

APPENDIX 8.2.1.B PROJECT COST WITH FOREIGN AND LOCAL CURRENCY BREAKDOWN
(1986 Price Level, Cabuyao-Sta. Rosa-Biñan)

SUMMARY

Phase I, Stage 1

	(Unit: thousand ₱)		
	<u>F.E.C</u>	<u>Local</u>	<u>Total</u>
Direct Construction Cost	25,702	20,737	46,439
Physical Cont. (8% of D.C.C.)	2,056	1,659	3,715
Sub Total	27,758	22,396	50,154
Leakage Detection	-	699	699
Detailed Design (10% of S.T. in Stage 1 & Stage 2)	4,836	4,835	9,671
Construction Supervision (4% of S.T.)	1,003	1,003	2,006
Total	33,597	28,933	62,530

Phase I, Stage 2

	(Unit: thousand ₱)		
	<u>F.E.C</u>	<u>Local</u>	<u>Total</u>
Direct Construction Cost	27,136	15,975	43,111
Physical Cont. (8% of D.C.C.)	2,171	1,278	3,449
Sub Total	29,307	17,253	46,560
Construction Supervision (4% of S.T.)	371	1,491	1,862
Total	29,678	18,744	48,422

Phase II

	(Unit: thousand ₱)		
	<u>F.E.C</u>	<u>Local</u>	<u>Total</u>
Direct Construction Cost	109,443	73,170	182,613
Physical Cont. (8% of D.C.C.)	8,755	5,854	14,609
Sub Total	118,198	79,024	197,222
Detailed Design (10% of S.T.)	9,861	9,861	19,722
Construction Supervision (4% of S.T.)	7,889	-	7,889
Total	135,948	88,885	224,833

The following tables show the breakdown of the project cost in each design year. The unit of all figures is thousand pesos. Project cost is further broken down into the Foreign Exchange Component and the Local Currency Component. Abbreviations in the tables are as follows:

COST	----	Construction Cost
C.FEC	----	Cost for Civil Work in the Foreign Exchange Component
C.DOM	----	Cost for Civil Work in the Local Currency Component
C.D.UNSKL	----	Cost for Unskilled Laborer of Civil Works in the Local Currency Component.
E.FEC	----	Cost for Equipments in the Foreign Exchange Component
E.DOM	----	Cost for Equipments in the Local Currency Component

$$COST = C.FEC + C.DOM + E.FEC + E.DOM$$

The exchange rates used in the cost estimates are as follows:

$$₱20 = \$1$$

$$\$1 = ¥155$$

No.	Category - Sta. Rosa - Binan	1988				1989				1990			
		CUST	C.FEC	C.DIM	E.D. UNSKI	E.FEC	E.DIM	COST	C.FEC	C.DIM	E.D. UNSKI	E.FEC	E.DIM
1.0	SOURCE FACILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(1) Deep Well	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(2) Pumping Station	0.0	0.0	0.0	0.0	0.0	0.0	790.0	71.1	276.5	39.5	371.3	71.1
	(3) Flow Meter	0.0	0.0	0.0	0.0	0.0	0.0	62.0	0.0	0.0	0.0	0.0	0.0
	SUB-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	852.0	71.1	276.5	39.5	433.3	71.1
2.0	TRANSMISSION FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(1) Pipelines	0.0	0.0	0.0	0.0	0.0	0.0	3268.0	588.2	915.0	130.7	1013.2	751.6
	(2) Pipe Protection	0.0	0.0	0.0	0.0	0.0	0.0	235.0	0.0	211.5	11.8	23.5	0.0
	SUB-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	3503.0	588.2	1126.5	142.5	1036.7	751.6
3.0	DISTRIBUTION FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(1) Reservoir	0.0	0.0	0.0	0.0	0.0	0.0	3417.0	888.4	2221.1	239.2	170.8	136.7
	(2) Pump Facility (Equip)	0.0	0.0	0.0	0.0	0.0	0.0	2090.0	0.0	0.0	0.0	0.0	0.0
	(3) Pump Facility (Civil)	0.0	0.0	0.0	0.0	0.0	0.0	2486.0	160.0	2506.0	479.9	174.7	335.3
	(4) Electric Sub-station	0.0	0.0	0.0	0.0	0.0	0.0	196.0	9.8	68.6	5.9	39.2	29.4
	(5) Electric Sub-station	0.0	0.0	0.0	0.0	0.0	0.0	3613.0	564.7	801.5	72.9	1912.5	361.3
	(5) Distribution Pipes	0.0	0.0	0.0	0.0	0.0	0.0	10735.0	1932.5	3005.1	429.4	3328.1	2459.3
	(1) Main Pipes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(2) River Crossing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(3) Driver Crossing Material	0.0	0.0	0.0	0.0	0.0	0.0	4721.0	94.4	991.4	283.3	3210.3	424.9
	(4) Valves	0.0	0.0	0.0	0.0	0.0	0.0	486.0	77.8	136.1	19.4	165.2	106.9
	(5) Internal Network	0.0	0.0	0.0	0.0	0.0	0.0	2027.0	20.3	202.7	60.8	1722.0	81.1
	(2) Service Connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(3) Water Meter	186.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(8) Svc Cnctn Rbltn w/o	39.0	1.0	10.1	2.3	24.4	3.5	355.0	1.0	10.1	2.3	24.4	3.5
	(9) Svc Cnctn Rbltn w/o	355.0	3.6	35.5	10.7	301.7	14.2	430.0	68.8	120.4	17.2	116.2	94.6
	(10) Lateral Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	226.0	0.0	0.0	0.0	0.0	0.0
	(11) Flow Meter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(12) Fire Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SUB-TOTAL	500.0	4.6	55.6	13.0	522.1	17.7	31032.0	3821.3	10097.5	1521.1	13693.0	1068.2
4.0	ADMINISTRATION BLDG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(1) Administration Bldg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(2) Operation Center	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SUB-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0	LAND ACQUISITION	180.0	4.6	45.6	13.0	522.1	17.7	36970.0	4623.1	12145.5	1882.2	15093.4	5148.0
	(1) Land Acquisition	180.0	4.6	45.6	13.0	522.1	17.7	0.0	0.0	0.0	0.0	0.0	0.0
	(2) Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(3) Storage Material & Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SUB-TOTAL	180.0	4.6	45.6	13.0	522.1	17.7	0.0	0.0	0.0	0.0	0.0	0.0
6.0	VEHICLE DETECTION	233.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(1) Leakage Detection	233.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.0	REPLACEMENT OF EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(1) Deep Well Pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(2) Chlorinator	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(3) Flow Meter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(4) Water Meter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(5) Operation Center	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(6) Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(7) Storage Material & Equip	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SUB-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GRAND TOTAL		1614.0	4.6	458.6	13.0	831.3	319.5	79341.0	820.0	1873.5	296.7	4048.4	1190.1

No.	Category - Sta. Rosa - Binan	1988				1989				1990			
		CUST	C.FEC	C.DIM	E.D. UNSKI	E.FEC	E.DIM	COST	C.FEC	C.DIM	E.D. UNSKI	E.FEC	E.DIM
1.0	DEEP WELL FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0	TRANSMISSION FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0	PURIFICATION PLANT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.0	RESERVOIR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0	DISTRIBUTION FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.0	ELECTRIC SUB-STATION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.0	DISTRIBUTION FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.0	SERVICE CONNECTION	500.0	4.6	45.6	13.0	522.1	17.7	2421.0	24.9	248.3	73.8	2049.0	98.8
9.0	ADMIN. BLDG. & OFF. CLR.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.0	LAND ACQUISITION	180.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11.0	VEHICLE & STORAGE MATERIAL	611.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.0	REPLACEMENT OF EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13.0	VEHICLE DETECTION	233.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL		1614.0	4.6	458.6	13.0	831.3	319.5	79341.0	820.0	1873.5	296.7	4048.4	1190.1

No.	Cabuyo-Sa. Rosa-Binan Item	Phase I (Stage I)				1991				1992			
		COST	C.FEC	C.DUM	E.DUM	C.FEC	E.DUM	C.DUM	E.DUM	C.FEC	E.DUM	C.DUM	E.DUM
1.0	SOURCE FACILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1	Deep Well	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0	PUMPING FACILITY	790.0	71.1	276.5	71.1	790.0	71.1	276.5	71.1	790.0	71.1	276.5	71.1
2.1	Pumping Station	62.0	0.0	0.0	0.0	62.0	0.0	0.0	0.0	62.0	0.0	0.0	0.0
2.2	Flow Meter	652.0	71.1	276.5	71.1	652.0	71.1	276.5	71.1	652.0	71.1	276.5	71.1
2.3	SUB-TOTAL	790.0	71.1	276.5	71.1	790.0	71.1	276.5	71.1	790.0	71.1	276.5	71.1
3.0	TRANSMISSION FACILITIES	3268.0	588.2	915.0	130.7	3268.0	588.2	915.0	130.7	3268.0	588.2	915.0	130.7
3.1	Pipelines	235.0	0.0	211.5	11.8	235.0	0.0	211.5	11.8	235.0	0.0	211.5	11.8
3.2	Flow Protection	3503.0	588.2	1126.5	118.9	3503.0	588.2	1126.5	118.9	3503.0	588.2	1126.5	118.9
3.3	SUB-TOTAL	3268.0	588.2	915.0	130.7	3268.0	588.2	915.0	130.7	3268.0	588.2	915.0	130.7
4.0	DISTRIBUTION FACILITIES	3317.0	888.4	2221.1	239.2	3317.0	888.4	2221.1	239.2	3317.0	888.4	2221.1	239.2
4.1	Reservoir	2090.0	0.0	2090.0	0.0	2090.0	0.0	2090.0	0.0	2090.0	0.0	2090.0	0.0
4.2	Flow Facility (Equip)	2686.0	160.0	2506.0	49.9	2686.0	160.0	2506.0	49.9	2686.0	160.0	2506.0	49.9
4.3	Chlorination Facility	196.0	9.8	68.6	5.9	196.0	9.8	68.6	5.9	196.0	9.8	68.6	5.9
4.4	Electric Sub-station	3643.0	584.7	801.5	72.9	3643.0	584.7	801.5	72.9	3643.0	584.7	801.5	72.9
4.5	Distribution pipes	14203.0	2556.8	3976.0	508.1	14203.0	2556.8	3976.0	508.1	14203.0	2556.8	3976.0	508.1
4.6	Main Pipes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.7	Driver Crossing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.8	3/4" River Crossing Material	5516.0	110.3	1158.4	33.1	5516.0	110.3	1158.4	33.1	5516.0	110.3	1158.4	33.1
4.9	Valves	972.0	155.6	272.2	38.8	972.0	155.6	272.2	38.8	972.0	155.6	272.2	38.8
4.10	Internal Network	4054.0	40.6	405.4	121.6	4054.0	40.6	405.4	121.6	4054.0	40.6	405.4	121.6
4.11	Service Connections	196.0	0.0	0.0	0.0	196.0	0.0	0.0	0.0	196.0	0.0	0.0	0.0
4.12	Water Meter	117.0	3.0	30.3	6.9	117.0	3.0	30.3	6.9	117.0	3.0	30.3	6.9
4.13	SRVC Cmnctn Rbltn w/H	1004.0	10.7	106.4	32.0	1004.0	10.7	106.4	32.0	1004.0	10.7	106.4	32.0
4.14	SRVC Cmnctn Rbltn w/H	800.0	146.2	240.8	34.4	800.0	146.2	240.8	34.4	800.0	146.2	240.8	34.4
4.15	Flow Meter	226.0	0.0	0.0	0.0	226.0	0.0	0.0	0.0	226.0	0.0	0.0	0.0
4.16	Flow Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.17	SUB-TOTAL	3317.0	888.4	2221.1	239.2	3317.0	888.4	2221.1	239.2	3317.0	888.4	2221.1	239.2
5.0	LAND ACQUISITION	1583.0	142.5	649.0	79.2	1583.0	142.5	649.0	79.2	1583.0	142.5	649.0	79.2
5.1	Vehicle	1583.0	142.5	649.0	79.2	1583.0	142.5	649.0	79.2	1583.0	142.5	649.0	79.2
5.2	Land Acquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.3	Stored Material & Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.4	SUB-TOTAL	1583.0	142.5	649.0	79.2	1583.0	142.5	649.0	79.2	1583.0	142.5	649.0	79.2
6.0	Leakage Detection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.1	Deep Well Pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.2	Chlorinator	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.3	Flow Meter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.4	Water Meter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.5	Operation Center	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.6	Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.7	Stored Material & Equip.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.8	SUB-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.0	GRAND TOTAL	47138.0	5447.7	14710.6	2131.9	47138.0	5447.7	14710.6	2131.9	47138.0	5447.7	14710.6	2131.9

Cabuyo-Sa. Rosa-Binan		Phase I (Stage I)				1991				1992			
		COST	C.FEC	C.DUM	E.DUM	C.FEC	E.DUM	C.DUM	E.DUM	C.FEC	E.DUM	C.DUM	E.DUM
1	Deep Well Facilities	852.0	71.1	276.5	71.1	268.3	268.3	810.1	268.3	2012.0	268.3	810.1	268.3
2	Transmission Facilities	3503.0	588.2	1126.5	142.5	504.0	504.0	141.1	158.3	128.0	22.7	35.3	39.0
3	Purification Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Reservoir	3417.0	888.4	2221.1	239.2	239.2	170.8	0.0	0.0	0.0	0.0	0.0	0.0
5	Disinfection Facilities	196.0	9.8	66.6	5.9	98.0	98.0	33.3	45.1	0.0	0.0	0.0	0.0
6	Electric Substation	2693.0	564.7	801.5	72.9	0.0	1912.5	0.0	0.0	0.0	0.0	0.0	0.0
7	Distribution Facilities	26533.0	3128.7	8154.3	1452.2	12688.0	10721.2	2571.1	2132.6	1762.0	241.9	403.4	509.1
8	Service Connection	5431.0	54.3	542.1	160.5	2509.0	4619.3	250.9	0.0	2509.0	25.1	250.9	2132.6
9	Admin. Bldg. & Upg. Ctr.	1583.0	142.5	649.0	79.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Land Acquisition	180.0	0.0	180.0	0.0	200.0	0.0	200.0	0.0	385.0	0.0	0.0	0.0
11	Vehicle & Stored Material	1101.0	0.0	0.0	0.0	543.0	720.8	0.0	354.1	0.0	0.0	0.0	0.0
12	Replacement of Equipment	3630.0	547.7	1007.6	2191.9	18534.0	30254.2	4008.5	3520.9	6794.0	598.0	1589.7	3857.4
13	SUB TOTAL	600.0	0.0	600.0	0.0	0.0	0.0	0.0	0.0	6704.0	0.0	0.0	0.0
14	Leakage Detection	37138.0	5447.7	14710.6	2131.9	1820.4	26253.2	9009.5	3179.2	6704.0	598.0	1589.7	3857.4
15	TOTAL												

Camvao-Sta. Rosa-Binan														
No.	SOURCE FACILITY	1993				1994				1995				
		COST	C.FEC	C.DON	C.D. UNSKI	E.FEC	E.DON	E.FEC	E.DON	C.FEC	C.DON	C.D. UNSKI	F.FEC	F.DON
1.0	DEEP WELL	1160.0	197.2	533.6	58.0	232.0	197.2	533.6	58.0	232.0	197.2	533.6	58.0	232.0
2.0	PUMPING FACILITY	790.0	71.1	276.5	39.5	371.3	71.1	276.5	39.5	371.3	71.1	276.5	39.5	371.3
	1) Pumping Station	62.0	0.0	0.0	0.0	62.0	0.0	0.0	0.0	62.0	0.0	0.0	0.0	0.0
	2) Flow Meter	2012.0	268.3	810.1	97.5	665.3	268.3	810.1	97.5	665.3	268.3	810.1	97.5	665.3
3.0	TRANSMISSION FACILITIES	126.0	22.7	35.3	5.0	39.0	29.0	17.6	2.5	19.6	14.5	0.0	0.0	0.0
	(1) Pipelines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(2) Pipe Protection	126.0	22.7	35.3	5.0	39.0	29.0	17.6	2.5	19.6	14.5	0.0	0.0	0.0
4.0	DISTRIBUTION FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(1) Reservoir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(2) Pump Facility (Equip)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(3) Pump Facility (Civil)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(4) Chlorination Facility	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(5) Electric Substation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	(6) Distribution pipes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1) Main Pipes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2) River Crossing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3) River Crossing Material	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4) Valves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	5) Internal Network	1762.0	241.9	493.4	70.5	599.1	387.6	486.1	69.4	599.2	381.9	486.2	68.6	583.1
	6) Service Connections	2508.0	25.1	250.8	75.2	2131.8	100.3	250.8	75.2	2131.8	100.3	250.8	75.2	2131.8
	7) Water Meter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8) Srvc Concntr. Sublin w/Hz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	9) Srvc Concntr. Sublin w/Hz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10) Lateral Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11) Flow Meter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12) Pipe Protection	4270.0	307.0	740.2	105.7	2730.9	487.9	706.9	104.6	2722.0	482.2	731.0	103.8	2714.9
5.0	ADMINISTRATION Bldg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.0	OPERATION CENTER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.0	VEHICLE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.0	STORAGE MATERIAL & EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9.0	LAND ACQUISITION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.0	VEHICLE	300.0	150.0	150.0	0.0	150.0	150.0	150.0	0.0	150.0	150.0	150.0	0.0	150.0
11.0	STORAGE MATERIAL & EQUIP	83.0	71.4	13.6	0.0	71.4	13.6	13.6	0.0	70.6	13.6	13.6	0.0	70.6
12.0	LEAKAGE DETECTION	385.0	0.0	0.0	0.0	221.4	163.6	0.0	0.0	220.6	163.4	0.0	0.0	163.4
13.0	REPLACEMENT OF EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14.0	DEEP WELL PUMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15.0	CHLORINATOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16.0	FLOW METER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17.0	WATER METER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18.0	OPERATION CENTER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19.0	VEHICLE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20.0	STORAGE MATERIAL & EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SUB-TOTAL	6793.0	599.0	1589.6	248.2	3156.6	948.8	1564.6	244.6	3627.5	928.4	143.8	2768.7	487.8
	GRAND TOTAL	6793.0	599.0	1589.6	248.2	3156.6	948.8	1564.6	244.6	3627.5	928.4	143.8	2768.7	487.8

No.	Camvao-Sta. Rosa-Binan IFM	1993				1994				1995				
		COST	C.FEC	C.DON	C.D. UNSKI	E.FEC	E.DON	E.FEC	E.DON	C.FEC	C.DON	C.D. UNSKI	E.FEC	E.DON
1	Deep Well Facilities	2012.0	268.3	810.1	97.5	665.3	268.3	810.1	97.5	665.3	268.3	810.1	97.5	665.3
2	Transmission Facilities	126.0	22.7	35.3	5.0	39.0	29.0	17.6	2.5	19.6	14.5	0.0	0.0	0.0
3	Purification Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Reservoir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Disinfection Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Electric Substation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Distribution Facilities	1742.0	281.4	493.4	70.5	599.1	387.6	486.1	69.4	599.2	381.9	480.2	583.1	377.3
8	Service Connection	2508.0	25.1	250.8	75.2	2131.8	100.3	250.8	75.2	2131.8	100.3	250.8	75.2	2131.8
9	Admin. Bldg. & Appx. Ctr.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Land acquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Vehicle & Stored Material	385.0	0.0	0.0	0.0	221.4	163.6	0.0	0.0	220.6	163.4	0.0	53.8	10.2
12	Replacement of Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	SUB TOTAL	6793.0	598.0	1589.6	248.2	3156.6	948.8	1561.6	244.6	3627.5	928.4	731.0	2768.7	487.8
14	Leakage detection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	TOTAL	6793.0	598.0	1589.6	248.2	3156.6	948.8	1564.6	244.6	3627.5	928.4	731.0	2768.7	487.8

No.	ITEM	Phase 1			Phase 2			Phase 3			Phase 4			Phase 5			Phase 6			Phase 7			Phase 8			Phase 9			Phase 10			Phase 11			Phase 12			Phase 13			Phase 14			Phase 15			Phase 16			Phase 17			Phase 18			Phase 19			Phase 20			Phase 21			Phase 22			Phase 23			Phase 24			Phase 25			Phase 26			Phase 27			Phase 28			Phase 29			Phase 30			Phase 31			Phase 32			Phase 33			Phase 34			Phase 35			Phase 36			Phase 37			Phase 38			Phase 39			Phase 40			Phase 41			Phase 42			Phase 43			Phase 44			Phase 45			Phase 46			Phase 47			Phase 48			Phase 49			Phase 50			Phase 51			Phase 52			Phase 53			Phase 54			Phase 55			Phase 56			Phase 57			Phase 58			Phase 59			Phase 60			Phase 61			Phase 62			Phase 63			Phase 64			Phase 65			Phase 66			Phase 67			Phase 68			Phase 69			Phase 70			Phase 71			Phase 72			Phase 73			Phase 74			Phase 75			Phase 76			Phase 77			Phase 78			Phase 79			Phase 80			Phase 81			Phase 82			Phase 83			Phase 84			Phase 85			Phase 86			Phase 87			Phase 88			Phase 89			Phase 90			Phase 91			Phase 92			Phase 93			Phase 94			Phase 95			Phase 96			Phase 97			Phase 98			Phase 99			Phase 100			Phase 101			Phase 102			Phase 103			Phase 104			Phase 105			Phase 106			Phase 107			Phase 108			Phase 109			Phase 110			Phase 111			Phase 112			Phase 113			Phase 114			Phase 115			Phase 116			Phase 117			Phase 118			Phase 119			Phase 120			Phase 121			Phase 122			Phase 123			Phase 124			Phase 125			Phase 126			Phase 127			Phase 128			Phase 129			Phase 130			Phase 131			Phase 132			Phase 133			Phase 134			Phase 135			Phase 136			Phase 137			Phase 138			Phase 139			Phase 140			Phase 141			Phase 142			Phase 143			Phase 144			Phase 145			Phase 146			Phase 147			Phase 148			Phase 149			Phase 150			Phase 151			Phase 152			Phase 153			Phase 154			Phase 155			Phase 156			Phase 157			Phase 158			Phase 159			Phase 160			Phase 161			Phase 162			Phase 163			Phase 164			Phase 165			Phase 166			Phase 167			Phase 168			Phase 169			Phase 170			Phase 171			Phase 172			Phase 173			Phase 174			Phase 175			Phase 176			Phase 177			Phase 178			Phase 179			Phase 180			Phase 181			Phase 182			Phase 183			Phase 184			Phase 185			Phase 186			Phase 187			Phase 188			Phase 189			Phase 190			Phase 191			Phase 192			Phase 193			Phase 194			Phase 195			Phase 196			Phase 197			Phase 198			Phase 199			Phase 200			Phase 201			Phase 202			Phase 203			Phase 204			Phase 205			Phase 206			Phase 207			Phase 208			Phase 209			Phase 210			Phase 211			Phase 212			Phase 213			Phase 214			Phase 215			Phase 216			Phase 217			Phase 218			Phase 219			Phase 220			Phase 221			Phase 222			Phase 223			Phase 224			Phase 225			Phase 226			Phase 227			Phase 228			Phase 229			Phase 230			Phase 231			Phase 232			Phase 233			Phase 234			Phase 235			Phase 236			Phase 237			Phase 238			Phase 239			Phase 240			Phase 241			Phase 242			Phase 243			Phase 244			Phase 245			Phase 246			Phase 247			Phase 248			Phase 249			Phase 250			Phase 251			Phase 252			Phase 253			Phase 254			Phase 255			Phase 256			Phase 257			Phase 258			Phase 259			Phase 260			Phase 261			Phase 262			Phase 263			Phase 264			Phase 265			Phase 266			Phase 267			Phase 268			Phase 269			Phase 270			Phase 271			Phase 272			Phase 273			Phase 274			Phase 275			Phase 276			Phase 277			Phase 278			Phase 279			Phase 280			Phase 281			Phase 282			Phase 283			Phase 284			Phase 285			Phase 286			Phase 287			Phase 288			Phase 289			Phase 290			Phase 291			Phase 292			Phase 293			Phase 294			Phase 295			Phase 296			Phase 297			Phase 298			Phase 299			Phase 300			Phase 301			Phase 302			Phase 303			Phase 304			Phase 305			Phase 306			Phase 307			Phase 308			Phase 309			Phase 310			Phase 311			Phase 312			Phase 313			Phase 314			Phase 315			Phase 316			Phase 317			Phase 318			Phase 319			Phase 320			Phase 321			Phase 322			Phase 323			Phase 324			Phase 325			Phase 326			Phase 327			Phase 328			Phase 329			Phase 330			Phase 331			Phase 332			Phase 333			Phase 334			Phase 335			Phase 336			Phase 337			Phase 338			Phase 339			Phase 340			Phase 341			Phase 342			Phase 343			Phase 344			Phase 345			Phase 346			Phase 347			Phase 348			Phase 349			Phase 350			Phase 351			Phase 352			Phase 353			Phase 354			Phase 355			Phase 356			Phase 357			Phase 358			Phase 359			Phase 360			Phase 361			Phase 362			Phase 363			Phase 364			Phase 365			Phase 366			Phase 367			Phase 368			Phase 369			Phase 370			Phase 371			Phase 372			Phase 373			Phase 374			Phase 375			Phase 376			Phase 377			Phase 378			Phase 379			Phase 380			Phase 381			Phase 382			Phase 383			Phase 384			Phase 385			Phase 386			Phase 387			Phase 388			Phase 389			Phase 390			Phase 391			Phase 392			Phase 393			Phase 394			Phase 395			Phase 396			Phase 397			Phase 398			Phase 399			Phase 400			Phase 401			Phase 402			Phase 403			Phase 404			Phase 405			Phase 406			Phase 407			Phase 408			Phase 409			Phase 410			Phase 411			Phase 412			Phase 413			Phase 414			Phase 415			Phase 416			Phase 417			Phase 418			Phase 419			Phase 420			Phase 421			Phase 422			Phase 423			Phase 424			Phase 425			Phase 426			Phase 427			Phase 428			Phase 429			Phase 430			Phase 431			Phase 432			Phase 433			Phase 434			Phase 435			Phase 436			Phase 437			Phase 438			Phase 439			Phase 440			Phase 441			Phase 442			Phase 443			Phase 444			Phase 445			Phase 446			Phase 447			Phase 448			Phase 449			Phase 450			Phase 451			Phase 452			Phase 453			Phase 454			Phase 455			Phase 456			Phase 457			Phase 458			Phase 459			Phase 460			Phase 461			Phase 462			Phase 463			Phase 464			Phase 465			Phase 466			Phase 467			Phase 468			Phase 469			Phase 470			Phase 471			Phase 472			Phase 473			Phase 474			Phase 475			Phase 476			Phase 477			Phase 478			Phase 479			Phase 480			Phase 481			Phase 482			Phase 483			Phase 484			Phase 485			Phase 486			Phase 487			Phase 488			Phase 489			Phase 490			Phase 491			Phase 492			Phase 493			Phase 494			Phase 495			Phase 496			Phase 497			Phase 498			Phase 499			Phase 500			Phase 501			Phase 502			Phase 503			Phase 504			Phase 505			Phase 506			Phase 507			Phase 508			Phase 509			Phase 510			Phase 511			Phase 512			Phase 513			Phase 514			Phase 515			Phase 516			Phase 517			Phase 518			Phase 519			Phase 520			Phase 521			Phase 522			Phase 523			Phase 524			Phase 525			Phase 526			Phase 527			Phase 528			Phase 529			Phase 530			Phase 531			Phase 532			Phase 533			Phase 534			Phase 535			Phase 536			Phase 537			Phase 538			Phase 539			Phase 540			Phase 541			Phase 542			Phase 543			Phase 544			Phase 545			Phase 546			Phase 547			Phase 548			Phase 549			Phase 550			Phase 551			Phase 552			Phase 553			Phase 554			Phase 555			Phase 556			Phase 557			Phase 558			Phase 559			Phase 560			Phase 561			Phase 562			Phase 563			Phase 564			Phase 565			Phase 566			Phase 567			Phase 568			Phase 569			Phase 570			Phase 571			Phase 572			Phase 573			Phase 574			Phase 575			Phase 576			Phase 577			Phase 578			Phase 579			Phase 580			Phase 581			Phase 582			Phase 583			Phase 584			Phase 585			Phase 586			Phase 587			Phase 588			Phase 589			Phase 590			Phase 591			Phase 592			Phase 593			Phase 594			Phase 595			Phase 596			Phase 597			Phase 598			Phase 599			Phase 600			Phase 601			Phase 602			Phase 603			Phase 604			Phase 605			Phase 606			Phase 607			Phase 608			Phase 609			Phase 610			Phase 611			Phase 612			Phase 613			Phase 614			Phase 615			Phase 616			Phase 617			Phase 618			Phase 619			Phase 620			Phase 621			Phase 622			Phase 623			Phase 624			Phase 625			Phase 626			Phase 627			Phase 628			Phase 629			Phase 630			Phase 631			Phase 632			Phase 633			Phase 634			Phase 635			Phase 636			Phase 637			Phase 638			Phase 639			Phase 640			Phase 641			Phase 642			Phase 643			Phase 644			Phase 645			Phase 646			Phase 647			Phase 648			Phase 649			Phase 650			Phase 651			Phase 652			Phase 653			Phase 654			Phase 655			Phase 656			Phase 657			Phase 658			Phase 659			Phase 660			Phase 661			Phase 662			Phase 663			Phase 664			Phase 665			Phase 666			Phase 667			Phase 668			Phase 669			Phase 670			Phase 671			Phase 672			Phase 673			Phase 674			Phase 675			Phase 676			Phase 677			Phase 678			Phase 679			Phase 680			Phase 681			Phase 682			Phase 683			Phase 684			Phase 685			Phase 686			Phase 687			Phase 688			Phase 689			Phase 690			Phase 691			Phase 692			Phase 693			Phase 694			Phase 695			Phase 696			Phase 697			Phase 698			Phase 699			Phase 700			Phase 701			Phase 702			Phase 703			Phase 704			Phase 705			Phase 706			Phase 707			Phase 708			Phase 709			Phase 710			Phase 711			Phase 712			Phase 713			Phase 714			Phase 715			Phase 716			Phase 717			Phase 718			Phase 719			Phase 720			Phase 721			Phase 722			Phase 723			Phase 724			Phase 725			Phase 726			Phase 727			Phase 728			Phase 729			Phase 730			Phase 731			Phase 732			Phase 733			Phase 734			Phase 735			Phase 736			Phase 737			Phase 738			Phase 739			Phase 740			Phase 741			Phase 742			Phase 743			Phase 744			Phase 745			Phase 746			Phase 747			Phase 748			Phase 749			Phase 750			Phase 751			Phase 752			Phase 753			Phase 754			Phase 755			Phase 756			Phase 757			Phase 758			Phase 759			Phase 760			Phase 761			Phase 762			Phase 763			Phase 764			Phase 765			Phase 766			Phase 767			Phase 768			Phase 769			Phase 770			Phase 771			Phase 772			Phase 773			Phase 774			Phase 775			Phase 776			Phase 777			Phase 778			Phase 779			Phase 780			Phase 781			Phase 782			Phase 783			Phase 784			Phase 785			Phase 786			Phase 787			Phase 788			Phase 789			Phase 790			Phase 791			Phase 792			Phase 793			Phase 794			Phase 795			Phase 796			Phase 797			Phase 798			Phase 799			Phase 800			Phase 801			Phase 802			Phase 803			Phase 804			Phase 805			Phase 806			Phase 807			Phase 808			Phase 809			Phase 810			Phase 811			Phase 812			Phase 813			Phase 814			Phase 815			Phase 816			Phase 817			Phase 818			Phase 819			Phase 820			Phase 821			Phase 822			Phase 823			Phase 824			Phase 825			Phase 826			Phase 827			Phase 828			Phase 829			Phase 830			Phase 831			Phase 832			Phase 833			Phase 834			Phase 835			Phase 836			Phase 837			Phase 838			Phase 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APPENDIX 8.2.1.C OPERATION AND MAINTENANCE COST BY PHASE (Cabuyao-Sta. Rosa-Biñan)

(Unit; thousand pesos)

Item	Phase I		Phase II
	Stage 1	Stage 2	
	Cost	Cost	Cost
Operation & Maintenance Cost			
Salary	1,360 p/M.M	539	1,322
Power	0.25 ₱/kWh	25	506
Chemical	27 ₱/kg	99	260
Miscellaneous		814	2,191
Maintenance		609	1,792
Total		2,086	6,071

APPENDIX 9.3.1 MARKET SURVEY

The market survey was conducted by interviews to the residents in the study area using the LWUA's interview sheet as per attached in the end of this section.

The total number of respondents and its estimated coverage ratio to the total number of households in the study area are as follows:

<u>Total Number of Respondents</u>	<u>Estimated Total Household</u>	<u>Coverage Ratio to Total Household</u>
7,291	23,725	31%

The results of the market survey are shown in TABLEs 9.3.1., 9.3.2. and 9.3.3.

From the market survey, the income distribution of the respondents is shown as follows:

<u>Income Bracket^{1/}</u>	<u>Cabuyao</u>		<u>Sta. Rosa</u>		<u>Binan</u>		<u>Total</u>	
	<u>Ave.</u>		<u>Ave.</u>		<u>Ave.</u>		<u>Ave.</u>	
	<u>Pesos</u>	<u>Number</u>	<u>Pesos</u>	<u>Number</u>	<u>Pesos</u>	<u>Number</u>	<u>Pesos</u>	<u>Number</u>
P900 and below	679	160	696	703	592	1,407	630	2,270
P901 to P1500	1,212	321	1,203	940	1,205	1,230	1,205	2,491
P1,501 to P2,500	2,152	157	2,130	554	2,099	637	2,118	1,348
P2,501 to P4,500	3,467	98	3,312	274	3,340	389	3,346	706
P4,501 and above	8,338	13	5,357	28	5,798	78	5,972	119

^{1/} Residential, excluding no-income and no-answer

TABLE 9.3.1 MARKET SURVEY SUMMARY
(Cabuyao)

Total Number of Respondents: 755

1. Distribution According to Building Type

	No.	%
a. Residential	755	100.00
b. Commercial	0	0.00
c. Industrial	0	0.00

2. Distribution According to Source of Water

	No.	%
a. Connected to System	288	38.15
b. Neighbor's Connection	70	9.27
c. Public Faucet	93	12.32
d. Private System	300	39.74
e. Water Vendor	0	0.00
f. Others	4	0.53

3. Average Persons Per Household

a. Residential / Number of Sample	: 5.73 /	748
b. Commercial / Number of Sample	: 0.00 /	0
c. Industrial / Number of Sample	: 0.00 /	0

4. Willingness To Connect (%)

	Residential	Commercial	Industrial	Total
a. Yes	: 37.22	0.00	0.00	37.22
b. No	: 24.64	0.00	0.00	24.64
c. Undecided	: 0.00	0.00	0.00	0.00
d. W/ Own Conn.:	38.15	0.00	0.00	38.15

5. Average Monthly Water Needs

Type / Number of Sample	Residential	Commercial	Industrial
a. Kerosene Can / 167	: 13.01	0.00	0.00
b. Drum / 578	: 2.99	0.00	0.00
c. Gallon / 3	: 4.33	0.00	0.00
d. Others / 1	: 25.00	0.00	0.00

6. Ave. Monthly Electric Bills for Residential Users (PESO): 58.84
Number of Effective Respondents : 740

7. Income Distribution

(Residential, Excluding No-Income and No-Answer)

	AVE.PESO	NUMBER
a. P900 and Below :	679	160
b. P901 to P1500 :	1212	321
c. P1501 to P2500 :	2152	157
d. P2501 to P4500 :	3467	98
e. P4501 and Above :	8338	13

TABLE 9.3.2 MARKET SURVEY SUMMARY
(Sta.Rosa)

Total Number of Respondents: 2594

1. Distribution According to Building Type

	No.	%
a. Residential	2524	97.30
b. Commercial	67	2.58
c. Industrial	3	0.12

2. Distribution According to Source of Water

	No.	%
a. Connected to System	619	23.86
b. Neighbor's Connection	343	13.22
c. Public Faucet	609	23.48
d. Private System	1016	39.17
e. Water Vendor	1	0.04
f. Others	6	0.23

3. Average Persons Per Household

a. Residential / Number of Sample	5.98 /	2524
b. Commercial / Number of Sample	6.61 /	67
c. Industrial / Number of Sample	16.67 /	3

4. Willingness To Connect (%)

	Residential	Commercial	Industrial	Total
a. Yes	44.06	32.84	100.00	43.83
b. No	31.58	43.28	0.00	31.84
c. Undecided	0.44	1.49	0.00	0.46
d. W/ Own Conn.	23.93	22.39	0.00	23.86

5. Average Monthly Water Needs

Type / Number of Sample	Residential	Commercial	Industrial
a. Kerosene Can / 550	11.76	22.26	0.00
b. Drum / 2020	3.24	6.03	4.33
c. Gallon / 16	10.56	0.00	0.00
d. Others / 5	2.10	0.00	0.00

6. Ave. Monthly Electric Bills for Residential Users (PESO): 51.42
Number of Effective Respondents : 2506

7. Income Distribution

(Residential, Excluding No-Income and No-Answer)

	AVE. PESO	NUMBER
a. P900 and Below	696	703
b. P901 to P1500	1203	940
c. P1501 to P2500	2130	554
d. P2501 to P4500	3312	274
e. P4501 and Above	5357	28

TABLE 9.3.3 MARKET SURVEY SUMMARY
(Biñan)

Total Number of Respondents: 3942

1. Distribution According to Building Type

	No.	%
a. Residential	: 3838	97.36
b. Commercial	: 101	2.56
c. Industrial	: 3	0.08

2. Distribution According to Source of Water

	No.	%
a. Connected to System	: 557	14.13
b. Neighbor's Connection	: 627	15.91
c. Public Faucet	: 1231	31.23
d. Private System	: 1512	38.36
e. Water Vendor	: 0	0.00
f. Others	: 15	0.38

3. Average Persons Per Household

a. Residential / Number of Sample	: 6.07 / 3833
b. Commercial / Number of Sample	: 6.33 / 100
c. Industrial / Number of Sample	: 12.67 / 3

4. Willingness To Connect (%)

	Residential	Commercial	Industrial	Total
a. Yes	: 49.56	41.58	33.33	49.34
b. No	: 35.36	26.73	0.00	35.11
c. Undecided	: 1.43	0.99	0.00	1.42
d. W/ Own Conn.	: 13.65	30.69	66.67	14.13

5. Average Monthly Water Needs

Type / Number of Sample	Residential	Commercial	Industrial
a. Kerosene Can / 794	: 10.46	15.74	0.00
b. Drum / 2898	: 3.30	5.62	6.00
c. Gallon / 141	: 22.08	9.50	0.00
d. Others / 2	: 4.50	0.00	0.00

6. Ave. Monthly Electric Bills for Residential Users (PESO): 53.25
Number of Effective Respondents : 3753

7. Income Distribution
(Residential, Excluding No-Income and No-Answer)

	AVE. PESO	NUMBER
a. P900 and Below :	592	1407
b. P901 to P1500 :	1205	1230
c. P1501 to P2500 :	2099	637
d. P2501 to P4500 :	3340	389
e. P4501 and Above :	5798	78

The existing sources of water of the respondents and their willingness to connect to each source of water are indicated below :

Sources of Water	Distribution %	Willingness to Connect	
		Yes %	No %
(1) Cabuyao			
Connected to System	38	-	-
Neighbor's Connection	9	61	39
Public Faucet	12	72	28
Private System	40	56	44
(2) Sta. Rosa			
Connected to System	24	-	-
Neighbor's Connection	13	66	33
Public Faucet	23	57	42
Private System	39	55	44
(3) Binan			
Connected to System	14	-	-
Neighbor's Connection	16	73	26
Public Faucet	31	58	41
Private System	38	51	47
(4) Total			
Connected to System	20	-	-
Neighbor's Connection	14	70	29
Public Faucet	27	58	41
Private System	39	53	46

The respondents' major sources of water are private system and public faucet, while the other respondents are connected to the system, some are dependent in their neighbours connection for their water needs. In addition, 0.4% of the respondents depend on the water vendors and others for their water sources. The above table shows that the respondents are willing to connect to the waterworks system.

The distribution of water sources and the respondents' willingness to connect according to income bracket are also obtained from the market survey as shown in TABLE 9.3.4.

TABLE 9.3.4 DISTRIBUTION OF WILLINGNESS TO CONNECT BY INCOME BRACKET

Sources of Water	Income Bracket				
	P900 & below	P901- P1,500	P1,501- P2,500	P2,501- P4,500	P4,501- & above
(1) Cabuyao					
Connected to System	34 %	38 %	75 %	34 %	8 %
Neighbor's Connection	13	10	6	7	8
Public Faucet	26	12	4	3	8
Private System	26	40	41	56	77
Willingness to Connect					
Yes	34	39	31	45	62
No	32	23	22	21	31
Undecided	0	0	0	0	0
With Own Connection	34	38	47	34	7
(2) Sta. Rosa					
Connected to System	14	24	30	33	41
Neighbor's Connection	21	10	11	9	0
Public Faucet	35	25	16	8	6
Private System	29	40	43	49	53
Willingness to Connect					
Yes	45	41	46	44	32
No	40	34	24	22	26
Undecided	1	0	1	1	0
With Own Connection	14	25	29	33	42
(3) Binan					
Connected to System	6	15	20	26	20
Neighbor's Connection	21	16	12	9	4
Public Faucet	47	28	18	11	15
Private System	25	41	50	53	60
Willingness to Connect					
Yes	50	49	51	47	45
No	42	34	27	26	33
Undecided	1	1	2	1	2
With Own Connection	7	16	20	26	20

As a result of the market survey, the respondents' willingness and unwillingness to connect is summarized as follows :

<u>Answer</u>	<u>Cabuyao</u>	<u>Sta. Rosa</u>	<u>Binan</u>
Yes	37 %	44 %	49 %
No	25	32	35
With own connection	38	24	14

Note : With respect to type of users, residential users account for 100% in Cabuyao, 97% in Sta.Rosa, and 97 % in Binan, Respectively.

It is observed from the results of the survey that the majority of the respondents in the three municipalities who are not yet connected to the existing system are willing to connect to the waterworks system. It is expected therefore that more residents in the Cabuyao-Sta.Rosa-Binan will connect to the new water supply system when it is expanded.

[illegible]

APPENDIX 9.7.1 FINANANCIAL INTERNAL RATE OF RETURN (FIRR)

In the calculation of Financial Internal Rate of Return (FIRR), the following two indicators are normally used to evaluate financial profitability of a project.

(1) Internal Rate of Return on Investment (IRROI)

The term IRROI indicates the internal rate of return on total capital investment, and assesses the profitability of the Project as a whole and the ability to recover funds invested in the Project.

The IRROI is calculated based on the assumption that the total capital investment is covered by its own capital. Therefore, the financial conditions such as the loan conditions on borrowed capital, changes on the ratio of equity to total capital requirement and others have no effect on the IRROI. Accordingly, the IRROI indicates the profitability of the Project itself.

(2) Internal Rate of Return on Equity (IRROE)

The term IRROE indicates the internal rate of return on equity, and assesses the profitability only with respect to equity and the ability to recover funds invested in the Project as equity. Here, the IRROE is calculated on the basis of such financial conditions proper to the Project as the loan conditions on borrowed capital and amount of capital owned.

In this study, the FIRR was calculated using the same method applied in the study report of the BACOLOD CITY WATER DISTRICT PHASE II WATER SUPPLY FEASIBILITY STUDY, DRAFT REPORT VOLUME 3 by LWUA.

APPENDIX 9.8.1 FINANCIAL RECOMMENDATION

The proposed water rates for 1/2 inch connections of commercial users, and 3/4 inch connections of domestic and commercial users to achieve financial self-sufficiency are as follows :

(1) Water rate for 1/2 inch connections of commercial users

Period	Rate/ Unit	First 10cu.m	11-20cu.m	21-35cu.m	Above 35cu.m
1988	P0.9	P 45.0	P 5.6	P 7.2	P 9.4
1989	1.3	65.0	8.2	10.4	13.6
1990	1.3	65.0	8.2	10.4	13.6
1991	1.9	95.0	11.8	15.2	20.0
1992	1.9	95.0	11.8	15.2	20.0
1993	2.4	120.0	15.0	19.2	25.2
1994	2.4	120.0	15.0	19.2	25.2
1995	2.7	135.0	16.8	21.6	28.4
1996	2.7	135.0	16.8	21.6	28.4
1997	3.5	175.0	21.8	28.0	36.8

(2) Water rate for 3/4 inch connection of domestic users

Period	Rate/ Unit	First 10cu.m	11-20cu.m	21-35cu.m	Above 35cu.m
1988	P0.9	P 36.0	P 4.5	P 5.8	P 7.5
1989	1.3	52.0	6.6	8.3	10.9
1990	1.3	52.0	6.6	8.3	10.9
1991	1.9	76.0	9.4	12.2	16.0
1992	1.9	76.0	9.4	12.2	16.0
1993	2.4	96.0	12.0	15.4	20.2
1994	2.4	96.0	12.0	15.4	20.2
1995	2.7	108.0	13.4	17.3	22.7
1996	2.7	108.0	13.4	17.3	22.7
1997	3.5	140.0	17.4	22.4	29.4

(3) Water rate for 3/4 inch connection of commercial users

Period	Rate/ Unit	First 10cu.m	11-20cu.m	21-35cu.m	Above 35cu.m
1988	P0.9	P 72.0	P 9.0	P11.6	P15.0
1989	1.3	104.0	13.2	16.6	21.8
1990	1.3	104.0	13.2	16.6	21.8
1991	1.9	152.0	18.8	24.4	32.0
1992	1.9	152.0	18.8	24.4	32.0
1993	2.4	192.0	24.0	30.8	40.3
1994	2.4	192.0	24.0	30.8	40.3
1995	2.7	216.0	26.8	34.6	45.4
1996	2.7	216.0	26.8	34.6	45.4
1997	3.5	280.0	34.8	44.4	58.8

LIST OF PERSONS CONCERNED

LIST OF PERSONS CONCERNED

ADVISORY COMMITTEE MEMBERS

Dr. Kiyoshi Yamada	- Chairman of Committee, Professor, Ritsumeikan University
Mr. Hisashi Watanabe	- Member, for Water Supply System Planning, Nagoya City
Mr. Masahiro Takai	- Member, for Water Source Planning, Kobe City
Mr. Tsutomu Sakagawa (Predecessor: Mr. Yoshiro Kaburagi)	- Member, for Water Supply System Planning, Ministry of Health and Welfare
Mr. Shozo Matsuura (Predecessor: Mr. Yoichi Seki)	- Coordinator, Japan International Cooperation Agency (JICA)

IWUA OFFICIALS

Mr. Porthos P. Alma Jose	- Administrator
Col. Carlos C. Leaño, Jr.	- Ex-General Manager
Mr. Salvador J. Rivera	- Sr. Deputy Administrator
Mr. Ibarra J. Olgado	- Deputy Administrator for Regulatory
Mr. Daniel I. Castillo	- Deputy Administrator for Finance
Mr. Vitaliano J. dela Vega	- Deputy Administrator for Engineering
Mr. Alfredo B. Espino	- Manager, Planning Department
Mr. Isidoro A. Yee	- Asst. Manager, Planning Department
Mr. Roberto B. Binag	- Manager, Water Systems Development Division
Mr. Eriberto R. Calubaquib	- Manager, Water Resources Division
Mr. Antonio R. de Vera	- Project Manager IV
Mr. Armando T. Fernandes	- Manager, Construction Department
Mr. Arador R. Sambo	- Manager, Water District Formation/ Review Department
Mr. Francis C. Joven	- Manager, Formation of Water District Division

LWUA OFFICIALS (CONT'D)

Mr. Hector A. Dayrit	- Manager, Rates Division
Mr. Teofilo R. Palaganas	- Area Manager, Advisory Services Div.
Mr. Henry I. Pacis	- Water District Development Officer
Mrs. Jean C. Leoncio	- Manager, Loan Evaluation Division

OTHER AGENCIES

NIA CONSULTANTS INC.

Mr. Isidro Digal	- Manager, Planning Division
Mr. Lorenzo N. Macaspac	- Professional Mechanical Engineer

NWRC

Atty. Elena Luz J. Alojipan	- Hearing Officer, IV
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MWSS

Mr. Antonio E. Kaimo	- Acting Department Manager, Planning and Design Department
----------------------	---

ANGELES CITY

Mr. Francisco G. Nepomuceno	- City Mayor
Atty. Filomeno Espiritu	- City Treasurer
Mr. Filomeno M. Bonifacio, Jr.	- City Engineer
Mr. Romeo P. Calara	- Sr. Mechanical Engineer

DAGUPAN CITY

Mr. Liberato L. Reyna, Sr.	- City Mayor
Mr. Cipriano M. Manaois	- Ex-Mayor
Mr. Juanito A. Pajaro	- City Treasurer
Mr. Silverio C. Coquia	- Waterworks Superintendent
Mr. Manuel B. Ravanzo	- City Development Coordinator

CABUYAO, STA. ROSA AND BINAN

Atty. Felicismo T. San Luis	- Governor, Province of Laguna
Mr. Romeo G. Ballesteros	- Provincial Civil Security Officer
Mr. Dante T. Reyes	- Executive Assistant/Development Coordinator
Mr. Catalino Caparas	- Waterworks Supervisor, Province of Laguna
Mr. Isidro T. Hildawa	- Mayor, Municipality of Cabuyao
Mr. Cesar E. Nepomuceno	- Mayor, Municipality of Sts. Rosa
Mr. Noe C. Zarate	- Mayor, Municipality of Biñan
Mrs. Josefa L. Pradel	- Municipal Development Coordinator, Cabuyao
Mr. Felizardo P. Manto	- Municipal Planning and Development Coordinator, Sta. Rosa
Mr. Carito P. Torres	- Municipal Census Officer, Sta. Rosa

BAYOMBONG AND SOLANO

Mrs. Belen F. Calderon	- Governor, Province of Nueva Vizcaya
Mrs. Natalia F. Dumlao	- Ex-Governor
Mr. Clamente G. Bacani	- Provincial Secretary
Mr. Artemio P. Bahia	- Provincial Attorney
Mr. Jesus M. Calata	- Provincial Engineer
Mr. Tomas C. Garra	- Supervising Project Analyst Provincial Planning & Develop't Office
Mr. Geoffrey B. Magday	- Concurrent Provincial Waterworks Officer
Capt. Federico M. Bolusan	- Provincial Waterworks Supervisor
Mr. John Bagasao	- Mayor, Municipality of Bayombong
Mr. Lunbert Galima	- Mayor, Municipality of Solano

STUDY TEAM MEMBERS

Mr. Toru Hayashi	- Team Leader Legislation/Organization Nippon Jogesuido Sekkei Co., Ltd. (NJS)
Mr. Masatoshi Momose	- Water Supply System Planning, NJS
Mr. Chikara Amitani	- Water Supply System Planning, NJS
Mr. Masuomi Hiroyama	- Transmission/Distribution System Planning, NJS
Mr. Hideaki Fukui	- Transmission/Distribution System Planning, NJS
Mr. Takafumi Kiguchi	- Facility Design, NJS
Mr. Yukio Maejima	- Water Source Planning, NJS
Mr. Fumiaki Ichino	- Water Source Planning, Richo Soil Investigation Co., Ltd.
Mr. Mitsuo Tsutsumi	- Well Development, NJS
Mr. Masaaki Awamoto	- Financial and Economic Analysis, Techno Consultants, Inc.

MINUTES OF THE MEETINGS

MINUTES OF THE MEETING
MUNICIPAL WATER SUPPLY
PROJECT STUDY

Manila, March 25, 1986

Toru Hayashi

Toru Hayashi
Study Team Leader
Japan International
Cooperation Agency

[Signature]
Atty. Ibarra Olegado
Officer in charge
LWUA

[Signature]

J.H.

[Signature]

MINUTES OF THE MEETING

A series of meetings between JICA survey team and LWUA personnel regarding the Inception Report were held during March 18 to March 24, 1986 to confirm the objectives, scope of work and schedule for implementation of the study. Also discussed during the meetings were undertakings by both parties and approaches to the project.

The following are the items agreed upon:

1. Objective of the Study

The objective of the study is to prepare Basic Development Plan and Short Term Development Plan for the water supply projects in the following four project areas.

1. Angeles City, Pampanga
2. Dagupan City, Pangasinan
3. Cabuyao, Sta. Rosa and Binan, Laguna
4. Bayombong and Solano, Nueva Vizcaya

2. Scope of the Study

The study will be conducted in four (4) phases including works both in the Philippines and in Japan. The following are the outline of each phase:

2.1 Phase I: Formulation of Basic Development Plan

- a) Collection and review of data and information available
- b) Implementation of field survey
- c) Outline of Basic Development Plan
- d) Preparation of framework for the Feasibility Study
- e) Preparatory work for implementation of Phase II study

2.2 Phase II: Field Investigation for Preparation of Feasibility Study

- a) Field Investigation
 - o Geoelectric prospecting
 - o Test well drilling and pumping test
 - o Inventory of wells and pumping tests of selected existing wells
 - o Measurement of yield at springs

- o Testing of existing pumps
- o Measurement of unaccounted-for-water and hydraulic survey
- o Investigation of existing water supply facilities
- b) Study of availability of materials and equipment for construction and improvement of water supply facilities and capability of local contractors
- c) Review of design criteria for design of proposed water supply facilities
- d) Study of the alternative water supply schemes

2.3 Phase III: Preparation of Feasibility Study (Draft Final Report)

- a) Preliminary design of the recommended water supply systems among alternatives
- b) Recommendation on organization/management of the system and establishment of water districts
- c) Implementation schedule
- d) Cost estimation for construction, operation, and maintenance of the system
- e) Financial study

2.4 Phase IV: Preparation of Final Report

3. Approach to the Project

3.1 Development of Master Plan

- a) Study Area

Study of fundamentals for the development of Master Plan will be made covering the entire city/municipality. However, the plan for the water supply system should be limited to those areas to be covered by level II/III systems.

- b) Target Year

The base year for planning is 1986 in principle and target year is 2010. In addition, the years, 1990, 1995 and 2000 shall be considered although detailed study, such as breakdown of population by sub-area shall be only made for the present, 1990 and 2010.

c) Plan of Water Supply System

Layout of the existing and proposed pipelines and other major facilities will be shown on the map

d) Rough Cost Estimates

Rough cost estimates will be made using cost data prepared by the LWUA for feasibility studies.

e) Water Sources

Based on the data on water resources collected during Phase I, applicable water sources will be recommended to meet the water demands and other conditions including socio-economic needs.

f) Establishment of the Water District

Information on the willingness by the cities and municipalities as well as present problem areas in management of the existing water supply systems will be collected and evaluated to make recommendations for implementation of the water supply project.

3.2 Preparation of Framework for the Short Term Development Plan

a) Previous reports, if any, prepared by the city/municipality will be reviewed. The subject area will be recommended in consideration of existing service area, potential water resources, needs and willingness of the inhabitants, and financial viability. Marketing surveys will be conducted by the LWUA financial specialists to support the study.

b) Target Year

The base year is 1986 in principle and target year is 1990 for the four project areas.

c) Water Sources

Existing water sources including springs and deep wells will be evaluated to their maximum safe capacities. Improvement of existing source facilities and new development requirements will also be studied.

- d) Preparatory work for the field survey during Phase II.

Most of the measurements in the field will be conducted during the Phase II. Since the work for test well drilling is critical, timely arrangement/procurement of equipment and material at the initial stage of the Phase II is indispensable. Detailed discussion to reach an agreement for the purpose between two parties will be made during the last two weeks of Phase I period reflecting the result of field survey and collected information. Responsibilities by each party for implementation of the field examination will be accomplished in accordance with the minutes exchanged on October 23, 1985.

4. Schedule for Implementation of the Study

4.1 Phase I

JICA team started field work from March 17 and is scheduled to finish its Phase I work on April 27. Discussions on the methodologies and required arrangements as well as collection and review of data will be conducted in Manila during first half of the study period. Field trip to the subject cities/municipalities will be done within two weeks during latter half of the study period. The outline of the basic development plan and framework of the short term plan will be prepared by the end of this Phase. Detailed schedule is attached herewith.

4.2 Phase II to Phase IV

Phase II field work is tentatively scheduled to start from the beginning of June 1986 and Final Report will be submitted at the end of February 1987 in Phase IV period.

5. Undertakings by JICA and LWUA

In accordance with the agreement between JICA and LWUA signed on October 23, 1985, each party will accomplish its responsibilities.



JICA



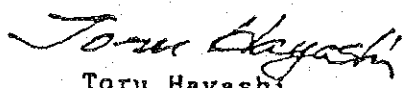
SCHEDULE FOR IMPLEMENTATION OF THE STUDY

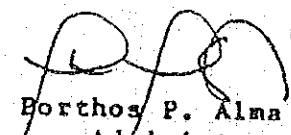
<u>Date</u>		<u>Activities</u>
March 17	Mon	1st Group: Tokyo-Manila, visit to Japan Embassy & JICA.
18	Tue	A.M.: Courtesy call on LWUA, P.M.: Explanation of and discussions on Inception Report.
19	Wed	Discussions on Inception Report, data collection and required arrangements.
20	Thur	Preparation of minutes and data collection.
21	Fri	Exchange of minutes.
22	Sat	Inner meeting of Survey Team.
(23)	Sun	- do -
24	Mon	Collection and review of data and information.
25	Tue	2nd Group: Tokyo-Manila, review of data and information.
26	Wed	. Analysis of data and information collected. . Preparatory work for the field survey
△ 27	Thur)
△ 28	Fri)
△ 29	Sat) Analysis of data and information collected.
(30)	Sun) B Group: Manila-Dagupan/ C Group: Manila-Dagupan
31	Mon	A Group: Cabuyao, etc / Dagupan City
April 1	Tue	. Data collection . Data collection
2	Wed	. Field Survey . Field Survey . Discussions with officers . Discussions with officers
3	Thur	
4	Fri	
5	Sat	Preparation of Field/ Preparation of Field Report Report
(6)	Sun	- do - - do -
7	Mon	A Group: Angeles City B Group: Bayombong & Solano C Group: Dagupan
8	Tue	. Data collection . Data collection
9	Wed	. Field Survey . Field Survey
	Thu	. Discussions with officers . Discussions with officers
11	Fri	

April 12	Sat	Preparation of Field Report	Preparation of Field Report
(13)	Sun	- do -	B Group: Dagupan-Manila
14	Mon	Review of data and information	
15	Tue	Preparation of Basic Development Plan and Framework of short term plan	
16	Wed	- do -	
17	Thur	- do -	
18	Fri	- do -	
19	Sat	- do -	
(20)	Sun	Preparation of Report	
21	Mon	Preparation of Report	
22	Tue	- do -	
23	Wed	- do -	
24	Thur	Meeting with LWUA	
25	Fri	Meeting with LWUA and visit to JICA and Embassy	
26	Sat	Inner meeting	
(27)	Sun	Manila - Tokyo	

MINUTES OF MEETING
MUNICIPAL WATER SUPPLY PROJECT STUDY

Manila, June 18, 1986


Toru Hayashi
Study Team Leader
Japan International
Cooperation Agency


Eorthos P. Alma Jose
Administrator
Local Water Utilities
Administration

MINUTES OF THE MEETING

A series of meeting between the JICA study team and LWUA officials regarding the Phase II Study Program for the Municipal Water Supply Project were held from June 9 to June 18, 1986 to confirm the placement of the Progress Report, scope of work and schedule of implementation of the study. Also discussed during the meeting were undertakings by both parties and approaches to the Phase II Study.

The following are the items agreed upon:

1. Progress Report

The study team submitted ten (10) copies of the Progress Report to LWUA on June 8, 1986.

2. Contents of the Phase II Study

2.1 Plan of Water Supply System

A plan of water supply system for the years 2010 and 1995 shall be prepared showing relationship of the major facilities and shall be incorporated in the Final Reports.

2.2 Basic Development Plan

The Basic Development Plan (2010) is recommended in the Progress Report as a result of the alternative study including potential water sources and required facilities. Supplemental description and schematic drawings will be prepared. Cost comparison between alternatives will be made based on the present cost.

2.3 Short Term Development Plan

The water supply system for the immediate improvement (1995) should be planned considering the relation to the Basic Development Plan.

2.4 Hydraulic Calculation

Hydraulic calculation on the recommended water supply system should be carried out.

2.5 Target Year

The target year for the immediate improvement is 1995. Required study for the fundamentals will be made for the year 1986 (base year), 1995 (immediate improvement) and 2010 (long term development), respectively. Implementation schedule for the year 1990 may also be included as the stage 1 of the immediate improvement program.

2.6 Design Criteria

Design criteria for feasibility study should follow the LWUA guidelines. To some extent, however, alternatives may be accepted if reasons are justifiable.

2.7 Composition of Reports

Composition of Interim Report and Draft Final Report will be finalized through the discussion between the Study Team and LWUA during the Phase II Study period.

3. Arrangement for Phase II Study

3.1 Land acquisition for Test Well Sites

LWUA shall at its own expense, be responsible for the land acquisition for test wells prior to the scheduled test well drilling.

3.2 Preparation for Drilling Equipment

In accordance with the Minutes of Meeting between JICA and LWUA dated October 23, 1985, LWUA shall at its own expense, be responsible for the provision of equipment for test well drilling.

One drilling rig shall be provided within the month of June, and another one beginning July.

Test well drilling in the three study areas shall be completed within the Phase II Study period.

3.3 Safekeeping of Materials for Test Wells

LWUA shall be responsible for safekeeping of materials for test wells which are supplied by JICA.

3.4 Field Survey

1. Schedule of the LWUA Engineers

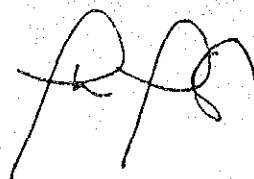
Required arrangements be made by the LWUA according to the following schedule:

Rodolfo Oamil	:	6/16 - 7/15 (Angeles City)
Allen Lowe	:	7/16 - 8/15 (Cabuyao, Sta. Rosa, Biñan)
Abelardo Buencamino	:	6/16 - 7/13 (Dagupan)
Melchor Casil	:	7/13 - 8/16 (Bayombong & Solano)

Schedule for the two hydrogeologists will be decided after making arrangement of drilling machine.

J.H.





2. Living allowance and travel cost for LWUA Engineers

LWUA is responsible for LWUA Engineer and well drillers.

In accordance with the schedule, they may work on Saturday/Sunday, if necessary.

3. Vehicle arrangement

Land Cruiser : LWUA will provide a vehicle (Land Cruiser) for the survey in Dagupan and Bayombong and Solano from June 16 (Mon) to August 15, 1986.

4. Preparation of road map for Cabuyao, Sta. Rosa and Biñan.

LWUA (Allen) will prepare and confirm (in the area) the road network for the subject area planned in the progress report. Aerial photograph be utilized for this purpose. This work should be completed by the beginning of July.

3.5 Market Survey

LWUA shall conduct the Market Survey for Angeles City on the third week of June.

3.6 Water Quality Analysis

Necessary arrangements for water quality analysis will be made at the LWUA laboratory or other institutions.

3.7 Electric Logging Equipment

LWUA will provide the study team with a set of electric logging equipment.

3.8 Data on Unit Cost

LWUA shall assist the study team in the collection of necessary data for unit cost.

S.H.

A

MM

22 September 1986

MINUTES OF AGREEMENT BETWEEN LWUA AND JICA

Discussions on the Interim Report and the requirement for completion of the Draft Final Report were made between the two parties (JICA and LWUA) from September 18 to 22, 1986. Fundamentals for planning water supply system for the four study areas and basic approach/figures which were incorporated in the Interim Report were agreed upon discussions. In addition, the following major subjects were confirmed by the two parties:

(1) Completion of Test Well Construction

The scheduled test well construction at the three sites, Dagupan, Angeles, and Sta. Rosa is behind schedule due to the delay of procurement of well drilling equipment, repair of broken equipment, land acquisition for test well sites as well as unfavorable weather.

Under these circumstances, the parties agreed that LWUA will make all efforts to catch up with the delay of construction.

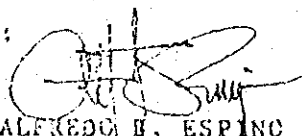
(2) Draft Final Report

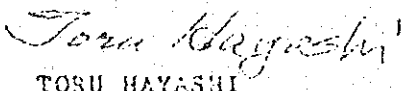
The major items to be included in the report are as follows:

- Chapter 1 Summary and Recommendations
- Chapter 2 General Background
- Chapter 3 Description of the Study Area
- Chapter 4 Existing System
- Chapter 5 Population and Water Demand Projections
- Chapter 6 Water Resources
- Chapter 7 Analysis and Evaluation of Alternatives
- Chapter 8 Recommended Plan
- Chapter 9 Financial Feasibility Analysis
- Chapter 10 Economic Feasibility Analysis
- Chapter 11 Organization and Management Study

Drawings to be prepared comprise general plan and standard drawings for major facilities.

Noted:


ALFREDO B. ESPINO
Planning Manager


TORU HAYASHI
Team Leader - JICA

MINUTES OF MEETING
MUNICIPAL WATER SUPPLY PROJECT STUDY

Manila, December 8, 1986

Toru Hayashi

Toru Hayashi
Study Team Leader
Japan International
Cooperation Agency

P. Alma Jose

Porthos P. Alma Jose
Administrator
Local Water Utilities
Administration

MINUTES OF THE MEETING

A series of meeting between JICA survey team and LWUA personnel regarding the Draft Final Report on Municipal Water Supply Project were held during the period December 2 to December 8, 1986 to present the report on the study and confirm its contents.

From Chapter 2 to Chapter 5, i.e., General Background, Description of the Study Area, Existing Water Supply and Sanitation Conditions, and Population and Water Demand Projections, no problem was noted since the contents of these chapters have already been discussed and concurred by both parties at the time the Progress Report and Interim Report were submitted.

The major items to be revised/supplemented are as follows:

Technical Aspect

1. Alternative study of transmission/distribution pipeline system

. Staged construction of pipeline:

An economic evaluation of staging construction of transmission and distribution mains will be studied and presented in the report. Two phases of construction should at least be considered taking into consideration the following recommended construction Phases:

- Phase I - (1989-1995)
- Phase II - (1996-2010)

. Alternative of pipeline routes: If there are available roads, 2 alternatives will be studied for major main routes. Others will be discussed and cancelled.

. Economic cost comparison

As per request of LWUA, economic evaluation will be made for the discount rate of 12 percent. The estimation using the rates of 10% and 15% will also be made for reference purpose.

2. Hydraulic calculation for the distribution network.
The computation results of alternative and recommended distribution system will be incorporated in the Appendix.
3. Review and revise/supplement the alternative study, Chapter 7 with reference to the presentation.
4. Preparation of implementation schedule using bar-chart. Based on the implementation program shown in the Draft Final Report, bar-chart showing construction period by phase will be prepared for major facilities. That for Phase II is roughly prepared.

5. Preparation of a plan of water supply facilities showing the differences of construction phases. The scale of the plan may be approximately from 1/20,000 to 1/25,000.

6. Cost estimates

Required cost for the services of leakage detection and for repair/replacement of existing pipes and accessories will be added under the following conditions:

- a) Old laterals: The subject length of the pipeline is 10-30% of the total length of existing laterals. Unit cost is that for new construction.
- b) Service Connections: Required cost is estimated based on the unit cost given below

$$\{ \text{P850 (material) + labor cost} \} \times \text{No. of existing connections}$$

- c) Cost for leak detection: P240/connect \times No. of existing connections

7. Study of economical sizing of pump transmission mains.

Financial Aspect

1. Financial scheme should not include government grant since the policy of the LWUA changed two months ago. The soft loan may be utilized to supplement regular loan. LWUA can extend soft loans up to a maximum of 50% of the total project cost.

A certain percent of Water District equity to the total construction cost may be considered depending on the ability-to-pay of the W.D.

2. Per latest policy Engineering cost is computed as a fixed percentage of estimated construction cost (ECC). ECC is equal to the summation of basic construction cost, physical contingencies and price contingencies. The percentages are:

$\text{ECC} \leq \text{P20M}$ = Engineering cost is 13% of ECC

$\text{ECC} > \text{P20M}$ = Engineering cost is 10% of ECC

Construction supervision is 4% of ECC

3. Debt service table

- a) Standard procedure = Regular loan can finance disbursements for the first four (4) years and soft loan for the next 4 years. However, the combination of the two types may be adopted.
- b) Preparation of separate debt service tables for regular loan and for soft loan.

4. Preparation of a table for unescalated O & M costs

5. Equivalent volume of water sold

- . Water consumption for the first 10 cu.m will be calculated using the total number of domestic connections and 10 cu.m/connection

- . Range of water consumption maybe as follows:

- 1) First 10 cu.m,
- 2) 11-20
- 3) 21-35
- 4) over 35

The present percentages for the ranges from 11 cu.m to over 35 cu.m will be used for the calculation of the total equivalent volume.

6. Financial Internal Rate of Return (FIRR) computation

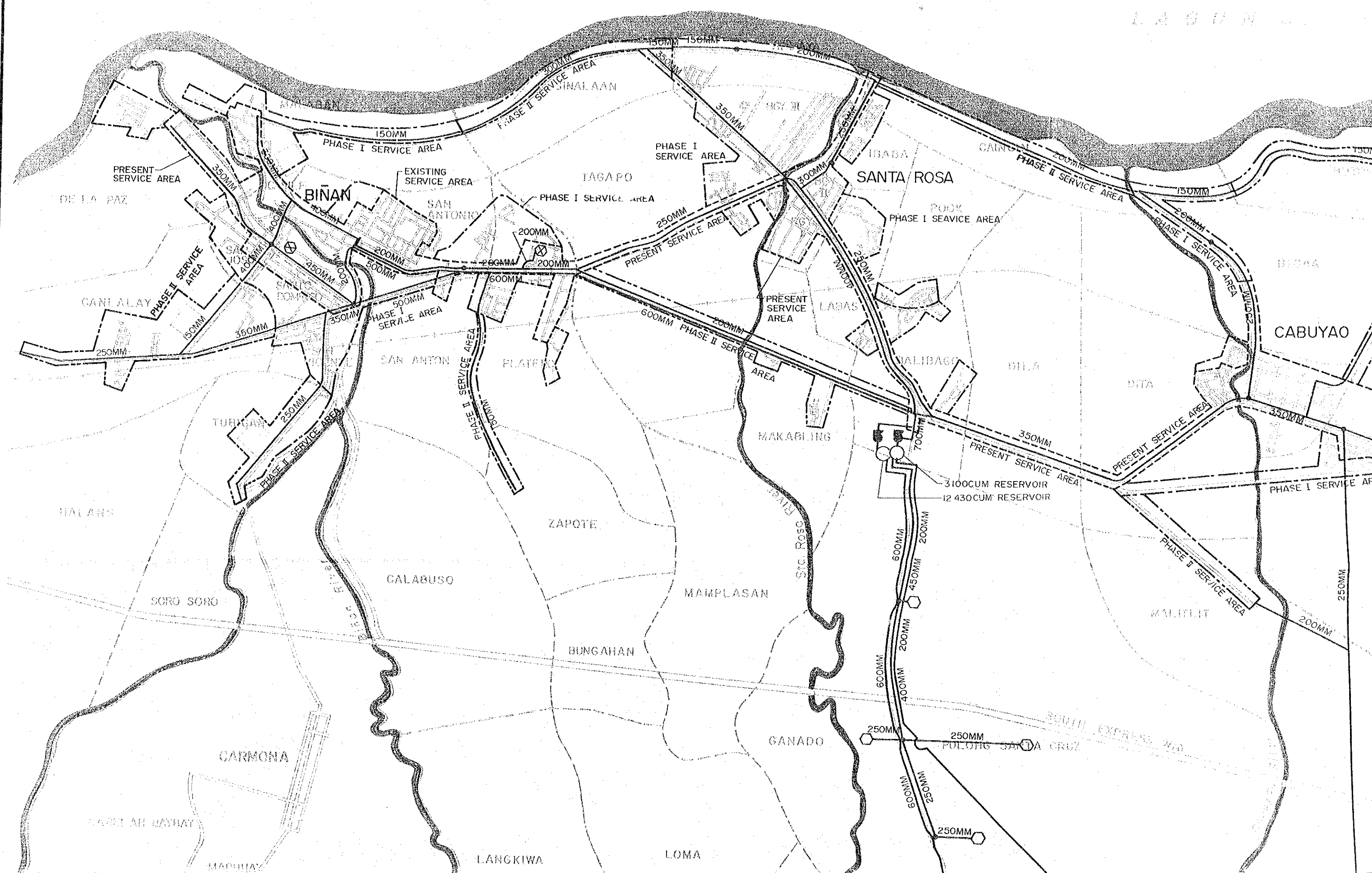
In conformance with LWUA procedure FIRR will be computed based on the total investment not just the portion funded by WD equity to measure the efficiency of the project as a whole.

The FIRR may at least be equal to the weighted average of the interest rates of the loans (regular and soft loans). The period for this analysis can be extended (20 to 40 years).

7. As per LWUA standards, fifteen (15%)percent inflation rate is used.

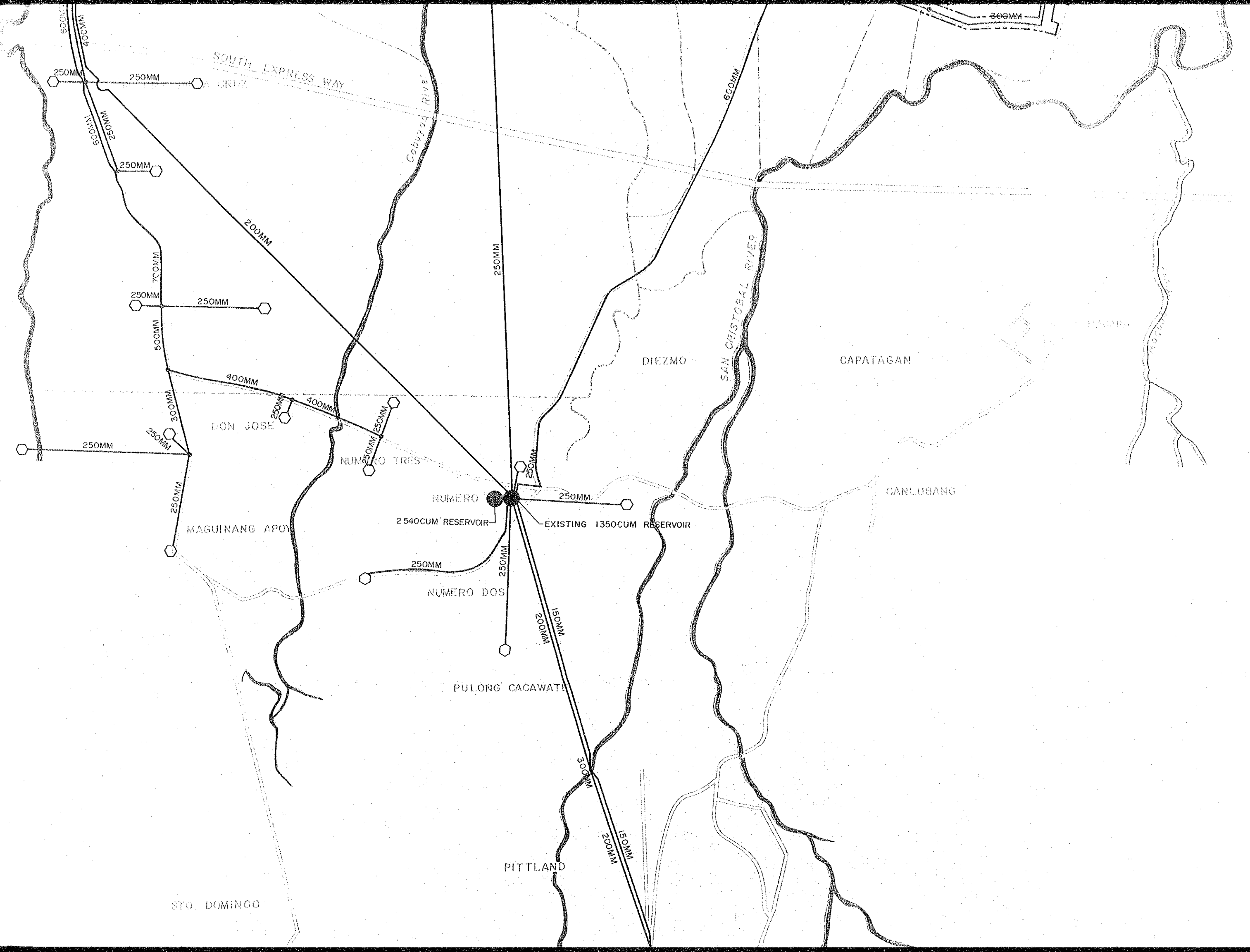
8. Economic Analysis

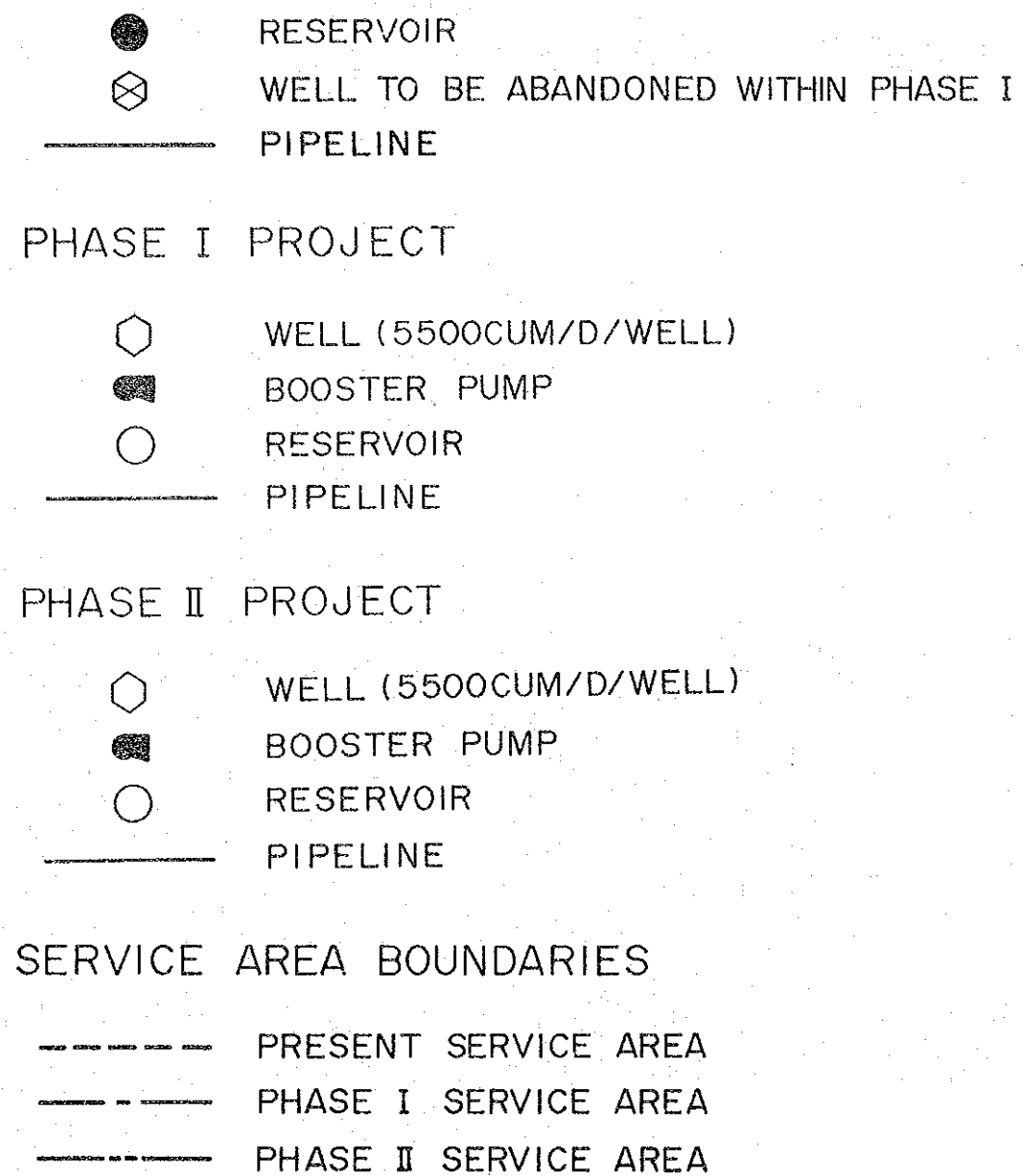
In consideration of the characteristics of the project, IERR may be lower than the desired level.



LAGUNA DE BAY







STO. DOMINGO

PUTING KAHAY

FIGURE 8.2.1
GENERAL LAYOUT OF THE RECOMMENDED WATER SUPPLY S
CABUYAO - STA. ROSA - BIÑAN, LAGUNA
MARCH 1987

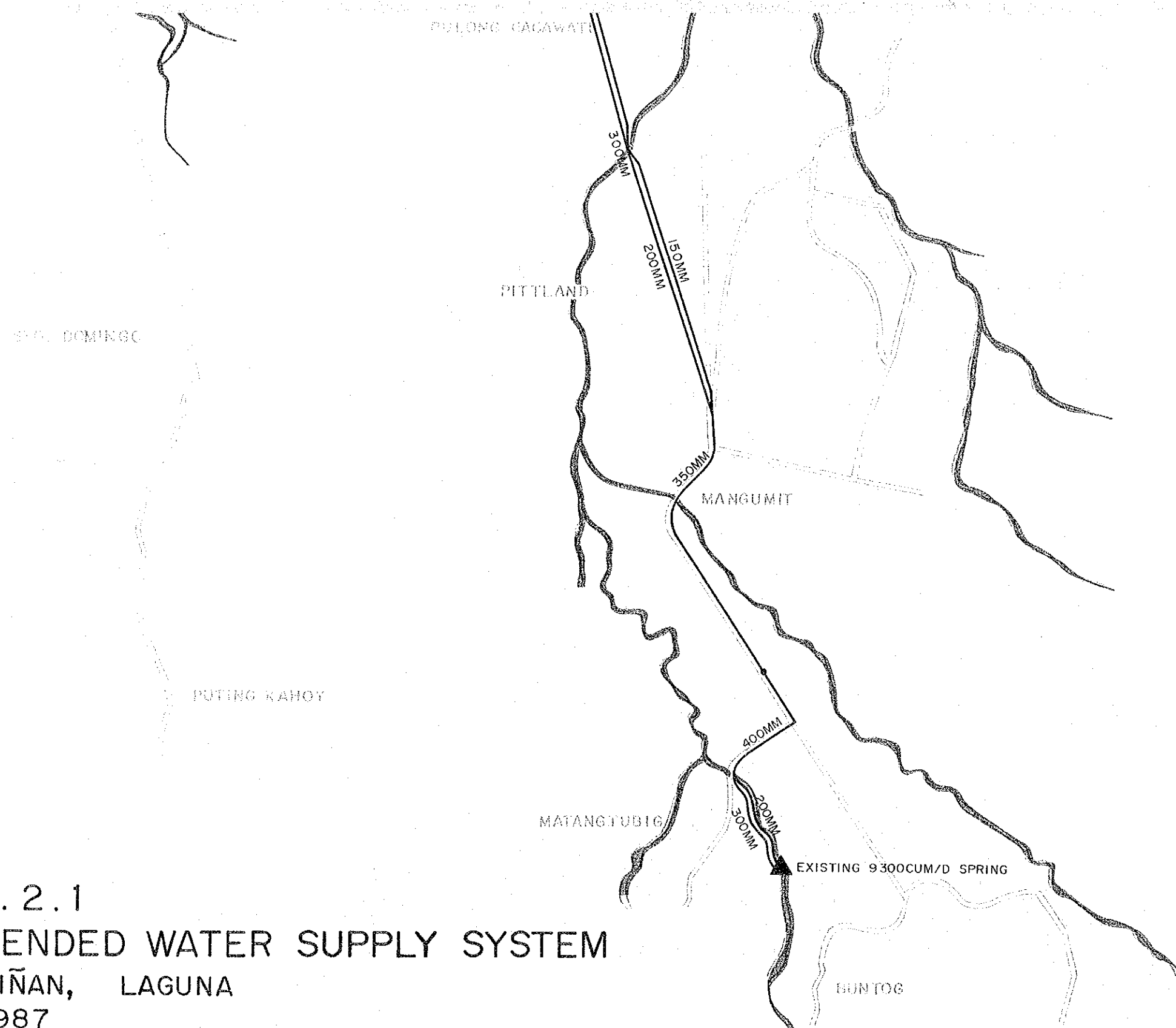


FIGURE 8.2.1
 THE RECOMMENDED WATER SUPPLY SYSTEM
 - STA. ROSA - BIÑAN, LAGUNA
 MARCH 1987

