7.3-5 Respondent's Profile

Total survey respondents are 67 percent female and 33 percent male. Majority are between the ages of 31 to 50 with household size of not more than five. Almost all female respondents are plain housekeepers equivalent to 43 percent of the total for occupation classification. Seventeen (17) percent are engaged in small private businesses. Others are teachers, laborers, janitors, farmers, etc.

The educational attainment distribution reflects a good literate population. College undergraduates and graduates are 29 percent and 19 percent, respectively. Fourteen (14) percent are high school graduates, while 22 percent are high school undergraduates. Seventy three (73) percent have been living in Cavite since birth. Ninety-eight (98) percent are Catholics. Family income is quite low with 85 percent earning not more than P5,000 per month, the current poverty level.

7.3-6 Present Water Supply System

Primary sources of respondents' drinking water are deep wells and public faucets, equivalent to 54 percent. Neighbor's wells and faucets account for 32 percent, while house connection is only 10 percent. Sixty-eight percent (68) percent of the respondents owned their water source and almost all use the same water source for drinking and other uses.

In terms of water expenses, 38 percent do not pay for their consumption. Half are paying not more than P200 per month. Seventy-eight (78) percent are not aware nor track their water consumption, while 21 percent consume not more than 30 m^3 of water per month.

TABLE 7-1 ESTIMATE OF DOMESTIC WATER DEMAND

BY CALCULATION YEAR (IN MCM/YR.)

City/Municipality	1980	1985	1990	1994
1. Dasmariñas	1.995	3.236	5.248	7.729
2. Indang	0.833	0.939	1.057	1.163
3. GMA	1.391	1.624	1.897	2.148
4. Mendez	0.425	0.461	0.499	0.532
5. Silang	1.399	1.874	2.508	3.168
6. Tanza	0.453	0.538	0.639	0.734
7. Tagaytay City	0.635	0.766	0.923	1.073
8. Amadeo	0.406	0.462	0.526	0.583
9. Magallanes	0.152	0.173	0.196	0.218
10. Maragondon	0.375	0.422	0.475	0.522
11. Ternate	0.107	0.118	0.131	0.143
12. Alfonso	0.668	0.767	0.880	0.983
13. Naic	0.484	0.563	0.654	0.737
14. G.E. Aguinaldo	0.211	0.226	0.242	0.255
15. Carmona	0.181	0.236	0.308	0.381
16. Trece Martirez	0.175	0.237	0.321	0.408
17. General Trias	0.459	0.529	0.610	0.684
Total	10.350	13.171	17.116	21.460

TABLE 7-2 WATER PERMIT GRANTED FOR IRRIGATION FROM DEEPWELLS

	Location	Discharge MCM/yr.	Date Granted
1.	Paradalian, Tanza NIA 120-51-26; 14-19-41	0.082	Oct. 1,1982
2.	Phil. Cutflower Corp. Buck Estate, Alfonso 120-57-04; 14-05-12	0.126	?
3.	Ancient Equipt., Tagaytay	0.02	?
		0.116	?
		0.03	?
4.	Monterey, Gen. Trias	0.315	?
		0.063	?
5.	M. Villalobos, Gen. Trias	0.047	Jan. 29, 1981
6.	Monterey, Gen. Trias	0.032	Dec. 28, 1979
7.	Dynavision, Carmona	1.195	Feb. 14, 1978
8.	R.S.D.G., Maragondon	2.112	Jan. 24, 1978
	Total	131.27	

Source: NWRB Water Right Permits

Note: ? - means assumption that rights were granted during the past 5 years.

Total groundwater discharge for agricultural use = 4.139 million cubic meters per year. (MCM/yr)

TABLE 7-3 ESTIMATE OF GROUNDWATER WITHDRAWAL RATES FOR INDUSTRIAL USE

Municipality/City	1980 & below	1985	1990	1994
1. ALFONSO	9,300	9,300	9,550	9,550
2. CARMONA				
A. Peoples Tech. Complex	-	-	36,035	36,035
B. Grandville Ind'l Complex	-	-	980	4,580
C. Mountain View Ind'l Complex	-	-	-	1,600
D. Outside Ind'l Parks	-	-	13,122	30,712
3. DASMARIÑAS				
A. First Cityland Ind'l Center	-	-	-	540
B. DBB-NHA Ind'l Estate	3,000	11,950	15,150	15,150
C. First Cavite Ind'l Estate	-	-	6,766	30,309
D. Outside Ind'l Estates	-	3,000	106,510	167,010
4. GENERAL TRIAS				
A. New Cavite Ind'l City	-	4,320	-	1,392
B. Gateway Business Park	-	-	-	15,000
C. Outside Ind'l Estate	6,200	6,200	8,760	21,250
5. GMA				
A. GMA - NHA Ind'l Estate	-	-	-	4,950
B. Outside	-	-	-	120,000
6. NAIC	-	720	720	720
7. SILANG	759	759	759	10,115
8. TANZA	-	1,350	13,420	22,670
9. TAGAYTAY	-	-	-	940
10. TRECE MARTIREZ	-	3,100	4,225	7,340
TOTAL (m^3/month)	19,259	40,699	215,997	499,863
TOTAL (MCM/yr)	0.231	0.488	2.591	5.998

Note: Industrial Establishments with a water consumption rate of less than 6 MCM/yr or 16.4 cu.m. per day were excluded except those inside industrial estates.

Table 7-4

WELL DATA SUMMARY

WELL NO.	PGDB NO.	LOCATION MUNICIPALITY/BARANGAY	YEAR COMPLETED	LONGITUDE	LATITUDE	ELEVATION (MASL)	WELL DEPTH (MBGL)	CASING SIZE (mm)	STATIC WATER LEVEL (MBGL)	DISCHARGE (Lps)	CONDUC-TIVITY (uS/cm)	TIME *** Elapsed
E - 1	32624-601	Carmona, Madaya (Motorolla Phil., Inc.)	1990	121 - 03 - 59	14 - 19 - 38	14.0	200	200	6.89 *	17.30	-	24 hrs.
E - 2	32624-602	Carmona, Madaya (Bendix Container, PTC)	1991	121 - 03 - 18	14 - 19 - 17	22.0	152	300	-	12.60	-	-
E - 3		Carmona, Cabilang Baybay, Real Street	1990	121 - 02 - 56	14 - 19 - 08	22.0	21	50	5.50	-	-	-
E - 4	32624-611	Carmona, Cabilang Baybay, Mla. Southwood PS #8	1992	121 - 02 - 30	14 - 18 - 55	23.0	238	250	5.89	26.50	-	-
E - 5		Carmona, Mabuhay, Cityland Dev't. Corp.	1990	121 - 02 - 31	14 - 18 - 39	25.0	180	200	9.46 *	10.00	-	5 hrs.
E - 6		GMA, de Castro, Mandaria Homes Subdivision	1986	121 - 01 - 00	14 - 19 - 24	93.0	180	150	55.78 *	5.00	-	1 hr.
E - 7		GMA, Pulido, Area N GMA-WD PS # 7	1970	121 - 01 - 10	14 - 18 - 57	81.0	210	200x150	59.41 *	20.00	-	24 hrs.
E - 8		GMA, Ulaes, GMA-WD PS #6	1978	121 - 00 - 32	14 - 18 - 41	110.0	120	200	-	20.00	-	-
E - 9		GMA, Memehe, GMA-WD PS #5	1981	121 - 01 - 02	14 - 18 - 21	120.0	138	200	81.33 *	8.60	-	1 hr.
E - 10		GMA, Poblacion Uno, GMA-WD PS #4	1992	121 - 00 - 00	14 - 17 - 56	158.0	138	150x100	87.34 *	3.00	-	5 hrs.
E - 11	32624-605	GMA, San Gabriel, Teacher's Vill. WD PS #3		121 - 00 - 21	14 - 17 - 43	159.0	-	150x100	-	6.70	-	-
E - 12	31621-621	GMA, Area K, GMA-WD PS #1		121 - 01 - 00	14 - 17 - 12	180.0	183	200	76.50	6.60	-	-
E - 13	31621-629	Silang, Phase I Bulihan, NHA PS #1	1982	120 - 59 - 29	14 - 16 - 45	186.0	150	200	43.35 *	8.90	-	3 hrs.
E - 14		Silang, Phase I Bulihan, AFP Housing PS #7	1983	120 - 59 - 46	14 - 16 - 20	198.0	180	200	73.94 *	8.80	-	3 hrs.
E - 15	31621-631	Silang, Phase I Bulihan, AFP Housing PS #4	1983	120 - 59 - 37	14 - 16 - 28	206.0	-	200	72.64 *	-	-	3 hrs.
E - 16		Dasmarinas, Area B, DAS-WD PS #3	1978	120 - 58 - 52	14 - 21 - 40	63.0	183	200	25.61 *	21.40	-	1 hr.
E - 17		Dasmarinas, Burol II,DAS-WD PS #5	1981	120 - 58 - 52	14 - 21 - 10	70.0	183	200	39.91 *	14.50	-	1 hr.
E - 18		Dasmarinas, San Mateo, DAS-WD Well #11	1992	120 - 59 - 20	14 - 20 - 25	90.0	180	-	44.81 *	18.40	-	1 hr.
E - 19		Dasmarinas, Luzviminda, DAS-WD PS #9	1992	120 - 59 - 16	14 - 19 - 53	98.0	177	200	42.70 *	8.50	-	1 hr.
E - 20		Dasmarinas, San Antonio de Padua, DAS-WD PS #18	1992	120 - 58 - 12	14 - 19 - 29	106.0	107	250	30.80 *	9.70	-	1 hr.
E - 21	31621-603	Dasmarinas, Pala Sampaloc, Mla. Mem. Park	1992	120 - 58 - 32	14 - 17 - 45	155.0	240	300	51.29 *	20.80	-	-
E - 22	31621-628	Silang, Biga, Silang WD PS #6	1993	120 - 58 - 30	14 - 15 - 03	255.0	108	200	65.91 *	7.50	-	6 hrs.
E - 23	31621-625	Silang, Poblacion I, Silang WD PS # 4	1986	120 - 58 - 08	14 - 13 - 28	310.0	198	300	78.51 *	12.60	-	2 hrs.
E - 24	31621-633	Silang, Lucsuhin, Silang WD PS #2	1983	120 - 57 - 57	14 - 12 - 50	330.0	246	200	68.81 *	8.50	-	1 hr.
E - 25		Amadeo, Poblacion 6, Level III Water System	1960	120 - 55 - 22	14 - 10 - 20	435.0	72	100	58.00	-	-	-
E - 26		Amadeo, Poblacion 8, Level III Water System	1990	120 - 55 - 10	14 - 10 - 15	426.0	75	150	45.90 *	1.20	-	20 min.
E - 27		Amadeo, Poblacion 12, Level III Water System	1959	120 - 54 - 58	14 - 10 - 19	420.0	193	200	60.00	9.40	-	-
E - 28		Amadeo, Poblacion 1, Level III Water System	1984	120 - 55 - 21	14 - 09 - 50	462.0	90	150	65.63 *	0.90	-	20 min.
E - 29		Amadeo, Loma, Level III Water System	1960	120 - 55 - 40	14 - 09 - 16	490.0	76	100	49.83 *	1.12	-	3 hrs.
E - 30		Tagaytay, Sungay East, Level III Water System	1993	120 - 59 - 40	14 - 07 - 42	585.0	140	300	81.60	1.80	-	-
E - 31		Tagaytay, Sungay East, Picnic Grove Resort	1992	120 - 59 - 04	14 - 07 - 35	587.0	122	150	83.00	2.70	-	-
E - 32		Tagaytay, Kaibagal South, RFM Well #4	1985	120 - 55 - 59	14 - 06 - 50	618.0	183	250	91.46	-	-	-
E - 33	31622-602	Tagaytay, Kaibagal South, RFM Well #3	1977	120 - 55 - 55	14 - 06 - 33	625.0	214	250	91.46	-	-	-
E - 34		Tagaytay, Kaibagal South, RFM Well #5	1987	120 - 55 - 43	14 - 06 - 35	630.0	335	300	91.46	-	-	-
E - 35	31622-601	Mendez, Poblacion 8, Mendez WD Well Source	1992	120 - 54 - 12	14 - 07 - 30	530.0	244	200	87.50	10.00	-	-
E - 36		Mendez, Poblacion 2 Level I Water System	1986	120 - 54 - 05	14 - 07 - 59	510.0	103	100	-	0.90	-	-
E - 37		Mendez, Poblacion 7 Level I Water System	1992	120 - 54 - 04	14 - 08 - 11	502.0	98	100	68.00	0.87	-	-
E - 38		Mendez, Cerca I Anuling, Elem. Sch. Compound	1960	120 - 53 - 20	14 - 07 - 55	505.0	114	100	90.00	-	-	-
E - 39		Mendez, Cerca II Anuling, Level II Water System	1991	120 - 53 - 08	14 - 07 - 51	500.0	100	100	-	1.30	-	-
E - 40		Mendez, Palocpoc, Level III Water System	1985	120 - 52 - 40	14 - 07 - 40	493.0	140	150	70.00	4.40	-	-
E - 41		Alfonso, Esperanza, Level II Water System	1960	120 - 52 - 05	14 - 07 - 50	460.0	66	100	45.70	-	-	-
E - 42		Alfonso, Esperanza Ibaba, Level II Water System	1957	120 - 52 - 10	14 - 07 - 29	484.0	100	100	67.80	1.00	-	-
E - 43		Alfonso, Esperanza Ilaya, Level II Water System	1990	120 - 52 - 25	14 - 07 - 15	501.0	102	100	67.10	1.00	-	-

Table 7-4
WELL DATA SUMMARY (con't.)

WELL NO.	PGDB NO.	LOCATION MUNICIPALITY/BARANGAY	YEAR COMPLETED	LONGITITUDE	LATITUDE	ELEVATION (MASL)	WELL DEPTH (MBGL)	CASING SIZE (mm)	STATIC WATER LEVEL (MBGL)	DISCHARGE (Lps)	CONDUC-TIVITY (uS/cm)	TIME *** Elapsed
E - 44	31672-603	Alfonso, Amoyon, SMC Training Center	1990	120 - 51 - 30	14 - 04 - 20	630.0	158	250	101.22	1.30	-	-
E - 45		Alfonso, Marahan I, Level III Water System	1959	120 - 50 - 42	14 - 07 - 58	420.0	33	100	21.34	-	-	-
E - 46		Alfonso, Paje, Level II Water System	1991	120 - 51 - 42	14 - 08 - 25	433.0	46	100	19.50 *	1.00	-	1 hr.
E - 47		Alfonso, Paje, Level III Water System	1960	120 - 51 - 20	14 - 08 - 38	410.0	65	100	19.01 *	-	-	30 min.
E - 48		Magallanes, Medina, Level III Water System	1992	120 - 47 - 48	14 - 08 - 00	310.0	60	100	12.59 *	-	-	30 min.
E - 49		Magallanes, Baliuag, Level II Water System	1992	120 - 47 - 18	14 - 08 - 59	250.0	70	100	-	-	-	-
E - 50		Magallanes, Baliuag, Level II Water System	1992	120 - 46 - 58	14 - 09 - 30	228.0	39	100	27.37 *	-	-	2 hrs.
E - 51		Magallanes, Beadita I, Furious Piggery Farm	1985	120 - 45 - 03	14 - 09 - 50	191.0	42	100	21.98	-	-	-
E - 52		Magallanes, Urdaneta, Level II Water System	1992	120 - 43 - 37	14 - 09 - 51	220.0	36	100	25.61 *	-	-	3 hrs.
E - 53		Magallanes, S. Agustin, Level III Water System	1992	120 - 43 - 30	14 - 10 - 20	220.0	36	100	24.43 *	0.89	-	1 hr.
E - 54		Magallanes, Poblacion 4, Level II Water System	1992	120 - 45 - 03	14 - 11 - 18	170.0	70	100	27.14 *	1.30	-	20 min.
E - 55		Magallanes, Poblacion 2, Level III Water System	1992	120 - 45 - 23	14 - 11 - 25	163.0	32	100	25.64	-	-	-
E - 56		Gen. Aguinaldo, Kaypaaba (Handpump)	1963	120 - 47 - 26	14 - 10 - 51	218.0	35	100	18.29	Abandoned	-	-
E - 57		Gen. Aguinaldo, Poblacion 4 (Handpump)	1990	120 - 47 - 42	14 - 11 - 20	200.0	66	50	36.65	-	-	-
E - 58		Gen. Aguinaldo, Lumipa, Piggery Farm	1994	120 - 47 - 02	14 - 12 - 05	170.0	100	100	41.25 *	2.00	-	30 min.
E - 59		Gen. Aguinaldo, Lumipa, Level III Water System	1193	120 - 47 - 00	14 - 12 - 30	155.0	60	100	43.28 *	-	-	30 min.
E - 60		Indang, Poblacion, Don Severino Agri. College	1980	120 - 52 - 40	14 - 11 - 53	294.0	150	200	16.76	-	-	-
E - 61		Indang, Kaytapos, Level III Water System	1962	120 - 53 - 02	14 - 11 - 46	308.0	36	100	19.00	1.00	-	-
E - 62		Indang, Aluloid, Level III Water System	1980	120 - 53 - 28	14 - 11 - 54	312.0	100	150	20.74 *	-	-	1 hr.
E - 63		Indang, Agos-os, Level III Water System	1985	120 - 51 - 29	14 - 13 - 26	213.0	100	150	31.00 *	-	-	2 hrs.
E - 64		Indang, Calumpang Lejos Level III Water System	1960	120 - 50 - 58	14 - 13 - 26	185.0	100	150	-	1.20	-	-
E - 65		Indang, Calumpang Lejos Level III Water System	1960	120 - 50 - 39	14 - 14 - 20	160.0	90	100	36.58 *	-	-	15 min.
E - 66		Gen Trias, Javalera, Gateway Holdings PS #5	1990	120 - 54 - 42	14 - 15 - 51	178.0	152	250	5.00	7.50	-	-
E - 67	31621-623	Gen Trias, Javalera, Gateway Holdings PS #4	1992	120 - 53 - 05	14 - 15 - 59	182.0	200	250	17.32 *	10.30	-	24 hrs.
E - 68	31621-635	Trece Martirez, Cabezas, La Paz Homes Subd.	1993	120 - 53 - 15	14 - 16 - 32	143.0	244	250	14.28 *	12.50	-	4 hrs.
E - 69		Trece Martirez, Inocencio, Level III Water Sys.	1985	120 - 52 - 28	14 - 16 - 05	144.0	40	100	30.46 *	0.89	-	20 min.
E - 70		Trece Martirez, Luciano, Level III Water System	1979	120 - 52 - 10	14 - 16 - 28	128.0	50	100	30.85 *	1.30	-	20 min.
E - 71		Trece Martirez, Hugo Perez, Level III Water Sys.	1980	120 - 53 - 30	14 - 17 - 10	135.0	-	100	23.51 *	-	-	30 min.
E - 72		Gen. Trias, Manggahan, Level III Water System	1960	120 - 54 - 42	14 - 17 - 35	118.0	-	100	13.23 *	-	-	24 hrs.
E - 73		G. Trias, S. Francisco, SM Campofrio Corp. PS#2	1992	120 - 55 - 01	14 - 17 - 39	120.0	152	200	24.97 *	12.30	-	24 hrs.
E - 74		Gen Trias, Buenavistas, Level III Water System	1985	120 - 54 - 05	14 - 18 - 28	98.0	150	200	20.25 *	-	-	30 min.
E - 75		Trece Martirez, Lapidario, Level III Water Sys.	1991	120 - 51 - 48	14 - 17 - 04	120.0	-	200	-	-	-	-
E - 76	31621-636	Trece Martirez, Cabuco, Don Bosco Exec. Village	1993	120 - 50 - 45	14 - 17 - 18	82.0	182	200	-	-	-	-
E - 77		Trece Martirez, Cabuco, Level III Water System	1981	120 - 50 - 25	14 - 17 - 30	80.0	40	100	21.34	0.95	-	-
E - 78		Naic, Palangue, Level III Water System	1992	120 - 43 - 36	14 - 16 - 56	69.0	42	100	22.38 *	-	0.618	20 min.
E - 79		Maragondon, Tulay Silangan (Hand Pump)	1960	120 - 46 - 08	14 - 16 - 17	53.0	52	100	24.08 *	-	0.420	24 hrs.
E - 80	31621-624	Maragondon, Bucal 4, Maragondon WD Well #2	1990	120 - 45 - 58	14 - 16 - 30	35.0	70	250	22.51 *	16.00	0.550	24 hrs.
E - 81		Maragondon, Bucal 2 (Hand-pump)	1960	120 - 45 - 21	14 - 16 - 35	30.0	50	100	16.69 *	-	0.569	5 hrs.
E - 82		Maragondon, Bucal 1 (Hand-pump)	1993	120 - 44 - 50	14 - 16 - 30	25.0	6	50	2.11	-	0.374	-
E - 83		Maragondon, Poblacion 1, Maragondon WD Well #1	1987	120 - 44 - 04	14 - 16 - 30	19.0	120	150	5.77	14.00	0.499	-
E - 84		Ternate, Canuyan, NAPOCOR Compound	1980	120 - 44 - 33	14 - 16 - 59	11.0	100	200	3.76 *	-	0.608	24 hrs.
E - 85		Ternate, Poblacion 1B, Mun. Hall Compound	1984	120 - 43 - 03	14 - 17 - 12	6.0	18	50	-	-	0.484	-
E - 86		Ternate, Poblacion 2, (Hand pump)	1986	120 - 42 - 49	14 - 17 - 22	3.0	12	50	-	-	0.522	-
E - 87		Ternate, Sapang 2, (Hand pump)	1994	120 - 42 - 25	14 - 16 - 50	6.0	32	50	3.66	-	0.421	-

Table 7-4

WELL DATA SUMMARY (con't.)

WELL NO.	PGDB NO.	LOCATION MUNICIPALITY/BARANGAY	YEAR COMPLETED	LONGITUDE	LATITUDE	ELEVATION (MASL)	WELL DEPTH (MBGL)	CASING SIZE (mm)	STATIC WATER LEVEL (MBGL)	DISCHARGE (Lps)	CONDUC-TIVITY (mS/cm)	TIME *** Elapsed
E - 88		Ternate, Comsadag, Puerto Azul, Comsadag PS	1980	120 - 41 - 15	14 - 16 - 45	23.0	46	300	25.18 *	-	0.427	20 min.
E - 89		Ternate, Puerto Azul, Palicpican PS #1	1980	120 - 40 - 58	14 - 16 - 33	8.0	46	250	-	6.00	0.390	-
E - 90	31624-602	Ternate, Puerto Azul, Palicpican PS #3	1993	120 - 40 - 42	14 - 16 - 12	37.0	100	200	-	5.00	0.330	-
E - 91		Ternate, Puerto Azul, Cayaubic PS	1980	120 - 40 - 17	14 - 16 - 42	16.0	60		-	6.31	1.944	-
E - 92		Ternate, San Juan B. (Hand Pump)	1985	120 - 43 - 41	14 - 17 - 55	3.0	9	50	1.83	-	0.387	-
E - 93		Ternate, San Juan (Hand Pump)	1992	120 - 43 - 58	14 - 18 - 22	3.0	15	50	-	-	0.546	-
E - 94		Ternate, San Miguel Capuzaan (Hand Pump)	1990	120 - 44 - 20	14 - 17 - 50	6.0	33	50	-	-	0.394	-
E - 95		Maragondon, San Miguel, (Shallow Well)	1994	120 - 44 - 42	14 - 17 - 20	19.0	30	50	6.00	-	0.442	-
E - 96		Naic, Muzon (Shallow Well)	1970	120 - 45 - 12	14 - 17 - 45	21.0	18	50	-	0.20	0.338	-
E - 97		Naic, Malainin Bago, (Shallow Well)	1984	120 - 45 - 45	14 - 18 - 15	20.0	24	50	-	0.40	0.524	-
E - 98		Naic, San Roque, (Shallow Well)	1974	120 - 46 - 03	14 - 18 - 45	16.0	24	50	-	-	0.513	-
E - 99		Naic, Sapa, Bangcaan Elem. Sch. (Shallow Well)	1987	120 - 46 - 15	14 - 19 - 28	2.5	18	50	1.41 *	-	0.588	1 hr.
E - 100		Naic, Ibayong Silangan, Naic Public Market	1991	120 - 45 - 00	14 - 19 - 15	12.0	24	50	9.00	-	0.546	-
E - 101		Naic, Sabang (Hand Pump)	1989	120 - 47 - 18	14 - 19 - 01	21.0	25	50	-	-	0.639	-
E - 102		Naic, Ibayan Silangan (Hand Pump)	1970	120 - 46 - 40	14 - 19 - 18	18.0	30	50	-	-	0.579	-
E - 103		Naic, Ibayo, Villa Apolonio Subdivision	1994	120 - 46 - 35	14 - 19 - 45	11.0	60	100	-	-	0.625	-
E - 104		Naic, Timalan Concepcion, Spheres Metal Craft	1982	120 - 46 - 53	14 - 19 - 58	10.0	21	50	-	-	0.700	-
E - 105		Naic, Munting Mapino, Coastal Homes Subd.	1986	120 - 46 - 40	14 - 20 - 10	10.0	18	50	-	-	0.606	-
E - 106		Naic, Timalang Xanluran (Hand Pump)	1980	120 - 46 - 45	14 - 20 - 30	9.0	36	50	-	-	1.052	-
E - 107		Naic, Timalang Concepcion (Shallow well)	1994	120 - 47 - 30	14 - 20 - 40	12.0	30	75	-	-	0.692	-
E - 108		Tanza, Calibuyo Bgy. Hall (Hand Pump)	1983	120 - 48 - 30	14 - 21 - 38	11.0	24	50	-	-	0.565	-
E - 109		Tanza, Halayhay, Premium Packaging Int'l Inc.	1986	120 - 48 - 41	14 - 22 - 27	6.0	90	250		15.00	0.497	6 hrs.
E - 110		Tanza, Sahud Ulan (Hand Pump)	1991	120 - 49 - 12	14 - 22 - 18	9.0	12	50	-	-	0.681	-
E - 111		Tanza, Amaya (Shallow well)	1992	120 - 50 - 12	14 - 22 - 55	12.0	15	50	-	-	0.467	-
E - 112		Tanza, Daang Amaya I. Tanza WD Well Source	1992	120 - 51 - 08	14 - 23 - 39	10.0	118	250	5.40 *	28.63	-	10 hrs.
E - 113		Tanza, Molawin (Hand Pump)	1990	120 - 51 - 10	14 - 23 - 00	11.0	18	50	-	-	0.911	-
E - 114		Tanza, Sanja Mayor (Shallow Well)	1984	120 - 51 - 11	14 - 22 - 35	17.0	36	50	-	-	0.893	-
E - 115		Tanza, Biga (Hand Pump)	1965	120 - 51 - 11	14 - 21 - 58	21.0	30	50	-	-	0.765	-
E - 116		Tanza, Punta (Hand Pump)	1966	120 - 51 - 28	14 - 21 - 10	22.0	72	50	-	-	0.725	-
E - 117		Silang, Puting Kahoy (Hand Pump)	1957	121 - 01 - 35	14 - 12 - 56	225.0	100	100	57.00	0.25	-	-
E - 118		Silang, Lalaan I, Level III Water System	1993	120 - 57 - 31	14 - 10 - 40	415.0	90	150	27.80 *	5.6	-	24 hrs.
E - 119		Silang, Lalaan I, Dug Well	1988	120 - 57 - 34	14 - 11 - 12	395.0	23	1000	11.72 *	-	-	-
E - 120		Amadeo, Tamakan, Level III Water System	1982	120 - 55 - 34	14 - 13 - 08	300.0	80	150	20.79 *	2.56	-	20 min.
E - 121		Dasmarinas, Salitran,St. Anthony Subd.	1982	120 - 56 - 38	14 - 20 - 46	61.0	150	200	22.56	18.93	-	-
E - 122		Dasmarinas, Salitran, South Meridian Subd.	1981	120 - 56 - 49	14 - 21 - 33	50.0	300	300x200	16.77	-	-	-
E - 123		Dasmarinas, Salitran, DA-RA Subdivision	1986	120 - 56 - 05	14 - 21 - 38	48.0	120	150	9.76	9.46	-	-

* Measurements conducted sometime in October 1994

** Measured during the survey otherwise data is taken from pumping test data

*** Elapsed time when measurements was taken after the pump was shut-off

TABLE 7-5

LIST OF INDUSTRIAL ESTABLISHMENTS IN THE STUDY AREA

ALFONSO, CAVITE	PRODUCT	NO. OF EMPLOY.	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
A1. MONTEREY FARM CORP. Buck Estate, Alfonso	Swine, cattle, processed meat	102	20 cat./d 500 hogs/d	0.068	Private DW	1980	0.054
A2. PHIL. CUTFLOWERS CORP. Buck Estate, Alfonso	Cutflowers, roses	25		0.003	Private DW		0.002
A3. SMC MAGNOLIA DAIRY FARM Amuyong, Alfonso	Fresh cow's milk, cattle feeder stocks	86	5,000 hds	0.104	Private DW	1965	0.084
A4. SMC MAGNOLIA POULTRY FARM, Amuyong, Alfonso	Hatching eggs, poultry	64		0.004	Private DW		0.003
		277		0.179			0.143

CARMONA, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
B1. PEOPLE'S TECHNOLOGY COMPLEX					PTC DW	1988	
1. ALMAZORA MOTORS CORP.	Bus and trucks body	54		0.005	PTC DW		0.004
2. AVSL GARMENTS, INC.	Ladies wear, denim pants, jogging suits			0.006	Private DW		0.005
3. AUKURAYA FOOD PHILS. INC.	Tofu and aburage			0.004	Private DW		0.003
4. BAVARIA FOODS CORP.	Processed meat	90	1,080	0.011	Private DW		0.004
5. BENAMI MFG. CORP.	Parts and steel fab.			0.004	Private DW		0.003
6. BENDIX CONTAINERS MFG. CORP.	nets, sacks	157		0.005	Private DW		0.004
7. CHUAYUCO STEEL MFG. CORP.	Galv. roofing mat'l. and steel products	110	25,200	0.360	Private DW	1992	0.002
8. CONSOLIDATED ADHESIVES INC.	Stickwel and white glue			0.004	Private DW		0.003
9. HD (HONGDRILL) ENG'G. EQPT. INC.	Rock & soil drill eqpt, and water well/pileboring	43		0.007	PTC DW		0.006
10.H.S. CRAFT MFG CORP. INC.	Christmas lights	57		0.000	PTC DW		0.000
11.HANEDA CORP.	PC comp, Al diecast-radar scanner & auto mach part	101		0.004	Private DW		0.003
12.HI-PRECISION STEEL CENTER INC.	Special steel products	57	28,800	0.029	PTC DW	1988	0.024
13.HI-TOYS PHILS., INC./ ARTIF. PLANTS INC.	Stuffed toys and artificial plants	214		0.003	PTC DW		0.002
14.INTEGRATED TRADE BONDERS	Tire recapping			0.001	Private DW		0.001
15.I-SHENG FOODS INC.	Coconut water, buko juice	36		0.009	Private DW		0.007
16.ITALPINO CO. PHILS. INC.	Christmas trees, ornaments			0.003	Private DW		0.002
17.J.P. AOKI RUBBER PHILS. INC.	Rubber products	98		0.028	PTC DW	1992	0.022
18.NEW POLYTEX INT'L. CORP	Kitchen & bath. fixtures	315		0.014	Private DW	1988	0.012
19.NEW RISE MFG AND DEV'T. CORP.	Ceramics and gift items	8		0.001	Private DW		0.000
20.NISHINO LEATHER IND., INC.	Tanned pigskin, garments	385	828	0.006	Private DW & PTC DW		0.005
21.NORTHWEST PHILS. ELEC'L. MFG. CO., INC.	Christmas lights and decorative bulbs	122		0.004	Private DW		0.003
22.ONDA BUTTON SELLING (PHILS.) INC	Fashion buttons, kitchen /kitchen fixtures	220	720	0.025	Private DW	1988	0.020
23.PHICO INTERNATIONAL	Gift and novelty items	144		0.018	PTC DW		0.014
24.PHILMETAL PRODUCTS, INC.	Rollformed pre-painted sheets, GI sheets	69		0.000	Private DW		0.000
25.PHIL. NAGANO SEIKO INC.	Reduction gear & gearbox cases	99		0.005	Private DW		0.004
26.PIGMENTEX INC.	Aluminum paste	20		0.002	Private DW		0.001
27.PINTAR INT'L. CORP.	Bone China gifts & & decorative access.			0.001	PTC DW		0.001
28.PROTEX PRODUCTS, INC.	Latex exam'n. gloves	52		0.002	Private DW		0.002
29.QUALITY HATS AND BAGS	Baseball caps, headgear	1017		0.001	Private DW		0.001
30.R.I.L. INDUSTRIES, INC.	Knitted t-shirts, cotton jeans/pants	55		0.002	Private DW		0.002
31.ROHM ELECTRONICS CORP.	M'comput., resistors, IC, molds, dies, parts	800		0.180	Private DW	1990	0.009

TABLE 7-5

LIST OF INDUSTRIAL ESTABLISHMENTS IN THE STUDY AREA (con't.)

CARMONA, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
32.ROMAR JEAN STAR PHILS. INC.	Garments			0.004	Private DW		0.003
33. SAN JOSE CABINET MFG., INC.	Kitchen cabinets and standard furnitures	32		0.000	PTC DW		0.000
34.SANOH FULTON PHILS.				0.002	Private DW		0.001
35.SEFA ASIA, INC.	Aircraft comp., fab. or aeronautical products	24		0.002	Private DW		0.001
36.SIN HENG CHAN PHILS. INC.	Prawn feeds	13		0.005	Private DW		0.004
37.SMOOTH LINE PHILS. INC.	Electronic devices			0.011	PTC DW		0.009
38.STAR PACKAGING	Plastic manufacturing			0.002	Private DW		0.001
39.STRONG INT'L. PHILS. INC.	Slippers	259		0.008	PTC DW		0.006
40.SYNBER MFG. CORP.	Recycled plastic resin & plastic bags	7		0.001	Private DW		0.001
41.TOP GRAND MFG. CORP.	Garments & knitted hats	10		0.004	Private DW		0.003
42.TSAO MFG CORP.	Christmas lights, bulbs, decor sets	77		0.004	Private DW		0.003
43.ULRICH INC.	Furniture beds			0.002	Private DW		0.001
44.VALERIE PRODUCTS MFG. CO.	Metal fabrication	126		0.002	PTC DW		0.002
45.YULETIDE ELECTRIC CREATION PHILS. INC.	Christmas and decorative light	30		0.002	Private DW		0.001
		4,901		0.446			0.208
B2. GRANDVILLE IN'L. COMPLEX					Complex DW	1990	
1. EVER RISE CERAMICS	Porcelain figurines	420		0.016	Complex DW	1992	0.013
2. KOU FU COLOR PRINTING CORP.	Printing of pack'g mat'ls.	31		0.001	Complex DW		0.001
3. PHIL. ELECTRIC WIRES & CABLES MFG. CORP.	Electric wires/cables for Christmas lights	33		0.001	Complex DW		0.001
4. SCORE MFG. CORP.	Stuffed toys			0.001	Complex DW		0.001
5. SENGA PHILS. INC.	Garments	500		0.021	Complex DW	1994	0.017
6. SUN YOUNG PHILS. INC.	Plastic chair base. chair arm, etc.	34		0.002	Complex DW		0.001
7. ZILOG PHILS. INC.	Semiconductor devices			0.006	Complex DW	1993	0.005
		1,018		0.049			0.039
B3. MOUNTAIN VIEW INDUSTRIAL COMPLEX (20 HECTARES) (11 locators to date)		(part. filled)		0.019	2 deepwells		0.015
OUTSIDE INDUSTRIAL COMPLEX							
B4. AC RAFTEL CORP. Bangkal, Carmona	Wood and metal furniture	193		0.012	Private DW	1990	0.010
B5. BEST CHEM'LS & PLASTICS INC., Maduya, Carmona	Cast polypropylene, adhesives, masking tapes	155		0.346	Private DW	1990	0.276
B6. EXITO ELECTRONICS CO. PHILS. INC.	Extension cords	400	14.4 M pcs	0.032	Private DW	1992	0.026
B7. GLOBAL LIGHTING PHILS. CORP. (1991)	Decorative/household electric bulbs	540	1.0 M pcs	0.068	Private DW	1991	0.055
B8. L. SOFTWOOD PRODUCTS Mabuhay, Carmona	Popsicle sticks, chopsticks, toothpicks	58		0.005	Private DW	1990	0.004
B9. LEADER GARMENTS Maduya, Carmona	Garments	368		0.018	Private DW	1990	0.014
B10. PILIPINAS ACTIVATED CARBON MFG CO INC, Mabuhay	Activated Carbon	49	240 MT	0.036	Private DW	1989	0.029
B11. TITAN MEGA BAGS IND'L. CORP.	Big and mega bags	87	900 MT	0.018	Private DW	1991	0.014
B12. TITAN MEGA TILES IND'L. CORP., Mabuhay, Carmona	PVC floor tiles	50	0.81 M pcs	0.018	Private DW	1993	0.014
		1,900		0.553			0.443

TABLE 7-5

LIST OF INDUSTRIAL ESTABLISHMENTS IN THE STUDY AREA (con't.)

DASMARINAS, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
C1. FIRST CITYLAND IND'L. CENTER Bgy. Langkaan, Dasmarinas					FCIC DW		
1. CONSTRUCTION DECKING SYSTEM	Decking panels for high rise bldgs.	14		0.002	FCIC DW		0.001
2. FERMATTA GARMENTS INC.	Polo and pajama garments	70		0.003	FCIC DW		0.003
3. FUJI WOODCRAFT	Woodcraft	25		0.002	FCIC DW		0.001
		109		0.007			0.005
C2. DBB - NHA IND'L. ESTATE Bagong Bayan, Dasmarinas					DBB-NHA DW		
1. BERLET HESTIA PHILS. INC.	Ladies apparel (brassieres sports wear, etc.)	856		0.036	DBB-NHA D	1978	0.029
2. DASMARINAS GARMENTS CORP.	Coats and jackets	895		0.038	DBB-NHA D	1982	0.031
3. MERIDIAN GARMENTS MFG. CORP.	Garments			0.012	DBB-NHA D	1985	0.010
4. SANITARY STEAM LAUNDRY	Laundry/dry cleaning services	238	8,400 pcs	0.119	DBB-NHA D	1982	0.095
		1,989		0.206			0.165
C3. FIRST CAVITE INDUSTRIAL ESTATE Bgy. Langkaan, Dasmarinas					FCIE DW (2 units)	1990	
1. ARTE WELL DRILLERS	Drilling			0.001	Deepwell		0.001
2. BLUESTAR CONSTRUCTION	Construction services			0.002	Deepwell		0.002
3. CAMBRIDGE ELECTRONICS	Printed circuit boards	44		0.049	Deepwell	1993	0.039
4. E.C.E. CONSTRUCTION	Construction services			0.002	Deepwell		0.001
5. HEIJI GARDEN INC.	Service			0.004	Deepwell		0.003
6. ISHIDA PHILS. GRATING INC.	Various grating steel products	49	2,160	0.006	Deepwell	1993	0.005
7. JP APPAREL	Garments	84		0.005	Deepwell		0.004
8. KAKUDAI (PHILS.) INC.	Faucets and valves	45		0.002	Deepwell		0.001
9.KANLAON CONSTRUCTION	Construction			0.002	Deepwell		0.002
10.KLT FRUITS	Processed tropical fruits	335		0.028	Deepwell	1992	0.022
11.KYUNG-IL	Textile & yarn, knitted sweaters	528	1,800	0.012	Deepwell	1992	0.010
12.LES GANTS PHILS. INC.	Various types of gloves	341	1.0 M pcs	0.011	Deepwell	1993	0.008
13.NEW EK LEE CONSTRUCTION	Construction			0.002	Deepwell		0.001
14.PHIL. ARTS AND CRAFTS	Handicrafts			0.001	Deepwell		0.000
15.PIDCO CONSTRUCTION	Construction			0.002	Deepwell		0.001
16.R.C.V CONSTRUCTION	Construction			0.003	Deepwell		0.003
17.S & J INDUSTRIES	Plastic & metal parts, mold dyes	18		0.002	Deepwell		0.002
18.SUN ACE INDUSTRIES	Leather goods, fashion access. & textile apparel	399	0.72 M pcs	0.037	Deepwell	1993	0.029
		1,843		0.170			0.135
OUTSIDE INDUSTRIAL ESTATE							
C4. COCA COLA BOTTLERS CORP., Burol Main	Carbonated drinks			0.144	Private DW	1989	0.115
C5. EUROMED LABORATORIES (1990), Bucal, Dasma.	Dextrose	294	11,520 m3	0.090	Private DW	1990	0.009
C6. FILKOR INTL. FOOD CORP. Palapala, Dasmarinas	Peanuts, choco balls	40		0.006	Private DW	1992	0.005
C7. FINETEX SPINNING MILLS INC, Palapala, Dasma.	Yarn	149		0.720	Private DW	1992	0.576
C8. HELLA PHILS. INC. Malinta, Dasmarinas	Automotive lights, signal equipment	133		0.006	Private DW		0.005
C9. JESSY AGRI ENTERPRISES Langkaan, Dasmarinas	Hogs	6	170 hds	0.003	Private DW		0.002
C10. KEANSBURG BREWERY Malinta	Beverages			0.072	Private DW	1991	0.058

TABLE 7-5

LIST OF INDUSTRIAL ESTABLISHMENTS IN THE STUDY AREA (con't.)

DASMARINAS, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
C11. MONTEREY MEAT PLANT CORP., Langkaan, Dasma.	Live & carcass sales for hogs/cattle, proc. meat	200		0.068	Private DW	1988	0.054
C12. REYNOLDS PHILS. CORP. (1988), San Agustin	Aluminum sheets and foils	591		0.014	Private DW	1981	0.011
C13.SAFFRON PHILS., INC. Paliparan, Dasmarinas	Dyed and finished textile fabrics and yarn		2,484	1.080	Private DW	1990	0.518
C14.SAN JOSE GARMENTS CORP. San Jose, Dasmarinas	Garments, coats, jackets	200		0.864	Private DW	1992	0.691
C15.SELF-DESIGNS INTL. INC. Langkaan, Dasmarinas	Woodcrafts, baskets	10		0.001	Private DW		0.001
		1,623		2.210			1.706

GMA, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
D1. GMA - NHA INDUSTRIAL ESTATE							
1. GMA MFG. INC.	Pressed metal enclosure units	90		0.005	Private DW		0.004
2. R.I.L. INDUSTRIES INC.	Garments	795		0.014	Private DW	1991	0.012
3. SOUTHERN STEAM LAUNDRY INC.	Laundry services	70		0.040	Private DW	1993	0.032
		955		0.059			0.048
OUTSIDE INDUSTRIAL ESTATE							
D2. LAKEVIEW IND'L. CORP. Kabilang Baybay, GMA	Polyester filament yarn fiber	109	10,800	1.440	Private DW cooling(2)	1980	1.152
		109		1.440			1.152

GEN. TRIAS, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
E1. NEW CAVITE INDUSTRIAL CITY					NCIC DW		
1. METAL FORMING CORP.	Insul'd sandwiched panels, pre-eng'd metal bldg syst	146		0.007	NCIC DW		0.006
2. NEW LIFE INDUSTRIAL CORP.	Plastic houseware products	27		0.004	NCIC DW	1993	0.003
3. SHEENA FARMS, INC.	Fresh mushrooms	7		0.002	NCIC DW		0.001
4. SUN SAVER TECH & MFG CORP.	Solar hot water systems	5		0.001	NCIC DW		0.001
5. VINCENT GARMENTS	Garments	48		0.003	NCIC DW		0.002
E2. GATEWAY BUSINESS PARK Javalera, Gen. Trias						1993	
1. ASAHI OPTICAL CAVITE PHILS. CORP.	High index opthalmic lenses	181		0.090	Private DW	1993	0.072
2. TOKUMI ELECTRONICS PHILS., INC.	Head phone assembly, speakers & microphone	836		0.090	Private DW	1993	0.072
		1,017		0.180			0.144
OUTSIDE INDUSTRIAL COMPLEX							
E3. ASIA'S CRAFTS AND GARMENTS	Garments	830		0.040	Private DW		0.032
E4. INDOCOIL PHILS. CORP. De Fuego, Gen.Trias	Mosquito coils	133		0.007	Private DW	1990	0.005
E5. INSTAFOOD CORP OF THE PHILS, De Fuego	Nata growing farm	40		0.005	Private DW	1993	0.004
E6. JE LIVESTOCK CORP. San Francisco, G. Trias	Livestock			0.087	Private DW	1992	0.070
E7. KINETICS INTL VENTURES CO, INC, San Francisco	Emergency light, air pot	58		0.003	Private DW	1993	0.002
E8. MONTEREY FARM CORP. De Fuego, Gen Trias	Hog breeding and growing, dairy production	138		0.123	Private DW	1979	0.098
E9. ROYAL TERN CERAMICS PHILS. INC., Manggahan	Sanitary wares	223		0.024	Private DW	1989	0.019

TABLE 7-5

LIST OF INDUSTRIAL ESTABLISHMENTS IN THE STUDY AREA (con't.)

GEN. TRIAS, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
E10. SAN MIGUEL CAMPOFRIO CORP., De Fuego	Processed meat	100	4,500	0.124	Private DW	1992	0.099
E11. TUNG TAI HSING RUBBER IND'L. CORP, Manggahan	Procured thread, black C rubber tire recapping	30		0.002	Private DW	1993	0.002
		1,552		0.415			0.332

NAIC, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
F1. GAZCEL AGRIBUSINESS CORP.	RFM poultry breeder farm	17		0.001	Private DW		0.001
F2. IVAN FARMS	RFM poultry breeder farm	19		0.001	Private DW		0.001
F3. LAOMAN FARMS	Piggery	20		0.001	Private DW		0.001
F4. MADISON SQUARE FARM Sabang, Naic	Swine	50		0.001	Private DW		0.001
F5. RIZAL POULTRY & L'STOCK ASS'N, INC., Sabang	Poultry	50		0.001	Private DW		0.001
F6. SAN DIEGO FARMS Palangue, Naic	Poultry	11		0.001	Private DW		0.000
F7. SPHERES METALCRAFT Timalan, Naic	Aluminum kitchenwares	181		0.009	Private DW	1982	0.007
F8. YUMUL ENTERPRISE NAIC POULTRY, Palangue II	Poultry	7		0.001	Private DW		0.000
		355		0.016			0.012

SILANG, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	ATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
G1. CAVITE FARMERS FEEDMILL & MKTG COOP., Baypass	Animal feeds	38		0.003	Silang WD	1977	0.002
G2. DRAGON TEXTILE MILLS INC., Lalaan I, Silang	Textile spurn yarn	80		1.044	Private DW	1991	0.835
G3. EURO TILES Biga, Silang	Glazed ceramics tiles	71		0.002	Private DW		0.001
G4. FIL-TAI AGRI GROUP, INC. Balubad, Silang				0.006	Private DW	1977	0.005
G5. JACNAVAR HOLMESGLEN MFG. CORP., Biga, Silang				0.001	Silang WD		0.001
G6. LEADER GOLF BAG MFG. CORP., Biga, Silang	Golf bags, wooden lead cover and accessories	67		0.001	Private DW		0.001
G7. SUMMER FRUITS, INC. Bypasss, Silang	Dried tropical fruits and concentrates	158		0.008	Silang WD	1991	0.006
G8. UNI-PROS CERAMICS, INC. Biga, Silang	Ceramics			0.000	Silang WD		0.000
		414		1.066			0.852

TAGAYTAY CITY	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
H1. BIOFOOD CORP. Kaybagal, Tagaytay	Fresh and dried mushroom	59		0.004	Deepwell		0.003
H2. RFM-BLUE RIBBON HATCHERY, Maitim II	BR goldstock day old broilers and GP chicks	25		0.001	Deepwell		0.001
H3. ROYAL BEE CORP. Lalaan I, Silang	Honey bee and bee prod.	14		0.002	Deepwell		0.001
H4. SUJIN SILKROAD PHILS. Guinhawa, Tagaytay	Silkworm and silkfiber	5		0.001	Deepwell		0.001
H5. THE FLOWER FARM CORP. Guinhawa, Tagaytay	Cutflower-roses, other flowers	18		0.004	Deepwell		0.003
		121		0.011			0.009

TANZA, CAVITE	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
I1. CATHAY FARMS Tanauan, Tanza	Swine	40	4,000 hds	0.086	Private DW	1990	0.069
I2. CESA PIGGERY FARM Amaya, Tanza	Swine	8	1,000 hds	0.040	Private DW	1986	0.022
I3. CHUNG FU IND. (PHIL) INC., Tanauan, Tanza	Yarn factory, knitted fabrics	305		0.025	Private DW	1990	0.020
I4. DOLPHIN ENV'L. CONTROL SYSTEM, Halayhay, Tanza	Water purifier, poly-aluminum chloride (PAC)	6		0.001	Private DW		0.001
I5. MADISON PIGGERY FARM	Swine		8,000 hds	0.109	Private DW	1988	0.087
I6. PREMIUM PACKAGING INT'L ASS'N. INC, Halayhay	Refill. PE Teraphthalate (RPET) container/preforms	458	0.50 M pcs	0.030	Private DW	1989	0.024
I7. UNITY FISHING DEV'T. CORP., Halayhay, Tanza	Drydocking			0.020	Private DW	1984	0.016
		817		0.311			0.239

TABLE 7-5

LIST OF INDUSTRIAL ESTABLISHMENTS IN THE STUDY AREA (con't.)

TRECE MARTIRES CITY	PRODUCT	NO. OF EMPLOY	PROD. CAP. MT/yr	WATER USE MCM/yr	SOURCE	DATE ESTABL.	EFFLUENT MCM/yr
J1. DON JUAN INTEGRATED FARM, Aguado, TM	Swine	16	2,700 hds	0.037	Private DW	1984	0.024
J2. HO-JIN PHILS. INC	Stainless steel bowl for human & animal pets	106		0.005			0.004
J3. JET ENTERPRISES		15		0.001			0.001
J4. KODI INTERNATIONAL Luciano, TM	Mannequins	45		0.002			0.002
J5. LILYWHITE GARMENTS Hugo Perez, TM	Garments	50		0.002	Private DW		0.002
J6. PELAGICA EAST, INC. Osorio, TM	Artificial marine corals, etc.	20		0.001			0.001
J7. PHIL. PYROTECHNIC INC. Conchu, TM	Toy products, display fireworks and fuses	121		0.004	Private DW		0.003
J8. PINNACLE CORP. De Ocampo, TM	Woodcraft	25		0.001			0.001
J9. QUICK PACK PHILS. INC. Conchu, TM	PVC shrink films	7		0.001			0.001
J10.RAMAH TAMAH FARM Conchu, TM	Steel			0.005	Private DW		0.004
J11.RUBY RICH (PHILS.) INC. Hugo Perez, TM	Fruit purees and conc.	70	2,520	0.003	Private DW		0.003
J12.SCT ELECTRO-COMPONENTS CORP., Conchu, TM	Electronic parts	45		0.002			0.002
J13.SHIN HEUNG (PHILS.) INC.	Cat and other pet toys	90		0.004			0.003
J14.SONIC STEEL INDUSTRIES INC., Hugo Perez, TM	Galvanizing (Zinc) factory	98	5,400	0.014	Private DW	1992	0.011
J15.TATAKE SPORTS PRODUCTS Osorio, TM	Rackets (tennis, squash, badminton)	68		0.003	Private DW		0.003
J16.TOP POWER INDUSTRIES De Ocampo, TM	Videogram system	28		0.002			0.001
		804		0.088			0.065

Table 7-6

RANGES OF GROUNDWATER LEVEL DECREASE RATES AND ESTIMATED TOTAL DECREASE IN THE STUDY AREA

City/Municipality	Number of Wells Surveyed	Decrease Rates (m/year)	Maximum Decrease Within the 14 yr Period[1] (m)
1. Alfonso	7	0.04 - 0.14	2.00
2. Amadeo	5	0.05 - 0.56	7.88
3. Carmona	5	0.60 - 0.87	12.18
4. Dasmariñas	6	1.05 - 2.61	5.22
5. Gen. E. Aguinaldo	4	0.01 - 0.28	1.38
6. Gen. Mariano Alvarez (GMA)	7	1.57 - 2.55	5.10
7. General Trias	5	0.22 - 0.86	2.51
8. Indang	6	0.03 - 0.34	4.67
9. Magallanes	8	0.20 - 0.32	4.48
10. Maragondon	6	0.03 - 0.08	1.13
11. Mendez	6	0.15 - 0.46	9.55
12. Naic	13*	0.52	0
13. Silang	6	0.27 - 2.84	31.26
14. Tagaytay	5*	0.16 - 1.15	16.03
15. Tanza	9	0.20 - 0.54	1.52
16. Ternate	11	0.27 - 0.70	3.78
17. Trece Martirez	7	0.06 - 0.72	10.05

Note: [1]Assuming the maximum annual rate for the whole period
*mostly shallow wells

Table 7-7 DOMESTIC WASTEWATER DISPOSAL SURVEY SUMMARY

SURVEY ITEMS	UPLAND	LOWLAND AREAS		
	GMA	Cavite City	Naic	Tanza
Households Surveyed				
· With Toilet	100	100	100	90
· Without Toilet	--	--	--	10
· With Septic Tank	95	100	95	75
Septic Tank Effluent Receptor				
· Open Street Canal	20	5	55	40
· Covered Street Canal	60	20	35	15
· Land	--	10	--	5
· Not Aware	15	65	5	15
Tank Material				
· Concrete	80	65	95	75
· Bricks	--	5	--	--
· Not Aware	15	30	--	--
Tank Bottom				
· Sealed	70	55	80	60
· Unsealed	5	15	5	5
· Not Aware	20	30	10	10
Tank Construction Year				
· Between 1960 - 1970	5	15	20	10
· Between 1971 - 1980	40	30	20	20
· Between 1981 - 1990	5	15	10	25
· Between 1991 - 1994	25	15	--	--
· Not Aware	20	25	45	20
Desludging Frequency				
· Once	--	10	--	--
· Not Yet Cleaned	65	25	50	45
· Not Aware	30	65	45	30
Kitchen Wastewater Receptor				
· Open Street Canal	55	50	60	50
· Covered Street CAnal	35	30	30	25
· Septic Tank	10	5	5	--
· River	--	--	56	5
· Land	--	10	--	20
· Not Aware	--	5	--	--
Bathing And Laundry Wastewater Receptor				
· Open Street Canal	50	45	60	50
· Covered Street Canal	30	25	30	25
· Septic Tank	10	--	5	--
· River	--	--	5	5
· Land	10	30	--	20
· Not Aware	--	--	--	--

Notes:

The Values are all in percentages of those surveyed for a particular town.
Twenty (20) households were surveyed at each poblacion. Some respondents were not aware of the answers to some questions. This is reflected in the items "Not Aware".

Table 7-8 **WATER USE AND WASTE WATER GENERATION**

City or Municipality	Ind'l. Estate	Industries	Water Use, MCM/yr	Waste-water, MCM/yr	Industry Types
Alfonso	0	4	0.179	0.143	Meat processing, poultry, dairy
Carmona	PTC GVIC MVIC Outside	45 7 11 9 72	0.446 0.049 0.019 0.553 1.067	0.208 0.039 0.015 0.443 0.705	Garments, clothing apparel, toys, home decor, steel, computer chips, adhesives & plastic, other
Dasmarinas	FCIC DBB-NHA FCIE Outside	3 4 18 12 37	0.007 0.206 0.170 2.210 2.593	0.005 0.165 0.135 1.706 2.016	Garments, clothing apparel, textile mill, construction, fruit / beverage / meat processing, plating, other
G M A	GMA-NHA Outside	3 1 4	0.059 1.440 1.499	0.048 1.152 1.200	Textile mill, garments, laundry, metal enclosure
Gen. Trias	NCIC GBP Outside	5 2 9 16	0.017 0.180 0.415 0.612	0.013 0.144 0.332 0.489	Garments, processed meat, livestock, houseware, electronics parts, other
Naic	0	8	0.016	0.012	Piggery, poultry, housewares
Silang	0	8	1.066	0.852	Textile mill, ceramics, processed fruit, other
Tagaytay City	0	5	0.011	0.009	Poultry, veg./ honey / fruit processing, other
Tanza	0	7	0.311	0.239	Piggery, plastic, ship docking, other
Trece Martires	0	16	0.088	0.065	Piggery, fruit processing, metal / electronics, toys, sports
TOTAL	9	177	7.441	5.724	

Table 7-9 STATUS OF POTENTIAL POLLUTIVE INDUSTRIES

Municipality or City	Establishment With WTP			Establishment with No WTP		
	Estate	Out-side	Effl., MCM/ yr.	Estate	Outside	Waste-water, MCM/yr
Alfonso	0	2	0.138			
Carmona	3	0	0.015	3 Meat proc., Steel, Rubber mfg	1 Plastic / adhesive	0.326
Dasmarinas	2	4	0.979	2 Laundry, Fruit proc.	2 Bottling Text. mill	0.809
G M A	0	0	0		1 Text. mill	1.152
Gen. Trias	2	3	0.411			
Silang	0	0	0		2 Text. mill Fruit proc.	0.842
Tanza	0	5	0.218			
Trece Martires	0	2	0.035		1 Fruit proc.	0.003
TOTAL = 35	7	16	1.796	5	7	3.132

Table 7-10 WASTEWATER SOURCES, CHARACTERISTICS, AND POLLUTION IMPACTS

Industry Types	Wastewater Sources	Wastewater Characteristics	Pollution Impacts
fruit proc. (3), meat proc. (1), and bottling (1)	raw material cleaning, meat prepa-ration, spills, and mixing	high suspended and dissolved organics / solids, BOD, oil and grease	High BOD levels (dissolved and suspended organic) from partially or untreated wastewater infiltrates through groundsoil. The residual BOD (dissolved organic) which could not be filtered through the soil strata can make groundwater unfit for domestic and other beneficial uses.
Metals / steel (1) factory	pickling, galvanizing, and coating of metals & parts	acidic, high toxic metal (Cr, Pb, Zn, etc.) levels, organic solvents, oil and grease	High residuals of toxic metals such as chromium (hexavalent), lead, other plating compounds, and cyanides from improperly treated wastewater of metals / steels facilities would leach and contaminate the groundwater. Clean-up of these highly toxic and hazardous materials in groundwater is very costly.
Textile mills (3), laundry service (1), rubber (1), and plastics (1)	cooking & washing of fibers, fabric desizing, polymerizati on, steam cleaning, rubber operations	highly alkaline, colored organics and dyes, high suspended solids, temperature	Waste components (organic and inorganic) generated from textile mills, laundry, rubber, and related operations are hazardous and would require extensive clean-up procedures if groundwater is contaminated.

Table 7-11 SUEVEY RESULTS OF SOLID WASTES GENERATION, COLLECTION AND DISPOSAL.

Municipality or City	Generation (MT/yr)	Dump Area (Ha)	Location	Longitude	Latitude	Relation to Surface water		Year Operation	Collection Budget (Peso)	Number & Trucks Frequency of Collection			
						Distance	Name			Trailer	Elf-type	Dumptruck	Compactor
1 Alfonso	5,430	None	None	-		--	--	None	500,00	-	-	2(weekly)	-
2 Amadeo	3,741	None	None	-		--	--	None	200,000	-	-	-	-
3 Carmona	6,030	1.0	Bangkal	121° 03' 00"	14° 18' 00"	300	Unnamed	ND	300,000	-	-	1(2/d)(M-S)	1(2/d)(M-S)
		65.0	Lantik	121° 00' 30"	14° 16' 50"	600	Unnamed	1993				-	
4 Dasmarinas	30,242	None	None	-	-	--	--	None	1,200,000	-	2(2/d)(M-S)	1(2/d)(M-S)	1(2/d)(M-S)
5 Gen. Aguinaldo	2,400	1.0	Pob. 4	120° 47' 40"	14° 11' 30"	100	Unnamed	1989	ND	-	-	-	-
6 GMA	18,250	None	None	-	-	--	--	None	ND	1(daily)	-	-	-
7 Gen. Trias	11,274	1.0	Pasong Kawayan	120° 53' 00"	14° 18' 20"	100	Unnamed	1991	100,000	1(2-3/d) (M-S)	-	-	-
8 Indang	5,346	0.02	Dos	120° 52' 25"	14° 11' 40"	100	Unnamed	1979	100,000	1(2-3/d) (M-S)	-	-	-
9 Magallanes	ND	ND	ND			--	--	ND	ND	-	-	-	-
10 Maragondon	4,830	0.05	Mabacao	120° 46' 20"	14° 14' 40"	400	Mabato	1992	90,000	-	1(daily)	-	-
		0.05	Mabacao	120° 46' 10"	14° 14' 10"								
11 Mendez	3,260	0.02	Miguel Mojica	120° 54' 30"	14° 08' 00"	400	Hbuling	1992	ND	-	-	-	-
12 Naic	11,700	1.0	Sabang	120° 46' 20"	14° 19' 30"	600	Alemang	1993	1,000,000	1(daily)	-	1(daily)	1(daily)
13 Silang	17,117	1.2	Lalaan	120° 58' 00"	14° 11' 55"	100	Unnamed	1984	1,240,000	-	-	2(2-3/d) (M-S)	-
14 Tagaytay	4,600	0.55	Silang Crossing	120° 58' 05"	14° 07' 20"	400	Unnamed	1994	1,700,000	-	2(1/d;M-F)	3(1-3/d;M-F)	1(1-2/d; M-F)
15 Tanza	11,300	5.0	Sahod Ulan	120° 45' 35"	14° 22' 00"	100	Unnamed	1993	1,000,000	-	-	3(3/d;4/wk)	
16 Ternate	2,010	0.25	Sapang	120° 41'	14° 16' 15"	300	Sapang	1993	400,000	-	1(3/wk)	-	
17 Trece Martires	3,430	2.0	Ocampo	120° 51' 00"	14° 18' 50"	200	Malilin	1992	ND	-	1(daily)	2(daily)	
TOTAL	140,960												

Source : JICA Study Team

Notes:

a. ND: No Data Available

b. Capacity of garbage collection trucks varies.

c. Uncompacted volume is as estimated garbage trucks capabilities, e.g. Jeepney w/trailers = 2 cu.m; elf-type = 4-6 cu.m; dump trucks = 10-12 cu.m; compactor truck = 14-18 cu.m.

d. S.L. = Sanitary Landfill, referring to the sanitary landfill operated by the Metro Manila Authority catering to the garbage mostly form metro Manila.

e. M-S means Monday to Sunday or everyday

Table 7-12 LOCATION OF BANKS CREEKS/RIVERS USED AS ILLEGAL DUMPSITES

Municipality or City	Name of Creek/River	Longitude	Latitude	Wastes tossed, (MT)*
Alfonso	Sambal Cr.	120°52'40"	14°07'30"	16.0
Amadeo	Unnamed Cr. Unnamed Cr.	120°55'00" 120°56'00"	14°11'00" 14°12'20"	20.0
Carmona	Unnamed Cr.	121°00'05"	14°17'00"	15.0
Dasmarinas	Unnamed R. Unnamed Cr.	120°56'20" 120°56'00"	14°19'50" 14°19'40"	7.0
G M A	Unnamed R.	121°00'06"	14°17'03"	20.0
Gen. Aguinaldo	Unnamed Cr.	120°47'30"	14°11'30"	19.0
Gen. Trias	Pasong Camachile R. Palubluban Cr.	120°52'30" 120°52'28"	14°23'00" 14°23'00"	52.0
Indang	Unnamed Cr.	120°51'30"	14°11'00"	3.0
Magallanes	Unnamed Cr. Unnamed Cr.	120°45'15" 120°45'20"	14°12'35" 14°12'30"	ND
Maragondon	Mabacao R.	120°45'30"	14°16'30"	0.0
Mendez	Quibaya Cr. Palocpoc Cr.	120°53'30" 120°52'45"	14°07'50" 14°07'50"	16.0
Naic	Labac R. Balsahan R.	120°45'50" 120°46'00"	14°18'20" 14°18'00"	10.0
Silang	Munt-ilog Cr. Unnamed Cr. Unnamed Cr.	120°58'45" 120°58'30" 120°58'20"	14°13'25" 14°13'25" 14°13'05"	22.0
Tagaytay	None	None	None	0.0
Tanza	Bucal Cr. Canas R.	121°51'30" 121°51'20"	14°23'55" 14°23'50"	16.0
Ternate	Maragondon R.	120°42'40"	14°17'15"	0.0
Trece Martires	Unnamed Cr. Unnamed Cr.	120°52'00" 120°51'45"	14°17'20" 14°17'25"	6.0
TOTAL				222.0

Legend: ND - No Data Available
* - Estimated volume of solid wastes

Table 7-13

PROJECT PERCEPTION AND AWARENESS
(Survey Summary)

SURVEY ITEMS	NUMBER OF RESPONDENTS					
	GMA	Mendez	Naic	Tagaytay	Tanza	Total
HEALTH AND HYGIENE						
Existence of relation between some diseases and lack of potable water -						
• Believed to have relation		4	7	17	6	60
• Believed to have no relation	26	46	21	33	44	189
• No Opinion	24		1			1
Diseases considered related to lack of potable water -						
• Diarrhea		3	3	10	5	29
• Stomach Ache	8	1	1	7		20
• Cholera	11		1		1	3
• Amoeba	1		1			2
• Others	1	1	1			4
• No Opinion	2					3
	3					
Sufficiency of present water supply source for the health and proper hygiene requirements of their families -						
• Considered as sufficient	40	46	45	43	48	222
• Considered as not sufficient	10	4	5	5	2	26
• Not sure				2		2
WATER SUPPLY SERVICE						
Adequacy of the level of water supply service in their areas -						
• Believed as adequate	24	39	46	27	47	183
• Believed as not so adequate	14	11	2	14	2	43
• Believed as inadequate	12		2	9	1	24
Existence of expectation of improvement on the present water supply system in their areas -						
• With expectation	41	49	48	47	49	234
• No expectation	8	1	1	2		12
• No opinion	1		1	1	1	4
Awareness of the proposed Cavite Water Supply Development Project -						
• Aware	8	9	1	7		25
• Not Aware	42	41	49	43	50	225
Occurrence of improvement in the supply of potable water due to the proposed project -						
• Believed it will improve	47	47	49	47	48	238
• Believed it will not improve	1	3				4
• No Opinion	2		1	3	2	8

Table 7-13 (con't.)

PROJECT PERCEPTION AND AWARENESS
(Survey Summary)

SURVEY ITEMS	NUMBER OF RESPONDENTS					
	GMA	Mendez	Naic	Tagaytay	Tanza	Total
Importance of improving availability of potable water						
• Believed as very important	50	50	50	50	50	250
Willingness to cooperate to comply with some study requirements -						
• Willing to cooperate	49	47	49	49	50	244
• Not willing to cooperate	1	3				4
• Not sure			1	1		2
GROUNDWATER DEVELOPMENT						
Necessity of adequate plan and proper management in the development of groundwater for water supply use -						
• Believed adequate plan and proper management needed	49	46	50	49	48	242
• Believed adequate plan and proper management not needed	1	4		1		6
• No Opinion					2	2
Appropriateness of continued withdrawal of groundwater in their areas						
• Considered as appropriate	23	15	20	14	25	97
• Considered as not appropriate	21	31	28	26	24	130
• Not sure	6	4	2	10	1	23
Awareness that improper groudnwater development could lead to long-term bad effects -						
• Aware	29	28	29	39	30	155
• Not Aware	18	21	21	10	19	89
• No Opinion	3	1		1	1	6

Table 7-14
SOCIO-ECONOMIC PROFILE OF RESPONDENTS
(Survey Summary)

SURVEY ITEMS	NUMBER OF RESPONDENTS					
	GMA	Mendez	Naic	Tagaytay	Tanza	Total
1. AGE						
• 21 - 30	9	4	11	12	14	50
• 31 - 40	15	14	20	22	15	86
• 41 - 50	16	13	13	7	11	60
• 51 - 60	5	12	4	7	7	35
• 61 - 70	4	3	2	2	3	14
• 71 - 82	1	4				5
2. SEX						
• Female	31	34	30	40	33	168
• Male	19	16	20	10	17	82
3. HOUSEHOLD SIZE						
• 1 - 5	29	22	21	24	29	125
• 6 - 10	20	27	27	25	19	118
• 11 - 15	1	1	2	1	2	7
4. OCCUPATION						
• Housewife	16	25	23	17	25	106
• Business	7	7	8	16	3	41
• Teacher	8	3	1	2	3	17
• Laborer, Janitor, Caretaker	3		4	3	4	14
• Employee	2	4	1	2	4	13
• Farmer, Vendor	3	1	4	4	1	13
• Driver, Mechanic	3	2	3		3	11
• Others	4	3	1		1	9
• No Occupation			3	1	2	6
• Barangay Member, Councilor	1	2		2		5
• Security Guard	1		1	2		4
• Engineer, Nurse, Midwife		1		1	2	4
• Electrician, Lineman	1	1			1	3
5. EDUCATIONAL ATTAINMENT						
• Elementary Level	2	6	7	3	11	29
• Elementary Graduate	3	1	2	3		9
• High School Level	10	8	17	5	15	55
• High School Graduate	10	4	6	11	5	36
• College Level	14	17	16	14	11	72
• College Graduate	11	14	2	13	8	48

Table 7-14 (con't.)
SOCIO-ECONOMIC PROFILE OF RESPONDENTS
(Survey Summary)

SURVEY ITEMS	NUMBER OF RESPONDENTS					
	GMA	Mendez	Naic	Tagaytay	Tanza	Total
6. RELIGION						
• Catholic	48	50	50	48	48	244
• Others	2			2	2	6
7. ETHNIC GROUP						
• Cavite	13	48	48	29	45	183
• Visayas	14	1	1	7	4	27
• Manila	11		1	2		14
• Bicol	5			3		8
• Batangas	1			4		5
• Others	6	1		5	1	13
8. MONTHLY INCOME						
• 1,000 and below	11	14	15	7	17	64
• 1,001 - 3,000	9	20	25	21	23	98
• 3,001 - 5,000	14	10	6	12	7	49
• 5,001 - 7,000	9	2	2	6	1	20
• 7,001 - 9,000	5		1	1		7
• 9,001 - 11,000	1	2	1	2	2	8
• 11,001 - 15,000	1			1		2
• 15,001 - Above		2				2

Table 7-15
PRESENT WATER SUPPLY INDICATORS
(Survey Summary)

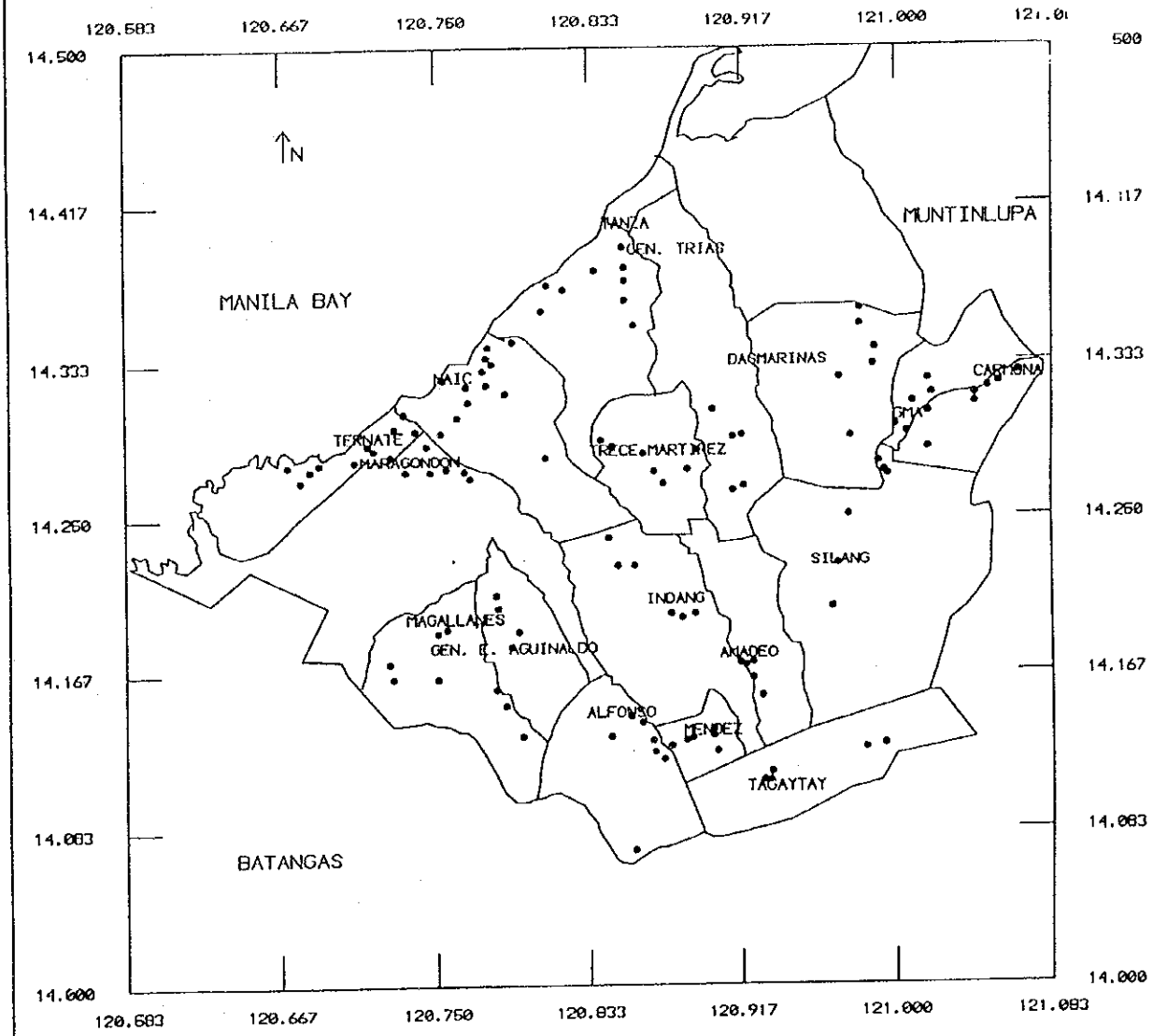
SURVEY ITEMS	NUMBER OF RESPONDENTS					
	GMA	Mendez	Naic	Tagaytay	Tanza	Total
SOURCE OF DRINKING WATER -						
• Deep well	14	2	24		26	66
• Public Faucet	13	15	4	32		64
• Neighbor's well		15	7		23	45
• Neighbor's faucet	13	15	5	1	1	35
• House Connection	9	1		16		26
• Public well	1	1	10	1		13
• Shallow well		1				1
OWNERSHIP OF WATER SOURCE -						
• Own water source	18	2	24	12	25	81
• Not own water source	32	48	26	38	25	169
MONTHLY WATER CONSUMPTION IN CUBIC METERS -						
• 10 and below	10	1	3	15	3	32
• 11 - 20	3	1	4	2		10
• 21 - 30	7	2	1			10
• 31 - 40		1				1
• 41 - 50	1					1
• 51 - 60	2					2
• Not Known	27	45	42	33	47	194
HOUSHOLD MONTHLY WATER EXPENSES -						
• P100 and below	22	8	6	19	1	56
• P101 - P200	19	24	2	28		73
• P201 - P300	5	10		3		18
• P301 - P400	2	4				6
• P401 - P500						
• P501 - P600		1				1
• Free	2	3	42		49	96
SOURCE FOR DRINKING WATER AND SOURCE FOR OTHER WATER USES -						
• The same source	49	50	50	50	50	249
• Not the same source	1					1
SOURCE OF WATER OTHER THAN FOR DRINKING PURPOSES -						
• Rain	1					1
• Neighbor's Well					1	1

Table 7-15 (con't.)

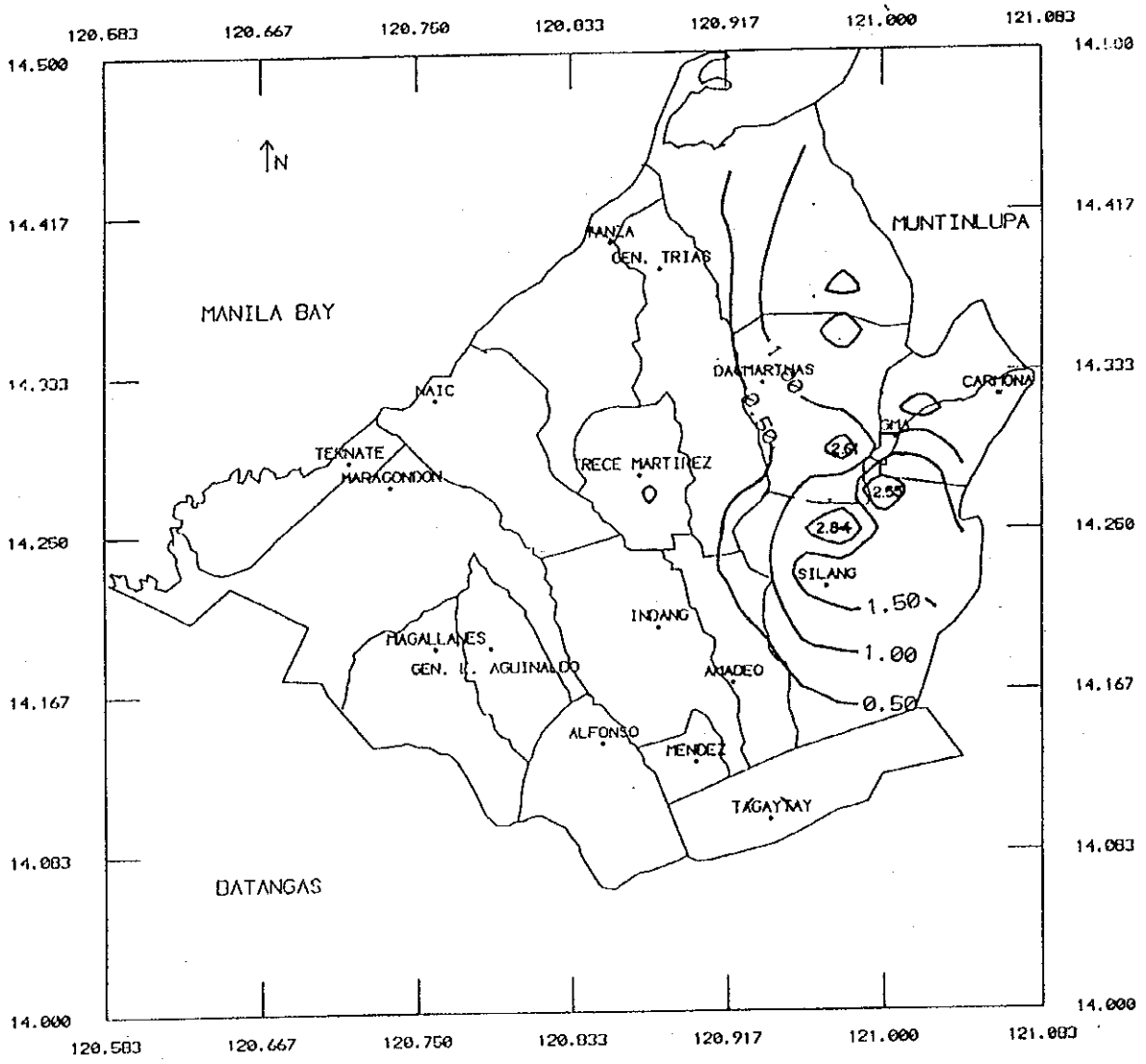
PRESENT WATER SUPPLY INDICATORS

(Survey Summary)

SURVEY ITEMS	NUMBER OF RESPONDENTS					
	GMA	Mendez	Naic	Tagaytay	Tanza	Total
6. RELIGION						
• Catholic	48	50	50	48	48	244
• Others	2			2	2	6
7. ETHNIC GROUP						
• Cavite	13	48	48	29	45	183
• Visayas	14	1	1	7	4	27
• Manila	11		1	2		14
• Bicol	5			3		8
• Batangas	1			4		5
• Others	6	1		5	1	13
8. MONTHLY INCOME						
• 1,000 and below	11	14	15	7	17	64
• 1,001 - 3,000	9	20	25	21	23	98
• 3,001 - 5,000	14	10	6	12	7	49
• 5,001 - 7,000	9	2	2	6	1	20
• 7,001 - 9,000	5		1	1		7
• 9,001 - 11,000	1	2	1	2	2	8
• 11,001 - 15,000	1			1		2
• 15,001 - Above		2				2



CAVITE WATER SUPPLY DEVELOPMENT STUDY	**Fig. 7-1** Location of Surveyed Wells
JAPAN INTERNATIONAL COOPERATION AGENCY	

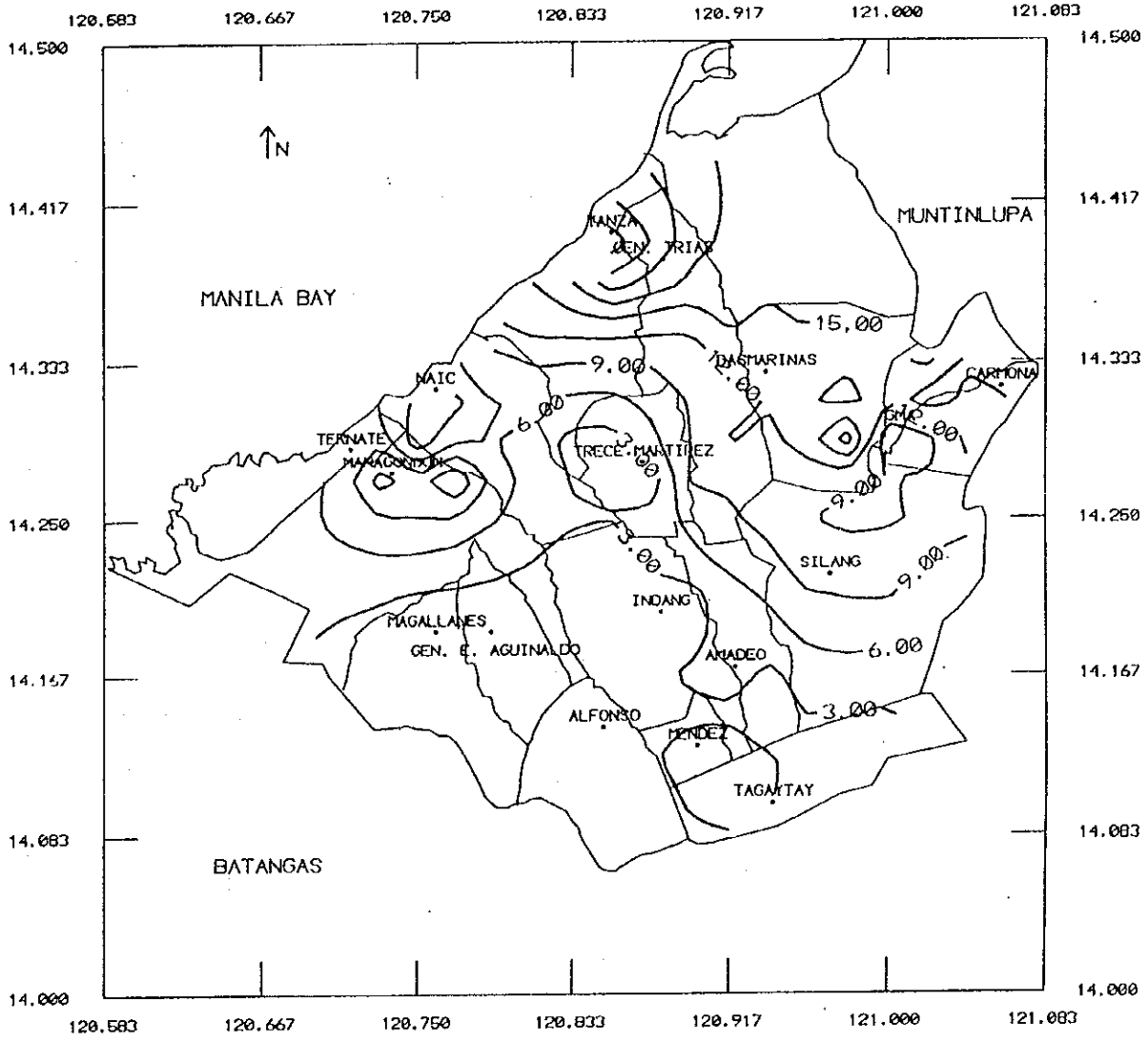


CAVITE WATER SUPPLY DEVELOPMENT STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7-2

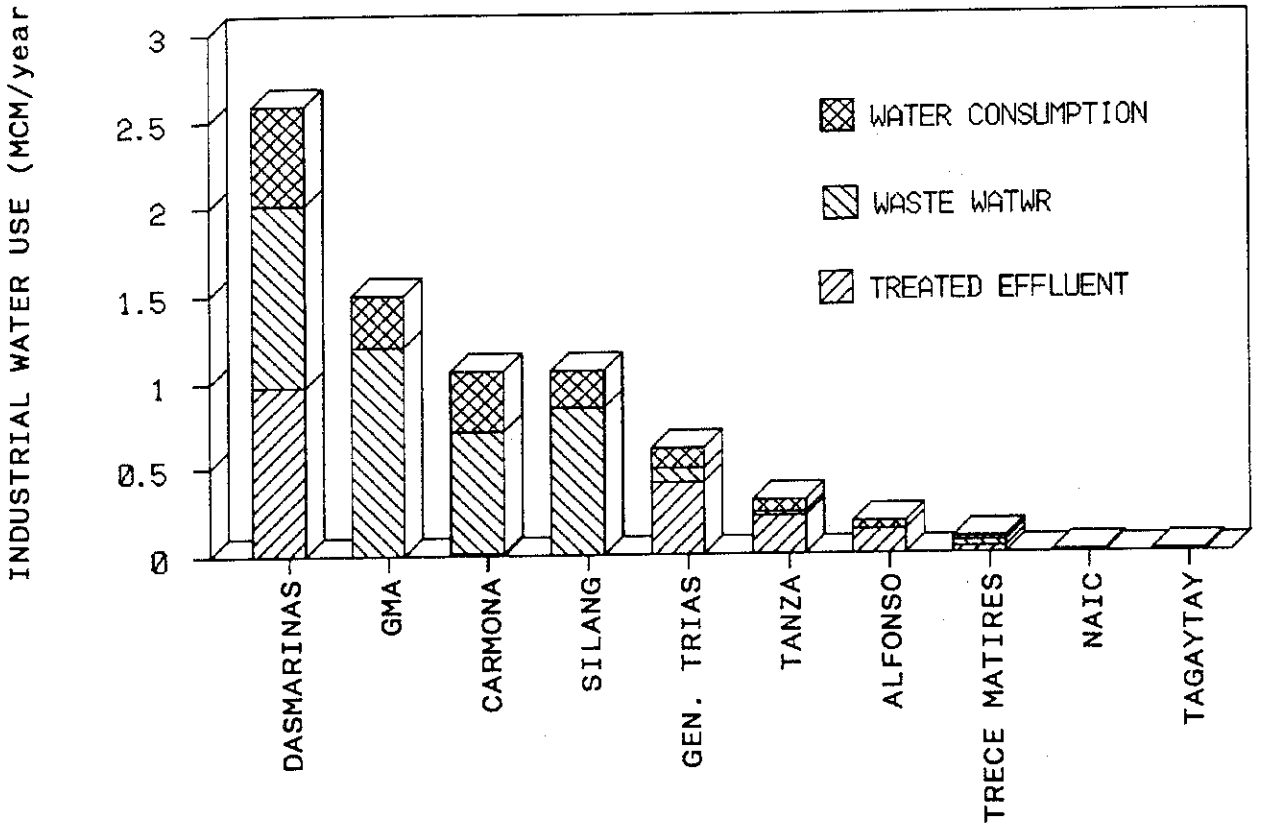
Plot of Groundwater Decrease Annual Rates



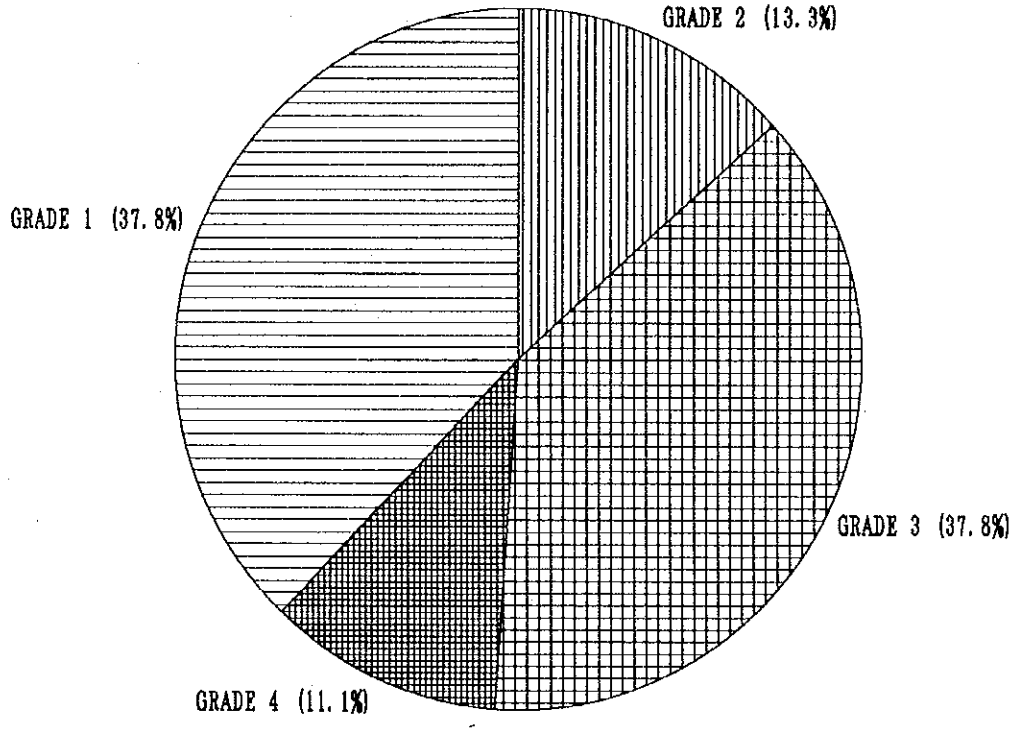
CAVITE WATER SUPPLY DEVELOPMENT STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7-3 Discharge Rates Based on Surveyed Wells



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 7-4 INDUSTRIAL WATER CONSUMPTION WASTEWATER GENERATION AND TREATED EFFLUENT
JAPAN INTERNATIONAL COOPERATION AGENCY	



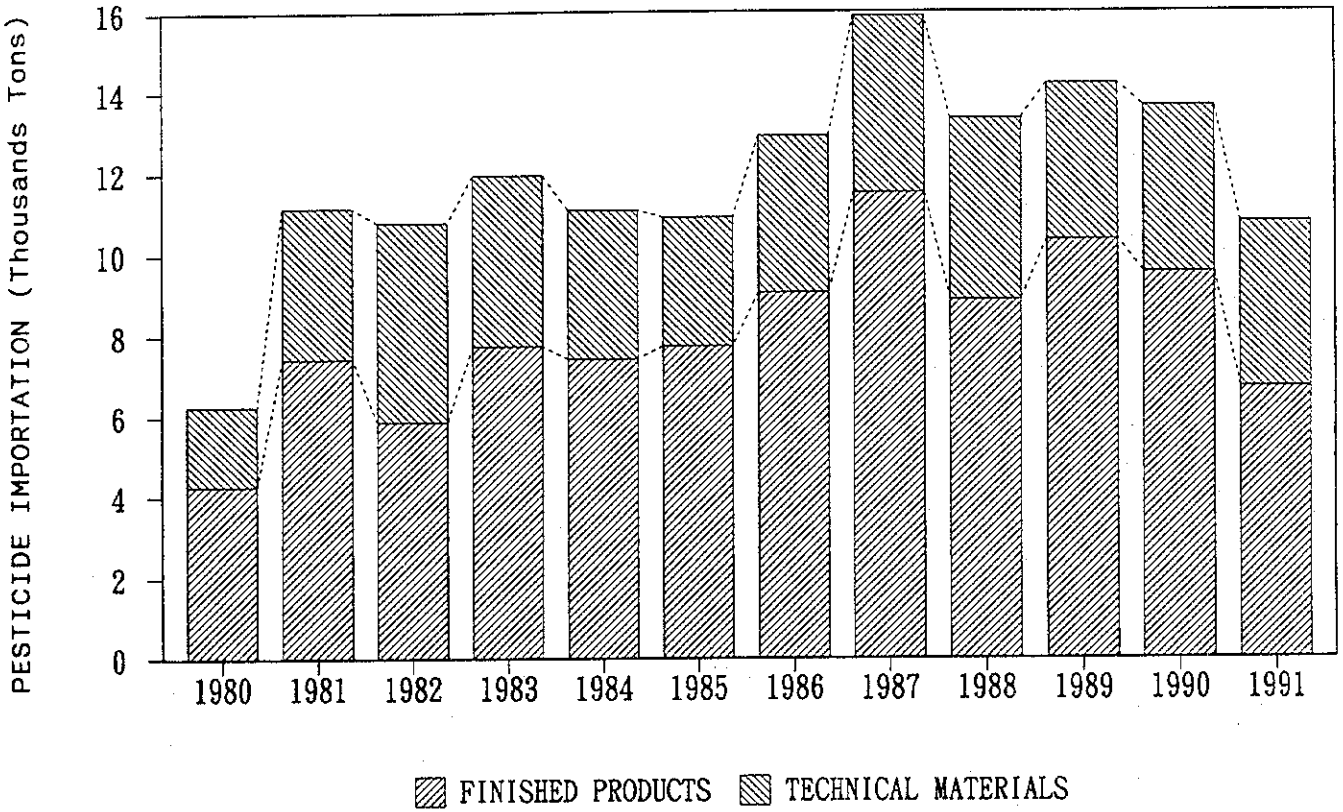
Grade 1 : Full compliance to effluent standard or water bodies for a public water supply source.

Grade 2 : In violation of the standards for a water supply source but in compliance with the effluent standards for other purposes like irrigation or as an industrial water supply source.

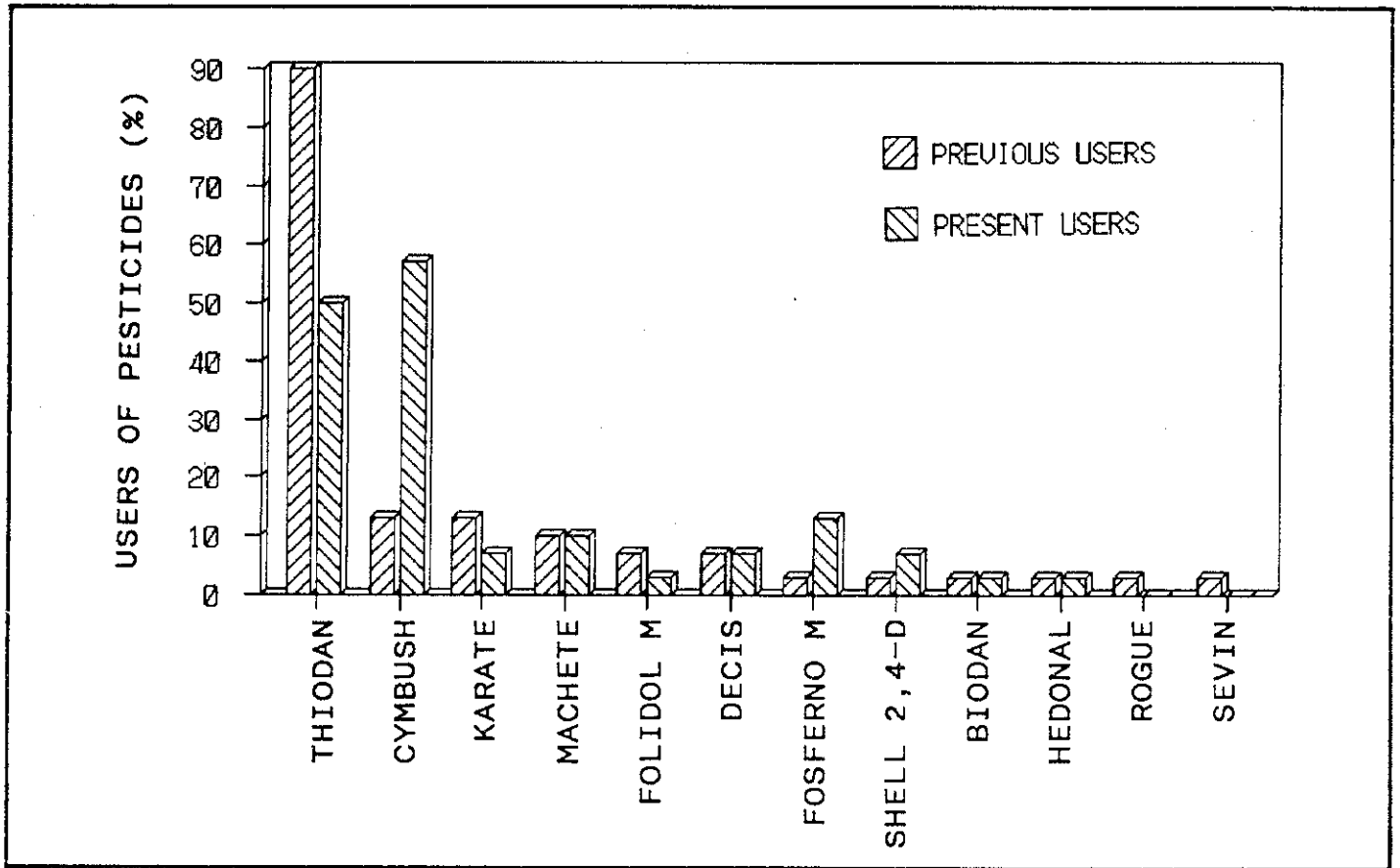
Grade 3 : In violation of all the effluent standards.

Grade 4 : "Strong Waste" with a BOD equal or greater than 3000 ml/L.

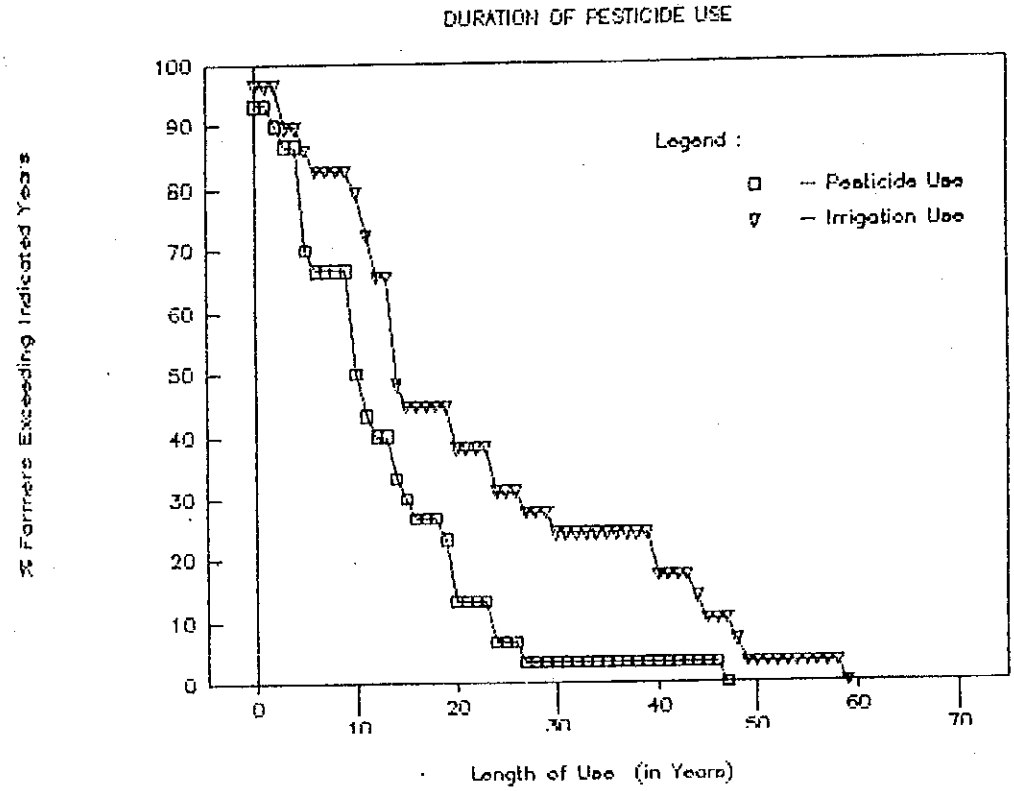
CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 7-5
JAPAN INTERNATIONAL COOPERATION AGENCY	CLASSIFICATION OF INDUSTRIAL EFFLUENT



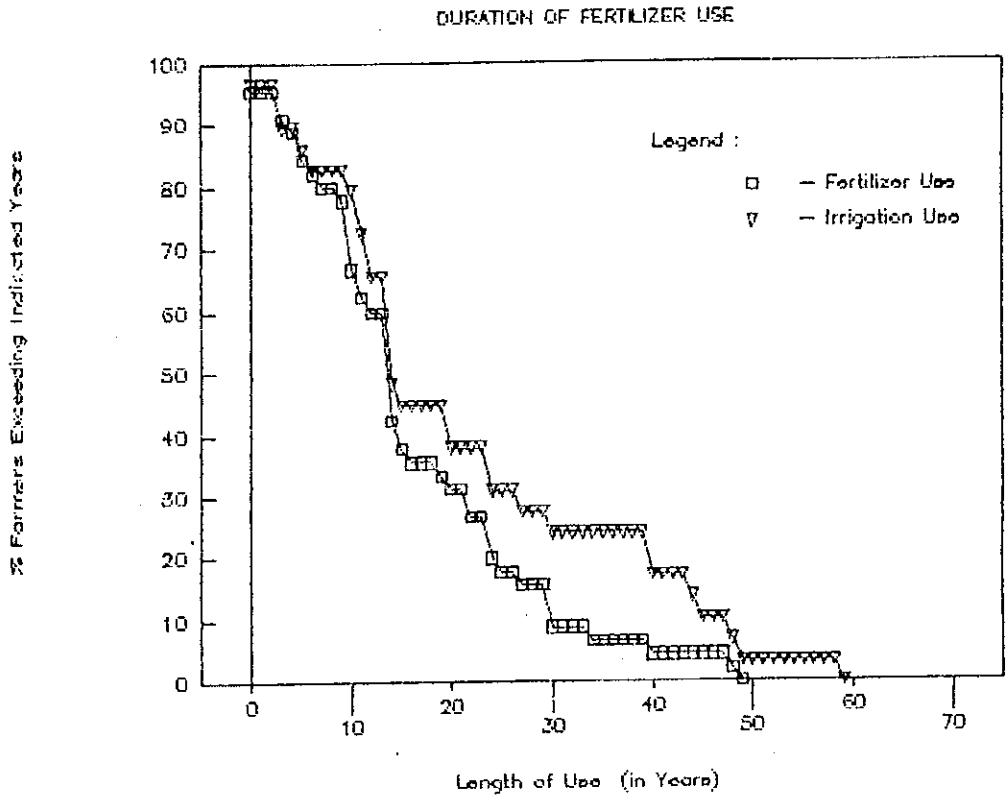
CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 7-6
JAPAN INTERNATIONAL COOPERATION AGENCY	PHILIPPINE ANNUAL PESTICIDE IMPORTATION



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 7-7 PESTICIDE USAGE
JAPAN INTERNATIONAL COOPERATION AGENCY	



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 7-8 HISTORICAL IRRIGATION AND PESTICIDE USAGE
JAPAN INTERNATIONAL COOPERATION AGENCY	



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 7-9 HISTORICAL USE OF FERTILIZERS AND IRRIGATION SYSTEMS
JAPAN INTERNATIONAL COOPERATION AGENCY	

8. EXISTING WATER SUPPLY SYSTEM

8. EXISTING WATER SUPPLY SYSTEM

8.1 STUDY METHODS

Questionnaire survey was the main method of data collection. The manner of data collection ares were as follows:

(1) The study team devised a questionnaire form that contained the relevant technical, administrative and financial data requirements filled in by the personnel in charge of the water supply.

(2) Questionnaire forms were distributed to the respective Municipal Planning Development Office and the study team discussed in detail all data requirements that were provided.

(3) Once the questionnaire forms were finished, the study team conducted a confirmation survey on the subject areas to validate the information gathered.

The questionnaire form as shown in **Table 8–1**, was prepared and distributed to all concerned agencies of the city/municipality. The questionnaire form contained the following information:

(1) System Scale

This provided the level of service for the water supply, service area coverage, service population, demand and supply capacity and water use classification.

(2) Water Source

The number and type of source utilized by the existing system e.g. deep well, spring or surface water.

(3) Existing Facilities

Description of the components of the water supply system, such as transmission/distribution lines, reservoir, pumping stations and treatment facilities.

(4) Water Quality

Record or water quality test results/certificates in accordance with the national Standard for Drinking Water (NSDW).

(5) Financial Condition

This contained information on water cost, production and collection efficiency. Records of the financial statements were requested whenever available.

(6) Operation and Maintenance

This indicated the personnel in charge of Water Supply, Operation and Maintenance, an Organizational Chart and Staffing.

In the course of data collection using the questionnaire for, it was anticipated that difficulties would be encountered in municipalities without water districts. These were water supply systems being managed by the Rural Waterworks and Sanitation Association (RWSA) and the Municipal Water Supply. A majority of these associations didn't have technical personnel and since a number of these projects were implemented by different Agencies, technical data were not readily available at the provincial/municipal level.

Considering the above constraints, the study team would extract information through actual interviews of the associations/consumers and by visual inspection of their facilities.

Among the basic data that would be recognized are the following:

(1) Technical description of the water system, such as water source facility, transmission lines, pumping stations, storage facilities, distribution line, treatment facility and service connections.

(2) Existing condition of the system, especially the present state of the facilities and the status of operation and maintenance.

(3) Water system's management and financial conditions, organizational set up, water fee and collection efficiency.

(4) Future plans of the association to improve/expand the present systems including the necessary technical and financial assistance that would be required.

8.2 SURVEY RESULT

Tables 8-2 to **8-18** show the detailed present status of the existing facilities in all the seventeen (17) municipalities/cities in the Study Area.

Table 8-19 to **8-23** show the results of hydraulic analysis of pipe-line system of the five F/S areas.

Fig.s 8-1 to **8-7** show the existing water supply systems of municipalities /cities with Water District in it. They are Indang, Mendez, Silang, Tanza, Tagaytay, Amadeo and Maragondon.

Fig. 8-8 to **8-13** show typical plan of the existing facilities. **Fig. 8-14** and **8-15** show the pump setting diameters of G.M.A. test well.

Fig.s 8-16(a) to **(j)** show the nodal diagram of recommended water supply system.

Table 8-1 Questionnaire Form

SURVEY OF EXISTING WATER SUPPLY FACILITIES

NAME: _____
BARANGAY: _____
TOWN/CITY: _____

I. SYSTEM SCALE

1. Service Level ☐ Level II ☐ Level III
2. Total Population (Poblacion) _____
3. Population (Service Area) _____
4. Demand
   - Maximum Daily Demand _____ cu.m/day
   - Average Daily Demand _____ cu.m/day
5. Supply Capacity
   - Maximum Daily Demand _____ cu.m/day
   - Average Daily Demand _____ cu.m/day
6. Water Use Classification
   - Domestic Consumption _____ cu.m/day
   - Commercial/Industrial _____ cu.m/day

II. WATER SOURCE

1. SPRING SOURCE

   Spring No. _____

   - Distance from Service Area, L = _____ m/km
     (above service area) el _____ m
     (below service area) el _____ m

   - Spring Yield,
     Q (Ave) = _____ Lps
     Q (Dry season) = _____ Lps

   - Intake Facility Dimension

2. DEEP WELL SOURCE

   Well No. _____

   - Distance from Service Area _____ m/km
   - Difference in Elevation
     (above service area) el _____ m
     (below service area) el _____ m

- Well Depth D = _____m
- Casing Material/diameter _____
- Screen meterial/diameter _____
- Discharge capacity, Q = _____Lpm
- Type of Pump/rating _____
- Power Supply Single/Three Phase

III. DESCRIPTION OF FACILITIES

I. Pipelines

- Transmission Line
  - Material _____
  - Size Range _____mm
  - Length, L _____m/km

- Distribution Lines
  - Material _____
  - Size Range _____mm
  - Length, L _____m/km

2. Reservoirs

- Type and Dimension _____
- Volume, V = _____cu.m
- Elevation head, H = _____m

3. Pumping Stations

Pumping Station No. _____

- Pump type/Rating _____
  _____
  _____
- Discharge Capacity, Q = _____Lps
- Pressure head H = _____m

4. Water Treatment Plant

- Treatment Method _____
  _____
  _____
- Capacity _____cu.m/day

Table 8-1(con't.) Questionnaire Form

IV. WATER QUALITY

Source No./ Type	Turbidity (Degree)	Color (Degree)	Fe (mg/L)	m/n (mg/L)	PH	Coliform unit/100ml

V. FINANCIAL CONDITION

1. - Water Cost P _____/cu.m
2. - Monthly Productions _____cu.m
3. - Charged Quantity _____cu.m
4. - Unaccounted Volume _____cu.m
5. - Cost of Unaccounted Water P _____
6. - Record of Financial Statement Showing list of collection and expenditures
   (to be provided by water district)

VI. OPERATION AND MANAGEMENT

1. Organization and Staffing
   (to be provided by water district)

2. Schedule of planned maintenance activites and corresponding cost

   (to be provided by water district)

Table 8-2 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(1) DASMARIÑAS	A. System Scale The present service area of LEVEL III system covering an area of 73 barangays against total number of barangays 74. The total served population for above system is 167,556. B. Description of Facilities (1) Water Source Bukal Spring Q - 717 cum/day Deep Well 27 operating from 15 HP submersible pump (2) Transmission 160mm - 200mm SP.PVC L = 41.553km (3) Reservoir Grand Reservoir 300 cum capacity overflow level 123m above msl 254 cum capacity Elevated Steel Reservoir 22 Range of capacity 20 ~ 302cum (4) Distribution 50mm ~ 100mm GI.PVC L - 144,477m Gravity Flow (5) Treatment No treatment is applied C. Water System Management Water District is managing the system and the water fee is as follows.

	Minimum Charge	11-20	21-30	31-40	41-50	51 above
Dasmariñas I	35.00	4.00	4.75	5.75	6.90	6.90
Dasmariñas II	35.00	4.35	4.60	5.00	5.65	6.70

D. Improvement Program
Laying of transmision/distribution pipelines are being implemented.

E. Organization and Staffing

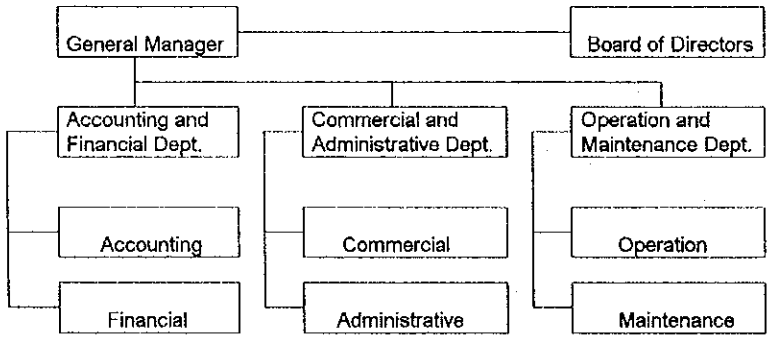


Table 8-3 Detailed Present Status of Existing Watre Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(2) INDANG	A. System Scale Indang Water District has 2 LEVEL III water supply systems which covers the poblacion and one barangay. Those systems are presently serving a total of 905 service connections in the poblacion and 104 in the barangay. B. Description of Facilities (1) Water Source Ikloy Spring 97.8 l/s IPLE I and II spring 14.5 l/s combined discharge (2) Transmission 100mm.450mm L=45m (3) Reservoir Ground Reservoir 316.4 m asl - 316.4 m above msl 330.0 m asl - 330.0 m above msl (4) Pumping Station The hydro-turbine pump draws from the sump and supplies water directly to the poblacion network. Pump discharge is 4.4 l/s 15 HP contrifugal pump also draw water from the sump and supplies water for 10 hours daily to the reservoir. (5) Distribution 63mm~160mm L=7,300m (6) Treatment No treatment is applied C. Water System Management Indang Water District presently operates two separate water system. One serves the poblacion and the other serves barangay Kaytambog. The water fee is as follows Classification Minimum 11-20 21-35 36-up Domestic P48.00/mo 5.00 6.00 7.00 Commercial P96.00/mo 10.00 12.00 14.00 D. Improvement Program The proposed improvement program include leak detection and repair, laying of transmission/distribution pipelines, rehabilitation of the pumping station and purchase of water meters and fittings. The total project cost will be P2.8M. E. Organization and Staffing The water supply systems are presently being managed by Indang WD with a staff of 12 consisting of General Manager, billing clerk, bookkeeper, cashier, secretary, loadman, utility man, 2 plumber, and 3 pump operator.

Table 8-4 Detailed Present Status of Existing Water Supply System

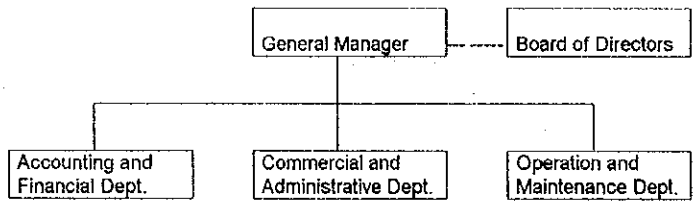
CITY/ MUNICIPALITY	PRESENT STATUS
(3) GEN. MARIANO ALVAREZ	A. System Scale GMA Water District is supplying water to 21 barangays including the poblacion. Other barangays are being served by LEVEL II water system managed by San Jose Water and Sewerage Cooperative (SAJOWASECO). Subdivision and villages in the area has their own LEVEL III water system. B. Description of Facilities. (1) Water Source The existing system utilities 8 deepwells equiped with 1unit-5,2units-15,1unit- 20, 3units-25 and 1unit-30 HP submersible pump respectively. The total amount of dischatge is estimated at 4.01 cum/m. (2) Pipeline Total length of transmission/distribution lines with diameter ranging from 50mm to 150mm GI/PVC is 17,800m. (3) Reservoir 4 Elevated Steel Tank 227 cum capacity 1 Steel Ground Reservoir 757 cum capacity (4) Treatment No treatment is applied C. Water System Management The water supply system is presently being managed by the GMA Water District. Water fee is as follow: Area / Minimum(0-5 cum) / Commodity charge(6 cum above) Residential / P 40.00 / P 8.00/cum Commercial / P 80.00 / P16.00/cum Mandarin Home / P 40.00 / P 5.00/cum D. Improvement Plan The proposed improvement program include leak detection and repair, source delvelopment, rehabilitation of existing pump station, construction of pumping station, reservoir construction and installation of disinfection facility. The total cost will be P 15.1 M. E. Organization Staffing 

Table 8-5 Detailed Present Status of Existing Water Supply System

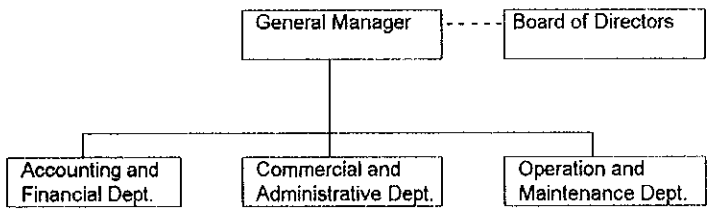
CITY/ MUNICIPALITY	PRESENT STATUS
(4) MENDEZ	A. System Scale Mendez Water District has one LEVEL III water supply system which serves a total of 801 service connections in poblacion and barangay Galicia. RWSA has two LEVEL II system and one LEVEL III system. B. Description of Facilities (1) Water Source Water District Deepwell equiped with 25HP submersible pump RWSA Source Panungyan: Deepwell 100 mm, Depth 103.7 m ANULING CERCA II Deepwell 100 mm, Depth 97.4 m Poblacion: Deepwell 150-200 mm Depth 244 m (2) Transmission WD 150 mm L=3,000m (3) Reservoir WD Ground Reservoir 212 cum capacity (4) Distribution WD 50mm ~ 150mm L=3,800m (5) Treatment No treatment is applied C. Water System Management The water system which presently managed by Mendez Water District Water fee is as follow: Residential P 8.00/cum Commercial P 16.00/cum D. Improvement Program The proposed improvement program include source development (well drilling 1,730 cum/day discharge), leak detection and repair, laying of total of 4,878 m transmission/distribution lines with diameters ranging from 50 mm to 200 mm, pumping station construction reservoir construction with a capacity of 100 cum, 1,712 service connection and installation of disinfection facility. The total project cost will be P 9.5 M. E. Organization and Staffing 

Table 8-6 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS		
(5) SILANG	A. System Scale Silang Water District has two water supply systems. One is LEVEL III, the other one is LEVEL II system. There are 3,517 households connection in the LEVEL III system and there are 86 public faucets in the LEVEL II system. 46,168 persons or abour 41 percent of the total population are served by above systems.		
	B. Description of Facilities (1) Water Source LEVEL III		
	Lucsuhin-1	Spring Discharge	 1,420 cum/day
	Lucsuhin-2	Deepwell Discharge	209m depth 1,090 cum/day
	Iba	Deepwell Disccharge	146m depth 1,090 cum/day
	Pumping Sta. No.4	Deepwell Discharge	200m depth 1,090 cum/day
	Gabriela Pumping Sta.	Deepwell Discharge	 1,360 cum/day
	LEVEL II		
	Butihan No.1	Deepwell Discharge	150m depth 650 cum/day
	Butihan No. 2	Deepwell Discharge	168m depth 1,090 cum/day
	Butihan No.3	Deepwell Discharge	183m depth 650 cum/day
	Butihan No. 4	Deepwell Discharge	 920 cum/day
	Butihan No. 5	Deepwell Discharge	 920 cum/day
	Butihan No. 6	Deepwell Discharge	
	(2) Transmission LEVEL III		
	100~150mm	GI,PVC,ACP	L= 2,265m
	LEVEL II 100~150mm	PVC	L=59,646m
	(3) Reservoir LEVEL III		
	Ground Reservoir	227 cum capacity	
	Overflow Elev.	133 m asl	
	LEVEL II		
	6 Elevated Steal Tank	227 cum capacity	

Table 8-6 Detailed Present Status of Existing Water Supply System

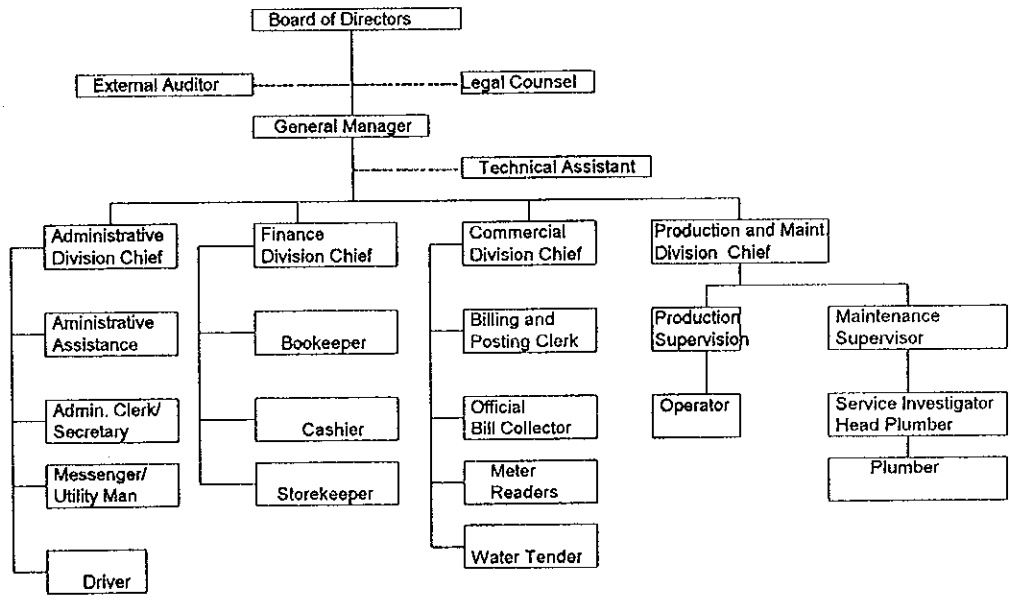
CITY/ MUNICIPALITY	PRESENT STATUS
(5) SILANG	(4) Distribution LEVEL III 50~150mm — GI,PVC,CI,ACP — L=15,847m LEVEL II 63,75mm — PVC — L=44,909m (5) Treatment No treatment is applied C. Water System Management Water District is managing the two systems and the water fee as follows: LEVEL III Domestic/Government: 1-10 P 50.00; 11-20 P 5.30; 21-30 P 6.30; over 30 P 7.45 Commercial: 1-10 P100.00; 11-20 P 10.60; 21-30 P 12.60; over 30 P 14.90 LEVEL II Each public faucets is charged P 80.00. D. Improvement Program The proposed improvement program include deepwell construction with depth of 220m and with casing diameter of 250mm and with discharge 1,560 cum/day, pumping station construction, leak detection and repair, pipe laying of about 0.955 km transmission and 25.022 km distribution, reservoir construction additionally with a capacity of 201 cum, 5,243 service connection and installation of disinfection facilities. The total project cost will be P 8.6 M. E. Organization and Staffing 

Table 8-7 Detailed Present Status of Existing Water Supply System

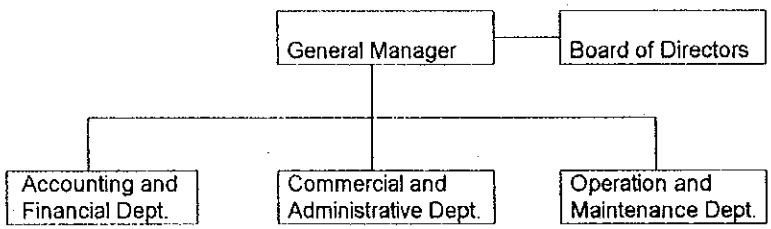
CITY/ MUNICIPALITY	PRESENT STATUS
(6) TANZA	A. System Scale Tanza Water District was created in 1988. LEVEL III water supply system are presently serving a total of 210 service connections . B. Description of Facilities (1) Water Source Deepwell — 115m depth, casing 200m~250mm (2) Reservoir Elevated Steel Tank — 250 cum capacity (3) Pipelines Total of 10,136m transmission/distribution pipelines (50 mm - 200 mm) are now being laid. (4) Treatment The water is treated using a hypochlorinator. C. Water System Management Water District is managing the system. Water fee is as follows: Residential/ Connection: 0-10 cum P 60.00; 11-20 cum 6.00/cum; 21-30 cum 6.20/cum; over 30 cum 6.35/cum D. Improvement Program The proposed improvement program include leak detection and repair, installation of water meters and fittings. E. Organization and Staffing 

Table 8-8 Detailed Present Status of Existing Water Supply System

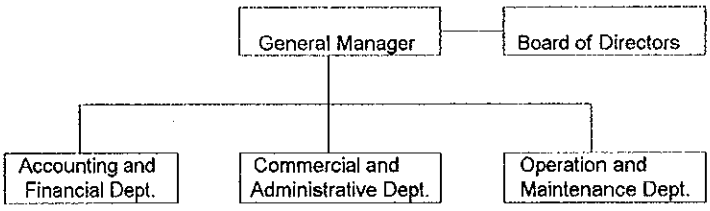
CITY/ MUNICIPALITY	PRESENT STATUS
(7) TAGAYTAY	A. System Scale Tagaytay City Water District has a LEVEL III water supply system and has a total of 2,552 metered service connections. B. Description of Facilities (1) Water Source Kaybubutong Spring 32.52 L/S yield 324 mas l Matang Tubig Spr ng 8.16 L/S yield 505 mas l Pulong Usiw Spring 0.89 L/S yield 550 mas l (2) Pipelines As of Jan. 1991, TCWD had a total of 48.98 km of transmission and distribution pipelines with pipe diameters ranging from 38 to 250 mm of PVC, CI, Steel and AC pipes.. (3) Reservoir Ground Reservoir RC Two-chambered Upper Chamber 250 cum (not utilized due to leakage) Lower Chamber 700 cum (4) Treatment The water is treated using a gas chlorinator at Booster Pumping Station No.5. C. Water System Management Tagaytay Water District is managing a LEVEL III water supply system. Water fee is as follows: Minimum (<10 cum) 11-25 26-45 Residential 110.00 5.80 7.05 Commercial 220.00 10.60 14.10 Institutional/Gov't 110.00 5.80 7.05 D. Improvement program The proposed improvement program include leak detection and repair, rehabilitation of pumping station facilities, installation of emergency power generator, 18 km pipe laying of PVC and SP with diameters ranging from 50 to 250 mm, rehabilitation of existing reservoir capacity ranging from 50 cum to 150 cum, installation of chlorinating equipment and total of 1,404 service connections. The total project cost will be P 29.3 M. E. Organization and Staffing 

Table 8-9 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(8) AMADEO	A. System Scale The Poblacion area of Amadeo is presently being served by Level III water supply system. Service population is 4,402 with a supply capacity of 350 cu.m/day. Water use is 100% domestic consumption. B. Description of Facilities (1) Water Source Present water source is deep well with a depth of 182 m and a capacity of 568 lpm (2) Distribution Line G.I. pipe and PVC pipes with the size ranging from 150-75 mm dia. and length of 2.5 km. (3) Pumping Station 25 HP submersible pump. Direct pumping in a 15-18 hrs. operation. (4) Treatment Treatment method is chlorination. C. Water System Management Water cost of P 50/month minimum. D. Improvement Program The municipal government intends to rehabilitate the existing PVC distribution pipes but doesn't have any budget as of the moment. E. Organization and Staffing The system is being managed by the Municipal Water Supply.

Table 8-10 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(9) MAGALLANES	A. System Scale The system serving the Poblacion and adjacent 4 barangays is a combined Level II/III with a total service population of 4,833.100% of consumers are residential. B. Description of Facilities (1) Water Source There are two (2) springs currently being utilized as water sources. (2) Transmission/Distribution Lines A combination of GI and PVC composed the distribution/transmission pipelines with size ranging from 100-150 mm dia. and a length of approx. 1,700 m. (3) Reservoir There are two (2) units of concrete reservoir located at the Poblacion and barangay Medina with a combined volume of 400 cu.m. (4) Treatment Treatment method is by chlorination. C. Water System Management Water cost is flat rate. for: Level II - P30.00/month Level III - P40.00/month D. Organization and Staffing The system is being managed by the Municipal Water Supply.

Table 8-11 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(10) MARAGONDON	A. System Scale Maragondon Water District has a LEVEL III water supply system which has 624 service connections as of January 1992. B. Description of Facilities (1) Water Source Deepwell 121m depth 160mm diameter 1,210cum/day discharge (2) Pipelines 38~100mm PVC, PB L=9,820m (3) Reservoir Elevated Steel Tank 167cum capacity (4) Treatment No treatment is applied C. Water System Management Maragondon Water Dsitrict is managing a LEVEL III water supply system. The water fee is as follows: Minimum (< 15) P45.0 / 16-20 P2.0 / 21-30 P2.5 / 31-50 P3.0 / 50 above P5.0 D. Improvement Program The proposed improvement program include total length of 2,095m pipe laying with diameters ranging from 100mm to 150mm, installation of hyprochlorinator, purchasing a generator and 445 service connections. The total project cost will be P2.3 M. E. Organization and Staffing The water supply system is manned by a manager, a plumber, a bookeeper and two collection clerks.

Table 8-12 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(11) TERNATE	A. System Scale The Poblacion area and adjacent barangay have their individual Level I system complete with pump and storage facilities. This is due to the availability of potable water source Which is only about 3-5 m below ground surface. The municipal government has no future plans to put up a piped water system (Level II or III).

Table 8-13 Detailed Present Status of Existing Water Supply System

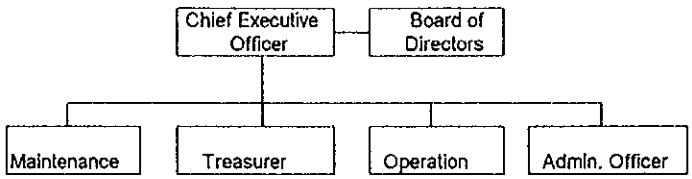
CITY/ MUNICIPALITY	PRESENT STATUS
(12) ALFONSO	A. System Scale The Poblacion area is presently being served by a combined level II/III water system with a total population of 5,300 and currently with 520 service connections. B. Description of Facility (1) WATER SOURCE - Spring Q = 3.5 Lps D = 1.6 km from service area Elev = 28.7 m above service area - Deep Well No. 1 (within service area) Q = 200 Lpm - Deep Well No. 2 (within service area) Q = 200 Lpm (2) Pipelines L = 1,700 m transmission/Distribution lines (3) Reservoir - Spring intake box only (4) Pumping Station - P.S. No.1 (20 Hp turbine pump) - P.S. No. 2 (10 Hp centifugal pump) (5) Treatment Facility No treatment C. Water System Management The system is presently being managed by Municipal Water Supply under the Office of the Mayor and collecting a flat rate of P 50/month. Water consumption is purely domestic (residential area) with an average of approximately 233 cu.m/day. D. Improvement Program The municipal government has set aside an annual budget of P 100,000 for the rehabilitation/improvement of the water system and has utilized P 40,000 in the repair of pumping facilities. E. Organization and Staffing 

Table 8-14 Detailed Present Status of Existing Water Supply System

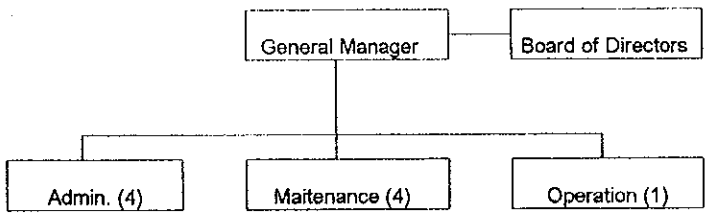
CITY/ MUNICIPALITY	PRESENT STATUS
(13) NAIC	A. System Scale The service level for the Poblacion area is only Level I (Private Wells with pump and storage) but the five (5) adjacent barangays has a level II/III water system serving a total of 2,950 residents or about 558 service connections. B. Description of Facility (1) Water Source Spring (by gravity) Q = 4.3 Lps D = 4 km from service area Elev = 30 m above service area (2) Reservoir Intake facility, V = 50 cu.m (3) Pipelines L = 8.53 km transmission and distribution lines with a diameter ranging from 38 mm to 200 mm PVC , and GI pipe. (4) Treatment Facility No treatment is applied. C. Water System Management Water District is managing the system and the water rates being charged is P 30.00 per month on the flat rate basis. D. Improvement Program The proposed improvement program include leak detection and repair, installation of water maters. E. Organization and Staffing 

Table 8-15 Detailed Present Status of Existing Water Supply System

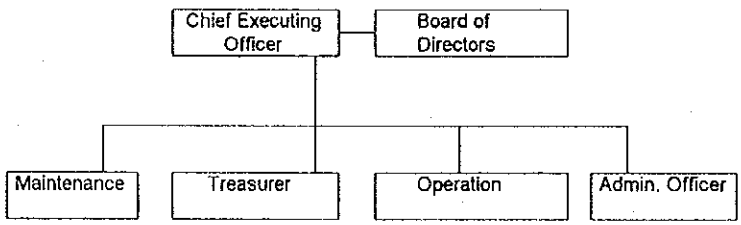
City/ MUNICIPALITY	PRESENT STATUS
(14) GENERAL AGUINALDO	A. System Scale The municipality of General Aguinaldo specifically the Poblacion area and two (2) adjacent barangays are presently being served by a level II/III water supply system. Served population for the above service area is 6,694. B. Description of Facility (1) Water Source Spring Q = 12.5 Lps L = 6.4 km from service area Elev = 100.00 m above service area (2) Reservoir Spring intake box, V = 5 cu.m (3) Pipelines L = 7.03 km transmission and distribution lines Dia = 25 ~ 100 mm 0 PUC pipes (4) Treatment Facility No treatment is applied. C. Water System Management The Municipal Water Supply is managing the system collecting a water fee of P 2.84/cu.m. Water users are purely domestic. Under this management, collected fees are included in the municipality's general fund. Thus, O & M would depend on the fund to be allocated by the municipality. D. Rehabilitation/Expansion Program The system is presently undergoing major rehabilitation works with the total replacement of existing pipelines and utilization of additional spring source. E. Organization and Staffing 

Table 8-16 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(15) CARMONA	The municipality of Carmona including the poblacion area has no existing piped water system. Most of the residents have their own private shallow wells (LEVEL I) except the newly established industrial zones which has their own water supply system. Poblacion area is a relatively flat terrain will shallow well depth ranging from 5~15 m below ground surface.

Table 8-17 Detailed Present Status of Existing Water Supply System

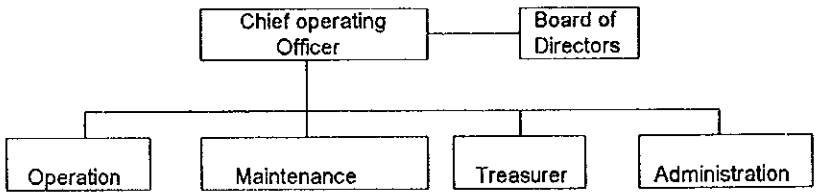
CITY/ MUNICIPALITY	PRESENT STATUS
(16) TRECE MARTIRES	A. System Scale The Poblacion area of Trece Martires and one adjacent barangay is presently being served by a LEVEL III water system. Total served population is 7,242 with serving connections numbering 1,107 units. B. Description of Facility (1) Water Service 4 units deep well Well depth - 100 ~ 120 m Q = 180 ~ 200 Lpm (2) Reservoir No reservoir (3) Pipe lines L = 4.92 km Distribution Lines Dia = 25 ~ 200 mm o puc & GI pipe (4) Pumping Stations - 3 units pump stations with 7.5 Hp turbine pump - 1 unit pump station with 10 Hp turbine pump (5) Treatment Facility Chlorination only C. Water System Management The city government is managing the system collecting a water rate of P 2.40/cu.m. Average daily consumption is about 960 cu.m. Majority of concessionaires are residential areas. D. Improvement Program The City Government is intending to create a water district and presently being studied by the city council. This year, the allocation for operation and maintenance work is P 150,000. E. Organization and Staffing 

Table 8-18 Detailed Present Status of Existing Water Supply System

CITY/ MUNICIPALITY	PRESENT STATUS
(17) GENERAL TRIAS	A. System Scale The Poblacion area and adjacent barangays have their individual LEVEL I system complete with pump and storage facilities. This is due to the availability of possible water source which is approx. 5 m below ground surface. However, other barangays e.g. Mangahan, Panungyanan, Buenavista have their own LEVEL II/III facilities. These areas are approx. 100 m higher compared to the Poblacion and are utilizing Deep Well as water sources.

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.

T I T L E : GMA1 (peak hour)
NO. OF PIPES : 92
NO. OF NODES : 54
PEAK FACTOR : 2
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .009

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
1	3	1	100.00	150	90	0.50	0.03LO	0.02	0.00
2	2	3	58.00	100	90	2.83	0.36	3.69	0.21
2001	2	3	58.00	150	110	10.06	0.57	3.69	0.21
3	3	43	284.00	150	90	11.34	0.64	6.69	1.90
4	2	44	282.00	100	90	4.14	0.53	7.47	2.11
5	44	45	50.00	100	90	2.14	0.27LO	2.20	0.11
6	44	43	56.00	100	90	0.42	0.05LO	0.11	0.01
7	43	4	126.00	150	90	10.64	0.60	5.95	0.75
8	45	19	462.00	100	90	1.74	0.22LO	1.49	0.69
9	4	10	162.00	150	90	2.39	0.14LO	0.38	0.06
10	4	5	70.00	100	90	1.60	0.20LO	1.29	0.09
1000	4	5	70.00	150	110	5.69	0.32	1.29	0.09
11	5	6	166.00	100	90	2.55	0.32	3.05	0.51
1100	5	6	166.00	100	110	3.12	0.40	3.05	0.51
12	6	7	88.00	100	90	1.80	0.23LO	1.60	0.14
1200	6	7	88.00	100	110	2.20	0.28LO	1.60	0.14
13	6	8	88.00	75	90	0.74	0.17LO	1.27	0.11
14	5	9	88.00	75	90	0.80	0.18LO	1.45	0.13
15	9	8	168.00	75	90	1.17	0.26LO	2.92	0.49
16	11	9	88.00	75	90	0.84	0.19LO	1.59	0.14
17	8	13	92.00	75	90	0.91	0.21LO	1.83	0.17
18	7	14	176.00	100	90	3.14	0.40	4.47	0.79
19	13	14	100.00	150	90	11.15	0.63	6.48	0.65
20	12	13	78.00	150	90	11.00	0.62	6.33	0.49
21	11	12	94.00	150	90	7.68	0.43	3.25	0.31
2100	11	12	94.00	150	110	9.39	0.53	3.25	0.31
22	10	11	34.00	150	90	2.82	0.16LO	0.51	0.02
23	19	10	158.00	150	90	1.17	0.07LO	0.10	0.02
24	12	17	98.00	100	90	2.40	0.31	2.72	0.27
2400	12	17	98.00	100	110	2.93	0.37	2.72	0.27
25	14	15	100.00	150	90	5.95	0.34	2.03	0.20
2500	14	15	100.00	150	110	7.28	0.41	2.03	0.20
26	16	15	84.00	100	90	2.88	0.37	3.81	0.32
27	17	16	92.00	100	90	4.37	0.56	8.24	0.76
28	17	18	64.00	100	90	0.21	0.03LO	0.03	0.00
291	19	50	30.00	100	90	2.45	0.31	2.82	0.08
292	50	18	100.00	100	90	3.42	0.43	5.23	0.52
30	20	19	170.00	150	90	5.59	0.32	1.81	0.31
31	18	21	160.00	100	90	2.57	0.33	3.10	0.50
32	16	22	242.00	100	90	0.25	0.03LO	0.04	0.01
33	15	23	180.00	100	90	1.46	0.19LO	1.08	0.19

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
3300	15	23	180.00	150	110	5.18	0.29LO	1.08	0.19
34	15	29	284.00	75	90	1.30	0.29LO	3.54	1.01
3400	15	29	284.00	100	110	3.38	0.43	3.54	1.01
35	15	27	308.00	100	90	2.70	0.34	3.39	1.04
36	27	28	80.00	100	90	0.65	0.08LO	0.24	0.02
3600	27	28	80.00	100	110	0.79	0.10LO	0.24	0.02
37	29	28	36.00	75	90	0.84	0.19LO	1.57	0.06
3700	29	28	36.00	100	110	2.18	0.28LO	1.57	0.06
38	29	30	84.00	75	90	0.70	0.16LO	1.13	0.09
39	23	30	170.00	100	90	3.45	0.44	5.33	0.91
40	23	24	114.00	100	90	1.67	0.21LO	1.40	0.16
41	24	31	104.00	75	90	1.92	0.43	7.33	0.76
42	25	24	120.00	100	90	1.19	0.15LO	0.75	0.09
43	22	26	140.00	100	90	2.47	0.31	2.88	0.40
4300	22	26	140.00	100	110	3.02	0.38	2.88	0.40
44	26	25	84.00	100	90	2.05	0.26LO	2.03	0.17
4400	26	25	84.00	100	110	2.50	0.32	2.03	0.17
45	25	35	178.00	75	110	2.16	0.49	6.30	1.12
46	35	34	100.00	75	110	1.01	0.23LO	1.54	0.15
47	31	34	140.00	75	90	1.19	0.27LO	3.02	0.42
48	30	31	90.00	75	90	0.25	0.06LO	0.17	0.02
49	30	33	90.00	100	90	2.93	0.37	3.95	0.36
50	28	32	90.00	50	90	0.46	0.23LO	3.68	0.33
5000	28	32	90.00	100	110	3.45	0.44	3.68	0.33
51	32	33	120.00	100	90	0.97	0.12LO	0.51	0.06
52	32	36	100.00	50	90	0.24	0.12LO	1.10	0.11
5200	32	36	100.00	100	110	1.80	0.23LO	1.10	0.11
53	33	37	100.00	100	90	3.03	0.39	4.19	0.42
54	34	38	54.00	50	90	0.62	0.32	6.57	0.35
5400	34	38	54.00	50	110	0.76	0.39	6.57	0.35
55	37	38	90.00	50	90	0.09	0.05LO	0.20	0.02
56	36	37	120.00	50	90	0.41	0.21LO	3.09	0.37
57	36	39	94.00	50	90	0.69	0.35	8.02	0.75
58	40	39	120.00	50	90	0.23	0.12LO	1.04	0.12
59	37	40	90.00	100	90	2.47	0.31	2.87	0.26
60	38	42	180.00	50	90	0.52	0.27LO	4.78	0.86
61	40	41	82.00	100	90	1.42	0.18LO	1.04	0.09
62	41	42	90.00	50	90	0.59	0.30	5.94	0.53
63	21	22	70.00	100	90	2.90	0.37	3.88	0.27
6300	21	22	70.00	100	110	3.55	0.45	3.88	0.27
64	51	21	100.00	100	90	4.90	0.62	10.19HI	1.02
641	20	51	38.00	100	90	4.93	0.63	10.31HI	0.39
65	20	46	206.00	150	90	5.02	0.28LO	1.48	0.31
66	46	47	120.00	150	90	0.64	0.04LO	0.03	0.00
67	46	48	80.00	100	110	3.87	0.49	4.55	0.36
68	48	49	226.00	100	110	2.95	0.38	2.75	0.62
69	11	50	155.00	100	110	0.94	0.12LO	0.33	0.05
70	51	50	165.00	100	110	0.03	0.00LO	0.00	0.00

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
101	100	2	50.00	200	110	17.83	0.57	2.63	0.13
201	200	11	20.00	150	110	16.60	0.94	9.34	0.19
301	300	20	20.00	200	110	17.23	0.55	2.46	0.05

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.504	188.00	196.15	8.15
2	-0.804	186.50	196.37	9.87
3	-1.044	188.00	196.15	8.15
4	-0.954	186.60	193.51	6.91
5	-0.824	184.70	193.42	8.72
6	-0.924	180.00	192.91	12.91
7	-0.864	178.50	192.77	14.27
8	-1.004	179.50	192.80	13.30
9	-0.474	183.50	193.29	9.79
10	-0.744	184.00	193.45	9.45
11	-0.574	182.00	193.43	11.43
12	-0.734	179.40	193.12	13.72
13	-0.764	179.30	192.63	13.33
14	-1.054	178.00	191.98	13.98
15	-2.094	178.00	191.78	13.78
16	-1.234	178.00	192.10	14.10
17	-0.754	178.20	192.85	14.65
18	-1.054	177.50	192.85	15.35
19	-3.714	180.00	193.46	13.46
20	-1.684	176.70	193.77	17.07
21	-1.014	174.20	192.36	18.16
22	-1.214	175.50	192.09	16.59
23	-1.514	173.50	191.58	18.08
24	-0.944	171.70	191.42	19.72
25	-1.194	167.40	191.51	24.11
26	-0.944	169.00	191.68	22.68
27	-1.264	164.00	190.74	26.74
28	-0.544	169.50	190.72	21.22
29	-0.964	170.40	190.77	20.37
30	-0.964	169.10	190.68	21.58
31	-0.984	168.00	190.66	22.66
32	-0.904	166.40	190.38	23.98
33	-0.874	165.60	190.32	24.72
34	-0.814	166.50	190.24	23.74
35	-1.154	167.20	190.39	23.19
36	-0.924	164.50	190.27	25.77
37	-0.884	164.80	189.90	25.10
38	-0.954	164.50	189.88	25.38
39	-0.924	164.00	189.52	25.52
40	-0.814	164.10	189.65	25.55

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
41	-0.834	162.00	189.56	27.56
42	-1.114	160.90	189.02	28.12
43	-1.114	187.30	194.26	6.96
44	-1.584	186.00	194.26	8.26
45	-0.404	185.50	194.15	8.65
46	-0.504	176.70	193.46	16.76
47	-0.644	172.00	193.46	21.46
48	-0.924	168.00	193.10	25.10
49	-2.948	162.30	192.48	30.18
50	0.000	180.00	193.38	13.38
51	0.000	179.00	193.38	14.38
100 R	17.832	186.50	196.50	10.00
200 R	16.601	183.62	193.61	9.99
300 R	17.227	176.80	193.82	17.02

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA2 (peak hour)
NO. OF PIPES : 30
NO. OF NODES : 27
PEAK FACTOR : 2
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .002

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
2	2	1	120.00	150	90	1.02	0.06LO	0.08	0.01
3	3	2	56.00	150	90	5.99	0.34	2.06	0.12
4	4	3	210.00	150	90	0.32	0.02LO	0.01	0.00
5	4	5	120.00	150	90	2.51	0.14LO	0.41	0.05
6	6	5	200.00	150	90	1.54	0.09LO	0.17	0.03
7	7	6	322.00	150	90	6.99	0.40	2.73	0.88
8	7	8	106.00	100	90	3.34	0.43	5.03	0.53
9	8	9	290.00	100	90	1.75	0.22LO	1.52	0.44
10	10	3	104.00	150	90	7.44	0.42	3.06	0.32
11	10	11	328.00	100	110	2.09	0.27LO	1.45	0.48
12	11	12	328.00	100	90	0.03	0.00LO	0.00	0.00
13	13	12	328.00	100	90	1.35	0.17LO	0.94	0.31
14	14	10	130.00	150	90	12.10	0.68	7.54	0.98
15	14	15	150.00	100	90	5.83	0.74	14.05HI	2.11
16	15	16	150.00	100	90	3.72	0.47	6.14	0.92
17	16	17	170.00	100	90	1.54	0.20LO	1.20	0.20
18	18	4	90.00	150	90	4.82	0.27LO	1.37	0.12
19	18	19	70.00	100	110	4.93	0.63	7.13	0.50
20	19	20	70.00	100	110	1.18	0.15LO	0.51	0.04
21	19	21	230.00	100	110	2.00	0.25LO	1.34	0.31
22	22	21	72.00	100	110	2.44	0.31	1.93	0.14
23	21	23	48.00	100	110	2.54	0.32	2.09	0.10
24	23	24	100.00	100	110	1.42	0.18LO	0.71	0.07
25	2	22	94.00	100	110	3.87	0.49	4.55	0.43
26	5	11	106.00	100	90	1.43	0.18LO	1.05	0.11
27	6	12	102.00	100	110	2.06	0.26LO	1.42	0.14
28	7	13	106.00	100	90	3.92	0.50	6.76	0.72
101	100	14	270.00	150	110	19.39	1.10	12.44HI	3.36
201	200	18	30.00	150	90	10.75	0.61	6.06	0.18
301	300	7	600.00	150	110	16.60	0.94	9.34	5.60

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-1.022	168.48	173.22	4.74
2	-1.102	162.34	173.23	10.89
3	-1.762	167.20	173.34	6.14
4	-1.992	163.40	173.34	9.94
5	-2.612	160.70	173.30	12.60
6	-3.392	146.30	173.33	27.03

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
7	-2.342	138.30	174.21	35.91
8	-1.592	138.00	173.68	35.68
9	-1.752	136.00	173.23	37.23
10	-2.572	164.10	173.66	9.56
11	-3.492	155.10	173.18	18.08
12	-3.442	143.60	173.18	29.58
13	-2.572	133.00	173.49	40.49
14	-1.462	161.50	174.64	13.14
15	-2.102	153.00	172.53	19.53
16	-2.182	148.50	171.61	23.11
17	-1.542	148.50	171.41	22.91
18	-1.000	162.70	173.47	10.77
19	-1.752	160.00	172.97	12.97
20	-1.182	156.00	172.93	16.93
21	-1.892	160.80	172.66	11.86
22	-1.432	162.30	172.80	10.50
23	-1.122	158.00	172.56	14.56
24	-1.422	156.50	172.49	15.99
100 R	19.385	166.00	178.00	12.00
200 R	10.751	163.65	173.65	10.00
300	16.600	135.00	179.81	44.81

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA3 (peak hour)
NO. OF PIPES : 31
NO. OF NODES : 21
PEAK FACTOR : 2
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .002

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1	2	1	98.00	150	90	1.08	0.06LO	0.09	0.01
1000	2	1	98.00	100	110	0.45	0.06LO	0.09	0.01
2	2	3	70.00	100	110	1.32	0.17LO	0.62	0.04
3	4	3	186.00	100	110	1.14	0.14LO	0.47	0.09
4	5	2	186.00	150	90	5.30	0.30LO	1.64	0.30
5	5	4	70.00	100	110	3.47	0.44	3.72	0.26
6	6	5	60.00	150	90	11.03	0.62	6.35	0.38
7	9	4	180.00	100	110	0.52	0.07LO	0.11	0.02
8	6	10	120.00	150	90	7.67	0.43	3.24	0.39
9	10	9	70.00	100	110	3.26	0.42	3.31	0.23
10	7	6	56.00	100	90	4.53	0.58	8.82	0.49
1010	7	6	56.00	150	110	16.09	0.91	8.82	0.49
11	7	8	80.00	100	90	1.45	0.18LO	1.07	0.09
1100	7	8	80.00	100	110	1.77	0.23LO	1.07	0.09
12	7	45	118.00	100	90	1.99	0.25LO	1.93	0.23
1200	7	45	118.00	150	110	7.08	0.40	1.93	0.23
13	8	46	114.00	100	90	1.57	0.20LO	1.24	0.14
14	12	11	134.00	100	110	1.57	0.20LO	0.86	0.12
15	11	13	176.00	100	90	1.44	0.18LO	1.06	0.19
1500	11	13	176.00	150	110	5.11	0.29LO	1.06	0.19
16	14	12	110.00	100	90	4.48	0.57	8.65	0.95
17	14	13	206.00	100	90	3.70	0.47	6.08	1.25
18	45	11	68.00	100	90	1.62	0.21LO	1.31	0.09
1800	45	11	68.00	150	110	5.74	0.32	1.31	0.09
19	12	46	120.00	100	90	0.60	0.08LO	0.21	0.03
20	10	15	290.00	150	90	1.04	0.06LO	0.08	0.02
38	13	31	400.00	100	90	4.47	0.57	8.59	3.44
42	31	36	400.00	100	90	1.04	0.13LO	0.58	0.23
58	46	45	94.00	100	110	0.12	0.02LO	0.01	0.00
101	100	7	20.00	150	90	34.63	1.96	52.74HI	1.05
201	200	14	300.00	150	110	10.52	0.60	4.01	1.20

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-1.528	136.20	139.86	3.66
2	-2.448	133.50	139.87	6.37
3	-2.458	132.20	139.82	7.62
4	-2.858	131.00	139.91	8.91
5	-2.258	132.00	140.17	8.17

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
6	-1.928	131.60	140.55	8.95
7	-1.718	131.20	141.05	9.85
8	-1.648	127.30	140.96	13.66
9	-2.738	127.00	139.93	12.93
10	-3.368	127.00	140.16	13.16
11	-2.378	124.60	140.73	16.13
12	-2.308	110.00	140.84	30.84
13	-5.788	114.60	140.54	25.94
14	-2.328	108.50	141.80	33.30
15	-1.038	115.00	140.14	25.14
31	-3.428	109.00	137.11	28.11
36	-1.038	101.70	136.87	35.17
45	-1.838	125.50	140.82	15.32
46	-2.048	123.20	140.82	17.62
100 R	34.626	132.10	142.10	10.00
200 R	10.516	128.00	143.00	15.00

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA4 (peak hour)
NO. OF PIPES : 28
NO. OF NODES : 20
PEAK FACTOR : 2
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .005

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
2	1	2	50.00	150	90	9.11	0.52	4.46	0.22
3	2	3	210.00	150	90	8.16	0.46	3.64	0.76
4	3	4	300.00	150	90	6.04	0.34	2.09	0.63
5	5	4	160.00	150	90	8.34	0.47	3.79	0.61
6	5	6	220.00	150	90	8.20	0.46	3.67	0.81
7	6	7	160.00	100	90	2.62	0.33	3.19	0.51
8	6	8	40.00	100	90	4.48	0.57	8.66	0.35
9	8	9	140.00	100	90	1.74	0.22LO	1.51	0.21
10	8	10	64.00	100	90	3.64	0.46	5.88	0.38
11	11	10	220.00	100	90	0.05	0.01LO	0.00	0.00
12	10	12	46.00	100	90	2.85	0.36	3.74	0.17
13	11	13	46.00	100	110	1.90	0.24LO	1.23	0.06
14	12	14	50.00	100	90	3.19	0.41	4.61	0.23
15	14	17	120.00	100	110	2.62	0.33	2.22	0.27
16	16	15	100.00	50	110	0.18	0.09LO	0.47	0.05
17	17	15	184.00	50	110	0.16	0.08LO	0.38	0.07
18	18	16	180.00	150	90	0.53	0.03LO	0.02	0.00
19	19	18	310.00	150	90	2.45	0.14LO	0.39	0.12
20	13	12	190.00	100	90	1.07	0.14LO	0.61	0.12
21	17	18	70.00	100	110	0.85	0.11LO	0.28	0.02
22	4	19	280.00	150	90	10.03	0.57	5.33	1.49
23	4	8	290.00	100	90	1.97	0.25LO	1.89	0.55
24	1	5	124.00	150	90	12.58	0.71	8.11	1.01
2400	1	5	124.00	100	110	5.29	0.67	8.11	1.01
25	7	9	40.00	100	110	1.84	0.23LO	1.15	0.05
26	9	11	64.00	100	110	2.85	0.36	2.58	0.16
201	200	1	30.00	150	90	12.45	0.70	7.95	0.24
202	200	1	30.00	150	110	15.22	0.86	7.95	0.24

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.686	121.45	124.76	3.31
2	-0.956	118.00	124.54	6.54
3	-2.116	119.00	123.77	4.77
4	-2.386	101.20	123.15	21.95
5	-1.336	113.40	123.76	10.36
6	-1.096	113.10	122.95	9.85
7	-0.776	111.50	122.44	10.94
8	-1.076	108.00	122.60	14.60

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
9	-0.736	106.00	122.39	16.39
10	-0.836	107.10	122.22	15.12
11	-0.896	97.00	122.23	25.23
12	-0.726	100.90	122.05	21.15
13	-0.836	94.00	122.17	28.17
14	-0.566	98.50	121.82	23.32
15	-0.346	105.50	121.49	15.99
16	-0.346	107.60	121.53	13.93
17	-1.606	106.50	121.56	15.06
18	-2.776	109.00	121.54	12.54
19	-7.576	115.20	121.66	6.46
200 R	27.674	124.60	125.00	0.40

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA5(Peak hour)
NO. OF PIPES : 26
NO. OF NODES : 17
PEAK FACTOR : 2
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : 0

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
2	1	2	208.00	150	90	5.14	0.29LO	1.55	0.32
3	2	3	72.00	75	90	2.31	0.52	10.30HI	0.74
4	1	4	104.00	150	90	5.12	0.29LO	1.53	0.16
4000	1	4	104.00	200	110	13.33	0.42	1.53	0.16
5	5	4	530.00	150	90	6.55	0.37	2.42	1.28
5000	5	4	530.00	150	110	8.00	0.45	2.42	1.28
6	6	5	550.00	150	90	9.40	0.53	4.73	2.60
6000	6	5	550.00	150	110	11.49	0.65	4.73	2.60
7	4	7	70.00	100	90	3.37	0.43	5.10	0.36
7000	4	7	70.00	200	110	25.52	0.81	5.10	0.36
8	7	8	250.00	100	90	4.56	0.58	8.94	2.24
8000	7	8	250.00	100	110	5.58	0.71	8.94	2.24
9	8	9	150.00	75	90	1.78	0.40	6.36	0.95
9000	8	9	150.00	100	110	4.84	0.59	6.36	0.95
10	9	10	100.00	50	90	0.22	0.11LO	0.94	0.09
1010	9	10	100.00	100	110	1.65	0.21LO	0.94	0.09
11	9	11	140.00	100	110	1.90	0.24LO	1.22	0.17
12	7	12	210.00	100	90	3.24	0.41	4.75	1.00
1200	7	12	210.00	150	110	11.53	0.65	4.75	1.00
13	12	13	450.00	100	90	3.54	0.45	5.59	2.52
14	12	14	60.00	100	90	1.68	0.21LO	1.41	0.08
1400	12	14	60.00	150	110	5.98	0.34	1.41	0.08
15	14	15	490.00	100	90	3.32	0.42	4.96	2.43
16	13	15	90.00	100	90	0.03	0.00LO	0.00	0.00
101	100	1	30.00	200	110	25.80	0.82	5.20	0.16
201	200	6	200.00	200	110	25.00	0.80	4.91	0.98

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-2.210	102.40	113.67	11.27
2	-2.830	107.50	113.35	5.85
3	-2.310	105.50	112.61	7.11
4	-4.110	100.40	113.51	13.11
5	-6.340	91.50	114.80	23.30
6	-4.110	78.50	117.40	38.90
7	-3.980	96.98	113.16	16.18
8	-3.720	87.00	110.92	23.92
9	-2.650	84.52	109.97	25.45
10	-1.870	83.50	109.87	26.37

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
11	-1.900	88.00	109.80	21.80
12	-3.570	94.80	112.16	17.36
13	-3.510	90.14	109.64	19.50
14	-4.340	101.00	112.07	11.07
15	-3.350	101.40	109.64	8.24
100 R	25.800	103.80	113.83	10.03
200	25.000	78.00	118.38	40.38

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA1 (max day)
NO. OF PIPES : 92
NO. OF NODES : 54
PEAK FACTOR : 1.3
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .009

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1	3	1	100.00	150	90	0.33	0.02LO	0.01	0.00
2	2	3	58.00	100	90	2.54	0.32	3.03	0.18
2001	2	3	58.00	150	110	9.04	0.51	3.03	0.18
3	3	43	284.00	150	90	10.58	0.60	5.88	1.67
4	2	44	282.00	100	90	3.84	0.49	6.50	1.83
5	44	45	50.00	100	90	2.14	0.27LO	2.21	0.11
6	44	43	56.00	100	90	0.67	0.08LO	0.25	0.01
7	43	4	126.00	150	90	10.52	0.60	5.82	0.73
8	45	19	462.00	100	90	1.88	0.24LO	1.74	0.80
9	4	10	162.00	150	90	4.29	0.24LO	1.11	0.18
10	4	5	70.00	100	90	1.23	0.16LO	0.79	0.06
1000	4	5	70.00	150	110	4.38	0.25LO	0.79	0.06
11	5	6	166.00	100	90	1.86	0.24LO	1.69	0.28
1100	5	6	166.00	100	110	2.27	0.29LO	1.69	0.28
12	6	7	88.00	100	90	1.27	0.16LO	0.84	0.07
1200	6	7	88.00	100	110	1.55	0.20LO	0.84	0.07
13	6	8	88.00	75	90	0.70	0.16LO	1.12	0.10
14	5	9	88.00	75	90	0.95	0.21LO	1.98	0.17
15	9	8	168.00	75	90	0.73	0.16LO	1.22	0.20
16	11	9	88.00	75	90	0.09	0.02LO	0.03	0.00
17	8	13	92.00	75	90	0.77	0.17LO	1.36	0.12
18	7	14	176.00	100	90	2.26	0.29LO	2.45	0.43
19	13	14	100.00	150	90	7.10	0.40	2.81	0.28
20	12	13	78.00	150	90	6.83	0.39	2.62	0.20
21	11	12	94.00	150	90	4.79	0.27LO	1.36	0.13
2100	11	12	94.00	150	110	5.86	0.33	1.36	0.13
22	10	11	34.00	150	90	4.93	0.28LO	1.43	0.05
23	19	10	158.00	150	90	1.12	0.06LO	0.09	0.01
24	12	17	98.00	100	90	1.51	0.19LO	1.15	0.11
2400	12	17	98.00	100	110	1.84	0.23LO	1.15	0.11
25	14	15	100.00	150	90	3.91	0.22LO	0.93	0.09
2500	14	15	100.00	150	110	4.78	0.27LO	0.93	0.09
26	16	15	84.00	100	90	1.81	0.23LO	1.62	0.14
27	17	16	92.00	100	90	2.79	0.35	3.59	0.33
28	17	18	64.00	100	90	0.07	0.01LO	0.00	0.00
291	19	50	30.00	100	90	2.08	0.26LO	2.09	0.06
292	50	18	100.00	100	90	2.25	0.29LO	2.42	0.24
30	20	19	170.00	150	90	3.73	0.21LO	0.86	0.15
31	18	21	160.00	100	90	1.63	0.21LO	1.34	0.21
32	16	22	242.00	100	90	0.17	0.02LO	0.02	0.00
33	15	23	180.00	100	90	0.95	0.12LO	0.49	0.09

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
3300	15	23	180.00	150	110	3.38	0.19LO	0.49	0.09
34	15	29	284.00	75	90	0.84	0.19LO	1.60	0.45
3400	15	29	284.00	100	110	2.20	0.28LO	1.60	0.45
35	15	27	308.00	100	90	1.76	0.22LO	1.53	0.47
36	27	28	80.00	100	90	0.42	0.05LO	0.11	0.01
3600	27	28	80.00	100	110	0.51	0.07LO	0.11	0.01
37	29	28	36.00	75	90	0.54	0.12LO	0.71	0.03
3700	29	28	36.00	100	110	1.42	0.18LO	0.71	0.03
38	29	30	84.00	75	90	0.46	0.10LO	0.51	0.04
39	23	30	170.00	100	90	2.24	0.29LO	2.40	0.41
40	23	24	114.00	100	90	1.11	0.14LO	0.65	0.07
41	24	31	104.00	75	90	1.25	0.28LO	3.29	0.34
42	25	24	120.00	100	90	0.75	0.10LO	0.32	0.04
43	22	26	140.00	100	90	1.60	0.20LO	1.28	0.18
4300	22	26	140.00	100	110	1.95	0.25LO	1.28	0.18
44	26	25	84.00	100	90	1.32	0.17LO	0.90	0.08
4400	26	25	84.00	100	110	1.61	0.21LO	0.90	0.08
45	25	35	178.00	75	110	1.40	0.32	2.83	0.50
46	35	34	100.00	75	110	0.65	0.15LO	0.69	0.07
47	31	34	140.00	75	90	0.77	0.18LO	1.36	0.19
48	30	31	90.00	75	90	0.17	0.04LO	0.08	0.01
49	30	33	90.00	100	90	1.91	0.24LO	1.78	0.16
50	28	32	90.00	50	90	0.30	0.15LO	1.66	0.15
5000	28	32	90.00	100	110	2.25	0.29LO	1.66	0.15
51	32	33	120.00	100	90	0.63	0.08LO	0.23	0.03
52	32	36	100.00	50	90	0.15	0.08LO	0.50	0.05
5200	32	36	100.00	100	110	1.17	0.15LO	0.50	0.05
53	33	37	100.00	100	90	1.97	0.25LO	1.89	0.19
54	34	38	54.00	50	90	0.40	0.21LO	2.95	0.16
5400	34	38	54.00	50	110	0.49	0.25LO	2.95	0.16
55	37	38	90.00	50	90	0.06	0.03LO	0.09	0.01
56	36	37	120.00	50	90	0.27	0.14LO	1.40	0.17
57	36	39	94.00	50	90	0.45	0.23LO	3.62	0.34
58	40	39	120.00	50	90	0.15	0.08LO	0.47	0.06
59	37	40	90.00	100	90	1.60	0.20LO	1.29	0.12
60	38	42	180.00	50	90	0.34	0.17LO	2.15	0.39
61	40	41	82.00	100	90	0.93	0.12LO	0.47	0.04
62	41	42	90.00	50	90	0.38	0.20LO	2.68	0.24
63	21	22	70.00	100	90	1.87	0.24LO	1.72	0.12
6300	21	22	70.00	100	110	2.29	0.29LO	1.72	0.12
64	51	21	100.00	100	90	3.19	0.41	4.61	0.46
641	20	51	38.00	100	90	3.46	0.44	5.35	0.20
65	20	46	206.00	150	90	3.26	0.18LO	0.67	0.14
66	46	47	120.00	150	90	0.42	0.02LO	0.01	0.00
67	46	48	80.00	100	110	2.52	0.32	2.05	0.16
68	48	49	226.00	100	110	1.92	0.24LO	1.24	0.28
69	50	11	155.00	100	110	0.10	0.01LO	0.00	0.00
70	51	50	165.00	100	110	0.27	0.03LO	0.03	0.01

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
101	100	2	50.00	200	110	15.95	0.51	2.14	0.11
201	200	11	20.00	150	110	6.09	0.34	1.46	0.03
301	300	20	20.00	200	110	11.55	0.37	1.18	0.02

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.328	188.00	196.22	8.22
2	-0.523	186.50	196.39	9.89
3	-0.679	188.00	196.22	8.22
4	-0.620	186.60	193.81	7.21
5	-0.536	184.70	193.76	9.06
6	-0.601	180.00	193.48	13.48
7	-0.562	178.50	193.40	14.90
8	-0.653	179.50	193.38	13.88
9	-0.308	183.50	193.58	10.08
10	-0.484	184.00	193.63	9.63
11	-0.373	182.00	193.59	11.59
12	-0.477	179.40	193.46	14.06
13	-0.497	179.30	193.25	13.95
14	-0.685	178.00	192.97	14.97
15	-1.361	178.00	192.88	14.88
16	-0.802	178.00	193.01	15.01
17	-0.490	178.20	193.34	15.14
18	-0.685	177.50	193.34	15.84
19	-2.414	180.00	193.65	13.65
20	-1.095	176.70	193.79	17.09
21	-0.659	174.20	193.13	18.93
22	-0.789	175.50	193.01	17.51
23	-0.984	173.50	192.79	19.29
24	-0.614	171.70	192.72	21.02
25	-0.776	167.40	192.75	25.35
26	-0.614	169.00	192.83	23.83
27	-0.822	164.00	192.41	28.41
28	-0.354	169.50	192.40	22.90
29	-0.627	170.40	192.43	22.03
30	-0.627	169.10	192.38	23.28
31	-0.640	168.00	192.38	24.38
32	-0.588	166.40	192.25	25.85
33	-0.568	165.60	192.22	26.62
34	-0.529	166.50	192.18	25.68
35	-0.750	167.20	192.25	25.05
36	-0.601	164.50	192.20	27.70
37	-0.575	164.80	192.03	27.23
38	-0.620	164.50	192.02	27.52
39	-0.601	164.00	191.86	27.86
40	-0.529	164.10	191.92	27.82

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
41	-0.542	162.00	191.88	29.88
42	-0.724	160.90	191.64	30.74
43	-0.724	187.30	194.55	7.25
44	-1.030	186.00	194.56	8.56
45	-0.263	185.50	194.45	8.95
46	-0.328	176.70	193.66	16.96
47	-0.419	172.00	193.65	21.65
48	-0.601	168.00	193.49	25.49
49	-1.916	162.30	193.21	30.91
50	0.000	180.00	193.59	13.59
51	0.000	179.00	193.59	14.59
100 R	15.947	186.50	196.50	10.00
200 R	6.085	183.62	193.61	9.99
300 R	11.547	176.80	193.82	17.02

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA2 (max day)
NO. OF PIPES : 30
NO. OF NODES : 27
PEAK FACTOR : 1.3
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .004

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
2	2	1	120.00	150	90	0.66	0.04LO	0.04	0.00
3	3	2	56.00	150	90	4.59	0.26LO	1.25	0.07
4	3	4	210.00	150	90	2.96	0.17LO	0.56	0.12
5	5	4	120.00	150	90	4.61	0.26LO	1.26	0.15
6	6	5	200.00	150	90	5.55	0.31	1.78	0.36
7	7	6	322.00	150	90	9.02	0.51	4.38	1.41
8	7	8	106.00	100	90	2.17	0.28LO	2.27	0.24
9	8	9	290.00	100	90	1.14	0.14LO	0.69	0.20
10	10	3	104.00	150	90	8.69	0.49	4.09	0.43
11	10	11	328.00	100	110	1.78	0.23LO	1.09	0.36
12	12	11	328.00	100	90	1.24	0.16LO	0.80	0.26
13	13	12	328.00	100	90	2.21	0.28LO	2.34	0.77
14	14	10	130.00	150	90	12.15	0.69	7.59	0.99
15	14	15	150.00	100	90	3.79	0.48	6.33	0.95
16	15	16	150.00	100	90	2.42	0.31	2.77	0.42
17	16	17	170.00	100	90	1.00	0.13LO	0.54	0.09
18	4	18	90.00	150	90	6.27	0.35	2.23	0.20
19	18	19	70.00	100	110	2.51	0.32	2.05	0.14
20	19	20	70.00	100	110	0.77	0.10LO	0.23	0.02
21	19	21	230.00	100	110	0.61	0.08LO	0.15	0.03
22	22	21	72.00	100	110	2.28	0.29LO	1.71	0.12
23	21	23	48.00	100	110	1.65	0.21LO	0.94	0.05
24	23	24	100.00	100	110	0.92	0.12LO	0.32	0.03
25	2	22	94.00	100	110	3.21	0.41	3.21	0.30
26	11	5	106.00	100	90	0.76	0.10LO	0.32	0.03
27	6	12	102.00	100	110	1.27	0.16LO	0.58	0.06
28	7	13	106.00	100	90	3.88	0.49	6.63	0.70
101	100	14	270.00	150	110	16.88	0.96	9.63	2.60
201	18	200	30.00	150	90	3.11	0.18LO	0.61	0.02
301	300	7	600.00	150	110	16.60	0.94	9.34	5.60

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.664	168.48	173.91	5.43
2	-0.716	162.34	173.92	11.58
3	-1.145	167.20	173.99	6.79
4	-1.295	163.40	173.87	10.47
5	-1.698	160.70	174.02	13.32
6	-2.205	146.30	174.38	28.08

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
7	-1.522	138.30	175.79	37.49
8	-1.035	138.00	175.55	37.55
9	-1.139	136.00	175.35	39.35
10	-1.672	164.10	174.41	10.31
11	-2.270	155.10	174.06	18.96
12	-2.237	143.60	174.32	30.72
13	-1.672	133.00	175.09	42.09
14	-0.950	161.50	175.40	13.90
15	-1.366	153.00	174.45	21.45
16	-1.418	148.50	174.03	25.53
17	-1.002	148.50	173.94	25.44
18	-0.650	162.70	173.67	10.97
19	-1.139	160.00	173.53	13.53
20	-0.768	156.00	173.51	17.51
21	-1.230	160.80	173.49	12.69
22	-0.931	162.30	173.61	11.31
23	-0.729	158.00	173.45	15.45
24	-0.924	156.50	173.41	16.91
100 R	16.884	166.00	178.00	12.00
200 R	-3.106	163.65	173.65	10.00
300	16.600	135.00	181.39	46.39

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA3 (max day)
NO. OF PIPES : 31
NO. OF NODES : 21
PEAK FACTOR : 1.3
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .003

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1	2	1	98.00	150	90	0.70	0.04LO	0.04	0.00
1000	2	1	98.00	100	110	0.29	0.04LO	0.04	0.00
2	2	3	70.00	100	110	0.86	0.11LO	0.28	0.02
3	4	3	186.00	100	110	0.74	0.09LO	0.21	0.04
4	5	2	186.00	150	90	3.44	0.19LO	0.74	0.14
5	5	4	70.00	100	110	2.26	0.29LO	1.68	0.12
6	6	5	60.00	150	90	7.17	0.41	2.86	0.17
7	9	4	180.00	100	110	0.34	0.04LO	0.05	0.01
8	6	10	120.00	150	90	4.98	0.28LO	1.46	0.18
9	10	9	70.00	100	110	2.12	0.27LO	1.49	0.10
10	7	6	56.00	100	90	2.94	0.37	3.97	0.22
1010	7	6	56.00	150	110	10.46	0.59	3.97	0.22
11	7	8	80.00	100	90	0.84	0.11LO	0.39	0.03
1100	7	8	80.00	100	110	1.03	0.13LO	0.39	0.03
12	7	45	118.00	100	90	1.09	0.14LO	0.63	0.07
1200	7	45	118.00	150	110	3.88	0.22LO	0.63	0.07
13	8	46	114.00	100	90	0.79	0.10LO	0.35	0.04
14	12	11	134.00	100	110	1.28	0.16LO	0.58	0.08
15	11	13	176.00	100	90	0.83	0.11LO	0.39	0.07
1500	11	13	176.00	150	110	2.96	0.17LO	0.39	0.07
16	14	12	110.00	100	90	3.60	0.46	5.77	0.63
17	14	13	206.00	100	90	2.87	0.37	3.79	0.78
18	45	11	68.00	100	90	0.89	0.11LO	0.44	0.03
1800	45	11	68.00	150	110	3.17	0.18LO	0.44	0.03
19	12	46	120.00	100	90	0.82	0.10LO	0.38	0.05
20	10	15	290.00	150	90	0.67	0.04LO	0.04	0.01
38	13	31	400.00	100	90	2.90	0.37	3.87	1.55
42	31	36	400.00	100	90	0.67	0.09LO	0.26	0.10
58	46	45	94.00	100	110	0.29	0.04LO	0.04	0.00
201	200	14	300.00	150	110	7.98	0.45	2.41	0.72
101	100	7	20.00	150	90	21.36	1.21	21.58HI	0.43

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.993	136.20	141.13	4.93
2	-1.591	133.50	141.14	7.64
3	-1.598	132.20	141.12	8.92
4	-1.858	131.00	141.16	10.16
5	-1.468	132.00	141.27	9.27

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
6	-1.253	131.60	141.45	9.85
7	-1.117	131.20	141.67	10.47
8	-1.071	127.30	141.64	14.34
9	-1.780	127.00	141.17	14.17
10	-2.189	127.00	141.27	14.27
11	-1.546	124.60	141.56	16.96
12	-1.500	110.00	141.64	31.64
13	-3.762	114.60	141.50	26.90
14	-1.513	108.50	142.28	33.78
15	-0.675	115.00	141.26	26.26
31	-2.228	109.00	139.95	30.95
36	-0.675	101.70	139.84	38.14
45	-1.195	125.50	141.59	16.09
46	-1.331	123.20	141.60	18.40
200 R	7.982	128.00	143.00	15.00
100 R	21.361	132.10	142.10	10.00

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA4 (max day)
NO. OF PIPES : 28
NO. OF NODES : 20
PEAK FACTOR : 1.3
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .009

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
2	1	2	50.00	150	90	5.93	0.34	2.01	0.10
3	2	3	210.00	150	90	5.30	0.30	1.64	0.34
4	3	4	300.00	150	90	3.93	0.22LO	0.94	0.28
5	5	4	160.00	150	90	5.42	0.31	1.71	0.27
6	5	6	220.00	150	90	5.32	0.30	1.65	0.36
7	6	7	160.00	100	90	1.70	0.22LO	1.44	0.23
8	6	8	40.00	100	90	2.91	0.37	3.90	0.16
9	8	9	140.00	100	90	1.13	0.14LO	0.68	0.10
10	8	10	64.00	100	90	2.36	0.30	2.65	0.17
11	11	10	220.00	100	90	0.03	0.00LO	0.00	0.00
12	10	12	46.00	100	90	1.85	0.24LO	1.68	0.08
13	11	13	46.00	100	110	1.24	0.16LO	0.55	0.03
14	12	14	50.00	100	90	2.07	0.26LO	2.07	0.10
15	14	17	120.00	100	110	1.70	0.22LO	1.00	0.12
16	16	15	100.00	50	110	0.12	0.06LO	0.21	0.02
17	17	15	184.00	50	110	0.11	0.05LO	0.17	0.03
18	18	16	180.00	150	90	0.34	0.02LO	0.01	0.00
19	19	18	310.00	150	90	1.59	0.09LO	0.18	0.06
20	13	12	190.00	100	90	0.69	0.09LO	0.27	0.05
21	17	18	70.00	100	110	0.55	0.07LO	0.12	0.01
22	4	19	280.00	150	90	6.52	0.37	2.40	0.67
23	4	8	290.00	100	90	1.28	0.16LO	0.85	0.25
24	1	5	124.00	150	90	8.18	0.46	3.65	0.45
2400	1	5	124.00	100	110	3.44	0.44	3.65	0.45
25	7	9	40.00	100	110	1.19	0.15LO	0.52	0.02
26	9	11	64.00	100	110	1.85	0.24LO	1.16	0.07
201	200	1	30.00	150	90	8.09	0.46	3.58	0.11
202	200	1	30.00	150	110	9.89	0.56	3.58	0.11

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.446	121.45	124.89	3.44
2	-0.621	118.00	124.79	6.79
3	-1.375	119.00	124.45	5.45
4	-1.551	101.20	124.17	22.97
5	-0.868	113.40	124.44	11.04
6	-0.712	113.10	124.08	10.98
7	-0.504	111.50	123.85	12.35
8	-0.699	108.00	123.92	15.92

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
9	-0.478	106.00	123.82	17.82
10	-0.543	107.10	123.75	16.65
11	-0.582	97.00	123.75	26.75
12	-0.472	100.90	123.67	22.77
13	-0.543	94.00	123.72	29.72
14	-0.368	98.50	123.57	25.07
15	-0.225	105.50	123.42	17.92
16	-0.225	107.60	123.44	15.84
17	-1.044	106.50	123.45	16.95
18	-1.804	109.00	123.44	14.44
19	-4.924	115.20	123.49	8.29
200 R	17.988	124.60	125.00	0.40

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

T I T L E : GMA5(MAX DAY)
NO. OF PIPES : 26
NO. OF NODES : 17
PEAK FACTOR : 1.3
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : 0

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
2	1	2	208.00	150	90	3.34	0.19LO	0.70	0.15
3	2	3	72.00	75	90	1.50	0.34	4.64	0.33
4	1	4	104.00	150	90	0.90	0.05LO	0.06	0.01
4000	1	4	104.00	200	110	2.34	0.07LO	0.06	0.01
5	5	4	530.00	150	90	8.19	0.46	3.67	1.94
5000	5	4	530.00	150	110	10.01	0.57	3.67	1.94
6	6	5	550.00	150	90	10.05	0.57	5.35	2.94
6000	6	5	550.00	150	110	12.28	0.69	5.35	2.94
7	4	7	70.00	100	90	2.19	0.28LO	2.30	0.16
7000	4	7	70.00	200	110	16.59	0.53	2.30	0.16
8	7	8	250.00	100	90	2.97	0.38	4.03	1.01
8000	7	8	250.00	100	110	3.63	0.46	4.03	1.01
9	8	9	150.00	75	90	1.16	0.26LO	2.87	0.43
9000	8	9	150.00	100	110	3.02	0.38	2.87	0.43
10	9	10	100.00	50	90	0.14	0.07LO	0.42	0.04
1010	9	10	100.00	100	110	1.07	0.14LO	0.42	0.04
11	9	11	140.00	100	110	1.23	0.16LO	0.55	0.08
12	7	12	210.00	100	90	2.11	0.27LO	2.14	0.45
1200	7	12	210.00	150	110	7.49	0.42	2.14	0.45
13	12	13	450.00	100	90	2.30	0.29LO	2.52	1.13
14	12	14	60.00	100	90	1.09	0.14LO	0.64	0.04
1400	12	14	60.00	150	110	3.89	0.22LO	0.64	0.04
15	14	15	490.00	100	90	2.16	0.27LO	2.24	1.10
16	13	15	90.00	100	90	0.02	0.00LO	0.00	0.00
101	100	1	30.00	200	110	8.02	0.26LO	0.60	0.02
201	200	6	200.00	200	110	25.00	0.80	4.91	0.98

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-1.436	102.40	113.81	11.41
2	-1.839	107.50	113.67	6.17
3	-1.501	105.50	113.33	7.83
4	-2.672	100.40	113.81	13.41
5	-4.121	91.50	115.75	24.25
6	-2.672	78.50	118.69	40.19
7	-2.587	96.98	113.64	16.66
8	-2.418	87.00	112.64	25.64
9	-1.722	84.52	112.21	27.69
10	-1.216	83.50	112.16	28.66

Table 8-19

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF G.M.A.(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
11	-1.235	88.00	112.13	24.13
12	-2.320	94.80	113.19	18.39
13	-2.281	90.14	112.06	21.92
14	-2.821	101.00	113.16	12.16
15	-2.177	101.40	112.06	10.66
100 R	8.020	103.80	113.83	10.03
200	25.000	78.00	119.67	41.67

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA

T I T L E : Tanza NO (Maxiaua Day Demand 2005)
NO. OF PIPES : 80
NO. OF NODES : 64
PEAK FACTOR : 1.3
MAX HEADLOSS/Ka : 10
MAX UNBAL(LPS) : .008

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1	2	1	75.00	50	100	0.41	0.21LO	2.52	0.19
2	4	1	420.00	50	100	0.27	0.14LO	1.14	0.48
3	5	4	48.00	75	100	0.96	0.22LO	1.68	0.08
4	5	3	313.00	75	100	0.70	0.16LO	0.92	0.29
5	3	2	95.00	75	100	0.68	0.15LO	0.89	0.08
6	8	3	69.00	75	100	0.69	0.16LO	0.91	0.06
7	7	5	45.00	75	100	2.26	0.51	8.17	0.37
8	6	7	336.00	150	110	7.07	0.40	1.92	0.65
9	7	8	312.00	100	100	2.20	0.28LO	1.91	0.60
10	8	9	63.00	75	100	0.72	0.16LO	0.97	0.06
11	7	10	90.00	75	100	1.49	0.34	3.77	0.34
12	10	9	306.00	50	100	0.26	0.13LO	1.11	0.34
13	9	13	69.00	75	100	0.05	0.01LO	0.01	0.00
14	10	12	66.00	50	100	0.25	0.13LO	1.01	0.07
15	12	13	291.00	50	100	0.25	0.13LO	0.99	0.29
16	14	13	60.00	75	100	0.51	0.11LO	0.51	0.03
17	12	16	60.00	75	100	1.40	0.32	3.37	0.20
18	16	15	177.00	50	100	0.22	0.11LO	0.79	0.14
19	14	15	111.00	75	100	0.62	0.14LO	0.75	0.08
20	15	18	54.00	50	100	0.21	0.10LO	0.69	0.04
21	17	18	180.00	50	100	0.21	0.11LO	0.75	0.13
22	16	17	54.00	75	100	0.64	0.15LO	0.80	0.04
23	22	23	105.00	50	100	0.26	0.13LO	1.04	0.11
24	24	22	105.00	50	100	0.11	0.06LO	0.23	0.02
25	25	24	120.00	50	100	0.38	0.20LO	2.20	0.26
26	26	22	50.00	100	110	2.61	0.33	2.20	0.11
27	11	25	147.00	100	110	5.02	0.64	7.35	1.08
28	11	6	195.00	150	110	7.64	0.43	2.22	0.43
29	29	11	465.00	150	110	13.26	0.75	6.16	2.87
30	21	318	396.00	200	110	21.51	0.68	3.71	1.47
31	20	46	135.00	50	100	0.16	0.08LO	0.42	0.06
32	20	19	156.00	150	110	19.16	1.08	12.17HI	1.90
33	19	14	60.00	100	110	1.55	0.20LO	0.84	0.05
34	22	12	84.00	100	110	2.27	0.29LO	1.69	0.14
35	25	26	48.00	100	110	3.48	0.44	3.73	0.18
36	26	27	120.00	50	100	0.60	0.31	5.05	0.61
37	28	27	489.00	50	100	0.04	0.02LO	0.03	0.02
38	25	28	120.00	50	100	0.68	0.35	6.41	0.77
39	29	21	315.00	150	110	3.95	0.22LO	0.66	0.21
40	19	30	570.00	200	110	17.39	0.55	2.51	1.43
41	39	31	129.00	200	110	15.18	0.48	1.95	0.25

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
42	31	33	275.00	150	110	9.94	0.56	3.61	1.00
43	31	32	360.00	100	110	3.20	0.41	3.19	1.15
44	33	32	216.00	75	100	0.60	0.14LO	0.70	0.15
45	32	34	306.00	100	110	1.44	0.18LO	0.73	0.22
46	33	34	171.00	150	110	7.58	0.43	2.19	0.37
47	34	35	273.00	150	110	7.37	0.42	2.08	0.57
48	35	36	351.00	100	110	3.04	0.39	2.91	1.02
49	35	38	222.00	150	110	1.57	0.09LO	0.12	0.03
50	36	37	330.00	75	100	0.07	0.02LO	0.01	0.00
51	38	37	225.00	75	100	1.63	0.37	4.44	1.00
52	39	37	309.00	75	100	2.07	0.47	6.91	2.13
53	39	38	294.00	100	110	3.54	0.45	3.86	1.14
54	39	43	150.00	50	100	0.67	0.34	6.20	0.93
55	43	44	150.00	50	100	0.34	0.17LO	1.72	0.26
56	40	39	354.00	100	110	2.91	0.37	2.68	0.95
2056	40	39	354.00	150	110	8.46	0.48	2.68	0.95
57	45	40	354.00	100	110	3.76	0.48	4.32	1.53
2057	45	40	354.00	150	110	10.94	0.62	4.32	1.53
58	45	41	100.00	50	100	1.08	0.55	14.84HI	1.48
60	41	47	50.00	50	100	0.42	0.21LO	2.56	0.13
301	318	20	300.00	200	110	20.32	0.65	3.34	1.00
201	200	29	200.00	200	110	18.44	0.59	2.79	0.56
1061	148	45	600.00	200	110	20.65	0.66	3.44	2.07
1062	48	148	600.00	200	110	22.22	0.71	3.94	2.37
1063	48	21	400.00	150	110	1.12	0.06LO	0.06	0.03
1064	49	21	350.00	200	110	19.03	0.61	2.96	1.04
1065	50	49	350.00	200	120	21.02	0.67	3.03	1.06
1066	51	50	400.00	250	120	22.48	0.46	1.16	0.46
1067	52	51	800.00	100	110	1.97	0.25LO	1.31	1.05
1068	53	52	800.00	100	110	2.62	0.33	2.21	1.77
1069	54	53	280.00	100	110	3.26	0.42	3.31	0.93
1070	55	54	250.00	100	110	3.91	0.50	4.63	1.16
1071	56	55	475.00	150	110	5.49	0.31	1.20	0.57
1072	57	56	500.00	150	110	6.45	0.36	1.62	0.81
1073	58	57	470.00	200	110	9.34	0.30LO	0.79	0.37
1075	600	58	560.00	200	110	13.26	0.42	1.52	0.85
1074	58	59	800.00	100	110	1.96	0.25LO	1.29	1.03
1077	700	51	150.00	250	110	22.58	0.46	1.37	0.21
1076	800	48	150.00	200	110	25.08	0.80	4.94	0.74

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.681	7.85	29.27	21.42
2	-0.269	7.96	29.46	21.50
3	-0.707	8.18	29.54	21.36
4	-0.694	9.09	29.75	20.66

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
5	-0.606	9.40	29.83	20.43
6	-0.571	10.34	30.84	20.50
7	-1.109	9.24	30.20	20.96
8	-0.793	8.51	29.60	21.09
9	-0.928	7.79	29.54	21.75
10	-0.974	8.40	29.86	21.46
11	-0.610	9.72	31.27	21.55
12	-0.864	8.40	29.76	21.36
13	-0.809	6.65	29.47	22.82
14	-0.425	6.16	29.51	23.35
15	-0.637	7.50	29.43	21.93
16	-0.540	8.05	29.56	21.51
17	-0.430	7.76	29.52	21.76
318	-1.193	10.94	32.46	21.52
18	-0.419	6.75	29.39	22.64
19	-0.213	5.99	29.56	23.57
20	-1.002	8.79	31.46	22.67
21	-2.590	13.09	33.93	20.84
22	-0.203	9.06	29.91	20.85
23	-0.256	9.03	29.80	20.77
24	-0.270	9.10	29.93	20.83
25	-0.475	9.48	30.19	20.71
26	-0.264	9.41	30.02	20.61
27	-0.640	8.34	29.41	21.07
28	-0.643	8.60	29.43	20.83
29	-1.228	11.20	34.14	22.94
30	-2.214	6.97	28.13	21.16
31	-2.047	6.54	27.88	21.34
32	-2.357	4.00	26.73	22.73
33	-1.755	4.39	26.89	22.50
34	-1.647	4.52	26.51	21.99
35	-2.759	3.43	25.94	22.51
36	-2.969	1.29	24.92	23.63
37	-3.765	1.03	24.92	23.89
38	-3.489	2.83	25.91	23.08
39	-5.082	2.04	27.05	25.01
40	-3.346	1.77	28.00	26.23
41	-0.659	2.10	28.04	25.94
43	-0.335	1.50	26.12	24.62
44	-0.335	1.50	25.86	24.36
45	-4.865	1.50	29.53	28.03
46	-0.156	8.75	31.40	22.65
47	-0.416	2.10	27.92	25.82
148	-1.566	7.00	31.59	24.59
48	-1.748	11.00	33.96	22.96
49	-1.992	14.00	34.97	20.97
50	-1.456	15.50	36.03	20.53
51	-2.073	16.50	36.49	19.99

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
52	-0.643	19.00	37.54	18.54
53	-0.643	24.60	39.31	14.71
54	-0.643	26.00	40.24	14.24
55	-1.581	27.00	41.39	14.39
56	-0.963	30.52	41.97	11.45
57	-2.894	31.80	42.78	10.98
58	-1.956	34.48	43.15	8.67
200 R	18.441	11.25	34.70	23.45
600 R	13.256	33.19	44.00	10.81
59	-1.956	32.20	42.12	9.92
700 R	22.575	14.06	36.70	22.64
800 R	25.084	11.00	34.70	23.70

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA(con't)

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T I T L E        :  Tanza MD (Peak Hour Demand 2005)
NO. OF PIPES     :  80
NO. OF NODES     :  64
PEAK FACTOR      :  2
MAX HEADLOSS/Km  :  10
MAX UNBAL(LPS)   :  .009
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1	2	1	75.00	50	100	0.63	0.32	5.51	0.41
2	4	1	420.00	50	100	0.42	0.21LO	2.59	1.09
3	5	4	48.00	75	100	1.49	0.34	3.75	0.18
4	5	3	313.00	75	100	1.10	0.25LO	2.15	0.67
5	3	2	95.00	75	100	1.04	0.24LO	1.95	0.19
6	8	3	69.00	75	100	1.03	0.23LO	1.90	0.13
7	7	5	45.00	75	100	3.52	0.80	18.47HI	0.83
8	6	7	336.00	150	110	11.00	0.62	4.36	1.47
9	7	8	312.00	100	100	3.47	0.44	4.42	1.38
10	8	9	63.00	75	100	1.21	0.27LO	2.58	0.16
11	7	10	90.00	75	100	2.31	0.52	8.50	0.76
12	10	9	306.00	50	100	0.42	0.22LO	2.64	0.81
13	9	13	69.00	75	100	0.21	0.05LO	0.10	0.01
14	10	12	66.00	50	100	0.39	0.20LO	2.29	0.15
15	12	13	291.00	50	100	0.40	0.20LO	2.36	0.69
16	14	13	60.00	75	100	0.64	0.14LO	0.78	0.05
17	12	16	60.00	75	100	2.20	0.50	7.73	0.46
18	16	15	177.00	50	100	0.36	0.18LO	1.97	0.35
19	14	15	111.00	75	100	0.92	0.21LO	1.54	0.17
20	15	18	54.00	50	100	0.30	0.15LO	1.39	0.08
21	17	18	180.00	50	100	0.34	0.18LO	1.81	0.33
22	16	17	54.00	75	100	1.01	0.23LO	1.82	0.10
23	22	23	105.00	50	100	0.39	0.20LO	2.32	0.24
24	24	22	105.00	50	100	0.18	0.09LO	0.54	0.06
25	25	24	120.00	50	100	0.59	0.30	4.96	0.60
26	26	22	50.00	100	110	4.06	0.52	4.97	0.25
27	11	25	147.00	100	110	7.77	0.99	16.50HI	2.43
28	11	6	195.00	150	110	11.88	0.67	5.03	0.98
29	29	11	465.00	150	110	20.59	1.16	13.90HI	6.46
30	21	318	396.00	200	110	32.84	1.05	8.13	3.22
31	20	46	135.00	50	100	0.24	0.12LO	0.93	0.12
32	20	19	156.00	150	110	29.22	1.65	26.58HI	4.15
33	19	14	60.00	100	110	2.21	0.28LO	1.61	0.10
34	22	12	84.00	100	110	3.53	0.45	3.84	0.32
35	25	26	48.00	100	110	5.39	0.69	8.39	0.40
36	26	27	120.00	50	100	0.92	0.47	11.18HI	1.34
37	28	27	489.00	50	100	0.06	0.03LO	0.07	0.04
38	25	28	120.00	50	100	1.05	0.54	14.24HI	1.71
39	29	21	315.00	150	110	8.41	0.48	2.65	0.84
40	19	30	570.00	200	110	26.69	0.85	5.54	3.16
41	30	31	129.00	200	110	23.28	0.74	4.30	0.55

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
42	31	33	276.00	150	110	15.23	0.86	7.96	2.20
43	31	32	360.00	100	110	4.90	0.62	7.04	2.53
44	33	32	216.00	75	100	0.92	0.21LO	1.55	0.34
45	32	34	306.00	100	110	2.20	0.28LO	1.60	0.49
46	33	34	171.00	150	110	11.61	0.66	4.82	0.82
47	34	35	273.00	150	110	11.27	0.64	4.56	1.25
48	35	36	351.00	100	110	4.66	0.59	6.42	2.26
49	35	38	222.00	150	110	2.36	0.13LO	0.25	0.06
50	36	37	330.00	75	100	0.10	0.02LO	0.02	0.01
51	38	37	225.00	75	100	2.50	0.57	9.81	2.21
52	39	37	309.00	75	100	3.20	0.72	15.45HI	4.77
53	39	38	294.00	100	110	5.51	0.70	8.73	2.57
54	39	43	150.00	50	100	1.03	0.53	13.75HI	2.06
55	43	44	150.00	50	100	0.52	0.26LO	3.82	0.57
56	40	39	354.00	100	110	4.49	0.57	5.99	2.12
2056	40	39	354.00	150	110	13.06	0.74	5.99	2.12
57	45	40	354.00	100	110	5.81	0.74	9.64	3.41
2057	45	40	354.00	150	110	16.89	0.96	9.64	3.41
58	45	41	100.00	50	100	1.65	0.84	32.92HI	3.29
60	41	47	50.00	50	100	0.64	0.33	5.68	0.28
301	318	20	300.00	200	110	31.00	0.99	7.31	2.19
201	200	29	200.00	200	110	30.88	0.98	7.25	1.45
1061	148	45	600.00	200	110	31.84	1.01	7.67	4.60
1062	48	148	600.00	200	110	34.25	1.09	8.78	5.27
1063	48	21	400.00	150	110	4.85	0.27LO	0.96	0.38
1064	49	21	350.00	200	110	23.56	0.75	4.40	1.54
1065	50	49	350.00	200	120	26.63	0.85	4.69	1.64
1066	51	50	400.00	250	120	28.87	0.59	1.84	0.74
1067	52	51	800.00	100	110	1.06	0.14LO	0.42	0.33
1068	53	52	800.00	100	110	2.05	0.26LO	1.41	1.13
1069	54	53	280.00	100	110	3.04	0.39	2.92	0.82
1070	55	54	250.00	100	110	4.03	0.51	4.91	1.23
1071	56	55	475.00	150	110	6.47	0.37	1.63	0.78
1072	57	56	500.00	150	110	7.95	0.45	2.39	1.20
1073	58	57	470.00	200	110	12.40	0.39	1.34	0.63
1075	600	58	560.00	200	110	18.42	0.59	2.79	1.56
1074	58	59	800.00	100	110	3.01	0.38	2.86	2.29
1077	700	51	150.00	250	110	30.99	0.63	2.46	0.37
1076	800	48	150.00	200	110	41.79	1.33	12.69HI	1.90

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-1.048	7.85	22.24	14.39
2	-0.414	7.96	22.65	14.69
3	-1.088	8.18	22.83	14.65
4	-1.068	9.09	23.33	14.24

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
5	-0.932	9.40	23.51	14.11
6	-0.878	10.34	25.80	15.46
7	-1.706	9.24	24.34	15.10
8	-1.220	8.51	22.96	14.45
9	-1.428	7.79	22.80	15.01
10	-1.498	8.40	23.57	15.17
11	-0.938	9.72	26.78	17.06
12	-1.330	8.40	23.39	14.99
13	-1.244	6.65	22.70	16.05
14	-0.654	6.16	22.76	16.60
15	-0.980	7.50	22.59	15.09
16	-0.830	8.05	22.92	14.87
17	-0.662	7.76	22.82	15.06
318	-1.836	10.94	29.20	18.26
18	-0.644	6.75	22.51	15.76
19	-0.328	5.99	22.86	16.87
20	-1.542	8.79	27.00	18.21
21	-3.984	13.09	32.41	19.32
22	-0.312	9.06	23.71	14.65
23	-0.394	9.03	23.47	14.44
24	-0.416	9.10	23.76	14.66
25	-0.730	9.48	24.36	14.88
26	-0.406	9.41	23.96	14.55
27	-0.984	8.34	22.62	14.28
28	-0.990	8.60	22.65	14.05
29	-1.890	11.20	33.25	22.05
30	-3.406	6.97	19.70	12.73
31	-3.150	6.54	19.15	12.61
32	-3.626	4.00	16.61	12.61
33	-2.700	4.39	16.95	12.56
34	-2.534	4.52	16.13	11.61
35	-4.244	3.43	14.88	11.45
36	-4.568	1.29	12.62	11.33
37	-5.792	1.03	12.62	11.59
38	-5.368	2.83	14.82	11.99
39	-7.818	2.04	17.39	15.35
40	-5.148	1.77	19.51	17.74
41	-1.014	2.10	19.63	17.53
43	-0.516	1.50	15.33	13.83
44	-0.516	1.50	14.75	13.25
45	-7.484	1.50	22.92	21.42
46	-0.240	8.75	26.88	18.13
47	-0.640	2.10	19.35	17.25
148	-2.410	7.00	27.53	20.53
48	-2.690	11.00	32.80	21.80
49	-3.064	14.00	33.95	19.95
50	-2.240	15.50	35.60	20.10
51	-3.190	16.50	36.33	19.83

Table 8-20

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TANZA(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
52	-0.990	19.00	36.66	17.66
53	-0.990	24.60	37.79	13.19
54	-0.990	26.00	38.61	12.61
55	-2.432	27.00	39.84	12.84
56	-1.482	30.52	40.61	10.09
57	-4.452	31.80	41.81	10.01
58	-3.010	34.48	42.44	7.96
200 R	30.884	11.25	34.70	23.45
600 R	18.421	33.19	44.00	10.81
59	-3.010	32.20	40.15	7.95
700 R	30.993	14.06	36.70	22.64
800 R	41.790	11.00	34.70	23.70

Table 8-21

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF NAIC

T I T L E : Naic Water District
NO. OF PIPES : 102
NO. OF NODES : 73
PEAK FACTOR : 2
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .007

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
6	300	5	20.00	150	120	18.00	1.02	9.23	0.18
7	5	6	500.00	100	110	3.94	0.50	4.71	2.36
707	5	6	500.00	150	120	12.51	0.71	4.71	2.36
8	6	7	500.00	100	110	3.44	0.44	3.66	1.83
808	6	7	500.00	150	120	10.92	0.62	3.66	1.83
9	7	8	500.00	100	110	3.06	0.39	2.94	1.47
909	7	8	500.00	150	120	9.70	0.55	2.94	1.47
10	8	9	500.00	75	100	1.20	0.27LO	2.51	1.25
101	8	9	500.00	150	120	8.90	0.50	2.51	1.25
11	9	10	500.00	75	100	0.84	0.19LO	1.29	0.65
111	9	10	500.00	150	120	6.21	0.35	1.29	0.65
12	10	11	500.00	75	100	0.41	0.09LO	0.34	0.17
121	10	11	500.00	150	120	3.03	0.17LO	0.34	0.17
13	200	11	50.00	200	130	35.00	1.11	6.71	0.34
14	12	11	500.00	50	90	0.38	0.19LO	2.62	1.31
151	13	11	300.00	200	120	28.33	0.90	5.26	1.58
161	18	13	40.00	200	120	29.28	0.93	5.59	0.22
171	19	18	55.00	200	130	33.66	1.07	6.25	0.34
181	24	19	150.00	250	130	34.79	0.71	2.24	0.34
19	25	24	100.00	250	130	39.70	0.81	2.86	0.29
1900	97	25	400.00	150	130	21.33	1.21	10.90HI	4.36
2000	98	97	300.00	200	120	22.23	0.71	3.36	1.01
20	24	23	50.00	100	110	3.87	0.49	4.55	0.23
21	23	22	50.00	50	90	0.88	0.45	12.47HI	0.62
22	22	21	50.00	50	90	0.40	0.21LO	2.96	0.15
23	20	21	50.00	50	90	0.68	0.35	7.74	0.39
24	23	20	50.00	75	100	2.19	0.50	7.69	0.38
25	19	20	50.00	50	90	0.57	0.29LO	5.53	0.28
26	20	17	55.00	75	100	1.61	0.36	4.36	0.24
27	18	17	50.00	100	110	3.39	0.43	3.55	0.18
28	17	16	50.00	50	90	0.54	0.27LO	4.98	0.25
29	21	16	50.00	50	90	0.32	0.16LO	1.96	0.10
30	16	15	50.00	50	90	0.28	0.14LO	1.54	0.08
31	14	15	50.00	50	90	0.38	0.19LO	2.58	0.13
32	17	14	50.00	100	110	3.61	0.46	3.99	0.20
33	14	12	50.00	100	110	2.67	0.34	2.29	0.11
34	11	26	320.00	250	130	69.05	1.41	7.96	2.55
35	26	27	335.00	250	130	67.92	1.38	7.72	2.59
36	27	48	220.00	250	130	53.82	1.10	5.02	1.10
37	27	28	60.00	150	120	13.17	0.75	5.18	0.31
38	28	29	120.00	75	100	1.45	0.33	3.69	0.47

Table 8-21

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF NAIC(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
39	28	32	115.00	150	130	7.93	0.45	1.75	0.20
40	28	30	75.00	75	100	1.64	0.37	4.50	0.34
41	30	31	120.00	50	90	0.40	0.20LO	2.83	0.34
42	32	31	65.00	50	90	0.66	0.34	7.33	0.48
43	32	33	130.00	100	110	6.00	0.76	10.25HI	1.33
44	33	34	35.00	150	120	5.73	0.32	1.11	0.04
45	47	33	60.00	50	90	0.57	0.29LO	5.51	0.33
46	34	35	85.00	100	110	3.00	0.38	2.84	0.24
47	34	35	38.00	75	100	1.98	0.45	6.35	0.24
48	35	36	90.00	100	110	4.36	0.55	5.65	0.51
49	45	36	40.00	50	90	0.33	0.17LO	2.03	0.08
50	36	37	220.00	100	110	3.44	0.44	3.66	0.81
51	37	38	100.00	200	130	24.95	0.79	3.59	0.36
52	38	39	310.00	150	120	7.80	0.44	1.97	0.61
53	39	40	260.00	100	110	2.86	0.36	2.60	0.67
54	38	42	310.00	150	120	11.92	0.67	4.31	1.34
55	42	41	480.00	100	110	3.25	0.41	3.29	1.58
56	42	43	300.00	100	110	3.16	0.40	3.13	0.94
57	44	37	50.00	200	130	26.07	0.83	3.89	0.19
58	45	44	230.00	100	110	3.10	0.39	3.01	0.69
59	66	44	60.00	200	130	24.18	0.77	3.39	0.20
60	66	65	35.00	50	90	0.69	0.35	7.86	0.28
61	65	67	100.00	50	90	0.78	0.40	9.86	0.99
62	46	66	230.00	200	130	25.58	0.81	3.76	0.86
63	46	45	65.00	100	110	4.40	0.56	5.77	0.38
64	47	46	110.00	200	130	33.08	1.05	6.05	0.67
65	48	47	50.00	200	130	39.15	1.25	8.26	0.41
66	48	49	110.00	150	120	13.65	0.77	5.53	0.61
67	49	55	50.00	100	110	3.91	0.50	4.63	0.23
68	47	55	100.00	100	110	3.75	0.48	4.29	0.43
69	55	56	120.00	100	110	3.85	0.49	4.50	0.54
70	46	56	80.00	75	100	1.51	0.34	3.84	0.31
71	56	64	150.00	100	110	3.76	0.48	4.30	0.65
72	64	65	100.00	100	110	2.38	0.30	1.86	0.19
73	64	63	65.00	50	90	0.64	0.32	6.83	0.44
74	63	62	30.00	50	90	0.29	0.15LO	1.63	0.05
75	62	68	60.00	50	90	0.24	0.12LO	1.12	0.07
76	65	68	75.00	50	90	0.54	0.27LO	4.99	0.37
77	57	63	155.00	50	90	0.58	0.29LO	5.67	0.88
78	56	57	80.00	50	90	0.37	0.19LO	2.56	0.20
79	54	57	110.00	100	110	4.17	0.53	5.22	0.57
80	55	54	75.00	100	110	2.63	0.34	2.23	0.17
81	50	54	50.00	100	110	3.98	0.51	4.78	0.24
82	49	50	70.00	150	120	8.40	0.48	2.26	0.16
83	50	51	110.00	100	110	3.35	0.43	3.48	0.38
84	51	52	60.00	75	100	1.88	0.43	5.79	0.35
85	53	52	45.00	50	90	0.40	0.20LO	2.88	0.13
86	54	53	80.00	75	100	1.66	0.38	4.61	0.37

Table 8-21
RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF NAIC(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
87	53	58	155.00	50	90	0.34	0.17LO	2.15	0.33
88	57	58	50.00	100	110	2.86	0.36	2.59	0.13
89	58	62	150.00	50	90	0.56	0.28LO	5.32	0.80
90	63	62	60.00	50	90	0.17	0.09LO	0.61	0.05
91	60	61	140.00	50	90	0.69	0.35	7.85	1.10
92	59	60	160.00	75	100	1.65	0.37	4.54	0.73
93	58	59	50.00	75	100	1.30	0.29LO	2.94	0.15
94	52	59	130.00	75	100	1.22	0.28LO	2.61	0.34
95	80	25	460.00	200	130	19.22	0.61	2.21	1.02
96	400	80	50.00	200	130	20.00	0.64	2.38	0.12
97	1000	5	50.00	200	130	1.12	0.04LO	0.01	0.00
98	500	98	10.00	200	130	22.00	0.70	2.84	0.03
99	2000	98	20.00	200	130	1.01	0.03LO	0.01	0.00

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
5	-2.666	30.00	40.00	10.00
6	-2.098	28.00	37.64	9.64
7	-1.602	22.00	35.81	13.81
8	-2.666	20.00	34.34	14.34
9	-3.044	19.00	33.09	14.09
10	-3.610	12.00	32.44	20.44
11	1.908	11.00	32.27	21.27
12	-2.290	10.00	33.58	23.58
13	-0.954	14.00	33.85	19.85
14	-0.560	14.00	33.70	19.70
15	-0.660	14.00	33.57	19.57
16	-0.576	14.00	33.64	19.64
17	-0.856	14.00	33.90	19.90
18	-0.996	14.00	34.07	20.07
19	-0.562	14.00	34.42	20.42
20	-0.466	14.00	34.14	20.14
21	-0.762	14.00	33.74	19.74
22	-0.476	14.00	33.89	19.89
23	-0.798	14.00	34.52	20.52
24	-1.034	14.00	34.75	20.75
25	-0.856	16.00	35.04	19.04
26	-1.134	7.00	29.73	22.73
27	-0.922	9.00	27.14	18.14
28	-2.150	10.00	26.83	16.83
29	-1.454	10.00	26.40	16.40
30	-1.246	7.00	26.49	19.49
31	-1.056	6.00	26.15	20.15
32	-1.264	10.00	26.63	16.63
33	-0.942	9.00	25.29	16.29
34	-0.754	8.00	25.25	17.25

Table 8-21

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF NAIC(con't)

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T I T L E        : Naic Water District
NO. OF PIPES     : 5
NO. OF NODES     : 6
PEAK FACTOR      : 1.3
MAX HEADLOSS/Ka  : 10
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PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1	100	1	4550.00	200	130	4.59	0.15LO	0.16	0.71
2	1	2	550.00	150	120	4.56	0.26LO	0.73	0.40
3	2	3	550.00	150	120	4.47	0.25LO	0.70	0.39
4	3	4	360.00	100	110	2.95	0.38	2.75	0.99
5	4	5	360.00	100	110	1.25	0.16LO	0.56	0.20

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.023	43.00	56.29	13.29
2	-0.095	43.00	55.89	12.89
3	-1.521	42.00	55.50	13.50
4	-1.695	39.00	54.51	15.51
5	-1.252	30.00	54.31	24.31
100 R	4.586	57.00	57.00	0.00

Table 8-21

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF NAIC(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
35	-0.618	7.00	25.01	18.01
36	-1.246	6.00	24.50	18.50
37	-4.562	8.00	23.70	15.70
38	-5.224	8.00	23.34	15.34
39	-4.944	11.00	22.73	11.73
40	-2.858	9.00	22.05	13.05
41	-3.250	8.00	20.42	12.42
42	-5.510	8.00	22.00	14.00
43	-3.162	8.00	21.06	13.06
44	-1.206	8.00	23.89	15.89
45	-0.976	9.00	24.58	15.58
46	-1.590	9.00	24.96	15.96
47	-1.758	7.00	25.62	18.62
48	-1.020	5.00	26.04	21.04
49	-1.338	6.00	25.43	19.43
50	-1.076	6.00	25.27	19.27
51	-1.472	5.00	24.89	19.89
52	-1.056	8.00	24.54	16.54
53	-0.922	8.00	24.66	16.66
54	-0.776	9.00	25.03	16.03
55	-1.176	9.00	25.19	16.19
56	-1.224	9.00	24.65	15.65
57	-1.114	8.00	24.45	16.45
58	-1.338	7.00	24.32	17.32
59	-0.876	7.00	24.20	17.20
60	-0.962	6.00	23.47	17.47
61	-0.686	7.00	22.37	15.37
62	-0.782	6.00	23.51	17.51
63	-0.746	7.00	23.56	16.56
64	-0.736	7.00	24.00	17.00
65	-1.758	5.00	23.82	18.82
66	-0.716	7.00	24.09	17.09
67	-0.776	7.00	22.83	15.83
68	-0.776	5.00	23.44	18.44
80	-0.782	16.00	36.06	20.06
97	-0.900	18.00	39.40	21.40
98	-0.780	20.45	40.41	19.96
200	35.000	10.00	32.61	22.61
300	18.000	30.00	40.18	10.18
400	20.000	16.00	36.18	20.18
500	22.000	20.41	40.44	20.03
1000 R	1.124	30.00	40.00	10.00
2000 R	1.014	20.41	40.41	20.00

Table 8-22

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF MENDEZ

T I T L E : MENDEZ WATER DISTRICT (Peak-Hour)
NO. OF PIPES : 73
NO. OF NODES : 54
PEAK FACTOR : 2.00
MAX. HL/1000 : 10.00
MAX. UNBALANCE : 0.0008

PIPE NO.	FROM NODE	TO NODE	LENGTH (M)	DIAM (MM)	HWC	FLOW (L/S)	VELOCITY (M/S)	HEADLOSS (M/1000)	(M)
1	100	1	10.00	150	110	10.00	0.57	3.60	0.04
2	1	2	100.00	150	110	5.40	0.31	1.15	0.12
3	2	3	300.00	150	110	5.40	0.31	1.15	0.35
4	3	4	710.00	150	110	5.40	0.31	1.15	0.82
5	4	5	300.00	150	110	5.40	0.31	1.15	0.35
6	5	6	400.00	63	90	4.18	1.34	71.06HI	28.42
7	6	7	400.00	63	90	2.58	0.83	29.08HI	11.63
8	7	8	300.00	50	100	1.54	0.78	28.36HI	8.51
9	1	9	200.00	150	110	3.88	0.22	0.62	0.12
10	9	10	40.00	150	110	6.45	0.36	1.60	0.06
110	9	14	460.00	150	110	18.57	1.05	11.34HI	5.22
11	10	11	40.00	150	110	24.37	1.38	18.76HI	0.75
12	11	12	140.00	150	110	23.81	1.35	17.97HI	2.52
13	12	13	160.00	100	110	7.26	0.92	14.37HI	2.30
14	12	14	240.00	150	110	15.24	0.86	7.87	1.89
15	13	15	110.00	100	110	5.70	0.73	9.18	1.01
16	14	15	80.00	100	110	8.14	1.04	17.76HI	1.42
17	15	16	45.00	100	110	7.43	0.95	14.97HI	0.67
18	16	17	50.00	100	110	5.24	0.67	7.85	0.39
19	14	18	100.00	150	110	24.25	1.37	18.59HI	1.86
20	15	19	95.00	100	110	5.48	0.70	8.53	0.81
21	16	20	60.00	50	90	1.77	0.90	44.44HI	2.67
22	17	25	260.00	75	100	4.54	1.03	29.14HI	7.58
23	18	19	90.00	50	90	0.52	0.27	4.66	0.37
24	19	20	60.00	50	100	1.91	0.97	42.21HI	2.53
25	18	22	160.00	150	110	23.23	1.31	17.17HI	2.75
26	19	23	160.00	63	90	3.10	0.99	40.74HI	6.52
27	20	24	170.00	63	90	2.68	0.86	31.10HI	5.29
28	22	21	70.00	63	90	2.50	0.80	27.38HI	1.92
29	22	23	75.00	63	90	3.65	1.17	55.31HI	4.15
30	23	24	55.00	63	90	2.31	0.74	23.67HI	1.30
31	24	25	65.00	50	100	0.12	0.06LO	0.27	0.02
32	21	26	160.00	50	100	2.26	1.15	57.59HI	9.21
33	22	27	165.00	100	110	16.30	2.08	64.19HI	10.59
34	23	28	165.00	63	90	3.36	1.08	47.36HI	7.81
35	24	29	165.00	63	90	3.04	0.98	39.39HI	6.50
36	25	30	175.00	75	100	4.30	0.97	26.40HI	4.62
37	27	26	75.00	50	100	0.73	0.37	7.20	0.54
38	27	28	75.00	50	100	1.22	0.62	18.31HI	1.37
39	29	28	50.00	50	100	0.12	0.06LO	0.23	0.01
40	30	29	75.00	50	100	1.43	0.73	24.80HI	1.86
41	26	31	135.00	50	100	2.37	1.21	63.13HI	8.52
42	27	32	135.00	100	110	13.11	1.67	42.88HI	5.79
43	28	33	125.00	63	90	2.57	0.82	28.85HI	3.61

Table 8-22
RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF MENDEZ(con't)

PIPE NO.	FROM NODE	TO NODE	LENGTH (M)	DIAM (MM)	HWC	FLOW (L/S)	VELOCITY (M/S)	HEADLOSS (M/1000)	(M)
44	29	34	120.00	63	90	2.58	0.83	29.00HI	3.48
45	30	35	115.00	50	100	1.99	1.01	45.66HI	5.25
47	33	32	75.00	63	90	1.51	0.48	10.77HI	0.81
48	34	33	65.00	50	100	0.38	0.19	2.12	0.14
149	35	34	60.00	50	100	0.31	0.16	1.48	0.09
50	31	37	140.00	50	100	1.29	0.66	20.50HI	2.87
51	32	38	140.00	50	100	1.97	1.00	44.82HI	6.27
151	32	36	140.00	50	100	1.97	1.00	44.82HI	6.27
52	34	39	160.00	50	100	1.27	0.65	19.82HI	3.17
53	35	40	170.00	50	100	1.14	0.58	16.22HI	2.76
154	37	36	100.00	100	110	6.98	0.89	13.33HI	1.33
55	37	38	46.00	50	100	0.45	0.23	2.85	0.13
155	37	38	46.00	50	100	0.45	0.23	2.85	0.13
56	39	38	160.00	50	100	1.45	0.74	25.31HI	4.05
57	40	39	50.00	50	100	0.88	0.45	10.04HI	0.50
158	36	41	300.00	100	110	6.30	0.80	11.03HI	3.31
159	32	37	300.00	100	110	8.80	1.12	20.48HI	6.14
160	38	43	300.00	75	100	3.62	0.82	19.19HI	5.76
161	41	42	100.00	75	100	2.93	0.66	12.97HI	1.30
162	43	42	100.00	75	100	0.50	0.11	0.49	0.05
163	41	44	300.00	75	100	2.40	0.54	8.98	2.69
164	42	46	300.00	75	100	1.53	0.35	3.90	1.17
165	43	46	350.00	75	100	1.44	0.33	3.49	1.22
167	44	45	200.00	50	100	1.58	0.81	29.88HI	5.98
168	46	45	200.00	50	100	1.62	0.82	31.00HI	6.20
169	45	47	200.00	50	100	1.56	0.79	29.04HI	5.81
170	49	10	660.00	200	110	19.44	0.62	3.04	2.01
171	48	9	670.00	200	110	22.26	0.71	3.91	2.62
172	48	49	110.00	150	110	13.34	0.75	6.14	0.68
173	51	49	110.00	150	110	7.02	0.40	1.87	0.21
174	50	51	110.00	150	110	7.36	0.42	2.05	0.22
175	48	50	110.00	150	110	7.70	0.44	2.22	0.24
176	51	52	150.00	50	100	0.22	0.11	0.77	0.12
177	200	48	2.00	200	110	44.00	1.40	13.80HI	0.03

NODE NO.	FLOW (L/S)	ELEVATION (M)	HGL (M)	PRESSURE (M)
1	-0.72	100.57	132.48	31.91
2	0.00	92.00	132.36	40.36
3	0.00	96.00	132.02	36.02
4	0.00	82.00	131.20	49.20
5	-1.22	73.43	130.86	57.43
6	-1.69	62.00	102.43	40.43
7	-1.04	50.57	90.80	40.23
8	-1.54	42.00	82.29	40.29
9	-1.12	99.20	132.35	33.15
10	-1.52	98.00	132.29	34.29
11	-0.56	97.60	131.54	33.94
12	-1.30	92.30	129.02	36.72
13	-1.56	97.88	126.73	28.85

Table 8-22

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF MENDEZ(con't)

NODE NO.	FLOW (L/S)	ELEVATION (M)	HGL (M)	PRESSURE (M)
14	-1.42	90.35	127.14	36.79
15	-0.94	94.59	125.72	31.13
16	-0.42	90.00	125.04	35.04
17	-0.70	89.10	124.65	35.55
18	-0.50	89.91	125.28	35.37
19	-1.00	91.42	124.91	33.49
20	-1.00	89.59	122.38	32.79
21	-0.24	80.37	120.61	40.24
22	-0.78	82.67	122.53	39.86
23	-1.08	83.72	118.39	34.67
24	-1.82	81.62	117.09	35.47
25	-0.36	81.10	117.07	35.97
26	-0.62	73.26	111.40	38.14
27	-1.24	74.08	111.94	37.86
28	-2.12	74.91	110.57	35.66
29	-1.78	74.40	110.59	36.19
30	-0.88	75.05	112.45	37.40
31	-1.08	73.71	102.88	29.17
32	-1.88	72.05	106.15	34.10
33	-1.44	70.02	106.97	36.95
34	-1.24	72.74	107.11	34.37
35	-0.54	72.68	107.20	34.52
36	-0.68	62.00	98.67	36.67
37	-2.22	69.23	100.01	30.78
38	-2.66	66.41	99.88	33.47
39	-0.70	71.40	103.92	32.52
40	-0.26	68.84	104.44	35.60
41	-0.96	56.00	95.37	39.37
42	-1.90	63.00	94.07	31.07
43	-1.68	60.00	94.12	34.12
44	-0.82	50.00	92.67	42.67
45	-1.64	50.00	86.70	36.70
46	-1.36	58.00	92.90	34.90
47	-1.56	48.00	80.89	32.89
48	-0.70	120.00	134.97	14.97
49	-0.92	121.00	134.30	13.30
50	-0.34	122.00	134.73	12.73
51	-0.12	123.00	134.50	11.50
52	-0.22	125.00	134.39	9.39
100	10.00	100.57	132.52	31.95
200 R	44.00	120.00	135.00	15.00

Table 8-22

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF MENDEZ(con't)

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T I T L E      : MENDEZ WATER DISTRICT (Max-day demand)
NO. OF PIPES   : 78
NO. OF NODES   : 54
PEAK FACTOR    : 1.30
MAX. HL/1000   : 10.00
MAX. UNBALANCE : 0.0009
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PIPE NO.	FROM NODE	TO NODE	LENGTH (M)	DIAM (MM)	HWC	FLOW (L/S)	VELOCITY (M/S)	HEADLOSS (M/1000)	(M)
1	100	1	10.00	150	110	10.00	0.57	3.60	0.04
2	1	2	100.00	150	110	3.51	0.20	0.52	0.05
3	2	3	300.00	150	110	3.51	0.20	0.52	0.16
4	3	4	710.00	150	110	3.51	0.20	0.52	0.37
5	4	5	300.00	150	110	3.51	0.20	0.52	0.16
6	5	6	400.00	63	90	2.72	0.87	32.00HI	12.80
7	6	7	400.00	63	90	1.69	0.54	13.09HI	5.24
8	7	8	300.00	50	100	1.00	0.51	12.77HI	3.83
9	1	9	200.00	150	110	6.02	0.34	1.41	0.28
10	9	10	40.00	150	110	5.70	0.32	1.27	0.05
110	9	14	460.00	150	110	12.11	0.69	5.13	2.36
11	10	11	40.00	150	110	15.81	0.89	8.41	0.34
12	11	12	140.00	150	110	15.44	0.87	8.06	1.13
13	12	13	160.00	100	110	4.72	0.60	6.46	1.03
14	12	14	240.00	150	110	9.88	0.56	3.53	0.85
15	13	15	110.00	100	110	3.70	0.47	4.12	0.45
16	14	15	80.00	100	110	5.30	0.67	8.01	0.64
17	15	16	45.00	100	110	4.83	0.61	6.74	0.30
18	16	17	50.00	100	110	3.40	0.43	3.53	0.18
19	14	18	100.00	150	110	15.77	0.89	8.38	0.84
20	15	19	95.00	100	110	3.56	0.45	3.84	0.36
21	16	20	60.00	50	90	1.15	0.58	20.00HI	1.20
22	17	25	260.00	75	100	2.95	0.67	13.11HI	3.41
23	18	19	80.00	50	90	0.34	0.17	2.11	0.17
24	19	20	60.00	50	100	1.24	0.63	19.01HI	1.14
25	18	22	160.00	150	110	15.10	0.85	7.73	1.24
26	19	23	160.00	63	90	2.01	0.65	18.34HI	2.93
27	20	24	170.00	63	90	1.74	0.56	14.00HI	2.38
28	22	21	70.00	63	90	1.62	0.52	12.33HI	0.86
29	22	23	75.00	63	90	2.37	0.76	24.92HI	1.87
30	23	24	55.00	63	90	1.50	0.48	10.67HI	0.59
31	24	25	65.00	50	100	0.08	0.04LO	0.12	0.01
32	21	26	160.00	50	100	1.47	0.75	25.94HI	4.15
33	22	27	165.00	100	110	10.60	1.35	28.91HI	4.77
34	23	28	165.00	63	90	2.18	0.70	21.32HI	3.52
35	24	29	165.00	63	90	1.98	0.63	17.73HI	2.93
36	25	30	175.00	75	100	2.80	0.63	11.89HI	2.08
37	27	26	75.00	50	100	0.48	0.24	3.24	0.24
38	27	28	75.00	50	100	0.79	0.40	8.26	0.62
39	29	28	55.00	50	100	0.07	0.04LO	0.10	0.01
40	30	29	75.00	50	100	0.93	0.47	11.16HI	0.84
41	26	31	135.00	50	100	1.54	0.79	28.43HI	3.84
42	27	32	135.00	100	110	8.52	1.09	19.31HI	2.61
43	28	33	125.00	63	90	1.67	0.54	12.99HI	1.62

Table 8-22

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF MENDEZ(con't)

PIPE NO.	FROM NODE	TO NODE	LENGTH (M)	DIAM (MM)	HWC	FLOW (L/S)	VELOCITY (M/S)	HEADLOSS (M/1000)	(M)
44	29	34	120.00	63	90	1.67	0.54	13.06HI	1.57
45	30	35	115.00	50	100	1.29	0.66	20.56HI	2.36
47	33	32	75.00	63	90	0.98	0.31	4.85	0.36
48	34	33	65.00	50	100	0.25	0.13	0.95	0.06
149	35	34	60.00	50	100	0.20	0.10	0.67	0.04
50	31	37	140.00	50	100	0.84	0.43	9.23	1.29
51	32	38	140.00	50	100	1.28	0.65	20.18HI	2.83
151	32	38	140.00	50	100	1.28	0.65	20.18HI	2.83
52	34	39	160.00	50	100	0.82	0.42	8.92	1.43
53	35	40	170.00	50	100	0.74	0.38	7.30	1.24
154	37	36	100.00	100	110	4.53	0.58	6.00	0.60
55	37	38	46.00	50	100	0.29	0.15	1.29	0.06
155	37	38	46.00	50	100	0.29	0.15	1.29	0.06
56	39	38	160.00	50	100	0.94	0.48	11.39HI	1.82
57	40	39	50.00	50	100	0.57	0.29	4.52	0.23
158	36	41	300.00	100	110	4.09	0.52	4.97	1.49
159	32	37	300.00	100	110	5.72	0.73	9.22	2.77
160	38	43	300.00	75	100	2.36	0.53	8.64	2.59
161	41	42	190.00	75	100	1.91	0.43	5.84	0.58
162	43	42	100.00	75	100	0.33	0.07LO	0.22	0.02
163	41	44	300.00	75	100	1.56	0.35	4.04	1.21
164	42	46	300.00	75	100	1.00	0.23	1.76	0.53
165	43	46	350.00	75	100	0.94	0.21	1.57	0.55
167	44	45	200.00	50	100	1.03	0.52	13.45HI	2.69
168	46	45	200.00	50	100	1.05	0.53	13.96HI	2.79
169	45	47	200.00	50	100	1.01	0.52	13.08HI	2.62
170	49	10	660.00	200	110	11.09	0.35	1.08	0.71
171	48	9	670.00	200	110	12.52	0.40	1.35	0.90
172	48	49	110.00	150	110	7.67	0.43	2.21	0.24
173	51	49	110.00	150	110	4.01	0.23	0.67	0.07
174	50	51	110.00	150	110	4.24	0.24	0.73	0.08
175	48	50	110.00	150	110	4.46	0.25	0.81	0.09
176	51	52	150.00	50	100	0.14	0.07LO	0.35	0.05
177	200	48	2.00	200	110	25.10	0.80	4.88	0.01

NODE NO.	FLOW (L/S)	ELEVATION (M)	HGL (M)	PRESSURE (M)
1	-0.47	100.57	134.37	33.80
2	0.00	92.00	134.32	42.32
3	0.00	96.00	134.16	38.16
4	0.00	82.00	133.80	51.80
5	-0.79	73.43	133.64	60.21
6	-1.04	62.00	120.84	58.84
7	-0.68	50.57	115.60	65.03
8	-1.00	42.00	111.77	69.77
9	-0.73	99.20	134.09	34.89
10	-0.99	98.00	134.04	36.04
11	-0.36	97.60	133.70	36.10
12	-0.84	92.30	132.57	40.27
13	-1.01	97.88	131.54	33.66

Table 8-22

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF MENDEZ(con't)

NODE NO.	FLOW (L/S)	ELEVATION (M)	HGL (M)	PRESSURE (M)
14	-0.92	90.35	131.73	41.38
15	-0.61	94.59	131.09	36.50
16	-0.27	90.00	130.78	40.78
17	-0.45	89.10	130.61	41.51
18	-0.33	89.91	130.89	40.98
19	-0.65	91.42	130.72	39.30
20	-0.65	89.59	129.58	39.99
21	-0.16	90.37	128.79	48.42
22	-0.51	82.67	129.65	46.98
23	-0.70	83.72	127.79	44.07
24	-1.18	81.62	127.20	45.58
25	-0.23	81.10	127.20	46.10
26	-0.40	73.26	124.64	51.38
27	-0.81	74.08	124.88	50.80
28	-1.38	74.91	124.27	49.36
29	-1.16	74.40	124.28	49.88
30	-0.57	75.05	125.12	50.07
31	-0.70	73.71	120.80	47.09
32	-1.22	72.05	122.27	50.22
33	-0.94	70.02	122.64	52.62
34	-0.81	72.74	122.71	49.97
35	-0.35	72.68	122.75	50.07
36	-0.44	62.00	118.91	56.91
37	-1.44	69.23	119.51	50.28
38	-1.73	66.41	119.45	53.04
39	-0.45	71.40	121.27	49.87
40	-0.17	68.84	121.51	52.67
41	-0.62	56.00	117.42	61.42
42	-1.23	63.00	116.83	53.83
43	-1.09	60.00	116.86	56.86
44	-0.53	50.00	116.20	66.20
45	-1.07	50.00	113.51	63.51
46	-0.88	58.00	116.31	58.31
47	-1.01	48.00	110.90	62.90
48	-0.45	120.00	134.99	14.99
49	-0.60	121.00	134.75	13.75
50	-0.22	122.00	134.90	12.90
51	-0.08	123.00	134.82	11.82
52	-0.14	125.00	134.77	9.77
199	10.00	100.57	134.41	33.84
200 R	25.10	120.00	135.00	15.00

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY

T I T L E : TAGAYTAY CITY WD (Zone I)
NO. OF PIPES : 57
NO. OF NODES : 35
PEAK FACTOR : 2
MAX HEADLOSS/Km : 10
MAX UNBAL(LPS) : .009

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
31	31	32	311.00	63	90	1.67	0.53	13.14HI	4.09
4031	31	33	622.00	150	120	12.18	0.69	4.48	2.79
32	33	32	311.00	63	90	0.90	0.29LO	4.18	1.30
33	33	34	311.00	63	90	1.12	0.36	6.31	1.96
39	40	31	63.00	150	110	12.52	0.71	5.54	0.35
3900	40	31	63.00	100	110	4.30	0.55	5.54	0.35
40	41	40	60.00	150	110	12.89	0.73	5.85	0.35
4008	41	40	60.00	100	110	4.43	0.56	5.85	0.35
41	42	41	516.00	150	110	9.43	0.53	3.28	1.69
4100	42	41	516.00	150	120	10.28	0.58	3.28	1.69
42	43	42	436.00	150	110	14.88	0.84	7.63	3.33
4201	43	42	436.00	150	120	16.23	0.92	7.63	3.33
43	44	43	371.00	150	110	9.58	0.54	3.38	1.25
4301	44	43	371.00	200	130	24.14	0.77	3.38	1.25
44	45	44	430.00	150	110	10.31	0.58	3.87	1.66
4401	45	44	430.00	200	130	25.99	0.83	3.87	1.66
45	46	45	274.00	150	110	6.97	0.39	1.87	0.51
4501	46	45	274.00	250	130	31.60	0.64	1.87	0.51
46	47	46	278.00	150	110	7.29	0.41	2.04	0.57
4601	47	46	278.00	250	130	33.04	0.67	2.04	0.57
47	47	48	247.00	75	100	4.37	0.99	27.52HI	6.80
1047	47	51	954.00	63	90	1.47	0.47	10.48HI	10.00
4047	47	52	1272.00	250	130	21.66	0.44	0.93	1.18
48	48	49	410.00	75	100	2.25	0.51	8.05	3.30
49	49	50	175.00	75	100	0.37	0.08LO	0.29	0.05
50	51	50	122.00	75	100	1.15	0.26LO	2.33	0.28
51	52	51	318.00	50	90	1.36	0.69	27.72HI	8.81
52	52	53	360.00	50	90	0.40	0.20LO	2.92	1.05
5201	52	53	360.00	75	100	1.30	0.29LO	2.92	1.05
53	53	54	373.00	63	90	0.02	0.01LO	0.00	0.00
59	60	47	158.00	150	110	12.65	0.72	5.65	0.89
4059	60	47	158.00	250	130	57.36	1.17	5.65	0.89
60	60	61	7.00	150	110	19.53	1.10	12.61HI	0.09
1060	60	65	1425.00	150	120	20.67	1.17	11.93HI	17.00
1061	60	65	1425.00	150	120	20.67	1.17	11.93HI	17.00
61	61	62	380.00	150	110	18.96	1.07	11.94HI	4.54
62	62	63	400.00	150	110	17.84	1.01	10.67HI	4.27
63	63	64	402.00	150	110	16.71	0.95	9.45	3.80
64	64	65	236.00	150	110	23.83	1.35	18.23HI	4.30
65	65	565	800.00	100	110	0.80	0.10LO	0.24	0.20
651	65	565	800.00	75	100	0.34	0.08LO	0.24	0.20

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
66	65	66	653.00	150	110	20.08	1.14	13.28HI	8.67
1065	65	67	1092.00	150	120	20.78	1.18	12.04HI	13.15
1067	65	67	1092.00	150	120	20.78	1.18	12.04HI	13.15
67	66	67	439.00	150	110	17.42	0.99	10.21HI	4.48
68	67	68	97.00	150	110	16.38	0.93	9.11	0.88
6800	67	68	97.00	200	130	41.29	1.31	9.11	0.88
69	68	69	303.00	150	110	13.79	0.78	6.63	2.01
6900	68	69	303.00	200	130	34.76	1.11	6.63	2.01
70	70	69	400.00	150	110	8.16	0.46	2.51	1.00
7000	68	70	400.00	150	110	8.16	0.46	2.51	1.00
4500	33	5000	50.00	150	120	7.60	0.43	1.87	0.09
4600	52	6000	50.00	200	130	16.00	0.51	1.58	0.08
4700	69	7000	50.00	200	130	55.00	1.75	15.49HI	0.77
4000	1000	60	50.00	250	120	131.13	2.67	30.23HI	1.51
1820	42	50	1820.00	150	130	7.49	0.42	1.57	2.86
850	50	64	850.00	150	130	8.04	0.46	1.79	1.52

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
31	-2.976	650.20	687.78	37.58
32	-2.562	642.22	683.70	41.48
33	-2.562	634.24	685.00	50.76
34	-1.120	626.26	683.03	56.77
40	-0.508	650.10	688.13	38.03
41	-2.380	650.00	688.48	38.48
42	-3.916	660.70	690.17	29.47
43	-2.600	667.60	693.60	26.00
44	-2.582	673.20	694.85	21.65
45	-2.268	689.70	696.52	6.82
46	-1.762	691.70	697.03	5.33
47	-2.192	687.40	697.60	10.20
48	-2.120	675.70	690.80	15.10
49	-1.874	668.70	687.50	18.80
50	-0.970	662.80	687.31	24.51
51	-1.680	660.20	687.60	27.40
52	-2.600	645.50	696.41	50.91
53	-1.680	660.20	695.36	35.16
54	-0.020	626.80	695.36	68.56
60	-0.244	690.50	698.49	7.99
61	-0.562	690.60	698.40	7.80
62	-1.120	682.20	693.86	11.66
63	-1.138	664.20	689.59	25.39
64	-0.916	664.10	685.79	21.69
65	-2.398	667.70	681.49	13.79
565	-1.138	647.70	681.30	33.60
66	-2.656	648.90	672.82	23.92

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
67	-1.306	639.50	668.34	28.84
68	-0.970	636.70	667.46	30.76
69	-1.708	626.30	665.45	39.15
70	0.000	615.17	666.45	51.28
5000	-7.500	639.00	684.90	45.90
6000	-16.000	651.00	696.33	45.33
7000	-55.000	631.00	664.68	33.68
1000 R	131.128	695.00	700.00	5.00

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

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T I T L E          : TAGAYTAY CITY WD (Zone II)
NO. OF PIPES       : 31
NO. OF NODES       : 28
PEAK FACTOR        : 2
MAX HEADLOSS/Km    : 10
MAX UNBAL(LPS)     : 0
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1	2	1	200.00	100	110	0.42	0.05LO	0.07	0.01
2	3	2	150.00	100	110	1.16	0.15LO	0.49	0.07
3	4	3	100.00	150	110	2.04	0.12LO	0.19	0.02
4	5	4	20.00	150	110	1.16	0.07LO	0.07	0.00
4005	5	6	347.00	75	110	2.18	0.49	6.38	2.22
4006	6	7	94.00	75	110	1.68	0.43	4.85	0.46
4007	7	8	87.00	75	110	1.42	0.32	2.89	0.25
4008	8	9	418.00	50	110	0.82	0.42	7.54	3.15
4009	9	10	350.00	50	100	0.34	0.17LO	1.76	0.62
10	11	5	278.00	150	110	4.16	0.24LO	0.72	0.20
11	12	11	276.00	150	110	4.66	0.26LO	0.89	0.25
12	13	12	342.00	150	110	5.22	0.30LO	1.10	0.38
13	14	13	50.00	150	110	5.86	0.33	1.36	0.07
1013	14	4	966.00	100	110	1.64	0.21LO	0.92	0.89
4014	14	15	200.00	50	100	0.98	0.50	12.50HI	2.50
4015	15	16	100.00	50	100	0.46	0.23LO	3.08	0.31
16	14	17	284.00	150	110	9.02	0.51	3.02	0.86
17	17	18	293.00	150	110	8.32	0.47	2.60	0.76
4018	18	19	285.00	50	90	1.13	0.58	19.76HI	5.63
4088	18	19	285.00	75	100	3.65	0.83	19.76HI	5.63
18	18	21	722.00	50	90	1.00	0.51	15.78HI	11.39
4019	19	20	100.00	50	100	0.38	0.19LO	2.17	0.22
4020	19	21	437.00	50	90	0.91	0.46	13.18HI	5.76
4021	19	21	437.00	75	100	2.93	0.66	13.18HI	5.76
4021	21	22	300.00	50	100	0.42	0.21LO	2.61	0.78
22	21	23	623.00	75	100	0.40	0.09LO	0.33	0.21
28	18	29	356.00	150	110	1.90	0.11LO	0.17	0.06
29	29	30	231.00	150	110	1.18	0.07LO	0.07	0.02
30	30	31	344.00	150	110	0.62	0.04LO	0.02	0.01
4300	21	3000	50.00	75	110	3.52	0.80	15.49HI	0.77
201	2000	14	50.00	150	110	18.10	1.02	10.96HI	0.55

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
1	-0.420	635.50	678.45	42.95
2	-0.740	641.10	678.47	37.37
3	-0.880	645.30	678.54	33.24
4	-0.760	648.10	678.56	30.46
5	-0.920	648.00	678.56	30.56

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
6	-0.300	624.40	676.35	51.95
7	-0.460	650.50	675.89	25.39
8	-0.600	645.90	675.64	29.74
9	-0.480	630.97	672.49	41.52
10	-0.340	618.26	671.87	53.61
11	-0.500	655.00	678.76	23.76
12	-0.560	662.70	679.01	16.31
13	-0.640	673.30	679.38	6.08
14	-0.600	672.90	679.45	6.55
15	-0.520	667.70	676.95	9.25
16	-0.460	665.40	676.64	11.24
17	-0.700	662.30	678.59	16.29
18	-0.640	660.00	677.83	17.83
19	-0.560	657.30	672.20	14.90
20	-0.380	654.80	671.98	17.18
21	-0.500	647.60	666.44	18.84
22	-0.420	640.10	665.66	25.56
23	-0.400	631.80	666.23	34.43
29	-0.720	648.70	677.77	29.07
30	-0.560	655.00	677.76	22.76
31	-0.620	650.20	677.75	27.55
2000 R	18.100	680.00	680.00	0.00
3000	-3.520	648.00	665.67	17.67

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

```
T I T L E        :  TAGAYTAY CITY WD (Zone III)
NO. OF PIPES     :  4
NO. OF NODES     :  5
PEAK FACTOR      :  2
MAX HEADLOSS/Km  :  10
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
23	23	24	580.00	50	90	0.56	0.29LO	5.39	3.13
24	24	25	362.00	50	90	0.00	0.00LO	2.76	1.00
4400	23	4000	580.00	75	100	3.52	0.80	18.48HI	10.72
4301	3000	23	623.00	100	110	4.84	0.62	6.88	4.29

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
23	-0.760	631.80	643.71	11.91
24	-0.560	602.00	640.59	38.59
25	0.000	584.40	639.59	55.19
4000	-3.520	607.00	633.00	26.00
3000 R	4.840	648.00	648.00	0.00

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

```
T I T L E        : TAGAYTAY CITY WD (Zone IV)
NO. OF PIPES     : 4
NO. OF NODES     : 5
PEAK FACTOR      : 2
MAX HEADLOSS/Km  : 10
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
4025	25	28	1800.00	75	110	0.46	0.10LO	0.36	0.65
26	25	26	215.00	50	90	0.78	0.40	9.96	2.14
27	26	27	300.00	50	90	0.44	0.22LO	3.45	1.04
4401	4000	25	365.00	100	110	1.68	0.21LO	0.97	0.35

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
25	-0.440	584.40	601.65	17.25
26	-0.340	577.30	599.50	22.20
27	-0.440	566.30	598.47	32.17
28	-0.460	539.40	601.00	61.60
4000 R	1.680	602.00	602.00	0.00

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

```
T I T L E          : TAGAYTAY CITY WD (Zone V)
NO. OF PIPES       : 9
NO. OF NODES       : 7
PEAK FACTOR        : 2
MAX HEADLOSS/Ka    : 10
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
34	34	35	311.00	63	90	1.19	0.38	7.04	2.19
4034	34	35	311.00	100	110	4.90	0.62	7.04	2.19
35	35	36	311.00	63	90	0.99	0.32	5.06	1.57
4035	35	36	311.00	100	100	3.73	0.47	5.06	1.57
36	36	37	345.00	63	90	1.19	0.38	7.02	2.42
3601	36	37	345.00	75	100	2.09	0.47	7.02	2.42
37	37	38	389.00	75	100	1.64	0.37	4.48	1.74
4038	38	39	173.00	75	100	0.39	0.09LO	0.31	0.05
4501	5000	34	310.00	100	110	6.09	0.78	10.52HI	3.26

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
34	0.000	626.26	631.74	5.48
35	-1.366	618.28	629.55	11.27
36	-1.450	610.30	627.98	17.68
37	-1.636	596.30	625.56	29.26
38	-1.248	583.80	623.81	40.01
39	-0.388	578.20	623.76	45.56
5000 R	6.088	634.00	635.00	1.00

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

```
T I T L E        :  TAGAYTAY CITY WD (Zone VI)
NO. OF PIPES     :  11
NO. OF NODES     :  7
PEAK FACTOR      :  2
MAX HEADLOSS/Km  :  10
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
54	54	55	133.00	50	90	0.60	0.30	6.09	0.81
4054	54	55	133.00	150	120	14.38	0.81	6.09	0.81
55	55	56	363.00	50	90	0.51	0.26LO	4.49	1.63
4055	55	56	363.00	150	120	12.20	0.69	4.49	1.63
56	56	57	242.00	50	90	1.16	0.59	20.68HI	5.00
4056	56	57	242.00	100	110	8.77	1.12	20.68HI	5.00
57	57	58	289.00	50	90	0.87	0.45	12.30HI	3.55
4057	57	58	289.00	100	110	6.63	0.84	12.30HI	3.55
58	58	59	675.00	50	90	0.79	0.40	10.21HI	6.89
4058	58	59	675.00	75	90	2.30	0.52	10.21HI	6.89
4601	6000	54	735.00	150	110	17.30	0.98	10.08HI	7.41

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
54	-2.324	626.00	639.59	13.59
55	-2.274	621.30	638.78	17.48
56	-2.772	614.70	637.15	22.45
57	-2.432	602.70	632.15	29.45
58	-4.410	591.50	628.59	37.09
59	-3.090	575.70	621.70	46.00
6000 R	17.302	647.00	647.00	0.00

Table 8-23
RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

```
T I T L E        : TAGAYTAY CITY WD (Zone VII)
NO. OF PIPES     : 63
NO. OF NODES     : 49
PEAK FACTOR      : 2
MAX HEADLOSS/Km  : 10
MAX UNBAL(LPS)   : 0
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
71	70	71	132.00	100	100	10.48	1.33	34.25HI	4.52
72	71	72	380.00	100	100	9.43	1.20	28.19HI	10.71
73	72	73	380.00	100	100	7.89	1.01	20.28HI	7.71
74	73	74	380.00	100	100	6.36	0.81	13.58HI	5.16
75	74	75	372.00	100	100	4.46	0.57	7.05	2.62
4076	75	76	300.00	50	100	0.77	0.39	7.96	2.39
77	75	77	396.00	100	100	1.00	0.13LO	0.44	0.18
78	70	78	380.00	150	110	20.17	1.14	13.39HI	5.09
7801	70	78	380.00	150	120	22.01	1.25	13.39HI	5.09
79	78	79	212.00	150	110	19.57	1.11	12.66HI	2.68
7901	78	79	212.00	150	120	21.35	1.21	12.66HI	2.68
80	79	80	338.00	150	110	19.01	1.08	12.00HI	4.06
8000	79	80	338.00	150	120	20.74	1.17	12.00HI	4.06
81	80	81	305.00	150	110	18.36	1.04	11.25HI	3.43
8100	80	81	305.00	150	120	20.03	1.13	11.25HI	3.43
82	81	82	232.00	150	110	17.82	1.01	10.64HI	2.47
8200	81	82	232.00	150	120	19.44	1.10	10.64HI	2.47
4083	82	83	200.00	75	100	0.75	0.17LO	1.07	0.21
4084	82	84	150.00	50	90	0.50	0.26LO	4.44	0.67
4088	82	84	150.00	75	100	1.63	0.37	4.44	0.67
4085	84	85	500.00	50	100	0.75	0.38	7.62	3.81
4086	85	86	60.00	50	100	0.09	0.04LO	0.14	0.01
87	82	87	398.00	150	110	32.61	1.85	32.56HI	12.96
4088	87	88	150.00	50	100	0.21	0.10LO	0.70	0.10
89	87	89	266.00	150	110	14.95	0.85	7.70	2.05
8900	87	89	266.00	150	120	16.31	0.92	7.70	2.05
90	89	90	296.00	150	110	14.58	0.83	7.35	2.17
9000	89	90	296.00	150	120	15.91	0.90	7.35	2.17
91	90	91	150.00	50	90	0.32	0.16LO	1.87	0.28
103	103	102	120.00	150	110	0.72	0.04LO	0.03	0.00
104	90	103	227.00	150	110	14.40	0.81	7.18	1.63
1004	90	105	1164.00	100	110	3.57	0.45	3.91	4.55
1114	90	105	1164.00	150	120	11.31	0.64	3.91	4.55
105	103	104	180.00	150	110	11.81	0.67	4.97	0.90
106	104	105	757.60	150	110	8.45	0.48	2.68	2.03
107	105	106	325.00	150	110	9.85	0.56	3.55	1.15
1107	105	113	1013.00	100	110	2.31	0.29LO	1.74	1.77
1117	105	113	1013.00	150	120	7.31	0.41	1.74	1.77
108	106	107	134.00	150	110	8.19	0.46	2.53	0.34
109	107	108	250.00	50	90	0.91	0.46	13.14HI	3.28
110	107	109	209.00	150	110	5.16	0.29LO	1.08	0.22

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
111	109	110	150.00	50	90	0.96	0.49	14.73HI	2.21
4112	110	111	100.00	50	100	0.37	0.19LO	2.04	0.20
113	109	112	73.00	150	110	2.65	0.15LO	0.31	0.02
114	112	113	272.00	150	110	1.41	0.08LO	0.10	0.03
115	113	114	200.00	75	100	0.72	0.16LO	0.99	0.20
116	113	115	169.00	75	110	2.42	0.55	7.72	1.30
1116	113	120	957.00	100	110	0.67	0.09LO	0.18	0.17
1666	113	120	957.00	200	130	4.93	0.16LO	0.18	0.17
117	115	116	229.00	150	110	0.98	0.06LO	0.05	0.01
118	117	116	112.00	150	110	0.25	0.01LO	0.00	0.00
119	118	117	202.00	75	90	0.47	0.11LO	0.55	0.11
120	119	118	190.00	75	90	0.76	0.17LO	1.33	0.25
121	120	119	55.00	50	90	0.94	0.48	14.19HI	0.78
122	120	121	200.00	50	90	0.88	0.45	12.55HI	2.51
4123	121	122	200.00	50	100	0.59	0.30	4.92	0.98
4124	122	123	300.00	50	100	0.22	0.11LO	0.81	0.24
125	120	124	66.00	50	90	0.68	0.35	7.72	0.51
1125	120	127	556.00	100	110	2.85	0.36	2.59	1.44
126	124	125	109.00	50	90	0.55	0.28LO	5.22	0.57
127	125	126	70.00	50	90	0.42	0.21LO	3.17	0.22
128	126	127	311.00	50	90	0.15	0.07LO	0.45	0.14
4701	7000	70	400.00	250	130	54.51	1.11	5.14	2.06

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
70	-1.850	615.17	644.94	29.77
71	-1.046	611.77	640.42	28.65
72	-1.538	601.99	629.71	27.72
73	-1.538	592.21	622.00	29.79
74	-1.876	582.43	616.84	34.41
75	-2.694	572.86	614.22	41.36
76	-0.768	565.36	611.83	46.47
77	-0.998	562.67	614.04	51.37
78	-1.262	604.60	639.86	35.26
79	-1.166	598.30	637.17	38.87
80	-1.366	590.30	633.12	42.82
81	-1.136	585.20	629.68	44.48
82	-1.756	584.10	627.22	43.12
83	-0.754	579.10	627.00	47.90
84	-1.382	580.35	626.55	46.20
85	-0.662	567.85	622.74	54.89
86	-0.068	566.35	622.73	56.38
87	-1.136	580.90	614.26	33.36
99	-0.206	585.15	614.15	29.00
89	-0.780	584.60	612.21	27.61
90	-0.890	588.30	610.03	21.73

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
91	-0.316	574.70	609.75	35.05
102	-0.722	577.84	608.40	30.56
103	-1.868	586.10	608.41	22.31
104	-3.356	582.40	607.51	25.11
105	-3.870	582.15	605.48	23.33
106	-1.660	570.70	604.33	33.63
107	-2.120	573.00	603.99	30.99
108	-0.906	566.75	600.70	33.95
109	-1.552	575.70	603.76	28.06
110	-0.596	571.95	601.55	29.60
111	-0.368	569.45	601.35	31.90
112	-1.232	574.80	603.74	28.94
113	-2.290	577.90	603.71	25.81
114	-0.722	572.90	603.52	30.62
115	-1.432	579.35	602.41	23.06
116	-1.232	589.50	602.40	12.90
117	-0.224	590.10	602.40	12.30
118	-0.292	584.80	602.51	17.71
119	-0.180	579.60	602.76	23.16
120	-0.242	580.70	603.54	22.84
121	-0.292	575.64	601.03	25.39
122	-0.368	570.59	600.05	29.46
123	-0.224	563.00	599.80	36.80
124	-0.130	582.20	603.03	20.83
125	-0.130	578.00	602.47	24.47
126	-0.274	579.40	602.24	22.84
127	-3.000	587.00	602.10	15.10
7000 R	54.510	627.00	647.00	20.00

Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

```
T I T L E        :  TAGAYTAY CITY WD (Zone VIII)
NO. OF PIPES     :  13
NO. OF NODES     :  13
PEAK FACTOR      :  2
MAX HEADLOSS/Km  :  10
MAX UNBAL(LPS)   :  0
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
92	91	92	349.00	50	90	1.75	0.89	44.26HI	15.45
4092	91	93	721.00	75	110	4.67	1.06	26.17HI	18.87
93	92	93	372.00	50	90	0.75	0.38	9.19	3.42
94	93	94	270.00	50	90	1.04	0.53	16.96HI	4.58
4095	93	95	476.00	100	110	3.48	0.44	3.74	1.78
4096	95	96	189.00	100	110	2.16	0.28LO	1.55	0.29
4097	96	97	57.00	75	100	0.80	0.18LO	1.19	0.07
4100	99	98	281.00	50	100	1.00	0.51	12.98HI	3.65
4101	100	99	281.00	75	110	2.48	0.56	8.10	2.28
4102	102	100	281.00	75	110	3.88	0.88	18.55HI	5.21
4801	8000	91	125.00	100	110	1.34	0.17LO	0.64	0.08
4802	91	102	230.00	100	110	5.08	0.65	7.52	1.73
8500	8500	91	950.00	150	120	11.50	0.65	4.03	3.83

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
91	-1.340	574.70	592.92	18.22
92	-1.000	564.30	577.47	13.17
93	-0.900	558.20	574.05	15.85
94	-1.040	547.90	569.48	21.58
95	-1.320	543.80	572.28	28.48
96	-1.360	533.40	571.98	38.58
97	-0.800	531.70	571.91	40.21
102	-1.200	577.84	591.19	13.35
100	-1.400	558.50	585.98	27.48
99	-1.480	539.28	583.70	44.42
98	-1.000	520.00	580.05	60.05
8000 R	1.340	593.00	593.00	0.00
8500	11.500	550.00	596.75	46.75

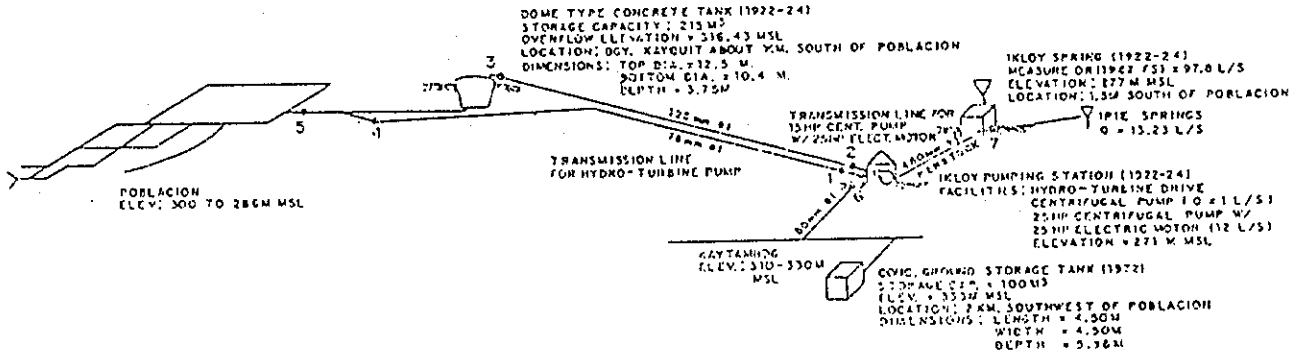
Table 8-23

RESULT OF HYDRAULIC ANALYSIS OF PIPE-LINE SYSTEM OF TAGAYTAY(con't)

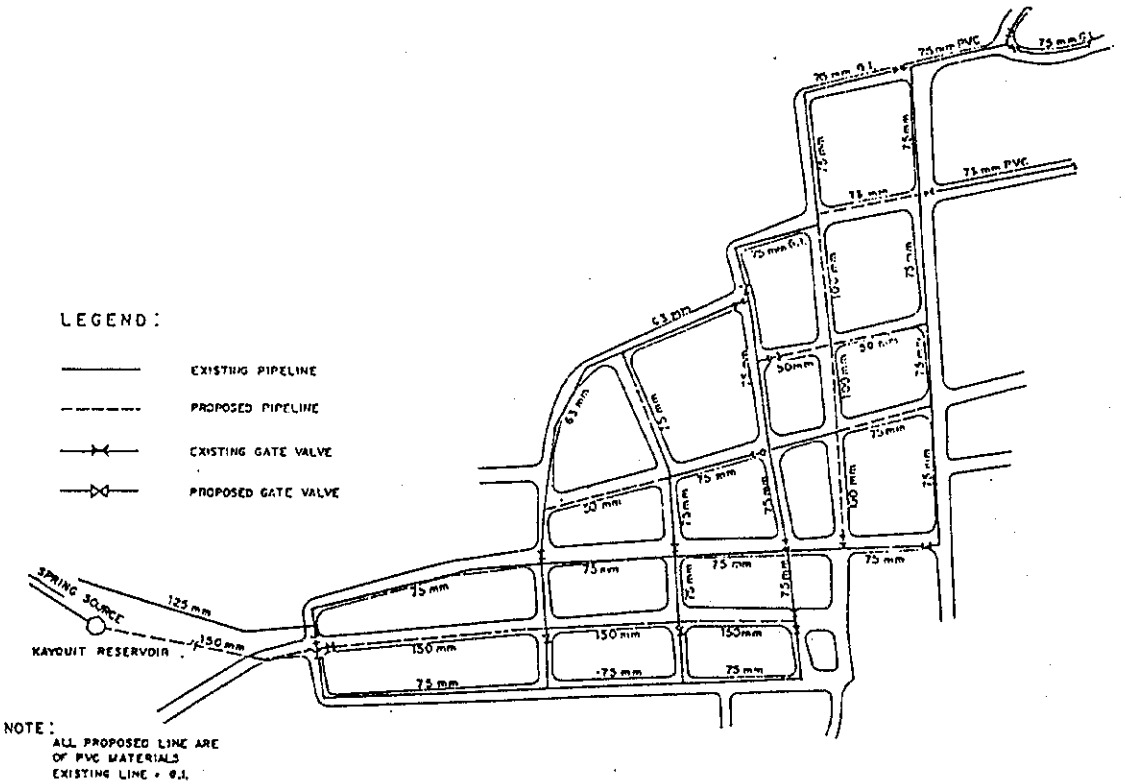
```
T I T L E        :  TAGAYTAY CITY WD (Zone IX)
NO. OF PIPES     :  9
NO. OF NODES     :  8
PEAK FACTOR      :  2
MAX HEADLOSS/Km  :  10
MAX UNBAL(LPS)   :  .003
```

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
129	127	128	347.00	50	90	0.47	0.24LO	3.84	1.33
4129	127	128	347.00	100	110	3.53	0.45	3.84	1.33
130	128	129	240.00	50	90	1.81	0.92	47.07HI	11.30
131	129	130	240.00	50	90	0.95	0.48	14.29HI	3.43
132	128	131	451.00	50	90	0.75	0.38	9.16	4.13
1132	128	133	935.00	100	110	0.68	0.09LO	0.18	0.17
133	132	131	204.00	50	90	0.18	0.09LO	0.65	0.13
134	133	132	280.00	50	90	0.93	0.47	13.68HI	3.83
3000	9600	133	20.00	100	110	0.86	0.11LO	0.28	0.01

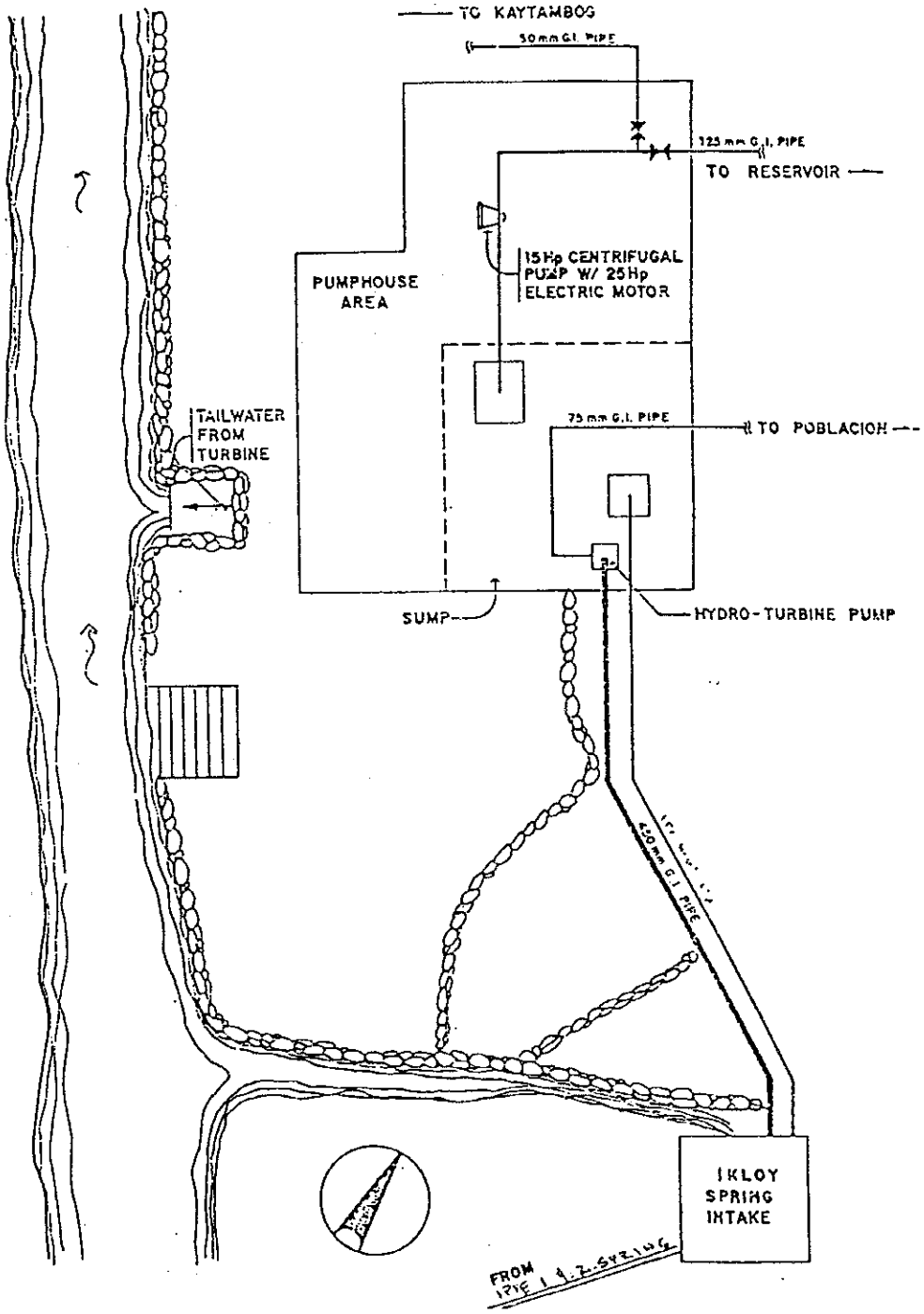
NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
127	4.000	587.00	651.50	64.50
128	-0.770	607.50	650.16	42.66
129	-0.858	573.75	638.87	65.12
130	-0.948	580.00	635.44	55.44
131	-0.924	632.90	646.03	13.13
132	-0.748	624.90	646.16	21.26
133	-0.616	640.10	649.99	9.89
9600 R	0.964	640.10	650.00	9.90



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-1(1/3)
JAPAN INTERNATIONAL COOPERATION AGENCY	EXISTING WATER SUPPLY SYSTEM(I) INDANG WATER DISTRICT



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-1(2/3)
JAPAN INTERNATIONAL COOPERATION AGENCY	EXISTING WATER SUPPLY SYSTEM (2) INDANG WATER DISTRICT

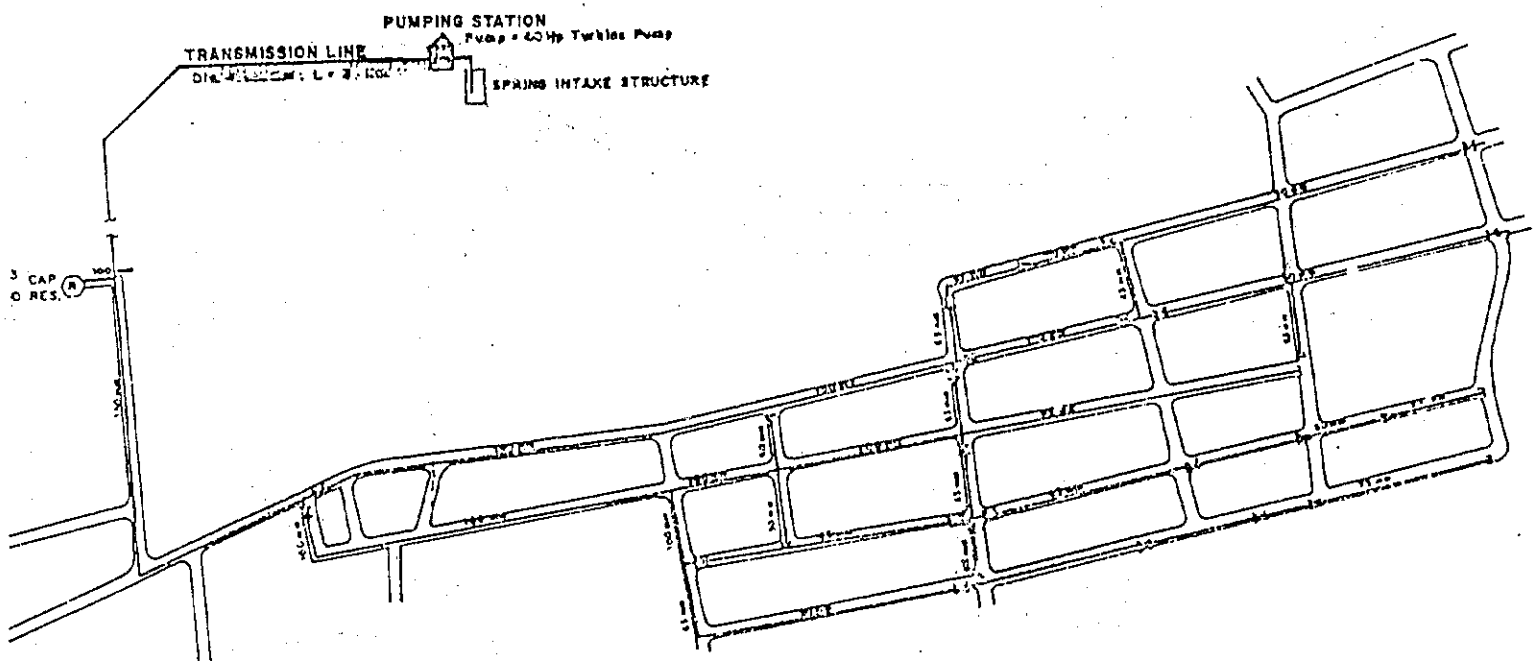


CAVITE WATER SUPPLY DEVELOPMENT STUDY

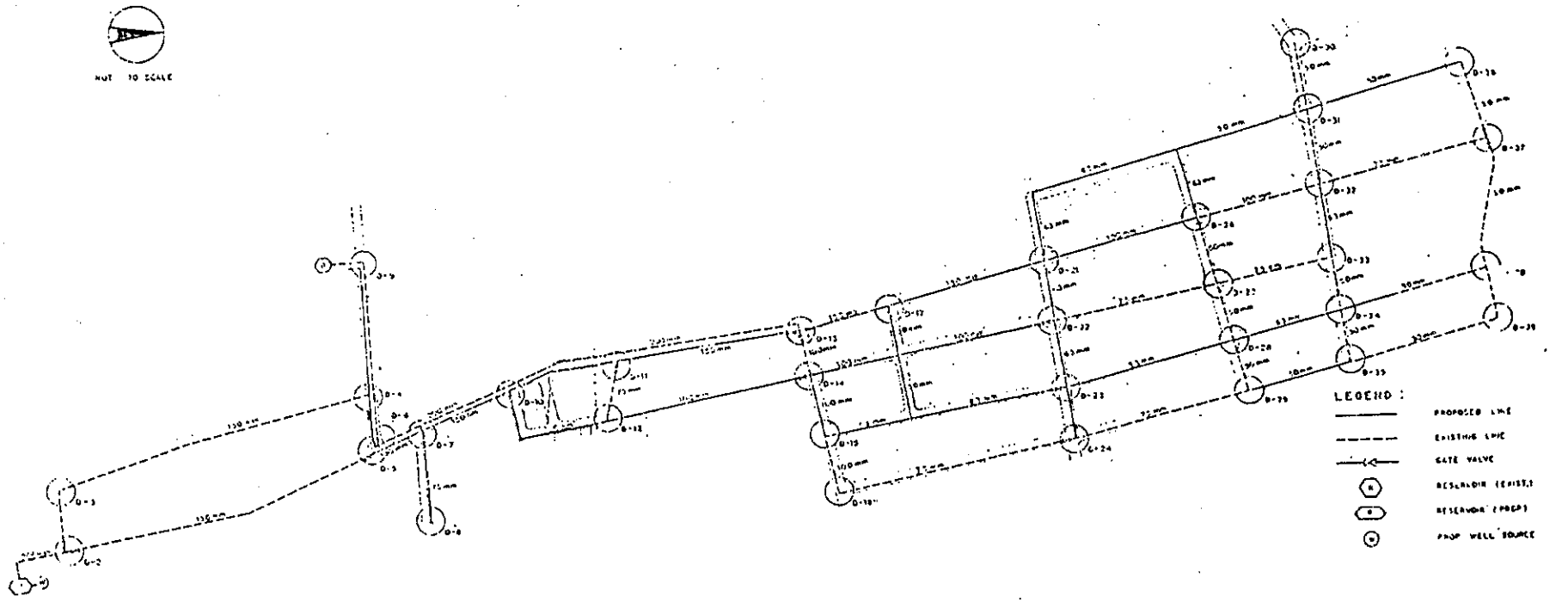
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 8-1(3/3)

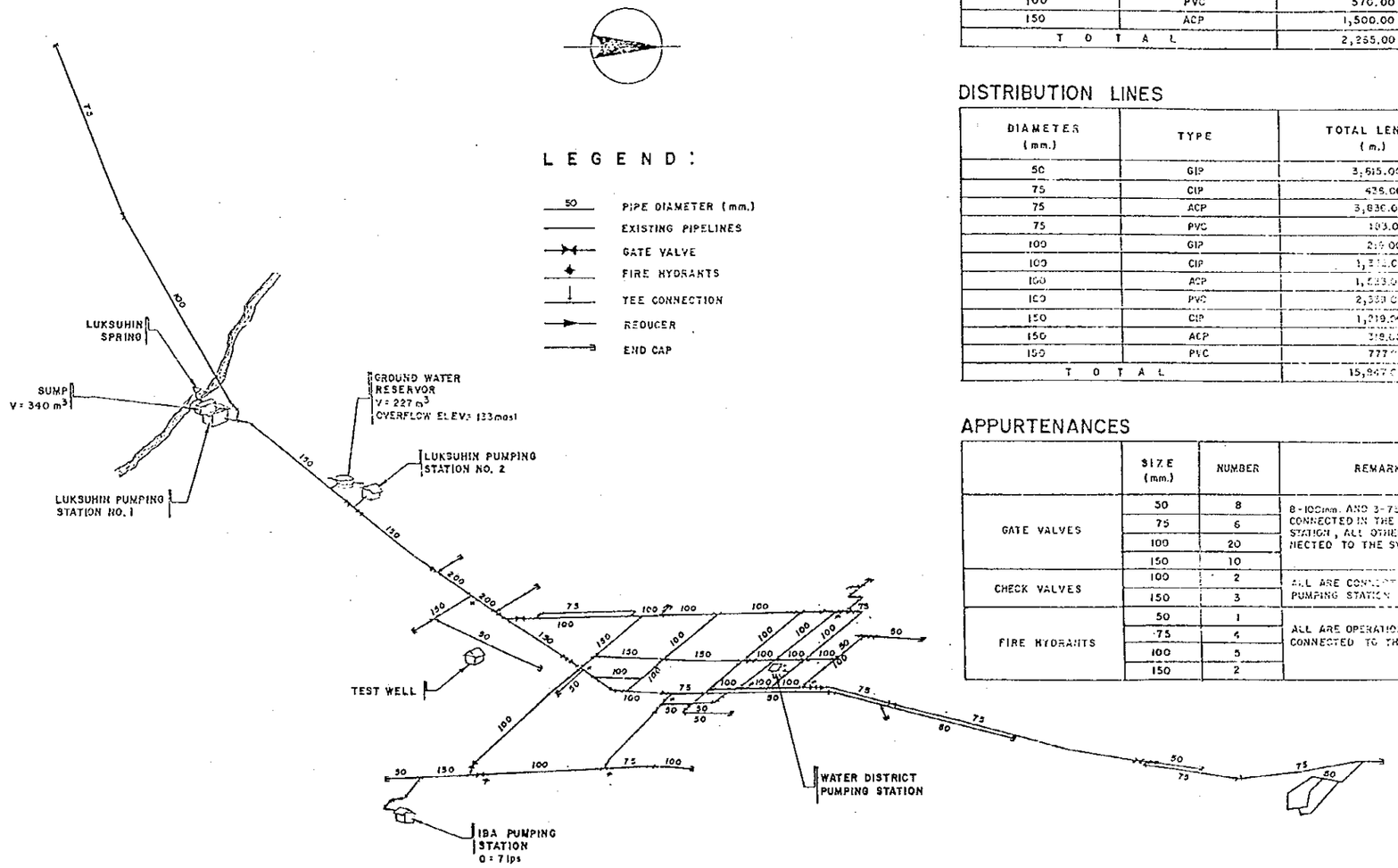
EXISTING SOURCE FACILITIES
INDANG WATER DISTRICT



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-2(1/2)
JAPAN INTERNATIONAL COOPERATION AGENCY	EXISTING WATER SUPPLY SYSTEM MENDEZ WATER DISTRICT



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-2(2/2)
JAPAN INTERNATIONAL COOPERATION AGENCY	PROPOSED WATER SUPPLY SYSTEM MENDEZ WATER DISTRICT



TRANSMISSION LINES

DIAMETER (mm.)	TYPE	TOTAL LENGTH (m.)
100	GIP	195.00
100	PVC	570.00
150	ACP	1,500.00
T O T A L		2,265.00

DISTRIBUTION LINES

DIAMETER (mm.)	TYPE	TOTAL LENGTH (m.)
50	GIP	3,615.00
75	GIP	438.00
75	ACP	3,838.00
75	PVC	183.00
100	GIP	219.00
100	CIP	1,311.00
100	ACP	1,533.00
100	PVC	2,538.00
150	CIP	1,019.00
150	ACP	318.00
150	PVC	777.00
T O T A L		15,947.00

APPURTENANCES

	SIZE (mm.)	NUMBER	REMARKS
GATE VALVES	50	8	8-100mm. AND 3-75m. ARE CONNECTED IN THE PUMPING STATION, ALL OTHERS ARE CONNECTED TO THE SYSTEM.
	75	6	
	100	20	
	150	10	
CHECK VALVES	100	2	ALL ARE CONNECTED TO THE PUMPING STATION
	150	3	
FIRE HYDRANTS	50	1	ALL ARE OPERATIONAL AND CONNECTED TO THE SYSTEM
	75	4	
	100	5	
	150	2	

SOURCE DESCRIPTION

	DESCRIPTION	PUMP SETTING	DEPTH (m.)	CASING (mm)	DISCHARGE (lps.)	PUMP DRIVES
LPS-1	LUKSUMIN SPRING P.S.				11.71	40 Hp VTP
LPS-2	TELESCOPIC CASING		203	250/200	17.6	20 Hp SUBM.
IBA PS	TELESCOPIC CASING		146	250/200	7.2	30 Hp SUBM.
WD PS	TELESCOPIC CASING		200	250/200	9.3	30 Hp SUBM.
Gabriela	DW	100 m			15.2	30 Hp SUBM.
Biga	DW	85 m			15.8	30 Hp SUBM.
Bulihan I	DW	73 m			6.3	15 Hp SUBM.
Bulihan II	DW	73 m			12.6	30 Hp SUBM.
Bulihan III	DW	73 m			6.3	15 Hp SUBM.
Bulihan IV	DW	-			8.6	25 Hp SUBM.
Bulihan V	DW	115.8 m			10.6	25 Hp SUBM.
Bulihan VI	DW	73 m			6.3	15 Hp SUBM.
Bulihan VII	DW	91.4 m			10	15 Hp SUBM.

SERVICE CONNECTION AS OF MARCH 1990

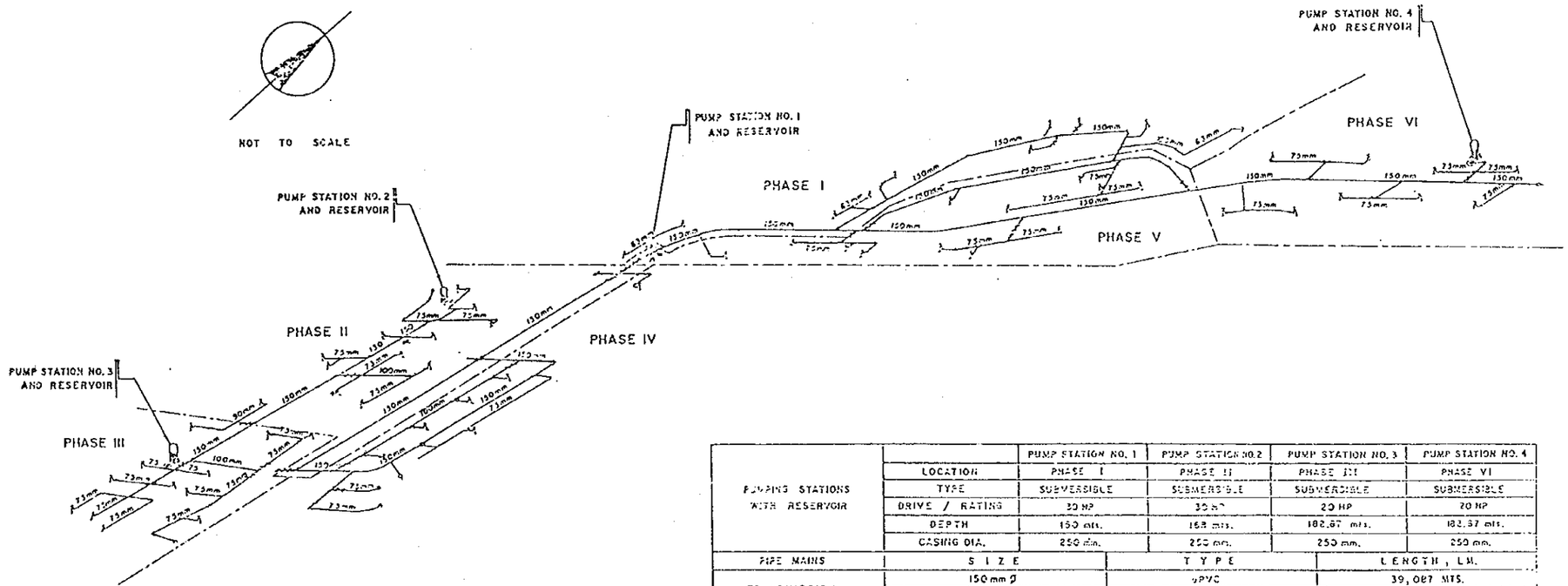
TYPE	METERED	UNMETERED	TOTAL
DOMESTIC	2,669	-	2,669
COMMERCIAL / INST'L.	133	-	133
TOTAL	2,062	-	2,082

CAVITE WATER SUPPLY DEVELOPMENT STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 8-3(1/2)

EXISTING WATER SUPPLY SYSTEM(1)
SILANG WATER DISTRICT



		PUMP STATION NO. 1	PUMP STATION NO.2	PUMP STATION NO. 3	PUMP STATION NO. 4
PUMPING STATIONS WITH RESERVOIR	LOCATION	PHASE I	PHASE II	PHASE III	PHASE VI
	TYPE	SUBMERSIBLE	SUBMERSIBLE	SUBMERSIBLE	SUBMERSIBLE
	DRIVE / RATING	30 HP	35 HP	20 HP	20 HP
	DEPTH	150 mts.	168 mts.	182.87 mts.	182.87 mts.
	CASING DIA.	250 mm.	250 mm.	250 mm.	250 mm.

PIPE MAINS	SIZE	TYPE	LENGTH, LM.
TRANSMISSION	150 mm ø	uPVC	39,087 MTS.
	100 mm ø	uPVC	20,559 MTS.
DISTRIBUTION	75 mm ø	uPVC	38,758 MTS.
	63 mm ø	uPVC	6,151 MTS.
	TOTAL		

GATE VALVES	SIZE	NUMBER	CONDITIONS
	150 mm	12	ALL ARE CONNECTED TO THE SYSTEM AND OPERATIONAL
	100 mm	36	20 GV ARE CONNECTED TO THE SYSTEM, 16 GV ARE IN PUMPHOUSE
	75 mm	5	ALL ARE CONNECTED TO THE SYSTEM AND OPERATIONAL
	63 mm	5	ALL ARE CONNECTED TO THE SYSTEM AND OPERATIONAL

FIRE HYDRANTS	SIZE	NUMBER	CONDITIONS
	150 mm	4	ALL ARE CONNECTED TO THE SYSTEM AND OPERATIONAL
	100 mm	1	CONNECTED TO THE SYSTEM AND OPERATIONAL

PUBLIC FAUCET		PHASE I	PHASE II	PHASE III	PHASE IV	PHASE V	PHASE VI	TOTAL
	BLOCK FAUCET	13	16	15	15	17	8	84
	LAUNDRY SHED	13	16	15	15	17	8	84

LEGEND :

- 75 — PIPE DIAMETER (mm)
- EXISTING PIPELINES
- GATE VALVE
- FIRE HYDRANT
- REDUCER
- END CAP
- PUBLIC FAUCET
- BLOW OFF VALVE
- PHASE BOUNDARY

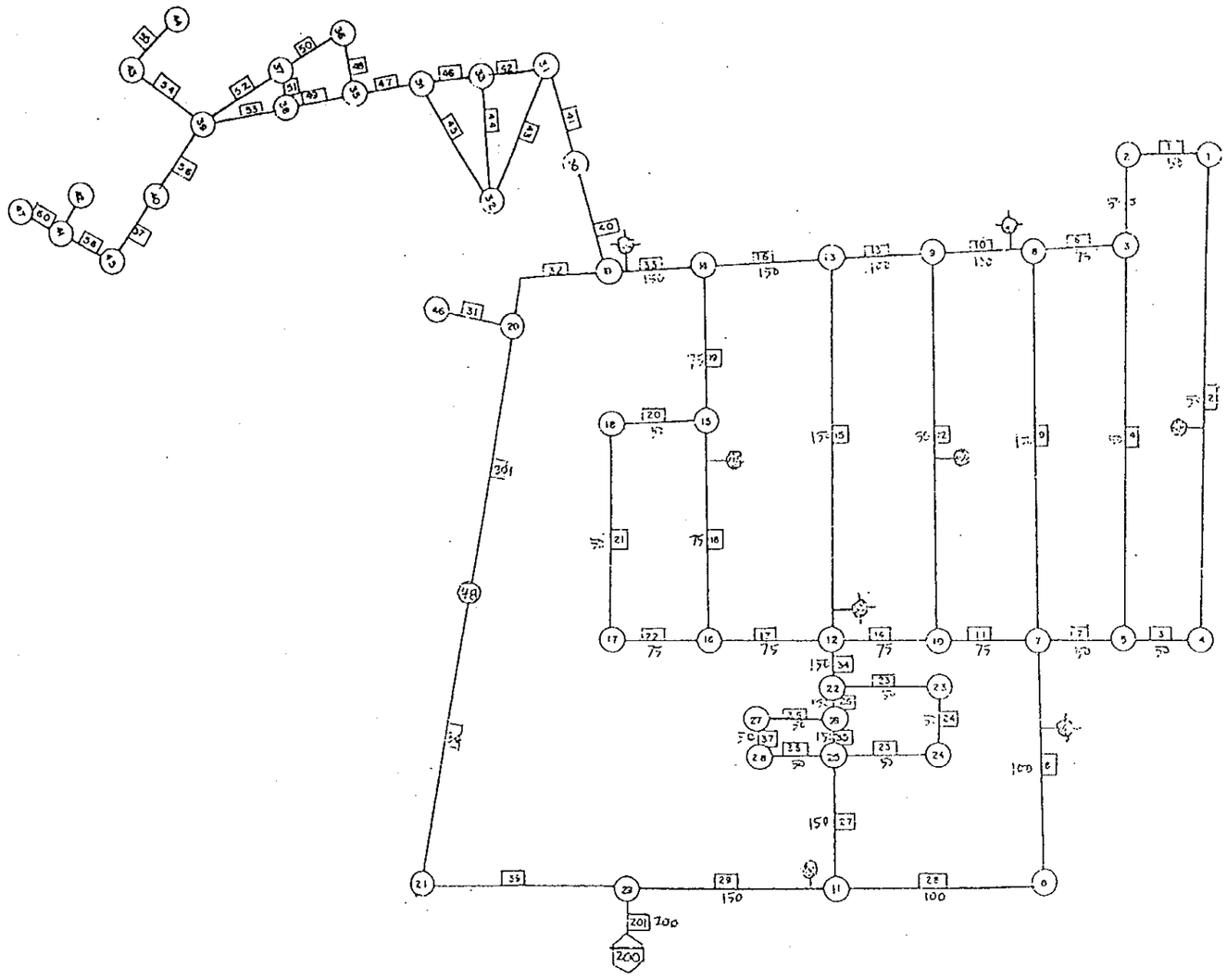
CAVITE WATER SUPPLY DEVELOPMENT STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY

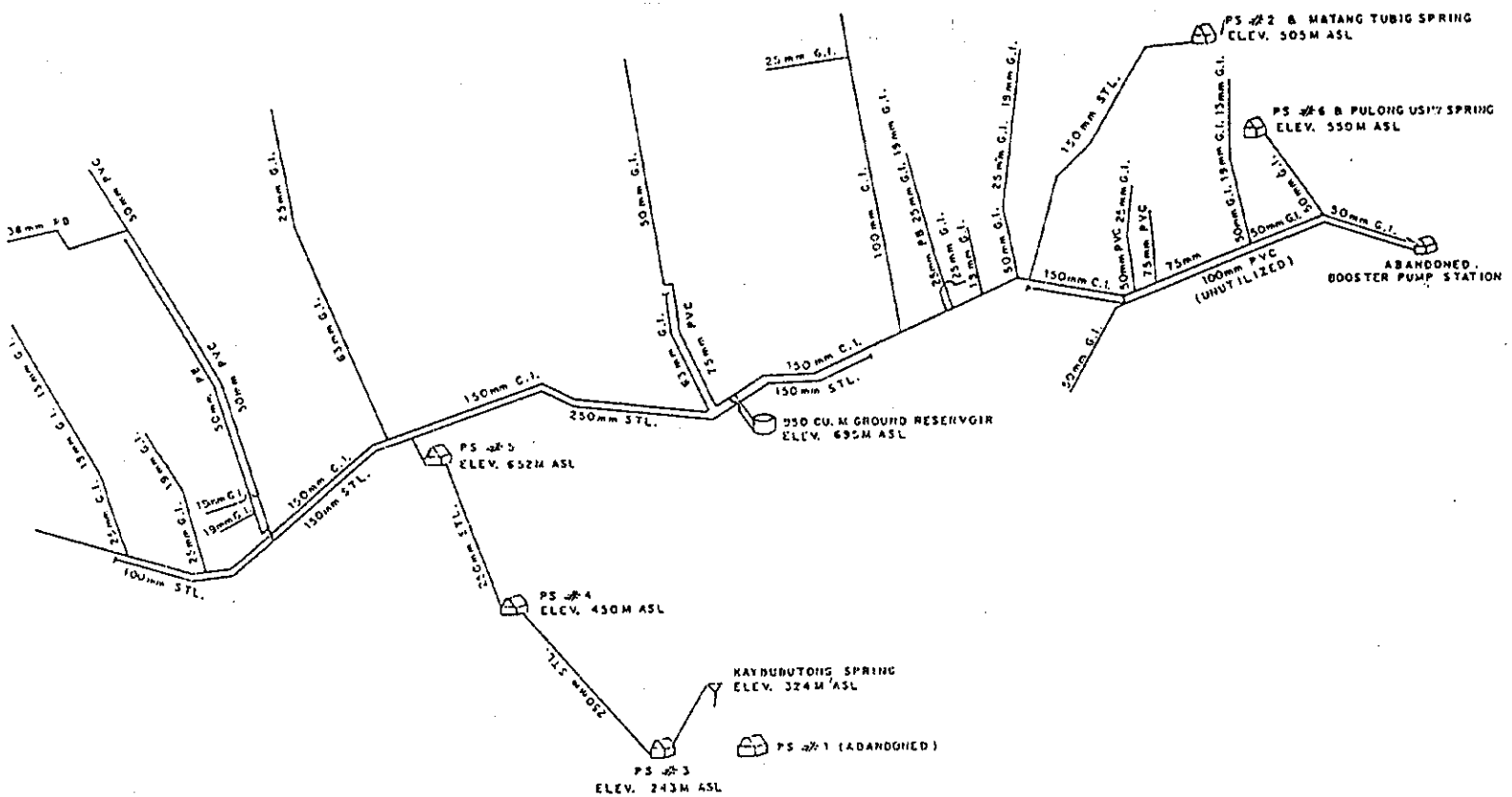
Fig. 8-3(2/2)

EXISTING WATER SUPPLY SYSTEM(2)

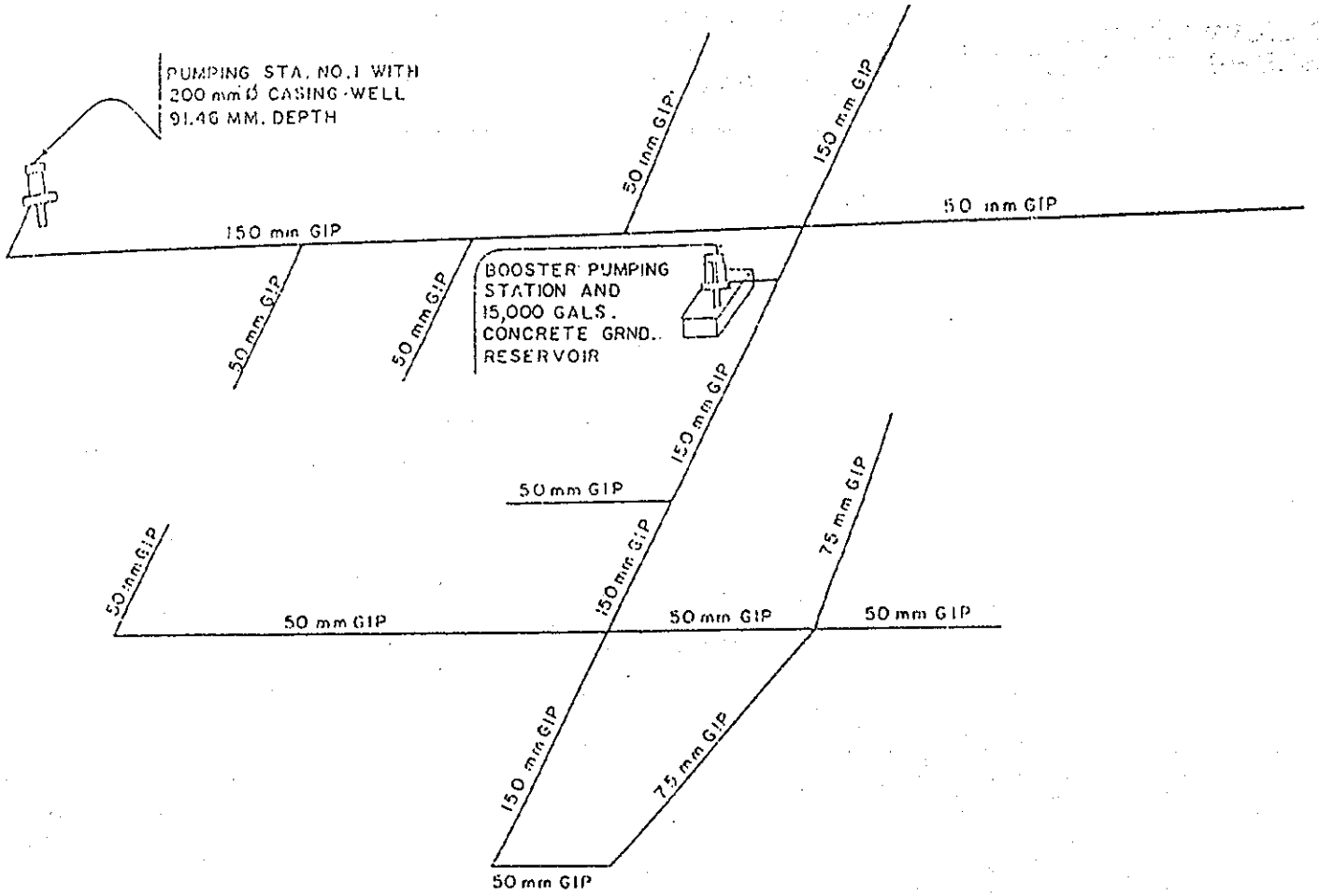
SILANG WATER DISTRICT



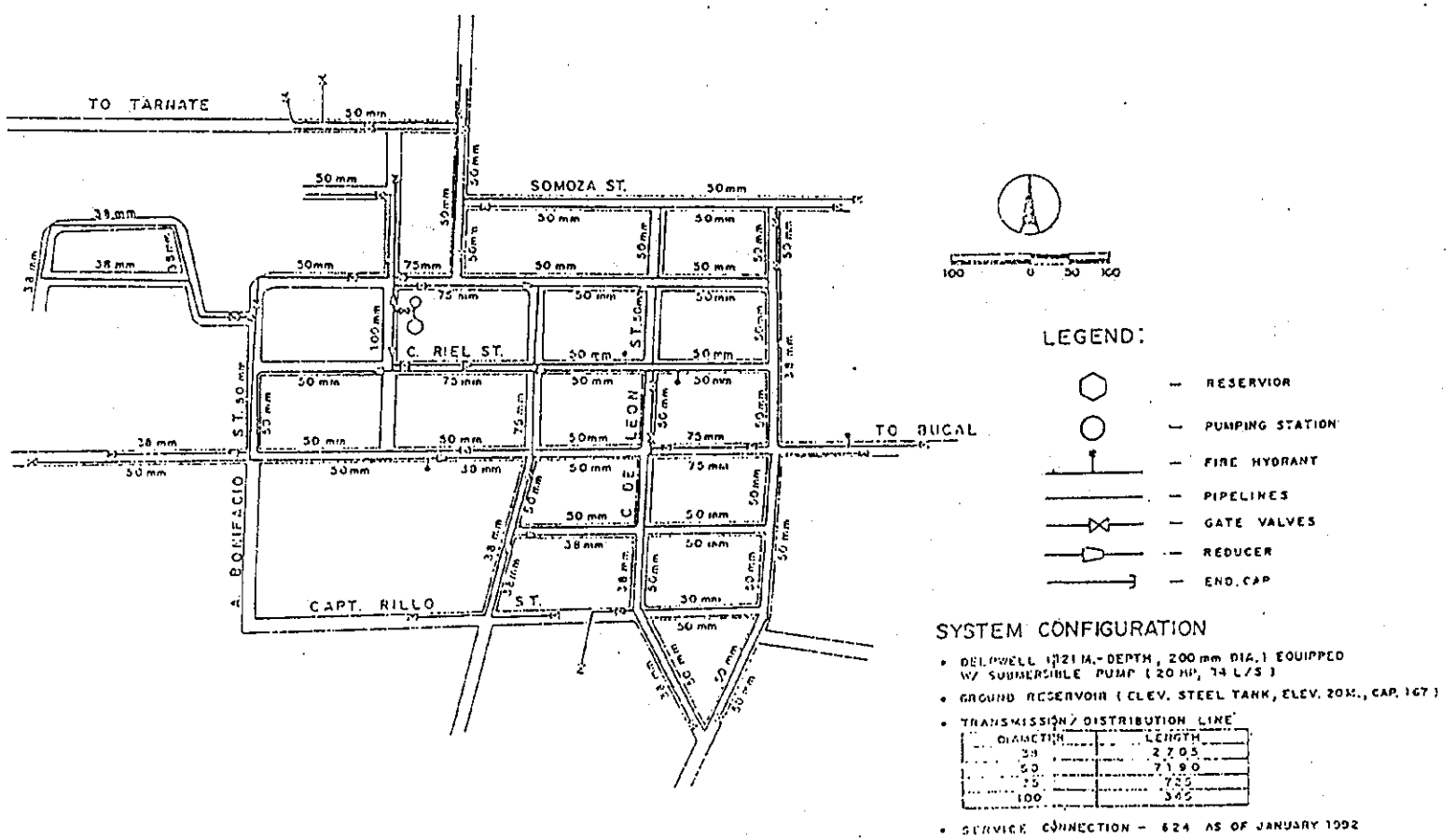
CAVITE WATER SUPPLY DEVELOPMENT STUDY	**Fig. 8-4** EXISTING WATER SUPPLY SYSTEM TANZA WATER DISTRICT
JAPAN INTERNATIONAL COOPERATION AGENCY	



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-5 EXISTING WATER SUPPLY SYSTEM TAGAYTAY WATER DISTRICT
JAPAN INTERNATIONAL COOPERATION AGENCY	



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-6
JAPAN INTERNATIONAL COOPERATION AGENCY	EXISTING WATER SUPPLY SYSTEM AMADEO WATER DISTRICT

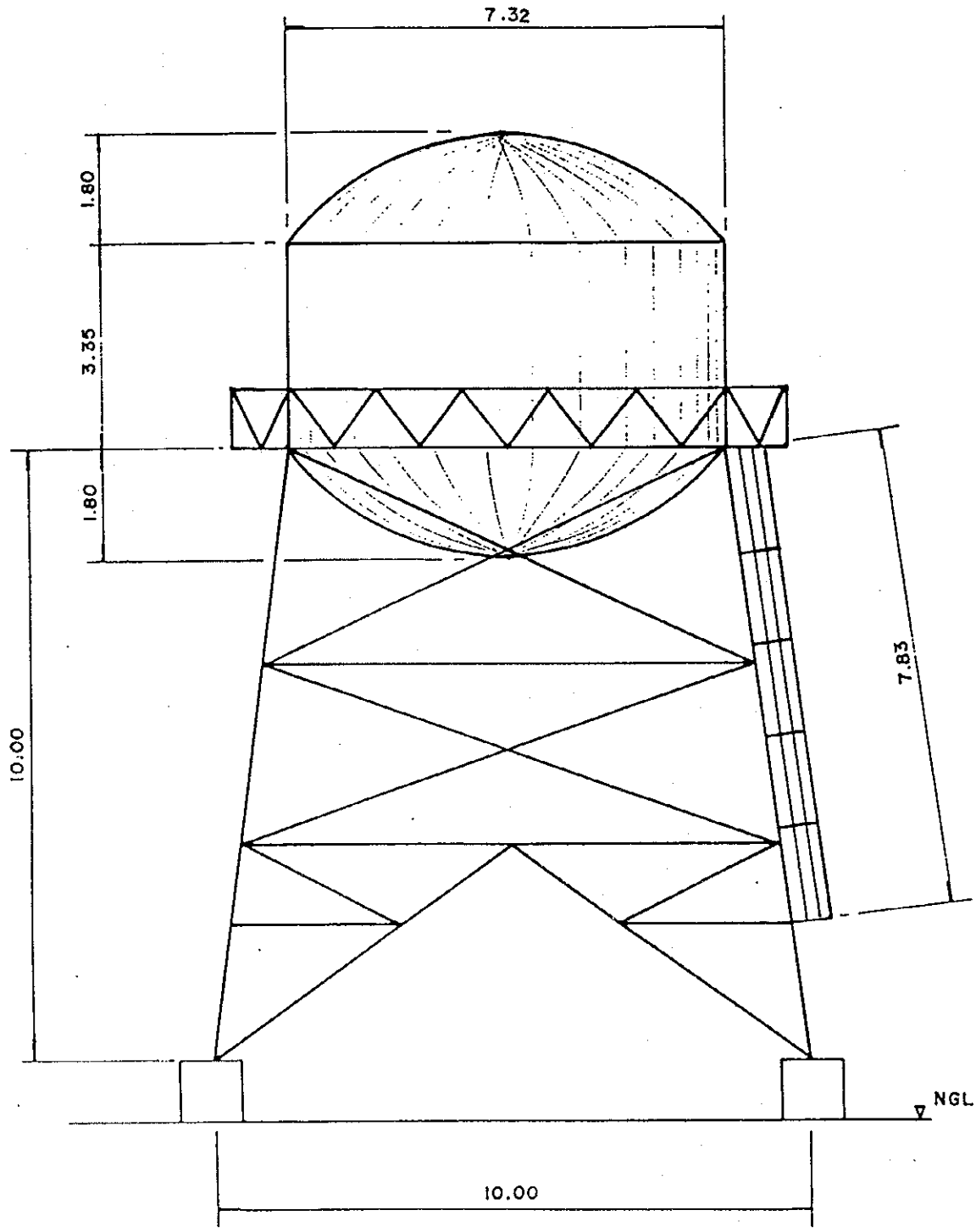


CAVITE WATER SUPPLY DEVELOPMENT STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY

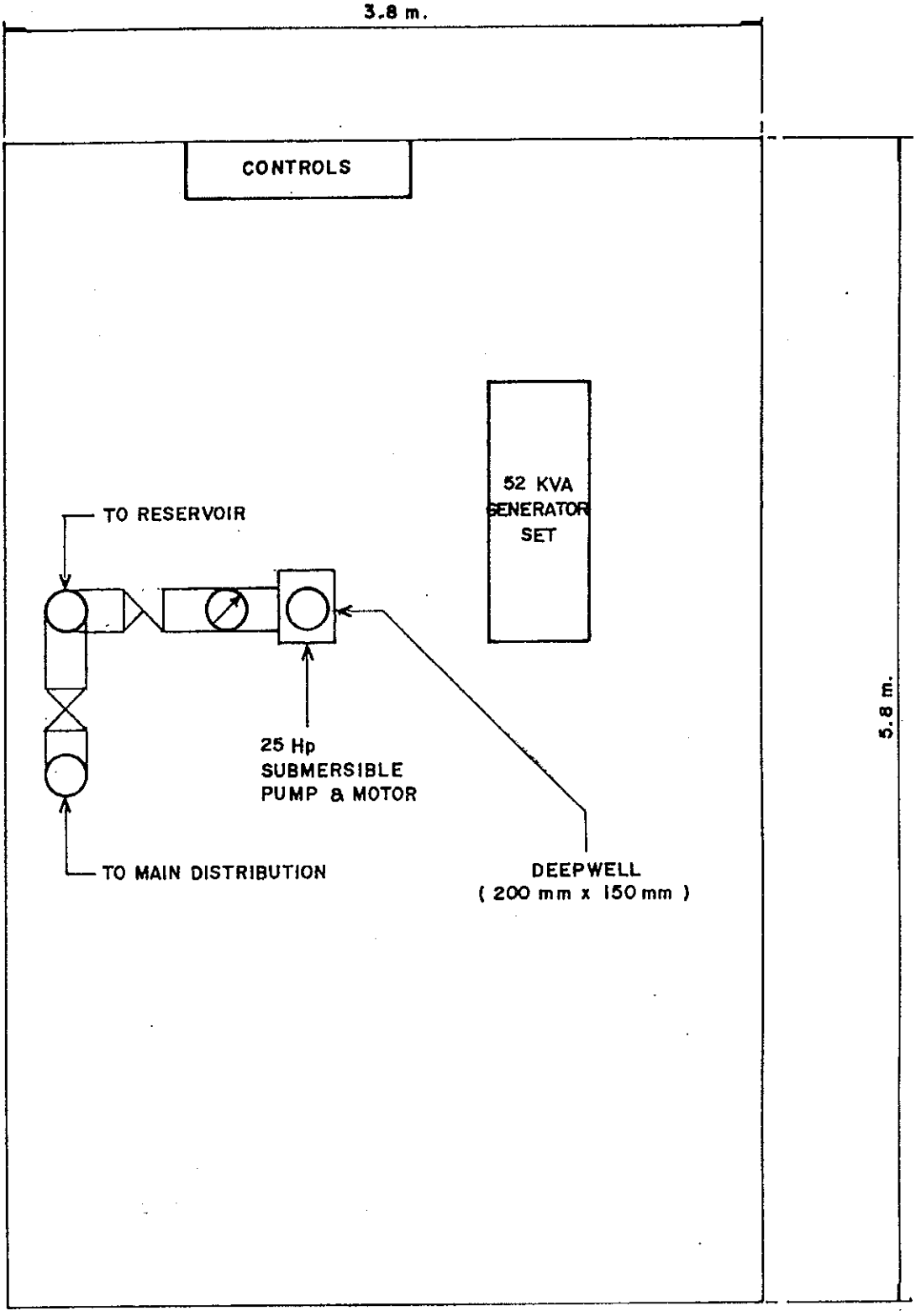
Fig.8-7

EXISTING WATER SUPPLY SYSTEM
MARAGONDON WATER DISTRICT

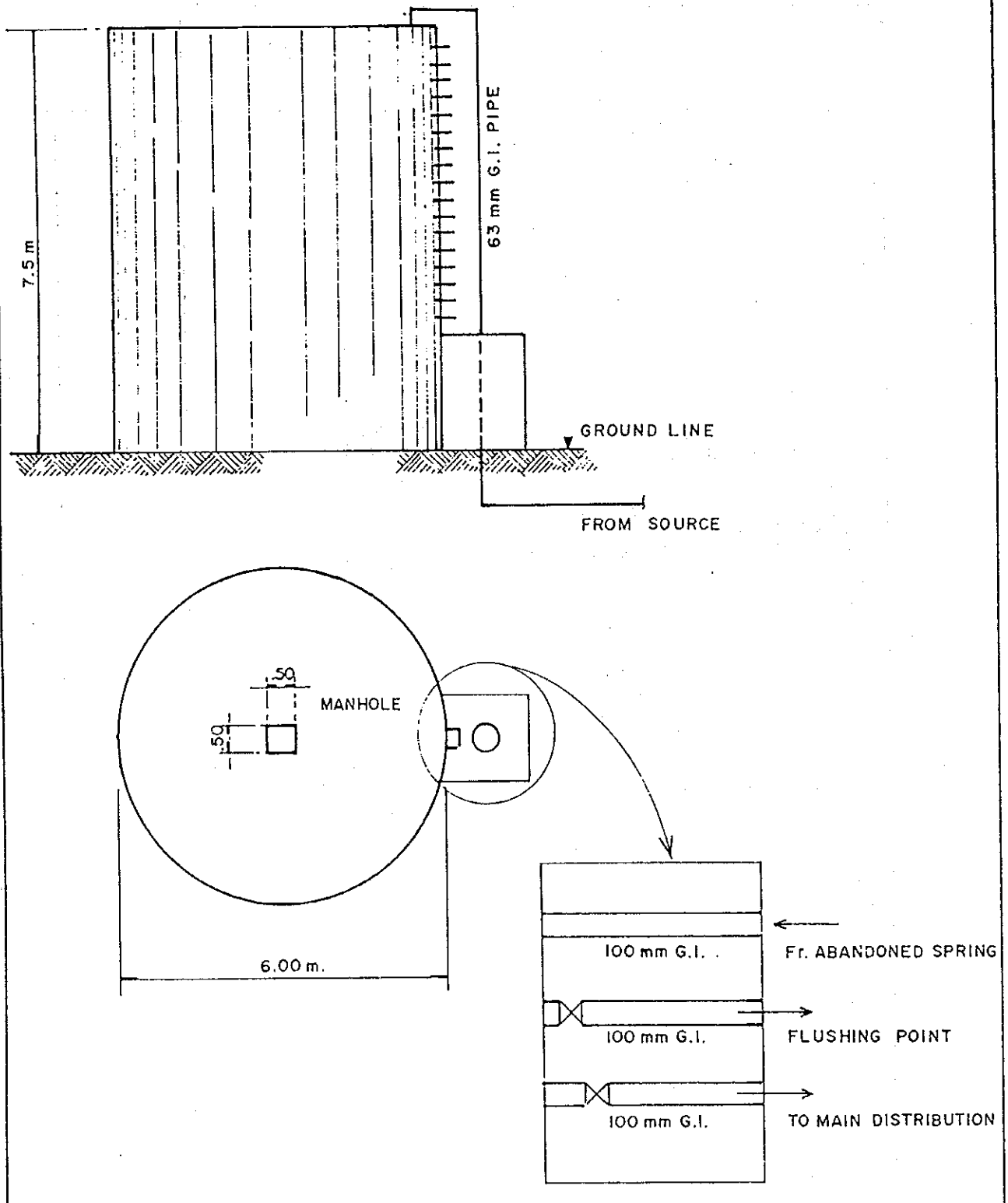


V = 230 CU.M. OR 60,000 GALLONS

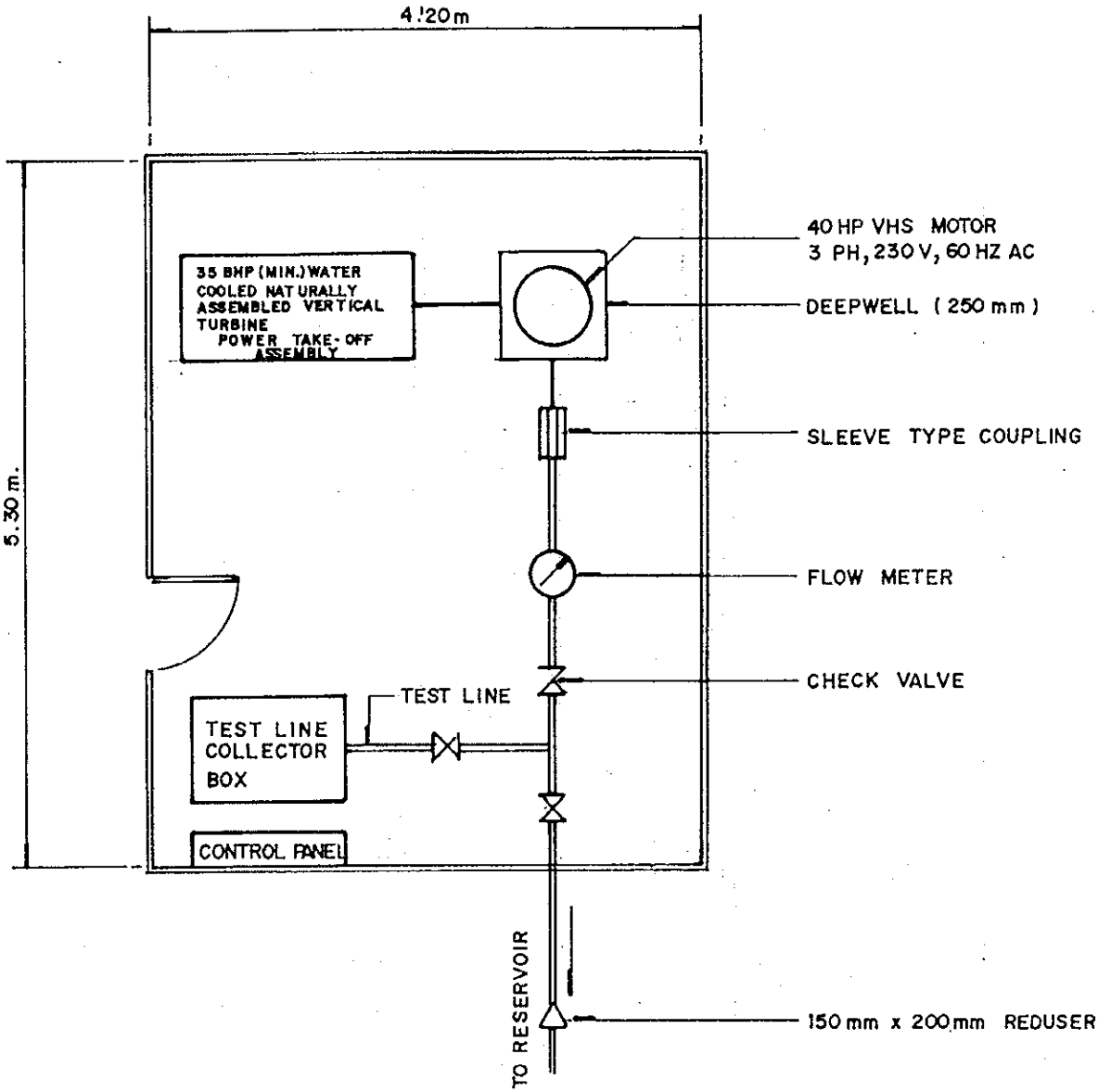
CAVITE WATER SUPPLY DEVELOPMENT STUDY	**Fig. 8-8** PLAN OF EXISTING ELEVATED STEEL TANK GMA WATER DISTRICT GMA, CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-9 PLAN OF EXISTING PUMPING STATION MENDEZ WATER DISTRICT MENDEZ , CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	

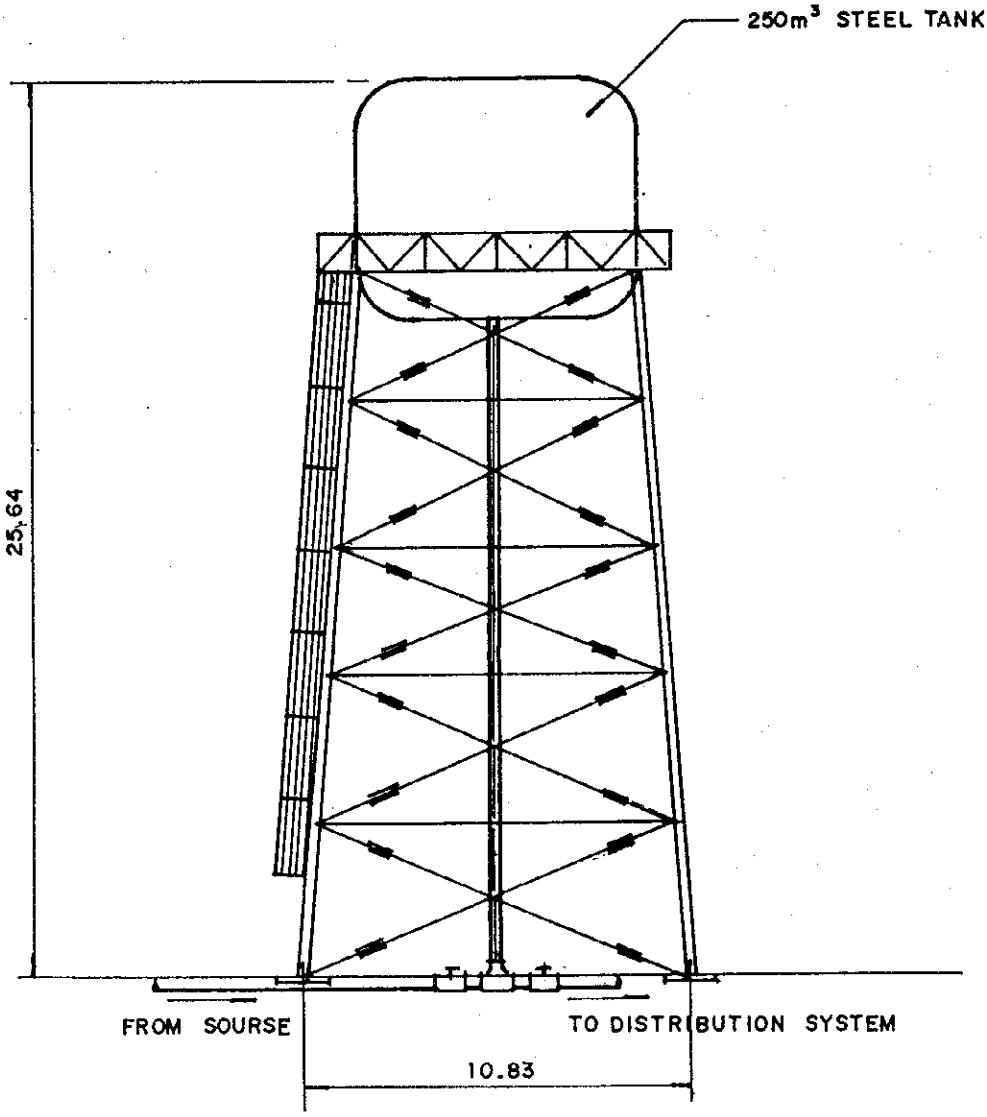


CAVITE WATER SUPPLY DEVELOPMENT STUDY	**Fig.8-10** PLAN OF EXISTING RESERVOIR
JAPAN INTERNATIONAL COOPERATION AGENCY	MENDEZ WATER DISTRICT MENDEZ , CAVITE



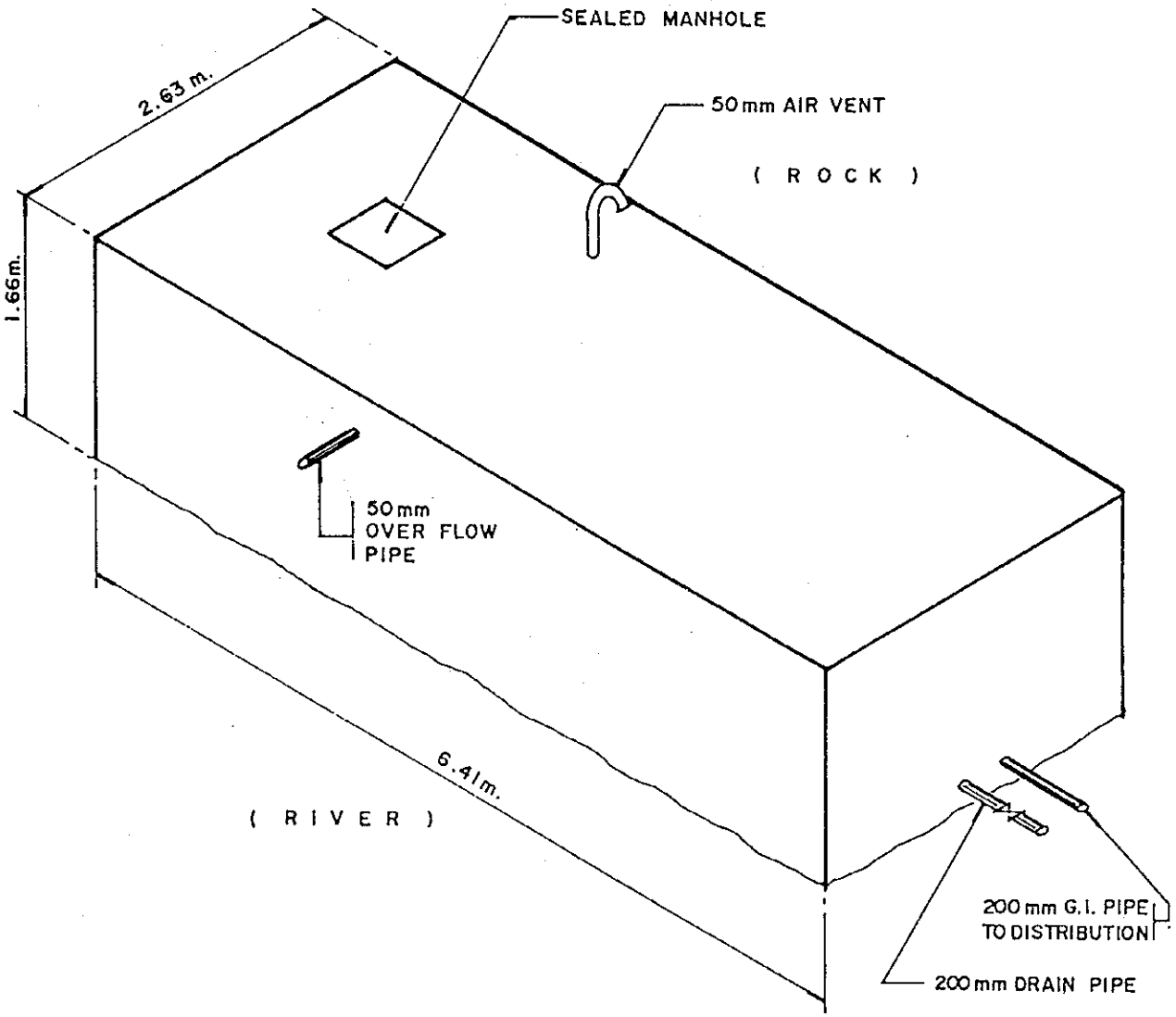
SCALE : 1 : 50 m.

CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig.8-11 PLAN OF EXISTING PUMPING STATION TANZA WATER DISTRICT
JAPAN INTERNATIONAL COOPERATION AGENCY	TANZA , CAVITE

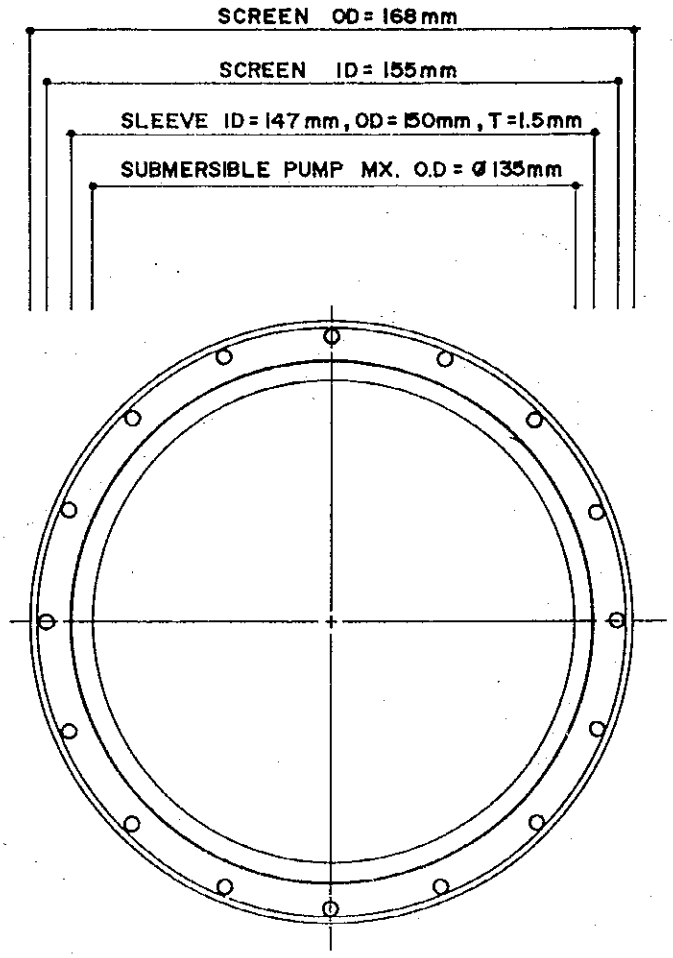


SCALE 1 : 200 m.

CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-12 TYPICAL ELEVATION OF EXIST. ELEVATED STEEL TANK TANZA WATER DISTRICT
JAPAN INTERNATIONAL COOPERATION AGENCY	TANZA, CAVITE



CAVITE WATER SUPPLY DEVELOPMENT STUDY	**Fig.8-13** SPRING INTAKE STRUCTURE NAIC WATER DISTRICT
JAPAN INTERNATIONAL COOPERATION AGENCY	NAIC , CAVITE

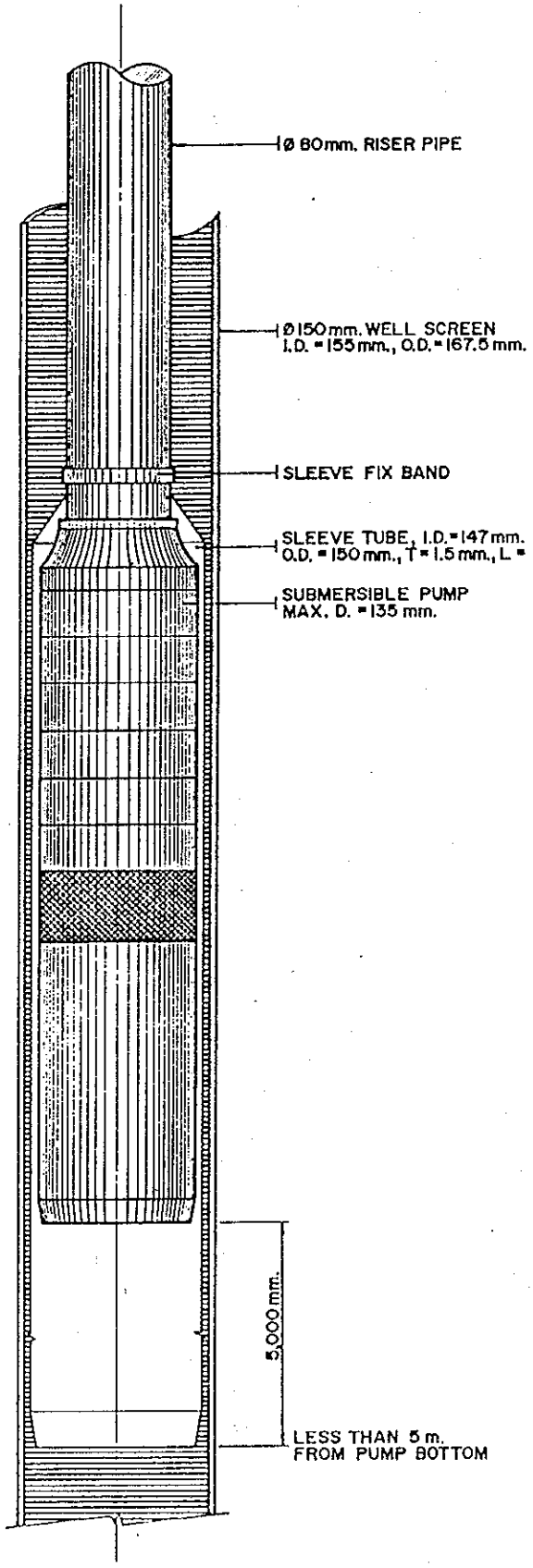


TOP VIEW

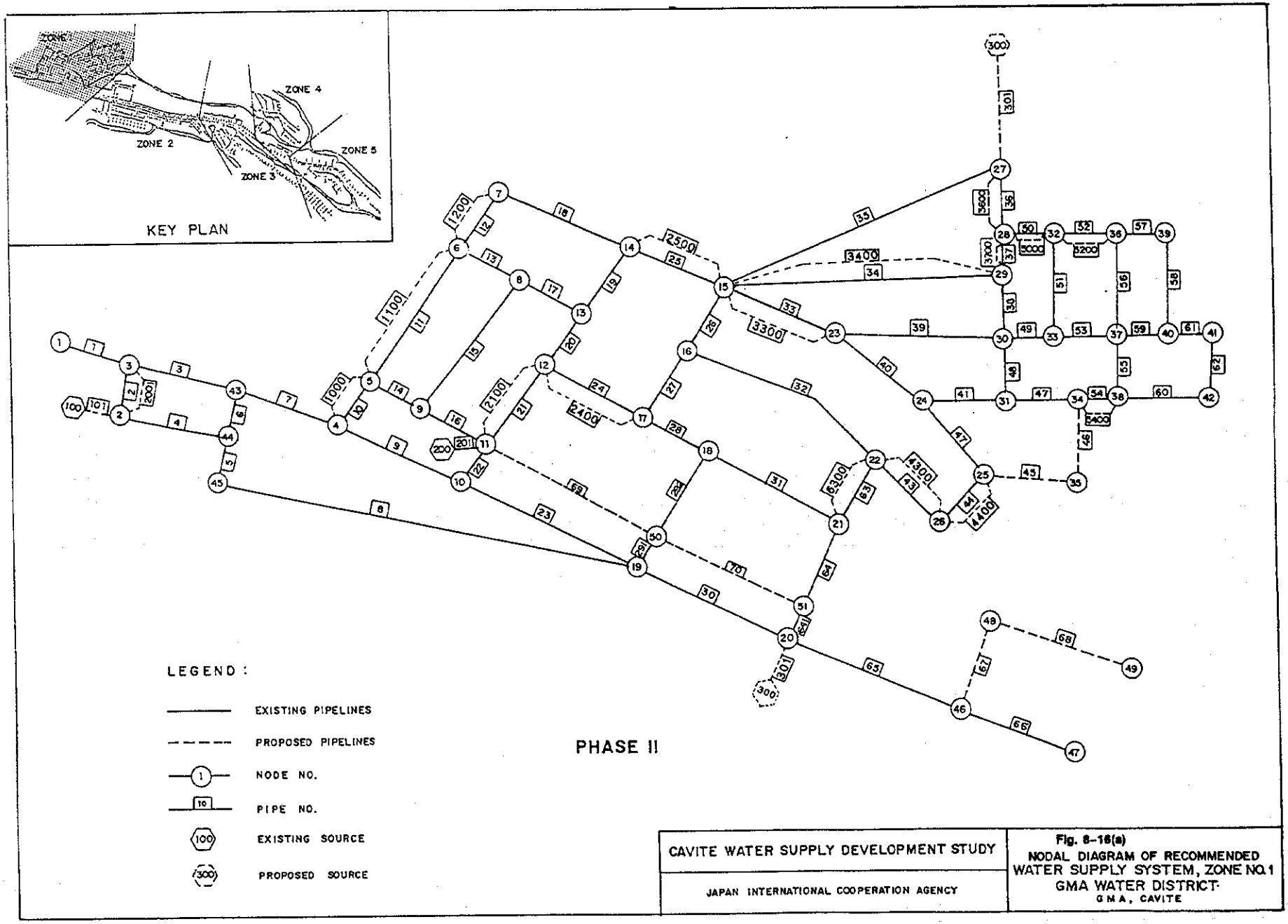
SCALE 1:20 M.

CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-14 GMA TEST WELL WELL SCREEN DIMENSION
JAPAN INTERNATIONAL COOPERATION AGENCY	GMA, CAVITE

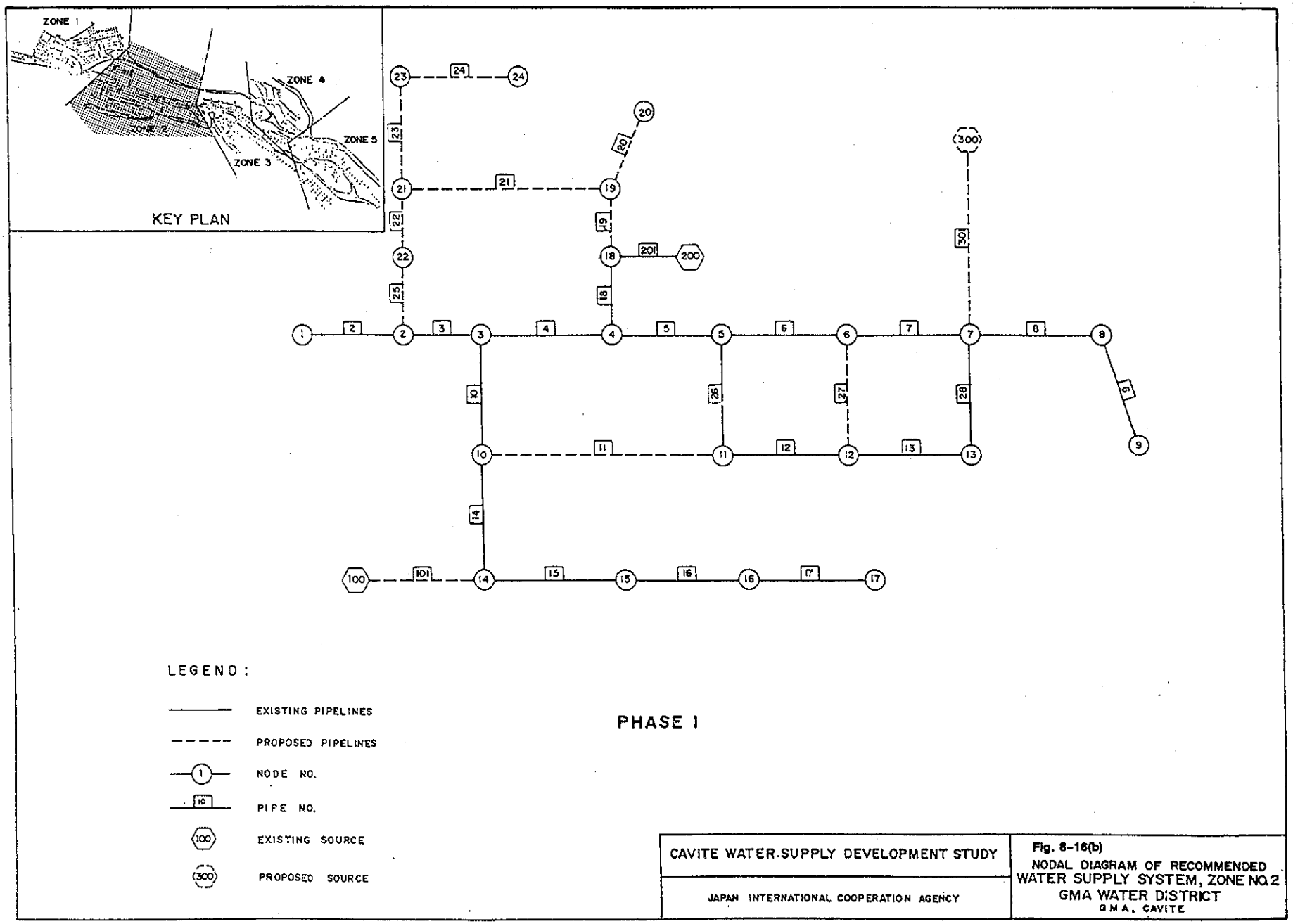
SECTIONAL VIEW



CAVITE WATER SUPPLY DEVELOPMENT STUDY	**Fig. 8-15** G.M.A. TEST WELL SUBMERSIBLE PUMP SETTING
JAPAN INTERNATIONAL COOPERATION AGENCY	G M A , CAVITE



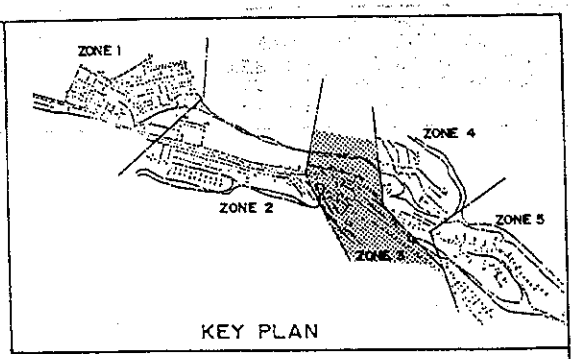
CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-16(a) NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM, ZONE NO.1 GMA WATER DISTRICT GMA, CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	



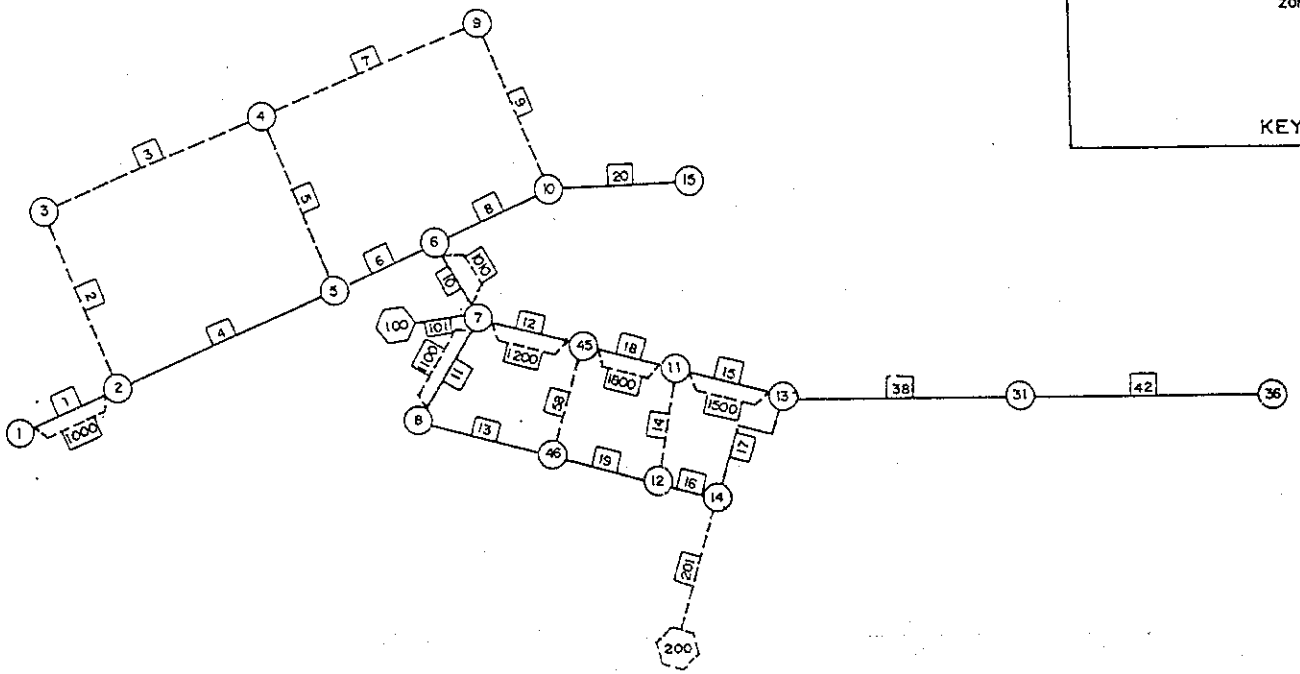
CAVITE WATER SUPPLY DEVELOPMENT STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 8-16(b)
NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM, ZONE NO.2
GMA WATER DISTRICT
GMA, CAVITE



KEY PLAN

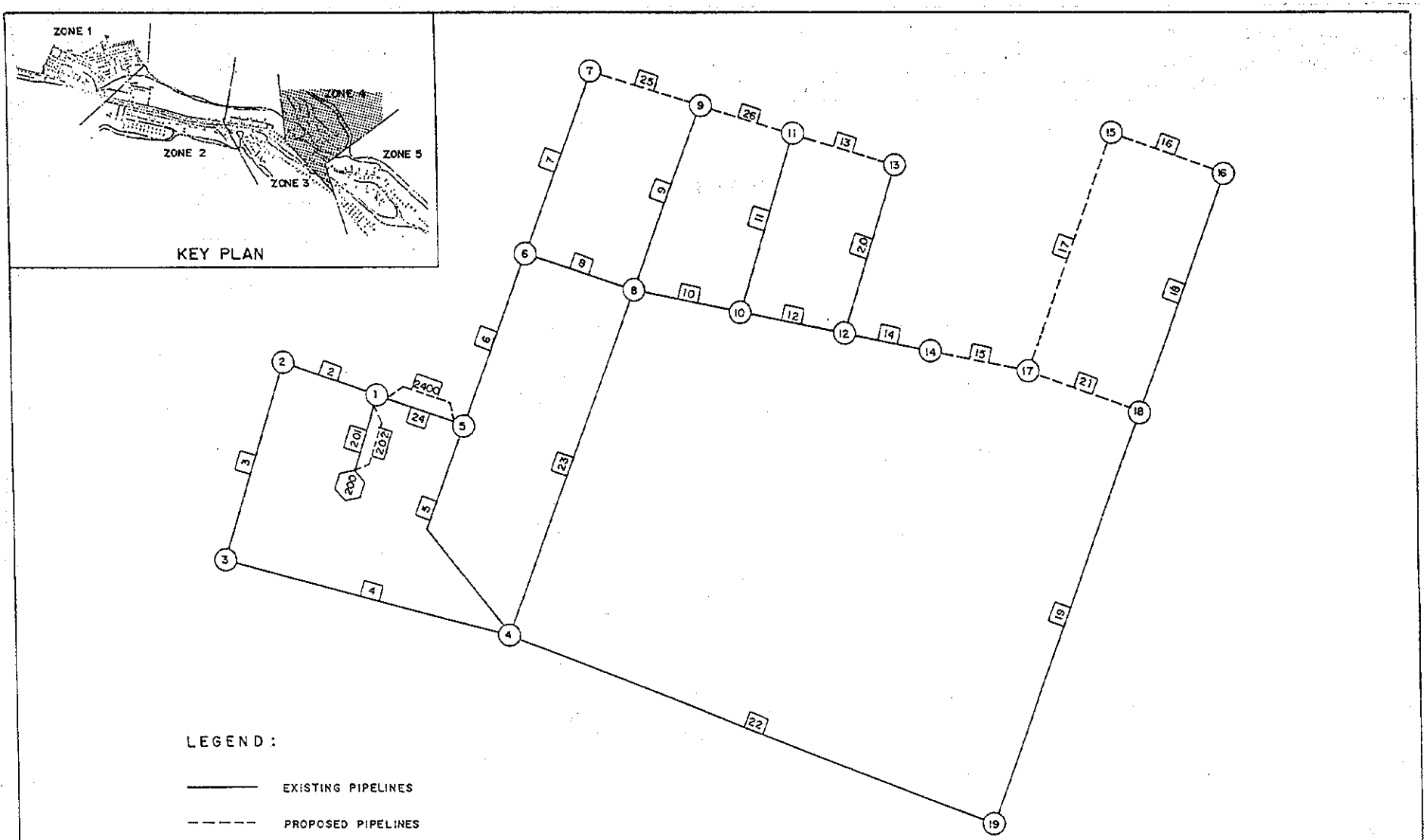


LEGEND :

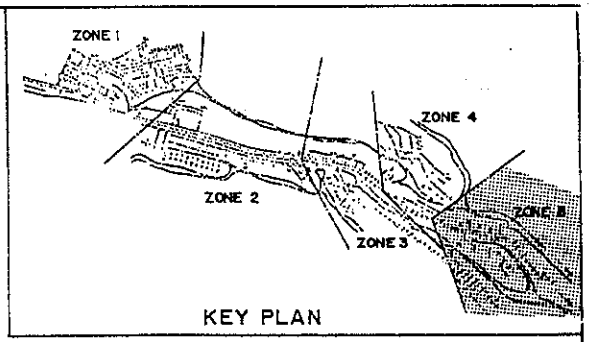
- EXISTING PIPELINES
- PROPOSED PIPELINES
- (1) NODE NO.
- [10] PIPE NO.
- (100) EXISTING SOURCE
- (200) PROPOSED SOURCE

PHASE I

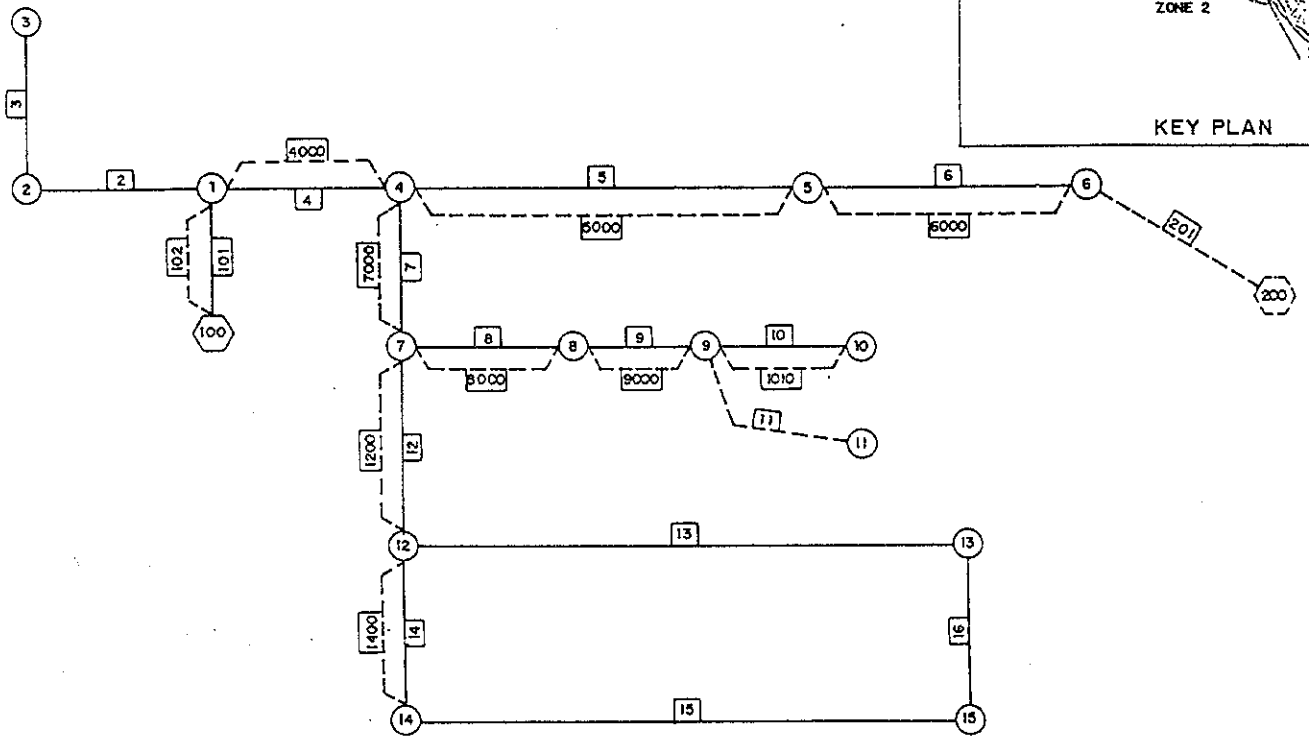
CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig.8-16(c) NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM, ZONE NO.3 GMA WATER DISTRICT GMA, CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-16(d) NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM, ZONE NO.4 GMA WATER DISTRICT GMA, CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	



KEY PLAN

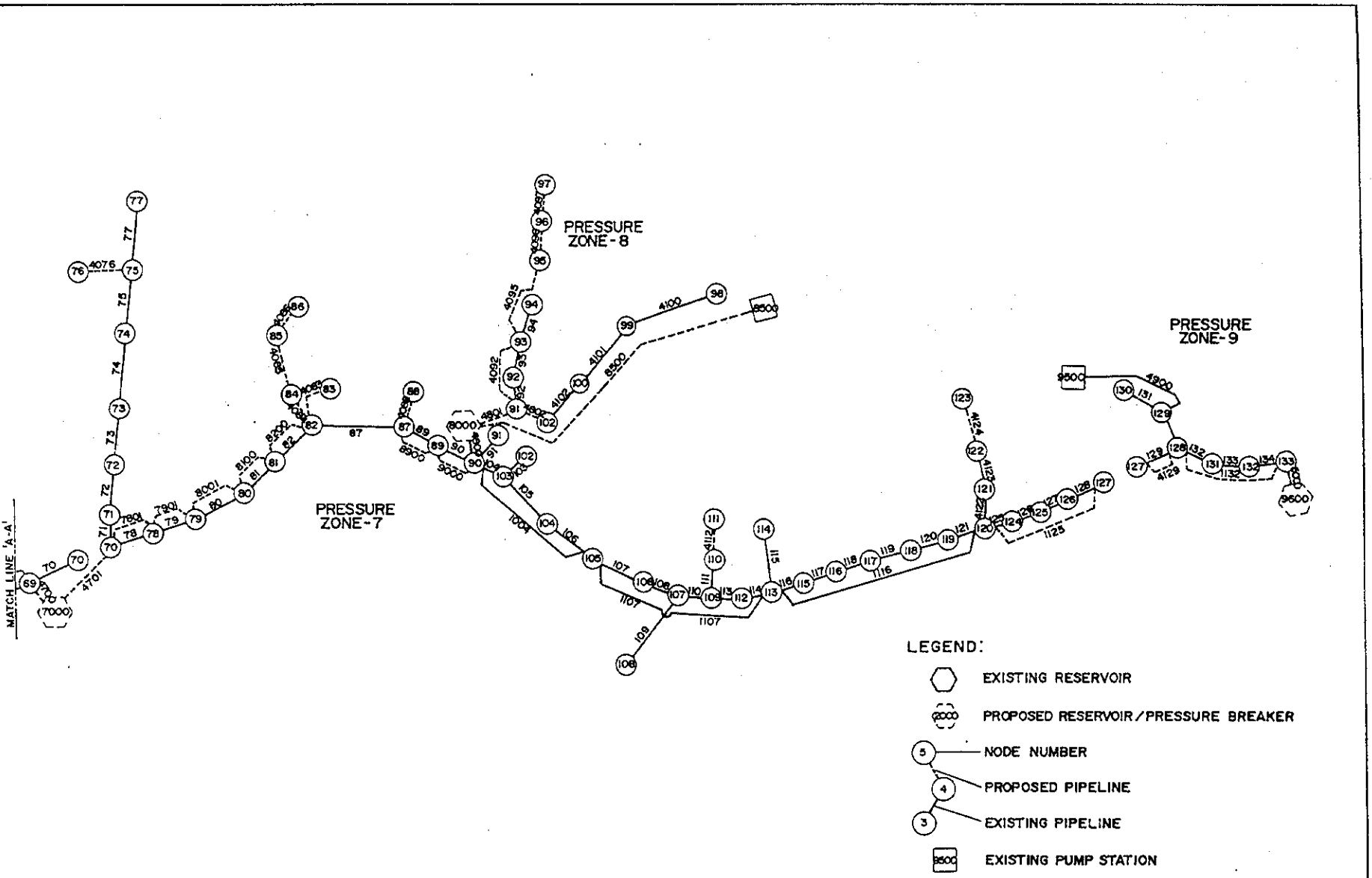


LEGEND :

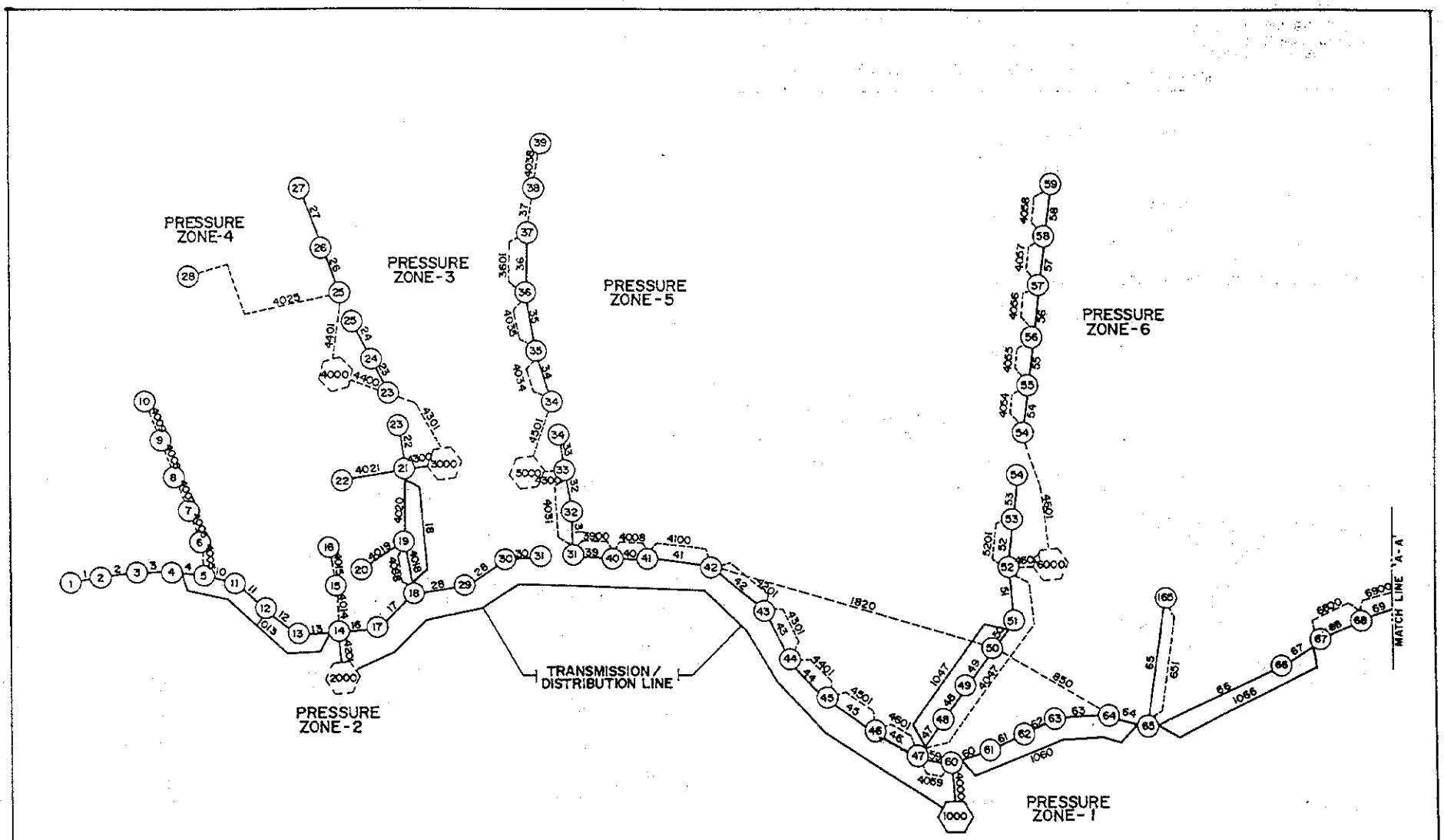
- EXISTING PIPELINES
- PROPOSED PIPELINES
- (1) NODE NO.
- [10] PIPE NO.
- (100) EXISTING SOURCE
- (200) PROPOSED SOURCE

PHASE I

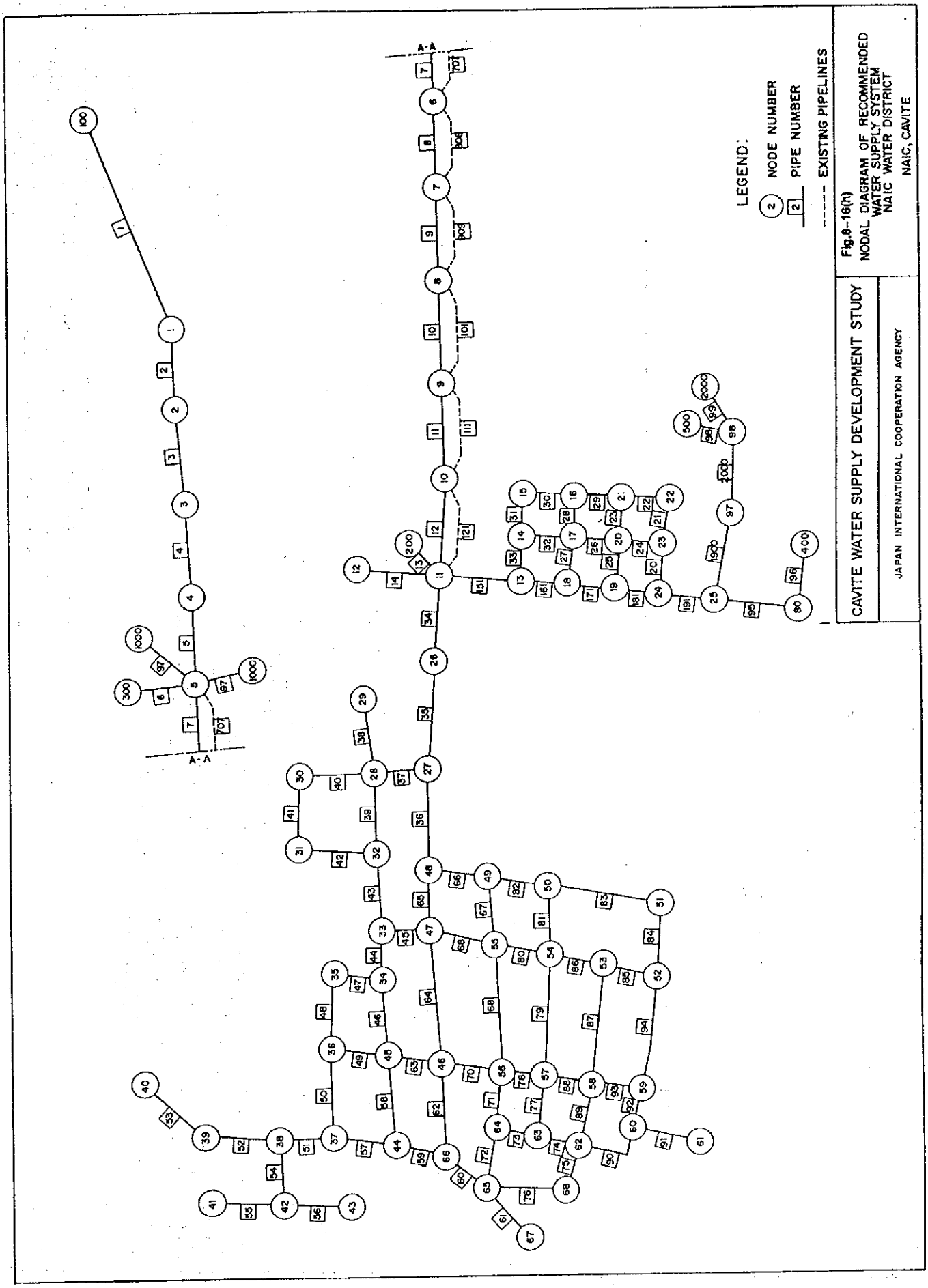
CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-16(e) NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM, ZONE NO. 5 GMA WATER DISTRICT GMA, CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	

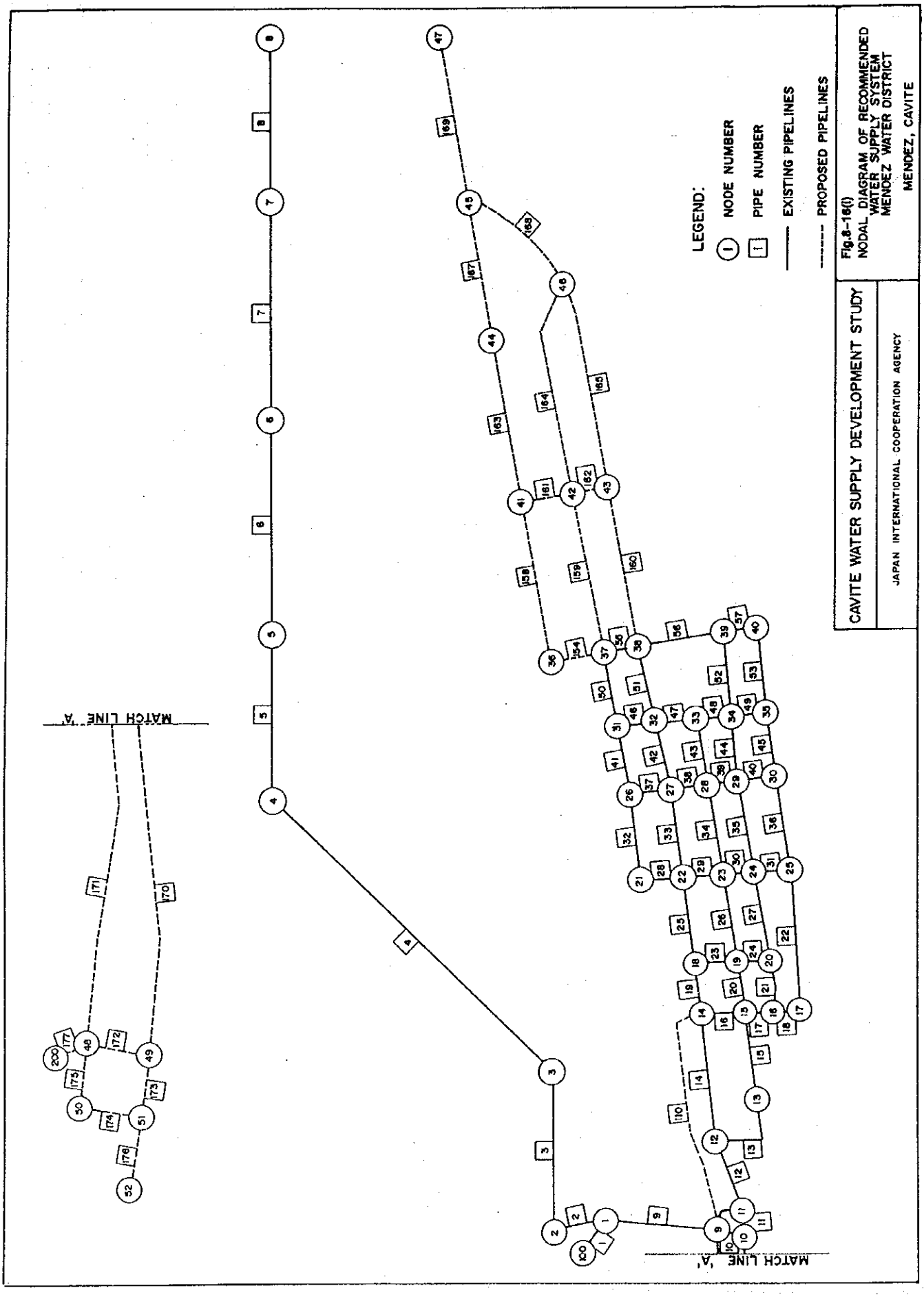


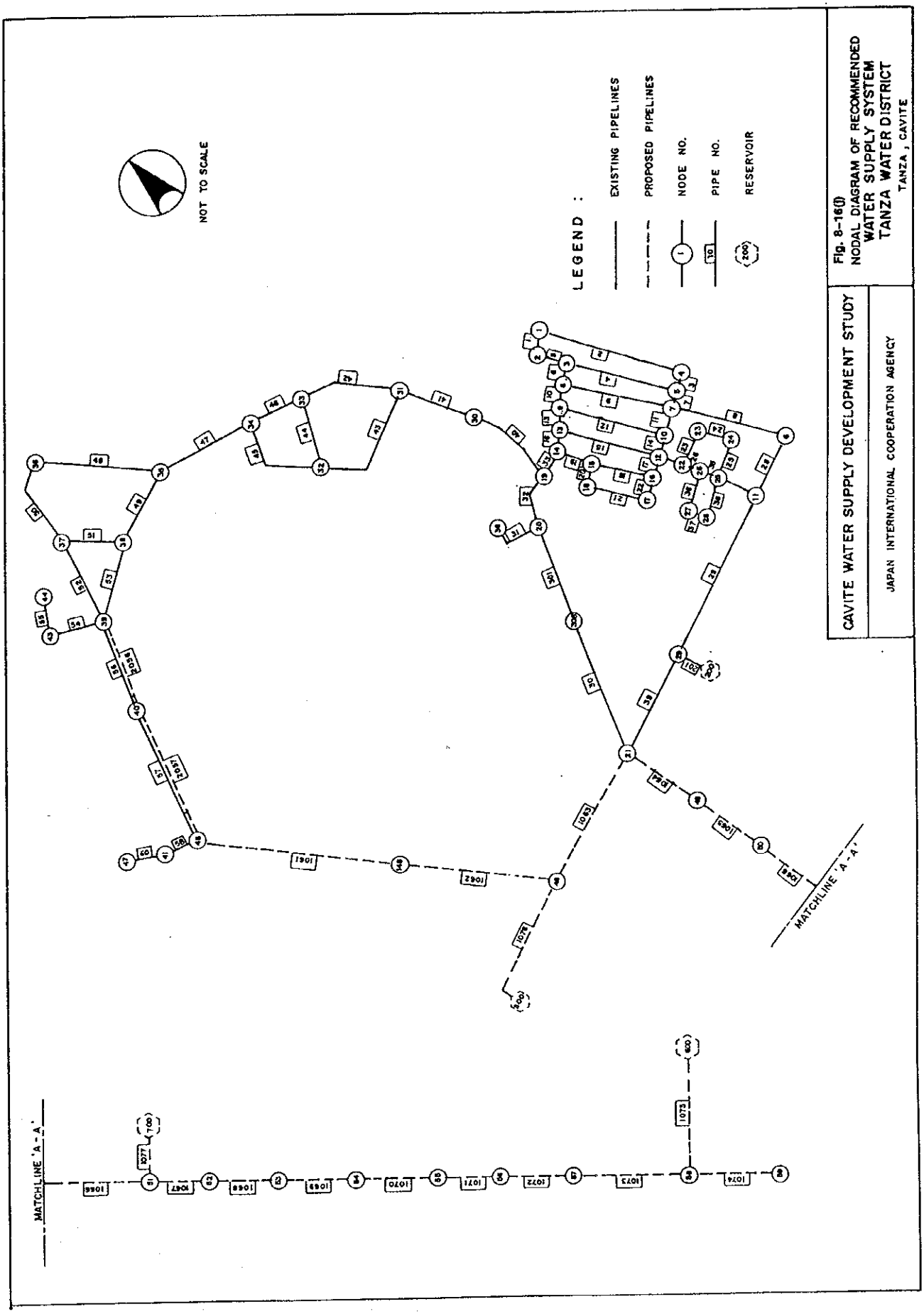
CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig. 8-16(f) NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM TAGAYTAY WATER DISTRICT TAGAYTAY, CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	



CAVITE WATER SUPPLY DEVELOPMENT STUDY	Fig.8-16(g) NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM TAGAYTAY WATER DISTRICT TAGAYTAY, CAVITE
JAPAN INTERNATIONAL COOPERATION AGENCY	


LEGEND:
(2) NODE NUMBER
2 PIPE NUMBER
EXISTING PIPELINES
CAVITE WATER SUPPLY DEVELOPMENT STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY
Fig.8-16(h)
NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM
NAIC WATER DISTRICT
NAIC, CAVITE
A-A
A-A


LEGEND:
NODE NUMBER
PIPE NUMBER
EXISTING PIPELINES
PROPOSED PIPELINES
MATCH LINE 'A'
MATCH LINE 'A'
CAVITE WATER SUPPLY DEVELOPMENT STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY
Fig.8-16(1)
NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM
MENDEZ WATER DISTRICT
MENDEZ, CAVITE


NOT TO SCALE
LEGEND :
EXISTING PIPELINES
PROPOSED PIPELINES
NODE NO.
PIPE NO.
RESERVOIR
MATCHLINE 'A-A'
MATCHLINE 'A-A'
CAVITE WATER SUPPLY DEVELOPMENT STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY
Fig. 8-16(1)
NODAL DIAGRAM OF RECOMMENDED WATER SUPPLY SYSTEM
TANZA WATER DISTRICT
TANZA, CAVITE