	Jun	34.2	0.0	34.2	62.8	97.0	0.6	0.5	1.0	96.0	-	277.3	1.0	0.9	1.9	275.4	-	374.3	291.0	665.3	5.9	0.3	0.0	75.9	85.2	580.1	216.6	-	-
	Jul	143.7	0.0	143.7	263.8	407.4	19.8	0.5	20.3	387.2	-	1,164.9	36.9	0.9	37.8	1,127.0	-	1,572.3	1,222.3	2,794.6	6.1	0.3	0.0	75.9	140.5	2,654.1	990.9	-	-
	Aug	172.8	0.0	172.8	317.4	490.2	5.5	0.5	6.0	484.3	-	1,401.6	10.2	0.9	11.1	1,390.4	-	1,891.8	1,470.7	3,362.5	6.1	0.3	0.0	75.9	99.5	3,263.0	1,218.3	-	-
	Sep	45.9	0.0	45.9	84.3	130.2	23.8	0.5	24.3	105.9	-	372.3	44.4	0.9	45.3	327.0	-	502.5	390.7	893.2	5.9	0.3	0.0	75.9	151.8	741.4	276.8	-	-
	Oct	28.6	0.0	28.6	52.5	81.1	20.3	0.5	20.8	60.4	-	232.0	37.8	0.9	38.7	193.3	-	313.1	243.4	556.6	6.1	0.3	0.0	75.9	141.9	414.7	154.8	-	-
	Nov	9.6	0.0	9.6	17.6	27.2	12.7	0.5	13.2	13.9	-	77.6	23.8	0.9	24.7	53.0	-	104.8	81.5	186.2	5.9	0.3	0.0	75.9	120.1	66.2	24.7	-	-
	Dec	6.7	0.0	6.7	12.4	19.1	0.2	0.5	0.7	18.4	-	54.6	0.4	0.9	1.3	53.2	-	73.6	57.2	130.9	6.1	0.3	0.0	75.9	84.4	46.5	17.4	-	-
1972	Jan	4.9	0.0	4.9	9.0	13.9	6.2	0.5	6.7	7.1	-	39.6	11.6	0.9	12.5	27.1	-	53.5	41.6	95.0	6.1	0.3	0.0	75.9	101.7	-	-	6.6	2.5
	Feb	4.1	0.0	4.1	7.5	11.5	3.9	0.5	4.4	7.2	-	32.9	7.2	0.9	8.1	24.8	-	44.5	34.6	79.0	5.5	0.3	0.0	75.9	94.3	-	-	15.2	5.7
	Mar	3.8	0.0	3.8	7.0	10.9	4.4	0.5	4.9	5.9	-	31.1	8.3	0.9	9.2	21.9	-	42.0	32.6	74.6	6.1	0.3	0.0	75.9	96.5	-	-	21.9	8.2
	Apr	4.5	0.0	4.5	8.2	12.7	4.3	0.5	4.8	7.9	-	36.2	8.0	0.9	8.9	27.3	-	48.9	38.0	86.8	5.9	0.3	0.0	75.9	95.9	-	-	9.0	3.4
	May	26.7	0.0	26.7	49.1	75.8	10.3	0.5	10.8	65.0	-	216.8	19.2	0.9	20.1	196.6	-	292.6	227.5	520.1	6.1	0.3	0.0	75.9	113.3	406.7	151.9	-	-
	Jun	22.6	0.0	22.6	41.5	64.1	0.6	0.5	1.0	63.0	-	183.1	1.0	0.9	1.9	181.2	-	247.2	192.2	439.3	5.9	0.3	0.0	75.9	85.2	354.2	132.2	-	-
	Jul	22.5	0.0	22.5	41.4	63.9	19.8	0.5	20.3	43.6	-	182.7	36.9	0.9	37.8	144.9	-	246.6	191.7	438.4	6.1	0.3	0.0	75.9	140.5	297.8	111.2	-	-
	Aug	93.0	0.0	93.0	170.9	263.9	5.5	0.5	6.0	258.0	-	754.5	10.2	0.9	11.1	743.4	-	1,018.4	791.7	1,810.2	6.1	0.3	0.0	75.9	99.5	1,710.7	638.7	-	-
	Sep	50.1	0.0	50.1	92.1	142.2	23.8	0.5	24.3	117.9	-	406.6	44.4	0.9	45.3	361.2	-	548.8	426.6	975.4	5.9	0.3	0.0	75.9	151.8	823.6	307.5	-	-
	Oct	23.7	0.0	23.7	43.6	67.3	20.3	0.5	20.8	46.5	-	192.4	37.8	0.9	38.7	153.7	-	259.7	201.9	461.6	6.1	0.3	0.0	75.9	141.9	319.7	119.4	-	-
	Nov	11.6	0.0	11.6	21.3	33.0	12.7	0.5	13.2	19.7	-	94.2	23.8	0.9	24.7	69.6	-	127.2	98.9	226.1	5.9	0.3	0.0	75.9	120.1	106.0	39.6	-	-
	Dec	7.8	0.0	7.8	14.4	22.2	0.2	0.5	0.7	21.5	-	63.4	0.4	0.9	1.3	62.1	-	85.6	66.5	152.1	6.1	0.3	0.0	75.9	84.4	67.7	25.3	-	-
1973	Jan	6.2	0.0	6.2	11.4	17.5	6.2	0.5	6.7	10.8	-	50.2	11.6	0.9	12.5	37.6	-	67.7	52.6	120.3	6.1	0.3	0.0	75.9	101.7	18.7	7.0	-	-
	Feb	4.7	0.0	4.7	8.6	13.3	3.9	0.5	4.4	9.0	-	38.1	7.2	0.9	8.1	29.9	-	51.4	39.9	91.3	5.5	0.3	0.0	75.9	94.3	-	-	3.0	1.1
	Mar	9.9	0.0	9.9	18.1	28.0	4.4	0.5	4.9	23.1	-	80.0	8.3	0.9	9.2	70.8	-	108.0	83.9	191.9	6.1	0.3	0.0	75.9	96.5	95.4	35.6	-	-
	Apr	18.6	0.0	18.6	34.1	52.7	4.3	0.5	4.8	47.9	-	150.6	8.0	0.9	8.9	141.7	-	203.2	158.0	361.2	5.9	0.3	0.0	75.9	95.9	265.4	99.1	-	-
	May	56.5	0.0	56.5	103.7	160.2	10.3	0.5	10.8	149.4	-	458.0	19.2	0.9	20.1	437.8	-	618.2	480.6	1,098.7	6.1	0.3	0.0	75.9	113.3	985.4	367.9	-	-
	Jun	62.4	0.0	62.4	114.6	177.0	0.6	0.5	1.0	175.9	-	505.9	1.0	0.9	1.9	504.0	-	682.9	530.9	1,213.7	5.9	0.3	0.0	75.9	85.2	1,128.6	421.4	-	-
	Jul	111.6	0.0	111.6	204.9	316.5	19.8	0.5	20.3	296.2	-	904.8	36.9	0.9	37.8	867.0	-	1,221.3	949.5	2,170.8	6.1	0.3	0.0	75.9	140.5	2,030.3	758.0	-	-
	Aug	92.1	0.0	92.1	169.2	261.3	5.5	0.5	6.0	255.3	-	747.0	10.2	0.9	11.1	735.9	-	1,008.3	783.9	1,792.2	6.1	0.3	0.0	75.9	99.5	1,692.7	632.0	-	-
	Sep	120.0	0.0	120.0	220.3	340.2	23.8	0.5	24.3	315.9	-	972.7	44.4	0.9	45.3	927.4	-	1,312.9	1,020.7	2,333.6	5.9	0.3	0.0	75.9	151.8	2,181.9	814.6	-	-
	Oct	26.1	0.0	26.1	47.9	74.0	20.3	0.5	20.8	53.2	-	211.5	37.8	0.9	38.7	172.7	-	285.4	221.9	507.3	6.1	0.3	0.0	75.9	141.9	365.4	136.4	-	-
	Nov	9.9	0.0	9.9	18.1	28.0	12.7	0.5	13.2	14.8	-	80.1	23.8	0.9	24.7	55.4	-	108.1	84.0	192.1	5.9	0.3	0.0	75.9	120.1	72.1	26.9	-	-
	Dec	6.9	0.0	6.9	12.6	19.5	0.2	0.5	0.7	18.8	-	55.7	0.4	0.9	1.3	54.4	-	75.1	58.4	133.5	6.1	0.3	0.0	75.9	84.4	49.1	18.3	-	-
1974	Jan	6.0	0.0	6.0	11.0	16.9	6.2	0.5	6.7	10.2	-	48.4	11.6	0.9	12.5	35.9	-	65.4	50.8	116.2	6.1	0.3	0.0	75.9	101.7	14.6	5.4	-	-
	Feb	4.4	0.0	4.4	8.1	12.4	3.9	0.5	4.4	8.1	-	35.6	7.2	0.9	8.1	27.4	-	48.0	37.3	85.3	5.5	0.3	0.0	75.9	94.3	-	-	8.9	3.3
	Mar	4.3	0.0	4.3	7.8	12.1	4.4	0.5	4.9	7.2	-	34.6	8.3	0.9	9.2	25.4	-	46.7	36.3	83.0	6.1	0.3	0.0	75.9	96.5	-	-	13.5	5.0
	Apr	6.3	0.0	6.3	11.6	18.0	4.3	0.5	4.8	13.2	-	51.4	8.0	0.9	8.9	42.5	-	69.4	53.9	123.3	5.9	0.3	0.0	75.9	95.9	27.4	10.2	-	-
	May	8.3	0.0	8.3	15.2	23.5	10.3	0.5	10.8	12.7	-	67.2	19.2	0.9	20.1	47.1	-	90.8	70.6	161.3	6.1	0.3	0.0	75.9	113.3	48.0	17.9	-	-
	Jun	54.8	0.0	54.8	100.7	155.6	0.6	0.5	1.0	154.5	-	444.7	1.0	0.9	1.9	442.8	-	600.3	466.7	1,067.0	5.9	0.3	0.0	75.9	85.2	981.8	366.6	-	-
	Jul	69.7	0.0	69.7	128.0	197.7	19.8	0.5	20.3	177.4	-	565.2	36.9	0.9	37.8	527.3	-	762.9	593.0	1,355.9	6.1	0.3	0.0	75.9	140.5	1,215.4	453.8	-	-
	Aug	27.5	0.0	27.5	50.5	78.0	5.5	0.5	6.0	72.0	-	222.9	10.2	0.9	11.1	211.8	-	300.9	233.9	534.8	6.1	0.3	0.0	75.9	99.5	435.3	162.5	-	-
	Sep	59.7	0.0	59.7	109.6	169.2	23.8	0.5	24.3	145.0	-	483.9	44.4	0.9	45.3	438.6	-	653.1	507.7	1,160.8	5.9	0.3	0.0	75.9	151.8	1,009.0	376.7	-	-
	Oct	40.4	0.0	40.4	74.2	114.5	20.3	0.5	20.8	93.8	-	327.5	37.8	0.9	38.7	288.7	-	442.0	343.6	785.6	6.1	0.3	0.0	75.9	141.9	643.7	240.3	-	-
	Nov	9.2	0.0	9.2	17.0	26.2	12.7	0.5	13.2	13.0	-	75.0	23.8	0.9	24.7	50.3	-	101.2	78.7	179.9	5.9	0.3	0.0	75.9	120.1	59.8	22.3	-	-
	Dec	6.6	0.0	6.6	12.1	18.7	0.2	0.5	0.7	18.0	-	53.5	0.4	0.9	1.3	52.2	-	72.2	56.2	128.4	6.1	0.3	0.0	75.9	84.4	44.0	16.4	-	-

Table G.1 (2) Water Balance Analysis Bang Giang and Ky Cung River Basins (2) : 2020 Demand Condition

		Ky Cung River										Bang Giang River						Whole Basin											
		Water Resources					Water Demand			Balance (W/O M.Flow Req.)		Water Resources	Water Demand			Balance (W/O M.Flow Req.)		4680			0.04694	0.026618	0.003437	75.9456		Balance(W/ M.Flow Req.) Whole Basin			
		Ban Lai Reservoir			1010 Remnant Flow	Total to Lang Son	0.84575 Irr-2 Net dmnd	Fishery /Live S	Total			River Outflow	1.573246 Irr-1 Net dmnd	Fishery /Live S	TOTAL			River Outflow Both	Remnant Flow Ky Cung	TOTAL	Water Supply Urban	Water Supply Others	Industry	Mainte-nance Flow	TOTAL	Surplus Volume	Surplus Discharge	Deficit Volume	Deficit Discharge
		Inflow	Storage	Outflow						Surplus Volume	Deficit Volume					Surplus Volume	Deficit Volume												
		(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(M^3/sec)	(Mill. M3)	(M^3/sec)
1960	Jan	7.0	310.5	16.6	12.8	29.4	10.6	0.8	11.5	18.0	-	56.7	19.8	1.6	21.4	35.4	-	86.2	59.5	145.7	1.5	0.8	0.1	75.9	111.2	34.5	12.9	-	-
	Feb	5.3	300.9	16.6	9.7	26.3	7.8	0.8	8.6	17.6	-	42.7	14.5	1.6	16.0	26.6	-	69.0	44.8	113.8	1.3	0.7	0.1	75.9	102.8	11.0	4.1	-	-
	Mar	9.1	289.6	16.6	16.7	33.3	8.2	0.8	9.0	24.3	-	73.7	15.2	1.6	16.8	56.9	-	106.9	77.3	184.2	1.5	0.8	0.1	75.9	104.1	80.1	29.9	-	-
	Apr	4.2	282.1	23.0	7.7	30.7	6.6	0.8	7.5	23.2	-	33.9	12.3	1.6	13.9	20.0	-	64.5	35.5	100.0	1.4	0.8	0.1	75.9	99.6	0.5	0.2	-	-
	May	13.5	263.2	16.6	24.9	41.4	18.5	0.8	19.3	22.1	-	109.7	34.4	1.6	36.0	73.8	-	151.2	115.1	266.3	1.5	0.8	0.1	75.9	133.7	132.7	49.5	-	-
	Jun	19.9	260.2	16.6	36.6	53.2	1.3	0.8	2.1	51.1	-	161.7	2.4	1.6	4.0	157.8	-	215.0	169.7	384.7	1.4	0.8	0.1	75.9	84.3	300.4	112.1	-	-
	Jul	99.5	263.5	152.6	182.7	335.3	24.8	0.8	25.7	309.6	-	806.6	46.2	1.6	47.8	758.9	-	1,141.9	846.4	1,988.3	1.5	0.8	0.1	75.9	151.8	1,836.6	685.7	-	-
	Aug	121.0	210.4	121.6	222.2	343.8	6.7	0.8	7.5	336.3	-	981.3	12.4	1.6	14.0	967.3	-	1,325.1	1,029.7	2,354.9	1.5	0.8	0.1	75.9	99.9	2,255.0	841.9	-	-
	Sep	75.0	209.8	74.6	137.7	212.3	36.7	0.8	37.5	174.8	-	608.2	68.3	1.6	69.8	538.4	-	820.6	638.2	1,458.8	1.4	0.8	0.1	75.9	185.7	1,273.1	475.3	-	-
	Oct	33.0	210.2	33.6	60.7	94.2	33.5	0.8	34.4	59.9	-	267.8	62.4	1.6	63.9	203.9	-	362.1	281.0	643.1	1.5	0.8	0.1	75.9	176.6	466.5	174.2	-	-
	Nov	14.4	209.7	16.6	26.4	43.0	20.7	0.8	21.6	21.4	-	116.5	38.6	1.6	40.1	76.4	-	159.5	122.3	281.8	1.4	0.8	0.1	75.9	140.0	141.8	52.9	-	-
	Dec	11.8	207.4	16.6	21.8	38.3	6.0	0.8	6.8	31.5	-	96.1	11.2	1.6	12.7	83.3	-	134.4	100.8	235.2	1.5	0.8	0.1	75.9	97.9	137.3	51.3	-	-
1961	Jan	6.1	202.7	16.6	11.3	27.9	10.6	0.8	11.5	16.4	-	49.7	19.8	1.6	21.4	28.3	-	77.6	52.2	129.7	1.5	0.8	0.1	75.9	111.2	18.5	6.9	-	-
	Feb	5.2	192.2	16.6	9.6	26.2	7.8	0.8	8.6	17.6	-	42.5	14.5	1.6	16.0	26.4	-	68.7	44.6	113.2	1.3	0.7	0.1	75.9	102.8	10.4	3.9	-	-
	Mar	9.8	180.9	16.6	17.9	34.5	8.2	0.8	9.0	25.5	-	79.2	15.2	1.6	16.8	62.5	-	113.8	83.2	197.0	1.5	0.8	0.1	75.9	104.1	92.8	34.7	-	-
	Apr	22.9	174.0	16.6	42.1	58.7	6.6	0.8	7.5	51.3	-	186.0	12.3	1.6	13.9	172.1	-	244.7	195.2	439.9	1.4	0.8	0.1	75.9	99.6	340.3	127.1	-	-
	May	9.1	180.4	16.6	16.6	33.2	18.5	0.8	19.3	13.9	-	73.4	34.4	1.6	36.0	37.4	-	106.6	77.0	183.7	1.5	0.8	0.1	75.9	133.7	50.0	18.7	-	-
	Jun	49.3	172.8	16.6	90.6	107.2	1.3	0.8	2.1	105.1	-	400.1	2.4	1.6	4.0	396.2	-	507.3	419.9	927.2	1.4	0.8	0.1	75.9	84.3	842.9	314.7	-	-
	Jul	27.6	205.6	23.2	50.7	73.9	24.8	0.8	25.7	48.2	-	223.9	46.2	1.6	47.8	176.1	-	297.8	234.9	532.7	1.5	0.8	0.1	75.9	151.8	380.9	142.2	-	-
	Aug	55.7	210.0	55.6	102.4	158.0	6.7	0.8	7.5	150.4	-	452.0	12.4	1.6	14.0	438.0	-	610.0	474.3	1,084.3	1.5	0.8	0.1	75.9	99.9	984.5	367.6	-	-
	Sep	64.9	210.1	65.0	119.1	184.1	36.7	0.8	37.5	146.6	-	526.1	68.3	1.6	69.8	456.3	-	710.3	552.1	1,262.3	1.4	0.8	0.1	75.9	185.7	1,076.7	402.0	-	-
	Oct	29.0	210.0	29.1	53.2	82.3	33.5	0.8	34.4	47.9	-	234.9	62.4	1.6	63.9	171.0	-	317.2	246.5	563.7	1.5	0.8	0.1	75.9	176.6	387.0	144.5	-	-
	Nov	22.3	209.9	16.6	40.9	57.5	20.7	0.8	21.6	35.9	-	180.5	38.6	1.6	40.1	140.4	-	238.0	189.4	427.5	1.4	0.8	0.1	75.9	140.0	287.5	107.3	-	-
	Dec	13.8	215.6	16.6	25.3	41.9	6.0	0.8	6.8	35.1	-	111.9	11.2	1.6	12.7	99.1	-	153.8	117.4	271.2	1.5	0.8	0.1	75.9	97.9	173.3	64.7	-	-
1962	Jan	12.0	212.8	16.6	22.1	38.7	10.6	0.8	11.5	27.2	-	97.6	19.8	1.6	21.4	76.2	-	136.3	102.4	238.7	1.5	0.8	0.1	75.9	111.2	127.5	47.6	-	-
	Feb	5.9	208.2	16.6	10.9	27.5	7.8	0.8	8.6	18.9	-	48.1	14.5	1.6	16.0	32.0	-	75.6	50.5	126.0	1.3	0.7	0.1	75.9	102.8	23.3	8.7	-	-
	Mar	5.5	197.5	16.6	10.1	26.7	8.2	0.8	9.0	17.7	-	44.6	15.2	1.6	16.8	27.8	-	71.3	46.8	118.1	1.5	0.8	0.1	75.9	104.1	14.0	5.2	-	-
	Apr	6.1	186.4	16.6	11.2	27.8	6.6	0.8	7.5	20.4	-	49.6	12.3	1.6	13.9	35.7	-	77.4	52.0	129.5	1.4	0.8	0.1	75.9	99.6	29.9	11.2	-	-
	May	11.3	176.0	16.6	20.7	37.3	18.5	0.8	19.3	18.0	-	91.6	34.4	1.6	36.0	55.6	-	129.0	96.1	225.1	1.5	0.8	0.1	75.9	133.7	91.4	34.1	-	-
	Jun	67.3	170.7	16.6	123.5	140.1	1.3	0.8	2.1	138.0	-	545.4	2.4	1.6	4.0	541.5	-	685.5	572.3	1,257.9	1.4	0.8	0.1	75.9	84.3	1,173.5	438.1	-	-
	Jul	69.2	221.3	80.6	127.1	207.7	24.8	0.8	25.7	182.0	-	561.2	46.2	1.6	47.8	513.5	-	768.9	588.9	1,357.9	1.5	0.8	0.1	75.9	151.8	1,206.1	450.3	-	-
	Aug	78.1	209.9	78.1	143.4	221.5	6.7	0.8	7.5	213.9	-	633.1	12.4	1.6	14.0	619.1	-	854.5	664.3	1,518.9	1.5	0.8	0.1	75.9	99.9	1,419.0	529.8	-	-
	Sep	23.7	209.9	23.6	43.4	67.0	36.7	0.8	37.5	29.5	-	191.8	68.3	1.6	69.8	122.0	-	258.9	201.3	460.2	1.4	0.8	0.1	75.9	185.7	274.5	102.5	-	-
	Oct	14.3	210.0	16.6	26.3	42.8	33.5	0.8	34.4	8.5	-	115.9	62.4	1.6	63.9	52.0	-	158.8	121.6	280.4	1.5	0.8	0.1	75.9	176.6	103.8	38.7	-	-
	Nov	6.7	207.7	17.0	12.3	29.3	20.7	0.8	21.6	7.7	-	54.2	38.6	1.6	40.1	14.0	-	83.5	56.9	140.3	1.4	0.8	0.1	75.9	140.0	0.3	0.1	-	-
	Dec	4.8	197.4	16.6	8.8	25.4	6.0	0.8	6.8	18.5	-	38.7	11.2	1.6	12.7	26.0	-	64.1	40.6	104.7	1.5	0.8	0.1	75.9	97.9	6.8	2.5	-	-
1963	Jan	3.7	185.5	44.0	6.8	50.8	10.6	0.8	11.5	39.3	-	29.9	19.8	1.6	21.4	8.5	-	80.6	31.3	111.9	1.5	0.8	0.1	75.9	111.2	0.7	0.3	-	-
	Feb	3.7	145.2	35.0	6.8	41.8	7.8	0.8	8.6	33.1	-	29.8	14.5	1.6	16.0	13.8	-	71.6	31.3	102.8	1.3	0.7	0.1	75.9	102.8	0.1	0.0	-	-
	Mar	4.1	113.9	28.5	7.5	36.0	8.2	0.8	9.0	27.0	-	33.3	15.2	1.6	16.8	16.5	-	69.3	34.9	104.3	1.5	0.8	0.1	75.9	104.1	0.2	0.1	-	-
	Apr	4.1	89.5	24.5	7.5	32.0	6.6	0.8	7.5	24.5	-	33.1	12.3	1.6	13.9	19.2	-	65.1	34.7	99.8	1.4	0.8	0.1	75.9	99.6	0.3	0.1	-	-
	May	5.4	69.1	33.5	10.0	43.5	18.5	0.8	19.3	24.1	-	44.1	34.4	1.6	36.0	8.1	-	87.6	46.3	133.8	1.5	0.8	0.1	75.9	133.7	0.2	0.1	-	-
	Jun	9.1	41.0	16.6	16.8	33.4	1.3	0.8	2.1	31.2	-	74.0	2.4	1.6	4.0	70.1	-	107.4	77.7	185.0	1.4	0.8	0.1	75.9	84.3	100.7	37.6	-	-
	Jul	61.7	33.6	16.6	113.3	129.9	24.8	0.8	25.7	104.2	-	500.2	46.2	1.6	47.8	452.4	-	630.0	524.8	1,154.8	1.5	0.8	0.1	75.9	151.8	1,003.1	374.5	-	-
	Aug	59.5	78.6	16.6	109.3	125.9	6.7	0.8	7.5	118.3	-	482.6	12.4	1.6	14.0	468.6	-	608.4	506.4	1,114.8	1.5	0.8	0.1	75.9	99.9	1,014.9	378.9	-	-
	Sep	37.5	121.6	16.6	68.9	85.5	36.7	0.8	37.5	48.0	-	304.3	68.3	1.6	69.8	234.4	-	389.8	319.3	709.1	1.4	0.8	0.1	75.9	185.7	523.4	195.4	-	-
	Oct	16.6	142.5	16.6	30.5	47.1	33.5	0.8	34.4	12.7	-	134.8	62.4	1.6	63.9	70.8	-	181.9	141.4	323.3	1.5	0.8	0.1	75.9	176.6	146.6	54.7	-	-
	Nov	17.7	142.5	16.6	32.5	49.1	20.7	0.8	21.6	27.5	-	143.3	38.6	1.6	40.1	103.2	-	192.4	150.4	342.7	1.4	0.8	0.1	75.9	140.0	202.8	75.7	-	-
	Dec	9.1	143.6	16.6	16.7	33.3	6.0	0.8	6.8	26.5	-	73.8	11.2	1.6	12.7	61.1	-	107.1	77.5	184.6	1.5	0.8	0.1	75.9	97.9	86.7	32.4	-	-
1964	Jan	6.5	136.1	16.6	12.0	28.6	10.6	0.8	11.5	17.1	-	53.0	19.8	1.6	21.4	31.6	-	81.6	55.6	137.2	1.5	0.8	0.1	75.9	111.2	26.0	9.7	-	-
	Feb	5.5	126.0	16.6	10.2	26.8	7.8	0.8	8.6	18.1	-	44.9	14.5	1.6	16.0	28.8	-	71.6	47.1	118.7	1.3	0.7	0.1	75.9	102.8	16.0	6.0	-	-
	Mar	6.4	115.0	16.6	11.8	28.4	8.2	0.8	9.0	19.4	-	52.0	15.2	1.6	16.8	35.2	-	80.4	54.6	135.0	1.5	0.8	0.1	75.9	104.1	30.9	11.5	-	-
	Apr	14.7	104.8	16.6	27.0	43.5	6.6	0.8	7.5	36.1	-	119.0	12.3	1.6	13.9	105.2	-	162.6	124.9	287.4	1.4	0.8	0.1	75.9	99.6	187.9	70.1	-	-
	May	17.3	102.9	16.6	31.8	48.4	18.5	0.8	19.3	29.1	-	140.5	34.4	1.6	36.0	104.6	-	189.0	147.5	336.4	1.5	0.8	0.1	75.9	133.7	202.8	75.7	-	-
	Jun	42.1	103.6	16.6	77.3	93.9	1.3	0.8	2.1	91.8	-	341.5	2.4	1.6	4.0	337.5	-	435.4	358.3	793.7	1.4	0.8	0.1	75.9	84.3	709.3	264.8	-	-
	Jul	65.7	129.1	16.6	120.7	137.3	24.8	0.8	25.7	111.6	-	533.1	46.2	1.6	47.8	485.3	-	670.4	559.4	1,229.8	1.5	0.8	0.1	75.9	151.8	1,078.0	402.5	-	-
	Aug	58.3	178.3	26.6	107.1	133.7	6.7	0.8	7.5	126.2	-	473.1	12.4	1.6	14.0	459.1	-	606.8	496.4	1,103.2	1.5	0.8	0.1	75.9	99.9	1,003.4	374.6	-	-
	Sep	39.9	210.0	39.9	73.3	113.2	36.7	0.8	37.5	75.6	-	323.5	68.3	1.6	69.8	253.7	-	436.7	339.5	776.1	1.4	0.8	0.1	75.9	185.7	590.5	220.5	-	-
	Oct	46.1	210.0	46.1	84.6	130.7	33.5	0.8	34.4	96.3	-	373.5	62.4	1.6	63.9	309.5	-	504.2	391.9	896.1	1.5	0.8	0.1	75.9	176.6	719.4	268.6	-	-
	Nov	12.0	210.0	16.6	22.0	38.6	20.7	0.8	21.6	17.0	-	97.1	38.6	1.6	40.1	56.9	-	135.7	101.9	237.6	1.4	0.8	0.1	75.9	140.0	97.6	36.4	-	-
	Dec	8.0	205.3	16.6	14.7	31.3	6.0	0.8	6.8	24.4	-	64.9	11.2	1.6	12.7	52.1	-	96.1	68.1	164.2	1.5	0.8	0.1	75.9	97.9	66.3	24.7	-	-

Table G.1 (2) Water Balance Analysis Bang Giang and Ky Cung River Basins (2) : 2020 Demand Condition

		Ky Cung River										Bang Giang River						Whole Basin											
		Water Resources					Water Demand			Balance (W/O M.Flow Req.)		Water Resources	Water Demand			Balance (W/O M.Flow Req.)		4680			0.04694	0.026618	0.003437	75.9456		Balance(W/ M.Flow Req.) Whole Basin			
		Ban Lai Reservoir			1010	Total to Lang Son	0.84575						1.573246	TOTAL				River Outflow	Remnant Flow Ky Cung	TOTAL	Water Supply		Industry	Mainte-nance Flow	TOTAL				
		Inflow	Storage	Outflow	Remnant Flow		Irr-2 Net dmnd	Fishery /Live S	Total	Surplus Volume	Deficit Volume	River Outflow	Irr-1 Net dmnd	Fishery /Live S		Surplus Volume	Deficit Volume	Both			Urban	Others				Surplus Volume	Surplus Discharge	Deficit Volume	Deficit Discharge
		(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(M^3/sec)	(Mill. M3)	(M^3/sec)
1965	Jan	5.2	196.7	16.6	9.6	26.2	10.6	0.8	11.5	14.7	-	42.2	19.8	1.6	21.4	20.8	-	68.4	44.3	112.7	1.5	0.8	0.1	75.9	111.2	1.5	0.6	-	-
	Feb	4.1	185.3	28.0	7.5	35.5	7.8	0.8	8.6	26.8	-	32.9	14.5	1.6	16.0	16.9	-	68.4	34.5	102.9	1.3	0.7	0.1	75.9	102.8	0.1	0.0	-	-
	Mar	5.3	161.4	16.6	9.7	26.3	8.2	0.8	9.0	17.3	-	42.9	15.2	1.6	16.8	26.1	-	69.2	45.0	114.2	1.5	0.8	0.1	75.9	104.1	10.1	3.8	-	-
	Apr	29.3	150.1	16.6	53.9	70.5	6.6	0.8	7.5	63.0	-	237.8	12.3	1.6	13.9	224.0	-	308.3	249.6	557.8	1.4	0.8	0.1	75.9	99.6	458.3	171.1	-	-
	May	16.0	162.8	16.6	29.4	46.0	18.5	0.8	19.3	26.6	-	129.8	34.4	1.6	36.0	93.8	-	175.7	136.2	311.9	1.5	0.8	0.1	75.9	133.7	178.2	66.5	-	-
	Jun	97.8	162.2	16.6	179.6	196.2	1.3	0.8	2.1	194.1	-	793.2	2.4	1.6	4.0	789.3	-	989.5	832.4	1,821.9	1.4	0.8	0.1	75.9	84.3	1,737.5	648.7	-	-
	Jul	81.3	243.5	114.8	149.3	264.1	24.8	0.8	25.7	238.4	-	659.3	46.2	1.6	47.8	611.6	-	923.4	691.8	1,615.3	1.5	0.8	0.1	75.9	151.8	1,463.5	546.4	-	-
	Aug	31.7	210.0	31.6	58.2	89.8	6.7	0.8	7.5	82.2	-	256.8	12.4	1.6	14.0	242.8	-	346.6	269.5	616.1	1.5	0.8	0.1	75.9	99.9	516.2	192.7	-	-
	Sep	17.4	210.0	16.6	32.0	48.6	36.7	0.8	37.5	11.1	-	141.4	68.3	1.6	69.8	71.6	-	190.0	148.4	338.4	1.4	0.8	0.1	75.9	185.7	152.8	57.0	-	-
	Oct	11.1	210.9	16.6	20.4	36.9	33.5	0.8	34.4	2.6	-	89.9	62.4	1.6	63.9	25.9	-	126.8	94.3	221.1	1.5	0.8	0.1	75.9	176.6	44.5	16.6	-	-
	Nov	12.5	205.4	16.6	23.0	39.6	20.7	0.8	21.6	18.0	-	101.5	38.6	1.6	40.1	61.3	-	141.1	106.5	247.6	1.4	0.8	0.1	75.9	140.0	107.6	40.2	-	-
	Dec	6.6	201.3	16.6	12.1	28.7	6.0	0.8	6.8	21.9	-	53.6	11.2	1.6	12.7	40.8	-	82.3	56.2	138.5	1.5	0.8	0.1	75.9	97.9	40.6	15.1	-	-
1966	Jan	5.5	191.3	16.6	10.0	26.6	10.6	0.8	11.5	15.1	-	44.3	19.8	1.6	21.4	22.9	-	71.0	46.5	117.5	1.5	0.8	0.1	75.9	111.2	6.3	2.3	-	-
	Feb	4.1	180.2	27.5	7.6	35.1	7.8	0.8	8.6	26.4	-	33.4	14.5	1.6	16.0	17.4	-	68.5	35.1	103.6	1.3	0.7	0.1	75.9	102.8	0.8	0.3	-	-
	Mar	3.5	156.8	39.5	6.5	46.0	8.2	0.8	9.0	36.9	-	28.5	15.2	1.6	16.8	11.7	-	74.5	29.9	104.4	1.5	0.8	0.1	75.9	104.1	0.3	0.1	-	-
	Apr	7.3	120.8	16.6	13.4	30.0	6.6	0.8	7.5	22.6	-	59.2	12.3	1.6	13.9	45.4	-	89.2	62.2	151.4	1.4	0.8	0.1	75.9	99.6	51.8	19.3	-	-
	May	6.2	111.5	19.0	11.4	30.4	18.5	0.8	19.3	11.1	-	50.4	34.4	1.6	36.0	14.4	-	80.8	52.9	133.8	1.5	0.8	0.1	75.9	133.7	0.1	0.0	-	-
	Jun	84.3	98.7	16.6	154.8	171.4	1.3	0.8	2.1	169.3	-	683.6	2.4	1.6	4.0	679.7	-	855.0	717.4	1,572.4	1.4	0.8	0.1	75.9	84.3	1,488.0	555.6	-	-
	Jul	99.7	166.4	56.1	183.1	239.2	24.8	0.8	25.7	213.5	-	808.4	46.2	1.6	47.8	760.7	-	1,047.6	848.3	1,895.9	1.5	0.8	0.1	75.9	151.8	1,744.1	651.2	-	-
	Aug	38.9	210.0	48.9	71.4	120.3	6.7	0.8	7.5	112.8	-	315.3	12.4	1.6	14.0	301.3	-	435.6	330.8	766.4	1.5	0.8	0.1	75.9	99.9	666.6	248.9	-	-
	Sep	20.1	200.0	16.6	37.0	53.6	36.7	0.8	37.5	16.0	-	163.3	68.3	1.6	69.8	93.4	-	216.9	171.4	388.2	1.4	0.8	0.1	75.9	185.7	202.6	75.6	-	-
	Oct	12.4	203.6	16.6	22.8	39.4	33.5	0.8	34.4	5.0	-	100.5	62.4	1.6	63.9	36.6	-	139.9	105.5	245.4	1.5	0.8	0.1	75.9	176.6	68.8	25.7	-	-
	Nov	7.6	199.4	16.6	14.0	30.6	20.7	0.8	21.6	9.0	-	61.9	38.6	1.6	40.1	21.7	-	92.5	64.9	157.4	1.4	0.8	0.1	75.9	140.0	17.4	6.5	-	-
	Dec	4.4	190.4	17.0	8.1	25.1	6.0	0.8	6.8	18.2	-	35.7	11.2	1.6	12.7	22.9	-	60.8	37.4	98.2	1.5	0.8	0.1	75.9	97.9	0.3	0.1	-	-
1967	Jan	4.0	177.8	38.5	7.3	45.8	10.6	0.8	11.5	34.3	-	32.1	19.8	1.6	21.4	10.7	-	77.9	33.7	111.6	1.5	0.8	0.1	75.9	111.2	0.4	0.1	-	-
	Feb	4.8	143.3	16.6	8.9	25.5	7.8	0.8	8.6	16.8	-	39.1	14.5	1.6	16.0	23.1	-	64.6	41.1	105.6	1.3	0.7	0.1	75.9	102.8	2.9	1.1	-	-
	Mar	4.0	131.5	31.0	7.3	38.3	8.2	0.8	9.0	29.3	-	32.3	15.2	1.6	16.8	15.6	-	70.7	33.9	104.6	1.5	0.8	0.1	75.9	104.1	0.5	0.2	-	-
	Apr	6.2	104.5	16.6	11.3	27.9	6.6	0.8	7.5	20.4	-	49.9	12.3	1.6	13.9	36.0	-	77.8	52.3	130.1	1.4	0.8	0.1	75.9	99.6	30.5	11.4	-	-
	May	17.0	94.0	16.6	31.2	47.7	18.5	0.8	19.3	28.4	-	137.6	34.4	1.6	36.0	101.6	-	185.3	144.4	329.7	1.5	0.8	0.1	75.9	133.7	196.0	73.2	-	-
	Jun	22.3	94.4	16.6	40.9	57.5	1.3	0.8	2.1	55.4	-	180.7	2.4	1.6	4.0	176.7	-	238.2	189.6	427.8	1.4	0.8	0.1	75.9	84.3	343.5	128.2	-	-
	Jul	19.0	100.1	16.6	34.9	51.5	24.8	0.8	25.7	25.8	-	154.0	46.2	1.6	47.8	106.2	-	205.4	161.6	367.0	1.5	0.8	0.1	75.9	151.8	215.3	80.4	-	-
	Aug	59.8	102.5	16.6	109.9	126.5	6.7	0.8	7.5	118.9	-	485.1	12.4	1.6	14.0	471.1	-	611.6	509.1	1,120.6	1.5	0.8	0.1	75.9	99.9	1,020.8	381.1	-	-
	Sep	52.1	145.7	16.6	95.7	112.3	36.7	0.8	37.5	74.7	-	422.4	68.3	1.6	69.8	352.6	-	534.7	443.2	977.9	1.4	0.8	0.1	75.9	185.7	792.3	295.8	-	-
	Oct	9.6	181.2	17.0	17.6	34.6	33.5	0.8	34.4	0.2	-	77.6	62.4	1.6	63.9	13.7	-	112.2	81.5	193.7	1.5	0.8	0.1	75.9	176.6	17.0	6.4	-	-
	Nov	7.1	173.8	16.6	13.0	29.6	20.7	0.8	21.6	8.0	-	57.4	38.6	1.6	40.1	17.3	-	87.0	60.3	147.3	1.4	0.8	0.1	75.9	140.0	7.3	2.7	-	-
	Dec	5.4	164.3	16.6	9.8	26.4	6.0	0.8	6.8	19.6	-	43.5	11.2	1.6	12.7	30.8	-	69.9	45.6	115.6	1.5	0.8	0.1	75.9	97.9	17.7	6.6	-	-
1968	Jan	4.2	153.0	33.5	7.8	41.3	10.6	0.8	11.5	29.8	-	34.3	19.8	1.6	21.4	12.9	-	75.6	36.0	111.5	1.5	0.8	0.1	75.9	111.2	0.3	0.1	-	-
	Feb	4.8	123.8	16.6	8.8	25.4	7.8	0.8	8.6	16.7	-	38.7	14.5	1.6	16.0	22.6	-	64.1	40.6	104.7	1.3	0.7	0.1	75.9	102.8	1.9	0.7	-	-
	Mar	6.4	111.9	16.6	11.7	28.3	8.2	0.8	9.0	19.3	-	51.7	15.2	1.6	16.8	35.0	-	80.0	54.3	134.3	1.5	0.8	0.1	75.9	104.1	30.2	11.3	-	-
	Apr	15.4	101.7	16.6	28.3	44.9	6.6	0.8	7.5	37.4	-	124.9	12.3	1.6	13.9	111.1	-	169.8	131.1	300.9	1.4	0.8	0.1	75.9	99.6	201.3	75.2	-	-
	May	25.3	100.5	16.6	46.5	63.1	18.5	0.8	19.3	43.8	-	205.4	34.4	1.6	36.0	169.4	-	268.5	215.5	484.0	1.5	0.8	0.1	75.9	133.7	350.4	130.8	-	-
	Jun	56.7	109.3	16.6	104.1	120.7	1.3	0.8	2.1	118.6	-	459.8	2.4	1.6	4.0	455.8	-	580.5	482.5	1,063.0	1.4	0.8	0.1	75.9	84.3	978.6	365.4	-	-
	Jul	70.8	149.4	16.6	130.1	146.7	24.8	0.8	25.7	121.0	-	574.5	46.2	1.6	47.8	526.7	-	721.2	602.8	1,324.0	1.5	0.8	0.1	75.9	151.8	1,172.2	437.7	-	-
	Aug	215.3	203.6	208.6	395.3	603.9	6.7	0.8	7.5	596.4	-	1,745.7	12.4	1.6	14.0	1,731.7	-	2,349.6	1,831.8	4,181.4	1.5	0.8	0.1	75.9	99.9	4,081.6	1,523.9	-	-
	Sep	72.4	210.3	72.6	132.9	205.5	36.7	0.8	37.5	167.9	-	586.7	68.3	1.6	69.8	516.9	-	792.2	615.6	1,407.8	1.4	0.8	0.1	75.9	185.7	1,222.1	456.3	-	-
	Oct	24.1	210.1	24.2	44.3	68.5	33.5	0.8	34.4	34.1	-	195.4	62.4	1.6	63.9	131.5	-	263.9	205.1	469.0	1.5	0.8	0.1	75.9	176.6	292.3	109.1	-	-
	Nov	13.1	210.0	16.6	24.1	40.7	20.7	0.8	21.6	19.1	-	106.6	38.6	1.6	40.1	66.4	-	147.3	111.8	259.1	1.4	0.8	0.1	75.9	140.0	119.1	44.5	-	-
	Dec	7.3	206.5	16.6	13.4	30.0	6.0	0.8	6.8	23.2	-	59.3	11.2	1.6	12.7	46.5	-	89.3	62.2	151.5	1.5	0.8	0.1	75.9	97.9	53.6	20.0	-	-
1969	Jan	7.6	197.2	16.6	14.0	30.6	10.6	0.8	11.5	19.1	-	62.0	19.8	1.6	21.4	40.6	-	92.6	65.1	157.7	1.5	0.8	0.1	75.9	111.2	46.5	17.4	-	-
	Feb	4.2	188.3	25.0	7.8	32.8	7.8	0.8	8.6	24.1	-	34.3	14.5	1.6	16.0	18.3	-	67.1	36.0	103.1	1.3	0.7	0.1	75.9	102.8	0.4	0.1	-	-
	Mar	4.4	167.5	23.0	8.1	31.1	8.2	0.8	9.0	22.1	-	35.8	15.2	1.6	16.8	19.0	-	66.9	37.5	104.4	1.5	0.8	0.1	75.9	104.1	0.3	0.1	-	-
	Apr	8.7	148.9	16.6	16.0	32.5	6.6	0.8	7.5	25.1	-	70.4	12.3	1.6	13.9	56.6	-	103.0	73.9	176.9	1.4	0.8	0.1	75.9	99.6	77.4	28.9	-	-
	May	13.9	141.0	16.6	25.6	42.2	18.5	0.8	19.3	22.9	-	113.1	34.4	1.6	36.0	77.1	-	155.3	118.6	273.9	1.5	0.8	0.1	75.9	133.7	140.3	52.4	-	-
	Jun	33.6	138.4	16.6	61.7	78.3	1.3	0.8	2.1	76.1	-	272.3	2.4	1.6	4.0	268.3	-	350.5	285.7	636.2	1.4	0.8	0.1	75.9	84.3	551.9	206.1	-	-
	Jul	34.3	155.3	16.6	63.0	79.6	24.8	0.8	25.7	53.9	-	278.2	46.2	1.6	47.8	230.4	-	357.8	291.9	649.7	1.5	0.8	0.1	75.9	151.8	497.9	185.9	-	-
	Aug	104.5	173.0	67.6	191.9	259.5	6.7	0.8	7.5	252.0	-	847.6	12.4	1.6	14.0	833.6	-	1,107.1	889.4	1,996.5	1.5	0.8	0.1	75.9	99.9	1,896.6	708.1	-	-
	Sep	29.3	210.0	28.6	53.9	82.5	36.7	0.8	37.5	44.9	-	238.0	68.3	1.6	69.8	168.1	-	320.5	249.7	570.2	1.4	0.8	0.1	75.9	185.7	384.5	143.6	-	-
	Oct	13.8	210.7	16.6	25.3	41.9	33.5	0.8	34.4	7.5	-	111.7	62.4	1.6	63.9	47.7	-	153.6	117.2	270.8	1.5	0.8	0.1	75.9	176.6	94.1	35.1	-	-
	Nov	11.4	207.9	16.6	20.9	37.5	20.7	0.8	21.6	15.9	-	92.3	38.6	1.6	40.1	52.1	-	129.8	96.8	226.6	1.4	0.8	0.1	75.9	140.0	86.6	32.4	-	-
	Dec	5.0	202.7	16.6	9.1	25.7	6.0	0.8	6.8	18.9	-	40.4	11.2	1.6	12.7	27.7	-	66.1	42.4	108.5	1.5	0.8	0.1	75.9	97.9	10.6	4.0	-	-

Table G.1 (2) Water Balance Analysis Bang Giang and Ky Cung River Basins (2) : 2020 Demand Condition

		Ky Cung River										Bang Giang River						Whole Basin											
		Water Resources					Water Demand			Balance (W/O M.Flow Req.)		Water Resources	Water Demand			Balance (W/O M.Flow Req.)		4680			0.04694	0.026618	0.003437	75.9456		Balance(W/ M.Flow Req.) Whole Basin			
		Ban Lai Reservoir			1010	Total to Lang Son	0.84575						1.573246	TOTAL				River Outflow	Remnant Flow Ky Cung	TOTAL	Water Supply		Industry	Mainte-nance Flow	TOTAL				
		Inflow	Storage	Outflow	Remnant Flow		Irr-2 Net dmnd	Fishery /Live S	Total	Surplus Volume	Deficit Volume	River Outflow	Irr-1 Net dmnd	Fishery /Live S		Surplus Volume	Deficit Volume	Both			Urban	Others				Surplus Volume	Surplus Discharge	Deficit Volume	Deficit Discharge
		(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(Mill. M3)	(M^3/sec)	(Mill. M3)	(M^3/sec)
1970	Jan	4.8	191.1	22.5	8.9	31.4	10.6	0.8	11.5	19.9	-	39.2	19.8	1.6	21.4	17.8	-	70.6	41.1	111.7	1.5	0.8	0.1	75.9	111.2	0.5	0.2	-	-
	Feb	4.0	173.4	29.5	7.3	36.8	7.8	0.8	8.6	28.2	-	32.3	14.5	1.6	16.0	16.3	-	69.1	33.9	103.0	1.3	0.7	0.1	75.9	102.8	0.3	0.1	-	-
	Mar	4.0	147.9	31.0	7.3	38.3	8.2	0.8	9.0	29.3	-	32.3	15.2	1.6	16.8	15.5	-	70.6	33.9	104.4	1.5	0.8	0.1	75.9	104.1	0.3	0.1	-	-
	Apr	14.8	120.9	16.6	27.2	43.8	6.6	0.8	7.5	36.3	-	120.0	12.3	1.6	13.9	106.2	-	163.8	126.0	289.8	1.4	0.8	0.1	75.9	99.6	190.2	71.0	-	-
	May	34.0	119.1	16.6	62.4	79.0	18.5	0.8	19.3	59.7	-	275.6	34.4	1.6	36.0	239.6	-	354.6	289.2	643.7	1.5	0.8	0.1	75.9	133.7	510.1	190.4	-	-
	Jun	58.0	136.5	16.6	106.6	123.2	1.3	0.8	2.1	121.0	-	470.5	2.4	1.6	4.0	466.6	-	593.7	493.8	1,087.4	1.4	0.8	0.1	75.9	84.3	1,003.1	374.5	-	-
	Jul	74.2	177.9	42.1	136.3	178.4	24.8	0.8	25.7	152.7	-	601.9	46.2	1.6	47.8	554.1	-	780.3	631.6	1,411.8	1.5	0.8	0.1	75.9	151.8	1,260.1	470.5	-	-
	Aug	79.1	210.0	78.6	145.3	223.9	6.7	0.8	7.5	216.4	-	641.7	12.4	1.6	14.0	627.7	-	865.6	673.4	1,539.0	1.5	0.8	0.1	75.9	99.9	1,439.2	537.3	-	-
	Sep	53.6	210.6	53.6	98.5	152.1	36.7	0.8	37.5	114.5	-	434.8	68.3	1.6	69.8	365.0	-	586.9	456.3	1,043.2	1.4	0.8	0.1	75.9	185.7	857.5	320.2	-	-
	Oct	20.5	210.6	20.6	37.7	58.3	33.5	0.8	34.4	23.9	-	166.3	62.4	1.6	63.9	102.4	-	224.6	174.5	399.1	1.5	0.8	0.1	75.9	176.6	222.4	83.0	-	-
	Nov	8.8	210.5	16.6	16.1	32.7	20.7	0.8	21.6	11.1	-	71.0	38.6	1.6	40.1	30.9	-	103.7	74.5	178.3	1.4	0.8	0.1	75.9	140.0	38.3	14.3	-	-
	Dec	7.4	202.7	16.6	13.6	30.2	6.0	0.8	6.8	23.4	-	60.1	11.2	1.6	12.7	47.3	-	90.3	63.0	153.3	1.5	0.8	0.1	75.9	97.9	55.4	20.7	-	-
1971	Jan	5.1	193.5	18.0	9.3	27.3	10.6	0.8	11.5	15.8	-	41.1	19.8	1.6	21.4	19.7	-	68.4	43.1	111.5	1.5	0.8	0.1	75.9	111.2	0.3	0.1	-	-
	Feb	4.4	180.5	23.0	8.0	31.0	7.8	0.8	8.6	22.4	-	35.3	14.5	1.6	16.0	19.3	-	66.3	37.1	103.4	1.3	0.7	0.1	75.9	102.8	0.6	0.2	-	-
	Mar	4.6	161.9	19.0	8.5	27.5	8.2	0.8	9.0	18.5	-	37.4	15.2	1.6	16.8	20.7	-	64.9	39.3	104.2	1.5	0.8	0.1	75.9	104.1	0.1	0.0	-	-
	Apr	3.9	147.5	28.5	7.1	35.6	6.6	0.8	7.5	28.1	-	31.3	12.3	1.6	13.9	17.5	-	66.9	32.9	99.8	1.4	0.8	0.1	75.9	99.6	0.2	0.1	-	-
	May	19.2	122.9	16.6	35.3	51.9	18.5	0.8	19.3	32.6	-	156.1	34.4	1.6	36.0	120.1	-	208.0	163.8	371.8	1.5	0.8	0.1	75.9	133.7	238.1	88.9	-	-
	Jun	34.2	125.5	16.6	62.8	79.4	1.3	0.8	2.1	77.3	-	277.3	2.4	1.6	4.0	273.4	-	356.7	291.0	647.7	1.4	0.8	0.1	75.9	84.3	563.4	210.3	-	-
	Jul	143.7	143.1	76.6	263.8	340.4	24.8	0.8	25.7	314.7	-	1,164.9	46.2	1.6	47.8	1,117.1	-	1,505.3	1,222.3	2,727.6	1.5	0.8	0.1	75.9	151.8	2,575.8	961.7	-	-
	Aug	172.8	210.2	172.6	317.4	490.0	6.7	0.8	7.5	482.5	-	1,401.6	12.4	1.6	14.0	1,387.6	-	1,891.5	1,470.7	3,362.2	1.5	0.8	0.1	75.9	99.9	3,262.4	1,218.0	-	-
	Sep	45.9	210.4	46.6	84.3	130.9	36.7	0.8	37.5	93.4	-	372.3	68.3	1.6	69.8	302.5	-	503.2	390.7	893.9	1.4	0.8	0.1	75.9	185.7	708.2	264.4	-	-
	Oct	28.6	209.7	27.6	52.5	80.1	33.5	0.8	34.4	45.8	-	232.0	62.4	1.6	63.9	168.1	-	312.1	243.4	555.6	1.5	0.8	0.1	75.9	176.6	378.9	141.5	-	-
	Nov	9.6	210.8	16.6	17.6	34.2	20.7	0.8	21.6	12.6	-	77.6	38.6	1.6	40.1	37.5	-	111.8	81.5	193.3	1.4	0.8	0.1	75.9	140.0	53.3	19.9	-	-
	Dec	6.7	203.7	16.6	12.4	28.9	6.0	0.8	6.8	22.1	-	54.6	11.2	1.6	12.7	41.8	-	83.5	57.2	140.7	1.5	0.8	0.1	75.9	97.9	42.8	16.0	-	-
1972	Jan	4.9	193.9	21.5	9.0	30.5	10.6	0.8	11.5	19.0	-	39.6	19.8	1.6	21.4	18.2	-	70.1	41.6	111.6	1.5	0.8	0.1	75.9	111.2	0.4	0.2	-	-
	Feb	4.1	177.2	28.0	7.5	35.5	7.8	0.8	8.6	26.8	-	32.9	14.5	1.6	16.0	16.9	-	68.4	34.6	103.0	1.3	0.7	0.1	75.9	102.8	0.2	0.1	-	-
	Mar	3.8	153.3	34.0	7.0	41.0	8.2	0.8	9.0	32.0	-	31.1	15.2	1.6	16.8	14.3	-	72.1	32.6	104.7	1.5	0.8	0.1	75.9	104.1	0.6	0.2	-	-
	Apr	4.5	123.1	17.5	8.2	25.7	6.6	0.8	7.5	18.2	-	36.2	12.3	1.6	13.9	22.3	-	61.9	38.0	99.9	1.4	0.8	0.1	75.9	99.6	0.3	0.1	-	-
	May	26.7	110.1	16.6	49.1	65.7	18.5	0.8	19.3	46.3	-	216.8	34.4	1.6	36.0	180.8	-	282.5	227.5	509.9	1.5	0.8	0.1	75.9	133.7	376.3	140.5	-	-
	Jun	22.6	120.2	16.6	41.5	58.1	1.3	0.8	2.1	55.9	-	183.1	2.4	1.6	4.0	179.2	-	241.2	192.2	433.3	1.4	0.8	0.1	75.9	84.3	349.0	130.3	-	-
	Jul	22.5	126.2	16.6	41.4	58.0	24.8	0.8	25.7	32.3	-	182.7	46.2	1.6	47.8	135.0	-	240.7	191.7	432.4	1.5	0.8	0.1	75.9	151.8	280.7	104.8	-	-
	Aug	93.0	132.2	16.6	170.9	187.5	6.7	0.8	7.5	179.9	-	754.5	12.4	1.6	14.0	740.5	-	942.0	791.7	1,733.7	1.5	0.8	0.1	75.9	99.9	1,633.8	610.0	-	-
	Sep	50.1	208.6	48.6	92.1	140.7	36.7	0.8	37.5	103.1	-	406.6	68.3	1.6	69.8	336.7	-	547.2	426.6	973.8	1.4	0.8	0.1	75.9	185.7	788.2	294.3	-	-
	Oct	23.7	210.2	23.9	43.6	67.5	33.5	0.8	34.4	33.1	-	192.4	62.4	1.6	63.9	128.5	-	259.9	201.9	461.7	1.5	0.8	0.1	75.9	176.6	285.1	106.4	-	-
	Nov	11.6	210.0	16.6	21.3	37.9	20.7	0.8	21.6	16.4	-	94.2	38.6	1.6	40.1	54.1	-	132.2	98.9	231.1	1.4	0.8	0.1	75.9	140.0	91.1	34.0	-	-
	Dec	7.8	205.0	16.6	14.4	31.0	6.0	0.8	6.8	24.1	-	63.4	11.2	1.6	12.7	50.7	-	94.3	66.5	160.9	1.5	0.8	0.1	75.9	97.9	62.9	23.5	-	-
1973	Jan	6.2	196.2	16.6	11.4	28.0	10.6	0.8	11.5	16.5	-	50.2	19.8	1.6	21.4	28.8	-	78.1	52.6	130.7	1.5	0.8	0.1	75.9	111.2	19.5	7.3	-	-
	Feb	4.7	185.8	16.6	8.6	25.2	7.8	0.8	8.6	16.6	-	38.1	14.5	1.6	16.0	22.0	-	63.3	39.9	103.2	1.3	0.7	0.1	75.9	102.8	0.4	0.2	-	-
	Mar	9.9	173.9	16.6	18.1	34.7	8.2	0.8	9.0	25.7	-	80.0	15.2	1.6	16.8	63.2	-	114.7	83.9	198.7	1.5	0.8	0.1	75.9	104.1	94.6	35.3	-	-
	Apr	18.6	167.2	16.6	34.1	50.7	6.6	0.8	7.5	43.2	-	150.6	12.3	1.6	13.9	136.7	-	201.3	158.0	359.3	1.4	0.8	0.1	75.9	99.6	259.7	97.0	-	-
	May	56.5	169.2	16.6	103.7	120.3	18.5	0.8	19.3	101.0	-	458.0	34.4	1.6	36.0	422.0	-	578.3	480.6	1,058.8	1.5	0.8	0.1	75.9	133.7	925.2	345.4	-	-
	Jun	62.4	209.0	16.6	114.6	131.2	1.3	0.8	2.1	129.0	-	505.9	2.4	1.6	4.0	501.9	-	637.1	530.9	1,167.9	1.4	0.8	0.1	75.9	84.3	1,083.6	404.6	-	-
	Jul	111.6	254.8	156.6	204.9	361.5	24.8	0.8	25.7	335.8	-	904.8	46.2	1.6	47.8	857.1	-	1,266.3	949.5	2,215.8	1.5	0.8	0.1	75.9	151.8	2,064.1	770.6	-	-
	Aug	92.1	209.8	91.6	169.2	260.8	6.7	0.8	7.5	253.2	-	747.0	12.4	1.6	14.0	733.0	-	1,007.8	783.9	1,791.7	1.5	0.8	0.1	75.9	99.9	1,691.8	631.6	-	-
	Sep	120.0	210.3	119.6	220.3	339.9	36.7	0.8	37.5	302.3	-	972.7	68.3	1.6	69.8	902.9	-	1,312.6	1,020.7	2,333.3	1.4	0.8	0.1	75.9	185.7	2,147.6	801.8	-	-
	Oct	26.1	210.7	26.6	47.9	74.5	33.5	0.8	34.4	40.1	-	211.5	62.4	1.6	63.9	147.5	-	285.9	221.9	507.8	1.5	0.8	0.1	75.9	176.6	331.2	123.7	-	-
	Nov	9.9	210.2	16.6	18.1	34.7	20.7	0.8	21.6	13.1	-	80.1	38.6	1.6	40.1	39.9	-	114.8	84.0	198.8	1.4	0.8	0.1	75.9	140.0	58.9	22.0	-	-
	Dec	6.9	203.5	16.6	12.6	29.2	6.0	0.8	6.8	22.4	-	55.7	11.2	1.6	12.7	42.9	-	84.9	58.4	143.3	1.5	0.8	0.1	75.9	97.9	45.4	16.9	-	-
1974	Jan	6.0	193.7	16.6	11.0	27.6	10.6	0.8	11.5	16.1	-	48.4	19.8	1.6	21.4	27.1	-	76.0	50.8	126.8	1.5	0.8	0.1	75.9	111.2	15.7	5.8	-	-
	Feb	4.4	183.1	22.0	8.1	30.1	7.8	0.8	8.6	21.4	-	35.6	14.5	1.6	16.0	19.5	-	65.6	37.3	102.9	1.3	0.7	0.1	75.9	102.8	0.2	0.1	-	-
	Mar	4.3	165.5	25.5	7.8	33.3	8.2	0.8	9.0	24.3	-	34.6	15.2	1.6	16.8	17.8	-	67.9	36.3	104.3	1.5	0.8	0.1	75.9	104.1	0.2	0.1	-	-
	Apr	6.3	144.3	16.6	11.6	28.2	6.6	0.8	7.5	20.8	-	51.4	12.3	1.6	13.9	37.5	-	79.6	53.9	133.5	1.4	0.8	0.1	75.9	99.6	34.0	12.7	-	-
	May	8.3	134.0	16.6	15.2	31.8	18.5	0.8	19.3	12.5	-	67.2	34.4	1.6	36.0	31.3	-	99.1	70.6	169.6	1.5	0.8	0.1	75.9	133.7	36.0	13.4	-	-
	Jun	54.8	125.7	16.6	100.7	117.3	1.3	0.8	2.1	115.2	-	444.7	2.4	1.6	4.0	440.8	-	562.0	466.7	1,028.7	1.4	0.8	0.1	75.9	84.3	944.4	352.6	-	-
	Jul	69.7	163.9	23.6	128.0	151.6	24.8	0.8	25.7	125.9	-	565.2	46.2	1.6	47.8	517.4	-	716.8	593.0	1,309.8	1.5	0.8	0.1	75.9	151.8	1,158.0	432.4	-	-
	Aug	27.5	210.0	27.5	50.5	78.0	6.7	0.8	7.5	70.5	-	222.9	12.4	1.6	14.0	208.9	-	300.9	233.9	534.8	1.5	0.8	0.1	75.9	99.9	435.0	162.4	-	-
	Sep	59.7	210.0	59.6	109.6	169.2	36.7	0.8	37.5	131.6	-	483.9	68.3	1.6	69.8	414.0	-	653.0	507.7	1,160.8	1.4	0.8	0.1	75.9	185.7	975.1	364.1	-	-
	Oct	40.4	210.1	39.6	74.2	113.8	33.5	0.8	34.4	79.4	-	327.5	62.4	1.6	63.9	263.5	-	441.2	343.6	784.8	1.5	0.8	0.1	75.9	176.6	608.2	227.1	-	-
	Nov	9.2	210.9	16.6	17.0	33.6	20.7	0.8	21.6	12.0	-	75.0	38.6	1.6	40.1	34.8	-	108.5	78.7	187.2	1.4	0.8	0.1	75.9	140.0	47.2	17.6	-	-
	Dec	6.6	203.5	16.6	12.1	28.7	6.0	0.8	6.8	21.9	-	53.5	11.2	1.6	12.7	40.8	-	82.2	56.2	138.4	1.5	0.8	0.1	75.9	97.9	40.5	15.1	-	-