

II-4 FINANCE OF THE PROJECT

II-4-1 Source of Funds

It is expected that the project shall be financed by an international loan and local financial arrangement. The condition of such loans varies according to the policy of the lending agencies and will not be known until specific negotiation is concluded and agreement completed.

For the sake of financial consideration of the project implementation, however, assumption on three different alternatives are considered as follows:

Condition A -- Interest rate

Foreign	2% per annum
Local	2% "
Repayment period	
Foreign	30 years including 10 years of grace period
Local	- do -

Condition B -- Interest rate

Foreign	3% per annum
Local	3% per annum
Repayment period	
Foreign	25 years including 7 years of grace period
Local	- do -

Condition C -- Interest rate

Foreign	6% per annum
Local	15% per annum
Repayment period	
Foreign	15 years including 3 years of grace period
Local	- do -

II-4-2 Financial Schedules

The viability of financial schedules for each of the three alternative loan conditions is considered and is shown in Tables 2.4.1. a-1 to 4, 2.4.1. b-1 to 4 and 2.4.1. c-1 to 4. It should be noted that such consideration remains to be the rough estimates to provide general outlook of the financial condition which may come out with the assumption of repayment of loan entirely from the net income of SMWO pertaining to the present project since the detailed financial analysis and operational forecast of entire system of SMWO by the addition of groundwater system is not possible at this stage.

It should be noted that the schedules shown in these Tables are based on three different unit price of water (water rate), in order to be viable, higher than the current rate of 5.3 US cents (US\$1 = VN\$500) per cum. In case of Condition A, it is 6.2 cents, 17% higher than the current rate, and in case of Condition B, it is 6.8 cents, 28% higher. For Condition C, 12.0 cents which means 126% higher. This seems to indicate the condition should be the level of Condition A so that the project will financially be viable with the source of repayment entirely on the income of SMWO.

Regarding the cash flow, some money shall be provided to cover deficit in cash balance in the first portion of the amortization period. The source of funds may be the general account of SMWO, city banks, the national bank, international financing agencies or others. This can easily be repaid from this project account in later years since the project account is profitable for the whole amortization period.

The financial schedules for the alternative plan, 100,000 + 100,000 cmd, are attached herewith following the above tables. There will be almost no big difference of financial conditions between the two alternative plans in terms of water rate needed to be viable.

TABLE 2.4.1.A-1 CONDITION A
 AMORTIZATION SCHEDULE, FOREIGN CURRENCY, INTEREST RATE 2.0 %
 REPAYMENT PERIOD 30 YEARS, GRACE PERIOD 10 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	16410	0	0	16574	164
1976	16574	0	0	16905	331
1977	16905	338	0	16905	0
1978	16905	338	0	16905	0
1979	16905	338	0	16905	0
1980	16905	338	0	16905	0
1981	16905	338	0	16905	0
1982	16905	338	0	16905	0
1983	16905	338	0	16905	0
1984	16905	338	0	16905	0
1985	16905	338	423	16482	0
1986	16482	330	845	15637	0
1987	15637	313	845	14792	0
1988	14792	296	845	13947	0
1989	13947	279	845	13102	0
1990	13102	262	845	12257	0
1991	12257	245	845	11412	0
1992	11412	228	845	10567	0
1993	10567	211	845	9722	0
1994	9722	194	845	8877	0
1995	8877	178	845	8032	0
1996	8032	161	845	7187	0
1997	7187	144	845	6342	0
1998	6342	127	845	5497	0
1999	5497	110	845	4652	0
2000	4652	93	845	3807	0
2001	3807	76	845	2962	0
2002	2962	59	845	2117	0
2003	2117	42	845	1272	0
2004	1272	25	845	427	0
2005	427	9	427	0	0

TABLE 2.4.1.A-2 CONDITION A, (US\$1,000)

AMORTIZATION SCHEDULE, LOCAL CURRENCY, INTEREST RATE 2.0 %
 REPAYMENT PERIOD 30 YEARS, GRACE PERIOD 10 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	8190	0	0	8272	82
1976	8272	0	0	8437	165
1977	8437	169	0	8437	0
1978	8437	169	0	8437	0
1979	8437	169	0	8437	0
1980	8437	169	0	8437	0
1981	8437	169	0	8437	0
1982	8437	169	0	8437	0
1983	8437	169	0	8437	0
1984	8437	169	0	8437	0
1985	8437	169	211	8226	0
1986	8226	165	422	7804	0
1987	7804	156	422	7382	0
1988	7382	148	422	6960	0
1989	6960	139	422	6538	0
1990	6538	131	422	6116	0
1991	6116	122	422	5694	0
1992	5694	114	422	5272	0
1993	5272	105	422	4850	0
1994	4850	97	422	4428	0
1995	4428	89	422	4006	0
1996	4006	80	422	3584	0
1997	3584	72	422	3162	0
1998	3162	63	422	2740	0
1999	2740	55	422	2318	0
2000	2318	46	422	1896	0
2001	1896	38	422	1474	0
2002	1474	29	422	1052	0
2003	1052	21	422	630	0
2004	630	13	422	208	0
2005	208	4	208	0	0

TABLE 2.4.1.A-3 CONDITION A,

INCOME FORECAST

(US\$1,000)

INTEREST CAPITALIZED
 REPAYMENT PERIOD 30 YEARS, GRACE PERIOD 10 YEARS
 INTEREST RATE, FOREIGN 2.0%, LOCAL 2.0%

YEAR	OPERATING REVENUE	DEPRICI- ATION	INTEREST PAYABLE FOREIGN	LOCAL	SUB-T	TOTAL EXPENSE	NET INCOME	ACCUMULATED INCOME
1975	0	126	0	0	0	126	-126	-126
1976	634	492	0	0	0	778	-144	-270
1977	1585	492	338	169	507	1715	-130	-400
1978	2536	492	338	169	507	2144	392	-8
1979	2536	492	338	169	507	2144	392	384
1980	2536	492	338	169	507	2144	392	776
1981	2536	492	338	169	507	2144	392	1168
1982	2536	492	338	169	507	2144	392	1560
1983	2536	492	338	169	507	2144	392	1952
1984	2536	492	338	169	507	2144	392	2344
1985	2536	492	338	169	507	2144	392	2736
1986	2536	492	350	165	495	2132	404	3140
1987	2536	492	313	156	469	2106	430	3570
1988	2536	492	296	148	444	2081	455	4025
1989	2536	492	279	139	418	2055	481	4506
1990	2536	492	262	131	393	2030	506	5012
1991	2536	492	245	122	367	2004	532	5544
1992	2536	492	228	114	342	1979	557	6101
1993	2536	492	211	105	316	1953	583	6684
1994	2536	492	194	97	291	1928	608	7292
1995	2536	492	178	89	267	1904	632	7924
1996	2536	492	161	80	241	1878	658	8582
1997	2536	492	144	72	216	1853	683	9265
1998	2536	492	127	63	190	1827	709	9974
1999	2536	492	110	55	165	1802	734	10708
2000	2536	492	93	46	139	1776	760	11468
2001	2536	492	76	38	114	1751	785	12253
2002	2536	492	59	29	88	1725	811	13064
2003	2536	492	42	21	63	1700	836	13900
2004	2536	492	25	13	38	1675	861	14761
2005	2536	492	9	4	13	1650	886	15647

WATER RATE US¢ 6.20/CUM, OPERATING COST US¢ 2.80/CUM

TABLE 2.4.1.A-4 CONDITION A

CASH FLOW FORECAST

(US\$ L, 000)

INTEREST CAPITALIZED

YEAR	NET INCOME	DEPRECIATION		PROCEEDS		REVENUE TOTAL	CONST. COST	REPAYMENT		EXPENSE TOTAL	CASH BALANCE	ACCUMULATED TOTAL
		F	L	F	L			F	L			
1975	-126	126	8190	16410	8190	24600	6300	0	0	6300	18300	18300
1976	-144	492	0	0	0	348	18300	0	0	18300	-17952	348
1977	-130	492	0	0	0	362	0	0	0	0	362	710
1978	392	492	0	0	0	884	0	0	0	0	884	1594
1979	392	492	0	0	0	884	0	0	0	0	884	2478
1980	392	492	0	0	0	884	0	0	0	0	884	3362
1981	392	492	0	0	0	884	0	0	0	0	884	4246
1982	392	492	0	0	0	884	0	0	0	0	884	5130
1983	392	492	0	0	0	884	0	0	0	0	884	6014
1984	392	492	0	0	0	884	0	0	0	0	884	6898
1985	392	492	0	0	0	884	0	0	0	0	884	7148
1986	404	492	0	0	0	896	0	423	211	634	250	6777
1987	430	492	0	0	0	922	0	845	422	1267	-371	6432
1988	455	492	0	0	0	947	0	845	422	1267	-345	6112
1989	481	492	0	0	0	973	0	845	422	1267	-320	5818
1990	506	492	0	0	0	998	0	845	422	1267	-294	5549
1991	532	492	0	0	0	1024	0	845	422	1267	-269	5306
1992	557	492	0	0	0	1049	0	845	422	1267	-243	5088
1993	583	492	0	0	0	1075	0	845	422	1267	-218	4896
1994	608	492	0	0	0	1100	0	845	422	1267	-192	4729
1995	632	492	0	0	0	1124	0	845	422	1267	-167	4589
1996	658	492	0	0	0	1150	0	845	422	1267	-143	4469
1997	683	492	0	0	0	1175	0	845	422	1267	-117	4377
1998	709	492	0	0	0	1201	0	845	422	1267	-92	4311
1999	734	492	0	0	0	1226	0	845	422	1267	-66	4270
2000	760	492	0	0	0	1252	0	845	422	1267	-41	4255
2001	785	492	0	0	0	1277	0	845	422	1267	-15	4265
2002	811	492	0	0	0	1303	0	845	422	1267	10	4301
2003	836	492	0	0	0	1328	0	845	422	1267	36	4362
2004	861	492	0	0	0	1353	0	845	422	1267	61	4448
2005	886	492	0	0	0	1378	0	845	422	1267	86	4548
								427	208	635	743	5191

(US\$1,000)

TABLE 2.4.1.B-1 CONDITION B,

AMORTIZATION SCHEDULE, FOREIGN CURRENCY, INTEREST RATE 3.0 %
REPAYMENT PERIOD 25 YEARS, GRACE PERIOD 7 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	16410	0	0	16655	246
1976	16556	0	0	17156	500
1977	17156	515	0	17156	0
1978	17156	515	0	17156	0
1979	17156	515	0	17156	0
1980	17156	515	0	17156	0
1981	17156	515	0	17156	0
1982	17156	515	0	17156	0
1983	16679	500	477	16679	0
1984	15726	472	953	15726	0
1985	14773	443	953	14773	0
1986	13820	415	953	13820	0
1987	12867	386	953	12867	0
1988	11914	357	953	11914	0
1989	10961	329	953	10961	0
1990	10008	300	953	10008	0
1991	9055	272	953	9055	0
1992	8102	243	953	8102	0
1993	7149	214	953	7149	0
1994	6196	185	953	6196	0
1995	5243	157	953	5243	0
1996	4290	129	953	4290	0
1997	3337	100	953	3337	0
1998	2384	72	953	2384	0
1999	1431	43	953	1431	0
2000	478	14	478	478	0

TABLE 2.4.1.B-2 CONDITION B, (US\$1,000)

AMORTIZATION SCHEDULE, LOCAL CURRENCY, INTEREST RATE 3.0 %
 REPAYMENT PERIOD 25 YEARS, GRACE PERIOD 7 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	8190	0	0	8313	123
1976	8313	0	0	8562	249
1977	8562	257	0	8562	0
1978	8562	257	0	8562	0
1979	8562	257	0	8562	0
1980	8562	257	0	8562	0
1981	8562	257	0	8562	0
1982	8562	257	238	8324	0
1983	8324	250	476	7848	0
1984	7848	235	476	7372	0
1985	7372	221	476	6896	0
1986	6896	207	476	6420	0
1987	6420	193	476	5944	0
1988	5944	178	476	5468	0
1989	5468	164	476	4992	0
1990	4992	150	476	4516	0
1991	4516	135	476	4040	0
1992	4040	121	476	3564	0
1993	3564	107	476	3088	0
1994	3088	93	476	2612	0
1995	2612	78	476	2136	0
1996	2136	64	476	1660	0
1997	1660	50	476	1184	0
1998	1184	36	476	708	0
1999	708	21	476	232	0
2000	232	7	232	0	0

TABLE 2.4.1.B-3 CONDITION B,

INCOME FORECAST

(US\$ L, 000)

INTEREST CAPITALIZED
 REPAYMENT PERIOD 25 YEARS, GRACE PERIOD 7 YEARS
 INTEREST RATE, FOREIGN 3.0%, LOCAL 3.0%

YEAR	OPERATING REVENUE	OPERATING EXPENSE	DEP/ACC- TION	FOREIGN	LOCAL	SUB-T	TOTAL EXPENSE	NET INCOME	ACCUMULATED INCOME
1975	0	0	126	0	0	0	126	-126	-126
1976	695	286	492	0	0	0	778	-83	-209
1977	1738	716	492	515	257	772	1980	-242	-451
1978	2781	1145	492	515	257	772	2409	372	-79
1979	2781	1145	492	515	257	772	2409	372	293
1980	2781	1145	492	515	257	772	2409	372	665
1981	2781	1145	492	515	257	772	2409	372	1037
1982	2781	1145	492	515	257	772	2409	372	1409
1983	2781	1145	492	500	250	750	2387	394	1803
1984	2781	1145	492	472	235	707	2344	437	2240
1985	2781	1145	492	443	221	664	2301	480	2720
1986	2781	1145	492	415	207	622	2259	522	3242
1987	2781	1145	492	386	193	579	2216	565	3807
1988	2781	1145	492	357	178	535	2172	609	4416
1989	2781	1145	492	329	164	493	2130	651	5067
1990	2781	1145	492	300	150	450	2087	694	5761
1991	2781	1145	492	272	135	407	2044	737	6498
1992	2781	1145	492	243	121	364	2001	780	7278
1993	2781	1145	492	214	107	321	1958	823	8101
1994	2781	1145	492	186	93	279	1916	865	8966
1995	2781	1145	492	157	78	235	1872	909	9875
1996	2781	1145	492	129	64	193	1830	951	10826
1997	2781	1145	492	100	50	150	1787	994	11820
1998	2781	1145	492	72	36	108	1745	1036	12856
1999	2781	1145	492	43	21	64	1701	1080	13936
2000	2781	1145	492	14	7	21	1658	1123	15059

WATER RATE US\$ 6.80/CUM, OPERATING COST US\$ 2.80/CUM

TABLE 2.4.1.B-4. CONDITION B,

CASH FLOW FORECAST

(US\$1,000)

INTEREST CAPITALIZED

YEAR	NET INCOME		DEPRECIATION		PROCEEDS		REVENUE		CONST. COST		REPAYMENT		EXPENSE		CASH BALANCE		ACCUMULATED TOTAL	
	F	L	F	L	F	L	F	L	F	L	F	L	F	L	F	L	F	L
1975	-126		126	8199	16410	0	24600	6300	0	0	0	0	6300	18300	18300		18300	
1976	-83		492	0	0	0	409	18300	0	0	0	0	18300	-17891	409		409	
1977	-242		492	0	0	0	250	0	0	0	0	0	0	250	659		659	
1978	372		492	0	0	0	864	0	0	0	0	0	0	864	1523		1523	
1979	372		492	0	0	0	864	0	0	0	0	0	0	864	2387		2387	
1980	372		492	0	0	0	864	0	0	0	0	0	0	864	3251		3251	
1981	372		492	0	0	0	864	0	0	0	0	0	0	864	4115		4115	
1982	372		492	0	0	0	864	0	0	477	238	0	715	149	4264		4264	
1983	394		492	0	0	0	886	0	0	953	476	0	1429	-543	3721		3721	
1984	437		492	0	0	0	929	0	0	953	476	0	1429	-500	3221		3221	
1985	480		492	0	0	0	972	0	0	953	476	0	1429	-457	2764		2764	
1986	522		492	0	0	0	1014	0	0	953	476	0	1429	-415	2349		2349	
1987	565		492	0	0	0	1057	0	0	953	476	0	1429	-372	1977		1977	
1988	609		492	0	0	0	1101	0	0	953	476	0	1429	-328	1643		1643	
1989	651		492	0	0	0	1143	0	0	953	476	0	1429	-286	1363		1363	
1990	694		492	0	0	0	1186	0	0	953	476	0	1429	-243	1120		1120	
1991	737		492	0	0	0	1229	0	0	953	476	0	1429	-200	920		920	
1992	780		492	0	0	0	1272	0	0	953	476	0	1429	-157	763		763	
1993	823		492	0	0	0	1315	0	0	953	476	0	1429	-114	649		649	
1994	865		492	0	0	0	1357	0	0	953	476	0	1429	-72	577		577	
1995	909		492	0	0	0	1401	0	0	953	476	0	1429	-28	549		549	
1996	951		492	0	0	0	1443	0	0	953	476	0	1429	14	563		563	
1997	994		492	0	0	0	1485	0	0	953	476	0	1429	57	620		620	
1998	1036		492	0	0	0	1528	0	0	953	476	0	1429	99	719		719	
1999	1080		492	0	0	0	1572	0	0	953	476	0	1429	143	862		862	
2000	1123		492	0	0	0	1615	0	0	478	232	0	710	905	1767		1767	

TABLE 2.4.1.C-1 CONDITION C,

(US\$1,000)

AMORTIZATION SCHEDULE, FOREIGN CURRENCY, INTEREST RATE 6.0 %
 REPAYMENT PERIOD 15 YEARS, GRACE PERIOD 3 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	16410	0	0	16902	492
1976	16902	0	0	17916	1014
1977	17916	1075	0	17916	0
1978	17916	1075	747	17159	0
1979	17169	1030	1493	15676	0
1980	15676	941	1493	14183	0
1981	14183	851	1493	12690	0
1982	12690	761	1493	11197	0
1983	11197	672	1493	9704	0
1984	9704	582	1493	8211	0
1985	8211	493	1493	6718	0
1986	6718	403	1493	5225	0
1987	5225	313	1493	3732	0
1988	3732	224	1493	2239	0
1989	2239	134	1493	746	0
1990	746	45	746	0	0
				1075	
				1822	
				2523	
				2434	
				2344	
				2254	
				2165	
				2075	
				1986	
				1896	
				1806	
				1717	
				1627	
				791	

TABLE 2.4.1.C-2 CONDITION C, (US\$1,000)

AMORTIZATION SCHEDULE, LOCAL CURRENCY, INTEREST RATE 15.0 %
 REPAYMENT PERIOD 15 YEARS, GRACE PERIOD 3 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL		
1975	8190	0	0	8804	614
1976	8804	0	0	10125	1321
1977	10125	1519	0	10125	0
1978	10125	1519	422	9703	0
1979	9703	1455	844	8859	0
1980	8859	1329	844	8015	0
1981	8015	1202	844	7171	0
1982	7171	1075	844	6327	0
1983	6327	949	844	5483	0
1984	5483	822	844	4639	0
1985	4639	696	844	3795	0
1986	3795	569	844	2951	0
1987	2951	443	844	2107	0
1988	2107	316	844	1263	0
1989	1263	189	844	419	0
1990	419	63	419	0	0
			482		

TABLE 2.4.1.C-3 CONDITION C,

INCOME FORECAST

(US\$1,000)

INTEREST CAPITALIZED
 REPAYMENT PERIOD 15 YEARS, GRACE PERIOD 3 YEARS
 INTEREST RATE, FOREIGN 6.0%, LOCAL 15.0%

YEAR	OPERATING REVENUE	EXPENSE	DEPRICI- ATION	FOREIGN	INTEREST PAYABLE LOCAL	SUB-T	TOTAL EXPENSE	NET INCOME	ACCUMULATED INCOME
1975	0	0	126	0	0	0	126	-126	-126
1976	1227	286	492	0	0	0	778	449	323
1977	3068	716	492	1075	1519	2594	3802	-734	-411
1978	4908	1145	492	1075	1519	2594	4231	677	255
1979	4908	1145	492	1030	1455	2485	4122	760	1052
1980	4908	1145	492	941	1529	2270	3907	1001	2053
1981	4908	1145	492	851	1202	2053	3690	1218	3271
1982	4908	1145	492	761	1076	1837	3474	1434	4705
1983	4908	1145	492	672	949	1621	3258	1650	6355
1984	4908	1145	492	582	822	1404	3041	1867	8222
1985	4908	1145	492	493	696	1189	2826	2082	10304
1986	4908	1145	492	403	569	972	2609	2299	12603
1987	4908	1145	492	313	443	756	2393	2515	15118
1988	4908	1145	492	224	310	540	2177	2731	17849
1989	4908	1145	492	134	189	323	1960	2948	20797
1990	4908	1145	492	45	63	108	1745	3163	23960

WATER RATE US\$ 12.00/CUM, OPERATING COST US\$ 2.80/CUM

TABLE 2.4.1.C-4 CONDITION C,

CASH FLOW FORECAST

YEAR	(US\$, 000)										ACCUMULATED TOTAL		
	INTEREST CAPITALIZED					REPAYMENT						EXPENSE TOTAL	CASH BALANCE
	NET INCOME	DEPRE- CIATION	PROCEEDS F	L	TOTAL	CONST. COST	F	L	TOTAL	TOTAL			
1975	-126	126	16410	8190	24600	6300	0	0	0	6300	18300	18300	
1976	449	492	0	0	941	18300	0	0	0	18300	-17559	941	
1977	-734	492	0	0	-242	0	0	0	0	0	-242	599	
1978	677	492	0	0	1169	0	747	422	0	1169	0	699	
1979	786	492	0	0	1278	0	1493	844	0	2337	-1059	-360	
1980	1001	492	0	0	1493	0	1493	844	0	2337	-844	-1204	
1981	1218	492	0	0	1710	0	1493	844	0	2337	-627	-1831	
1982	1434	492	0	0	1926	0	1493	844	0	2337	-411	-2242	
1983	1650	492	0	0	2142	0	1493	844	0	2337	-195	-2437	
1984	1867	492	0	0	2359	0	1493	844	0	2337	22	-2415	
1985	2082	492	0	0	2574	0	1493	844	0	2337	237	-2178	
1986	2299	492	0	0	2791	0	1493	844	0	2337	454	-1724	
1987	2515	492	0	0	3007	0	1493	844	0	2337	670	-1054	
1988	2731	492	0	0	3223	0	1493	844	0	2337	886	-168	
1989	2948	492	0	0	3440	0	1493	844	0	2337	1103	935	
1990	3163	492	0	0	3655	0	746	419	0	1165	2490	3425	

TABLE 2.4.2.A-1 CONDITION A,
 (US\$1,000)
 AMORTIZATION SCHEDULE, FOREIGN CURRENCY, INTEREST RATE 2.0 %
 REPAYMENT PERIOD 30 YEARS, GRACE PERIOD 10 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	15223	0	0	15375	152
1976	15375	0	0	15682	307
1977	15682	314	0	15682	0
1978	15682	314	0	15682	0
1979	15682	314	0	15682	0
1980	15682	314	0	15682	0
1981	15682	314	0	15682	0
1982	15682	314	0	15682	0
1983	15682	314	0	15682	0
1984	15682	314	0	15682	0
1985	15682	314	0	15290	0
1986	15290	392	706	14506	66
1987	14506	784	1090	13722	0
1988	13722	290	1074	12938	0
1989	12938	274	1058	12154	0
1990	12154	259	1043	11370	0
1991	11370	243	1027	10586	0
1992	10586	227	1011	9802	0
1993	9802	212	996	9018	0
1994	9018	196	980	8234	0
1995	8234	180	964	7450	0
1996	7450	165	949	6666	0
1997	6666	149	933	5882	0
1998	5882	133	917	5098	0
1999	5098	118	902	4314	0
2000	4314	102	886	3530	0
2001	3530	86	870	2746	0
2002	2746	71	855	1962	0
2003	1962	55	839	1178	0
2004	1178	39	823	394	0
2005	394	24	808	0	0
		8	402		

TABLE 2.4.2.A-2 CONDITION A (US\$1,000)
 AMORTIZATION SCHEDULE, LOCAL CURRENCY, INTEREST RATE 2.0 %
 REPAYMENT PERIOD 30 YEARS, GRACE PERIOD 10 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	7577	0	0	7653	76
1976	7653	0	0	7806	153
1977	7806	156	0	7806	0
1978	7806	156	0	7806	0
1979	7806	156	0	7806	0
1980	7806	156	0	7806	0
1981	7806	156	0	7806	0
1982	7806	156	0	7806	0
1983	7806	156	0	7806	0
1984	7806	156	0	7806	0
1985	7806	156	0	7806	0
1986	7611	156	195	7611	0
1987	7221	152	390	7221	0
1988	6831	144	390	6831	0
1989	6441	137	390	6441	0
1990	6051	129	390	6051	0
1991	5661	121	390	5661	0
1992	5271	113	390	5271	0
1993	4881	105	390	4881	0
1994	4491	98	390	4491	0
1995	4101	90	390	4101	0
1996	3711	82	390	3711	0
1997	3321	74	390	3321	0
1998	2931	66	390	2931	0
1999	2541	59	390	2541	0
2000	2151	51	390	2151	0
2001	1761	43	390	1761	0
2002	1371	35	390	1371	0
2003	981	27	390	981	0
2004	591	20	390	591	0
2005	201	12	390	201	0
		4	201	0	0

TABLE 2.4.2.A-3 CONDITION A,
INCOME FORECAST
(US\$1,000)

YEAR	OPERATING		DEPRICI- ATION	INTEREST PAYABLE		TOTAL EXPENSE	NET INCOME	ACCUMULATED INCOME
	REVENUE	EXPENSE		FOREIGN	LOCAL			
1975	0	0	296	0	0	296	-296	-296
1976	1186	573	456	0	0	1029	157	-139
1977	1777	858	456	314	156	1784	-7	-146
1978	2372	1145	456	314	156	2071	301	155
1979	2372	1145	456	314	156	2071	301	456
1980	2372	1145	456	314	156	2071	301	757
1981	2372	1145	456	314	156	2071	301	1058
1982	2372	1145	456	314	156	2071	301	1359
1983	2372	1145	456	314	156	2071	301	1660
1984	2372	1145	456	314	156	2071	301	1961
1985	2372	1145	456	314	156	2071	301	2262
1986	2372	1145	456	306	152	2059	313	2575
1987	2372	1145	456	290	144	2035	337	2912
1988	2372	1145	456	274	137	2012	360	3272
1989	2372	1145	456	259	129	1989	383	3655
1990	2372	1145	456	243	121	1965	407	4062
1991	2372	1145	456	227	113	1941	431	4493
1992	2372	1145	456	212	105	1918	454	4947
1993	2372	1145	456	196	98	1895	477	5424
1994	2372	1145	456	180	90	1871	501	5925
1995	2372	1145	456	165	82	1848	524	6449
1996	2372	1145	456	149	74	1824	548	6997
1997	2372	1145	456	133	66	1800	572	7569
1998	2372	1145	456	118	59	1778	594	8163
1999	2372	1145	456	102	51	1754	618	8781
2000	2372	1145	456	86	43	1730	642	9423
2001	2372	1145	456	71	35	1707	665	10088
2002	2372	1145	456	55	27	1683	689	10777
2003	2372	1145	456	39	20	1660	712	11489
2004	2372	1145	456	24	12	1637	735	12224
2005	2372	1145	456	8	4	1613	759	12983

WATER RATE US¢ 5.80/CUM, OPERATING COST US¢ 2.80/CUM

TABLE 2.4.2.A-4 CONDITION A,

CASH FLOW FORECAST

INTEREST CAPITALIZED
(US\$1,000)

YEAR	NET INCOME	DEPRECIATION	PROCEEDS		REVENUE TOTAL	CONST. COST	REPAYMENT		EXPENSE TOTAL	CASH BALANCE	ACCUMULATED TOTAL
			F	L			F	L			
1975	-296	296	15223	7577	22800	14800	0	0	14800	8000	8000
1976	157	456	0	0	613	8000	0	0	8000	-7387	613
1977	-7	456	0	0	449	0	0	0	0	449	1062
1978	301	456	0	0	757	0	0	0	0	757	1819
1979	301	456	0	0	757	0	0	0	0	757	2576
1980	301	456	0	0	757	0	0	0	0	757	3333
1981	301	456	0	0	757	0	0	0	0	757	4090
1982	301	456	0	0	757	0	0	0	0	757	4847
1983	301	456	0	0	757	0	0	0	0	757	5604
1984	301	456	0	0	757	0	0	0	0	757	6361
1985	301	456	0	0	757	0	0	0	0	170	6531
1986	313	456	0	0	769	0	392	195	587	-405	6126
1987	337	456	0	0	793	0	784	390	1174	-381	5745
1988	360	456	0	0	816	0	784	390	1174	-358	5387
1989	383	456	0	0	839	0	784	390	1174	-335	5052
1990	407	456	0	0	863	0	784	390	1174	-311	4741
1991	431	456	0	0	887	0	784	390	1174	-287	4454
1992	454	456	0	0	910	0	784	390	1174	-264	4190
1993	477	456	0	0	933	0	784	390	1174	-241	3949
1994	501	456	0	0	957	0	784	390	1174	-217	3732
1995	524	456	0	0	980	0	784	390	1174	-194	3538
1996	548	456	0	0	1004	0	784	390	1174	-170	3368
1997	572	456	0	0	1028	0	784	390	1174	-146	3222
1998	594	456	0	0	1050	0	784	390	1174	-124	3098
1999	618	456	0	0	1074	0	784	390	1174	-100	2998
2000	642	456	0	0	1098	0	784	390	1174	-76	2922
2001	665	456	0	0	1121	0	784	390	1174	-53	2869
2002	689	456	0	0	1145	0	784	390	1174	-29	2840
2003	712	456	0	0	1168	0	784	390	1174	-6	2834
2004	735	456	0	0	1191	0	784	390	1174	17	2851
2005	759	456	0	0	1215	0	394	201	595	620	3471

TABLE 2.4.2.2-1 CONDITION B, (US\$1,000)
 AMORTIZATION SCHEDULE, FOREIGN CURRENCY, INTEREST RATE 3.0 %
 REPAYMENT PERIOD 25 YEARS, GRACE PERIOD 7 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	15223	0	0	15451	228
1976	15451	0	0	15915	464
1977	15915	477	0	15915	0
1978	15915	477	0	477	0
1979	15915	477	0	477	0
1980	15915	477	0	477	0
1981	15915	477	0	477	0
1982	15915	477	442	15473	0
1983	15473	454	884	14589	0
1984	14589	438	884	13705	0
1985	13705	411	884	12821	0
1986	12821	385	884	11937	0
1987	11937	358	884	11053	0
1988	11053	332	884	10169	0
1989	10169	305	884	9285	0
1990	9285	279	884	8401	0
1991	8401	252	884	7517	0
1992	7517	226	884	6633	0
1993	6633	199	884	5749	0
1994	5749	172	884	4865	0
1995	4865	146	884	3981	0
1996	3981	119	884	3097	0
1997	3097	93	884	2213	0
1998	2213	66	884	1329	0
1999	1329	40	884	445	0
2000	445	13	445	0	0

TABLE 2.4.2.D-2 CONDITION B. (US\$1,000)
 AMORTIZATION SCHEDULE, LOCAL CURRENCY, INTEREST RATE 3.0 %
 REPAYMENT PERIOD 25 YEARS, GRACE PERIOD 7 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	7577	0	0	7691	114
1976	7691	0	0	7922	231
1977	7922	238	0	7922	0
1978	7922	238	0	7922	0
1979	7922	238	0	7922	0
1980	7922	238	0	7922	0
1981	7922	238	0	7922	0
1982	7922	238	220	7702	0
1983	7702	231	440	7262	0
1984	7262	218	440	6822	0
1985	6822	205	440	6382	0
1986	6382	191	440	5942	0
1987	5942	178	440	5502	0
1988	5502	165	440	5062	0
1989	5062	152	440	4622	0
1990	4622	139	440	4182	0
1991	4182	125	440	3742	0
1992	3742	112	440	3302	0
1993	3302	99	440	2862	0
1994	2862	86	440	2422	0
1995	2422	73	440	1982	0
1996	1982	59	440	1542	0
1997	1542	46	440	1102	0
1998	1102	33	440	662	0
1999	662	20	440	222	0
2000	222	7	222	0	0

TABLE 2.4.2.B-3 CONDITION B,
INCOME FORECAST
(US\$1,000)

YEAR	OPERATING		DEPRICI- ATION	INTEREST PAYABLE		TOTAL EXPENSE	NET INCOME	ACCUMULATED INCOME
	REVENUE	EXPENSE		FOREIGN	LOCAL			
1975	0	0	296	0	0	296	-296	-296
1976	1329	573	456	0	0	1929	300	4
1977	1991	858	456	477	238	2029	-38	-34
1978	2658	1145	456	477	238	2316	342	308
1979	2658	1145	456	477	238	2316	342	650
1980	2658	1145	456	477	238	2316	342	992
1981	2658	1145	456	477	238	2316	342	1334
1982	2658	1145	456	477	238	2316	342	1676
1983	2658	1145	456	464	231	2296	362	2038
1984	2658	1145	456	438	218	2257	401	2439
1985	2658	1145	456	411	205	2217	441	2880
1986	2658	1145	456	385	191	2177	481	3361
1987	2658	1145	456	358	178	2137	521	3882
1988	2658	1145	456	332	165	2098	560	4442
1989	2658	1145	456	305	152	2058	600	5042
1990	2658	1145	456	279	139	2019	639	5681
1991	2658	1145	456	252	125	1973	680	6361
1992	2658	1145	456	226	112	1939	719	7080
1993	2658	1145	456	199	99	1899	759	7839
1994	2658	1145	456	172	86	1859	799	8638
1995	2658	1145	456	146	73	1820	838	9476
1996	2658	1145	456	119	59	1779	879	10355
1997	2658	1145	456	93	46	1740	918	11273
1998	2658	1145	456	66	33	1700	958	12231
1999	2658	1145	456	40	20	1661	997	13228
2000	2658	1145	456	13	7	1621	1037	14265

WATER RATE US¢ 6.50/CUM, OPERATING COST US¢ 2.80/CUM

TABLE 2.4.2.B-4 CONDITION B,
CASH FLOW FORECAST

INTEREST CAPITALIZED
(US\$1,000)

YEAR	NET INCOME	DEPRE- CIATION	PROCEEDS		REVENUE TOTAL	CONST. COST	REPAYMENT F	L	EXPENSE TOTAL	CASH BALANCE	ACCUMULATED TOTAL
			F	L							
1975	-296	296	15223	7577	22800	14800	0	0	14800	8000	8000
1976	300	456	0	0	756	8000	0	0	8000	-7244	756
1977	-38	456	0	0	418	0	0	0	0	418	1174
1978	342	456	0	0	798	0	0	0	0	798	1972
1979	342	456	0	0	798	0	0	0	0	798	2770
1980	342	456	0	0	798	0	0	0	0	798	3568
1981	342	456	0	0	798	0	0	0	0	798	4366
1982	342	456	0	0	798	0	442	220	662	136	4502
1983	362	456	0	0	818	0	884	440	1324	-506	3996
1984	401	456	0	0	857	0	884	440	1324	-467	3529
1985	441	456	0	0	897	0	884	440	1324	-427	3102
1986	481	456	0	0	937	0	884	440	1324	-387	2715
1987	521	456	0	0	977	0	884	440	1324	-347	2368
1988	560	456	0	0	1016	0	884	440	1324	-308	2060
1989	600	456	0	0	1056	0	884	440	1324	-268	1792
1990	639	456	0	0	1095	0	884	440	1324	-229	1563
1991	680	456	0	0	1136	0	884	440	1324	-188	1375
1992	719	456	0	0	1175	0	884	440	1324	-149	1226
1993	759	456	0	0	1215	0	884	440	1324	-109	1117
1994	799	456	0	0	1255	0	884	440	1324	-69	1048
1995	838	456	0	0	1294	0	884	440	1324	-30	1018
1996	879	456	0	0	1335	0	884	440	1324	11	1029
1997	918	456	0	0	1374	0	884	440	1324	50	1079
1998	958	456	0	0	1414	0	884	440	1324	90	1169
1999	997	456	0	0	1453	0	884	440	1324	129	1298
2000	1037	456	0	0	1493	0	445	222	667	826	2124

TABLE 2.4.2.C-1 CONDITION C, (US\$1,000)
 AMORTIZATION SCHEDULE, FOREIGN CURRENCY, INTEREST RATE 6.0 %
 REPAYMENT PERIOD 15 YEARS, GRACE PERIOD 3 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL TOTAL		
1975	15223	0	0	15680	457
1976	15680	0	0	16621	941
1977	16621	997	0	16621	0
1978	16621	997	997	15928	0
1979	15928	956	1690	14543	0
1980	14543	873	2341	13158	0
1981	13158	789	2258	11773	0
1982	11773	706	2174	10388	0
1983	10388	623	2091	9003	0
1984	9003	540	2008	7618	0
1985	7618	457	1925	6233	0
1986	6233	374	1842	4848	0
1987	4848	291	1759	3463	0
1988	3463	208	1676	2078	0
1989	2078	125	1593	693	0
1990	693	42	1510	0	0
			735		

TABLE 2.4.2.C-2 CONDITION C, (US\$1,000)
 AMORTIZATION SCHEDULE, LOCAL CURRENCY, INTEREST RATE 15.0 %
 REPAYMENT PERIOD 15 YEARS, GRACE PERIOD 3 YEARS

YEAR	OUTSTANDING AT START OF YEAR	PAYMENT		OUTSTANDING BALANCE	CAPITALIZED INTEREST
		INTEREST	PRINCIPAL		
1975	7577	0	0	8145	568
1976	8145	0	0	9367	1222
1977	9367	1405	0	9367	0
1978	9367	1405	391	8976	0
1979	8976	1346	781	8195	0
1980	8195	1229	781	7414	0
1981	7414	1112	781	6633	0
1982	6633	995	781	5852	0
1983	5852	878	781	5071	0
1984	5071	761	781	4290	0
1985	4290	643	781	3509	0
1986	3509	526	781	2728	0
1987	2728	409	781	1947	0
1988	1947	292	781	1166	0
1989	1166	175	781	385	0
1990	385	58	385	0	0
				443	

TABLE 2.4.2.C-3 CONDITION C,
INCOME FORECAST

(US\$1,000)

YEAR	OPERATING		DEPRICI- ATION	INTEREST PAYABLE		TOTAL EXPENSE	NET INCOME	ACCUMULATED INCOME
	REVENUE	EXPENSE		FOREIGN	LOCAL			
1975	0	0	296	0	0	296	-296	-296
1976	2413	573	456	0	0	1029	1384	1088
1977	3614	858	456	997	2402	3716	-102	986
1978	4826	1145	456	997	2402	4003	823	1809
1979	4826	1145	456	956	2302	3903	923	2732
1980	4826	1145	456	873	2102	3703	1123	3855
1981	4826	1145	456	789	1901	3502	1324	5179
1982	4826	1145	456	706	1701	3302	1524	6703
1983	4826	1145	456	623	1501	3102	1724	8427
1984	4826	1145	456	540	1301	2902	1924	10351
1985	4826	1145	456	457	1100	2701	2125	12476
1986	4826	1145	456	374	900	2501	2325	14801
1987	4826	1145	456	291	700	2301	2525	17326
1988	4826	1145	456	208	500	2101	2725	20051
1989	4826	1145	456	125	300	1901	2925	22976
1990	4826	1145	456	42	100	1701	3125	26101

WATER RATE US\$ 11.80/CUM, OPERATING COST US\$ 2.80/CUM.

TABLE 2.4.2.C-4 CONDITION C,
CASH FLOW FORECAST

YEAR	INTEREST CAPITALIZED (US\$, 000)										ACCUMULATED TOTAL	
	NET INCOME	DEPRE- CIATION		PROCEEDS		REVENUE TOTAL	CONST. COST	REPAYMENT		EXPENSE TOTAL		CASH BALANCE
		F	L	F	L			F	L			
1975	-296	296	15223	7577	22800	14800	0	0	0	14800	8000	8000
1976	1384	456	0	0	1840	8000	0	0	0	8000	-6160	1840
1977	-102	456	0	0	354	0	0	0	0	0	354	2194
1978	823	456	0	0	1279	0	693	391	0	1084	195	2389
1979	923	456	0	0	1379	0	1385	781	0	2166	-787	1602
1980	1123	456	0	0	1579	0	1385	781	0	2166	-587	1015
1981	1324	456	0	0	1780	0	1385	781	0	2166	-386	629
1982	1524	456	0	0	1980	0	1385	781	0	2166	-186	443
1983	1724	456	0	0	2180	0	1385	781	0	2166	14	457
1984	1924	456	0	0	2380	0	1385	781	0	2166	214	671
1985	2125	456	0	0	2581	0	1385	781	0	2166	415	1086
1986	2325	456	0	0	2781	0	1385	781	0	2166	615	1701
1987	2525	456	0	0	2981	0	1385	781	0	2166	815	2516
1988	2725	456	0	0	3181	0	1385	781	0	2166	1015	3531
1989	2925	456	0	0	3381	0	1385	781	0	2166	1215	4746
1990	3125	456	0	0	3581	0	693	385	0	1078	2503	7249

NOTE:

ANNUAL SOLD WATER AFTER COMPLETING 2ND STAGE CONSTRUCTION IS 40.2 MILLION GPM
PROVIDED THAT THOSES OF FIRST THREE YEARS ARE AS FOLLOWS:

	FIRST YEAR	SECOND AND THIRD YEARS	0 GPM	PROPORTIONATE TO THE RATIO OF COST OF CONSTRUCTION COMPLETED TO TOTAL CONSTRUCTION COST

USEFUL LIFE OF FACILITIES: 45 YEARS
SALVAGE VALUE: 10%

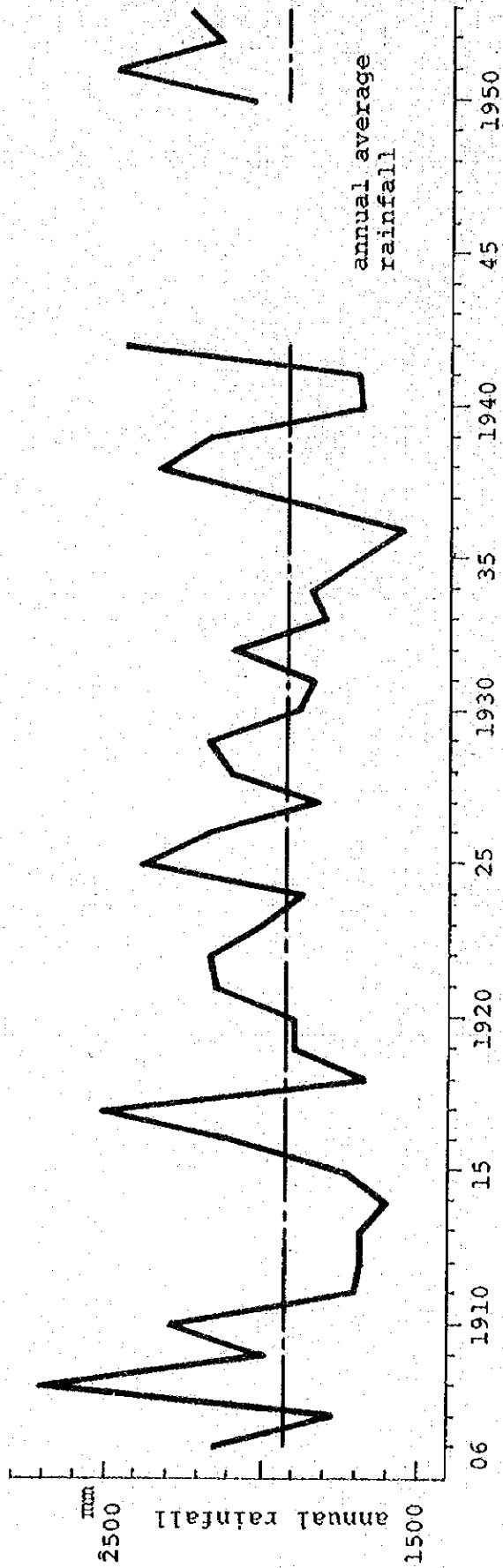
A P P E N D I X

APPENDIX A RAIN FALL

The rainfall for the year 1969 was the smallest in recent 20 years regarding meteorological data in Saigon and Hiep Hoa. On the other hand, the minimum flow of the Dong Nai River was about 90 cum/sec at Tan Uyen that is located about 15 km upstream from Bien Hoa where the drainage area of the river is about 22,600 sqkm.

From above two numbers, 90 cum/sec and 22,600 sqkm, the specific discharge is obtained as 4 l/sec/sqkm.

This figure can be applicable in roughly estimating the dry season flow of the Saigon River although topographical and meteorological conditions are more or less different each other. Hence, 16 cum/sec of discharge is obtained multiplying the drainage area of the Saigon river, 4,300 sqkm, by the above specific discharge.



maximum 2,720 mm (1908)
 minimum 1,555 mm (1936)
 average 1,940 mm (for 55 years)

NOTE: Unknown from 1943 to 1949

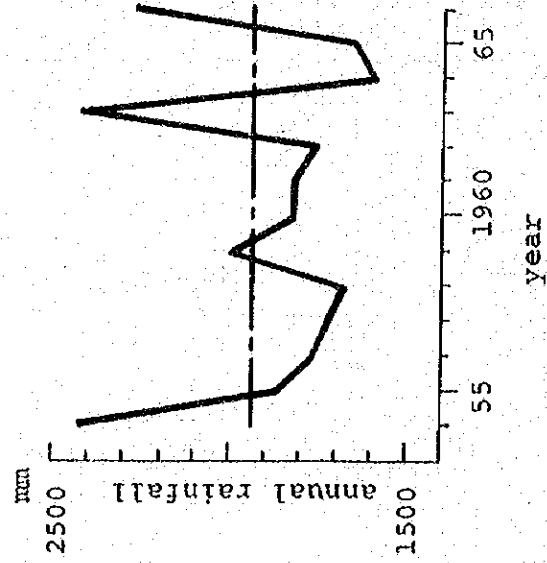


Fig. PRECIPITATION AT SAIGON

Table App. 1.a Precipitation

Location	Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total	
Saigon	1906	40mm	0	0	190	280	300	230	340	410	260	80	30	2160	
	1907	0	10	5	5	250	240	220	270	250	255	130	150	1775	
	1908	40	10	15	70	300	420	390	500	340	345	170	120	2720	
	1909	30	10	20	25	190	260	590	170	290	290	70	50	1975	
	1910	10	0	30	110	250	420	280	310	280	500	50	50	2290	
	1911	15	5	0	180	210	280	220	180	300	230	40	30	1690	
	1912	40	0	0	0	60	210	380	320	350	200	50	70	1680	
	1913	20	10	0	5	260	210	300	280	250	200	40	110	1685	
	1914	25	10	5	5	150	320	360	200	240	240	80	170	40	1605
	1915	5	5	10	20	230	460	110	130	250	250	370	20	120	1730
	1916	5	5	35	5	170	280	300	310	460	410	60	50	2090	
	1917	110	5	5	5	250	220	280	310	440	600	280	25	2530	
	1918	10	5	5	30	160	330	250	200	450	160	30	30	1660	
	1919	5	5	10	20	170	470	100	190	410	320	140	60	1900	
	1920	10	10	5	10	210	360	320	240	240	220	55	120	1900	
	1921	10	0	45	20	220	220	310	135	465	450	245	15	2135	
	1922	15	0	130	140	80	290	380	290	470	260	85	25	2165	
	1923	15	0	5	30	360	205	290	315	365	225	170	15	1995	
	1924	0	0	15	40	90	520	275	170	250	330	110	70	1870	

UNIT: millimeters

Table App. 1.b Precipitation

Location	Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Saigon	1925	10	0	60	105	170	415	565	300	295	300	150	15	2385
	1926	0	0	0	0	115	325	385	390	290	340	270	65	2180
	1927	0	0	5	25	220	350	320	230	340	175	145	5	1815
	1928	0	0	5	65	215	390	260	340	505	285	5	20	2090
	1929	25	5	0	50	230	325	350	465	325	200	150	45	2170
	1930	5	5	0	80	375	250	320	210	205	190	180	70	1890
	1931	30	0	0	5	270	180	340	160	335	415	80	25	1840
	1932	0	5	10	20	335	420	310	225	280	280	180	30	2095
	1933	30	0	0	20	50	405	245	300	295	290	110	60	1805
	1934	0	5	15	140	385	275	215	220	375	115	80	25	1850
	1935	5	0	0	50	205	280	340	120	370	185	105	30	1690
	1936	15	0	10	25	70	255	330	230	255	255	60	50	1555
	1937	30	10	0	30	165	335	420	370	275	150	150	20	1955
	1938	5	10	0	15	310	405	430	240	395	360	125	25	2320
1939	5	0	15	105	460	325	235	330	350	120	205	5	2155	
1940	0	0	0	15	220	415	230	255	295	175	40	40	1685	
1941	0	5	5	15	120	150	220	325	330	300	170	60	1700	
1942	90	5	10	145	205	260	280	263.3	682.5	364.8	130.0	15.1	2453.5	

UNIT: millimeters

Table App. 1-c Precipitation

Unknown from 1943 to 1949

Location	Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Saigon	1950	38.5	42.7	4.3	65.0	248.8	304.0	284.1	224.7	487.4	212.0	89.2	33.2	2033.9
	1951	2.4	18.5	3.5	77.6	311.7	454.5	288.4	293.0	409.9	351.4	255.2	13.8	2479.9
	1952	0.3	0.2	4.4	31.8	344.5	506.2	229.8	276.6	204.4	374.5	105.5	58.6	2136.8
	1953	4.5	11.7	11.7	104.6	420.0	269.7	216.8	217.6	384.7	214.8	245.2	132.9	2234.2
	1954	26.7	0	38.9	121.4	277.6	297.0	387.7	504.7	451.7	262.1	54.4	6.1	2428.3
	1955	0.5	0.2	0	35.0	207.9	345.2	188.3	225.6	232.3	364.6	237.9	25.6	1863.1
	1956	nil	nil	nil	94.8	198.0	101.2	296.0	241.1	451.7	204.8	90.2	83.0	1760.8
	1957	1.0	nil	37.7	18.9	47.6	293.3	230.5	172.5	566.2	256.9	36.8	54.1	1715.3
	1958	nil	5.6	7.6	16.2	159.2	246.9	286.4	283.6	276.1	362.1	13.3	17.4	1674.4
	1959	-do-	nil	0.4	119.5	145.0	209.2	338.6	501.3	200.0	318.4	138.8	18.0	1989.2
	1960	11.5	14.4	nil	70.7	290.4	478.4	182.3	236.9	241.7	189.5	74.2	32.3	1822.3
	1961	2.6	0.4	6.6	58.1	172.8	241.4	289.7	282.6	439.3	184.5	82.4	40.2	1815.6
	1962	27.7	nil	28.8	36.8	260.3	257.5	372.2	246.5	256.0	204.6	42.4	28.5	1761.3
	1963	25.5	-do-	1.6	nil	320.1	449.1	534.4	315.7	470.0	232.6	44.4	26.7	2420.1
1964	nil	-do-	nil	-do-	137.1	271.0	298.5	309.9	156.1	194.3	197.4	26.8	1591.1	
1965	-do-	-do-	-do-	27.9	167.4	214.1	221.9	330.3	335.-	137.0	154.7	52.0	1640.6	
1966	19.4	Traces	32.7	47.6	510.2	269.4	251.3	209.9	331.2	308.7	204.2	96.7	2281.3	
1967	27.7	nil	nil	4.7	244.3	140.8	351.7	150.4						

UNIT: millimeters

Table App. 1. d Precipitation

Location	Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Hiep Hoa	1967	5.0	0	0	88.0	177.0	168.0	290.0	247.0	262.0	330.0	176.0	0	1,743.0
	1968	0	0	0	84.0	262.8	456.3	152.1	209.0	403.2	273.6	30.0	15.0	1,886.0
	1969	78.0	42.0	0	81.0	58.0	262.0	126.7	210.2	313.5	147.1	48.8	2.5	1,369.8
	1970	13.5	5.6	0	10.0	246.0	291.2	105.9	241.3	133.7	355.3	113.7	150.3	1,666.5
	1971	0	1.0	34.0	27.0	137.6	247.5	121.2	241.4	306.3	327.9	165.9	139.6	1,749.4
	1972	16.0	0	25.0	59.5	62.1	184.9	127.8	80.7	469.6	262.0	160.1	25.9	1,473.6
Phu Cuong	1967	20.4	0	0.2	40.4	178.4	262.0	323.7	250.5	259.6	176.5	162.9	4.2	1,678.8
	1968	0	0	0	83.3	176.9	104.8	175.7	299.9	230.6	168.0	31.0	10.0	1,280.2
	1969	0	5.0	17.0	0	0	37.0	50.0	332.9	312.3	283.3	220.0	285.0	1,560.5
	1970	32.0	0	40.0	35.0	127.0	135.0	162.0	164.2	181.0	160.0	30.0	201.8	1,268.0
	1971	0	0	0.3	3.5	214.9	437.0	146.0	358.7	28.4	362.7	17.0	100.5	1,669.0
	1972	0	0	0	171.8	148.3	53.8	20.5	65.0	560.3	413.4	0	0	1,433.1
Hoc Mon	1972	-	-	-	-	118.6	248.0	165.0	32.0	782.0	230.0	280.0	-	-

UNIT: millimeters

APPENDIX B OPERATING COST

Design Capacities

Proposed daily maximum production	200,000 cum
Proposed daily average production (80% of the above)	160,000 "
Annual production	58.4 million cum
Amount of sold water (70% of annual production)	40.9 "

Operating expenses

1) Labor cost

The results of operation by SMWO

	1968	1969	1970	1971	1972
Total water production, million cum	81.9	105.5	127.4	134.6	143.1
Labor cost, million piasters	63.1	70.1	111.0	135.8	150.3
Labor cost per cum, piasters	.77	.66	.87	1.01	1.05

Taking the unit cost 1.05 in 1972, labor cost for the increased production of 200,000 cmd as day maximum or 160,000 cmd as day average will be 54.8 million cmd x 1.05 piasters per cum = 57.5 million piasters per year. However, it is very reasonable to consider that number of personnel will not increase directly in proportion to the increase ratio of production but less than that. It is found by a statistical operation that the pertinent increase number of personnel shall be 320 as the number of personnel was 980 in 1972. Hence,

Labor cost for 980 persons	150.3 million piasters
Labor cost for 320 persons increased for production expansion	49.0 million piasters

2) Chemicals

Average dosage: Lime 15 ppm
Chlorine 3 ppm

Annual chemical consumption

Lime $15 \times 58.4 = 876$ tons
Chlorine $3 \times 58.4 = 17$ "

Cost of chemicals

Lime $876 \text{ tons} \times 22,000 \text{ piasters/ton} = 19.2$
million
piasters

Chlorine $175 \text{ tons} \times 121,000 \text{ piasters/ton} = 21.2$
million
piasters

Total

40.5
million piasters

3) Power

Power facilities	Power rating	Q'ty	Standby unit	Total power	Commission ratio ¹⁾	Actual power
Intake pump	26 KW	70 ¹⁾	6	1890 ²⁾	.83 ³⁾	1512 ⁴⁾
Relay pump	110	2	1	220	.8	176
"	90	2	1	180	.8	144
"	110	2	1	220	.8	176
"	75	2	1	150	.8	120
"	80	2	1	160	.8	128
(Relay pump total)				(930)		(744)
Backwash pump	280	1	1	280	.042 ⁵⁾	126)
Surfacewash pump	180	1	1	125	.042	8
Lighting	75	-	-	75	.5	38
Airconditioning	22	-	-	22	.75	17
Instrumentation	15	-	-	15	1	15
(Plant total)				(517)		(90)
Service pump	820	4	1	3,280	.57 ⁷⁾	1,640
(Service pump total)				(3,280)		(1,640)
Power Total				(6,617)		(3,986)

Power cost⁸⁾

4,000 KW x 24 x 365 = 35 million kWh

35 million kWh x 10 piasters/kWh = 350 million piasters

- NOTE: 1) Stand-by unit not included
 2) Stand-by unit not included
 3) Average annual power demand/Actual maximum power demand
 4) Total power x commission ratio
 5) Number of filters (excluding stand-by unit) 11
 Average length of filter run 48 hours

Frequency of backwash .5/day x 11 = 5.5 say, 6.0 times/day
 Total washing time per day 10 minutes/cycle x 6.0 times
 = 60 minutes

$$\text{Commission ratio} = \frac{60}{1,440} = .042$$

- 6) Rounded
- 7) Roughly, Average daily water demand/hourly peak demand
- 8) Power cost, i.e., running cost, will almost be the same when power is supplied by a diesel power system in the water supply plants.

4) Supplies, materials, maintenance, repairs and transport

	1968	1969	1970	1971	1972
Total water production, million cum	81.9	105.5	127.4	134.6	143.1
Supplies etc.	114.3	39.9	91.6	24.2	177.0
Cost per cum, piasters	1.40	.38	.72	.18	1.24

Taking the unit cost, 1.24, expenses for supplies, materials, maintenance and transport will be:

$$58.4 \text{ million cum} \times 1.24 = 72.4 \text{ million piasters}$$

5) Billing, collection and accounting

	1968	1969	1970	1971	1972
Total water production, million cum	81.9	105.5	127.4	134.6	143.1
Billing etc.	24.3	28.0	42.7	52.2	60.1
Cost per cum	.30	.27	.34	.39	.42

Applying .42 piasters per cum,
 Cost of billing, collection and accounting for the proposed expansion quantity,

$$.42 \times 58.4 \text{ million cum} = 24.5 \text{ million piasters}$$

6) Administrative and general

Administrative and general costs shall be proportional to the number of personnel. Therefore, additional cost for the increased personnel in accordance to the increase of the production will be (refer to the article 1) Labor cost):

$$24 \text{ million piasters} \times \frac{320}{980} = 7.8 \text{ million piasters}$$

(Administrative cost in 1972)

Total Operating Expenses 544.3 million piasters

Likewise, operating expenses in other cases will be estimated in accordance with the size of the production and the individual operating condition.

Table App.2 SAIGON WATER DISTRIBUTION PROJECT

COMPARATIVE INCOME STATEMENT (1968-1972) BY SMWO

	1968	1969	1970	1971	1972
AVERAGE NUMBER OF CONNECTIONS	52,093	69,130	90,280	106,951	121,606
Total water produced, million cum	81.9	105.5	127.4	134.6	143.1
Total water consumed, million cum	55.6	72.9	65.3	90.9	99.0
Percent not billed	32	31	33	31	31
	(millions of piasters)				
<u>Operating Revenues</u>					
Water sales	446.7	758.1	1,091.6	1,487.5	2,128.5
Other	62.6	45.8	70.3	78.8	241.8
Total revenue	509.3	803.9	1,161.9	1,566.3	2,370.3
<u>Operating Expenses</u>					
Labor	63.1	70.1	111.0	135.7	156.3
Chemicals	27.0	43.9	73.9	103.3	117.4
Power	70.0	104.8	199.2	269.8	355.1
Supplies, materials, maintenance, repairs and transport	114.3	49.9	91.6	24.2	177.0
Billing, collection and accounting	24.3	27.0	42.7	52.2	60.1
Administrative and general	9.7	10.7	17.1	20.9	24.0
Total operating expenses	308.4	306.4	535.5	606.1	889.9
<u>Other expenses</u>					
Provision or bad debts	15.5	14.5	15.3	13.1	11.5
Depreciation	196.6	215.8	227.0	418.9	540.8
Interest	79.7	87.8	148.7	173.6	206.6
Taxes	1.2	36.6	15.5	18.4	61.7
Miscellaneous	1.6	2.2	4.2	5.7	12.8
Total other expenses	294.6	356.9	410.7	629.7	833.4
Total all expenses	603.0	663.3	946.2	1,235.6	1,723.3
Net operating income (loss)	(93.7)	140.6	215.7	330.5	647.0
Other income	9.2	69.3	59.7	48.8	97.1
Net income (loss)	(84.5)	209.9	275.4	379.3	744.1
Extraordinary adjustments to income (expenses)	139.0	(239.2)	(245.7)	(316.3)	(494.4)
Adjusted net income (loss)	54.5	(29.3)	29.7	63.0	249.7

Table App.3 Case Study on Cost of Water Excluding Distribution System (for ref.)

Case	Loan Condition*	Capital Cost	Interest	Operating Cost (US\$1,000)	Total	Sold Water Million cum	Cost of Water US\$	VN\$**
Alternative 1	a/30/2/2	24,600	9,632	30,753	64,985	1,186.1	5.5	28
	b/25/3/3	24,600	11,574	25,310	61,484	981.6	6.3	32
	c/15/6/15	24,600	20,746	14,424	59,770	572.6	10.5	53
Alternative 2	a/30/2/2	22,800	8,929	31,025	65,485	1,186.1	5.5	28
	b/25/3/3	22,800	10,111	25,582	58,493	981.6	6.0	30
	c/15/6/15	22,800	19,212	14,696	56,708	572.6	9.9	50

* Loan condition/Repayment period/Interest of foreign currency/Interest of local currency

** US\$1 = VN\$500

Table App.4 Case Study on Cost of Water including Distribution System (for ref.)

Case	Loan Condition*	Capital Cost	Interest	Operating Cost	Total	Sold Water Million cum	Cost of Water US\$	VN\$**
Alternative 1	a/30/2/2	36,440	14,486	30,753	81,679	1,186.1	6.9	35
	b/25/3/3	36,440	22,222	25,310	83,972	981.6	8.6	43
	c/15/6/15	36,440	31,038	14,424	81,902	572.6	14.3	72
Alternative 2	a/30/2/2	34,640	13,783	31,025	79,448	1,186.1	6.7	34
	b/25/3/3	34,640	20,759	25,582	80,981	981.6	8.3	42
	c/15/6/15	34,640	29,504	14,696	78,840	572.6	13.8	69

* Loan condition/Repayment period/Interest of foreign currency/Local currency

** US\$1 = VN\$500

APPENDIX C DISTRIBUTION PIPE REQUIREMENT

In proportion to the increase of supplied water, new mains should be added to the existing distribution network. According to the report "Saigon Water Distribution Project", some 400,000 m of distribution pipe will be required for an increased supply of about 500,000 cmd by 1980¹ excluding pipe length for replacements. Hence, distribution pipe requirements for the production added by the groundwater project, namely, 200,000 cmd, will be some 160,000 m. And the average pipe laying cost will be roughly 74 dollars per meter including engineering. Therefore, pipe laying cost for the 200,000 cmd will be:

$$\text{US\$74 @ 160,000 m} = \text{US\$11,840,000}$$

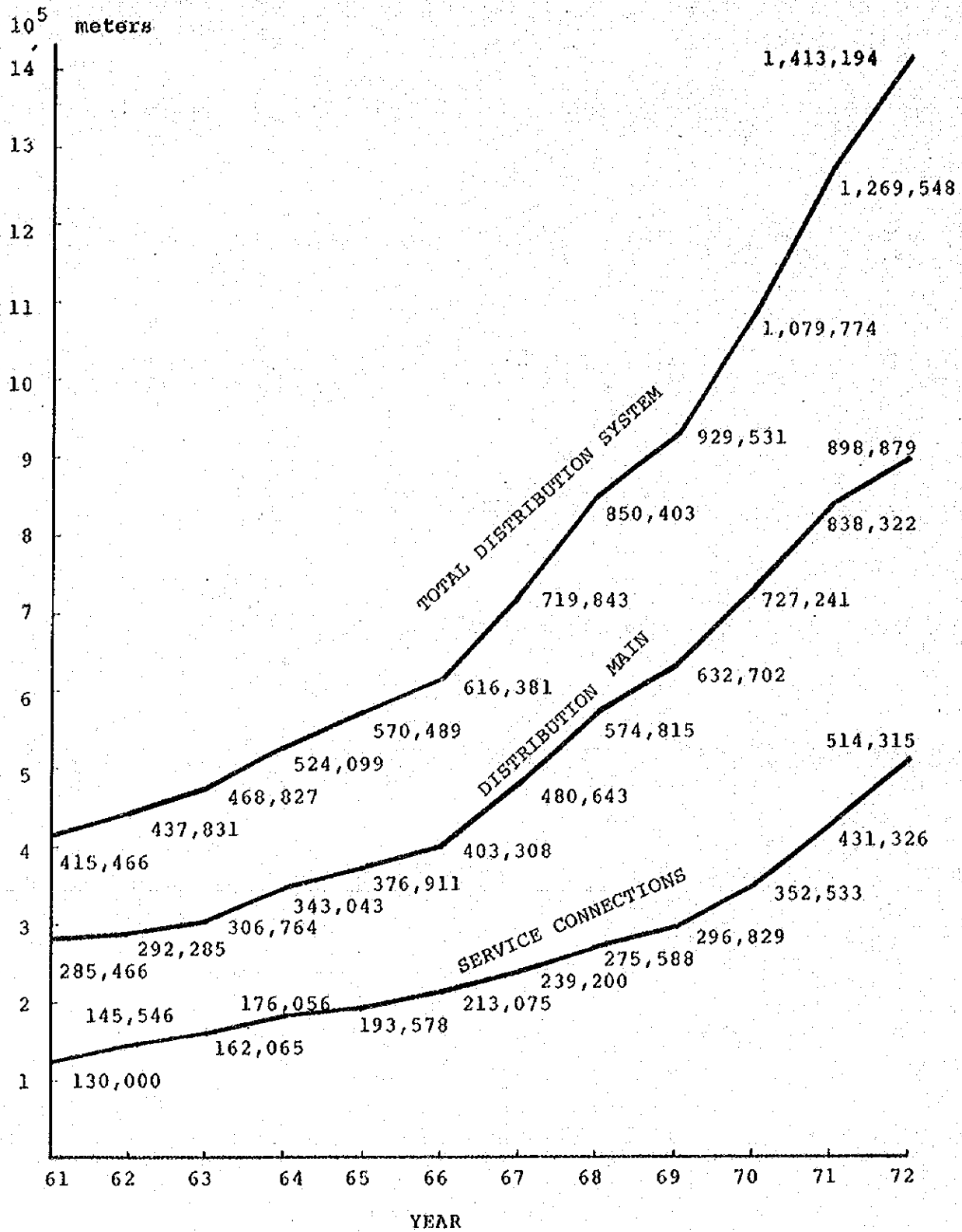


Fig. WATER DISTRIBUTION SYSTEM IN SAIGON

by SMWO

APPENDIX D. DONG NAI WATER SUPPLY SYSTEM

Intake Pumping Station

Location	Dong Nai River, just upstream of Bien Hoa bridge
Intake Pumps	6 units
Design Capacity	450,000 cmd (actual 400,000 cmd)

Raw Water Transmission Main

Material, Diameter and Length	PS-Concrete Pipe, $\phi 72"$, 11 km
Capacity	505,000 cmd

Water Purification Plant

Capacity	480,000 cmd
Rectangular Sedimentation Basins	5
Rapid Sand Filters	20 (filtration rate 150 m/day)
Filtered Water Reservoirs	2 x 40,000 cum = 80,000 cum 2 x 95,000 cum = 190,000 cum Total 270,000 cum
Treated Water Pumps	5 units, 680,000 cmd

Treated Water Main

Material, Diameter and Length	PS-Concrete Pipe, $\phi 78"$, 11.5 km
Capacity	Ultimate not known. Supposedly 750,000 cmd

Elevated Storage Tanks

8 major tanks with capacity of 49,000 cmd in total

APPENDIX E RECOMMENDATIONS FOR RIVER SURVEY

Following errors are anticipated to be contained in the results of the survey. Some of them may be negligible but the others may not. Hence, some countermeasures must be considered to minimize these errors.

Cross Section Survey

Errors in the cross section survey are mainly caused by sounding wire and lead settled at deviated positions stated as follows:

- 1) Survey boats are almost unable to be settled on the survey line exactly and
- 2) Sounding wire is deviated by fast flow representing a bigger depth than the real.

Repetition of the survey will minimize the error. At the same time, it is ideal to quickly measure the water depths while the river current disappears during the time between upward and downward streams.

Level Recording

Three kinds of errors may occur in water level recording for structural property of the recorder and some of them will be inevitable.

- a. Float lag,
- b. Line shift and
- c. Dip of balancing lead and wire

One set of gears necessarily has a play and when the leading gear turns its direction of revolution, the passive one will begin to move to reverse direction after a lag caused by the play. This phenomenon also occurs in the case of water surface and the float. It is called a float lag.

A wire moves as water-level varies. It means one side of the wire gets longer than the other and it causes variation of weight. Therefore, the float has to vary its draft to get balance. This is called line shift.

A balancing lead and a part of a wire may dip into the water when water surface is higher than a certain level. In this occasion, the draft of the float varies due to buoyancy of the lead and the record becomes lower than real one.

All these errors are considered to be negligibly small in the present survey. In case, however, a very severe accuracy is needed, they must carefully be considered.

Current Velocity

The current meter is required to be set at correct positions, namely at 20% and 80% depths. A wrong mean velocity will be obtained if a meter is situated at deviated position.

It is not easy to set a meter at correct positions as the hanging cable deflects by the current. This deflection is very big if the current exceeds 0.7 m/sec or so.

There will be two methods to solve this problem in this survey. One is to use a heavier weight and the other is to measure the angle between the cable and the (vertical) sounding line so as to compensate the length of the cable by projecting it to the sounding line. The latter was chosen because it was difficult to acquire a proper heavier weight.

A numerical table of compensation for deflection angles was prepared. However, it was still difficult to get correct depths since the water was too turbid for the cable to be observed if it stretched straight well down to the end.

A current meter has its own equation for calculating velocity from number of revolutions. This equation is valid to a certain range of velocity. Therefore, a certain amount of error is unavoidable when velocities outside a regular range are measured--too fast or too slow.

Thus, errors of flow velocity measurement are anticipated.

In order to avoid or to minimize such errors, improvement of equipment should be considered. For instance, heavier weights, say, 40 or

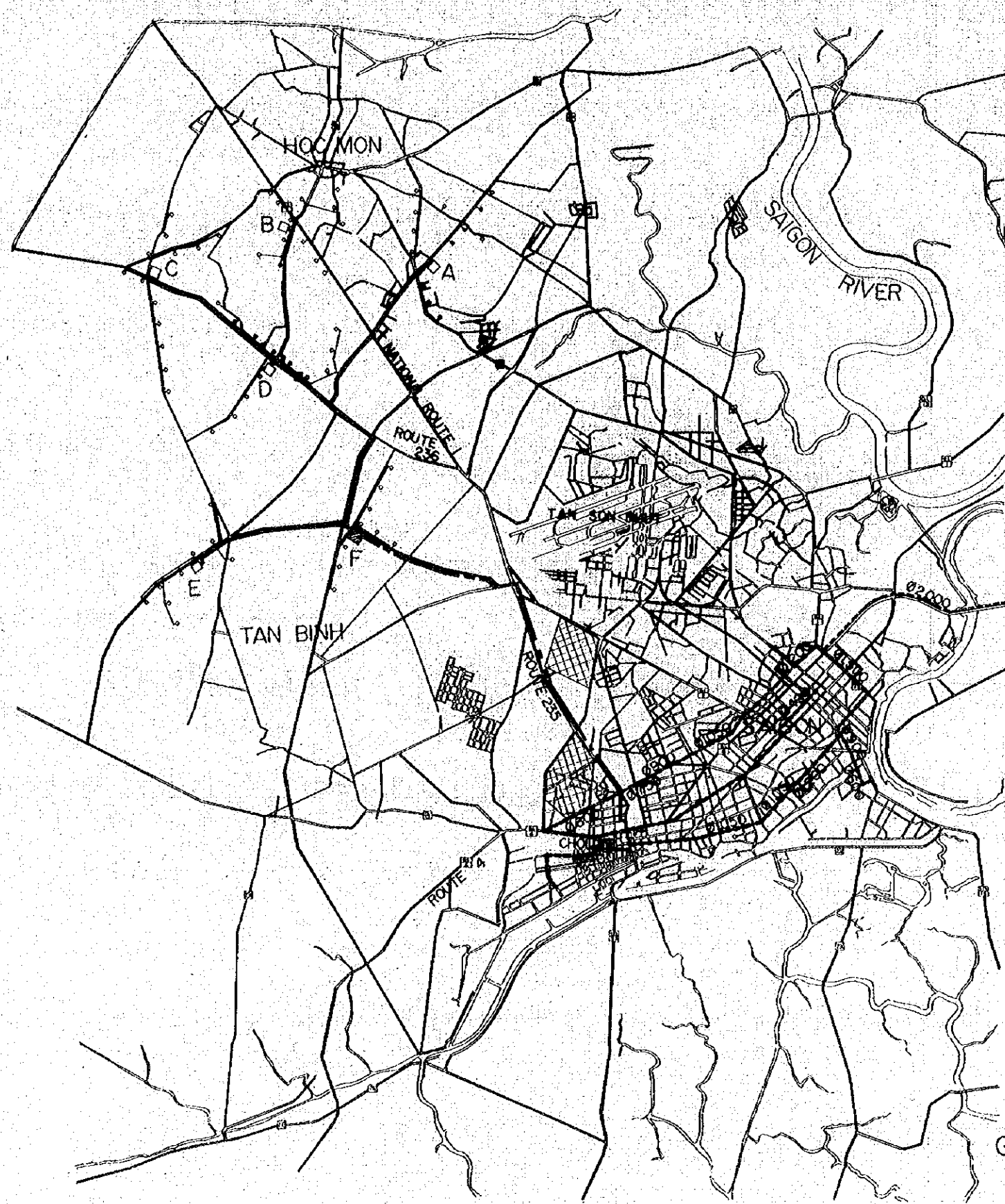
50 kg, for the current meter will effectively reduce the deflection although it can not be handled manually but a winch. As for measurement of low current, a fine current meter will be worth to be tried.

For advanced survey method, an ultrasonic automatic flowmeter can be adopted, which will reduce most of manpower and ensure the continuous long-term recording of the river flow.

In so far as the river survey is undertaken continuously for long period in the traditional way using Price type current meters, number of trained members are needed. Meanwhile, a knowledgeable and experienced engineer must attend the apparatus if the ultrasonic flow recording system is applied in the survey.

APPENDIX F ALTERNATIVE LAYOUT OF GROUNDWATER SUPPLY SYSTEM

Shown herewith is an alternative plan of groundwater supply system in which wells are distributed also in the military zone. Diameters of some parts of raw water mains would be reduced if this plan is executed. (See Fig. LAYOUT OF GROUNDWATER SUPPLY SYSTEM on next page.)



- LEGEND**
- WELL
 - RELAY PUMPING STATION
 - ▨ WATER TREATMENT PLANT
 - COLLECTION MAIN
 - RAW WATER MAIN
 - TREATED WATER MAIN
 - EXISTING SERVICE MAIN
 - ▩ NEW HOUSING AREA

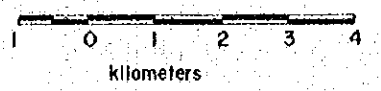


Fig. LAYOUT
OF
GROUNDWATER SUPPLY SYSTEM

Table App. 5.a CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES at Phu Cuong in 1971 by SMWO

Date	*	pH	Turbidity SiO ₂ ppm	Color unit	Total Alkalinity CaCO ₃ ppm	Total Hardness	Total Iron ppm	Chloride NaCl ppm
8 August	L	6.6	22	110	12	12	0.1	3.5
	H	7.0	25	120	15	11	0.1	3.5
9	L	6.4	22	100	10	9	0.1	3.0
	H	6.4	22	100	10	9	0.1	3.0
10	L	6.5	25	80	11	12	0.1	3.0
	H	6.2	20	120	8	10	0.1	3.0
11	L	6.5	25	100	11	10	0.1	3.0
	H	6.5	24	120	11	10	0.1	3.0
12	L	6.6	32	80	11	11	0.1	3.5
	H	6.2	30	80	9	9	0.1	2.5
13	L	6.4	25	60	10	9	0.1	3.5
	H	6.4	25	80	10	9	0.1	3.5
14	L	7.1	21	80	10	9	0.1	2.5
	H	7.1	20	80	10	9	0.1	2.5
15	L	7.0	30	80	13	12	0.1	3.5
	H	6.4	25	80	10	11	0.1	3.0
16	L	6.9	24	80	10	10	0.1	3.0
	H	7.1	24	80	10	10	0.1	3.0
17	L	6.4	22	80	9	11	0.1	3.0
	H	6.4	23	60	9	11	0.1	3.0
18	L	6.6	21	80	10	12	0.1	3.5
	H	6.3	20	70	8	10	0.1	3.5
19	L	6.2	28	100	9	9	0.1	4.0
	H	6.5	27	100	10	10	0.1	3.5
20	L	6.2	28	80	8	8	0.1	2.0
	H	6.3	27	100	8	8	0.1	2.0
21	L	6.3	20	80	9	8	0.1	3.0
	H	6.3	22	80	9	8	0.1	3.0
22	L	6.5	18	100	10	12	0.1	3.0
	H	6.5	18	100	10	12	0.1	3.0
23	L	6.9	18	80	13	12	0.1	3.5
	H	6.4	20	80	9	10	0.1	3.3
24	L	6.5	18	70	10	10	0.1	3.5
	H	6.5	18	80	10	10	0.1	3.5
25	L	6.4	15	80	10	9	0.1	2.5
	H	6.2	15	80	9	9	0.1	2.5
26	L	6.2	22	100	9	10	0.1	3.5
	H	6.4	23	100	10	10	0.1	3.5

Table App.5.b

CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES

at Phu Chuong in 1971 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Date	*	Color	Turbidity	Cl ⁻
27 Aug.	H	100	23	5.0	21 Sept.	H	30	7	3.3
	L	120	24	2.5		L	45	7	4.1
28	H	100	18	5.8	22	H	30	10	3.3
	L	100	18	5.0		L	35	9	3.3
29	L	120	22	2.5	23	L	45	10	2.5
30	H	100	23	2.5	24	H	45	7	24.9
	L	100	25	2.5		L	45	8	3.3
31	H	100	20	2.5	25	H	45	7	3.3
	L	100	20	2.5		L	50	7	3.3
1 Sept.	H	30	20	2.5	26	H	45	6	4.1
	L	100	25	3.3		L	50	6	3.3
2	H	60	25	2.5	27	H	50	14	3.3
	L	100	20	2.5		L	55	14	3.3
3	H	80	17	5.8	28	H	70	11	2.5
	L	100	17	5.8		L	65	10	3.3
4	H	100	25	2.5	29	H	65	10	3.3
	L	100	20	3.3		L	70	10	3.3
5	H	110	20	1.7	30	H	65	9	4.1
	L	110	20	2.5		L	40	7	5.0
6	H	80	20	2.5	1 Oct.	H	70	12	3.3
	L	100	20	4.2		L	55	12	3.3
7	H	80	25	2.5	2	H	55	11	3.3
	L	80	17	2.5		L	55	10	3.3
8	H	80	15	1.7	3	H	40	10	4.1
	L	100	15	1.7		L	55	10	4.1
9	H	80	15	1.7	4	H	50	10	2.5
	L	80	15	1.7		L	55	10	3.3
10	H	80	15	1.7	5	H	55	10	3.3
	L	80	15	1.7		L	55	10	2.5
11	H	80	15	1.7					
	L	60	10	1.7	21	L	50	11	3.3
12	H	100	16	1.7		H	35	11	3.3
	L	80	16	1.7	22	L	45	15	1.7
13	H	80	17	3.3		H	35	10	1.7
	L	80	17	3.3	23	L	35	10	1.7
14	H	80	17	3.3		H	30	9	1.7
	L	80	15	3.3	24	L	40	10	1.7
15	H	20	10	5.8		H	40	12	1.7
	L	70	15	5.0	25	L	40	15	1.7
16	H	60	10	3.3		H	40	11	2.4
	L	120	25	3.3	26	L	60	8	1.7
17	H	80	10	3.3		H	50	8	1.7
	L	80	10	4.1	27	L	40	11	1.7
18	H	70	16	4.1		H	20	10	2.4
	L	70	12	3.3	28	L	45	11	3.3
19	H	80	18	2.5		H	20	10	2.4
	L	80	12	3.3	29	L	35	6	3.3
20	H	50	10	2.5		H	35	6	3.3
	L	60	10	2.5	30	L	40	10	2.4
					31	H	20	9	2.4
						L	35	10	3.3
						H	40	10	3.3

unit as SiO₂ as NaCl
ppm ppm

Table App.5.c

CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES

at Phu Cuong in 1971 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Date	*	Color	Turbidity	Cl ⁻		
1	Nov.	L	55	15	2.4	26	Nov.	L	30	13	3.3
		H	55	10	2.4			H	30	13	4.1
2		L	50	10	3.3	27		L	40	14	4.1
		H	55	10	1.7			H	40	14	4.1
3		L	45	7	1.7	28		L	40	12	4.1
		H	45	6	1.7			H	35	12	2.4
4		L	45	15	1.7	29		L	45	11	2.4
		H	50	10	1.7			H	40	10	2.4
5		L	50	11	1.7	30		L	50	11	3.3
		H	50	10	1.7			H	35	10	1.7
6		L	40	6	3.3	1	Dec.	L	40	10	3.3
		H	45	6	2.4			H	35	10	1.7
7		L	50	10	1.7	2		L	30	9	2.4
		H	50	9	1.7			H	35	10	1.7
8		L	50	10	2.4	3		L	40	11	1.7
		H	50	10	2.4			H	40	10	1.7
9		L	55	11	2.4	4		L	60	12	1.7
		H	60	10	2.4			H	45	11	2.4
10		L	40	13	4.1	5		L	35	10	3.3
		H	40	10	2.4			H	30	9	1.7
11		L	45	10	4.9	6		L	40	10	2.4
		H	40	12	4.1			H	45	10	2.4
12		L	40	10	4.1	7		L	50	11	2.4
		H	40	10	3.3			H	40	11	1.7
13		L	60	13	4.9	8		L	35	10	3.3
		H	50	10	4.9			H	35	10	2.4
14		L	40	11	4.1	9		L	35	9	1.7
		H	30	9	2.4			H	45	11	1.7
15		L	50	10	2.4	10		L	45	10	1.7
		H	50	10	1.7			H	35	10	2.4
16		L	30	9	4.1	11		L	40	10	2.4
		H	30	8	4.9			H	40	8	1.7
17		L	40	10	3.3	12		L	55	11	2.4
		H	30	6	3.3			H	50	10	2.4
18		L	35	10	3.3	13		L	35	8	1.7
		H	35	10	3.3			H	30	9	1.7
19		L	40	15	2.4	14		L	45	10	1.7
		H	30	11	3.3			H	50	10	2.4
20		L	35	10	3.3	15		L	55	11	3.3
		H	35	11	2.4			H	50	10	3.3
21		L	40	10	3.3	16		L	50	10	2.4
		H	35	10	3.3			H	45	11	1.7
22		L	40	7	2.4	17		L	30	10	1.7
		H	30	9	4.1			H	35	9	1.7
23		L	40	10	3.3	18		L	40	11	2.4
		H	40	10	3.3			H	40	10	1.7
24		L	30	10	4.1						
		H	25	11	4.1						
25		L	25	11	3.3						
		H	25	11	4.1						

unit FTU NaCl ppm

Table App.5.d CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES

at Phu Cuong in 1972 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Date	*	Color	Turbidity	Cl ⁻
4 Jan.	L	55	15	4.9	1 Feb.	L	55	15	4.9
	H	55	15	5.8		H	55	10	4.9
5	L	60	17	5.0	2	L	55	10	4.1
	H	60	15	5.8		H	15	5	4.1
6	L	35	16	5.0	3	L	55	10	4.1
	H	55	16	5.8		H	45	12	4.1
7	L	60	35	5.8	4	L	55	15	4.1
	H	55	17	5.0		H	55	13	4.1
8	L	60	17	5.0	5	L	50	13	4.1
	H	35	15	5.8		H	55	14	4.1
9	L	50	18	5.8	6	L	55	15	4.9
	H	30	15	6.6		H	50	15	4.9
10	L	45	10	5.8	7	L	55	12	4.1
	H	10	10	5.8		H	50	13	4.1
11	L	30	10	5.8	8	L	55	13	4.1
	H	35	10	5.8		H	35	10	4.1
12	L	35	15	5.8	9	L	30	10	4.9
	H	40	15	6.6		H	35	14	4.9
13	L	35	10	6.6	10	L	55	13	4.9
	H	40	11	6.6		H	50	13	4.9
14	L	50	10	5.8	11	L	65	13	6.6
	H	20	80	6.6		H	50	14	4.9
15	L	45	15	5.0	12	L	60	15	6.6
	H	40	10	5.0		H	55	15	4.9
16	L	40	15	5.8	13	L	65	15	6.6
	H	55	19	5.8		H	65	15	4.1
17	L	80	35	5.8	25	L	40	12	8.3
	H	55	25	6.6		H	40	11	6.6
18	L	55	15	6.6	26	L	40	14	6.6
	H	55	15	6.6		H	40	12	9.1
19	L	80	15	6.6	27	L	60	11	6.6
	H	55	15	6.6		H	70	14	6.6
20	L	55	15	5.0	28	L	20	12	10.7
	H	55	15	5.0		H	90	15	6.6
21	L	70	15	5.0	29	L	80	15	6.6
	H	55	15	5.0		H	80	12	12.3
22	L	55	15	5.0	1 Mar.	L	80	15	16.5
	H	45	15	5.0		H	60	19	6.6
25	L	40	20	4.9	2	L	60	14	8.3
	H	30	15	4.9		H	60	15	6.6
26	L	50	14	4.9	3	L	60	14	9.9
	H	30	10	5.8		H	40	16	5.0
27	L	40	9	4.9	4	L	40	15	5.0
	H	30	9	4.9		H	40	12	6.6
28	L	40	14	4.9	5	L	20	14	1.7
	H	55	13	4.9		H	10	11	8.3
29	L	65	19	5.8	6	L	40	15	5.7
	H	30	10	5.8		H	40	15	4.9
30	L	55	17	5.8	7	L	40	17	5.7
	H	35	10	5.8		H	45	12	5.0
31	L	55	13	4.9	8	L	40	15	5.0
	H	55	17	5.8		H	40	15	5.0

unit FTU NaCl ppm

Table App.5.e CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES
at Phu Cuong in 1972 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Date	*	Color	Turbidity	Cl ⁻
9 Mar.	L	20	15	5.7	1 Apr.	L	10	50	69.3
	H	20	15	5.7		H	14	60	9.9
10	L	40	15	2.4	2	L	15	60	21.5
	H	30	15	4.3		H	12	40	14.8
11	L	40	15	4.9	3	L	15	50	53.6
	H	40	16	4.2		H	15	50	8.2
12	L	60	16	6.6	4	L	15	55	37.3
	H	80	16	6.6		H	15	55	9.9
13	L	80	16	3.3	5	L	10	55	30.5
	H	60	16	8.3		H	12	60	9.1
14	L	70	16	8.3					
	H	100	17	18.1	9	L	80	14	6.6
15	L	60	15	13.2		H	40	15	12.4
	H	100	18	16.5	10	L	60	15	7.4
						H	80	18	14.8
17	L	20	50	29.7	11	L	75	16	20.6
	H	19	50	5.8		H	60	15	15.6
18	L	15	50	36.3	12	L	100	20	9.9
	H	15	50	5.8		H	80	16	14.0
19	L	17	70	31.4	13	L	60	15	33.0
	H	16	70	9.1		H	70	15	16.5
20	L	15	60	19.8	14	L	40	14	37.3
	H	15	60	9.9		H	50	15	12.3
21	L	15	40	18.2	15	L	40	12	41.2
	H	16	60	8.3		H	40	15	9.0
22	L	10	55	8.3	16	L	20	12	49.5
	H	10	55	6.6		H	90	15	12.4
23	L	15	55	4.1	17	L	50	16	33.0
	H	17	70	11.5		H	70	14	12.4
24	L	15	60	3.3	18	L	20	14	41.2
	H	16	55	9.9		H	40	14	20.6
25	L	15	40	5.8	19	L	30	12	20.6
	H	14	50	11.5		H	30	14	12.4
26	L	15	55	8.2	20	L	30	12	8.2
	H	15	55	4.1		H	30	14	12.4
27	L	17	50	15.6	21	L	50	15	5.0
	H	15	50	18.2		H	60	15	14.8
28	L	15	50	18.2	22	L	80	16	9.9
	H	14	50	18.2		H	70	14	20.6
29	L	10	40	14.8	23	L	80	20	4.1
	H	12	40	9.9		H	70	11	19.8
30	L	12	40	24.8	24	L	70	16	4.1
	H	14	40	10.7		H	80	16	8.2
31	L	12	50	52.8	25	L	60	15	12.4
	H	10	50	10.7		H	40	16	12.4
					26	L	70	16	20.6
						H	70	18	12.4
					27	L	80	19	20.6
						H	60	16	12.4
					28	L	60	14	28.9
						H	60	17	12.4

unit FTU NaCl ppm

Table App.5.f CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES

at Phu Cuong in 1972 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Date	*	Color	Turbidity	Cl ⁻
2 May	L	50	15	18.9	6 Jun.	L	60	14	3.8
	H	50	15	10.7		H	40	13	8.2
3	L	50	13	20.6	7	L	70	15	4.1
	H	60	11	4.1		H	50	15	6.6
4	L	55	14	16.5	8	L	40	11	6.6
	H	50	15	6.6		H	30	11	3.3
5	L	50	17	14.1	9	L	30	10	5.8
	H	50	18	5.7		H	40	10	5.8
6	L	55	17	3.3	10	L	30	10	5.0
	H	100	18	9.8		H	50	10	5.8
7	L	100	45	4.9	11	L	30	10	6.6
	H	55	20	5.7		H	40	10	4.9
8	L	75	18	3.3	12	L	50	12	8.2
	H	55	17	8.2		H	20	10	3.3
9	L	90	18	4.9	13	L	30	14	9.1
	H	90	20	6.6		H	40	11	3.3
10	L	100	20	5.7	14	L	50	12	7.4
	H	90	20	8.2		H	50	12	3.3
11	L	100	35	10.7	15	L	50	10	6.6
	H	85	18	8.2		H	40	11	6.6
12	L	85	14	28.8	16	L	50	22	8.2
	H	100	14	20.6		H	55	15	4.1
13	L	100	32	16.5	17	L			
	H	100	20	39.4		H	55	18	6.6
14	L	100	35	6.6	18	L	70	25	3.3
	H	100	16	12.3		H	40	15	6.6
15	L	75	20	7.4	25	L	30	18	10.7
	H	75	19	35.6		H	40	10	9.1
16	L	65	18	8.2	26	L	40	15	7.4
	H	70	18	37.3		H	55	16	4.1
17	L	65	17	17.3	27	L	50	16	9.1
	H	70	15	4.1		H	30	16	9.9
18	L	55	15	13.2	28	L	30	19	9.9
	H	75	16	4.9		H	35	15	7.4
19	L	65	18	18.9	29	L	35	17	6.6
	H	70	22	4.9		H	35	15	7.4
20	L	65	15	12.3	30	L	35	15	8.2
	H	65	15	20.6		H	50	15	5.8
21	L	65	14	4.1	1 Jul.	L	50	15	6.6
	H	60	15	11.5		H	55	15	5.8
30	L	30	20	45.5	2	L	60	16	5.0
	H	55	15	41.1		H	40	14	8.2
31	L	55	15	28.9	3	L	55	15	8.2
	H	55	14	41.1		H	30	14	5.0
1 Jun.	L	30	15	18.2	4	L	60	20	5.8
	H	60	16	33.0		H	40	16	8.2
2	L	60	14	37.8	5	L	60	15	5.0
	H	60	14	27.2		H	55	14	7.4
3	L	30	15	4.1	6	L	14	14	5.0
	H	55	14	8.2		H	40	10	4.1
4	L	50	15	3.3	7	L	30	30	8.2
	H	70	15	5.8		H	50	14	7.4
5	L	60	15	3.3	8	L	30	14	8.2
	H	70	13	8.2		H	65	15	8.2

Table App.5.g CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES

at Phu Cuong in 1972 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Date	*	Color	Turbidity	Cl ⁻
9 Jul.	L	10	9	6.6	10 Aug.	L	60	17	9.9
	H	15	10	9.1		H	60	17	7.4
10	L	5	9	5.8	11	L	70	15	8.2
	H	9	9	9.1		H	60	15	8.2
11	L	30	10	6.6	12	L	50	14	7.4
	H	50	12	5.0		H	60	15	8.2
12	L	15	14	5.6	13	L	60	11	9.1
	H	50	15	5.0		H	70	15	4.1
13	L	30	14	6.6	14	L	60	10	6.6
	H	50	13	8.2		H	70	14	6.6
14	L	30	14	6.6	15	L	50	12	8.2
	H	50	11	5.0		H	60	13	5.8
19	L	10	12	9.9	16	L	70	12	5.0
	H	50	20	7.4		H	70	12	5.8
20	L	60	35	6.6	17	L	70	15	5.8
	H	60	30	8.2		H	70	11	5.8
21	L	30	15	6.6	18	L	70	17	5.8
	H	35	15	8.2		H	50	12	5.0
22	L	10	14	6.6	19	L	60	16	5.0
	H	20	15	8.2		H	50	15	6.6
23	L	20	15	8.2	20	L	60	15	7.4
	H	30	15	9.9		H	50	13	8.2
24	L	10	10	9.1	21	L	50	11	8.2
	H	35	10	9.9		H	50	10	8.2
25	L	10	10	9.1	22	L	70	11	8.2
	H	25	10	9.9		H	60	10	8.2
26	L	20	15	9.9	23	L	60	12	8.2
	H	50	16	8.2		H	60	11	6.6
27	L				24	L	60	14	5.8
	H	25	12	8.2		H	50	12	6.6
28	L	10	15	9.1	25	L	50	10	5.8
	H	50	20	7.4		H	60	11	6.6
29	L	20	15	9.1	26	L	60	14	7.4
	H	50	15	8.2		H	60	14	5.8
30	L	30	20	9.9	27	L	60	16	6.6
	H	50	21	7.4		H	60	14	7.4
31	L	50	20	9.1	28	L	60	15	8.2
	H	50	15	6.6		H	70	15	6.6
1 Aug.	L	50	15	9.1	29	L	70	15	8.2
	H	55	15	6.6		H	70	15	5.8
2	L	100	30	8.2	2 Sept.	L	70	25	4.1
	H	50	15	6.6		H	80	25	5.0
3	L	100	20	8.2	3	L	80	28	5.0
	H	70	15	9.1		H	20	20	5.0
4	L	50	15	8.2	4	L	100	20	5.8
	H	55	20	6.6		H	90	20	5.0
5	L	50	15	7.4	5	L	60	20	5.8
	H	70	14	6.6		H	100	20	5.0
6	L	80	15	9.1	6	L	60	18	5.0
	H	90	15	8.2		H	80	18	5.0
7	L	40	10	9.1	7	L	100	20	5.8
	H	50	15	9.9		H	80	20	5.8

unit FTU NaCl ppm

Table App.5.h CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES

at Phu Cuong in 1973 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Conductivity	Date	*	Color	Turbidity	Cl ⁻	Conductivity
30 Jan.	L	60	28	5.0	25	26 Jan.	L	20	18	5.0	35
	H	50	17	5.8	25		H	40	10	5.0	35
31	L	15	7	6.6	30	27	L	40	30	5.0	30
	H	15	88	6.6	40		H	60	27	5.0	65
1 Feb.	L	80	38	6.6	30	28	L	40	20	5.0	30
	H	60	22	9.9	30		H	30	17	5.0	35
2	L	20	8	5.0	35	1 Mar.	L	60	30	5.0	35
	H	60	21	6.6	35		H	50	28	5.0	35
3	L	40	21	6.6	35	2	L	80	32	4.1	35
	H	60	22	6.6	35		H	60	32	5.8	35
4	L	50	22	5.0	30	3	L	80	35	7.4	30
	H	55	22	5.0	30		H	70	35	6.6	35
5	L	60	27	6.6	30	4	L	70	35	7.4	30
	H	45	17	5.0	30		H	90	37	6.6	35
6	L	50	20	6.6	30	5	L	80	40	6.6	35
	H	45	18	5.8	30		H	100	42	8.2	35
7	L	40	18	6.6	30	6	L	100	40	9.9	45
	H	40	18	6.6	35		H	100	40	6.6	35
8	L	60	23	6.6	55	7	L	120	40	6.6	80
	H	55	27	6.6	30		H	100	37	6.6	35
9	L	50	18	6.6	35	8	L	120	47	20.6	70
	H	55	18	5.0	35		H	100	37	21.5	40
10	L	60	22	7.4	40	9	L	80	30	12.3	80
	H	50	18	5.8	30		H	100	36	8.2	50
11	L	65	23	6.6	30	10	L	80	30	7.4	35
	H	55	18	7.4	30		H	100	30	7.4	35
12	L	50	22	7.4	35	11	L	80	37	9.9	40
	H	50	18	8.2	30		H	70	42	10.7	45
13	L	50	22	8.2	35	12	L	40	33	8.2	40
	H	60	25	9.1	40		H	70	27	7.4	55
14	L	60	27	14.1	35	13	L	70	42	18.2	55
	H	60	27	16.5	35		H	70	42	5.0	35
15	L	55	22	8.2	45	14	L	70	32	9.9	35
	H	70	27	14.1	70		H	60	32	9.9	40
16	L	65	25	8.2	35	21	L	40	22	74.2	180
	H	65	25	11.5	45		H	80	32	36.5	120
17	L	80	40	8.2	30	22	L	30	28	115.2	280
	H	60	25	9.9	45		H	60	20	41.0	95
18	L	65	20	8.2	30	23	L	40	20	82.4	70
	H	65	22	9.9	30		H	60	25	21.5	180
23	L	50	20	5.8	30	24	L	60	20	59.4	150
	H	50	30	6.6	35		H	60	25	28.9	80
24	L	60	22	5.0	40	25	L	50	20	71.0	170
	H	50	22	6.6	30		H	60	25	26.4	70
25	L	45	22	5.0	30	26	L	40	17	8.9	100
	H	40	22	5.8	35		H	60	22	29.7	70

unit FTU NaCl 10⁻⁶ U/cm ppm

unit FTU NaCl 10⁻⁶ U/cm ppm

Table App.5.1 CHEMICAL ANALYSIS OF SAIGON RIVER WATER SAMPLES
at Phu Cuong in 1973 by SMWO

Date	*	Color	Turbidity	Cl ⁻	Conductivity	Date	*	Color	Turbidity	Cl ⁻	Conductivity
27 Mar.	L	60	22	40.2	105	15 Apr.	L	20	10	192.1	420
	H	70	27	21.5	75		H	25	10	132.0	300
28	L	60	17	36.9	100	16	L	30	15	231.0	520
	H	60	22	16.5	75		H	30	15	92.4	230
29	L	70	30	12.3	55	17	L	10	10	264.0	590
	H	60	27	36.5	100		H	15	12	94.7	190
30	L	80	32	11.5	40	18	L	50	10	453.0	990
	H	60	23	42.7	115		H	30	15	132.0	780
31	L	80	22	37.2	100	19	L	20	12	154.0	310
	H	80	35	27.2	75		H	25	15	474.4	1000
1 Apr.	L	40	17	36.5	160	20	L	10	8	154.3	340
	H	40	22	49.5	120		H	10	8	305.3	890
2	L	40	20	51.1	140	21	L	20	12	123.4	300
	H	50	25	52.8	145		H	30	10	281.5	600
3	L	40	18	69.3	195	22	L	30	8	165.0	400
	H	60	22	45.5	110		H	10	12	123.4	300
4	L	60	20	99.0	245	23	L	30	12	254.8	720
	H	30	18	82.4	220		H	20	12	99.8	210
5	L	40	20	90.6	240	24	L	40	12	123.4	160
	H	60	20	57.7	160		H	20	10	165.0	350
6	L	40	20	189.8	410	25	L	40	12	115.2	90
	H	40	20	104.8	240		H	20	8	41.2	230
7	L	40	15	78.3	205	26	L	50	12	41.2	50
	H	30	18	99.0	155		H	20	10	132.0	290
8	L	40	16	119.3	290	27	L	60	15	41.2	40
	H	60	18	57.7	150		H	25	10	208.0	350
9	L	30	23	148.5	390	28	L	20	10	288.4	450
	H	40	28	165	220		H	30	10	112.1	230
						29	L	40	10	82.4	190
							H	30	10	236.8	440
						30	L	20	10	289.2	600
							H	25	10	206.2	440

unit FTU NaCl 10⁻⁶g/cm
ppm

Table App.5.j WATER QUALITY DATA OF SAIGON RIVER in 1973 at Phu Cuong

Date	Sampling Depth meters	pH	Alkalinity as CaCO ₃ ppm	Hardness	Turbidity FTU	Colour UNIT	Chloride as NaCl ppm	Iron ppm	Conductivity x 10 ⁻⁶ Ω/cm
5 April	2	5.4	3.0	31.0	25.0	45.0	136.9	0.1	310.0
	8	5.5	4.0	29.0	30.0	50.0	140.2	0.1	330.0
	2	6.1	6.0	6.0	32.0	70.0	8.3	0.1	35.0
	8	6.5	9.0	7.0	38.0	80.0	12.4	0.1	35.0
18	2	5.6	4.0	72.0	32.0	50.0	495.0	0.2	980.0
	6	5.8	5.0	83.0	27.0	40.0	578.0	0.1	1,000.0
25	2	6.0	5.0	12.0	25.0	55.0	53.6	0.1	160.0
	6	5.9	5.0	13.0	38.0	70.0	56.1	0.1	120.0
28	2	6.3	4.0	8.0	25.0	60.0	7.4	0.1	40.0
	8	6.4	5.0	8.0	22.0	50.0	10.7	0.1	45.0
9 May	2	5.7	5.0	20.0	40.0	60.0	78.4	0.1	180.0
	8	5.9	5.0	20.0	42.0	60.0	82.5	0.1	200.0
12	2	6.0	5.0	9.0	42.0	60.0	23.1	0.1	70.0
	5	6.0	6.0	3.0	60.0	100.0	25.8	0.1	70.0
16	2	5.5	5.0	30.0	25.0	55.0	127.0	0.1	310.0
	8	5.4	5.0	35.0	27.0	45.0	128.7	0.1	280.0
19	2	4.8	5.0	52.0	18.0	25.0	288.7	0.1	600.0
	4	5.2	5.0	46.0	15.0	20.0	222.7	0.1	450.0
24	2	5.5	5.0	21.0	32.0	60.0	74.3	0.1	180.0
	2	5.2	5.0	20.0	35.0	70.0	74.3	0.1	180.0
29	2	5.0	4.0	47.0	38.0	55.0	208.5	0.1	400.0
	4	5.0	4.0	46.0	28.0	55.0	214.5	0.1	420.0

by SMNO

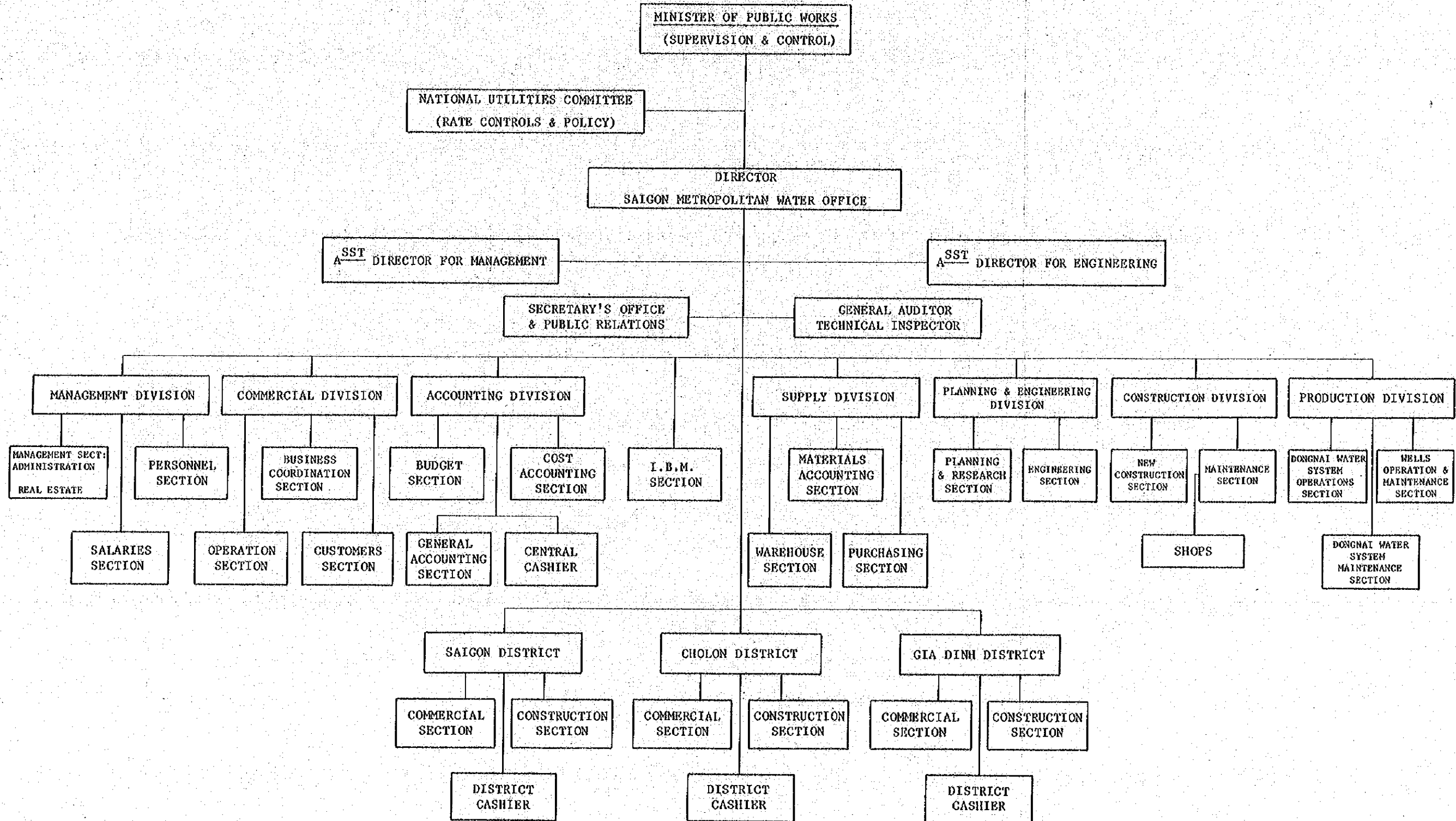


Fig. SAIGON METROPOLITAN WATER OFFICE ORGANIZATION CHART

