社会開発調査部報告書

No. 52

REPUBLIC OF THE PHILIPPINES

METROPOLITAN WATERWORKS AND SEWERAGE SYSTEM

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

VOLUME 3
SUPPORTING REPORT

2

JUNE 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

S S S
92-057(¾)

CHAPTER 11

URBAN DEVELOPMENT PLANNING

CHAPTER 11 URBAN DEVELOPMENT PLANNING

CONTENTS

LIST OF TABLES 11-i

LIST OF FIGURES 11-v

11.1 BRIEF BACKGROUND OF THE STUDY AREA 11-1

11.1.1 Political Delineations 11-1
11.1.2 Land Area and Population 11-1

11.2 SOCIO-ECONOMIC PROFILE 11-2

11.2.1 Social Profile 11-2
11.2.2 Economic Profile 11-3

11.3 HOUSING 11-5

11.3.1 Housing Statistics or Present Situation 11-5
11.3.2 Housing Demand 11-6
11.3.3 Housing Regulation 11-7
11.3.4 Issues and Problems 11-7

11.4 LAND USE 11-9

11.4.1 Methodology 11-9
11.4.2 Classification of Land Use 11-9
11.4.3 Land Use Development 11-11

11.5 INFRASTRUCTURE 11-12

11.5.1 Transportation 11-12
11.5.2 Sewerage System 11-12
11.5.3 Power Supply 11-12

11.6 DEVELOPMENT FRAME WORK 11-13

11.6.1 General 11-13
11.6.2 Region Development Plan In The Study Area 11-14
11.6.3 Growth Of The Study Area 11-17
11.6.4 Land Use Development 11-19

11.7 CONFIRMATION OF FRAMEWORK 11-22

11.7.1 Population 11-22
11.7.2 Economic Growth 11-26
11.7.3 Industrial Structure 11-29

11.8 URBAN DEVELOPMENT PLANNING 11-31

11.8.1 General 11-31
11.8.2 Antipolo Area Development Plan 11-33
11.8.3 Conclusions 11-37

LIST OF TABLES

11.1.1 POPULATION AND GROWTH RATE BY REGION FOR CENSUS YEARS ... 11-41
11.1.2 POPULATION DENSITY OF THE STUDY AREA 11-42
11.1.3 POPULATION DISTRIBUTION OF THE STUDY AREA 11-43

11.2.1 REGIONAL SOCIAL PROFILE 11-44
11.2.2A POVERTY INCIDENCE BY REGION 11-45
11.2.2B HOUSEHOLD POPULATION 15 YEARS OLD AND OVER BY EMPLOYMENT STATUS AND BY REGION 11-46
11.2.2C EMPLOYMENT GENERATION IN METRO MANILA BY SECTOR 11-47
11.2.2D LABOR PRODUCTIVITY, 1980-1988 (AT CONSTANT 1978 PRICES) 11-48
11.2.3A GROSS REGIONAL DOMESTIC PRODUCT FOR 1987-1988 (AT CONSTANT 1972 PRICES) 11-49
11.2.3B REGIONAL SHARE OF GROSS REGIONAL DOMESTIC PRODUCT (AT CONSTANT 1972 PRICES) 11-50
11.2.3C NCR GROSS REGIONAL DOMESTIC PRODUCT BY SECTOR (AT CONSTANT 1972 PRICES) 11-51
11.2.3D FAMILY INCOME DISTRIBUTION AND SOURCES 11-52
11.2.3E 1985 NCR AVERAGE ANNUAL FAMILY INCOME AND EXPENDITURE BY INCOME CLASS 11-53
11.2.3F 1988 NCR AND CAVITE PROVINCE FAMILY INCOME AND EXPENDITURE BY INCOME CLASS 11-54
11.2.3G NUMBER OF ESTABLISHMENT BY KIND OF TRADE/BUSINESS BY MUNICIPALITY, CAVITE (S.A), 1989 11-55
11.2.3H NUMBER AND TYPE OF COMMERCIAL ESTABLISHMENTS BY KIND OF TRADE, PROVINCE OF CAVITE 11-56
11.2.3I NUMBER OF ESTABLISHMENTS BY KIND OF TRADE/BUSINESS BY MUNICIPALITIES, PROVINCE OF RIZAL, 1990 11-57

11.3.1A POPULATION AND NUMBER OF HOUSEHOLDS 11-58
11.3.1B NUMBER OF FAMILIES BY TYPE OF BUILDING OCCUPIED: PHILIPPINES, NCR AND REGION IV, 1985 11-59
11.3.1C NUMBER OF OCCUPIED DWELLING UNITS BY TYPE OF BUILDING, MUNICIPALITY OF CAVITE, 1980 11-60
11.3.1D NUMBER OF BUILDINGS BY REGION AND PROVINCE: 1989 11-61

11.3.2 PROJECTED NUMBER OF HOUSEHOLDS OF THE STUDY AREA 11-62
11.3.3 METRO MANILA PRIORITY RESETTLEMENT PROGRAM MAGNITUDE BY CITY/MUNICIPALITY 11-63

11.4.1 ESTIMATED AREA BY LAND USE CATEGORY 11-64

11.5.1A LENGTH OF EXISTING ROADS BY SYSTEM CLASSIFICATION (AS OF DECEMBER 31, 1989) 11-65
11.5.1B EXISTING ROADS BY SURFACE TYPE (CAVITE AND RIZAL) 11-66
11.5.2 SOURCE OF POTABLE WATER AND HOUSEHOLD SERVED 11-67

11.7.1 TOTAL POPULATION, HOUSEHOLD POPULATION AND NUMBER OF HOUSEHOLDS IN THE STUDY AREA (1990) 11-68
11.7.2 POPULATION DISTRIBUTION IN ANTIPOLO (1990) 11-69
11.7.3 GROWTH RATE OF THE STUDY AREA'S POPULATION (1990-2010) .. 11-70
11.7.4 POPULATION PROJECTION FOR THE STUDY AREA, 1990-2010 11-71
11.7.5 POPULATION PROJECTION FOR THE MUNICIPALITY OF ANTIPOLO, 1990-2010 11-72
11.7.6 POPULATION DISTRIBUTION, LAND AREA AND POPULATION DENSITY ANTIPOLO AREA (1990, 2000 AND 2010) 11-73
11.7.7 POPULATION DISTRIBUTION, LAND AREA AND POPULATION DENSITY AQUIFER BASIN ZONE (1990, 2000 AND 2010) 11-74
11.7.8 BLIGHTED POPULATION BY CITY/MUNICIPALITY, NATIONAL CAPITAL REGION 11-75
11.7.9 BLIGHTED POPULATION PROJECTION, NCR 11-76
11.7.10 GENERAL FUND (MUNICIPALITY OF ANTIPOLO) 11-27
11.7.11 PER CAPITA DOMESTIC DEMAND GROWTH 11-28
11.7.12 LARGE MANUFACTURING ESTABLISHMENTS 11-29

11.8.1 ESTIMATED AREA COVERED BY THE ANTIPOLO (1991) 11-77
11.8.2 ESTIMATED AREA BY LAND CATEGORY, ANTIPOLO AREA, 1991 11-78
11.8.3 ESTIMATED AREA BY LAND CATEGORY, ANTIPOLO AREA, 2020 11-79

LIST OF FIGURES

11.1.1 GROWTH OF PHILIPPINE POPULATION 11-80
11.1.2 POPULATION DENSITY OF NCR 11-81
11.1.3 POPULATION DENSITY OF CAVITE AND RIZAL 11-82
11.1.4 GROWTH OF THE STUDY AREA POPULATION..... 11-83

11.2.1 EMPLOYMENT SITUATION 1980-1990 11-84

11.4.1 LAND USE MAP (1990) 11-85

11.5.1 TRAFFIC FLOW (1989) 11-86

11.6.1 PHYSICAL GROWTH STRATEGY 11-87
11.6.2 GROWTH OF THE STUDY AREA 11-88

11.7.1 ESTIMATED POPULATION GROWTH OF THE STUDY AREA 11-89
11.7.2 COMPARISON BETWEEN AWSOP'S AND THE JICA STUDY TEAM'S POPULATION PROJECTION FOR THE MUNICIPALITY OF ANTIPOLO 11-90
11.7.3 BLIGHTED AREAS IN THE NCR 11-91
11.7.4 GROSS DOMESTIC PRODUCT (GDP) NATIONAL OF THE CAPITAL REGION 11-92
11.7.5 INDUSTRIAL LOCATIONS 11-93

11.8.1 STRUCTURE PLAN 11-94
11.8.2 LAND USE MAP, ANTIPOLO AREA: 1991 11-95
11.8.3 FUTURE LAND USE MAP, ANTIPOLO AREA: 2010 11-96
11.8.4 LAND AREA COMPARISON, 1991-2010 11-97
11.8.5 LAND USE PLAN 11-98

CHAPTER 11 URBAN DEVELOPMENT PLANNING

11.1 BRIEF BACKGROUND OF THE STUDY AREA

11.1.1 Political Delineation

There are thirteen administrative regions in the Philippines including the National Capital Region (NCR). The Study Area comprises the NCR and the two provinces (Rizal and part of Cavite) of Region IV.

The NCR, better known as Metro Manila, is composed of four (4) cities and thirteen (13) municipalities, namely: the cities of Manila, Quezon, Pasay and Caloocan; and the municipalities of Las Piñas, Makati, Malabon, Mandaluyong, Marikina, Muntinlupa, Navotas, Parañaque, Pasig, Pateros, San Juan, Taguig, and Valenzuela.

Region IV has the most number of provinces, totaling eleven (11): Aurora, Batangas, Cavite, Laguna, Mindoro Oriental, Mindoro Occidental, Marinduque, Palawan, Quezon, Rizal and Romblon. Rizal has fourteen (14) municipalities, while Cavite has one city and five (5) municipalities.

Manila was proclaimed the capital of the Philippines on 24 June 1571 and remained so until Quezon City became the capital on 17 July 1948. By Presidential Decree No. 940, Manila was restored as the capital and the permanent seat of the National Government on 14 June 1976.

11.1.2 Land Area and Population

(1) Land Area

The Philippines has a total land area of approximately 300,000 square kilometers. Region IV, among all the regions, has the largest land area (46,924.10 km^2), representing 15.64 percent of the country's total. NCR, on the other hand, has the smallest land area (636 km^2), representing only 0.21 percent of the country's total.

(2) Population and Distribution

The 1990 Philippine Population Census (Preliminary Count by the National Statistics Office as of May 1990) placed the population of the country at 60,685,000. This figure is 12,587,000 more than the population ten years ago (1980) and reflects an annual growth rate of 2.3 percent (Table 11.1.1 and Figure 11.1.1).

Among the thirteen regions, the NCR and the Southern Tagalog Region (Region IV) account for the bulk (36.7 percent) of the country's total population. The total population of Metro Manila is 7,833,000. Cavite and Rizal have respective populations of 458,771 and 880,608. NCR and Region IV are the most urbanized and economically developed of the 13 regions.

The MSA covers the whole of NCR and 3.2 percent of Region IV. It comprises five (5) cities and thirty-two (32) municipalities whose combined population in 1990 was 9,172,379 (6,805,630 in 1980). This population figure represents 15.17 percent of the country's total and reflects an increase of 34.78 percent over the 1980 figure, or an annual growth rate of 3.03 percent.

The population densities in the MSA are shown in Table 11.1.2 and Figures 11.1.2 and 11.1.3.

11.2 SOCIAL-ECONOMIC PROFILE

In view of the inadequate economic accounts at the municipal level, the summary values of economic indicators for the Study Area were drawn from provincial and regional data using employment and income participation ratios as basic parameters.

11.2.1 Social Profile

(1) Social Development Indicators

The NCR and Region IV as a whole has the major advantage among the regions in terms of social services, physical facilities and those

amenities associated with urban life. However, a large portion of its population still bears the brunt of poverty and its attendant ills: unemployment, underemployment, congestion, ill-health and malnutrition, poor delivery of basic services, etc. Table 11.2.1 shows the social profile of the regions using major indicators.

(2) Labor Force

The economically active population within the age range of 15-64 years constitutes the country's labor force (NSO definition). In 1988, the total population of those who are 15 years old and above was 35,865,000 (Table 11.2.2B).

For Metro Manila, its labor force in 1989 was estimated to be 3.1 million, representing around 60 percent of the working age population, and which for the last three years increased at an annual average rate of 3.0 percent.

(3) Employment

Total employment in the Philippines was 20,595,000 in the third quarter of 1986 (Table 11.2.2B). Employment rate for the same period was 88.9 percent, a reduction from the 95.0 percent registered in 1980. The employment rate, however, improved to 91.7 percent in 1988.

For Metro Manila, the employment rate was estimated at 82.2 percent in 1989, slightly lower than the 84.8 percent registered in the third quarter of 1988 and slightly higher than the 1986 average of 80.6 percent.

11.2.2 Economic Profile

(1) Gross Regional Domestic Product

The National Capital Region (NCR) maintained in 1989 its traditional lead among the regions by producing a hefty ₱33.2 billion worth of Gross Regional Domestic Product (GRDP). The primacy of NCR in setting the trend of the national economy may be gleaned from its performance during the 1980-1986 period when its annual contribution to the total Gross

Domestic Product (GDP) averaged as much as 31 percent (Table 11.2.3A-C)

(2) Economic Sectors

In the medium- and long-term periods, the capital region is envisioned to have its industry dominance gradually reduced by the transfer of its major socio-economic activities to the industrial centers of its regional neighbors. It will, however, hold on to its lead as center for trade, finance and commerce and education, and as seat of the National Government. In consonance with the limits that its environment and geography can provide, existing levels of industrial activity shall be maintained.

(3) Household Income

According to the Family Income and Expenditures Survey (FIES) conducted by the NSO in 1985, the average annual family income in the Philippines was P31,052. It was ₱29,985 in Region IV, ₱57,193 in NCR, ₱39,759 in Cavite Province, and ₱38,518 in Rizal (Table 11.2.3D).

With the current economic situation, declining real incomes place increased demands on the government's shelter, health and social infrastructure programs.

(4) Industry and Trade

The industry sector in the Philippines is dominated by manufacturing whose contribution since 1972 to the value added by industry averages to around 75%. The share of construction and utilities has varied between 15% to 20% of total industry value added.

In the Study Area, the industry sector is composed of manufacturing, construction, electricity, gas and water.

11.3 Housing

11.3.1 Housing Statistics or Present Situation

Housing is a basic need which contributes to a population's productivity, welfare, social stability and economic development. Despite well-meaning intentions and modest accomplishments in the past, there yet remain vast number of Filipinos living in unacceptable and substandard housing. It is recognized that fundamental changes in policies and strategies area necessary for a better and more effective service delivery of housing to the intended beneficiaries, especially those most in need.

In recent years, the country has been experiencing a serious economic crisis that has adversely affected the people's income and employment opportunities. The Study Area is not spared by this crisis which has negatively impacted on the housing supply.

The country's housing problem is twofold: fist, it is a problem of quantity, i.e., the need for new housing stock for natural population and household growth; and second, it is a problem of quality, i.e., the need to upgrade existing stock of makeshift and light material housing.

The bulk of the Philippine population reside in private households while very few live in institutional types of residences. In 1980, there were 8.6 million households with an average size of 5.6 persons per household (Table 11.3.1A).

As of May 1990, there were about 11.4 million households with an average size of 5.3 persons per household (Table 11.3.1A). Apparently, the basic social unit in the Philippine society, which is the household, has become smaller in size giving rise to speculations that the extended family systems may be breaking up in response to present economic conditions.

The clamor for home ownership and security of tenure has increased. In NCR, it is estimated that about 58 percent of Filipino households do not own the houses they live in while 22 percent do not have tenure of the land on which their houses are built.

According to the 1990 Census of Population and Housing of the National Statistics Office (NSO), there are about 1,836,564 unit-houses in the MSA. Of this total, Metro Manila accounted for 1,557,000 units (84.8%), Cavite (that part of the Study Area) for 91,435 units (5.0%), and Rizal Province for 188,129 units (10.2%).

Table 11.3.1B presents by type of building the number of families in the country and the NCR. The majority (67.1%) of families in the NCR live in single houses. The remaining 32.9% live in duplex (4.23%), apartment/accessoria/condominium (21.62%), improvised buildings or shanties (4.9%), commercial/industrial/agricultural buildings (1.8%) and other dwellings (0.4%) such as natural shelters, boats, etc.

Table 11.3.1B shows by type of building the number of occupied units. The majority (90.3%) of dwelling units in Cavite (Study Area) is occupied by single houses and only 9.7% lives in the remaining types of buildings (Table 11.3.1C). According to the 1989 Census of Buildings (NSO), there were 893,534 building units in NCR (about 21%) of the total number in the Philippines), 116,158 units in Cavite Province and 105,496 units in Rizal. These figures are shown in Table 11.3.1D.

11.3.2 Housing Demand

Housing needs are subdivided into backlog and future needs. The backlog consists of two major components: (1) the reduction of doubled-up households and substandard dwelling units, (2) the provision of sites and services for marginal income families. Future needs, on the other hand, include: the need for new houses due to new household formation, rural to urban in-migration and replacement of existing stock due to age deterioration. With households in 1986 numbering about 10 million nationwide, and an annual average rate of increase of 2.13% in the rural areas and 4.58% in the urban areas, housing needs have been given due attention in the government's plan for the period of 1987-1992.

The projected housing needs of the country for the period 1987-1992 was estimated at 3.4 million dwelling units. Of this total, 576,000 or 17.1 percent will be needed for NCR and 205,000 for Region IV.

The number of households in the Study Area which was 1.8 million in 1990, is estimated to reach 3.1 million in 2010 for a yearly average

increase of 27 percent (Table 11.3.2)

PROJECTED HOUSING NEEDS, 1987-1992
(Thousand Dwelling Units)

	1987	1988	1989	1990	1991	1992	1987-92
Philippines	531	545	558	570	580	592	3,376
NCR	91	93	96	98	98	100	576
Region IV	31	32	34	35	36	37	205

Source: 1980 Census of Housing (NEDA)

11.3.3 Housing Regulation

The Housing and Land Use Regulatory Board (HLURB) eased the housing standards and rules under Batas Pambansa Blg. 220 (Standards for Socialized and Economic Housing) to make lots and housing units affordable to more families in the lower income bracket and to further encourage the housing program. The HLURB introduced major changes to BP 220. For example, for owners of subdivision with minimum development, lots with minimal provisions and utilities may be sold to the public and further improvements may be made by the homeowners themselves.

11.3.4 Issues and Problems

Despite the increase in the number of units constructed by the private and the public sectors for low-income housing, the production of affordable housing has not matched the rapid population increase, and thus, the growing demand for housing in Metro Manila. Aggravated by land speculation and increases in prices of construction materials, and compounded further by peace and order problems in some provinces which helps increase in-migration to Metro Manila, squatting has risen to alarming levels. This led to substandard living due to inadequate, sanitation facilities, water supply, electricity livelihood and educa-

tion opportunities. It is estimated that about one-third of Metro Manila's population are squatters.

NCR as an urban center has progressively deteriorated. The rapid urbanization has overtaken the existing supply of basic amenities resulting to an imbalance of too many people with less or no basic services. Squatter colonies have become part of the metropolitan landscape.

Inevitably, social ills became as alarming as the aforesaid problems and are hurting the citizenry considerably. Together with unemployment, underemployment, traffic and transportation mess, a rise in criminality has been noted. In addition, there is a breakdown in the educational system.

A conservative estimate of the number of squatter households, based on surveys conducted by the NHA in 1990, is as follows:

National Total	:	710,000 households
Metro Manila	:	430,000 households
Regional Urban Center	:	280,000 households

The squatting problem particularly in Metro Manila is so large that there is a need to address the problem on a priority basis. The highest priority for clearing and resettlement are squatters impeding public access, those occupying land needed for government infrastructure programs and those residing in dangerous areas. The latest survey conducted by the NHA in coordination with local government units and other government agencies indicates that there are 220 such priority sites in Metro Manila that are occupied by 59,071 families (Table 11.3.3).

The major problems of the housing sector may be identified as follows:

- o Mushrooming of squatter areas resulting in inadequate sanitation facilities
- o People migrate from agriculture to industrialized place.
- o High cost of construction materials

- o Lack of financial resources for the replacement of unacceptable dwelling units or for the provision of low-cost housing for low-income local residents.

All these manifestations are built within the problem of lack of proper and adequate urban planning to emphasize owning decent and affordable housing units.

11.4 LAND USE

11.4.1 Methodology

In accordance with the concept of the framework plan, the present land use conditions were analyzed as the basic data for the groundwater development in Metro Manila.

A land use map covering the entire Study Area of about 212,560 hectares was produced following the guidelines on map preparation:

- o pre-field work which involves the collection of available data and field checking of Cavite and Rizal provinces.

- o post-field work which involves the compilation of all data and making of final land use map.

The main maps and data for the analysis are the contour map with 1/50,000 scale (NAMRIA, reprinted 1990) and the land use map with 1/50,00 and 1/75,00 scales (BSWM, 1988).

11.4.2 Classification of Land Use

The total land area of the Study Area is estimated at 212,555 hectares and is divided as follows:

	NCR	: 63,600 Has.
	Cavite (S.A.)	: 18,572 Has.
	Rizal (*)	: 130,383 Has.
(*)	NCSO, Bureau of Lands	: 130,383 Has.

BSWM	:	130,892 Has.
Office of the Provincial Assessor	:	157,345 Has.

Land use is classified into the following six major categories: (a) Built-up area; (b) Agricultural area; (c) Forest; (d) Wetland; (e) Open Space; and (f) Others.

(a) Built-up Area

In Metro Manila the built-up area occupies 47 percent of the total area. That of the Rizal province occupies 11.7 percent of the province's total.

The built-up areas of the Rizal Province are sporadically scattered. Major ones are concentrated in Cainta, Taytay and Antipolo because of their contiguity to Metro Manila.

The major built-up areas of Cavite are composed of the municipalities ringing the Metropolitan Area, namely, Bacoor, Kawit, Noveleta and Cavite City. Imus is also rapidly expanding and experiencing the suburbanizing trend of Metro Manila.

(b) Agricultural Area

This category includes all areas that are intended for agriculture: rice field, cropland, plantation, etc.

In Rizal, the total agricultural area is about 19,167 hectares or 14.7 percent of the total area of the province. The southern part of Imus constitutes this type of area in Cavite.

(c) Forest

Forests are found mainly in the mountainous parts of Montalban, Antipolo and Tanay, and also in the lower hills and along waterways or creeks. They cover about 16,618 hectares or 12.7 percent of the total area of the Rizal province and are the next most extensive natural cover of the Rizal province.

(d) Wetland

Wetland areas are found in low-lying coastal plains adjacent to large bodies of water.

(e) Open Space

This category consists of those areas associated or mixed-up with built-up areas. Most of the open spaces are found in the NCR.

(f) Others

Under this category are areas which could not be classified under the preceding five categories.

11.4.3 Land Use Development

Responding to the social, economic and political activities in recent years, changes in the land use pattern in Metro Manila may be summarized as follows:

- Increase in the number and density of squatter housing areas.
- The development of middle and upper class residential subdivisions on urban peripheries where land is inexpensive.
- The development in the main urban area of townhouses and high-rise condominiums for the middle and upper income market.
- The conversion of agricultural and fishpond areas for residential and/or commercial use.
- The emergence and intensification of suburban commercial nodes at intersections of major transport routes in response to the need of the growing number of residential subdivisions in the suburbs.
- The location of new and the relocation of existing industries at cheaper sites to the north (Bulacan), east (Rizal) and south (Cavite). These sites are along major transport routes.

11.5 INFRASTRUCTURE

In contrast to the rapid population growth witnessed during the past few decades, the infrastructure situation in the NCR has not kept pace as to be adequate to the basic needs of the inhabitants.

11.5.1 Transportation

The transport system of the country and Study Area remains to be dominated by land transportation facilities. This type of system accounts for 65 percent of the total domestic passenger traffic. The latest technology in land transport is the Light Rail Transit (LRT) which was opened in Metro Manila to decongest the streets.

The public transportation in Metro Manila, Cavite and Rizal is predominantly road-based, consisting largely of jeepneys and buses for primary and secondary routes, and tricycles and pedicabs for feeder routes.

11.5.2 Sewerage System

Two sewerage systems are working in the NCR. One is the Central Manila Sewerage System constructed before 1909 with an original overload capacity of 450,000 people. Presently, this system covers 1,850 hectares and serves 530,000 people. It has a total length of 240 km. The other is located in Quezon City and Makati, and which is made up of isolated systems in subdivisions and commercial areas serving 350,000 people. Total length is about 140 km. The rest of the NCR populace discharges its wastewater either into storm drains, septic tanks or directly to esteros (small streams).

11.5.3 Power Supply

The country's electric power is generated by the state-owned National Power Corporation (NPC). Power generation is done through geothermal means or through the use of oil, coal, hydropower, and other energy resources. The generated power is supplied (at 115 kv or at 230 kv) to the Manila Electric Company (MERALCO) which distributes it over the whole of NCR, Rizal and Cavite.

11.6 DEVELOPMENT FRAMEWORK

The Chapter delves into conditions of zones and existing and future urban uses. It organized the background information used in Stage I and the complementary data generated during the second survey to estimate future populations, economic growth and future land use. These data sets were also used in the development of the specific proposal for this study for the period 1990-2010.

Total population projections data were based on the 1980 and 1990 census of NCSO and were adjusted to reflect the yearly growth. More precise estimates on the number of people, family size, number of subdivisions, conditions of land use and other information which will be useful inputs in urban development planning were derived for the Antipolo area through detailed field survey. In addition, extensive spot surveys were conducted in the various areas of the NCR, the Cavite and Rizal provinces in order that the whole study area may be more generally viewed.

The planning period adopted is the next twenty (20) years; that is from 1990 to 2010. A 20-year horizon is adopted for two reasons: first, reasonable projections of population and service demands cannot be made for more than 20 years, using the base year data for 1980 and those available for 1990 when this study began; second, developments after the year 2010 will have little effect on future project selection, as discounting makes relatively insignificant the present value of future costs.

11.6.1 General

The study for the groundwater development of the MWSS service area analyzed the data on socio-economic conditions with the insights that these data may yield the needs of groundwater development. As the study covers a large area and encompasses quite a number of cities and municipalities, making it feasible required setting up background information and updated data for the whole Study Area. The urban development plan focused on the Antipolo area and some parts of its surrounding municipalities, namely, Taytay, Angono, Teresa and Binangonan, the aggregate area of which is about fifty-one (51) square kilometers.

11.6.2 Regional Development Plan in the Study Area

(1) Regional Development Priorities

The overriding socio-economic goals based on the NEDA guidelines for the preparation of the Medium-Term Regional Development Plan are economic recovery in the short-term and sustainable growth in the long-term, the generation of employment, the alleviation of poverty of the great masses of the population, and the provision of a more just and equitable sharing of the fruits of development. As these goals fit the regional situation, they have therefore been adopted also as the regional goals.

As Metro Manila continues to attract migrants and investors due to its inherent amenities and attractions, the existing pressures on urban services and facilities reflected by water and transport crises, increasing blightedness, housing shortage, traffic congestion and so forth, are expected to persist within the medium-term period (1990-1994).

Within this scenario, the impact of these metropolitan concerns could only be mitigated through the development of growth centers outside the National Capital Region which would act as complementary urban satellites (Figure 11.6.1).

Some of the current functions within the metropolis, such as primary manufacturing, may be transferred to these growth centers and thus complement the activities and services offered by Metro Manila.

Within the metropolitan area, there is a need to formulate measures to discourage further congestion, particularly highly dense urban zones. This may cover a an on expansion of industries or even the closing down of pollutive ones.

The regional development goals of poverty alleviation, employment generation and the promotion of an efficient urban system be the guiding policy thrusts of the metropolitan government. Thus, the promotion of micro, cottage, small and medium industries and the efficient mobility of people and goods shall be basic requisites of all related action programs.

With the other regions' development of their resource base and the increases in their respective contributions to the national economy, the NCR is expected to play a larger role in international trade, commerce and finance in light of the encouraging prospects within the Asia Pacific Region.

(2) Policies and Strategies

a. Alleviation of Poverty

The principles of self-reliance and social justice guide the poverty alleviation efforts of the government in Metro Manila. Increasing the access of the underprivileged to answer basic needs, developing their capabilities and promoting their self-organization would be the key strategies towards providing greater equity.

More specifically, reducing the incidence of poverty in Metro Manila shall be pursued through a coordinated, area-specific and multi-sectoral approach. This shall be undertaken through high-impact, horizontally-integrated programs which cover the provision of employment and livelihood, land and housing, health, social welfare, education and training, infrastructure support and environmental sanitation services. As a basic criterion, target areas shall be identified based on their compatibility with the land use and road transport system within the metropolis and its peripheral areas.

b. Delivery of Urban Services

Greater access by the people to goods and urban services is a key element in reducing poverty incidence. Specific measures in this regard shall be undertaken through concerted efforts of the public and private sectors.

Coordination with Local Government Councils and the Legislative Body shall be undertaken by the concerned sectors or by the metropolitan government in the updating of laws and the formulation of appropriate policy measures required for a more efficient and effective delivery of services within the metropolitan area.

Information dissemination shall be strengthened to promote consumer protectionism/assistance, awareness of product standards, and help in the conservation of water supply and power.

c. Creation of a Healthy Urban Environment

Efforts to bring about greater equity shall be coupled with those on improving the environment an use of urban land.

In particular, formulation of a Land Use Plan will pave the way for sound land allocation for urban uses and establish the basis for an updated Zoning Ordinance as a more meaningful land development control.

The improvement/rehabilitation/maintenance of natural drainage courses and existing facilities, particularly water supply, flood control/drainage and sewerage networks, should be given priority so as to prevent further deterioration of the urban ecosystem. Anti-pollution laws should likewise be strictly enforced, particularly on industries along Laguna Lake and water bodies.

These activities should be backstopped with massive information dissemination to promote public awareness and encourage active public participation and cooperation should be optimized.

The expected growth within the "CALABAR" area is seen as an opportunity to decongest the high density areas of the metropolis. Thus, strong coordination and support shall be provided in the:

- o development of all growth corridors outside the peripheral areas of the metropolitan region, and
- o the development of complementary centers to the North and the South of the NCR

An inter-regional planning system between the NCR, Regions III and IV shall be initiated to integrate the thrusts and growth directions of the three regions and to establish linkages between the technical and social infrastructure services network of Metro Manila with those of Central and Southern Luzon. It is necessary that the consolidation of develop-

ment efforts be coordinated in such a way as to assign specific areas the functions for which they are most suitable and hence optimize their potentials.

Figure 11.6.1 illustrates in detail the policies and strategies for a more desirable physical growth of Metro Manila.

11.6.3 Growth of the Study Area

(1) Urban Growth

Like most primate cities in the developing world, Metro Manila has continued to grow in a deteriorating environmental setting --- urbanization accelerated with emphatic regard to economic growth with little being done to preserve or enhance the quality of the environment.

Metro Manila's rapid urbanization has led to congestion and intensification of urban activities that:

(a) placed serious strains and pressures on supporting infrastructures and have rendered existing services and systems inadequate;

Decreasing water pressure, rampant illegal water and power connections, uncollected garbage, congested road junctions, buses and jeepneys overflowing with passengers, clogged drainage networks, proliferation of makeshift housing structures are some of the more visible evidence of the inadequacy or insufficiency of the present systems and services.

(b) resulted to incompatible and conflicting land uses;

The intensifying urban development on the lower lands without proper drainage facilities will aggravate the area's vulnerability to flooding.

(c) encouraged growth on the peripheries where basic infrastructure services are not available;

The absence of drainage facilities in the lower lands where water table is high offers opportunity for human contact with untreated wastes during flooding.

Unregulated pumping of groundwater in areas where surface water supply is not available has led to the depletion of aquifers and, particularly along the coast, to saline water intrusion.

Largely dictated by private sector investment decisions, the growth of Metro Manila, to date, has remained uncontrolled. Government response is currently weak. There are no specific provisions for the guidance of private sector and government agencies engaged in development, and upon which an environmentally sound Land Use Plan can be based. The current Zoning Ordinance is based on existing land use patterns and, therefore, reinforces existing development trends. The legislation on idle land tax, which has been in existence since 1978 to encourage development of vacant lands, has not been implemented.

(2) Growth of the Study Area

The geographical spread of Metro Manila, measured from the mouth of the Pasig River, has increased from an 8-kilometer radius after 1950 to some 20 kilometers in 1990.

The present trend indicates that the continuous increase of the urban area -- up to a 25-kilometer radius involving the whole Cavite area (South corridor), the Antipolo urban area (East corridor), and the urban spot locations along the Laguna coastal corridor -- may continue up to the year 2010 (Figure 11.6.2).

Outside its political boundaries, Metro Manila's population and industrial activities have spilled over to:

(a) the provinces of Bulacan -- to the north through MacArthur Highway (North corridor);

(b) the municipalities of Cainta, Taytay, San Mateo and Antipolo of Rizal -- to the east through Sumulong Highway and Ortigas Avenue Extension (East corridor); and

(c) the municipalities of Bacoor and Imus of Cavite through Gen. Aguinaldo Highway and San Pedro through South Super Highway to the South (South corridor).

Meanwhile, population spills are sited in strips along major corridors, with industries appearing in spot locations.

It is anticipated that for the planning period (Medium-Term NCR Development Plan, 1990-1994), Metro Manila shall continue to experience infilling in the main urban area. It shall undergo simultaneous outward expansion in all directions largely due to private sector-initiated development. Infilling will cause the further reduction of idle and open spaces in the core and intensification of and/or change in land use patterns. New developments are expected to proceed in a sporadic manner, and largely as opportunity responses to the free operation of market forces.

Both trends shall continue to bring about the unwelcome effects of:

(a) development going ahead in areas where infrastructure systems and basic utilities are inadequate;

(b) development exacerbating flooding problem by preventing natural drainage or run-off; and

(c) development contributing further to inefficient land use patterns in the absence of an updated Land Use Plan and/or Zoning Ordinance.

Apparently, it is no longer pragmatic to confine planning for Metro Manila's growth within the boundaries of the National Capital Region.

11.6.4 Land Use Development

The social, economic and political activities in recent years effected changes in the pattern of land use which can be summarized as follows:

- increase in the number and density of blighted areas;
- the development of middle and upper class residential subdivisions on the urban periphery where land is cheaper;
- the development of townhouses and high-rise condominiums for

the middle- and upper-income markets in the main urban area;

- the conversion of agricultural and fishpond areas to residential and/or commercial uses;

- the development of high intensity commercial activities along major transport routes;

- the emergence of intensifying suburban commercial nodes at intersections of major transport routes in response to the need of the growing number of residential subdivisions in the suburb; and

- the location of new and relocation of existing industries at cheaper sites to the North, East and South, along major transport routes.

Apparently, the existing land use pattern has contributed much to the current major problems and has widened the gap between demand for and delivery of basic services. Pursuing development without due regard to the opportunities and constraints posed by the inherent characteristics of the land compounds the deterioration of the urban environment. In the absence of a sound and environment-oriented Land Use Plan and complementing development controls and regulations, current land use trend is expected to continue up to the year 2000, and up to year 2010, if no measure is implemented to control the current problem.

(1) Industrial Development

As emphasized earlier, the main objective of the urban growth corridor development is the continuing promotion and strengthening of urban/industrial development, particularly of the urban growth corridor in the provinces of Rizal and Cavite.

The pressure along the Laguna coast in Rival could be reduced if the two planned industrial areas (San Mateo and Pinugay) are developed rapidly. Location of industries poses the most serious problem in Cavite. This need for an industrial area could be answered by encouraging the industrial growth toward Silang, and not along the Laguna de Bay. Pursuing this option would direct industrial/urban development out of the water

shed area of Laguna de Bay. Furthermore, this growth axis could be combined with that of Cavite by not allowing industrial location along the coast beyond Rosario.

There are 10,000 ha. of land in that area in Cavite (Study Area) which is not suitable for intensive agriculture (hilly upland with high erosion potential, generally slopes of 8 to 18%). Not all of this land, however, is suitable for industrial/urban development. The determination of specific locations in the area and the determination of the amount of suitable land would a separate study.

Being part of the National Industrial Core Region, the growth of industry in the Study Area will largely reflect overall national trends. Government efforts to restructure the industry and maintain export growth will have a direct bearing on the development of Cavite and Rizal.

Regionally, the key issue is the promotion of a diversified industrial base which will be internationally competitive, and is integrated with downstream industries. This integration is also essential in increasing the stability of the industrial output of Cavite and Rizal, in utilizing the potential of small firms/cottage industries for development, and in more equitable distribution of industrial income.

(2) Integrated Industrial/Urban Development

The present location of industries in areas contiguous to Metro manila does not serve the government objective of industrial decentralization. The emphasis should be on locating industries in areas separated from Metro Manila.

The present pattern of industrial estates indicates that the plan for such estates has not sufficiently taken into account the housing needs of employees and the development of other urban amenities. The results are unnecessary high commuting time and costs, traffic congestions, and a poor quality of the urban environment.

The land area presently planned for industrial estates appears to be sufficient for the medium-term requirements of large industry. The

emphasis, therefore, should be on the requirements of small cottage industries.

The industrial location will be outside of prime agricultural and the residential areas, and will take into account the long-term spatial development strategy.

(3) Urban Centers

Intermediate-sized urban cities in the Region are not well developed, largely due to polarization effects of Metro Manila. However, there are areas in Rizal which the government plans to develop into administrative centers. For Cavite, and in terms of size of urban centers, no clear delineation could be made.

11.7 CONFIRMATION OF FRAMEWORK

11.7.1 Population

(1) Present Population Distribution

a. Study Area

The Study Area was estimated to have a population of about 9.4 million people in 1990. Almost 84.7 percent of this population reside in the National Capital Region.

Cavite City and the five Cavite municipalities accounted for a total of 0.46 million people, equivalent to 4.9 percent of the Study Area's population. The fourteen municipalities of Rizal have a total population of 0.98 million, equivalent to 10.4 percent of the Study Area's population (Table 11.7.1).

b. Antipolo Area

The 1990 Population Census (NSO) placed the total population of the Antipolo Municipality at about 207,800 or some 137,400 more than its population ten years ago (1980). Annual growth rate is placed at 10.8%.

Table 11.72 shows the total population of the Antipolo Municipality at barangay level.

There is no problem of congestion in the municipality of Antipolo. Population density as of 1990 is about 7 persons per hectare. This figure is expected to soon reach 14 persons per hectare and to be 2.1 times by 2010. However, statistics on available land do not really imply availability of land, since about 72 percent of Antipolo is forest land.

The population is mainly concentrated on 28 percent of Antipolo's area. As a result, overcrowding in urban barangays has already started and squatter communities have also sprouted.

The total land area of the municipality of Antipolo is about 30,610 hectares. Present density of its population is 6.8 persons per hectare. Out of the 207,842 total population of the municipality, 112,717 persons (54.2%) live in urban barangay areas which are now under study.

The present density of the Antipolo Study Area is 24 persons per hectare. This figure is expected to increase to 37 persons per hectare by the year 2000 and to 50 persons per hectare by the year 2010.

Full urbanization of all barangays in Antipolo may not be feasible due to its geographic characteristics. Thus, rural-urban population distribution will not change much within the next five to ten years. However, urbanization in the middle-highland zone between the Antipolo town and the Angono-Cainta-Marcos Highway route may be change drastically within 10 to 20 years (Table 11.7.6).

Table 11.7.7 shows the population distribution, density and land area within the aquifer basin zone for years 1990, 2000 and 2010.

(2) Population Growth of the Study Area

During the period 1980-1990, the population growth rate of the Study Area reached the following rates: 2.83 percent (NCR), 3.43 (Cavite) and 5.46 (Rizal).

Based on NSO data (1980), the population growth rate from 1990 to 2010 is expected to slow down slightly to an average of 2.22 percent for NCR and 2.82 percent for Cavite. For the same period, Rizal's population will show a slight increase with its average annual growth of 3.59 percent. Given these growth rates, the population of Cavite and Rizal are expected to double in a span of 20 years (Table 11.7.3 and Figure 11.7.1).

(3) Population Projections up to Year 2010

Total population is a determinant of total water demand. To project water demand, this study estimated future populations using official population data prepared by the National Statistics Office.

The population projections were based on the results of the 1980 and 1990 Census of Population and Housing (NSO), using three alternative forecasts, namely: high, medium and low forecasts for the Study Area. These are differentiated through the taking of assumptions on the time when the country attains replacement level fertility.

The projections for cities and municipalities inside the Study Area for selected years are given in Table 11.7.4 (Study Area) and Table 11.7.5 (Municipality of Antipolo at barangay level).

(4) Comparison of Population Projection

Figure 11.7.2 shows the comparison of population projections made by AWSOP (Angat Water Supply Optimization Project, 1988) and the JICA Study Team for the municipality of Antipolo.

Using the same method adopted by the NSO, both projected population growth trends were not quite far from each other.

The variance occurred because AWSOP's projections were based on the 1980 National Statistics Office's (NSO's) census data, which at that time was the only one available, while the Study Team's projections were based on the 1980 and the updated 1990 NSO census data.

Given the figure, it shows that the projected population made by the

AWSOP for the year 1990 was two times less than the actual 1990 NSO data.

(5) Projections of Blighted Populations

Total population for Metro Manila reached a staggering 7.929 million in 1990, making it one of the megacities of the world. A significant proportion of its population live in areas considered as unsuitable for human habitation such as along railroad tracks , esteros and river banks. These areas referred to as blighted areas and their residents as the blighted population.

Because of Metro Manila's high population growth, urban blight has become a major problem spawning marginalized conditions among squatters.

In 1985, the National Housing Authority estimated 2.3 million people to be living in blighted areas in the NCR. This population grew to an estimated 2.8 million in 1990, or approximately one-third of the total population. This estimate included those who have benefited from the urban land reform and housing program under the National Shelter Program.

Figure 11.7.3 shows the approximate locations of blighted areas in the various part of NCR.

The distribution and percentage in 1982, 1985 and 1990 of the blighted population in each city/municipality are shown in Table 11.7.8.

The percentage of blighted population was notably high in Pasay City, Quezon City and Navotas.

There was no data on blighted populations in other MWSS service areas outside of the NCR. It is assumed that there are a few blighted areas in the Cavite and Rizal provinces.

Assuming that the high in-migration rate is checked, the blighted population is projected to grow such rate that its proportion to total population in each municipality remains constant.

The projections for the general blighted populations are given in Table 11.7.9.

11.7.2 Economic Growth

(1) Income and Expenditure (Antipolo)

Antipolo is a third class municipality which in 1988 has a total revenue of about ₱11,596,801. This is double the 1987 amount of about ₱5,142,350. Most of the year-1988 revenue came from real property taxes amounting to ₱4,448,106. Earnings of municipality mostly comes from business taxes on goods and services. Operating and miscellaneous income was ₱1,881. The overall collection performance of the municipality has improved since 1980.

For the next five to ten (5-10) years, revenue collection is anticipated to greatly improve with much of the revenue coming from the local government taxes on real properties.

The next possible major earner for the town will be the public market which will be improved to provide expanded and efficient public service. Other potential revenue earners are the tourist spots of Antipolo.

Projected appropriation from the General Fund is expected to reach ₱20 million in the year 2000 from the 1988 level of ₱11.59 million. Expected expenditures to be sourced from the General Fund will remain to be very well within the limits of available funds. These funds which in 1988 totaled ₱11.46 million are expected to increase gradually until it reaches ₱99 million in the year 2000.

Table 11.7.10 GENERAL FUND (MUNICIPALITY OF ANTIPOLO), 1988

ACCOUNT DISTRIBUTION	ESTIMATED REVENUE	ACTUAL
Tax Revenue		
Real Property Tax-Current Year	3,990,000.00	2,851,188.18
Real Property Tax-Previous Year	1,722,000.00	1,140,573.76
Real Property Tax-Penalty	262,500.00	456,604.54
TOTAL REAL PROPERTY TAXES	5,974,500.00	4,448,106.48
Taxes on Good and Services	3,494,345.03	2,365,288.18
Other Taxes	2,236,546.00	2,680,718.29
Total Taxes Revenue	11,705,391.03	9,512,112.95
OPERATING & MISCELLANEOUS REVENUE	2,184,278.00	2,082,807.35
MISCELLANEOUS INCOME		1,881.10
TOTAL INCOME	13,889,669.03	11,596,801.40

(2) Economic Growth Projections

As economic growth fosters a proportionate increase in water demand, in the same manner also is per capita domestic demand for water affected. Industrial and commercial demands are also expected to increase in proportion to the growth of their respective gross domestic products.

The MWSS CORPLAN computed growth rates from NSO's special releases of data and projections on family income.
As shown in Table 11.7.11, per capita income is projected to grow in 1991 and to decrease drastically in 1992. From 1994, it is projected to grow minimally up to the year 2010.

TABLE 11.7.11 PER CAPITA INCOME GROWTH (%)

YEAR	PER CAPITA INCOME GROWTH (%) SECTOR		
	1	2	3
1987	-1.37	-1.37	0.00
1988	-3.95	-3.95	0.00
1989	-7.37	-7.37	0.00
1990	-9.17	-9.17	0.00
1992	14.72	-14.72	0.00
1990	-9.17	-9.17	0.00
1992	14.72	-14.72	0.00
1993	-1.22	-1.22	0.00
1994	-1.43	-1.43	0.00
1995	1.49	1.49	0.00
1996	3.11	3.11	0.00
1997	-3.01	-3.01	0.00
1998	-2.92	-2.92	0.00
1999	-3.00	-3.00	0.00
2000	-12.31	-12.31	0.00
2001	-1.28	-1.28	0.00
2002	-1.18	-1.18	0.00
2003	-1.08	-1.08	0.00
2004	-1.00	-1.00	0.00
2005	-0.91	-0.91	0.00
2006	-0.84	-0.84	0.00
2010	-0.56	-0.56	0.00

1. General Population
2. Urban Development Beneficiaries
3. Blighted Population

Source: MWSS (CORPLAN)

Economic growth in the industrial and commercial sectors are measured by growth in gross domestic products (GDP). This is the sum of all goods

and services produced expressed in pesos. Data on GDP for both industrial and commercial sectors in the NCR for previous years, as well as projections up to year 1992, were obtained from NEDA. The gross domestic product of the services sector was used to estimate commercial growth. The output of the industrial and commercial sectors decreased in the 1983 to 1986 period. These sectors are projected to post positive growths from 1987 to 2010.

There were no data on industrial and commercial growths for other areas outside of NCR.

The computed growth rates are shown in Figure 11.7.4.

11.7.3 Industrial Structure

Table 11.7.12 shows the distribution between the NCR and Region IV of manufacturing establishments for 1986 and 1987. Out of the 3,403 manufacturing establishments in 1987, 2,878 or 84.6 percent were located in Metro Manila, the country's industrial center. Region IV accounted for 525, or 15.4 percent of the total.

TABLE 11.7.12 LARGE MANUFACTURING ESTABLISHMENTS, YEARS 1986 AND 1987

	No. of Manufacturing Establishments			
Region	1986	%	1987	%
NCR	2,801	85.6	2,878	84.6
REGION IV	473	14.4	525	15.4
TOTAL	3,724	100.0	3,403	100.0

As shown in Figure 11.7.5, industries are overconcentrated in Metro Manila. The largest number of manufacturing firms are concentrated in the Valenzuela-Caloocan-Quezon City area which lies northeast of NCR, in the Marikina-Pasig area situated along the Marikina and Pasig rivers, and the Parañaque-Taguig-Muntinlupa area along the South Superhighway.

Meanwhile, as population spills on strips along major corridors, industrial development of areas outside Metro Manila appear in spot locations.

The industrial development of areas outside Metro Manila is hampered by extreme concentration of industries in the NCR -- from manufacturing to resources based industries to food processing and wood products, etc.

At present, there are two major industrial areas outside of the NCR. One is in Rizal and the other is in Cavite. The greater concentration of industries is in Rizal, specifically in the Cainta-Angono area. For Cavite, the concentration is in the area between the towns of Rosario and Silang (outside of the Study Area).

In Rizal, both San Mateo and Pinugay (where industrial estates are planned) are occupying areas suitable for grazing.

Cavite presently has eight existing industrial estates, two of which are located within the Study Area: Cavite Export Processing Zone in Rosario and Informal Industrial Estate in Imus.

The Cavite Export Processing Zone is the fourth Export Processing Zone (EPZ) in the Philippines. It became operational in 1986. If fully developed, about 120 export companies may be located within its 275-hectare area. An initial area of 72 hectares are now fully developed, complete with road network, water and sewer lines, power service and access to communication facilities.

The Informal Industrial Estate in the municipality of Imus and part of Dasmariñas along the General Aguinaldo Highway is situated on a 12-hectare tract of land. Wire harness and electrical components for specific types of cars for export are produced there.

11.8 URBAN DEVELOPMENT PLANNING

11.8.1 General

(1) Basic Structure Plan

A basic structure plan attempts to encompass all plans and regional development plans, in order to make into a coherent whole the plan on what and how Metropolitan Manila and the contiguous provinces of Rizal and Cavite should be (Figure 11.8.1).

The transition area between the inner urban core and outlying area of Metropolitan Manila is seen to provide enough room for expansion while retaining a medium intensity of development. It shall have a balanced distribution of population densities, encouraging concentration of activities at selected centers, and along lines of accessibility.

The areas outside the Metropolitan complex are expected to absorb a considerable amount of urban growth. The emphasis is seen, however, on urban concentration at selected centers of activity along major transport routes, projecting a linear-cellular pattern.

Urban nucleations in the north, east and south are expected to develop into multi-functional activity centers, providing expanded opportunities in housing, employment and social services, as well as education and cultural facilities. In lying areas between the corridors of growth shall, however, be subjected to development guidelines to ensure retention or conservation of major open spaces, forest, watershed and prime agricultural areas.

While the development along the eastern corridor at present has not gained much progress due to the problem of flooding, especially in the coastal towns of Laguna Lake, poor groundwater, and the topographic constraints posed by surrounding mountains. But, it is expected that rational programming will, nevertheless, push its development through. Also, the high-intensive residential development in the slope area located in the middle-land dividing the Antipolo and Angono-Taytay-Marcos Highway areas, will be expected in the near future.

Further growth is anticipated in the south because of its greater ab-

sorptive capacity and the activities of the private sector. The towns in the coastal areas of Cavite and the towns adjacent to Laguna Lake are expected to quickly industrialize.

Utilizing the dominant influence of transportation on urban growth in bringing about desired densities of development, it is envisioned that the planned development for the outer areas shall achieve maximum benefits.

(2) Study Area Planning

The land use plan in essence in the translation into physical form of planning policies and principles. Such policies are based on the realities of the present dynamic, if rather unregulated and chaotic, conditions obtaining in the metropolis.

To sum up the present situation, haphazard and sub-standard development in the metropolitan area is going on at a rapid rate. There is great disparity in residential density in the various cities/municipalities, ranging from 715 persons/hectare to as low as 49 persons/hectare.

The city has grown rapidly making it functionally unbalanced. This has stretched the lines of communication and also made the provision of municipal services and other facilities, which are so essential to urban living, difficult. There is overcrowding, congestion and unsanitary conditions. This is particularly bad in the old Manila residential area. At present, housing is not related to employment centers. The undesirable mixing of land uses is almost everywhere, applying especially to the Metropolitan area as a whole.

Land use and transportation are the main basis for the successful implementation of urban development projects. Landuse and transportation are complementary and thus, influence each other.

In order to have systematic urban development, a structure plan of the study area is prepared so that necessary control measures and directives will be formulated towards planned development of the different sectors of the area in view of the present condition of the Metropolitan and surrounding provinces.

11.8.2 Antipolo Area Development Plan

(1) Development and Growth of Antipolo

The Antipolo area encompasses a broad spectrum of levels of development and probable growth

Pasig and Marikina in NCR along the Marikina River are highly industrialized and densely populated. Therefore, the present and emerging growth towards the East corridor covered by Cainta, Taytay and Antipolo, in Rizal Province are trends to continue. The populations of these municipalities are local centers of population and light industry, and the remainder of Rizal Province is agricultural, forest and grassland with a low population density.

Development plans for the Antipolo area are centered on upgrading and enhancing the overall socio-economic conditions. Priorities include the increase of food production and farm income, construction of infrastructure facilities supportive of social and economic development, maintenance of existing watershed areas and other forest lands, development of potential tourist attractions, and establishments of labor-intensive, small-scale rural enterprises which will create employment opportunities. The provision of adequate basic facilities for health, education, housing and protective services is also given attention.

Full urbanization in the municipality of Antipolo may not be feasible due to geographic characteristics. However, urbanization in the East corridor covered by Antipolo town and surrounding municipalities of Taytay and Angono may be changed drastically in the coming years.

(2) Locational Advantage

The locational importance of the town of Antipolo will depend largely on the direction of expansion and development of Metro Manila in the years to come. Antipolo is endowed with natural resources and a favorable climate. These advantages, however, could be overshadowed by many factors, which can also work against the development of the town. Among these unfavorable factors are: poor infrastructure, continuous pollution of precious river and creeks, and fast-rising values of real estate

properties.

In relation to the whole province of Rizal, Antipolo is considered as an agricultural area/town possessing potential agricultural lands. However, it has not produced enough agricultural cash crop. The main constraint is the lack of water source for irrigation of most upland agricultural areas.

(3) Physical Features

The physical characteristics of Antipolo has been described in Stage I. Some of the significant aspects may again be mentioned as they will become useful in the discussion on the land use plan of Antipolo Area.

Antipolo is characterized by the predominance of mountain ranges. The town proper itself which occupies eight percent of the land area lies on a rolling area about 183 m above sea level (on the average). The surrounding areas lie on a higher elevation, with some places peaking as high as 300 m above sea level, especially at the eastern side of the town where most mountain ranges lie.

Antipolo town lies approximately 22 km. east of Metro Manila. The municipality is bounded on the northwest by the municipalities of Marikina and San Mateo, on the north by the municipality of Montalban, on the east by Quezon Province, on the southeast by Tanay and Teresa and on the southwest by the municipalities of Angono, Cainta and Taytay. The municipality covers a total land area of 30,610 has. and occupies 23.5 percent of the total area of Rizal Province.

(4) Antipolo Study Area

The area under consideration, previously identified as Antipolo area and its urbanizable peripheral areas and parts of the municipalities of Taytay, Angono, Binangonan and Teresa, is about 51 square kilometers and covers the barangay of Antipolo and the contiguous municipalities (Figure 11.8.1).

The Antipolo area is characterized by a high-intensive residential development because of its strategic location -- contiguous to Metro

Manila, its relatively cheaper land values, its rapid transformation of forest/grassland and agricultural land to other land uses.

This area is envisioned to absorb a considerable amount of urban growth. The emphasis shall be as described earlier and focused on intensive residential development and urban concentration along major transport routes, projecting a linear-cellular pattern.

(5) Existing Condition of Land Use

Figure 11.8.2 (Land Use Map, Antipolo Area, 1991) and Table 11.8.2 shows the estimated area by land category.

The existing general land use pattern in Antipolo area shows the predominance of forest/grassland (land usually rolling and generally covered with second growth forest and grasses), mostly on the southern side of the study area. Forest/grassland occupies about 2,660 hectares or 52.3 percent of the total land area.

Agricultural land is planted to cash crop like rice and plantation (mango), but also covers farm areas mostly located at the east-south side of the study area. This land which is about 796 hectares is the second larger area.

The category open space consists of vacant area within the built-up areas. Unoccupied subdivisions which are mostly mixed with grassland constitute the third larger area. Examination of the field survey shows that the unoccupied subdivisions are larger than the total built-up area in Antipolo and surrounding municipalities.

Commercial areas are concentrated mostly in the main road (M.L. Quezon street) of Antipolo town, and in some precariously-sited commercial areas along the intersection of Marcos Highway and Sumulong Highway at the northern part of the study area.

Industrial areas are those where small industries are located.

The category built-up area consists of residential, institutional and facilities places.

Thirteen percent of the existing urban land is used for residential purposes while a larger number of lands are vacant lots owned by private individuals speculating on the ever increasing prices of real estate.

It can be seen that Antipolo urban area is a mixture of residential and commercial establishments.

The present trend of the study area indicates a continuous increase of the urban area involving the whole of the unoccupied subdivisions (mixed with the open area) and agricultural and grassland, especially in Antipolo, Taytay and Angono, at the western side of the Sumulong Highway M.L. Quezon Extension line.

(6) Land Use Projection

The future land use projection for the Antipolo area will determine the physical development of the study within the next twenty years.

The factors considered are: a) the goals and objectives of the sectoral components of the development plan; b) land capability of areas; and c) growing trend of the area.

Its high slopes are constraints for Antipolo's expansion of its agriculture and its urban area, thus limiting its expansion and urbanization. However, it can be used to work positively for the future development perspective which is directed towards the promotion of tourism and preservation of agro-forestry.

The eastern fringe of the study area in the next 10 to 20 years will not change drastically. However, urbanization in the western fringe covered by the Antipolo town and the impinged parts of Taytay and Angono may be changed drastically in the coming 20 years.

The predominance of forest/grassland will depend on the rate of reforestation and deforestation in the area affected by urban growth pressure.

Urbanization should be controlled due to development constraints brought about by steep slopes and poor soil conditions.

The present subdivision development is more than sufficient for the Antipolo area's expected expansion within the next five years. However, according to the present and anticipated growth of Metro Manila, the area is expected to be the main means of absorbing future population growth requiring new subdivision to be developed.

The influx of urban population is the basis for the future expansion of Antipolo. At the Municipality level, from 207,842 in 1990, its population will increase to 435,886 by the year 2010. The population in the study area will increase from 123,347 in 1990 to 255,831 by the year 2010.

By the year 2010, some 822 hectares of presently open/unoccupied area (776), grassland (2,660) and agricultural areas (796) will be devoted to residential use, especially along the western fringe of the Study Area.

By 2010, Antipolo area is also projected to have expanded outside its current boundaries, with the planned industrial estate some 10 km. east of the Antipolo town.

Figure 11.8.3 shows the land use projection. The future built-up area of 722 hectares in 1990 will increase to 1,544 hectares by 2010 (Tables 11.8.2 and 1.8.3).

Figure 11.8.4 shows a land-use comparison of the Antipolo area between 1991 and 2010.

1.8.3 Conclusions

(1) Land Use Plan

The land use plan is presented in general terms (Figure 11.8.5). In can be amended according to authorized decision from time to time. The land use plan shall be regulated under zoning regulations which may be dictated by the authorized regional or municipal agency. These should be strictly enforced in regard to each kind of development and any proposal shall be rigorously screened.

Space standards for community facilities and services and all future

land use shall be governed by zonal plans under the Master Plan.

a. Urban Consolidation Zone

This is the main built-up area. It is a densely populated urban area where implementation of the plan is needed to avoid water shortage, pollution and unhealthy environment created by mixed and uncontrolled land use.

- No more expansion
- No new heavy industries
- Rehabilitation of blighted areas
- Upgrading of urban service
- Land use planning and update zoning ordinance
- Closure of open dump sites

The improvement/rehabilitation/maintenance of natural drainage courses and existing facilities, particularly water supply, flood control/drainage and sewerage networks, should be given priority so as to prevent further deterioration of the urban ecosystem.

b. Complementary Urban Satellites

The metropolitan concern may be mitigated through the development of growth centers outside the metropolis which will act as complementary urban satellites of the National Capital Region.

(2) Residential and Open Areas

New settlement areas have to be specified outside of the NCR in view of the development of the east (Rizal) and south (Cavite) corridors.

In view of annual increase of population pressure from Metro Manila, population will increase in the contiguous provinces also. New settlement areas have been proposed in different parts of Rizal and Cavite in order to develop the town in a planned way, controlling the haphazard urban sprawl.

Open areas are needed to provide open spaces and community facilities.

(3) Industry and Tourism

It is necessary to create new jobs to ease the problem of unemployment. For that purpose, industries like handicrafts and cottage industries, which do not pollute the environment and will not stand as obstacles to residential planning, are to be established.

The appropriate land for industries may be located at the south of Imus and Bacoor in Cavite and at the east of Antipolo and Tanay in Rizal.

Two industrial estates are proposed in San Mateo and Antipolo (Pinugay). Other industries are to be spread over different places of the study area.

In the land use plan of Antipolo area, appropriate land has been allotted to the different small and medium scale industries which are feasible to run in the future.

If the different industries are allowed to establish only in the places shown in the land use plan, there will be substantial savings in expenditure for the development of infrastructures.

In the current process of establishment of industries, different industries are being established in arbitrary places due to the lack of coordination between authorized agencies and individuals.

It will take more time to start large-scale industries in the eastern part of Antipolo because the transportation cost is high in this mountainous area of Rizal, as compared to that in Cavite area.

It would, however, be unwise to locate large and heavy industries in Antipolo area, as these would pose problems on air pollution, waste disposal, traffic congestion, among others. Moreover, the area does not have enough water supply to sustain large scale industries.

There is an ample scope to develop the tourist industry in the Antipolo area. Properly developed, the tourist industry can increase national revenues, employment opportunities, and helps to earn convertible foreign currencies.

(4) Agro-Industry/Farming and Regional Open Space

The success of the agro-industrial thrusts of the provinces of Rizal and Cavite is seen as the key to the gradual deceleration of urbanization in Metro Manila and its eventual decongestion.

(5) Flooding Area

Lower areas are not suitable for residential use, industry, etc.

(6) Preservation Areas

a. Greenbelt/Forest Area

Creation of a green belt and construction of dike protection around the coastal lake against erosion and flooding in the lower zones is needed.

b. Watershed

The relatively underdeveloped northern Marikina valley has the potential for further development to meet the projected future demands for many years and is to be considered as preservation area.

(7) Zoning Regulations

It is necessary to formulate zoning ordinances to manage the trend of urban development and also to have development plans for settlement areas.

Zoning protects residential areas from the harmful intrusions of commercial and industrial uses while simultaneously promoting business and industry as a result of the planned and orderly development that it ensures. It prevents overcrowding in buildings and land, thus, facilitating the provision and continued adequacy of water, sewerage, transportation and other facilities.

The zoning regulations and their administration are major tools in carrying out the land use part of the Master Plan of which it is an integral part.

Table 11.1.1 POPULATION AND GROWTH RATE BY REGION FOR CENSUS YEARS

	POPULATION (THOUSANDS)												GROWTH RATE (%)				
	1960		1970		1975		1980		1985 (Estimate)		1990		1960/ 1970	1970/ 1975	1975/ 1980	1980/ 1985	1985/ 1990
Philippines	27,088	100.0	36,684	100.0	42,071	100.0	48,098	100.0	54,688	100.0	60,685	100.0	3.1	2.8	2.7	2.6	2.4
NCR (National Capital Region)	2,462	9.1	3,697	10.8	4,970	11.8	5,296	12.3	6,942	12.7	7,929	13.1	4.9	4.6	3.6	3.2	3.1
Region																	
1. Ilocos	2,428	9.0	2,991	8.1	3,269	7.8	3,541	7.4	3,903	7.1	3,551	5.9	2.1	1.8	1.6	2.0	1.6
2. Cagayan Valley	1,202	4.4	1,691	4.6	1,933	4.6	2,215	4.6	2,521	4.6	2,341	3.9	3.5	2.7	2.8	2.6	2.0
3. Central Luzon	2,525	9.3	3,615	9.9	4,210	10.0	4,803	10.0	5,456	10.0	6,199	10.2	3.7	3.1	2.7	2.6	2.5
4. Southern Tagalog	3,081	11.4	4,457	12.1	5,214	12.4	6,119	12.7	7,089	13.0	8,266	13.6	3.8	3.2	3.3	3.0	3.0
5. Bicol	2,363	8.7	2,967	8.1	3,194	7.6	3,477	7.2	3,922	7.2	3,910	6.4	2.3	1.5	1.7	2.4	1.3
6. Western Visayas	3,078	11.4	3,618	9.9	4,146	9.8	4,526	9.4	5,092	9.3	5,393	8.9	1.6	2.8	1.8	2.4	1.8
7. Central Visayas	2,523	9.3	3,033	8.3	3,387	7.9	3,787	7.9	4,195	7.7	4,593	7.6	1.9	2.2	2.3	2.1	1.9
8. Eastern Visayas	2,041	7.5	2,381	6.5	2,600	6.2	2,799	5.8	2,073	5.6	3,055	5.0	1.6	1.8	1.5	1.9	0.9
9. Western Visayas	1,351	5.0	1,869	5.1	2,048	4.9	2,528	5.3	2,863	5.2	3,159	5.2	3.3	1.8	4.3	2.1	2.3
10. Northern Mindanao	1,297	4.8	1,953	5.3	2,314	5.5	2,759	5.7	3,718	5.8	3,510	5.8	4.2	3.5	3.6	2.9	2.3
11. Southern Mindanao	1,353	5.0	2,201	6.0	2,715	6.5	3,347	7.0	3,836	7.0	4,457	7.3	5.0	4.3	4.3	2.8	2.9
12. Central Mindanao	1,383	5.1	1,941	5.3	2,070	4.9	2,271	4.7	2,598	4.8	3,171	5.2	3.4	1.3	1.9	2.7	3.5

Source: 1960-1980 Philippine Statistical Yearbook 1989 (NEDA)
1985 Philippine Yearbook 1989 (NSO)
1990 1990 Census of Population and Housing (NSO)

Table 11.1.2 POPULATION DENSITY OF THE STUDY AREA

City/Municipality	POPULATION DENSITY (Persons/Ha.) 1970	1975	1980	1985	1990
NCR	62.4	78.1	93.2	109.2	123.2
1. Manila	347.5	386.2	425.7	461.1	414.4
2. Pasay	148.4	183.5	207.0	238.7	254.7
3. Quezon	45.4	57.6	70.1	82.9	98.2
4. Caloocan	49.2	71.2	83.8	97.4	133.7
5. Las Pinas	11.0	19.7	32.9	50.1	68.9
6. Makati	88.6	111.9	124.6	140.9	151.2
7. Malabon	60.5	74.7	81.6	94.1	118.4
8. Mandaluyong	57.5	70.1	79.0	89.9	95.0
9. Marikina	29.2	43.3	54.4	66.8	79.2
10. Muntinlupa	13.9	20.2	29.3	39.3	59.5
11. Navotas	320.2	373.5	485.2	566.8	715.4
12. Paranaque	25.4	41.5	54.5	69.6	78.3
13. Pasig	120.4	161.5	206.6	257.5	303.8
14. Pateros	24.5	31.6	38.7	46.5	49.0
15. San Juan	100.5	117.8	125.1	137.0	122.1
16. Taguig	16.4	21.9	39.8	49.3	79.2
17. Valenzuela	20.9	32.0	45.2	61.8	72.3
CAVITE	12.4	14.4	17.5	21.0	24.7
18. Bacoor	9.2	11.9	17.2	22.3	30.6
19. Cavite City	64.0	69.7	74.1	81.7	77.5
20. Imus	4.5	5.0	6.1	7.4	9.5
21. Kawit	21.1	25.2	29.4	35.3	35.6
22. Noveleta	19.5	22.4	26.7	31.6	40.0
23. Rosario	42.0	50.7	58.8	71.5	80.0
RIZAL	2.4	3.2	4.3	5.2	6.8
24. Angono	4.7	6.8	10.2	13.0	17.5
25. Antipolo	0.9	1.3	2.3	3.0	5.7
26. Baras	3.1	4.2	4.8	5.7	7.1
27. Binangonan	7.2	8.7	11.1	12.9	12.8
28. Cainta	20.3	36.3	57.9	81.2	107.5
29. Cardona	5.4	6.8	7.9	8.8	10.5
30. Jala-Jala	1.6	1.9	2.4	2.8	3.3
31. Morong	5.0	5.6	6.6	7.0	8.6
32. Pililla	2.0	2.6	3.1	3.6	4.4
33. Montalban	0.7	1.0	1.3	1.6	2.0
34. San Mateo	4.5	6.0	8.0	9.5	12.6
35. Tanay	1.0	1.4	1.7	2.0	2.0
36. Taytay	13.8	17.3	22.3	25.6	33.3
37. Teresa	5.0	7.2	7.9	8.6	11.1

Table 11.1.3 POPULATION DISTRIBUTION OF THE STUDY AREA

CITY/MUNICIPALITY	POPULATION					LAND AREA (Has.)	DENSITY (Pers/Has.) (1990)
	1970	1975	1980	1985 (Estimate)	1990 (Preliminary)		
METRO MANILA	3,966,695	4,970,006	5,925,884	6,942,194	7,833,000	63,600	123.2
Manila	1,330,788	1,479,116	1,630,485	1,765,907	1,587,000	3,830	414.4
Pasay	206,283	254,999	287,770	331,860	354,000	1,390	254.7
Quezon	754,452	956,864	1,165,865	1,377,926	1,632,000	16,620	98.2
Caloocan	274,453	397,201	467,816	543,302	746,000	5,530	133.7
Las Pinas	45,732	81,610	136,514	207,770	286,000	4,150	68.9
Makati	264,918	334,448	372,631	421,367	452,000	2,990	151.2
Malabon	141,514	174,878	191,001	220,197	277,000	2,340	118.4
Mandaluyong	149,407	182,267	205,366	233,843	247,000	2,600	95.0
Marikina	113,400	168,453	211,613	259,806	308,000	3,890	79.2
Muntinlupa	65,057	94,563	136,679	183,693	278,000	4,670	59.5
Navotas	83,245	97,098	126,146	147,364	186,000	260	715.4
Paranaque	97,214	158,974	208,552	266,740	300,000	3,830	78.3
Pasig	156,492	209,915	268,570	334,770	395,000	1,300	303.8
Pateros	25,468	32,821	40,288	48,346	51,000	1,040	49.0
San Juan	104,559	122,492	130,088	142,444	127,000	1,040	122.1
Taguig	55,257	73,702	134,137	166,308	267,000	3,370	79.2
Valenzuela	98,456	150,605	212,363	290,551	340,000	4,700	72.3
CAVITE	230,689	267,926	324,273	389,775	459,122	18,572	24.7
Bacoor	48,440	62,225	90,364	116,783	160,287	5,240	30.6
Cavite City	75,739	82,456	87,666	96,639	92,000	1,183	77.8
Imus	43,686	48,566	59,103	71,440	92,144	9,701	9.5
Kawit	28,447	33,813	39,368	47,250	47,692	1,340	35.6
Noveleta	10,560	12,141	14,460	17,120	21,635	541	40.0
Rosario	23,817	28,725	33,312	40,543	45,364	567	80.0
RIZAL	307,238	414,192	555,473	673,066	880,608	130,383	6.8
Angono	12,127	17,574	26,511	33,864	45,563	2,600	17.5
Antipolo	26,508	40,944	68,912	93,242	173,908	30,610	5.7
Baras	7,166	9,722	11,196	13,321	16,680	2,340	7.1
Binangonan	52,296	63,215	80,980	93,858	93,305	7,270	12.8
Cainta	20,714	36,971	59,025	82,749	109,552	1,019	107.5
Cardona	16,880	21,266	24,503	27,313	32,841	3,120	10.5
Jala-Jala	8,115	9,276	11,945	13,667	16,314	4,930	3.3
Morong	18,970	21,058	24,858	26,295	32,220	3,760	8.6
Pililla	15,052	18,985	23,222	26,887	32,524	7,390	4.4
Montalban	20,882	31,176	41,859	49,856	63,824	31,280	2.0
San Mateo	29,183	38,955	51,910	61,381	81,917	6,490	12.6
Tanay	23,247	33,382	40,443	48,121	48,880	24,340	2.0
Taytay	46,717	58,274	75,328	86,507	112,414	3,374	33.3
Teresa	9,381	13,394	14,781	16,005	20,666	1,860	11.1
T O T A L	4,504,622	5,652,124	6,805,630	8,005,035	9,172,730	212,555	43.2

Source: Metro Manila — Philippine Yearbook 1989 (NSO)
1990 Census of Population and Housing (NSO)
(1990 figures are based on preliminary results of the 1990 Census of Population and Housing. Details may not add up total due to rounding and the results should be considered tentative.

Rizal — National Statistic Office, Rizal Branch

Cavite — National Statistic Office, Cavite Branch

Table 11.2.1 REGIONAL SOCIAL PROFILE

	CBR 1986	CDR 1987	IMR 1986	LITERACY RATE 1989	PREVAL. RATE 1989	UNEMPL. RATE(%) 1985
Philippines	26.70	5.80	35.00	89.90	19.42	7.12
NCR	32.10	7.00	33.40	98.10	9.44	22.11
CAR	-	-	-	86.30	17.07	-
Region I	29.40	7.00	37.70	90.60	19.87	3.65
Region II	27.90	5.80	43.60	88.50	17.41	5.76
Region III	28.50	5.50	29.60	93.60	18.70	6.91
Region IV	28.70	6.30	37.30	93.00	20.15	6.56
Region V	27.40	7.30	41.40	87.60	27.53	2.97
Region VI	20.20	6.20	43.50	88.00	22.77	4.52
Region VII	27.80	6.50	35.20	88.00	17.07	3.38
Region VIII	18.40	5.80	41.00	81.00	28.57	5.53
Region IX	19.10	3.30	32.40	81.70	16.85	6.55
Region X	28.40	4.90	33.20	90.50	19.04	4.20
Region XI	30.10	4.40	23.00	90.40	17.21	5.17
Region XII	18.30	2.70	25.30	78.9	19.46	1.99

Notes:

CBR - Crude Birth Rate per 1,000 population
CDR - Crude Death Rate per 1,000 population
IMR - Infant Mortality Rate per 1,000 population
LITERACY RATE - For the household population 10 years old and above
PREVALENCE RATE -

Sources: 1989 Philippine Statistical Yearbook, NSCB
1989 Functional Literacy, Education and Mass Media Survey, Department of Health

TABLE 11.2.2A POVERTY INCIDENCE BY REGION

REGION	POVERTY INCIDENCE (in percent)
Philippines	
NCR	31.04
CAR	1.55
Region I	3.16
Region II	1.96
Region III	8.21
Region IV	13.42
Region V	3.21
Region VI	6.68
Region VII	7.55
Region VIII	2.91
Region IX	3.71
Region X	5.54
Region XI	7.14
Region XII	3.91

Sources: 1989 Philippine Statistical Yearbook
National Statistics Coordination Board

TABLE 11.2.2B HOUSEHOLD POPULATION 15 YEARS OLD AND OVER BY EMPLOYMENT STATUS AND BY REGION

Region	1986				1988			
	Number ('000)	% in Labor Force	Employment Rate %	Unemployment Rate %	Number ('000)	% in Labor Force	Employment Rate %	Unemployment Rate %
Philippines	33,838	63.8	88.9	11.1	35,865	65.4	91.7	8.3
Region IV	4,558	63.8	87.0	13.0	4,729	64.6	91.8	8.2
NCR	4,727	58.6	71.4	28.6	5,005	60.2	82.8	17.2
Cavite (*)	606	54.6	94.3	5.8	657	54.5	96.4	3.6
Rizal	455	62.2	84.8	15.2	480	67.7	91.1	8.9
Total	5,788	58.5	74.8	25.2	6,142	60.2	84.8	15.2

* All Cavite Province. The numbers are not applicable for the Study Area, but may be used as reference however.

Source: National Statistic Office (NSO), Region IV

TABLE 11.2.2C EMPLOYMENT GENERATION IN METRO MANILA BY SECTOR

	1980-1983	1983-1986	1986-1988	1980-1988
	(in thousands)			
All Industries	195	11	326	532
Agriculture	2	2	4	8
Mining & Quarrying	2	(2)	6	6
Manufacturing	(29)	(81)	97	(13)
Electricity Gas and Water	5	(9)	5	1
Construction	10	(23)	44	31
Wholesale & Retail Trade	75	100	35	210
Transportation, Storage and Communication	(17)	12	34	29
Financing, Insurance, Real Estate	12	29	5	46
Community, Social and Personal Services	135	(18)	97	214

Source: Metro Manila Authority (MMA)
Bureau of Local Employment

TABLE 11.2.2D LABOR PRODUCTIVITY, 1980-1988
(AT CONSTANT 1978 PRICES)

(in thousand pesos)

Year	Philippines	NCR
1980	1,252	3,423
1981	1,242	3,531
1982	1,272	3,514
1983	1,159	3,495
1984	1,089	2,963
1985	1,019	2,769
1986	998	2,844
1987	987	2,531
1988	1,917	2,663

Source: NSCB, NSO

TABLE 11.2.3A GROSS REGIONAL DOMESTIC PRODUCT FOR 1987-1988
(AT CONSTANT 1972 PRICES)

REGION	Actual (in PM)		Growth Rate	Per Capita GRDP (in P)	Growth Rate (in %)
	1987	1988*	1987-1988	1988	1987-1988
PHIL.	95,948	101,758	6.63	1,733	3.56
NCR	28,502	31,323	9.90	4,143	6.89
I	4,323	4,507	4.25	1,090	2.28
II	2,301	2,432	5.70	897	3.16
III	7,664	8,286	8.12	1,413	5.59
IV	14,221	14,929	4.97	1,941	2.19
V	3,120	3,257	4.41	776	2.09
VI	6,545	6,902	5.44	1,269	3.19
VII	6,905	7,421	7.48	1,669	5.45
VIII	2,323	2,383	2.60	735	0.76
IX	3,350	3,492	4.24	1,141	1.96
X	5,248	5,570	6.13	1,620	3.41
XI	7,082	7,186	1.47	1,739	-0.98
XII	3,844	4,064	5.74	1,451	3.14

(*) As of January 1989

Sources: Economic and Social Statistics Office
National Statistical Coordination Board

TABLE 11.2.3B REGIONAL SHARE OF GROSS REGIONAL DOMESTIC PRODUCT
(AT CONSTANT 1972 PRICES)

	1987 (in million pesos)	REGIONAL SHARE (in percent)
Philippines	107,144	
NCR	33,256	31.04
CAR	1,663	1.55
Region I	3,388	3.16
Region II	2,104	1.96
Region III	8,792	8.21
Region IV	14,384	13.42
Region V	3,437	3.21
Region VI	7,154	6.66
Region VII	8,086	7.55
Region VIII	3,121	2.91
Region IX	3,977	3.71
Region X	5,937	5.54
Region XI	7,655	7.14
Region XII	4,190	3.91

Sources: Economic and Social Statistics Office
National Statistics and Coordination Board

* Revised Estimate as of June 1990

TABLE 11.2.3C NCR GROSS REGIONAL DOMESTIC PRODUCT BY SECTOR (AT CONSTANT 1972 PRICES)

Sector/ Subsector	1980		1986		Average, 1980-86		
	Amount (mil. P)	Growth (%)	Amount (mil. P)	Growth (%)	GRDP (mil. P)	Percent (%)	Growth Rate (%)
INDUSTRY	15.25	52.00	13.37	50.2	15.30	51.8	-5.7
Mining	-	-	-	-	-	-	-
Manufacturing	12.26	41.8	11.60	43.6	12.40	42.0	-0.8
Constructions	2.44	8.3	0.90	3.4	2.20	7.4	-12.8
Electricity, Gas and Water	0.55	1.9	0.87	3.3	0.70	2.4	7.9
SERVICES	14.05	48.0	13.26	49.8	14.30	48.3	19.4
Transport, Communication and Storage	2.04	7.0	2.20	8.3	2.20	7.4	1.3
Trade	2.91	9.9	3.77	14.2	3.40	11.5	4.5
Finance and Housing	3.31	11.3	1.12	4.2	2.50	8.5	12.4
Other Services	5.79	19.8	6.17	23.2	6.20	20.9	1.2
T O T A L	29.30	100.0	26.63	100.0	29.60	100.1	13.7

Note : Figures may not add up to totals due to rounding
Source: National Account Staff, NEDA

TABLE 11.2.3D FAMILY INCOME DISTRIBUTION AND SOURCES

Income Distribution (Unit: %)

Region/Province	Average Family Income (in Peso)	Below P 10,000	P 10,000 19,999	Below P 19,999 Sub-Total	P 20,000 39,999	Above P40,000
REGION IV	29.985	12.7	33.1	45.8	33.2	21.0
Cavite	39.759	0.0	16.2	16.2	48.3	35.5
Rizal	38.517	4.9	35.5	40.4	30.9	28.7
METRO MANILA	57.193	1.5	11.9	13.4	37.0	49.6
PHILIPPINES	31.052	15.2	33.7	48.9	30.7	20.4

Income Sources (Unit: %)

Region/Province	Wages and Salaries Agriculture	Wages and Salaries Non-Agriculture	Entrepreneurial Activities Agriculture	Entrepreneurial Activities Non-Agriculture	Other Income Sources
REGION IV	10.30	35.97	24.00	11.21	18.53
Cavite	4.00	67.48	6.20	7.39	14.39
Rizal	8.57	44.89	17.09	13.71	15.73
METRO MANILA	0.50	57.96	0.09	16.60	24.85
PHILIPPINES	9.20	31.24	28.62	12.40	18.54

Source: 1985 Family Income and Expenditures Survey (NSO)

TABLE 11.2.3E 1985 NCR AVERAGE ANNUAL FAMILY INCOME AND EXPENDITURE BY INCOME CLASS

Income Class	Families			Average Income (₱)	Average Expenditure (₱)
	Number	% to Total	Accumulative		
Under P6,000	1,719	0.1	-	5,520	7,205
P 6,000 - P 9,999	17,697	1.4	1.5	8,504	11,308
P10,000 - P14,999	51,118	3.9	5.4	13,076	14,484
P15,000 - P19,999	104,882	8.0	13.4	17,706	18,319
P20,000 - P29,999	256,991	19.6	33.0	24,975	24,823
P30,000 - P39,999	228,460	17.4	50.4	34,719	32,176
P40,000 - P49,999	281,570	21.5	71.9	48,716	43,046
P50,000 - P99,999	222,246	17.0	88.9	75,962	64,074
P100,000 and over	146,965	11.1	100.0	187,182	140,697
NCR	1,310,549			57,193	48,453

Source: 1985 Family Income and Expenditure Survey (NCSO)

TABLE 11.2.3F 1988 NCR AND CAVITE PROVINCE FAMILY INCOME AND EXPENDITURE BY INCOME CLASS

INCOME CLASS AND AREA	Total Number of Families		Average Income	Average Expenditure
	No. of Families	%	(₱)	(₱)
NATIONAL CAPITAL REGION	1,435,437	100	79,314	60,355
Under P10,000	5,390	0.4	7,822	12,939
P10,000 14,999	14,501		12,705	17,209
P15,000 19,999	44,191	3.1	17,505	18,897
P20,000 29,999	190,062	13.2	25,281	24,888
P30,000 39,999	210,456	14.4	35,073	32,529
P40,000 50,999	327,560	22.8	49,291	43,897
P60,000 AND OVER ...	643,277	44.8	131,387	92,544
Manila	343,744		60,394	43,447
Pasig	71,987		95,093	64,747
Quezon	287,214		97,759	74,555
Caloocan	113,884		59,074	46,926
Pasay	69,912		63,816	49,007
Makati	84,376		127,037	98,963
Other Metro	464,318		78,090	61,395
CAVITE	195,935	100	45,506	39,540
Under P10,000	1,255	0.6	9,064	8,656
P10,000 14,999	6,290	3.2	12,887	12,644
P15,000 19,999	15,322	7.8	17,581	17,481
P20,000 29,999	43,879	22.4	25,025	23,761
P30,000 39,999	36,334	18.6	34,829	33,125
P40,000 50,999	49,792	25.4	47,969	43,425
P60,000 AND OVER ...	43,063	22.0	88,302	69,218
RIZAL (No Data)				

Source: 1988 Family Income and Expenditure Survey (NSO)

TABLE 11.2.3G NUMBER OF ESTABLISHMENTS BY KIND OF TRADE/ BUSINESS BY MUNICIPALITY, CAVITE (S.A), 1989

City/Municipality	Wholesale/ Retail	Public and Private Services	Financing Insurance & Real Estate	Total
Cavite (Province)	9,314	1,848	388	11,550
Cavite City	2,403	690	82	3,175
Bacoor	754	170	79	1,003
Imus	692	114	25	831
Kawit	891	96	63	1,050
Noveleta	228	54	11	293
Rosario	337	52	11	400
TOTAL	5,305	1,176	271	6,752
Percent	78.57	17.42	4.01	100

Source: Office of the Provincial Planning and Development Coordination Trece Martires, Cavite

TABLE 11.2.3H NUMBER AND TYPE OF COMMERCIAL ESTABLISHMENTS BY KIND OF TRADE, PROVINCE OF CAVITE

Trade/Business	1987		1989		
	Number	% of Total	Number	% of Total	% Increase
Wholesale/Retail	8,710	81.67	9,314	80.64	6.93
Financing/Insurance Real Estate	156	1.46	388	3.36	148.72
Public and Private Business	1,799	16.87	1,848	16.00	2.72
TOTAL	10,665	100.00	11,550	100.00	8.30

Source: Office of the Provincial Planning and Development Coordination
Trece Martires, Cavite

TABLE 11.2.3I NUMBER OF ESTABLISHMENTS BY KIND OF TRADE/BUSINESS BY MUNICIPALITIES, PROVINCE OF RIZAL, 1990

Municipality	Manufacturing	Electricity Gas and Water	Construction	Wholesale/Retail	Trans. Comm. Storage	Banking and Finance	Comm.,Social and Personnel Water	Total	Percentage of Total
Angono	65	-	6	489	-	4	158	722	7.8
Antipolo	116	-	3	912	6	13	319	1,369	14.9
Baras	13	1	3	78	-	1	27	123	1.4
Binangonan	82	6	2	487	2	5	96	680	7.5
Cainta	117	7	21	1,005	3	20	109	1,282	14.0
Cardona	15	4	2	304	2	1	49	377	4.2
Jalajala	-	-	-	131	-	-	7	138	1.5
Morong	26	-	5	200	9	5	143	388	4.3
Pililla	11	2	-	293	-	-	48	258	2.8
Montalban	6	-	16	197	13	2	64	706	7.7
San Mateo	45	3	6	600	20	4	6	684	7.5
Tanay	32	4	4	532	6	5	193	776	8.5
Taytay	450	5	5	874	-	7	124	1,465	16.0
Teresa	15	-	5	123	-	2	32	177	1.9
TOTAL	933	32	78	6,537	61	69	1,375	9,145	100
Percent	10.86	0.35	0.85	71.48	0.67	0.75	15.04	100	

Source: Socio Economic Profile, Province of Rizal
(Department of Trade and Industry)

TABLE 11.3.1A POPULATION AND NUMBER OF HOUSEHOLDS

City/Municipality	1980			1990			
	No. of Households	Population	Average size of Households	No. of Households		Population	Average size of Households
PHILIPPINES	8,607,000	48,098,460	5.6	11,380,000		60,477,000	5.3
NCR	1,102,000	5,925,884	5.4	1,557,000	85.3%	7,833,000	5.0
Manila	301,000	1,630,485	5.4	310,000		1,587,000	4.9
Caloocan	89,000	467,816	5.2	150,000		746,000	4.8
Pasay City	55,000	287,770	5.2	73,000		354,000	4.9
Quezon City	218,000	1,165,865	5.2	327,000		1,632,000	5.0
Las Pinas	25,000	136,514	5.5	56,000		286,000	5.1
Makati	69,000	372,631	5.4	89,000		452,000	5.0
Malabon	36,000	191,001	5.3	58,000		277,000	4.8
Mandaluyong	39,000	205,366	5.3	49,000		247,000	5.0
Marikina	39,000	211,613	5.4	62,000		308,000	5.0
Muntinlupa	24,000	136,679	5.6	53,000		276,000	5.1
Navotas	23,000	126,146	5.4	35,000		196,000	5.2
Paranaque	38,000	208,552	5.6	61,000		300,000	4.9
Pasig	50,000	268,570	5.4	77,000		395,000	5.1
Pateros	7,000	40,288	5.5	10,000		51,000	5.2
San Juan	24,000	130,088	5.5	24,000		127,000	5.2
Taguig	25,000	134,137	5.3	53,000		267,000	5.0
Valenzuela	40,000	212,363	5.3	70,000		340,000	4.9
CAVITE	(No data per municipality)	324,273		91,435	5.0%	458,771	5.0
Bacoor		90,364		30,948		160,287	5.2
Cavite City		87,666		19,043		91,649	4.8
Imus		59,103		18,667		92,144	4.9
Kawit		39,368		9,763		47,692	4.9
Noveleta		14,460		4,013		21,635	5.4
Rosario		33,312		9,001		45,364	5.0
RIZAL	(No data per municipality)	555,473		188,129	9.7%	880,608	4.9
Angono		26,511		8,939		45,563	5.1
Antipolo		68,912		34,205		173,908	5.1
Baras		11,196		3,116		16,680	5.4
Binangonan		80,980		24,394		93,305	3.8
Cainta		59,025		20,969		109,552	5.2
Cardona		24,503		6,263		32,841	5.2
Jala-Jala		11,945		3,035		16,314	5.4
Morong		24,858		6,255		32,220	5.2
Pililla		23,222		6,132		32,524	5.3
Montalban		41,859		12,454		63,824	5.1
San Mateo		51,910		15,925		81,917	5.1
Tanay		40,443		10,603		48,880	4.6
Taytay		75,328		21,861		112,414	5.1
Teresa		14,781		13,978		20,666	1.5
TOTAL (Study Area)		6,805,630		1,836,564	100%	9,172,379	5.0

Source: NCR 1990 Census of Population and Housing (NSO)
(1990 figures and 1980 No. of Households are based on Preliminary results of the 1990 Census of Population and Housing
CAVITE National Statistics Office, Cavite Branch
RIZAL National Statistics Office, Rizal Branch

TABLE 11.3.1B NUMBER OF FAMILIES BY TYPE OF BUILDING OCCUPIED: PHILIPPINES, NCR AND REGION IV, 1985

Area/Region	Total Number of families	Type of Building					
		Single House	Duplex	Apartment/ accesoria/ condominium	Improvised (Barong-Barong)	Commercial/ industrial/ agricultural	Other housing units, natural shelter, boat, etc.
Philippines	9,847,340	8,830,688	234,349	409,406	313,960	49,371	9,566
Metro Manila Area (NCR)	1,310,549	879,680	55,408	283,357	63,492	23,662	4,950
IV. Southern Tagalog	1,303,730	1,199,302	42,645	19,894	37,563	2,723	1,603

Source: 1985 Family Income and Expenditures Survey (NSO)

TABLE 11.3.1C NUMBER OF OCCUPIED DWELLING UNITS BY TYPE OF BUILDING, MUNICIPALITY OF CAVITE, 1980

Municipality	Total Number of Occupied Dwelling Units	Type of Building: Single House	Duplex	Apartment/ accesoria/ condominium	Improvised (Barong-Barong)	Commercial/ industrial/ agricultural	Other housing units, natural shelter, boat, etc.	Hotel, Lodging house Dormitory, etc.	Institutional (hospital, Convent, School Dormitory, etc.)	Other collective Living quarters (Military camp, etc.)
CAVITE (Prov.)	138,327	130,072	3,177	2,606	1,981	478	7	1	2	3
Cavite City	16,781	13,903	974	1,304	412	184	3	-	1	-
Bacoor	16,081	14,384	793	606	263	32	2	-	1	-
Imus	11,025	10,741	115	135	17	17	-	-	-	-
Kawit	7,208	6,738	96	218	119	37	-	-	-	-
Noveleta	2,532	2,397	95	20	14	6	-	-	-	-
Rosario	5,872	5,577	197	79	19	-	-	-	-	-
CAVITE (Study Area)	59,499	53,740	2,270	2,362	844	276	5	0	2	0
Percentage	100	90.3	3.8	3.9	1.4	0.5	0.08	-	0.02	-

Source: Cavite Provincial Development Plan (HLURB)

TABLE 11.3.1D NUMBER OF BUILDINGS BY REGION AND PROVINCE: 1989

Region/Province	No. of Buildings	Region/Province	No. of Buildings
PHILIPPINES	4,259,941	CAVITE (NDA)	116,158
NCR	893,524		
Manila	130,504		
Caloocan City	96,749	RIZAL (NDA)	113,060
Pasay City	35,322		
Quezon City	192,276		
Las Pinas	47,151		
Makati	45,543		
Malabon	26,558		
Mandaluyong	24,228		
Marikina	37,291		
Muntinlupa	40,367		
Navotas	24,267		
Paranaque	51,564		
Pasig	50,698		
Pateros	6,118		
San Juan	11,777		
Taguig	34,261		
Valenzuela	38,830		

NDA (No data available per municipality)

Source: 1989 Census of Buildings (NSO)
(Preliminary Data)

TABLE 11.3.2 PROJECTED NUMBER OF HOUSEHOLDS OF THE STUDY AREA

Region/Province	1990	1995	2000	2005	2010
Philippines	11,380,000	13,212,456	15,152,959	16,812,192	18,381,100
Metro Manila (NCR)	1,557,000	1,847,899	2,150,299	2,384,682	2,605,799
Cavite (S.A.)	91,435	110,543	130,774	150,646	170,319
Rizal	188,129	225,154	264,926	299,520	331,549
TOTAL	1,836,564	2,183,596	2,545,999	2,834,848	3,107,667

Source: Study Team

TABLE 11.3.3 METRO MANILA PRIORITY RESETTLEMENT PROGRAM
MAGNITUDE BY CITY/MUNICIPALITY

City/Municipality	ESTIMATED NUMBER OF FAMILIES BY CLASSIFICATION					
	No. of Areas	Esteros/ Waterways	PNR Tracks	DPWH Infra. Projects	Other Gov't. Projects	TOTAL
Manila	86	733	732	1,198	7,476	10,139
Navotas	3	4,352	-	135	-	4,487
Malabon	2	3,344	-	26	-	3,370
Valenzuela	5	981	-	-	208	1,189
Caloocan	4	83	-	430	500	1,013
Quezon City	20	1,489	-	2,210	3,867	7,566
Pasig	9	132	-	144	148	424
San Juan	15	161	-	150	399	710
Marikina	5	530	-	150	-	680
Mandaluyong	10	27	4,000	400	10,515	14,942
Makati	11	388	945	1,678	576	3,587
Pasay	12	1,013	-	702	299	2,014
Las Pinas	4	1,097	-	-	1,200	2,297
Paranaque	12	1,030	-	515	58	1,603
Taguig	2	32	-	-	200	232
Pateros	3	600	-	-	-	600
Muntinlupa	17	-	1,569	100	2,549	4,218
TOTAL	220	15,992	7,246	7,838	27,995	59,071

Source: NHA, 1990

TABLE 11.4.1 ESTIMATED AREA BY LAND USE CATEGORY

Region/ Province	LAND USE					TOTAL AREA (Has.)
	BUILT-UP AREA Residential Commercial Industrial Institutional Facilities	AGRICULTURAL Rice field Cropland Plantation	FOREST/GRASSLAND Forest Grassland Shrubland Pasture	WETLAND Lake Pond Swamp/Marsh	OPEN SPACE	
NCR	33,840	2,500	6,700	1,760	18,800	63,600
	(53.2)	(3.9)	(10.5)	(2.8)	(29.6)	(100)
CAVITE (S.A.)	6,497	10,235	840	1,000	-	18,572
	(35.0)	(55.1)	(4.5)	(5.4)		(100)
RIZAL	15,231	20,178	94,230	304	19,240	130,383
	(11.7)	(15.5)	(72.3)	(0.2)	(9.1)	(100)
TOTAL	51,585.5	30,238	94,228	1,003.5	29,761	212,555
	(24.3)	(14.2)	(44.3)	(0.5)	(14.0)	100)

Filename:TAB1051.PRN

TABLE 11.5.1A LENGTH OF EXISTING ROADS BY SYSTEM CLASSIFICATION
AS OF DECEMBER 31, 1989

Region/Province City	National	Provincial	City	Municipal	Barangay	Total (km)
PHILIPPINES	26110.084	29143.717	3949.38	12706.896	87159.104	159069.181
NCR	896.992		1273.741	554.339	271.286	2996.358
(*) Cavite (S.A.)	NDA					67.849
(**) Rizal	245.009	66.830		143.39	782.930	1238.159
TOTAL (S.A.)						4302.366

NDA: No data available

Source: Department of Public Works and Highways (DPWH)
(*) Department of Public Works and Highways
Trece Martires Branch
(**) Socio-Economic Profile, Rizal Branch

TABLE 11.5.1B EXISTING ROADS BY SURFACE TYPE (CAVITE AND RIZAL)

City/ Municipality	Length (KM)	Width (KM)	TYPE OF PAVEMENT									
			Concrete		Asphalt		Gravel		Earthfill		Bit. Seal Coat	
			Length	%	Length	%	Length	%	Length	%	Length	%
Cavite City	55.705		40.696	73.06	5.567	10.00	2.675	4.80	6.767	12.14		
Bacoor	1.595		1.595	100.00								
Imus	6.689		6.689	100.00								
Kawit	0.749		0.749	100.00								
Noveleta	2.000		2.000	100.00								
Rosario	1.111		1.111	100.00								
CAVITE (Total	67.849		52.840		5.567		2.675		6.767			
RIZAL	1,238.159		228.563		267.773		615.276		126.548			

Source: Department of Public Works and Highways,
Trece Martires, Cavite Branch

Socio-economic Profile, Rizal Branch

TABLE 11.5.2 SOURCE OF POTABLE WATER AND HOUSEHOLD SERVED

Municipality/ City	WATERWORK SYSTEM				Deepwell		Shallow Well		Dugwell		Spring River	
	Level III		Level II									
	No.	Household Served	No.	Household Served	No.	Household Served	No.	Household Served	No.	Household Served	No.	Household Served
Bacoor	4	2,490	-	-	2264	4,964	3223	9,036	6	12	-	-
Imus	1	698	-	-	567	969	5945	11,159	-	-	-	-
Kawit	1	1,889	-	-	1602	3,748	2012	4,734	3	4	-	-
Noveleta	-	-	-	-	435	1,090	808	2,945	-	-	-	-
Rosario	-	-	1	105	1985	4,843	1003	1,064	-	-	-	-
Cavite City	17	7,308	-	-	-	-	-	-	-	-	-	-
CAVITE (Total)	23	12,385	1	105	6853	15,634	12991	28,938	9	16	-	-
Angono	-	-	-	-	58	459	230	1,410	8	157	-	-
Antipolo	7	30,290	-	-	534	5,916	196	3,915	32	685	24	1,855
Baras	1	351	-	-	122	1,839	110	1,390	8	23	5	21
Binangonan			13	42,567	128	2,574	348	1,487	-	-	-	-
Cainta	2	9,786	-	-	43	580	356	3,224	2	5	-	-
Cardona	-	-	3	1,645	77	1,085	346	1,788	2	5	-	-
Jala-jala	-	-	1	1,753	63	870	389	1,117	3	211	-	-
Montalban	1	21,871	-	-	45	3,551	98	2,101	-	-	-	-
Morong	2	11,300	-	-	37	2,924	157	1,429	-	-	-	-
Pililla	-	-	3	8,689	11	435	53	2,210	20	122	7	1,816
San Mateo	1	17,651	-	-	58	4,967	76	1,785	-	-	-	-
Tanay	-	-	-	-	32	408	526	2,529	-	-	3	55
Taytay	2	37,257	-	-	62	451	63	449	1	35	-	-
Teresa	-	-	1	594	43	1,798	137	386	3	51	4	117
RIZAL (Total)	16	128,506	21	55,248	1313	27,857	3085	25,220	79	1,294	43	3,864

Source: DPWH, Cavite Provincial Profile (1989)
Socio-Economic Profile Province of Rizal (1990)

TABLE 11.7.1 TOTAL POPULATION, HOUSEHOLD POPULATION AND NUMBER OF HOUSEHOLDS IN THE STUDY AREA (1990)

CITY/MUNICIPALITY	TOTAL POPULATION	HOUSEHOLD POPULATION	NUMBER OF HOUSEHOLDS
METRO MANILA	7,928,867	7,887,861	1,567,665
1. Manila	1,598,918	1,585,887	308,874
2. Pasay City	366,623	364,959	73,642
3. Quezon City	1,666,766	1,659,940	331,760
4. Caloocan City	761,011	759,420	150,972
5. Las Pinas	296,851	296,645	57,774
6. Makati	452,734	450,163	89,310
7. Malabon	278,380	278,161	58,051
8. Mandaluyong	244,538	242,526	49,065
9. Marikina	310,010	309,103	60,090
10. Muntinlupa	276,972	268,960	53,449
11. Navotas	186,799	186,642	38,864
12. Parañaque	307,717	306,865	61,252
13. Pasig	397,309	396,764	77,621
14. Pateros	51,401	51,359	9,808
15. San Juan	126,708	125,815	24,338
16. Taguig	266,080	265,043	53,153
17. Valenzuela	340,050	339,609	69,642
CAVITE	457,020	456,569	91,396
1. Bacoor	159,685	159,663	30,928
2. Cavite City	91,641	91,480	19,040
3. Imus	92,125	91,875	18,618
4. Kawit	47,755	47,755	9,767
5. Noveleta	20,409	20,409	4,012
6. Rosario	45,405	45,387	9,001
RIZAL	980,194	978,596	189,712
1. Angono	46,014	45,439	8,941
2. Antipolo	207,842	207,665	40,852
3. Baras	16,880	16,880	3,163
4. Binangonan	127,561	127,421	24,378
5. Cainta	126,839	126,680	24,775
6. Cardona	32,962	32,958	6,264
7. Jala-Jala	16,318	16,318	3,035
8. Morong	32,165	32,165	6,255
9. Pililla	32,771	32,771	6,131
10. Montalban	67,074	67,011	12,891
11. San Mateo	82,310	82,289	16,079
12. Tanay	58,410	58,196	11,089
13. Taytay	112,403	112,163	21,881
14. Teresa	20,645	20,640	3,978
T O T A L	9,366,081	9,323,026	1,848,773

Source: National Statistics Office
1990 Census of Population and Housing

TABLE 11.7.2 POPULATION DISTRIBUTION IN ANTIPOLO (1990)

MUNICIPALITY/ BARANGAY	TOTAL POPULATION	HOUSEHOLD POPULATION	NUMBER OF HOUSEHOLDS
ANTIPOLO	207,842	207,665	40,852
1. Bagong Nayon	18,002	18,002	3,472
2. Beverly Hills	1,034	1,034	191
3. Calawis	1,662	1,662	353
4. Cupang	25,696	25,690	5,005
5. Dalig	20,334	20,334	3,964
6. De La Paz	21,033	21,033	4,158
7. Inarawan	4,965	4,965	1,023
8. Mambugan	15,636	15,611	2,970
9. Mayamot	15,887	15,887	3,142
10. San Isidro	19,260	19,248	3,776
11. San Jose	26,121	26,049	5,067
12. San Juan	1,394	1,394	298
13. San Luis	6,241	6,241	1,340
14. San Roque	17,227	17,165	3,287
15. Sta. Cruz	13,340	13,340	2,806

Source: National Statistics Office
1990 Census of Population and Housing (Report No. 2-A)

TABLE 11.7.3 GROWTH RATE OF THE STUDY AREA'S POPULATION (1990-2010)

CITY/MUNICIPALITY	ANNUAL GROWTH RATE				
	1990/ 1980	1995/ 1990	2000/ 1995	2005/ 2000	2010/ 2005
I. METRO MANILA	2.83	2.47	2.07	1.73	1.42
1. Manila	-0.27	0.82	0.47	0.20	0.00
2. Pasay City	2.34	2.28	1.98	1.86	1.59
3. Quezon City	3.50	3.15	2.96	2.76	2.47
4. Calookan City	4.79	2.74	2.31	1.89	1.56
5. Las Pinas	7.69	6.63	5.77	5.00	4.28
6. Makati	3.68	1.55	1.14	0.81	0.53
7. Malabon	3.69	1.88	1.43	1.08	0.77
8. Mandaluyong	1.67	1.67	1.24	0.91	0.62
9. Marikina	3.74	2.95	2.41	1.96	1.56
10. Muntinlupa	6.99	4.50	3.82	3.24	2.70
11. Navotas	3.85	2.11	1.64	1.26	0.94
12. Parañaque	3.81	3.65	3.05	2.54	2.08
13. Pasig	3.84	3.21	2.65	2.17	1.75
14. Pateros	2.36	2.56	2.06	1.64	1.27
15. San Juan	-0.33	1.01	0.64	0.36	0.13
16. Taguig	6.77	3.12	2.57	2.10	1.68
17. Valenzuela	4.63	4.63	4.10	3.49	2.93
II. CAVITE	3.43	3.11	2.69	2.33	1.92
1. Bacoor	5.69	4.16	3.61	3.11	2.63
2. Cavite City	0.44	1.46	1.14	1.03	0.49
3. Imus	4.43	3.02	2.57	2.17	1.79
4. Kawit	1.93	2.90	2.46	2.07	1.70
5. Noveleta	3.44	2.67	2.25	1.88	1.53
6. Rosario	3.09	3.14	2.68	2.26	1.88
III. RIZAL	5.46	3.20	2.84	2.52	2.07
1. Angono	5.28	3.59	3.07	2.56	2.03
2. Antipolo	10.83	4.61	4.01	3.40	2.79
3. Baras	3.89	2.42	2.01	1.59	1.17
4. Binangonan	4.33	1.97	1.60	1.22	0.84
5. Cainta	7.44	5.22	4.56	3.90	3.24
6. Cardona	2.75	1.31	1.00	0.68	0.35
7. Jala-Jala	2.91	1.75	1.40	1.04	0.68
8. Montalban	4.50	2.44	2.02	1.61	1.17
9. Morong	2.36	1.42	1.36	1.69	1.47
10. Pililla	3.23	1.96	1.58	1.21	0.83
11. San Mateo	4.52	2.31	1.91	1.50	1.09
12. Tanay	3.46	2.42	2.01	1.59	1.17
13. Taytay	3.79	2.83	2.72	3.08	2.61
14. Teresa	3.13	0.82	0.55	0.27	0.03

TABLE 11.7.4 POPULATION PROJECTION FOR THE STUDY AREA, 1990-2010

CITY/MUNICIPALITY	1980 (CENSUS)	1990 (CENSUS)	1995	2000	2005	2010
I. NCR	5,970,307	7,928,867	8,971,500	9,948,977	10,847,652	11,649,608
1. Manila	1,642,709	1,598,918	1,666,014	1,705,567	1,723,126	1,723,147
2. Pasay City	259,927	366,623	402,932	433,048	457,147	475,225
3. Quezon City	1,174,605	1,666,766	1,870,519	2,049,017	2,200,635	2,323,154
4. Caloocan City	471,323	761,011	872,801	979,527	1,076,883	1,164,630
5. Las Pinas	137,537	296,951	413,469	551,508	708,704	878,109
6. Makati	375,424	452,734	489,333	517,961	539,315	553,794
7. Malabon	192,433	278,380	305,870	328,653	346,868	360,515
8. Mandaluyong	206,906	244,538	265,870	282,944	296,044	305,315
9. Marikina	213,199	310,010	359,368	405,480	447,289	483,621
10. Muntinlupa	137,704	276,972	346,829	419,918	493,739	565,215
11. Navotas	127,092	186,799	207,567	225,328	240,031	251,550
12. Paranaque	210,115	307,717	369,370	430,253	488,493	541,964
13. Pasig	270,563	397,309	466,552	532,663	593,888	648,283
14. Pateros	40,590	51,401	58,438	64,776	70,318	74,945
15. San Juan	131,063	126,708	133,478	137,583	140,304	141,007
16. Taguig	135,143	266,050	311,031	353,627	392,792	427,323
17. Valenzuela	213,955	340,050	432,359	530,521	632,076	731,811
II. CAVITE	321,273	457,020	534,043	611,062	686,525	756,085
1. Bacoor	90,364	159,685	196,636	235,535	275,150	313,538
2. Cavite City	87,666	91,641	98,576	104,379	109,908	112,628
3. Imus	59,103	92,125	107,162	121,860	135,818	148,512
4. Kawit	39,368	47,755	55,217	62,446	69,254	75,407
5. Noveleta	14,460	20,409	23,325	26,102	28,673	30,955
6. Rosario	33,312	45,405	53,127	60,737	68,022	74,715
III. RIZAL	567,346	950,194	1,150,043	1,325,537	1,503,547	1,667,350
1. Angono	27,136	46,014	55,062	64,219	72,979	80,798
2. Antipolo	70,377	207,542	261,738	319,819	379,154	435,886
3. Baras	11,434	16,880	19,051	21,063	22,808	24,152
4. Binangonan	82,702	127,561	140,791	152,533	162,155	169,117
5. Cainta	60,280	126,839	164,650	206,860	251,447	295,646
6. Cardona	25,024	32,962	35,194	36,995	38,270	38,952
7. Jala-Jala	12,199	16,318	17,814	19,109	20,131	20,826
8. Montalban	42,749	67,074	75,766	83,837	90,845	96,318
9. Morong	25,387	32,165	34,528	36,957	40,222	43,304
10. Pililla	23,716	32,771	36,137	39,119	41,556	43,312
11. San Mateo	53,014	82,310	92,401	101,679	109,620	115,769
12. Tanay	41,303	58,410	65,923	72,889	78,925	83,678
13. Taytay	76,930	112,403	129,481	148,322	173,025	197,131
14. Teresa	15,095	20,645	21,507	22,106	22,410	22,441
T O T A L	6,861,926	9,366,081	10,655,856	11,885,576	13,038,024	14,073,043

Source: Estimation made by the Study Team based on NSO data

TABLE 11.7.5 POPULATION PROJECTION FOR THE MUNICIPALITY OF ANTIPOLO, 1990-2010

MUNICIPALITY/ BARANGAY	1990	1995	2000	2005	2010
ANTIPOLO	207,842	261,738	319,649	379,154	435,886
1. Bagong Nayon	18,002	22,644	27,647	32,752	37,637
2. Beverly Hills	1,034	1,385	1,767	2,161	2,532
3. Calavis	1,662	2,172	2,725	3,293	3,831
4. Cupang	25,696	32,283	39,380	46,620	53,551
5. Dalig	20,344	25,566	31,204	36,956	42,461
6. De La Paz (Pob.)	21,033	26,441	32,269	38,215	43,906
7. Inarawan	4,965	6,312	7,767	9,254	10,673
8. Mambugan	15,636	19,680	24,039	28,487	32,743
9. Mayamot	15,887	19,995	24,423	28,941	33,264
10. San Isidro	19,260	24,220	29,566	35,020	40,240
11. San Jose	26,121	32,815	40,026	47,385	54,425
12. San Juan	1,394	1,838	2,319	2,813	3,280
13. San Luis	6,241	7,910	9,712	11,553	13,311
14. San Roque	17,227	21,673	26,465	31,355	36,034
15. Sta. Cruz	13,340	16,804	20,535	24,349	27,995

Source: Estimation made by the Study Team based on NSO data. Due to the absence of population data at barangay level prior to 1990, population projections at barangay level were based on the growth rate of the whole Antipolo municipality.

TABLE 11.7.6 POPULATION DISTRIBUTION, LAND AREA AND POPULATION DENSITY: ANTIPOLO AREA (1990, 2000 AND 2010)

BARANGAY/ MUNICIPALITY	POPULATION						LAND AREA (Ha.)		DENSITY S.A. (Person per Ha.)		
	1990		2000		2010		Total				
	Barangay	Study Area	Barangay	Study Area	Baragay	Study Area	Barangay	Study Area	1990	2000	2010
1. Bagong Nayon	18,002	14,402	27,647	22,117	37,637	30,110	648.0	319.2	45	69	94
2. Santa Cruz	13,340	9,338	20,538	14,377	27,995	19,597	1,108.0	778.4	12	18	25
3. De La Paz	21,033	21,033	32,269	32,269	43,906	43,906	420.6	420.6	50	77	104
4. Beverly Hills	1,034	1,034	1,767	1,767	2,532	2,532	31.4	31.4	33	56	81
5. San Roque	17,227	17,227	26,465	26,465	36,034	36,034	380.4	380.4	45	70	95
6. Dalig	20,344	14,241	31,204	21,843	42,461	29,723	556.5	332.6	43	66	89
7. San Jose	26,121	13,061	40,028	20,014	54,425	27,214	5,640.1	270.0	48	74	101
8. San Isidro	19,260	19,260	29,566	29,566	40,240	40,240	360.8	360.8	53	82	112
9. San Luis	6,241	3,121	9,712	4,856	13,311	6,656	697.2	233.6	13	21	28
SUB-TOTAL	142,602	112,717	219,196	173,274	298,544	236,012	9,843.0	3,127.0	36	55	75
10. Taytay	-----	7,970	------	10,517	------	13,978	------	764.8	10	14	18
11. Angono	-----	1,750	------	2,705	------	4,189	------	935.0	2	3	4
12. Binangonan	-----	700	------	958	------	1,334	------	141.0	5	7	9
13. Teresa	-----	210	------	256	------	318	------	120.0	2	2	3
SUB-TOTAL	-----	10,630	------	14,436	------	19,819	------	1,960.8	5	7	10
TOTAL		123,347		187,710		255,831		5,087.8	24	37	50

TABLE 11.7.7 POPULATION DISTRIBUTION, LAND AREA AND POPULATION DENSITY: AQUIFER BASIN ZONE (1990, 2000 AND 2010)

BARANGAY/ MUNICIPALITY	POPULATION						LAND AREA (Ha.)		DENSITY S.A. (Person per Ha.)		
	1990		2000		2010		Total				
	Barangay	Study Area	Barangay	Study Area	Baragay	Study Area	Barangay	Study Area	1990	2000	2010
BARANGAY											
Santa Cruz	13,340	4,002	20,538	6,161	27,995	8,399	1,108.0	123.6	32	50	68
De La Paz	21,033	16,826	32,269	25,815	43,906	35,125	420.6	159.4	106	162	220
San Roque	17,227	15,504	26,465	23,819	36,034	32,431	380.4	308.4	50	77	105
Dalig	20,344	14,241	31,204	21,843	42,461	29,723	556.5	332.6	43	66	89
San Jose	26,121	13,061	40,028	20,014	54,428	27,214	5,640.1	270.0	48	74	101
San Isidro	19,260	15,408	29,566	23,653	40,240	32,192	360.8	169.0	91	140	190
San Luis	6,241	3,121	9,712	4,856	13,311	6,656	697.2	233.6	13	21	28
MUNICIPALITY											
Angono	-----	1,750	------	2,705	------	4,189	------	572.4	3	5	7
Binangonan	-----	700	------	958	------	1,334	------	141.0	5	7	9
Teresa	-----	210	------	256	------	318	------	120.0	2	2	3
TOTAL	123,566	84,823	189,782	130,080	258,375	177,581	9,163.6	2,430.0	35	54	73

TABLE 11.7.8 BLIGHTED POPULATION BY CITY/MUNICIPALITY, NATIONAL CAPITAL REGION

CITY/ MUNICIPALITY	1982			1985			1990		
	NHA BLIGHTED POPULATION ESTIMATES	TOTAL POPULATION	%	NHA BLIGHTED POPULATION ESTIMATES	TOTAL POPULATION	%	BLIGHTED POPULATION ESTIMATES	TOTAL POPULATION	%
1. MANILA	545,496	1,723,044	32	470,237	1,765,903	26.6	425,312	1,595,918	26.6
2. CALOOCAN CITY	130,080	492,549	26	196,507	543,903	36.2	304,404	761,011	40.0
3. PASAY CITY	76,902	294,709	26	259,490	331,861	57.2	319,695	366,623	87.2
4. QUEZON CITY	371,904	1,296,099	29	566,415	1,377,927	41.1	755,045	1,666,766	45.3
5. LAS PINAS	29,592	98,655	30	35,235	207,770	17.0	53,433	296,851	18.0
6. MAKATI	81,612	393,537	21	77,033	421,367	18.3	82,850	452,734	18.3
7. MALABON	48,883	203,313	24	51,092	220,198	23.2	79,617	278,360	28.6
8. MANDALUYONG	63,570	217,505	29	68,629	233,544	29.3	86,811	244,538	35.5
9. MARIKINA	32,484	204,995	16	80,000	259,507	30.8	105,035	310,010	33.9
10. MUNTINLUPA	39,594	116,754	34	47,200	183,694	25.7	79,491	276,972	28.7
11. NAVOTAS	56,020	129,314	43	73,683	147,365	50.0	93,399	186,799	50.0
12. PARANAQUE	36,180	156,955	23	22,580	266,741	8.5	32,310	307,717	10.5
13. PASIG	37,898	309,337	12	78,348	334,771	23.4	112,836	397,309	28.4
14. PATEROS	2,946	45,277	7	8,000	48,347	16.5	8,481	51,401	16.5
15. SAN JUAN	21,972	135,590	16	15,000	142,444	10.5	13,304	126,708	10.5
16. TAGUIG	49,614	134,238	37	38,231	166,308	23.0	66,529	266,080	25.0
17. VALENZUELA	21,060	160,841	13	157,500	290,552	54.2	187,027	340,050	55.0
TOTAL	1,645,807	6,112,712	27	2,275,180	6,942,207	32.8	2,805,579	7,928,867	35.4

TABLE 11.7.9 BLIGHTED POPULATION PROJECTION, NCR

YEAR	TOTAL POPULATION (Thousands)	GROSS BLIGHTED POPULATION (Thousands)	% OF THE TOTAL POPULATION
1985	6,942.21	2,275.18	32.8
1986	7,036.55	2,305.09	32.7
1987	7,244.38	2,414.25	33.3
1988	7,462.03	2,533.21	33.9
1989	7,690.01	2,663.38	34.6
1990	7,928.87	2,805.57	35.4
1995	8,971.80	3,172.40	35.4
2000	9,948.98	3,512.38	35.3
2005	10,847.65	3,820.59	35.2
2010	11,649.61	4,091.27	35.1

Source: NHA-CORPLAN (1985-1990)
STUDY TEAM (1995-2010)

TABLE 11.8.1 ESTIMATED AREA COVERED BY THE ANTIPOLO (1991)

BARANGAY/ MUNICIPALITY	LAND AREA BRGY./ MUNICIPALITY	AREA COVERED BY THE STUDY AREA (Ha.)	PERCENTAGE OF THE TOTAL BRGY./MUNICIPALITY AREA (%)
BARANGAY			
Bagong Nayon	648.0	319.2	49.3
Santa Cruz	1,108.0	778.4	70.3
De la Paz	420.6	420.6	100.0
Beverly Hills	31.4	31.4	100.0
San Roque	380.4	380.4	100.0
Dalig	556.5	332.6	59.8
San Jose	5,640.1	270.0	4.8
San Isidro	360.8	360.8	100.0
San Luis	697.2	233.6	33.5
MUNICIPALITY			
Taytay	3,374.0	761.8	22.7
Angono	2,600.0	935.0	36.0
Binangonan	7,270.0	141.0	1.9
Teresa	1,860.0	120.0	6.5
TOTAL	--	5,087.8	--

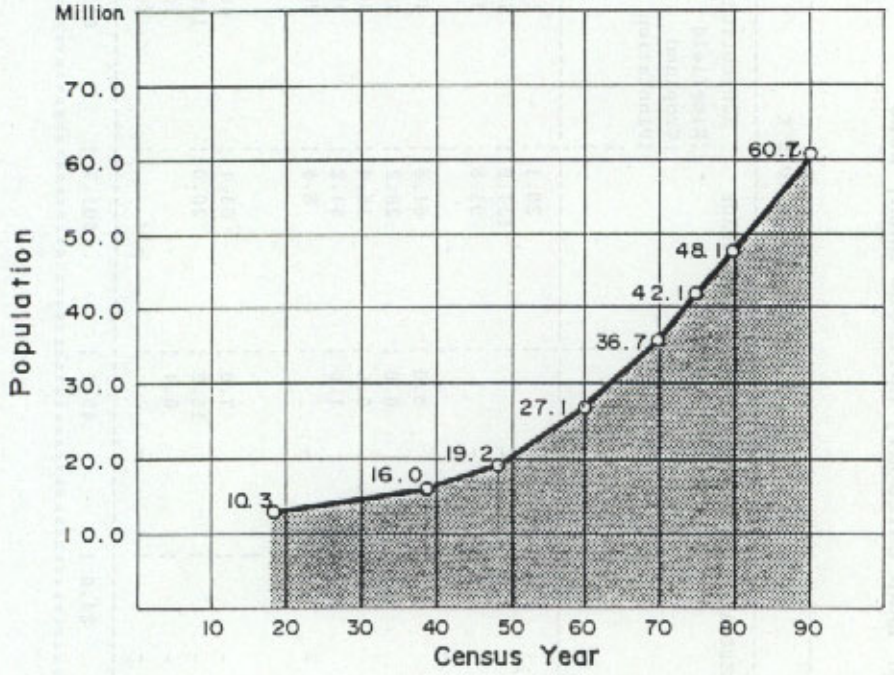
TABLE 11.8.2 ESTIMATED AREA BY LAND CATEGORY, ANTIPOLO AREA, 1991

BARANGAY/ MUNICIPALITY	LAND USE							LAND AREA (Ha.)
	BUILT-UP Residential Institutional Facilities	COMMERCIAL	INDUSTRIAL	OPEN SPACE	AGRICULTURAL Ricefield Cropland Plantation	FOREST/ GRASSLAND Forest Grassland Shrubland Pasture	OTHERS Wetland Quarry	
Bagong Nayon	69.1	2.8	-	36.2	44.0	157.1	10.0	319.2
Sta. Cruz	115.0	1.0	-	147.6	85.0	385.0	44.8	778.4
De la Paz	56.0	1.5	-	134.6	72.0	156.2	-	420.6
Beverly Hills	20.0	-	-	7.0	4.4	-	-	31.4
San Roque	95.0	2.0	5.0	74.4	87.0	117.0	-	380.4
Dalig	85.0	0.8	6.0	75.0	100.5	65.3	-	332.6
San Jose	55.0	2.0	3.6	47.0	90.5	68.9	-	270.0
San Isidro	43.4	2.0	0.4	82.0	57.0	176.0	-	360.8
San Luis	10.0	-	-	13.6	30.0	180.0	-	233.6
Taytay	115.2	-	5.2	122.6	41.8	477.0	-	761.8
Angono	45.0	-	10.5	35.0	149.0	665.2	30.0	935.0
Binangonan	6.5	-	6.4	-	10.6	117.2	-	141.0
Teresa	-	-	-	0.8	24.2	95.0	-	120.0
TOTAL	721.5	12.1	37.4	775.8	796.0	2,659.9	54.8	5087.8

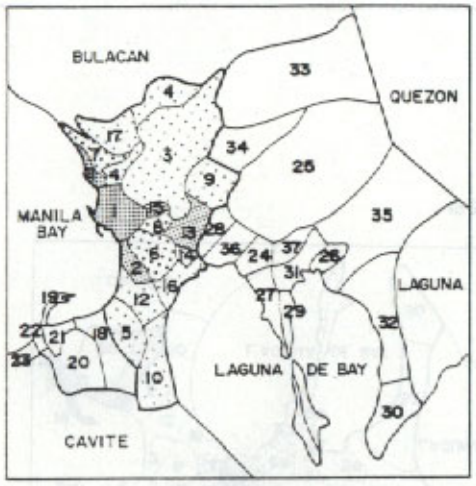
TABLE 11.8.3 ESTIMATED AREA BY LAND CATEGORY, ANTIPOLO AREA, 2020

BARANGAY/ MUNICIPALITY	LAND USE							LAND AREA (Ha.)
	BUILT-UP Residential Institutional Facilities	COMMERCIAL	INDUSTRIAL	OPEN SPACE	AGRICULTURAL Ricefield Cropland Plantation	FOREST/ GRASSLAND Forest Grassland Shrubland Pasture	OTHERS	
Bagong Nayon	113.0	3.9	-	20.1	29.2	135.6	12.4	319.2
Sta. Cruz	298.5	2.0	-	134.0	58.6	285.3	-	778.4
De la Paz	151.2	3.6	-	95.8	35.0	135.0	-	420.6
Beverly Hills	29.6	-	-	-	1.8	-	-	31.4
San Roque	168.6	4.0	6.0	61.8	42.8	97.2	-	380.4
Dalig	155.5	3.2	6.0	28.2	88.5	51.2	-	332.6
San Jose	114.0	3.8	6.5	15.4	66.5	63.8	-	270.0
San Isidro	108.4	3.5	1.0	54.2	38.4	155.3	-	360.8
San Luis	32.7	-	-	8.8	26.5	165.6	-	233.6
Taytay	224.4	-	7.0	63.4	48.2	420.8	-	764.8
Angono	130.5	-	15.2	20.0	145.2	597.7	26.4	935.0
Binangonan	10.5	-	6.4	-	10.6	113.5	-	141.0
Teresa	2.0	-	-	-	24.0	94.0	-	120.0
TOTAL	1,543.9	24.0	48.1	501.7	616.3	2,315.0	38.8	5,087.8

GROWTH OF PHILIPPINE POPULATION

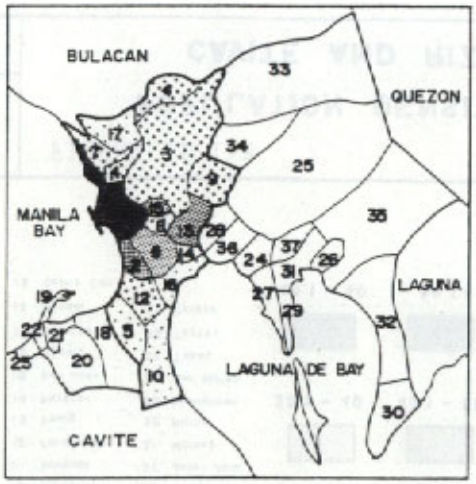


STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 11.1.1 GROWTH OF PHILIPPINE POPULATION
JAPAN INTERNATIONAL COOPERATION AGENCY	

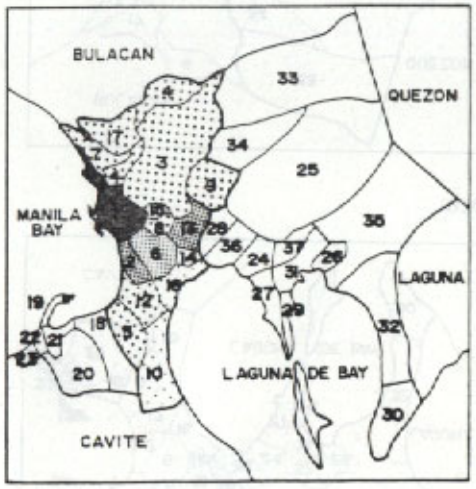


1970

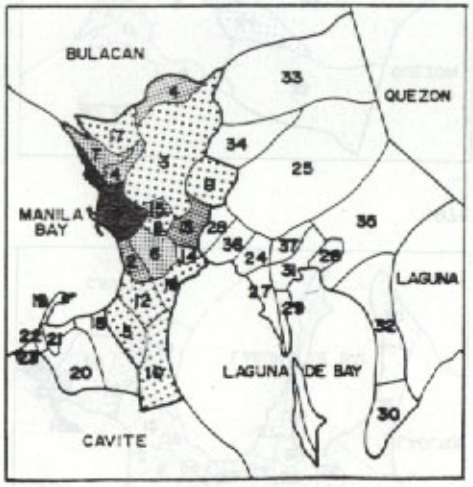
1975



1980



1985



1990

CITY / MUNICIPALITY

1. Manila
2. Pasay
3. Quezon
4. Caloocan
5. Las Piñas
6. Makati
7. Malabon
8. Mandaluyong
9. Marikina
10. Muntinlupa
11. Navotas
12. Parañaque
13. Pasig
14. Pateros
15. San Juan
16. Taguig
17. Valenzuela
18. Bacoor
19. Cavite City
20. Imus
21. Kawit
22. Noveleta
23. Rosario
24. Angono
25. Antipolo
26. Baras
27. Binangonan
28. Cainta
29. Cardona
30. Jala - Jala
31. Morong
32. Pililla
33. Montalban
34. San Mateo
35. Teresa
36. Taytay
37. Teresa

LEGEND

DENSITY (Pers./Ha.)

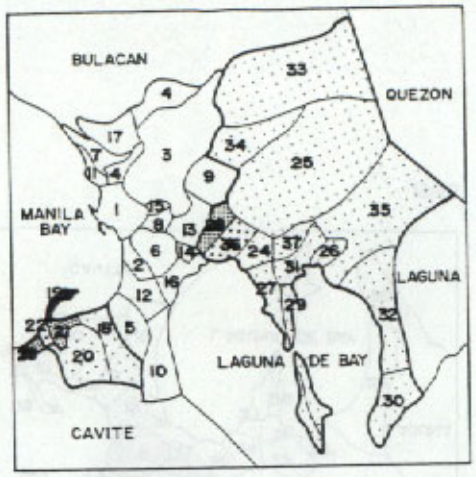
0 - 50	50.1 - 100
100.1 - 200	200.1 - 400
400 +	

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

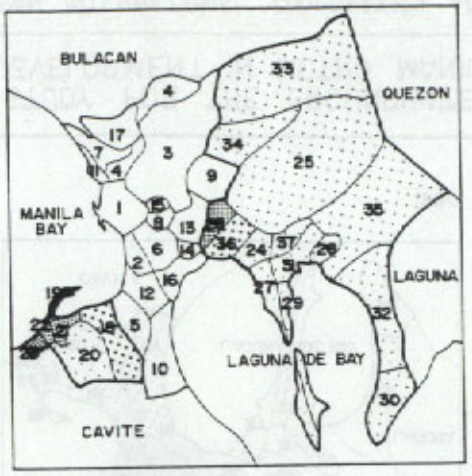
JAPAN INTERNATIONAL COOPERATION AGENCY

FIGURE 11.1.2

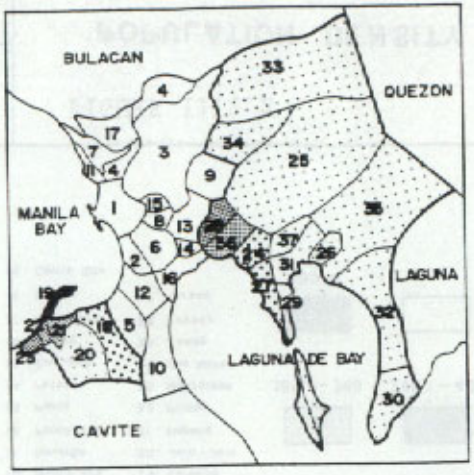
POPULATION DENSITY OF NCR



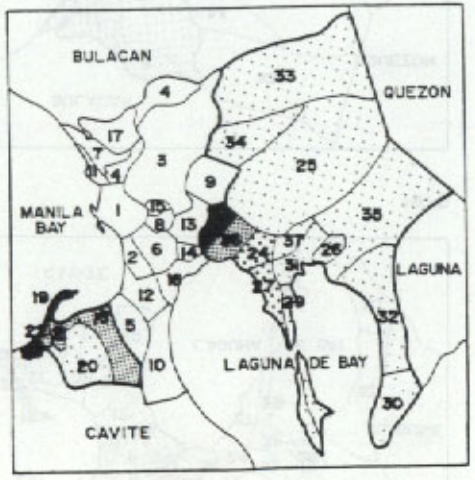
1970



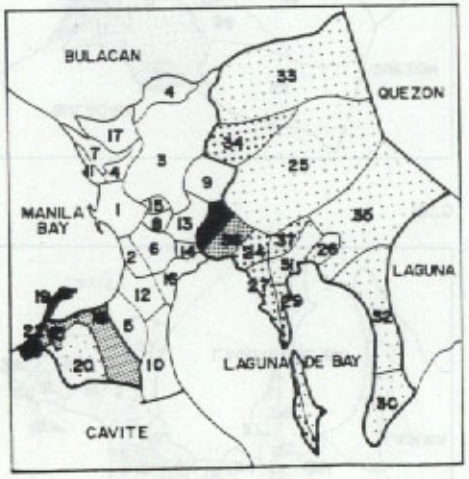
1975



1980



1985



1990

CITY / MUNICIPALITY

1. Manila
2. Pasay
3. Quezon
4. Caloocan
5. Las Piñas
6. Makati
7. Malabon
8. Mandaluyong
9. Marikina
10. Muntinlupa
11. Navotas
12. Parañaque
13. Pasig
14. Pateros
15. San Juan
16. Taguig
17. Valenzuela
18. Bacoor
19. Cavite City
20. Imus
21. Kawit
22. Noveleta
23. Rosario
24. Angono
25. Antipolo
26. Baras
27. Binangonan
28. Cainta
29. Cardona
30. Jala - Jala
31. Morong
32. Pillilla
33. Montalban
34. San Mateo
35. Tanay
36. Taytay
37. Teresa

LEGEND

DENSITY (Pers./Ha.)

0 - 10	10.1 - 20
20.1 - 40	40.1 - 60
60.1 - 80	80.1 +

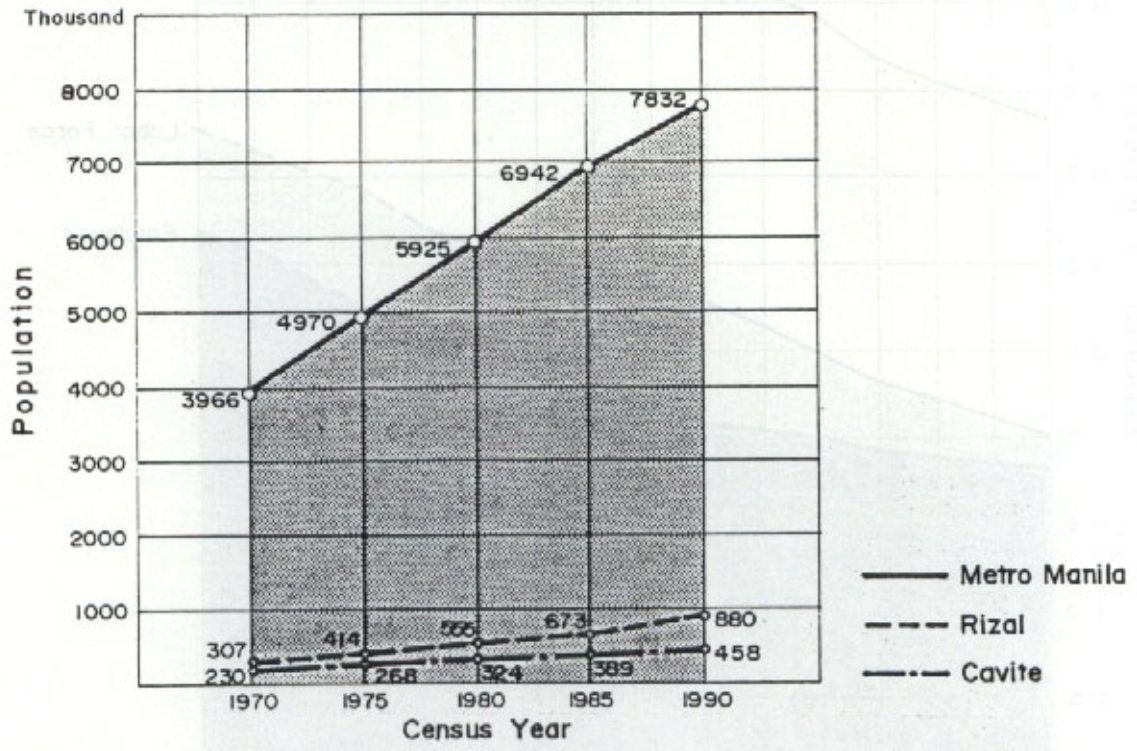
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

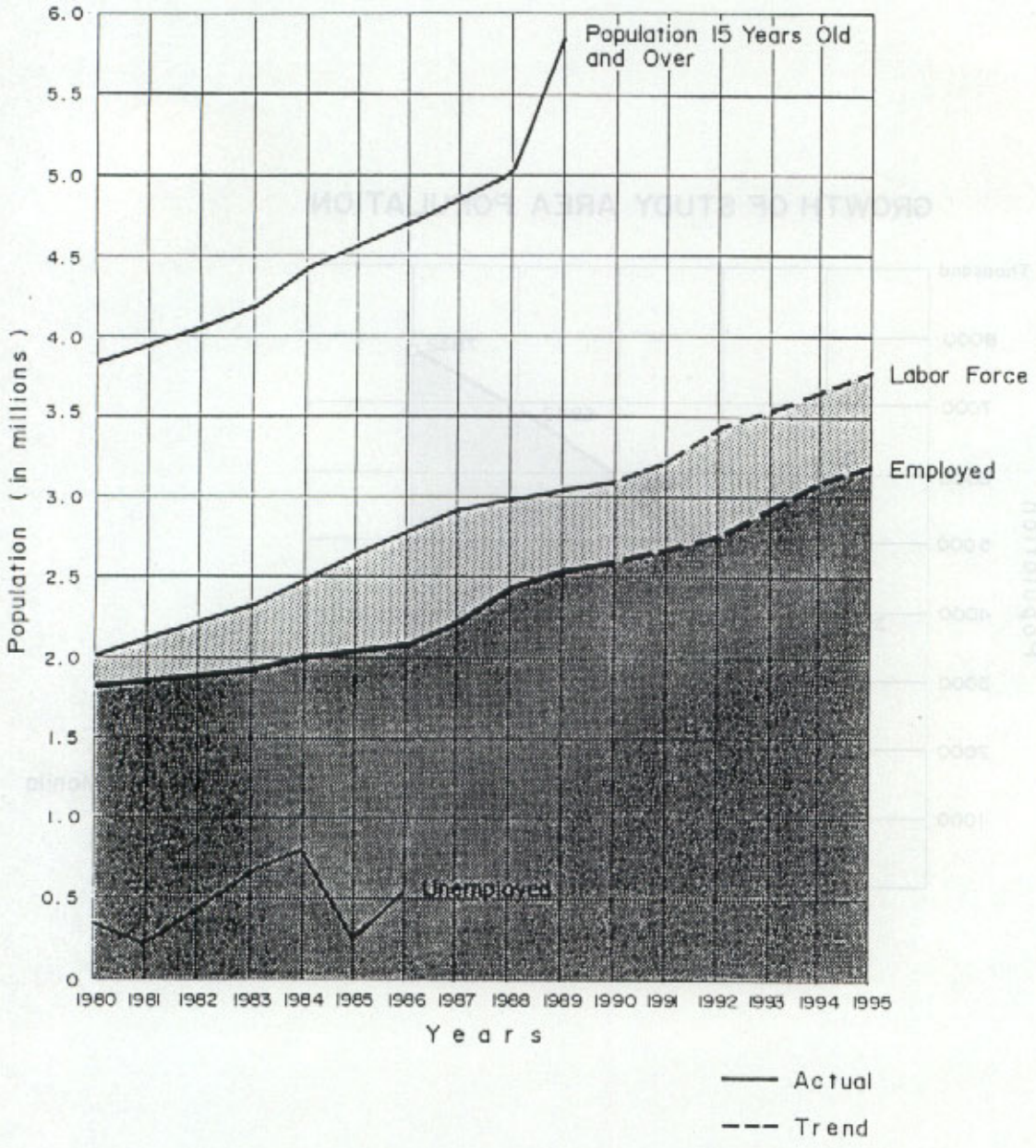
FIGURE 11.1.3

POPULATION DENSITY OF CAVITE AND RIZAL

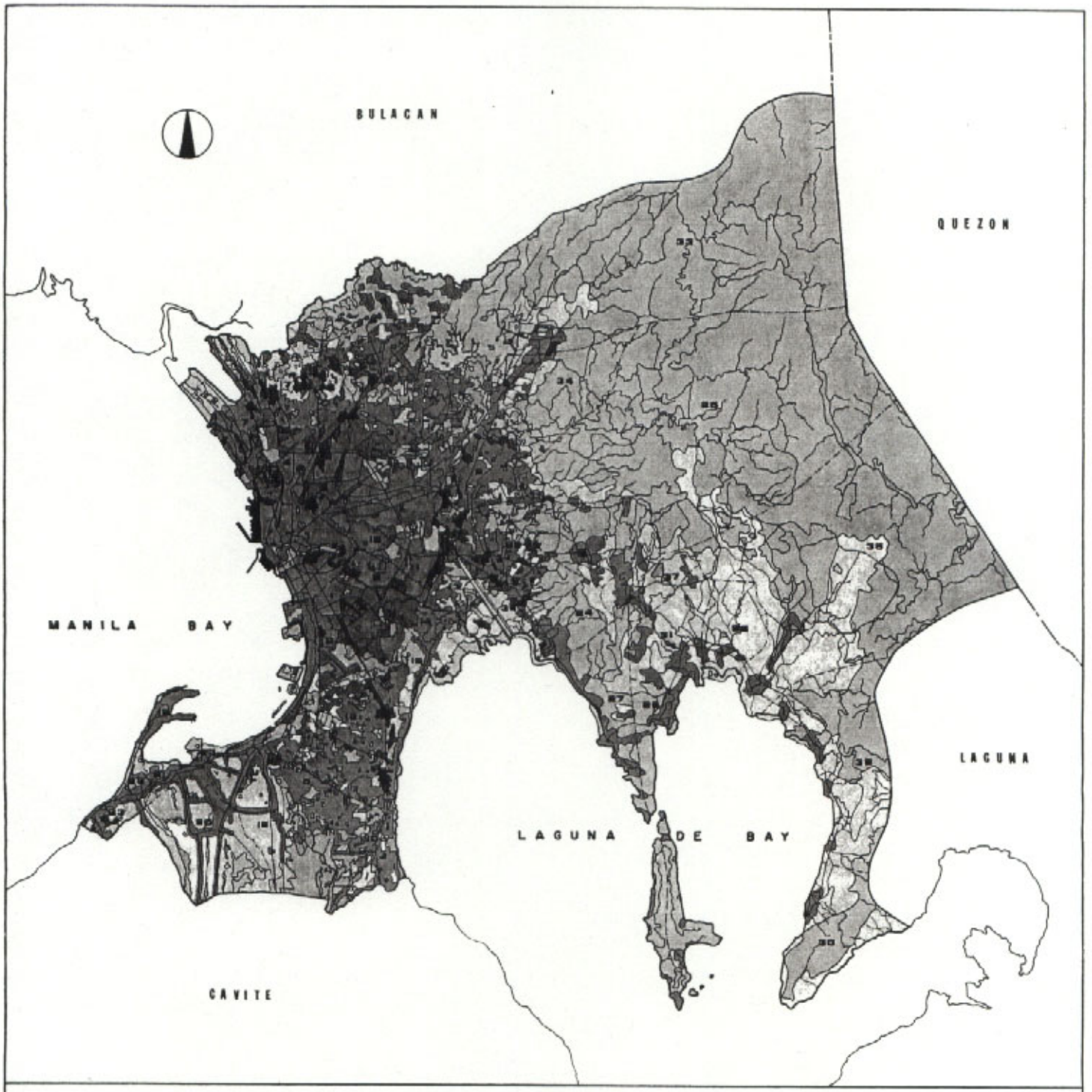
GROWTH OF STUDY AREA POPULATION



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 11.1.4 GROWTH OF STUDY AREA POPULATION
JAPAN INTERNATIONAL COOPERATION AGENCY	



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA JAPAN INTERNATIONAL COOPERATION AGENCY	FIGURE 11.2.1 EMPLOYMENT SITUATION 1980 - 1990



CITY / MUNICIPALITY

1. Manila	20. Imus
2. Pasay	21. Kawit
3. Quezon	22. Noveleta
4. Caloocan	23. Rosario
5. Las Piñas	24. Angono
6. Makati	25. Antipolo
7. Malabon	26. Baras
8. Mandaluyong	27. Binangonan
9. Marikina	28. Cainta
10. Muntinlupa	29. Cardona
11. Navotas	30. Jala - Jala
12. Parañaque	31. Morong
13. Pasig	32. Pililla
14. Pateros	33. Rodriguez
15. San Juan	34. San Mateo
16. Taguig	35. Tanay
17. Valenzuela	36. Taytay
18. Bacoor	37. Teresa
19. Cavite City	

STUDY AREA

PROVINCIAL BOUNDARY

CITY / MUNICIPALITY BOUNDARY

SCALE

0 2 4 6 8 10 km

LEGEND

- LOW DENSITY
- MIDDLE DENSITY
- HIGH DENSITY

} BUILT-UP AREA

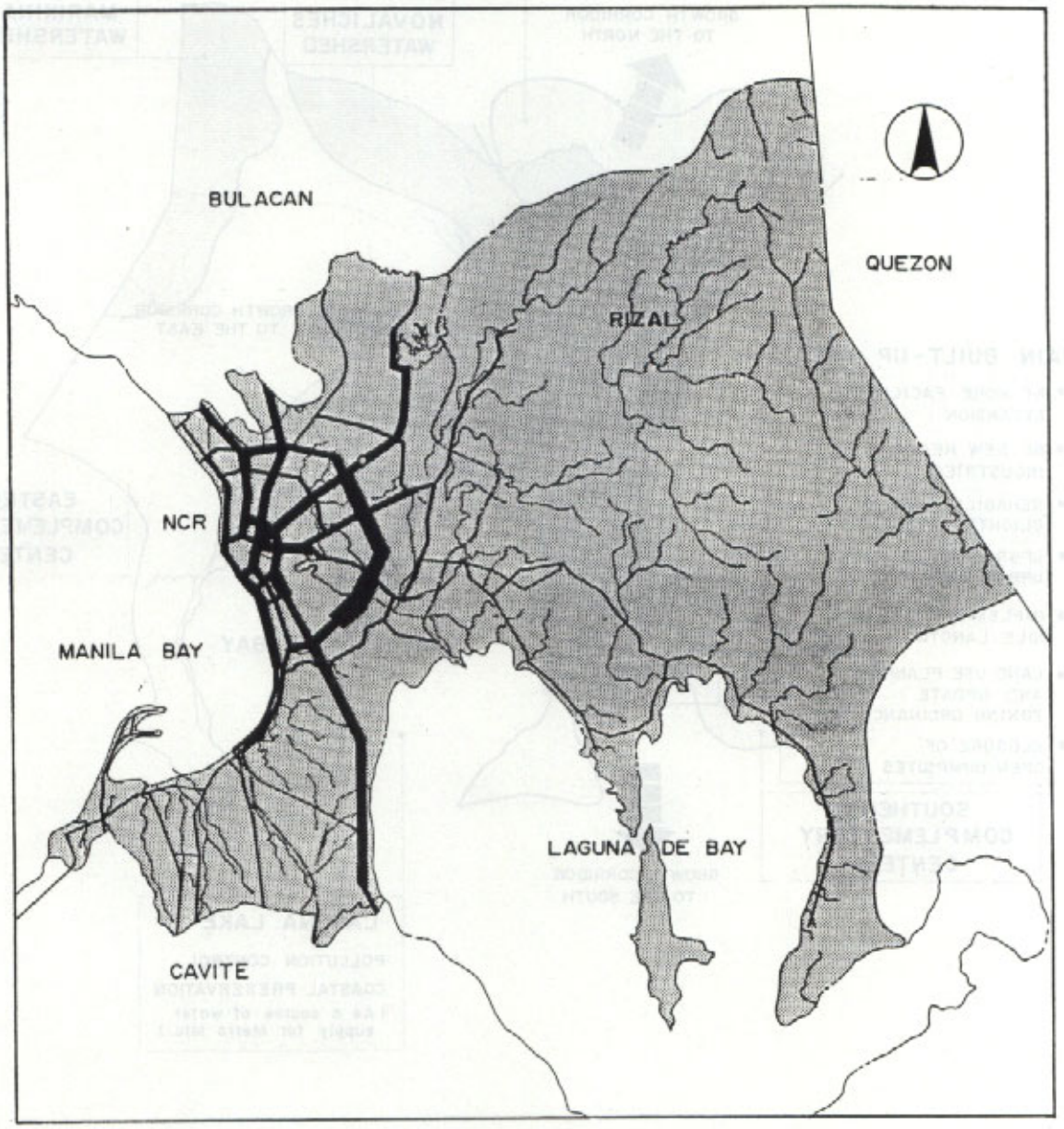
- INDUSTRIAL AREA
- AGRICULTURAL LAND
- FOREST / GRASSLAND
- WETLAND
- OPEN SPACE

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

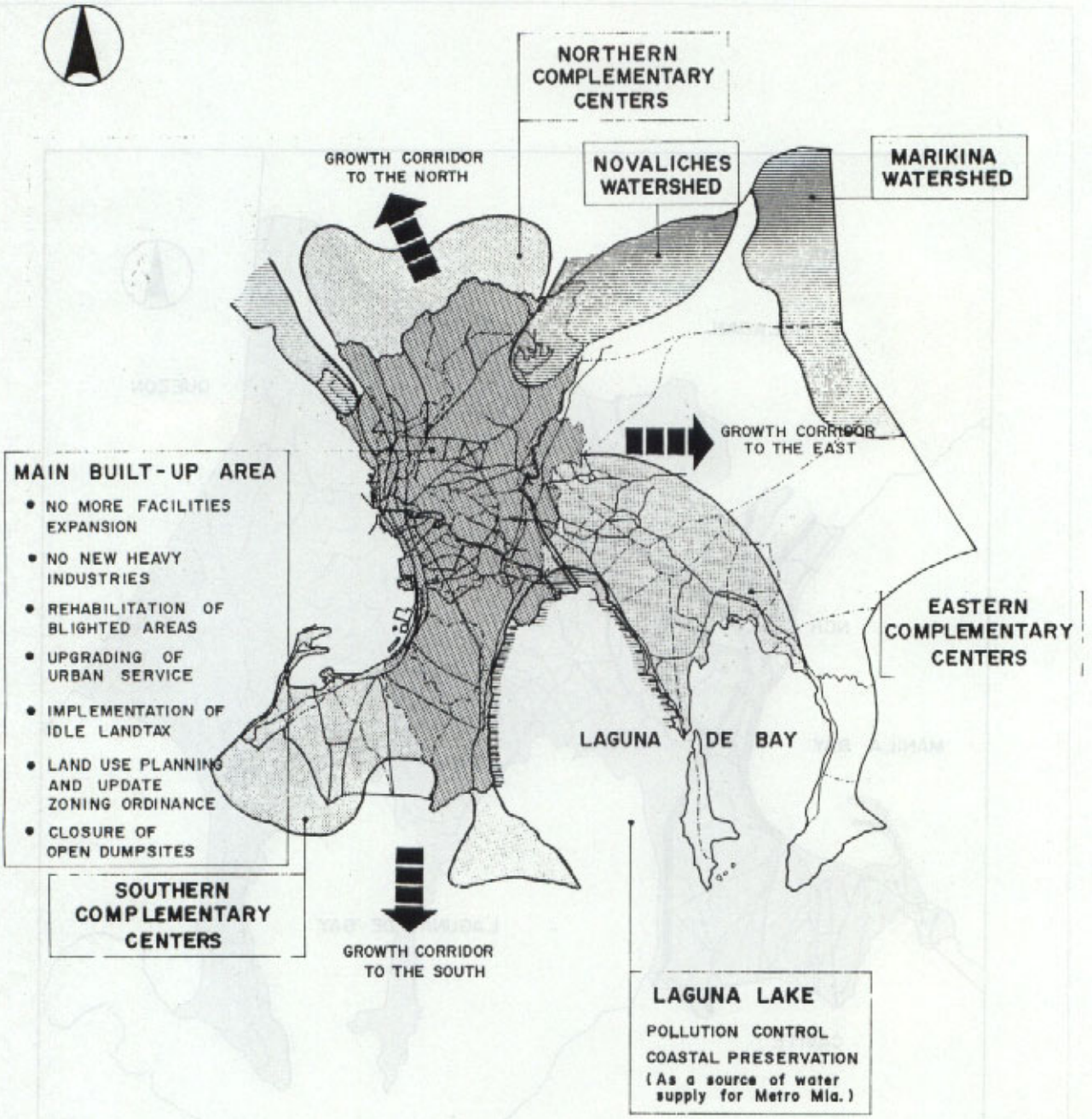
JAPAN INTERNATIONAL COOPERATION AGENCY

LAND USE MAP 1990

FIGURE 11.4.1



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 11.5.1
JAPAN INTERNATIONAL COOPERATION AGENCY	TRAFFIC FLOW (1989)

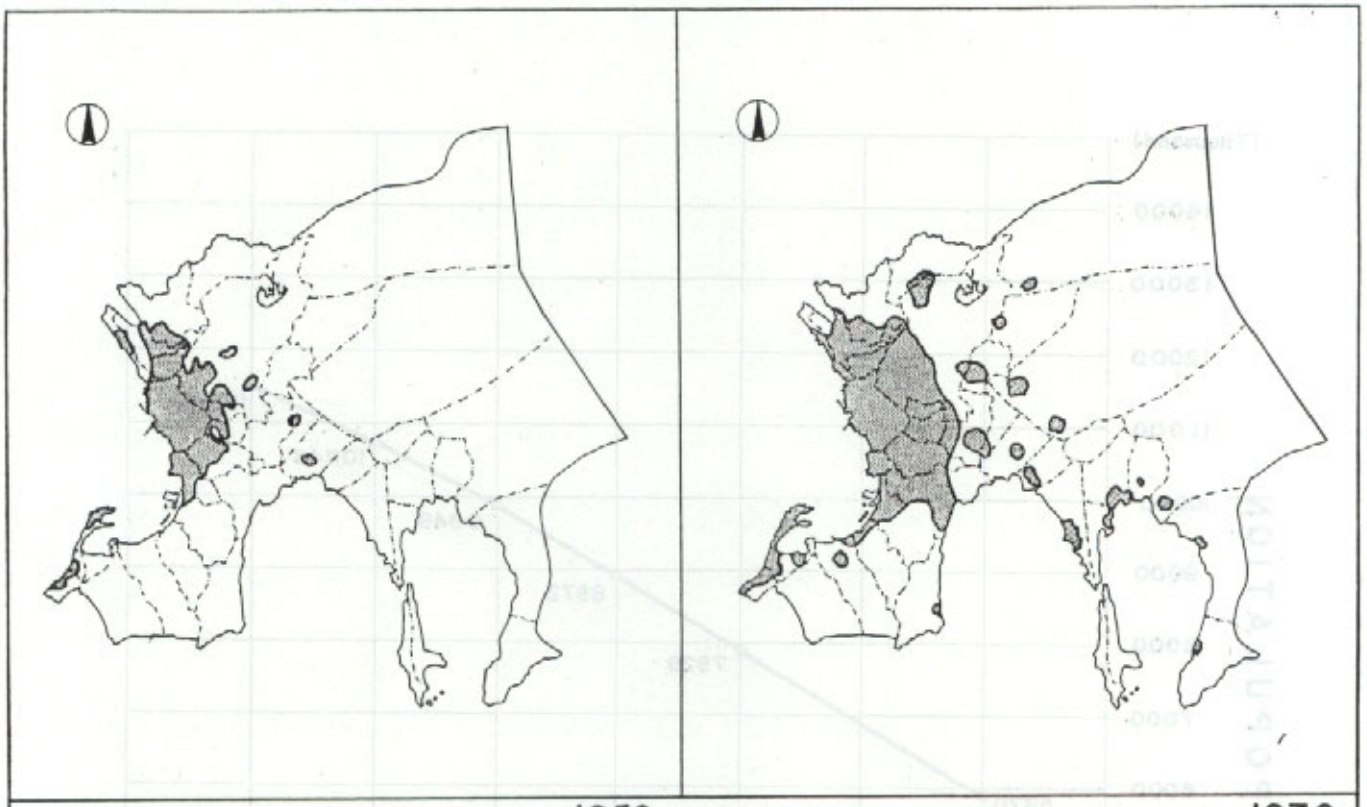


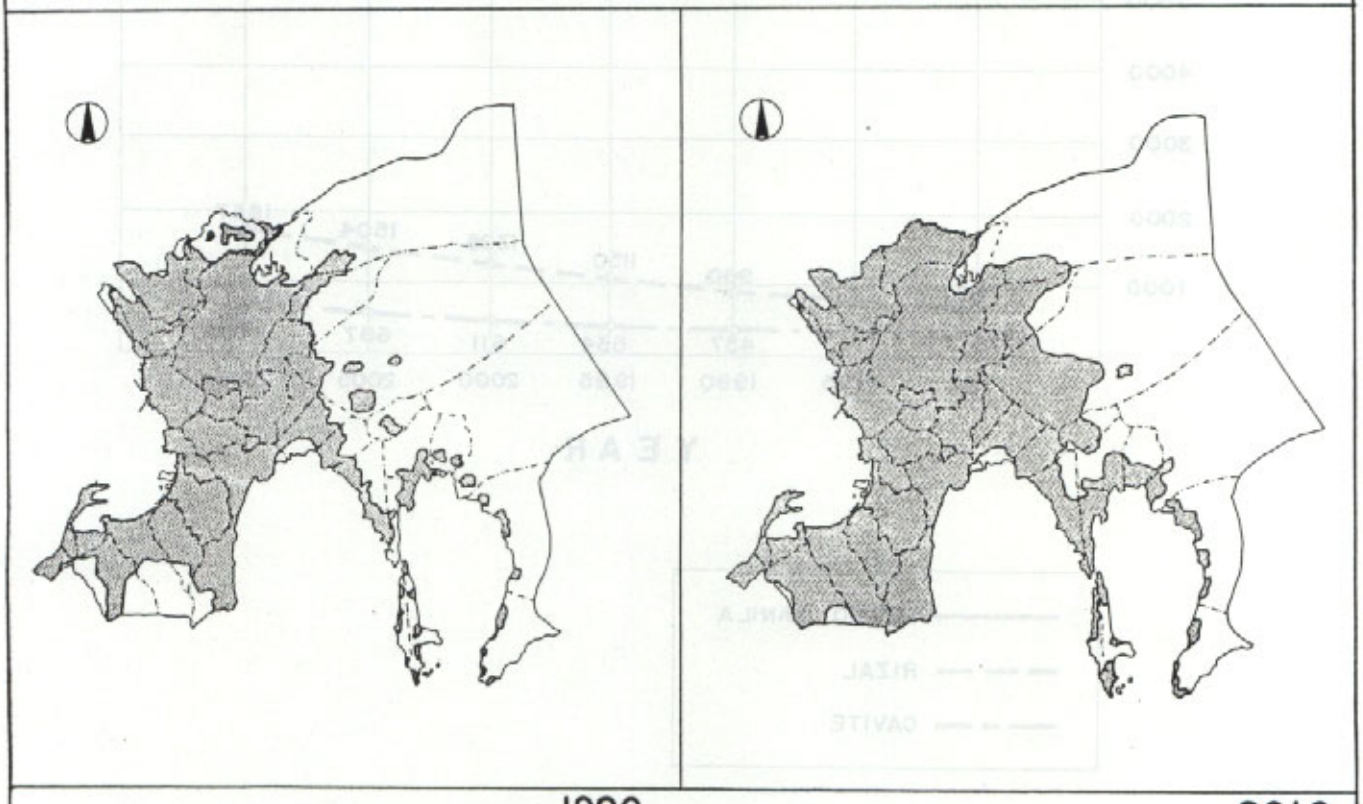
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

PHYSICAL GROWTH STRATEGY

FIGURE 11.6.1



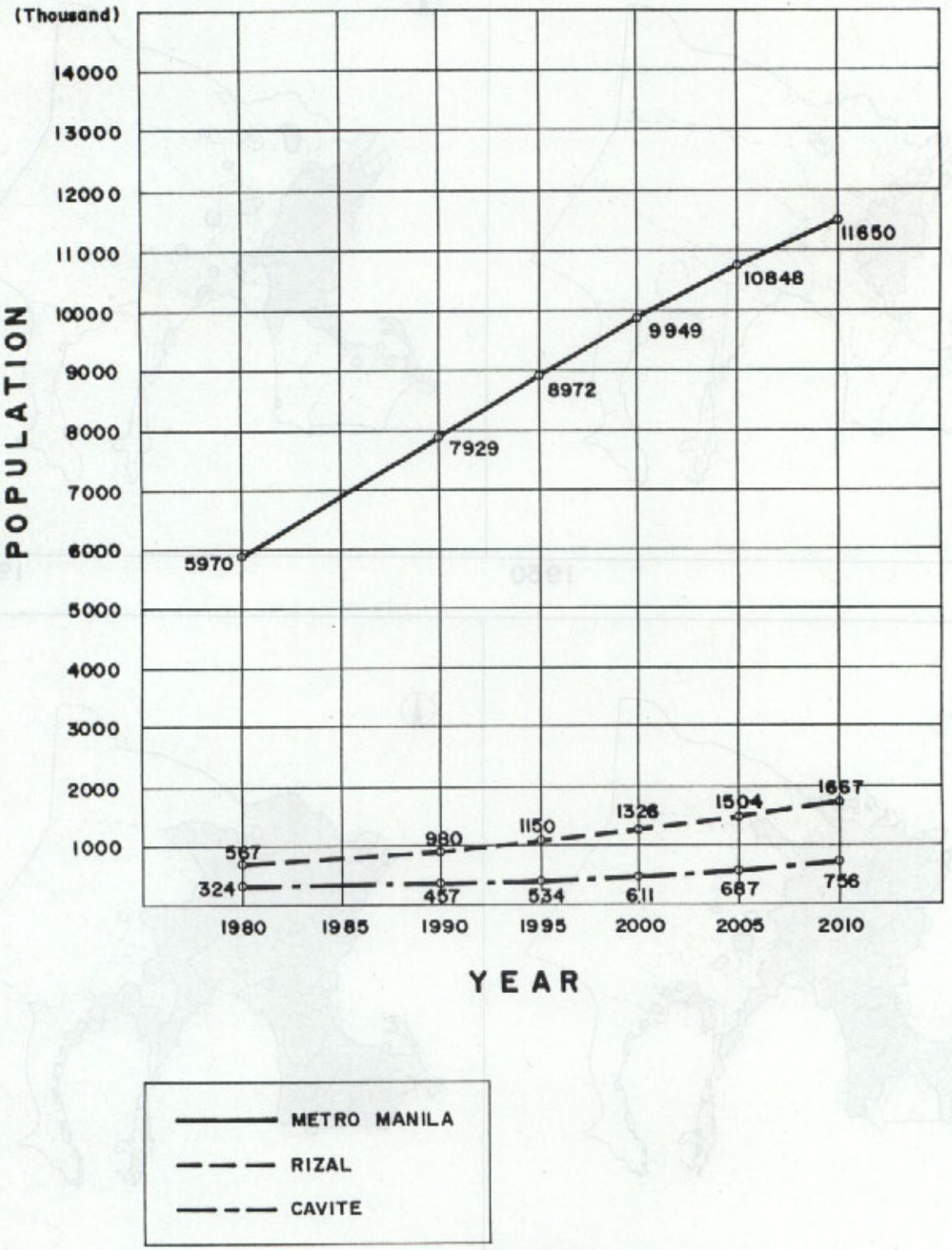


STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

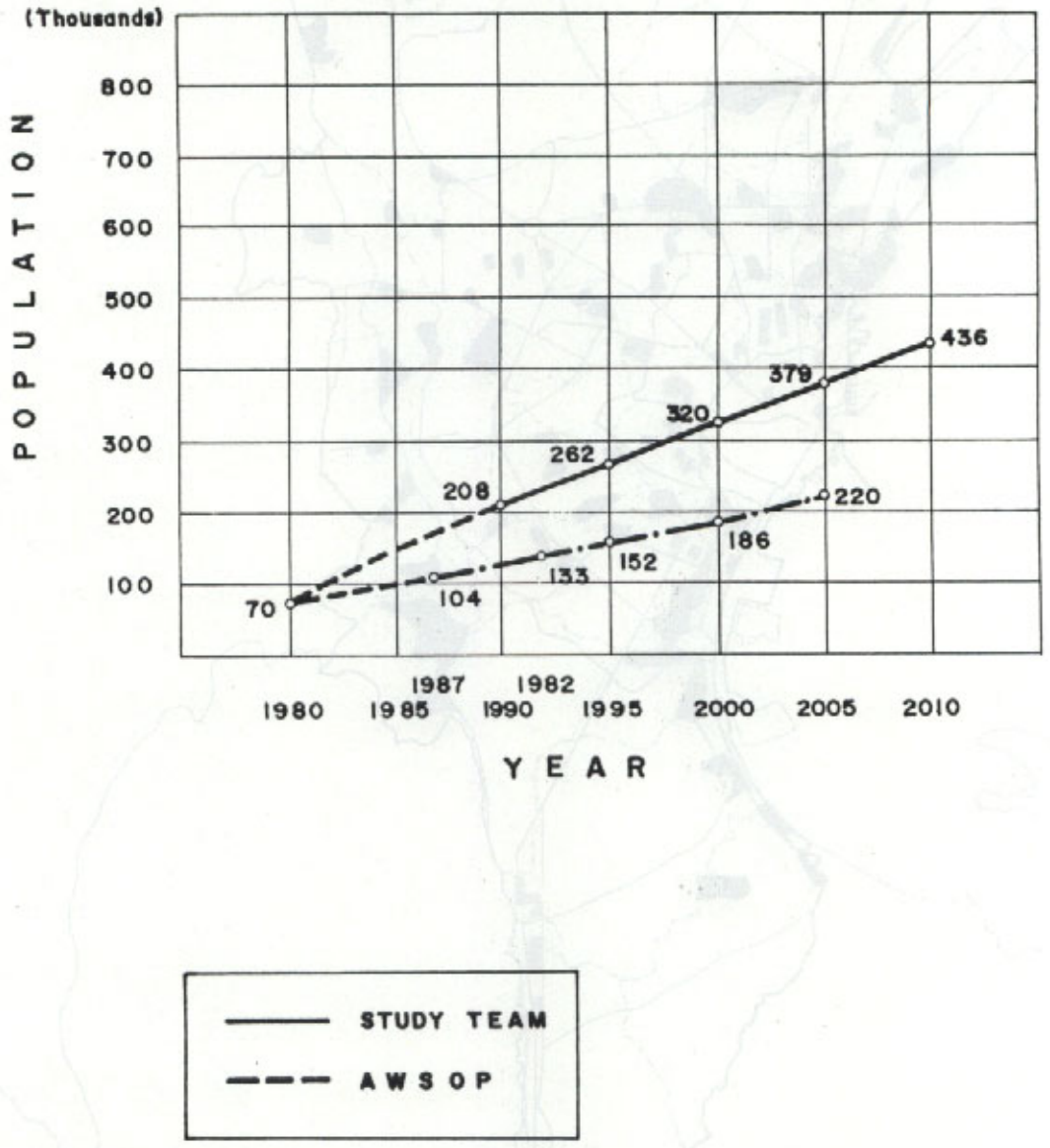
JAPAN INTERNATIONAL COOPERATION AGENCY

GROWTH OF THE STUDY AREA

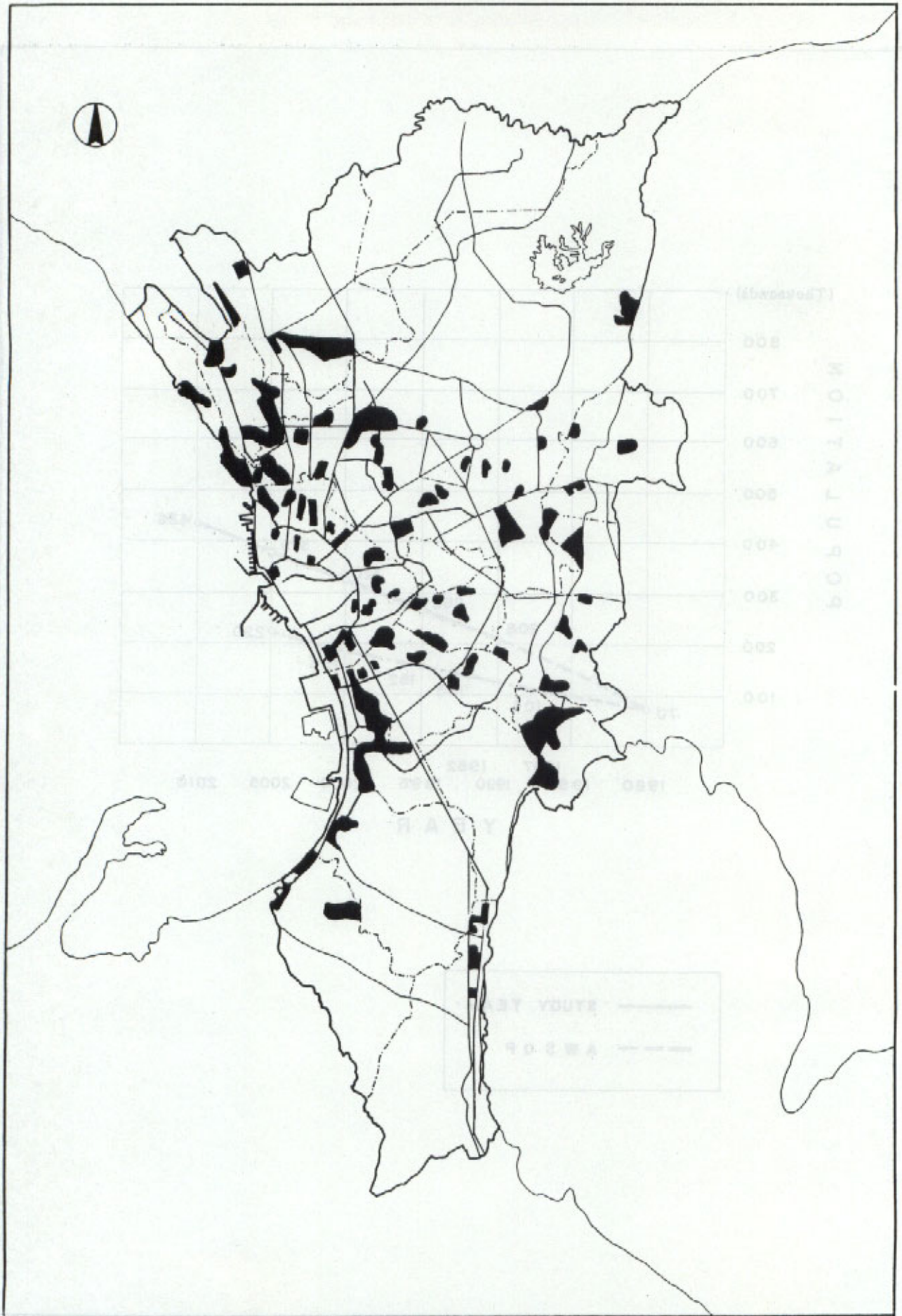
FIGURE 11.6.2



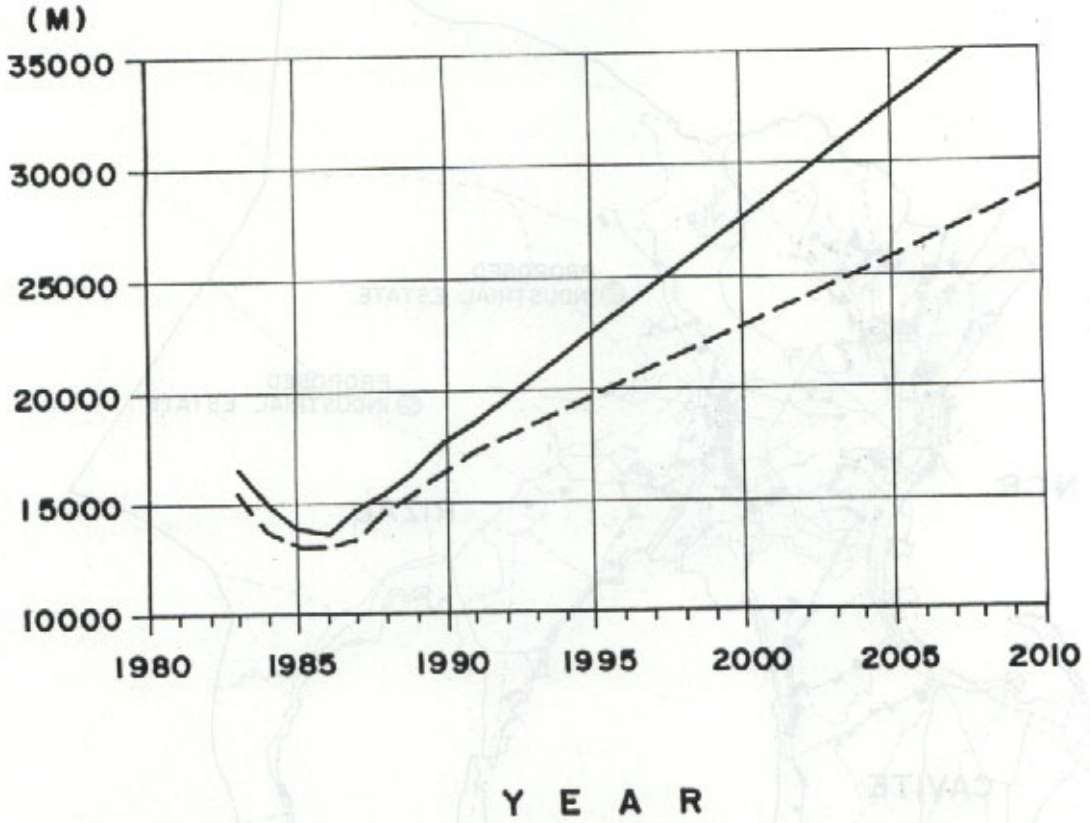
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 11.7.1 ESTIMATED POPULATION GROWTH OF THE STUDY AREA
JAPAN INTERNATIONAL COOPERATION AGENCY	



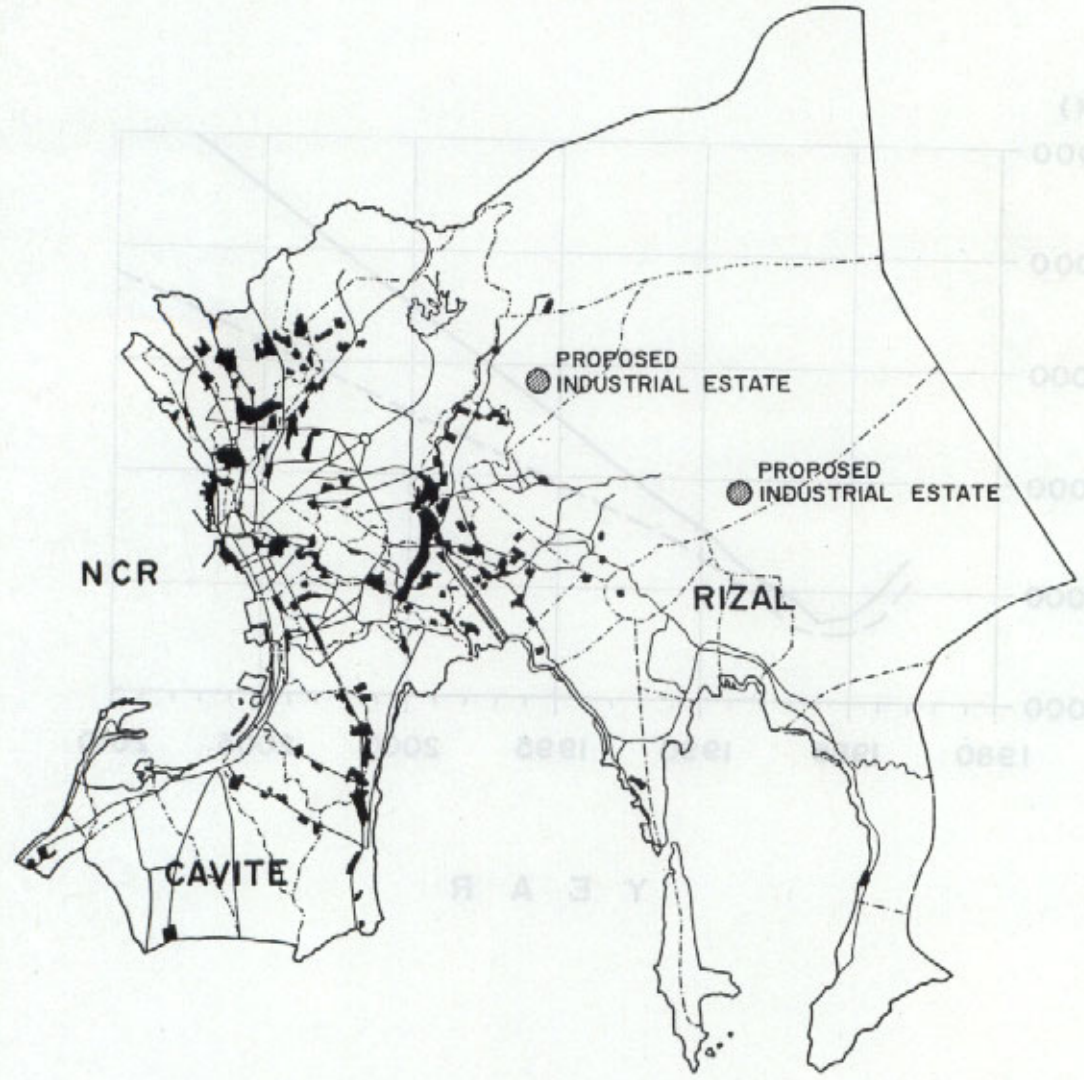
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA JAPAN INTERNATIONAL COOPERATION AGENCY	FIGURE 11.7.2 COMPARISON BETWEEN AWSOP'S AND THE JICA STUDY TEAM'S POPULATION PROJECTION FOR THE MUNICIPALITY OF ANTIPOLO



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 11.7.3
JAPAN INTERNATIONAL COOPERATION AGENCY	BLIGHTED AREAS IN THE NCR



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA JAPAN INTERNATIONAL COOPERATION AGENCY	FIGURE 11.7.4 GROSS DOMESTIC PRODUCT (GDP) NATIONAL OF THE CAPITAL REGION



INDUSTRIES

PROPOSED INDUSTRIAL ESTATE

STUDY AREA

PROVINCIAL BOUNDARY

CITY / MUNICIPALITY BOUNDARY

SCALE

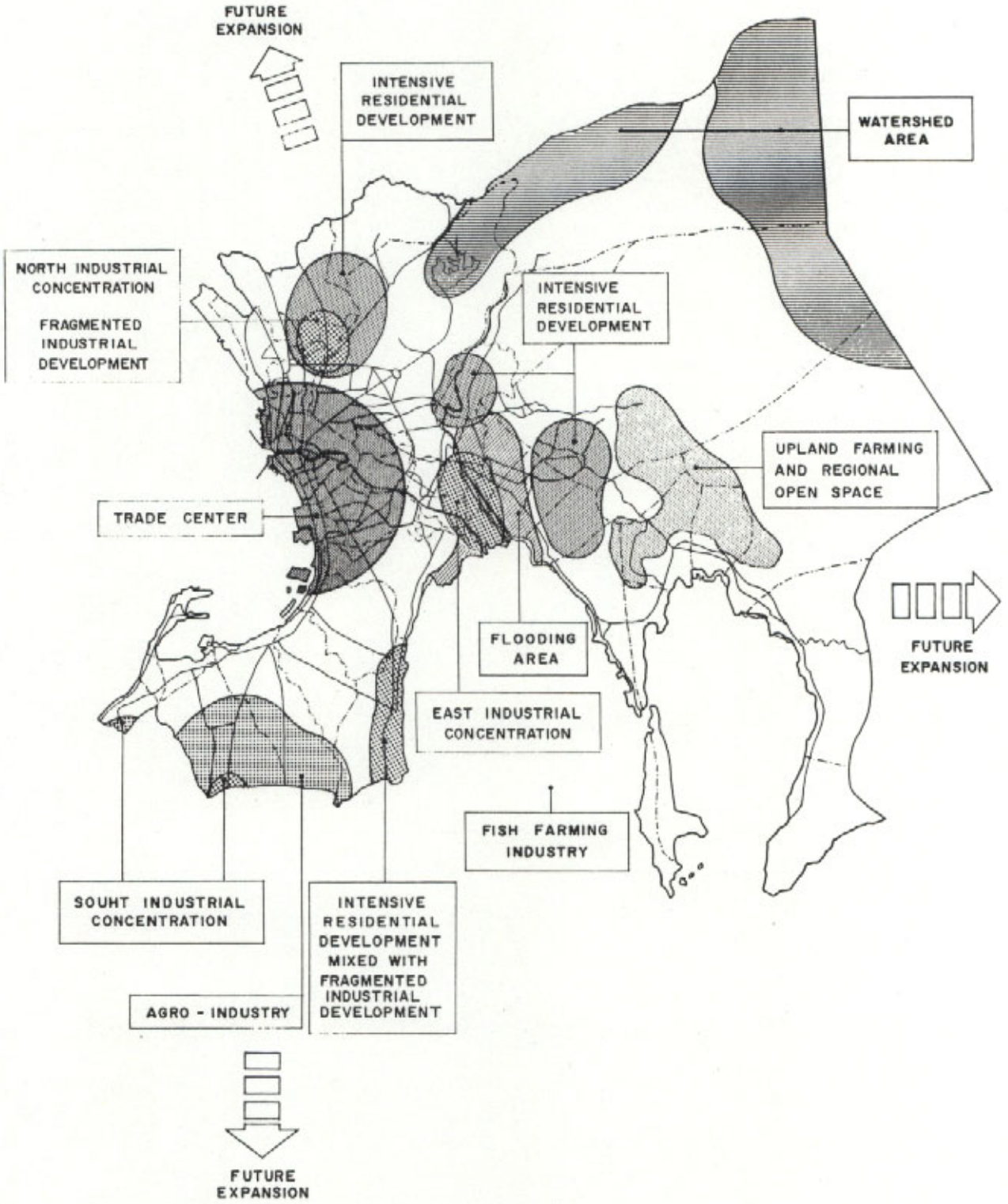
0 2 4 6 8 10km

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

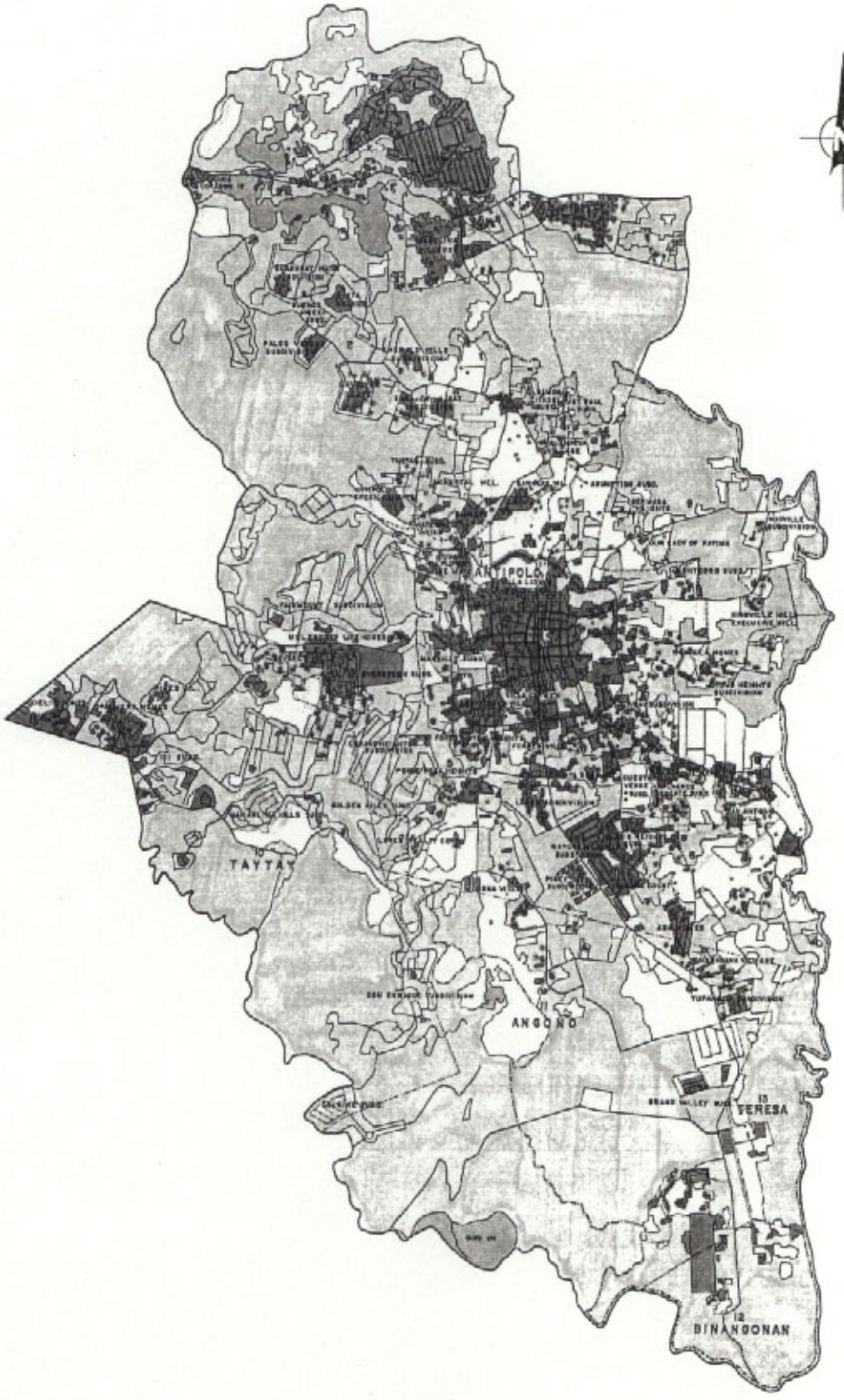
JAPAN INTERNATIONAL COOPERATION AGENCY

INDUSTRIAL LOCATIONS

FIGURE 11.7.5



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	STRUCTURE PLAN
JAPAN INTERNATIONAL COOPERATION AGENCY	FIGURE 11.8.1



BARANGAY / MUNICIPALITY

1. Bagong Nayon
2. Sto. Cruz
3. De la Paz
4. Beverly Hills
5. San Roque
6. Dalig
7. San Jose
8. San Isidro
9. San Luis
10. Taytay
11. Angono
12. Binangonan
13. Teresa

STUDY AREA
AQUIFER BASIN ZONE
MUNICIPALITY BOUNDARY
BARANGAY BOUNDARY

SCALE

LEGEND

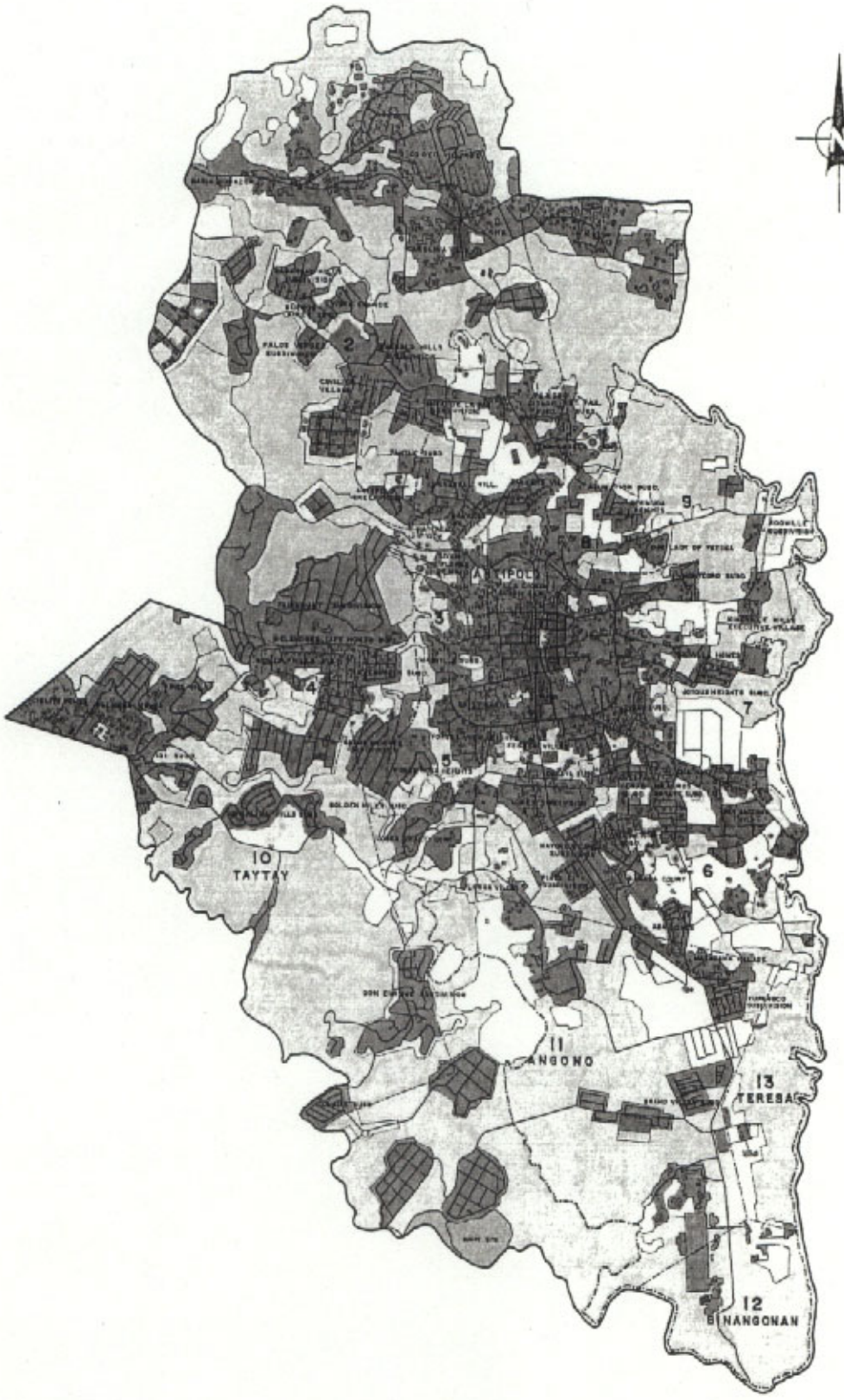
BUILT-UP AREA
COMMERCIAL AREA
INDUSTRIAL AREA
AGRICULTURAL LAND
FOREST/GRASS LAND
OPEN SPACE
OTHERS

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

LAND USE MAP
ANTIPOLO AREA

1991
FIGURE 11.8.2



BARANGAY / MUNICIPALITY

1. Bagong Nayon
2. Sta. Cruz
3. De la Paz
4. Beverly Hills
5. San Roque
6. Dalig
7. San Jose
8. San Isidro
9. San Luis
10. Taytay
11. Angono
12. Binangonan
13. Teresa

STUDY AREA
AQUIFER BASIN ZONE
MUNICIPALITY BOUNDARY
BARANGAY BOUNDARY

LEGEND

- BUILT-UP AREA
- COMMERCIAL AREA
- INDUSTRIAL AREA
- AGRICULTURAL LAND
- FOREST GRASS LAND
- OPEN SPACE
- OTHERS

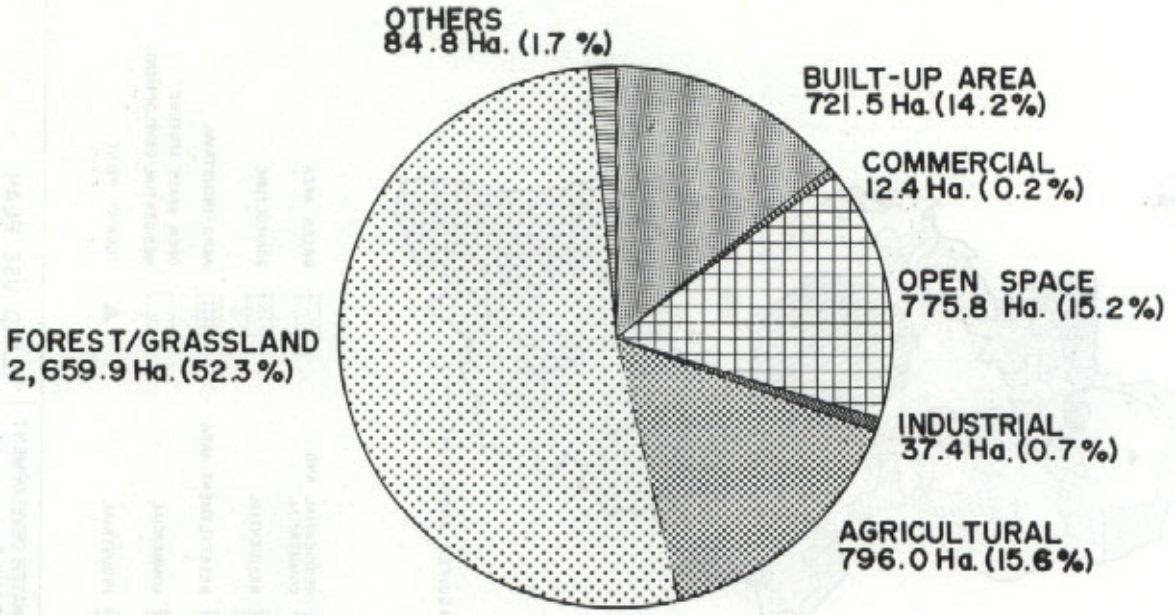
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

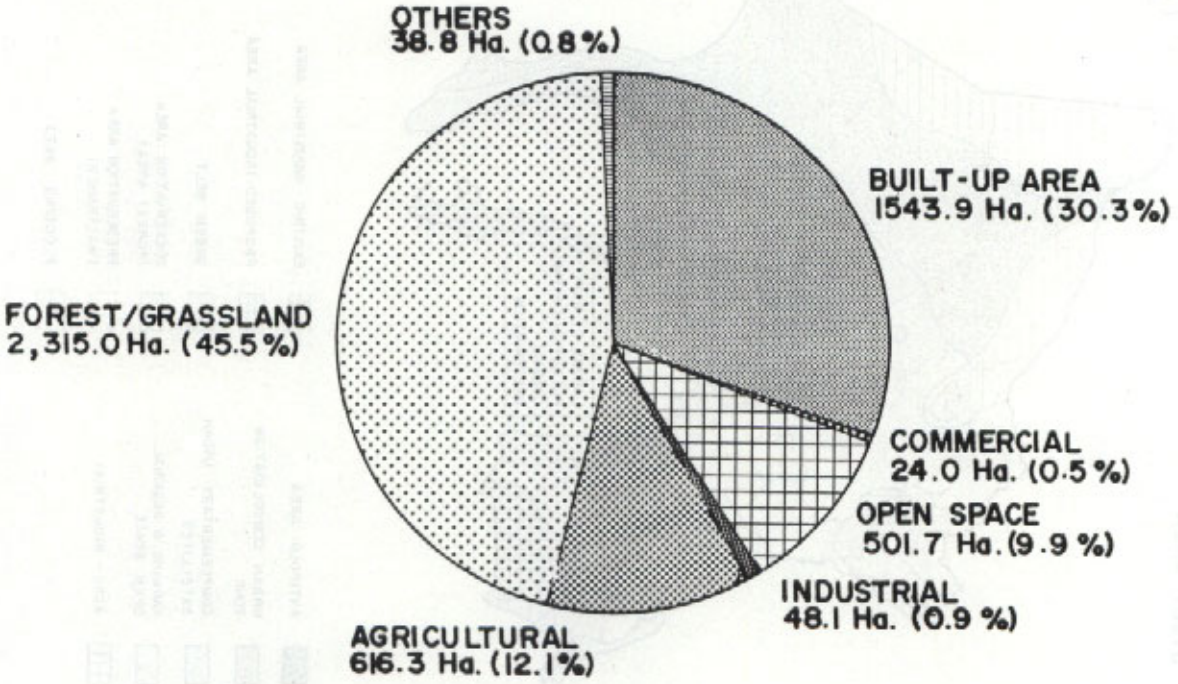
FUTURE LAND USE MAP
ANTIPOLO AREA

2010
FIGURE 11.8.3

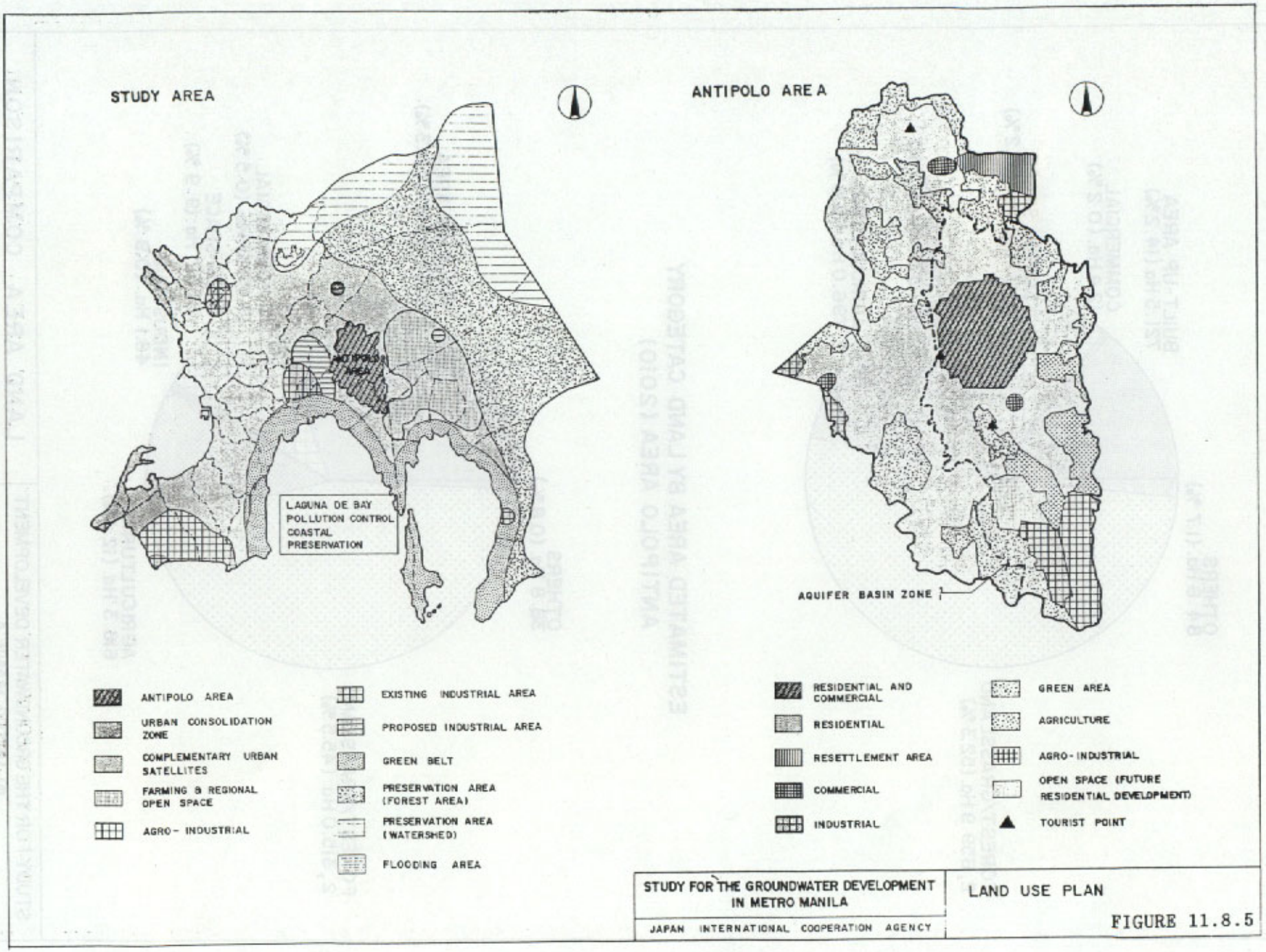
ESTIMATED AREA BY LAND CATEGORY
ANTIPOLO AREA (1991)



ESTIMATED AREA BY LAND CATEGORY
ANTIPOLO AREA (2010)



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	LAND AREA COMPARISON 1991 - 2010
JAPAN INTERNATIONAL COOPERATION AGENCY	FIGURE 11.8.4



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

LAND USE PLAN

FIGURE 11.8.5

CHAPTER 12

WATER SUPPLY SYSTEMS

CHAPTER 12 WATER SUPPLY SYSTEMS

CONTENTS

LIST OF TABLES 12-ii

LIST OF FIGURES 12-iii

12.1 GENERAL SITUATION IN THE COUNTRY 12-1

12.1.1 Present Water Supply Services 12-1
12.1.2 Institutional Aspect 12-1
12.1.3 Master Plan Of The Philippines 12-2

12.2 PRESENT SITUATION IN THE MWSS SERVICE AREA (MSA) 12-4

12.2.1 Service Area 12-4
12.2.2 Served Population And Water Amount 12-5
12.2.3 Existing Water Supply Facilities 12-6
12.2.4 Water Quality 12-13

12.3 ON-GOING AND PROPOSED PROJECTS 12-14

12.3.1 On-going Project 12-14
12.3.2 Proposed Projects 12-17
12.3.3 Future Water Source And Production Capacity 12-20

LIST OF TABLES

12.1.1 PRESENT WATER SUPPLY COVERAGE, 1987 12-22

12.1.2 NUMBER OF FAMILIES BY MAIN SOURCE OF WATER SUPPLY, BY REGION, URBAN AND RURAL, 1985 12-22

12.1.3 EXISTING WATER SUPPLY FACILITIES, 1987 12-23

12.1.4 RESPONSIBILITY OF GOVERNMENTAL AGENCIES 12-23

12.1.5 PHYSICAL TARGETS, INVESTMENT REQUIREMENTS AND SERVICE COVERAGE, FIRST STAGE (1988-1992) 12-24

12.1.6 PHYSICAL TARGETS, INVESTMENT REQUIREMENTS AND SERVICE COVERAGE, SECOND STAGE (1993-2000) 12-25

12.1.7 WATER SUPPLY TARGETS: 1988-2000 12-25

12.2.1 MWSS WATER SUPPLY STATISTICS, 1984-1990 12-26

12.2.2 WATER DISTRIBUTION AND ITS DISPOSITION 12-27

12.2.3 CAPACITY OF WATER SOURCES 12-27

12.2.4 RAW WATER DRAWN FROM SURFACE WATER SOURCES 12-28

12.2.5 DRAWN RAW WATER, BY MONTH: 1990 12-28

12.2.6 MWSS WATER PRODUCTION: 1985-1990 12-28

12.2.7 WATER PRODUCTION BY MONTH 12-29

12.2.8 OUTLINE OF TREATMENT PLANTS 12-30

12.2.9 EXISTING PUMPING STATIONS 12-31

12.2.10 PHYSICAL AND CHEMICAL ANALYSES AT MWSS TREATMENT PLANTS (FROM JANUARY 1 TO DECEMBER 31, 1989) 12-32

12.2.11 RESULTS OF BACTERIOLOGICAL QUALITY ANALYSIS (FROM JANUARY 1 TO DECEMBER 31, 1989) 12-33

12.2.12 PHYSICAL AND CHEMICAL ANALYSES OF MWSS TAP WATER (FROM JANUARY 1 TO DECEMBER 31, 1989) 12-34

12.3.1 ON-GOING PROJECTS OF MWSS 12-35

12.3.2 NRW REDUCTION BY MWSRP I 12-36

12.3.3 NRW REDUCTION BY MWSRP II 12-36

12.3.4 PROPOSED PROJECTS OF MWSS 12-37

12.3.5 PLANNED AUGMENTATION OF WATER SOURCES 12-38

LIST OF FIGURES

12.1.1 PERCENTAGE OF FAMILIES BY MAIN SOURCE OF WATER SUPPLY, 1985 12-39

12.2.1 MWSS SERVICE AREA 12-40
12.2.2 PRESENT WATER SUPPLY SERVICE AREA BY MWSS 12-41
12.2.3 MWSS WATER SUPPLY STATISTICS (1990) 12-42
12.2.4 EXISTING AND MAJOR SUPPLY FACILITIES 12-43
12.2.5 SCHEMATIC DRAWING OF WATER CONVEYANCE SYSTEM..... 12-44
12.2.6 SURFACE WATER FLOW CHART 12-45
12.2.7 RAW WATER BY SOURCE (MONTHLY DAILY AVERAGE) 12-46
12.2.8 GENERAL LAYOUT PLAN OF BALARA TREATMENT PLANT 12-47
12.2.9 FLOW DIAGRAM OF BALARA TREATMENT PLANT 12-48
12.2.10 GENERAL LAYOUT PLAN OF LA MESA TREATMENT PLANT 12-49
12.2.11 FLOW DIAGRAM OF LA MESA TREATMENT PLANT 12-50
12.2.12 EXISTING PRIMARY DISTRIBUTION SYSTEM 12-51

12.3.1 AREAS COVERED BY REHABILITATION PROJECTS 12-52
12.3.2 DEVELOPMENT PLAN OF AWSOP 12-53
12.3.3 STUDY AREA OF RPWSIP 12-54
12.3.4 FRINGE AREAS WATER SUPPLY PROJECT STUDY AREA 12-55

CHAPTER 12 WATER SUPPLY SYSTEMS

12.1 GENERAL SITUATION IN THE COUNTRY

12.1.1 Present Water Supply Services

As of end-1987, around 63% of the country's total population have access to public water supply systems. The rest of the population, approximately 37%, sourced their water from open dug wells, rainwater cisterns, lakes and streams, a number of which are of doubtful quality. The service area coverage included 86% for Metro Manila and its contiguous areas, 55% for other urban areas,and 62% for the rural areas. Out of the 86% covered in Metro Manila, however, only 57% were directly served with MWSS water, 16% were served indirectly by MWSS through ambulant vendors, and the rest acquired water through private wells and other undetermined sources. Present water supply coverage in the country is shown in Table 12.1.1. Number of families by main water sources and respective percentage are shown in Table 12.1.2 and Figure 12.1.1.

In Metro Manila, water supply service consists of individual house connections, private wells, some public standpipes in blighted areas and ambulant vendors. In large urban centers outside Metro Manila, majority of the people is served by Level III systems. In the rural areas, however, the most common water supply facilities are protected wells and developed springs. There are also some Level II and III systems but the latter are generally found only in large poblaciones. Table 12.1.3 shows the condition of existing water supply facilities.

12.1.2 Institutional Aspect

The provision of potable water is under the responsibility of the Department of Public Works and Highways (DPWH) and two of its attached agencies, namely, the Metropolitan Waterworks and Sewerage System (MWSS) and the Local Water Utilities Administration (LWUA). The MWSS operates the water supply and sewerage systems in Metro Manila and its contiguous areas, while the LWUA handles the development and improvement of water and sewerage systems in the areas not covered by MWSS.

The DPWH is concerned mainly with the development of Level I systems. It is also the lead agency in establishing national water supply plans and programs upon which all involved agencies in the sector base their respective development plans. Other agencies involved in water supply include the National Water Resources Board (NWRB) and the Department of Local Governments (DLG). The DLG's role is limited to the general administrative/institution building activities. The NWRB on the other hand is involved mainly in policies and regulations concerning the proper utilization and rights thereof of water resources all over the Philippines.

A matrix of responsibility of the concerned agencies in the water supply sector is presented in Table 12.1.4.

12.1.3 Master Plan of the Philippines

To provide direction, establish priorities, and rationalize implementation of projects in the sector, the Philippine Government prepared in 1980 the Integrated Water Supply Program for the period 1980-2000 and the 1982 Philippine Rural Water Supply Master Plan. These were later superseded by the Water Supply, Sewerage, and Sanitation Master Plan for the period 1988-2000 that was formulated in 1987. The master plan contains the sectoral objectives, policies, programs, institutional arrangements, and financial and economic considerations.

The Master Plan calls for a two-stage implementation of projects: the first stage covering the period 1988 to 1992 and the second stage encompassing the period 1993-2000.

As shown in Table 12.1.5, several activities are envisaged during the first stage (1988-92). In Metro Manila and its contiguous areas, a package of projects is to be undertaken to improve the existing facilities and expand their coverage. These are the Manila Water Supply Rehabilitation Project I (MWSRP I), the Metro Manila Water Distribution Project (MMWDP), the Angat Water Supply Optimization Project (AWSOP), Manila Water Supply Rehabilitation Project II (MWSRP II), Fringe Areas Water Supply Project (FAWSP) and Rizal Province Water Supply Improvement Project (RPWSIP). These projects will expand and improve the service coverage of the system to 87% of the metropolitan population.

In other urban areas, it is envisaged that 450 Piped Systems (Levels II and III) will be constructed, and 250 systems will be rehabilitated to increase the population coverage to 77%.

In the rural areas, about 933 piped systems and around 87,146 point sources (Level I) will be constructed and 21,620 facilities to be repaired or rehabilitated to raise the service coverage to about 92% of the rural population.

The second stage (1993-2000) of this Master Plan considers the complete water supply coverage of both urban and rural areas with emphasis on proper operation and maintenance of facilities, and the gradual construction of sewerage systems. Table 12.1.6 reflects the physical targets, investment requirements and service coverage per sector of the second stage.

In Metro Manila, the Manila Water Supply Project III was planned to boost the service coverage to 97%. This project, however, was deferred after construction has already started because its estimated cost had escalated.

In other urban areas, 654 piped systems are programmed for construction, while 350 systems are scheduled for rehabilitation, to expand population coverage to 95%.

In the rural areas, about 794 piped systems will be constructed. Likewise, 13,340, 9,500, and 21,500 Level I systems will be constructed, replaced and rehabilitated, respectively, to increase population coverage to 93%.

Table 12.1.7 summarizes the physical targets of the water supply sector outside of Metro Manila for the years 1988-2000.

12.2 Present Situation in the MWSS Service Area (MSA)

12.2.1 Service Area

Based on Republic Act No. 5234, the MWSS has jurisdiction over the

following areas (refer to Figure 12.2.1):

- Metropolitan Manila (National Capital Region):
  4 cities: Manila, Pasay, Quezon, and Caloocan
  13 municipalities: Las Piñas, Makati, Malabon, Mandaluyong, Marikina, Muntinlupa, Navotas, Parañaque, Pasig, Pateros, San Juan, Taguig, Valenzuela
- Rizal Province:
  14 municipalities: Angono*, Antipolo, Baras*, Binangonan*, Cainta, Cardona*, Jala-Jala*, Montalban, Morong*, Pililla*, San Mateo, Tanay*, Taytay, Teresa*
  * Merged into MSA by the Batas Pambansa Blg. 799, approved April 27, 1984.
- A Part of Cavite Province:
  1 city: Cavite
  5 municipalities: Bacoor, Imus, Kawit, Noveleta, Rosario
- Lungsod Silangan (Tagalog word, Eastern City - not specified)
- Other areas that may come within the development path of the expanding Metropolitan Manila Area, which areas the Board of MWSS may determine and declare as contiguous to its service area and requiring immediate attention, under such terms and conditions that may be agreed upon by the parties concerned. -- Subject to the approval of the President.

Among these areas, the Central Distribution System (CDS) of MWSS, which distributes water from two surface water treatment plants, services only those within Metro Manila including a part of Bacoor and Kawit of Cavite Province. But even in Metro Manila, peripheral areas such as the northern part of Caloocan City, the northern part of Quezon City, most of Valenzuela, the eastern part of Marikina, part of Taguig, a part of Parañaque, most of Las Piñas, and most of Muntinlupa, are not covered by the CDS. These areas and the other areas in said two provinces predominantly rely on isolated groundwater supply systems operated by MWSS and other public entities such as Water Districts, municipalities, and barangays. Figure 12.2.2 presents the areas covered by existing MWSS water supply systems. The meshed area in this figure is covered by the CDS and is mainly supplied with surface water; the striped area (outly-

ing area) is served by the MWSS groundwater supply systems. The groundwater supply is very important to places under these latter areas, though representing only a small percentage of the total water supply of MWSS.

AWSOP which is currently under implementation targets an additional 15 m3/sec of surface water. It also aims to expand the area covered by CDS. After completion of this project, the northern part of abovesaid outlying area will be part of the CDS.

Under a Memorandum of Agreement executed in 1990 between the MWSS, LWUA and the Province of Bulacan, MWSS agreed to provide bulk water to Obando and Meycauayan in 1991. There will be direct service connections to San Jose del Monte, Norzagaray and Angat in 1993 after MSA has expanded to encompass these three towns. By 1995, ten other towns of Bulacan, namely Balagtas, Bocaue, Bulacan, Marilao, Guiguinto, Malolos, Calumpit, Paombong, Hagonoy, and Sta. Maria will be supplied by MWSS with bulk water after the completion of the Umiray-Angat Transbasin Project. The Bulacan Bulk Water Supply Project is a component of AWSOP. However, its implementation schedule has not been decided yet.

In the future, there will be a diminution in the relative importance of groundwater because of the increase in surface water supply. However, the areas that could not be reached by surface water, i.e., areas in the Rizal Province, shall solely rely on groundwater.

12.2.2 Served Population and Water Amount

The total population within the MSA, except the area under BP799, was estimated at 8.83 million through a NSCO census in 1990. From the MWSS Annual Report in 1989, the total served population by MWSS is about 7.98 million.

Using census population and estimated served population, the ratio of served population to total population is calculated at more than 90% as of the 1989 year-end. However, about 30% of said total served population is estimated as indirectly served population.

Table 12.2.1 presents the status of water supply amount and served popu-

lation in last the 7 years. Figure 12.2.3 is derived from the year-1990 of the said table. Based on 1990 data, the total served population is 8.2 million or 90% of the total population within MSA. Out of this figure, 2.6 million or 29% of total population is estimated as illegal users of the system.

Average per capita water consumption in 1990 is calculated at 303 liter per capita per day (lpcd) including Non-Revenue Water (NRW). Non-effective Water consisting of leakage and meter error is estimated around 35% of total distributed amount. Thus, the actual average per capita water consumption is 198 lpcd, while the average per capita water consumption for house connection is 138 lpcd.

Per capita water consumption for the last 7 years has been decreasing. Comparing with the per capita water consumption for house connection in the year 1984, a decrease of 22% or 39 lpcd was registered. This fact does not imply the water saving by users. It seems to be the result of water shortage caused by insufficient water supply capacity of the MWSS system. In this regard, development of new water sources is urgently needed in the MWSS.

The distributed water is shown in Table 12.2.2. As to NRW, it was estimated at around 58% of the total distributed water, while the Revenue Water is at 42%. However, 17% of NRW is suspected to be illegally used water. Therefore, effective water amount is about 52% of distributed water, while 41% of total distributed water is estimated as leaked water. Therefore, leakage detection and repair are indispensable for optimization of the MWSS system. The eradication of illegal use such as illegal connections and tampering of fire hydrants will contribute to the reduction of NRW and increase MWSS revenue.

12.2.3 Existing Water Supply Facilities

(1) Outline of the System

The MWSS has two water sources consisting of surface water and groundwater. The raw water drawn from surface water sources, namely, Ipo Dam (Angat River, Ipo River), La Mesa Dam (Novaliches Watershed), and Alat Diversion Dam (Alat River), is conveyed to two (2) treatment plants,

namely, the Balara Treatment Plant (Nos. 1 and 2) and the La Mesa Treatment Plant.

Treated water from the Balara Treatment Plant is sent to the San Juan and the Pasig Treated Water Reservoirs and the Balara Pumping Station. That from the La Mesa Treatment Plant is sent to the Bagbag Reservoir.

The groundwater drawn from MWSS deepwells is injected directly into the distribution systems after chlorination.

The distribution system serving Metro Manila and Cavite City operates eight booster pumping stations and eight mini-booster pumping stations.

The outline of the system from the surface water sources to the treated water reservoirs is illustrated by Figure 12.2.4.

(2) Water Source

The water sources of the MWSS water supply system consist of surface water and groundwater. The total capacity of these water sources is around 2,495,000 m3 per day as presented in Table 12.2.3.

The water drawn from above sources is conveyed to existing treatment plants through two tunnels and four aqueducts. Schematic drawing and flow balance of these facilities are shown in Figures 12.2.5 and 12.2.6. Outlines of facilities are described below:

Angat Reservoir and Dam

The Angat Reservoir and Dam are located on the Angat River in San Lorenzo, Norzagaray, Bulacan approximately 7.5 km upstream of the New Ipo Dam. The Angat Dam is a rockfill dam with a dike and a spillway. It is operated by the National Power Corporation (NPC) as a hydroelectric plant. Although basically a power project, it is multi-purpose in concept and provides power, water supply, irrigation and flood control benefits. Water is supplied to the MWSS at an annual mean of 22 m^3/sec (1,900,800 m^3/day). The water released through the existing four (4) auxiliary turbines travels downstream to the New Ipo Dam.

The Angat Reservoir and Dam have the following features:

o Reservoir

Drainage	568 km^2.
Lowest river elevation at dam site	Elev. 92.50 m.
Maximum normal pool	Elev. 217 m.
Minimum power pool	Elev. 219 m.
Usable storage	850 million m^3.
Length	35 km.
Maximum width	3 km.
Reservoir area at maximum normal pool	23 km^2.

o Earth and Rockfill Dam

Maximum Height	131 m.
Length at crest	568 m.
Widest section	550 m.
Type of impervious core	Inclined Earth
Elevation at Crest (middle)	Elev. 223.5 m.
Elevation at Crest (Abut.)	Elev. 221.5 m.
Upstream slope	1 on 2.5
Downstream slope	1 on 1.35
Quantities of fill:	
a) Impervious earthfill core	880,000 m^3.
b) Rockfill	5,725,000 m^3.
c) Filters	464,000 m^3

New Ipo Dam and Reservoir

The New Ipo Dam was completed in January 1984. It is one of the components of the Manila Water Supply Project II (MWSP II) whose main purpose is to increase the water supply capacity of MWSS. When it was completed, it increased the water supply capacity of MWSS to an average of 2,500,000 m^3/day (28.9 m^3/sec.).

The New Ipo Dam is located on the Angat river near its confluence with the Ipo River in Bulacan. It is about 7.5 km downstream of the Angat Dam and 200 m downstream of the old Ipo Dam, which was submerged when the

New Ipo Dam was completed.

The New Ipo Reservoir has its maximum flood pool at Elev. 102.0 m. The dam crest is at Elev. 103.5 m. To develop a 28.6 m^3/sec transmission capacity in the Ipo-Bicti tunnels, a normal operating water surface of Elev. 100.0 m at the New Ipo Dam is required. This selected reservoir operating level results in a nominal 2.5 m permanent impairment on the Angat auxiliary (4 turbines) plant design tailwater level.

Water is diverted at the New Ipo Dam through the new intake structure; through the new connecting tunnel into the two existing Ipo-Bicti tunnels.

First and Second Ipo-Bicti Tunnels

Tunnel No. 1 was constructed in the 1930s and has a hydraulic area of about 4.00 m^2. It is 6,440 m. long and invert elevations at Ipo and at Bicti are respectively 86.02 m and 84.23 m. Vertical walls and slightly curved invert are concrete-lined throughout. Crown lining of selected sections only, with a total length of 400 m, was completed in October 1983. With the completion of the crown lining, the tunnel capacity is estimated at 8.6 m^3/sec for the 12.0 m head differential.

Tunnel No. 2 was completed in 1969 and has a standard 3.0 m horseshoe cross section with a flat invert. It is 6,500 m long and has similar invert elevations as Tunnel No. 1. It is completely concrete-lined for the full length. It delivers 20.0 m^3/sec. with New Ipo Dam at Elev. 100.0 m and Bicti at Elev. 88.0 m.

First, Second, Third and Fourth Bicti-Novaliches Aqueducts

There are interconnection structures at Bicti, interconnecting Tunnel No. 1 and Tunnel No. 2 to the Bicti-Novaliches Aqueducts. At the Bicti interconnection structures, the hydraulic grade line (HGL) is generally at elev. 88.0 m.

Aqueducts Nos. 1, 2 and 3 are each about 15 km long and each is composed of multiple segments of pipe siphon and tunnel. Aqueduct Nos. 1 and 2 share common tunnel segments interconnected with parallel dual pipe siphons. Aqueduct No. 3 is not interconnected with Aqueduct Nos. 1 and 2

downstream of Bicti. All tunnel segments were constructed with crown-line elevations that follow a design HGL sloping from elev. 87.2 m at Bicti to Elev. 79.7 m at Novaliches. A reconstruction of the aqueduct interconnection structure at the outlets of Tunnel No.1 and No.2 at Bicti was completed in 1980. This raised the HGL at Bicti to elev. 88.0 m. Under this new condition, Aqueduct No. 3can deliver 9.2 m^3/sec.

Aqueduct No. 4 was completed in 1985 and is fully concrete-lined. With water level at Bicti at Elev. 88.0 m, Aqueduct No. 4 can deliver 14.1 m^3/sec. The 4 aqueducts' total maximum capacity to deliver water to Novaliches is 28.6 m^3/sec.

Novaliches Reservoir and La Mesa Dam

Over the normal reservoir operating range from Elev. 69 to Elev. 79.7 m, the Novaliches Reservoir and La Mesa Dam provide an active volume of 40 million m^3 for regulation of streamflows and seasonal demand variations at the Balara Treatment Plant.

On the Alat River near Novaliches, a low weir with flashboards on the ogee crest diverts streamflows through an aqueduct to Novaliches. The reliable streamflow for the combined Novaliches-Alat watershed is relatively small.

In 1990, the total volume of raw water drawn from all surface water sources was 916.9 million m^3 with an average daily supply of 2,512 thousands m^3 or about 101% of available water source yield. Table 12.2.4 compares the raw water supply drawn from all surface water sources for last five years.

Average daily raw water supply from surface water sources for the last five years is about 2,436 thousands m^3. Considering the drought during the dry season, this amount is insufficient to answer demand. New water sources must be developed to cope with this problem of water shortage. Table 12.2.5 presents monthly raw water amount. Figure 12.2.7 derived from this table shows that raw water from Ipo/Alat/La Mesa dams varied monthly in wide range. Especially, it extremely decreased during dry season, in April down to only about 6% of average monthly flow. Thus the stability of MWSS system is much rely on the Angat Dam water source. In

connection with this matter, AWSOP has been launched to gain 15 m^3/sec. (129,600 m^3/day) of water from Angat Dam through Ipo Dam and a new conveyance system to be constructed.

Based on the 1990 MWSS Annual Report, MWSS gained about 33 million m^3 of groundwater in said year through MWSS-owned deepwells. (This is discussed in the following subsection on water production.)

(3) Water Production

MWSS's two treatment plants, namely, the Balara Treatment Plant (Nos. 1 and 2) and the La Mesa Treatment Plant, have a combined treatment capacity amounting to some 2,600 thousands m^3/day (Figures 12.2.8 to 12.2.11). In addition to this output, MWSS produced about 82,000 m^3/day of groundwater through its 131 operational deepwells scattered within MSA excluding BP799 area. Table 12.2.6 presents the statistics of water production by MWSS for the last 6 years. Table 12.2.7 shows its monthly record in 1990.

Because of insufficient flow capacity of the aqueduct No. 4, the La Mesa Treatment Plant has been producing less water than the Balara Treatment Plant despite its treatment capacity; while the Balara Treatment Plant has been operating beyond its normal capacity. In AWSOP, La Mesa Treatment Plant No. 2 is planned to be constructed for the additional 15 m^3/sec. (1,296,000 m^3/day) raw water. However, a part of the additional water will be diverted to the existing La Mesa Treatment Plant so that the plant will operate at 100% capacity. Thus the capacity of new plant is planned to accommodate for the remaining water (about 900,000 m^3/day) Outlines of existing two treatment plants are shown in Table 12.2.8.

As of March 1991, MWSS has 258 deepwells of which 131 wells are in operation. The water from these wells is injected into the distribution pipelines directly or distributed through booster pumping stations. Details on this subject are discussed in Section 3.3 of Main Report.

(4) Water Distribution

The water produced in the Balara and the La Mesa Treatment Plants and groundwater deepwells are distributed in the Central Distribution System

(CDS) and other isolated distribution systems directly or through distribution reservoirs and booster pumping stations (Figure 12.2.12).

The supply system that serves most of the MSA is the CDS. It is composed of the following:

(a) Primary Distribution System (PDS):
It consists of a general network of main pipes with diameters of 300 mm and above, which forms a skeleton of the CDS with two treatment plants, pumping stations and reservoirs. The PDS ensures the flow transfers from the Main Treated Water Tanks to the Secondary Distribution System.

(b) Secondary Distribution System (SDS):

It consists of pipes with diameters from 100 mm to 250 mm. The SDS provides the water to the Tertiary Distribution System and service connections.

(c) Tertiary Distribution System (TDS):

It consists of pipes with diameters of 50 mm and 75 mm. The TDS is installed to serve isolated groups of consumers, and to avoid long service connections.

Figure 12.2.12 also presents the schematic layout of the existing primary distribution system. The main sources of treated water for the PDS are two treatment plants, namely Balara and La Mesa Treatment Plants. Water from Balara is regulated by the San Juan Reservoir with a total capacity of 150,000 m^3 while the Bagbag reservoir with a total capacity of 200,000 m^3 regulates the water coming from La Mesa.

During peak demand periods, the supply from the treatment plants is partially supplemented by the regulating reservoirs, i.e. San Juan and Bagbag, and partially by gravity and pumped flow from the balancing storage reservoirs located within the distribution network. Since the hydraulic performance of the CDS has been improved by MWSP II and works carried out after MWSP II, several reservoirs and pumping station were phased out or decommissioned. The abandoned elevated concrete reservoirs

that have little effect on the improvement of the hydraulic performance of the system are as follows:

- Camp Murphy Water Tanks
- Balintawak Pumping Station and Tank
- Port Area Pumping Station and Tank
- Paranaque Pumping Station and Tank
- Pasig Reservoir

Because of the same reason, several pumping stations are decommissioned in areas where water can be adequately served by gravity flow. Table 12.2.9 presents the status of existing 15 pumping stations.

12.2.4 Water Quality

Water samples from various points in and out of the distribution system, different stages of purification process are continuously analyzed for bacteriological, physical, chemical and biological characteristics. Samples are checked and counterchecked by the four coordinating laboratories; namely, the Manila Health Laboratory, the Bureau of Research and Laboratory of the Department of Health, The Central Laboratory Division and the Process Quality Laboratory of MWSS.

Table 12.2.10 presents the results of physical and chemical analysis on the raw water, chemical treated water, sedimented water, filtered water and finished water of the Balara and the La Mesa Treatment Plants in 1989. The finished water of Balara indicates worse water quality in turbidity though other parameters are almost even.

Based on the Accomplishment Report for CY 1989 of the Central Laboratory Division, the percentage of satisfaction in the Bacteriological Examination on 1,714 MWSS tap water samples was 100%, while 747 samples from MWSS deepwells shows 78.4% satisfaction as shown in Table 12.2.11. On the other hand, the Process Quality Unit reported less satisfaction percentage for the same kind of examination. Considering the residual chlorine samples, this contamination seems to be caused by low pressure in the distribution system and insufficient construction work of service connection and small size distribution pipes.

The results of water quality analysis on the physical and chemical characteristics of various samples obtained in 1989 are shown in Table 12.2.12. Though the water quality of tap water satisfies the Philippine water quality standard for drinking water on the average, it exceeds the values of this standard in the city of Manila and other cities and municipalities during drought/flood periods. .

12.3 ONGOING AND PROPOSED PROJECTS

12.3.1 Ongoing Projects

MWSS is implementing several rehabilitation and expansion projects to reduce NRW and to increase service concessionaires(Table 12.3.1).

Outline of these projects are as follows:

(1) Manila Water Supply Rehabilitation Project (I) (MWSRP I)
1983 - 1991

This ongoing project, better known as REHAB I covers 8,872 ha within 57 zones out of the MWSS's 120 water supply zones with an initial estimated cost of ₱ 974 million and was initially scheduled to be completed by 1989. Presently, physical targets of the project are identified as: replacement of 150 km tertiary line; installation of 280 public faucets; construction of 50 km new tertiary lines and new/replacements of 108,000 house connections; and relocation of 12,000 water meters. Estimated project cost is revised to a total of ₱ 1.83 billion, of which $35.1 million will be lent by ADB. Through implementation of these works, NRW in the said zones will be reduced to 25%. Recovery of unaccounted water will be 500,000 m3/day. Areas covered by MWSRP I is shown in Figure 12.3.1.

The project we expected to be completed at the year-end of 1990 initially. However, due to delay of implementation, 86.35% was reported as its physical accomplishment as of 1990 year-end. As to NRW, Table 12.3.2 shows effects of MWSRP I as of July 1990. Though only 16 zones have been rehabilitated, the average percentage of NRW in these zones has been significantly reduced by around 47% down to 25.8%. Comparing with the

reduction of water supply amount and increase of the revenue water, the reduction of the NRW can be considered mainly as a due to the reduction of leakage. Assuming that the water consumption is stable between pre- and post-rehabilitation and the illegal use was cleared by the project, the ratio of illegal use water is calculated at 11.4% of NRW.

(2) Manila Water Supply Rehabilitation Project II (MWSRP II)
1988 - 1992

With the same objectives as the MWSRP I, the MWSRP II is envisioned to accelerate the rehabilitation program of the MWSS with its area coverage of another 9,061 hectares (within 52 zones out of 63 remaining). The area of the 11 zones not covered by both projects is located within the fringe areas, as shown in Figure 12.3.1. MWSRP II will replace 1,000 km of tertiary lines, install 285 public faucets and replace 87,121 water meters. Total project cost is estimated to be ₱ 1.4 billion at present. The ADB will lend $26.4 million for the project in total. This project aims to reduce NRW in the project area to 25% or less and over NRW to about 30% by 1992. Recovery of unaccounted water will be 265,450 m^3/day.

This project which was started in May 1989 will be completed at year-end 1992. As of year-end 1990, its physical accomplishment was reported to be 35.37%. Table 12.3.3 presents the results of measurement regarding NRW in 3 zones rehabilitated in the project. As a result, the NRW of 51.4% before rehabilitation was reduced to 21.50% by this project.

(3) Angat Water Supply Optimization Project (AWSOP)
1989 - 1994

The Angat Water Supply Optimization Project is designed to meet the domestic water needs of Metro Manila prior to the entry of MWSP III into the mainstream of the MWSS Central Distribution System. The project aims to augment the present water capacity of Metro Manila by 15 m^3/sec.

Under this project, it is also programmed that the available flow of 9 m^3/sec. from the adjacent Umiray River is integrated into the project's structure (Umiray-Angat Transbasin Project). The project has been divided into four (4) components, namely: AWSOP I, II, III, and IV. Among of them, AWSOP I and II have commenced last year. AWSOP III and IV have not

been started yet.

Location of major facilities to be constructed in the project is illustrated in Figure 12.3.2. The project cost is estimated at ₱ 7,898 million in total. The loan agreements for $40 million with IBRD, and $130 million with ADB were signed on November and December 1989 respectively. New loan agreement for additional $80 million was agreed recently.

AWSOP I includes the construction of a 4.3 m diameter, 6.16 km long tunnel from Ipo Intake to Bicti Outlet, and an 18 MW Auxiliary Hydro-Power Plant. Construction of the tunnel was started on June 6, 1989. As to the power plant, it is still in the preconstruction stage while the designing stage has been completed.

AWSOP II includes the construction of 16.1 km long aqueduct and La Mesa Treatment Plant No. 2 with a capacity of 900,000 m^3/day, with the construction work for the aqueduct having been started during the middle of 1989. The other component is still in the preconstruction stage.

AWSOP III has not been started yet. It is aimed at the construction of a distribution network with a total length of more than 1,000 km, including construction of additional 360,000 service connections, 4 pumping stations and 4 treated water reservoirs with a combined capacity of 250,000 m^3/day, and the rehabilitation of existing 11 pumping stations.

Construction of transmission pipeline with a total length of 35 km for Bulacan Bulk Water Supply Project and telemetering system for the facilitates existing and to be constructed under this project will be composed in AWSOP IV.

(4) Metro Manila Groundwater Development Project (MMGWDP)
1990-1992

The project will provide a holistic management of the total groundwater utilization in Metro Manila. The components of the project include the formulation of a plan for the rehabilitation, operation, maintenance and development of MWSS wells; evaluation of groundwater development in MSA; development of remedial measures and preventive schemes for saline-intruded areas; and the establishment of a standard groundwater monitor-

ing system to counter other problems besetting the groundwater system in MSA. Project cost is P63.11 million. The study on the project was commenced in August 1990 under the grant aid of the Government of Japan through JICA.

(5) Locally Funded Projects (continuing program)

These are projects made as a quick response to public requests for improvement, expansion, replacement, interconnection of small scale watermains extensions and other miscellaneous works that fall outside of ongoing foreign assisted projects. These projects are part of normal work activities of the office and get funding from the annual Engineering budget averaging ₱100 million per year.

12.3.2 Proposed Projects

Aside from the ongoing projects, the MWSS is planning to implement several projects with the principal objectives of extending the water services to the unserved areas and of augmentation of water production capacity (Table 12.3.4). Outlines of these projects are as follows:

(1) Rizal Province Water Supply Improvement Project (RPWSIP)
1989 - 1998

The project will provide adequate water supply to the 9 municipalities of Rizal covered by Batas Pambansa 799 namely: Angono, Baras, Cardona, Jala-Jala, Morong Pililla, Tanay, Taytay, and Teresa as shown in Figure 12.3.3.(Binangonan was one of the subjects of the project initially. However, it seceded from the project and Taytay was integrated instead).

The project that is being implemented from 1990-1998 extracts groundwater of 11,300 m^3/day for Baras, Cardona, Jala-Jala, Morong, Pililla, Tanay and Teresa while Laguna de Bay will serve Angono and Taytay at a supply volume of 36,800 m^3/day. This will benefit 142,450 customers at a cost of ₱895 million under the financial assistance by French Government.

This project aims to construct intake structure, water treatment plant, pumping station, reservoir and distribution pipes for Angono and Taytay, and to construct deep wells, elevated tanks and distribution pipes for

other seven towns.

(2) Fringe Area Water Supply Project (FAWSP)
1989 - 1993

Main objective of this project is to improve the water supply in the inadequately served areas shown in Figure 12.3.4. Most of these areas are not connected to the central distribution system of the MWSS and, therefore, the major source of water is groundwater.

The Fringe Area consists of one (1) city and eight (8) municipalities enumerated as follows:

South Sector : Bacoor, Muntinlupa
East Sector : Antipolo, Montalban, San Mateo
West Sector : Cavite City, Kawit, Imus, Rosario

Eight other cities/municipalities in the fringe areas, namely,: Caloocan city B, Marikina, Novaliches in Quezon City, Valenzuela, Las Pinas, Taguig, Cainta, and Taytay will be served with surface water through AWSOP.

The project will construct new deepwells and rehabilitate old ones, pump stations, distribution lines and 40,000 house service connections. At a cost of ₱ 252.4 million, the project is expected to benefit 600,000 customers by 1993.

(3) Metropolitan Manila Water Distribution Project (MMWDP)
1986 - 1991

The project provides the extension of MWSS water supply facilities by maximizing the available capacity of the recently completed Manila Water Supply II Project. The project involves the laying of additional 280 kms of new lines, 26,879 new house service connections including the interconnection of 72 subdivisions, pockets of in-filling developments, urban sites, low income areas and other areas served through groundwater but are showing signs of saline intrusion. The project cost is estimated to be ₱ 1.2 billion including loan amount of 38.0 million from IBRD. This project will benefit 800,000 customers.

As of August 1990, physical accomplishment of MMWDP was reported at 70.62% representing the pipe laying of a total of 384,220 m watermains, installation of 26,182 units of house service connections, interconnection at 567 points, installation of 133 fire hydrants, and 1,894 gate valves.

(4) Umiray-Angat Transbasin Project (UATP)
1991 - 1995

From a diversion dam located in Dingalan, Aurora Province, an estimated 800,000 m^3/day will be diverted from the Umiray River Basin to the Angat River Basin to increase further the capacity of AWSOP. This transbasin project will entail the construction of a diversion dam, tunnels and aqueducts, auxiliary power unit and a treatment plant. The project will cost ₱2.45 billion and will benefit 2.2 million population by year 1995. A loan from ADB with an amount of $1.2 million will be allotted for the feasibility study of the project from the year 1990.

(5) Manila South Water Distribution Project (MSWDP)
1990 - 1995

The project will serve as an alternative source from the existing Angat Water Supply. This project will supply Paranaque, Muntinlupa, Las Pinas, and Bacoor. Project's components include construction of two treated water reservoirs, three booster pumping stations, 52.3 km of primary distribution lines, 220 km of secondary and tertiary distribution networks and 99,100 house service connections. At a cost of ₱1.5 billion, the project will benefit about 1,000,000 population.

(6) Manila Water Supply Project III (MWSP III)
1998 - 2004

The MWSP III project is a multi-purpose development of the Kaliwa River Basin located in Tanay, Rizal that aims to provide long term water supply for Metro Manila and to generate incidental power for the Luzon grid. The project is subdivided into 3 major components, namely: headworks, treatment plant and distribution system capable of conveying a full yield of 1,900,000 m^3/day. Project cost is ₱3 billion.

The MWSP III was started in 1983, and as of 1989, MWSS has already spent ₱426,560,000 for its detailed design, construction of bypass tunnel, relocation and other preparatory works. Based on its approved implementation schedule, MWSS will spend a total of ₱1.15 billion for the next 8 years (1989-1997) for the purpose of transferring the settlers from the watershed.

Considering the huge financing necessary for its completion, the project will be deferred for 12 years. The project cost was found to be more than twice the cost of developing Angat and Umiray Rivers and Laguna de Bay.

(7) Manila North-East Water Supply Project (MNEWSP)
1991 - 1995

The project will revive the utilization of the long abandoned Wawa Dam. It aims to construct potential groundwater sources catering to the water supply requirements of the municipalities of Montalban, San Mateo and a part of Marikina. The project will rehabilitate the intake structure, construct a treatment plant, transmission lines, distribution network and about 43,000 house service connections. With a possible yield of 72,000 m3/day from Wawa Dam alone, the project is expected to benefit 260,000 customers by 1995 at a cost of ₱580.2 million.

(8) Balara Treatment Plant Rehabilitation Project
1991 - 1994

The rehabilitation project aims to increase operating efficiencies of the Balara Treatment Plant by installing additional equipment, civil structures and telemetering systems. When completed, improvement of water quality and reduction of operating cost are expected. Project cost is placed at ₱ 486.3 million.

12.3.3 Future Water Source and Production Capacity

(1) Water Source

Based on the implementation plans of ongoing projects, only the AWSOP is expected to augment the yield of water sources by an annual average of

1,300 thousands m3/day or 15 m3/sec. Several projects though are lined up by the MWSS to augment the water sources yield: RPWSIP, UATP, MWSP III, MNEWSP (Table 12.3.5). However, these projects are still on the study or on the designing stage and financial sources for them have not been finalized yet. As such, their implementation schedules are only tentative.

(2) Water Production

Since the completion of the La Mesa Treatment Plant in 1985, water production capacity of MWSS has remained at 2,636 thousands m3/day. Among MWSS's ongoing projects only AWSOP is planned for augmenting this capacity through construction of the La Mesa Treatment Plant No. 2 with a capacity of 900 thousands m3/day.

Several courses for increasing supply are being resorted to. One involves the recovery of NRW. Targeted to be discovered by the MWSRP I and II are 765 thousands m3/day of NRW. As more than half of this amount is estimated to be accounted for by leakage from the distribution lines, around 400 thousands m3/day of treated water will be available for consumption, a not so insubstantial amount. Another involves project proposals to augment water production capacity, but these are still on the study or detailed engineering stage.

The highest probability of being implemented among the MWSS proposed projects on increasing production capacity appear to fall on MNEWSP. This project that will use Wawa River as water source is expected to contribute 72 MLD. Other projects propose utilization of Laguna de Bay and groundwater. For reasons of finances and the long construction project could have been the biggest step yet to be taken in augmenting water production capacity.

TABLE 12.1.1 PRESENT WATER SUPPLY COVERAGE: 1987

(million)

Area	Total Population	(%)	Population Served						Underserved/ Unserved Population	(%)
			Total	(%)	Wells/Developed Spring	(%)	Piped System	(%)		
Philippines	57.36	100	36.17	63	17.92	31	18.25	32	21.19	37
Urban	23.53	100	15.39	65	12.52	53	2.87	12	8.14	35
Metro Manila and and its contiguous area	8.16	100	7.01	86	6.84	84	0.17	2	1.15	14
Others	15.37	100	8.38	55	5.68	37	2.70	18	6.99	45
Rural	33.83	100	20.78	62	5.40	16	15.38	46	13.05	38

* Excluding the 303,433 population of the towns of Rizal province under BP 799.

Source: Department of Public Works and Highways, Water Supply, Sewerage, and Sanitation Master Plan of the Philippines: 1988-2000.

TABLE 12.1.2 NUMBER OF FAMILIES BY MAIN SOURCE OF WATER SUPPLY, BY REGION, URBAN AND RURAL: 1985

Area/Region	Total Number of Families	Faucet inside the house/yard community wtr.system	Faucet, other community water system	Tubed /piped well, own use	Tubed /piped well, others	Dug well	Spring, river, stream, etc.	Rain	Peddler
Philippines	9,847,339	1,853,841	1,723,961	1,678,497	1,631,065	1,702,881	929,892	118,825	208,378
	(100%)	(19)	(13)	(17)	(17)	(17)	(9)	(1)	(2)
Urban	3,726,049	1,462,080	777,429	517,756	478,673	244,330	59,765	14,505	171,511
	(100%)	(39)	(21)	(14)	(13)	(7)	(2)	(0)	(5)
Rural	6,121,290	391,761	946,532	1,160,740	1,152,392	1,458,551	870,126	104,321	36,867
	(100%)	(6)	(15)	(19)	(19)	(24)	(14)	(2)	(1)
Metro Manila Area (NCR)	1,310,549	738,297	292,377	61,783	65,789	32,978	-	-	119,325
	(100%)	(56)	(22)	(5)	(5)	(3)	(-)	(-)	(9)
I. Ilocos	711,232	100,683	90,894	216,201	173,249	94,134	35,529	542	-
II. Cagayan Valley	462,088	18,195	12,915	166,107	127,900	103,281	31,901	1,364	426
III. Central Luzon	956,921	181,438	103,870	380,517	255,389	16,978	14,752	-	3,978
IV. Southern Tagalog	1,303,729	227,001	287,491	256,822	222,193	205,930	100,253	1,294	2,745
	(100%)	(17)	(22)	(20)	(17)	(16)	(8)	(0)	(0)
V. Bicol	668,473	104,311	132,255	88,488	65,793	182,640	86,157	-	8,830
VI. Western Visayas	881,554	70,807	120,490	109,445	119,298	360,119	85,821	9,045	6,530
VII. Central Visayas	783,846	99,975	138,570	60,326	148,001	166,741	116,040	20,760	33,433
VIII. Eastern Visayas	567,496	53,634	157,361	39,594	112,786	137,640	60,793	693	4,996
IX. Western Mindanao	494,818	37,418	72,497	38,272	51,003	174,204	104,750	6,094	10,580
X. Northern Mindanao	565,270	109,462	171,727	23,622	54,236	98,859	99,104	5,778	2,482
XI. Southern Mindanao	705,453	84,995	94,402	160,893	174,835	46,363	64,590	70,553	8,823
XII. Central Mindanao	435,911	27,625	49,111	76,429	60,595	83,015	130,203	2,701	6,231

* Bracketed figures indicate percentages to total number of families.

Source: National Statistics Office, 1985 Family Income and Expenditures Survey.

TABLE 12.1.3 EXISTING WATER SUPPLY FACILITIES: 1987

Area	Type of Facility	Number	Population Served	Total Population	Percent of Population served
Metro Manila and its contiguous areas	Dams	4	7,008,000	8,160,000	86%
	Tunnels	2	-		-
	Aqueducts	7	-		-
	Treatment plants	2	-		-
	Balancing Reservoir	2	-		-
	Pipelines	3,000	-		-
	Pumping stations and reservoir	9	-		-
	Active deepwells	118	-		-
	Fire hydrants	2,350	-		-
	House Service Connection	543,900	-		-
Other urban areas	Waterworks systems (Level III)	214	3,970,000	15,370,000	26%
	Communal faucet systems (Level II)	1,900	1,710,000		11%
	Point sources (Level I)	9,000	2,700,000		18%
Rural areas	Piped systems (Level II & III)	3,232	5,400,000	33,830,000	16%
	Shallow wells	464,678	15,380,000		46%
	Deep wells	193,404			
	Developed springs	9,726			
			36,168,000	57,360,000	63%

Source: Department of Public Works and Highways, Water Supply, Sewerage and Sanitation Master Master Plan of the Philippines: 1988-2000.

TABLE 12.1.4 RESPONSIBILITY OF GOVERNMENTAL AGENCIES

Coverage Area / Responsibility Area / Agency	Metro Manila & its Contiguous Areas			Other Urban and Rural Areas			
	MWSS	DPWH	NWRB	LWUA	DPWH	DLG	NWRB
PLANNING	X (Area Wide)	Sector	C	Other Urban & Rural Areas (Area Wide)	Sector		C
PROGRAMMING	X			L-II/III	L-I Source Dev.	L-I	
FINANCING	X			X	X	X	
INSTITUTIONAL	X			X	Interim	Interim	
ENGINEERING	X			X	X	X	
CONSTRUCTION	X			L-II/III Source Dev.	L-I	L-I	
OPERATION AND MAINTENANCE	X			WD/ RWSA			

X - Directly Responsible
C - Coordination
Source: Department of Public Works and Highways, Water Supply, Sewerage, and Sanitation Master Plan of the Philippines: 1988-2000.

TABLE 12.1.5 PHYSICAL TARGETS, INVESTMENT REQUIREMENTS AND SERVICE COVERAGE, FIRST STAGE (1988-1992)

Particulars	Implementing Agency	Physical Targets	Investment Requirements (million P)	Population Served (million)		% of Population Served	
				Additional	Cumulative	Additional	Cumulative
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WATER SUPPLY			21,691.85				87
I. Metro Manila and its Contiguous Areas			9,568.85	1.440	8.448	4	87
1. Manila Water Supply Rehabilitation Project I	MWSS	- Replacement of 131,000 house con. - Removal 28,000 spaghetti con. - Replacement of 200 km. pipelines - Installation of 600 flow rec. stations - Replacement of 108,000 pcs. water mts. - Repair of 22,500 pcs. water meters - Installation of 12,000 pcs. new water meters - Repair of 300 pcs. valves - Replacement of 2.25 pcs. valve	973.57				
2. Metro Manila Water Distribution Project		- Const. of 28 km. new pipelines - Inst. of 100,000 new house con. - Intercon. 72 sub. to serve 15,600 households - Infilling of 24 areas with secondary and tertiary pipelines - Const. of tertiary pipelines for 160 low-income areas - Drilling and equipping of 5 new deep wells	829.51				
3. Manila Water Supply Project II		- Completion of ongoing works	176.08				
4. Angat Water Supply Optimization Project		- Const. of new 6.4 km. tunnel - Const. of new 16.3 km. aqueduct - Expansion of La Mesa Treatment Plant - Const./Inst. of distribution pipelines pumping stations and reservoir - Inst. of additional house service connections	5,363.10				
5. Manila Water Supply Rehabilitation Project II		- Replacement of 104,000 house con. - - Removal of 13,000 spaghetti con. - Replacement of 50 km. pipelines Inst. of 1,040 flow rec. stations connections - Repair of 7,280 pcs. water meters - Installation of 3,120 water meters - Inst. of 1,560 new valves - Replacement of 11,440 water meters Repair or replacement of 1,560 valves	1,043.40				
6. Fringe Areas Water Supply Project		- Construction of deep wells - Const./Inst. of pipelines - Rehab. of existing facilities Inst. of new house service connection	1,021.55				
7. Water Supply Development in Rizal		- Const. of shallow and deep wells - Const./Inst. of pipelines - Development of springs Installation of house service connection	161.64				
II. Other Urban Areas	LWUA, DLG	- Construction of: 450 Piped Systems 450 Piped Systems (L-II/III) Repair/Rehab. of 250 systems	4,367.00 3,943.00 424.00	4.913 4.913	13.766	22	77
III. Rural Areas	DPWH, DLG, LWUA	- Construction of: 933 Piped Systems 933 Piped Systems (L-II/III) 87.46 Point Sources (L-I) Repair/Rehab. of 21,620 systems	7,756.00 1,668.00 5,990.00 98.00	13.723 0.473 13.25	34.030	30	92

Source: Department of Public Works and Highways, Water Supply, Sewerage and Sanitation Master Plan of the Philippines: 1988-2000.

TABLE 12.1.6 PHYSICAL TARGETS, INVESTMENT REQUIREMENT AND SERVICE COVERAGE, SECOND STAGE (1993-2000)

Particulars	Implementing Agency	Physical Targets	Investment Requirements (million P)	Population Served (million)		% of Population Served	
				Additional	Cumulative	Additional	Cumulative
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WATER SUPPLY							
I. Metro Manila and its Contiguous Areas			22,689.21				94
1. Manila Water Supply Rehabilitation Project III	MWSS	- Const. of 113 meters rockfilled dam - Const. of 2,400 mld treatment plant - Const. of 14 km tunnel - Const. of 23.2 mega watts hydro-electric plant - Const. of pumping stations and reservoirs - Const. of about 500 km. pipelines - Installation of 170,000 new house service connections	129,000.00	2.705	11.153	10	97
II. Other Urban Areas	LWUA	- Construction of: 654 Piped Systems (L-II/III) Repair/Rehab. of 350 systems	6,915.00 6,321.00 594.00	9.025 9.025	23.506	18	95
III. Rural Areas	DPWH, LWUA	- Construction of: 794 Piped Systems (L-II/III) 13,340 Point Sources (L-I) Repair/Rehab. of 21,000 systems Replacement of 9,500 systems	2,874.21 1,929.00 755.46 161.25 28.50	2.715 0.715 2	36.030	1	93

Source: Department of Public Works and Highways, Water Supply, Sewerage and Sanitation Master Plan of the Philippines: 1988-2000.

TABLE 12.1.7 WATER SUPPLY TARGETS: 1988-2000

Category	1988	1989	1990	1991	1992	1993-2000	Total
A. Rural Areas							
1. Point Sources	10,387	16,238	27,119	30,202	24,820	44,340	153,106
Construction	7,823	14,576	20,796	24,433	19,518	13,340	100,486
Shallow well	4,381	7,901	10,831	11,825	9,520	5,070	49,528
Deep well	2,767	5,337	8,357	10,820	8,550	7,200	43,031
Spring developed	405	1,068	1,393	1,788	1,448	1,070	7,177
Others	270	270	215	-	-	-	755
Repair/rehabilitation	2,564	1,662	6,323	5,769	5,320	21,500	43,120
Replacement	-	-	-	-	-	9,500	9,500
2. Piped Systems (Level II/III)	131	204	110	262	226	794	1,727
B. Other Urban Areas							
Piped systems (Level II/III)	84	105	165	184	162	1,004	1,704
Construction	34	55	115	134	112	654	1,104
Repair/rehabilitation	50	50	50	50	50	350	600

Source: Department of Public Works and Highways, Water Supply, Sewerage and Sanitation Master Plan of the Philippines: 1988-2000.

TABLE 12.2.1 MWSS WATER SUPPLY STATISTICS, 1984-1990

Year	1984	1985	1986	1987	1988	1989	1990
1) Pop'n under MWSS (million)	7.480	7.712	7.938	8.167	8.405	8.651	9.133
2) Water Production							
a) Surface Water (million m3)	642.24	757.37	874.07	834.75	849.34	859.10	875.80
b) Groundwater (million m3)	25.56	29.45	30.43	27.87	29.48	28.96	33.33
Total	667.80	786.83	904.51	862.62	878.82	888.06	909.13
Increase	-	119.03	117.68	(41.89)	16.20	9.24	21.07
3) Water Consumption							
a) Volume Sold (million m3)	289.90	302.85	310.78	336.51	359.45	375.77	384.67
%	43.4%	38.5%	34.4%	39.0%	40.9%	42.3%	42.3%
b) NRW (million m3)	377.90	483.98	593.73	526.11	519.37	512.29	524.46
%	56.6%	61.5%	65.6%	61.0%	59.1%	57.7%	57.7%
Total	667.80	786.83	904.51	862.62	878.82	888.06	909.13
c) House Connection (mil. m3)	168.55	183.55	195.47	218.48	225.85	235.74	244.97
d) P.F. & Other Conn. (mil. m3)	121.35	119.30	115.31	118.03	133.60	140.03	139.70
e) Illegal Use (mil. m3)	151.16	193.59	237.49	210.44	207.75	204.92	209.78
Sub Total	441.06	496.44	548.27	546.95	567.20	580.69	594.45
%	66.0%	63.1%	60.6%	63.4%	64.5%	65.4%	65.4%
f) Leak, Meter Error (mil. m3)	226.74	290.39	356.24	315.67	311.62	307.37	314.68
%	34.0%	36.9%	39.4%	36.6%	35.5%	34.6%	34.6%
Total	667.80	786.83	904.51	862.62	878.82	888.06	909.13
4) Number of Connections							
a) House Connection	321,512	377,538	442,323	490,223	508,545	543,128	599,754
b) Public Faucet	1,020	1,080	1,160	1,230	1,300	1,420	1,490
c) Others	27,039	27,368	26,919	26,703	44,688	43,910	47,343
Total	349,571	405,986	470,402	518,156	554,533	588,458	648,587
Increase	-	56,415	64,416	47,754	36,377	33,925	60,129
5) Estimated Population Served							
a) House Connection (million)	2.604	3.058	3.583	3.971	4.119	4.399	4.858
b) Public Faucet (million)	0.496	0.525	0.564	0.598	0.632	0.690	0.724
Sub Total	3.100	3.583	4.147	4.569	4.751	5.089	5.582
Increase	-	0.483	0.564	0.422	0.182	0.338	0.493
c) Illegal Use (million)	1.358	1.955	2.738	2.483	2.381	2.399	2.649
Total	4.458	5.538	6.884	7.052	7.132	7.489	8.232
Increase	-	1.080	1.347	0.167	0.080	0.357	0.743
6) Per Capita Water Consumption (lpcd)							
a) for distributed water	410	389	360	335	338	325	303
b) for effective water	271	246	218	212	218	212	198
c) for domestic water	177	164	149	151	150	147	138

Note: 5a = 4a x 8.1, 5b = 4b x 486, 5c = (3b x 0.4 x (3c/3a)) / (3c/4a) x 8.1
6a = (3a+3b) / (5a+5b+5c), 6b = (3c+3d+3e) / (5a+5b+5c), 6c = 3c / 5a

Source: Corporate Planning Group

TABLE 12.2.2 WATER DISTRIBUTION AND ITS DISPOSITION

MONTH 1990	DISTRIBUTED WATER	REVENUE WATER	NON-REVENUE WATER	NRW BREAKDOWN (ESTIMATED)		
				ILLEGAL USE	LEAKAGE	METER ERROR
1	75,640,760	32,117,320	43,523,440	1,949,850	36,794,716	4,778,874
2	66,304,860	29,805,980	36,498,880	1,635,150	30,856,153	4,007,577
3	74,098,800	30,426,570	43,672,230	1,956,516	36,920,503	4,795,211
4	70,446,810	31,539,440	38,907,370	1,743,050	32,892,291	4,272,029
5	72,263,882	32,216,412	40,047,470	1,794,127	33,856,131	4,397,212
6	70,541,918	32,359,116	38,182,802	1,710,590	32,279,741	4,192,472
7	77,868,754	32,062,970	45,805,784	2,052,099	38,724,210	5,029,475
8	79,949,295	32,781,163	47,168,132	2,113,132	39,875,939	5,179,061
9	81,132,259	33,427,116	47,705,143	2,137,190	40,329,928	5,238,025
10	82,649,978	33,325,055	49,324,923	2,209,757	41,699,290	5,415,877
11	78,463,710	33,240,963	45,222,747	2,025,979	38,231,310	4,965,458
12	79,567,729	32,223,546	47,344,183	2,121,019	40,024,772	5,198,391
TOTAL	908,928,755	385,525,651	523,403,104	23,448,459	442,484,984	57,469,661
DAILY AVG.	2,490,216	1,056,235	1,433,981	64,242	1,212,288	157,451
% TO DIST.	100.0%	42.4%	57.6%	2.6%	48.7%	6.3%
% TO NRW			100.0%	4.5%	84.5%	11.0%
1989 TOTAL	888,059,928	376,055,417	512,004,511	84,962,387	367,566,421	59,475,703
DAILY AVG.	2,433,041	1,030,289	1,402,752	232,774	1,007,031	162,947
% TO DIST.	100.0%	42.3%	57.7%	9.6%	41.4%	6.7%
% TO NRW			100.0%	16.6%	71.8%	11.6%

Source: Water Distribution and Its Disposition, Water Distribution & Maintenance Dept., MWSS

TABLE 12.2.3 CAPACITY OF WATER SOURCES

Source		Area of Watershed (km^2)	Water Right or Capacity (m^3/day)	Status
Angat Dam (Angat River)		568	1,901,000 1/	Used
Ipo Dam (Angat River, Ipo River)	Old	-	(Submerged by New Dam)	
	New	70	474,000 2/	Used
La Mesa Dam (Novaliches Watershed)		27	100,000 3/	Used
Alat Diversion Dam (Alat River)		14	20,000 4/	Used
Marikina River Pumping Stations 5/	1st	-	189,000	Abandoned
	2nd	-	189,000	Abandoned
Wawa Dam (Wawa River)		280	57,000	Abandoned
Groundwater			82,000 6/	Used
Total			3,012,000 m^3/day	
Used w/o Groundwater			2,495,000 m^3/day	

1/: Allocated, 22 CMS
2/: AWSOP; derived from catchment area, rainfall, and permeability coefficient
3/: AWSOP; calculated based on water balance
4/: AWSOP; based on measurement
5/: Abandoned due to bad water quality
6/: Annual average pumpage of MWSS-owned deep wells

TABLE 12.2.4 RAW WATER DRAWN FROM SURFACE WATER SOURCES

(thousand m^3)

year	1986	1987	1988	1989	1990
Total	879,956.2	877,733.1	871,413.4	899,157.9	916,875.4
Daily Avg.	2,410.8	2,404.7	2,387.4	2,463.5	2,512.0

Source: MWSS Annual Report 1986, 1987, 1988, 1989, 1990

TABLE 12.2.5 DRAWN RAW WATER BY MONTH: 1990

MONTH 1990	RAW WATER				RECOVERED WASH WATER	TOTAL TREATED WATER
	ANGAT DAM	IPO/ALAT/ LA MESA DAM	MARIKINA PUMP STN.	SUB-TOTAL		
1	65,876,000	8,072,900	0	73,948,900	2,286,000	76,234,900
2	62,673,400	2,017,800	0	64,691,200	2,153,000	66,844,200
3	71,790,700	60,600	0	71,851,300	2,466,800	74,318,100
4	67,951,100	458,900	0	68,410,000	2,299,200	70,709,200
5	71,517,200	(1,688,700)	0	69,828,500	2,794,500	72,623,000
6	51,647,000	17,343,700	0	68,990,700	1,981,500	70,972,200
7	43,104,200	33,127,900	0	76,232,100	2,478,500	78,710,600
8	35,250,800	44,201,900	0	79,452,700	1,405,600	80,858,300
9	74,386,800	5,815,500	0	80,202,300	1,811,700	82,014,000
10	58,703,900	22,451,300	0	81,155,200	2,669,900	83,825,100
11	57,995,300	19,112,600	0	77,107,900	2,398,700	79,506,600
12	67,467,400	10,420,800	0	77,888,200	2,474,400	80,362,600
TOTAL	728,363,800	161,395,200	0	889,759,000	27,219,800	916,978,800
DAILY AVG.	1,995,517	442,179	0	2,437,696	74,575	2,512,271
%	81.9%	18.1%	0	100.0%	-	-
1989						
TOTAL	703,683,900	170,540,000	0	874,223,900	24,961,000	899,184,900
DAILY AVG.	1,927,901	467,233	0	2,395,134	68,386	2,463,520
%	80.5%	19.5%	0	100.0%	-	-

Source: Weekly Status of Water Production and Elevations, Water Sources and Treatment Dept., MWSS

TABLE 12.2.6 MWSS WATER PRODUCTION: 1985-1990

(unit: m^3)

Year	Treated Surface Water			Groundwater from Wells			Total
	Balara T.P.	La Mesa T.P.	Sub Total	Manila & Suburbs	Cavite Waterworks	Sub-Total	
1985	480,875,282	276,501,100	757,376,382	22,934,495	6,519,749	29,454,244	786,830,626
1986	534,394,436	339,681,600	874,076,036	22,840,692	7,590,881	30,431,573	904,507,519
1987	521,429,600	313,332,400	834,762,000	19,816,742	8,055,750	27,872,492	862,634,492
1988	509,568,000	339,772,700	849,340,700	21,418,094	8,059,931	29,478,025	878,818,725
1989	511,068,700	348,015,800	859,084,500	20,989,504	7,977,002	28,966,506	888,051,066
1990	504,033,800	371,767,600	875,801,400	22,553,080	10,773,164	33,326,244	909,127,644
AVG.	510,228,303	331,511,867	841,740,170	21,758,768	8,162,746	29,921,514	871,661,684
Daily.	1,397,886	908,252	2,306,138	59,613	22,364	81,977	2,388,115

Source: Water Sources & Treatment Dept., MWSS

TABLE 12.2.7 WATER PRODUCTION BY MONTH

MONTH 1990	SURFACE WATER				GROUNDWATER			PRODUCED WATER TOTAL
	BALARA NO. 1 TP	BALARA NO. 2 TP	LA MESA TP	SUB-TOTAL	MANILA & SUBURBS	CAVITE WATERWORKS	SUB-TOTAL	
1	12,230,200	29,250,300	31,483,900	72,964,400	1,835,348	841,009	2,676,357	75,640,757
2	10,985,900	25,952,100	27,010,900	63,948,900	1,723,730	832,229	2,555,959	66,504,859
3	12,196,400	28,837,300	30,168,800	71,202,500	1,931,569	964,726	2,896,295	74,098,795
4	11,564,500	27,501,800	28,710,500	67,776,800	1,779,453	890,555	2,670,008	70,446,808
5	11,604,900	27,858,200	30,123,500	69,586,600	1,860,741	813,541	2,674,282	72,260,882
6	11,646,100	27,124,000	29,101,600	67,871,700	1,800,217	870,001	2,670,218	70,541,918
7	12,998,300	29,732,600	32,292,300	75,023,200	1,929,954	915,800	2,845,754	77,868,954
8	14,136,800	30,033,400	32,915,900	77,086,100	1,808,524	994,671	2,803,195	79,889,295
9	14,502,300	30,350,300	33,578,200	78,430,800	1,856,112	845,347	2,701,459	81,132,259
10	14,893,300	31,258,800	33,582,600	79,734,700	1,986,586	928,692	2,915,278	82,649,978
11	14,103,000	30,380,000	31,088,500	75,571,500	1,457,293	935,017	2,392,310	77,963,810
12	14,527,800	30,364,500	31,710,300	76,602,600	2,023,553	941,576	2,965,129	79,567,729
TOTAL	155,389,500	348,643,300	371,767,000	875,799,800	21,993,080	10,773,164	32,766,244	908,566,044
DAILY AVG.	425,725	955,187	1,018,540	2,399,452	60,255	29,516	89,771	2,489,222
%	17.1%	38.4%	40.9%	96.4%	2.4%	1.2%	3.6%	100.0%
1989								
TOTAL	145,611,300	365,457,400	348,015,800	859,084,500	20,989,504	7,977,002	28,966,506	888,051,006
DAILY AVG.	398,935	1,001,253	953,468	2,353,656	57,505	21,855	79,360	2,433,016
%	16.4%	41.2%	39.2%	96.7%	2.4%	0.9%	3.3%	100.0%

Source: Weeekly Status of Water Production and Elevations, Water Sources and Treatment Dept., MWSS

TABLE 12.2.8 OUTLINE OF TREATMENT PLANTS

	Balara Treatment Plant		La Mesa Treatment Plant
	No.1	NO.2	
Year Completed	1935	1958	1985
Location	Balara, Quezon City	same as left	Novaliches, Quezon City
Design Capacity	100 MGD (Normal) = 378,000 m^3/d 125 MGD (Maximum) = 473,000 m^3/d	200 MGD (Normal) = 757,000 m^3/d 300 MGD (Maximum) = 1,136,000 m^3/d	1,500,000 m^3/d
Chemical Mixing	Hydraulic Jump	Rapid Mixing 2 units	Flush Mixer 6 units
Coagulant Used	Alum	Alum	Ferric Chloride/Alum/Polymer
Flocculation Basin	2 units	12 units	72 units
Volume	2,016 m^3	20,300 m^3	20,736 m^3 (8x8x4.5x72)
Detention Time	2,016 / (378,000-132,000) = 11.8 min.	20,300 /757,000 = 38.6 min.	20,736 / 1,500,000 = 19.9 min.
Sedimentation Basin	2 units	12 units	12 units
Volume	4 MG/unit x 2 = 30,000 m^3 (210 x 21 x 3.8 m x 2 units)	106,000 m^3 (73.2 x 18.3 x 6.0 x 6) 73.2 x 18.3 x 7.2 x 6)	83,800 m^3 (16 x 97 x (4.5 + 1.5) x 12)
Detention Time	189 min.	201 min.	80 min.
Accelator	2 units	-	-
Capacity	17.5 MGD/unit (Normal) = 132,000 m^3/d 25.0 MGD/unit (Maximum) = 189,000 m^3/d	-	-
Coagulant Used	Ferric Chloride/Alum/Polymer	-	-
Filter	10 units	20 units	24 units
Type	Dual Media Rapid Sand Filter	same as left	3 layer RSF
Filtration Area	162 m^2/unit	162 m^2/unit	180 m^2/unit
Capacity	12.5 MGD/unit = 47,300 m^3/d/unit	10 MGD/unit = 37,800 m^3/d/unit 15 MGD/unit (Maximum)	62,640 m^3/d/unit
Filt. Velocity	290 m/d	233 m/d	348 m/d

Source: Water Distribution & Maintenance Dept.

TABLE 12.2.9 EXISTING PUMPING STATIONS

NAME	VOLUME OF RESERVOIR ($1000\ m^3$)	PUMPS & MOTOR discharge/head/output/No./type/(*) (MLD) (M) (HP)	COMPLT'N YEAR	PRESENT STATUS
ALGECIRAS	38	22.62 / 46.0/ 225 / 4 / S 34.07 / 30.0/ 200 / 3 / B	1976	operational
BALARA	19	30.30 / 61.0/ 250 / 1 / S 45.51 / 91.5/ 500 / 7 / B /(3)	1972	operational
CALOOCAN	19	22.62 / 46.0/ 225 / 3 / S 34.07 / 30.0/ 200 / 2 / B	1971	inactive
CUBAO	-	24.98 / 33.8/ 200 / 4 / B	1988 renovated	operational
D. TUAZON	19	22.02 / 46.0/ 225 / 4 / S 34.07 / 30.0/ 200 / 3 / B	1972	inactive
ERMITA	19	22.62 / 46.0/ 225 / 3 / S /(1) 34.07 / 30.0/ 200 / 2 / B /(1)	1970	operational
ESPIRITU	19	22.62 / 46.0/ 225 / 3 / S 34.07 / 30.0/ 200 / 3 / B	1976	inactive
FORT BONIFACIO	28	61.20 / 29.0/ 349 / 4 / S /(1)	1986	operational
MAKATI	19	34.07 / 30.0/ 200 / 3 / B 22.62 / 46.0/ 300 / 3 / S	1972	inactive
NOVALICHES	7	3.36 / 23.8/ 20 / 3 / S	1986	operational
NOVELETA	8	23.52 / 30.0/ 45 / 3 / S 31.20 / 30.0/ 149 / 3 / S	1990	operational
PASAY	19	22.62 / 46.0/ 225 / 2 / S 34.07 / 30.0/ 200 / 2 / B	1977	operational
PASIG	80	49.06 / 36.0/ 375 / 5 / S /(1)	1984	operational
SAN JUAN	95 + 57	45.51 / 91.5/ 500 / 6 / B /(2) 30.30 / 61.0/ 250 / 1 / B	1948	operational
TONDO	19	22.62 / 46.0/ 225 / 3 / S 34.07 / 30.0/ 200 / 2 / B	1975	inactive

type: S -- storage pump which boosts water from reservoir to the PDS
B -- in line booster pump which boosts water of PDS.

(*) No. of not-operational pump unit

TABLE 12.2.10 PHYSICAL AND CHEMICAL ANALYSES AT MWSS TREATMENT PLANTS
(FROM JANUARY 1 TO DECEMBER 31, 1989)

SAMPLE		pH	Turbidity units	Acidity mg/l	Free CO2 mg/l	Alkalinity mg/l	Bicarbonates mg/l	Hardness mg/l	Chlorides mg/l	Iron mg/l	Residual Chlorine mg/l
Balara Treatment Plant											
Raw Water	Avg.	7.38	19.23	9.10	8.00	54.26	66.20	50.94	7.02	0.15	
	Min.	7.15	6.16	7.15	6.29	51.38	62.68	44.94	5.21	0.09	
	Max.	7.49	49.40	10.33	9.09	58.67	71.58	53.73	8.22	0.25	
Treated	Avg.	7.13	15.38	8.63	7.59	52.06	63.44	50.71	6.93		
	Min.	6.76	5.98	6.80	5.98	48.80	59.53	45.79	5.26		
	Max.	7.36	44.22	10.93	9.61	56.83	69.33	56.50	9.19		
Influent	Avg.	7.10	8.51	8.57	7.54	52.33	63.84	51.00	7.02		
	Min.	6.76	6.07	7.38	6.49	48.26	58.88	45.68	5.68		
	Max.	7.35	15.66	10.48	9.22	57.67	70.36	53.27	9.15		
Filtered Water	Avg.	7.08	3.51	7.91	6.96	51.79	63.18	51.39	7.09		
	Min.	6.86	2.79	7.00	6.16	48.78	59.51	44.78	4.67		
	Max.	7.36	6.39	10.06	8.85	56.33	68.72	56.20	9.41		
Finished Water	Avg.	7.10	3.62	8.13	7.15	51.73	63.11	51.10	7.40	0.07	0.52
	Min.	6.76	2.77	6.76	5.94	49.38	60.24	46.18	5.82	0.05	0.31
	Max.	7.32	6.21	10.23	9.00	57.18	69.76	53.25	11.00	0.08	0.73
La Mesa Treatment Plant											
Raw Water	Avg.	7.22	16.92	11.62	10.23	69.06	84.25	53.08	4.37	0.08	
	Min.	7.16	5.16	10.13	8.91	57.43	70.07	47.94	3.16	0.05	
	Max.	7.30	40.93	13.37	11.76	85.68	104.53	67.00	6.24	0.20	
Treated	Avg.	7.06	17.72	11.54	10.18	65.51	79.92	52.80	4.71	0.09	
(Before Settlement)	Min.	6.97	4.53	10.12	9.08	54.77	66.82	48.97	3.76	0.05	
	Max.	7.19	61.75	13.92	12.55	77.00	93.94	68.25	6.08	0.29	
Influent	Avg.	7.05	6.14	11.58	9.25	64.86	79.12	52.71	5.67	0.05	0.96
(Settled)	Min.	6.96	3.41	10.29	9.06	52.84	64.46	47.71	4.87	0.05	0.90
	Max.	7.15	13.75	13.52	11.37	73.90	90.16	68.00	7.30	0.06	1.07
Filtered Water	Avg.	7.06	1.92	11.21	9.87	63.94	78.00	52.32	5.72	0.05	0.71
	Min.	6.98	1.15	9.26	8.15	53.77	65.60	45.90	4.81	0.05	0.61
	Max.	7.16	3.92	13.15	11.57	72.13	88.00	68.25	7.36	0.05	0.78
Finished Water	Avg.	7.07	2.01	11.07	9.73	64.10	78.44	52.17	5.71	0.05	0.78
	Min.	6.99	1.12	9.59	8.44	53.87	65.72	48.06	4.65	0.05	0.61
	Max.	7.17	4.78	13.17	11.59	71.58	87.33	67.00	7.16	0.05	0.80
Bagbag Reservoir	Avg.	7.09	1.56	11.29	9.94	63.48	78.09	52.48	5.60		0.22
	Min.	7.04	1.09	10.10	8.89	54.00	65.88	47.66	4.85		0.14
	Max.	7.16	2.46	13.03	11.47	71.95	87.78	69.05	6.11		0.32

TABLE 12.2.11 RESULTS OF BACTERIOLOGICAL QUALITY ANALYSIS
(FROM JANUARY 1 TO DECEMBER 31, 1989)

Location	Total No.of	No.of Samples of Samples	Percentage of w/ MPN <2.2	Avg. Residual Satisfaction	Chlorine mg/l
Central Labo. Div.	MWSS Tap Water from Manila City	1,026	1,026	100.0%	0.33 range(0.30-0.43)
	MWSS Tap Water from Other Cities and Municipalities	688	688	100.0%	0.34 (0.20-0.61)
	MWSS Deepwells	735	576	78.4%	0.33 (0.20-0.40)
Process Quality Unit	Manila Tap Water	922	861	93.3%	0.32 (0.13-0.44)
	Suburbs Tap Water	629	445	70.7%	0.19 (0.09-0.85)

TABLE 12.2.12 PHYSICAL AND CHEMICAL ANALYSES OF MWSS TAP WATER (FROM JANUARY 1 TO DECEMBER 31, 1989)

SAMPLE		pH	Color units	Turbidity units	Alkalinity mg/l	Bicarbonate mg/l	Acidity mg/l	Free CO_2 mg/l	Chlorides mg/l	Iron mg/l	Hardness mg/l	Residual Chlorine mg/l	Total Solids mg/l	Silica mg/l	R_2O_3 (Al_2O & Fe_2O_3) mg/l	Aluminum mg/l	Calcium mg/l	Magnesium mg/l	Sulfates mg/l	Fluorides mg/l	Residual Alum mg/l
Philippine Standard		6.5-8.5	5.00	5.00					200.00	1.00			500.00				75.00	50.00	200.00	0.60	
MWSS Tap Water																					
City of Manila	Avg.	7.45	5.00	3.90	50.40	61.50	7.00	6.20	5.20	0.06	60.40	0.35									
(Grab Sample)	Min.	6.40	5.00	1.40	34.40	42.00	2.00	1.80	3.00	0.05	48.00	0.00									
	Max.	8.25	30.00	32.50	72.40	88.30	22.00	19.40	8.00	0.20	90.00	0.60									
City of Manila	Avg.	7.42	5.20	3.50	40.00	48.80	7.40	6.50	4.30	0.06	61.40		138.00	18.80	2.70	1.40	17.80	4.10	35.40	0.04	0.03
(Composite Sample)	Min.	6.90	5.00	2.00	30.00	36.60	3.00	2.60	2.50	0.05	53.00		112.00	8.20	0.40	0.20	6.90	0.30	18.30	0.04	0.02
	Max.	8.05	7.00	7.10	49.20	60.00	18.00	10.60	6.00	0.10	73.00		177.00	26.80	5.20	2.70	25.20	9.40	54.80	0.04	0.04
Other Cities and	Avg.	7.60	5.20	3.50	56.50	65.20	5.20	5.40	5.90	0.06	58.80	0.30									
Municipalities	Min.	6.65	3.00	1.50	33.20	40.50	3.00	2.60	2.00	0.05	10.00	0.00									
(Grab Sample)	Max.	9.30	10.00	10.15	243.20	250.80	26.00	22.90	51.00	0.15	74.00	3.00									
Other Cities and	Avg.	7.71	5.80	3.59	42.10	51.40	6.20	5.40	6.70	0.06	61.10		149.30	20.80	3.30	1.70	18.70	3.60	44.00	0.03	0.03
Municipalities	Min.	7.20	5.00	2.00	26.80	32.70	3.00	2.60	2.00	0.05	52.00		114.00	5.20	0.40	0.20	7.40	nil	19.40	0.04	0.02
(Composite Sample)	Max.	8.20	15.00	10.15	59.00	72.00	20.00	17.60	19.00	0.15	70.00		196.00	29.00	7.70	4.00	26.90	10.10	66.20	0.04	0.04

TABLE 12.3.1 ON-GOING PROJECTS OF MWSS

PROJECT	EXPECTED VOL. TO BE INCREASED /RECOVERED	IMPLEMENTATION SCHEDULE START/ COMPLETE	TOTAL PROJECT COST	SOURCES OF FUND	PROJECT COMPONENTS	REMARKS
Manila Water Supply Rehabilitation Project I (MWSRP I)	NRW Recovery 500 MLD	1983/1991	P 1832.91 M	CC =P 794.00 M ADB =$ 29.16 M	- Replacement of 150 kms. tertiary distribution lines - Installation of 280 public faucets - Construction of 50 kms. new tertiary dist. lines - Construction and replacement of 108,000 house service connections - Relocation of 12,000 water meters	completed in 1991
Manila Water Supply Rehabilitation Project II (MWSRP II)	NRW Recovery 265 MLD	1988/1992	P 1376.52 M	ADB 947=$ 26.40 M OBP =P400.00 M CC =P 89.23 M Equity=P 172.15 M	- Replacement of 1,000 kms. tertiary distribution lines - Installation of 285 public faucets - Construction of tertiary dist. lines - Construction and replacement of 87,121 water meters	
Metropolitan Manila Water Distribution Project (MMWDP)	-	1986/1992	P 1,111.76 M	CC =P509.68 M IBRD 2676=$ 24.53 M	- Construction of 280 kms. dist. lines - Construction of 100,000 house service connections (including interconnection of 72 sub-divisions)	
Angat Water Supply Optimization Project (AWSOP)	Increase 1,300 MLD (Angat Riv.)	1989/1994	P 8,400 M	IBRD 3124=$ 40.00 M ADB 986 =$ 103.70 M OECF =$ 80.00 M Bonds =P1,300.00 M CC =P 27.19 M Equity =P2,121.69 M	- Auxiliary Unit Powerhouse - 6.1 kms. tunnel - 900 MLD Water Treatment Plant - 16 kms. Aqueduct - 4 Treated Water Reservoirs - 11 Pumping Stations upgrading work - 4 Pumping Stations construction work - 137 kms. primary dist. lines - 178 kms. secondary dist. lines - 360,000 house service connections - La Mesa By-ass Aqueduct	
Locally Funded Project			P 100 M (annualy)	Local = P 100 M	- normal act. including improvement, expansion, replacement, interconnection, and other miscellaneous works that fall outside of ongoing foreign assisted projects	

SOURCE: 1) FCBD - PCK used in 1991 Budget
(FCBD -Financial control and Budget Department)
(PCK - Project Cost Estimate)
2) PPD - Engineering Area Project Cost Estimates for Total Project Costs
(PPD - Planning and Programming Department)

TABLE 12.3.2 NRW REDUCTION BY MWSRP I

Group No.	Zone No.	PRE-REHABILITATION DATA					POST-REHABILITATION DATA					Rehab Completion Month
		Month Measured	Total Supply (MLD)	Revenue Water (MLD)	NRW (MLD)	NRW (%)	Month Measured	Total Supply (MLD)	Revenue Water (MLD)	NRW (MLD)	NRW (%)	
IA	53	Sep.'84	42.504	12.734	29.770	70.04	May '90	18.037	12.902	5.135	28.47	Feb. '90
II	15	Feb.'85	4.989	1.976	3.013	60.39	Oct. '89	4.608	3.360	1.248	27.08	Sept. '86
	26	Oct.'85	20.061	7.726	12.335	61.49	Jun. '90	13.075	9.093	3.982	30.46	Feb. '90
	37	Jan.'86	41.820	5.650	36.170	86.49	Mar. '90	12.412	8.807	3.605	29.04	Jan. '90
	68	Oct.'85	10.662	4.781	5.881	55.16	Jul. '89	8.108	6.424	1.684	20.77	June '89
	70	Sep.'85	2.202	0.862	1.340	60.85	Feb. '88	1.955	1.629	0.326	16.68	Dec. '87
VII	90	Oct.'87	18.719	4.320	14.399	76.92	Feb. '90	9.627	7.659	1.968	20.44	Jan. '90
VIII	62	Jan.'88	10.775	3.254	7.521	69.80	Jun. '89	4.748	3.951	0.797	16.78	June '89
IX	59	Jun.'88	0.630	0.359	0.271	43.05	Feb. '90	0.610	0.474	0.137	22.40	Jan. '90
Total			152.362	41.662	110.70	72.66		73.180	54.299	18.882	25.80	

Source: MWSRP I Status Report, July 1990

TABLE 12.3.3 NRW REDUCTION BY MWSRP II

Group No.	Zone No.	PRE-REHABILITATION DATA					POST-REHABILITATION DATA					Rehab Completion Month
		Month Measured (MLD)	Total Supply (MLD)	Revenue Water (MLD)	NRW (MLD)	NRW (%)	Month Measured (MLD)	Total Supply (MLD)	Revenue Water (MLD)	NRW (MLD)	NRW (%)	
I	22	Apr. '88	7.733	4.428	3.305	42.74	Nov. '89	5.994	4.768	1.226	20.45	Dec. '88
	44	Mar. '88	7.355	2.588	4.767	64.81	March '9	5.621	4.258	1.363	24.25	Apr. '89
	66	Sep. '88	3.213	1.870	1.343	41.80	Jan. '90	2.653	2.174	0.479	18.06	Jan. '90
TOTAL			18.301	8.886	9.415	51.45		14.268	11.200	3.068	21.50	

TABLE 12.3.4 PROPOSED PROJECTS OF MWSS

PROJECT	EXPECTED VOL. TO BE INCREASED /RECOVERED	IMPLEMENTATION SCHEDULE START/COMPLETE	TOTAL PROJECT COST (mil. P)	FUND ALLOCATION Activity	L.C. (mil. P)	F.C. (mil. $)	PROJECT COMPONENTS	REMARKS
Rizal Province Water Supply Improvement Project (RPWSIP)	Increase 48 MLD (37-Laguna de Bay 11-Groundwater)	1991/1998	895.1		667.06	7.93	- Intake structure - Water Treatment Plant - Pumping Station - Reservoir - Distribution Pipeline - Deep Wells - Elevated Tanks - Distribution Tanks	On-going detailed engineering construction '92
Fringe Areas Water Supply Project (FAWSP)	Groundwater	1989/1993	252.4	F/S D/S C	38.00 10.00 204.51		- Deepwells (construction and rehabilitation) - Pump Stations - Distribution Network - 40,000 House Service Connections	On-going test wells construction as part of F.S. Construction April '91
Metro Manila Groundwater Dev't. Project (MMGWDP)	-	1990/1992	90	F/S	14.92	2.7	- Execution of study on groundwater development	On-going development study
Umiray-Angat Transbasin Project (UATP)	Increase 800 MLD (Umiray River)	1991/1995	2,454	F/S D/S C	3.50 7.30 800.00	1.27 8.86 44.73	- Diversion Dam - Tunnel/Aqueduct - Watershed Erosion Control	Technical assistance started February 1991 construction June'93
Manila South Water Distribution Project (MSWDP)		1991/1993	1,707		1,311.50	13.42	- Clean Water Reservoirs - Booster Pumping Stations - 52.8 kms. Primary Dist. Network - 220 kms. Secondary and Tertiary Dist. Network - 99,100 House Service Connections	On-going detailed engineering
Manila Water Supply Project III (MWSP III)	Increase 1,900 MLD (Kaliwa River)	1998/2004	12,923				- Laiban Dam - Tunnel - Power Plant - Treatment Plant - Treated Water Reservoir - Distribution System	Detailed engineering for review Construction deferred

TABLE 12.3.4 PROPOSED PROJECTS OF MWSS (cont'd)

PROJECT	EXPECTED VOL. TO BE INCREASED /RECOVERED	IMPLEMENTATION SCHEDULE START/COMPLETE	TOTAL PROJECT COST (mil. P)	FUND ALLOCATION Activity	L.C. (mil. P)	F.C. (mil. $)	PROJECT COMPONENTS	REMARKS
Manila North-East Water Supply Project (MNEWSP)	Increase 72 MLD (Wawa River)	1991/1995	580	F/S	4.58	1.28	- Rehabilitation of Intake Structure - Water Treatment Plant - Treated Water Reservoirs - Transmission Main/Aqueduct - Distribution System - Wells - 43,000 House Service Connections	F.S. to start June 1991 Construction Jan. '94
				D/S	3.00	0.47		
				C	245.00	9.2		
Balara Treatment Plant Rehabilitation Project (BTPRP)	-	1991/1994	486.32	F/S	2.60	0.86	- Rehabilitation of Balara Treatment Plant	Technical assistance to start Aug. 1991 by JICA Construction Dec. '93
				D/S	9.20	1.23		
				C	103.30	10.33		
Cavite Water Supply Project (CWSP)	Increase 300 MLD (Laguna de Bay)	1992/1995	1,489				- Water Treatment Plant - Treated Water Reservoir - Booster Pumping Station - 150 kms Dist. Network - 75,000 House Service Connections	F/S Jan '92-Dec '92 D/S Jan '93-Dec '93 Construction Jan'94 Dec '94

(PPD - Planning and Programming Dept.)

TABLE 12.3.5 PLANNED AUGMENTATION OF WATER SOURCES

YEAR	PROJECT	CAPACITY (m^3/day)
1993	AWSOP	129,600
1995	MNEWSP	72,000
1997	UATP	777,600
2011	MWSP III	1,900,000

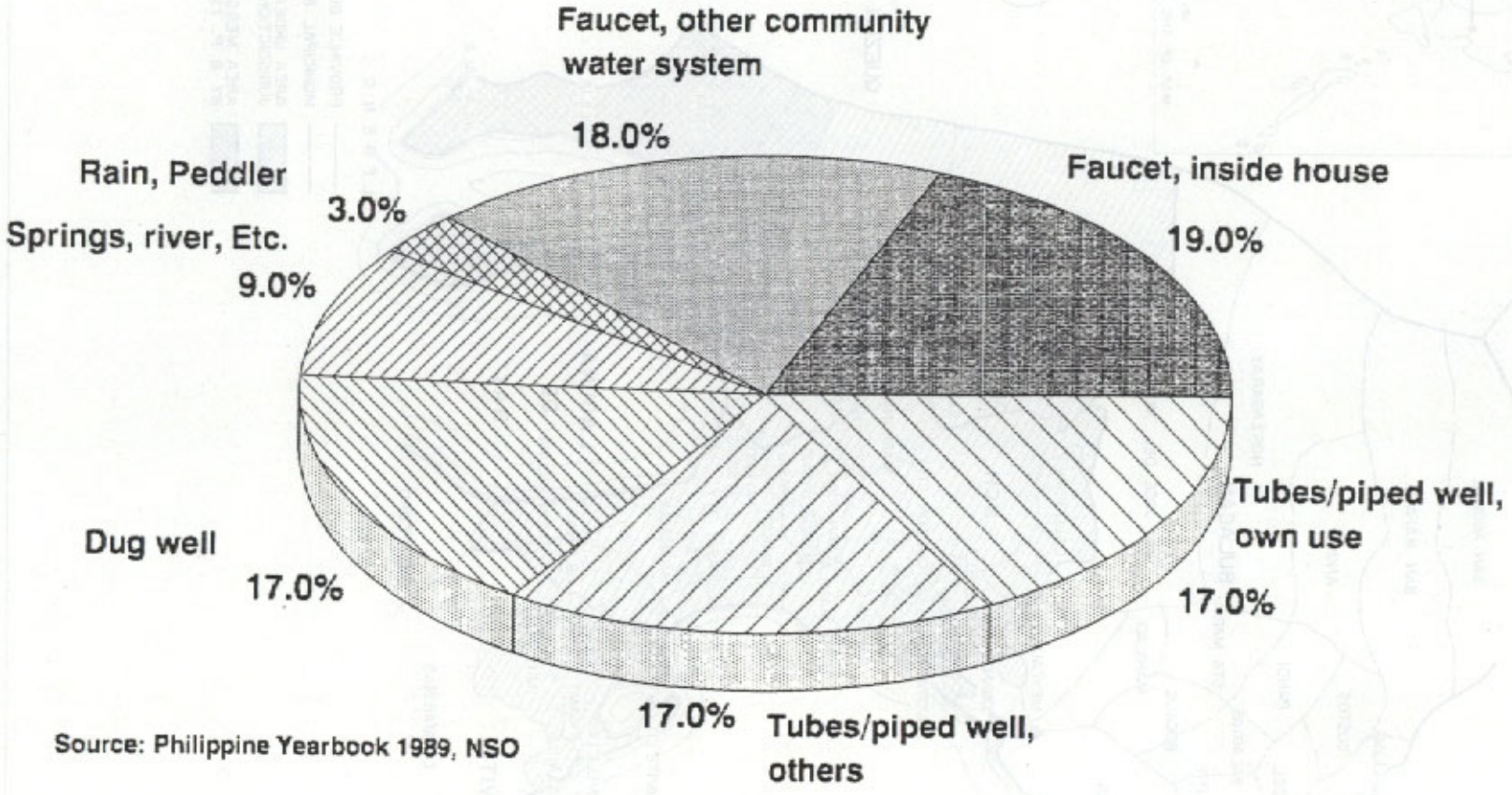
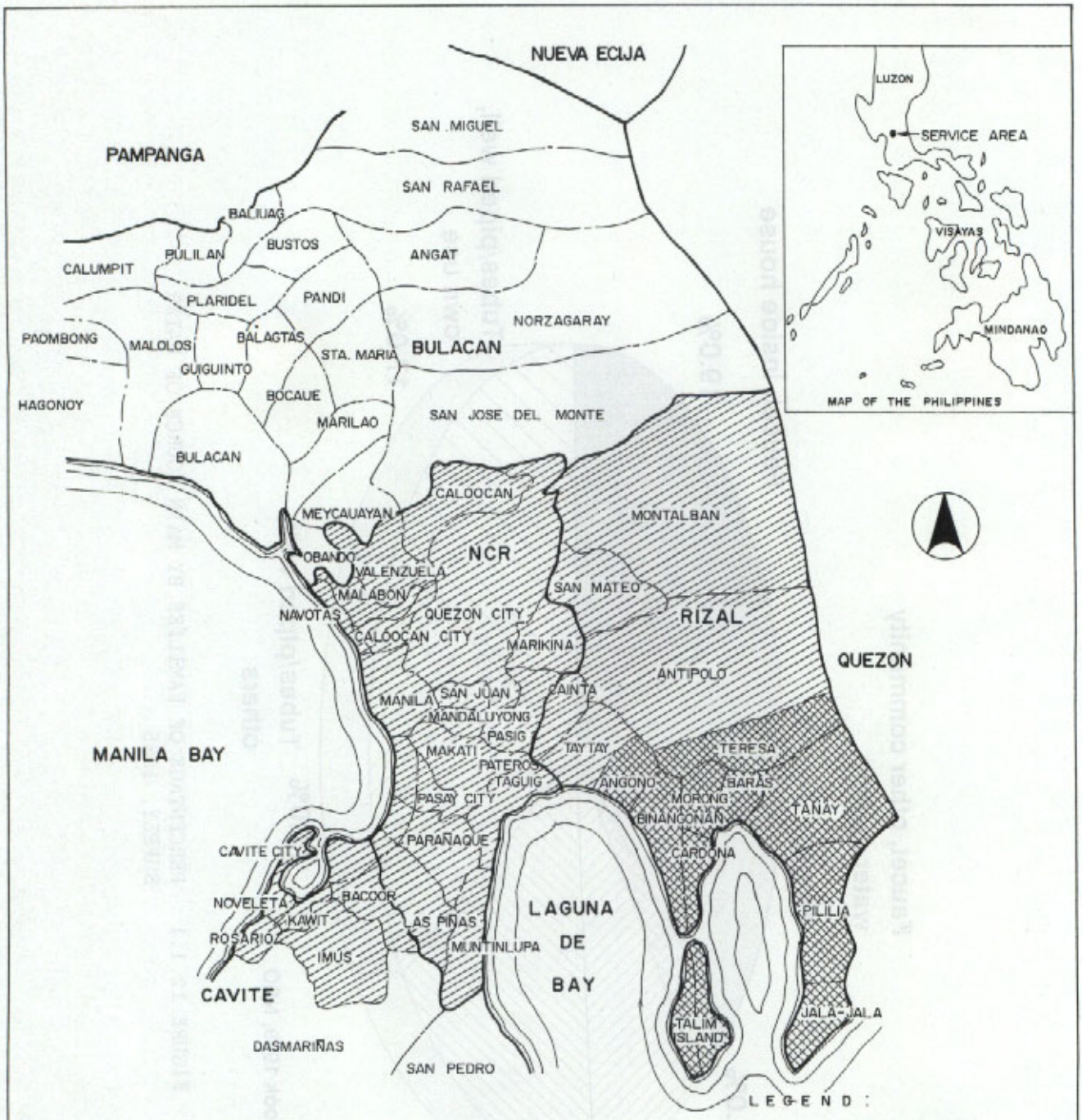
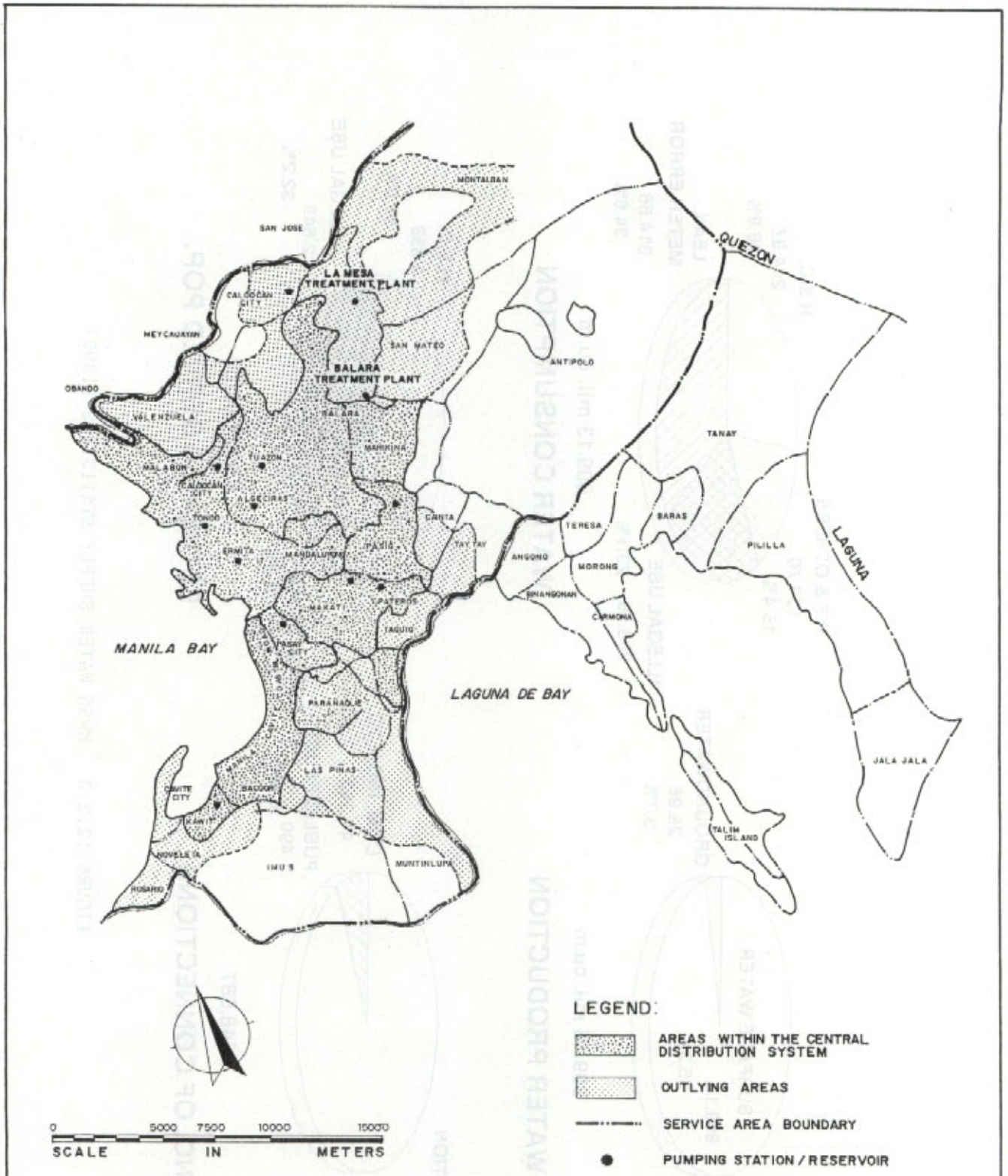


FIGURE 12.1.1 PERCENTAGE OF FAMILIES BY MAIN SOURCE OF WATER SUPPLY, 1985



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.1
JAPAN INTERNATIONAL COOPERATION AGENCY	MWSS SERVICE AREA



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.2 PRESENT WATER SUPPLY SERVICE AREA BY MWSS
JAPAN INTERNATIONAL COOPERATION AGENCY	

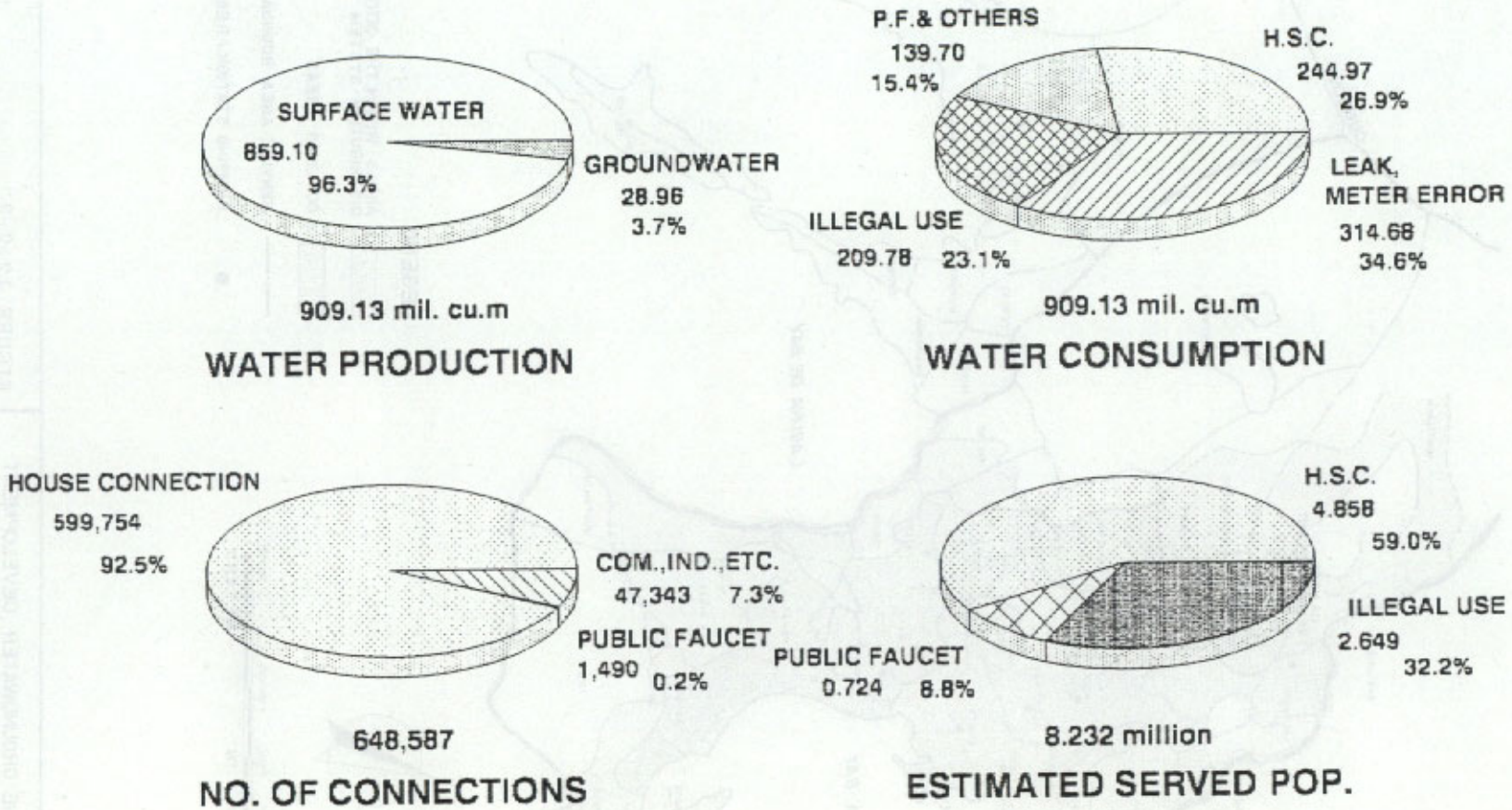
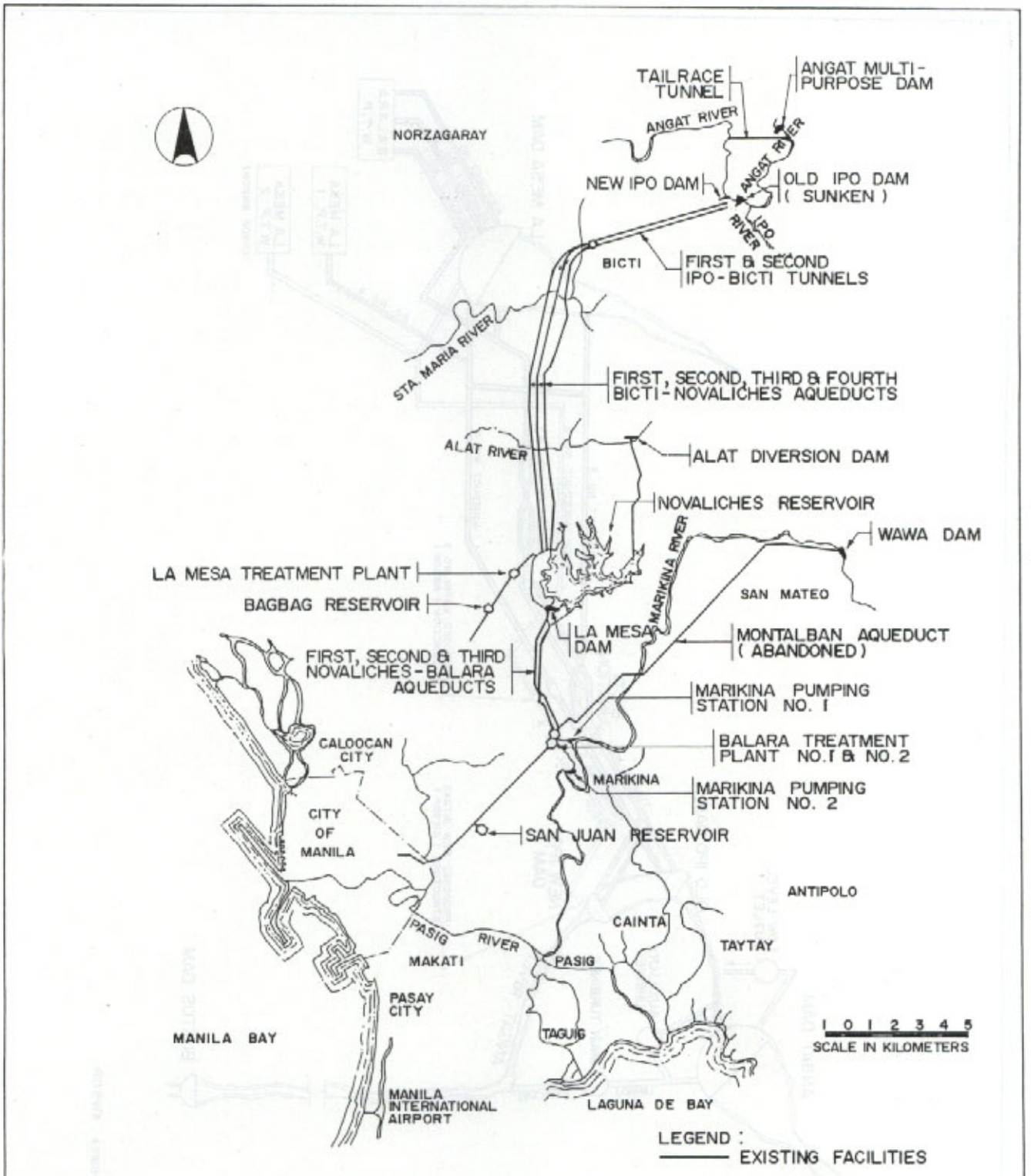
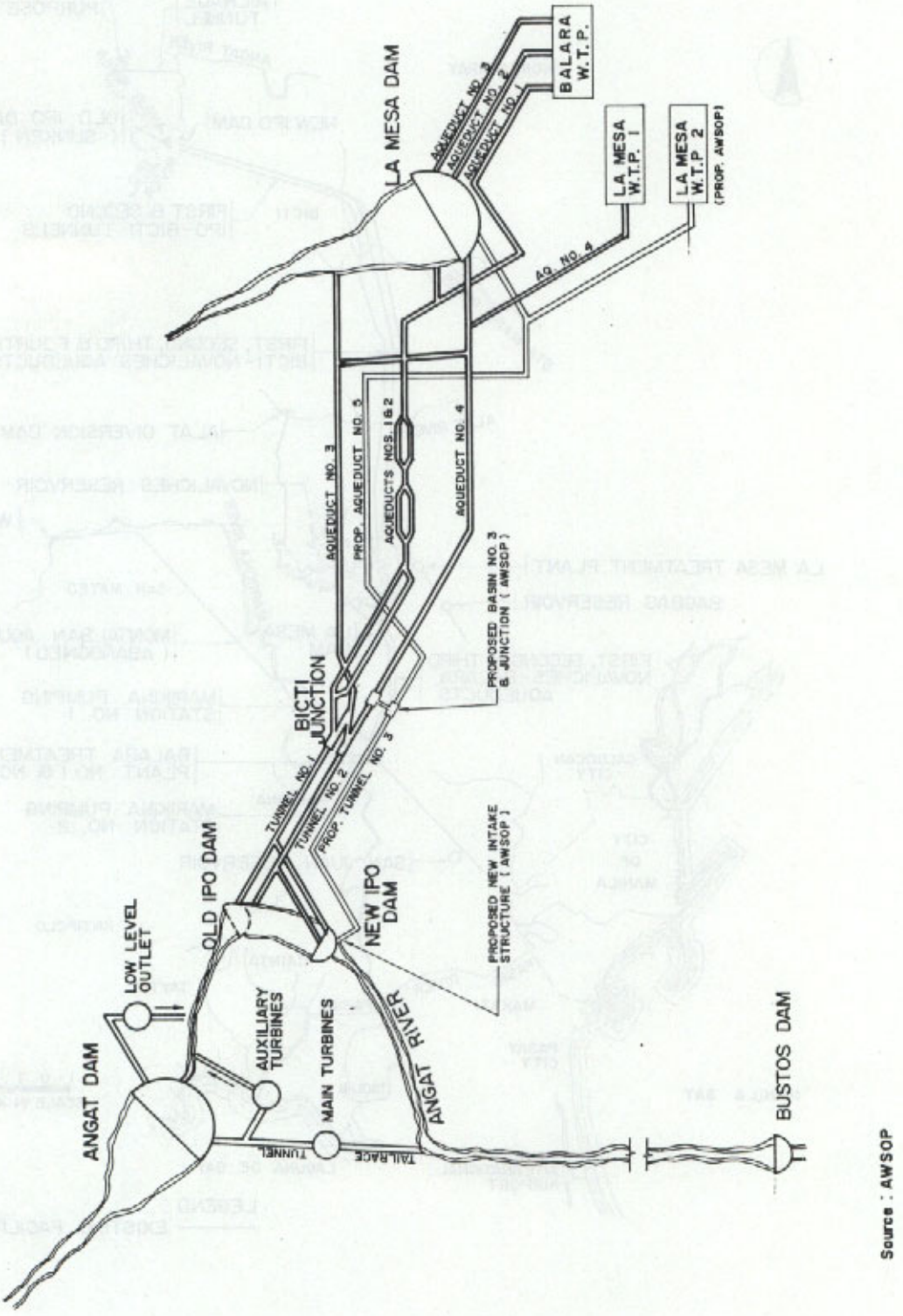


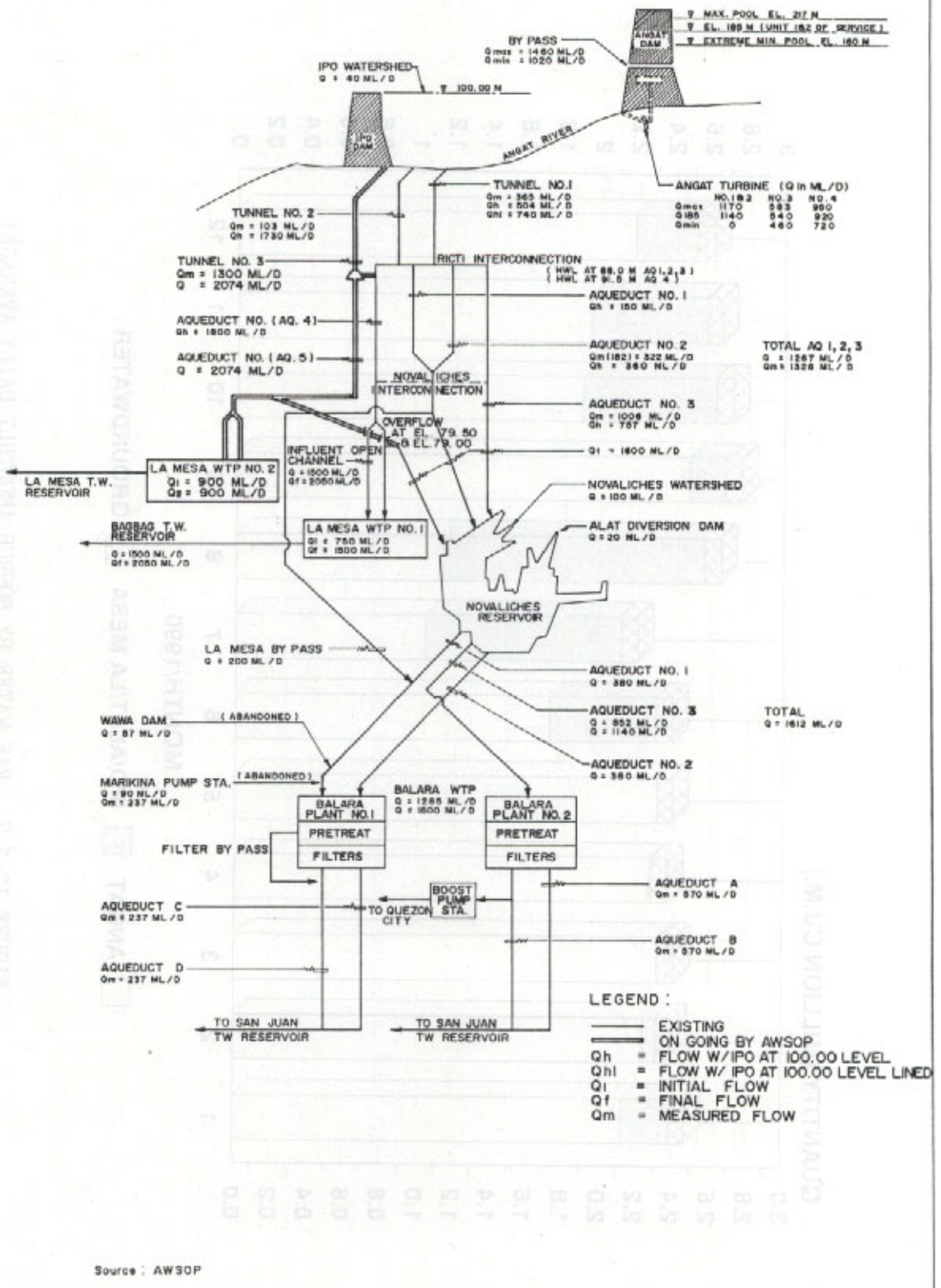
FIGURE 12.2.3 MWSS WATER SUPPLY STATISTICS (1990)



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.4 EXISTING AND MAJOR SUPPLY FACILITIES
JAPAN INTERNATIONAL COOPERATION AGENCY	



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.5 SCHEMATIC DRAWING OF WATER CONVEYANCE SYSTEM
JAPAN INTERNATIONAL COOPERATION AGENCY	



Source : AWSOP

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.6
JAPAN INTERNATIONAL COOPERATION AGENCY	SURFACE WATER FLOW CHART

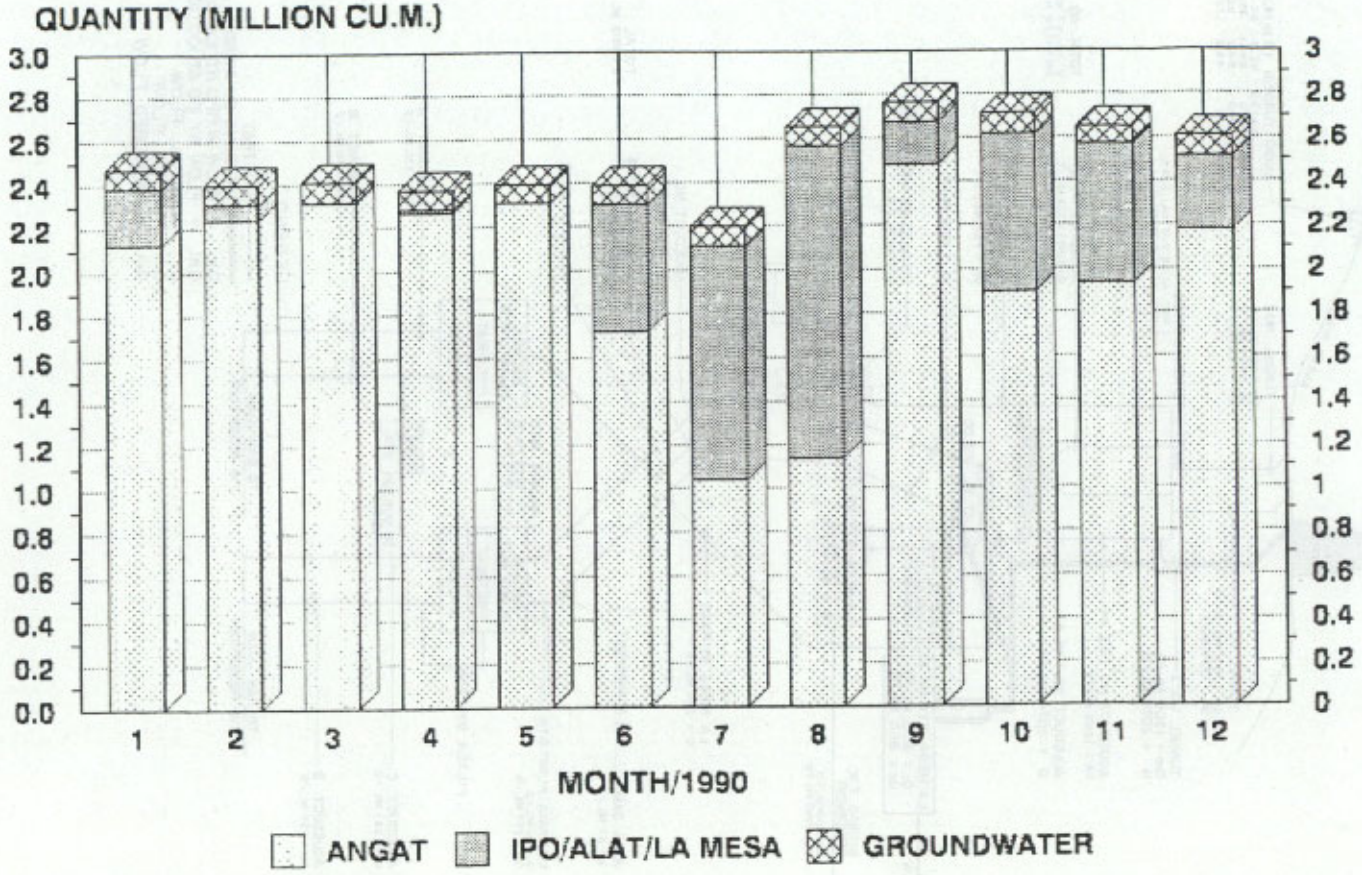
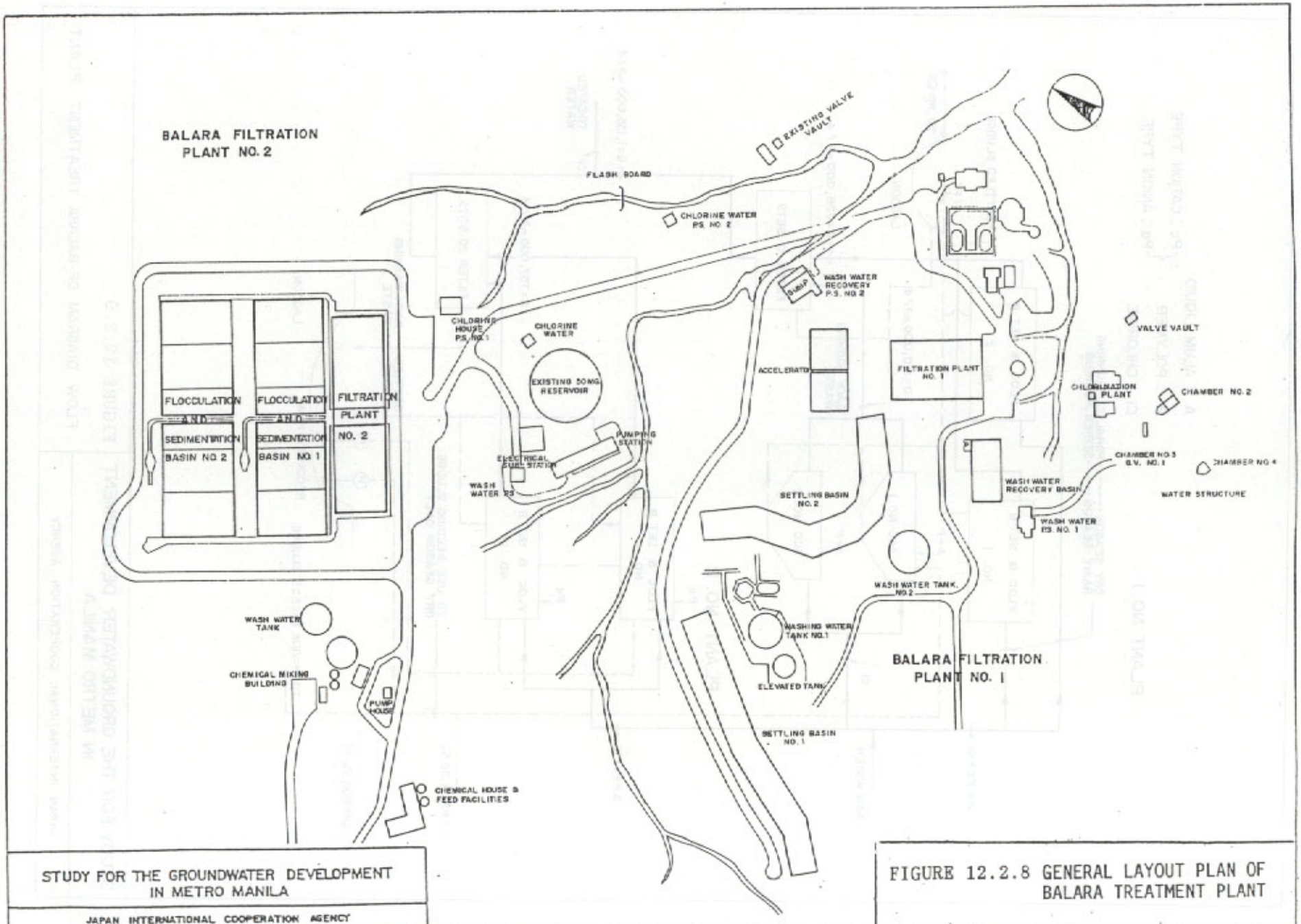


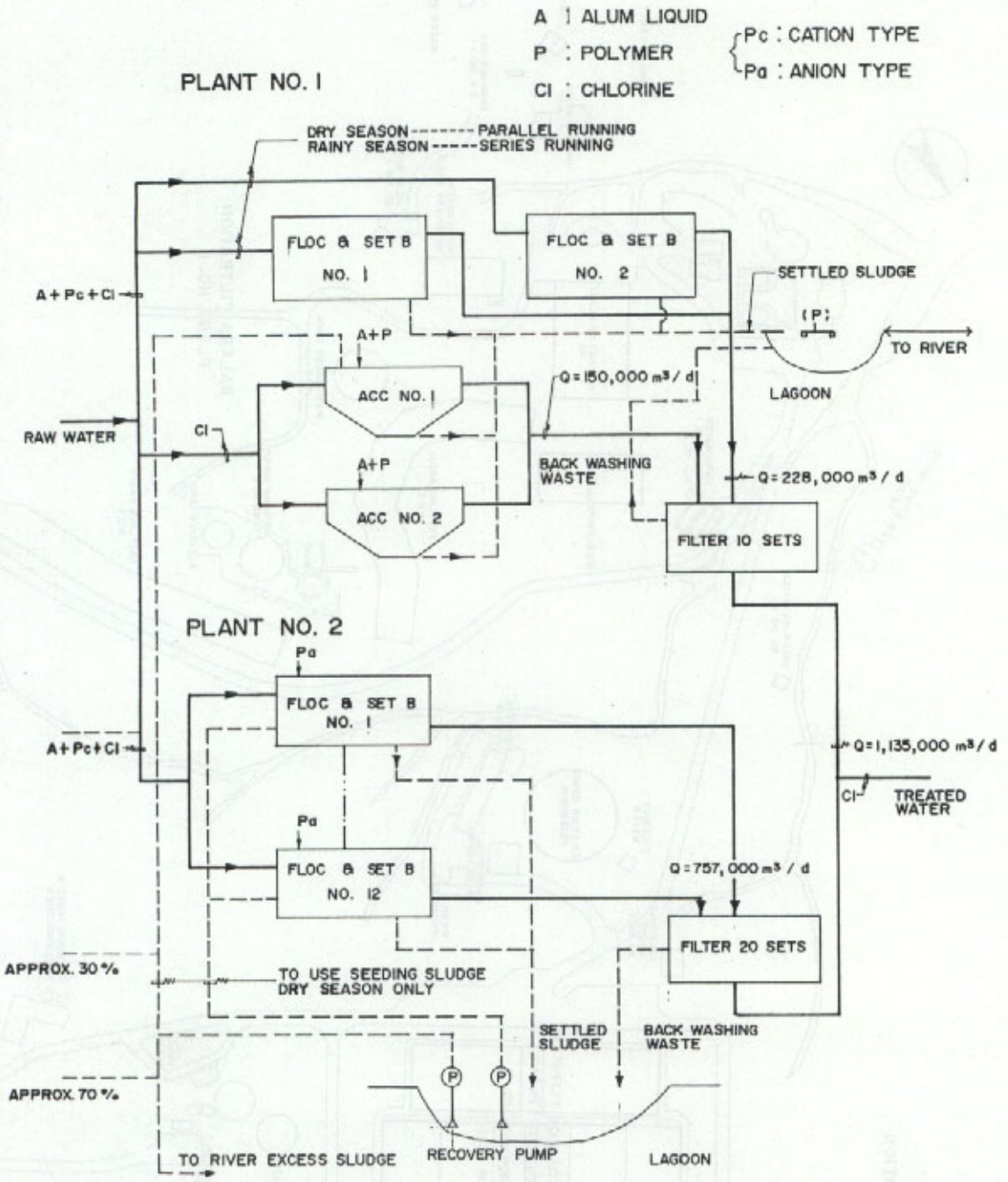
FIGURE 12.2.7 RAW WATER BY SOURCE (MONTHLY DAILY AVERAGE)



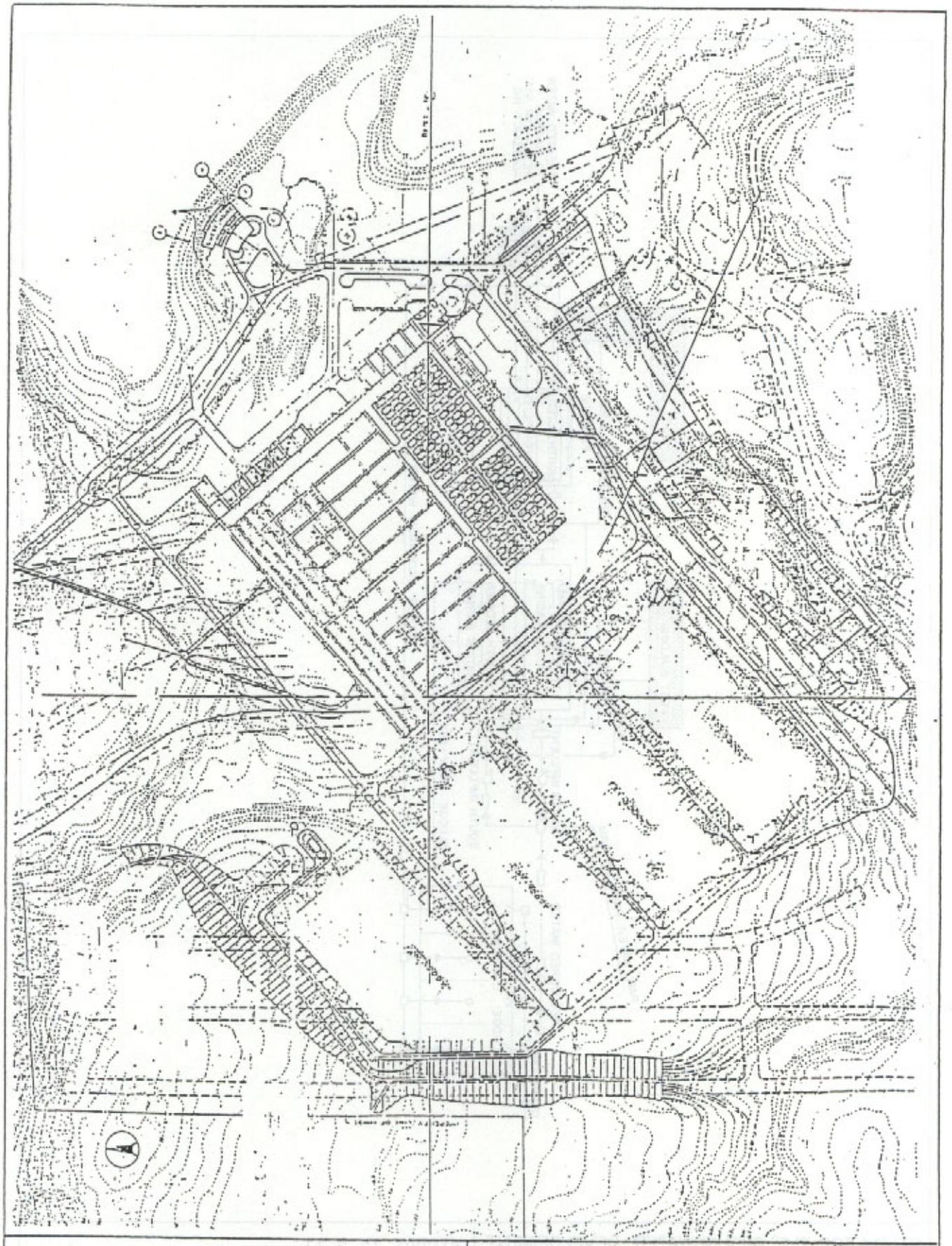
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

FIGURE 12.2.8 GENERAL LAYOUT PLAN OF BALARA TREATMENT PLANT



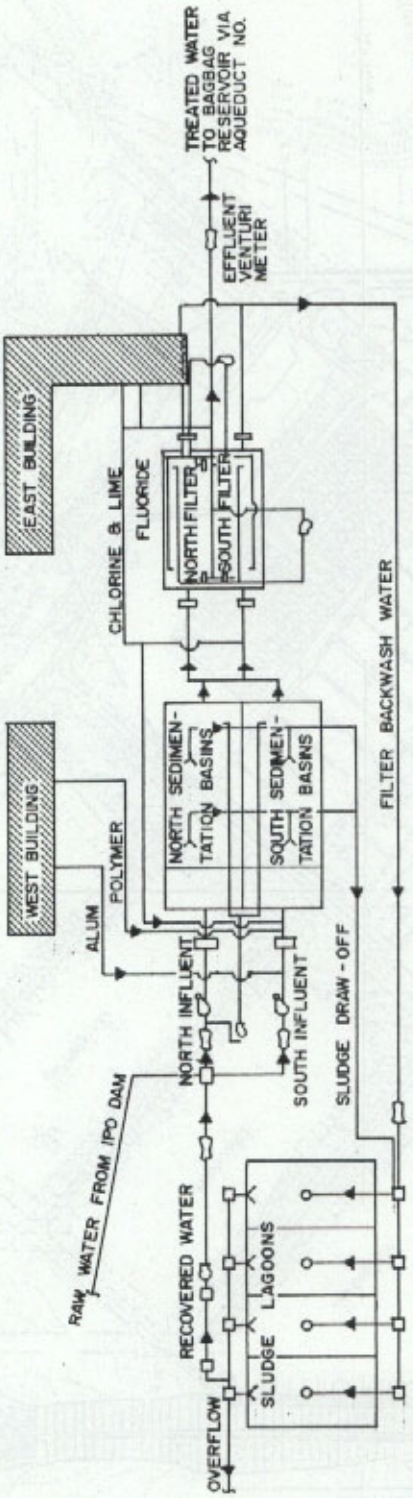
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.9
JAPAN INTERNATIONAL COOPERATION AGENCY	FLOW DIAGRAM OF BALARA TREATMENT PLANT



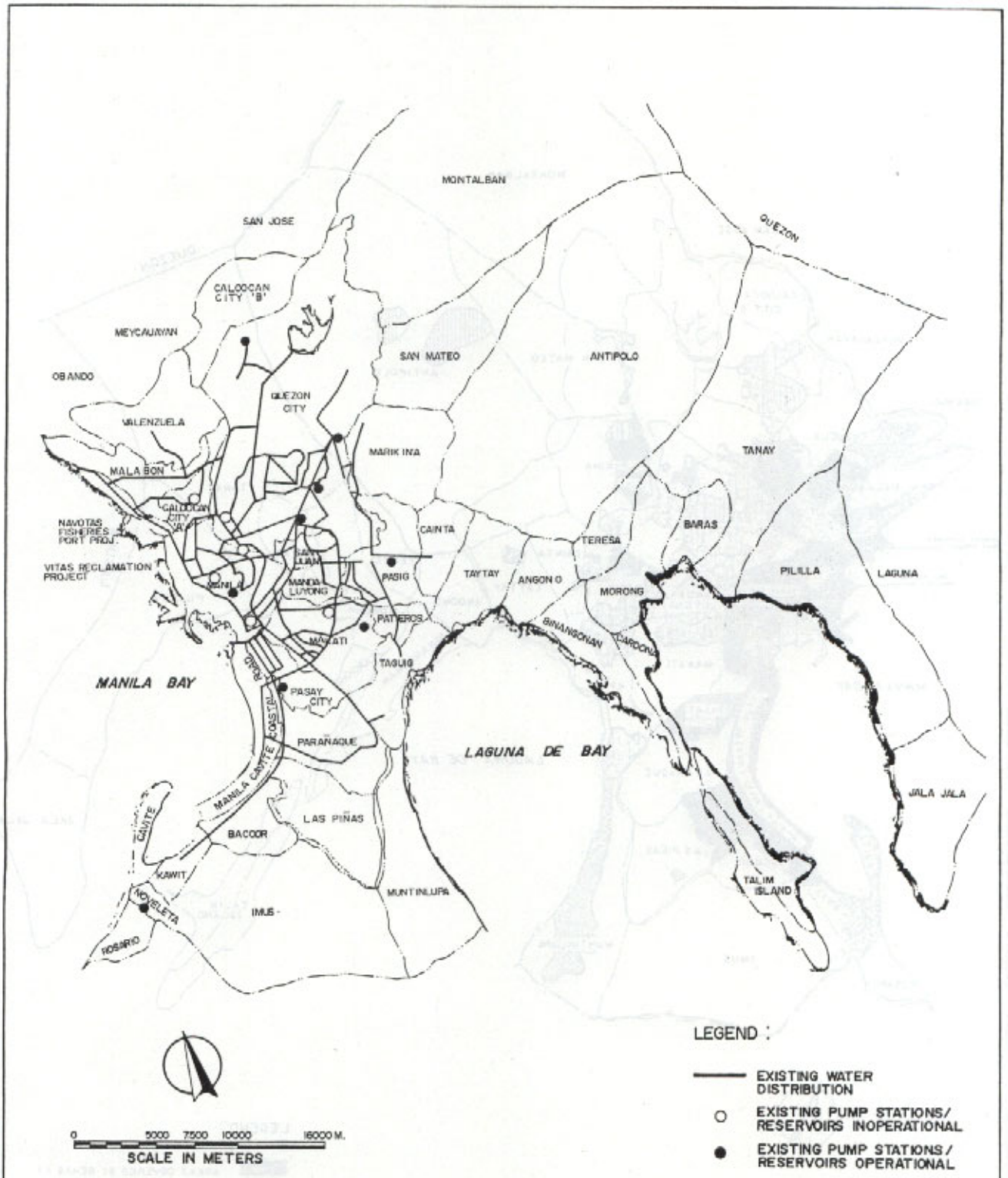
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

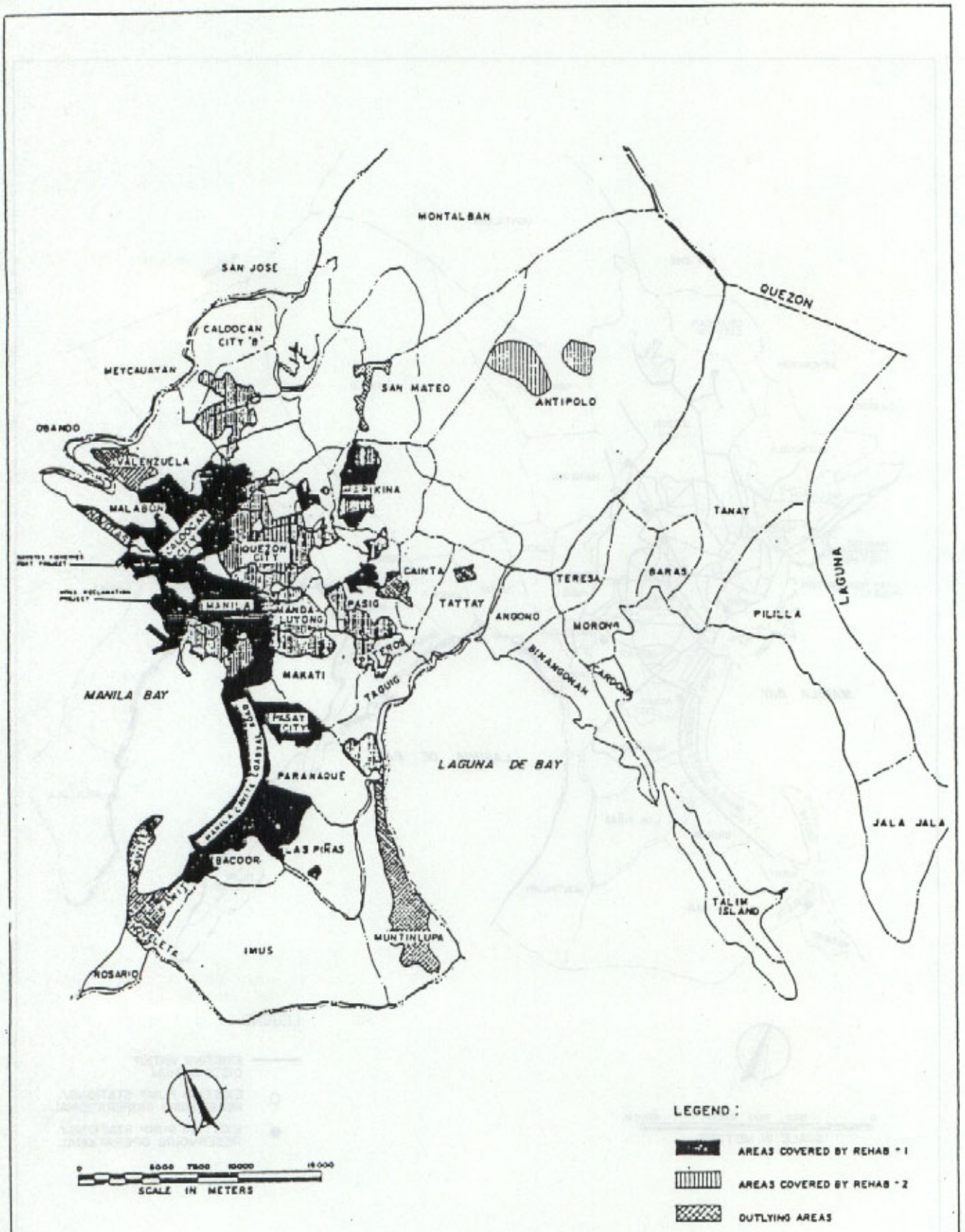
FIGURE 12.2.10 GENERAL LAYOUT PLAN OF LA MESA TREATMENT PLANT



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.11
JAPAN INTERNATIONAL COOPERATION AGENCY	FLOW DIAGRAM OF LA MESA TREATMENT PLANT



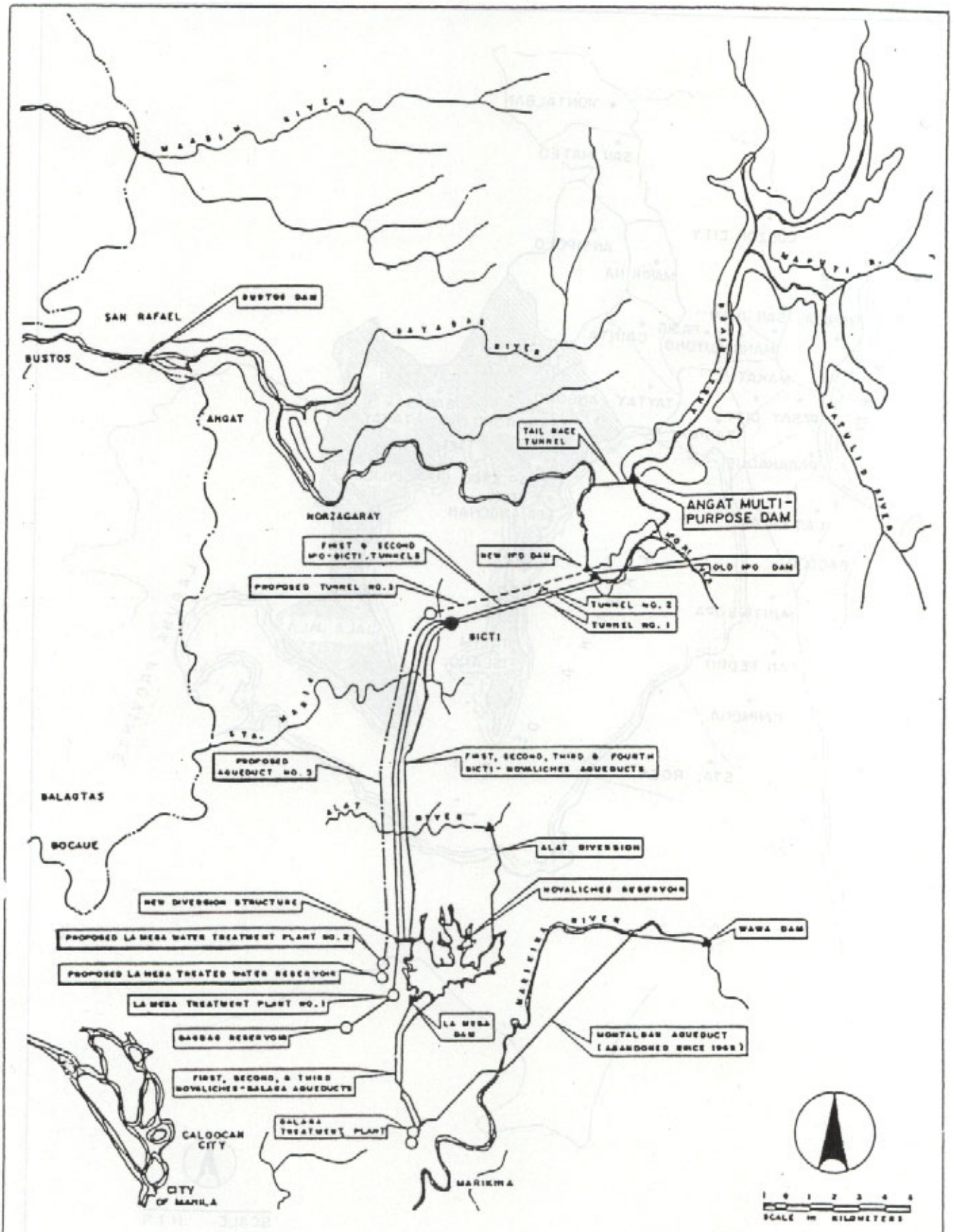
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.2.12 EXISTING PRIMARY DISTRIBUTION SYSTEM
JAPAN INTERNATIONAL COOPERATION AGENCY	



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

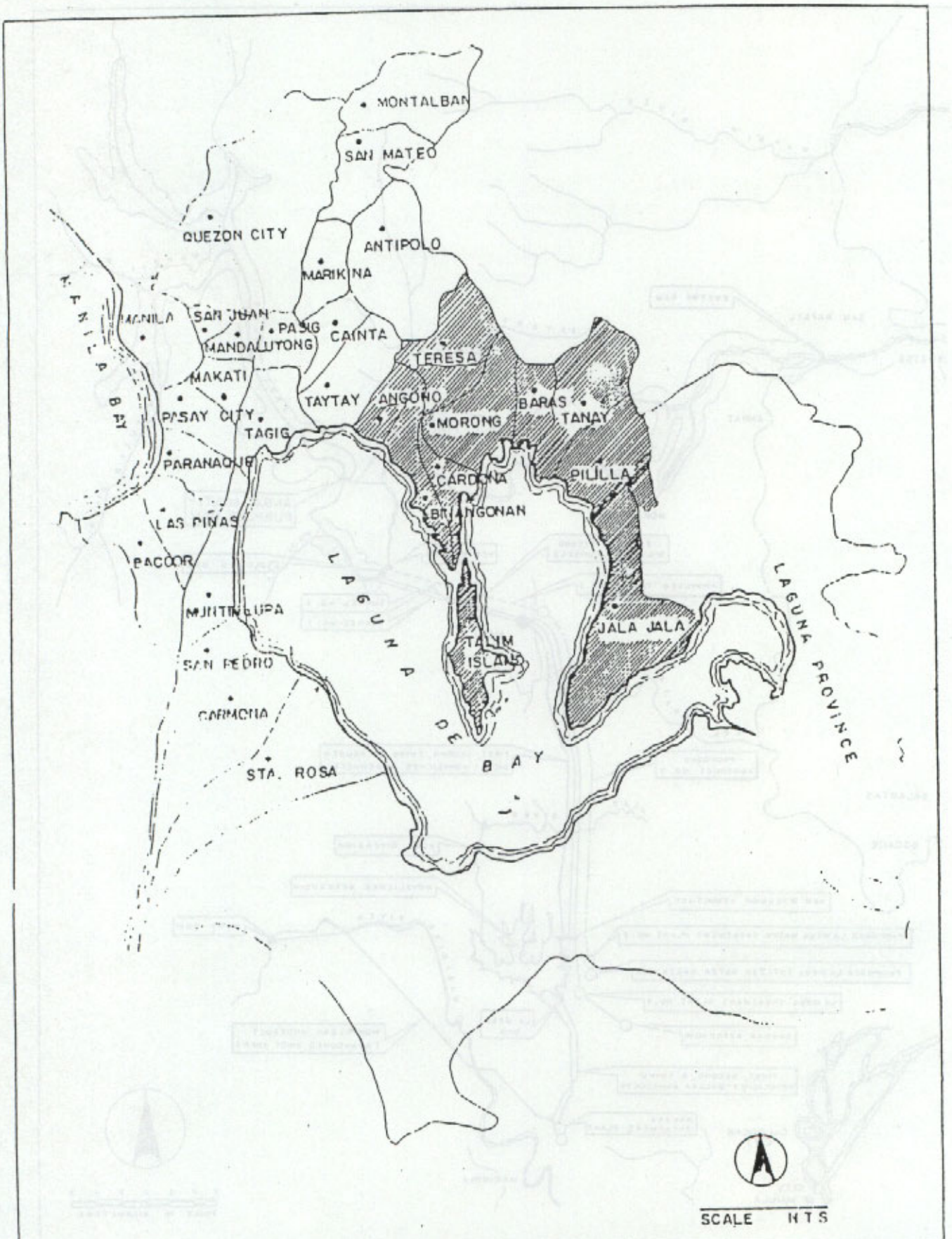
FIGURE 12.3.1 AREAS COVERED BY REHABILITATION PROJECTS



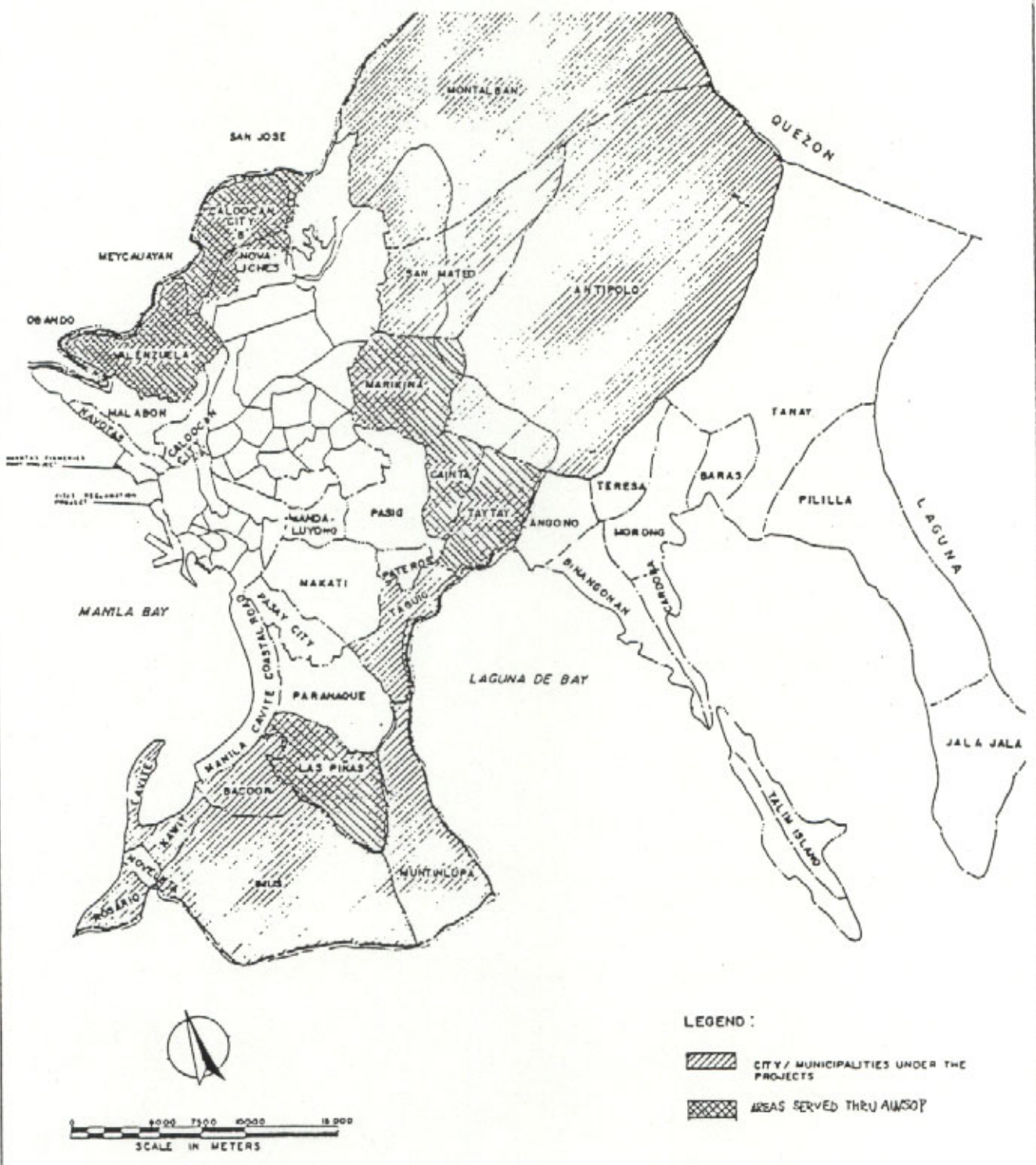
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

FIGURE 12.3.2
DEVELOPMENT PLAN OF AWSOP



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.3.3 STUDY AREA OF RPWSIP
JAPAN INTERNATIONAL COOPERATION AGENCY	



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 12.3.4 FRINGE AREAS WATER SUPPLY PROJECT STUDY AREA
JAPAN INTERNATIONAL COOPERATION AGENCY	

CHAPTER 13

WATER DEMAND PROJECTION

CHAPTER 13 WATER DEMAND PROJECTIONS

CONTENTS

LIST OF TABLES 13-ii

LIST FIGURES 13-iv

13.1 SCOPE 13-1

13.2 WATER DEMAND PROJECTION 13-1

13.2.1 Present Condition 13-1
13.2.2 Water Consumption Projection 13-5
13.2.3 Total Water Demand 13-9

13.3 SUPPLY CAPACITY AGAINST DEMAND 13-11

13.4 GROUNDWATER DISCHARGE PROJECTION 13-12

13.4.1 Outlines Of Scenarios 13-12
13.4.2 Projected Groundwater Discharge 13-14

13.5 WATER DEMAND PROJECTION IN ANTIPOLO BASIN 13-15

13.5.1 Present Situation 13-15
13.5.2 Water Demand Projection 13-17
13.5.3 Analysis On Supply Capacity And Projected Demand 13-19

LIST OF TABLES

13.2.1 NUMBER OF CONNECTIONS AND BILLED CONSUMPTION IN 1990 13-21
13.2.2 STATUS OF FIELD MEASUREMENT ON NON-REVENUE WATER 13-22
13.2.3 STATUS OF DOMESTIC WATER SUPPLY BY MWSS AND PRIVATE SYSTEMS 13-23
13.2.4 STATUS OF COMMERCIAL CONSUMPTION IN 1990 13-24
13.2.5 STATUS OF INDUSTRIAL CONSUMPTION IN 1990 13-25
13.2.6 PER CAPITA DOMESTIC WATER DEMAND GROWTH 13-26
13.2.7 PER CAPITA DOMESTIC CONSUMPTION PROJECTION 13-27
13.2.8 ESTIMATED SERVED POPULATION IN THE NCR IN 1990, BY CITY/MUNICIPALITY 13-28
13.2.9 MODIFIED WATER-BLIGHTED POPULATION IN NCR, BY CITY/MUNICIPALITY 13-29
13.2.10 PROJECTED DOMESTIC WATER CONSUMPTION IN 1995, BY CITY/MUNICIPALITY..... 13-30
13.2.11 PROJECTED DOMESTIC WATER CONSUMPTION IN 2000, BY CITY/MUNICIPALITY 13-31
13.2.12 PROJECTED DOMESTIC WATER CONSUMPTION IN 2005, BY CITY/MUNICIPALITY 13-32
13.2.13 PROJECTED DOMESTIC WATER CONSUMPTION IN 2010, BY CITY/MUNICIPALITY 13-33
13.2.14 COMMERCIAL WATER DEMAND GROWTH PROJECTION 13-34
13.2.15 MWSS COMMERCIAL CONSUMPTION PROJECTION 13-35
13.2.16 INDUSTRIAL WATER DEMAND GROWTH PROJECTION 13-36
13.2.17 MWSS INDUSTRIAL CONSUMPTION PROJECTION 13-37
13.2.18 NON-REVENUE WATER PROJECTED BY CORPLAN 13-38
13.2.19 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (CASE 1) 13-39
13.2.20 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (CASE 1) 13-40
13.2.21 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (CASE 1) 13-41
13.2.22 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (CASE 1) 13-42
13.2.23 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (CASE 2) 13-43
13.2.24 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (CASE 2) 13-44
13.2.25 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (CASE 2&3) 13-45
13.2.26 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (CASE 2&3) 13-46
13.2.27 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (CASE 3) 13-47
13.2.28 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (CASE 3) 13-48

13.2.29 SUMMARY OF PROJECTED WATER DEMAND (CASE 1) 13-49
13.2.30 SUMMARY OF PROJECTED WATER DEMAND (CASE 2) 13-50
13.2.31 SUMMARY OF PROJECTED WATER DEMAND (CASE 3) 13-51

13.3.1 DISTRIBUTION OF WATER DEMAND IN 1995, BY SOURCE 13-52
13.3.2 DISTRIBUTION OF WATER DEMAND IN 2000, BY SOURCE 13-53
13.3.3 DISTRIBUTION OF WATER DEMAND IN 2005, BY SOURCE 13-54
13.3.4 DISTRIBUTION OF WATER DEMAND IN 2010, BY SOURCE 13-55
13.3.5 ANALYSIS ON WATER SUPPLY AND SUPPLY CAPACITY 13-56

13.4.1 MWSS COMMERCIAL CONSUMPTION PROJECTION (SCENARIO 2) 13-57
13.4.2 MWSS Industrial Consumption Projection (SCENARIO 2) 13-58
13.4.3 MWSS Commercial Consumption Projection (SCENARIO 3) 13-59
13.4.4 MWSS Industrial Consumption Projection (SCENARIO 3) 13-60
13.4.5 PROJECTED DOMESTIC WATER CONSUMPTION IN 1995 (SCENARIO 4), BY CITY/MUNICIPALITY 13-61
13.4.6 PROJECTED DOMESTIC WATER CONSUMPTION IN 2000 (SCENARIO 4), BY CITY/MUNICIPALITY 13-62
13.4.7 PROJECTED DOMESTIC WATER CONSUMPTION IN 2005 (SCENARIO 4), BY CITY/MUNICIPALITY 13-63
13.4.8 PROJECTED DOMESTIC WATER CONSUMPTION IN 2010 (SCENARIO 4), BY CITY/MUNICIPALITY 13-64
13.4.9 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (SCENARIO 2) .. 13-65
13.4.10 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (SCENARIO 2) .. 13-66
13.4.11 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (SCENARIO 2) .. 13-67
13.4.12 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (SCENARIO 2) .. 13-68
13.4.13 DISTRIBUTION OF WATER DEMAND IN 1995 (SCENARIO 2), BY SOURCE 13-69
13.4.14 DISTRIBUTION OF WATER DEMAND IN 2000 (SCENARIO 2), BY SOURCE 13-70
13.4.15 DISTRIBUTION OF WATER DEMAND IN 2005 (SCENARIO 2), BY SOURCE 13-71
13.4.16 DISTRIBUTION OF WATER DEMAND IN 2010 (SCENARIO 2), BY SOURCE 13-72
13.4.17 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (SCENARIO 3) .. 13-73
13.4.18 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (SCENARIO 3)... 13-74
13.4.19 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (SCENARIO 3) .. 13-75
13.4.20 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (SCENARIO 3) .. 13-76

13.4.21 DISTRIBUTION OF WATER DEMAND IN 1995 (SCENARIO 3) BY SOURCE 13-77
13.4.22 DISTRIBUTION OF WATER DEMAND IN 2000 (SCENARIO 3) BY SOURCE 13-78
13.4.23 DISTRIBUTION OF WATER DEMAND IN 2005 (SCENARIO 3) BY SOURCE 13-79
13.4.24 DISTRIBUTION OF WATER DEMAND IN 2010 (SCENARIO 3) BY SOURCE 13-80
13.4.25 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (SCENARIO 4) .. 13-81
13.4.26 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (SCENARIO 4) .. 13-82
13.4.27 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (SCENARIO 4) .. 13-83
13.4.28 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (SCENARIO 4) .. 13-84
13.4.29 DISTRIBUTION OF WATER DEMAND IN 1995 (SCENARIO 4), BY SOURCE 13-85
13.4.30 DISTRIBUTION OF WATER DEMAND IN 2000 (SCENARIO 4), BY SOURCE 13-86
13.4.31 DISTRIBUTION OF WATER DEMAND IN 2005 (SCENARIO 4), BY SOURCE 13-87
13.4.32 DISTRIBUTION OF WATER DEMAND IN 2010 (SCENARIO 4), BY SOURCE 13-88
13.4.33 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 1) 13-89
13.4.34 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 2) 13-91
13.4.35 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 3) 13-93
13.4.36 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 4) 13-95
13.4.37 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 1) 13-97
13.4.38 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 2) 13-98
13.4.39 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 3) 13-99
13.4.40 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 4) 13-100

13.5.1 NUMBER OF CONNECTIONS AND WATER CONSUMPTION IN THE ANTIPOLO BASIN 13-101
13.5.2 GROUNDWATER DISCHARGE IN THE ANTIPOLO BASIN (1990) 13-101
13.5.3 PROJECTED MWSS SERVED POPULATION 13-102
13.5.4 DOMESTIC DEMAND PROJECTION IN THE ANTIPOLO BASIN 13-103
13.5.5 WATER DEMAND PROJECTION IN THE ANTIPOLO BASIN 13-104
13.5.6 WATER DEMAND PROJECTION IN THE MWSS SERVICE AREA 13-105
13.5.7 PROJECTED NET WATER DEMAND TO MWSS SYSTEM 13-106
13.5.8 WATER DEMAND AND SUPPLY IN THE ANTIPOLO BASIN 13-107

LIST OF FIGURES

13.2.1 MWSS WATER DEMAND 13-108

13.2.2 PRIVATE WATER DEMAND 13-109

13.2.3 TOTAL WATER DEMAND (MWSS+PRIVATE) 13-110

DEMAND VS. SUPPLY CAPACITY (WITHIN CDS) 13-111

13.5.1 MWSS SERVICE COVERAGE IN 1995, AND 2000 13-112

13.5.2 MWSS SERVICE COVERAGE IN 2010 13-113

13.5.3 DEMAND VS. SUPPLY CAPACITY
(WITHIN MWSS SERVICE AREA IN ANTIPOLO) 13-114

CHAPTER 13 WATER DEMAND PROJECTIONS

13.1 SCOPE

The water demand projection for the water supply system of MWSS was done to determine the domestic, commercial, and industrial water demand in the MSA, from the city/municipal level down to the barangay level, and especially for the specified Antipolo Study Area; and also, to update the projection that was made through the previous projects conducted by the MWSS. The present projection was arrived at through calculations using updated data on present water consumption, population, income growth, change of water tariff, economic growth, etc.

From the menu of available projection methods, such as time-series trend analysis, regression analysis, factorial analysis, piling up of detailed water use, etc., this study opted for a kind of multiple regression analysis, which type the Manila Water Supply Project III (MWSP III) and the Angat Water Supply Optimization Project (AWSOP) also used.

So that planning for the respective areas may be unified, a general adoption of the methods and data used in the Fringe Area Water Supply Project (FAWSP) and the Rizal Province Water Supply Improvement Project (RPWSIP, now RPWSP) was made, to the extent warranted in the areas covered by both projects.

13.2 WATER DEMAND PROJECTION

13.2.1 Present Condition

(1) Domestic Water Consumption

The derivation of the figure for the equivalent served population rests on these assumptions: for house service connections, the average number of users per connection is 8.1 (MWSS Consumer Survey, 1981); and for public faucets, the average number of users is 486 (60 times of H.S.C.), the same figure being used for projection by the Corporate Planning Group of MWSS (CORPLAN). A different assumption, however, was applied

to some areas under FAWSP, e.g., Imus, Antipolo, Montalban and San Mateo -- an assumption resulting from the detailed investigation of each area by FAWSP.

The data on billed water consumption and number of house service connections are shown in Table 13.2.1. These were prepared by the Computer Service Center of the MWSS.

Of the billed domestic water, metering losses accounted for about 9.57 percent. This ratio was estimated from the results of a field survey conducted under the Manila Water Supply Rehabilitation Project II (MWSRP II, Table 13.2.2).

Calculations on present per capita water consumption were made based on recorded water consumption and the estimated served population (Table 13.2.3). For house service connections, the average per capita water consumption is 170 liters per capita per day (lpcd). This consumption type recorded a low of 51 lpcd in Las Piñas and a high of 324 lpcd in Parañaque.

Average per capita water consumption from public faucets is 19 lpcd, ranging from 9 lpcd in Makati to 79 lpcd in Antipolo. For purposes of statistical analysis, however, using these figures raises questions as they are much influenced by the accuracy of assumptions. The number of public faucets is very limited for making a statistical analysis. The estimated per capita consumption from public faucets is thus not suitable for the projection of future water consumption.

Municipalities with low per capita consumption are generally found in areas experiencing water supply constraints, e.g., Caloocan City, Las Piñas, Malabon, Muntinlupa, Navotas, Pateros, Taguig, Valenzuela, and some municipalities in the provinces of Cavite and Rizal. Because of insufficient water supply, water consumption in these areas is suppressed. Considering their potential demand to be higher, a rapid increase in water consumption will be seen after improvement of the water supply situation is effected by MWSS through several ongoing projects such as AWSOP, Manila South Water Distribution Project (MSWDP), and FAWSP. This improvement is factored into the demand projection for these areas.

For the BP799 area in Rizal Province, no useful data on water consumption was obtained. The data prepared by RPWSIP were utilized for the projection of future water consumption.

(2) Commercial Water Consumption

The total billed commercial consumption in 1990 averaged 303,732 m^3/day as shown in Table 13.2.4. The larger part of this consumption was taken up by the NCR, amounting to 99.2% of the total. In particular, Manila, Quezon City and Makati combined to share of 97.1% of the total. The commercial sector of Cavite and Rizal consumed only 0.4% and 0.5%, respectively, of the total commercial consumption.

After adjustment for meter error, the average consumption per meter connection was placed at 8.119 m^3/day, ranging from 0.734 m^3/day in Muntinlupa to 14.910 m^3/day in Makati. The correction factor used for the adjustment of consumption was based on the survey result conducted by the Manila Water Supply Rehabilitation Project I (MWSRP I) and is calculated as follows:

Ratio of large meter to be rehabilitated	53.52%
Increase of consumption after rehabilitated	24.9%

Estimated over-all meter error:

53.52% x 24.9% = 13.33% increase

(Source: 4th Quarter Report 1987, MWSRP I)

Thus, the recorded billed consumption of large meters such as commercial and industrial sector was increased by 13.33% for data processing.

For the BP799 area, no useful data on water consumption of commercial sector were available.

(3) Industrial Water Consumption

The total billed industrial consumption in 1990 averaged 74,552 m^3/day as shown in Table 13.2.5. Most of this was also consumed in the NCR, amounting to 96.3% of the total, almost the same figure for its commercial consumption. Of this percentage, more than half was also accounted for by Manila, Quezon City and Makati which combined to a total share of

54.8% of total consumption. In the case of Mandaluyong and Pasig, the parity between commercial and industrial consumption breaks as the figure for industrial consumption share is higher, i.e., 3.3% for commercial and 9.2% for industrial in Mandaluyong, and 2.7% and 9.6% in Pasig. The industrial sector of Cavite and Rizal consumed only 1.4% and 2.3% respectively, of the total industrial consumption. After making the same adjustment for meter error as that done for the commercial sector, the average consumption per meter connection became 10.788 m^3/day, ranging from 0.756 m^3/day in Muntinlupa to 29.897 m^3/day in Mandaluyong. For the BP799 area, no useful data was available on the water consumption of the industrial sector

(4) Groundwater Consumption

As discussed in Subsection 2.2.3, MWSS has been pumping up a yearly average of about 29,922,000 m^3 of groundwater for the last 6 years. This volume is equivalent to about 82,000 m^3/day or 3.4% of all MWSS water production for the same period.

In addition to the pumpage by MWSS, groundwater pumpage of the private sector in 1990 amounted to a daily average of about 840,700 m^3. Around 45% or about 379,000 m^3 of pumpage by the private sector was used for domestic use. This volume is equivalent to 44% of served water by MWSS. The population with private water supply systems was estimated to be about 38% of the population with MWSS water supply system, in consideration of said per capita water consumption and private pumpage for domestic use (Table 13.2.3). Thus, about 31% of the water demand for domestic use was supplied from private groundwater pumpage.

As shown in Table 13.2.4, it is estimated that about 106,800 m^3/day or 24% of total water demand for commercial use was supplied by the private sector.

In contrast to the commercial water consumption, about 81% of the total water demand for industrial use, or around 354,900 m^3/day, was supplied by the private sector (Table 13.2.5).

13.2.2 Water Consumption Projection

(1) Domestic Water Consumption

Projections of domestic consumption were computed separately for general and blighted populations. Population and per capita water consumption were determined for each group.

a) Per Capita Water Consumption

Domestic water consumption is affected by income growth and water tariff change with some extent of elasticity for both factors. The projection for a given year is done by first determining the per capita domestic water consumption in that year. This may be given by the following formula:

$$PCC(I) = PCC(I-1) \times [1+(PCIG(I-1)+(TI(I-1) \times PED)]$$

where:

I	=	year
PCC(I)	=	per capita consumption for year I
PCIG(I)	=	per capita income growth in real terms in year I
IED	=	income elasticity consumption
TI(I)	=	tariff increase in real terms in year I
PED	=	price elasticity of consumption

Data on per capita income growth, water tariff increases, income elasticity, and price elasticity are assumed by CORPLAN as shown in Table 13.2.6. For the general population, CORPLAN assumed a continuous decrease of per capita income up to the year 2010. Tariff was assumed to increase continuously starting year 1993, by 1.38% annually. Income elasticity and price elasticity computed by CORPLAN are 0.30 and -0.20 respectively. Per capita consumption in the year 2010, therefore, was computed to decrease to about 87% of that in 1990.

Projected per capita consumption of the blighted population in the year 2010 was also computed to decrease slightly due to tariff increase, even with the assumption of stability in their per capita income. Table 13.2.6 also shows the computation results for both groups.

Computation results show rather low per capita consumption relative to those in foreign countries. In previous studies, i.e., FAWSP and RPWSIP, increasing per capita consumption were assumed in projecting future water consumption.

This Study, therefore, set the per capita consumption of the general population at 180 lpcd for the year 1995 and 200 lpcd for 2010. Said settings are in harmony with the per capita consumption in typical developed areas such as Manila and Quezon City. For the years between 1995 and 2010, per capita consumptions were interpolated. For some municipalities with present high per capita consumption, that is, those with more than 200 lpcd, namely, Makati, Parañaque, and San Juan -- per capita consumption in the year 2010 was set in consideration of present consumption.

The per capita consumption in some areas which presently lack water, but which are expected to benefit from AWSOP and MSWDP, was assumed to substantially increase by the year 1995. The per capita consumption in those areas was also set at 180 lpcd, considering the present water consumption amount and the distance from the central distribution system.

For municipalities located in the outlying areas but which are covered by the ongoing projects, i.e., FAWSP and RPWSP, the per capita consumption applied in each project was also adopted in this Study for consistency. For areas in Cavite, however, the same per capita consumption as the one for NCR was adopted. Table 13.2.7 presents the adopted per capita consumption of each city/municipality for selected years.

Per capita consumption of the blighted population is limited by the water supply capacity of faucets. Their consumption was calculated to be 30 lpcd, on the assumption that they get their water from public faucets having a 24-hour flow rate of 10 liter/min. and a service rate of 486 persons per faucet. In projecting their consumption, setting the per capita consumption at 35 lpcd seems to be appropriate, considering the estimated present per capita consumption from public faucets was that presented in Table 13.2.3. This per capita consumption is held to be constant up to the year 2010.

b) Projected Population

The population of each city/municipality in the future that was projected in Section 6.1 contains general and blighted population categories. The projected population under such categories were adopted for the projection of water consumption.

For some areas, the estimated year-1990 general population is smaller than the estimated equivalent number of population for house service connections shown in Table 13.2.8. This means that a part of the blighted population have house service connections instead of public faucets. For those areas, therefore, corrections were made on the ratio of blighted population to total population, on the assumption that the estimated equivalent number of population for house service connections is equal to the general population of the area as shown in Table 13.2.8.

Moreover, since beneficiaries of private sector supply systems may also be categorized under general population, around 80% of the NCR population was estimated to fall under this category as shown in Table 13.2.3. Therefore, the ratio of the total blighted population was adjusted at 20% of total population in accordance with the respective shares of the estimated blighted population in each municipality in year-1990 as shown in Table 13.2.9.

Assuming these blighted population ratios will remain constant in the future, the future populations were projected for both groups.

The ratio of population served by MWSS was determined for each projection year, by city/municipality, with due consideration to present served population by MWSS and private water supply systems presented in Table 13.2.2.

For the areas covered by FAWSP and RPWSP, the respective served population projected in the reports of these projects were adopted, that is, after the projected population of each area was adjusted.

C) Domestic Consumption

Total domestic consumption is obtained by multiplying per capita consumption and population over all cities and municipalities for each

projection year. Computation results at 5-year intervals for years 1995-2010 are presented in Tables 13.2.10 to 13.2.13.

(2) Commercial Water Consumption

Commercial water consumption is similarly influenced by economic growth and tariff changes in real terms, with some extent of elasticity on both factors.

The annual commercial consumption in a given year may be given by the following formula:

$$CD(I) = CD(I-1) \times [1+(CG(I-1)\times COED)+(CTI(I-1)\times CPED)]$$

where:

- I = Year
- CD(I) = Total commercial consumption in year I
- CG(I) = GDP growth rate in service sector in year I
- COED = output elasticity of consumption in service sector
- CTI(I)= tariff increase in real terms in year I
- CPED = price elasticity of consumption

Data on GDP growth in the service sector discussed in Section 6.1 were applied for this projection. Data on tariff increases, output elasticity, and price elasticity were assumed by CORPLAN as shown in Table 13.2.4. As computed, commercial consumption in the year 2010 in the MSA, excluding the BP799 area, will be more than double the estimated present demand.

The share of MWSS water supply to the total commercial consumption was calculated at 76.3% based on the actual billed water consumption and the estimated total commercial consumption (Table 13.2.4). The amount of privately supplied water for commercial consumption was about 106,800 m^3/day based on the groundwater use survey. Assuming that the share of private supply and the share of the consumption of each city/municipality will be stable in the future, the commercial consumption in the future was projected as shown in Table 13.2.15. For the areas under BP799, commercial consumption was computed using the methods adopted in RPWSP as presented in Appendices D and E.

It is estimated that MWSS shall supply 801,100 m3/day for commercial consumption in the year 2010. This amount is equivalent to 2.3 times of the presently supplied amount for commercial use.

(3) Industrial Water Consumption

Industrial water consumption in the future is projected in the same way as commercial water consumption.

The projected growth of the GDP for the industrial sector as discussed in Chapter 11 was applied in the projection of industrial consumption. Data on tariff increases, output elasticity, and price elasticity that were assumed by CORPLAN were also adopted for the Study and are shown in Table 13.2.16.

Industrial consumption in the year 2010 is estimated to be about 1.8 times of estimated present demand.

The share of MWSS water supply to the total industrial consumption is calculated at 19.2%, based on the actual billed water consumption and the results of the groundwater use survey (Table 13.2.5). The private supply for industrial consumption in 1990 was about 354,900 m3/day. Assuming that the share of the private supply and the share of the consumption by each city/municipality will be stable in the future, the industrial consumption in the future was projected as shown in Table 13.2.17. For the areas covered by RPWSP, industrial consumptions were computed using the respective methods adopted in RPWSP.

It is estimated that MWSS shall supply 223,700 m3/day for industrial consumption in the year 2010. This amount is equivalent to 2.6 times of present MWSS industrial consumption.

13.2.3 Total Water Demand

The total water demand is obtained by summing up the domestic, commercial, and industrial consumption that are projected for each year. Also added to this demand are the water losses during distribution.

Present Non-Revenue Water of MWSS exceeds 50% of total distributed

amount, and it includes various components e.g., meter error, illegal connections, leakage, and so on. The projected future consumption, however, excludes leakage. The MWSS water demand thus involves adding the amount of leakage.

The size of projected water demand, given the currently high NRW ratios, (see Table 13.2.18) will be affected substantially by the leakage ratios that are adopted. MWSS aims to reduce the NRW ratio to 25% in its reduction program under MWSRP I and II, which are currently being implementation.

Reducing the NRW ratios to such levels may, however, be difficult to achieve as present ratios are still high. Even AWSOP already adopted higher NRW ratios in its feasibility stage. But even these higher ratios were revised for much higher ones at AWSOP's detailed design stage.

For reasons of comparison, three cases were presented for the above said ratios, from which cases the leakage ratios that were used by this study in projecting the water demand were determined.

The first case (Case 1) is based on the projection of CORPLAN: Leakage amount will be reduced to 25.2% of total demand in year 1995, and to 21% in years 2000, 2005, and 2010 as shown in Table 13.2 18. These ratios are considered as direct results of NRW reduction programs. MWSS areas in Cavite and Rizal are assigned leakage ratios that are adopted in FAWSP's and RPWSP's respective areas.

The second case (Case 2) is based on the ratios used in AWSOP's feasibility study stage. These NRW ratios--30% in year 1995 and 25% in years 2000, 2005 and 2010--are higher than those of CORPLAN.

In the ongoing detailed design stage of AWSOP, leakage ratios higher than those in Case 2 were adopted: 35% for year 1996. The third case (Case 3) had this considered such that the ratio for 1995 is 35%, that for 2000 is 30%, and 25% for years 2005 and 2010.

All three cases are tabulated below. The ratios applied in Case 3 are the ones adopted by this Study for the projection of water demand.

ADOPTED LOSS RATIO (% to Total Supply)

	1995	2000	2005	2010
CASE 1	25.2	21.0	21.0	21.0
CASE 2	30.0	25.0	25.0	25.0
CASE 3	35.0	30.0	25.0	25.0

The computation results for years 1995, 2000, 2005, and 2010 are summarized in Tables 13.2.19 to 13.2.31 and Figures 13.2.1 to 13.2.3.

13.3 Supply Capacity Against Demand

A yearly water demand and supply analysis for the period 1995 to 2000 and for years 2005 and 2010 was made considering the projected water demand and the planned water supply capacity.

The projected water demand was allocated by expected water source, assuming the ratio of supplied water by source as shown in Tables 13.3.1 to 13.3.4. The location of respective areas, the present coverage of the Central Distribution System (CDS), and existing groundwater pumping capacity were considered for this assumption. In this assumption, Bacoor and Kawit in Cavite will be served through CDS. Areas in Rizal, however, are generally supplied with groundwater, except some areas that are close to the existing CDS.

On the assumption that the planned and ongoing projects to augment the water source and treatment capacity will be implemented on schedule, a comparison of surface water supply capacity and water demand (Summarized in Tables 13.2.29 to 13.2.31) for each particular year was done and is presented in Table 13.3.5 and Figure 13.3.1. From this comparison, the following were noted:

a. AWSOP is indispensable to meet demand.

b. The surface water supply capacity will not be critical to meet demand until 2010 even if produced water is supplied to NCR and a part of Cavite and Rizal, and the augmentation of water source is conducted on schedule.

c. If the implementation of UATP and MNEWSP is delayed, water supply situation will be critical by the year 2005.

d. Required groundwater pumpage will increase to about 1,278,000 m^3/day in 2010 including discharge by private sector.

e. The share of groundwater in total water supply will decrease to about 24.6% in 2010.

f. If the Bulacan Bulk Water Supply Project is implemented, implementation of MWSP III should be advanced as early as possible. Otherwise, the supply situation will be critical soon after year 2005. Though water amount to be allotted for the Bulacan project shall be decided based on the probable implementation schedule of MNEWSP, UATP, and MWSP III, the proposed amount for its Phase I (1996; 100,200 m^3/day, 2000; 131,100 m^3/day) can be secured if UATP is executed on schedule. However, supply of all proposed amount for Phase II (2010; 398,400 m^3/day) before completion of MWSP III will make MWSS water supply situation critical.

13.4 Groundwater Discharge Projection

13.4.1 Outlines of Scenarios

For preparation of data to be used in the simulation of future groundwater level in Metro Manila, projection of groundwater discharge was done using the projected groundwater demand in the study area. For that purpose, four scenarios were prepared considering the assumptions stated in each case.

Basic Assumptions:

a. AWSOP will be completed in 1996.

b. UATP will be completed in 1998.

c. MNEWSP will be completed in 1997. Water source for the whole

area of Montalban, San Mateo, and a part of Marikina will be converted to the Wawa Dam the next year. Groundwater utilization facilities to be constructed to meet demand by that year will be operated continuously from that year onward.

d. MSWDP will be completed in 1995.

Scenario 1 (Basic Scenario):

The increase of commercial and industrial water demand will be in proportion to the estimated present share of the MWSS and the Private sector, except in some areas within CDS such as Manila, Pasay, Quezon, Caloocan, Makati, Malabon, Mandaluyong, Navotas, and San Juan. In these areas, said increase will be covered by MWSS only. In Cavite area, only Bacoor and Kawit will be supplied by CDS.

The calculations done in Subsections 13.2 and 13.3 were based on this scenario.

Scenario 2 (Optimistic Scenario):

The same assumption on commercial and industrial water demand as in Scenario 1. However,commercial and industrial water demand increase in private sector from year 2001 is converted to MWSS (Tables 13.4.1 and 13.4.2). Municipalities in the Cavite area will be supplied by CDS.

Scenario 3 (Most Optimistic Scenario):

The same assumption on commercial and industrial water demand as in Scenario 1. However, commercial and industrial water demand increase in the private sector from year 1996 is converted to MWSS. Municipalities in the Cavite area will be supplied by CDS.

Scenario 4 (Pessimistic Scenario):

The same assumption on commercial and industrial water demand as in Scenario 1. However, implementation of projects mentioned in Basic Assumptions is delayed for 2 years. In the Cavite area, only Bacoor and Kawit will be supplied by CDS.

Difference between assumptions in each scenario can be summarized briefly as follows:

Scenario No.	MWSS Surface Water Supply Projects	Future Pumpage of Commercial & Industrial Private Wells	CDS Connection in Cavite MSA
1	On-schedule completion of ongoing projects	Increasing[1]	Bacoor 100% covered, Kawit 50%, others 0%
2	Same as Scenario 1	Increasing[2] up to year-2000, thereafter pumpage is constant	All municipalities covered
3	Same as Scenario 1	Increasing[2] up to year-1995, thereafter pumpage is constant	All municipalities covered
4	Two years delay of completion of ongoing projects	Same as Scenario 1	Same as Scenario 1

1 With respect to future demand increases but maintaining year-1990 percentage shares
2 With respect to future demand increases and up to the year indicated

13.4.2 Projected Groundwater Discharge

In accordance with the above-mentioned scenarios, groundwater demand in the future was projected. Tables 13.4.9 to 13.4.12 summarize the demand projection in Scenario 2 for selected years, while Tables 13.4.13 to 13.4.16 present an allocation of the projected water demand by source of the same scenario. Tables 13.4.17 to 13.4.24 and Tables 13.4.25 to 13.4.32 were similarly prepared for Scenarios 3 and 4.

Using the results of above projection, distribution of groundwater discharge was projected for each scenario (Tables 13.4.33 to 13.4.36). To increase the probability of the projection, adjustment including interpolation was done on the projected discharge between the years 1991 to 1999 for several areas in Cavite and Rizal so as to moderate the rate of increase of discharge. Projections for each scenario are summarized in Tables 13.4.37 to 13.4.40.

In Scenario 1, groundwater discharge of the MWSS and the private sector

will respectively increase to 280,000 m^3/day, and 998,000 m^3/day. This total increase of 1,278,000 m^3/day is equivalent to 1.37 times of estimated present discharge.

In Scenario 2, total discharge will increase to 1,139,000 m^3/day or 1.22 times of present level. It is 1,064,000 m^3/day or 1.14 times of the present level in Scenario 3.

In Scenario 4, which is pessimistic but has a high probability, total discharge will be 1,295,000 m^3/day or 1.39 times of present discharge.

For all scenarios, areas in Cavite and Rizal require much increase of groundwater discharge.

13.5 Water Demand Projection in Antipolo Basin

13.5.1. Present Situation

a) Existing System

The Poblacion area of Antipolo which occupies the center of the Antipolo Basin was initially served by the water supply system constructed by the then Bureau of Public Works. This system includes 6 deepwells and about 20 km of distribution pipelines. When Antipolo became a part of the MWSS service area in 1976, the system was turned over to MWSS. Immediately thereafter, a full scale rehabilitation of said system was undertaken by MWSS, especially the source facilities.

The rapid urbanization and the development of new subdivisions in the early 1980s significantly raised the need for water sources. To meet this demand, MWSS constructed an additional 4 deepwells for the system: 2 wells in 1981; 1 well in 1982; and 1 well in 1983. A total of 10 deepwells have therefore been operational since those times. All of these wells are currently operated on 24-hour basis. Their various capacities range from 210 liter/min. to 1,400 liter/min. Due to limited water source and rugged terrain of the area, rationing is done in the system via control of valves.

At present, the system in Antipolo has about 33.59 km of distribution pipelines as a result of some expansions which mostly consist of interconnections requested by newly developed subdivisions.. A distribution reservoir is not provided in the system so that the pumped groundwater is directly injected into the distribution pipes after some extent of chlorination.

b) Water Consumption

As shown in Table 13.5.1, the Computer Service Center of MWSS summarized the existing number of connections and water consumption in 1990 of the MWSS water supply system in the Antipolo Basin.

Observations regarding this table are summarized below:

a. Total water consumption in the basin is rather small in comparison with the share of no. of connections due to small water consumption in industrial sector.

b. The share of domestic consumption is in accord with the share of no. of connections.

c. The character of the area in the basin may be categorized as a residential area with small scale commercial enterprises.

d. Per capita domestic consumption may be estimated as follows:
2,962 m^3/day / (3,535 conn. x 8.1 person/conn.)
= 103.4 lpcd

According to the groundwater use survey conducted in this study, 26 deepwells are operated in the basin in addition to the 10 deepwells of MWSS. The discharge and water consumption by use obtained by the survey is summarized in Table 13.5.2.

Thus, the MWSS system discharged about half of the total groundwater discharge in the basin. Only 33.5% of MWSS discharge was billed as revenue water in 1990. Though a part of NRW seems to be consumed by illegal connections, most of it is considered to be leakage in view of the rather low per capita consumption estimated for the area. Survey on

this matter was conducted by FAWSP in 1989. As a result of that survey, ratios for leakage and unbilled consumption during that time were estimated at 68.2% and 0.2% of production amount, respectively.

Using the present population in the basin -- the 84,823 estimated in Chapter 2 -- and the data presented in Table 13.5.2, the average per capita domestic consumption may be estimated as follows:

Assumption: Ratio of illegal consumption = 0.2%

Water consumption for domestic use in the basin is,

3.4475 + (3.5803 x 0.002)

= 3.4547 MCM = 9,465 m^3/day

therefore, average per capita consumption is,

9,465 m^3/day /84,823 = 112 lpcd

13.5.2 Water Demand Projection

(1) Domestic Water Consumption

The population projected in Chapter 11 was adopted for the projection of water demand in the Antipolo basin. MWSS service ratio was determined in accordance with the planned service coverage of the MWSS system and the extent of urbanization. MWSS service coverage was determined under the following assumptions:

a. The service area within the basin boundary will be limited by the year 2000, except for the present service area that is out of the basin.

b. The service area will continuously expand outward from the central area (poblacion).

c. The priority of service will be laid on the present developed area, and it will be covered by the year 2000.

d. Present developed area closely located outside the basin will be covered after the year 2001.

e. The basin will be fully covered by the system by the year

2010.

Figures 13.5.1 and 13.5.2 present the service coverage in selected years. Population in the service area may be estimated by multiplying the population of the Antipolo study area and the service ratio. In 1995, it will be about 71,000, including those in the present service area outside of the basin, and which is about 67% of the population in the basin. It will increase to about 195,000 or about 110% of basin population in the year 2010. Since the estimated present served population is about 29,000 (3,535 conn. x 8.1), the served population in 2010 will be about 6.8 times of present served population (Table 13.5.3).

The domestic water demand in the MWSS's system in the basin were computed as shown in Table 13.5.4, adopting the same per capita consumption as those applied in the previous projection in FAWSP.

(2) Commercial Water Consumption

The water consumption of the commercial sector computed in Subsection 13.2 was adopted in projecting the commercial water consumption in the Antipolo Basin.

Based on the data presented in Table 13.5.1, 51% of the MWSS commercial consumption projected for the Antipolo municipality is considered to be consumed in the basin.

Allocation to each barangay was done in accordance with the domestic consumption share of each barangay. The computation results for the entire basin and the MWSS system are presented in Tables 13.5.5 and 13.5.6.

(3) Industrial Water Consumption

The water consumption in industrial sector computed in Section 13.2 is adopted in the projection of industrial water consumption.

Based on the data presented in Table 13.5.1, 3% of the MWSS industrial consumption projected for Antipolo municipality is considered to be consumed in the basin. The present private industrial consumption, in

addition to the MWSS industrial consumption, was added to the total demand, considering that the bulk of it was consumed by a few poultry farms.

Allocation to each barangay was done in accordance with the share of the domestic consumption. The computation results for the entire basin and the MWSS system are presented in Tables 13.5.5 6and 13.5.6 for the entire basin and the MWSS system.

(4) Distribution Loss

Losses during water distribution are mainly caused by leakage. Though the present leakage ratio is considerably high, probably amounting to more than 50%, a ratio of 30% was applied for the projection up to the year 2000, and 25% after that, in anticipation of the benefits of the NRW reduction program and of new projects to be implemented in the basin, including the high rate replacement of old distribution pipes.

(5) Total Demand

Total water demand in the basin and in the MWSS service area are summarized in Tables 13.5.5 and 13.5.6.

13.5.3 Analysis on Supply Capacity and Projected Demand

Projected water demand for the Antipolo basin is summarized as shown in Table 13.5.5. Because of the limited yield of the groundwater resource in the basin, additional water sources in the future shall be mainly obtained from surface water resources. Based on the computer simulation of the groundwater condition in the basin, a groundwater discharge of about 27,800 m^3/day is considered to be the maximum limit of discharge in the basin. Augmentation of water source, as implied in the table, is a course that should be immediately pursued.

Due to the pumpage of existing groundwater pumping facilities, the water source augmentation by groundwater resource has a maximum limit of 8,344 m^3/day. Of this figure, 2,070 m^3/day will be obtained through rehabilitation of existing MWSS's deepwells. Therefore, the total additional pumpage resulting from the development of new wells must not exceed

6,274 m^3/day.

After augmentation of the groundwater resource, supply capacity will be able to meet the demand until the year 1998, on a daily average basis. On a daily maximum basis, however, supply capacity will not be able to satisfy the demand from 1995.

Further augmentation is thus required, and at an average of about 1,800 m^3/day in the year 2000 and about 18,100 m^3/day in the year 2010, assuming maximum groundwater production capacity is about 27,400 m^3/day (Table 13.5.8 and Figure 13.5.3). On a daily maximum basis, amount of augmentation is 15,500 m^3/day in 2000 and 40,900m^3/day in 2010.

TABLE13.2.1 NUMBER OF CONNECTIONS AND BILLED CONSUMPTION IN 1990

CITY /MUNICIPALITY	NUMBER OF SERVICE CONNECTIONS					WATER CONSUMPTION IN 1990 (CUBIC METER)						% TO TOTAL
	DOM	P.F.	COM.	IND.	OTHERS	DOM	P.F.	COM.	IND.	OTHERS	TOTAL	
I. NCR	581,778	462	41,010	5,163	528	275,826,999	1,430,279	109,937,591	24,761,109	1,442,996	413,399,174	97.4
CITY OF MANILA	155,052	86	14,452	707	88	75,898,348	354,831	42,357,707	4,760,534	913,457	124,284,877	29.3
PASAY CITY	25,087	33	1,907	161	8	10,198,494	62,164	5,327,980	292,085	3,565	15,884,288	3.7
QUEZON CITY	147,326	167	10,695	1,712	276	73,012,861	498,558	21,807,459	5,762,759	466,348	107,548,003	25.3
CALOOCAN CITY	44,673	41	2,535	718	5	16,802,242	118,420	3,875,980	2,973,311	8,800	22,878,553	5.4
LAS PINAS	7,939	8	315	32	19	1,082,472	13,573	159,821	38,895	12,195	1,346,156	0.3
MAKATI	40,210	5	3,189	294	8	22,351,210	7,495	15,313,713	1,494,580	5,532	39,172,530	9.2
MALABON	18,012	19	989	368	1	6,240,013	58,209	1,033,252	1,923,024	360	9,254,858	2.2
MANDALUYONG	21,345	19	1,123	257	4	9,453,861	51,006	1,610,376	2,508,080	3,510	15,626,893	3.7
MARIKINA	28,315	23	1,288	503	3	13,818,472	95,034	1,249,818	452,522	356	15,616,202	3.7
MUNTINLUPA	5,505	0	106	11	95	1,315,447	0	25,061	1,704	24,050	1,366,302	0.3
NAVOTAS	13,795	6	471	126	3	3,214,442	19,807	655,258	650,139	1,343	4,540,989	1.1
PARANAQUE	13,552	17	1,045	168	3	11,830,787	42,757	2,160,859	539,614	1,254	14,575,271	3.4
PASIG	32,630	21	1,105	266	11	15,810,304	45,118	3,010,142	2,600,769	1,088	21,467,421	5.1
PATEROS	2,349	0	34	3	0	628,561	0	17,946	1,135	0	647,642	0.2
SAN JUAN	12,851	8	920	146	1	8,833,477	45,615	2,841,428	386,174	205	11,706,899	2.8
TAGUIG	4,060	3	61	8	1	1,188,990	7,620	116,262	2,771	270	1,315,913	0.3
VALENZUELA	15,077	6	775	283	2	5,046,998	10,072	734,929	373,813	565	6,166,377	1.5
II. CAVITE	16,879	17	731	53	1,293	4,304,555	43,328	394,069	33,818	336,131	5,111,901	1.2
BACOOR	3,881	5	132	3	58	941,683	19,813	86,483	585	21,983	1,070,467	0.3
CAVITE CITY	7,807	8	398	32	218	1,982,973	17,099	234,181	19,886	56,740	2,310,879	0.5
IMUS	978	0	54	6	1	284,472	0	20,855	1,779	536	307,642	0.1
KAWIT	3,055	4	119	9	663	825,494	6,416	39,294	10,754	174,127	1,056,085	0.2
NOVELETA	507	0	5	1	104	117,848	0	1,592	300	28,112	147,852	0.0
ROSARIO	651	0	23	2	249	152,085	0	11,744	514	54,633	218,976	0.1
III. RIZAL	17,116	9	654	180	15	4,892,593	21,582	530,031	635,331	2,307	6,081,844	1.4
ANGONO	-	-	-	-	-	-	-	-	-	-	-	-
ANTIPOLO	4,445	1	223	41	3	1,316,107	1,416	194,554	570,530	481	2,083,188	0.5
BARAS	-	-	-	-	-	-	-	-	-	-	-	-
BINANGONAN	-	-	-	-	-	-	-	-	-	-	-	-
CAINTA	3,003	2	134	25	8	995,761	4,142	144,691	14,206	1,275	1,160,061	0.3
CARDONA	-	-	-	-	-	-	-	-	-	-	-	-
JARA-JARA	-	-	-	-	-	-	-	-	-	-	-	-
MONTALBAN	2,039	0	36	10	3	546,674	0	13,395	5,022	440	565,531	0.1
MORONG	-	-	-	-	-	-	-	-	-	-	-	-
PILILLA	-	-	-	-	-	-	-	-	-	-	-	-
SAN MATEO	3,678	4	107	47	0	841,283	12,224	59,772	17,650	0	930,929	0.2
TANAY	-	-	-	-	-	-	-	-	-	-	-	-
TAYTAY	3,951	2	154	56	1	1,192,782	3,800	117,619	27,823	111	1,342,135	0.3
TERESA	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	621,773	488	42,395	5,396	1,836	285,024,147	1,501,189	110,862,091	25,430,258	1,781,234	424,598,919	100.0

SOURCE : COMPUTER SERVICE CENTER, MWSS

TABLE 13.2.2 RESULTS OF FIELD MEASUREMENT ON NON-REVENUE WATER

No. of Zones Measured	38
Surveyed Area	6,308 ha.
No. of Surveyed Households	237,072
Date Measured	Mar. 1988 - Nov. 1990
Supplied Water	625.037 MLD (100%)
Revenue Water	234.867 MLD (37.58%)
Non-Revenue Water (NRW)	390.170 MLD (62.42%)
NRW Breakdown:	
Unbilled WSC	21.145 MLD (3.38%)
Poor Metering	22.474 MLD (3.60%)
Illegal Use	51.830 MLD (8.29%)
Probable Leakage	294.751 MLD (47.16%)
% to Revenue Water:	
Unbilled WSC	8.99%
Poor Metering	9.57%
Illegal Use	22.07%
Probable Leakage	125.50%

Source: 1st Q'tr Report 1991, MWSRP II

TABLE 13.2.3 STATUS OF DOMESTIC WATER SUPPLY BY MWSS AND PRIVATE SYSTEMS

CITY/MUNICIPALITY	1990 CENSUS POPULATION	MWSS HOUSE SERVICE CONNECTION							MWSS PUBLIC FAUCETS						EQUIVALENT NO. OF POPULATION SERVED BY MWSS		PRIVATE WELL			EQUIVALENT NO. OF POPULATION SERVED BY MWSS & PRIVATE SYSTEM	
		AVG. DAILY CONSUMPTION		CONNECTIONS			AVERAGE PER CAPITA CONS.	CORR'D PER CAPITA CONS.	AVERAGE DAILY CONSUMP.	PUBLIC FAUCETS			AVERAGE PER CAPITA CONS.	CORR'D PER CAPITA CONS.			DOMESTIC SUPPLY AMOUNT	ESTIMATED SERVED POPULATION	SHARE IN SUPPLY AMOUNT		
		AMOUNT (M3/D)	% TO TOTAL	NUMBER	EQUIVALENT NO. OF POPULATION	% TO TOTAL POP.	(LPCD)	(LPCD)	(M3/D)	NUMBER	EQUIV. NO. OF POP.	% TO TOTAL POP.	(LPCD)	(LPCD)	TOTAL (ESC+PF)	% TO TOTAL POP.	(M3/D)	*	(%)	TOTAL	% TO TOTAL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	[19]	[20]	[21]
I. NCR	7,928,867	355,690	96.8	597,778	4,761,062	60.0	158.7	174	3,319	462	224,532	2.8	17.5	19	4,985,594	62.9	266,935	1,355,526	84.3	6,341,059	80.0
1. Manila	1,598,918	207,561	26.6	155,052	1,255,921	78.5	165.6	181	972	86	41,796	2.6	23.3	25	1,297,717	81.2	2,214	12,204	1.0	1,309,921	81.9
2. Pasay City	368,623	27,561	3.6	25,087	203,205	55.6	137.5	151	170	23	16,038	4.4	10.6	12	219,243	59.8	5,327	32,372 *	15.9	251,615	68.6
3. Quezon City	1,668,768	230,035	25.6	167,226	1,193,341	71.5	157.6	184	1,366	167	81,162	4.9	16.8	18	1,274,503	76.5	31,316	170,503	12.4	1,445,006	86.7
4. Caloocan City	761,811	44,116	5.6	44,693	361,851	47.5	121.9	134	324	41	19,926	2.6	16.3	18	381,777	50.2	19,137	106,313 *	28.2	488,091	64.1
5. Las Pinas	296,851	2,556	0.4	7,529	66,305	21.7	46.1	51	37	8	3,888	1.3	9.6	10	69,194	23.0	57,141	287,450 *	94.6	385,644	129.9
6. Makati	452,724	51,236	7.8	60,330	325,761	71.3	188.0	206	21	5	2,839	0.5	8.5	9	328,131	72.5	10,375	48,906	13.1	377,037	83.3
7. Malabon	278,380	17,096	2.2	18,012	145,857	52.4	117.2	128	159	19	9,234	3.3	17.3	19	155,131	55.7	1,892	10,511 *	9.1	165,642	59.5
8. Mandaluyong	244,538	25,591	3.3	21,345	172,855	70.7	149.8	164	160	19	9,234	3.8	15.1	17	182,125	74.5	1,695	8,108	5.0	191,236	78.2
9. Marikina	311,010	37,859	4.8	28,315	223,362	71.8	165.1	181	260	23	11,178	3.6	23.3	26	240,530	77.6	5,348	28,525	11.3	270,054	87.1
10. Muntinlupa	276,973	3,634	0.5	5,505	44,591	16.1	80.8	89	-	-	0	-	-	-	44,591	16.1	49,108	273,822 *	52.6	317,413	114.6
11. Navotas	186,795	8,807	1.1	13,795	111,740	59.8	78.8	86	54	6	2,316	1.2	18.6	20	114,056	61.4	1,691	9,356 *	14.8	124,050	66.4
12. Paranaque	301,717	32,413	4.2	19,552	169,771	35.7	265.3	324	117	17	8,262	2.7	14.2	16	178,033	38.4	47,553	146,979	57.2	265,012	86.1
13. Pasig	397,309	63,316	5.5	22,630	266,303	66.5	163.9	180	124	21	10,206	2.6	12.1	13	276,509	69.1	9,223	51,361	16.2	325,870	82.0
14. Pateros	51,491	1,722	0.2	2,343	19,027	37.0	90.5	99	-	-	0	-	-	-	19,027	37.0	0	0 *	0.0	19,027	37.0
15. San Juan	126,798	23,653	3.0	12,851	104,093	82.1	227.2	249	125	8	3,888	3.1	32.1	35	107,981	85.2	252	1,012	1.0	108,993	86.0
16. Taguig	266,080	3,259	0.4	6,963	32,888	12.4	99.1	109	21	3	1,458	0.5	14.3	16	34,344	12.9	21,514	119,522 *	85.7	153,866	57.8
17. Valenzuela	340,050	13,827	1.8	15,977	122,124	35.9	113.2	124	28	6	2,916	0.9	9.5	10	125,040	36.8	3,157	17,539 *	17.2	142,579	41.9
II. CAVITE	451,020	11,793	1.5	15,873	136,133	29.8	86.6	95	119	17	8,262	1.8	14.4	16	144,395	31.6	46,864	260,354	58.2	404,749	88.6
1. Bacoor	159,685	2,580	0.3	3,881	31,438	19.7	80.1	90	54	5	2,430	1.5	23.3	26	33,868	21.2	31,507	175,039 *	91.6	208,905	130.8
2. Cavite City	91,641	5,433	0.7	7,801	62,233	69.0	85.9	94	67	8	3,888	4.2	11.0	13	66,125	73.2	849	4,713 *	12.4	71,841	78.4
3. Imus	92,125	719	0.1	978	7,335	8.0	106.3	116	-	0	0	0.0	-	-	7,335	8.0	3,268	18,158 *	79.3	25,491	27.7
4. Kawit	47,755	1,262	0.3	3,855	24,748	51.8	51.4	100	18	4	1,944	4.1	9.0	10	26,690	55.9	2,338	15,722 *	53.1	42,412	88.8
5. Noveleta	20,695	323	0.0	507	4,107	20.1	78.6	86	-	0	0	0.0	-	-	4,107	20.1	5,659	31,439 *	94.1	35,546	174.3
6. Rosario	45,695	497	0.1	651	5,273	11.6	93.0	87	-	0	0	0.0	-	-	5,273	11.6	2,751	15,282 *	85.8	20,555	45.2
III. RIZAL	980,194	13,456	1.7	17,115	138,499	14.2	96.1	105	76	9	3,726	0.3	13.5	15	142,715	14.6	65,171	362,061	81.5	504,776	51.5
1. Angono	46,814	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Antipolo	207,862	3,606	0.5	6,445	36,905	17.8	100.1	110	4	1	54	0.0	11.8	13	36,959	17.8	29,367	163,150 *	88.1	199,109	95.8
3. Baras	16,880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Binangonan	127,561	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Cainta	126,839	2,728	0.3	3,803	24,324	19.2	112.2	123	11	2	972	0.8	11.7	13	25,296	19.9	9,273	51,511 *	95.5	76,813	60.6
6. Cardona	32,962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Jala-Jala	16,318	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Montalban	67,074	1,458	0.2	2,003	15,904	23.7	96.2	106	0	0	0	0.0	-	-	15,904	23.7	4,244	23,578 *	72.1	39,482	58.9
9. Morong	32,165	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Pililla	32,771	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11. San Mateo	82,310	2,305	0.3	3,678	31,263	38.0	73.7	81	33	4	1,218	1.5	37.5	30	32,481	39.5	2,647	14,706 *	50.8	47,187	57.3
12. Tanay	58,410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Taytay	112,483	3,268	0.4	3,951	33,603	28.5	100.1	110	37	2	972	0.8	27.6	30	34,575	29.3	19,640	109,111 *	84.5	142,686	126.4
14. Teresa	20,645	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	9,360,081	380,888	100.0	631,773	5,036,634	53.8	155.0	170	4,113	488	236,010	2.5	17.4	19	5,272,644	56.3	378,970	1,977,941	30.6	7,250,585	77.4

(5)=(4)x8.1 (7)=(2)/(5)x1000 (8)=(7)x1.0957 (11)=(10)x486 (13)=(9)/(11)x1000 (14)=(13)x1.0957 (15)=(5)+(11) (16)=(15)/(8)x1000 (19)=(18)/{[(2)+(9)]*1.0957+(17)}*100 (20)=(15)+(18)

* Assumed per capita consumption of 180 lpcd was used instead of estimated per capita consumption considering suppressed water supply condition.

TABLE 13.2.4 STATUS OF COMMERCIAL CONSUMPTION IN 1990

CITY/MUNICIPALITY	AVG. DAILY BILLED MWSS COMMERCIAL CONSUM.			NUMBER OF MWSS METER CONNECTION	CONSUMPTION PER METER CONNECTION		PRIVATE WELL COMM'L PUMPAGE (M3/DAY)	ESTIMATED TOTAL COMM'L CONSUM. (M3/DAY)	% TO TOTAL (%)	SHARE OF PRIVATE WELL (%)
	AMOUNT (M3/DAY)	CORRECTED (M3/DAY)	% TO TOTAL		BILLED (M3/DAY)	CORRECTED (M3/DAY)				
I. NCR	301,200	341,350	99.2	41,010	7.345	8.324	93,315	434,665	96.4	21.5
1. Manila	116,049	131,518	38.2	14,452	8.030	9.100	4,665	136,183	30.2	3.4
2. Pasay City	14,597	16,543	4.8	1,907	7.655	8.675	8,795	25,338	5.6	34.7
3. Quezon City	76,185	86,340	25.1	10,695	7.123	8.073	27,641	113,981	25.3	24.3
4. Caloocan City	10,071	11,414	3.3	2,535	3.973	4.502	3,674	15,088	3.3	24.4
5. Las Pinas	547	620	0.2	315	1.738	1.970	3,678	4,299	1.0	85.6
6. Makati	41,955	47,548	13.8	3,189	13.156	14.910	11,721	59,269	13.1	19.8
7. Malabon	2,831	3,208	0.9	989	2.862	3.244	2,016	5,224	1.2	38.6
8. Mandaluyong	9,891	11,210	3.3	1,123	8.808	9.982	2,128	13,338	3.0	16.0
9. Marikina	3,424	3,881	1.1	1,288	2.659	3.013	1,400	5,280	1.2	26.5
10. Muntinlupa	69	78	0.0	106	0.648	0.734	8,230	8,308	1.8	99.1
11. Navotas	1,795	2,035	0.6	471	3.812	4.320	621	2,655	0.6	23.4
12. Paranaque	5,920	6,709	1.9	1,045	5.665	6.420	4,914	11,624	2.6	42.3
13. Pasig	8,247	9,346	2.7	1,105	7.463	8.458	6,658	16,004	3.5	41.6
14. Pateros	49	56	0.0	34	1.446	1.639	0	56	0.0	0.0
15. San Juan	7,237	8,201	2.4	920	7.866	8.915	97	8,299	1.8	1.2
16. Taguig	319	361	0.1	61	5.222	5.918	3,655	4,016	0.9	91.0
17. Valenzuela	2,014	2,282	0.7	775	2.598	2.944	3,423	5,705	1.3	60.0
II. CAVITE	1,080	1,224	0.4	731	1.477	1.674	5,175	6,399	1.4	80.9
1. Bacoor	237	268	0.1	132	1.793	2.032	703	971	0.2	72.4
2. Cavite City	642	727	0.2	398	1.612	1.827	3,480	4,207	0.9	82.7
3. Imus	57	65	0.0	54	1.058	1.199	644	709	0.2	90.9
4. Kawit	108	122	0.0	119	0.905	1.025	0	122	0.0	0.0
5. Noveleta	4	5	0.0	5	0.872	0.989	0	5	0.0	0.0
6. Rosario	32	36	0.0	23	1.399	1.585	348	385	0.1	90.5
III. RIZAL	1,452	1,646	0.5	654	2.220	2.516	8,338	9,983	2.2	83.5
1. Angono	-	-	-	-	-	-	-	-	-	-
2. Antipolo	533	604	0.2	223	2.390	2.709	2,763	3,367	0.7	82.1
3. Baras	-	-	-	-	-	-	-	-	-	-
4. Binangonan	-	-	-	-	-	-	-	-	-	-
5. Cainta	396	449	0.1	134	2.958	3.353	3,173	3,622	0.8	87.6
6. Cardona	-	-	-	-	-	-	-	-	-	-
7. Jala-Jala	-	-	-	-	-	-	-	-	-	-
8. Montalban	37	42	0.0	36	1.019	1.155	844	886	0.2	95.3
9. Morong	-	-	-	-	-	-	-	-	-	-
10. Pililla	-	-	-	-	-	-	-	-	-	-
11. San Mateo	164	186	0.1	107	1.530	1.734	390	576	0.1	67.8
12. Tanay	-	-	-	-	-	-	-	-	-	-
13. Taytay	322	365	0.1	154	2.092	2.371	1,167	1,532	0.3	76.2
14. Teresa	-	-	-	-	-	-	-	-	-	-
TOTAL	303,732	344,219	100.0	42,395	7.164	8.119	106,828	451,047	100.0	23.7

TABLE 13.2.5 STATUS OF INDUSTRIAL CONSUMPTION IN 1990

CITY/MUNICIPALITY	AVG. DAILY BILLED MWSS INDUSTRIAL CONSUM.			NUMBER OF MWSS METER CONNECTION	CONSUMPTION PER METER CONNECTION		PRIVATE WELL IND'L PUMPAGE (M3/DAY)	ESTIMATED TOTAL IND'L CONS. (M3/DAY)	% TO TOTAL	SHARE OF PRIVATE WELL (%)
	BILLED (M3/DAY)	CORRECTED (M3/DAY)	% TO TOTAL		BILLED (M3/DAY)	CORRECTED (M3/DAY)				
I. NCR	71,792	81,361	96.3	6,291	11.412	12.933	280,687	362,048	82.4	77.5
1. Manila	15,545	17,617	20.9	795	19.554	22.160	5,786	23,403	5.3	24.7
2. Pasay City	810	918	1.1	169	4.793	5.432	3,375	4,293	1.0	78.6
3. Quezon City	17,066	19,341	22.9	1,988	8.585	9.729	32,368	51,708	11.8	62.6
4. Caloocan City	8,170	9,259	11.0	723	11.300	12.806	4,665	13,923	3.2	33.5
5. Las Pinas	138	156	0.2	51	2.702	3.062	20,959	21,115	4.8	99.3
6. Makati	4,110	4,658	5.5	302	13.609	15.423	3,383	8,041	1.8	42.1
7. Malabon	5,270	5,972	7.1	369	14.281	16.184	14,565	20,537	4.7	70.9
8. Mandaluyong	6,881	7,799	9.2	261	26.365	29.879	5,353	13,151	3.0	40.7
9. Marikina	1,241	1,406	1.7	506	2.452	2.779	6,833	8,239	1.9	82.9
10. Muntinlupa	71	80	0.1	106	0.667	0.756	34,280	34,360	7.8	99.8
11. Navotas	1,785	2,023	2.4	129	13.836	15.681	1,739	3,762	0.9	46.2
12. Paranaque	1,482	1,679	2.0	171	8.666	9.821	17,691	19,370	4.4	91.3
13. Pasig	7,128	8,079	9.6	277	25.734	29.165	60,077	68,156	15.5	88.1
14. Pateros	3	4	0.0	3	1.037	1.175	1,756	1,760	0.4	99.8
15. San Juan	1,059	1,200	1.4	147	7.201	8.161	59	1,259	0.3	4.7
16. Taguig	8	9	0.0	9	0.926	1.049	41,198	41,208	9.4	100.0
17. Valenzuela	1,026	1,162	1.4	285	3.599	4.079	26,600	27,763	6.3	95.8
II. CAVITE	1,014	1,149	1.4	1,346	0.753	0.853	5,889	7,037	1.6	83.7
1. Bacoor	62	70	0.1	61	1.014	1.149	0	70	0.0	0.0
2. Cavite City	210	238	0.3	250	0.840	0.952	0	238	0.1	0.0
3. Imus	6	7	0.0	7	0.906	1.027	530	538	0.1	98.7
4. Kawit	507	574	0.7	672	0.754	0.854	0	574	0.1	0.0
5. Noveleta	78	88	0.1	105	0.741	0.840	0	88	0.0	0.0
6. Rosario	151	171	0.2	251	0.602	0.682	5,358	5,530	1.3	96.9
III. RIZAL	1,747	1,980	2.3	195	8.959	10.153	68,328	70,308	16.0	97.2
1. Angono	-	-	-	-	-	-	-	-	-	-
2. Antipolo	1,565	1,773	2.1	44	35.561	40.301	12,025	13,798	3.1	87.1
3. Baras	-	-	-	-	-	-	-	-	-	-
4. Binangonan	-	-	-	-	-	-	-	-	-	-
5. Cainta	42	48	0.1	34	1.247	1.414	36,173	36,221	8.2	99.9
6. Cardona	-	-	-	-	-	-	-	-	-	-
7. Jala-Jala	-	-	-	-	-	-	-	-	-	-
8. Montalban	15	17	0.0	13	1.151	1.305	2,941	2,958	0.7	99.4
9. Morong	-	-	-	-	-	-	-	-	-	-
10. Pililla	-	-	-	-	-	-	-	-	-	-
11. San Mateo	48	55	0.1	47	1.029	1.166	604	658	0.1	91.7
12. Tanay	-	-	-	-	-	-	-	-	-	-
13. Taytay	77	87	0.1	57	1.343	1.522	16,586	16,672	3.8	99.5
14. Teresa	-	-	-	-	-	-	-	-	-	-
TOTAL	74,552	84,490	100.0	7,832	9.519	10.788	354,904	439,394	100.0	80.8

Billed Water Consumption categorized in Others are included in Industrial Consumption

TABLE 13.2.6 PER CAPITA DOMESTIC WATER DEMAND GROWTH

FOR GENERAL POPULATION

YEAR	PCIG(I) (1)	IED (2)	IR1(I) (3)	TI(I) (4)	PED (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)
1990	-9.17	0.30	-2.75	-0.77	-0.20	0.15	-2.60	1.0000
1991	14.72	0.30	4.42	-2.53	-0.20	0.51	4.92	1.0492
1992	-17.64	0.30	-5.29	-0.31	-0.20	0.06	-5.23	0.9943
1993	-1.22	0.30	-0.37	1.38	-0.20	-0.28	-0.64	0.9880
1994	-1.43	0.30	-0.43	1.38	-0.20	-0.28	-0.71	0.9810
1995	1.49	0.30	0.45	1.38	-0.20	-0.28	0.17	0.9827
1996	3.11	0.30	0.93	1.38	-0.20	-0.28	0.66	0.9891
1997	-3.01	0.30	-0.90	1.38	-0.20	-0.28	-1.18	0.9775
1998	-2.92	0.30	-0.88	1.38	-0.20	-0.28	-1.15	0.9662
1999	-3.00	0.30	-0.90	1.38	-0.20	-0.28	-1.18	0.9548
2000	-12.31	0.30	-3.69	1.38	-0.20	-0.28	-3.97	0.9169
2001	-1.28	0.30	-0.38	1.38	-0.20	-0.28	-0.66	0.9109
2002	-1.18	0.30	-0.35	1.38	-0.20	-0.28	-0.63	0.9052
2003	-1.08	0.30	-0.32	1.38	-0.20	-0.28	-0.60	0.8997
2004	-1.00	0.30	-0.30	1.38	-0.20	-0.28	-0.58	0.8945
2005	-0.91	0.30	-0.27	1.38	-0.20	-0.28	-0.55	0.8896
2006	-0.84	0.30	-0.25	1.38	-0.20	-0.28	-0.53	0.8849
2007	-0.77	0.30	-0.23	1.38	-0.20	-0.28	-0.51	0.8804
2008	-0.70	0.30	-0.21	1.38	-0.20	-0.28	-0.49	0.8762
2009	-0.63	0.30	-0.19	1.38	-0.20	-0.28	-0.46	0.8721
2010	-0.56	0.30	-0.17	1.38	-0.20	-0.28	-0.44	0.8682

FOR BLIGHTED POPULATION

YEAR	PCIG(I) (1)	IED (2)	IR1(I) (3)	TI(I) (4)	PED (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)
1990	0.00	0.11	0.00	-0.77	-0.06	0.05	0.05	1.0000
1991	0.00	0.11	0.00	-2.53	-0.06	0.15	0.15	1.0015
1992	0.00	0.11	0.00	-0.31	-0.06	0.02	0.02	1.0017
1993	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	1.0009
1994	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	1.0000
1995	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9992
1996	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9984
1997	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9976
1998	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9967
1999	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9959
2000	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9951
2001	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9943
2002	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9934
2003	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9926
2004	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9918
2005	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9910
2006	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9902
2007	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9893
2008	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9885
2009	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9877
2010	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9869

SOURCE: CORPLAN

(1) Per capita income growth in real terms in year I (%)
(2) Income elasticity of consumption
(3) Increase rate by income growth in year I (1) * (2) (%)
(4) Tariff increase in real terms in year I (%)
(5) Price elasticity of consumption
(6) Increase rate by tariff increase in year I (4) * (5) (%)
(7) Increase rate in year I (%)
(8) Increase index in year I, 1.0000 in base year 1990

TABLE 13.2.7 PER CAPITA DOMESTIC CONSUMPTION PROJECTION

CITY/MUNICIPALITY	1990	1995	2000	2005	2010
I. NCR	174				
CITY OF MANILA	181	186	191	195	200
PASAY CITY *a	151	180	187	193	200
QUEZON CITY	184	188	192	196	200
CALOOCAN CITY *a	134	180	187	193	200
LAS PINAS *s	51	180	187	193	200
MAKATI	206	210	213	217	220
MALABON *a	128	180	187	193	200
MANDALUYONG	164	180	187	193	200
MARIKINA	181	186	190	195	200
MUNTINLUPA *s	89	180	187	193	200
NAVOTAS *a	86	180	187	193	200
PARANAQUE	324	305	287	268	250
PASIG	180	185	190	195	200
PATEROS *a	99	180	187	193	200
SAN JUAN	249	249	249	250	250
TAGUIG *a	109	180	187	193	200
VALENZUELA *a	124	180	187	193	200
II. CAVITE	95				
BACOOR *s, f	90	180	187	193	200
CAVITE CITY *f	94	180	187	193	200
IMUS *f	116	180	187	193	200
KAWIT *f	100	180	187	193	200
NOVELETA **	86	180	187	193	200
ROSARIO *f	87	180	187	193	200
III. RIZAL	105				
ANGONO *r	-	141	160	181	205
ANTIPOLO *f	110	138	149	155	162
BARAS *r	-	141	160	181	205
BINANGONAN *r	-	141	160	181	205
CAINTA *a	123	180	187	193	200
CARDONA *r	-	141	160	181	205
JARA-JARA *r	-	141	160	181	205
MONTALBAN *f	103	111	118	124	129
MORONG *r	-	141	160	181	205
PILILLA *r	-	141	160	181	205
SAN MATEO *f	81	178	190	204	219
TANAY *r	-	141	160	181	205
TAYTAY *a	112	180	187	193	200
TERESA *r	-	141	160	181	205

1. Areas with <*a> have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with <*s> also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with <*f> have suppressed demand due to limited water sources, and be expected to be improved by FAWSP.
4. Areas with <*r> are merged area under BP799, and be expected to be improved by RPWSIP.
5. Per capita water demand in Noveleta was assumed to be same as the one in Kawit

TABLE 13.2.8 ESTIMATED SERVED POPULATION IN THE NCR IN 1990, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (1990)			ESTIMATED SERVED POPULATION			SERVED % TO TOTAL			CORRECTED POPULATION			SERVED % TO CORRECTED POP.	
	TOTAL (CENSUS)	GENERAL (ESTIMATED)	BLIGHTED (ESTIMATED)	TOTAL	H.S.C. (ESTIMATED)	PUBLIC FAUCETS (ESTIMATED)	TOTAL	H.S.C.	P.F.	GENERAL	WATER BLIGHTED	BL'D % TO TOTAL	GENERAL	WATER BL'D
							TOTAL	GENERAL	BL'D					
NCR	7,928,867	5,123,288	2,805,579	4,985,534	4,761,002	224,532	62.9	92.9	8.0	5,701,383	2,227,484	28.1	83.5	10.1
CITY OF MANILA	1,598,918	1,173,606	425,312	1,297,717	1,255,921	41,796	81.2	107.0	9.8	1,255,921	342,997	21.5	100.0	12.2
PASAY CITY *a	366,623	46,928	319,695	219,243	203,205	16,038	59.8	433.0	5.0	203,205	163,418	44.6	100.0	9.8
QUEZON CITY	1,666,766	911,721	755,045	1,274,503	1,193,341	81,162	76.5	130.9	10.7	1,193,341	473,425	28.4	100.0	17.1
CALOOCAN CITY *a	761,011	456,607	304,404	381,777	361,851	19,926	50.2	79.2	6.5	456,607	304,404	40.0	79.2	6.5
LAS PINAS *s	296,851	243,418	53,433	68,194	64,306	3,888	23.0	26.4	7.3	243,418	53,433	18.0	26.4	7.3
MAKATI	452,734	369,884	82,850	328,131	325,701	2,430	72.5	88.1	2.9	369,884	82,850	18.3	88.1	2.9
MALABON *a	278,380	198,763	79,617	155,131	145,897	9,234	55.7	73.4	11.6	198,763	79,617	28.6	73.4	11.6
MANDALUYONG	244,538	157,727	86,811	182,129	172,895	9,234	74.5	109.6	10.6	172,895	71,644	29.3	100.0	12.9
MARIKINA	310,010	204,975	105,035	240,530	229,352	11,178	77.6	111.9	10.6	229,352	80,659	26.0	100.0	13.9
MUNTINLUPA *s	276,972	197,481	79,491	44,591	44,591	0	16.1	22.6	0.0	197,481	79,491	28.7	22.6	0.0
NAVOTAS *a	186,799	93,400	93,399	114,656	111,740	2,916	61.4	119.6	3.1	111,740	75,060	40.2	100.0	3.9
PARANAQUE	307,717	275,407	32,310	118,033	109,771	8,262	38.4	39.9	25.6	275,407	32,310	10.5	39.9	25.6
PASIG	397,309	284,473	112,836	274,509	264,303	10,206	69.1	92.9	9.0	284,473	112,836	28.4	92.9	9.0
PATEROS *a	51,401	42,920	8,481	19,027	19,027	0	37.0	44.3	0.0	42,920	8,481	16.5	44.3	0.0
SAN JUAN	125,708	113,404	13,304	107,981	104,093	3,888	85.2	91.8	29.2	113,404	13,304	10.5	91.8	29.2
TAGUIG *a	266,080	199,551	66,529	34,344	32,886	1,458	12.9	16.5	2.2	199,551	66,529	25.0	16.5	2.2
VALENZUELA *a	340,050	153,023	187,027	125,040	122,124	2,916	36.8	79.8	1.6	153,023	187,027	55.0	79.8	1.6

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.

TABLE 13.2.9 MODIFIED WATER-BLIGHTED POPULATION IN NCR, BY CITY/MUNICIPALITY

CITY/ MUNICIPALITY	1990 TOTAL POPULATION	1990 BLIGHTED POPULATION	1990 %	1995 TOTAL POPULATION	1995 WATER BLIGHTED POPULATION	2000 TOTAL POPULATION	2000 WATER BLIGHTED POPULATION	2005 TOTAL POPULATION	2005 WATER BLIGHTED POPULATION	2010 TOTAL POPULATION	2010 WATER BLIGHTED POPULATION
1. Manila City	1,598,918	244,184	15.3	1,666,014	253,102	1,705,567	257,958	1,723,126	259,690	1,723,147	258,959
2. Pasay City	366,623	116,339	31.7	402,932	127,193	433,048	136,092	457,147	143,156	475,225	148,397
3. Quezon City	1,666,766	337,037	20.2	1,870,519	376,263	2,049,017	410,335	2,200,635	439,136	2,323,154	462,274
4. Caloocan City	761,011	216,709	28.5	872,801	247,245	979,527	276,244	1,076,883	302,624	1,164,630	326,356
5. Las Pinas	296,851	38,040	12.8	413,469	52,707	551,808	70,029	708,704	89,621	878,109	110,730
6. Makati	452,734	58,982	13.0	489,333	63,417	517,961	66,829	539,315	69,337	553,794	70,997
7. Malabon	278,380	56,680	20.4	305,870	61,952	328,653	66,271	346,868	69,696	360,515	72,233
8. Mandaluyong	244,538	51,004	20.9	265,870	55,164	282,944	58,445	296,044	60,935	305,315	62,665
9. Marikina	310,010	57,422	18.5	359,368	66,217	405,480	74,381	447,289	81,760	483,621	88,151
10. Muntinlupa	276,972	56,591	20.4	346,829	70,494	419,918	84,969	493,739	99,553	565,215	113,642
11. Navotas	186,799	53,436	28.6	207,567	59,067	225,328	63,836	240,031	67,760	251,550	70,811
12. Paranaque	307,717	23,002	7.5	369,370	27,466	430,253	31,851	488,493	36,035	541,964	39,866
13. Pasig	397,309	80,329	20.2	466,552	93,837	532,663	106,657	593,888	118,495	648,283	128,982
14. Pateros	51,401	6,038	11.7	58,438	6,828	64,776	7,535	70,318	8,151	74,945	8,663
15. San Juan	126,708	9,471	7.5	133,478	9,925	137,583	10,185	140,304	10,350	141,007	10,372
16. Taguig	266,080	47,363	17.8	311,031	55,075	353,627	62,339	392,792	68,998	427,323	74,851
17. Valenzuela	340,050	133,147	39.2	432,359	168,407	530,824	205,839	632,076	244,234	731,811	281,971
T O T A L	7,928,867	1,585,773	20.0	8,971,800	1,794,360	9,948,977	1,989,795	10,847,652	2,169,530	11,649,608	2,329,922

TABLE 13.2.10 PROJECTED DOMESTIC WATER CONSUMPTION IN 1995, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (1995)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (1995)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOM. CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	8,971,800	7,177,440	1,794,360	192	35	1,379,354	62,803	1,442,157	80	30	70	5,777,280	542,543	6,319,823	1,107,301	18,983	1,126,283	272,054	43,814	315,868
CITY OF MANILA	1,666,014	1,412,912	253,102	186	35	262,886	8,859	271,745	95	30	85	1,342,266	75,931	1,418,197	249,742	2,658	252,399	13,144	6,201	19,345
PASAY CITY *a	402,932	275,239	127,193	180	35	49,633	4,452	54,085	85	30	68	234,378	38,158	272,536	42,188	1,336	43,524	7,445	3,116	10,561
QUEZON CITY	1,370,519	1,494,256	376,263	188	35	280,548	13,169	293,717	95	30	82	1,419,543	112,899	1,532,422	266,521	3,951	270,472	14,022	9,218	23,240
CALOOCAN CITY *a	872,801	625,556	247,245	180	35	112,600	8,654	121,254	70	30	59	437,889	74,174	512,063	78,820	2,596	81,416	33,780	6,058	39,838
LAS PINAS *a	613,469	360,782	52,707	180	35	64,937	1,845	66,782	45	30	43	162,343	15,812	178,155	29,221	553	29,775	35,715	1,286	37,001
MAKATI	489,333	425,816	63,417	210	35	89,221	2,220	91,451	90	30	82	383,324	19,025	402,349	80,308	666	80,974	8,923	1,554	10,477
MALABON *a	305,870	243,818	61,952	180	35	43,905	2,168	46,074	70	30	62	170,742	18,586	189,328	30,734	650	31,384	13,172	1,518	14,689
MANDALUYONG	285,870	210,706	55,164	180	35	37,927	1,931	39,858	95	30	82	200,171	16,549	216,720	36,033	579	36,610	1,895	1,352	3,246
MARIKINA	359,368	293,151	66,217	186	35	54,423	2,318	56,741	95	30	83	278,493	19,865	298,359	51,702	695	52,397	2,721	1,622	4,343
MUNTINLUPA *a	346,829	276,335	70,494	180	35	49,740	2,467	52,208	40	30	38	110,534	21,148	131,682	19,896	740	20,636	29,844	1,727	31,571
NAVOTAS *a	207,567	148,530	59,067	180	35	26,730	2,068	28,797	90	30	73	133,650	17,720	151,370	24,057	620	24,677	2,672	1,447	4,120
PARANAQUE *a	359,370	341,904	17,466	305	35	104,333	961	105,294	80	40	55	205,142	10,987	216,129	82,600	385	82,984	41,733	577	42,310
PASIG	455,552	372,715	83,837	185	35	68,833	3,284	72,117	90	30	78	335,444	28,151	363,595	61,949	985	62,935	6,883	2,299	9,182
PATEROS *a	58,438	51,610	6,828	180	35	9,290	239	9,529	65	30	43	33,224	2,049	35,273	6,180	72	4,252	5,109	167	5,277
SAN JUAN	133,478	123,553	9,925	249	35	30,794	347	31,141	95	45	91	117,375	4,466	121,841	29,254	156	29,410	1,540	191	1,731
TAGUIG *a	388,031	255,956	55,075	180	35	46,072	1,928	48,000	20	20	22	51,191	16,523	67,714	9,214	578	9,793	36,858	1,349	38,207
VALENZUELA *a	432,359	263,952	168,407	180	35	47,511	5,894	53,406	65	30	51	171,569	50,522	222,091	30,882	1,768	32,651	16,629	4,126	20,755
II. CAVITE	534,343	515,406	18,937	180	35	92,773	652	93,425	48	30	47	245,186	5,667	250,853	44,133	198	44,332	48,640	454	49,094
BACOOR *f,s	196,836	189,262	7,574	180	35	34,067	258	34,325	45	30	44	85,168	2,212	87,380	15,330	77	15,408	18,737	181	18,918
CAVITE CITY *f	98,576	98,654	1,922	180	35	17,398	67	17,465	62	54	63	60,656	1,035	61,689	10,918	36	10,954	5,480	31	5,511
IMUS *f	107,152	103,813	3,349	180	35	18,686	117	18,804	43	28	41	43,045	937	43,982	7,748	33	7,781	10,938	84	11,023
KAWIT *f	55,287	54,555	692	180	35	9,820	23	9,843	69	67	69	37,702	442	38,144	6,786	15	6,802	3,034	8	3,041
NOVELETA	23,325	22,511	814	180	35	4,052	28	4,080	25	30	25	5,628	344	5,972	1,013	9	1,022	3,039	20	3,059
ROSARIO *f	53,127	48,611	4,516	180	35	8,750	158	8,908	27	18	26	12,989	797	13,786	2,338	28	2,366	6,412	130	6,542
III. RIZAL	1,149,930	660,355	489,575	154	34	101,805	16,835	118,640	47	10	31	308,031	46,718	354,749	45,785	1,752	47,536	56,021	15,083	71,104
ANGONO *r	55,062	22,025	33,037	141	35	3,115	1,156	4,271	100	0	40	22,025	0	22,025	3,115	0	3,115	0	1,156	1,156
ANTIPOLO *f	261,738	206,574	53,064	138	39	28,796	2,068	30,864	37	23	34	76,871	12,330	89,241	10,608	482	11,090	18,188	1,586	19,774
BARAS *r	19,851	898	18,153	141	31	127	558	685	100	0	5	898	0	898	127	0	127	0	558	558
BINANGONAN *r	140,791	49,553	91,238	141	34	7,008	3,109	10,117	100	0	35	49,553	0	49,553	7,008	0	7,008	0	3,109	3,109
CAINTA *a	164,650	131,720	32,930	180	35	23,710	1,153	24,862	25	30	28	32,930	9,879	42,809	5,927	346	6,273	17,782	807	18,589
CARDONA *r	35,194	3,465	31,729	141	30	490	966	1,456	100	0	10	3,465	0	3,465	490	0	490	0	966	966
JALA-JALA *r	17,814	517	17,297	141	31	73	542	615	100	0	3	517	0	517	73	0	73	0	542	542
MONTALBAN *f	75,766	58,344	16,822	111	39	6,538	657	7,195	56	41	52	32,779	6,841	39,620	3,636	267	3,903	2,902	390	3,292
MORONG *r	34,528	6,750	27,778	141	31	955	861	1,816	100	0	20	6,750	0	6,750	955	0	955	0	861	861
PILILLA *r	36,123	4,968	31,159	141	32	703	993	1,696	100	0	14	4,968	0	4,968	703	0	703	0	993	993
SAN MATEO *f	92,401	50,515	41,886	178	39	8,995	1,636	10,630	44	24	35	22,275	9,859	32,134	3,957	385	4,342	5,038	1,251	6,289
TANAY *r	65,833	15,347	50,483	141	33	2,170	1,656	3,826	100	0	23	15,347	0	15,347	2,170	0	2,170	0	1,656	1,656
TAYTAY *a	129,481	103,585	25,896	180	35	18,645	906	19,552	35	30	34	36,255	7,759	44,014	6,526	232	6,758	12,119	674	12,794
TERESA *r	21,503	3,394	18,113	141	32	480	575	1,055	100	0	16	3,394	0	3,394	480	0	480	0	575	575
TOTAL	10,655,773	8,353,201	2,302,572	188	35	1,573,933	80,290	1,654,262	76	26	65	6,330,496	594,929	6,925,425	1,197,219	20,939	1,218,158	376,754	59,351	436,105

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by SSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by FAWSP.
4. Areas with (*r) are merged area under BP795, and be expected to be improved by RPWSIP.

TABLE 13.2.11 PROJECTED DOMESTIC WATER CONSUMPTION IN 2000, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2000)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2000)			NWSS CONNECTED %			NWSS CONNECTED POPULATION			NWSS DOMESTIC CONSUMPTION			PRIVATE DOMESTIC CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	NWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	9,568,977	7,959,182	1,983,795	196	35	1,552,371	59,643	1,632,014	88	60	83	1,026,290	1,193,877	8,220,167	1,378,486	41,786	1,420,282	183,955	27,857	211,812
CITY OF MANILA	1,705,567	1,447,609	257,958	191	35	276,069	9,029	285,097	95	60	90	1,375,228	154,375	1,530,603	262,265	5,417	267,682	13,803	3,611	17,415
PASAY CITY *a	433,048	296,956	136,092	187	35	55,432	4,763	60,195	90	60	81	267,260	81,655	348,916	49,885	2,858	52,747	5,543	1,905	7,448
QUEZON CITY	2,049,017	1,638,682	410,335	192	35	314,355	14,362	328,717	95	60	88	1,556,748	246,201	1,802,949	298,633	8,617	307,254	15,718	5,745	21,462
CALOOCAN CITY *a	979,527	703,283	276,244	187	35	131,280	9,669	140,948	80	60	74	562,627	165,346	728,373	105,024	5,801	110,825	25,256	3,867	30,123
LAS PINAS *a	551,808	481,779	70,029	187	35	89,932	2,451	92,383	75	60	73	361,335	42,017	403,352	67,445	1,471	68,920	22,483	980	23,463
MAKATI	517,961	451,132	66,829	203	35	91,093	2,339	93,432	95	60	90	428,576	40,097	468,673	91,288	1,403	92,691	4,885	936	5,740
MALABON *a	328,653	262,382	66,271	187	35	48,978	2,319	51,297	80	60	76	209,906	39,762	249,668	39,182	1,392	40,574	9,796	928	10,723
MANDALUYONG	282,944	224,499	58,445	189	35	41,906	2,046	43,952	95	60	88	213,274	35,067	248,341	39,811	1,227	41,038	2,095	818	2,914
MARIKINA	405,490	331,099	74,391	190	35	61,052	2,603	65,656	95	60	89	314,544	44,628	359,173	59,900	1,562	61,462	3,153	1,041	4,194
MUNTINLUPA *a	419,818	334,949	84,869	187	35	62,524	2,374	65,498	75	60	72	251,211	50,982	302,193	46,893	1,784	48,677	15,631	1,190	16,821
NAVOTAS *a	225,328	161,492	63,836	187	35	30,145	2,234	32,379	95	60	85	153,417	38,302	191,719	28,638	1,341	29,978	1,507	894	2,401
PARANAQUE *a	430,253	398,402	31,851	287	35	114,249	1,115	115,364	89	60	79	318,721	19,111	337,832	91,399	669	92,068	22,850	446	23,296
PASIG	532,663	425,006	106,657	190	35	80,850	3,733	84,583	95	60	88	404,306	63,994	468,300	76,887	2,240	79,047	4,043	1,493	5,536
PATEROS *a	64,776	57,241	7,535	187	35	10,685	264	10,949	70	60	69	40,068	4,521	44,590	7,479	158	7,638	3,205	106	3,311
SAN JUAN	137,583	127,398	10,185	249	35	31,784	356	32,141	95	60	93	121,028	6,111	127,139	30,195	214	30,409	1,589	143	1,732
TAGUIG *a	353,623	291,288	62,339	187	35	54,374	2,182	56,556	70	60	68	203,902	37,403	241,305	38,062	1,309	39,371	16,312	873	17,185
VALENZUELA *a	530,824	324,985	205,839	187	35	60,664	7,204	67,868	75	60	69	243,738	123,584	367,242	45,598	4,323	49,820	15,066	2,882	18,048
II. CAVITE	611,062	593,551	17,511	187	35	110,796	613	111,409	71	46	70	420,474	7,997	428,471	78,688	280	78,768	32,108	333	32,441
BACOOR *f,s	235,538	228,354	7,184	187	35	42,626	251	42,878	80	60	79	182,683	4,310	186,994	34,101	151	34,252	8,525	101	8,626
CAVITE CITY *f	104,379	102,876	1,503	187	35	19,204	53	19,256	78	58	78	80,123	877	80,998	14,956	31	14,987	4,248	22	4,270
IMUS *f	121,860	118,797	3,063	187	35	22,175	107	22,283	57	39	57	67,721	1,207	68,928	12,641	42	12,683	9,534	65	9,599
KAWIT *f	52,446	51,928	518	187	35	11,568	18	11,586	84	76	84	52,015	333	52,408	9,708	14	9,722	1,850	4	1,854
NOVELETA	28,102	25,354	748	187	35	4,733	26	4,759	64	48	64	16,311	360	16,671	3,045	13	3,057	1,688	14	1,702
ROSARIO *f	68,737	66,242	4,495	187	35	10,499	157	10,656	38	19	37	21,622	850	22,473	4,036	30	4,066	6,462	128	6,590
III. REGAL	1,325,612	853,057	462,355	165	35	142,305	16,187	158,891	66	11	67	565,460	52,168	621,628	94,949	2,042	96,991	47,755	14,145	61,900
ANGONO *r	64,283	32,110	32,109	160	35	5,138	1,124	6,262	100	0	50	32,110	0	32,110	5,138	0	5,138	0	1,124	1,124
ANTIPOLO *f	319,849	263,155	56,694	149	42	39,166	2,381	41,547	44	24	40	115,023	13,380	128,403	17,128	562	17,690	22,038	1,819	23,857
BARAS *r	21,063	1,883	19,880	160	31	189	610	799	100	0	6	1,883	0	1,883	189	0	189	0	610	610
BINANGONAN *r	152,533	68,131	84,402	160	34	10,902	2,873	13,775	100	0	45	68,131	0	68,131	10,902	0	10,902	0	2,873	2,873
CAINTA *a	206,860	186,174	20,686	187	35	34,758	724	35,476	80	60	69	130,322	12,412	142,733	24,327	434	24,761	10,426	290	10,715
CARDONA *r	36,995	3,545	33,050	160	30	631	1,005	1,636	100	0	11	3,545	0	3,545	631	0	631	0	1,005	1,005
JALA-JALA *r	19,106	1,681	17,428	160	31	269	542	811	100	0	9	1,681	0	1,681	269	0	269	0	542	542
MONTALBAN *f	83,827	68,324	15,813	118	42	8,050	664	8,714	67	44	62	45,263	6,902	52,165	5,354	290	5,644	2,696	324	3,020
MORONG *r	36,951	7,832	29,125	160	31	1,253	900	2,153	100	0	21	7,832	0	7,832	1,253	0	1,253	0	900	900
PILILLA *r	39,119	7,254	31,865	160	32	1,161	1,010	2,171	100	0	15	7,254	0	7,254	1,161	0	1,161	0	1,010	1,010
SAN MATEO *f	101,673	60,502	41,077	190	42	11,539	1,725	13,264	56	26	44	33,817	10,575	44,392	6,439	444	6,883	5,100	1,281	6,381
TANAY *r	72,764	24,525	48,239	160	33	3,924	1,570	5,494	100	0	34	24,525	0	24,525	3,924	0	3,924	0	1,570	1,570
TAYTAY *a	148,322	133,490	14,832	187	35	24,918	539	25,457	70	60	69	93,443	8,899	102,342	17,443	311	17,754	7,475	228	7,703
TERESA *r	22,106	4,951	17,155	160	31	792	539	1,331	100	0	22	4,951	0	4,951	792	0	792	0	539	539
TOTAL	11,885,451	9,415,790	2,469,661	193	35	1,815,872	86,442	1,902,314	85	51	78	8,016,224	1,254,042	9,270,266	1,551,854	44,107	1,595,962	264,088	42,335	306,353

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by KSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by PAWSP.
4. Areas with (*r) are merged area under BP199, and be expected to be improved by RPWSIP.

TABLE 13.2.12 PROJECTED DOMESTIC WATER CONSUMPTION IN 2005, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2005)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2005)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOMESTIC CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	10,847,652	8,678,122	2,169,530	200	35	1,738,884	75,934	1,814,818	91	10	87	7,895,821	1,518,671	9,414,493	1,581,188	53,153	1,634,341	157,696	22,780	180,476
CITY OF MANILA	1,123,128	1,462,436	259,690	195	35	285,867	9,089	294,976	95	10	91	1,390,264	181,783	1,572,047	271,593	6,362	277,955	14,294	2,727	17,021
PASAY CITY *a	457,147	313,991	143,156	193	35	60,705	5,010	65,715	95	10	87	298,291	100,209	398,501	57,679	3,507	61,187	3,035	1,503	4,538
QUEZON CITY	2,200,635	1,761,499	439,136	196	35	345,108	15,380	360,477	95	10	90	1,673,624	307,395	1,980,819	327,852	10,759	338,611	17,255	4,611	21,866
CALOOCAN CITY *a	1,076,882	774,259	302,624	193	35	149,650	10,592	160,242	85	10	83	658,121	211,836	869,957	127,237	7,414	134,651	22,454	3,178	25,631
LAS PINAS *a	308,704	619,083	89,621	193	35	119,689	3,137	122,826	85	10	83	526,220	62,735	588,955	101,736	2,196	103,932	17,953	941	18,894
MAKATI	539,315	469,978	69,337	217	35	101,758	2,428	104,178	95	10	92	446,679	68,536	495,215	86,663	1,699	88,362	5,088	728	5,816
MALABON *a	346,868	277,172	69,696	193	35	53,501	2,433	55,026	85	10	82	235,596	48,787	284,383	45,549	1,706	47,256	8,038	732	8,770
MANDALUYONG	296,044	235,109	60,935	193	35	45,454	2,133	47,587	95	10	90	223,354	42,654	266,008	43,182	1,493	44,675	2,272	640	2,913
MARIKINA	447,269	365,529	81,760	195	35	71,351	2,862	74,219	95	10	90	347,253	57,232	404,485	67,789	2,003	69,793	3,568	858	4,426
MUNTINLUPA *a	693,735	594,186	99,553	193	35	76,209	3,484	79,694	85	10	82	505,058	69,687	574,745	97,778	2,439	100,217	11,431	1,045	12,477
NAVOTAS *a	240,033	172,271	67,760	193	35	33,306	2,372	35,677	95	10	88	163,657	67,432	231,089	31,640	1,660	33,300	1,665	711	2,377
PARANAQUE *a	638,493	452,458	36,035	268	35	121,433	1,261	122,694	85	10	84	384,590	25,224	409,814	103,218	883	104,101	18,215	378	18,593
PASIG	593,888	475,393	118,495	195	35	92,651	4,147	96,798	95	10	90	451,624	82,946	534,570	88,018	2,903	90,921	4,633	1,244	5,877
PATEROS *a	70,318	62,167	8,151	193	35	12,019	285	12,304	80	10	79	49,734	5,706	55,439	9,615	200	9,815	2,404	85	2,489
SAN JUAN	140,304	129,954	10,350	250	35	32,455	362	32,818	95	10	93	122,457	7,245	130,701	30,833	254	31,086	1,623	109	1,731
TAGUIG *a	392,792	323,794	68,998	193	35	62,600	2,415	65,015	80	10	78	259,035	48,299	307,334	50,080	1,690	51,771	12,520	726	13,245
VALENZUELA *a	632,076	387,842	244,234	193	35	74,983	8,548	83,531	85	10	79	329,566	170,964	500,530	63,735	5,984	69,719	11,247	2,564	13,812
II. CAVITE	686,825	670,951	15,874	193	35	129,717	556	130,273	80	54	80	538,520	8,520	547,040	104,114	298	104,412	25,603	258	25,861
BACOOR *f,s	295,150	288,616	6,534	193	35	51,932	229	52,161	85	10	85	228,324	4,574	232,897	44,143	160	44,303	7,790	68	7,858
CAVITE CITY *f	109,908	108,804	1,104	193	35	21,035	39	21,074	93	85	93	101,384	940	102,324	19,601	33	19,634	1,635	6	1,640
IMUS *f	135,818	133,081	2,737	193	35	25,725	98	25,825	68	42	67	90,389	1,165	91,544	17,475	40	17,516	8,254	55	8,309
KAWIT *f	69,254	68,838	416	193	35	13,309	15	13,323	95	100	96	65,722	416	66,138	12,706	15	12,721	603	0	603
NOVELETA	28,673	28,010	663	193	35	5,435	23	5,439	76	53	75	21,612	415	21,827	4,140	15	4,154	1,276	9	1,284
ROSARIO *f	68,022	63,601	4,421	193	35	12,256	155	12,451	49	23	47	31,290	1,020	32,310	6,049	36	6,085	6,247	119	6,366
III. RIZAL	1,503,411	1,052,571	450,840	175	35	184,124	15,568	200,092	74	13	56	795,105	59,481	854,586	137,601	2,350	139,950	46,523	13,618	60,142
ANGONO *r	72,919	43,787	29,132	181	35	7,927	1,022	8,949	100	0	60	43,787	0	43,787	7,927	0	7,927	0	1,022	1,022
ANTIPOLO *f	379,156	338,179	59,975	155	44	49,458	2,539	52,097	50	22	46	160,880	13,295	174,175	24,929	585	25,514	24,529	2,054	26,583
BARAS *r	22,808	2,215	20,593	181	31	401	529	1,930	100	0	10	2,215	0	2,215	401	0	401	0	629	629
BINANGONAN *r	162,155	87,908	74,247	181	34	15,915	2,520	18,435	100	0	54	87,908	0	87,908	15,915	0	15,915	0	2,520	2,520
CAINTA *a	251,447	226,302	25,145	193	35	43,752	880	44,632	80	70	79	181,042	17,681	198,643	35,001	816	35,817	8,750	264	9,014
CARDONA *r	38,270	4,645	33,625	181	30	841	1,021	1,862	100	0	12	4,645	0	4,645	841	0	841	0	1,021	1,021
JALA-JALA *r	20,131	3,137	16,994	181	31	568	526	1,094	100	0	16	3,137	0	3,137	568	0	568	0	526	526
MONTALBAN *f	90,865	77,407	13,458	124	44	9,560	591	10,152	76	48	72	58,758	6,387	65,145	7,257	281	7,538	2,303	310	2,614
MORONG *r	40,222	9,762	30,459	181	31	1,768	940	2,708	100	0	24	9,762	0	9,762	1,768	0	1,768	0	940	940
PILILLA *r	43,556	11,935	25,621	181	31	2,161	928	3,089	100	0	29	11,935	0	11,935	2,161	0	2,161	0	928	928
SAN MATEO *f	109,620	71,766	37,854	224	44	16,041	1,666	16,307	66	27	53	47,653	10,086	57,739	8,722	444	10,166	4,919	1,222	6,141
TANAY *r	78,789	32,489	46,300	181	32	5,882	1,497	7,379	100	0	41	32,489	0	32,489	5,882	0	5,882	0	1,497	1,497
TAYTAY *a	173,025	155,723	17,303	193	35	30,106	606	30,712	80	70	79	124,578	12,112	136,690	24,085	424	24,509	6,021	182	6,203
TERESA *r	22,410	6,315	16,095	181	31	1,143	504	1,647	100	0	28	6,315	0	6,315	1,143	0	1,143	0	504	504
TOTAL	13,037,888	10,401,643	2,636,245	197	35	2,052,725	92,458	2,145,183	88	60	82	9,289,447	1,586,672	10,796,118	1,822,902	55,802	1,878,704	229,823	36,656	266,479

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by PAWSP.
4. Areas with (*r) are merged area under EP799, and be expected to be improved by RPWSIP.

TABLE 13.2.13 PROJECTED DOMESTIC WATER CONSUMPTION IN 2010, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2010)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2010)			NWSS CONNECTED %			NWSS CONNECTED POPULATION			NWSS DOMESTIC CONSUMPTION			PRIVATE DOM. CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	NWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	11,869,608	9,319,686	2,329,922	204	35	1,905,230	81,541	1,986,777	92	75	89	8,581,840	1,747,441	10,329,281	1,753,085	61,160	1,814,246	152,144	20,387	172,531
CITY OF MANILA	1,923,147	1,464,198	458,959	200	35	292,826	9,064	301,901	95	75	92	1,390,978	356,219	1,585,198	278,196	6,798	284,993	14,642	2,266	16,908
PASAY CITY *a	415,225	326,828	148,397	200	35	65,366	5,194	70,560	95	75	89	310,687	111,298	421,184	62,097	3,895	65,993	3,268	1,298	4,567
QUEZON CITY	2,323,154	1,860,880	462,274	200	35	372,176	16,180	388,356	95	75	91	1,767,836	346,705	2,114,542	353,567	12,135	365,702	18,609	4,045	22,654
CALOOCAN CITY *a	1,194,630	838,274	326,356	200	35	167,655	11,422	179,077	90	75	86	754,446	244,767	999,214	150,889	8,567	159,456	16,765	2,856	19,621
LAS PINAS *a	678,109	767,379	110,730	200	35	153,476	3,876	157,351	85	75	84	652,232	83,047	735,280	130,454	2,907	133,361	23,021	969	23,990
MAKATI	553,794	482,797	70,997	220	35	106,215	2,485	108,700	95	75	92	458,653	53,248	511,905	100,904	1,864	102,768	5,311	621	5,932
MALABON *a	360,515	288,282	72,233	200	35	57,656	2,528	60,185	90	75	87	259,454	54,175	313,629	51,891	1,896	53,787	5,766	632	6,398
MANDALUYONG	305,315	242,650	62,665	200	35	48,530	2,193	50,723	95	75	91	230,513	46,999	277,512	46,103	1,645	47,748	2,426	548	2,975
MARIKINA	483,621	395,470	88,151	200	35	79,094	3,085	82,179	95	75	91	375,697	66,813	442,510	75,139	2,314	77,453	3,955	771	4,726
MUNTINLUPA *a	565,215	451,573	113,642	200	35	90,315	3,977	94,292	85	75	83	383,831	85,232	469,063	76,767	2,983	79,750	13,547	994	14,542
NAVOTAS *a	251,550	180,739	70,811	200	35	36,148	2,478	38,626	95	75	89	171,702	53,109	224,810	34,340	1,859	36,199	1,807	620	2,427
PARANAQUE *a	541,964	502,098	39,866	250	35	125,525	1,395	126,920	85	75	84	426,783	29,899	456,682	106,696	1,046	107,742	18,829	349	19,178
PASIG	648,283	519,301	128,982	200	35	103,860	4,514	108,375	95	75	91	493,336	96,736	590,072	98,667	3,386	102,053	5,193	1,129	6,322
PATEROS *a	74,345	66,282	8,063	200	35	13,256	303	13,560	90	75	88	59,654	6,497	66,151	11,931	227	12,158	1,326	76	1,401
SAN JUAN	141,307	130,635	10,372	250	35	32,659	363	33,022	95	75	94	124,103	7,779	131,882	31,035	272	31,298	1,623	91	1,714
TAGUIG *a	427,323	352,472	74,851	200	35	70,494	2,620	73,114	90	75	87	317,224	56,139	373,363	63,445	1,965	65,410	7,049	655	7,704
VALENZUELA *a	731,881	449,840	281,931	200	35	89,968	9,869	99,837	90	75	84	404,856	211,479	616,334	80,971	7,402	88,373	8,993	2,467	11,464
II. CAVITE	756,085	744,387	11,698	200	35	148,877	409	149,287	87	56	86	644,597	6,494	651,190	128,939	227	129,167	19,938	182	20,120
BACOOR *f,s	313,838	309,444	4,394	200	35	61,889	154	62,043	85	75	85	263,027	3,296	266,323	52,605	115	52,721	9,283	38	9,322
CAVITE CITY *f	112,628	111,952	676	200	35	22,390	24	22,414	100	100	100	111,952	676	112,628	22,390	24	22,414	0	0	0
IMUS *f	148,542	146,579	1,963	200	35	29,316	69	29,385	85	51	84	124,258	995	125,253	24,852	35	24,886	4,464	34	4,498
KAWIT *f	75,401	75,106	301	200	35	15,021	11	15,032	100	100	100	75,106	302	75,407	15,021	11	15,032	0	0	0
NOVELETA	30,955	30,476	479	200	35	6,095	17	6,112	87	68	86	26,422	328	26,751	5,284	11	5,296	811	5	816
ROSARIO *f	74,715	70,830	3,885	200	35	14,166	136	14,302	62	23	60	43,032	897	44,929	8,786	31	8,818	5,380	105	5,484
III. RIZAL	1,667,207	1,242,272	424,936	186	36	230,791	15,185	245,976	81	14	64	1,006,835	61,112	1,067,947	190,411	2,405	192,815	40,381	12,780	53,161
ANGONO *r	80,788	56,552	24,236	205	35	11,583	848	12,431	100	0	70	56,552	0	56,552	11,583	0	11,583	0	848	848
ANTIPOLO *f	635,886	376,317	59,569	162	46	60,883	2,740	63,623	58	19	63	218,993	11,261	230,254	35,430	518	35,948	25,453	2,222	27,675
BARAS *r	24,182	3,412	20,770	205	30	699	630	1,329	100	0	14	3,412	0	3,412	699	0	699	0	630	630
BINANGONAN *r	169,117	108,067	61,050	205	34	22,135	2,063	24,198	100	0	64	108,067	0	108,067	22,135	0	22,135	0	2,063	2,063
CAINTA *a	295,646	266,082	29,565	200	35	53,216	1,035	54,251	90	75	89	239,473	22,173	261,647	47,895	776	48,671	5,322	259	5,580
CARDONA *r	38,952	5,348	33,604	205	30	1,095	1,020	2,115	100	0	14	5,348	0	5,348	1,095	0	1,095	0	1,020	1,020
JALA-JALA *r	23,826	4,821	19,005	205	31	988	490	1,478	100	0	23	4,821	0	4,821	988	0	988	0	490	490
MONTALBAN *f	55,318	85,317	11,001	189	46	12,969	506	13,475	82	44	78	70,530	4,788	75,318	9,068	220	9,288	3,901	286	4,187
MORONG *r	43,304	11,947	31,357	205	31	2,447	966	3,413	100	0	28	11,947	0	11,947	2,447	0	2,447	0	966	966
PILILLA *r	43,312	14,971	28,341	205	31	3,067	882	3,949	100	0	35	14,971	0	14,971	3,067	0	3,067	0	882	882
SAN MATEO *f	115,769	83,360	32,409	219	46	18,260	1,491	19,750	77	25	63	64,384	8,105	72,489	14,103	373	14,476	4,157	1,118	5,274
TANAY *r	83,535	40,939	42,596	205	32	8,385	1,366	9,751	100	0	49	40,939	0	40,939	8,385	0	8,385	0	1,366	1,366
TAYTAY *a	191,131	177,418	13,713	200	35	35,484	690	36,174	90	75	89	159,676	14,785	174,461	31,935	517	32,453	3,548	172	3,720
TERESA *r	22,441	7,721	14,720	205	31	1,581	458	2,039	100	0	34	7,721	0	7,721	1,581	0	1,581	0	458	458
TOTAL	14,072,300	11,306,345	2,766,555	202	35	2,284,899	97,141	2,382,040	91	66	86	10,233,371	1,815,047	12,048,418	2,072,436	63,792	2,136,228	212,463	33,349	245,812

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSDP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by NSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by PAWSP.
4. Areas with (*r) are merged area under RPT99, and be expected to be improved by RPWSIP.

TABLE 13.2.14 COMMERCIAL WATER DEMAND GROWTH PROJECTION

YEAR	CG(I) (1)	COED(I) (2)	IR1(I) (3)	CTI(I) (4)	CPED(I) (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)	DEMAND (9)
1990	5.98	1.06	6.34	-3.34	-0.11	0.37	6.71	1.0000	451,047
1991	5.70	1.06	6.04	-1.77	-0.11	0.19	6.24	1.0624	479,177
1992	3.55	1.06	3.76	-0.61	-0.11	0.07	3.83	1.1031	497,530
1993	4.51	1.06	4.78	-0.54	-0.11	0.06	4.84	1.1564	521,611
1994	4.64	1.06	4.92	1.01	-0.11	-0.11	4.81	1.2120	546,686
1995	4.22	1.06	4.47	-0.11	-0.11	0.01	4.49	1.2664	571,207
1996	4.06	1.06	4.30	-0.52	-0.11	0.06	4.36	1.3216	596,116
1997	3.83	1.06	4.06	-0.62	-0.11	0.07	4.13	1.3762	620,724
1998	3.60	1.06	3.82	-0.58	-0.11	0.06	3.88	1.4296	644,807
1999	3.60	1.06	3.82	-0.22	-0.11	0.02	3.84	1.4845	669,568
2000	3.49	1.06	3.70	-3.99	-0.11	0.44	4.14	1.5459	697,277
2001	3.34	1.06	3.54	-0.22	-0.11	0.02	3.56	1.6010	722,132
2002	3.23	1.06	3.42	-0.21	-0.11	0.02	3.45	1.6562	747,023
2003	3.12	1.06	3.31	-0.20	-0.11	0.02	3.33	1.7113	771,893
2004	3.03	1.06	3.21	-0.19	-0.11	0.02	3.23	1.7667	796,846
2005	2.95	1.06	3.13	-0.18	-0.11	0.02	3.15	1.8223	821,921
2006	2.86	1.06	3.03	-0.17	-0.11	0.02	3.05	1.8778	846,993
2007	2.78	1.06	2.95	-0.16	-0.11	0.02	2.96	1.9335	872,101
2008	2.70	1.06	2.86	-0.15	-0.11	0.02	2.88	1.9892	897,204
2009	2.63	1.06	2.79	-0.14	-0.11	0.02	2.80	2.0449	922,355
2010	2.57	1.06	2.72	-0.13	-0.11	0.01	2.74	2.1009	947,613

SOURCE: (1) Studt Team, (2, 4, 5) CORPLAN

(1) GDP growth rate in service sector in real terms in year I (%)
(2) Output elasticity of consumption in service sector
(3) Increase rate by GDP growth in year I (1)x(2) (%)
(4) Tariff increase in real terms in year I (%)
(5) Price elasticity of consumption
(6) Increase rate by tariff increase in year I (4)x(5) (%)
(7) Increase rate in year I (%)
(8) Increase index in year I. (1.0000 in base year 1990)
(9) Projected total commercial demand (M3/D) (8) x 451,047

TABLE 13.2.15 MWSS COMMERCIAL CONSUMPTION PROJECTION

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	434,665	96.4	78.5	21.5	550,461	448,632	101,829	671,952	561,191	110,761	792,069	672,476	119,593	913,196	784,697	128,498
1. Manila *	136,183	30.2	96.6	3.4	172,462	167,797	4,665	210,526	205,861	4,665	248,160	243,494	4,665	286,109	281,444	4,665
2. Pasay City *	25,338	5.6	65.3	34.7	32,088	23,293	8,795	39,170	30,375	8,795	46,172	37,377	8,795	53,233	44,438	8,795
3. Quezon City *	113,981	25.3	75.7	24.3	144,346	116,705	27,641	176,204	148,563	27,641	207,702	180,061	27,641	239,464	211,824	27,641
4. Caloocan City *	15,089	3.3	75.6	24.4	19,107	15,433	3,674	23,324	19,650	3,674	27,494	23,820	3,674	31,698	28,024	3,674
5. Las Pinas	4,299	1.0	14.4	85.6	5,444	786	4,658	6,646	959	5,686	7,833	1,131	6,702	9,031	1,303	7,728
6. Makati *	59,269	13.1	80.2	19.8	75,058	63,337	11,721	91,624	79,903	11,721	108,003	96,282	11,721	124,519	112,798	11,721
7. Malabon *	5,224	1.2	61.4	38.6	6,616	4,600	2,016	8,076	6,060	2,016	9,519	7,504	2,016	10,975	8,959	2,016
8. Mandaluyong *	13,336	3.0	84.0	16.0	16,891	14,763	2,128	20,620	18,491	2,128	24,305	22,177	2,128	28,022	25,894	2,128
9. Marikina	5,280	1.2	73.5	26.5	6,687	4,914	1,773	8,163	5,999	2,164	9,622	7,071	2,551	11,094	8,153	2,941
10. Muntinlupa	8,208	1.8	0.9	99.1	10,521	99	10,423	12,843	120	12,723	15,139	142	14,997	17,454	163	17,291
11. Navotas *	2,655	0.6	76.6	23.4	3,363	2,742	621	4,105	3,484	621	4,839	4,218	621	5,576	4,958	621
12. Paranaque	11,624	2.6	57.7	42.3	14,720	8,497	6,223	17,969	10,372	7,597	21,181	12,226	8,955	24,420	14,096	10,324
13. Pasig	16,004	3.5	58.4	41.6	20,268	11,836	8,431	24,741	14,448	10,292	29,163	17,031	12,132	33,623	19,636	13,987
14. Pateros	56	0.0	100.0	0.0	71	71	0	86	86	0	102	102	0	117	117	0
15. San Juan *	8,299	1.8	98.8	1.2	10,510	10,412	97	12,829	12,732	97	15,122	15,025	97	17,435	17,338	97
16. Taguig	4,016	0.9	9.0	91.0	5,086	457	4,629	6,208	558	5,650	7,318	658	6,660	8,437	758	7,679
17. Valenzuela	5,705	1.3	40.0	60.0	7,224	2,890	4,335	8,819	3,528	5,291	10,395	4,158	6,237	11,985	4,794	7,191
II. CAVITE	6,399	1.4	19.1	80.9	8,103	1,550	6,554	9,892	1,892	8,000	11,660	2,230	9,430	13,443	2,571	10,873
1. Bacoor	971	0.2	27.6	72.4	1,230	340	890	1,502	415	1,087	1,770	489	1,281	2,041	564	1,477
2. Cavite City	4,207	0.9	17.3	82.7	5,327	921	4,406	6,503	1,124	5,379	7,666	1,325	6,341	8,838	1,528	7,310
3. Imus	709	0.2	9.1	90.9	898	82	816	1,096	100	996	1,292	118	1,174	1,490	136	1,354
4. Kawit	122	0.0	100.0	0.0	155	155	0	189	189	0	222	222	0	256	256	0
5. Noveleta	5	0.0	100.0	0.0	6	6	0	8	8	0	9	9	0	10	10	0
6. Rosario	385	0.1	9.5	90.5	487	46	441	595	56	539	701	66	635	808	77	732
III. RIZAL	9,983	2.2	16.5	83.5	15,668	5,109	10,559	20,285	7,396	12,889	25,513	10,320	15,193	31,370	13,854	17,517
1. Angono	-	-	-	-	623	623	0	1,028	1,028	0	1,585	1,585	0	2,317	2,317	0
2. Antipolo	3,367	0.7	17.3	82.1	4,264	765	3,499	5,205	934	4,271	6,136	1,101	5,035	7,074	1,269	5,805
3. Baras	-	-	-	-	25	25	0	38	38	0	80	80	0	140	140	0
4. Binangonan	-	-	-	-	1,402	1,402	0	2,180	2,180	0	3,183	3,183	0	4,427	4,427	0
5. Cainta	3,622	0.8	12.4	87.6	4,587	569	4,018	5,600	695	4,905	6,601	819	5,782	7,610	944	6,667
6. Cardona	-	-	-	-	98	98	0	126	126	0	168	168	0	219	219	0
7. Jala-Jala	-	-	-	-	15	15	0	54	54	0	114	114	0	198	198	0
8. Montalban	886	0.2	4.7	95.3	1,122	53	1,069	1,370	64	1,306	1,614	76	1,539	1,861	87	1,774
9. Morong	-	-	-	-	191	191	0	251	251	0	354	354	0	489	489	0
10. Pililla	-	-	-	-	141	141	0	232	232	0	432	432	0	613	613	0
11. San Mateo	576	0.1	32.2	67.8	729	235	494	890	287	603	1,049	338	711	1,209	390	819
12. Tanay	-	-	-	-	434	434	0	785	785	0	1,176	1,176	0	1,677	1,677	0
13. Taytay	1,532	0.3	23.8	76.2	1,941	462	1,478	2,369	565	1,804	2,792	665	2,127	3,219	767	2,452
14. Teresa	-	-	-	-	96	96	0	158	158	0	229	229	0	316	316	0
TOTAL	451,047	100.0	76.3	23.7	574,232	455,291	118,941	702,129	570,478	131,651	829,242	685,026	144,216	958,009	801,121	156,888

TABLE 13.2.16 INDUSTRIAL WATER DEMAND GROWTH PROJECTION

YEAR	IG(I) (1)	IOED(I) (2)	IR1(I) (3)	ITI(I) (4)	IPED(I) (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)	DEMAND (9)
1990	8.61	0.78	6.72	-2.81	-0.11	0.31	7.02	1.0000	439,394
1991	4.23	0.78	3.30	-1.77	-0.11	0.19	3.49	1.0349	454,747
1992	5.62	0.78	4.38	-0.52	-0.11	0.06	4.44	1.0809	474,941
1993	5.10	0.78	3.98	-0.45	-0.11	0.05	4.03	1.1244	494,070
1994	4.83	0.78	3.77	0.84	-0.11	-0.09	3.68	1.1658	512,227
1995	4.79	0.78	3.74	-0.09	-0.11	0.01	3.75	1.2094	531,415
1996	4.60	0.78	3.59	-0.42	-0.11	0.05	3.63	1.2534	550,728
1997	4.13	0.78	3.22	-0.52	-0.11	0.06	3.28	1.2945	568,784
1998	4.12	0.78	3.21	-0.49	-0.11	0.05	3.27	1.3368	587,369
1999	3.94	0.78	3.07	-0.17	-0.11	0.02	3.09	1.3781	605,530
2000	3.79	0.78	2.96	-3.97	-0.11	0.44	3.39	1.4249	626,075
2001	3.67	0.78	2.86	-0.19	-0.11	0.02	2.88	1.4659	644,128
2002	3.53	0.78	2.75	-0.17	-0.11	0.02	2.77	1.5066	661,984
2003	3.39	0.78	2.64	-0.16	-0.11	0.02	2.66	1.5467	679,604
2004	3.29	0.78	2.57	-0.15	-0.11	0.02	2.58	1.5866	697,156
2005	3.19	0.78	2.49	-0.15	-0.11	0.02	2.50	1.6264	714,618
2006	3.09	0.78	2.41	-0.14	-0.11	0.02	2.43	1.6658	731,952
2007	3.00	0.78	2.34	-0.14	-0.11	0.02	2.36	1.7051	749,192
2008	2.91	0.78	2.27	-0.14	-0.11	0.02	2.29	1.7440	766,313
2009	2.83	0.78	2.21	-0.13	-0.11	0.01	2.22	1.7828	783,338
2010	2.75	0.78	2.15	-0.13	-0.11	0.01	2.16	1.8213	800,253

SOURCE: (1) Study Team, (2, 4, 5) CORPLAN

(1) GDP growth rate in industrial sector in real terms in year I (%)
(2) Output elasticity of consumption in industrial sector
(3) Increase rate by GDP growth in year I (1) * (2) (%)
(4) Tariff increase in real terms in year I (%)
(5) Price elasticity of consumption
(6) Increase rate by tariff increase in year I (4) * (5) (%)
(7) Increase rate in year I (%)
(8) Increase index in year I. (1.0000 in base year 1990)
(9) Projected total industrial demand (M3/D) (8) x 439,394

TABLE 13.2.17 MWSS INDUSTRIAL CONSUMPTION PROJECTION

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	362,048	82.4	22.5	77.5	437,871	113,331	324,540	515,868	146,218	369,650	588,825	176,980	411,846	659,386	206,731	452,655
1. Manila *	23,403	5.3	75.3	24.7	28,304	22,519	5,786	33,346	27,560	5,786	38,092	32,276	5,786	42,623	36,837	5,786
2. Pasay City *	4,293	1.0	21.4	78.6	5,192	1,817	3,375	6,116	2,742	3,375	6,981	3,607	3,375	7,818	4,443	3,375
3. Quezon City *	51,708	11.8	37.4	62.6	62,538	30,170	32,368	73,677	41,310	32,368	84,087	51,730	32,368	94,175	61,807	32,368
4. Caloocan City *	13,923	3.2	66.5	33.5	16,839	12,175	4,665	19,839	15,174	4,665	22,644	17,980	4,665	25,358	20,693	4,665
5. Las Pinas	21,115	4.8	0.7	99.3	25,537	189	25,348	30,086	222	29,863	34,341	254	34,087	38,456	284	38,171
6. Makati *	8,041	1.8	57.9	42.1	9,725	6,362	3,383	11,458	8,074	3,383	13,078	9,694	3,383	14,645	11,262	3,383
7. Malabon *	20,537	4.7	29.1	70.9	24,838	10,273	14,565	29,253	14,688	14,565	33,401	18,836	14,565	37,404	22,839	14,565
8. Mandaluyong *	13,151	3.0	59.3	40.7	15,906	10,553	5,353	18,739	13,386	5,353	21,389	16,036	5,353	23,952	18,599	5,353
9. Marikina	8,239	1.8	17.1	82.9	9,965	1,701	8,264	11,739	2,004	9,736	13,400	2,287	11,113	15,005	2,561	12,444
10. Muntinlupa	34,360	7.8	0.2	99.8	41,556	97	41,459	48,958	114	48,844	55,882	130	55,751	62,578	146	62,432
11. Navotas *	3,762	0.9	53.8	46.2	4,550	2,811	1,739	5,360	3,621	1,739	6,118	4,379	1,739	6,852	5,112	1,739
12. Paranaque	19,370	4.4	8.7	91.3	23,427	2,031	21,396	27,600	2,393	25,207	31,503	2,731	28,772	35,288	3,059	32,220
13. Pasig	68,156	15.5	11.9	88.1	82,430	9,770	72,659	97,113	11,511	85,602	110,847	13,139	97,708	124,130	14,713	109,417
14. Pateros	1,760	0.4	0.2	99.8	2,128	4	2,124	2,507	5	2,502	2,862	6	2,856	3,205	6	3,198
15. San Juan *	1,259	0.3	95.3	4.7	1,522	1,463	59	1,794	1,735	59	2,047	1,988	59	2,293	2,234	59
16. Taguig	41,208	9.4	0.0	100.0	49,838	11	49,826	58,715	13	58,702	67,019	15	67,004	75,050	17	75,033
17. Valenzuela	27,763	6.3	4.2	95.8	33,577	1,406	32,171	39,558	1,656	37,902	45,153	1,891	43,262	50,564	2,117	48,446
II. CAVITE	7,037	1.6	16.3	83.7	8,511	1,388	7,122	10,027	1,637	8,391	11,445	1,868	9,577	12,817	2,092	10,725
1. Bacoor	70	0.0	100.0	0.0	85	85	0	100	100	0	114	114	0	128	128	0
2. Cavite City	238	0.1	100.0	0.0	288	288	0	339	339	0	387	387	0	433	433	0
3. Imus	538	0.1	1.3	98.7	650	9	641	766	10	756	874	12	863	979	13	966
4. Kawit	574	0.1	100.0	0.0	694	694	0	818	818	0	934	934	0	1,045	1,045	0
5. Noveleta	88	0.0	100.0	0.0	107	107	0	126	126	0	143	143	0	161	161	0
6. Rosario	5,530	1.3	3.1	96.9	6,688	207	6,481	7,879	244	7,635	8,993	278	8,715	10,071	312	9,759
III. RIZAL	70,303	16.0	2.8	97.2	90,479	3,347	87,131	108,913	5,440	103,472	127,524	9,149	118,375	146,784	14,834	131,950
1. Angono	-	-	-	-	1,121	196	925	1,850	555	1,295	2,854	1,284	1,570	4,170	2,502	1,668
2. Antipolo	13,198	3.1	12.9	87.1	16,688	2,145	14,543	19,681	2,527	17,154	22,441	2,884	19,557	25,130	3,230	21,901
3. Baras	-	-	-	-	46	8	38	68	20	48	144	65	79	252	151	101
4. Binangonan	-	-	-	-	2,523	442	2,081	3,324	1,177	2,747	5,729	2,578	3,151	7,968	4,781	3,187
5. Cainta	36,221	8.2	0.1	99.9	43,803	58	43,748	51,610	68	51,541	58,909	78	58,831	65,968	88	65,880
6. Cardona	-	-	-	-	177	31	146	227	68	159	303	136	167	395	237	158
7. Jala-Jala	-	-	-	-	33	5	28	97	29	68	204	92	112	355	213	142
8. Montalban	2,958	0.7	0.6	99.4	3,538	21	3,517	4,215	24	4,191	4,811	28	4,784	5,388	31	5,357
9. Morong	-	-	-	-	344	60	284	451	135	316	636	286	350	881	529	352
10. Pililla	-	-	-	-	253	44	209	417	125	292	778	350	428	1,104	662	442
11. San Mateo	658	0.1	8.3	91.7	796	66	730	938	78	860	1,071	89	982	1,199	100	1,099
12. Tanay	-	-	-	-	782	137	645	1,413	424	989	2,118	953	1,165	3,019	1,811	1,208
13. Taytay	16,672	3.8	0.5	99.5	20,164	105	20,059	23,756	124	23,632	27,116	141	26,975	30,365	158	30,207
14. Teresa	-	-	-	-	173	30	143	286	86	200	411	185	226	570	342	228
TOTAL	439,394	100.0	19.2	80.8	536,861	118,068	418,793	634,808	153,295	481,513	727,795	187,997	539,798	818,967	223,657	595,310

* Future demand increase was assumed to be shouldered by MWSS only.

TABLE 13.2.18 NON-REVENUE WATER PROJECTED BY CORPLAN

YEAR	UNACCOUNTED-FOR WATER (%)	LOSSES (%)	UNBILLED CONSUMP.(%)	NRW (%)
1986	10.00	39.38	26.26	65.64
1987	4.50	36.59	24.20	60.99
1988	2.19	35.46	23.64	59.10
1989	0.70	34.61	23.08	57.69
1990	0.00	34.61	23.08	57.69
1991	0.00	33.00	22.00	55.00
1992	0.00	31.20	20.80	52.00
1993	0.00	30.00	20.00	50.00
1994	0.00	27.60	18.40	46.00
1995	0.00	25.20	16.80	42.00
1996	0.00	22.80	15.20	38.00
1997	0.00	21.00	14.00	35.00
1998	0.00	21.00	14.00	35.00
|	|	|	|	|
2006	0.00	21.00	14.00	35.00

Source: CORPLAN

TABLE 13.2.19 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (CASE 1)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,126,290	448,832	113,331	568,770	25.2	2,257,022	315,907	101,829	324,540	742,276	1,442,197	550,461	437,871	568,770	2,999,298	78.1	81.5	25.9	75.3
1. Manila	252,399	167,337	22,519	149,150	25.2	591,885	15,345	4,665	5,386	29,796	271,745	172,462	28,304	149,150	621,661	92.9	97.3	19.6	95.2
2. Pasay City	43,524	23,293	1,817	23,123	25.2	91,756	10,561	8,795	3,375	22,731	54,085	32,088	5,192	23,123	114,487	80.5	72.6	35.0	80.1
3. Quezon City	270,472	116,305	30,170	140,603	25.2	557,550	23,246	27,641	32,368	83,254	293,718	144,346	62,538	140,603	641,204	92.1	80.9	48.2	87.0
4. Caloocan City	81,416	15,433	12,175	36,130	25.2	145,154	35,838	3,674	4,665	48,176	121,254	19,107	16,838	36,730	193,930	67.1	80.8	72.3	75.2
5. Las Pinas	25,775	186	189	10,360	25.2	41,109	37,007	4,658	25,348	67,013	66,782	5,444	25,537	10,360	108,122	44.6	14.4	0.7	38.0
6. Makati	80,974	63,337	6,342	50,755	25.2	201,408	10,477	11,721	3,383	25,581	91,451	75,058	9,725	50,755	226,989	88.5	84.4	65.2	88.7
7. Malabon	31,384	4,500	10,273	15,584	25.2	61,841	14,689	2,016	14,565	31,270	46,074	6,616	24,838	15,584	93,111	68.1	68.5	41.4	66.4
8. Mandaluyong	36,610	14,763	10,553	20,863	25.2	82,789	3,248	2,128	5,353	10,729	39,858	16,891	15,906	20,863	93,518	91.9	87.4	66.3	88.5
9. Marikina	52,397	4,914	1,701	19,881	25.2	78,894	4,343	1,773	8,264	14,380	56,741	6,687	9,965	19,881	93,274	92.3	73.5	17.1	84.6
10. Muntinlupa	20,636	99	97	7,018	25.2	27,850	31,571	10,423	41,459	83,453	52,208	10,521	41,556	7,018	111,303	39.5	0.9	0.2	25.0
11. Navotas	24,677	2,742	2,811	10,184	25.2	40,414	4,120	621	1,739	6,480	28,797	3,363	4,550	10,184	46,894	85.7	81.5	61.8	86.2
12. Paranaque	62,984	8,497	2,031	24,766	25.2	98,278	42,310	6,233	21,396	69,939	105,294	14,720	23,427	24,766	168,207	59.8	57.7	8.7	58.4
13. Pasig	62,935	11,826	9,770	28,482	25.2	113,023	9,182	8,431	72,659	90,273	72,117	20,256	82,430	28,482	203,296	87.3	58.4	11.9	55.6
14. Pateros	4,252	71	4	1,458	25.2	5,785	5,277	0	2,124	7,401	9,529	71	2,128	1,458	13,185	44.6	100.0	0.2	43.9
15. San Juan	29,410	10,412	1,463	13,909	25.2	55,195	1,731	97	59	1,887	31,141	10,510	1,522	13,909	57,082	94.4	99.1	96.1	96.7
16. Taguig	9,793	457	11	3,457	25.2	13,718	38,207	4,629	49,826	92,662	48,000	5,086	49,838	3,457	106,380	20.4	9.0	0.0	12.9
17. Valenzuela	32,651	2,890	1,406	12,447	25.2	49,394	20,755	4,335	32,171	57,261	53,406	7,224	33,577	12,447	106,654	61.1	40.0	4.2	46.3
II. CAVITE	44,332	1,550	1,389	20,259	30.0	67,529	49,094	6,554	7,122	62,769	93,425	8,103	8,511	20,259	130,299	47.5	19.1	16.3	51.8
1. Bacoor	15,408	340	85	6,785	30.0	22,617	18,918	890	0	19,808	34,325	1,230	85	6,785	42,425	44.9	27.6	100.0	53.3
2. Cavite City	10,354	921	288	5,213	30.0	17,375	6,511	4,406	0	10,917	17,465	5,327	288	5,213	28,293	62.7	17.3	100.0	61.4
3. Imus	3,781	82	9	3,374	30.0	11,245	11,023	816	641	12,480	18,804	898	650	3,374	23,725	41.4	9.1	1.3	47.4
4. Kawit	6,802	155	694	3,279	30.0	10,929	3,041	0	0	3,041	9,843	155	694	3,279	13,971	69.1	100.0	100.0	78.2
5. Noveleta	1,022	6	107	486	30.0	1,621	3,059	0	0	3,059	4,080	6	107	486	4,680	25.0	100.0	100.0	34.8
6. Rosario	2,366	46	207	1,123	30.0	3,742	6,542	441	6,481	13,464	8,908	487	6,688	1,123	17,205	26.6	9.5	3.1	21.8
III. RIZAL	47,536	5,809	3,347	17,875	24.2	73,868	71,104	10,559	87,131	168,794	118,640	15,668	90,478	17,875	242,661	40.1	32.6	3.7	30.4
1. Angono	3,115	823	196	694	15.0	4,828	1,156	0	925	2,081	4,271	823	1,121	694	6,909	72.9	100.0	17.5	69.9
2. Antipolo	11,090	765	2,145	6,000	30.0	19,999	19,774	3,493	14,543	37,816	30,864	4,258	16,688	6,000	57,816	35.9	17.9	12.9	34.6
3. Baras	127	25	8	28	15.0	188	558	0	38	596	685	25	46	28	784	18.5	100.0	17.4	23.9
4. Binangonan	7,008	1,402	442	1,562	15.0	10,414	3,109	0	2,081	5,190	10,117	1,402	2,523	1,562	15,604	69.3	100.0	17.5	66.7
5. Cainta	6,273	569	58	2,325	25.2	9,225	18,589	4,018	43,748	66,356	24,862	4,587	43,807	2,325	75,581	25.2	12.4	0.1	12.2
6. Cardona	490	98	31	109	15.0	728	966	0	146	1,112	1,456	98	177	109	1,840	33.7	100.0	17.5	39.6
7. Jala-Jala	73	15	5	16	15.0	109	542	0	22	564	615	15	27	16	673	11.9	100.0	18.5	16.2
8. Montalban	3,903	53	21	1,704	30.0	5,680	3,292	1,069	3,557	7,918	7,195	1,122	3,578	1,704	13,599	54.2	4.7	0.6	41.8
9. Morong	955	191	60	213	15.0	1,419	861	0	284	1,145	1,816	191	344	213	2,564	52.6	100.0	17.4	55.3
10. Pililla	703	141	44	157	15.0	1,045	993	0	209	1,202	1,696	141	253	157	2,247	41.5	100.0	17.4	46.5
11. San Mateo	4,352	235	66	1,994	30.0	6,648	6,278	494	730	7,502	10,630	729	796	1,994	14,150	40.9	32.2	8.3	47.0
12. Tanay	2,170	434	131	484	15.0	3,225	1,656	0	645	2,301	3,826	434	782	484	5,526	56.7	100.0	17.5	58.4
13. Taytay	6,798	462	105	2,481	25.2	9,846	12,754	1,478	20,059	34,291	19,552	1,941	20,164	2,481	44,138	34.8	23.8	0.5	22.3
14. Teresa	480	96	30	107	15.0	713	575	0	143	718	1,055	96	173	107	1,431	45.5	100.0	17.3	49.8
TOTAL	1,218,158	455,291	118,068	606,903	25.3	2,398,419	436,105	118,941	418,793	973,839	1,654,262	574,232	536,861	606,903	3,372,258	73.6	79.3	22.0	71.1

TABLE 13.2.20 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (CASE I)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,420,282	561,191	146,218	565,567	21.0	2,693,158	311,812	110,761	369,650	692,223	1,632,094	671,952	515,868	565,567	3,385,401	87.0	83.5	28.3	79.6
1. Manila	267,682	205,861	27,560	133,205	21.0	634,308	17,415	4,665	5,786	27,866	285,097	210,526	33,346	133,205	662,174	93.9	97.8	82.6	95.8
2. Pasay City	52,747	30,375	2,742	22,824	21.0	108,688	7,448	8,795	3,375	19,618	60,195	39,170	6,116	22,824	128,306	87.6	77.5	44.8	84.7
3. Quezon City	307,254	148,563	41,310	132,148	21.0	629,275	21,462	27,641	32,368	81,471	328,717	176,204	73,677	132,148	710,746	93.5	84.3	56.1	88.5
4. Caloocan City	110,825	19,650	15,174	38,717	21.0	184,366	30,123	3,674	4,665	38,462	140,948	23,324	19,839	38,717	222,828	78.6	84.2	76.5	82.7
5. Las Pinas	68,920	559	222	18,635	21.0	88,736	23,463	5,686	29,863	59,013	92,383	6,246	30,086	18,635	147,749	74.6	14.4	0.7	60.1
6. Makati	92,691	79,503	8,074	48,026	21.0	228,695	5,740	11,721	3,183	20,644	98,432	91,224	11,258	48,026	249,339	94.2	87.2	70.5	91.6
7. Malabon	40,574	6,060	14,698	16,303	21.0	77,635	10,723	2,016	14,565	27,304	51,297	8,076	29,263	16,303	104,939	79.1	75.0	50.2	74.0
8. Mandaluyong	41,038	18,491	13,386	19,383	21.0	92,299	2,814	2,128	5,353	10,295	43,952	20,620	18,739	19,383	102,693	93.4	89.7	71.4	89.9
9. Marikina	61,462	5,999	2,004	18,465	21.0	87,929	4,194	2,164	9,736	16,094	65,656	8,163	11,739	18,465	104,023	93.6	73.5	17.1	84.5
10. Muntinlupa	48,677	120	114	13,002	21.0	61,913	15,821	12,723	48,844	78,387	65,498	12,843	48,958	13,002	140,301	74.3	0.9	0.2	44.1
11. Navotas	29,978	3,484	3,621	9,858	21.0	46,941	2,403	621	1,739	4,761	32,379	4,105	5,360	9,858	51,702	92.6	84.9	67.6	90.8
12. Paranaque	92,068	10,372	2,393	27,867	21.0	132,700	23,296	7,597	25,201	56,100	115,364	17,969	27,600	27,867	188,800	79.8	57.7	8.7	70.3
13. Pasig	75,047	14,448	11,511	27,913	21.0	132,920	5,536	10,292	85,602	101,430	84,583	24,741	97,113	27,913	234,349	93.5	58.4	11.9	56.7
14. Pateros	7,638	86	5	2,055	21.0	9,783	3,311	0	2,502	5,813	10,949	86	2,507	2,055	15,597	69.8	100.0	0.2	62.7
15. San Juan	30,409	12,732	1,735	11,929	21.0	56,804	1,732	97	59	1,888	32,141	12,829	1,794	11,929	58,693	94.6	99.2	96.7	96.8
16. Taguig	38,373	558	13	10,618	21.0	50,560	11,185	5,650	58,302	81,537	56,556	6,208	58,315	10,618	132,097	69.6	9.0	0.0	38.3
17. Valenzuela	49,820	3,528	1,656	14,621	21.0	69,626	16,048	5,291	33,502	61,241	67,868	8,819	35,158	14,621	130,867	73.4	40.0	4.2	53.2
II. CAVITE	98,788	1,892	1,637	35,270	30.0	117,586	32,641	8,000	8,391	49,032	111,429	9,892	10,027	35,270	166,598	70.7	19.1	16.3	70.6
1. Bacoor	34,252	415	100	14,900	30.0	49,666	8,626	1,087	0	9,713	42,878	1,502	100	14,900	59,379	79.9	27.6	100.0	83.6
2. Cavite City	14,987	1,124	339	7,050	30.0	23,500	4,210	5,379	0	9,649	19,256	6,503	339	7,050	33,148	77.8	17.3	100.0	70.9
3. Imus	12,683	100	10	5,483	30.0	18,277	5,599	996	756	11,351	22,283	1,096	766	5,483	29,628	56.9	9.1	1.3	61.7
4. Kawit	9,723	189	818	4,598	30.0	15,328	1,855	0	0	1,855	11,578	189	818	4,598	17,183	84.0	100.0	100.0	89.2
5. Noveleta	3,057	8	126	1,367	30.0	4,558	1,702	0	0	1,702	4,759	8	126	1,367	6,260	64.2	100.0	100.0	72.8
6. Rosario	4,066	56	244	1,871	30.0	6,238	6,590	538	1,635	14,763	10,656	595	1,879	1,871	21,001	38.2	9.5	3.1	29.7
III. RIZAL	96,991	7,396	5,440	31,914	22.5	141,742	61,900	12,889	103,472	178,262	158,891	20,285	108,913	31,914	320,004	61.0	36.5	5.0	44.3
1. Angono	5,138	1,028	555	1,186	15.0	7,907	1,124	0	1,295	2,419	6,262	1,028	1,850	1,186	10,326	82.1	100.0	30.0	76.6
2. Antipolo	17,690	934	2,527	9,064	30.0	30,215	23,877	4,271	17,134	45,283	41,567	5,205	19,661	9,064	75,498	42.6	17.9	12.9	40.0
3. Baras	189	38	20	44	15.0	291	610	0	48	658	799	38	68	44	949	23.7	100.0	29.5	30.6
4. Binangonan	10,902	2,180	1,177	2,516	15.0	16,775	2,873	0	2,747	5,620	13,775	2,180	3,924	2,516	22,395	79.1	100.0	30.0	74.9
5. Cainta	24,761	595	68	6,785	21.0	32,209	10,715	4,905	51,541	67,162	35,476	5,500	51,610	6,785	99,471	69.8	12.4	0.1	32.5
6. Cardona	631	126	68	146	15.0	971	1,005	0	159	1,164	1,636	126	227	146	2,135	38.6	100.0	30.0	45.5
7. Jala-Jala	269	54	29	62	15.0	414	542	0	68	610	811	54	97	62	1,024	33.2	100.0	29.9	40.4
8. Montalban	5,644	64	24	2,457	30.0	8,189	3,070	1,305	4,191	8,566	8,714	1,370	4,215	2,457	16,755	64.8	4.7	0.6	48.9
9. Morong	1,253	251	135	289	15.0	1,928	900	0	316	1,216	2,153	251	451	289	3,144	58.2	100.0	29.9	61.3
10. Pililla	1,161	232	125	268	15.0	1,786	1,010	0	292	1,302	2,171	232	417	268	3,088	53.5	100.0	30.0	57.8
11. San Mateo	6,883	287	78	3,106	30.0	10,354	6,381	603	860	7,844	13,264	890	938	3,106	18,198	51.9	32.2	8.3	56.9
12. Tanay	3,924	785	424	906	15.0	6,039	1,570	0	989	2,559	5,494	785	1,413	906	8,598	71.4	100.0	30.0	70.2
13. Taytay	17,754	565	124	4,902	21.0	23,345	1,883	1,804	23,838	33,120	25,437	2,369	23,756	4,902	56,464	69.8	23.8	0.5	41.3
14. Teresa	192	158	86	183	15.0	1,219	539	0	200	739	1,331	158	286	183	1,958	59.5	100.0	30.1	62.3
TOTAL	1,595,962	570,478	153,295	632,752	21.4	2,952,486	306,353	131,651	481,513	919,517	1,902,314	702,129	634,808	632,752	3,872,003	83.9	81.2	24.1	76.3

TABLE 13.2.21 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (CASE I)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,634,341	612,476	176,980	660,250	21.0	3,144,047	180,476	119,593	411,846	711,915	1,814,818	732,069	588,825	660,250	3,855,961	90.1	84.9	30.1	81.5
1. Manila	277,955	243,494	32,276	147,193	21.0	700,919	17,021	4,665	5,786	27,472	294,976	248,160	38,062	147,193	728,391	94.2	98.1	84.8	96.2
2. Pasay City	61,177	37,377	3,601	27,157	21.0	129,317	4,538	8,795	3,375	16,708	65,715	46,172	6,981	27,157	146,025	93.1	81.0	51.7	88.6
3. Quezon City	338,611	180,061	51,730	151,626	21.0	722,028	21,866	27,641	32,368	81,874	360,477	207,702	84,097	151,626	803,902	93.9	86.7	61.5	89.8
4. Caloocan City	134,651	23,820	17,980	46,904	21.0	223,355	25,631	3,874	4,665	33,970	160,282	27,494	22,644	46,304	257,324	84.0	86.6	79.4	86.8
5. Las Pinas	103,932	1,131	356	27,995	21.0	133,312	18,894	6,103	34,087	59,684	122,826	7,233	34,341	27,995	192,995	84.6	14.4	0.7	69.1
6. Makati	98,362	96,282	9,694	54,318	21.0	258,656	5,816	11,321	3,383	20,920	104,178	108,003	13,078	54,318	279,576	94.4	89.1	74.1	92.5
7. Malabon	47,256	7,504	18,836	19,563	21.0	93,159	8,770	2,016	14,565	25,351	56,026	9,519	33,401	19,563	118,510	84.3	78.8	56.4	78.6
8. Mandaluyong	44,675	22,177	16,036	22,034	21.0	104,922	2,913	2,128	5,353	10,394	47,587	24,305	21,389	22,034	115,315	93.9	91.2	75.0	91.0
9. Marikina	69,793	7,071	2,287	21,040	21.0	100,191	4,426	2,551	11,113	18,090	74,219	9,622	13,400	21,040	118,281	94.0	73.5	17.1	84.7
10. Muntinlupa	67,217	142	130	17,940	21.0	85,429	12,477	14,997	55,751	83,225	79,694	15,139	55,882	17,940	168,655	84.3	0.9	0.2	50.7
11. Navotas	33,300	4,218	4,379	11,137	21.0	53,035	2,377	621	1,739	4,737	35,677	4,839	6,118	11,137	57,771	93.3	87.2	71.5	91.8
12. Paranaque	104,101	12,226	2,731	31,648	21.0	150,706	18,593	8,955	28,772	56,320	122,694	21,181	31,503	31,648	207,026	84.8	57.7	8.7	72.8
13. Pasig	90,921	17,031	11,139	32,189	21.0	153,280	5,877	12,132	97,708	115,717	96,798	29,163	110,847	32,189	268,997	93.9	58.4	11.9	57.0
14. Pateros	9,815	102	6	2,638	21.0	12,560	2,483	0	2,856	5,346	12,304	102	2,862	2,638	17,905	79.8	100.0	0.2	70.1
15. San Juan	31,086	15,025	1,988	12,786	21.0	60,885	1,731	97	59	1,888	32,818	15,122	2,047	12,786	62,773	94.7	99.4	97.1	97.0
16. Taguig	51,771	658	15	13,941	21.0	66,385	13,245	6,660	67,004	86,909	65,015	7,318	67,019	13,941	153,293	79.6	9.0	0.0	43.3
17. Valenzuela	69,719	4,158	1,891	20,141	21.0	95,909	13,812	6,237	43,262	63,311	83,531	10,395	45,153	20,141	159,220	83.5	40.0	4.2	60.2
II. CAVITE	104,412	2,230	1,868	36,170	25.0	144,680	25,861	9,430	9,517	44,808	130,273	11,660	11,445	36,170	189,548	80.1	19.1	16.3	76.3
1. Bacoor	44,303	489	114	14,968	25.0	59,874	7,858	1,281	0	9,140	52,161	1,770	114	14,968	69,014	84.9	27.6	100.0	86.8
2. Cavite City	19,834	1,325	387	1,115	25.0	22,661	1,440	6,341	0	7,781	21,274	7,666	387	7,115	36,242	93.2	17.3	100.0	78.5
3. Imus	17,516	116	12	5,882	25.0	23,527	8,309	1,174	863	10,346	25,825	1,292	874	5,882	33,873	67.8	9.1	1.3	69.5
4. Kawit	12,121	222	934	4,626	25.0	18,502	603	0	0	603	13,323	222	934	4,626	19,105	95.5	100.0	100.0	96.8
5. Noveleta	4,154	9	143	1,436	25.0	5,742	1,284	0	0	1,284	5,439	9	143	1,436	7,027	76.4	100.0	100.0	81.7
6. Rosario	6,085	66	278	2,143	25.0	8,573	6,366	635	8,715	15,715	12,451	701	8,993	2,143	24,288	48.9	9.5	3.1	35.3
III. RIZAL	139,950	10,320	9,149	41,145	20.5	200,564	60,142	15,133	118,375	193,711	200,092	25,513	127,524	41,145	394,275	69.9	40.4	7.2	50.9
1. Angono	7,927	1,585	1,284	1,905	15.0	12,701	1,022	0	1,570	2,592	8,949	1,585	2,854	1,905	15,293	88.6	100.0	45.0	83.1
2. Antipolo	25,514	1,101	2,884	9,833	25.0	39,332	26,583	5,035	19,557	51,175	52,097	6,136	22,441	9,833	90,506	49.0	17.9	12.9	43.5
3. Baras	401	80	65	96	15.0	642	629	0	79	708	1,030	80	144	96	1,350	38.9	100.0	45.1	47.6
4. Binangonan	15,915	3,183	2,578	3,825	15.0	25,501	2,520	0	3,151	5,671	18,435	3,183	5,729	3,825	31,172	86.3	100.0	45.0	81.8
5. Cainta	35,617	819	78	9,706	21.0	46,221	9,014	5,782	58,831	73,627	44,632	6,601	58,909	9,706	119,848	79.8	12.4	0.1	38.6
6. Cardona	841	168	136	202	15.0	1,347	1,021	0	167	1,188	1,862	168	303	202	2,535	45.2	100.0	44.9	53.1
7. Jala-Jala	568	114	92	137	15.0	911	526	0	112	638	1,094	114	204	137	1,549	51.9	100.0	45.1	58.8
8. Montalban	7,538	76	28	2,547	25.0	10,188	2,614	1,539	4,784	8,936	10,152	1,614	4,811	2,547	19,124	74.3	4.7	0.6	53.1
9. Morong	1,788	354	286	425	15.0	2,833	940	0	350	1,290	2,728	354	636	425	4,123	65.3	100.0	45.0	68.7
10. Pililla	2,161	432	350	519	15.0	3,462	928	0	428	1,356	3,089	432	778	519	4,818	70.0	100.0	45.0	71.8
11. San Mateo	10,166	338	89	3,531	25.0	14,124	5,141	711	982	7,833	16,307	1,049	1,071	3,531	21,958	62.3	32.2	8.3	64.3
12. Tanay	5,882	1,176	953	1,414	15.0	9,425	1,497	0	1,165	2,662	7,379	1,176	2,118	1,414	12,087	79.7	100.0	45.0	78.0
13. Taytay	24,509	665	141	6,729	21.0	32,045	6,203	2,127	26,975	35,304	30,712	2,792	27,116	6,729	67,349	79.8	23.8	0.5	47.6
14. Teresa	1,143	229	185	275	15.0	1,832	504	0	226	730	1,647	229	411	275	2,562	69.4	100.0	45.0	71.5
TOTAL	1,878,704	685,026	187,997	737,565	21.1	3,489,291	266,479	144,216	539,738	950,493	2,145,183	829,242	727,735	737,565	4,439,785	87.6	82.6	25.8	78.6

TABLE 13.2.22 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (CASE I)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,814,246	784,697	206,731	745,812	21.0	3,551,486	172,531	128,498	452,655	753,685	1,986,777	913,196	659,386	745,812	4,305,171	91.3	85.9	31.4	82.5
1. Manila	284,593	281,444	36,837	160,364	21.0	763,239	16,908	4,665	5,786	27,359	301,501	286,109	42,623	160,364	790,598	94.4	98.4	86.4	96.5
2. Pasay City	65,993	44,438	4,443	30,536	21.0	145,410	4,567	8,795	3,375	16,736	70,560	53,233	7,818	30,536	162,146	93.5	83.5	56.8	89.7
3. Quezon City	365,702	211,824	61,807	169,949	21.0	809,282	22,654	27,641	32,368	82,662	388,356	239,464	94,175	169,949	891,944	94.2	88.5	65.6	90.7
4. Caloocan City	159,456	28,024	20,693	55,337	21.0	263,511	19,621	3,674	4,665	27,960	179,077	31,698	25,358	55,337	291,470	89.0	88.4	81.6	90.4
5. Las Pinas	133,361	1,303	284	35,813	21.0	170,822	23,990	7,728	38,171	69,889	157,351	9,031	38,456	35,873	240,711	84.8	14.4	0.7	71.0
6. Makati	102,356	112,798	11,262	60,296	21.0	287,124	5,932	11,721	3,383	21,036	108,700	124,519	14,645	60,296	308,160	94.5	90.6	76.9	93.2
7. Malabon	53,187	8,959	22,839	22,750	21.0	108,335	6,398	2,016	14,565	22,979	60,185	10,975	37,404	22,750	131,314	89.4	81.6	61.1	82.5
8. Mandaluyong	47,148	25,894	18,599	24,520	21.0	116,762	2,975	2,128	5,353	10,456	50,723	28,022	23,952	24,520	127,218	94.1	92.4	77.7	91.8
9. Marikina	77,453	8,153	2,561	23,437	21.0	111,604	4,726	2,941	12,444	20,112	82,179	11,094	15,005	23,437	131,715	94.2	73.5	17.1	84.7
10. Muntinlupa	79,150	163	146	21,282	21.0	101,342	14,542	17,291	62,432	94,265	94,232	17,454	62,578	21,282	195,606	84.6	0.9	0.2	51.8
11. Navotas	35,199	4,958	5,112	12,299	21.0	58,569	2,427	621	1,739	4,787	38,626	5,578	6,852	12,299	63,356	93.7	88.9	74.6	92.4
12. Paranaque	107,742	14,096	3,059	33,200	21.0	158,097	19,178	10,324	32,220	61,722	126,920	24,420	35,278	33,200	219,819	84.9	57.7	8.7	71.5
13. Pasig	102,053	19,636	14,713	36,259	21.0	172,661	6,322	13,987	109,417	129,726	108,375	33,623	124,130	36,259	302,386	94.2	58.4	11.9	57.1
14. Pateros	12,156	111	6	3,355	21.0	15,548	1,401	0	3,198	4,600	13,560	111	3,205	3,355	20,146	89.7	100.0	0.2	77.2
15. San Juan	31,296	17,338	2,234	13,522	21.0	64,391	1,724	97	59	1,880	33,022	17,435	2,293	13,522	66,272	94.8	99.4	97.4	97.2
16. Taguig	65,410	358	17	17,594	21.0	83,379	7,704	7,679	75,033	90,416	73,114	8,037	75,050	17,594	173,795	89.5	9.0	0.0	48.1
17. Valenzuela	88,373	4,394	2,117	25,329	21.0	120,213	11,464	7,191	48,446	67,101	99,837	11,585	50,564	25,329	187,714	88.5	40.0	4.2	64.3
II. CAVITE	129,167	2,511	2,092	44,610	25.0	178,439	20,120	10,873	10,725	41,718	149,287	13,443	12,817	44,610	220,157	86.5	19.1	16.3	81.1
1. Bacoor	52,721	564	128	17,804	25.0	71,216	9,322	1,477	0	10,799	62,043	2,041	128	17,804	82,015	85.0	27.6	100.0	86.8
2. Cavite City	22,414	1,528	433	8,125	25.0	32,500	0	7,310	0	7,310	22,414	8,838	433	8,125	39,810	100.0	17.3	100.0	81.6
3. Imus	24,886	136	13	8,345	25.0	33,381	4,498	1,354	966	6,818	29,385	1,490	979	8,345	40,199	84.7	9.1	1.3	83.0
4. Kawit	15,032	256	1,045	5,444	25.0	21,778	0	0	0	0	15,032	256	1,045	5,444	21,778	100.0	100.0	100.0	100.0
5. Noveleta	5,296	10	161	1,822	25.0	7,289	816	0	0	816	6,112	10	161	1,822	8,105	86.6	100.0	100.0	89.9
6. Rosario	8,818	77	312	3,069	25.0	12,275	5,484	732	9,759	15,975	14,302	809	10,071	3,069	28,250	61.7	9.5	3.1	43.5
III. RIZAL	192,815	13,854	14,834	56,680	20.4	278,182	53,161	17,517	131,930	202,608	245,976	31,370	146,764	56,680	480,790	78.4	44.2	10.1	57.9
1. Angono	11,583	2,117	2,502	2,894	15.0	19,296	848	0	1,668	2,516	12,431	2,117	4,170	2,894	21,812	93.2	100.0	60.0	88.5
2. Antipolo	35,948	1,269	3,230	13,482	25.0	53,929	27,675	5,805	21,901	55,380	63,623	7,074	25,130	13,482	109,309	56.5	17.9	12.9	49.3
3. Baras	699	140	151	175	15.0	1,165	630	0	101	731	1,329	140	252	175	1,896	52.6	100.0	59.9	61.4
4. Binangonan	22,135	4,427	4,781	5,531	15.0	36,874	2,063	0	3,187	5,250	24,198	4,427	7,968	5,531	42,124	91.5	100.0	60.0	87.5
5. Cainta	48,671	344	88	13,212	21.0	62,314	5,580	6,667	65,880	78,127	54,251	7,010	65,968	13,212	141,041	89.7	12.4	0.1	44.6
6. Cardona	1,095	219	237	274	15.0	1,825	1,020	0	158	1,178	2,115	219	395	274	3,003	51.8	100.0	60.0	60.8
7. Jala-Jala	988	198	213	247	15.0	1,646	490	0	142	632	1,478	198	355	247	2,278	66.8	100.0	60.0	72.3
8. Montalban	9,288	87	31	3,135	25.0	12,542	2,187	1,774	5,357	9,318	11,475	1,861	5,388	3,135	21,860	80.9	4.7	0.6	57.4
9. Morong	2,447	489	529	611	15.0	4,076	966	0	352	1,318	3,413	489	881	611	5,394	71.7	100.0	60.0	75.6
10. Pililla	3,067	613	662	766	15.0	5,108	882	0	442	1,324	3,949	613	1,104	766	6,432	77.7	100.0	60.0	79.4
11. San Mateo	14,476	350	100	4,989	25.0	19,954	5,274	819	1,099	7,193	19,750	1,209	1,199	4,989	27,147	73.3	32.2	8.3	73.5
12. Tanay	6,385	1,677	1,811	2,095	15.0	13,968	1,366	0	1,208	2,574	9,751	1,677	3,019	2,095	16,542	86.0	100.0	60.0	84.4
13. Taytay	32,453	357	158	8,573	21.0	42,251	3,721	2,452	30,207	36,380	36,174	3,219	30,365	8,573	78,630	89.7	21.8	0.5	53.7
14. Teresa	1,581	316	342	395	15.0	2,634	458	0	228	686	2,039	316	570	395	3,320	77.5	100.0	60.0	79.3
TOTAL	2,136,228	801,121	223,657	847,102	21.1	4,008,108	245,812	156,888	595,310	998,010	2,382,040	958,009	818,967	847,102	5,006,118	89.7	83.6	27.3	80.1

TABLE 13.2.23 SUMMARY OF PROJECTED WATER DEMAND IN 1995 [CASE 2]

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,126,290	446,632	113,331	723,537	30.0	2,411,790	315,907	101,829	324,540	742,276	1,442,197	550,461	437,871	723,537	3,154,065	78.1	81.5	25.9	76.5
1. Manila	252,399	167,797	22,515	189,735	30.0	632,450	19,345	4,665	5,786	29,796	271,745	172,462	28,304	189,735	662,246	92.9	97.3	79.6	95.5
2. Pasay City	43,524	23,293	1,811	29,414	30.0	98,048	10,561	8,395	3,375	22,331	54,085	32,088	5,192	29,414	120,779	80.5	72.6	35.0	81.2
3. Quezon City	270,472	116,705	30,170	178,863	30.0	596,210	23,246	21,641	32,368	83,254	293,717	144,346	62,538	178,863	679,464	92.1	80.9	48.2	87.7
4. Caloocan City	81,416	15,433	12,115	46,724	30.0	155,748	39,838	3,614	4,665	48,116	121,254	19,107	16,839	46,724	203,924	67.1	80.8	72.3	76.4
5. Las Pinas	29,775	786	169	13,178	30.0	43,928	37,007	4,658	25,348	67,013	66,782	5,444	25,517	13,178	110,941	44.6	14.4	0.7	39.6
6. Makati	80,974	63,337	6,342	64,566	30.0	215,219	10,477	11,721	3,383	25,581	91,451	75,058	9,725	64,566	240,800	88.5	84.4	65.2	89.4
7. Malabon	31,384	4,680	10,273	19,824	30.0	66,081	14,589	2,016	14,565	31,270	46,074	6,696	24,838	19,824	97,352	68.1	69.5	41.4	67.9
8. Mandaluyong	36,610	14,763	10,553	26,540	30.0	88,466	3,248	2,128	5,353	10,729	39,858	16,891	15,906	26,540	99,195	91.9	87.4	66.3	89.2
9. Marikina	52,337	4,914	1,701	25,291	30.0	84,304	4,343	1,773	8,264	14,380	56,741	6,687	9,965	25,291	98,684	92.3	73.5	17.1	85.4
10. Muntinlupa	20,636	99	97	8,928	30.0	29,760	31,511	10,423	41,453	83,453	52,208	10,521	41,556	8,928	113,213	39.5	0.9	0.2	26.3
11. Navotas	24,611	2,742	2,811	12,956	30.0	43,185	4,120	621	1,739	6,480	28,797	3,363	4,550	12,956	49,665	85.7	81.5	61.8	87.0
12. Paranaque	62,984	8,497	2,031	31,505	30.0	105,017	42,310	6,223	21,396	69,929	105,294	14,720	23,427	31,505	174,946	59.8	57.7	8.7	60.0
13. Pasig	62,935	11,836	9,770	36,232	30.0	120,773	9,182	8,431	72,559	90,273	72,117	20,268	82,430	36,232	211,046	87.3	58.4	11.9	57.2
14. Pateros	4,252	71	4	1,854	30.0	6,181	5,277	0	2,124	7,401	9,529	71	2,128	1,854	13,582	44.6	100.0	0.2	45.5
15. San Juan	29,410	10,412	1,463	17,694	30.0	58,980	1,751	97	59	1,887	31,161	10,510	1,522	17,694	60,887	94.4	99.1	96.1	96.9
16. Taguig	9,193	457	11	4,388	30.0	14,659	38,207	4,629	49,826	92,662	48,000	5,086	49,838	4,398	107,321	20.4	9.0	0.0	13.7
17. Valenzuela	32,651	2,890	1,406	15,834	30.0	52,781	20,755	4,335	32,171	57,261	53,406	7,224	33,577	15,834	110,041	61.1	40.0	4.2	48.0
II. CAVITE	44,332	1,550	1,389	20,259	30.0	67,529	49,094	6,564	7,122	62,769	93,425	8,103	8,511	20,259	130,299	47.5	19.1	16.3	51.8
1. Bacoor	15,408	340	85	6,785	30.0	22,617	18,918	890	0	19,808	34,325	1,230	85	6,785	42,425	44.9	27.6	100.0	53.3
2. Cavite City	10,954	921	288	5,213	30.0	17,375	6,511	4,406	0	10,917	17,465	5,327	288	5,213	28,293	62.7	17.3	100.0	61.4
3. Imus	7,781	82	9	3,374	30.0	11,245	11,023	816	641	12,480	18,804	898	650	3,374	23,725	41.4	9.1	1.3	47.4
4. Kawit	6,802	155	694	3,279	30.0	10,929	3,041	0	0	3,041	9,843	155	694	3,279	13,971	69.1	100.0	100.0	78.2
5. Noveleta	1,022	6	107	486	30.0	1,621	3,059	0	0	3,059	4,080	6	107	486	4,680	25.0	100.0	100.0	34.6
6. Rosario	2,366	46	287	1,123	30.0	3,742	6,542	441	6,481	13,464	8,908	487	6,688	1,123	17,205	26.6	9.5	3.1	21.7
III. RIZAL	47,536	5,109	3,347	19,182	25.5	75,175	71,104	10,559	87,131	168,794	118,640	15,668	90,479	19,182	243,969	40.1	32.6	3.7	30.8
1. Angono	3,115	623	156	694	15.0	4,628	1,156	0	925	2,081	4,271	623	1,121	694	6,709	72.9	100.0	17.5	69.0
2. Antipolo	11,090	765	2,145	6,000	30.0	19,999	19,774	3,499	14,543	37,816	30,864	4,264	16,688	6,000	57,816	35.9	17.9	12.8	34.6
3. Baras	127	25	8	28	15.0	188	558	0	38	596	685	25	46	28	784	18.5	100.0	17.4	23.9
4. Binangonan	7,008	1,402	442	1,562	15.0	10,414	3,109	0	2,081	5,190	10,117	1,402	2,523	1,562	15,604	69.3	100.0	17.5	66.7
5. Cainta	6,273	569	58	2,951	30.0	9,857	18,589	4,018	43,748	66,356	24,862	4,587	43,807	2,957	76,213	25.2	12.4	0.1	12.9
6. Cardona	450	98	31	109	15.0	728	566	0	146	1,112	1,456	98	177	109	1,840	30.7	100.0	17.5	39.6
7. Jala-Jala	73	15	5	18	15.0	109	542	0	22	564	615	15	27	18	673	11.9	100.0	18.5	16.2
8. Montalban	3,303	53	21	1,704	30.0	5,680	3,292	1,069	3,557	7,918	7,195	1,122	3,578	1,704	13,599	54.2	4.7	0.6	41.8
9. Morong	955	191	60	213	15.0	1,419	861	0	284	1,145	1,816	191	344	213	2,564	52.6	100.0	17.4	55.3
10. Pililla	703	141	44	157	15.0	1,045	993	0	209	1,202	1,696	141	253	157	2,247	41.5	100.0	17.4	46.5
11. San Mateo	4,352	235	66	1,994	30.0	6,648	6,298	494	730	7,502	10,630	729	796	1,994	14,150	40.9	32.2	8.3	47.0
12. Tanay	2,170	434	137	484	15.0	3,225	1,656	0	645	2,301	3,826	434	782	484	5,526	56.7	100.0	17.5	58.4
13. Taytay	6,798	462	105	3,156	30.0	10,522	12,754	1,478	20,059	34,291	19,552	1,941	20,164	3,156	44,813	34.8	23.8	0.5	23.5
14. Teresa	480	96	30	107	15.0	713	575	0	143	718	1,055	96	173	107	1,431	45.5	100.0	17.1	49.8
TOTAL	1,218,158	455,291	118,068	762,978	29.9	2,554,494	436,105	118,941	418,793	973,839	1,654,262	574,232	536,861	762,978	3,528,333	73.6	79.3	22.0	72.4

TABLE 13.2.24 SUMMARY OF PROJECTED WATER DEMAND IN 2000 [CASE 2]

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,420,202	561,191	146,218	709,204	25.0	2,836,814	211,812	180,761	369,650	692,223	1,632,014	671,952	515,868	709,204	3,529,038	87.0	83.5	28.3	80.4
1. Manila	267,682	205,861	27,560	167,035	25.0	668,138	17,415	4,665	5,786	27,866	285,097	210,526	33,346	167,035	696,004	93.9	97.8	82.6	96.0
2. Pasay City	52,747	30,375	2,742	28,621	25.0	114,484	7,448	8,355	3,375	19,618	60,195	39,170	6,116	28,621	134,102	87.6	77.5	44.8	85.4
3. Quezon City	307,254	148,563	41,310	165,709	25.0	662,837	21,462	27,641	32,368	81,471	328,717	176,204	73,677	165,709	744,307	93.5	84.3	56.1	89.1
4. Caloocan City	110,825	19,650	15,174	48,550	25.0	194,199	30,123	3,674	4,665	38,462	140,948	23,324	19,839	48,550	232,661	78.6	84.2	76.5	83.5
5. Las Pinas	68,920	959	222	23,367	25.0	93,468	23,463	5,886	29,863	59,013	92,383	6,845	30,086	23,367	152,481	74.6	14.4	0.7	61.3
6. Makati	92,691	15,803	8,074	60,223	25.0	240,892	5,740	11,221	3,383	20,844	98,432	91,624	11,458	60,223	261,736	94.2	87.2	70.5	92.0
7. Malabon	40,574	6,060	14,698	20,444	25.0	81,775	10,723	2,016	14,565	27,304	51,297	8,076	29,263	20,444	109,080	79.1	75.0	50.2	75.0
8. Mandaluyong	41,038	18,491	13,386	24,305	25.0	97,221	2,914	2,128	5,353	10,395	43,952	20,620	18,739	24,305	107,616	93.4	89.7	71.4	90.3
9. Marikina	61,462	5,899	2,004	23,155	25.0	92,619	4,194	2,164	9,736	16,094	65,656	8,163	11,739	23,155	108,713	93.6	73.5	17.1	85.2
10. Muntinlupa	48,677	120	114	16,304	25.0	65,215	16,821	12,722	48,844	78,387	65,498	12,843	48,958	16,304	143,603	74.3	0.9	0.2	45.4
11. Navotas	29,978	3,484	3,621	12,361	25.0	49,445	2,401	621	1,739	4,761	32,379	4,105	5,360	12,361	54,206	92.6	84.9	67.6	91.2
12. Paranaque	92,068	10,372	2,393	34,944	25.0	139,777	23,298	7,597	25,207	56,100	115,364	17,969	27,600	34,944	195,877	79.8	57.7	8.7	71.4
13. Pasig	79,047	14,448	11,511	35,002	25.0	140,009	5,536	10,252	85,602	101,430	84,583	24,741	97,113	35,002	241,438	93.5	58.4	11.9	58.0
14. Pateros	7,638	86	5	2,576	25.0	10,305	3,311	0	2,502	5,813	10,949	86	2,507	2,576	16,118	69.8	100.0	0.2	63.9
15. San Juan	30,409	12,732	1,735	14,958	25.0	59,834	1,732	97	59	1,888	32,141	12,829	1,794	14,958	61,722	94.6	99.2	96.7	96.9
16. Taguig	39,371	558	11	13,314	25.0	53,256	17,185	5,650	58,702	81,537	56,556	6,208	58,715	13,314	134,793	69.6	9.0	0.0	39.5
17. Valenzuela	49,820	3,528	1,656	18,335	25.0	73,339	13,048	5,291	37,902	56,241	67,868	8,819	39,558	18,335	134,580	73.4	40.0	4.2	54.5
II. CAVITE	78,768	1,892	1,637	35,270	30.0	117,566	32,641	8,000	8,391	49,032	111,409	9,892	10,027	35,270	166,598	70.7	19.1	16.3	70.6
1. Bacoor	34,252	415	100	14,900	30.0	49,666	8,826	1,087	0	9,713	42,878	1,502	100	14,900	59,379	79.9	27.6	100.0	83.6
2. Cavite City	14,987	1,124	339	7,050	30.0	23,500	4,270	5,379	0	9,649	19,256	6,503	339	7,050	33,148	77.8	17.3	100.0	70.9
3. Imus	12,683	100	10	5,483	30.0	18,277	9,593	996	756	11,351	22,283	1,096	766	5,483	29,628	56.9	9.1	1.3	61.7
4. Kawit	9,723	189	818	4,598	30.0	15,328	1,855	0	0	1,855	11,578	189	818	4,598	17,183	84.0	100.0	100.0	89.2
5. Noveleta	3,057	8	126	1,367	30.0	4,558	1,702	0	0	1,702	4,759	8	126	1,367	6,260	64.2	100.0	100.0	72.8
6. Rosario	4,066	56	244	1,871	30.0	6,238	6,593	538	7,635	14,763	10,656	595	7,879	1,871	21,001	38.2	9.5	3.1	29.7
III. RIZAL	96,991	7,396	5,440	34,882	24.1	144,710	61,300	12,889	103,472	178,262	158,891	20,285	108,913	34,882	322,972	61.0	36.5	5.0	44.8
1. Angono	5,138	1,028	555	1,186	15.0	7,907	1,124	0	1,295	2,419	6,262	1,028	1,850	1,186	10,326	82.1	100.0	30.0	76.6
2. Antipolo	17,690	934	2,527	9,064	30.0	30,215	23,877	4,271	17,134	45,283	41,567	5,205	19,661	9,064	75,498	42.6	17.9	12.9	40.0
3. Baras	189	38	20	44	15.0	291	610	0	48	658	799	38	68	44	949	23.7	100.0	29.5	30.6
4. Binangonan	10,902	2,180	1,177	2,516	15.0	16,775	2,873	0	2,747	5,620	13,775	2,180	3,924	2,516	22,395	79.1	100.0	30.0	74.9
5. Cainta	24,761	695	58	8,508	25.0	34,032	10,715	4,505	51,541	61,162	35,476	5,200	51,610	8,508	101,194	69.8	12.4	0.1	33.6
6. Cardona	631	126	58	146	15.0	971	1,005	0	159	1,164	1,636	126	227	146	2,135	38.6	100.0	30.0	45.5
7. Jala-Jala	269	54	29	62	15.0	414	542	0	68	610	811	54	97	62	1,024	33.2	100.0	29.9	40.4
8. Montalban	5,644	64	24	2,457	30.0	8,189	3,070	1,305	4,191	8,566	8,714	1,370	4,215	2,457	16,755	64.8	4.7	0.6	48.9
9. Morong	1,253	251	135	289	15.0	1,928	900	0	316	1,216	2,153	251	451	289	3,144	58.2	100.0	29.9	61.3
10. Pililla	1,161	232	125	268	15.0	1,786	1,010	0	292	1,302	2,171	232	417	268	3,088	53.5	100.0	30.0	57.8
11. San Mateo	6,883	287	38	3,106	30.0	10,354	6,381	603	860	7,844	13,264	890	938	3,106	18,198	51.9	32.2	8.3	56.9
12. Tanay	3,924	785	424	906	15.0	6,039	1,570	0	989	2,559	5,494	785	1,413	906	8,598	71.4	100.0	30.0	70.2
13. Taytay	17,754	565	124	6,147	25.0	24,590	7,683	1,804	23,632	33,120	25,437	2,369	23,756	6,147	57,709	69.8	23.8	0.5	42.6
14. Teresa	792	158	86	183	15.0	1,219	539	0	200	739	1,331	158	286	183	1,958	59.5	100.0	30.1	62.3
TOTAL	1,595,962	570,478	153,295	779,356	25.1	3,099,091	306,353	131,651	481,513	919,517	1,902,314	702,129	634,808	779,356	4,018,608	83.9	81.2	24.1	77.1

TABLE 13.2.25 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (CASE 2 & 3)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,634,341	672,476	176,980	827,532	25.0	3,311,729	180,476	119,593	411,846	711,915	1,814,818	792,069	588,825	827,532	4,023,644	90.1	84.9	30.1	82.3
1. Manila	277,955	243,494	32,276	184,535	25.0	738,301	17,021	4,665	5,786	27,472	294,976	248,160	38,062	184,535	765,733	94.2	98.1	84.8	96.4
2. Pasay City	61,117	37,337	3,607	34,054	25.0	136,214	4,538	8,795	3,375	16,708	65,715	46,172	6,981	34,054	152,922	93.1	81.0	51.7	89.1
3. Quezon City	338,611	180,061	51,730	190,134	25.0	760,536	21,866	27,641	32,368	81,874	360,477	207,702	84,097	190,134	842,410	93.9	86.7	61.5	90.3
4. Caloocan City	134,551	23,820	17,980	58,817	25.0	235,167	25,631	3,674	4,665	33,970	160,282	27,494	22,644	58,817	269,237	84.0	86.6	79.4	87.4
5. Las Pinas	103,932	1,131	254	35,105	25.0	140,422	18,894	6,703	34,087	59,684	122,826	7,833	34,341	35,105	200,105	84.6	14.4	0.7	70.2
6. Makati	98,362	96,282	9,694	68,813	25.0	272,451	5,816	11,721	3,383	20,920	104,178	108,003	13,078	68,113	293,371	94.4	89.1	74.1	92.9
7. Malabon	47,256	7,504	18,836	24,532	25.0	98,128	8,770	2,016	14,565	25,351	56,026	9,519	33,401	24,532	123,479	84.3	78.8	56.4	79.5
8. Mandaluyong	44,675	22,177	16,036	21,629	25.0	110,518	2,913	2,128	5,353	10,394	47,587	24,305	21,389	27,629	120,911	93.9	91.2	75.0	91.4
9. Marikina	85,793	7,071	2,287	26,384	25.0	105,535	4,426	2,551	11,113	18,090	74,219	9,622	13,400	26,384	123,625	94.0	73.5	17.1	85.4
10. Muntinlupa	57,217	142	130	22,496	25.0	89,985	12,477	14,997	55,751	83,225	79,694	15,139	55,882	22,496	173,211	84.3	0.9	0.2	52.0
11. Navotas	33,300	4,218	4,379	13,966	25.0	55,863	2,377	823	1,739	4,737	35,677	4,899	6,118	13,966	60,600	93.3	87.2	71.6	92.2
12. Paranaque	104,101	12,226	2,731	39,686	25.0	158,744	18,593	8,955	28,772	56,320	122,694	21,181	31,503	39,686	215,064	84.8	57.7	8.7	73.8
13. Pasig	90,921	17,031	13,139	40,364	25.0	161,455	5,877	12,132	97,708	115,717	96,798	29,163	110,847	40,364	277,172	93.9	58.4	11.9	58.3
14. Pateros	9,815	102	6	3,307	25.0	13,229	2,489	0	2,856	5,346	12,304	102	2,862	3,307	18,575	79.8	100.0	0.2	71.2
15. San Juan	31,086	15,025	1,988	16,033	25.0	64,133	1,731	57	59	1,888	32,818	15,122	2,047	16,033	66,020	94.7	99.4	97.1	97.1
16. Taguig	51,771	658	15	17,481	25.0	69,925	13,245	6,660	67,004	86,909	65,015	7,318	67,019	17,481	156,834	79.6	9.0	0.0	44.6
17. Valenzuela	69,719	4,158	1,891	25,256	25.0	101,024	13,812	6,237	43,262	63,311	83,531	10,395	45,153	25,256	164,335	83.5	40.0	4.2	61.5
II. CAVITE	104,412	2,230	1,868	36,170	25.0	144,680	25,861	5,430	9,577	44,868	130,273	11,660	11,445	36,170	189,548	80.1	19.1	16.3	76.3
1. Bacoor	44,303	489	114	14,968	25.0	59,874	7,858	1,281	0	9,140	52,161	1,770	114	14,968	69,014	84.9	27.6	100.0	86.8
2. Cavite City	19,634	1,325	387	7,115	25.0	28,461	1,440	5,341	0	7,781	21,074	7,666	387	7,115	36,242	93.2	17.3	100.0	78.5
3. Imus	17,516	118	12	5,882	25.0	23,527	8,309	1,174	863	10,346	25,825	1,292	874	5,882	33,873	67.8	9.1	1.3	69.5
4. Kawit	12,721	222	934	4,626	25.0	18,502	603	0	0	603	13,323	222	934	4,626	19,105	95.5	100.0	100.0	96.8
5. Noveleta	4,154	9	143	1,436	25.0	5,742	1,284	0	0	1,284	5,439	9	143	1,436	7,027	76.4	100.0	100.0	81.7
6. Rosario	6,085	66	278	2,143	25.0	8,573	6,366	635	8,715	15,715	12,451	701	8,993	2,143	24,288	48.9	9.5	3.1	35.3
III. RIZAL	139,950	10,320	5,149	45,319	22.1	204,739	60,142	15,193	118,335	193,711	200,092	25,513	127,524	45,319	398,449	69.9	40.4	1.2	51.4
1. Angono	7,927	1,585	1,284	1,905	15.0	12,701	1,022	0	1,570	2,592	8,949	1,585	2,854	1,905	15,293	88.6	100.0	45.0	83.1
2. Antipolo	25,514	1,101	2,884	9,833	25.0	39,332	26,583	5,035	19,557	51,175	52,097	6,136	22,441	9,833	90,506	49.0	17.9	12.9	43.5
3. Baras	401	80	65	96	15.0	642	629	0	79	708	1,030	80	144	96	1,350	38.9	100.0	45.1	47.6
4. Binangonan	15,915	3,183	2,578	3,825	15.0	25,501	2,520	0	3,151	5,671	18,435	3,183	5,729	3,825	31,172	86.3	100.0	45.0	81.8
5. Cainta	35,817	819	78	12,111	25.0	48,825	5,014	5,782	58,831	73,627	44,632	6,601	58,909	12,111	122,313	79.8	12.4	0.1	39.8
6. Cardona	841	168	136	202	15.0	1,347	1,021	0	167	1,188	1,862	168	303	202	2,535	45.2	100.0	44.9	53.1
7. Jala-Jala	568	114	92	137	15.0	911	526	0	112	638	1,094	114	204	137	1,549	51.9	100.0	45.1	58.8
8. Montalban	7,538	76	28	2,547	25.0	10,188	2,614	1,539	4,784	8,936	10,152	1,614	4,811	2,547	19,124	74.3	4.7	0.6	53.3
9. Morong	1,768	354	286	425	15.0	2,833	940	0	350	1,290	2,708	354	636	425	4,123	65.3	100.0	45.0	68.7
10. Pililla	2,161	432	350	519	15.0	3,462	928	0	428	1,356	3,089	432	778	519	4,818	70.0	100.0	45.0	71.9
11. San Mateo	10,166	338	89	3,531	25.0	14,124	6,141	711	982	7,833	16,307	1,049	1,071	3,531	21,958	62.3	32.2	8.3	64.3
12. Tanay	5,882	1,176	953	1,414	15.0	9,425	1,497	0	1,165	2,662	7,379	1,176	2,118	1,414	12,087	79.7	100.0	45.0	78.0
13. Taytay	24,509	665	141	8,439	25.0	33,754	6,203	2,127	26,975	35,304	30,712	2,792	27,116	8,439	69,058	79.8	23.8	0.5	48.9
14. Teresa	1,143	229	185	275	15.0	1,832	504	0	226	730	1,647	229	411	275	2,562	69.4	100.0	45.0	71.5
TOTAL	1,878,704	685,026	187,997	909,422	24.8	3,661,148	266,479	144,216	539,798	950,493	2,145,183	829,242	727,795	909,422	4,611,641	87.6	82.6	25.8	79.4

TABLE 13.2.26 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (CASE 2 & 3)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,814,246	784,697	206,731	935,225	25.0	1,740,899	172,531	128,498	452,655	753,685	1,986,777	913,196	659,386	935,225	4,494,583	91.3	85.9	31.4	61.2
1. Manila	284,993	281,444	36,831	201,092	25.0	804,366	16,808	4,665	5,786	27,359	301,801	286,109	42,623	201,092	831,725	94.4	98.4	86.4	96.7
2. Pasay City	65,993	44,438	4,443	38,291	25.0	153,165	4,567	8,795	3,375	16,736	70,560	53,233	7,818	38,291	169,901	93.5	83.5	56.8	90.1
3. Quezon City	365,702	211,824	61,809	213,111	25.0	852,444	22,654	27,841	32,368	82,662	388,356	239,464	94,175	213,111	935,106	94.2	88.5	65.6	91.2
4. Caloocan City	159,456	28,024	20,693	69,391	25.0	277,565	19,621	3,674	4,665	27,960	179,077	31,698	25,358	69,391	305,524	89.0	88.4	81.6	90.8
5. Las Pinas	133,361	1,303	284	44,983	25.0	179,932	23,390	7,728	38,771	69,889	157,351	9,031	38,456	44,983	249,821	84.8	14.4	0.7	72.0
6. Makati	102,768	112,798	11,262	75,609	25.0	302,437	5,932	11,721	3,383	21,036	108,700	124,519	14,645	75,609	323,473	94.5	90.6	76.9	93.5
7. Malabon	53,787	8,959	22,839	28,528	25.0	114,113	6,398	2,016	14,565	22,979	60,185	10,975	37,404	28,528	137,092	89.4	81.6	61.1	83.2
8. Mandaluyong	47,748	25,894	18,599	30,747	25.0	122,989	2,995	2,128	5,353	10,456	50,723	28,022	23,952	30,747	133,445	94.1	92.4	77.7	92.2
9. Marikina	77,453	8,153	2,561	29,389	25.0	117,556	4,726	2,941	12,444	20,112	82,179	11,094	15,005	29,389	137,668	94.2	73.5	17.1	85.4
10. Muntinlupa	79,750	163	146	26,687	25.0	106,746	14,542	17,291	62,432	94,265	94,292	17,454	62,578	26,687	201,011	84.6	0.9	0.2	53.1
11. Navotas	36,199	4,958	5,112	15,423	25.0	61,692	2,427	621	1,339	4,787	38,626	5,578	6,852	15,423	66,479	93.7	88.9	74.5	92.8
12. Paranaque	107,742	14,096	3,059	41,632	25.0	166,529	19,178	10,324	32,220	61,722	126,920	24,420	35,278	41,632	228,251	84.9	57.7	8.7	73.0
13. Pasig	102,053	19,636	14,713	45,467	25.0	181,869	5,322	13,987	109,417	129,726	108,375	33,623	124,130	45,467	311,595	94.2	58.4	11.9	58.4
14. Pateros	12,158	117	6	4,094	25.0	16,376	1,401	0	3,198	4,600	13,560	117	3,205	4,094	20,975	89.7	100.0	0.2	78.1
15. San Juan	31,298	17,338	2,234	16,956	25.0	67,826	1,724	97	59	1,880	33,022	17,435	2,293	16,956	69,706	94.8	99.4	97.4	97.3
16. Taguig	65,410	758	17	22,062	25.0	88,247	7,704	7,679	75,033	90,416	73,114	8,437	75,050	22,062	178,664	89.5	9.0	0.0	49.4
17. Valenzuela	88,373	4,794	2,117	31,761	25.0	127,045	11,464	7,191	48,446	67,101	99,837	11,985	50,564	31,761	194,147	88.5	40.0	4.2	65.4
II. CAVITE	129,167	2,571	2,092	44,610	25.0	178,439	20,120	10,873	10,725	41,718	149,287	13,443	12,817	44,610	220,157	86.5	19.1	16.3	81.1
1. Bacoor	52,721	564	128	17,804	25.0	71,216	9,322	1,477	0	10,799	62,043	2,041	128	17,804	82,015	85.0	27.6	100.0	86.8
2. Cavite City	22,414	1,528	433	8,135	25.0	32,500	0	7,310	0	7,310	22,414	8,838	433	8,135	39,810	100.0	17.3	100.0	81.6
3. Imus	24,886	136	13	8,345	25.0	33,381	4,498	1,354	966	6,818	29,385	1,490	979	8,345	40,199	84.7	9.1	1.3	83.0
4. Kawit	15,032	256	1,045	5,444	25.0	21,778	0	0	0	0	15,032	256	1,045	5,444	21,778	100.0	100.0	100.0	100.0
5. Noveleta	5,296	10	161	1,822	25.0	7,289	816	0	0	816	6,112	10	161	1,822	8,105	86.6	100.0	100.0	89.9
6. Rosario	8,818	77	312	3,069	25.0	12,276	5,484	732	5,759	15,975	14,302	808	10,071	3,069	28,250	61.7	9.5	3.1	43.5
III. RIZAL	192,815	13,854	14,834	62,289	21.9	283,791	53,161	17,517	131,930	202,608	245,976	31,370	146,764	62,289	486,399	78.4	44.2	10.1	58.3
1. Angono	11,583	2,317	2,502	2,894	15.0	19,296	848	0	1,668	2,516	12,431	2,317	4,170	2,894	21,812	93.2	100.0	60.0	88.5
2. Antipolo	35,948	1,269	3,230	13,482	25.0	53,929	27,675	5,805	21,901	55,380	63,623	7,074	25,130	13,482	109,309	56.5	17.9	12.9	49.3
3. Baras	699	140	151	175	15.0	1,165	630	0	101	731	1,329	140	252	175	1,896	52.6	100.0	59.9	61.4
4. Binangonan	22,135	4,427	4,781	5,531	15.0	36,874	2,063	0	3,187	5,250	24,198	4,427	7,968	5,531	42,124	91.5	100.0	60.0	87.5
5. Cainta	48,571	944	88	16,567	25.0	66,170	5,580	6,667	65,880	78,127	54,151	7,610	65,968	16,567	144,297	89.7	12.4	0.1	45.9
6. Cardona	1,035	219	237	274	15.0	1,825	1,020	0	158	1,178	2,115	219	395	274	3,003	51.8	100.0	60.0	60.8
7. Jala-Jala	988	198	213	247	15.0	1,646	490	0	142	632	1,478	198	355	247	2,278	66.8	100.0	60.0	72.3
8. Montalban	9,288	87	31	3,135	25.0	12,542	2,187	1,774	5,357	9,318	11,475	1,861	5,388	3,135	21,860	80.9	4.7	0.6	57.4
9. Morong	2,447	489	529	611	15.0	4,076	966	0	352	1,318	3,413	489	881	611	5,394	71.7	100.0	60.0	75.6
10. Pililla	3,067	613	662	766	15.0	5,108	882	0	442	1,324	3,949	613	1,104	766	6,432	77.7	100.0	60.0	79.4
11. San Mateo	14,476	390	100	4,989	25.0	19,954	5,274	819	1,099	7,193	19,750	1,209	1,199	4,989	27,147	73.3	32.2	8.3	73.5
12. Tanay	8,385	1,677	1,811	2,095	15.0	13,968	1,366	0	1,208	2,574	9,751	1,677	3,019	2,095	16,542	86.0	100.0	60.0	84.4
13. Taytay	32,453	767	158	11,126	25.0	44,504	3,721	2,452	30,207	36,380	36,174	3,219	30,365	11,126	80,884	89.7	23.8	0.5	55.0
14. Teresa	1,581	316	342	395	15.0	2,634	458	0	228	686	2,039	316	570	395	3,320	77.5	100.0	60.0	79.3
TOTAL	2,136,228	801,121	223,657	1,042,123	24.8	4,203,129	245,812	156,888	595,310	998,010	2,382,040	958,003	818,967	1,042,123	5,201,139	89.7	83.6	27.3	80.8

TABLE 13.2.27 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (CASE 3)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,126,290	448,632	113,331	909,059	35.0	2,597,312	315,801	101,829	324,540	742,276	1,442,197	550,461	437,871	909,059	3,339,588	78.1	81.5	25.9	77.8
1. Manila	252,399	167,797	22,516	238,385	35.0	681,100	15,345	4,665	5,786	29,796	271,745	172,462	28,304	238,385	710,897	92.9	97.3	79.6	95.8
2. Pasay City	43,524	23,293	1,817	36,957	35.0	105,590	10,561	8,795	3,375	22,731	54,085	32,088	5,192	36,957	128,321	80.5	72.6	35.0	82.3
3. Quezon City	270,472	116,705	30,110	224,725	35.0	642,072	23,246	27,641	32,368	83,254	293,717	144,346	62,538	224,725	725,326	92.1	80.9	48.2	88.5
4. Caloocan City	81,416	15,433	12,115	58,705	35.0	167,723	15,838	3,674	4,665	48,176	121,254	18,107	16,839	58,705	215,905	67.1	80.8	72.3	77.7
5. Las Pinas	29,775	786	169	16,558	35.0	47,308	37,007	4,658	25,348	67,013	66,782	5,444	25,537	16,558	114,320	44.6	14.4	0.7	41.4
6. Makati	80,974	63,337	6,342	81,121	35.0	231,774	10,477	11,721	3,383	25,581	91,451	75,058	9,725	81,121	257,355	88.5	84.4	65.2	90.1
7. Malabon	31,384	4,600	10,273	24,908	35.0	71,165	14,689	2,016	14,565	31,270	46,074	6,616	24,838	24,908	102,435	68.1	69.5	41.4	69.5
8. Mandaluyong	36,610	14,763	10,553	33,345	35.0	95,271	3,248	2,128	5,353	10,729	39,858	16,891	15,906	33,345	106,000	91.9	87.4	66.3	89.9
9. Marikina	52,397	4,914	1,701	31,776	35.0	90,788	4,343	1,773	8,264	14,380	56,741	6,687	9,965	31,776	105,169	92.3	73.5	17.1	86.3
10. Mustinlupa	20,636	99	97	11,217	35.0	32,049	31,571	10,423	41,459	83,453	52,208	10,521	41,556	11,217	115,501	39.5	0.9	0.2	27.7
11. Navotas	24,677	2,742	2,811	16,278	35.0	46,507	4,120	621	1,739	6,480	28,797	3,363	4,550	16,278	52,987	85.7	81.5	61.8	87.8
12. Paranaque	62,984	8,497	2,031	39,583	35.0	113,095	42,310	6,223	21,396	69,929	105,294	14,720	23,427	39,583	183,025	59.8	57.7	8.7	61.8
13. Pasig	62,935	11,836	9,770	45,522	35.0	130,063	9,182	8,431	12,659	90,273	72,117	20,268	82,430	45,522	220,336	87.3	58.4	11.9	59.0
14. Pateros	4,252	71	4	2,330	35.0	6,657	5,277	0	2,124	7,401	9,529	71	2,128	2,330	14,057	44.6	100.0	0.2	47.4
15. San Juan	29,410	10,412	1,463	22,231	35.0	63,517	1,731	97	59	1,887	31,141	10,510	1,522	22,231	65,404	94.4	99.1	96.1	97.1
16. Taguig	9,753	457	11	5,525	35.0	15,787	38,207	4,629	49,826	92,662	48,000	5,086	49,836	5,525	108,445	20.4	9.0	0.0	14.6
17. Valenzuela	32,851	2,890	1,406	18,894	35.0	56,841	20,755	4,335	32,171	57,261	53,606	7,224	33,577	19,894	114,101	61.1	40.0	4.2	49.8
II. CAVITE	44,332	1,550	1,389	20,259	30.0	67,529	49,094	6,554	7,122	62,769	93,425	8,103	8,511	20,259	130,299	47.5	19.1	16.3	51.8
1. Bacoor	15,408	340	85	6,785	30.0	22,617	18,918	890	0	19,808	34,325	1,230	85	6,785	42,425	44.9	27.6	100.0	53.3
2. Cavite City	10,954	921	288	5,213	30.0	17,375	6,511	4,406	0	10,917	17,465	5,327	288	5,213	28,293	62.7	17.3	100.0	61.4
3. Imus	1,781	82	3	3,374	30.0	11,245	11,023	816	641	12,480	18,804	898	650	3,374	23,725	41.4	9.1	1.3	47.4
4. Kawit	5,802	155	694	3,279	30.0	10,929	3,041	0	0	3,041	9,843	155	694	3,279	13,971	69.1	100.0	100.0	78.2
5. Noveleta	1,022	6	107	486	30.0	1,621	3,059	0	0	3,059	4,080	6	107	486	4,680	25.0	100.0	100.0	34.6
6. Rosario	2,366	46	207	1,123	30.0	3,742	5,542	441	6,481	13,464	8,908	487	6,688	1,123	17,205	26.6	9.5	3.1	21.7
III. RIZAL	47,536	5,109	3,347	20,750	27.0	76,743	71,104	10,559	87,131	168,794	118,640	15,668	90,479	20,750	245,537	40.1	32.6	3.7	31.3
1. Angono	3,115	623	196	694	15.0	4,628	1,156	0	925	2,081	4,271	623	1,121	694	6,709	72.9	100.0	17.5	69.0
2. Antipolo	11,090	765	2,145	6,000	30.0	19,999	19,774	3,499	14,543	37,816	30,864	4,264	16,688	6,000	57,816	35.9	17.9	12.9	34.6
3. Baras	127	25	8	28	15.0	188	558	0	38	596	685	25	46	28	784	18.5	100.0	17.4	23.9
4. Binangonan	7,008	1,402	442	1,562	15.0	10,414	3,109	0	2,081	5,190	10,117	1,402	2,523	1,562	15,604	69.3	100.0	17.5	66.7
5. Cainta	6,273	569	58	3,116	35.0	10,016	18,589	4,018	43,748	66,356	24,862	4,587	43,807	3,116	76,972	25.2	12.4	0.1	13.8
6. Cardona	480	98	31	109	15.0	728	966	0	146	1,112	1,456	98	177	109	1,840	33.7	100.0	17.5	39.6
7. Jala-Jala	13	15	5	16	15.0	109	542	0	22	564	615	15	27	16	673	11.9	100.0	18.5	16.2
8. Montalban	3,303	53	21	1,704	30.0	5,680	3,292	1,069	3,557	7,918	7,195	1,122	3,578	1,704	13,599	54.2	4.7	0.6	41.8
9. Morong	955	191	60	313	15.0	1,419	861	0	284	1,145	1,816	191	344	313	2,564	52.6	100.0	17.4	55.3
10. Pililla	703	141	44	157	15.0	1,045	993	0	209	1,202	1,696	141	253	157	2,247	41.5	100.0	17.4	46.5
11. San Mateo	4,352	235	66	1,994	30.0	6,648	6,278	494	730	7,502	10,630	729	796	1,994	14,150	40.9	32.2	8.3	47.0
12. Tanay	2,170	434	137	484	15.0	3,225	1,656	0	645	2,301	3,826	434	782	484	5,526	56.7	100.0	17.5	58.4
13. Taytay	6,198	462	105	3,966	35.0	11,331	12,754	1,478	20,059	34,291	18,952	1,941	20,164	3,966	45,622	34.8	23.8	0.5	24.8
14. Teresa	480	96	30	107	15.0	713	575	0	143	718	1,055	96	173	107	1,431	45.5	100.0	17.3	49.8
TOTAL	1,218,158	455,291	118,068	950,068	34.7	2,741,584	436,105	118,941	418,793	973,839	1,654,262	574,232	536,861	950,068	3,715,423	73.6	79.3	22.0	73.8

TABLE 3.2.28 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (CASE 3)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,420,202	561,191	146,218	911,833	30.0	3,039,444	211,812	110,761	369,650	692,223	1,632,014	671,952	515,868	911,833	3,731,667	87.0	83.5	28.3	81.5
1. Manila	267,682	205,861	27,560	214,759	30.0	715,862	17,415	4,665	5,786	27,866	285,097	210,526	33,346	214,759	743,728	93.9	97.8	82.6	96.3
2. Pasay City	52,747	30,375	2,742	36,799	30.0	122,662	7,448	8,895	3,375	19,618	60,195	39,170	6,116	36,799	142,280	87.6	77.5	44.8	86.2
3. Quezon City	307,254	148,563	41,310	293,055	30.0	790,182	21,462	27,541	32,368	81,471	328,717	176,204	73,677	293,055	791,653	93.5	84.3	56.1	89.7
4. Caloocan City	130,825	19,650	15,174	62,421	30.0	208,070	30,123	3,674	4,665	38,462	160,948	23,324	19,839	62,421	246,532	78.6	84.2	76.5	84.4
5. Las Pinas	88,920	959	222	30,043	30.0	100,145	23,463	5,696	29,863	59,013	92,383	6,646	30,086	30,043	159,158	74.6	14.4	0.7	62.9
6. Makati	92,691	79,903	8,074	77,429	30.0	258,098	5,740	11,721	3,383	20,844	98,432	91,624	11,458	77,429	278,943	94.2	87.2	70.5	92.5
7. Malabon	40,574	6,060	14,698	26,285	30.0	87,616	10,723	2,016	14,565	27,304	51,297	8,076	29,263	26,285	114,921	79.1	75.0	50.2	76.2
8. Mandaluyong	41,038	18,491	13,386	31,250	30.0	104,166	2,914	2,128	5,353	10,395	43,952	20,620	18,739	31,250	114,560	93.4	89.7	71.4	90.9
9. Marikina	61,462	5,993	2,004	29,770	30.0	99,235	4,194	2,164	9,736	16,094	65,656	8,163	11,739	29,770	115,328	93.6	73.5	17.1	86.0
10. Muntinlupa	46,677	120	114	20,962	30.0	69,874	16,821	12,723	48,844	78,387	63,498	12,843	48,958	20,962	148,261	74.3	0.9	0.2	47.1
11. Navotas	29,978	3,484	3,621	15,893	30.0	52,977	2,401	821	1,739	4,961	32,379	4,105	5,360	15,893	57,737	92.6	84.9	67.6	91.8
12. Paranaque	92,068	10,372	2,393	44,928	30.0	149,761	23,296	7,897	25,207	56,100	115,364	17,969	27,600	44,928	205,861	79.8	57.7	8.7	72.8
13. Pasig	79,047	14,448	11,511	45,003	30.0	150,009	5,536	10,292	85,602	101,430	84,583	24,741	97,113	45,003	251,439	93.5	58.4	11.9	59.7
14. Pateros	7,638	86	5	3,312	30.0	11,041	3,311	0	2,502	5,813	10,949	86	2,507	3,312	16,854	69.8	100.0	0.2	65.5
15. San Juan	30,409	12,732	1,735	19,232	30.0	64,108	1,732	97	59	1,888	32,141	12,829	1,794	19,232	65,996	94.6	99.2	96.7	97.1
16. Taguig	39,371	556	13	17,118	30.0	57,060	17,185	5,650	58,702	81,537	56,556	6,206	58,715	17,118	138,597	69.6	9.0	0.0	41.2
17. Valenzuela	49,820	3,528	1,656	23,573	30.0	78,578	18,048	5,291	37,902	61,241	67,868	8,819	39,558	23,573	139,818	73.4	40.0	4.2	56.2
II. CAVITE	78,768	1,892	1,631	35,270	30.0	117,566	32,641	8,000	8,391	49,032	111,409	9,892	10,027	35,270	166,598	70.1	19.1	16.3	70.6
1. Bacoor	34,252	415	100	14,900	30.0	49,666	8,626	1,087	0	9,713	42,878	1,502	100	14,900	59,379	79.9	27.6	100.0	83.6
2. Cavite City	14,987	1,124	339	7,050	30.0	23,500	4,270	5,379	0	9,649	19,256	6,503	339	7,050	33,148	77.8	17.3	100.0	70.9
3. Imus	12,683	100	10	5,483	30.0	18,277	9,599	996	756	11,351	22,283	1,096	766	5,483	29,628	56.9	9.1	1.3	61.7
4. Kawit	9,723	189	818	4,598	30.0	15,328	1,855	0	0	1,855	11,578	189	818	4,598	17,183	84.0	100.0	100.0	89.2
5. Noveleta	3,057	8	126	1,367	30.0	4,558	1,702	0	0	1,702	4,759	8	126	1,367	6,260	64.2	100.0	100.0	72.8
6. Rosario	4,066	56	244	1,871	30.0	6,238	8,590	538	7,635	14,763	10,656	595	7,879	1,871	21,001	38.2	9.5	3.1	29.7
III. RIZAL	96,991	7,396	5,440	39,070	26.2	148,897	61,800	12,889	103,472	178,262	158,891	20,285	108,913	39,070	327,159	61.0	36.5	5.0	45.5
1. Angono	5,138	1,028	555	1,186	15.0	7,907	1,124	0	1,295	2,419	6,262	1,028	1,850	1,186	10,326	82.1	100.0	30.0	76.6
2. Antipolo	17,690	934	2,527	9,064	30.0	30,215	23,877	4,271	17,134	45,283	41,567	5,205	19,661	9,064	75,498	42.6	17.9	12.9	40.0
3. Baras	189	38	20	44	15.0	291	510	0	48	558	799	38	68	44	949	23.7	100.0	29.5	30.6
4. Binangonan	10,902	2,180	1,177	2,516	15.0	16,775	2,873	0	2,747	5,620	13,775	2,180	3,924	2,516	22,395	79.1	100.0	30.0	74.9
5. Cainta	24,761	595	68	10,939	30.0	36,463	10,715	4,905	51,541	67,162	35,476	5,500	51,610	10,939	103,625	69.8	12.4	0.3	35.2
6. Cardona	631	126	58	146	15.0	971	1,005	0	159	1,164	1,636	126	227	146	2,135	38.6	100.0	30.0	45.5
7. Jala-Jala	269	54	29	62	15.0	414	542	0	68	610	811	54	97	62	1,024	33.2	100.0	29.9	40.4
8. Montalban	5,644	84	24	2,457	30.0	8,189	3,070	1,305	4,191	8,566	8,714	1,370	4,215	2,457	16,755	64.8	6.1	0.6	48.9
9. Morong	1,253	251	135	289	15.0	1,928	900	0	316	1,216	2,153	251	451	289	3,144	58.2	100.0	29.9	61.3
10. Pililla	1,161	232	125	268	15.0	1,786	1,010	0	292	1,302	2,171	232	417	268	3,088	53.5	100.0	30.0	57.8
11. San Mateo	6,883	287	78	3,106	30.0	10,354	5,381	603	880	7,844	13,264	890	958	3,106	18,198	51.9	32.2	8.2	56.9
12. Tanay	3,924	785	424	906	15.0	6,039	1,570	0	989	2,559	5,494	785	1,413	906	8,598	71.4	100.0	30.0	70.2
13. Taytay	17,754	565	124	7,904	30.0	26,346	1,683	1,804	23,632	33,120	25,437	2,369	23,756	7,904	59,466	69.8	23.8	0.5	44.3
14. Teresa	792	158	86	183	15.0	1,219	539	0	200	739	1,331	158	286	183	1,958	59.5	100.0	30.1	62.3
TOTAL	1,595,962	570,478	153,289	986,173	29.8	3,305,903	306,253	131,651	481,513	919,517	1,902,314	702,129	634,802	986,173	4,225,424	83.9	81.2	24.1	78.2

TABLE 13.2.29 SUMMARY OF PROJECTED WATER DEMAND (CASE 1)

YEAR	MWSS SERVED WATER DEMAND (M3/D)					LOSS RATIO	MWSS SERVICE SHARE (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	%	DOM.	COM.	IND.	TOTAL
1995	1,218,158	455,291	118,068	606,903	2,398,420	25.3	73.6	79.3	22.0	71.1
1996	1,293,719	478,328	125,113	612,073	2,509,233	24.4	75.9	79.7	22.5	72.3
1997	1,369,280	501,366	132,159	617,243	2,620,047	23.6	78.1	80.2	22.9	73.3
1998	1,444,840	524,403	139,204	622,412	2,730,860	22.8	80.1	80.6	23.4	74.4
1999	1,520,401	547,441	146,250	627,582	2,841,674	22.1	82.1	80.9	23.8	75.3
2000	1,595,962	570,478	153,295	632,752	2,952,487	21.4	83.9	81.2	24.1	76.3
2005	1,878,704	685,026	187,997	737,565	3,489,292	21.1	87.6	82.6	25.8	78.6
2010	2,136,228	801,121	223,657	847,102	4,008,108	21.1	89.7	83.6	27.3	80.1

YEAR	PRIVATELY SERVED WATER DEMAND (M3/D)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL
1995	436,105	118,941	418,793	973,839
1996	410,155	121,483	431,337	962,975
1997	384,204	124,025	443,881	952,110
1998	358,254	126,567	456,425	941,246
1999	332,303	129,109	468,969	930,381
2000	306,353	131,651	481,513	919,517
2005	266,479	144,216	539,798	950,493
2010	245,812	156,888	595,310	998,010

YEAR	TOTAL WATER DEMAND (M3/D)				
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL
1995	1,654,263	574,232	536,861	606,903	3,372,259
1996	1,703,873	599,811	556,450	612,073	3,472,208
1997	1,753,484	625,391	576,040	617,243	3,572,157
1998	1,803,094	650,970	595,629	622,412	3,672,106
1999	1,852,705	676,550	615,219	627,582	3,772,055
2000	1,902,315	702,129	634,808	632,752	3,872,004
2005	2,145,183	829,242	727,795	737,565	4,439,785
2010	2,382,040	958,009	818,967	847,102	5,006,118

TABLE 13.2.30 SUMMARY OF PROJECTED WATER DEMAND (CASE 2)

YEAR	MWSS SERVED WATER DEMAND (M3/D)					LOSS RATIO	MWSS SERVICE SHARE (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	%	DOM.	COM.	IND.	TOTAL
1995	1,218,158	455,291	118,068	762,978	2,554,495	29.9	73.6	79.3	22.0	72.4
1996	1,293,719	478,328	125,113	766,254	2,663,414	28.8	75.9	79.7	22.5	73.4
1997	1,369,280	501,366	132,159	769,529	2,772,333	27.8	78.1	80.2	22.9	74.4
1998	1,444,840	524,403	139,204	772,805	2,881,253	26.8	80.1	80.6	23.4	75.4
1999	1,520,401	547,441	146,250	776,080	2,990,172	26.0	82.1	80.9	23.8	76.3
2000	1,595,962	570,478	153,295	779,356	3,099,091	25.1	83.9	81.2	24.1	77.1
2005	1,878,704	685,026	187,997	909,422	3,661,149	24.8	87.6	82.6	25.8	79.4
2010	2,136,228	801,121	223,657	1,042,123	4,203,129	24.8	89.7	83.6	27.3	80.8

YEAR	PRIVATELY SERVED WATER DEMAND (M3/D)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL
1995	436,105	118,941	418,793	973,839
1996	410,155	121,483	431,337	962,975
1997	384,204	124,025	443,881	952,110
1998	358,254	126,567	456,425	941,246
1999	332,303	129,109	468,969	930,381
2000	306,353	131,651	481,513	919,517
2005	266,479	144,216	539,798	950,493
2010	245,812	156,888	595,310	998,010

YEAR	TOTAL WATER DEMAND (M3/D)				
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL
1995	1,654,263	574,232	536,861	762,978	3,528,334
1996	1,703,873	599,811	556,450	766,254	3,626,389
1997	1,753,484	625,391	576,040	769,529	3,724,444
1998	1,803,094	650,970	595,629	772,805	3,822,498
1999	1,852,705	676,550	615,219	776,080	3,920,553
2000	1,902,315	702,129	634,808	779,356	4,018,608
2005	2,145,183	829,242	727,795	909,422	4,611,642
2010	2,382,040	958,009	818,967	1,042,123	5,201,139

TABLE 13.2.31 SUMMARY OF PROJECTED WATER DEMAND (CASE 3)

YEAR	MWSS SERVED WATER DEMAND (M3/D)					LOSS RATIO	MWSS SERVICE SHARE (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	%	DOM.	COM.	IND.	TOTAL
1995	1,218,158	455,291	118,068	950,068	2,741,585	34.7	73.6	79.3	22.0	73.8
1996	1,293,719	478,328	125,113	957,289	2,854,450	33.5	75.9	79.7	22.5	74.8
1997	1,369,280	501,366	132,159	964,510	2,967,314	32.5	78.1	80.2	22.9	75.7
1998	1,444,840	524,403	139,204	971,731	3,080,179	31.5	80.1	80.6	23.4	76.6
1999	1,520,401	547,441	146,250	978,952	3,193,043	30.7	82.1	80.9	23.8	77.4
2000	1,595,962	570,478	153,295	986,173	3,305,908	29.8	83.9	81.2	24.1	78.2
2005	1,878,704	685,026	187,997	909,422	3,661,149	24.8	87.6	82.6	25.8	79.4
2010	2,136,228	801,121	223,657	1,042,123	4,203,129	24.8	89.7	83.6	27.3	80.8

YEAR	PRIVATELY SERVED WATER DEMAND (M3/D)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL
1995	436,105	118,941	418,793	973,839
1996	410,155	121,483	431,337	962,975
1997	384,204	124,025	443,881	952,110
1998	358,254	126,567	456,425	941,246
1999	332,303	129,109	468,969	930,381
2000	306,353	131,651	481,513	919,517
2005	266,479	144,216	539,798	950,493
2010	245,812	156,888	595,310	998,010

YEAR	TOTAL WATER DEMAND (M3/D)				
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL
1995	1,654,263	574,232	536,861	950,068	3,715,424
1996	1,703,873	599,811	556,450	957,289	3,817,424
1997	1,753,484	625,391	576,040	964,510	3,919,424
1998	1,803,094	650,970	595,629	971,731	4,021,425
1999	1,852,705	676,550	615,219	978,952	4,123,425
2000	1,902,315	702,129	634,808	986,173	4,225,425
2005	2,145,183	829,242	727,795	909,422	4,611,642
2010	2,382,040	958,009	818,967	1,042,123	5,201,139

TABLE 13.3.1 DISTRIBUTION OF WATER DEMAND IN 1995, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	2,597,312	742,276	3,339,588	98.3	1.7	2,552,414	44,898	742,276	787,174	23.6
1. Manila	681,100	29,796	710,897	100.0	0.0	681,100	0	29,796	29,796	4.2
2. Pasay City	105,590	22,731	128,321	95.2	4.8	100,508	5,082	22,731	27,813	21.7
3. Quezon City	642,072	83,254	725,326	97.1	2.9	623,746	18,326	83,254	101,580	14.0
4. Caloocan City	167,729	48,176	215,905	100.0	0.0	167,729	0	48,176	48,176	22.3
5. Las Pinas	47,307	67,013	114,320	96.3	3.7	45,573	1,734	67,013	68,747	60.1
6. Makati	231,774	25,581	257,355	96.8	3.2	224,414	7,360	25,581	32,941	12.8
7. Malabon	71,165	31,270	102,435	98.3	1.7	69,921	1,244	31,270	32,514	31.7
8. Mandaluyong	95,271	10,729	106,000	100.0	0.0	95,271	0	10,729	10,729	10.1
9. Marikina	90,788	14,380	105,169	100.0	0.0	90,788	0	14,380	14,380	13.7
10. Muntinlupa	32,049	83,453	115,501	78.1	21.9	25,030	7,019	83,453	90,472	78.3
11. Navotas	46,507	6,480	52,987	99.3	0.7	46,194	313	6,480	6,793	12.8
12. Paranaque	113,095	69,929	183,025	98.4	1.6	111,327	1,768	69,929	71,697	39.2
13. Pasig	130,063	90,273	220,336	99.8	0.2	129,807	256	90,273	90,529	41.1
14. Pateros	6,657	7,401	14,057	100.0	0.0	6,657	0	7,401	7,401	52.6
15. San Juan	63,517	1,887	65,404	100.0	0.0	63,517	0	1,887	1,887	2.9
16. Taguig	15,787	92,662	108,449	94.6	5.4	14,940	847	92,662	93,509	86.2
17. Valenzuela	56,841	57,261	114,101	98.3	1.7	55,892	949	57,261	58,210	51.0
II. CAVITE	67,529	62,769	130,299	22.3	77.7	15,061	52,468	62,769	115,237	88.4
1. Bacoor	22,617	19,808	42,425	66.6	33.4	15,061	7,556	19,808	27,364	64.5
2. Cavite City	17,375	10,917	28,293	0.0	100.0	0	17,375	10,917	28,293	100.0
3. Imus	11,245	12,480	23,725	0.0	100.0	0	11,245	12,480	23,725	100.0
4. Kawit	10,929	3,041	13,971	0.0	100.0	0	10,929	3,041	13,971	100.0
5. Noveleta	1,621	3,059	4,680	0.0	100.0	0	1,621	3,059	4,680	100.0
6. Rosario	3,742	13,464	17,205	0.0	100.0	0	3,742	13,464	17,205	100.0
III. RIZAL	76,743	168,794	245,537	17.1	82.9	13,094	63,649	168,794	232,443	94.7
1. Angono	4,628	2,081	6,709	100.0	0.0	4,628	0	2,081	2,081	31.0
2. Antipolo	19,999	37,816	57,816	0.0	100.0	0	19,999	37,816	57,816	100.0
3. Baras	188	596	784	0.0	100.0	0	188	596	784	100.0
4. Binangonan	10,414	5,190	15,604	0.0	100.0	0	10,414	5,190	15,604	100.0
5. Cainta	10,616	66,356	76,972	45.5	54.5	4,830	5,786	66,356	72,142	93.7
6. Cardona	728	1,112	1,840	0.0	100.0	0	728	1,112	1,840	100.0
7. Jala-Jala	109	564	673	0.0	100.0	0	109	564	673	100.0
8. Montalban	5,680	7,918	13,599	0.0	100.0	0	5,680	7,918	13,599	100.0
9. Morong	1,419	1,145	2,564	0.0	100.0	0	1,419	1,145	2,564	100.0
10. Pililla	1,045	1,202	2,247	0.0	100.0	0	1,045	1,202	2,247	100.0
11. San Mateo	6,648	7,502	14,150	0.0	100.0	0	6,648	7,502	14,150	100.0
12. Tanay	3,225	2,301	5,526	0.0	100.0	0	3,225	2,301	5,526	100.0
13. Taytay	11,331	34,291	45,622	32.1	67.9	3,636	7,695	34,291	41,986	92.0
14. Teresa	713	718	1,431	0.0	100.0	0	713	718	1,431	100.0
TOTAL	2,741,584	973,839	3,715,423	94.1	5.9	2,580,569	161,015	973,839	1,134,854	30.5

TABLE 13.3.2 DISTRIBUTION OF WATER DEMAND IN 2000, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,039,444	692,223	3,731,667	98.5	1.5	2,994,546	44,898	692,223	737,121	19.8
1. Manila	715,862	27,866	743,728	100.0	0.0	715,862	0	27,866	27,866	3.7
2. Pasay City	122,662	19,618	142,280	95.9	4.1	117,580	5,082	19,618	24,700	17.4
3. Quezon City	710,182	81,471	791,653	97.4	2.6	691,856	18,326	81,471	99,797	12.6
4. Caloocan City	208,070	38,462	246,532	100.0	0.0	208,070	0	38,462	38,462	15.6
5. Las Pinas	100,145	59,013	159,158	98.3	1.7	98,411	1,734	59,013	60,747	38.2
6. Makati	258,098	20,844	278,943	97.1	2.9	250,738	7,360	20,844	28,204	10.1
7. Malabon	87,616	27,304	114,921	98.6	1.4	86,372	1,244	27,304	28,548	24.8
8. Mandaluyong	104,166	10,395	114,560	100.0	0.0	104,166	0	10,395	10,395	9.1
9. Marikina	99,235	16,094	115,328	100.0	0.0	99,235	0	16,094	16,094	14.0
10. Muntinlupa	69,874	78,387	148,261	90.0	10.0	62,855	7,019	78,387	85,406	57.6
11. Navotas	52,977	4,761	57,737	99.4	0.6	52,664	313	4,761	5,074	8.8
12. Paranaque	149,761	56,100	205,861	98.8	1.2	147,993	1,768	56,100	57,868	28.1
13. Pasig	150,009	101,430	251,439	99.8	0.2	149,753	256	101,430	101,686	40.4
14. Pateros	11,041	5,813	16,854	100.0	0.0	11,041	0	5,813	5,813	34.5
15. San Juan	64,108	1,888	65,996	100.0	0.0	64,108	0	1,888	1,888	2.9
16. Taguig	57,060	81,537	138,597	98.5	1.5	56,213	847	81,537	82,384	59.4
17. Valenzuela	78,578	61,241	139,818	98.8	1.2	77,629	949	61,241	62,190	44.5
II. CAVITE	117,566	49,032	166,598	39.7	60.3	46,709	70,858	49,032	119,890	72.0
1. Bacoor	49,666	9,713	59,379	84.8	15.2	42,110	7,556	9,713	17,269	29.1
2. Cavite City	23,500	9,649	33,148	0.0	100.0	0	23,500	9,649	33,148	100.0
3. Imus	18,277	11,351	29,628	0.0	100.0	0	18,277	11,351	29,628	100.0
4. Kawit	15,328	1,855	17,183	30.0	70.0	4,598	10,730	1,855	12,585	73.2
5. Noveleta	4,558	1,702	6,260	0.0	100.0	0	4,558	1,702	6,260	100.0
6. Rosario	6,238	14,763	21,001	0.0	100.0	0	6,238	14,763	21,001	100.0
III. RIZAL	148,897	178,262	327,159	42.2	57.8	62,799	86,098	178,262	264,360	80.8
1. Angono	7,907	2,419	10,326	100.0	0.0	7,907	0	2,419	2,419	23.4
2. Antipolo	30,215	45,283	75,498	6.1	93.9	1,834	28,381	45,283	73,664	97.6
3. Baras	291	658	949	0.0	100.0	0	291	658	949	100.0
4. Binangonan	16,775	5,620	22,395	0.0	100.0	0	16,775	5,620	22,395	100.0
5. Cainta	36,463	67,162	103,625	84.1	15.9	30,677	5,786	67,162	72,948	70.4
6. Cardona	971	1,164	2,135	0.0	100.0	0	971	1,164	2,135	100.0
7. Jala-Jala	414	610	1,024	0.0	100.0	0	414	610	1,024	100.0
8. Montalban	8,189	8,566	16,755	18.4	81.6	1,505	6,684	8,566	15,250	91.0
9. Morong	1,928	1,216	3,144	0.0	100.0	0	1,928	1,216	3,144	100.0
10. Pililla	1,786	1,302	3,088	0.0	100.0	0	1,786	1,302	3,088	100.0
11. San Mateo	10,354	7,844	18,198	21.5	78.5	2,224	8,130	7,844	15,974	87.8
12. Tanay	6,039	2,559	8,598	0.0	100.0	0	6,039	2,559	8,598	100.0
13. Taytay	26,346	33,120	59,466	70.8	29.2	18,651	7,695	33,120	40,815	68.6
14. Teresa	1,219	739	1,958	0.0	100.0	0	1,219	739	1,958	100.0
TOTAL	3,305,908	919,517	4,225,424	93.9	6.1	3,104,053	201,854	919,517	1,121,371	26.5

TABLE 13.3.3 DISTRIBUTION OF WATER DEMAND IN 2005, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,311,729	711,915	4,023,644	98.6	1.4	3,266,831	44,898	711,915	756,813	18.8
1. Manila	738,301	27,472	765,773	100.0	0.0	738,301	0	27,472	27,472	3.6
2. Pasay City	136,214	16,708	152,922	96.3	3.7	131,132	5,082	16,708	21,790	14.2
3. Quezon City	760,536	81,874	842,410	97.6	2.4	742,210	18,326	81,874	100,200	11.9
4. Caloocan City	235,267	33,970	269,237	100.0	0.0	235,267	0	33,970	33,970	12.6
5. Las Pinas	140,422	59,684	200,105	98.8	1.2	138,688	1,734	59,684	61,418	30.7
6. Makati	272,451	20,920	293,371	97.3	2.7	265,091	7,360	20,920	28,280	9.6
7. Malabon	98,128	25,351	123,479	98.7	1.3	96,884	1,244	25,351	26,595	21.5
8. Mandaluyong	110,518	10,394	120,911	100.0	0.0	110,518	0	10,394	10,394	8.6
9. Marikina	105,535	18,090	123,625	100.0	0.0	105,535	0	18,090	18,090	14.6
10. Muntinlupa	89,985	83,225	173,211	92.2	7.8	82,966	7,019	83,225	90,244	52.1
11. Navotas	55,863	4,737	60,600	99.4	0.6	55,550	313	4,737	5,050	8.3
12. Paranaque	158,744	56,320	215,064	98.9	1.1	156,976	1,768	56,320	58,088	27.0
13. Pasig	161,455	115,717	277,172	99.8	0.2	161,199	256	115,717	115,973	41.8
14. Pateros	13,229	5,346	18,575	100.0	0.0	13,229	0	5,346	5,346	28.8
15. San Juan	64,133	1,888	66,020	100.0	0.0	64,133	0	1,888	1,888	2.9
16. Taguig	69,925	86,909	156,834	98.8	1.2	69,078	847	86,909	87,756	56.0
17. Valenzuela	101,024	63,311	164,335	99.1	0.9	100,075	949	63,311	64,260	39.1
II. CAVITE	144,680	44,868	189,548	41.3	58.7	59,719	84,961	44,868	129,829	68.5
1. Bacoor	59,874	9,140	69,014	87.4	12.6	52,318	7,556	9,140	16,696	24.2
2. Cavite City	28,461	7,781	36,242	0.0	100.0	0	28,461	7,781	36,242	100.0
3. Imus	23,527	10,346	33,873	0.0	100.0	0	23,527	10,346	33,873	100.0
4. Kawit	18,502	603	19,105	40.0	60.0	7,401	11,101	603	11,704	61.3
5. Noveleta	5,742	1,284	7,027	0.0	100.0	0	5,742	1,284	7,027	100.0
6. Rosario	8,573	15,715	24,288	0.0	100.0	0	8,573	15,715	24,288	100.0
III. RIZAL	204,739	193,711	398,449	48.7	51.3	99,731	105,008	193,711	298,718	75.0
1. Angono	12,701	2,592	15,293	100.0	0.0	12,701	0	2,592	2,592	16.9
2. Antipolo	39,332	51,175	90,506	21.8	78.2	8,572	30,760	51,175	81,934	90.5
3. Baras	642	708	1,350	0.0	100.0	0	642	708	1,350	100.0
4. Binangonan	25,501	5,671	31,172	0.0	100.0	0	25,501	5,671	31,172	100.0
5. Cainta	48,686	73,627	122,313	88.1	11.9	42,900	5,786	73,627	79,413	64.9
6. Cardona	1,347	1,188	2,535	0.0	100.0	0	1,347	1,188	2,535	100.0
7. Jala-Jala	911	638	1,549	0.0	100.0	0	911	638	1,549	100.0
8. Montalban	10,188	8,936	19,124	34.4	65.6	3,504	6,684	8,936	15,620	81.7
9. Morong	2,833	1,290	4,123	0.0	100.0	0	2,833	1,290	4,123	100.0
10. Pililla	3,462	1,356	4,818	0.0	100.0	0	3,462	1,356	4,818	100.0
11. San Mateo	14,124	7,833	21,958	42.4	57.6	5,994	8,130	7,833	15,963	72.7
12. Tanay	9,425	2,662	12,087	0.0	100.0	0	9,425	2,662	12,087	100.0
13. Taytay	33,754	35,304	69,058	77.2	22.8	26,059	7,695	35,304	42,999	62.3
14. Teresa	1,832	730	2,562	0.0	100.0	0	1,832	730	2,562	100.0
TOTAL	3,661,148	950,493	4,611,641	93.6	6.4	3,426,281	234,867	950,493	1,185,360	25.7

TABLE 13.3.4 DISTRIBUTION OF WATER DEMAND IN 2010, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (MJ/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (MJ/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,740,899	753,685	4,494,583	98.8	1.2	3,696,001	44,898	753,685	798,583	17.8
1. Manila	804,366	27,359	831,725	100.0	0.0	804,366	0	27,359	27,359	3.3
2. Pasay City	153,165	16,736	169,901	96.7	3.3	148,083	5,082	16,736	21,818	12.8
3. Quezon City	852,444	82,662	935,106	97.9	2.1	834,118	18,326	82,662	100,988	10.8
4. Caloocan City	277,565	27,960	305,524	100.0	0.0	277,565	0	27,960	27,960	9.2
5. Las Pinas	179,932	69,889	249,821	99.0	1.0	178,198	1,734	69,889	71,623	28.7
6. Makati	302,437	21,036	323,473	97.6	2.4	295,077	7,360	21,036	28,396	8.8
7. Malabon	114,113	22,979	137,092	98.9	1.1	112,869	1,244	22,979	24,223	17.7
8. Mandaluyong	122,989	10,456	133,445	100.0	0.0	122,989	0	10,456	10,456	7.8
9. Marikina	117,556	20,112	137,668	100.0	0.0	117,556	0	20,112	20,112	14.6
10. Muntinlupa	106,746	94,265	201,011	93.4	6.6	99,727	7,019	94,265	101,284	50.4
11. Navotas	61,692	4,787	66,479	99.5	0.5	61,379	313	4,787	5,100	7.7
12. Paranaque	166,529	61,722	228,251	98.9	1.1	164,761	1,768	61,722	63,490	27.8
13. Pasig	181,869	129,726	311,595	99.9	0.1	181,613	256	129,726	129,982	41.7
14. Pateros	16,376	4,600	20,975	100.0	0.0	16,376	0	4,600	4,600	21.9
15. San Juan	67,826	1,880	69,706	100.0	0.0	67,826	0	1,880	1,880	2.7
16. Taguig	88,247	90,416	178,664	99.0	1.0	87,400	847	90,416	91,263	51.1
17. Valenzuela	127,045	67,101	194,147	99.3	0.7	126,096	949	67,101	68,050	35.1
II. CAVITE	178,439	41,718	220,157	41.8	58.2	74,549	103,890	41,718	145,608	66.1
1. Bacoor	71,216	10,799	82,015	89.4	10.6	63,660	7,556	10,799	18,355	22.4
2. Cavite City	32,500	7,310	39,810	0.0	100.0	0	32,500	7,310	39,810	100.0
3. Imus	33,381	6,818	40,199	0.0	100.0	0	33,381	6,818	40,199	100.0
4. Kawit	21,778	0	21,778	50.0	50.0	10,889	10,889	0	10,889	50.0
5. Noveleta	7,289	816	8,105	0.0	100.0	0	7,289	816	8,105	100.0
6. Rosario	12,275	15,975	28,250	0.0	100.0	0	12,275	15,975	28,250	100.0
III. RIZAL	283,791	202,608	486,399	53.7	46.3	152,420	131,371	202,608	333,979	68.7
1. Angono	19,296	2,516	21,812	100.0	0.0	19,296	0	2,516	2,516	11.5
2. Antipolo	53,929	55,380	109,309	33.7	66.3	18,149	35,780	55,380	91,160	83.4
3. Baras	1,165	731	1,896	0.0	100.0	0	1,165	731	1,896	100.0
4. Binangonan	36,874	5,250	42,124	0.0	100.0	0	36,874	5,250	42,124	100.0
5. Cainta	66,270	78,127	144,397	91.3	8.7	60,484	5,786	78,127	83,913	58.1
6. Cardona	1,825	1,178	3,003	0.0	100.0	0	1,825	1,178	3,003	100.0
7. Jala-Jala	1,646	632	2,278	0.0	100.0	0	1,646	632	2,278	100.0
8. Montalban	12,542	9,318	21,860	46.7	53.3	5,858	6,684	9,318	16,002	73.2
9. Morong	4,076	1,318	5,394	0.0	100.0	0	4,076	1,318	5,394	100.0
10. Pililla	5,108	1,324	6,432	0.0	100.0	0	5,108	1,324	6,432	100.0
11. San Mateo	19,954	7,193	27,147	59.3	40.7	11,824	8,130	7,193	15,323	56.4
12. Tanay	13,968	2,574	16,542	0.0	100.0	0	13,968	2,574	16,542	100.0
13. Taytay	44,504	36,380	80,884	82.7	17.3	36,809	7,695	36,380	44,075	54.5
14. Teresa	2,634	686	3,320	0.0	100.0	0	2,634	686	3,320	100.0
TOTAL	4,203,129	998,010	5,201,139	93.3	6.7	3,922,970	280,159	998,010	1,278,170	24.6

TABLE 13.3.5 ANALYSIS ON WATER SUPPLY AND SUPPLY CAPACITY

YEAR	MWSS WATER DEMAND (M3/D)			MWSS PRODUCTION FROM SURFACE WATER (M3/D)					EXCESS IN PRODUCTION (M3/D)	REQUIRED GROUNDWATER SUPPLY (M3/D)		
	TOTAL	W/I CDS	LOSS (%)	EXISTING	ANGAT (ON-GOING)	WAWA (PLANNED)	UMIRAY (PLANNED)	TOTAL (M3/D)		MWSS	PRIVATE	TOTAL
1995	2,741,584	2,646,504	35.0	2,234,700	-	-	-	2,234,700	(411,804)	161,015	973,839	1,134,854
1996	2,854,449	2,761,986	34.0	2,234,700	1,231,200	-	-	3,465,900	703,914	169,183	962,975	1,132,157
1997	2,967,314	2,877,467	33.0	2,234,700	1,231,200	68,400	-	3,534,300	656,833	177,351	952,110	1,129,461
1998	3,080,178	2,992,949	32.0	2,234,700	1,231,200	68,400	738,700	4,273,000	1,280,051	185,518	941,246	1,126,764
1999	3,193,043	3,108,430	31.0	2,234,700	1,231,200	68,400	738,700	4,273,000	1,164,570	193,686	930,381	1,124,068
2000	3,305,908	3,223,912	30.0	2,234,700	1,231,200	68,400	738,700	4,273,000	1,049,088	201,854	919,517	1,121,371
2005	3,661,148	3,548,890	25.0	2,234,700	1,231,200	68,400	738,700	4,273,000	724,110	234,867	950,493	1,185,360
2010	4,203,129	4,050,388	25.0	2,234,700	1,231,200	68,400	738,700	4,273,000	222,612	280,159	998,010	1,278,169

WATER PRODUCTION:

1. EXISTING; actual average production in last 5 years: 2,352,364 M3/D
   actual production loss in MWSS in 1990; 1.5%
   assumed production loss in the future: 5%
   2,352,364 x 95% = 2,234,746
2. ANGAT; AWSOP 15CMS x 95% (production loss: 5%)
3. WAWA; MWEWSP 72MLD x 95% (production loss: 5%)
4. UMIRAY; UATP 9CMS x 95% (production loss: 5%)
5. Demand for MWSS in Angono and Taytay is assumed to be supplied with surface water through RPWSP.

TABLE 13.4.1 MWSS COMMERCIAL CONSUMPTION PROJECTION (SCENARIO 2)

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	434,665	96.4	78.5	21.5	550,461	448,632	101,829	671,952	561,191	110,761	792,069	681,308	110,761	913,196	802,434	110,761
1. Manila *	136,183	30.2	96.6	3.4	172,462	167,797	4,665	210,526	205,861	4,665	248,160	243,494	4,665	286,109	281,444	4,665
2. Pasay City *	25,338	5.6	65.3	34.7	32,088	23,293	8,795	39,170	30,375	8,795	46,172	37,377	8,795	53,233	44,438	8,795
3. Quezon City *	113,981	25.3	75.7	24.3	144,346	116,705	27,641	176,204	148,563	27,641	207,702	180,061	27,641	239,464	211,824	27,641
4. Caloocan City *	15,088	3.3	75.6	24.4	19,107	15,433	3,674	23,324	19,650	3,674	27,494	23,820	3,674	31,698	28,024	3,674
5. Las Pinas	4,299	1.0	14.4	85.6	5,444	786	4,658	6,646	958	5,686	7,833	2,147	5,686	9,031	3,345	5,686
6. Makati *	59,269	13.1	80.2	19.8	75,058	63,337	11,721	91,624	79,903	11,721	108,003	96,282	11,721	124,516	112,798	11,721
7. Malabon *	5,224	1.2	61.4	38.6	6,616	4,600	2,016	8,076	6,060	2,016	9,519	7,504	2,016	10,975	8,959	2,016
8. Mandaluyong *	13,338	3.0	84.0	16.0	16,891	14,763	2,128	20,620	18,493	2,128	24,305	22,177	2,128	28,022	25,894	2,128
9. Marikina	5,280	1.2	73.5	26.5	6,687	4,314	1,773	8,163	5,999	2,164	9,622	7,458	2,164	11,094	8,930	2,164
10. Muntinlupa	8,308	1.8	0.9	99.1	10,521	98	10,423	12,843	120	12,723	15,139	2,416	12,723	17,454	4,731	12,723
11. Navotas *	2,655	0.6	76.6	23.4	3,363	2,742	621	4,105	3,484	621	4,839	4,218	621	5,578	4,958	621
12. Paranaque	11,624	2.6	57.7	42.3	14,720	8,497	6,223	17,969	10,372	7,597	21,181	13,584	7,597	24,420	16,823	7,597
13. Pasig	16,004	3.5	58.4	41.6	20,268	11,836	8,431	24,741	14,448	10,292	29,163	18,871	10,292	33,623	23,331	10,292
14. Pateros	56	0.0	100.0	0.0	71	71	0	86	86	0	102	102	0	117	117	0
15. San Juan *	8,299	1.8	98.8	1.2	10,510	10,412	97	12,828	12,732	97	15,122	15,025	97	17,435	17,338	97
16. Taguig	4,006	0.9	9.0	91.0	5,075	457	4,629	6,206	558	5,650	7,318	1,668	5,650	8,437	2,787	5,650
17. Valenzuela	5,705	1.3	40.0	60.0	7,224	2,890	4,335	8,819	3,528	5,291	10,395	5,104	5,291	11,985	6,694	5,291
II. CAVITE	6,399	1.4	19.1	80.9	8,103	1,550	6,554	9,892	1,892	8,000	11,660	3,660	8,000	13,443	5,443	8,000
1. Bacoor	971	0.2	27.6	72.4	1,230	340	890	1,502	415	1,087	1,770	683	1,087	2,041	954	1,087
2. Cavite City	4,207	0.9	17.3	82.7	5,327	921	4,406	6,503	1,124	5,379	7,666	2,287	5,379	8,838	3,459	5,379
3. Imus	709	0.2	9.1	90.9	898	82	816	1,096	100	996	1,292	296	996	1,490	494	996
4. Kawit	122	0.0	100.0	0.0	155	155	0	189	189	0	222	222	0	256	256	0
5. Noveleta	5	0.0	100.0	0.0	6	6	0	8	8	0	9	9	0	10	10	0
6. Rosario	385	0.1	9.5	90.5	487	46	441	595	56	538	701	163	538	808	270	538
III. RIZAL	9,983	2.2	16.5	83.5	15,668	5,109	10,559	20,285	7,396	12,889	25,513	10,320	15,193	31,370	13,854	17,517
1. Angono	-	-	-	-	623	623	0	1,028	1,028	0	1,585	1,585	0	2,317	2,317	0
2. Antipolo	3,367	0.7	17.9	82.1	4,264	765	3,499	5,205	934	4,271	6,136	1,101	5,035	7,074	1,269	5,805
3. Baras	-	-	-	-	25	25	0	38	38	0	80	80	0	140	140	0
4. Binangonan	-	-	-	-	1,402	1,402	0	2,180	2,180	0	3,183	3,183	0	4,427	4,427	0
5. Cainta	3,622	0.8	12.4	87.6	4,587	569	4,018	5,600	695	4,905	6,601	819	5,782	7,610	944	6,667
6. Cardona	-	-	-	-	98	98	0	126	126	0	168	168	0	219	219	0
7. Jala-Jala	-	-	-	-	15	15	0	54	54	0	114	114	0	198	198	0
8. Montalban	886	0.2	4.7	95.3	1,122	53	1,069	1,370	64	1,305	1,614	76	1,539	1,861	87	1,774
9. Morong	-	-	-	-	191	191	0	251	251	0	354	354	0	489	489	0
10. Pililla	-	-	-	-	141	141	0	232	232	0	432	432	0	613	613	0
11. San Mateo	576	0.1	32.2	67.8	729	235	494	890	287	603	1,049	338	711	1,209	390	819
12. Tanay	-	-	-	-	434	434	0	785	785	0	1,176	1,176	0	1,677	1,677	0
13. Taytay	1,532	0.3	23.8	76.2	1,941	462	1,478	2,369	565	1,804	2,792	665	2,127	3,219	767	2,452
14. Teresa	-	-	-	-	96	96	0	158	158	0	223	223	0	316	316	0
TOTAL	451,047	100.0	76.3	23.7	574,232	455,291	118,941	702,129	570,478	131,651	829,242	695,287	133,955	958,009	821,731	136,278

* Future demand increase was assumed to be shouldered by MWSS only.

TABLE 13.4.2 MWSS INDUSTRIAL CONSUMPTION PROJECTION (SCENARIO 2)

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	362,048	82.4	22.5	77.5	437,871	113,331	324,540	515,868	146,218	369,650	588,825	219,175	369,650	659,386	289,736	369,650
1. Manila *	23,403	5.3	75.3	24.7	28,304	22,519	5,786	33,346	27,560	5,786	38,062	32,276	5,786	42,623	36,837	5,786
2. Pasay City *	4,293	1.0	21.4	78.6	5,192	1,817	3,375	6,116	2,742	3,375	6,981	3,607	3,375	7,818	4,443	3,375
3. Quezon City *	51,708	11.8	37.4	62.6	62,538	30,170	32,368	73,677	41,310	32,368	84,097	51,730	32,368	94,175	61,807	32,368
4. Caloocan City *	13,923	3.2	66.5	33.5	16,839	12,175	4,665	19,833	15,174	4,665	22,644	17,980	4,665	25,358	20,693	4,665
5. Las Pinas	21,115	4.8	0.7	99.3	25,537	189	25,348	30,086	222	29,863	34,341	4,477	29,863	38,456	8,592	29,863
6. Makati *	8,041	1.8	57.9	42.1	9,725	6,342	3,383	11,458	8,074	3,383	13,078	9,694	3,383	14,645	11,262	3,383
7. Malabon *	20,537	4.7	29.1	70.9	24,838	10,273	14,565	29,261	14,698	14,565	33,401	18,836	14,565	37,404	22,839	14,565
8. Mandaluyong *	13,151	3.0	59.3	40.7	15,906	10,553	5,353	18,739	13,386	5,353	21,389	16,036	5,353	23,952	18,599	5,353
9. Marikina	8,239	1.9	17.1	82.9	9,965	1,701	8,264	11,733	2,004	9,736	13,400	3,664	9,736	15,005	5,270	9,736
10. Muntinlupa	34,360	7.8	0.2	99.8	41,556	97	41,459	48,958	114	48,844	55,892	7,038	48,844	62,578	13,734	48,844
11. Navotas *	3,762	0.9	53.8	46.2	4,550	2,811	1,739	5,360	3,621	1,739	6,118	4,379	1,739	6,852	5,112	1,739
12. Paranaque	19,370	4.4	8.7	91.3	23,427	2,031	21,396	27,600	2,393	25,207	31,503	6,296	25,207	35,278	10,071	25,207
13. Pasig	68,156	15.5	11.9	88.1	82,430	9,770	72,659	97,113	11,511	85,602	110,847	25,245	85,602	124,130	38,528	85,602
14. Pateros	1,760	0.4	0.2	99.8	2,128	4	2,124	2,501	5	2,502	2,862	360	2,502	3,205	703	2,502
15. San Juan *	1,259	0.3	95.3	4.7	1,522	1,463	59	1,794	1,735	59	2,047	1,988	59	2,293	2,234	59
16. Taguig	41,208	9.4	0.0	100.0	49,838	11	49,826	58,715	13	58,702	67,019	8,317	58,702	75,050	16,348	58,702
17. Valenzuela	27,763	6.3	4.2	95.8	33,577	1,406	32,171	39,556	1,656	37,902	45,153	7,251	37,902	50,564	12,662	37,902
II. CAVITE	7,037	1.6	16.3	83.7	8,511	1,389	7,122	10,027	1,637	8,391	11,445	3,055	8,391	12,817	4,426	8,391
1. Bacoor	70	0.0	100.0	0.0	85	85	0	100	100	0	114	114	0	128	128	0
2. Cavite City	238	0.1	100.0	0.0	288	288	0	339	339	0	387	387	0	433	433	0
3. Imus	538	0.1	1.3	98.7	650	9	641	766	10	756	874	119	756	979	223	756
4. Kawit	574	0.1	100.0	0.0	694	694	0	818	818	0	934	934	0	1,045	1,045	0
5. Noveleta	88	0.0	100.0	0.0	107	107	0	126	126	0	143	143	0	161	161	0
6. Rosario	5,530	1.3	3.1	96.9	6,688	207	6,481	7,879	244	7,635	8,993	1,358	7,635	10,071	2,436	7,635
III. RIZAL	70,308	16.0	2.8	97.2	90,479	3,347	87,131	108,813	5,440	103,472	123,524	9,149	114,375	146,764	14,834	131,930
1. Angono	-	-	-	-	1,121	196	925	1,850	555	1,295	2,854	1,284	1,570	4,170	2,502	1,668
2. Antipolo	13,798	3.1	12.9	87.1	16,688	2,145	14,543	19,663	2,527	17,136	22,441	2,884	19,557	25,130	3,230	21,901
3. Baras	-	-	-	-	46	8	38	68	20	48	144	65	79	252	151	101
4. Binangonan	-	-	-	-	2,523	442	2,081	3,324	1,177	2,747	5,729	2,578	3,151	7,968	4,781	3,187
5. Calinta	36,221	8.2	0.1	99.9	43,807	58	43,748	51,610	68	51,541	58,509	78	58,431	65,968	88	65,880
6. Cardona	-	-	-	-	177	31	146	227	68	159	303	136	167	395	231	158
7. Jala-Jala	-	-	-	-	27	5	22	97	29	68	204	92	112	355	213	142
8. Montalban	2,958	0.7	0.6	99.4	3,578	21	3,557	4,215	24	4,191	4,811	28	4,784	5,388	31	5,357
9. Morong	-	-	-	-	344	60	284	451	135	316	636	286	350	881	529	352
10. Pililla	-	-	-	-	253	44	209	469	125	292	778	350	428	1,104	662	442
11. San Mateo	658	0.1	8.3	91.7	796	66	730	938	78	860	1,071	89	982	1,199	100	1,099
12. Tanay	-	-	-	-	782	137	645	1,483	424	989	2,118	953	1,165	3,019	1,811	1,208
13. Taytay	16,672	3.8	0.5	99.5	20,164	105	20,059	23,756	124	23,632	27,116	141	26,975	30,365	158	30,207
14. Teresa	-	-	-	-	173	30	143	286	86	200	411	185	226	570	342	228
TOTAL	439,394	100.0	19.2	80.8	536,861	118,068	418,793	634,808	153,295	481,513	723,795	231,379	496,416	818,967	308,996	509,971

* Future demand increase was assumed to be shouldered by MWSS only.

TABLE 13.4.3 MWSS COMMERCIAL CONSUMPTION PROJECTION (SCENARIO 3)

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	434,665	96.4	78.5	21.5	553,461	448,632	101,829	671,952	570,123	101,829	792,069	690,240	101,829	913,196	811,367	101,829
1. Manila *	136,183	30.2	56.6	3.4	172,462	167,797	4,665	210,526	205,861	4,665	248,160	243,494	4,665	286,109	281,444	4,665
2. Pasay City *	25,338	5.6	65.3	34.7	32,088	23,293	8,795	39,170	30,375	8,795	46,132	37,337	8,795	53,233	44,438	8,795
3. Quezon City *	113,581	25.3	75.7	24.3	144,346	116,705	27,641	176,204	148,563	27,641	207,702	180,061	27,641	239,464	211,824	27,641
4. Caloocan City *	15,088	3.3	75.6	24.4	19,107	15,433	3,674	23,324	19,650	3,674	27,484	23,810	3,674	31,698	28,024	3,674
5. Las Pinas	4,299	1.0	14.4	85.6	5,444	786	4,658	6,646	1,988	4,658	7,833	3,175	4,658	9,031	4,373	4,658
6. Makati *	55,269	13.1	80.2	19.8	85,056	63,337	11,721	91,624	79,903	11,721	108,003	96,282	11,721	124,519	112,798	11,721
7. Malabon *	5,224	1.2	61.4	38.6	6,616	4,600	2,016	8,076	6,060	2,016	9,519	7,504	2,016	10,975	8,959	2,016
8. Mandaluyong *	13,238	3.0	84.0	16.0	16,891	14,763	2,128	20,620	18,493	2,128	24,305	22,177	2,128	28,022	25,894	2,128
9. Marikina	5,280	1.2	73.5	26.5	6,687	4,914	1,773	8,163	6,390	1,773	9,622	7,850	1,773	11,094	9,321	1,773
10. Muntinlupa	8,308	1.8	0.9	99.1	10,521	99	10,423	12,843	2,421	10,423	15,139	4,717	10,423	17,454	7,032	10,423
11. Navotas *	2,655	0.6	76.6	23.4	3,363	2,742	621	4,105	3,484	621	4,839	4,218	621	5,578	4,958	621
12. Paranaque	11,624	2.6	57.7	42.3	14,720	8,497	6,223	17,969	11,746	6,223	21,181	14,958	6,223	24,420	18,197	6,223
13. Pasig	16,004	3.5	58.4	41.6	20,268	11,836	8,431	24,741	16,309	8,431	29,163	20,732	8,431	33,623	25,192	8,431
14. Pateros	56	0.0	100.0	0.0	71	71	0	86	86	0	102	102	0	117	117	0
15. San Juan *	8,299	1.8	98.8	1.2	10,510	10,412	97	12,829	12,732	97	15,122	15,025	97	17,435	17,338	97
16. Taguig	4,016	0.9	9.0	91.0	5,086	457	4,629	6,208	1,580	4,629	7,318	2,689	4,629	8,437	3,809	4,629
17. Valenzuela	5,785	1.3	40.0	60.0	7,224	2,890	4,335	8,819	4,484	4,335	10,395	6,061	4,335	11,985	7,650	4,335
II. CAVITE	6,399	1.4	19.1	80.9	8,103	1,550	6,554	9,892	3,338	6,554	11,660	5,106	6,554	13,443	6,889	6,554
1. Bacoor	971	0.2	27.6	72.4	1,230	340	890	1,502	611	890	1,770	880	890	2,041	1,150	890
2. Cavite City	4,207	0.9	17.3	82.7	5,327	921	4,406	6,503	2,097	4,406	7,666	3,259	4,406	8,838	4,431	4,406
3. Imus	709	0.2	9.1	90.9	898	82	816	1,096	280	816	1,292	476	816	1,490	674	816
4. Kawit	122	0.0	100.0	0.0	155	155	0	189	189	0	222	222	0	256	256	0
5. Noveleta	5	0.0	100.0	0.0	6	6	0	8	8	0	9	9	0	10	10	0
6. Rosario	385	0.1	9.5	90.5	487	46	441	595	154	441	701	260	441	808	367	441
III. RIZAL	9,983	2.2	16.5	83.5	15,668	5,109	10,559	20,285	7,396	12,889	25,513	10,320	15,193	31,370	13,854	17,517
1. Angono	-	-	-	-	623	623	0	1,028	1,028	0	1,585	1,585	0	2,317	2,317	0
2. Antipolo	3,367	0.7	17.9	82.1	4,264	765	3,499	5,205	934	4,271	6,136	1,101	5,035	7,074	1,269	5,805
3. Baras	-	-	-	-	25	25	0	38	38	0	80	80	0	140	140	0
4. Binangonan	-	-	-	-	1,402	1,402	0	2,180	2,180	0	3,183	3,183	0	4,427	4,427	0
5. Cainta	3,622	0.8	12.4	87.6	4,587	569	4,018	5,600	695	4,905	6,601	819	5,782	7,610	944	6,667
6. Cardona	-	-	-	-	98	98	0	126	126	0	168	168	0	219	219	0
7. Jala-Jala	-	-	-	-	15	15	0	54	54	0	114	114	0	198	198	0
8. Montalban	996	0.2	4.7	95.3	1,122	53	1,069	1,370	64	1,305	1,614	96	1,539	1,861	87	1,774
9. Morong	-	-	-	-	191	191	0	251	251	0	354	354	0	489	489	0
10. Pililla	-	-	-	-	141	141	0	232	232	0	432	432	0	613	613	0
11. San Mateo	576	0.1	32.2	67.8	729	235	494	890	287	603	1,049	338	711	1,209	390	819
12. Tanay	-	-	-	-	434	434	0	785	785	0	1,176	1,176	0	1,677	1,677	0
13. Taytay	1,532	0.3	23.8	76.2	1,941	462	1,478	2,369	565	1,804	2,792	665	2,127	3,219	767	2,452
14. Teresa	-	-	-	-	96	96	0	158	158	0	229	229	0	316	316	0
TOTAL	451,047	100.0	76.3	23.7	574,232	455,291	118,941	702,129	580,857	121,272	829,242	705,666	123,576	958,009	832,110	125,899

* Future demand increase was assumed to be shouldered by MWSS only.

TABLE 13.4.4 MWSS INDUSTRIAL CONSUMPTION PROJECTION (SCENARIO 3)

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	362,048	82.4	22.5	77.5	437,871	113,331	324,540	515,868	191,328	324,540	588,825	264,285	324,540	659,386	334,846	324,540
1. Manila *	23,403	5.3	75.3	24.7	28,304	22,519	5,786	33,346	27,560	5,786	38,062	32,276	5,786	42,623	36,837	5,786
2. Pasay City *	4,293	1.0	21.4	78.6	5,192	1,817	3,375	6,116	2,742	3,375	6,981	3,607	3,375	7,818	4,443	3,375
3. Quezon City *	51,708	11.8	37.4	62.6	62,538	30,170	32,368	73,677	41,310	32,368	84,097	51,730	32,368	94,175	61,807	32,368
4. Caloocan City *	13,923	3.2	66.5	33.5	16,839	12,175	4,665	19,839	15,174	4,665	22,644	17,980	4,665	25,358	20,693	4,665
5. Las Pinas	21,115	4.8	0.7	99.3	25,537	189	25,348	30,086	4,738	25,348	34,341	8,993	25,348	38,456	13,108	25,348
6. Makati *	8,041	1.8	57.9	42.1	9,725	6,342	3,383	11,458	8,074	3,383	13,078	9,694	3,383	14,645	11,262	3,383
7. Malabon *	20,537	4.7	29.1	70.9	24,838	10,273	14,565	29,263	14,698	14,565	33,401	18,836	14,565	37,404	22,839	14,565
8. Mandaluyong *	13,151	3.0	59.3	40.7	15,906	10,553	5,353	18,739	13,386	5,353	21,389	16,036	5,353	23,952	18,599	5,353
9. Marikina	8,239	1.9	17.1	82.9	9,965	1,701	8,264	11,739	3,476	8,264	13,400	5,136	8,264	15,005	6,742	8,264
10. Muntinlupa	34,360	7.8	0.2	99.8	41,556	97	41,459	48,958	7,499	41,459	55,882	14,423	41,459	62,578	21,119	41,459
11. Navotas *	3,762	0.9	53.8	46.2	4,550	2,811	1,739	5,360	3,621	1,739	6,118	4,379	1,739	6,852	5,112	1,739
12. Paranaque	19,370	4.4	8.7	91.3	23,427	2,031	21,396	27,600	6,204	21,396	31,503	10,107	21,396	35,278	13,883	21,396
13. Pasig	68,156	15.5	11.9	88.1	82,430	9,770	72,659	97,113	24,453	72,659	110,841	38,188	72,659	124,130	51,471	72,659
14. Pateros	1,760	0.4	0.2	99.8	2,128	4	2,124	2,507	383	2,124	2,862	738	2,124	3,205	1,081	2,124
15. San Juan *	1,259	0.3	95.3	4.7	1,522	1,463	59	1,794	1,735	59	2,047	1,988	59	2,293	2,234	59
16. Taguig	41,208	9.4	0.0	100.0	49,838	11	49,826	58,715	8,889	49,826	67,019	17,193	49,826	75,050	25,224	49,826
17. Valenzuela	27,763	6.3	4.2	95.8	33,577	1,406	32,171	39,558	7,387	32,171	45,153	12,981	32,171	50,564	18,392	32,171
II. CAVITE	7,037	1.6	16.3	83.7	8,511	1,389	7,122	10,027	2,905	7,122	11,445	4,323	7,122	12,817	5,695	7,122
1. Bacoor	70	0.0	100.0	0.0	85	85	0	100	100	0	114	114	0	128	128	0
2. Cavite City	238	0.1	100.0	0.0	288	288	0	339	339	0	387	387	0	433	433	0
3. Imus	538	0.1	1.3	98.7	650	9	641	766	125	641	874	233	641	979	338	641
4. Kawit	574	0.1	100.0	0.0	694	694	0	818	818	0	934	934	0	1,045	1,045	0
5. Noveleta	88	0.0	100.0	0.0	107	107	0	126	126	0	143	143	0	161	161	0
6. Rosario	5,530	1.3	3.1	96.9	6,688	207	6,481	7,879	1,398	6,481	8,993	2,513	6,481	10,071	3,590	6,481
III. RIZAL	70,308	16.0	2.8	97.2	90,479	3,347	87,131	108,913	5,440	103,472	123,524	9,149	114,375	146,764	14,834	131,930
1. Angono	-	-	-	-	1,121	196	925	1,850	555	1,295	2,854	1,284	1,570	4,170	2,502	1,668
2. Antipolo	13,798	3.1	12.9	87.1	16,688	2,145	14,543	19,661	2,527	17,134	22,441	2,884	19,557	25,130	3,230	21,901
3. Baras	-	-	-	-	46	8	38	68	20	48	144	65	79	252	151	101
4. Binangonan	-	-	-	-	2,523	442	2,081	3,924	1,177	2,747	5,729	2,578	3,151	7,968	4,781	3,187
5. Cainta	36,221	8.2	0.1	99.9	43,807	58	43,748	51,610	68	51,541	58,909	78	58,831	65,968	88	65,880
6. Cardona	-	-	-	-	177	31	146	287	68	159	303	136	167	395	237	158
7. Jala-Jala	-	-	-	-	27	5	22	97	29	68	204	92	112	355	213	142
8. Montalban	2,958	0.7	0.6	99.4	3,578	21	3,557	4,215	24	4,191	4,811	28	4,784	5,388	31	5,357
9. Morong	-	-	-	-	344	60	284	451	135	316	636	286	350	881	529	352
10. Pililla	-	-	-	-	253	44	209	417	125	292	778	350	428	1,104	662	442
11. San Mateo	658	0.1	8.3	91.7	796	66	730	938	78	860	1,071	89	982	1,199	100	1,099
12. Tanay	-	-	-	-	782	137	645	1,413	424	989	2,118	953	1,165	3,019	1,811	1,208
13. Taytay	16,672	3.8	0.5	99.5	20,164	105	20,059	23,756	124	23,632	27,116	141	26,975	30,365	158	30,207
14. Teresa	-	-	-	-	173	30	143	288	86	200	411	185	226	570	342	228
TOTAL	439,394	100.0	19.2	80.8	536,861	118,068	418,793	634,808	199,674	435,134	723,795	277,758	450,037	818,967	355,375	463,592

* Future demand increase was assumed to be shouldered by MWSS only.

TABLE 13.4.5 PROJECTED DOMESTIC WATER CONSUMPTION IN 1995 (SCENARIO 4), BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (1995)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (1995)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOM. CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	8,971,800	7,177,440	1,794,360	192	35	1,378,394	62,802	1,442,197	78	25	67	5,584,487	452,825	6,037,312	1,067,796	15,843	1,083,645	311,598	46,954	358,552
CITY OF MANILA	1,666,014	1,412,912	253,102	186	35	262,886	8,859	271,745	94	25	84	1,328,137	63,236	1,391,413	247,113	2,215	249,328	15,773	6,644	22,417
PASAY CITY *a	402,932	275,739	127,193	180	35	49,633	4,452	54,085	83	25	65	228,863	31,798	260,661	41,195	1,113	42,308	8,438	3,333	11,771
QUEZON CITY	1,870,519	1,494,256	376,263	188	35	280,568	13,169	293,717	93	25	79	1,385,658	94,066	1,482,724	260,910	3,292	264,202	19,628	9,877	29,515
CALOOCAN CITY *a	822,801	625,556	247,245	180	35	112,600	8,654	121,254	69	25	57	431,534	61,811	493,445	77,694	2,163	79,857	34,906	6,490	41,396
LAS PINAS *a	413,469	360,762	52,707	180	35	64,937	1,845	66,782	37	25	35	135,482	13,177	148,659	24,027	461	24,488	40,910	1,384	42,294
MAKATI	488,333	425,916	62,417	210	35	89,231	2,220	91,451	87	25	79	370,587	15,854	386,431	77,631	555	78,186	11,600	1,665	13,265
MALABON *a	305,870	243,918	61,952	180	35	43,905	2,168	46,074	68	25	59	165,854	15,488	181,352	29,856	542	30,398	14,950	1,626	15,676
MANDALUYONG	265,870	210,706	55,164	180	35	37,923	1,931	39,858	93	25	79	195,957	13,791	209,748	35,272	483	35,755	2,655	1,448	4,103
MARIKINA	355,368	283,151	66,217	186	35	54,423	2,318	56,741	93	25	80	272,630	16,554	289,185	50,614	579	51,193	3,810	1,738	5,548
MUNTINLUPA *a	346,829	276,335	70,494	180	35	49,740	2,467	52,208	32	25	31	88,427	17,623	106,051	15,917	617	16,534	33,823	1,850	35,674
NAVOTAS *a	207,557	148,500	59,057	180	35	26,730	2,067	28,797	88	25	70	130,680	14,767	145,447	23,522	517	24,039	3,208	1,551	4,758
PARANAQUE *a	369,370	343,904	27,466	305	35	104,333	961	105,294	51	35	50	174,371	9,613	183,984	53,210	336	53,546	51,123	625	51,748
PASIG	466,552	372,715	93,837	185	35	68,833	3,284	72,117	87	25	75	324,262	23,459	347,722	59,884	821	60,705	8,948	2,463	11,411
PATEROS *a	58,433	51,610	6,828	180	35	9,290	238	9,529	44	35	42	22,706	1,707	24,415	4,087	60	4,147	5,202	179	5,381
SAN JUAN	133,478	122,553	8,925	249	35	30,794	347	31,141	93	40	89	114,904	3,970	118,874	28,628	139	28,777	2,166	208	2,364
TAGUIG *a	311,031	255,856	55,075	180	35	46,072	1,928	48,000	18	25	18	46,072	13,769	59,841	8,293	482	8,775	37,779	1,446	39,225
VALENZUELA *a	432,355	263,952	168,407	180	35	47,511	5,894	53,406	63	25	48	166,290	42,102	208,392	29,932	1,474	31,406	17,579	4,821	22,400
II. CAVITE	534,843	515,406	18,537	180	35	92,773	652	93,425	40	28	39	205,411	5,134	210,605	36,974	182	37,156	55,799	471	56,270
BACOOR *f,s	196,636	189,262	7,374	180	35	34,067	258	34,325	35	25	35	66,342	1,844	68,186	11,924	65	11,988	22,144	194	22,337
CAVITE CITY *f	98,576	96,654	1,922	180	35	17,398	67	17,465	63	54	63	60,892	1,038	61,930	10,961	36	10,997	6,437	31	6,468
IMUS *f	107,162	103,813	3,349	180	35	18,686	117	18,804	28	27	28	29,068	904	29,972	5,232	32	5,264	13,454	86	13,540
KAWIT *f	55,217	54,555	662	180	35	9,823	23	9,843	62	66	62	33,824	437	34,261	6,088	15	6,104	3,732	8	3,739
NOVELETA	23,325	22,511	814	180	35	4,052	28	4,080	23	25	23	5,178	203	5,381	932	7	939	3,120	21	3,141
ROSARIO *f	53,127	48,611	4,516	180	35	8,750	158	8,908	21	17	21	10,228	768	10,996	1,837	27	1,864	6,912	131	7,044
III. RIZAL	1,149,930	660,355	489,575	154	34	101,807	16,834	118,641	42	9	28	277,437	43,274	320,711	41,681	1,429	43,110	60,126	15,205	75,331
ANGONO *r	55,862	22,025	33,837	141	35	3,115	1,156	4,271	100	0	40	22,025	0	22,025	3,115	0	3,115	0	1,156	1,156
ANTIPOLO *f	261,738	208,574	53,164	138	39	28,797	2,069	30,867	29	23	28	60,515	12,205	72,720	8,351	476	8,827	20,446	1,594	22,039
BARAS *r	19,051	898	18,153	141	31	127	558	685	100	0	5	898	0	898	127	0	127	0	558	558
BINANGONAN *r	140,751	49,553	91,198	141	34	7,008	3,109	10,117	100	0	35	49,553	0	49,553	7,008	0	7,008	0	3,109	3,109
CAINTA *a	164,650	131,720	32,930	180	35	23,710	1,153	24,862	23	25	23	30,296	8,233	38,528	5,453	288	5,741	18,258	864	19,121
CARDONA *r	35,194	3,465	31,729	141	30	490	966	1,456	100	0	10	3,465	0	3,465	490	0	490	0	966	966
JALA-JALA *r	17,814	517	17,297	141	31	73	542	615	100	0	3	517	0	517	73	0	73	0	542	542
MONTALBAN *f	75,766	58,944	16,822	111	38	6,543	656	7,199	43	40	42	25,346	6,725	32,075	3,813	262	3,075	3,729	394	4,123
MORONG *r	34,528	6,750	27,778	141	31	955	861	1,816	100	0	20	6,750	0	6,750	955	0	955	0	861	861
PILILLA *r	36,137	4,968	31,169	141	32	703	993	1,696	100	0	14	4,968	0	4,968	703	0	703	0	993	993
SAN MATEO *f	92,401	50,515	41,886	138	39	8,992	1,634	10,625	42	33	33	23,216	9,634	30,850	3,777	376	4,152	5,215	1,256	6,472
TANAY *r	65,810	15,347	50,463	141	33	2,170	1,656	3,826	100	0	23	15,347	0	15,347	2,170	0	2,170	0	1,656	1,656
TAYTAY *a	129,481	103,585	25,896	180	35	18,645	906	19,552	32	25	31	33,147	6,474	39,621	5,966	227	6,193	12,679	680	13,359
TERESA *r	21,507	3,394	18,113	141	32	480	575	1,055	100	0	16	3,394	0	3,394	480	0	480	0	575	575
TOTAL	10,655,773	8,353,201	2,302,572	188	35	1,573,975	80,289	1,654,264	73	22	62	6,067,335	501,293	6,568,628	1,146,251	17,660	1,163,911	427,724	63,629	490,353

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by ANWSDP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by FMWSP.
4. Areas with (*r) are merged area under RP795, and be expected to be improved by RPWSIP.

TABLE 13.4.6 PROJECTED DOMESTIC WATER CONSUMPTION IN 2000 (SCENARIO 4), BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2000)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2000)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOMESTIC CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	9,948,977	7,959,182	1,989,795	196	35	1,562,318	69,643	1,632,314	85	55	79	6,747,352	1,094,387	7,841,780	1,322,901	38,304	1,361,204	239,470	31,339	270,810
CITY OF MANILA	1,705,567	1,447,609	257,958	191	35	276,069	9,029	285,097	95	55	89	1,375,228	141,877	1,517,105	262,265	4,966	267,231	13,803	4,063	17,866
PASAY CITY *a	433,048	296,956	136,092	181	35	55,432	4,763	60,195	88	55	78	261,321	74,851	336,172	48,789	2,620	51,409	6,652	2,143	8,795
QUEZON CITY	2,043,017	1,638,682	410,335	192	35	314,355	14,362	328,717	95	55	87	1,556,748	225,684	1,782,432	298,637	7,899	306,536	15,718	6,463	22,181
CALOOCAN CITY *a	978,527	703,283	276,244	181	35	131,280	9,669	140,948	76	55	70	534,495	151,934	686,429	99,772	5,318	105,090	31,507	4,351	35,858
LAS PINAS *a	551,808	481,779	70,029	187	35	89,932	2,451	92,383	63	55	62	303,521	38,516	342,037	56,657	1,348	58,005	33,275	1,103	34,378
MAKATI	517,961	451,132	66,829	213	35	96,083	2,338	98,632	93	55	88	419,553	36,756	456,309	83,366	1,286	90,653	6,725	1,053	7,779
MALABON *a	328,653	262,382	66,271	181	35	48,978	2,319	51,297	76	55	72	199,411	36,449	235,859	37,223	1,276	38,499	11,755	1,044	12,798
MANDALUYONG	282,944	224,499	58,445	181	35	41,506	2,046	43,552	95	55	87	213,276	32,145	245,419	39,811	1,125	40,936	2,095	921	3,016
MARIKINA	405,680	331,099	74,581	190	35	63,052	2,603	65,656	95	55	88	314,544	40,910	355,454	59,300	1,432	61,331	3,753	1,172	4,324
MUNTINLUPA *a	413,918	334,949	84,969	187	35	62,524	2,974	65,498	61	55	60	204,289	46,733	251,052	38,139	1,636	39,775	24,384	1,339	25,723
NAVOTAS *a	225,328	161,492	63,835	187	35	30,145	2,234	32,379	93	55	82	150,189	35,110	185,299	28,035	1,229	29,264	2,110	1,005	3,115
PARANAQUE *a	432,253	398,402	33,851	287	35	114,249	1,115	115,364	92	55	71	286,849	17,518	304,367	82,259	613	82,872	31,990	502	32,491
PASIG	522,563	426,806	106,657	190	35	80,850	3,733	84,583	93	55	85	396,186	58,661	454,847	75,190	2,053	77,244	5,659	1,680	7,339
PATEROS *a	66,776	57,241	7,535	187	35	10,685	264	10,949	60	55	59	34,244	4,144	38,488	6,411	145	6,556	4,274	119	4,393
SAN JUAN	121,583	117,398	10,185	249	35	31,784	356	32,141	95	55	92	121,028	5,602	126,630	30,195	196	30,391	1,589	160	1,750
TAGUIG *a	353,627	291,288	62,339	187	35	54,376	2,182	56,556	50	55	51	145,644	34,287	179,930	27,187	1,200	28,387	27,187	982	28,169
VALENZUELA *a	530,824	324,985	205,839	187	35	60,664	7,204	67,868	71	55	65	230,739	113,312	343,951	43,071	3,962	47,034	17,593	3,242	20,836
II. CAVITE	611,062	593,551	17,511	187	35	110,759	613	111,409	81	43	61	364,963	7,574	372,541	68,127	265	68,392	42,669	348	43,017
BACOOR *f,s	235,538	228,354	7,184	187	35	42,628	251	42,878	66	55	66	150,714	3,951	154,665	28,133	138	28,272	14,492	113	14,606
CAVITE CITY *f	104,379	102,876	1,503	187	35	19,206	52	19,256	72	56	72	74,071	872	74,942	13,827	31	13,857	5,379	33	5,399
IMUS *f	121,860	118,797	3,063	187	35	22,115	107	22,283	51	39	51	60,586	1,195	61,781	11,309	42	11,351	10,866	65	10,931
KAWIT *f	62,446	61,928	518	187	35	11,560	18	11,578	78	75	78	48,304	389	48,692	9,017	14	9,030	2,543	5	2,548
NOVELETA	26,102	25,354	748	187	35	4,733	26	4,759	48	48	48	12,178	359	12,537	2,272	13	2,284	2,461	14	2,475
ROSARIO *f	60,737	56,242	4,495	187	35	10,489	157	10,646	34	16	33	19,122	809	19,931	3,569	28	3,598	6,929	329	7,258
III. RIZAL	1,325,412	863,057	462,355	165	35	142,681	16,187	158,868	58	11	42	504,833	49,643	554,476	83,290	1,948	85,238	59,391	14,228	73,619
ANGONO *r	64,219	32,110	32,109	163	35	5,138	1,124	6,262	100	0	50	32,110	0	32,110	5,138	0	5,138	0	1,124	1,124
ANTIPOLO *f	319,849	263,155	56,694	149	42	39,210	2,381	41,591	61	23	38	107,654	13,040	120,533	16,076	548	16,624	23,134	1,833	24,967
BARAS *r	21,863	1,183	19,880	163	31	189	610	799	100	0	6	1,183	0	1,183	189	0	189	0	610	610
BINANGONAN *r	152,533	68,131	84,402	163	34	10,902	2,873	13,775	100	0	45	68,131	0	68,131	10,902	0	10,902	0	2,873	2,873
CAINTA *a	206,860	186,174	20,686	187	35	34,752	724	35,476	52	55	52	96,810	11,377	108,188	18,071	398	18,469	16,681	326	17,007
CARDONA *r	36,995	3,545	33,050	163	30	631	1,005	1,636	100	0	11	3,545	0	3,545	631	0	631	0	1,005	1,005
JALA-JALA *r	19,105	1,681	17,424	160	31	269	542	811	100	0	9	1,681	0	1,681	269	0	269	0	542	542
MONTALBAN *f	83,837	68,024	15,813	118	42	8,027	694	8,691	63	43	59	42,855	6,800	49,655	5,057	286	5,342	2,970	379	3,348
MORONG *r	36,957	7,832	29,125	160	31	1,253	900	2,153	100	0	21	7,832	0	7,832	1,253	0	1,253	0	900	900
PILILLA *r	39,119	7,254	31,865	160	32	1,161	1,010	2,171	100	0	19	7,254	0	7,254	1,161	0	1,161	0	1,010	1,010
SAN MATEO *f	101,679	60,602	41,077	190	42	11,514	1,725	13,240	51	25	40	30,307	10,269	41,176	5,872	431	6,304	5,642	1,294	6,936
TANAY *r	72,764	24,525	48,239	160	33	3,924	1,570	5,494	100	0	34	24,525	0	24,525	3,924	0	3,924	0	1,570	1,570
TAYTAY *a	148,322	133,490	14,832	197	35	26,918	519	25,437	56	55	56	74,754	8,156	82,912	13,954	286	14,240	10,964	234	11,198
TERESA *r	22,106	4,951	17,155	160	31	792	539	1,331	100	0	22	4,951	0	4,951	792	0	792	0	539	539
TOTAL	11,885,451	9,415,790	2,469,661	193	35	1,815,848	86,442	1,902,291	81	47	74	7,617,192	1,151,605	8,768,797	1,474,318	40,517	1,514,835	341,530	45,925	387,456

NOTE: 1. Areas with ('a') have suppressed demand due to low water pressure, and be expected to be improved by AMSOP.
2. Areas with ('s') also have suppressed demand due to low water pressure, and be expected to be improved by KEWDP.
3. Areas with ('f') have suppressed demand due to limited water sources, and be expected to be improved by FAWSP.
4. Areas with ('r') are merged area under BP799, and be expected to be improved by RPWSIP.

TABLE 13.4.7 PROJECTED DOMESTIC WATER CONSUMPTION IN 2005 (SCENARIO 4), BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2005)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2005)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOMESTIC CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	10,847,652	8,678,122	2,169,530	200	35	1,738,884	75,934	1,814,818	93	65	85	7,287,983	1,410,195	8,198,178	1,555,660	49,357	1,605,016	179,224	26,577	205,801
CITY OF MANILA	1,723,126	1,463,435	259,690	195	35	285,887	9,089	294,976	95	65	90	1,390,264	166,799	1,559,063	271,593	5,908	277,501	14,294	3,181	17,476
PASAY CITY *a	457,147	313,593	143,156	193	35	60,705	5,010	65,715	93	65	84	292,011	93,352	385,363	56,656	3,257	59,912	4,249	1,754	6,003
QUEZON CITY	2,200,635	1,761,459	439,176	196	35	345,108	15,370	360,477	95	65	89	1,673,424	285,439	1,958,862	327,852	9,990	337,843	17,255	5,379	22,635
CALOOCAN CITY *a	1,076,883	774,255	302,624	193	35	149,590	10,592	160,282	83	65	78	642,635	196,705	839,341	124,263	6,885	131,148	25,447	3,707	29,154
LAS PINAS *a	708,704	619,082	89,621	193	35	119,589	3,137	122,826	81	65	79	501,457	58,256	559,711	96,963	2,039	98,961	22,741	1,098	23,839
MAKATI	535,315	469,978	65,337	217	35	101,751	2,627	104,178	95	65	91	446,479	45,069	491,548	96,663	1,577	98,241	5,088	849	5,937
MALABON *a	346,868	277,172	69,696	193	35	53,587	2,439	56,026	83	65	79	230,053	45,302	275,355	44,437	1,586	46,062	9,110	854	9,963
MANDALUYONG	296,044	235,109	60,935	193	35	45,454	2,133	47,587	95	65	85	223,354	39,608	262,961	43,182	1,386	44,568	2,273	746	3,019
MARIKINA	447,289	365,529	81,760	195	35	71,357	2,862	74,215	95	65	90	347,253	53,144	400,397	67,769	1,860	69,650	3,588	1,002	4,569
MUNTINLUPA *a	493,739	394,186	99,553	193	35	76,039	3,494	79,694	81	65	78	319,291	64,709	384,000	61,730	2,265	63,994	14,480	1,220	15,699
NAVOTAS *a	240,231	172,271	67,960	193	35	33,326	2,372	35,677	95	65	87	163,557	44,044	207,701	31,642	1,542	33,182	1,665	830	2,495
PARANAQUE *a	488,693	452,458	36,235	268	35	121,433	1,261	122,694	83	65	82	375,541	33,422	388,963	100,788	820	101,609	20,644	441	21,085
PASIG	593,888	475,393	118,495	195	35	92,651	4,147	96,798	95	65	89	451,924	77,021	528,945	88,018	2,696	90,714	4,633	1,452	6,084
PATEROS *a	70,318	62,167	8,151	193	35	12,019	285	12,304	76	65	75	47,247	5,298	52,545	9,134	185	9,320	2,885	100	2,984
SAN JUAN	140,224	129,954	10,269	250	35	32,455	362	32,818	95	65	93	123,457	6,727	130,184	30,833	235	31,068	1,623	127	1,750
TAGUIG *a	392,192	323,794	68,398	193	35	62,600	2,435	65,015	76	65	74	246,883	44,845	290,332	47,576	1,570	49,146	15,024	845	15,869
VALENZUELA *a	632,015	387,842	244,234	193	35	74,902	8,548	83,531	81	65	75	314,152	158,752	472,904	60,726	5,556	66,292	14,247	2,992	17,239
II. CAVITE	686,825	670,951	15,874	193	35	129,717	556	130,273	77	51	76	513,933	8,153	522,086	99,360	285	99,646	30,357	270	30,627
BACOOR *f,s	275,150	268,816	6,534	193	35	51,932	229	52,161	83	65	83	222,951	4,247	227,198	43,104	145	43,253	8,829	80	8,909
CAVITE CITY *f	109,908	108,804	1,104	193	35	21,035	39	21,074	87	65	87	94,659	938	95,598	18,301	33	18,334	2,935	5	2,940
IMUS *f	135,818	133,381	2,737	193	35	25,729	96	25,825	56	43	54	85,178	1,150	86,328	16,467	40	16,507	9,262	56	9,318
KAWIT *f	69,254	68,838	416	193	35	13,309	15	13,323	91	95	91	62,643	395	63,038	12,111	14	12,125	1,198	1	1,199
NOVELETA	28,672	28,010	663	193	35	5,415	23	5,439	11	61	71	19,887	406	20,293	3,845	14	3,859	1,510	5	1,515
ROSARIO *f	68,022	63,801	4,421	193	35	12,296	155	12,451	45	23	44	28,620	1,017	29,637	5,533	36	5,569	6,783	119	6,882
III. RIZAL	1,503,413	1,052,571	450,840	175	35	184,176	15,968	200,144	71	12	53	745,967	56,343	802,310	130,673	3,231	134,704	51,703	13,738	65,440
ANGONO *r	32,979	43,781	25,192	181	35	7,927	1,022	8,949	100	0	50	43,787	0	43,787	7,927	0	7,927	0	1,022	1,022
ANTIPOLO *f	339,154	319,178	55,975	155	44	49,673	2,539	52,212	46	21	44	153,286	12,595	165,881	23,747	554	24,301	25,726	2,085	27,811
BARAS *r	22,898	2,215	20,593	181	33	401	629	1,030	100	0	33	2,215	0	2,215	401	0	401	0	629	629
BINANGONAN *r	362,155	87,908	74,247	181	34	15,915	2,520	18,435	100	0	54	87,908	0	87,908	15,915	0	15,915	0	2,520	2,520
CAINTA *a	251,447	226,303	25,145	193	35	43,752	880	44,632	76	65	75	171,990	16,344	188,334	33,251	572	33,823	10,500	308	10,808
CARDONA *r	28,279	4,645	23,635	181	30	841	1,021	1,862	100	0	13	4,645	0	4,645	841	0	841	0	1,021	1,021
JALA-JALA *r	23,131	3,137	19,994	181	33	568	526	1,094	100	0	15	3,137	0	3,137	568	0	568	0	526	526
MONTALBAN *f	93,845	77,407	13,438	124	44	9,598	591	10,190	72	47	66	55,733	6,316	62,049	6,911	278	7,189	2,688	313	3,001
MORONG *r	43,232	9,763	33,469	181	33	1,768	940	2,708	100	0	24	9,763	0	9,763	1,768	0	1,768	0	940	940
PILILLA *r	43,556	11,935	29,621	181	31	2,161	928	3,089	100	0	29	11,935	0	11,935	2,161	0	2,161	0	928	928
SAN MATEO *f	108,628	71,766	37,854	204	44	14,642	1,666	16,308	62	26	50	44,495	9,842	54,337	9,011	433	9,510	5,563	1,233	6,796
TANAY *r	78,789	32,489	46,300	181	32	5,882	1,497	7,379	100	0	41	32,489	0	32,489	5,882	0	5,882	0	1,497	1,497
TAYTAY *a	173,025	155,723	17,302	193	35	30,106	606	30,712	76	65	75	118,349	11,247	129,596	22,881	394	23,274	7,226	212	7,437
TERESA *r	22,810	6,315	16,095	181	31	1,143	504	1,647	100	0	28	6,315	0	6,315	1,143	0	1,143	0	504	504
TOTAL	13,037,888	10,401,643	2,636,245	197	35	2,052,777	92,458	2,145,234	87	56	81	9,047,881	1,474,691	10,522,571	1,785,693	53,873	1,839,566	261,284	40,585	301,868

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by PAMSP.
4. Areas with (*r) are merged area under BP795, and be expected to be improved by RPWSIP.

TABLE 13.4.8 PROJECTED DOMESTIC WATER CONSUMPTION IN 2010 (SCENARIO 4), BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2010)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2010)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOM. CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L [LPCD]	BL'D [LPCD]	GENERAL [M3/D]	WATER BLIGHTED [M3/D]	TOTAL [M3/D]	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL [M3/D]	WATER BLIGHTED [M3/D]	TOTAL [M3/D]	GENERAL [M3/D]	WATER BLIGHTED [M3/D]	TOTAL [M3/D]
I. NCR	11,649,608	9,319,686	2,329,922	284	35	1,905,250	81,547	1,986,777	92	70	87	8,533,562	1,630,945	10,164,507	1,743,430	57,283	1,800,513	161,800	24,464	186,264
CITY OF MANILA	1,723,187	1,464,188	258,999	280	35	392,838	9,064	401,901	95	70	91	1,390,978	181,271	1,572,250	278,196	6,344	284,540	14,642	2,719	17,361
PASAY CITY *a	475,225	325,828	148,397	280	35	65,366	5,194	70,560	95	70	87	310,487	103,878	414,365	62,097	3,636	65,733	3,268	1,558	4,826
QUEZON CITY	2,323,158	1,860,880	462,274	280	35	372,176	16,180	388,356	95	70	90	1,767,836	323,592	2,091,428	353,567	11,326	364,893	18,609	4,854	23,463
CALOOCAN CITY *a	1,164,630	838,274	326,356	280	35	167,655	11,422	179,077	88	70	83	737,681	228,469	966,150	147,536	7,996	155,532	20,119	3,427	23,545
LAS PINAS *a	878,109	767,379	110,730	280	35	153,476	3,876	157,351	85	70	83	652,272	77,511	729,783	130,454	2,713	133,167	23,021	1,163	24,184
MAKATI	553,794	482,797	70,997	220	35	106,215	2,485	108,700	95	70	92	458,657	49,698	508,355	100,504	1,739	102,644	5,311	745	6,056
MALABON *a	360,535	288,282	72,253	200	35	57,656	2,528	60,185	88	70	84	253,688	50,563	304,251	50,736	1,770	52,507	6,919	758	7,677
MANDALUYONG	305,315	242,650	62,665	200	35	48,530	2,193	50,723	95	70	90	230,517	43,866	274,383	46,103	1,535	47,639	2,426	658	3,084
MARIKINA	483,623	395,479	88,151	200	35	79,094	3,085	82,179	95	70	90	375,697	61,706	437,402	75,139	2,160	77,299	3,955	926	4,880
MUNTINLUPA *a	565,215	451,573	113,642	280	35	90,315	3,977	94,292	85	70	82	383,837	79,550	463,386	76,767	2,786	79,552	13,547	1,193	14,740
NAVOTAS *a	251,550	180,739	70,811	200	35	36,148	2,478	38,626	95	70	88	171,702	49,568	221,270	34,340	1,735	36,075	1,807	744	2,551
PARANAQUE *a	541,964	502,098	39,866	250	35	125,525	1,395	126,920	85	70	84	426,783	27,906	454,690	106,696	977	107,673	18,829	419	19,247
PASIG	648,283	519,301	128,982	200	35	103,860	4,514	108,375	95	70	93	493,336	90,287	583,623	98,667	3,160	101,827	5,193	1,354	6,547
PATEROS *a	74,945	66,282	8,663	200	35	13,256	303	13,560	86	70	86	57,003	6,064	63,067	11,401	212	11,613	1,856	91	1,947
SAN JUAN	141,007	130,635	10,372	250	35	32,659	363	33,022	95	70	93	124,103	7,260	131,364	31,026	254	31,280	1,633	109	1,742
TAGUIG *a	427,323	352,472	74,851	200	35	70,494	2,620	73,114	86	70	83	303,126	52,396	355,522	60,625	1,834	62,459	3,869	786	10,655
VALENZUELA *a	731,811	445,840	281,971	200	35	89,168	9,869	99,037	88	70	83	395,859	197,380	593,239	79,172	6,908	86,080	10,796	2,961	13,757
II. CAVITE	156,085	144,387	11,698	200	35	148,877	409	149,287	84	53	84	625,225	6,194	631,418	125,045	217	125,262	23,832	193	24,025
BACOOR *f,s	313,838	309,444	4,394	200	35	61,889	154	62,043	85	70	85	263,027	3,076	266,103	52,605	108	52,713	5,233	46	5,279
CAVITE CITY *f	112,628	111,952	676	200	35	22,390	24	22,414	97	35	93	108,593	642	109,236	21,719	22	21,741	672	1	673
IMUS *f	148,542	146,579	1,963	200	35	29,316	69	29,385	78	50	76	114,332	982	115,313	22,866	34	22,901	6,449	34	6,484
KAWIT *f	75,407	75,106	301	200	35	15,021	11	15,032	98	35	98	73,904	286	73,990	14,721	10	14,731	300	1	301
NOVELETA	30,955	30,476	479	200	35	6,095	17	6,112	83	66	83	25,295	315	25,610	5,059	11	5,070	1,036	6	1,042
ROSARIO *f	74,715	70,830	3,885	200	35	14,166	136	14,302	57	23	55	40,373	894	41,267	8,075	31	8,106	8,091	105	8,196
III. RIZAL	1,557,207	1,242,272	424,936	186	38	230,305	15,185	245,090	78	14	62	971,268	58,049	1,029,318	193,923	2,291	196,214	46,982	12,894	59,876
ANGONO *r	80,788	56,552	24,236	205	35	11,583	848	12,431	100	0	70	56,552	0	56,552	11,583	0	11,583	0	848	848
ANTIPOLO *f	435,886	376,317	59,569	152	46	60,363	2,740	63,104	55	18	50	206,374	10,722	217,097	33,530	493	34,023	27,834	2,247	29,580
BARAS *r	24,182	3,412	20,770	205	33	699	630	1,329	100	0	14	3,412	0	3,412	699	0	699	0	630	630
BINANGONAN *r	169,117	108,067	61,050	205	34	22,135	2,063	24,198	100	0	64	108,067	0	108,067	22,135	0	22,135	0	2,063	2,063
CAINTA *a	295,646	266,082	29,565	200	35	53,216	1,035	54,251	86	70	84	228,830	20,695	249,525	45,766	724	46,490	7,450	310	7,761
CARDONA *r	38,952	5,348	33,604	205	33	1,095	1,020	2,115	100	0	14	5,348	0	5,348	1,095	0	1,095	0	1,020	1,020
JALA-JALA *r	20,826	4,821	16,005	205	31	988	490	1,478	100	0	23	4,821	0	4,821	988	0	988	0	490	490
MONTALBAN *f	96,318	85,317	11,001	129	46	11,006	506	11,512	80	43	76	68,254	4,730	72,984	8,805	218	9,022	2,201	288	2,489
MORONG *r	43,304	11,947	31,357	205	31	2,447	966	3,413	100	0	28	11,947	0	11,947	2,447	0	2,447	0	966	966
PILILLA *r	43,312	14,971	28,341	205	31	3,067	882	3,949	100	0	35	14,971	0	14,971	3,067	0	3,067	0	882	882
SAN MATEO *f	115,769	83,360	32,409	219	46	18,256	1,491	19,747	73	25	63	60,853	8,102	68,955	13,327	333	13,699	4,929	1,118	6,047
TANAY *r	83,535	40,939	42,596	205	33	8,385	1,366	9,751	100	0	43	40,939	0	40,939	8,385	0	8,385	0	1,366	1,366
TAYTAY *a	197,131	177,418	19,713	200	35	35,484	690	36,174	86	70	84	152,579	13,755	166,379	30,516	483	30,999	4,968	207	5,175
TERESA *r	22,441	7,721	14,720	205	31	1,581	458	2,039	100	0	34	7,721	0	7,721	1,581	0	1,581	0	458	458
TOTAL	14,372,900	11,306,345	2,766,555	202	35	2,285,012	97,141	2,382,154	90	61	84	10,130,054	1,695,188	11,825,243	2,052,398	59,591	2,111,989	232,614	37,551	270,165

NOTE: 1. Areas with <*a> have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with <*s> also have suppressed demand due to low water pressure, and be expected to be improved by NSWDP.
3. Areas with <*f> have suppressed demand due to limited water sources, and be expected to be improved by FAWSP.
4. Areas with <*r> are merged area under RP795, and be expected to be improved by RPWSIP.

TABLE 13.4.9 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (SCENARIO 2)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,126,290	448,632	113,331	909,059	35.0	2,597,312	315,907	101,829	324,540	742,276	1,442,197	550,461	437,871	909,059	3,339,588	78.1	81.5	25.9	77.8
1. Manila	252,399	167,797	22,519	238,385	35.0	681,100	19,345	4,685	5,786	29,196	271,745	172,482	28,304	238,385	710,897	92.9	97.3	79.6	95.8
2. Pasay City	43,524	23,293	1,817	36,957	35.0	105,590	10,561	8,795	3,375	22,731	54,085	32,088	5,192	36,957	128,321	80.5	72.6	35.0	82.3
3. Quezon City	270,472	116,705	30,170	224,725	35.0	642,072	23,246	21,641	32,368	83,254	293,717	144,346	62,538	224,725	725,326	92.1	80.9	48.2	88.5
4. Caloocan City	81,416	15,433	12,175	58,705	35.0	167,729	39,838	3,674	4,665	48,176	121,254	19,107	16,839	58,705	215,905	67.1	80.8	72.3	77.7
5. Las Pinas	29,775	786	189	16,558	35.0	47,307	37,007	4,658	25,348	67,013	66,782	5,444	25,537	16,558	114,320	44.6	14.4	0.7	41.4
6. Makati	80,974	63,333	6,342	81,121	35.0	231,774	10,477	11,721	3,383	25,581	91,451	75,058	9,725	81,121	257,355	88.5	84.4	65.2	90.1
7. Malabon	31,384	4,500	10,273	24,908	35.0	71,165	14,689	2,016	14,565	31,270	46,074	6,516	24,838	24,908	102,435	68.1	69.5	41.4	69.5
8. Mandaluyong	36,610	14,783	10,553	33,345	35.0	95,271	3,248	2,128	5,353	10,729	39,858	16,891	15,906	33,345	106,000	91.8	87.4	66.3	89.9
9. Marikina	52,397	4,914	1,701	31,776	35.0	90,788	4,343	1,773	8,264	14,380	56,741	6,687	9,965	31,776	105,169	92.3	73.5	17.1	86.3
10. Muntinlupa	20,636	99	97	11,217	35.0	32,049	31,571	10,423	41,459	83,453	52,208	10,521	41,556	11,217	115,501	39.5	0.9	0.2	27.7
11. Navotas	24,677	2,742	2,811	16,278	35.0	46,507	4,120	621	1,739	6,480	28,797	3,363	4,550	16,278	52,987	85.7	81.5	61.8	87.8
12. Paranaque	62,984	8,497	2,031	39,583	35.0	113,095	42,310	6,223	21,396	69,929	105,294	14,720	23,427	39,583	183,025	59.8	57.7	8.7	61.8
13. Pasig	62,935	11,836	9,770	45,522	35.0	130,063	9,188	8,431	72,659	90,273	72,117	20,268	82,430	45,522	220,336	87.3	58.4	11.9	59.0
14. Pateros	4,252	71	4	2,330	35.0	6,657	5,237	0	2,164	7,401	9,529	71	2,128	2,330	14,057	44.6	100.0	0.2	47.4
15. San Juan	23,410	10,412	1,463	22,231	35.0	63,517	1,731	97	59	1,887	31,141	10,510	1,522	22,231	65,404	94.4	99.1	96.1	97.1
16. Taguig	3,733	457	11	5,525	35.0	15,787	38,207	4,629	49,826	92,662	48,000	5,086	49,838	5,525	108,449	20.4	9.0	0.0	14.6
17. Valenzuela	32,651	2,890	1,486	19,894	35.0	56,841	20,755	4,335	32,171	57,261	53,406	7,224	33,593	19,894	114,101	61.1	40.0	4.2	49.8
II. CAVITE	44,332	1,550	1,389	20,259	30.0	67,529	49,094	6,554	7,122	62,769	93,425	8,103	8,511	20,259	130,298	47.5	19.1	16.3	51.8
1. Bacoor	15,408	340	85	6,785	30.0	22,617	16,918	890	0	19,808	34,325	1,230	85	6,785	42,425	44.9	27.6	100.0	53.3
2. Cavite City	10,554	921	288	5,213	30.0	17,375	6,511	4,406	0	10,917	17,465	5,327	288	5,213	28,293	62.7	17.3	100.0	61.4
3. Imus	7,781	82	9	3,374	30.0	11,245	11,023	816	641	12,480	18,804	898	650	3,374	23,725	41.4	9.1	1.3	47.4
4. Kawit	6,802	155	694	3,279	30.0	10,929	3,041	0	0	3,041	9,843	155	694	3,279	13,971	69.1	100.0	100.0	78.2
5. Noveleta	1,022	6	107	486	30.0	1,621	3,059	0	0	3,059	4,080	6	107	486	4,680	25.0	100.0	100.0	34.6
6. Rosario	2,366	46	207	1,123	30.0	3,742	6,542	441	6,481	13,464	8,908	487	6,688	1,123	17,205	26.6	9.5	3.1	21.7
III. RIZAL	47,536	5,109	3,347	20,750	27.0	76,743	71,104	10,559	87,131	168,794	118,640	15,668	90,479	20,750	245,537	40.1	32.6	3.7	31.3
1. Angono	3,115	623	196	694	15.0	4,628	1,156	0	925	2,081	4,271	623	1,121	694	6,709	72.9	100.0	17.5	69.0
2. Antipolo	11,090	765	2,145	6,000	30.0	19,999	19,774	3,499	14,543	37,816	30,864	4,264	16,688	6,000	57,816	35.9	17.9	12.9	34.6
3. Baras	127	25	8	28	15.0	188	558	0	38	596	685	25	46	28	784	18.5	100.0	17.4	23.9
4. Binangonan	7,008	1,402	442	1,562	15.0	10,414	3,109	0	2,081	5,190	10,117	1,402	2,523	1,562	15,604	69.3	100.0	17.5	66.7
5. Cainta	6,273	569	58	3,716	35.0	10,616	18,589	4,018	43,748	66,356	24,862	4,587	43,807	3,716	76,972	25.2	12.4	0.1	13.8
6. Cardona	490	98	31	109	15.0	728	966	0	146	1,112	1,456	98	177	109	1,840	33.7	100.0	17.5	39.6
7. Jala-Jala	73	15	5	16	15.0	109	542	0	22	564	615	15	27	16	673	11.9	100.0	18.5	16.2
8. Montalban	3,903	53	21	1,704	30.0	5,680	3,292	1,069	3,557	7,918	7,195	1,122	3,578	1,704	13,599	54.2	4.7	0.6	41.8
9. Morong	955	131	60	213	15.0	1,419	861	0	284	1,145	1,816	191	344	213	2,564	52.6	100.0	17.4	55.3
10. Pililla	703	141	44	157	15.0	1,045	993	0	209	1,202	1,696	141	253	157	2,247	41.5	100.0	17.4	46.5
11. San Mateo	4,352	235	66	1,994	30.0	6,648	6,278	494	730	7,502	10,630	729	796	1,994	14,150	40.9	32.2	8.3	47.0
12. Tanay	2,170	434	137	484	15.0	3,225	1,656	0	645	2,301	3,826	434	782	484	5,526	56.7	100.0	17.5	58.4
13. Taytay	6,798	462	105	3,966	35.0	11,331	12,754	1,478	20,059	34,291	19,552	1,941	20,164	3,966	45,622	34.8	23.8	0.5	24.8
14. Teresa	480	96	30	107	15.0	713	575	0	143	718	1,055	96	173	107	1,431	45.5	100.0	17.3	49.8
TOTAL	1,218,158	455,291	118,068	950,068	34.7	2,741,584	436,105	118,941	418,793	973,839	1,654,262	574,232	536,861	950,068	3,715,423	73.6	79.3	22.0	73.8

TABLE 13.4.10 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (SCENARIO 2)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,420,202	561,193	146,218	911,833	30.0	3,039,444	211,812	110,761	369,650	692,223	1,632,014	671,952	515,868	911,833	3,731,667	87.0	83.5	28.3	81.5
1. Manila	267,682	205,861	27,560	214,759	30.0	715,862	17,415	4,885	5,786	27,886	285,097	210,526	33,346	214,759	743,728	93.9	97.8	82.6	96.2
2. Pasay City	52,747	30,375	2,742	36,799	30.0	122,662	7,448	8,795	3,375	19,618	60,195	39,170	6,116	36,799	142,280	87.6	77.5	44.8	86.2
3. Quezon City	207,254	148,563	41,310	213,055	30.0	710,182	21,462	27,841	32,368	81,671	328,717	176,204	73,677	213,055	791,653	93.5	84.3	56.1	89.7
4. Caloocan City	110,825	19,850	15,174	62,421	30.0	208,070	30,123	3,674	4,665	38,462	140,948	23,524	19,839	62,421	246,532	78.6	84.2	76.5	84.4
5. Las Pinas	68,920	959	222	30,043	30.0	100,145	23,463	5,686	29,863	59,013	92,383	6,646	30,086	30,043	159,158	74.6	14.4	0.7	62.9
6. Makati	92,691	79,303	8,074	77,429	30.0	258,098	5,740	11,721	3,383	20,844	98,432	91,024	11,458	77,429	278,943	94.2	87.2	70.5	92.5
7. Malabon	40,574	6,080	14,698	26,285	30.0	87,616	10,723	2,016	14,565	27,304	51,297	8,076	29,263	26,285	114,921	79.1	75.0	50.2	76.2
8. Mandaluyong	41,038	18,691	13,386	31,250	30.0	104,166	2,914	2,128	5,353	10,395	43,952	20,820	18,739	31,250	114,560	93.4	89.7	71.4	90.9
9. Marikina	61,462	5,399	2,804	25,770	30.0	99,235	4,194	2,164	9,736	16,094	65,656	8,163	11,739	23,770	115,328	93.6	73.5	17.1	86.0
10. Muntinlupa	48,677	120	114	20,962	30.0	69,874	16,821	12,723	48,844	78,387	65,498	12,843	48,958	20,962	148,261	74.3	0.9	0.2	47.1
11. Navotas	29,978	3,464	3,621	15,893	30.0	52,977	2,401	621	1,739	4,761	32,379	4,105	5,360	15,893	57,737	92.6	84.9	67.6	91.8
12. Paranaque	92,068	10,372	2,393	44,928	30.0	149,761	23,296	7,597	25,207	56,100	115,364	17,969	27,600	44,928	205,861	79.8	57.7	8.7	72.7
13. Pasig	79,047	14,448	11,511	45,003	30.0	150,009	5,536	10,292	85,602	101,430	84,583	24,741	97,113	45,003	251,439	93.5	58.4	11.9	59.7
14. Pateros	7,638	86	5	3,312	30.0	11,041	3,311	0	2,502	5,813	10,949	86	2,507	3,312	16,854	69.8	100.0	0.2	65.5
15. San Juan	30,409	12,732	1,735	19,232	30.0	64,108	1,732	97	59	1,888	32,141	12,829	1,794	19,232	65,996	94.6	99.2	96.7	97.1
16. Taguig	39,371	558	13	17,118	30.0	57,060	17,185	5,650	58,702	81,537	56,556	6,208	58,715	17,118	138,597	69.6	9.0	0.0	41.2
17. Valenzuela	49,820	3,528	1,656	23,573	30.0	78,578	18,048	5,291	33,502	61,241	67,868	8,819	35,158	23,573	139,818	73.4	40.0	4.2	56.2
II. CAVITE	78,768	1,892	1,637	35,270	30.0	117,566	32,841	8,000	8,191	49,032	111,609	9,892	10,027	35,270	166,598	70.7	19.1	18.3	70.6
1. Bacoor	34,252	415	100	14,900	30.0	49,666	8,826	1,087	0	9,713	42,878	1,502	100	14,900	59,379	79.9	27.6	100.0	83.6
2. Cavite City	14,987	1,124	339	7,050	30.0	23,500	4,270	5,379	0	9,649	19,256	6,503	339	7,050	33,148	77.8	17.3	100.0	70.9
3. Imus	12,683	100	10	5,483	30.0	18,277	9,599	996	756	11,351	22,283	1,096	766	5,483	29,628	56.9	9.1	1.3	61.7
4. Kawit	9,723	189	818	4,598	30.0	15,328	1,855	0	0	1,855	11,578	189	818	4,598	17,183	84.0	100.0	100.0	89.2
5. Novelete	3,059	8	126	1,367	30.0	4,558	1,702	0	0	1,702	4,759	8	126	1,367	6,260	64.2	100.0	100.0	72.8
6. Rosario	4,066	56	244	1,871	30.0	6,238	6,590	538	7,635	14,763	10,656	595	7,879	1,871	21,001	38.2	9.5	3.1	29.7
III. RIZAL	96,991	7,396	5,442	39,070	26.2	148,897	81,500	12,889	103,472	178,262	178,491	20,285	108,913	39,070	327,159	61.0	36.5	5.0	45.5
1. Angono	5,138	1,028	555	1,186	15.0	7,907	1,124	0	1,295	2,419	6,262	1,028	1,850	1,186	10,326	82.1	100.0	30.0	76.6
2. Antipolo	17,690	934	2,527	9,064	30.0	30,215	23,877	4,271	17,134	45,283	41,567	5,205	19,661	9,064	75,498	42.6	17.9	12.9	40.0
3. Baras	185	38	20	44	15.0	291	610	0	48	658	799	38	68	44	949	23.7	100.0	29.5	30.6
4. Binangonan	10,922	2,180	1,177	2,516	15.0	16,775	2,873	0	2,747	5,620	13,775	2,180	3,924	2,516	22,395	79.1	100.0	30.0	74.9
5. Cainta	24,761	695	68	10,939	30.0	36,463	12,715	4,905	51,541	67,162	35,476	5,600	51,610	10,939	103,625	69.8	12.4	0.1	35.2
6. Cardona	631	126	58	146	15.0	971	1,005	0	159	1,164	1,636	126	227	146	2,135	38.6	100.0	30.0	45.5
7. Jala-Jala	259	54	29	62	15.0	414	542	0	68	610	811	54	97	62	1,024	33.2	100.0	29.9	40.4
8. Montalban	5,644	64	24	2,457	30.0	8,189	1,070	1,305	4,191	8,566	8,714	1,370	4,215	2,457	16,755	64.8	4.7	0.6	48.9
9. Morong	1,253	251	135	289	15.0	1,928	900	0	316	1,216	2,153	251	451	289	3,144	58.2	100.0	29.9	61.3
10. Pililla	1,181	232	125	268	15.0	1,786	1,010	0	292	1,302	2,171	232	417	268	3,088	53.5	100.0	30.0	57.8
11. San Mateo	6,883	287	18	3,106	30.0	10,354	5,381	603	860	7,844	13,264	890	938	3,106	18,198	51.9	32.2	8.3	56.9
12. Tanay	3,324	785	424	906	15.0	6,039	1,570	0	989	2,559	5,494	785	1,413	906	8,598	71.4	100.0	30.0	70.2
13. Taytay	17,754	565	124	7,904	30.0	26,346	1,582	1,804	23,632	33,120	25,437	2,369	23,756	7,904	59,466	69.8	23.8	0.5	44.3
14. Teresa	792	158	86	183	15.0	1,219	519	0	200	739	1,331	158	286	183	1,958	59.5	100.0	30.1	62.3
TOTAL	1,595,962	570,478	153,295	986,173	28.8	3,305,908	326,153	131,651	481,313	919,517	1,922,114	702,123	634,808	986,173	4,225,424	83.9	81.2	24.1	78.2

TABLE 13.4.11 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (SCENARIO 2)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,824,341	681,308	219,115	844,941	25.0	3,379,765	180,476	110,761	369,650	660,888	1,814,816	792,069	588,825	844,941	4,040,653	90.1	86.0	37.2	83.6
1. Manila	277,955	243,494	32,276	184,575	25.0	738,301	17,021	4,665	5,786	27,472	294,976	248,160	38,062	184,575	765,773	94.2	98.1	84.8	96.4
2. Pasay City	61,177	37,377	3,807	34,054	25.0	136,214	4,538	8,795	3,375	16,708	65,715	46,172	6,981	34,054	152,922	93.1	81.0	51.7	89.1
3. Quezon City	338,611	180,061	51,720	190,134	25.0	760,536	21,866	27,641	32,368	81,874	360,477	207,702	84,097	190,134	842,410	93.9	86.7	61.5	90.3
4. Caloocan City	134,651	23,820	17,560	58,817	25.0	235,267	25,631	3,674	4,665	33,970	160,282	27,494	22,844	58,817	269,237	84.0	86.6	79.4	87.4
5. Las Pinas	103,932	2,147	4,477	36,852	25.0	147,408	18,894	5,586	29,863	54,444	122,826	7,833	34,341	36,852	201,852	84.6	27.4	13.0	73.0
6. Makati	98,362	96,282	9,694	68,113	25.0	272,451	5,816	11,721	3,383	20,920	104,178	108,003	13,078	68,113	293,371	94.4	89.1	74.1	92.9
7. Malabon	47,256	7,504	16,836	24,552	25.0	98,128	8,770	2,016	14,565	25,351	56,026	9,519	31,401	24,552	123,479	84.3	78.8	46.4	79.5
8. Mandaluyong	44,675	23,177	16,036	27,029	25.0	110,918	2,913	2,128	5,353	10,394	47,587	24,305	21,389	27,029	120,911	93.9	91.2	75.0	91.8
9. Marikina	69,793	7,458	3,664	26,972	25.0	107,886	4,426	2,164	9,736	16,326	74,219	9,622	13,400	26,972	124,213	94.0	77.5	27.3	86.9
10. Muntinlupa	67,217	2,415	7,038	25,557	25.0	102,228	12,477	12,723	48,844	74,043	79,694	15,138	55,882	25,557	176,271	84.3	15.0	12.6	58.0
11. Navotas	33,300	4,218	4,379	13,966	25.0	55,863	2,377	621	1,739	4,737	35,677	4,839	6,118	13,966	60,600	93.3	87.2	71.6	92.2
12. Paranaque	104,101	13,584	6,296	41,327	25.0	165,308	18,593	1,557	25,207	51,357	122,694	21,181	31,503	41,327	216,705	84.8	64.1	20.0	76.3
13. Pasig	90,921	18,831	25,245	45,013	25.0	180,050	5,877	10,292	85,602	101,771	96,798	29,163	110,847	45,013	281,821	93.9	64.7	22.8	63.9
14. Pateros	9,815	102	360	3,425	25.0	13,701	2,489	0	2,502	4,992	12,304	102	2,862	3,425	18,693	79.8	100.0	12.6	73.3
15. San Juan	31,086	15,025	1,988	16,033	25.0	64,133	1,731	97	59	1,888	32,818	15,122	2,047	16,033	66,020	94.7	99.4	97.1	97.1
16. Taguig	51,771	1,868	8,317	20,585	25.0	82,341	13,245	5,650	58,702	77,597	65,015	7,518	67,019	20,585	159,938	79.6	22.8	12.4	51.5
17. Valenzuela	69,719	5,104	7,251	27,358	25.0	109,432	13,812	5,291	37,902	57,005	83,531	10,395	45,153	27,358	166,437	83.5	49.1	16.1	65.7
II. CAVITE	104,413	3,660	3,055	37,042	25.0	148,169	25,861	8,000	8,391	42,252	130,273	11,660	11,445	37,042	190,421	80.1	31.4	26.7	77.8
1. Bacoor	46,303	883	114	15,033	25.0	60,133	7,858	1,087	0	8,945	52,161	1,770	114	15,033	69,078	84.8	38.6	100.0	87.1
2. Cavite City	19,634	2,287	387	7,436	25.0	29,743	1,440	5,379	0	6,819	21,074	7,666	387	7,436	36,562	93.2	29.8	100.0	81.3
3. Imus	17,516	296	119	5,977	25.0	23,907	8,308	996	756	10,061	25,825	1,292	874	5,977	33,968	67.8	22.9	13.6	70.4
4. Kawit	12,721	222	934	4,626	25.0	18,502	603	0	0	603	13,323	222	934	4,626	19,105	95.5	100.0	100.0	96.8
5. Noveleta	4,154	9	143	1,436	25.0	5,742	1,284	0	0	1,284	5,439	9	143	1,436	7,027	76.4	100.0	100.0	81.7
6. Rosario	6,085	163	1,358	2,535	25.0	10,141	6,368	538	7,635	14,539	12,451	701	8,993	2,535	24,680	48.9	23.2	15.1	41.1
III. RIZAL	139,950	10,320	9,149	45,319	22.1	204,739	60,162	15,193	118,375	193,711	200,092	25,513	127,524	45,319	398,449	69.9	40.4	7.2	51.4
1. Angono	7,927	1,585	1,284	1,905	15.0	12,701	1,082	0	1,510	2,592	8,949	1,585	2,854	1,905	15,293	88.6	100.0	45.0	83.1
2. Antipolo	25,514	1,101	2,884	9,833	25.0	39,332	26,583	5,035	19,557	51,175	52,097	6,136	22,441	9,833	90,506	49.0	17.9	12.9	43.5
3. Baras	401	80	65	96	15.0	642	625	0	73	708	1,030	80	144	96	1,350	38.9	100.0	45.1	47.6
4. Binangonan	15,915	3,183	2,578	3,825	15.0	25,501	2,520	0	3,151	5,671	18,435	3,183	5,729	3,825	31,172	86.3	100.0	45.0	81.8
5. Cainta	35,617	819	78	12,171	25.0	48,686	9,014	5,782	58,831	73,627	44,632	6,601	58,909	12,171	122,313	79.8	12.4	0.1	39.8
6. Cardona	841	168	136	202	15.0	1,347	1,021	0	167	1,188	1,862	168	303	202	2,535	45.2	100.0	44.9	53.1
7. Jala-Jala	568	114	92	137	15.0	911	526	0	112	638	1,094	114	204	137	1,549	51.9	100.0	45.1	58.8
8. Montalban	1,538	76	28	2,547	25.0	10,188	2,614	1,539	4,184	8,936	10,152	1,614	4,811	2,547	19,124	84.3	4.7	0.6	53.3
9. Morong	1,768	354	286	425	15.0	2,833	940	0	350	1,290	2,708	354	636	425	4,123	65.3	100.0	45.0	68.7
10. Pililla	2,161	432	350	519	15.0	3,462	928	0	428	1,356	3,089	432	778	519	4,818	70.0	100.0	45.0	71.9
11. San Mateo	10,166	338	89	3,531	25.0	14,124	6,141	711	982	7,833	16,307	1,049	1,071	3,531	21,958	62.3	32.2	8.3	64.3
12. Tanay	5,882	1,176	353	1,414	15.0	9,425	1,497	0	1,165	2,662	7,379	1,176	2,118	1,414	12,087	79.7	100.0	45.0	78.0
13. Taytay	24,583	665	141	8,439	25.0	33,754	6,203	2,127	28,575	36,904	30,712	2,792	27,116	8,439	69,058	79.8	23.8	0.5	48.9
14. Teresa	1,143	229	165	275	15.0	1,832	504	0	226	730	1,647	229	411	275	2,562	69.4	100.0	45.0	71.5
TOTAL	1,878,104	695,287	231,319	927,302	24.8	3,732,673	266,479	133,955	496,416	896,850	2,145,183	829,242	727,735	927,302	4,629,523	87.6	83.8	31.8	80.6

TABLE 13.4.12 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (SCENARIO 2)

CITY/ MUNICIPALITY	NWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					NWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,814,246	802,434	289,736	968,805	25.0	3,875,221	172,531	110,761	369,650	652,943	1,986,777	913,195	659,386	968,805	4,528,164	91.3	87.9	43.9	85.6
1. Manila	284,993	281,444	36,837	201,092	25.0	804,366	16,908	4,665	5,786	27,359	301,901	286,109	42,623	201,092	831,725	94.4	98.4	86.4	96.7
2. Pasay City	65,993	44,438	4,443	38,291	25.0	153,165	4,567	8,795	3,375	16,736	70,560	53,233	7,818	38,291	169,901	93.5	83.5	56.8	90.1
3. Quezon City	365,702	211,824	61,807	213,111	25.0	852,444	22,654	27,641	32,368	82,663	388,356	239,464	94,175	213,111	935,106	94.2	88.5	65.6	91.2
4. Caloocan City	159,456	28,024	20,693	69,391	25.0	277,565	19,621	3,674	4,665	27,960	179,077	31,698	25,358	69,391	305,524	89.0	88.4	81.6	90.8
5. Las Pinas	133,361	3,345	8,592	48,433	25.0	193,732	23,990	5,686	29,863	59,540	157,351	9,031	38,456	48,433	253,271	84.8	37.0	22.3	76.5
6. Makati	102,168	112,798	11,262	75,809	25.0	302,437	5,932	11,721	3,383	21,036	108,700	124,519	14,645	75,809	323,473	94.5	90.6	76.9	93.5
7. Malabon	53,787	8,959	22,839	28,528	25.0	114,113	6,398	2,016	14,565	22,979	60,185	10,975	37,404	28,528	137,092	89.4	81.6	61.1	83.2
8. Mandaluyong	47,748	25,894	18,599	30,747	25.0	122,989	2,975	2,128	5,353	10,456	50,723	28,022	23,952	30,747	133,445	94.1	92.4	77.7	92.2
9. Marikina	77,453	8,930	5,210	30,551	25.0	122,203	4,726	2,164	9,736	16,626	82,179	11,094	15,005	30,551	138,829	94.2	80.5	35.1	88.0
10. Muntinlupa	89,750	4,731	13,734	32,739	25.0	130,955	14,542	12,723	48,844	76,108	94,292	17,454	62,578	32,739	207,063	84.6	27.1	21.9	63.2
11. Navotas	36,199	4,958	5,112	15,423	25.0	61,692	2,427	621	1,739	4,787	38,626	5,578	6,852	15,423	66,479	93.7	88.9	74.6	92.8
12. Paranaque	107,742	16,823	10,011	44,879	25.0	179,516	19,178	7,597	25,207	51,981	126,920	24,420	35,278	44,879	231,497	84.9	68.9	28.5	77.5
13. Pasig	102,053	23,331	38,528	54,637	25.0	218,549	6,322	10,292	85,602	102,216	108,375	33,623	124,130	54,637	320,765	94.2	69.4	31.0	68.1
14. Pateros	12,158	117	103	4,326	25.0	17,304	1,401	0	2,502	3,904	13,560	117	3,205	4,326	21,207	89.7	100.0	21.9	81.6
15. San Juan	31,298	17,338	2,234	16,956	25.0	67,826	1,724	97	59	1,880	33,022	17,435	2,293	16,956	69,706	94.8	99.4	97.4	97.3
16. Taguig	65,410	2,787	15,348	28,182	25.0	112,727	7,194	5,650	58,702	72,057	73,114	8,437	75,050	28,182	184,784	89.5	33.0	21.8	61.0
17. Valenzuela	88,373	6,694	12,662	35,909	25.0	143,638	11,464	5,291	37,502	54,657	99,837	11,985	50,164	35,909	198,295	88.5	55.9	25.0	72.4
II. CAVITE	129,167	5,443	4,426	46,345	25.0	185,381	20,120	8,000	8,391	36,511	149,287	13,443	12,817	46,345	221,892	86.5	40.5	34.5	83.5
1. Bacoor	52,721	954	128	17,934	25.0	71,736	9,322	1,087	0	10,409	62,043	2,041	128	17,934	82,145	85.0	46.7	100.0	87.3
2. Cavite City	22,414	3,463	433	8,769	25.0	35,075	0	5,379	0	5,379	22,414	8,838	433	8,769	40,454	100.0	39.1	100.0	86.7
3. Imus	24,886	494	223	8,534	25.0	34,138	4,498	936	756	6,250	29,385	1,430	979	8,534	40,388	84.7	33.1	22.8	84.5
4. Kawit	15,032	256	1,045	5,444	25.0	21,778	0	0	0	0	15,032	256	1,045	5,444	21,778	100.0	100.0	100.0	100.0
5. Noveleta	5,296	10	161	1,822	25.0	7,289	816	0	0	816	6,112	10	161	1,822	8,105	86.6	100.0	100.0	89.9
6. Rosario	8,818	270	2,436	3,841	25.0	15,365	5,484	638	7,635	13,657	14,302	908	10,071	3,841	29,022	61.7	33.4	24.2	52.9
III. RIZAL	192,815	13,854	14,834	62,289	21.9	283,791	53,161	17,517	131,930	202,608	245,976	31,370	146,764	62,289	486,399	78.4	44.2	10.1	58.3
1. Angono	11,583	2,317	2,502	2,894	15.0	19,296	848	0	1,668	2,516	12,431	2,317	4,170	2,894	21,812	93.2	100.0	60.0	88.5
2. Antipolo	35,948	1,269	3,230	13,482	25.0	53,929	27,675	5,805	21,901	55,380	63,623	7,074	25,130	13,482	109,309	56.5	17.9	12.9	49.3
3. Baras	699	140	151	175	15.0	1,165	630	0	101	731	1,329	140	252	175	1,896	52.6	100.0	59.9	61.4
4. Binangonan	22,135	4,427	4,781	5,531	15.0	36,874	2,063	0	3,187	5,250	24,198	4,427	7,968	5,531	42,124	91.5	100.0	60.0	87.5
5. Cainta	48,671	944	88	16,567	25.0	66,270	5,580	6,667	65,880	78,127	54,251	7,610	65,968	16,567	144,397	89.7	12.4	0.1	45.9
6. Cardona	1,095	219	237	374	15.0	1,925	1,020	0	158	1,178	2,115	219	395	374	3,103	51.8	100.0	60.0	60.8
7. Jala-Jala	988	198	213	247	15.0	1,646	490	0	142	632	1,478	198	355	247	2,278	66.8	100.0	60.0	72.3
8. Montalban	9,288	87	31	3,135	25.0	12,542	2,187	1,774	5,357	9,318	11,475	1,861	5,388	3,135	21,860	80.9	4.7	0.6	57.4
9. Morong	2,447	489	529	611	15.0	4,076	966	0	352	1,318	3,413	489	881	611	5,394	71.7	100.0	60.0	75.6
10. Pililla	3,067	613	662	766	15.0	5,108	882	0	442	1,324	3,949	613	1,104	766	6,432	77.7	100.0	60.0	79.4
11. San Mateo	14,476	390	100	4,389	25.0	19,354	5,274	819	1,099	7,192	19,750	1,209	1,199	4,389	27,147	73.3	32.2	8.3	73.5
12. Tanay	8,385	1,677	1,811	2,095	15.0	13,968	1,366	0	1,208	2,574	9,751	1,677	3,019	2,095	16,542	86.0	100.0	60.0	84.4
13. Taytay	32,453	867	158	11,126	25.0	44,604	3,721	2,452	30,207	36,380	36,174	3,319	30,365	11,126	80,984	89.7	23.8	0.5	55.0
14. Teresa	1,581	316	342	395	15.0	2,634	458	0	228	686	2,039	316	570	395	3,320	77.5	100.0	60.0	79.3
TOTAL	2,136,228	821,731	308,996	1,077,439	24.8	4,344,394	245,812	136,278	509,971	892,062	2,382,040	958,009	818,967	1,077,439	5,236,455	89.7	85.8	37.7	83.0

TABLE 13.4.13 DISTRIBUTION OF WATER DEMAND IN 1995 (SCENARIO 2), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	2,597,312	742,276	3,339,588	98.3	1.7	2,552,414	44,898	742,276	787,174	23.6
1. Manila	681,100	29,796	710,897	100.0	0.0	681,100	0	29,796	29,796	4.2
2. Pasay City	105,590	22,731	128,321	95.2	4.8	100,508	5,082	22,731	27,813	21.7
3. Quezon City	642,072	83,254	725,326	97.1	2.9	623,746	18,326	83,254	101,580	14.0
4. Caloocan City	167,729	48,176	215,905	100.0	0.0	167,729	0	48,176	48,176	22.3
5. Las Pinas	47,307	67,013	114,320	96.3	3.7	45,573	1,734	67,013	68,747	60.1
6. Makati	231,774	25,581	257,355	96.8	3.2	224,414	7,360	25,581	32,941	12.8
7. Malabon	71,165	31,270	102,435	98.3	1.7	69,921	1,244	31,270	32,514	31.7
8. Mandaluyong	95,271	10,729	106,000	100.0	0.0	95,271	0	10,729	10,729	10.1
9. Marikina	90,788	14,380	105,169	100.0	0.0	90,788	0	14,380	14,380	13.7
10. Muntinlupa	32,049	83,453	115,501	78.1	21.9	25,030	7,019	83,453	90,472	78.3
11. Navotas	46,507	6,480	52,987	99.3	0.7	46,194	313	6,480	6,793	12.8
12. Paranaque	113,095	69,929	183,025	98.4	1.6	111,327	1,768	69,929	71,697	39.2
13. Pasig	130,063	90,273	220,336	99.8	0.2	129,807	256	90,273	90,529	41.1
14. Pateros	6,657	7,401	14,057	100.0	0.0	6,657	0	7,401	7,401	52.6
15. San Juan	63,517	1,887	65,404	100.0	0.0	63,517	0	1,887	1,887	2.9
16. Taguig	15,787	92,662	108,449	94.6	5.4	14,940	847	92,662	93,509	86.2
17. Valenzuela	56,841	57,261	114,101	98.3	1.7	55,892	949	57,261	58,210	51.0
II. CAVITE	67,529	62,769	130,299	22.3	77.7	15,061	52,468	62,769	115,237	88.4
1. Bacoor	22,617	19,808	42,425	66.6	33.4	15,061	7,556	19,808	27,364	64.5
2. Cavite City	17,375	10,917	28,293	0.0	100.0	0	17,375	10,917	28,293	100.0
3. Imus	11,245	12,480	23,725	0.0	100.0	0	11,245	12,480	23,725	100.0
4. Kawit	10,929	3,041	13,971	0.0	100.0	0	10,929	3,041	13,971	100.0
5. Noveleta	1,621	3,059	4,680	0.0	100.0	0	1,621	3,059	4,680	100.0
6. Rosario	3,742	13,464	17,205	0.0	100.0	0	3,742	13,464	17,205	100.0
III. RIZAL	76,743	168,794	245,537	17.1	82.9	13,094	63,649	168,794	232,443	94.7
1. Angono	4,628	2,081	6,709	100.0	0.0	4,628	0	2,081	2,081	31.0
2. Antipolo	19,999	37,816	57,816	0.0	100.0	0	19,999	37,816	57,816	100.0
3. Baras	188	596	784	0.0	100.0	0	188	596	784	100.0
4. Binangonan	10,414	5,190	15,604	0.0	100.0	0	10,414	5,190	15,604	100.0
5. Cainta	10,616	66,356	76,972	45.5	54.5	4,830	5,786	66,356	72,142	93.7
6. Cardona	728	1,112	1,840	0.0	100.0	0	728	1,112	1,840	100.0
7. Jala-Jala	109	564	673	0.0	100.0	0	109	564	673	100.0
8. Montalban	5,680	7,918	13,599	0.0	100.0	0	5,680	7,918	13,599	100.0
9. Morong	1,419	1,145	2,564	0.0	100.0	0	1,419	1,145	2,564	100.0
10. Pililla	1,045	1,202	2,247	0.0	100.0	0	1,045	1,202	2,247	100.0
11. San Mateo	6,648	7,502	14,150	0.0	100.0	0	6,648	7,502	14,150	100.0
12. Tanay	3,225	2,301	5,526	0.0	100.0	0	3,225	2,301	5,526	100.0
13. Taytay	11,331	34,291	45,622	32.1	67.9	3,636	7,695	34,291	41,986	92.0
14. Teresa	713	718	1,431	0.0	100.0	0	713	718	1,431	100.0
TOTAL	2,741,584	973,839	3,715,423	94.1	5.9	2,580,569	161,015	973,839	1,134,854	30.5

TABLE 13.4.14 DISTRIBUTION OF WATER DEMAND IN 2000 (SCENARIO 2), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE	GROUND-	G.W.
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND- WATER	SURFACE WATER	GROUND- WATER	GROUND- WATER	WATER TOTAL	SHARE (%)
I. NCR	3,039,444	692,223	3,731,667	98.5	1.5	2,994,546	44,898	692,223	737,121	19.8
1. Manila	715,862	27,866	743,728	100.0	0.0	715,862	0	27,866	27,866	3.7
2. Pasay City	122,662	19,618	142,280	95.9	4.1	117,580	5,082	19,618	24,700	17.4
3. Quezon City	710,182	81,471	791,653	97.4	2.6	691,856	18,326	81,471	99,797	12.6
4. Caloocan City	208,070	38,462	246,532	100.0	0.0	208,070	0	38,462	38,462	15.6
5. Las Pinas	100,145	59,013	159,158	98.3	1.7	98,411	1,734	59,013	60,747	38.2
6. Makati	258,098	20,844	278,943	97.1	2.9	250,738	7,360	20,844	28,204	10.1
7. Malabon	87,616	27,304	114,921	98.6	1.4	86,372	1,244	27,304	28,548	24.8
8. Mandaluyong	104,166	10,395	114,560	100.0	0.0	104,166	0	10,395	10,395	9.1
9. Marikina	99,235	16,094	115,328	100.0	0.0	99,235	0	16,094	16,094	14.0
10. Muntinlupa	69,874	78,387	148,261	90.0	10.0	62,855	7,019	78,387	85,406	57.6
11. Navotas	52,977	4,761	57,737	99.4	0.6	52,664	313	4,761	5,074	8.8
12. Paranaque	149,761	56,100	205,861	98.8	1.2	147,993	1,768	56,100	57,868	28.1
13. Pasig	150,009	101,430	251,439	99.8	0.2	149,753	256	101,430	101,686	40.4
14. Pateros	11,041	5,813	16,854	100.0	0.0	11,041	0	5,813	5,813	34.5
15. San Juan	64,108	1,888	65,996	100.0	0.0	64,108	0	1,888	1,888	2.9
16. Taguig	57,060	81,537	138,597	98.5	1.5	56,213	847	81,537	82,384	59.4
17. Valenzuela	78,578	61,241	139,818	98.8	1.2	77,629	949	61,241	62,190	44.5
II. CAVITE	117,566	49,032	166,598	39.7	60.3	46,709	70,858	49,032	119,890	72.0
1. Bacoor	49,666	9,713	59,379	84.8	15.2	42,110	7,556	9,713	17,269	29.1
2. Cavite City	23,500	9,649	33,148	0.0	100.0	0	23,500	9,649	33,148	100.0
3. Imus	18,277	11,351	29,628	0.0	100.0	0	18,277	11,351	29,628	100.0
4. Kawit	15,328	1,855	17,183	30.0	70.0	4,598	10,730	1,855	12,585	73.2
5. Noveleta	4,558	1,702	6,260	0.0	100.0	0	4,558	1,702	6,260	100.0
6. Rosario	6,238	14,763	21,001	0.0	100.0	0	6,238	14,763	21,001	100.0
III. RIZAL	148,897	178,262	327,159	42.2	57.8	62,799	86,098	178,262	264,360	80.8
1. Angono	7,907	2,419	10,326	100.0	0.0	7,907	0	2,419	2,419	23.4
2. Antipolo	30,215	45,283	75,498	6.1	93.9	1,834	28,381	45,283	73,664	97.6
3. Baras	291	658	949	0.0	100.0	0	291	658	949	100.0
4. Binangonan	16,775	5,620	22,395	0.0	100.0	0	16,775	5,620	22,395	100.0
5. Cainta	36,463	67,162	103,625	84.1	15.9	30,677	5,786	67,162	72,948	70.4
6. Cardona	971	1,164	2,135	0.0	100.0	0	971	1,164	2,135	100.0
7. Jala-Jala	414	610	1,024	0.0	100.0	0	414	610	1,024	100.0
8. Montalban	8,189	8,566	16,755	18.4	81.6	1,505	6,684	8,566	15,250	91.0
9. Morong	1,928	1,216	3,144	0.0	100.0	0	1,928	1,216	3,144	100.0
10. Pililla	1,786	1,302	3,088	0.0	100.0	0	1,786	1,302	3,088	100.0
11. San Mateo	10,354	7,844	18,198	21.5	78.5	2,224	8,130	7,844	15,974	87.8
12. Tanay	6,039	2,559	8,598	0.0	100.0	0	6,039	2,559	8,598	100.0
13. Taytay	26,346	33,120	59,466	70.8	29.2	18,651	7,695	33,120	40,815	68.6
14. Teresa	1,219	739	1,958	0.0	100.0	0	1,219	739	1,958	100.0
TOTAL	3,305,908	919,517	4,225,424	93.9	6.1	3,104,053	201,854	919,517	1,121,371	26.5

TABLE 13.4.15 DISTRIBUTION OF WATER DEMAND IN 2005 (SCENARIO 2), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,379,765	660,888	4,040,653	98.7	1.3	3,334,867	44,898	660,888	705,786	17.5
1. Manila	738,301	27,472	765,773	100.0	0.0	738,301	0	27,472	27,472	3.6
2. Pasay City	136,214	16,708	152,922	96.3	3.7	131,132	5,082	16,708	21,790	14.2
3. Quezon City	760,536	81,874	842,410	97.6	2.4	742,210	18,326	81,874	100,200	11.9
4. Caloocan City	235,267	33,970	269,237	100.0	0.0	235,267	0	33,970	33,970	12.6
5. Las Pinas	147,408	54,444	201,852	98.8	1.2	145,674	1,734	54,444	56,178	27.8
6. Makati	272,451	20,920	293,371	97.3	2.7	265,091	7,360	20,920	28,280	9.6
7. Malabon	98,128	25,351	123,479	98.7	1.3	96,884	1,244	25,351	26,595	21.5
8. Mandaluyong	110,518	10,394	120,911	100.0	0.0	110,518	0	10,394	10,394	8.6
9. Marikina	107,886	16,326	124,213	100.0	0.0	107,886	0	16,326	16,326	13.1
10. Muntinlupa	102,228	74,043	176,271	93.1	6.9	95,209	7,019	74,043	81,062	46.0
11. Navotas	55,863	4,737	60,600	99.4	0.6	55,550	313	4,737	5,050	8.3
12. Paranaque	165,308	51,397	216,705	98.9	1.1	163,540	1,768	51,397	53,165	24.5
13. Pasig	180,050	101,771	281,821	99.9	0.1	179,794	256	101,771	102,027	36.2
14. Pateros	13,701	4,992	18,693	100.0	0.0	13,701	0	4,992	4,992	26.7
15. San Juan	64,133	1,888	66,020	100.0	0.0	64,133	0	1,888	1,888	2.9
16. Taguig	82,341	77,597	159,938	99.0	1.0	81,494	847	77,597	78,444	49.0
17. Valenzuela	109,432	57,005	166,437	99.1	0.9	108,483	949	57,005	57,954	34.8
II. CAVITE	148,169	42,252	190,421	52.2	47.8	77,310	70,859	42,252	113,111	59.4
1. Bacoor	60,133	8,945	69,078	87.4	12.6	52,577	7,556	8,945	16,501	23.9
2. Cavite City	29,743	6,819	36,562	21.0	79.0	6,243	23,500	6,819	30,319	82.9
3. Imus	23,907	10,061	33,968	23.5	76.5	5,630	18,277	10,061	28,338	83.4
4. Kawit	18,502	603	19,105	42.0	58.0	7,772	10,730	603	11,333	59.3
5. Noveleta	5,742	1,284	7,027	20.6	79.4	1,184	4,558	1,284	5,842	83.1
6. Rosario	10,141	14,539	24,680	38.5	61.5	3,903	6,238	14,539	20,777	84.2
III. RIZAL	204,739	193,711	398,449	48.7	51.3	99,731	105,008	193,711	298,718	75.0
1. Angono	12,701	2,592	15,293	100.0	0.0	12,701	0	2,592	2,592	16.9
2. Antipolo	39,332	51,175	90,506	21.8	78.2	8,572	30,760	51,175	81,934	90.5
3. Baras	642	708	1,350	0.0	100.0	0	642	708	1,350	100.0
4. Binangonan	25,501	5,671	31,172	0.0	100.0	0	25,501	5,671	31,172	100.0
5. Cainta	48,686	73,627	122,313	88.1	11.9	42,900	5,786	73,627	79,413	64.9
6. Cardona	1,347	1,188	2,535	0.0	100.0	0	1,347	1,188	2,535	100.0
7. Jala-Jala	911	638	1,549	0.0	100.0	0	911	638	1,549	100.0
8. Montalban	10,188	8,936	19,124	34.4	65.6	3,504	6,684	8,936	15,620	81.7
9. Morong	2,833	1,290	4,123	0.0	100.0	0	2,833	1,290	4,123	100.0
10. Pililla	3,462	1,356	4,818	0.0	100.0	0	3,462	1,356	4,818	100.0
11. San Mateo	14,124	7,833	21,958	42.4	57.6	5,994	8,130	7,833	15,963	72.7
12. Tanay	9,425	2,662	12,087	0.0	100.0	0	9,425	2,662	12,087	100.0
13. Taytay	33,754	35,304	69,058	77.2	22.8	26,059	7,695	35,304	42,999	62.3
14. Teresa	1,832	730	2,562	0.0	100.0	0	1,832	730	2,562	100.0
TOTAL	3,732,673	896,850	4,629,523	94.1	5.9	3,511,908	220,765	896,850	1,117,615	24.1

TABLE 13.4.16 DISTRIBUTION OF WATER DEMAND IN 2010 (SCENARIO 2), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER	GROUND-WATER		
I. NCR	3,875,221	652,943	4,528,164	98.8	1.2	3,830,323	44,898	652,943	697,841	15.4
1. Manila	804,366	27,359	831,725	100.0	0.0	804,366	0	27,359	27,359	3.3
2. Pasay City	153,165	16,736	169,901	96.7	3.3	148,083	5,082	16,736	21,818	12.8
3. Quezon City	852,444	82,662	935,106	97.9	2.1	834,118	18,326	82,662	100,988	10.8
4. Caloocan City	277,565	27,960	305,524	100.0	0.0	277,565	0	27,960	27,960	9.2
5. Las Pinas	193,732	59,540	253,271	99.1	0.9	191,998	1,734	59,540	61,274	24.2
6. Makati	302,437	21,036	323,473	97.6	2.4	295,077	7,360	21,036	28,396	8.8
7. Malabon	114,113	22,979	137,092	98.9	1.1	112,869	1,244	22,979	24,223	17.7
8. Mandaluyong	122,989	10,456	133,445	100.0	0.0	122,989	0	10,456	10,456	7.8
9. Marikina	122,203	16,626	138,829	100.0	0.0	122,203	0	16,626	16,626	12.0
10. Muntinlupa	130,955	76,108	207,063	94.6	5.4	123,936	7,019	76,108	83,127	40.1
11. Navotas	61,692	4,787	66,479	99.5	0.5	61,379	313	4,787	5,100	7.7
12. Paranaque	179,516	51,981	231,497	99.0	1.0	177,748	1,768	51,981	53,749	23.2
13. Pasig	218,549	102,216	320,765	99.9	0.1	218,293	256	102,216	102,472	31.9
14. Pateros	17,304	3,904	21,207	100.0	0.0	17,304	0	3,904	3,904	18.4
15. San Juan	67,826	1,880	69,706	100.0	0.0	67,826	0	1,880	1,880	2.7
16. Taguig	112,727	72,057	184,784	99.2	0.8	111,880	847	72,057	72,904	39.5
17. Valenzuela	143,638	54,657	198,295	99.3	0.7	142,689	949	54,657	55,606	28.0
II. CAVITE	185,381	36,511	221,892	61.8	38.2	114,522	70,859	36,511	107,370	48.4
1. Bacoor	71,736	10,409	82,145	89.5	10.5	64,180	7,556	10,409	17,965	21.9
2. Cavite City	35,075	5,379	40,454	33.0	67.0	11,575	23,500	5,379	28,879	71.4
3. Imus	34,138	6,250	40,388	46.5	53.5	15,861	18,277	6,250	24,527	60.7
4. Kawit	21,778	0	21,778	50.7	49.3	11,048	10,730	0	10,730	49.3
5. Noveleta	7,289	816	8,105	37.5	62.5	2,731	4,558	816	5,374	66.3
6. Rosario	15,365	13,657	29,022	59.4	40.6	9,127	6,238	13,657	19,895	68.6
III. RIZAL	283,791	202,608	486,399	53.7	46.3	152,420	131,371	202,608	333,979	68.7
1. Angono	19,296	2,516	21,812	100.0	0.0	19,296	0	2,516	2,516	11.5
2. Antipolo	53,929	55,380	109,309	33.7	66.3	18,149	35,780	55,380	91,160	83.4
3. Baras	1,165	731	1,896	0.0	100.0	0	1,165	731	1,896	100.0
4. Binangonan	36,874	5,250	42,124	0.0	100.0	0	36,874	5,250	42,124	100.0
5. Cainta	66,270	78,127	144,397	91.3	8.7	60,484	5,786	78,127	83,913	58.1
6. Cardona	1,825	1,178	3,003	0.0	100.0	0	1,825	1,178	3,003	100.0
7. Jala-Jala	1,646	632	2,278	0.0	100.0	0	1,646	632	2,278	100.0
8. Montalban	12,542	9,318	21,860	46.7	53.3	5,858	6,684	9,318	16,002	73.2
9. Morong	4,076	1,318	5,394	0.0	100.0	0	4,076	1,318	5,394	100.0
10. Pililla	5,108	1,324	6,432	0.0	100.0	0	5,108	1,324	6,432	100.0
11. San Mateo	19,954	7,193	27,147	59.3	40.7	11,824	8,130	7,193	15,323	56.4
12. Tanay	13,968	2,574	16,542	0.0	100.0	0	13,968	2,574	16,542	100.0
13. Taytay	44,504	36,380	80,884	82.7	17.3	36,809	7,695	36,380	44,075	54.5
14. Teresa	2,634	686	3,320	0.0	100.0	0	2,634	686	3,320	100.0
TOTAL	4,344,394	892,062	5,236,455	94.3	5.7	4,097,265	247,128	892,062	1,139,190	21.8

TABLE 13.4.17 SUMMARY OF PROJECTED WATER DEMAND IN 1995 [SCENARIO 3]

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,136,290	448,832	113,331	909,059	35.0	2,597,312	315,907	101,829	324,540	742,276	1,442,197	550,461	437,871	909,059	3,339,588	78.1	81.5	25.9	77.8
1. Manila	252,399	187,797	22,519	238,385	35.0	681,100	19,345	4,665	5,786	29,796	271,745	192,462	28,304	238,385	710,897	92.9	97.3	79.6	95.8
2. Pasay City	43,524	23,293	1,817	36,957	35.0	105,590	10,561	8,795	3,375	22,731	54,085	32,088	5,192	36,957	128,321	80.5	72.6	35.0	82.3
3. Quezon City	270,472	116,705	30,170	224,725	35.0	642,072	23,246	27,641	32,368	83,254	293,717	144,346	62,538	224,725	725,326	92.1	80.9	48.2	88.5
4. Caloocan City	81,416	15,433	12,175	58,705	35.0	167,729	39,838	3,834	4,665	48,176	121,254	19,107	16,839	58,705	215,905	67.1	80.8	72.3	77.7
5. Las Pinas	29,775	786	189	16,558	35.0	47,308	37,007	4,558	25,348	67,013	66,782	5,444	25,537	16,558	114,320	44.6	14.4	0.7	41.4
6. Makati	80,974	63,337	6,342	81,121	35.0	231,774	10,477	11,121	3,383	25,581	91,451	75,058	9,725	81,121	257,355	88.5	84.4	65.2	90.1
7. Malabon	31,384	4,600	10,273	24,908	35.0	71,165	14,689	2,016	14,565	31,270	46,074	6,616	24,838	24,908	102,435	68.1	69.5	41.4	69.5
8. Mandaluyong	36,610	14,763	10,553	33,345	35.0	95,271	3,248	2,128	5,353	10,729	39,858	16,891	15,906	33,345	106,000	91.9	87.4	66.3	89.9
9. Marikina	52,287	4,914	1,701	31,176	35.0	90,788	4,343	1,773	8,264	14,380	56,741	6,687	9,965	31,176	105,169	92.1	73.5	17.1	86.3
10. Muntinlupa	20,636	99	97	11,217	35.0	32,049	31,571	10,423	41,459	83,453	52,208	10,521	41,556	11,217	115,501	39.5	0.9	0.2	27.7
11. Navotas	24,877	2,742	2,811	16,278	35.0	46,507	4,120	621	1,739	6,480	28,997	3,363	4,550	16,278	52,987	85.7	81.5	61.8	87.8
12. Paranaque	62,984	8,491	2,031	39,583	35.0	113,095	42,310	6,223	21,396	69,929	105,294	14,720	23,427	39,583	183,025	59.8	57.7	8.7	61.8
13. Pasig	62,935	11,836	9,770	45,522	35.0	130,063	3,182	8,431	72,659	90,273	72,117	20,268	82,430	45,522	220,336	87.3	58.4	11.9	59.0
14. Pateros	4,252	71	4	2,330	35.0	6,657	5,237	0	2,124	7,401	9,529	71	2,128	2,330	14,057	44.6	100.0	0.2	47.4
15. San Juan	29,410	10,412	1,463	22,231	35.0	63,517	1,733	97	56	1,887	31,141	10,510	1,522	22,231	65,404	94.4	99.1	96.1	97.1
16. Taguig	9,793	457	11	5,525	35.0	15,787	38,207	4,629	49,826	92,662	48,000	5,086	49,838	5,525	108,449	20.4	9.0	0.0	14.6
17. Valenzuela	32,651	2,890	1,406	19,894	35.0	56,841	20,755	4,335	32,171	57,261	53,406	7,224	33,577	19,894	114,101	61.1	40.0	4.2	49.8
II. CAVITE	44,332	1,550	1,389	20,259	30.0	67,529	49,094	6,554	7,122	62,769	93,425	8,103	8,511	20,259	130,299	47.5	19.1	16.3	51.8
1. Bacoor	15,408	340	85	6,785	30.0	22,617	18,918	890	0	19,808	34,325	1,230	85	6,785	42,425	44.9	27.6	100.0	53.3
2. Cavite City	10,954	921	288	5,213	30.0	17,375	6,511	4,406	0	10,917	17,465	5,327	288	5,213	28,293	62.7	17.3	100.0	61.4
3. Imus	7,781	82	9	3,374	30.0	11,245	11,023	818	641	12,480	18,804	898	650	3,374	23,725	41.4	9.1	1.3	47.4
4. Kawit	6,802	155	694	3,279	30.0	10,929	3,041	0	0	3,041	9,843	155	694	3,279	13,971	69.1	100.0	100.0	78.2
5. Noveleta	1,022	6	107	486	30.0	1,621	3,059	0	0	3,059	4,080	6	107	486	4,680	25.0	100.0	100.0	34.6
6. Rosario	2,366	46	207	1,123	30.0	3,742	6,542	441	6,481	13,464	8,908	487	6,688	1,123	17,205	26.6	9.5	3.1	21.7
III. RIZAL	47,536	5,109	3,347	20,750	27.0	76,743	71,104	10,559	87,131	168,794	118,640	15,668	90,479	20,750	245,537	40.1	32.6	3.7	31.3
1. Angono	3,115	623	196	694	15.0	4,628	1,156	0	925	2,081	4,271	623	1,121	694	6,709	72.9	100.0	17.5	69.0
2. Antipolo	11,090	765	2,145	6,000	30.0	19,999	19,774	3,499	14,543	37,816	30,864	4,264	16,688	6,000	57,816	35.9	17.9	12.9	34.6
3. Baras	127	25	8	28	15.0	188	558	0	38	596	685	25	46	28	784	18.5	100.0	17.4	23.9
4. Binangonan	7,008	1,402	442	1,562	15.0	10,414	3,109	0	2,081	5,190	10,117	1,402	2,523	1,562	15,604	69.3	100.0	17.5	66.7
5. Cainta	6,273	569	58	3,716	35.0	10,616	18,589	4,018	43,748	66,356	24,862	4,587	43,807	3,716	76,972	25.2	12.4	0.1	13.8
6. Cardona	480	98	31	109	15.0	728	966	0	146	1,112	1,456	98	177	109	1,840	33.7	100.0	17.5	39.6
7. Jala-Jala	73	15	5	16	15.0	109	542	0	22	564	615	15	27	16	673	11.9	100.0	18.5	16.2
8. Montalban	3,903	53	21	1,704	30.0	5,680	3,292	1,069	3,557	7,918	7,195	1,122	3,578	1,704	13,599	54.2	4.7	0.6	41.8
9. Morong	955	191	60	213	15.0	1,419	861	0	284	1,145	1,816	191	344	213	2,564	52.6	100.0	17.4	55.3
10. Pililla	803	141	44	157	15.0	1,045	893	0	309	1,202	1,696	141	253	157	2,247	47.5	100.0	17.4	46.5
11. San Mateo	4,352	235	66	1,994	30.0	6,648	6,278	494	730	7,502	10,630	729	796	1,994	14,150	40.9	32.2	8.3	47.0
12. Tanay	2,110	434	137	484	15.0	3,225	1,656	0	645	2,301	3,826	434	782	484	5,526	56.7	100.0	17.5	58.4
13. Taytay	6,398	462	105	3,966	35.0	11,331	12,754	1,478	20,059	34,291	19,552	1,941	20,164	3,966	45,622	34.8	23.8	0.5	24.8
14. Teresa	480	96	30	107	15.0	713	575	0	143	718	1,055	96	173	107	1,431	45.5	100.0	17.3	49.8
TOTAL	1,218,158	455,291	118,068	950,068	34.7	2,741,584	436,105	118,941	418,793	973,839	1,654,262	574,232	536,861	950,068	3,715,423	73.6	79.3	22.0	73.8

TABLE 13.4.16 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (SCENARIO 3)

CITY/ MUNICIPALITY	NWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					NWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,420,202	570,123	191,328	934,994	30.0	3,116,648	211,812	101,829	324,540	638,180	1,632,014	671,952	515,868	934,994	3,754,828	87.0	84.8	37.1	83.0
1. Manila	267,682	205,851	27,560	214,759	30.0	715,852	17,415	4,665	5,786	27,866	285,097	210,526	33,346	214,759	743,728	93.9	97.8	82.6	96.3
2. Pasay City	52,747	30,335	2,742	36,799	30.0	122,662	7,448	8,795	3,375	19,618	60,195	39,170	6,116	36,799	142,280	87.6	77.5	44.8	86.2
3. Quezon City	307,254	148,563	41,310	213,855	30.0	710,182	21,462	27,641	32,368	81,471	328,717	176,204	73,677	213,855	791,653	93.5	84.3	56.1	89.7
4. Caloocan City	110,825	19,650	15,174	62,421	30.0	208,070	30,123	3,674	4,665	38,462	140,948	23,324	19,839	62,421	246,532	78.6	84.2	76.5	84.4
5. Las Pinas	68,920	1,387	4,738	32,419	30.0	108,064	23,463	4,658	25,348	53,470	92,383	6,046	30,086	32,419	161,533	74.6	29.9	15.7	66.9
6. Makati	92,691	79,303	8,074	77,429	30.0	258,098	5,340	11,721	3,383	20,844	98,032	91,024	11,458	77,429	278,943	94.2	87.2	70.5	92.5
7. Malabon	40,574	6,060	14,698	26,285	30.0	87,616	10,723	2,016	14,585	27,304	51,297	8,076	29,283	26,285	114,921	79.1	75.0	50.2	76.2
8. Mandaluyong	41,038	18,481	13,386	31,250	30.0	104,166	2,314	2,128	5,953	10,395	43,352	20,620	18,739	31,250	114,560	93.4	89.7	71.4	90.9
9. Marikina	61,462	6,350	3,476	30,569	30.0	101,896	4,194	1,773	8,264	14,231	65,656	8,163	11,739	30,569	116,127	93.6	78.3	29.6	87.7
10. Muntinlupa	48,677	2,421	7,499	25,113	30.0	83,710	16,821	10,423	41,459	68,702	65,498	12,843	48,958	25,113	152,412	74.3	18.8	15.3	54.9
11. Navotas	29,978	3,484	3,621	15,893	30.0	52,977	2,401	621	1,739	4,761	32,379	4,105	5,360	15,893	57,737	92.6	84.9	67.6	91.8
12. Paranaque	92,068	11,746	6,204	47,150	30.0	157,168	23,296	6,223	21,396	50,915	115,364	17,969	27,600	47,150	208,083	79.8	65.4	22.5	75.5
13. Pasig	79,047	15,309	24,453	51,347	30.0	171,157	5,536	8,431	72,659	86,626	84,583	24,741	97,113	51,347	257,783	93.5	65.9	25.2	66.4
14. Pateros	7,638	86	383	3,475	30.0	11,582	3,311	0	2,124	5,435	10,949	86	2,507	3,475	17,017	69.8	100.0	15.3	68.1
15. San Juan	30,403	12,732	1,735	19,232	30.0	64,108	1,732	97	59	1,888	32,141	12,829	1,794	19,232	65,996	94.6	99.2	96.7	97.1
16. Taguig	39,371	1,580	8,889	21,360	30.0	71,199	17,185	4,629	49,826	71,640	56,556	6,208	58,715	21,360	142,839	69.6	25.4	15.1	49.8
17. Valenzuela	49,820	4,484	7,387	26,439	30.0	88,131	16,048	4,335	32,171	54,554	67,868	8,819	39,558	26,439	142,684	73.4	50.8	18.7	61.8
II. CAVITE	78,768	3,338	2,305	36,434	30.0	121,445	32,641	6,554	7,122	46,317	111,409	9,892	10,027	36,434	167,762	70.7	33.7	29.0	72.4
1. Bacoor	34,252	611	800	14,984	30.0	49,947	8,626	890	0	9,516	42,878	1,502	100	14,984	59,463	79.9	40.7	100.0	84.0
2. Cavite City	14,987	2,097	339	7,467	30.0	24,889	4,270	4,406	0	8,676	19,256	6,503	339	7,467	33,565	77.8	32.2	100.0	74.2
3. Imus	12,683	280	825	5,609	30.0	18,697	9,599	816	641	11,057	22,282	1,096	766	5,609	29,754	56.9	25.6	16.3	62.8
4. Kawit	9,723	189	818	4,598	30.0	15,328	1,855	0	0	1,855	11,578	189	818	4,598	17,183	84.0	100.0	100.0	89.2
5. Noveleta	3,057	8	126	1,367	30.0	4,558	1,702	0	0	1,702	4,759	8	126	1,367	6,260	64.2	100.0	100.0	72.8
6. Rosario	4,066	154	1,396	2,408	30.0	8,026	6,590	441	6,481	13,511	10,656	595	7,879	2,408	21,537	38.2	25.8	17.7	37.3
III. RIZAL	96,991	7,396	5,440	39,070	26.2	148,897	61,900	12,889	103,472	178,262	158,891	20,285	108,913	39,070	327,159	61.0	36.5	5.0	45.5
1. Angono	5,138	1,028	555	1,186	15.0	7,907	1,124	0	1,295	2,419	6,262	1,028	1,850	1,186	10,326	82.1	100.0	30.0	76.6
2. Antipolo	17,680	934	2,527	9,064	30.0	30,215	23,877	4,271	17,134	45,283	41,567	5,205	19,661	9,064	75,498	42.6	17.9	12.9	40.0
3. Baras	183	38	20	44	15.0	291	610	0	48	658	799	38	68	44	949	23.7	100.0	29.5	30.6
4. Binangonan	10,902	2,180	1,117	2,516	15.0	16,775	2,873	0	2,747	5,620	13,775	2,180	3,924	2,516	22,395	79.1	100.0	30.0	74.9
5. Cainta	24,761	695	66	10,939	30.0	36,463	10,715	4,905	51,541	67,161	35,476	5,600	51,610	10,939	103,625	69.8	12.4	0.1	35.2
6. Cardona	631	126	68	146	15.0	971	1,005	0	159	1,164	1,636	126	227	146	2,135	38.6	100.0	30.0	45.5
7. Jala-Jala	269	54	25	62	15.0	414	542	0	68	610	811	54	97	62	1,024	33.2	100.0	29.9	40.4
8. Montalban	5,644	64	24	2,457	30.0	8,189	3,070	1,305	4,191	8,566	8,714	1,370	4,215	2,457	16,755	64.8	4.7	0.6	48.9
9. Morong	1,253	251	135	283	15.0	1,928	900	0	316	1,216	2,153	251	451	283	3,144	58.2	100.0	29.9	61.3
10. Pililla	1,161	232	125	268	15.0	1,786	1,010	0	292	1,302	2,171	232	417	268	3,088	53.5	100.0	30.0	57.8
11. San Mateo	6,883	287	78	3,106	30.0	10,354	5,381	601	860	7,844	13,264	890	938	3,106	18,198	51.9	32.2	8.3	56.9
12. Tanay	3,324	785	424	906	15.0	6,039	1,570	0	989	2,559	5,494	785	1,413	906	8,598	71.4	100.0	30.0	70.2
13. Taytay	17,754	565	124	7,904	30.0	26,346	7,683	1,804	23,632	33,120	25,437	2,369	23,756	7,904	59,466	69.8	23.8	0.5	44.3
14. Teresa	732	158	86	183	15.0	1,219	539	0	200	739	1,331	158	286	183	1,958	59.5	100.0	30.1	62.3
TOTAL	1,595,952	580,857	199,674	1,010,498	29.8	3,386,990	306,353	121,272	435,134	862,155	1,902,314	702,129	634,808	1,010,498	4,249,749	83.8	82.7	31.5	79.7

TABLE 13.4.19 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (SCENARIO 3)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. MCR	1,634,341	693,240	264,285	862,956	25.0	3,451,822	180,476	101,829	324,540	606,845	1,814,818	792,069	588,825	862,956	4,058,667	90.1	87.1	44.9	85.0
1. Manila	277,955	261,494	32,276	184,575	25.0	738,301	17,021	4,665	5,786	27,472	294,976	248,160	38,062	184,575	765,773	94.2	98.1	84.8	96.4
2. Pasay City	61,177	31,377	3,601	34,054	25.0	136,214	4,538	8,795	3,375	16,708	65,715	46,172	6,981	34,054	152,922	93.1	81.0	51.7	89.1
3. Quezon City	338,611	180,061	51,330	190,134	25.0	760,536	23,866	27,641	32,368	81,874	362,477	207,702	84,097	190,134	842,410	93.9	86.7	61.5	90.3
4. Caloocan City	134,651	23,820	17,980	58,817	25.0	235,267	25,631	3,674	4,665	33,970	160,282	27,494	22,644	58,817	269,237	84.0	86.6	79.4	87.4
5. Las Pinas	103,932	3,175	8,993	38,700	25.0	154,799	18,894	4,658	25,348	48,901	122,826	7,833	34,341	38,700	203,700	84.6	40.5	26.2	76.0
6. Makati	98,362	88,282	9,894	68,113	25.0	272,451	5,816	11,721	3,383	20,920	104,178	100,003	13,078	68,113	293,371	94.4	89.1	74.1	92.9
7. Malabon	47,256	7,504	18,836	24,532	25.0	98,128	8,770	2,016	14,565	25,351	56,026	9,519	33,401	24,532	123,479	84.3	78.8	56.4	79.5
8. Mandaluyong	44,675	22,177	16,036	27,629	25.0	110,518	2,913	2,128	5,353	10,394	47,587	24,305	21,389	27,629	120,911	93.9	91.2	75.0	91.4
9. Marikina	69,793	7,850	5,136	27,593	25.0	110,371	4,426	1,773	8,264	14,463	74,219	9,622	13,400	27,593	124,834	94.0	81.6	38.3	88.4
10. Muntinlupa	67,217	4,717	14,423	28,785	25.0	115,142	12,477	10,423	41,459	64,358	79,694	15,139	55,882	28,785	179,500	84.3	31.2	25.8	64.1
11. Navotas	33,300	4,218	4,379	13,966	25.0	55,863	2,377	621	1,739	4,737	35,677	4,839	6,118	13,966	60,600	93.3	87.2	71.6	92.2
12. Paranaque	104,101	14,958	10,107	43,055	25.0	172,221	18,593	6,223	21,356	46,212	122,694	21,181	31,503	43,055	218,433	84.8	70.6	32.1	78.8
13. Pasig	90,921	20,732	38,188	49,947	25.0	199,788	5,877	8,431	72,659	86,967	96,798	29,163	110,847	49,947	286,755	93.9	71.1	34.5	69.7
14. Pateros	9,815	102	738	3,551	25.0	14,206	2,489	0	2,124	4,613	12,304	102	2,862	3,551	18,819	79.8	100.0	25.8	75.5
15. San Juan	31,086	15,025	1,988	16,033	25.0	64,133	1,731	97	59	1,888	32,818	15,122	2,047	16,033	66,020	94.7	99.4	97.1	97.1
16. Taguig	51,771	2,689	17,193	23,884	25.0	95,537	13,245	4,629	49,826	67,700	65,015	7,318	67,019	23,884	163,237	79.6	36.8	25.7	58.5
17. Valenzuela	69,719	6,061	12,981	29,587	25.0	118,348	13,812	4,335	32,171	50,318	83,531	10,395	45,153	29,587	168,666	83.5	58.3	28.8	70.2
II. CAVITE	104,412	5,106	4,323	37,947	25.0	151,788	25,861	6,554	7,122	39,537	130,273	11,660	11,445	37,947	191,326	80.1	43.8	37.8	79.3
1. Bacoor	44,303	880	114	15,099	25.0	60,395	7,858	890	0	8,748	52,161	1,770	114	15,099	69,144	84.9	49.7	100.0	87.3
2. Cavite City	19,636	3,259	387	7,760	25.0	31,040	1,440	4,406	0	5,847	21,074	7,666	387	7,760	36,886	93.2	42.5	100.0	84.1
3. Imus	17,516	476	233	6,075	25.0	24,300	8,309	836	641	9,787	25,825	1,292	874	6,075	34,066	67.8	36.8	26.6	71.3
4. Kawit	12,721	222	934	4,626	25.0	18,502	603	0	0	603	13,323	222	934	4,626	19,105	95.5	100.0	100.0	96.8
5. Noveleta	4,154	9	143	1,436	25.0	5,742	1,284	0	0	1,284	5,439	9	143	1,436	7,027	76.4	100.0	100.0	81.7
6. Rosario	6,085	260	2,513	2,953	25.0	11,810	6,366	441	6,481	13,287	12,451	701	8,993	2,953	25,098	48.9	37.1	27.9	47.1
III. RIZAL	139,950	10,320	9,149	45,319	22.1	204,739	60,142	15,193	118,375	193,711	200,092	25,513	127,524	45,319	398,449	69.9	40.4	7.2	51.4
1. Angono	7,927	1,585	1,284	1,905	15.0	12,701	1,022	0	1,570	2,592	8,949	1,585	2,854	1,905	15,293	88.6	100.0	45.0	83.1
2. Antipolo	25,514	1,101	2,884	9,833	25.0	39,332	26,583	5,035	19,557	51,175	52,097	6,136	22,441	9,833	90,506	49.0	17.9	12.9	43.5
3. Baras	401	80	65	96	15.0	642	629	0	79	708	1,030	80	144	96	1,350	38.9	100.0	45.1	47.6
4. Binangonan	15,595	3,183	2,578	3,825	15.0	25,501	2,520	0	3,151	5,671	18,435	3,183	5,729	3,825	31,172	86.3	100.0	45.0	81.8
5. Cainta	35,517	819	78	12,171	25.0	48,586	9,014	5,782	58,831	73,627	44,632	6,601	58,909	12,171	122,313	79.8	12.4	0.1	39.8
6. Cardona	841	168	136	202	15.0	1,347	1,021	0	167	1,188	1,862	168	303	202	2,535	45.2	100.0	44.9	53.1
7. Jala-Jala	568	114	92	137	15.0	911	526	0	112	638	1,094	114	204	137	1,549	51.9	100.0	45.1	58.8
8. Montalban	3,538	76	28	2,547	25.0	10,188	2,514	1,539	4,784	8,836	10,152	1,614	4,811	2,547	19,124	74.3	4.7	0.6	53.3
9. Morong	1,768	354	286	425	15.0	2,833	940	0	350	1,290	2,708	354	636	425	4,123	65.3	100.0	45.0	68.7
10. Pililla	2,161	432	350	519	15.0	3,462	928	0	428	1,356	3,089	432	778	519	4,818	70.0	100.0	45.0	71.8
11. San Mateo	10,166	338	89	3,531	25.0	14,124	6,141	711	982	7,833	16,307	1,049	1,071	3,531	21,958	62.3	32.2	8.3	64.3
12. Tanay	5,882	1,176	953	1,414	15.0	9,425	1,497	0	1,165	2,662	7,379	1,176	2,118	1,414	12,087	79.7	100.0	45.0	78.0
13. Taytay	24,509	665	141	8,439	25.0	33,754	6,803	2,127	26,975	35,904	30,712	2,792	27,116	8,439	69,058	79.8	23.8	0.5	48.8
14. Teresa	1,143	229	185	275	15.0	1,832	504	0	226	730	1,647	229	411	275	2,562	69.4	100.0	45.0	71.5
TOTAL	1,878,704	705,666	277,758	946,222	24.8	3,808,350	266,479	123,576	450,037	840,092	2,145,183	829,242	727,795	946,222	4,648,442	87.6	85.1	38.2	81.9

TABLE 13.4.20 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (SCENARIO 3)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,814,246	811,367	334,846	986,820	25.0	3,947,279	172,531	101,829	324,540	598,900	1,986,777	913,196	659,386	986,820	4,546,178	91.3	88.8	50.8	86.8
1. Manila	284,993	281,444	36,837	201,052	25.0	804,326	16,908	4,865	5,786	27,359	301,901	286,109	42,623	201,092	831,725	94.4	98.4	86.4	96.7
2. Pasay City	65,993	44,438	4,443	38,291	25.0	153,165	4,567	8,795	3,375	16,736	70,560	53,233	7,818	38,291	169,901	93.5	83.5	56.8	90.1
3. Quezon City	385,702	211,824	68,807	213,111	25.0	852,444	22,654	27,843	32,368	82,862	388,356	239,464	94,175	213,111	935,106	94.2	88.5	65.6	91.2
4. Caloocan City	159,456	28,824	20,693	69,351	25.0	277,565	19,621	3,874	4,665	27,360	179,077	31,698	25,358	69,391	305,524	89.0	88.4	81.6	90.8
5. Las Pinas	133,361	4,373	13,108	50,281	25.0	201,123	23,990	4,658	25,348	53,996	157,351	9,031	38,456	50,281	255,119	84.8	48.4	34.1	78.8
6. Makati	102,768	112,798	13,262	75,609	25.0	302,437	5,932	11,121	3,383	21,036	108,700	124,519	14,645	75,609	323,473	94.5	90.6	76.9	93.5
7. Malabon	53,787	8,959	22,839	28,528	25.0	114,113	6,398	2,016	14,565	22,979	60,185	10,975	37,404	28,528	137,092	89.4	81.6	61.1	83.2
8. Mandaluyong	47,748	25,894	16,599	30,747	25.0	122,989	2,975	2,128	5,353	10,456	50,723	28,022	23,952	30,747	133,445	94.1	92.4	77.7	92.2
9. Marikina	77,453	9,321	6,742	31,172	25.0	124,688	4,726	1,773	8,264	14,763	82,179	11,094	15,005	31,172	139,451	94.2	84.0	44.9	89.4
10. Muntinlupa	79,750	7,032	21,119	35,967	25.0	143,869	14,542	10,423	41,459	66,423	94,292	17,454	62,578	35,967	210,292	84.6	40.3	33.7	68.4
11. Navotas	36,199	4,958	5,112	15,423	25.0	61,692	2,427	621	1,739	4,787	38,626	5,578	6,852	15,423	66,479	93.7	88.9	74.6	92.8
12. Paranaque	107,742	18,197	13,883	46,607	25.0	186,429	19,178	6,223	21,396	46,797	126,920	24,420	35,278	46,607	233,225	84.8	74.5	39.4	79.9
13. Pasig	102,853	25,192	51,471	59,572	25.0	238,287	6,322	8,431	72,659	87,412	108,375	33,623	124,130	59,572	325,700	94.2	74.9	41.5	73.2
14. Pateros	12,158	117	1,081	4,452	25.0	17,808	1,401	0	2,124	3,525	13,560	117	3,205	4,452	21,334	89.7	100.0	33.7	83.5
15. San Juan	31,298	17,338	2,234	16,956	25.0	67,826	1,724	97	59	1,880	33,022	17,435	2,293	16,956	69,706	94.8	99.4	97.4	97.3
16. Taguig	65,410	3,803	25,224	31,481	25.0	125,923	7,704	4,629	49,826	62,160	73,114	8,437	75,050	31,481	188,083	89.5	45.1	33.6	67.0
17. Valenzuela	88,373	7,350	18,392	38,138	25.0	152,554	11,464	4,335	32,111	47,970	99,837	11,985	50,564	38,138	200,524	88.5	63.8	36.4	76.1
II. CAVITE	129,167	6,883	5,695	47,250	25.0	189,001	20,120	6,554	7,122	33,796	149,287	13,443	12,817	47,250	222,797	86.5	51.2	44.4	84.8
1. Bacoor	52,721	1,150	128	18,000	25.0	71,998	9,322	890	0	10,212	62,043	2,041	128	18,000	82,210	85.0	56.4	100.0	87.6
2. Cavite City	22,414	4,431	433	9,093	25.0	36,372	0	4,406	0	4,406	22,414	8,838	433	9,093	40,778	100.0	50.1	100.0	89.2
3. Imus	24,886	674	338	8,633	25.0	34,530	4,498	816	641	5,956	29,385	1,490	979	8,633	40,486	84.7	45.2	34.5	85.3
4. Kawit	15,032	256	1,045	5,444	25.0	21,778	0	0	0	0	15,032	256	1,045	5,444	21,778	100.0	100.0	100.0	100.0
5. Noveleta	5,296	10	161	1,822	25.0	7,289	816	0	0	816	6,112	10	161	1,822	8,105	86.6	100.0	100.0	89.9
6. Rosario	8,818	367	3,590	4,258	25.0	17,034	5,484	441	6,481	12,406	14,302	808	10,071	4,258	29,439	61.7	45.4	35.7	57.9
III. RIZAL	192,815	13,854	14,834	62,289	21.9	283,791	53,161	17,517	131,930	202,608	245,976	31,370	146,764	62,289	486,399	78.4	44.2	10.1	58.3
1. Angono	11,583	2,317	2,502	2,894	15.0	19,296	846	0	1,668	2,516	12,431	2,317	4,170	2,894	21,812	93.2	100.0	60.0	88.5
2. Antipolo	35,948	1,269	3,230	13,482	25.0	53,929	27,675	5,805	21,901	55,380	63,623	7,074	25,130	13,482	109,309	56.5	17.9	12.9	49.3
3. Baras	699	140	151	175	15.0	1,165	630	0	101	731	1,329	140	252	175	1,896	52.6	100.0	59.9	61.4
4. Binangonan	22,135	4,427	4,781	5,531	15.0	36,874	2,063	0	3,187	5,250	24,198	4,427	7,968	5,531	42,124	91.5	100.0	60.0	87.5
5. Cainta	48,671	944	88	16,567	25.0	66,270	5,580	6,667	65,880	78,127	54,251	7,610	65,968	16,567	144,397	89.7	12.4	0.1	45.9
6. Cardona	1,095	219	237	274	15.0	1,825	1,020	0	158	1,178	2,115	219	395	274	3,003	51.8	100.0	60.0	60.8
7. Jala-Jala	988	198	213	247	15.0	1,646	480	0	142	632	1,478	198	355	247	2,278	66.8	100.0	60.0	72.3
8. Montalban	9,288	87	31	3,135	25.0	12,542	2,187	1,774	5,357	9,318	11,475	1,861	5,388	3,135	21,860	80.9	4.7	0.6	57.4
9. Morong	2,447	489	529	611	15.0	4,076	966	0	352	1,318	3,413	489	881	611	5,394	71.7	100.0	60.0	75.6
10. Pililla	3,067	613	662	766	15.0	5,108	882	0	442	1,324	3,949	613	1,104	766	6,432	77.7	100.0	60.0	79.4
11. San Mateo	14,476	390	100	4,989	25.0	19,954	5,274	819	1,099	7,193	19,750	1,209	1,199	4,989	27,147	73.3	32.2	8.3	73.5
12. Tanay	8,385	1,677	1,811	2,095	15.0	13,968	1,366	0	1,208	2,574	9,751	1,677	3,019	2,095	16,542	86.0	100.0	60.0	84.4
13. Taytay	32,453	767	158	11,126	25.0	44,504	3,721	2,452	30,207	36,380	36,174	3,219	30,365	11,126	80,884	89.7	23.8	0.5	55.0
14. Teresa	1,581	316	342	395	15.0	2,634	458	0	228	686	2,039	316	570	395	3,320	77.5	100.0	60.0	79.3
TOTAL	2,136,228	832,110	355,375	1,096,358	24.8	4,420,071	245,812	125,899	463,592	835,304	2,382,040	958,009	818,967	1,096,358	5,255,375	89.7	86.9	43.4	84.1

TABLE 13.4.21 DISTRIBUTION OF WATER DEMAND IN 1995 (SCENARIO 3) BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	2,597,312	742,276	3,339,588	98.3	1.7	2,552,414	44,898	742,276	787,174	23.6
1. Manila	681,100	29,796	710,897	100.0	0.0	681,100	0	29,796	29,796	4.2
2. Pasay City	105,590	22,731	128,321	95.2	4.8	100,508	5,082	22,731	27,813	21.7
3. Quezon City	642,072	83,254	725,326	97.1	2.9	623,746	18,326	83,254	101,580	14.0
4. Caloocan City	167,729	48,176	215,905	100.0	0.0	167,729	0	48,176	48,176	22.3
5. Las Pinas	47,307	67,013	114,320	96.3	3.7	45,573	1,734	67,013	68,747	60.1
6. Makati	231,774	25,581	257,355	96.8	3.2	224,414	7,360	25,581	32,941	12.8
7. Malabon	71,165	31,270	102,435	98.3	1.7	69,921	1,244	31,270	32,514	31.7
8. Mandaluyong	95,271	10,729	106,000	100.0	0.0	95,271	0	10,729	10,729	10.1
9. Marikina	90,788	14,380	105,169	100.0	0.0	90,788	0	14,380	14,380	13.7
10. Muntinlupa	32,049	83,453	115,501	78.1	21.9	25,030	7,019	83,453	90,472	78.3
11. Navotas	46,507	6,480	52,987	99.3	0.7	46,194	313	6,480	6,793	12.8
12. Paranaque	113,095	69,929	183,025	98.4	1.6	111,327	1,768	69,929	71,697	39.2
13. Pasig	130,063	90,273	220,336	99.8	0.2	129,807	256	90,273	90,529	41.1
14. Pateros	6,657	7,401	14,057	100.0	0.0	6,657	0	7,401	7,401	52.6
15. San Juan	63,517	1,887	65,404	100.0	0.0	63,517	0	1,887	1,887	2.9
16. Taguig	15,787	92,662	108,449	94.6	5.4	14,940	847	92,662	93,509	86.2
17. Valenzuela	56,841	57,261	114,101	98.3	1.7	55,892	949	57,261	58,210	51.0
II. CAVITE	67,529	62,769	130,299	22.3	77.7	15,061	52,468	62,769	115,237	88.4
1. Bacoor	22,617	19,808	42,425	66.6	33.4	15,061	7,556	19,808	27,364	64.5
2. Cavite City	17,375	10,917	28,293	0.0	100.0	0	17,375	10,917	28,293	100.0
3. Imus	11,245	12,480	23,725	0.0	100.0	0	11,245	12,480	23,725	100.0
4. Kawit	10,929	3,041	13,971	0.0	100.0	0	10,929	3,041	13,971	100.0
5. Noveleta	1,621	3,059	4,680	0.0	100.0	0	1,621	3,059	4,680	100.0
6. Rosario	3,742	13,464	17,205	0.0	100.0	0	3,742	13,464	17,205	100.0
III. RIZAL	76,743	168,794	245,537	17.1	82.9	13,094	63,649	168,794	232,443	94.7
1. Angono	4,628	2,081	6,709	100.0	0.0	4,628	0	2,081	2,081	31.0
2. Antipolo	19,999	37,816	57,816	0.0	100.0	0	19,999	37,816	57,816	100.0
3. Baras	188	596	784	0.0	100.0	0	188	596	784	100.0
4. Binangonan	10,414	5,190	15,604	0.0	100.0	0	10,414	5,190	15,604	100.0
5. Cainta	10,616	66,356	76,972	45.5	54.5	4,830	5,786	66,356	72,142	93.7
6. Cardona	728	1,112	1,840	0.0	100.0	0	728	1,112	1,840	100.0
7. Jala-Jala	109	564	673	0.0	100.0	0	109	564	673	100.0
8. Montalban	5,680	7,918	13,599	0.0	100.0	0	5,680	7,918	13,599	100.0
9. Morong	1,419	1,145	2,564	0.0	100.0	0	1,419	1,145	2,564	100.0
10. Pililla	1,045	1,202	2,247	0.0	100.0	0	1,045	1,202	2,247	100.0
11. San Mateo	6,648	7,502	14,150	0.0	100.0	0	6,648	7,502	14,150	100.0
12. Tanay	3,225	2,301	5,526	0.0	100.0	0	3,225	2,301	5,526	100.0
13. Taytay	11,331	34,291	45,622	32.1	67.9	3,636	7,695	34,291	41,986	92.0
14. Teresa	713	718	1,431	0.0	100.0	0	713	718	1,431	100.0
TOTAL	2,741,584	973,839	3,715,423	94.1	5.9	2,580,569	161,015	973,839	1,134,854	30.5

TABLE 13.4.22 DISTRIBUTION OF WATER DEMAND IN 2000 (SCENARIO 3) BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE	GROUND-	G.W.
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER	GROUND-WATER	WATER TOTAL	SHARE (%)
I. NCR	3,039,444	692,223	3,731,667	98.5	1.5	2,994,546	44,898	692,223	737,121	19.8
1. Manila	715,862	27,866	743,728	100.0	0.0	715,862	0	27,866	27,866	3.7
2. Pasay City	122,662	19,618	142,280	95.9	4.1	117,580	5,082	19,618	24,700	17.4
3. Quezon City	710,182	81,471	791,653	97.4	2.6	691,856	18,326	81,471	99,797	12.6
4. Caloocan City	208,070	38,462	246,532	100.0	0.0	208,070	0	38,462	38,462	15.6
5. Las Pinas	100,145	59,013	159,158	98.3	1.7	98,411	1,734	59,013	60,747	38.2
6. Makati	258,098	20,844	278,943	97.1	2.9	250,738	7,360	20,844	28,204	10.1
7. Malabon	87,616	27,304	114,921	98.6	1.4	86,372	1,244	27,304	28,548	24.8
8. Mandaluyong	104,166	10,395	114,560	100.0	0.0	104,166	0	10,395	10,395	9.1
9. Marikina	99,235	16,094	115,328	100.0	0.0	99,235	0	16,094	16,094	14.0
10. Muntinlupa	69,874	78,387	148,261	90.0	10.0	62,855	7,019	78,387	85,406	57.6
11. Navotas	52,977	4,761	57,737	99.4	0.6	52,664	313	4,761	5,074	8.8
12. Paranaque	149,761	56,100	205,861	98.8	1.2	147,993	1,768	56,100	57,868	28.1
13. Pasig	150,009	101,430	251,439	99.8	0.2	149,753	256	101,430	101,686	40.4
14. Pateros	11,041	5,813	16,854	100.0	0.0	11,041	0	5,813	5,813	34.5
15. San Juan	64,108	1,888	65,996	100.0	0.0	64,108	0	1,888	1,888	2.9
16. Taguig	57,060	81,537	138,597	98.5	1.5	56,213	847	81,537	82,384	59.4
17. Valenzuela	78,578	61,241	139,818	98.8	1.2	77,629	949	61,241	62,190	44.5
II. CAVITE	117,566	49,032	166,598	55.4	44.6	65,098	52,468	49,032	101,500	60.9
1. Bacoor	49,666	9,713	59,379	84.8	15.2	42,110	7,556	9,713	17,269	29.1
2. Cavite City	23,500	9,649	33,148	26.1	73.9	6,125	17,375	9,649	27,024	81.5
3. Imus	18,277	11,351	29,628	38.5	61.5	7,032	11,245	11,351	22,596	76.3
4. Kawit	15,328	1,855	17,183	28.7	71.3	4,399	10,929	1,855	12,784	74.4
5. Noveleta	4,558	1,702	6,260	64.4	35.6	2,937	1,621	1,702	3,323	53.1
6. Rosario	6,238	14,763	21,001	40.0	60.0	2,496	3,742	14,763	18,505	88.1
III. RIZAL	148,897	178,262	327,159	43.8	56.2	65,285	83,612	178,262	261,874	80.0
1. Angono	7,907	2,419	10,326	100.0	0.0	7,907	0	2,419	2,419	23.4
2. Antipolo	30,215	45,283	75,498	6.1	93.9	1,834	28,381	45,283	73,664	97.6
3. Baras	291	658	949	0.0	100.0	0	291	658	949	100.0
4. Binangonan	16,775	5,620	22,395	0.0	100.0	0	16,775	5,620	22,395	100.0
5. Cainta	36,463	67,162	103,625	84.1	15.9	30,677	5,786	67,162	72,948	70.4
6. Cardona	971	1,164	2,135	0.0	100.0	0	971	1,164	2,135	100.0
7. Jala-Jala	414	610	1,024	0.0	100.0	0	414	610	1,024	100.0
8. Montalban	8,189	8,566	16,755	30.6	69.4	2,509	5,680	8,566	14,246	85.0
9. Morong	1,928	1,216	3,144	0.0	100.0	0	1,928	1,216	3,144	100.0
10. Pililla	1,786	1,302	3,088	0.0	100.0	0	1,786	1,302	3,088	100.0
11. San Mateo	10,354	7,844	18,198	35.8	64.2	3,706	6,648	7,844	14,492	79.6
12. Tanay	6,039	2,559	8,598	0.0	100.0	0	6,039	2,559	8,598	100.0
13. Taytay	26,346	33,120	59,466	70.8	29.2	18,651	7,695	33,120	40,815	68.6
14. Teresa	1,219	739	1,958	0.0	100.0	0	1,219	739	1,958	100.0
TOTAL	3,305,908	919,517	4,225,424	94.5	5.5	3,124,929	180,978	919,517	1,100,495	26.0

TABLE 13.4.23 DISTRIBUTION OF WATER DEMAND IN 2005 (SCENARIO 3) BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,451,822	606,845	4,058,667	98.7	1.3	3,406,924	44,898	606,845	651,743	16.1
1. Manila	738,301	27,472	765,773	100.0	0.0	738,301	0	27,472	27,472	3.6
2. Pasay City	136,214	16,708	152,922	96.3	3.7	131,132	5,082	16,708	21,790	14.2
3. Quezon City	760,536	81,874	842,410	97.6	2.4	742,210	18,326	81,874	100,200	11.9
4. Caloocan City	235,267	33,970	269,237	100.0	0.0	235,267	0	33,970	33,970	12.6
5. Las Pinas	154,799	48,901	203,700	98.9	1.1	153,065	1,734	48,901	50,635	24.9
6. Makati	272,451	20,920	293,371	97.3	2.7	265,091	7,360	20,920	28,280	9.6
7. Malabon	98,128	25,351	123,479	98.7	1.3	96,884	1,244	25,351	26,595	21.5
8. Mandaluyong	110,518	10,394	120,911	100.0	0.0	110,518	0	10,394	10,394	8.6
9. Marikina	110,371	14,463	124,834	100.0	0.0	110,371	0	14,463	14,463	11.6
10. Muntinlupa	115,142	64,358	179,500	93.9	6.1	108,123	7,019	64,358	71,377	39.8
11. Navotas	55,863	4,737	60,600	99.4	0.6	55,550	313	4,737	5,050	8.3
12. Paranaque	172,221	46,212	218,433	99.0	1.0	170,453	1,768	46,212	47,980	22.0
13. Pasig	199,788	86,967	286,755	99.9	0.1	199,532	256	86,967	87,223	30.4
14. Pateros	14,206	4,613	18,819	100.0	0.0	14,206	0	4,613	4,613	24.5
15. San Juan	64,133	1,888	66,020	100.0	0.0	64,133	0	1,888	1,888	2.9
16. Taguig	95,537	67,700	163,237	99.1	0.9	94,690	847	67,700	68,547	42.0
17. Valenzuela	118,348	50,318	168,666	99.2	0.8	117,399	949	50,318	51,267	30.4
II. CAVITE	151,789	39,537	191,326	65.4	34.6	99,321	52,468	39,537	92,005	48.1
1. Bacoor	60,395	8,749	69,144	87.5	12.5	52,839	7,556	8,749	16,305	23.6
2. Cavite City	31,040	5,847	36,886	44.0	56.0	13,665	17,375	5,847	23,222	63.0
3. Imus	24,300	9,767	34,066	53.7	46.3	13,055	11,245	9,767	21,012	61.7
4. Kawit	18,502	603	19,105	40.9	59.1	7,573	10,929	603	11,532	60.4
5. Noveleta	5,742	1,284	7,027	71.8	28.2	4,121	1,621	1,284	2,905	41.3
6. Rosario	11,810	13,287	25,098	68.3	31.7	8,068	3,742	13,287	17,029	67.9
III. RIZAL	204,739	193,711	398,449	49.9	50.1	102,217	102,522	193,711	296,232	74.3
1. Angono	12,701	2,592	15,293	100.0	0.0	12,701	0	2,592	2,592	16.9
2. Antipolo	39,332	51,175	90,506	21.8	78.2	8,572	30,760	51,175	81,934	90.5
3. Baras	642	708	1,350	0.0	100.0	0	642	708	1,350	100.0
4. Binangonan	25,501	5,671	31,172	0.0	100.0	0	25,501	5,671	31,172	100.0
5. Cainta	48,686	73,627	122,313	88.1	11.9	42,900	5,786	73,627	79,413	64.9
6. Cardona	1,347	1,188	2,535	0.0	100.0	0	1,347	1,188	2,535	100.0
7. Jala-Jala	911	638	1,549	0.0	100.0	0	911	638	1,549	100.0
8. Montalban	10,188	8,936	19,124	44.3	55.7	4,508	5,680	8,936	14,616	76.4
9. Morong	2,833	1,290	4,123	0.0	100.0	0	2,833	1,290	4,123	100.0
10. Pililla	3,462	1,356	4,818	0.0	100.0	0	3,462	1,356	4,818	100.0
11. San Mateo	14,124	7,833	21,958	52.9	47.1	7,476	6,648	7,833	14,481	66.0
12. Tanay	9,425	2,662	12,087	0.0	100.0	0	9,425	2,662	12,087	100.0
13. Taytay	33,754	35,304	69,058	77.2	22.8	26,059	7,695	35,304	42,999	62.3
14. Teresa	1,832	730	2,562	0.0	100.0	0	1,832	730	2,562	100.0
TOTAL	3,808,350	840,092	4,648,442	94.8	5.2	3,608,462	199,888	840,092	1,039,980	22.4

TABLE 13.4.24 DISTRIBUTION OF WATER DEMAND IN 2010 (SCENARIO 3) BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,947,279	598,900	4,546,178	98.9	1.1	3,902,381	44,898	598,900	643,798	14.2
1. Manila	804,366	27,359	831,725	100.0	0.0	804,366	0	27,359	27,359	3.3
2. Pasay City	153,165	16,736	169,901	96.7	3.3	148,083	5,082	16,736	21,818	12.8
3. Quezon City	852,444	82,662	935,106	97.9	2.1	834,118	18,326	82,662	100,988	10.8
4. Caloocan City	277,565	27,960	305,524	100.0	0.0	277,565	0	27,960	27,960	9.2
5. Las Pinas	201,123	53,996	255,119	99.1	0.9	199,389	1,734	53,996	55,730	21.8
6. Makati	302,437	21,036	323,473	97.6	2.4	295,077	7,360	21,036	28,396	8.8
7. Malabon	114,113	22,979	137,092	98.9	1.1	112,869	1,244	22,979	24,223	17.7
8. Mandaluyong	122,989	10,456	133,445	100.0	0.0	122,989	0	10,456	10,456	7.8
9. Marikina	124,688	14,763	139,451	100.0	0.0	124,688	0	14,763	14,763	10.6
10. Muntinlupa	143,869	66,423	210,292	95.1	4.9	136,850	7,019	66,423	73,442	34.9
11. Navotas	61,692	4,787	66,479	99.5	0.5	61,379	313	4,787	5,100	7.7
12. Paranaque	186,429	46,797	233,225	99.1	0.9	184,661	1,768	46,797	48,565	20.8
13. Pasig	238,287	87,412	325,700	99.9	0.1	238,031	256	87,412	87,668	26.9
14. Pateros	17,808	3,525	21,334	100.0	0.0	17,808	0	3,525	3,525	16.5
15. San Juan	67,826	1,880	69,706	100.0	0.0	67,826	0	1,880	1,880	2.7
16. Taguig	125,923	62,160	188,083	99.3	0.7	125,076	847	62,160	63,007	33.5
17. Valenzuela	152,554	47,970	200,524	99.4	0.6	151,605	949	47,970	48,919	24.4
II. CAVITE	189,001	33,796	222,797	72.2	27.8	136,533	52,468	33,796	86,264	38.7
1. Bacoor	71,998	10,212	82,210	89.5	10.5	64,442	7,556	10,212	17,768	21.6
2. Cavite City	36,372	4,406	40,778	52.2	47.8	18,997	17,375	4,406	21,781	53.4
3. Imus	34,530	5,956	40,486	67.4	32.6	23,285	11,245	5,956	17,201	42.5
4. Kawit	21,778	0	21,778	49.8	50.2	10,849	10,929	0	10,929	50.2
5. Noveleta	7,289	816	8,105	77.8	22.2	5,668	1,621	816	2,437	30.1
6. Rosario	17,034	12,406	29,439	78.0	22.0	13,292	3,742	12,406	16,148	54.9
III. RIZAL	283,791	202,608	486,399	53.7	46.3	152,420	131,371	202,608	333,979	68.7
1. Angono	19,296	2,516	21,812	100.0	0.0	19,296	0	2,516	2,516	11.5
2. Antipolo	53,929	55,380	109,309	33.7	66.3	18,149	35,780	55,380	91,160	83.4
3. Baras	1,165	731	1,896	0.0	100.0	0	1,165	731	1,896	100.0
4. Binangonan	36,874	5,250	42,124	0.0	100.0	0	36,874	5,250	42,124	100.0
5. Cainta	66,270	78,127	144,397	91.3	8.7	60,484	5,786	78,127	83,913	58.1
6. Cardona	1,825	1,178	3,003	0.0	100.0	0	1,825	1,178	3,003	100.0
7. Jala-Jala	1,646	632	2,278	0.0	100.0	0	1,646	632	2,278	100.0
8. Montalban	12,542	9,318	21,860	46.7	53.3	5,858	6,684	9,318	16,002	73.2
9. Morong	4,076	1,318	5,394	0.0	100.0	0	4,076	1,318	5,394	100.0
10. Pililla	5,108	1,324	6,432	0.0	100.0	0	5,108	1,324	6,432	100.0
11. San Mateo	19,954	7,193	27,147	59.3	40.7	11,824	8,130	7,193	15,323	56.4
12. Tanay	13,968	2,574	16,542	0.0	100.0	0	13,968	2,574	16,542	100.0
13. Taytay	44,504	36,380	80,884	82.7	17.3	36,809	7,695	36,380	44,075	54.5
14. Teresa	2,634	686	3,320	0.0	100.0	0	2,634	686	3,320	100.0
TOTAL	4,420,071	835,304	5,255,375	94.8	5.2	4,191,334	228,737	835,304	1,064,041	20.2

TABLE 13.4.25 SUMMARY OF PROJECTED WATER DEMAND IN 1995 (SCENARIO 4)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,083,645	448,632	111,331	886,097	35.0	2,531,704	358,552	101,329	324,540	784,921	1,442,197	550,481	437,871	886,097	3,316,625	75.1	81.5	25.9	76.3
1. Manila	245,328	167,797	22,519	236,131	35.0	676,375	22,417	4,665	5,786	32,868	271,745	172,462	28,304	236,731	709,242	91.8	97.3	79.6	95.4
2. Pasay City	42,308	23,293	1,817	36,302	35.0	103,720	11,776	8,795	3,375	23,946	54,085	32,088	5,192	36,302	127,666	78.2	72.6	35.0	81.2
3. Quezon City	264,202	116,705	30,170	221,349	35.0	632,427	29,515	27,641	32,368	89,523	293,717	144,346	62,538	221,349	721,950	90.0	80.9	48.2	87.6
4. Caloocan City	79,857	15,433	12,175	57,866	35.0	165,331	41,396	1,674	4,665	49,735	121,254	16,107	16,839	57,866	215,066	65.9	80.8	72.3	76.9
5. Las Pinas	24,488	286	189	13,711	35.0	38,173	42,294	4,858	25,348	72,500	66,782	5,444	25,537	13,711	111,473	36.7	14.4	0.7	35.1
6. Makati	78,186	63,333	6,342	79,620	35.0	227,485	13,265	11,721	3,383	28,369	91,451	75,058	9,725	79,620	255,854	85.5	84.4	65.2	88.9
7. Malabon	30,398	4,600	10,272	24,376	35.0	69,647	15,676	2,016	14,565	32,257	46,074	6,616	24,838	24,376	101,904	66.0	69.5	41.4	68.3
8. Mandaluyong	35,755	14,161	10,553	32,884	35.0	93,353	4,103	2,128	5,353	11,584	39,858	16,891	15,906	32,884	105,539	89.7	87.4	66.3	89.0
9. Marikina	51,193	4,514	1,701	31,127	35.0	88,536	5,548	1,773	8,264	15,584	56,741	6,687	9,965	31,127	104,520	90.2	73.5	17.1	85.1
10. Muntinlupa	16,534	99	97	9,008	35.0	25,737	35,674	10,423	41,459	87,555	52,208	10,521	41,556	9,008	113,292	31.7	0.9	0.2	22.7
11. Navotas	24,039	1,742	2,811	15,934	35.0	45,526	4,758	621	1,733	7,118	28,797	3,363	4,550	15,934	52,644	83.5	81.5	61.8	86.5
12. Paranaque	53,546	8,457	2,031	34,501	35.0	98,575	51,748	6,223	21,396	79,367	105,294	14,720	23,427	34,501	177,942	50.9	57.7	8.7	55.6
13. Pasig	60,705	11,636	9,770	44,322	35.0	126,634	11,411	8,431	72,659	92,502	72,117	20,268	82,430	44,322	219,136	84.2	58.4	11.9	57.8
14. Pateros	4,147	71	4	2,273	35.0	6,495	5,381	0	2,124	7,505	9,528	71	2,128	2,273	14,001	43.5	100.0	0.2	46.4
15. San Juan	28,777	10,412	1,463	21,890	35.0	62,542	2,364	97	59	2,520	31,141	10,510	1,522	21,890	65,063	92.4	99.1	96.1	96.1
16. Taguig	8,775	457	11	4,977	35.0	14,221	33,225	4,629	49,836	93,680	42,000	5,086	49,836	4,977	107,901	18.3	9.0	0.0	13.2
17. Valenzuela	31,406	2,890	1,406	19,224	35.0	54,925	22,000	4,335	32,171	58,506	53,406	7,224	33,577	19,224	111,431	58.8	40.0	4.2	48.4
II. CAVITE	37,156	1,550	1,389	17,183	30.0	57,278	56,270	6,554	7,122	69,945	93,425	8,103	8,511	17,183	127,223	39.8	19.1	16.3	45.0
1. Bacoor	11,988	340	85	5,320	30.0	17,732	22,337	890	0	23,228	34,325	1,230	85	5,320	40,960	34.9	27.6	100.0	43.3
2. Cavite City	10,997	921	288	5,231	30.0	17,436	5,468	4,406	0	10,875	17,465	5,327	288	5,231	28,311	63.0	17.3	100.0	61.6
3. Imus	5,264	82	9	2,295	30.0	7,649	13,540	816	641	14,997	18,804	898	650	2,295	22,647	28.0	9.1	1.3	33.8
4. Kawit	6,104	155	694	2,980	30.0	9,932	3,739	0	0	3,739	9,843	155	694	2,980	13,671	62.0	100.0	100.0	72.6
5. Noveleta	939	6	107	451	30.0	1,503	3,141	0	0	3,141	4,080	6	107	451	4,644	23.0	100.0	100.0	32.4
6. Rosario	1,864	46	207	908	30.0	3,025	7,044	441	6,481	13,965	8,908	487	6,688	908	16,990	20.9	9.5	3.1	17.8
III. RIZAL	43,110	5,109	3,347	18,728	26.6	70,295	75,531	10,559	87,131	173,221	118,641	15,668	90,479	18,728	243,516	36.3	32.6	3.7	28.9
1. Angono	3,115	623	196	894	15.0	4,828	1,156	0	925	2,081	4,271	623	1,121	894	6,909	72.9	100.0	17.5	69.9
2. Antipolo	8,827	765	2,145	5,030	30.0	16,767	22,039	3,499	14,543	40,082	30,867	4,264	16,688	5,030	56,848	28.6	17.9	12.9	29.5
3. Baras	127	25	8	28	15.0	188	558	0	38	596	685	25	46	28	784	18.5	100.0	17.4	23.9
4. Binangonan	7,008	1,402	442	1,562	15.0	10,414	3,109	0	2,081	5,190	10,117	1,402	2,523	1,562	15,604	69.3	100.0	17.5	66.7
5. Cainta	5,741	569	58	3,429	35.0	9,798	19,121	4,018	43,748	66,888	24,862	4,587	43,807	3,429	76,685	23.1	12.4	0.1	12.8
6. Cardona	490	98	31	109	15.0	728	966	0	146	1,112	1,456	98	177	109	1,840	33.7	100.0	17.5	39.6
7. Jala-Jala	73	15	5	16	15.0	109	542	0	22	564	615	15	27	16	673	11.9	100.0	18.5	16.2
8. Montalban	3,076	53	21	1,350	30.0	4,499	4,123	1,069	3,557	8,750	7,199	1,122	3,578	1,350	13,248	42.7	4.7	0.6	34.0
9. Morong	955	191	60	213	15.0	1,419	861	0	284	1,145	1,816	191	344	213	2,564	52.6	100.0	17.4	55.3
10. Pililla	703	141	44	157	15.0	1,045	993	0	209	1,202	1,696	141	253	157	2,247	41.5	100.0	17.4	46.5
11. San Mateo	4,152	235	66	1,909	30.0	6,362	6,473	494	730	7,697	10,625	729	796	1,909	14,059	39.1	32.2	8.3	45.3
12. Tanay	2,170	434	137	484	15.0	3,225	1,656	0	645	2,301	3,826	434	782	484	5,526	56.7	100.0	17.5	58.4
13. Taytay	6,193	462	105	3,640	35.0	10,401	13,359	1,478	20,059	34,896	19,552	1,941	20,164	3,640	45,297	31.7	23.8	0.5	23.0
14. Teresa	480	96	30	107	15.0	713	575	0	143	718	1,055	96	173	107	1,431	45.5	100.0	17.3	49.8
TOTAL	1,163,911	455,291	116,068	922,008	34.7	2,659,277	490,353	118,441	418,793	1,028,087	1,654,264	574,232	536,861	922,008	3,687,364	70.4	79.3	22.0	72.1

TABLE 13.4.26 SUMMARY OF PROJECTED WATER DEMAND IN 2000 (SCENARIO 4)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,161,204	561,191	146,218	886,548	30.0	2,955,161	270,810	110,761	369,650	751,221	1,632,014	671,952	515,868	886,548	3,706,382	83.4	83.5	28.3	79.7
1. Manila	287,231	205,861	27,560	214,585	30.0	715,237	17,866	4,885	5,786	28,317	285,097	210,526	33,346	214,585	743,535	93.7	97.8	82.6	96.2
2. Pasay City	51,400	30,375	2,742	36,221	30.0	120,738	8,795	8,795	3,375	20,965	60,195	35,170	6,116	36,221	141,703	85.4	77.5	44.8	85.2
3. Quezon City	306,536	148,563	41,310	212,747	30.0	709,156	22,181	27,641	32,368	82,189	328,717	176,204	73,677	212,147	791,345	93.3	84.3	56.1	89.6
4. Caloocan City	105,090	19,650	15,174	59,362	30.0	199,838	35,858	3,674	4,665	44,197	140,948	23,324	19,839	59,362	244,074	74.5	84.2	76.5	81.9
5. Las Pinas	58,005	959	222	25,386	30.0	84,553	34,378	5,886	29,863	69,927	92,383	6,846	30,086	25,386	154,480	62.8	14.4	0.7	54.7
6. Makati	90,653	79,903	8,074	76,556	30.0	255,186	7,779	11,721	3,383	22,883	98,432	91,624	11,458	76,556	278,069	92.1	87.2	70.5	91.8
7. Malabon	38,499	6,060	14,698	25,396	30.0	84,652	12,798	2,016	14,565	29,380	51,297	8,076	29,263	25,396	114,032	85.1	75.0	50.2	74.2
8. Mandaluyong	40,936	18,491	13,386	31,206	30.0	104,019	3,016	2,128	5,353	10,497	43,952	20,620	18,739	31,206	114,516	93.1	89.7	71.4	90.8
9. Marikina	81,331	5,999	2,004	29,385	30.0	98,049	4,324	2,184	9,736	16,224	85,656	8,183	11,739	29,385	115,273	93.4	73.5	17.1	85.9
10. Muntinlupa	35,775	120	114	17,147	30.0	57,156	25,723	12,723	48,844	87,289	65,498	12,843	48,958	17,147	144,446	60.7	0.9	0.2	39.6
11. Navotas	29,264	3,484	3,621	15,587	30.0	51,956	3,116	621	1,739	5,475	32,379	4,105	5,360	15,587	57,431	90.4	84.9	67.6	90.5
12. Paranaque	82,872	10,372	2,393	40,987	30.0	136,625	32,491	3,597	25,207	65,295	115,364	17,969	27,600	40,987	201,920	71.8	57.7	8.7	67.7
13. Pasig	77,244	14,448	11,511	44,230	30.0	147,433	7,339	10,292	85,602	103,233	84,583	24,741	97,113	44,230	250,666	91.3	58.4	11.9	58.8
14. Pateros	8,556	86	5	2,849	30.0	9,496	4,393	0	2,502	6,895	10,949	86	2,507	2,849	16,391	55.9	100.0	0.2	57.9
15. San Juan	30,391	12,732	1,735	19,225	30.0	64,082	1,750	97	59	1,906	32,141	12,829	1,794	19,225	65,988	94.6	99.2	96.7	97.1
16. Taguig	28,387	558	13	12,411	30.0	41,369	28,169	5,850	58,702	92,521	56,556	6,208	58,715	12,411	133,890	50.2	9.0	0.0	30.9
17. Valenzuela	47,034	3,528	1,656	22,379	30.0	74,597	20,834	5,291	37,902	64,028	67,868	8,819	39,558	22,379	138,624	69.3	40.0	4.2	53.8
II. CAVITE	66,392	1,892	1,637	30,823	30.0	102,143	43,017	8,000	8,391	59,408	111,409	9,892	10,027	30,823	162,151	81.4	19.1	16.3	63.4
1. Bacoor	28,272	415	100	12,337	30.0	41,123	14,606	1,087	0	15,693	42,878	1,502	100	12,337	56,816	65.9	27.6	100.0	72.4
2. Cavite City	13,857	1,124	339	6,566	30.0	21,886	5,399	5,379	0	10,778	19,256	6,503	339	6,566	32,664	72.0	17.3	100.0	67.0
3. Imus	11,351	100	10	4,912	30.0	16,374	10,931	996	756	12,683	22,283	1,096	766	4,912	29,057	50.9	9.1	1.3	56.4
4. Kawit	9,030	189	818	4,302	30.0	14,338	2,548	0	0	2,548	11,578	189	818	4,302	16,886	78.0	100.0	100.0	84.9
5. Noveleta	2,284	8	126	1,036	30.0	3,454	2,475	0	0	2,475	4,759	8	126	1,036	5,928	48.0	100.0	100.0	58.3
6. Rosario	3,598	56	244	1,671	30.0	5,569	7,058	538	7,635	15,231	10,656	595	7,879	1,671	20,800	33.8	9.5	3.1	26.8
III. RIZAL	85,238	7,396	5,440	34,033	25.8	132,107	73,629	12,889	103,472	189,991	158,868	20,285	108,913	34,033	322,098	53.7	36.5	5.0	41.0
1. Angono	5,138	1,028	555	1,186	15.0	7,907	1,124	0	1,295	2,419	6,262	1,028	1,850	1,186	10,326	82.1	100.0	30.0	76.6
2. Antipolo	16,624	934	2,527	8,608	30.0	28,692	24,967	4,271	17,134	46,373	41,591	5,205	19,661	8,608	75,064	40.0	17.9	12.9	38.2
3. Baras	189	38	20	44	15.0	291	610	0	48	658	799	38	68	44	949	23.7	100.0	29.5	30.6
4. Binangonan	10,902	2,180	1,177	2,516	15.0	16,775	2,873	0	2,747	5,620	13,775	2,180	3,924	2,516	22,395	79.1	100.0	30.0	74.9
5. Caiata	18,469	695	68	8,242	30.0	27,475	17,007	4,805	51,541	73,454	35,476	5,500	51,610	8,242	100,929	52.1	12.4	0.1	27.2
6. Cardona	831	126	68	146	15.0	971	1,005	0	159	1,164	1,836	126	227	146	2,135	36.6	100.0	30.0	45.5
7. Jala-Jala	269	54	29	62	15.0	414	542	0	68	610	811	54	97	62	1,024	33.2	100.0	29.9	40.4
8. Montalban	5,342	64	24	2,328	30.0	7,758	3,348	1,305	4,191	8,845	8,691	1,370	4,215	2,328	16,603	61.5	4.7	0.6	46.7
9. Morong	1,253	251	135	289	15.0	1,928	900	0	316	1,216	2,153	251	451	289	3,144	58.2	100.0	29.9	61.3
10. Pililla	1,161	232	125	268	15.0	1,786	1,010	0	292	1,302	2,171	232	417	268	3,088	53.5	100.0	30.0	57.8
11. San Mateo	6,304	287	78	2,858	30.0	9,527	5,936	601	860	8,399	13,240	890	938	2,858	17,926	47.6	32.2	8.3	53.1
12. Tanay	3,524	785	424	906	15.0	6,039	1,570	0	989	2,559	5,494	785	1,413	906	8,598	71.4	100.0	30.0	70.2
13. Taytay	14,240	565	124	6,398	30.0	21,325	11,196	1,804	23,632	36,634	25,437	2,369	23,756	6,398	57,960	56.0	23.8	0.5	36.8
14. Teresa	792	158	86	183	15.0	1,219	539	0	200	739	1,331	158	286	183	1,958	59.5	100.0	30.1	62.3
TOTAL	1,514,835	570,478	153,295	951,404	29.8	3,190,012	387,456	131,651	481,513	1,000,620	1,902,291	702,129	634,808	951,404	4,190,632	79.6	81.2	24.1	76.1

TABLE 13.4.27 SUMMARY OF PROJECTED WATER DEMAND IN 2005 (SCENARIO 4)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,609,016	672,476	176,980	819,491	25.0	3,277,963	205,801	119,593	411,846	737,240	1,814,818	792,069	588,825	819,491	4,015,202	88.7	84.9	30.1	81.6
1. Manila	277,501	243,494	32,276	184,424	25.0	737,695	17,476	4,665	5,786	27,926	294,976	248,160	38,062	184,424	765,621	94.1	98.1	84.8	96.4
2. Pasay City	59,712	31,377	3,607	33,565	25.0	134,261	6,003	8,795	3,375	18,172	65,715	46,172	6,981	33,565	152,434	90.9	81.0	51.7	88.1
3. Quezon City	337,843	182,061	51,730	189,878	25.0	759,511	22,635	27,641	32,368	82,643	360,477	207,702	84,097	189,878	842,154	93.7	86.7	61.5	90.2
4. Caloocan City	131,128	23,820	17,980	57,642	25.0	230,569	29,154	3,674	4,665	37,493	160,282	27,494	22,646	57,642	268,062	81.8	86.6	79.4	86.0
5. Las Pinas	98,987	1,131	256	33,457	25.0	133,829	23,839	6,703	34,087	64,628	122,826	7,833	34,341	33,457	198,457	80.6	14.4	0.7	67.4
6. Makati	98,241	86,282	9,694	68,072	25.0	272,289	5,937	11,721	3,383	21,041	104,178	108,003	13,078	68,072	293,331	94.3	89.1	74.1	92.8
7. Malabon	46,862	1,504	18,836	24,134	25.0	96,536	9,963	2,016	14,565	26,545	56,825	9,519	33,401	24,134	123,081	82.2	78.8	56.4	78.4
8. Mandaluyong	44,568	22,177	16,036	27,594	25.0	110,375	3,019	2,128	5,353	10,500	47,587	24,305	21,389	27,594	120,876	93.7	91.2	75.0	91.3
9. Marikina	69,650	1,071	2,287	26,336	25.0	105,344	4,569	2,551	11,113	18,233	74,219	9,622	13,400	26,336	123,577	93.8	73.5	17.1	85.2
10. Muntinlupa	63,994	142	130	21,422	25.0	85,689	15,699	14,997	55,751	86,448	79,694	15,139	55,882	21,422	172,137	80.3	0.9	0.2	49.8
11. Navotas	33,182	4,218	4,379	13,926	25.0	55,705	2,495	621	1,739	4,855	35,677	4,839	6,118	13,926	60,560	93.0	87.2	71.6	92.0
12. Paranaque	101,609	12,226	2,731	38,855	25.0	155,422	21,085	8,955	28,772	58,812	122,694	21,181	31,503	38,855	214,234	82.8	57.7	8.7	72.5
13. Pasig	90,714	17,031	13,139	40,295	25.0	161,179	6,084	12,132	97,708	115,924	96,798	29,163	110,847	40,295	277,103	93.7	58.4	11.9	58.2
14. Pateros	9,320	102	6	3,142	25.0	12,569	2,984	0	2,856	5,841	12,304	102	2,862	3,142	18,410	75.7	100.0	0.2	68.3
15. San Juan	31,068	15,025	1,988	16,027	25.0	64,108	1,750	97	59	1,906	32,818	15,122	2,047	16,027	66,014	94.7	99.4	97.1	97.1
16. Taguig	49,146	658	15	16,606	25.0	66,425	15,869	6,660	67,004	89,534	65,015	7,318	67,019	16,606	155,959	75.6	9.0	0.0	42.6
17. Valenzuela	66,292	4,158	1,891	24,114	25.0	96,455	17,239	6,237	43,262	66,738	83,531	10,395	45,153	24,114	163,193	79.4	40.0	4.2	59.1
II. CAVITE	99,646	2,230	1,868	34,581	25.0	138,325	30,627	9,430	9,577	49,635	130,273	11,660	11,445	34,581	187,959	76.5	19.1	16.3	73.6
1. Bacoor	43,253	489	114	14,618	25.0	58,474	8,909	1,281	0	10,190	52,161	1,770	114	14,618	68,663	82.9	27.6	100.0	85.2
2. Cavite City	18,334	1,325	387	6,682	25.0	26,727	2,740	6,341	0	9,081	21,074	7,666	387	6,682	35,808	87.0	17.3	100.0	74.6
3. Imus	16,587	118	12	5,545	25.0	22,182	9,318	1,174	863	11,355	25,825	1,292	874	5,545	33,537	63.9	9.1	1.3	66.1
4. Kawit	12,125	222	934	4,427	25.0	17,708	1,199	0	0	1,199	13,323	222	934	4,427	18,906	91.0	100.0	100.0	93.7
5. Noveleta	3,859	9	143	1,337	25.0	5,349	1,579	0	0	1,579	5,438	9	143	1,337	6,928	71.0	100.0	100.0	77.2
6. Rosario	5,569	66	278	1,971	25.0	7,885	6,882	635	8,715	16,231	12,451	701	8,993	1,971	24,116	44.7	9.5	3.1	32.7
III. RIZAL	134,704	18,320	9,149	43,570	22.0	197,743	65,440	15,193	118,375	199,009	200,144	25,513	127,524	43,570	396,752	67.3	40.4	7.2	49.8
1. Angono	7,927	1,585	1,284	1,905	15.0	12,701	1,022	0	1,570	2,592	8,949	1,585	2,854	1,905	15,293	88.6	100.0	45.0	83.1
2. Antipolo	24,301	1,101	2,884	9,429	25.0	37,714	27,811	5,035	19,557	52,402	52,112	6,136	22,441	9,429	90,117	46.6	17.9	12.3	41.9
3. Baras	401	80	65	96	15.0	642	629	0	79	708	1,030	80	144	96	1,350	38.9	100.0	45.1	47.6
4. Binangonan	15,915	1,183	2,578	3,825	15.0	25,501	2,520	0	3,151	5,671	18,435	1,183	5,729	3,825	31,172	86.3	100.0	45.0	81.8
5. Cainta	33,823	819	78	11,573	25.0	46,294	10,808	5,782	58,831	75,421	44,632	6,601	58,909	11,573	121,715	75.8	12.4	0.1	38.0
6. Cardona	841	188	136	202	15.0	1,347	1,021	0	167	1,188	1,862	188	303	202	2,535	45.2	100.0	44.3	53.1
7. Jala-Jala	568	114	92	137	15.0	911	526	0	112	638	1,094	114	204	137	1,549	51.9	100.0	45.1	58.8
8. Montalban	7,189	76	28	2,431	25.0	9,723	3,001	1,539	4,784	9,323	10,190	1,614	4,811	2,431	19,046	70.5	4.7	0.6	51.0
9. Morong	1,768	354	286	425	15.0	2,833	940	0	350	1,290	2,708	354	636	425	4,123	65.3	100.0	45.0	68.7
10. Pililla	2,161	432	350	519	15.0	3,462	928	0	428	1,356	3,089	432	778	519	4,818	70.0	100.0	45.0	71.9
11. San Mateo	9,510	336	89	3,312	25.0	13,250	6,796	711	982	8,488	16,306	1,049	1,071	3,312	21,738	58.3	32.2	8.3	61.0
12. Tanay	5,882	1,176	953	1,414	15.0	9,425	1,497	0	1,165	2,662	7,379	1,176	2,118	1,414	12,087	79.7	100.0	45.0	78.0
13. Taytay	23,274	565	141	8,027	25.0	32,108	7,437	2,127	26,975	36,539	30,712	2,692	27,116	8,027	68,647	75.8	21.8	0.5	46.8
14. Teresa	1,143	229	185	275	15.0	1,832	504	0	226	730	1,647	229	411	275	2,562	69.4	100.0	45.0	71.5
TOTAL	1,843,366	685,026	187,997	897,642	24.8	3,614,031	301,868	144,216	539,798	985,883	2,145,234	829,242	727,795	897,642	4,599,914	85.9	82.6	25.8	78.5

TABLE 13.4.28 SUMMARY OF PROJECTED WATER DEMAND IN 2010 (SCENARIO 4)

CITY/ MUNICIPALITY	MWSS SERVED WATER DEMAND (M3/D)						PRIVATELY SERVED WATER DEMAND (M3/D)				TOTAL WATER DEMAND (M3/D)					MWSS SERVICE RATIO (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	LOSS %	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	D	C	I	T
I. NCR	1,800,513	784,698	206,731	930,647	25.0	3,722,588	186,264	128,498	452,655	767,418	1,986,777	913,196	659,386	930,647	4,490,006	90.6	85.9	31.4	82.8
1. Manila	284,540	281,444	36,837	200,941	25.0	803,762	17,361	4,665	5,786	27,812	301,901	286,109	42,623	200,941	831,574	94.2	98.4	86.4	96.7
2. Pasay City	85,733	44,438	4,443	38,205	25.0	152,819	4,826	8,795	3,375	16,996	90,560	53,233	7,818	38,205	189,815	93.2	83.5	56.8	80.5
3. Quezon City	364,893	211,824	61,807	212,841	25.0	851,366	23,463	27,641	32,368	83,471	388,356	239,464	94,175	212,841	934,836	94.0	88.5	65.6	91.1
4. Caloocan City	155,532	23,024	20,693	68,083	25.0	272,332	23,545	3,574	4,665	31,884	179,077	31,598	25,358	68,083	304,216	86.8	88.4	81.6	89.5
5. Las Pinas	133,167	1,303	284	44,918	25.0	179,674	24,184	1,328	38,171	70,083	157,351	3,031	38,456	44,918	249,757	84.6	14.4	0.7	71.9
6. Makati	102,644	112,196	11,262	15,568	25.0	303,272	6,056	11,721	3,383	21,160	108,700	124,515	14,645	75,568	323,432	94.4	90.6	76.9	93.5
7. Malabon	52,507	8,959	22,839	28,102	25.0	112,407	7,677	2,016	14,565	24,258	60,185	10,975	37,404	28,102	136,665	87.2	81.6	61.1	82.2
8. Mandaluyong	47,639	25,894	18,599	30,711	25.0	122,843	3,084	2,128	5,353	10,566	50,723	28,022	23,952	30,711	133,409	93.9	92.4	77.7	92.1
9. Marikina	77,299	8,153	2,561	29,338	25.0	117,350	4,880	2,941	12,444	20,266	82,179	11,094	15,005	29,338	137,616	94.1	73.5	17.1	85.3
10. Muntinlupa	79,552	163	146	26,620	25.0	106,481	14,740	17,291	62,432	94,464	94,292	17,454	62,578	26,620	200,945	84.4	0.9	0.2	53.0
11. Navotas	36,075	4,958	5,112	15,382	25.0	61,527	2,551	621	1,739	4,911	38,626	5,578	6,852	15,382	66,438	93.4	88.9	74.6	92.6
12. Paranaque	107,673	14,096	3,059	41,609	25.0	166,436	19,247	10,324	32,220	61,791	126,920	24,420	35,278	41,609	228,227	84.8	57.7	8.7	72.9
13. Pasig	101,827	19,636	14,713	45,392	25.0	181,568	6,547	13,987	109,417	129,951	108,375	33,623	124,130	45,392	311,520	94.0	58.4	11.9	58.3
14. Pateros	11,613	117	6	3,912	25.0	15,648	1,387	0	3,758	5,145	13,560	117	3,205	3,912	20,794	85.6	100.0	0.2	75.3
15. San Juan	31,280	17,338	2,234	16,950	25.0	67,801	1,742	97	59	1,898	33,022	17,435	2,293	16,950	69,700	94.7	99.4	97.4	97.3
16. Taguig	62,459	758	87	21,078	25.0	84,313	10,855	7,679	15,033	93,367	73,114	8,437	15,050	21,078	117,680	85.4	9.0	0.6	47.5
17. Valenzuela	86,080	4,794	2,117	30,997	25.0	123,988	13,757	7,191	48,446	69,394	99,837	11,985	50,564	30,997	193,382	86.2	40.0	4.2	64.1
II. CAVITE	125,262	2,571	2,092	43,308	25.0	173,232	24,025	10,873	10,725	45,623	149,287	13,443	12,817	43,308	218,855	83.9	19.1	16.3	79.2
1. Bacoor	52,713	564	128	17,801	25.0	71,206	9,329	1,477	0	10,806	62,043	2,041	128	17,801	82,012	85.0	27.6	100.0	86.8
2. Cavite City	21,741	1,528	433	7,901	25.0	31,603	673	7,310	0	7,983	22,414	8,838	433	7,901	39,586	97.0	17.3	100.0	79.8
3. Imus	22,501	136	13	7,883	25.0	30,533	6,484	1,354	966	8,804	29,385	1,490	979	7,883	39,537	77.9	9.1	1.3	77.7
4. Kawit	14,731	256	1,045	5,344	25.0	21,377	301	0	0	301	15,032	256	1,045	5,344	21,678	98.0	100.0	100.0	98.6
5. Noveleta	5,070	10	161	1,747	25.0	6,988	1,042	0	0	1,042	6,112	10	161	1,747	8,030	83.0	100.0	100.0	87.0
6. Rosario	8,106	77	312	2,831	25.0	11,326	6,196	732	9,759	16,687	14,302	808	10,071	2,831	28,012	56.7	9.5	3.1	40.4
III. RIZAL	186,214	13,854	14,834	60,088	21.9	274,989	59,876	17,587	131,930	209,323	246,090	31,270	146,764	60,088	484,312	75.7	44.2	10.1	56.8
1. Angono	11,583	2,317	2,582	3,894	15.0	19,296	848	0	1,668	2,516	12,431	2,317	4,170	3,894	21,812	93.2	100.0	60.0	88.5
2. Antipolo	34,023	1,269	3,230	12,841	25.0	51,362	29,680	5,805	21,901	57,386	63,704	7,074	25,130	12,841	108,748	53.4	17.9	12.9	47.2
3. Baras	699	140	151	175	15.0	1,165	630	0	101	731	1,329	140	252	175	1,896	52.6	100.0	59.9	61.4
4. Binangonan	22,135	4,427	4,781	5,531	15.0	36,874	2,063	0	3,187	5,250	24,198	4,427	7,968	5,531	42,124	91.5	100.0	60.0	87.5
5. Cainta	46,490	344	88	15,841	25.0	62,762	7,761	6,667	65,880	80,308	54,251	7,610	65,968	15,841	143,670	85.7	12.4	0.1	44.1
6. Cardona	1,095	219	237	274	15.0	1,825	1,020	0	158	1,178	2,115	219	395	274	3,003	51.8	100.0	60.0	60.8
7. Jala-Jala	988	198	213	247	15.0	1,646	490	0	142	632	1,478	198	355	247	2,278	66.8	100.0	60.0	72.3
8. Montalban	9,022	87	31	3,047	25.0	12,187	2,490	1,774	5,352	9,620	11,512	1,861	5,383	3,047	21,808	78.4	4.7	0.6	55.9
9. Morong	2,447	489	529	611	15.0	4,076	966	0	352	1,318	3,413	489	881	611	5,394	71.7	100.0	60.0	75.6
10. Pililla	3,867	613	662	766	15.0	5,108	882	0	442	1,324	3,949	613	1,104	766	6,432	77.7	100.0	60.0	79.4
11. San Mateo	13,699	390	100	4,730	25.0	18,919	6,047	819	1,099	7,966	19,747	1,209	1,199	4,730	26,885	69.4	32.2	8.3	70.4
12. Tanay	8,385	1,677	1,811	2,095	15.0	13,968	1,366	0	1,208	2,574	9,751	1,677	3,019	2,095	16,542	86.0	100.0	60.0	84.4
13. Taytay	30,999	767	158	10,641	25.0	42,565	5,175	2,452	30,203	37,834	36,174	3,219	30,365	10,641	80,399	85.7	23.8	0.5	52.9
14. Teresa	1,581	316	342	395	15.0	2,634	458	0	228	686	2,033	316	570	395	3,320	77.5	100.0	60.0	79.3
TOTAL	2,111,989	801,121	223,657	1,034,043	24.8	4,170,810	270,165	156,888	595,310	1,022,363	2,382,154	958,009	818,967	1,034,043	5,193,173	88.7	83.6	27.3	80.3

TABLE 13.4.29 DISTRIBUTION OF WATER DEMAND IN 1995 (SCENARIO 4), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	2,531,704	784,921	3,316,625	98.2	1.8	2,486,806	44,898	784,921	829,819	25.0
1. Manila	676,375	32,868	709,242	100.0	0.0	676,375	0	32,868	32,868	4.6
2. Pasay City	103,720	23,946	127,666	95.1	4.9	98,638	5,082	23,946	29,028	22.7
3. Quezon City	632,427	89,523	721,950	97.1	2.9	614,101	18,326	89,523	107,849	14.9
4. Caloocan City	165,331	49,735	215,066	100.0	0.0	165,331	0	49,735	49,735	23.1
5. Las Pinas	39,173	72,300	111,473	95.6	4.4	37,439	1,734	72,300	74,034	66.4
6. Makati	227,485	28,369	255,854	96.8	3.2	220,125	7,360	28,369	35,729	14.0
7. Malabon	69,647	32,257	101,904	98.2	1.8	68,403	1,244	32,257	33,501	32.9
8. Mandaluyong	93,955	11,584	105,539	100.0	0.0	93,955	0	11,584	11,584	11.0
9. Marikina	88,936	15,584	104,520	100.0	0.0	88,936	0	15,584	15,584	14.9
10. Muntinlupa	25,737	87,555	113,292	72.7	27.3	18,718	7,019	87,555	94,574	83.5
11. Navotas	45,526	7,118	52,644	99.3	0.7	45,213	313	7,118	7,431	14.1
12. Paranaque	98,575	79,367	177,943	98.2	1.8	96,807	1,768	79,367	81,135	45.6
13. Pasig	126,634	92,502	219,136	99.8	0.2	126,378	256	92,502	92,758	42.3
14. Pateros	6,495	7,505	14,001	100.0	0.0	6,495	0	7,505	7,505	53.6
15. San Juan	62,542	2,520	65,063	100.0	0.0	62,542	0	2,520	2,520	3.9
16. Taguig	14,221	93,680	107,901	94.0	6.0	13,374	847	93,680	94,527	87.6
17. Valenzuela	54,925	58,506	113,431	98.3	1.7	53,976	949	58,506	59,455	52.4
II. CAVITE	57,278	69,945	127,223	17.8	82.2	10,176	47,102	69,945	117,047	92.0
1. Bacoor	17,732	23,228	40,960	57.4	42.6	10,176	7,556	23,228	30,784	75.2
2. Cavite City	17,436	10,875	28,311	0.0	100.0	0	17,436	10,875	28,311	100.0
3. Imus	7,649	14,997	22,647	0.0	100.0	0	7,649	14,997	22,647	100.0
4. Kawit	9,932	3,739	13,671	0.0	100.0	0	9,932	3,739	13,671	100.0
5. Noveleta	1,503	3,141	4,644	0.0	100.0	0	1,503	3,141	4,644	100.0
6. Rosario	3,025	13,965	16,990	0.0	100.0	0	3,025	13,965	16,990	100.0
III. RIZAL	70,295	173,221	243,516	16.1	83.9	11,346	58,949	173,221	232,170	95.3
1. Angono	4,628	2,081	6,709	100.0	0.0	4,628	0	2,081	2,081	31.0
2. Antipolo	16,767	40,082	56,848	0.0	100.0	0	16,767	40,082	56,848	100.0
3. Baras	188	596	784	0.0	100.0	0	188	596	784	100.0
4. Binangonan	10,414	5,190	15,604	0.0	100.0	0	10,414	5,190	15,604	100.0
5. Cainta	9,798	66,888	76,685	40.9	59.1	4,012	5,786	66,888	72,674	94.8
6. Cardona	728	1,112	1,840	0.0	100.0	0	728	1,112	1,840	100.0
7. Jala-Jala	109	564	673	0.0	100.0	0	109	564	673	100.0
8. Montalban	4,499	8,750	13,248	0.0	100.0	0	4,499	8,750	13,248	100.0
9. Morong	1,419	1,145	2,564	0.0	100.0	0	1,419	1,145	2,564	100.0
10. Pililla	1,045	1,202	2,247	0.0	100.0	0	1,045	1,202	2,247	100.0
11. San Mateo	6,362	7,697	14,059	0.0	100.0	0	6,362	7,697	14,059	100.0
12. Tanay	3,225	2,301	5,526	0.0	100.0	0	3,225	2,301	5,526	100.0
13. Taytay	10,401	34,896	45,297	26.0	74.0	2,706	7,695	34,896	42,591	94.0
14. Teresa	713	718	1,431	0.0	100.0	0	713	718	1,431	100.0
TOTAL	2,659,277	1,028,087	3,687,364	94.3	5.7	2,508,328	150,949	1,028,087	1,179,036	32.0

TABLE 13.4.30 DISTRIBUTION OF WATER DEMAND IN 2000 (SCENARIO 4), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE	GROUND-	G.W.
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND- WATER	SURFACE WATER	GROUND- WATER	GROUND- WATER	WATER TOTAL	SHARE (%)
I. NCR	2,955,161	751,221	3,706,382	98.5	1.5	2,910,263	44,898	751,221	796,119	21.5
1. Manila	715,217	28,317	743,535	100.0	0.0	715,217	0	28,317	28,317	3.8
2. Pasay City	120,738	20,965	141,703	95.8	4.2	115,656	5,082	20,965	26,047	18.4
3. Quezon City	709,156	82,189	791,345	97.4	2.6	690,830	18,326	82,189	100,515	12.7
4. Caloocan City	199,878	44,197	244,074	100.0	0.0	199,878	0	44,197	44,197	18.1
5. Las Pinas	84,553	69,927	154,480	97.9	2.1	82,819	1,734	69,927	71,661	46.4
6. Makati	255,186	22,883	278,069	97.1	2.9	247,826	7,360	22,883	30,243	10.9
7. Malabon	84,652	29,380	114,032	98.5	1.5	83,408	1,244	29,380	30,624	26.9
8. Mandaluyong	104,019	10,497	114,516	100.0	0.0	104,019	0	10,497	10,497	9.2
9. Marikina	99,049	16,224	115,273	100.0	0.0	99,049	0	16,224	16,224	14.1
10. Muntinlupa	57,156	87,289	144,446	87.7	12.3	50,137	7,019	87,289	94,308	65.3
11. Navotas	51,956	5,475	57,431	99.4	0.6	51,643	313	5,475	5,788	10.1
12. Paranaque	136,625	65,295	201,920	98.7	1.3	134,857	1,768	65,295	67,063	33.2
13. Pasig	147,433	103,233	250,666	99.8	0.2	147,177	256	103,233	103,489	41.3
14. Pateros	9,496	6,895	16,391	100.0	0.0	9,496	0	6,895	6,895	42.1
15. San Juan	64,082	1,906	65,988	100.0	0.0	64,082	0	1,906	1,906	2.9
16. Taguig	41,369	92,521	133,890	98.0	2.0	40,522	847	92,521	93,368	69.7
17. Valenzuela	74,597	64,028	138,624	98.7	1.3	73,648	949	64,028	64,977	46.9
II. CAVITE	102,743	59,408	162,151	36.9	63.1	37,868	64,875	59,408	124,283	76.6
1. Bacoor	41,123	15,693	56,816	81.6	18.4	33,567	7,556	15,693	23,249	40.9
2. Cavite City	21,886	10,778	32,664	0.0	100.0	0	21,886	10,778	32,664	100.0
3. Imus	16,374	12,683	29,057	0.0	100.0	0	16,374	12,683	29,057	100.0
4. Kawit	14,338	2,548	16,886	30.0	70.0	4,302	10,037	2,548	12,585	74.5
5. Noveleta	3,454	2,475	5,928	0.0	100.0	0	3,454	2,475	5,928	100.0
6. Rosario	5,569	15,231	20,800	0.0	100.0	0	5,569	15,231	20,800	100.0
III. RIZAL	132,107	189,991	322,098	35.1	64.9	46,346	85,761	189,991	275,752	85.6
1. Angono	7,907	2,419	10,326	100.0	0.0	7,907	0	2,419	2,419	23.4
2. Antipolo	28,692	46,373	75,064	6.4	93.6	1,834	26,858	46,373	73,230	97.6
3. Baras	291	658	949	0.0	100.0	0	291	658	949	100.0
4. Binangonan	16,775	5,620	22,395	0.0	100.0	0	16,775	5,620	22,395	100.0
5. Cainta	27,475	73,454	100,929	78.9	21.1	21,689	5,786	73,454	79,240	78.5
6. Cardona	971	1,164	2,135	0.0	100.0	0	971	1,164	2,135	100.0
7. Jala-Jala	414	610	1,024	0.0	100.0	0	414	610	1,024	100.0
8. Montalban	7,758	8,845	16,603	8.4	91.6	652	7,106	8,845	15,951	96.1
9. Morong	1,928	1,216	3,144	0.0	100.0	0	1,928	1,216	3,144	100.0
10. Pililla	1,786	1,302	3,088	0.0	100.0	0	1,786	1,302	3,088	100.0
11. San Mateo	9,527	8,399	17,926	6.6	93.4	633	8,894	8,399	17,293	96.5
12. Tanay	6,039	2,559	8,598	0.0	100.0	0	6,039	2,559	8,598	100.0
13. Taytay	21,325	36,634	57,960	63.9	36.1	13,630	7,695	36,634	44,329	76.5
14. Teresa	1,219	739	1,958	0.0	100.0	0	1,219	739	1,958	100.0
TOTAL	3,190,012	1,000,620	4,190,632	93.9	6.1	2,994,477	195,534	1,000,620	1,196,154	28.5

TABLE 13.4.31 DISTRIBUTION OF WATER DEMAND IN 2005 (SCENARIO 4), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,277,963	737,240	4,015,202	98.6	1.4	3,233,065	44,898	737,240	782,138	19.5
1. Manila	737,695	27,926	765,621	100.0	0.0	737,695	0	27,926	27,926	3.6
2. Pasay City	134,261	18,172	152,434	96.2	3.8	129,179	5,082	18,172	23,254	15.3
3. Quezon City	759,511	82,643	842,154	97.6	2.4	741,185	18,326	82,643	100,969	12.0
4. Caloocan City	230,569	37,493	268,062	100.0	0.0	230,569	0	37,493	37,493	14.0
5. Las Pinas	133,829	64,628	198,457	98.7	1.3	132,095	1,734	64,628	66,362	33.4
6. Makati	272,289	21,041	293,331	97.3	2.7	264,929	7,360	21,041	28,401	9.7
7. Malabon	96,536	26,545	123,081	98.7	1.3	95,292	1,244	26,545	27,789	22.6
8. Mandaluyong	110,375	10,500	120,876	100.0	0.0	110,375	0	10,500	10,500	8.7
9. Marikina	105,344	18,233	123,577	100.0	0.0	105,344	0	18,233	18,233	14.8
10. Muntinlupa	85,689	86,448	172,137	91.8	8.2	78,670	7,019	86,448	93,467	54.3
11. Navotas	55,705	4,855	60,560	99.4	0.6	55,392	313	4,855	5,168	8.5
12. Paranaque	155,422	58,812	214,234	98.9	1.1	153,654	1,768	58,812	60,580	28.3
13. Pasig	161,179	115,924	277,103	99.8	0.2	160,923	256	115,924	116,180	41.9
14. Pateros	12,569	5,841	18,410	100.0	0.0	12,569	0	5,841	5,841	31.7
15. San Juan	64,108	1,906	66,014	100.0	0.0	64,108	0	1,906	1,906	2.9
16. Taguig	66,425	89,534	155,959	98.7	1.3	65,578	847	89,534	90,381	58.0
17. Valenzuela	96,455	66,738	163,193	99.0	1.0	95,506	949	66,738	67,687	41.5
II. CAVITE	138,325	49,635	187,959	41.9	58.1	58,001	80,324	49,635	129,959	69.1
1. Bacoor	58,474	10,190	68,663	87.1	12.9	50,918	7,556	10,190	17,746	25.8
2. Cavite City	26,727	9,081	35,808	0.0	100.0	0	26,727	9,081	35,808	100.0
3. Imus	22,182	11,355	33,537	0.0	100.0	0	22,182	11,355	33,537	100.0
4. Kawit	17,708	1,199	18,906	40.0	60.0	7,083	10,625	1,199	11,823	62.5
5. Noveleta	5,349	1,579	6,928	0.0	100.0	0	5,349	1,579	6,928	100.0
6. Rosario	7,885	16,231	24,116	0.0	100.0	0	7,885	16,231	24,116	100.0
III. RIZAL	197,743	199,009	396,752	47.1	52.9	93,167	104,576	199,009	303,585	76.5
1. Angono	12,701	2,592	15,293	100.0	0.0	12,701	0	2,592	2,592	16.9
2. Antipolo	37,714	52,402	90,117	22.7	77.3	8,572	29,142	52,402	81,545	90.5
3. Baras	642	708	1,350	0.0	100.0	0	642	708	1,350	100.0
4. Binangonan	25,501	5,671	31,172	0.0	100.0	0	25,501	5,671	31,172	100.0
5. Cainta	46,294	75,421	121,715	87.5	12.5	40,508	5,786	75,421	81,207	66.7
6. Cardona	1,347	1,188	2,535	0.0	100.0	0	1,347	1,188	2,535	100.0
7. Jala-Jala	911	638	1,549	0.0	100.0	0	911	638	1,549	100.0
8. Montalban	9,723	9,323	19,046	26.9	73.1	2,617	7,106	9,323	16,429	86.3
9. Morong	2,833	1,290	4,123	0.0	100.0	0	2,833	1,290	4,123	100.0
10. Pililla	3,462	1,356	4,818	0.0	100.0	0	3,462	1,356	4,818	100.0
11. San Mateo	13,250	8,488	21,738	32.9	67.1	4,356	8,894	8,488	17,382	80.0
12. Tanay	9,425	2,662	12,087	0.0	100.0	0	9,425	2,662	12,087	100.0
13. Taytay	32,108	36,539	68,647	76.0	24.0	24,413	7,695	36,539	44,234	64.4
14. Teresa	1,832	730	2,562	0.0	100.0	0	1,832	730	2,562	100.0
TOTAL	3,614,031	985,883	4,599,914	93.6	6.4	3,384,232	229,798	985,883	1,215,681	26.4

TABLE 13.4.32 DISTRIBUTION OF WATER DEMAND IN 2010 (SCENARIO 4), BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE	GROUND-	G.W.
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER	GROUND-WATER	WATER TOTAL	SHARE (%)
I. NCR	3,722,588	767,418	4,490,006	98.8	1.2	3,677,690	44,898	767,418	812,316	18.1
1. Manila	803,762	27,812	831,574	100.0	0.0	803,762	0	27,812	27,812	3.3
2. Pasay City	152,819	16,996	169,815	96.7	3.3	147,737	5,082	16,996	22,078	13.0
3. Quezon City	851,366	83,471	934,836	97.8	2.2	833,040	18,326	83,471	101,797	10.9
4. Caloocan City	272,332	31,884	304,216	100.0	0.0	272,332	0	31,884	31,884	10.5
5. Las Pinas	179,674	70,083	249,757	99.0	1.0	177,940	1,734	70,083	71,817	28.8
6. Makati	302,272	21,160	323,432	97.6	2.4	294,912	7,360	21,160	28,520	8.8
7. Malabon	112,407	24,258	136,665	98.9	1.1	111,163	1,244	24,258	25,502	18.7
8. Mandaluyong	122,843	10,566	133,409	100.0	0.0	122,843	0	10,566	10,566	7.9
9. Marikina	117,350	20,266	137,616	100.0	0.0	117,350	0	20,266	20,266	14.7
10. Muntinlupa	106,481	94,464	200,945	93.4	6.6	99,462	7,019	94,464	101,483	50.5
11. Navotas	61,527	4,911	66,438	99.5	0.5	61,214	313	4,911	5,224	7.9
12. Paranaque	166,436	61,791	228,227	98.9	1.1	164,668	1,768	61,791	63,559	27.8
13. Pasig	181,568	129,951	311,520	99.9	0.1	181,312	256	129,951	130,207	41.8
14. Pateros	15,648	5,145	20,794	100.0	0.0	15,648	0	5,145	5,145	24.7
15. San Juan	67,801	1,898	69,700	100.0	0.0	67,801	0	1,898	1,898	2.7
16. Taguig	84,313	93,367	177,680	99.0	1.0	83,466	847	93,367	94,214	53.0
17. Valenzuela	123,988	69,394	193,382	99.2	0.8	123,039	949	69,394	70,343	36.4
II. CAVITE	173,232	45,623	218,855	42.9	57.1	74,338	98,894	45,623	144,517	66.0
1. Bacoor	71,206	10,806	82,012	89.4	10.6	63,650	7,556	10,806	18,362	22.4
2. Cavite City	31,603	7,983	39,586	0.0	100.0	0	31,603	7,983	39,586	100.0
3. Imus	30,733	8,804	39,537	0.0	100.0	0	30,733	8,804	39,537	100.0
4. Kawit	21,377	301	21,678	50.0	50.0	10,688	10,688	301	10,989	50.7
5. Noveleta	6,988	1,042	8,030	0.0	100.0	0	6,988	1,042	8,030	100.0
6. Rosario	11,326	16,687	28,012	0.0	100.0	0	11,326	16,687	28,012	100.0
III. RIZAL	274,989	209,323	484,312	52.7	47.3	144,999	129,991	209,323	339,313	70.1
1. Angono	19,296	2,516	21,812	100.0	0.0	19,296	0	2,516	2,516	11.5
2. Antipolo	51,362	57,386	108,748	35.3	64.7	18,149	33,213	57,386	90,599	83.3
3. Baras	1,165	731	1,896	0.0	100.0	0	1,165	731	1,896	100.0
4. Binangonan	36,874	5,250	42,124	0.0	100.0	0	36,874	5,250	42,124	100.0
5. Cainta	63,362	80,308	143,670	90.9	9.1	57,576	5,786	80,308	86,094	59.9
6. Cardona	1,825	1,178	3,003	0.0	100.0	0	1,825	1,178	3,003	100.0
7. Jala-Jala	1,646	632	2,278	0.0	100.0	0	1,646	632	2,278	100.0
8. Montalban	12,187	9,620	21,808	41.7	58.3	5,081	7,106	9,620	16,726	76.7
9. Morong	4,076	1,318	5,394	0.0	100.0	0	4,076	1,318	5,394	100.0
10. Pililla	5,108	1,324	6,432	0.0	100.0	0	5,108	1,324	6,432	100.0
11. San Mateo	18,919	7,966	26,885	53.0	47.0	10,025	8,894	7,966	16,860	62.7
12. Tanay	13,968	2,574	16,542	0.0	100.0	0	13,968	2,574	16,542	100.0
13. Taytay	42,565	37,834	80,399	81.9	18.1	34,870	7,695	37,834	45,529	56.6
14. Teresa	2,634	686	3,320	0.0	100.0	0	2,634	686	3,320	100.0
TOTAL	4,170,810	1,022,363	5,193,173	93.4	6.6	3,897,027	273,783	1,022,363	1,296,146	25.0

TABLE 13.4.33 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 1)

(MWSS)

CITY/MUNICIPALITY	1990				1995				2000				2005				2010			
I. NCR	32,961	35,348	37,736	40,123	42,511	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898
1. Manila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Pasay City	4,461	4,585	4,709	4,834	4,958	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082
3. Quezon City	14,186	15,014	15,842	16,670	17,498	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326
4. Caloocan City	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Las Pinas	1,527	1,568	1,610	1,651	1,693	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734
6. Makati	3,772	4,490	5,207	5,925	6,642	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360
7. Malabon	554	692	830	968	1,106	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244
8. Mandaluyong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Marikina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Muntinlupa	5,777	6,025	6,274	6,522	6,771	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019
11. Navotas	106	147	189	230	272	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
12. Paranaque	1,147	1,271	1,395	1,520	1,644	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768
13. Pasig	49	90	132	173	215	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256
14. Pateros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. San Juan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. Taguig	640	681	723	764	806	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847
17. Valenzuela	742	783	825	866	908	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949
II. CAVITE	26,970	31,098	35,226	39,354	43,482	47,610	52,280	56,909	61,559	66,209	70,858	73,679	76,499	79,320	82,140	84,961	88,747	92,533	96,318	100,104	103,890
1. Bacoor	6,314	6,562	6,811	7,059	7,308	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556
2. Cavite City	6,714	7,756	8,799	9,841	10,884	11,926	13,738	15,551	17,363	19,176	20,988	22,217	23,446	24,675	25,904	27,133	28,206	29,280	30,353	31,427	32,500
3. Imus	1,654	3,116	4,579	6,041	8,303	9,965	11,628	13,290	14,952	16,615	18,277	19,327	20,377	21,427	22,477	23,527	25,498	27,468	29,439	31,410	33,381
4. Kawit	4,329	4,569	5,609	6,249	6,889	7,529	8,189	8,810	9,450	10,090	10,730	10,804	10,878	10,953	11,027	11,101	11,059	11,016	10,974	10,931	10,889
5. Noveleta	7,070	1,070	7,070	7,070	7,070	7,070	1,070	7,070	7,070	1,070	7,070	7,070	1,070	7,070	7,070	1,070	7,114	7,158	7,202	7,245	7,289
6. Rosario	889	1,424	1,959	2,494	3,028	3,563	4,096	4,633	5,168	5,703	6,238	6,705	7,172	7,639	8,106	8,573	9,314	10,054	10,794	11,535	12,275
III. RIZAL	29,808	35,826	41,444	47,262	53,080	58,898	65,084	71,270	76,213	81,156	86,098	89,880	93,662	97,444	101,226	105,008	110,280	115,553	120,826	126,099	131,371
1. Angono	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Antipolo	11,621	13,297	14,972	16,648	18,323	19,999	21,575	23,352	25,028	26,705	28,381	28,857	29,332	29,808	30,284	30,760	31,764	32,768	33,772	34,776	35,780
3. Baras	-	29	58	87	116	145	174	203	233	262	291	361	431	502	572	642	747	851	956	1,060	1,165
4. Binangonan	-	1,678	3,355	5,033	6,710	8,388	10,065	11,743	13,420	15,098	16,775	18,520	20,266	22,011	23,756	25,501	27,776	30,050	32,325	34,600	36,874
5. Cainta	3,785	3,865	4,185	4,385	4,585	4,786	4,986	5,186	5,386	5,586	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786
6. Cardona	-	97	194	291	388	485	582	679	776	874	971	1,046	1,121	1,196	1,272	1,347	1,443	1,538	1,634	1,729	1,825
7. Jala-Jala	-	41	83	124	166	207	248	290	331	373	414	513	613	712	811	911	1,058	1,205	1,352	1,499	1,646
8. Montalban	3,243	3,310	4,218	4,705	5,193	5,680	6,182	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684
9. Morong	-	193	386	578	771	964	1,157	1,350	1,543	1,735	1,928	2,109	2,290	2,471	2,652	2,832	3,082	3,330	3,579	3,828	4,076
10. Pililla	-	199	397	596	794	893	1,072	1,250	1,429	1,607	1,786	2,121	2,455	2,792	3,127	3,462	3,792	4,121	4,450	4,779	5,108
11. San Mateo	4,706	5,094	5,483	5,871	6,260	6,648	7,389	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130
12. Tanay	-	604	1,208	1,812	2,416	3,019	3,623	4,227	4,831	5,435	6,039	6,716	7,393	8,070	8,748	9,425	10,333	11,242	12,151	13,060	13,968
13. Taytay	6,453	6,577	6,701	6,826	6,950	7,074	7,198	7,322	7,447	7,571	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695
14. Teresa	-	122	244	366	488	609	731	853	975	1,097	1,219	1,341	1,464	1,587	1,709	1,832	1,992	2,153	2,313	2,474	2,634
TOTAL	89,739	102,272	114,406	126,739	139,073	151,406	162,242	173,077	182,670	192,262	201,855	208,457	215,059	221,662	228,264	234,866	243,925	252,984	262,042	271,101	280,159

TABLE 13.4.33 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 1) (cont'd)

[PRIVATE]

CITY/MUNICIPALITY	1990	1995						2000						2005						2010
I. NCR	640,937	646,066	651,194	656,323	661,452	666,580	671,709	676,837	681,966	687,095	692,223	696,162	700,100	704,038	707,976	711,915	720,269	728,623	736,977	745,331	753,685
1. Manila	12,865	14,185	15,705	17,225	18,745	20,265	21,785	23,305	24,826	26,346	27,866	27,787	27,708	27,629	27,551	27,472	27,449	27,427	27,404	27,381	27,359
2. Pasay City	17,997	18,159	18,321	18,483	18,645	18,807	18,970	19,132	19,294	19,456	19,618	19,036	18,454	17,872	17,290	16,708	16,713	16,719	16,725	16,731	16,736
3. Quezon City	91,324	90,339	89,353	88,368	87,383	86,397	85,412	84,427	83,441	82,456	81,471	81,551	81,632	81,713	81,794	81,874	82,032	82,189	82,347	82,504	82,662
4. Caloocan City	21,476	28,575	29,673	30,772	31,870	32,969	34,068	35,166	36,265	37,363	38,462	37,564	36,665	35,767	34,868	33,970	32,768	31,566	30,364	29,162	27,960
5. Las Pinas	81,778	79,601	77,225	74,948	72,672	70,395	68,119	65,842	63,566	61,289	59,013	59,147	59,281	59,416	59,550	59,684	61,725	63,766	65,807	67,848	69,889
6. Makati	25,179	24,746	24,312	23,879	23,445	23,012	22,578	22,145	21,711	21,278	20,844	20,859	20,875	20,890	20,905	20,920	20,943	20,966	20,990	21,013	21,036
7. Malabon	16,473	19,356	20,239	21,122	22,006	22,889	23,772	24,655	25,538	26,421	27,304	26,914	26,523	26,132	25,742	25,351	24,876	24,402	23,928	23,453	22,979
8. Mandaluyong	8,976	9,118	9,260	9,402	9,543	9,685	9,827	9,969	10,111	10,253	10,395	10,395	10,394	10,394	10,394	10,394	10,406	10,419	10,431	10,444	10,456
9. Marikina	13,573	13,825	14,077	14,329	14,581	14,833	15,086	15,338	15,590	15,842	16,094	16,493	16,892	17,292	17,691	18,090	18,494	18,898	19,303	19,707	20,112
10. Muntinlupa	91,618	90,255	88,972	87,849	86,326	85,003	83,680	82,356	81,033	79,710	78,387	79,355	80,322	81,290	82,258	83,225	85,433	87,641	89,849	92,057	94,265
11. Navotas	4,051	4,122	4,193	4,264	4,335	4,406	4,477	4,548	4,619	4,690	4,761	4,756	4,751	4,746	4,741	4,737	4,747	4,757	4,767	4,777	4,787
12. Paranaque	70,158	68,752	67,346	65,941	64,535	63,129	61,723	60,317	58,911	57,506	56,100	56,144	56,188	56,232	56,276	56,320	57,400	58,481	59,561	60,641	61,722
13. Pasig	75,958	78,505	81,052	83,600	86,147	88,694	91,241	93,788	96,335	98,883	101,430	104,287	107,145	110,002	112,859	115,717	118,519	121,320	124,122	126,924	129,726
14. Pateros	1,756	2,162	2,567	2,973	3,379	3,785	4,190	4,596	5,002	5,408	5,813	5,720	5,626	5,533	5,439	5,346	5,196	5,047	4,898	4,749	4,600
15. San Juan	408	556	704	852	1,000	1,148	1,296	1,444	1,592	1,740	1,888	1,888	1,888	1,888	1,888	1,888	1,886	1,885	1,883	1,882	1,880
16. Taguig	66,361	67,884	69,401	70,918	72,435	73,952	75,469	76,986	78,503	80,020	81,537	82,611	83,686	84,760	85,834	86,909	87,610	88,312	89,013	89,715	90,416
17. Valenzuela	33,180	35,986	38,792	41,598	44,404	47,210	50,016	52,823	55,629	58,435	61,241	61,855	62,469	62,483	62,897	63,311	64,069	64,827	65,585	66,343	67,101
II. CAVITE	57,927	57,037	56,148	55,258	54,369	53,479	52,590	51,700	50,811	49,921	49,032	48,199	47,366	46,534	45,701	44,868	44,238	43,608	42,978	42,348	41,718
1. Bacoor	32,210	29,960	27,711	25,461	23,211	20,961	18,712	16,462	14,212	11,962	9,713	9,598	9,483	9,369	9,254	9,140	9,471	9,803	10,135	10,467	10,799
2. Cavite City	4,328	4,860	5,392	5,924	6,456	6,988	7,520	8,052	8,584	9,116	9,649	9,275	8,901	8,528	8,154	7,781	7,687	7,593	7,498	7,404	7,310
3. Imus	4,443	5,134	5,825	6,515	7,206	7,897	8,588	9,279	9,969	10,660	11,351	11,150	10,949	10,748	10,547	10,346	9,640	8,935	8,229	7,524	6,818
4. Kawit	2,830	2,732	2,635	2,537	2,440	2,342	2,245	2,147	2,050	1,952	1,855	1,604	1,354	1,103	853	603	482	362	241	121	0
5. Noveleta	5,659	5,263	4,868	4,472	4,076	3,680	3,285	2,889	2,493	2,097	1,702	1,618	1,535	1,451	1,368	1,284	1,191	1,097	1,003	910	816
6. Rosario	8,457	9,088	9,718	10,349	10,979	11,610	12,241	12,871	13,502	14,132	14,763	14,953	15,144	15,334	15,525	15,715	15,767	15,819	15,871	15,923	15,975
III. RIZAL	141,838	145,480	149,123	152,765	156,408	160,050	163,692	167,335	170,977	174,619	178,262	181,352	184,441	187,531	190,621	193,711	195,490	197,269	199,049	200,828	202,608
1. Angono	-	242	484	726	968	1,210	1,451	1,693	1,935	2,177	2,419	2,454	2,488	2,523	2,557	2,592	2,577	2,562	2,546	2,531	2,516
2. Antipolo	44,155	44,268	44,381	44,493	44,606	44,719	44,832	44,944	45,057	45,170	45,283	46,461	47,639	48,818	49,996	51,175	52,016	52,857	53,698	54,539	55,380
3. Baras	-	66	132	197	263	329	395	461	526	592	658	668	678	688	698	708	713	717	722	726	731
4. Binangonan	-	562	1,124	1,686	2,248	2,810	3,372	3,934	4,496	5,058	5,620	5,630	5,640	5,651	5,661	5,671	5,587	5,503	5,418	5,334	5,250
5. Cainta	48,619	50,473	52,328	54,182	56,036	57,891	59,745	61,599	63,453	65,308	67,162	68,455	69,748	71,041	72,334	73,627	74,527	75,427	76,327	77,227	78,127
6. Cardona	-	116	233	349	466	582	698	815	931	1,048	1,164	1,169	1,174	1,178	1,183	1,188	1,186	1,184	1,182	1,180	1,178
7. Jala-Jala	-	81	122	183	244	305	366	427	488	549	610	616	621	627	632	638	637	635	634	633	632
8. Montalban	8,030	8,084	8,137	8,191	8,244	8,298	8,352	8,405	8,459	8,513	8,566	8,640	8,714	8,788	8,862	8,936	9,012	9,089	9,165	9,242	9,318
9. Morong	-	122	243	365	486	608	730	851	973	1,094	1,216	1,231	1,246	1,260	1,275	1,290	1,296	1,301	1,307	1,312	1,318
10. Pililla	-	130	260	391	521	651	781	911	1,042	1,172	1,302	1,313	1,324	1,334	1,345	1,356	1,350	1,343	1,337	1,330	1,324
11. San Mateo	3,641	4,061	4,482	4,902	5,322	5,743	6,163	6,583	7,004	7,424	7,844	7,842	7,840	7,838	7,835	7,833	7,705	7,577	7,449	7,321	7,193
12. Tanay	-	256	512	768	1,024	1,280	1,535	1,791	2,047	2,303	2,559	2,580	2,600	2,621	2,641	2,662	2,644	2,627	2,609	2,592	2,574
13. Taytay	37,393	36,566	35,738	35,111	35,684	35,256	34,829	34,402	33,974	33,547	33,120	33,557	33,994	34,431	34,867	35,304	35,519	35,735	35,950	36,165	36,380
14. Teresa	-	74	148	222	296	370	443	517	591	665	739	737	735	734	732	730	721	712	704	695	686
TOTAL	840,702	848,583	856,465	864,346	872,228	880,109	887,991	895,872	903,754	911,635	919,517	925,712	931,907	938,103	944,298	950,493	959,997	969,500	979,004	988,507	998,010

TABLE 13.4.34 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 2)

(MWSS)

CITY/MUNICIPALITY	1990	1995				2000						2005						2010			
I. NCR	32,961	35,348	37,736	40,123	42,511	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898
1. Manila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Pasay City	4,461	4,585	4,709	4,834	4,958	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082
3. Quezon City	14,186	15,014	15,842	16,670	17,498	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326
4. Caloocan City	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Las Pinas	1,527	1,568	1,610	1,651	1,693	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734
6. Makati	3,772	4,490	5,207	5,925	6,642	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360
7. Malabon	554	692	830	968	1,106	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244
8. Mandaluyong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Marikina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Muntinlupa	5,777	6,025	6,274	6,522	6,771	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019
11. Navotas	106	147	189	230	272	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
12. Paranaque	1,147	1,271	1,395	1,520	1,644	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768
13. Pasig	49	90	132	173	215	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256
14. Pateros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. San Juan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. Taguig	640	681	723	764	806	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847
17. Valenzuela	742	783	825	866	908	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949
II. CAVITE	26,970	31,038	35,226	39,354	43,482	47,610	52,260	56,909	61,559	66,209	70,858	70,859	70,859	70,859	70,859	70,859	70,859	70,859	70,859	70,859	70,859
1. Bacoor	6,314	6,562	6,811	7,059	7,308	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556
2. Cavite City	6,714	7,156	8,799	9,841	10,884	11,926	13,138	15,551	17,363	19,176	20,988	20,988	20,988	20,988	20,988	20,988	20,988	20,988	20,988	20,988	20,988
3. Imus	1,654	3,316	4,979	6,641	8,303	9,965	11,628	13,290	14,952	16,615	18,277	18,277	18,277	18,277	18,277	18,277	18,277	18,277	18,277	18,277	18,277
4. Kawit	4,329	4,969	5,609	6,249	6,889	7,529	8,169	8,810	9,450	10,090	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730	10,730
5. Noveleta	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070
6. Rosario	889	1,424	1,959	2,494	3,028	3,563	4,098	4,633	5,168	5,703	6,238	6,238	6,238	6,238	6,238	6,238	6,238	6,238	6,238	6,238	6,238
III. RIZAL	29,808	35,826	41,444	47,262	53,080	58,898	65,084	71,270	76,213	81,156	86,098	88,880	93,662	97,444	101,226	105,008	110,280	115,553	120,826	126,099	131,371
1. Angono	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Antipolo	11,621	13,297	14,972	16,648	18,323	19,999	21,675	23,352	25,028	26,705	28,381	28,857	29,332	29,808	30,284	30,760	31,184	32,768	33,772	34,776	35,780
3. Baras	-	29	58	87	116	145	174	203	233	262	291	361	431	502	572	642	747	851	956	1,060	1,165
4. Binangonan	-	1,678	3,355	5,033	6,710	8,388	10,065	11,743	13,420	15,098	16,775	18,520	20,266	22,011	23,756	25,501	27,118	30,050	32,325	34,600	36,874
5. Cainta	3,785	3,985	4,185	4,385	4,585	4,786	4,986	5,186	5,386	5,586	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786
6. Cardona	-	97	194	291	388	485	582	679	776	874	971	1,046	1,121	1,196	1,272	1,347	1,443	1,538	1,634	1,729	1,825
7. Jala-Jala	-	41	83	124	166	207	248	290	331	373	414	513	613	712	811	911	1,058	1,205	1,352	1,499	1,646
8. Montalban	3,243	3,730	4,218	4,705	5,193	5,680	6,182	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684
9. Morong	-	193	386	578	771	964	1,157	1,350	1,543	1,735	1,928	2,109	2,290	2,471	2,652	2,833	3,082	3,330	3,579	3,828	4,076
10. Pililla	-	179	357	536	714	893	1,072	1,250	1,429	1,607	1,786	2,121	2,456	2,792	3,127	3,462	3,792	4,121	4,450	4,779	5,108
11. San Mateo	4,706	5,094	5,483	5,871	6,260	6,648	7,389	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130
12. Tanay	-	604	1,208	1,812	2,416	3,019	3,623	4,227	4,831	5,435	6,039	6,716	7,393	8,070	8,748	9,425	10,333	11,242	12,151	13,060	13,968
13. Taytay	6,453	6,577	6,701	6,826	6,950	7,074	7,198	7,322	7,447	7,571	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695
14. Teresa	-	122	244	366	488	609	731	853	975	1,097	1,219	1,341	1,464	1,587	1,709	1,832	1,992	2,153	2,313	2,474	2,634
TOTAL	89,739	102,072	114,406	126,739	139,073	151,406	162,242	173,077	182,670	192,262	201,855	204,637	209,419	213,201	216,983	220,765	226,037	231,310	236,583	241,856	247,128

TABLE 13.4.34 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 2) (cont'd)

(PRIVATE)

CITY/MUNICIPALITY	1990				1995				2000				2005				2010			
I. NCR	640,331	646,066	651,194	656,323	661,452	666,580	671,709	676,837	681,966	687,095	692,223	685,956	679,688	673,422	667,155	660,888	659,299	657,710	656,121	654,532	652,943
1. Manila	12,665	14,185	15,705	17,225	18,745	20,265	21,785	23,305	24,826	26,346	27,866	27,787	27,708	27,629	27,551	27,472	27,449	27,427	27,404	27,381	27,359
2. Pasay City	17,997	18,159	18,321	18,483	18,645	18,807	18,970	19,132	19,294	19,456	19,618	19,036	18,454	17,872	17,290	16,708	16,713	16,718	16,725	16,731	16,736
3. Quezon City	81,324	90,339	83,353	88,368	81,383	86,397	85,412	84,427	83,441	82,456	81,471	81,551	81,632	81,713	81,794	81,874	82,032	82,189	82,347	82,504	82,662
4. Caloocan City	27,476	28,575	29,673	30,772	31,870	32,969	34,068	35,166	36,265	37,363	38,462	37,564	36,665	35,767	34,868	33,970	32,768	31,566	30,364	29,162	27,960
5. Las Pinas	81,778	79,501	77,225	74,948	72,672	70,395	68,119	65,842	63,566	61,289	59,013	58,099	57,185	56,272	55,358	54,444	55,463	56,482	57,501	58,521	59,540
6. Makati	25,179	24,746	24,312	23,879	23,445	23,012	22,578	22,145	21,711	21,278	20,844	20,859	20,875	20,890	20,905	20,920	20,943	20,966	20,990	21,013	21,036
7. Malabon	18,473	19,356	20,239	21,122	22,006	22,889	23,772	24,655	25,538	26,421	27,304	26,914	26,523	26,132	25,742	25,351	24,876	24,402	23,928	23,453	22,979
8. Mandaluyong	8,976	9,118	9,260	9,402	9,543	9,685	9,827	9,969	10,111	10,253	10,395	10,395	10,394	10,394	10,394	10,394	10,406	10,419	10,431	10,444	10,456
9. Marikina	13,573	13,825	14,077	14,329	14,581	14,833	15,086	15,338	15,590	15,842	16,094	16,140	16,187	16,233	16,280	16,326	16,386	16,446	16,506	16,566	16,626
10. Muntinlupa	91,618	90,295	88,972	87,649	86,326	85,003	83,680	82,356	81,033	79,710	78,387	77,518	76,650	75,781	74,912	74,043	74,456	74,869	75,282	75,695	76,108
11. Navotas	4,051	4,122	4,193	4,264	4,335	4,406	4,477	4,548	4,619	4,690	4,761	4,756	4,751	4,746	4,741	4,737	4,747	4,757	4,767	4,777	4,787
12. Paranaque	70,158	68,152	67,346	65,541	64,535	63,129	61,723	60,317	58,911	57,506	56,100	55,153	54,219	53,278	52,338	51,397	51,514	51,631	51,748	51,865	51,981
13. Pasig	75,958	78,505	81,052	83,600	86,147	88,694	91,241	93,788	96,335	98,883	101,430	101,438	101,446	101,454	101,463	101,471	101,660	101,849	102,038	102,127	102,216
14. Pateros	1,756	2,162	2,567	2,973	3,379	3,785	4,190	4,596	5,002	5,408	5,813	5,645	5,485	5,320	5,156	4,992	4,774	4,556	4,339	4,121	3,904
15. San Juan	408	556	704	852	1,000	1,148	1,296	1,444	1,592	1,740	1,888	1,888	1,888	1,888	1,888	1,888	1,886	1,885	1,883	1,882	1,880
16. Taguig	66,367	67,884	69,401	70,918	72,435	73,952	75,469	76,986	78,503	80,020	81,537	80,749	79,961	79,173	78,385	77,597	76,489	75,381	74,273	73,165	72,057
17. Valenzuela	33,180	35,986	38,792	41,598	44,404	47,210	50,016	52,823	55,629	58,435	61,241	60,394	59,546	58,699	57,852	57,005	56,535	56,066	55,596	55,127	54,657
II. CAVITE	57,927	57,037	56,148	55,258	54,369	53,479	52,590	51,700	50,811	49,921	49,032	47,876	46,720	44,564	43,608	42,252	41,104	39,955	38,807	37,659	36,511
1. Bacoor	32,210	29,960	27,711	25,461	23,211	20,961	18,712	16,462	14,212	11,962	9,713	9,559	9,406	9,252	9,099	8,945	9,238	9,531	9,823	10,116	10,409
2. Cavite City	4,328	4,860	5,392	5,924	6,456	6,988	7,520	8,052	8,584	9,116	9,648	9,083	8,517	7,951	7,385	6,819	6,531	6,243	5,955	5,667	5,379
3. Imus	4,443	5,134	5,825	6,515	7,206	7,897	8,588	9,279	9,969	10,660	11,351	11,093	10,835	10,577	10,319	10,061	9,299	8,537	7,774	7,012	6,250
4. Kawit	2,830	2,732	2,635	2,537	2,440	2,342	2,245	2,147	2,050	1,952	1,855	1,604	1,354	1,103	853	603	482	362	241	121	0
5. Noveleta	5,659	5,263	4,868	4,472	4,076	3,680	3,285	2,889	2,493	2,097	1,702	1,618	1,535	1,451	1,368	1,284	1,191	1,097	1,003	910	816
6. Rosario	8,457	9,088	9,718	10,349	10,979	11,610	12,241	12,871	13,502	14,132	14,763	14,718	14,673	14,629	14,584	14,539	14,363	14,186	14,010	13,834	13,657
III. RIZAL	141,839	145,480	149,123	152,765	156,408	160,050	163,692	167,335	170,977	174,619	178,262	181,352	184,441	187,531	190,621	193,711	195,490	197,269	199,049	200,828	202,608
1. Angono	-	242	484	726	968	1,210	1,451	1,693	1,935	2,177	2,419	2,454	2,488	2,523	2,557	2,592	2,577	2,562	2,546	2,531	2,516
2. Antipolo	44,155	44,268	44,381	44,493	44,606	44,719	44,832	44,944	45,057	45,170	45,283	46,461	47,639	48,818	49,996	51,175	52,016	52,857	53,698	54,539	55,380
3. Baras	-	66	132	197	263	329	395	461	526	592	658	668	679	688	698	708	713	717	722	726	731
4. Binangonan	-	562	1,124	1,686	2,248	2,810	3,372	3,934	4,496	5,058	5,620	5,630	5,640	5,651	5,661	5,671	5,587	5,503	5,418	5,334	5,250
5. Cainta	48,619	50,473	52,328	54,182	56,036	57,891	59,745	61,599	63,453	65,308	67,162	68,455	69,748	71,041	72,334	73,627	74,527	75,427	76,327	77,227	78,127
6. Cardona	-	116	233	349	466	582	698	815	931	1,048	1,164	1,169	1,174	1,178	1,183	1,188	1,186	1,184	1,182	1,180	1,178
7. Jala-Jala	-	61	122	183	244	305	366	427	488	549	610	616	621	627	632	638	637	636	634	633	632
8. Montalban	8,030	8,084	8,137	8,191	8,244	8,298	8,352	8,405	8,459	8,513	8,566	8,640	8,714	8,788	8,862	8,936	9,012	9,089	9,165	9,242	9,318
9. Morong	-	122	243	365	486	608	730	851	973	1,094	1,216	1,231	1,246	1,260	1,275	1,290	1,296	1,301	1,307	1,312	1,318
10. Pililla	-	130	260	391	521	651	781	911	1,042	1,172	1,302	1,313	1,324	1,334	1,345	1,355	1,350	1,343	1,337	1,330	1,324
11. San Mateo	3,641	4,061	4,482	4,902	5,322	5,743	6,163	6,583	7,004	7,424	7,844	7,842	7,840	7,838	7,836	7,833	7,705	7,577	7,449	7,321	7,193
12. Tanay	-	256	512	768	1,024	1,280	1,535	1,791	2,047	2,303	2,559	2,580	2,600	2,621	2,641	2,662	2,644	2,627	2,609	2,592	2,574
13. Taytay	37,353	36,966	36,578	36,191	35,804	35,256	34,829	34,402	33,974	33,547	33,120	33,557	33,994	34,431	34,867	35,304	35,519	35,735	35,950	36,165	36,380
14. Teresa	-	74	148	222	296	370	443	517	591	665	739	737	735	734	732	730	721	712	704	695	686
TOTAL	840,098	848,583	856,465	864,346	872,229	880,109	887,991	895,872	903,754	911,635	919,517	914,983	910,450	905,917	901,383	896,850	895,892	894,935	893,977	893,019	892,062

TABLE 13.4.35 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 3)

(MWSS)

CITY/MUNICIPALITY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
I. NCR	32,961	35,348	37,736	40,123	42,511	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898
1. Manila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Pasay City	4,461	4,585	4,709	4,834	4,958	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082
3. Quezon City	14,186	15,014	15,842	16,670	17,498	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326
4. Caloocan City	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Las Pinas	1,527	1,568	1,610	1,651	1,693	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734
6. Makati	3,772	4,490	5,207	5,925	6,642	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360
7. Malabon	554	692	830	968	1,106	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244
8. Mandaluyong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Marikina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Muntinlupa	5,777	6,025	6,274	6,522	6,771	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019
11. Navotas	106	147	189	230	272	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
12. Paranaque	1,147	1,271	1,395	1,520	1,644	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768
13. Pasig	49	90	132	173	215	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256
14. Pateros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. San Juan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. Taguig	640	681	723	764	806	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847
17. Valenzuela	742	783	825	866	908	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949
II. CAVITE	26,970	32,070	37,169	42,269	47,369	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468	52,468
1. Bacoor	6,314	6,562	6,811	7,059	7,308	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556
2. Cavite City	6,714	7,756	8,799	9,841	10,884	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926	11,926
3. Imus	1,654	3,572	5,490	7,408	9,327	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245	11,245
4. Kawit	4,329	5,649	6,969	8,288	9,609	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929	10,929
5. Noveleta	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070
6. Rosario	889	1,460	2,030	2,601	3,171	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742
III. RIZAL	29,808	36,576	43,344	50,112	56,881	63,649	68,885	74,120	78,111	82,106	86,098	89,880	93,662	97,444	101,226	105,008	110,280	115,553	120,826	126,099	131,371
1. Angono	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Antipolo	11,621	13,297	14,972	16,648	18,324	19,999	21,676	23,352	25,028	26,705	28,381	28,857	29,332	29,808	30,284	30,760	31,764	32,768	33,772	34,776	35,780
3. Baras	-	38	75	113	150	188	208	229	250	270	291	361	431	502	572	642	747	851	956	1,060	1,165
4. Binangonan	-	2,083	4,166	6,248	8,331	10,414	11,686	12,959	14,231	15,503	16,775	18,520	20,266	22,011	23,756	25,501	27,776	30,050	32,325	34,600	36,874
5. Cainta	3,785	4,185	4,585	4,986	5,386	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786
6. Cardona	-	146	291	437	583	728	777	825	874	922	971	1,046	1,121	1,196	1,272	1,347	1,443	1,538	1,634	1,729	1,825
7. Jala-Jala	-	22	44	66	87	109	170	231	292	353	414	513	613	712	811	911	1,058	1,205	1,352	1,499	1,646
8. Montalban	3,243	3,330	4,218	4,705	5,193	5,680	6,182	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684	6,684
9. Morong	-	284	568	851	1,135	1,419	1,521	1,623	1,724	1,826	1,928	2,109	2,290	2,471	2,652	2,833	3,082	3,330	3,579	3,828	4,076
10. Pililla	-	209	418	627	836	1,045	1,193	1,341	1,489	1,638	1,786	2,121	2,456	2,792	3,127	3,462	3,792	4,121	4,450	4,779	5,108
11. San Mateo	4,706	5,094	5,483	5,871	6,259	6,648	7,389	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130	8,130
12. Tanay	-	645	1,290	1,935	2,580	3,225	3,788	4,350	4,913	5,476	6,039	6,716	7,393	8,070	8,748	9,425	10,333	11,242	12,151	13,060	13,968
13. Taytay	6,453	6,701	6,950	7,198	7,447	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695
14. Teresa	-	143	285	428	570	713	814	915	1,016	1,118	1,219	1,341	1,464	1,587	1,709	1,832	1,992	2,153	2,313	2,474	2,634
TOTAL	89,739	103,994	118,249	132,505	146,760	161,015	166,251	171,487	175,479	179,472	183,465	187,247	191,028	194,810	198,592	202,374	207,647	212,919	218,192	223,465	228,738

TABLE 13.4.35 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 3) (cont'd)

(PRIVATE)

CITY/MUNICIPALITY	1990				1995				2000				2005				2010	
I. NCR	640,937	648,066	651,194	656,323	661,452	666,580	671,709	676,837	681,966	687,095	692,223	695,148	698,072	640,996	623,921	606,845	605,256	603,667	602,078	600,489	598,900
1. Manila	12,665	14,185	15,705	17,225	18,745	20,265	21,785	23,305	24,826	26,346	27,866	27,787	27,708	27,629	27,551	27,472	27,449	27,427	27,404	27,381	27,359
2. Pasay City	17,997	18,159	18,321	18,483	18,645	18,807	18,970	19,132	19,294	19,456	19,618	19,036	18,454	17,872	17,290	16,708	16,713	16,719	16,725	16,731	16,736
3. Quezon City	91,324	90,339	89,353	88,368	87,383	86,397	85,412	84,427	83,441	82,456	81,471	81,551	81,632	81,713	81,794	81,874	82,032	82,189	82,347	82,504	82,662
4. Caloocan City	27,476	28,575	29,673	30,772	31,870	32,969	34,068	35,166	36,265	37,363	38,462	37,564	36,665	35,767	34,868	33,970	32,768	31,566	30,364	29,162	27,960
5. Las Pinas	81,778	79,501	77,225	74,948	72,672	70,395	68,119	65,842	63,566	61,289	59,013	56,991	54,968	52,946	50,923	48,901	49,920	50,939	51,958	52,977	53,996
6. Makati	25,179	24,746	24,312	23,879	23,445	23,012	22,578	22,145	21,711	21,278	20,844	20,859	20,875	20,890	20,905	20,920	20,943	20,966	20,990	21,013	21,036
7. Malabon	18,473	19,356	20,239	21,122	22,006	22,889	23,772	24,655	25,538	26,421	27,304	26,914	26,523	26,132	25,742	25,351	24,876	24,402	23,928	23,453	22,979
8. Mandaluyong	8,976	9,118	9,260	9,402	9,543	9,685	9,827	9,969	10,111	10,253	10,395	10,395	10,394	10,394	10,394	10,394	10,406	10,419	10,431	10,444	10,456
9. Marikina	13,573	13,825	14,077	14,329	14,581	14,833	15,086	15,338	15,590	15,842	16,094	15,768	15,442	15,115	14,789	14,463	14,523	14,583	14,643	14,703	14,763
10. Muntinlupa	91,618	90,295	88,972	87,649	86,326	85,003	83,680	82,356	81,033	79,710	78,387	75,581	72,776	69,970	67,164	64,358	64,771	65,184	65,597	66,010	66,423
11. Navotas	4,051	4,122	4,193	4,264	4,335	4,406	4,477	4,548	4,619	4,690	4,761	4,756	4,751	4,746	4,741	4,737	4,747	4,757	4,767	4,777	4,787
12. Paranaque	70,158	68,752	67,346	65,941	64,535	63,129	61,723	60,317	58,911	57,506	56,100	54,122	52,145	50,167	48,190	46,212	46,329	46,446	46,563	46,680	46,797
13. Pasig	75,958	78,505	81,052	83,600	86,147	88,694	91,241	93,788	96,335	98,883	101,430	98,537	95,645	92,752	89,860	86,967	87,056	87,145	87,234	87,323	87,412
14. Pateros	1,756	2,162	2,567	2,973	3,379	3,785	4,190	4,596	5,002	5,408	5,813	5,573	5,333	5,093	4,853	4,613	4,396	4,178	3,961	3,743	3,525
15. San Juan	408	556	704	852	1,000	1,148	1,296	1,444	1,592	1,740	1,888	1,888	1,888	1,888	1,888	1,888	1,886	1,885	1,883	1,882	1,880
16. Taguig	66,367	67,884	69,401	70,918	72,435	73,952	75,469	76,986	78,503	80,020	81,537	78,770	76,002	73,235	70,467	67,700	66,592	65,484	64,376	63,268	62,160
17. Valenzuela	33,180	35,986	38,792	41,598	44,404	47,210	50,016	52,823	55,629	58,435	61,241	59,056	56,872	54,687	52,502	50,318	49,848	49,379	48,909	48,439	47,970
II. CAVITE	57,927	57,037	56,148	55,258	54,369	53,479	52,590	51,700	50,811	49,921	49,032	47,133	45,234	43,335	41,436	39,537	38,388	37,240	36,092	34,944	33,796
1. Bacoor	32,210	29,960	27,711	25,461	23,211	20,961	18,712	16,462	14,212	11,962	9,713	9,520	9,327	9,134	8,942	8,749	9,041	9,334	9,627	9,919	10,212
2. Cavite City	4,328	4,860	5,392	5,924	6,456	6,988	7,520	8,052	8,584	9,116	9,648	8,888	8,128	7,367	6,607	5,847	5,559	5,271	4,983	4,695	4,406
3. Imus	4,443	5,134	5,825	6,515	7,206	7,897	8,588	9,279	9,969	10,660	11,351	11,034	10,717	10,400	10,084	9,767	9,004	8,242	7,480	6,718	5,956
4. Kawit	2,830	2,732	2,635	2,537	2,440	2,342	2,245	2,147	2,050	1,952	1,855	1,604	1,354	1,103	853	603	482	362	241	121	0
5. Noveleta	5,659	5,263	4,868	4,472	4,076	3,680	3,285	2,889	2,493	2,097	1,702	1,618	1,535	1,451	1,368	1,284	1,191	1,097	1,003	910	816
6. Rosario	8,457	9,088	9,718	10,349	10,979	11,610	12,241	12,871	13,502	14,132	14,763	14,468	14,173	13,878	13,582	13,287	13,111	12,935	12,758	12,582	12,406
III. RIZAL	141,838	145,480	149,123	152,765	156,408	160,050	163,692	167,335	170,977	174,619	178,262	181,352	184,441	187,531	190,621	193,711	195,490	197,269	199,049	200,828	202,608
1. Angono	-	242	484	726	968	1,210	1,451	1,693	1,935	2,177	2,419	2,454	2,488	2,523	2,557	2,592	2,577	2,562	2,546	2,531	2,516
2. Antipolo	44,155	44,268	44,381	44,493	44,606	44,719	44,832	44,944	45,057	45,170	45,283	46,461	47,639	48,818	49,996	51,175	52,016	52,857	53,698	54,539	55,380
3. Baras	-	66	132	197	263	329	395	461	526	592	658	668	678	688	698	708	713	717	722	726	731
4. Binangonan	-	562	1,124	1,686	2,248	2,810	3,372	3,934	4,496	5,058	5,620	5,630	5,640	5,651	5,661	5,671	5,587	5,503	5,418	5,334	5,250
5. Cainta	48,619	50,473	52,328	54,182	56,036	57,891	59,745	61,599	63,453	65,308	67,162	68,455	69,748	71,041	72,334	73,627	74,527	75,427	76,327	77,227	78,127
6. Cardona	-	116	233	349	466	582	698	815	931	1,048	1,164	1,169	1,174	1,178	1,183	1,188	1,186	1,184	1,182	1,180	1,178
7. Jala-Jala	-	61	122	183	244	305	366	427	488	549	610	616	621	627	632	638	637	636	634	633	632
8. Mostalban	8,030	8,084	8,137	8,191	8,244	8,298	8,352	8,405	8,459	8,513	8,566	8,640	8,714	8,788	8,862	8,936	9,012	9,089	9,165	9,242	9,318
9. Morong	-	122	243	365	486	608	730	851	973	1,094	1,216	1,231	1,246	1,260	1,275	1,290	1,296	1,301	1,307	1,312	1,318
10. Pililla	-	130	260	391	521	651	781	911	1,042	1,172	1,302	1,313	1,324	1,334	1,345	1,356	1,350	1,343	1,337	1,330	1,324
11. San Mateo	3,641	4,061	4,482	4,902	5,322	5,743	6,163	6,583	7,004	7,424	7,844	7,842	7,840	7,838	7,836	7,833	7,705	7,577	7,449	7,321	7,193
12. Tanay	-	256	512	768	1,024	1,280	1,535	1,791	2,047	2,303	2,559	2,580	2,600	2,621	2,641	2,662	2,644	2,627	2,609	2,592	2,574
13. Taytay	37,393	36,966	36,538	36,111	35,684	35,256	34,829	34,402	33,974	33,547	33,120	33,557	33,994	34,431	34,867	35,304	35,519	35,735	35,950	36,165	36,380
14. Teresa	-	74	148	222	296	370	443	517	591	665	739	737	735	734	732	730	721	712	704	695	686
TOTAL	840,702	848,583	856,465	864,346	872,228	880,109	887,991	895,872	903,754	911,635	919,517	923,632	927,747	871,862	855,977	840,092	839,134	838,177	837,219	836,261	835,304

TABLE 13.4.36 DISTRIBUTION OF GROUNDWATER DISCHARGE (SCENARIO 4)

(MWSS)

CITY/MUNICIPALITY	1990	1995									2000							2005				2010
I. NCR	32,961	35,348	37,736	40,123	42,511	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898	44,898
1. Manila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Pasay City	4,461	4,585	4,709	4,834	4,958	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082	5,082
3. Quezon City	14,186	15,014	15,842	16,670	17,498	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326	18,326
4. Caloocan City	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Las Pinas	1,527	1,568	1,610	1,651	1,693	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734
6. Makati	3,772	4,490	5,207	5,925	6,642	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360	7,360
7. Malabon	554	692	830	968	1,106	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244	1,244
8. Mandaluyong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Marikina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Muntinlupa	5,777	6,025	6,274	6,522	6,771	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019	7,019
11. Navotas	106	147	189	230	272	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313	313
12. Paranaque	1,147	1,271	1,395	1,520	1,644	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768
13. Pasig	49	90	132	173	215	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256
14. Pateros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. San Juan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. Taguig	640	681	723	764	806	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847
17. Valenzuela	742	783	825	866	908	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949	949
II. CAVITE	26,970	30,760	34,550	38,340	42,131	45,921	49,712	53,503	57,294	61,084	64,875	67,965	71,055	74,144	77,234	80,324	84,038	87,752	91,466	95,180	98,894	
1. Bacoor	6,314	6,562	6,811	7,059	7,308	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556	7,556
2. Cavite City	6,314	7,745	9,176	9,807	10,838	11,869	13,149	14,429	15,710	16,990	18,270	19,617	20,964	22,312	23,659	25,006	26,309	27,612	28,915	30,218	31,521	
3. Imus	1,656	3,126	4,596	6,070	7,542	9,014	10,486	11,958	13,430	14,902	16,374	17,535	18,697	19,859	21,020	22,182	23,892	25,602	27,313	29,023	30,733	
4. Kawit	4,329	4,900	5,471	6,041	6,612	7,183	7,754	8,324	8,895	9,466	10,037	10,154	10,272	10,389	10,507	10,625	10,637	10,650	10,663	10,676	10,688	
5. Noveleta	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	7,070	
6. Rosario	889	1,357	1,825	2,293	2,761	3,229	3,697	4,165	4,633	5,101	5,569	6,032	6,495	6,959	7,422	7,885	8,573	9,261	9,950	10,638	11,326	
III. RIZAL	29,808	34,686	39,564	44,442	49,320	54,199	60,511	66,824	73,137	79,450	84,734	88,497	92,260	96,022	99,786	103,549	108,632	113,715	118,798	123,881	128,964	
1. Angono	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2. Antipolo	11,821	12,650	13,479	14,308	15,138	16,767	18,785	20,803	22,821	24,840	26,858	27,315	27,772	28,229	28,686	29,142	29,957	30,771	31,585	32,399	33,213	
3. Baras	-	29	58	87	116	145	174	203	233	262	291	361	431	502	572	642	747	851	956	1,060	1,165	
4. Binangonan	-	1,678	3,355	5,033	6,710	8,388	10,065	11,743	13,420	15,098	16,775	18,520	20,266	22,011	23,756	25,501	27,775	30,050	32,325	34,600	36,874	
5. Cainta	3,785	3,985	4,185	4,385	4,585	4,786	4,986	5,186	5,386	5,586	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	5,786	
6. Cardona	-	97	194	291	388	485	582	679	776	874	971	1,046	1,121	1,196	1,272	1,347	1,443	1,538	1,634	1,729	1,825	
7. Jala-Jala	-	41	83	124	166	207	248	290	331	373	414	513	613	712	811	911	1,058	1,205	1,352	1,499	1,646	
8. Montalban	3,243	3,494	3,745	3,997	4,248	4,499	5,021	5,542	6,064	6,585	6,585	6,585	6,585	6,585	6,585	6,585	6,585	6,585	6,585	6,585	6,585	
9. Morong	-	193	386	578	771	964	1,157	1,350	1,543	1,735	1,928	2,109	2,290	2,471	2,652	2,833	3,082	3,330	3,579	3,828	4,076	
10. Pililla	-	179	357	536	714	893	1,072	1,250	1,429	1,607	1,786	2,121	2,456	2,792	3,127	3,462	3,792	4,121	4,450	4,779	5,108	
11. San Mateo	4,306	5,037	5,768	6,700	6,031	6,362	6,869	7,375	7,882	8,388	8,388	8,388	8,388	8,388	8,388	8,388	8,388	8,388	8,388	8,388	8,388	
12. Taguy	-	604	1,208	1,812	2,416	3,019	3,623	4,227	4,831	5,435	6,039	6,716	7,393	8,070	8,748	9,425	10,333	11,242	12,151	13,060	13,968	
13. Taytay	6,453	6,577	6,701	6,826	6,950	7,074	7,198	7,322	7,447	7,571	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	7,695	
14. Teresa	-	122	244	366	488	609	731	853	975	1,097	1,219	1,341	1,464	1,587	1,709	1,832	1,992	2,153	2,313	2,474	2,634	
TOTAL	89,739	100,795	111,850	122,906	133,962	145,017	155,121	165,225	175,328	185,432	194,508	201,360	208,213	215,066	221,918	228,771	237,568	246,365	255,162	263,959	272,756	

TABLE 13.4.36 DISTRIBUTION OF GROUNDWATER DISCHARGE [SCENARIO 4] (cont'd)

(PRIVATE)

CITY/MUNICIPALITY	1990	1995									2000									2005				2010
I. NCR	640,937	651,965	662,994	674,022	685,051	696,079	707,107	718,136	729,164	740,193	751,221	748,425	745,628	742,832	740,036	737,240	743,275	749,311	755,346	761,382	767,418
1. Manila	12,665	14,230	15,795	17,361	18,926	20,491	22,056	23,621	25,187	26,752	28,317	28,239	28,161	28,083	28,005	27,926	27,903	27,881	27,858	27,835	27,812
2. Pasay City	17,997	18,294	18,591	18,887	19,184	19,481	19,778	20,074	20,371	20,668	20,965	20,406	19,848	19,289	18,731	18,172	17,537	17,702	17,466	17,231	16,996
3. Quezon City	91,324	90,410	89,497	88,583	87,670	86,756	85,843	84,929	84,016	83,102	82,189	82,280	82,370	82,461	82,552	82,643	82,806	82,974	83,140	83,305	83,471
4. Caloocan City	27,475	29,148	30,820	32,492	34,164	35,836	37,508	39,180	40,852	42,525	44,197	42,856	41,515	40,175	38,834	37,493	36,371	35,249	34,128	33,006	31,884
5. Las Pinas	81,778	80,593	79,408	78,223	77,038	75,853	74,668	73,483	72,298	71,112	69,927	68,868	67,808	66,748	65,688	64,628	65,719	66,810	67,901	68,992	70,083
6. Makati	25,178	24,949	24,720	24,490	24,261	24,031	23,802	23,572	23,342	23,113	22,883	22,515	22,146	21,778	21,409	21,041	21,065	21,089	21,113	21,137	21,160
7. Malabon	19,673	19,564	20,654	21,745	22,835	23,926	25,017	26,108	27,198	28,289	29,380	28,813	28,246	27,679	27,112	26,545	26,087	25,630	25,173	24,715	24,258
8. Mandaluyong	9,816	9,128	9,280	9,432	9,584	9,737	9,889	10,041	10,193	10,345	10,497	10,498	10,498	10,499	10,500	10,500	10,513	10,526	10,540	10,553	10,566
9. Marikina	13,573	13,838	14,103	14,368	14,633	14,899	15,164	15,429	15,694	15,959	16,224	16,626	17,028	17,430	17,831	18,233	18,640	19,046	19,453	19,859	20,266
10. Muntinlupa	91,618	91,185	90,752	90,319	89,886	89,454	89,021	88,588	88,155	87,722	87,289	87,121	86,953	86,785	86,616	86,448	88,051	89,654	91,257	92,860	94,464
11. Navotas	4,851	4,193	4,336	4,478	4,621	4,763	4,906	5,048	5,191	5,333	5,475	5,351	5,227	5,103	4,979	4,855	4,866	4,877	4,889	4,900	4,911
12. Paranaque	70,158	69,672	69,185	68,699	68,213	67,727	67,240	66,754	66,268	65,782	65,295	63,999	62,702	61,405	60,109	58,812	59,408	60,004	60,600	61,196	61,791
13. Pasig	75,558	78,686	81,813	84,941	88,068	89,596	92,323	95,051	97,778	100,506	103,233	105,771	108,310	110,848	113,386	115,924	118,730	121,535	124,340	127,146	129,951
14. Pateros	1,756	2,270	2,784	3,298	3,812	4,325	4,839	5,353	5,867	6,381	6,895	6,684	6,473	6,262	6,051	5,841	5,702	5,562	5,423	5,284	5,145
15. San Juan	408	558	708	857	1,007	1,157	1,307	1,457	1,606	1,756	1,906	1,906	1,906	1,906	1,906	1,906	1,904	1,903	1,901	1,900	1,898
16. Taguig	66,367	68,982	71,598	74,213	76,829	79,444	82,059	84,675	87,290	89,906	92,521	91,923	91,326	90,728	90,131	89,534	90,300	91,067	91,834	92,600	93,367
17. Valenzuela	33,180	36,265	39,350	42,434	45,519	48,604	51,689	54,773	57,858	60,943	64,028	64,570	65,112	65,654	66,196	66,738	67,269	67,800	68,332	68,863	69,394
II. CAVITE	57,927	58,075	58,223	58,371	58,519	58,667	58,815	58,964	59,112	59,260	59,408	57,453	55,499	53,544	51,589	49,635	48,832	48,030	47,227	46,425	45,623
1. Bacoor	32,210	30,558	28,907	27,255	25,603	23,951	22,300	20,648	18,996	17,345	15,693	14,592	13,492	12,391	11,290	10,190	10,313	10,436	10,560	10,683	10,806
2. Cavite City	4,328	4,913	5,618	6,263	6,908	7,553	8,198	8,843	9,488	10,133	10,778	10,439	10,099	9,760	9,420	9,081	8,861	8,642	8,422	8,203	7,983
3. Imus	4,443	5,261	6,091	6,915	7,739	8,563	9,387	10,211	11,035	11,859	12,683	12,418	12,152	11,886	11,621	11,355	10,845	10,334	9,824	9,314	8,804
4. Kawit	2,830	2,802	2,774	2,745	2,717	2,689	2,661	2,632	2,604	2,576	2,548	2,298	2,008	1,738	1,468	1,199	1,019	839	660	480	301
5. Noveleta	5,659	5,341	5,022	4,704	4,385	4,067	3,748	3,430	3,111	2,793	2,475	2,286	2,117	1,938	1,758	1,579	1,472	1,364	1,257	1,149	1,042
6. Rosario	8,457	9,134	9,812	10,489	11,167	11,844	12,522	13,199	13,876	14,554	15,231	15,431	15,631	15,831	16,031	16,231	16,322	16,413	16,505	16,596	16,687
III. RIZAL	141,838	146,653	151,469	156,284	161,099	165,915	170,730	175,545	180,361	185,176	189,991	191,155	192,598	195,402	197,205	199,009	201,072	203,134	205,197	207,260	209,323
1. Angono	-	242	484	726	968	1,210	1,451	1,693	1,935	2,177	2,419	2,454	2,488	2,523	2,557	2,592	2,577	2,562	2,546	2,531	2,516
2. Antipolo	44,155	44,377	44,599	44,820	45,042	45,264	45,486	45,707	45,929	46,151	46,373	47,573	48,784	49,990	51,196	52,402	53,399	54,396	55,392	56,389	57,386
3. Baras	-	66	132	197	263	329	395	461	526	592	658	666	678	688	698	708	713	717	722	726	731
4. Binangonan	-	562	1,124	1,686	2,248	2,810	3,372	3,934	4,496	5,058	5,620	5,630	5,640	5,651	5,661	5,671	5,587	5,503	5,418	5,334	5,250
5. Cainta	48,619	51,102	53,586	56,069	58,553	61,036	63,520	66,003	68,487	70,970	73,454	73,847	74,241	74,634	75,028	75,421	76,399	77,376	78,353	79,330	80,308
6. Cardona	-	116	233	349	466	582	698	815	931	1,048	1,164	1,169	1,174	1,179	1,183	1,188	1,186	1,184	1,182	1,180	1,178
7. Jala-Jala	-	61	122	183	244	305	366	427	488	549	610	616	621	627	632	638	637	636	634	633	632
8. Montalban	8,830	8,111	8,193	8,274	8,356	8,437	8,519	8,600	8,682	8,763	8,845	8,940	9,036	9,132	9,228	9,323	9,383	9,442	9,502	9,561	9,620
9. Morong	-	122	243	365	486	608	730	851	973	1,094	1,216	1,231	1,246	1,260	1,275	1,290	1,296	1,301	1,307	1,312	1,318
10. Pililla	-	130	260	391	521	651	781	911	1,042	1,172	1,302	1,313	1,324	1,334	1,345	1,356	1,350	1,343	1,337	1,330	1,324
11. San Mateo	3,641	4,117	4,593	5,068	5,544	6,020	6,496	6,972	7,447	7,923	8,399	8,417	8,435	8,452	8,470	8,488	8,384	8,279	8,175	8,070	7,966
12. Tanay	-	256	512	768	1,024	1,280	1,535	1,791	2,047	2,303	2,559	2,580	2,600	2,621	2,641	2,662	2,644	2,627	2,609	2,592	2,574
13. Taytay	37,393	37,317	37,241	37,165	37,089	37,014	36,938	36,862	36,786	36,710	36,634	36,615	36,596	36,577	36,558	36,539	36,738	37,057	37,376	37,695	37,834
14. Teresa	-	74	148	222	296	370	443	517	591	665	739	737	735	734	732	730	721	712	704	695	686
TOTAL	840,702	856,694	872,686	888,677	904,669	920,661	936,653	952,645	968,636	984,628	1,000,620	997,873	994,725	991,778	988,831	985,883	993,179	1,000,475	1,007,771	1,015,067	1,022,363

TABLE 13.4.37 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 1)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. NCR	32,961	44,898	44,898	44,898	44,898	640,937	666,580	692,223	711,915	753,685	673,898	711,478	737,121	756,813	798,583
1. Manila	0	0	0	0	0	12,665	20,265	27,866	27,472	27,359	12,665	20,265	27,866	27,472	27,359
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	18,807	19,618	16,708	16,736	22,458	23,889	24,700	21,790	21,818
3. Quezon City	14,186	18,326	18,326	18,326	18,326	91,324	86,397	81,471	81,674	82,662	105,510	104,723	99,797	100,200	100,988
4. Caloocan City	0	0	0	0	0	27,476	32,959	38,462	33,970	27,960	27,476	32,959	38,462	33,970	27,960
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	70,395	59,013	59,684	69,889	83,305	72,129	60,747	61,418	71,623
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	23,012	20,844	20,920	21,036	28,951	30,372	28,204	28,280	28,396
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	22,889	27,304	25,351	22,979	19,027	24,133	28,548	26,595	24,223
8. Mandaluyong	0	0	0	0	0	8,976	9,685	10,395	10,394	10,456	8,976	9,685	10,395	10,394	10,456
9. Marikina	0	0	0	0	0	13,573	14,833	16,094	18,090	20,112	13,573	14,833	16,094	18,090	20,112
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	85,003	78,387	83,225	94,265	97,395	92,022	85,406	90,244	101,284
11. Navotas	106	313	313	313	313	4,051	4,406	4,761	4,737	4,787	4,157	4,719	5,074	5,050	5,100
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	63,129	56,100	56,320	61,722	71,305	64,897	57,868	58,088	63,490
13. Pasig	49	256	256	256	256	75,958	88,694	101,430	115,717	129,726	76,007	88,950	101,686	115,973	129,982
14. Pateros	0	0	0	0	0	1,756	3,785	5,813	5,346	4,600	1,756	3,785	5,813	5,346	4,600
15. San Juan	0	0	0	0	0	408	1,148	1,888	1,888	1,880	408	1,148	1,888	1,888	1,880
16. Taguig	640	847	847	847	847	66,367	73,952	81,537	86,909	90,416	67,007	74,799	82,384	87,756	91,263
17. Valenzuela	742	949	949	949	949	33,180	47,210	61,241	63,311	67,101	33,922	48,159	62,190	64,260	68,050
II. CAVITE	26,970	47,610	70,858	84,961	103,590	57,927	53,479	49,032	44,868	41,718	84,897	101,090	119,890	129,829	145,308
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	20,961	9,713	9,140	10,799	38,524	28,517	17,269	16,696	18,355
2. Cavite City	6,714	11,926	20,988	27,133	32,500	4,328	6,988	9,649	7,781	7,310	11,042	18,914	30,637	34,914	39,810
3. Imus	1,654	9,965	18,277	23,527	33,381	4,443	7,897	11,351	10,346	6,818	6,097	17,862	29,628	33,873	40,199
4. Kawit	4,329	7,529	10,730	11,101	10,889	2,830	2,342	1,855	603	0	7,159	9,872	12,585	11,704	10,889
5. Noveleta	7,070	7,070	7,070	7,070	7,289	5,659	3,680	1,702	1,284	816	12,729	10,750	8,772	8,354	8,105
6. Rosario	889	3,563	6,238	8,573	12,275	8,457	11,610	14,763	15,715	15,975	9,346	15,173	21,001	24,288	28,250
III. RIZAL	29,808	58,898	86,098	105,008	131,371	141,838	160,050	178,262	193,711	202,608	171,646	218,948	264,360	298,718	333,979
1. Angono	-	0	0	0	0	-	1,210	2,419	2,592	2,516	-	1,210	2,419	2,592	2,516
2. Antipolo	11,621	19,999	28,381	30,760	35,780	44,155	44,719	45,283	51,175	55,380	55,776	64,718	73,664	81,934	91,160
3. Baras	-	145	291	642	1,165	-	329	658	708	731	-	474	949	1,350	1,896
4. Binangonan	-	8,388	16,775	25,501	36,874	-	2,810	5,620	5,671	5,250	-	11,198	22,395	31,172	42,124
5. Cainta	3,785	4,786	5,786	5,786	5,786	48,619	57,891	67,162	73,627	78,127	52,404	62,676	72,948	79,413	83,913
6. Cardona	-	485	971	1,347	1,825	-	582	1,164	1,188	1,178	-	1,067	2,135	2,535	3,003
7. Jala-Jala	-	207	414	911	1,646	-	305	610	638	632	-	512	1,024	1,549	2,278
8. Montalban	3,243	5,680	6,684	6,684	6,684	8,030	8,298	8,566	8,936	9,318	11,273	13,978	15,250	15,620	16,002
9. Morong	-	964	1,928	2,853	4,075	-	608	1,216	1,290	1,318	-	1,572	3,144	4,123	5,394
10. Pililla	-	893	1,786	3,462	5,105	-	651	1,302	1,356	1,324	-	1,544	3,088	4,818	6,432
11. San Mateo	4,706	6,648	8,130	8,130	8,130	3,641	5,743	7,844	7,833	7,193	8,347	12,391	15,974	15,963	15,323
12. Tanay	-	3,019	6,039	9,425	13,968	-	1,280	2,559	2,662	2,574	-	4,299	8,598	12,087	16,542
13. Taytay	6,453	7,074	7,695	7,695	7,695	37,393	35,256	33,120	35,304	36,380	43,846	42,330	40,815	42,999	44,075
14. Teresa	-	609	1,219	1,832	2,634	-	370	739	730	686	-	979	1,958	2,562	3,320
TOTAL	89,739	151,406	201,855	234,866	280,159	840,702	880,109	919,517	950,493	998,010	930,441	1,031,515	1,121,372	1,185,360	1,278,170

TABLE 13.4.38 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 2)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. NCR	32,961	44,898	44,898	44,898	44,898	640,937	666,580	692,223	660,888	652,943	673,898	711,478	737,121	705,786	697,841
1. Manila	0	0	0	0	0	12,665	20,265	27,866	27,472	27,359	12,665	20,265	27,866	27,472	27,359
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	18,807	19,615	16,708	16,736	22,458	23,889	24,700	21,790	21,818
3. Quezon City	14,186	18,326	18,326	18,326	18,326	91,324	86,397	81,471	81,874	82,662	105,510	104,723	99,797	100,200	100,988
4. Caloocan City	0	0	0	0	0	27,476	32,969	38,462	33,970	27,960	27,476	32,969	38,462	33,970	27,960
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	70,395	59,013	54,444	59,540	83,305	72,129	60,747	56,178	61,274
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	23,012	20,844	20,920	21,036	28,951	30,372	28,204	28,280	28,396
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	22,889	27,304	25,351	22,979	19,027	24,133	28,548	26,595	24,223
8. Mandaluyong	0	0	0	0	0	8,976	9,685	10,395	10,394	10,456	8,976	9,685	10,395	10,394	10,456
9. Marikina	0	0	0	0	0	13,573	14,833	16,094	16,326	16,626	13,573	14,833	16,094	16,326	16,626
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	85,003	78,387	74,843	76,108	97,395	92,022	85,406	81,862	83,127
11. Navotas	106	313	313	313	313	4,051	4,406	4,761	4,737	4,787	4,157	4,719	5,074	5,050	5,100
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	63,129	56,100	51,397	51,981	71,305	64,897	57,868	53,165	53,749
13. Pasig	49	256	256	256	256	75,958	88,694	101,430	101,771	102,216	76,007	88,950	101,686	102,027	102,472
14. Pateros	0	0	0	0	0	1,756	3,785	5,813	4,992	3,904	1,756	3,785	5,813	4,992	3,904
15. San Juan	0	0	0	0	0	408	1,148	1,888	1,888	1,880	408	1,148	1,888	1,888	1,880
16. Taguig	840	847	847	847	847	66,367	73,952	81,537	77,597	72,057	67,007	74,799	82,384	78,444	72,904
17. Valenzuela	742	949	949	949	949	33,180	47,210	61,241	57,005	54,657	33,922	48,159	62,190	57,954	55,606
II. CAVITE	26,970	47,610	70,858	70,859	70,859	57,927	53,479	49,032	42,252	36,511	84,897	101,090	119,890	113,111	107,370
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	20,961	9,713	8,945	10,409	38,524	28,517	17,269	16,501	17,965
2. Cavite City	6,714	11,926	20,988	20,988	20,988	4,328	6,988	9,649	6,819	5,379	11,042	18,914	30,637	27,807	26,367
3. Imus	1,654	9,965	18,277	18,277	18,277	4,443	7,897	11,351	10,051	6,250	6,097	17,862	29,628	28,328	24,527
4. Kawit	4,329	7,529	10,730	10,730	10,730	2,830	2,342	1,855	603	0	7,159	9,872	12,585	11,333	10,730
5. Noveleta	7,070	7,070	7,070	7,070	7,070	5,659	5,680	1,702	1,284	816	12,729	10,750	8,772	8,354	7,886
6. Rosario	889	3,563	6,238	6,238	6,238	8,457	11,610	14,763	14,539	13,657	9,346	15,173	21,001	20,777	19,895
III. RIZAL	29,808	58,898	86,098	105,008	131,371	141,838	160,050	178,262	193,711	202,608	171,646	218,948	264,360	298,718	333,979
1. Angono	-	0	0	0	0	-	1,210	2,419	2,592	2,516	-	1,210	2,419	2,592	2,516
2. Antipolo	11,621	19,999	28,381	30,760	35,780	44,155	44,719	45,283	51,175	55,380	55,776	64,718	73,664	81,934	91,160
3. Baras	-	145	291	642	1,165	-	329	658	708	731	-	474	949	1,350	1,896
4. Binangonan	-	8,388	16,775	25,501	36,874	-	2,810	5,620	5,671	5,250	-	11,198	22,395	31,172	42,124
5. Cainta	3,785	4,785	5,786	5,786	5,786	48,619	57,891	67,162	73,627	78,127	52,404	62,676	72,948	79,413	83,913
6. Cardona	-	485	971	1,347	1,825	-	582	1,164	1,188	1,178	-	1,067	2,135	2,535	3,003
7. Jala-Jala	-	207	414	911	1,646	-	305	610	638	632	-	512	1,024	1,549	2,278
8. Montalban	3,243	5,680	6,684	6,684	6,684	8,030	8,298	8,566	8,936	9,318	11,273	13,978	15,250	15,620	16,002
9. Morong	-	964	1,928	2,833	4,076	-	608	1,216	1,290	1,318	-	1,572	3,144	4,123	5,394
10. Pililla	-	893	1,786	3,462	5,108	-	651	1,302	1,356	1,324	-	1,544	3,088	4,818	6,432
11. San Mateo	4,706	6,648	8,130	8,130	8,130	3,641	5,743	7,844	7,833	7,193	8,347	12,391	15,974	15,963	15,323
12. Tanay	-	3,819	6,039	9,425	13,965	-	1,280	2,559	2,662	2,574	-	4,299	8,598	12,087	16,542
13. Taytay	6,453	7,074	7,695	7,695	7,695	37,393	35,256	33,120	35,304	36,380	43,846	42,330	40,815	42,999	44,075
14. Teresa	-	609	1,219	1,832	2,634	-	370	739	730	686	-	979	1,958	2,562	3,320
TOTAL	89,739	151,406	201,855	220,765	247,128	840,702	880,109	919,517	896,850	892,062	930,441	1,031,515	1,121,372	1,117,615	1,139,190

TABLE 13.4.39 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 3)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. NCR	32,961	44,898	44,898	44,898	44,898	640,937	666,580	692,223	606,845	598,900	673,898	711,478	737,121	651,743	643,798
1. Manila	0	0	0	0	0	12,665	20,265	27,865	27,472	27,359	12,665	20,265	27,865	27,472	27,359
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	18,807	19,615	16,708	16,736	22,458	23,889	24,700	21,790	21,818
3. Quezon City	14,156	18,326	18,326	18,326	18,326	91,324	86,397	81,471	81,874	82,662	105,510	104,723	99,797	100,200	100,988
4. Caloocan City	0	0	0	0	0	27,476	32,969	38,462	33,970	27,960	27,476	32,969	38,462	33,970	27,960
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	70,395	59,013	48,901	53,996	83,305	72,129	60,747	50,635	55,730
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	23,012	20,844	20,920	21,036	28,951	30,372	28,204	28,280	28,396
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	22,889	27,304	25,351	22,979	19,027	24,133	28,548	26,595	24,223
8. Mandaluyong	0	0	0	0	0	8,976	9,685	10,395	10,394	10,456	8,976	9,685	10,395	10,394	10,456
9. Marikina	0	0	0	0	0	13,573	14,833	16,094	14,463	14,763	13,573	14,833	16,094	14,463	14,763
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	85,003	78,387	64,358	66,423	97,395	92,022	85,406	71,377	73,442
11. Navotas	106	313	313	313	313	4,051	4,406	4,761	4,737	4,787	4,157	4,719	5,074	5,050	5,100
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	63,129	56,100	46,212	46,797	71,305	64,897	57,868	47,980	48,565
13. Pasig	49	256	256	256	256	75,958	88,694	101,430	86,967	87,412	76,007	88,950	101,686	87,223	87,668
14. Pateros	0	0	0	0	0	1,756	3,785	5,813	4,613	3,525	1,756	3,785	5,813	4,613	3,525
15. San Juan	0	0	0	0	0	408	1,148	1,888	1,888	1,880	408	1,148	1,888	1,888	1,880
16. Taguig	840	847	847	847	847	66,367	73,952	81,537	67,700	62,160	67,007	74,799	82,384	68,547	63,007
17. Valenzuela	742	949	949	949	949	33,180	47,210	61,241	50,318	47,970	33,922	48,159	62,190	51,267	48,919
II. CAVITE	26,970	52,468	52,468	52,468	52,468	57,927	53,479	49,032	39,537	33,796	84,897	105,948	101,500	92,005	86,264
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	20,961	9,713	8,749	10,212	38,524	28,517	17,269	16,305	17,768
2. Cavite City	6,714	11,926	11,926	11,926	11,926	4,328	6,988	9,649	5,847	4,406	11,042	18,914	21,575	17,773	16,332
3. Imus	1,654	11,245	11,245	11,245	11,245	4,443	7,897	11,351	9,767	5,956	6,097	19,142	22,596	21,012	17,201
4. Nawit	4,329	10,929	10,929	10,929	10,929	2,830	2,342	1,855	803	0	7,159	13,272	12,784	11,532	10,930
5. Noveleta	7,070	7,070	7,070	7,070	7,070	5,659	3,680	1,702	1,284	816	12,729	10,750	8,772	8,354	7,886
6. Rosario	889	3,742	3,742	3,742	3,742	8,457	11,610	14,763	13,287	12,406	9,346	15,352	18,505	17,029	16,147
III. RIZAL	29,808	63,649	86,098	105,008	131,371	141,838	160,050	178,262	193,711	202,608	171,646	223,699	264,360	298,718	333,979
1. Angono	-	0	0	0	0	-	1,210	2,419	2,592	2,516	-	1,210	2,419	2,592	2,516
2. Antipolo	11,621	19,999	28,381	30,760	35,750	44,155	44,719	45,283	51,175	55,380	55,776	64,718	73,664	81,934	91,160
3. Baras	-	188	291	642	1,165	-	329	658	708	731	-	517	949	1,350	1,896
4. Binangonan	-	10,414	16,775	25,501	36,674	-	2,810	5,620	5,671	5,250	-	13,224	22,395	31,172	42,124
5. Cainta	3,785	5,786	5,786	5,786	5,786	48,619	57,891	67,162	73,627	78,127	52,404	63,677	72,948	79,413	83,913
6. Cardona	-	728	971	1,347	1,825	-	582	1,164	1,188	1,178	-	1,310	2,135	2,535	3,003
7. Jala-Jala	-	109	414	911	1,646	-	305	610	638	632	-	414	1,024	1,549	2,278
8. Montalban	3,243	5,680	6,684	6,684	6,684	8,030	8,298	8,566	8,936	9,318	11,273	13,978	15,250	15,620	16,002
9. Moreng	-	1,619	1,928	2,833	4,076	-	508	1,216	1,290	1,318	-	2,027	3,144	4,123	5,394
10. Pililla	-	1,045	1,786	3,462	5,108	-	651	1,302	1,356	1,324	-	1,696	3,088	4,818	6,432
11. San Mateo	4,706	6,648	8,130	8,130	8,130	3,641	5,743	7,844	7,833	7,193	8,347	12,390	15,974	15,963	15,323
12. Tanay	-	3,225	6,039	9,425	13,968	-	1,280	2,559	2,662	2,574	-	4,504	8,598	12,087	16,542
13. Taytay	6,453	7,695	7,695	7,695	7,695	37,393	35,256	33,120	35,384	36,380	43,846	42,951	40,815	42,999	44,075
14. Teresa	-	713	1,219	1,832	2,634	-	370	739	730	686	-	1,082	1,958	2,562	3,320
TOTAL	89,739	161,015	183,465	202,374	228,738	840,702	880,109	919,517	840,092	835,304	930,441	1,041,124	1,102,982	1,042,466	1,064,041

TABLE 13.4.40 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 4)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. MCE	32,961	44,898	44,898	44,898	44,898	640,937	696,079	751,221	737,240	767,418	673,898	740,977	796,119	782,138	812,316
1. Manila	0	0	0	0	0	12,665	20,491	28,317	27,926	27,812	12,665	20,491	28,317	27,926	27,812
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	19,481	20,965	18,172	16,986	22,458	24,563	26,047	23,254	22,068
3. Quezon City	14,186	18,326	18,326	18,326	18,326	91,324	86,756	82,189	82,645	83,471	105,510	105,082	100,515	100,969	101,797
4. Caloocan City	0	0	0	0	0	27,476	35,836	44,197	37,493	31,884	27,476	35,836	44,197	37,493	31,884
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	75,853	69,927	64,628	70,083	83,305	77,587	71,661	66,362	71,817
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	24,031	22,883	21,041	21,160	28,951	31,391	30,243	28,401	28,520
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	23,926	29,380	26,545	24,258	19,027	25,170	30,624	27,789	25,502
8. Mandaluyong	0	0	0	0	0	8,976	9,737	10,497	10,500	10,566	8,976	9,737	10,497	10,500	10,566
9. Marikina	0	0	0	0	0	13,573	14,899	16,224	18,233	20,266	13,573	14,899	16,224	18,233	20,266
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	89,454	87,289	88,448	94,464	97,395	96,473	94,308	93,467	101,483
11. Navotas	106	313	313	313	313	4,051	4,763	5,475	4,855	4,911	4,157	5,076	5,788	5,168	5,224
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	67,727	65,295	58,812	61,791	71,305	69,495	67,063	60,580	63,559
13. Pasig	49	256	256	256	256	75,958	89,596	103,233	115,924	129,951	76,007	89,852	103,489	116,180	130,207
14. Pateros	0	0	0	0	0	1,756	4,325	6,895	5,841	5,145	1,756	4,325	6,895	5,841	5,145
15. San Juan	0	0	0	0	0	408	1,157	1,906	1,906	1,898	408	1,157	1,906	1,906	1,898
16. Taguig	640	847	847	847	847	66,367	79,444	92,521	89,534	93,367	67,007	80,291	93,368	90,381	94,214
17. Valenzuela	742	949	949	949	949	33,180	48,604	64,028	66,738	68,394	33,922	49,553	64,977	67,687	70,343
II. CAVITE	26,970	45,921	64,875	80,324	98,894	57,927	58,667	59,408	49,635	45,623	84,897	104,588	124,283	129,958	144,517
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	23,951	15,693	10,190	10,806	38,524	31,507	23,249	17,746	18,362
2. Cavite City	6,714	11,869	16,270	25,006	31,521	4,328	7,553	10,778	9,081	7,983	11,042	19,422	29,048	34,087	39,504
3. Imus	1,654	9,014	16,374	22,182	30,733	4,443	8,563	12,683	11,355	8,804	6,097	17,577	29,057	33,537	39,537
4. Kawit	4,329	7,183	10,037	10,625	10,688	2,830	2,689	2,548	1,199	301	7,159	9,872	12,585	11,823	10,989
5. Noveleta	7,070	7,070	7,070	7,070	7,070	5,659	4,067	2,475	1,579	1,042	12,729	11,137	9,545	8,649	8,112
6. Rosario	889	3,229	5,569	7,885	11,326	8,457	11,844	15,231	16,231	16,687	9,346	15,073	20,800	24,116	28,012
III. RIZAL	29,808	54,199	84,734	103,549	128,964	141,838	165,915	189,991	199,009	209,323	171,646	220,113	274,725	302,558	338,286
1. Angono	-	0	0	0	0	-	1,210	2,419	2,592	2,516	-	1,210	2,419	2,592	2,516
2. Antipolo	11,621	16,767	26,858	29,142	33,213	44,155	45,264	46,373	52,402	57,386	55,776	62,031	73,230	81,545	90,599
3. Baras	-	145	291	642	1,165	-	329	658	708	731	-	474	949	1,350	1,896
4. Binangonan	-	8,388	16,775	25,501	36,674	-	2,810	5,620	5,671	5,250	-	11,198	22,395	31,172	42,124
5. Cainta	3,785	4,786	5,786	5,786	5,786	48,619	61,036	73,454	75,421	80,308	52,404	65,822	79,240	81,207	86,094
6. Cardona	-	485	971	1,347	1,825	-	582	1,164	1,188	1,178	-	1,067	2,135	2,535	3,003
7. Jala-Jala	-	207	414	911	1,646	-	305	610	638	632	-	512	1,024	1,549	2,278
8. Montalban	3,243	4,499	6,585	6,585	6,585	8,030	8,437	8,845	9,323	9,620	11,273	12,936	15,430	15,908	16,205
9. Morong	-	964	1,928	2,833	4,078	-	608	1,216	1,290	1,318	-	1,572	3,144	4,123	5,394
10. Pililla	-	893	1,786	3,462	5,108	-	651	1,302	1,356	1,324	-	1,544	3,088	4,818	6,432
11. San Mateo	4,706	6,362	8,388	8,388	8,388	3,641	6,020	8,399	8,488	7,966	8,347	12,382	16,787	16,876	16,354
12. Tanay	-	3,019	6,039	9,425	13,968	-	1,280	2,559	2,662	2,574	-	4,299	8,598	12,087	16,542
13. Taytay	6,453	7,074	7,695	7,695	7,695	37,393	37,014	36,634	36,539	37,834	43,846	44,088	44,329	44,234	45,529
14. Teresa	-	609	1,219	1,832	2,634	-	370	739	730	686	-	979	1,958	2,562	3,320
TOTAL	89,739	145,017	194,508	228,771	272,756	840,702	920,661	1,000,620	985,883	1,022,363	930,441	1,065,678	1,195,128	1,214,654	1,295,119

TABLE 13.5.1 NUMBER OF CONNECTIONS AND WATER CONSUMPTION IN THE ANTIPOLO BASIN

AREA	NO. OF CONNECTIONS					WATER CONSUMPTION (M^3/D)				
	DOM.	P.F.	COM.	IND.	TOTAL	DOM.	P.F.	COM.	IND.	TOTAL
ANTIPOLO MUNICIPALITY	4445	1	223	44	4713	3606	4	533	1565	5707
ANTIPOLO BASIN	3535	3	172	28	3738	2962	10	270	46	3288
SHARE (%)	79.5	300	77.1	63.6	79.3	82.1	250	50.7	2.9	57.6

Note: Data on P.F. may be processed improperly. But its influence is negligible.

Source: Computer Service Center, MWSS

TABLE 13.5.2 GROUNDWATER DISCHARGE IN THE ANTIPOLO BASIN (1990)

(UNIT: MCM)

OWNER	NO. OF WELLS	DISCHARGE	USE		
			DOM.	COM.	IND.
MWSS	10	3.5803	1.1884	0.1119	0.0190
PRIVATE	26	3.5210	2.2591	0.2209	1.0410
TOTAL	36	7.1013	3.4475	0.3328	1.0600
DAILY (M^3/D)		19,456	9,445	912	2,904
MWSS %	27.7	50.4	34.5	33.6	1.8

Source: Study Team

TABLE 13.5.3 PROJECTED MWSS SERVED POPULATION

(POBLACION SYSTEM)

BARANGAY/ MUNICIPALITY	POPULATION WITHIN STUDY AREA					SERVICE RATIO (%)				POPULATION WITHIN SERVICE AREA			
	1990	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
1. Bagong Nayon	14,402	18,115	22,117	26,202	30,110	0	0	0	0	0	0	0	0
2. Santa Cruz	9,338	11,763	14,377	17,044	19,597	0	30	50	70	0	4,313	8,522	13,718
3. De La Paz	21,033	26,441	32,269	38,215	43,906	70	80	85	90	18,509	25,815	32,483	39,515
4. Beverly Hills	1,034	1,385	1,767	2,161	2,532	90	90	95	100	1,247	1,590	2,053	2,532
5. San Roque	17,227	21,673	26,465	31,355	36,034	60	80	90	95	13,004	21,172	28,220	34,232
6. Dalig	14,241	17,896	21,843	25,869	29,723	70	80	90	95	12,527	17,474	23,282	28,237
7. San Jose	13,061	16,408	20,014	23,693	27,214	70	90	90	95	11,485	18,013	21,323	25,853
8. San Isidro	19,260	24,220	29,566	35,020	40,240	40	60	70	80	9,688	17,740	24,514	32,192
9. San Luis	3,121	3,955	4,856	5,777	6,656	0	70	90	95	0	3,399	5,199	6,323
SUB-TOTAL	112,717	141,856	173,274	205,335	236,012	47	63	71	77	66,460	109,516	145,596	182,603
10. Taytay	7,970	9,181	10,517	12,268	13,978	50	50	50	50	4,591	5,259	6,134	6,989
11. Angono	1,750	2,225	2,705	3,470	4,189	0	40	50	100	0	1,082	1,735	4,189
12. Binangonan	700	833	958	1,155	1,334	0	0	0	100	0	0	0	1,334
13. Teresa	210	234	256	289	318	0	0	0	100	0	0	0	318
SUB-TOTAL	10,630	12,473	14,436	17,182	19,819	37	44	46	65	4,591	6,341	7,869	12,830
TOTAL	123,347	154,329	187,710	222,517	255,831	46	62	69	76	71,050	115,857	153,465	195,433

TABLE 13.5.4 DOMESTIC DEMAND PROJECTION IN THE ANTIPOLO BASIN

(POBLACION SYSTEM)

BARANGAY/ MUNICIPALITY	POPULATION WITHIN THE BASIN				MWSS SERVED POPULATION				P.C.W.D (LPCD)				MWSS DOMESTIC WATER DEMAND (M3/D)				OTHER DOM. DEMAND IN BASIN				TOTAL DOM. DEMAND IN BASIN (M3/D)			
	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
1. Bagong Nayon	0	0	0	0	0	0	0	0	138	149	155	162	0	0	0	0	0	0	0	0	0	0	0	0
2. Santa Cruz	5,041	6,161	7,305	8,399	0	4,313	6,522	13,718	138	149	155	162	0	643	1,121	2,222	696	275	0	0	696	918	1,121	2,222
3. De La Paz	21,153	25,815	30,572	35,125	18,509	25,815	32,483	39,515	138	149	155	162	2,554	3,846	5,035	6,401	365	0	0	0	2,919	3,846	5,035	6,401
4. Beverly Hills	0	0	0	0	1,247	1,590	2,053	2,532	138	149	155	162	172	237	318	410	0	0	0	0	172	237	318	410
5. San Roque	19,506	23,819	28,220	32,431	13,004	21,172	28,220	34,232	138	149	155	162	1,795	3,155	4,374	5,546	897	394	0	0	2,692	3,549	4,374	5,546
6. Dalig	17,896	21,843	25,869	29,723	12,527	17,474	23,282	28,237	138	149	155	162	1,729	2,604	3,609	4,574	741	651	401	241	2,470	3,255	4,010	4,815
7. San Jose	15,408	20,014	23,693	27,214	11,485	18,013	23,323	25,853	138	149	155	162	1,585	2,684	3,305	4,188	679	238	367	220	2,264	2,922	3,672	4,408
8. San Isidro	19,376	23,651	28,016	32,192	9,688	17,740	24,514	32,192	138	149	155	162	1,337	2,643	3,800	5,215	1,337	881	543	0	2,674	3,524	4,342	5,215
9. San Luis	3,955	4,856	5,777	6,656	0	3,355	5,199	6,323	138	149	155	162	0	506	806	1,024	546	217	90	54	546	724	895	1,078
SUB-TOTAL	103,335	126,161	149,451	171,740	66,460	109,516	145,596	182,603	138	149	155	162	9,171	16,318	22,567	29,582	5,261	2,717	1,401	515	14,432	19,035	23,968	30,097
10. Taytay	0	0	0	0	4,591	5,255	6,134	6,989	180	187	193	200	826	983	1,184	1,398	0	0	0	0	826	983	1,184	1,398
11. Angono	2,225	2,705	3,470	4,189	0	1,082	1,735	4,189	141	160	181	205	0	173	314	859	314	260	314	0	314	433	628	859
12. Binangonan	833	958	1,155	1,334	0	0	0	1,334	141	160	181	205	0	0	0	273	117	153	209	0	117	153	209	273
13. Teresa	234	256	289	318	0	0	0	318	141	160	181	205	0	0	0	65	33	41	52	0	33	41	52	65
SUB-TOTAL	3,292	3,919	4,914	5,841	4,591	6,341	7,869	12,830	180	182	190	202	826	1,156	1,498	2,595	464	454	575	0	1,290	1,610	2,073	2,595
TOTAL	106,627	130,080	154,365	177,581	71,050	115,857	153,465	195,433	141	151	157	165	9,998	17,474	24,065	32,177	5,725	3,171	1,976	515	15,723	20,645	26,041	32,692

NOTE: Served population includes served population by the system outside of the basin.

TABLE 13.5.5 WATER DEMAND PROJECTION IN THE ANTIPOLO BASIN

BARANGAY/ MUNICIPALITY	1995					2000					2005					2010				
	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL
1. Bagong Nayon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Santa Cruz	696	0	0	0	696	918	18	3	284	1,222	1,321	31	5	452	1,809	2,222	45	7	758	3,032
3. De La Paz	2,919	100	19	1,145	4,183	3,846	105	17	1,475	5,443	5,035	117	18	1,321	6,491	6,401	129	19	1,780	8,330
4. Beverly Hills	172	7	1	77	257	237	6	1	105	349	318	7	1	109	436	410	8	1	140	560
5. San Roque	2,692	221	13	101	3,027	3,549	237	14	691	4,491	4,374	253	16	1,001	5,644	5,546	263	17	1,344	7,169
6. Dalig	2,470	67	13	500	3,050	3,255	71	11	220	3,557	4,010	84	13	511	4,618	4,815	92	14	836	5,756
7. San Jose	2,264	62	2,818	711	5,855	2,982	73	2,818	1,187	7,060	3,672	77	2,819	1,131	7,699	4,409	84	2,819	1,428	8,741
8. San Isidro	2,574	506	10	599	3,789	3,524	526	11	1,169	5,230	4,342	543	14	1,301	6,199	5,215	559	15	1,779	7,568
9. San Luis	545	0	0	0	546	724	14	2	224	963	895	19	3	276	1,193	1,078	21	3	349	1,451
SUB-TOTAL	14,432	963	2,873	3,134	21,402	19,035	1,050	2,878	5,354	28,316	23,968	1,132	2,888	6,101	34,089	30,097	1,200	2,896	8,414	42,607
10. Taytay	826	32	6	371	1,235	983	27	4	435	1,449	1,184	28	4	405	1,621	1,398	28	4	477	1,907
11. Angono	314	0	45	0	359	433	5	46	77	560	628	7	46	97	779	859	17	48	101	1,024
12. Binangonan	117	0	0	0	117	153	0	0	0	153	209	0	0	0	209	273	6	1	93	373
13. Teresa	33	0	0	0	33	41	0	0	0	41	52	0	0	0	52	65	1	0	22	89
SUB-TOTAL	1,290	32	51	371	1,744	1,610	32	50	511	2,203	2,073	35	51	502	2,661	2,595	52	53	693	3,393
TOTAL	15,723	995	2,925	3,505	23,147	20,645	1,081	2,928	5,865	30,520	26,041	1,167	2,939	6,603	36,749	32,692	1,252	2,949	9,107	46,000

NOTE: Served population includes served population by the system outside of the basin.

TABLE 13.5.6 WATER DEMAND PROJECTION IN THE MWSS SERVICE AREA

BARANGAY/ MUNICIPALITY	1995					2000					2005					2010				
	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL
1. Bagong Nayon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Santa Cruz	0	0	0	0	0	643	18	3	284	947	1,321	31	5	452	1,809	2,222	45	7	758	3,032
3. De La Paz	2,554	100	19	1,145	3,818	3,846	105	17	1,475	5,443	5,035	117	18	1,321	6,491	6,401	129	19	1,780	8,330
4. Beverly Hills	172	7	1	77	257	237	6	1	105	349	318	7	1	109	436	410	8	1	140	560
5. San Roque	1,795	221	13	101	2,130	3,155	237	14	591	4,097	4,374	253	16	1,001	5,644	5,546	283	17	1,344	7,169
6. Dalig	1,729	67	13	500	2,309	2,604	71	11	220	2,906	3,609	84	13	511	4,217	4,574	92	14	836	5,516
7. San Jose	1,585	62	11	711	2,369	2,684	73	2,818	1,187	6,762	3,305	77	2,819	1,131	7,332	4,188	84	2,819	1,428	8,520
8. San Isidro	1,337	52	10	599	1,998	2,643	526	11	1,169	4,349	3,800	543	14	1,301	5,657	5,215	559	16	1,779	7,568
9. San Luis	0	0	0	0	0	506	14	2	224	746	806	19	3	276	1,103	1,024	21	3	349	1,397
SUB-TOTAL	9,171	509	66	3,134	12,881	16,318	1,050	2,878	5,354	25,599	22,567	1,132	2,888	6,101	32,688	29,582	1,200	2,896	8,414	42,092
10. Taytay	826	32	6	371	1,235	983	27	4	435	1,449	1,184	28	4	405	1,621	1,398	28	4	477	1,907
11. Angono	0	0	0	0	0	173	5	46	77	300	314	7	46	97	464	859	17	48	101	1,024
12. Binangonan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	273	6	1	93	373
13. Teresa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	1	0	22	89
SUB-TOTAL	826	32	6	371	1,235	1,156	32	50	511	1,750	1,498	35	51	502	2,085	2,596	52	53	693	3,393
TOTAL	9,998	541	72	3,505	14,116	17,474	1,081	2,928	5,865	27,349	24,065	1,167	2,939	6,603	34,773	32,177	1,252	2,949	9,107	45,485
SERVICE RATIO (%)	64	39	2	100	61	85	100	100	100	90	92	100	100	100	95	98	100	100	100	99

NOTE: Served population includes served population by the system outside of the basin.

TABLE 13.5.7 PROJECTED NET WATER DEMAND TO MWSS SYSTEM

BARANGAY/ MUNICIPALITY	1995					2000					2005					2010				
	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL
1. Bagong Nayon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Santa Cruz	0	0	0	0	0	643	18	3	284	947	1,321	31	5	452	1,809	2,222	45	7	758	3,032
3. De La Paz	2,554	100	19	1,145	3,818	3,319	105	17	1,475	4,916	3,827	117	18	1,321	5,283	5,193	129	19	1,780	7,122
4. Beverly Hills	172	7	1	77	257	237	6	1	105	349	318	7	1	109	436	410	8	1	140	560
5. San Roque	153	70	13	101	337	1,513	86	14	691	2,304	2,733	253	16	1,001	4,002	3,904	112	17	1,344	5,377
6. Dalig	1,088	67	13	500	1,668	430	71	11	220	732	1,435	84	13	511	2,043	2,401	92	14	835	3,342
7. San Jose	1,585	62	11	711	2,369	2,684	73	12	1,187	3,955	3,305	77	12	1,131	4,525	4,188	84	13	1,428	5,713
8. San Isidro	1,337	52	10	599	1,998	2,643	72	11	1,169	3,895	3,800	89	14	1,301	5,203	5,215	105	16	1,779	7,114
9. San Luis	0	0	0	0	0	506	14	2	224	746	806	19	3	276	1,103	1,024	21	3	349	1,397
SUB-TOTAL	6,889	358	66	3,134	10,448	11,976	445	71	5,354	17,845	17,544	678	81	6,101	24,404	24,559	595	89	8,414	33,657
10. Taytay	826	32	5	371	1,235	983	27	4	435	1,449	1,184	28	4	405	1,621	1,398	28	4	477	1,907
11. Angono	0	0	0	0	0	173	5	1	77	255	282	7	1	97	387	282	17	3	101	402
12. Binangonan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	273	6	1	93	373
13. Teresa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	1	0	22	89
SUB-TOTAL	826	32	5	371	1,235	1,156	32	5	511	1,704	1,466	35	5	502	2,008	2,018	52	8	693	2,771
TOTAL	7,715	390	72	3,505	11,683	13,132	476	76	5,865	19,549	19,010	713	86	6,603	26,412	26,577	647	97	9,107	36,428
SERVICE RATIO (%)																				
TO TOTAL DEMAND	49	39	2	100	50	64	44	3	100	64	73	61	3	100	72	81	52	3	100	79
TO MWSS DEMAND	77	72	100	100	83	75	44	3	100	71	79	61	3	100	76	83	52	3	100	80

NOTE: Served population includes served population by the system outside of the basin.

TABLE 13.5.8 WATER DEMAND AND SUPPLY IN THE ANTIPOLO BASIN

(UNIT: CU.M/DAY)

	ANTIPOLO BASIN						MWSS SERVICE AREA					
	DEMAND	SUPPLY				SHORTAGE	DEMAND	SUPPLY				NET SHORTAGE
YEAR	DAILY AVERAGE	MWSS EX. WELL	PRIVATE WELL	MWSS REHAB.	MWSS AUGMENT.	DAILY AVERAGE	DAILY AVERAGE	MWSS EX. WELL	PRIVATE WELL	MWSS REHAB.	MWSS AUGMENT.	DAILY AVERAGE	DAILY MAXIMUM
1990	19,456	9,809	9,647	--	--	--	--	9,809	2,434	--	--	--	--
1995	23,147	9,809	9,647	2,070	5,810	(4,189)	14,116	9,809	2,434	2,070	5,810	(6,007)	1,051
1996	24,622	9,809	9,647	2,070	5,810	(2,714)	16,763	9,809	3,512	2,070	5,810	(4,439)	3,943
1997	26,096	9,809	9,647	2,070	5,810	(1,240)	19,409	9,809	4,591	2,070	5,810	(2,871)	6,834
1998	27,571	9,809	9,647	2,070	5,810	235	22,056	9,809	5,669	2,070	5,810	(1,303)	9,725
1999	29,045	9,809	9,647	2,070	5,810	1,709	24,702	9,809	6,748	2,070	5,810	265	12,617
2000	30,520	9,809	9,647	2,070	5,810	3,184	27,349	9,809	7,826	2,070	5,810	1,834	15,508
2005	36,749	9,809	9,647	2,070	5,810	9,413	34,773	9,809	8,512	2,070	5,810	8,572	25,958
2010	46,000	9,809	9,647	2,070	5,810	18,664	45,485	9,809	9,647	2,070	5,810	18,149	40,892

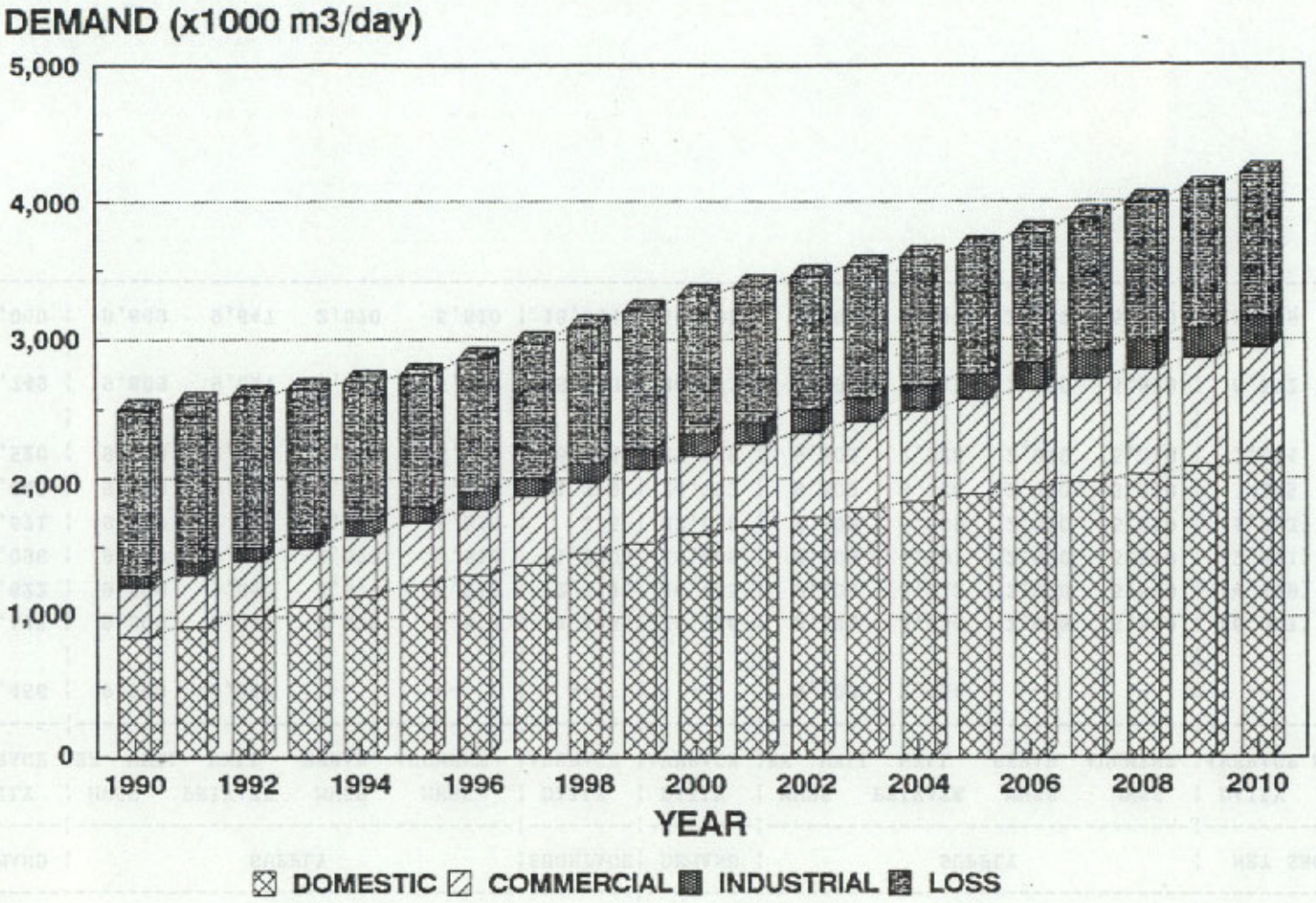


FIGURE 13.2.1 MWSS WATER DEMAND

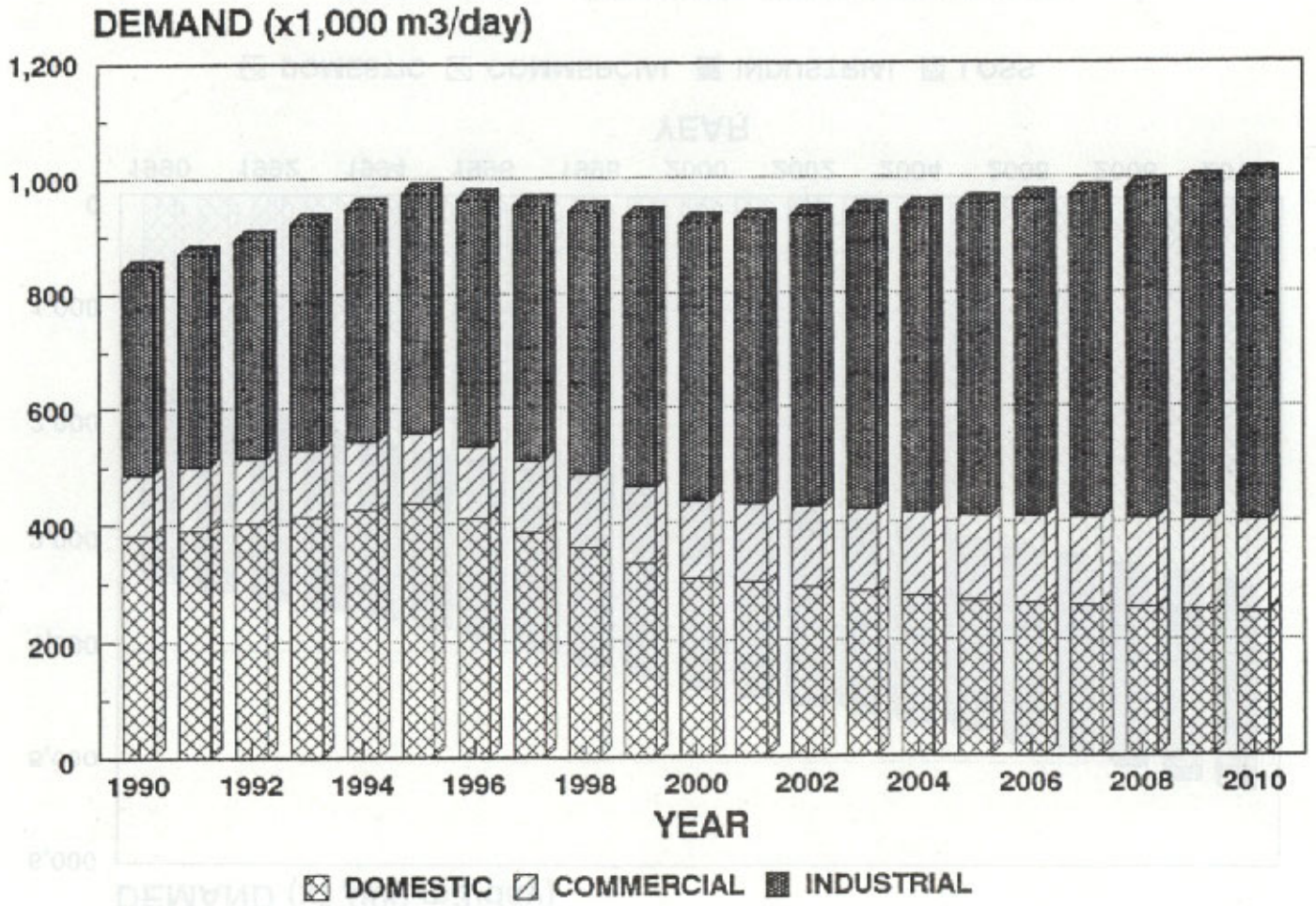


FIGURE 13.2.2 PRIVATE WATER DEMAND

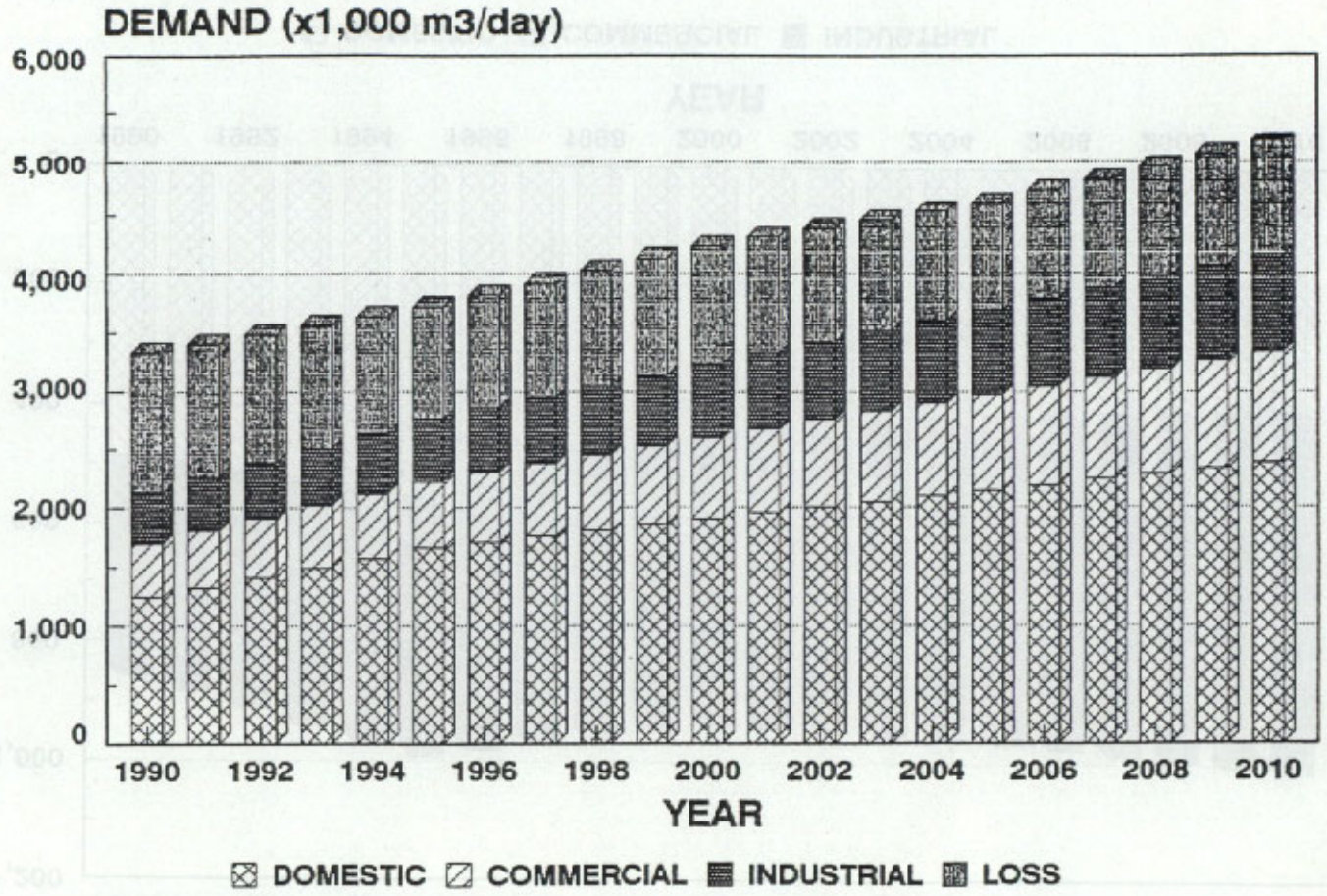


FIGURE 13.2.3 TOTAL WATER DEMAND (MWSS+PRIVATE)

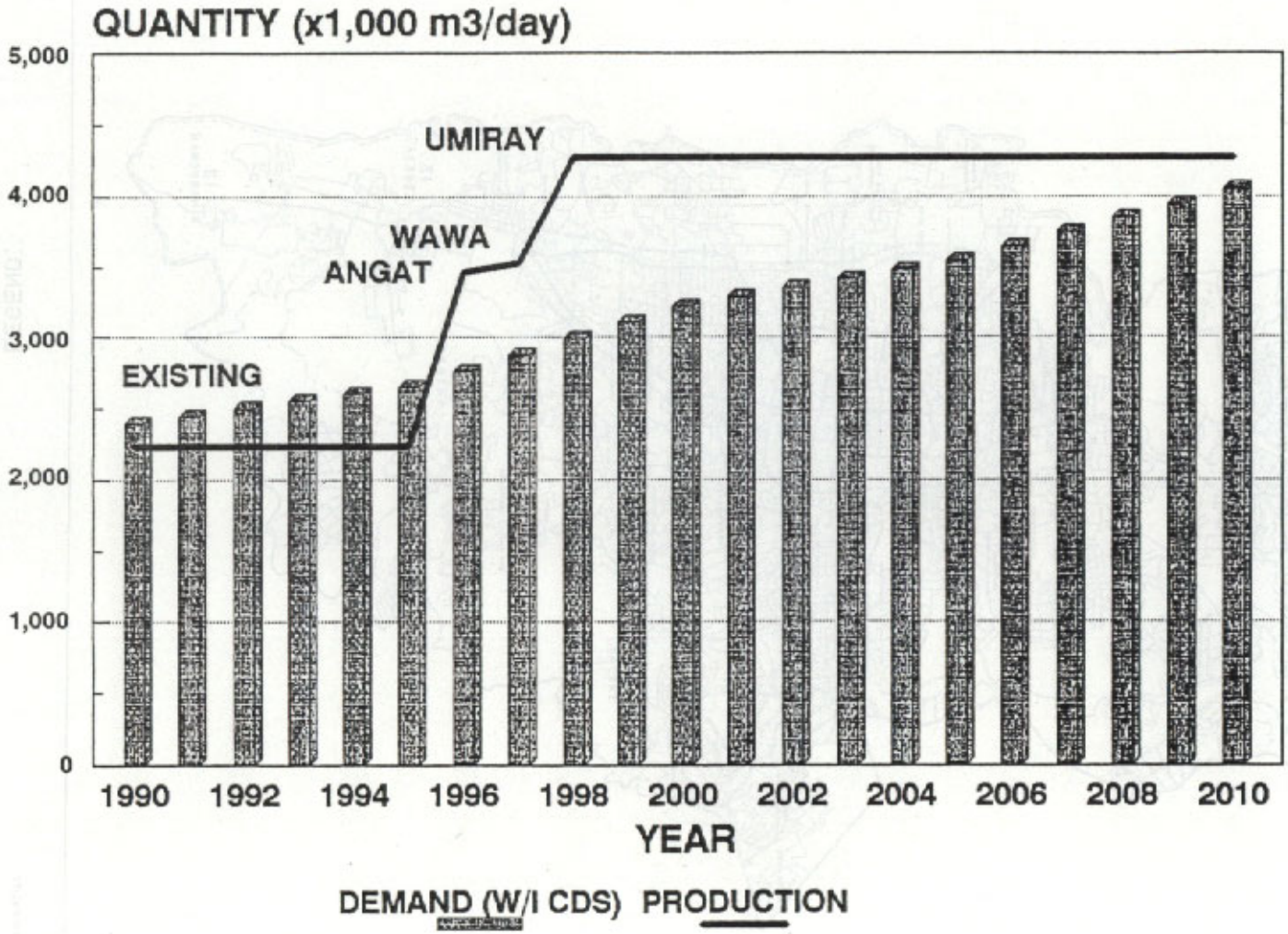
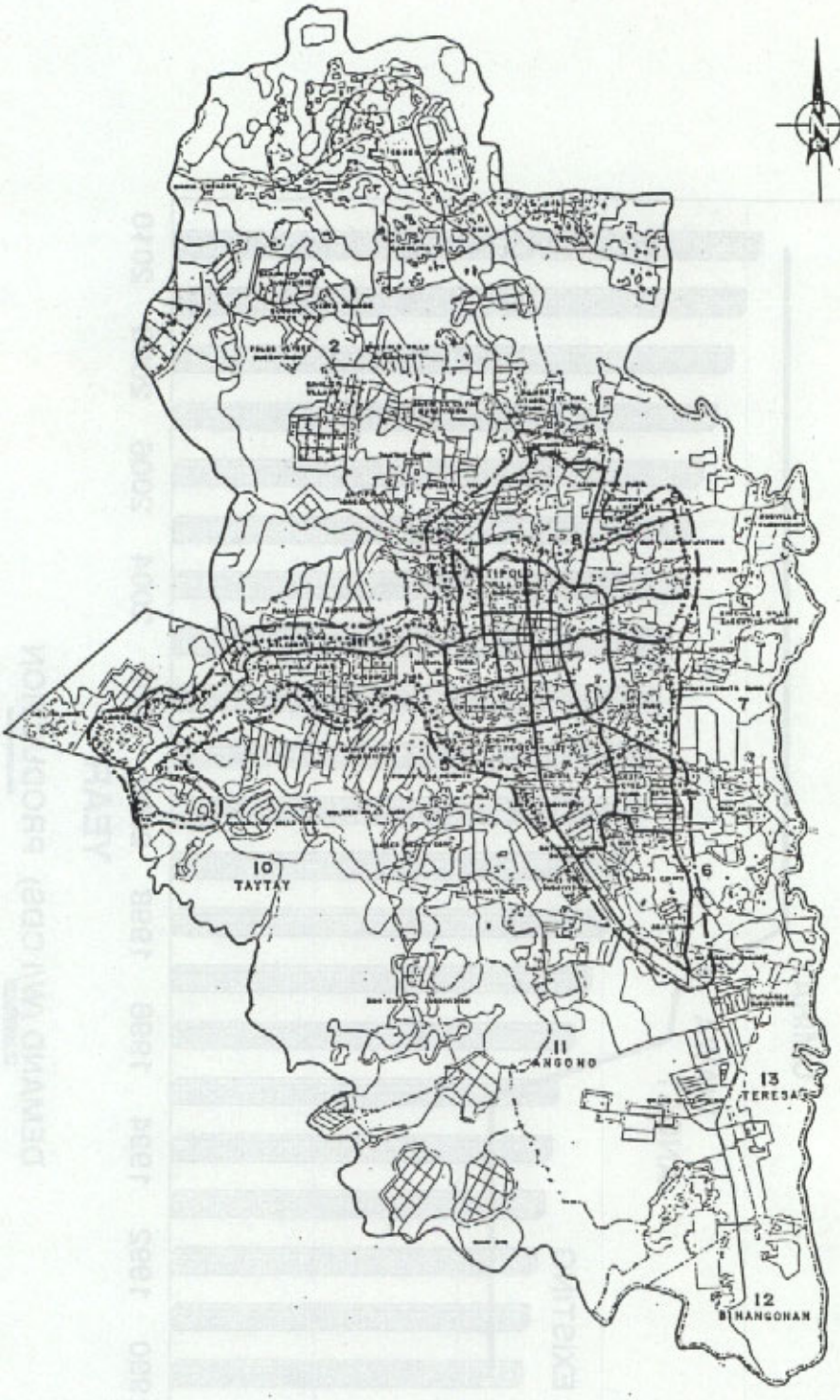


FIGURE 13.3.1 DEMAND VS. SUPPLY CAPACITY (WITHIN CDS)



BARANGAY / MUNICIPALITY

1. Bagong Nayon
2. Sto. Cristo
3. De la Paz
4. Beverly Hills
5. San Roque
6. Dalig
7. San Juan
8. San Isidro
9. San Luis
10. Taytay
11. Angono
12. Binangonan
13. Teresa

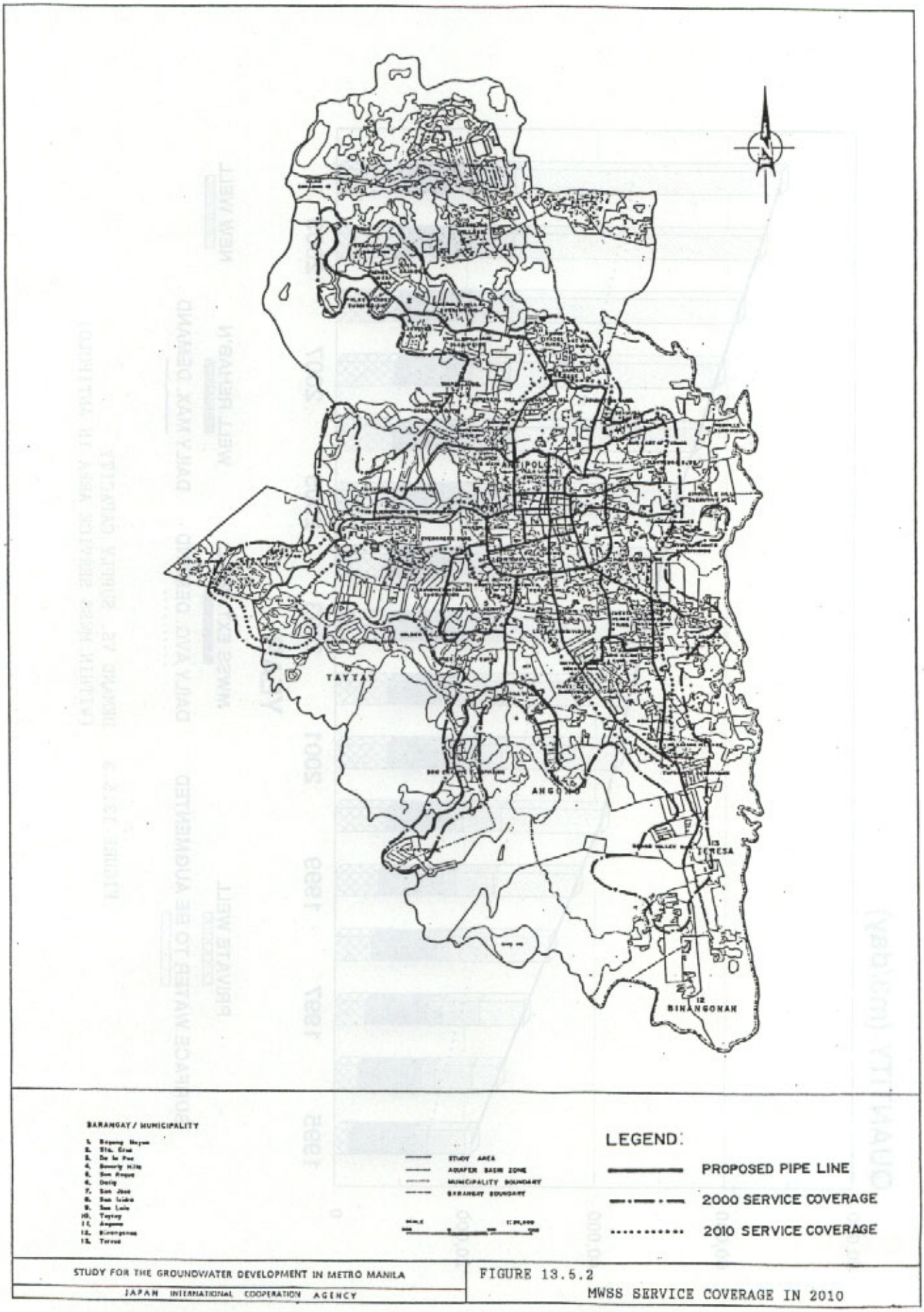
STUDY AREA
AQUIFER BASIN ZONE
MUNICIPALITY BOUNDARY
BARANGAY BOUNDARY

LEGEND:

PROPOSED PIPE LINE
1995 SERVICE COVERAGE
2000 SERVICE COVERAGE

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA
JAPAN INTERNATIONAL COOPERATION AGENCY

FIGURE 13.5.1
MWSS SERVICE COVERAGE IN 1995, AND 2000



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

FIGURE 13.5.2

MWSS SERVICE COVERAGE IN 2010

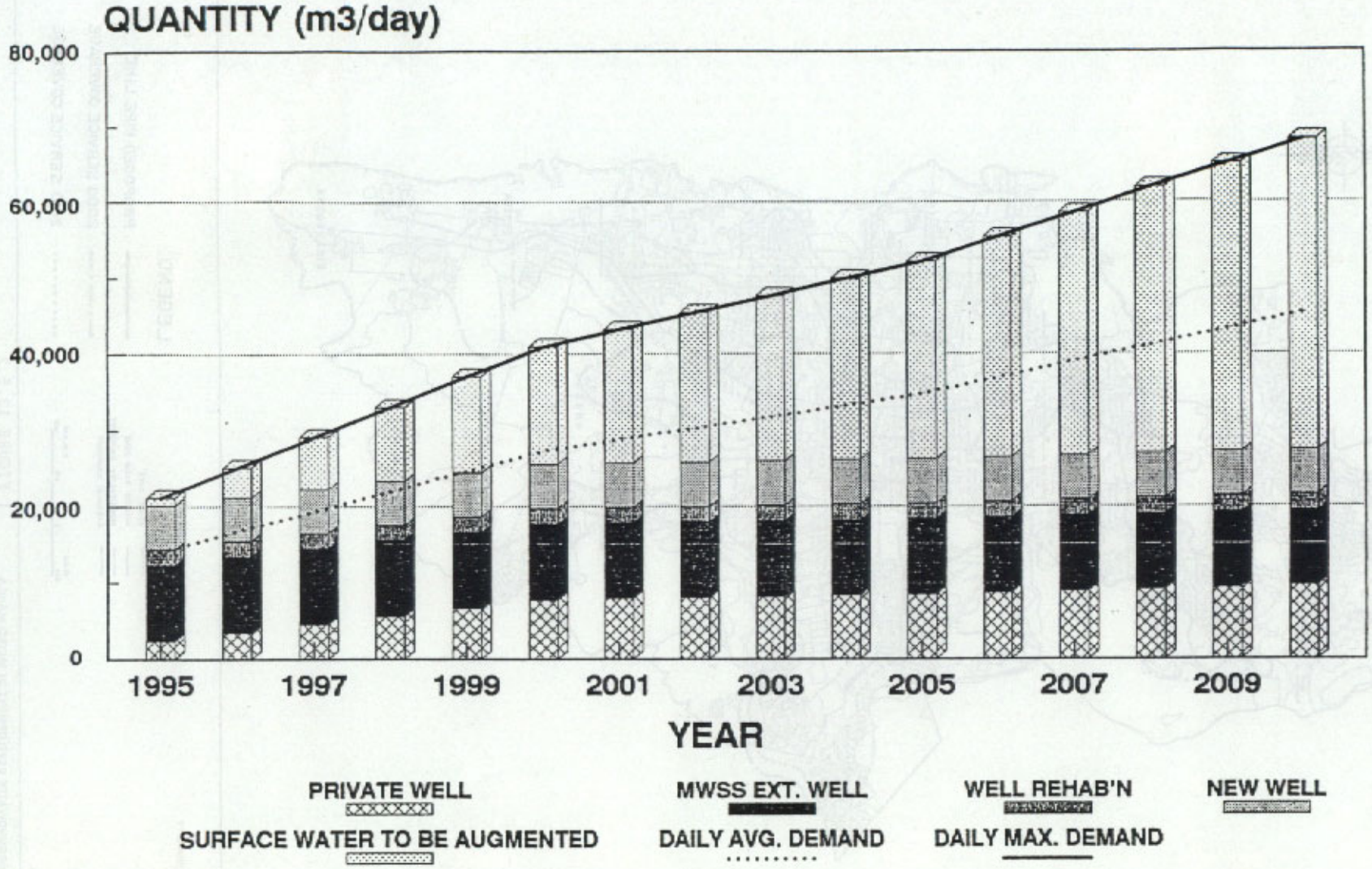


FIGURE 13.5.3 DEMAND VS. SUPPLY CAPACITY
(WITHIN MWSS SERVICE AREA IN ANTIPOLO)

APPENDICES

APPENDICES

APPENDIX A SURVEY ON LOCAL DRILLING CONTRACTORS

APPENDIX B LIST OF COLLECTED DATA

APPENDIX C ORGANIZATION AND MANAGEMENT

APPENDIX D WATER DEMAND PROJECTION FOR BP799 AREA (UPDATED RPWSIP PROJECTION)

APPENDIX E WATER DEMAND PROJECTION FOR FRINGE AREA (UPDATED FAWSP PROJECTION)

APPENDIX F HYDRAULIC ANALYSIS ON DISTRIBUTION NETWORK

APPENDIX G COST ESTIMATES FOR THE PROJECT

APPENDIX A

SURVEY ON
LOCAL DRILLING CONTRACTORS

LIST OF TABLES

PAGE

APPENDIX A SURVEY ON LOCAL DRILLING CONTRACTORS

1. THE ABILITIES AND CONDITIONS OF PRIVATE DRILLING COMPANIES A-1
2. SCHEDULE OF VISITS A-3
3. SELECTED COMPANIES A-5
4. LOCATION OF OFFICE AND WELL SITES A-7
5. QUESTIONNAIRE A-8

Table THE ABILITIES AND CONDITIONS OF PRIVATE DRILLING COMPANIES

No.	COMPANY NAME	Registration	Date of Establishment	Annual Proceed	Capital	Number of Employees	Warehouse & Repair Shop	Owned Drilling Machines	Core Boring Machines	Submersible Pumps	Electric logging	Well-Drilling	Core Boring	Rehabilitation	Pumping Test
1	Aqua-Line Basic Resources, Inc.	SEC BOI PCAB	May 16, 1989	P 2.5 M	P 1 M	32	225 m^2	R 3 sets (Max 760 m) P 2 sets (Max 300 m)	1 set (Max 800 m)	3 sets (Max 30 HP)	2 sets	Yes	(Yes)	Yes	Yes
2	Desco Holdings and Management, Inc.	SEC BOI	Dec. 18, 1974	P 37 M	P 20 M	202	3,500 m^2	R 5 sets (Max 750 m)	1 set (Max 90 m)		1 set	Yes	(Yes)	Yes	Yes
3	Diamond Drilling Corporation of the Philippines		June 8, 1971	P 8 M	P 10 M	110	1,500 m^2	R 20 sets (Max 1,300 m)	20 sets (Max 1,300 m)	Non	Non	(Yes)	Yes	No	No
4	Fieldman's Industrial Engingering and Machinery	BOI NPC NWRC	1973	P 1.7 M	P 2.6 M	3	Non	Non	Non	Num	Non	(Yes)	No	(Yes)	(Yes)
5	Hydro-Wells Inc.	SEC PCAB	Feb. 25, 1982	P 14 M	P 14 M	110	1,500 m^2	R 6 sets (Max 450 m) P 4 (300 m) S 3	Non	17 units (Max 75 HP)	1 set	Yes	No	Yes	Yes
6	Island Arc Drilling Corporation	NWRB Pending PCAB-LWUA	Aug. 11, 1987	P 0.2 M	P 0.5 M	27	375 m^2	R 4 sets (Max 350 m)	4 sets (Max 350 m)	1 set (Max 50 GPM)		(Yes)	Yes	Yes	Yes
7	Metro Drillers, Inc	SEC PCAB	1, 1981	P 2 M	P 2.4 M	20	75 m^2	R 1 set (Max 300 m) P 2 sets (Max 300 m)	Non	3 sets (Max 80 HP)	1 set (Rental)	Yes	No	Yes	Yes
8	Nidec (Phils), Inc.	PCAB SEC	June 16, 1977	P 1 M	P 7.4 M	50	225 m^2	R 6 sets (Max 300 m)	6 sets (Max 300 m)	Non	Non	(Yes)	(Yes)	No	Yes

Table continued

No.	COMPANY NAME	Registration	Date of Establishment	Annual Proceed	Capital	Number of Employees	Warehouse & Repair Shop	Owned Drilling Machines	Core Boring Machines	Submersible Pumps	Electric logging	Well-Drilling	Core Boring	Rehabilitation	Pumping Test
9	Orbit Wells Construction Corp.	NWRB	Sept. 1, 1980	P 6 M	P 0.5 M	25	300 m^2	R 2 sets (Max 300 m) P 2 sets (Max)	Non	10 sets (Max 150 HP)	Non	Yes	No	Yes	Yes
10	F.I. Well Drilling Corporation	PCAB SEC	May 17, 1980	P 2 M	P 0.2 M	85	900 m^2	R 6 sets (Max 360 m) P 1 set (Max 300 m)	Non	5 sets (Max)	1 set	Yes	No	Yes	Yes
11	Quick-Drill Engineering	LWUA PCAB No. 9399	June 24, 1986	P 20 M	P 5 M	18	400 m^2 (and Office)	R 4 sets (Max 300 m) P 2 (Max 240 m)	3 sets (Max 300 m)	9 units (Max 100 HP)	1 set	Yes	(Yes)	Yes	Yes
12	Service Contractors		1961	P 1 M	P 2.5 M	50	225 m^2 + 400 m^2 (in a part)	R 2 sets (Max 300 m) P 2 sets (Max 300 m)	1 set (Max 60 m)	7 sets (Max 135 HP)	Non	Yes	(Yes)	Yes	Yes
13	V.R. Romero Construction, Inc.	PCAB SEC NWRB	1982	P 7.5 M	P 20 M	27	300 m^2	R 2 sets (Max 450 m) P 2 sets (Max)	Non	3 sets (Max 115 HP)	1 set	Yes	No	Yes	Yes

ABBREVIATION:

SEC	:	Securities and Exchange Commission
BDT	:	Bureau of Domestic Trade
PCAB	:	Philippine Contractors Accreditation Board
NWRB	:	National Water Resources Board
LWUA	:	Local Water Utilities Administration
DTI	:	Department of Trade and Industry
NPC	:	National Power Corporation
NWRC	:	National Water Resources Council

Filename:ABIL-CON.FRM

Table SCHEDULE OF VISITS

COMPANY NAME	OFFICE	WORKSHOP OR REPAIR HOUSE	WELL-SITE	REMARKS QUESTIONNAIRE SHEET
1. Quick-Drill Engineering	9/10, 9/13	9/10	9/12 Antipolo	OK
2. Hydro-well Inc.	9/11, 9/14 9/17	9/11	9/14 Quezon City	OK
3. P.I. Well Drilling Corporation	(10/3), 10/5 10/8	10/5	10/5 Valenzuela	OK
4. Orbit Wells Construction Co.	9/21, 9/26	9/21	9/26 Pasig	OK
5. Aqua-Line Inc.	9/19, 9/20 9/25	9/25	9/25 Cainta	OK
6. Pioneer Well Drilling	9/21	Non	Non	X
7. Island Arch Drilling Corp.	9/12, (9/18) 9/20	9/12	Too far	OK
8. Service Contractors (SERCON)	9/24, 9/27	9/24	9/27 Las Pinas	OK
9. Fieldman's Industrial E & M	9/11, 9/14 9/17, 9/20	Non	Non	OK
10. V.R. Romero Construction Co.	(9/10), 9/24 9/26	9/24	9/26 Paranaque	OK
11. MIDEX (Phils.) Inc.	9/27, 10/2	9/27	9/29 Antipolo Quisao	OK
12. Diamond Drilling Corp. of the Phils.	9/13, 9/19	9/13	Too far	OK
13. Drilling Equipment Supply Co. (DESCO)	9/13, 9/19	9/13	9/19 Taytay	OK
14. Metro Drillers	9/25, (9/28) 10/1	10/1	10/1 Sucat, Paranaque	OK

Filename:CO-NAME

1. Anson's Drilling and Machinery Enterprises
2. Acoje Oil Exploration and Drilling Co., Inc.
3. Aquatech Industrial Corp.
4. Allied Drilling and pumps Co., Inc.
5. Alpha Tierra Management Corp.
6. Aqua-Line Inc.
7. Aquarius Well Drilling
8. ARGO Systems Inc.
9. Asia Soil Test, Inc.
10. Bago Bantay Well Drilling
11. Bezotte Diamond Core Drilling, Inc.
12. Certeza Geophysical Exploration, Inc.
13. Collosal International Corp. (Well Drilling Division)
14. Construction and Drilling Corp. of the Philippines
15. Diamond Drilling Corp. of the Philippines
16. Dizon B.R. Well Drilling
17. Drilling Corp. of Asia
18. Drilling Equipment Supply Co.
19. DGS Construction Inc.
20. Fieldman's Industrial Engineering and Machinery
21. Goldwater Driller and Machinery Corp.
22. Groconsuls and Associates
23. Hi-Water Marketing, Inc.
24. Hydro Drillers
25. Hydrowells, Inc.
26. Infra-structural Corp.
27. Island Arc Drilling Corp.
28. Katwell Drilling
29. Lopez Well Drilling and Construction
30. Lucas Well Drilling and Water Supply Co., Inc.
31. Markclay Philippines Incorporated
32. MCD Well Drilling Service
33. Metro Driller's Incorporated
34. MIDEX (Phils.) Inc.
35. Miguel Well Driller
36. Orbit Wells Construction Corp.
37. Phil. Geosystems and Industrial Corp.
38. Philippine Pumps and Machinery Corp.
39. P.I. Well Drilling Corp.
40. Pioneer Well Drilling Enterprises
41. Quick-Drill Engineering
42. Sand Rock Wells and Engineering Services
43. Sanvar Development Corporation
44. Service Contractors
45. Supreme Well Drilling
46. Techno Asia General
47. Technotest, Inc.
48. The Pipeline Engineering
49. V.R. Romero Construction, Inc.
50. Water Resource Systems Development Corp.

Filename:ANNEXES

SELECTED COMPANIES

1. Aqua-Line Inc.
   29-42 PAGASA Bliss
   PAGASA, Quezon City
   Telephone Nos. 96-7025; 99-9870
   Attention: Mr. Victorino Lin Jr.
   General Manager

2. Diamond Drilling Corp. of the Phils.
   344 South Superhighway, Parañaque, M.M.
   Telephone No. 828-9926
   Warehouse: 345 Bo. Santo Niño, Parañaque, M.M.
   Telephone No. 827-4868
   Attention: Mr. F.H. Dumo
   General Manager

3. Drilling Equipment Supply Co. (DESCO)
   9th Floor, Metrobank Plaza
   Sen. Gil J. Puyat Avenue
   Makati, Metro Manila
   Telephone Noo. 817-2627; 817-2637
   Attention: Mr. Lonnie Richards
   Drilling Operations Manager
   Shop : Telephone Nos. 842-0213; 842-0354; 842-0861

4. Fieldman's Industrial Engineering and Machinery
   Rm. 307 DELTA MOTORS SALES Copr. Bldg.
   West Avenue cor. Quezon Blvd., Quezon City
   Telephone Nos. 99-8766 local 4; 98-0651 to 54 local 4
   Attention: Mr. Rudy J. Fresnosa

5. Hydro-Wells Inc.
   54 Mapagbigay Matiyaga Street
   Luna Road, Quezon City
   Telephone Nos. 922-7605; 922-5973
   Attention: Mr. Louie A. Quizon
   President and General Manager

6. Island Arc Drilling Corp.
   2293 Pasong Tamo Ext. (CMS Compound)
   Makati, Metro Manila
   Telephone Nos. 828-4022; 801-5254
   Attention: Mr. Barry J. Brown
   General Manager

7. Metro Drilling Incorporated
   Suite 3029, VV Soliven Shopping Complex
   EDSA, San Juan, Metro Manila

Telephone Nos. 78-1054; 70-0144
Attention: Mr. Sergio L. Ongkiko, Jr.

8. MIDEX (Phils.) Inc.
1763 Concha Cruz Drive, BF Homes Executive Village
Almanza, Las Piñas, Metro Manila
Telephone No. 842-5002
Attention: Mrs. Lilia B. Mondoñeda
Director

9. Orbit Wells Contruction Corporation
Malonggay Road, FTI Complex
Taguig, Metro Manila
Telephone Nos. 818-5174; 828-0031 to 39
Attention: Mr. Sammy G. Valencia
President

10. Pioneer Well Drilling Enterprises
7 Lippay Street, San Lorenzo Village
Makati, Metro Manila
Telephone Nos. 815-4821; 815-4823
Attention: Mr. Esteban C. Fernandez
President

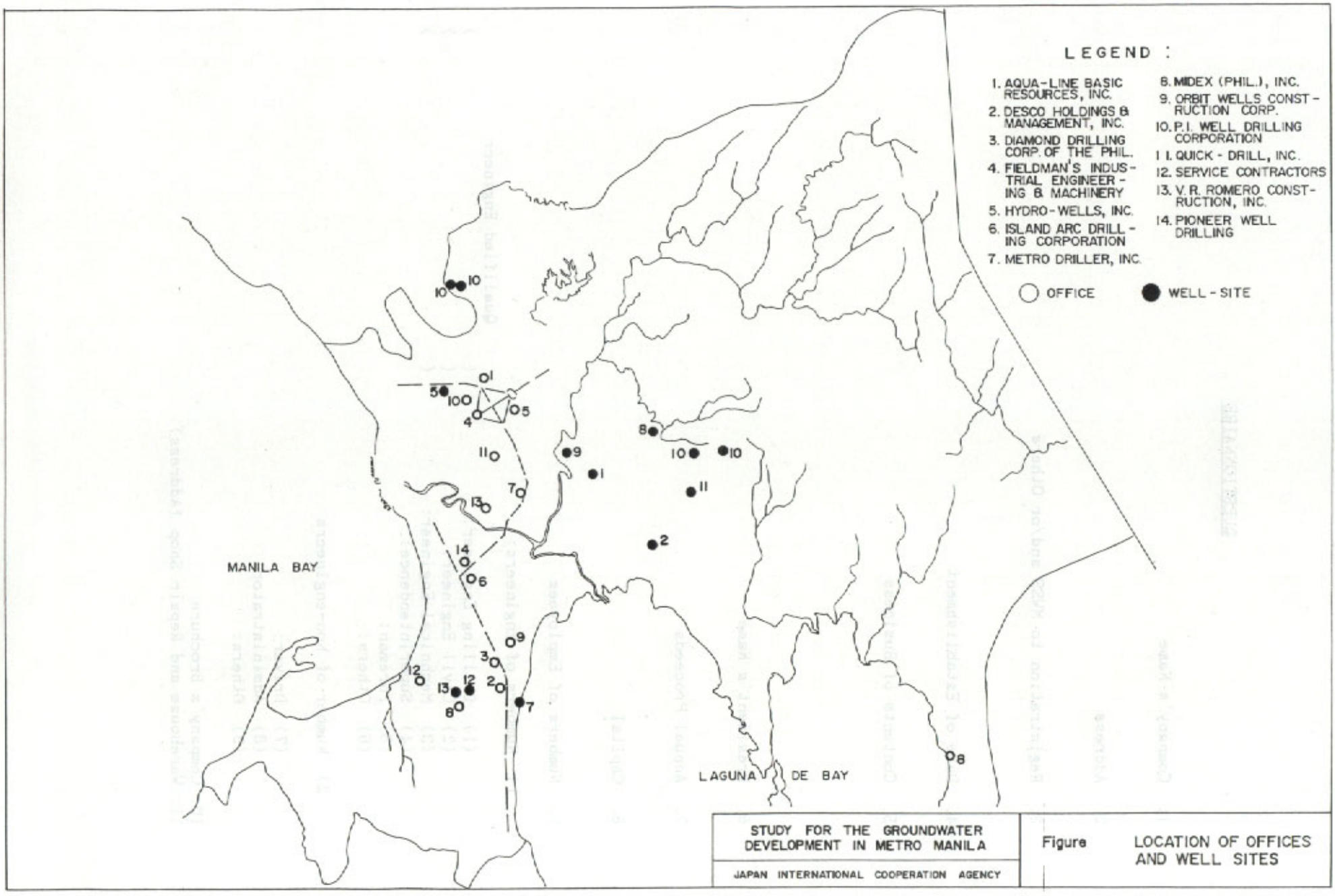
11. P.I. Well Drilling Corporation
245 Roosevelt Avenue, SFDM
Quezon City
Telephone Nos. 99-6455; 99-9366
Attention: Mr. Nilo P. Reyes

12. Quick-Drill Engineering
155 M Paterno Street
San Juan, Metro Manila
Telephone Nos. 77-4311; 77-3308
Attention: Mr. Bobby Reyes Laurel
General Manager

13. Service Contractors (SERCON)
J. de Leon Avenue, Parañaque
Metro Manila
Telephone No. 828-3124
Attention: Mr. Romero B. de Guzman
President

14. V.R. Romero Construction, Inc.
110 San Miguel St., Plainview
Mandaluyong, Metro Manila
Telephone Nos. 79-8476; 79-7413
Attention: Mr. Virgilio R. Romero

Filename:ANNEXES


LEGEND :
1. AQUA-LINE BASIC RESOURCES, INC.
2. DESCO HOLDINGS & MANAGEMENT, INC.
3. DIAMOND DRILLING CORP. OF THE PHIL.
4. FIELDMAN'S INDUSTRIAL ENGINEERING & MACHINERY
5. HYDRO-WELLS, INC.
6. ISLAND ARC DRILLING CORPORATION
7. METRO DRILLER, INC.
8. MIDEX (PHIL.), INC.
9. ORBIT WELLS CONSTRUCTION CORP.
10. P.I. WELL DRILLING CORPORATION
11. QUICK-DRILL, INC.
12. SERVICE CONTRACTORS
13. V.R. ROMERO CONSTRUCTION, INC.
14. PIONEER WELL DRILLING
OFFICE
WELL-SITE
MANILA BAY
LAGUNA DE BAY
STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA
JAPAN INTERNATIONAL COOPERATION AGENCY
Figure
LOCATION OF OFFICES AND WELL SITES

QUESTIONNAIRE

1. Company's Name

2. Address

3. Registration to MWSS and/or Others

4. Date of Establishment

5. Contents of Business

6. President's Name

7. Annual Proceeds

8. Capital

9. Numbers of Employees

   1) Numbers of Engineers:

		Qualified Engineer
(1)	Drilling Engineer:	( )
(2)	Civil Engineer:	( )
(3)	Mechnical Engineer:	( )
(4)	Superintendence:	
(5)	Foreman:	
(6)	Others:	

   2) Number of Non-engineers

(7)	Driver:
(8)	Administrator:
(9)	Others:

10. Company's Brochure
11. Warehouse and Repair Shop (Address)

12. On-going Well Drilling Sites near Metropolitan Manila Area

13. Owned Machines Related to Well Drilling

1) Well drilling

Name of machines	Type of machines	Capacity	Quantity	Age
(1)				
(2)				
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				
(11)				
(12)				
(13)				
(14)				
(15)				
(16)				
(17)				
(18)				
(19)				
(20)				

2) Core boring

(1)				
(2)				
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				
(11)				
(12)				
(13)				
(14)				
(15)				

3) Pumping test

Name of machines	Type of machines	Capacity	Quantity	Age
(1)				
(2)				
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				
(11)				
(12)				
(13)				
(14)				
(15)				

4) Geophysical logging equipment

(1)				
(2)				
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				
(11)				
(12)				

5) Vehicles

(1)				
(2)				
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				
(11)				
(12)				
(13)				
(14)				
(15)				

APPENDIX B

LIST OF COLLECTED DATA

LIST OF TABLES

PAGE

APPENDIX B LIST OF COLLECTED DATA

1. LIST OF REPORTS AND DOCUMENTS RELATED TO GROUNDWATER . B-1

2. LIST OF DATA AND REPORTS TO URBAN DEVELOPMENT AND WATER SUPPLY SYSTEMS B-3

3. LIST OF COLLECTED DATA (URBAN DEVELOPMENT PLANNING) .. B-7

APPENDICES B.1 LIST OF REPORTS AND DOCUMENTS RELATED TO GROUNDWATER

1. Quaison, Hernando P. (1971): The Groundwater Situation in Manila and Suburbs, Bureau of Mines (unpublished)

2. Quaison, Hernando P. (1975): The Groundwater Situation from Calumpit, Bulacan to Tansa, Cavite and Bay, Laguna, Bureau of Mines (unpublished)

3. National Water Resources Council (1983): Laguna Lake Basins, Framework Plan, Southern Tagalog, PHI/77/903-UNDP Assistance to the NWRC, Report No. 24-4A

4. National Environmental Protection Council (1984): Saltwater Intrusion Along Coastal Areas in the Philippines, Phase I Preliminary Assessment

5. National Environmental Protection Council (1985): Groundwater Salinity Intrusion Control Study, Draft Final Report, Volume I Main Report

6. National Environmental Protection Agency (1985): Groundwater Salinity Intrusion Control Study, Draft Final Report, Volume 2 Annexes

7. National Environmental Protection Council (1985): Economic Losses Due to Saltwater Intrusion

8. National Environmental Protection Council (1985): Groundwater Saline Intrusion Control Study, Advisory Technical Services Interim Report

9. National Environmental Protection Council (1985): Groundwater Salinity Intrusion Control Study, Draft Executive Summary

10. Japan International Cooperation Agency (1987): Manila South Port Rehabilitation Project, Feasibility Study, Final Report

11. National Environmental Protection Council (1987): Philippine Groundwater Salinity Intrusion Control Study, A Digest

12. National Water Resources Board (1987): Manual of Water Data Standards Vol. 3 Soil Moisture and Groundwater (reprinted from 1979 publication)

13. Environmental Management Bureau (1990): Leachate Pollution from Open Dumping Site in Metro Manila, Pre-Study Report, VIAK Consulting Engineers, Stockholm, SWEDEN

14. Japan International Cooperation Agency (1990): The Study on Flood Control and Drainage Project in Metro Manila, Draft Final Report (Supporting Report)

15. Metropolitan Waterworks and Sewerage System (1990): Fringe Areas Water Supply Project (FAWSP), SAN MATEO, RIZAL, Feasibility Study Report No. 1, March 1990

16. Metropolitan Waterworks and Sewerage System (1990): Fringe Areas Water Supply Project (FAWSP), IMUS, CAVITE, Feasibility Study Report No. 1, March 1990

17. Metropolitan Waterworks and Sewerage System (1990): Fringe Areas WAter Supply Project (FAWSP), MUNTINLUPA, NCRF (Uncompleted)

18. National Hydraulic Research Center (1990): Water Resources Management Model for Metro Manila, Progress Report No. 1 August 1990

Filename:LIST

APPENDICES B.2(1) LIST OF DATA AND REPORTS RELATED TO URBAN DEVELOPMENT AND WATER SUPPLY SYSTEMS

COLLECTED DATAS AND INFORMATIONS						
Report/ Map	Data/Information	Agency/ Institution	C I	Complete Incomplete	P C	Publication Copy	Place
R	Philippine Development Report 1988	NEDA (Pasig)		C		P	Japan
R	Medium-Term Philippine Development Plan 1987-1992	NEDA (Makati)		C		P	Japan
R	Medium-Term Public Investment Program 1989-1992	NEDA (Makati)		C		P	Japan
R	Medium-Term Southern Tagalog Region Development Plan	NEDA (Region IV, Quezon City)		C		P	Japan
R	Economic Indicators (July - 1990)	NSCB		C		C	Japan
R	Philippine Yearbook 1989	NSO		C		P	Japan
R	Preliminary Population Account (1990 Census of Population and Housing, Report No. 1)	NSO		C		C	Japan
R	Special Release (Highlights of the 1988 Family Income and Expenditures Survey)	NSO		C		C	Japan
R	1988 Compedium of Philippine Social Statistics	NSCB		C		C	Japan
R	Mass Media Infra-structure in the Philippines	PIA		C		P	Japan
R	Cavite Provincial Development Plan	HLURB		I		C	Japan

COLLECTED DATAS AND INFORMATIONS

Report/ Map	Data/Information	Agency/ Institution	C Complete	I Incomplete	P Publication	C Copy	Place
R	Cavite Provincial Profile 1989	Office of the Provincial Planning and Development Coordinator (Cavite Capitol Bldg.)		I		C	Japan
R	Province of Cavite Water Supply, Sewerage and Sanitation Development Plan 1990-2000	Office of the Provincial Planning and Development Coordinator (Cavite Capitol Bldg.)		I		C	Japan
R	Socio Economic Profile 1987 Province of Rizal	Office of the Provincial Planning and Development Coordinator (Rizal Capitol Bldg.)		I		C	Japan
R	Medium-Term National Capital Region Development Plan 1990-1994	MMA		I		C	Japan
R	Soil/Land Resources Evaluation Project Rizal Province	BSWM		I		C	Japan
R	Vegetation and Land Use of Metro Manila	BSWM		I		C	Japan
R	Preliminary Physical Planning Study of the Capital Investment Folio Project	MMA		I		C	Japan
R	Marikina Valley Action Plan	MMC (Metro Manila Commission)		C		C	Japan
M	Metro Manila Physical Survey (MMAPS)	MMA		C		C	Japan
M	1989 Metro Manila City Guide	Cityguide Inc.		C		P	Japan

COLLECTED DATAS AND INFORMATIONS

Report/ Map	Data/Information	Agency/ Institution	C I	Complete Incomplete	P C	Publication Copy	Place
M	Province of Cavite General Land Use Map S = 1:75,000	Office of the Provincial Planning and Development Coordinator (Cavite Capitol Bldg.)					
M	Province of Rizal	Office of the Provincial Planning and Development Coordinator (Rizal Capitol Bldg.)		C		C	Japan
M	Land Use Map Province of Cavite S = 1:75,000	BSWM		C		C	Japan
M	Ecosystem Appraisal Metro Manila, Watersheds of Manila Bay and Laguna de Bay Land Use Map (5 sheets)	BSWM		C		C	Japan
M	Land Use and Vegetation Map Province of Rizal (10 sheets)	BSWM		C		C	Japan
M	Land Use Map S = 1:10,000 (33 sheets)	JICA		C		P	MWSS JICA Office

Filename:DATAINFO.PRN

APPENDICES B.2(2) LIST OF DATA AND REPORTS RELATED TO URBAN DEVELOPMENT PLANNING AND WATER SUPPLY SYSTEMS

1. Annual Report 1989, MWSS

2. Monthly Report on Infrastructure Projects, for the month of August 1990, MWSS

3. Facts and Figures of Existing Water Supply, Sewerage and Sanitation Facilities and Other Civil Works Structures, August 1990, Planning Division, Planning and Programming Department, MWSS

4. Angat Water Supply Optimization Study Final Report (Stage 1) December 1987, MWSS

5. Water Supply, Sewerage and Sanitation Master Plan of the Philippines, 1988-2000, DPWH

6. Report of the Sub-Committee on Water Allocation and Operation of the Angat Dam, January 31, 1974 Department of Public Works Transportation and Communication

7. (BORROWED) Manila Water Supply III Project, Appendix J Distribution System, December 1979, MWSS

8. Report of Accomplishment for CY 1989 and Work Schedule for 1990 of the Central Laboratory Division, Applied Research and Quality Control Department

Filename:LIST

LIST OF COLLECTED DATA

(URBAN DEVELOPMENT PLANNING)

CLASSIFIC.	TITLE	OUTLINE
Report	Philippine Development Report 1988	Publisher : National Economic and Development Authority Date : 1989 Orig. or print : print Summary of content : This report covers the macro-economic and regional development and physical frameworks, and indicatorts of economic and social sectors, infrastructures, development financing and administration, etc.
Report	Five-Year Philippine Development Plan, 1983-1987 Goals, Strategies and Policies	Publisher : National Economic and Development Authority Date : May 1982 Orig. or print : print Development plans related to economic, social and political concerns.
Report	Medium-Term Philippine Development Plan 1987-1992	Publisher : National Economic and Development Authority Orig. or print : print Summary of content : Development framework, economic and social sectors data of the Philippines
Report	Medium-Term Public Investment Program 1989-1992	Publisher : National Economic and Development Authority Date : September 1989 Orig. or print : print Summary of content : This document present the prioritized programs and projects of the National Government and reflects government's response to change in the economic environment and efforts to refocus priorities in the different sectors.

Statistical Report	1986 Economic and Social Indicators	Publisher : National Statistics Coordination Board Date : 1987 Orig. or print : print Summary of content : Annual publication of statistical indicators aimed at measuring and monitoring the degree of achievement of the economic and social development goals set forth in the Republic of the Philippines medium and long-term plans.
Statistical Data	Philippines Yearbook 1989	Publisher : National Statistics Office Date : December 1989 Orig. or print : print Summary of content: Statistical information of the physiography, population and socioeconomic activities of the Philippines.
Statistical Data	1990 Census of Population and Housing	Publisher : National Statistics Office Date : December 1990 Orig. or print : print Summary of content : Population statistical data by Province, City, Municipality and Barangay of the Philippines
Report	Batas Pambansa Blg. 220	Publisher : Housing and Land Use Regulatory Board Orig. or print : print Summary of content : Amended rules and standards for economic and socialized housing projects to implement Batas Pambansa Blg. 220
Report	Socio Economic Profile Province of Rizal	Publisher : Rizal Provincial Capitol Building Date : 1990 Orig. or print : print Summary of content : Socio economic features of the province of Rizal
Report	Cavite Provincial Profile 1989	Publisher : Office of the Provincial Planning and Development Coordinator(Province of Cavite) Date : 1989 Orig. or print : print Summary of content : Socio economic profile of the province of Cavite

General Information	Mass Media Infrastructure in the Philippines	Publisher : Philippine Information Agency Date : Sept. 1987 Orig. or print : print Summary of content : General infrastructure information in the Philippines
Report	Angat Water Supply Optimization Project	Publisher : DCCD Engineering Corp. EDCOP and NHRC Date : June 1988 Orig. or print : print Summary of content : Feasibility Study on Angat Water Supply Project
Map	Land Use Map NCR Project	Publisher : Bureau of Coast & Geodetic Survey-NAMRIA-JICA Date : 1987 Orig. or print : print Summary of content : Land use map of Metro Manila S=1:10,000 (33 sheets)

APPENDIX C

ORGANIZATION AND MANAGEMENT

LIST OF TABLES

PAGE

APPENDIX C ORGANIZATION AND MANAGEMENT

1. SCHEDULE FOR VISIT AND HEARING C-1
2. LIST OF PERSONNEL CALLED ON C-2
3. HRDD SCHEDULE OF TRAINING AND SEMINAR FOR 1990 ..... C-3

Schedule for Visit & Hearing on Organizations of
Municipalities Outside CDS and Related MWSS Sectors

Revised: 6/14/91

DATE	DAY	A. M.	P. M.	REMARKS
6/10	Mon.	Cavite City	Noveleta, Rosario	
6/11	Tue.	Kawit	Imus, Bacoor	
6/12	Wed.	Independence Day		
6/13	Thu.	Antipolo	Cainta, Taytay	
6/14	Fri.	NWRB North Service Sector, MWSS	San Mateo Montalban	* Legal Power on new well drilling permit, etc.
6/16	Sun.			
6/17	Mon.	Mr. J. M. Dimatulac (RPWSIP/MSWDP)	Antipolo, Cainta, Taytay, Montalban, San Mateo	
6/18	Tue.	Mrs. Evangeline Dacanay (FAWSP) +	S-W Service Sector, Cavite City, Rosario	
6/19	Wed.	Recruitment & Employ- ment Divison Personnel Mgm't Dept.	Tech'l & Skills Dvpmt Div. HRDD	
6/20	Thu.	WDMD, CMD	HARD, PPD	Operations & Maintenance

List of Persons called on

MUNICIPALITY	NAME	POSITION	DATE
PROVINCE OF CAVITE			
Cavite City	Timoteo O. Encarnation, Jr.	Mayor	June 10
	Augusto P. Trias	City Development Coordinator	June 10/18
Bacoor	Pacifico R. Miranda	Municipal Development Coordinator	June 11
Imus	Erineo Maliksi	Mayor	June 11
	Edmer G. Para	Project Evaluation Officer, Office of the Municipal Planning and Development Coordinator	
Kawit	Atty. Federico A Poblete	Mayor	June 11
Noveleta	Virgilio L. Saqui	Mayor	June 18
Rosario	Reginaldo Q. Broas	Municipal Planning and Development Coordinator	June 10/18
PROVINCE OF RIZAL			
Antipolo	Ignacio E. Asuncion	Municipal Planning and Development Coordinator	June 13/17
Cainta	Benjamin V. Felix	Mayor	June 13
	Fernando F. Flores	Municipal Planning and Development Coordinator	June 17
	Mario B. Cruz	Economist, Office of the Municipal Planning Development Coordinator	June 13/17
Montalban (Rodriguez)	Angelito C. Manuel	Mayor	June 17
	Ernesto H. Villanueva, Sr.	Vice mayor	June 13
Montalban (Rodriguez)	(Miss) Julieta A. Cruz	Municipal Planning and Development Coordinator	June 17
	Teodorico C. Alejandro	Acting Municipal Eng'r	June 17
San Mateo	Rogelio J. San Miguel	Municipal Eng'r	June 13
	Noly Cristobal	Building Inspector	June 17
Taytay	Rodolfo G. Rico	Municipal Planning and Development Coordinator	June 13/17

TH/mtc/appen-b.wk1

HRDD SCHEDULE OF TRAINING/SEMINAR FOR 1990 (cont'd)

OPERATIONS AREA

	TRAINING/SEMINAR	DATE	NUMBER OF PARTICIPANTS	TRAINING HOURS	OFFICE
1.	PLANT ELECTRICAL CIRCUITS AND MOTOR CONTROL	Mar. 19 - 30	23	40	Electrician - WDMD
		Apr. 16 - 27	17	40	Pump Operators - WDMD
		Jun. 25 - Jul. 6	15	40	WDMD
		Aug. 6 - 17	21	40	WDMD
		Oct. 2 - 13	21	40	WDMD
		Dec. 3 - 14	14	40	WDMD
2.	WATER PURIFICATION	May. 2 - 11	19	64	Tech. Personnel WSTD
3.	WATER TREATMENT PLANT OPERATION & MAINTENANCE	Jun. 4 - 15	24	72	Tech. Personnel WSTD
4.	INDUSTRIAL SAFETY	Nov. 5 - 9	Operations Personnel (16)	40	
5.	FIRST AID	Dec. 3 - 7	Operations Personnel (24)	40	
6.	WATER DISTRIBUTION MAINTENACE PRACTICES	May 7 - 11	Foremens & Pipe Fitters (14)	40	

HRDD SCHEDULE OF TRAINING/SEMINAR FOR 1990 (cont'd)

CUSTOMER SERVICE AREA

TRAINING/SEMINAR	DATE	NUMBER OF PARTICIPANTS	TRAINING HOURS
1. EFFECTIVE CUSTOMER RELATIVES	Feb. 7 - 8	Bill Collectors (35)	16
	Apr. 30 - May 4	Bill Collectors (18)	16
	May 22 - 25	Bill Collectors (25)	16
	Jun. 5 - 8	Bill Collectors (42)	16
	Jul. 10 - 13	29	16
	Aug. 14 - 17	18	16
	Aug. 18 - 31	18	16
	Sep. 4 - 7	28	16
	Sep. 18 - 21	26	16
	Oct. 8 - 12	Customer Service Personnel (20)	40
	Nov. 5 - 9	Customer Service Personnel (15)	40
2. WATER DISTRIBUTION PREVENTIVE MAINTENANCE PRACTICES	Apr. 23 - 27	Engineers Service Investigators (15)	40
3. WATER DISTRIBUTION MAINTENANCE PRACTICES	Aug. 20 - 24	Service Center Personnel (10)	40

HRDD SCHEDULE OF TRAINING/SEMINAR FOR 1990 (cont'd)

CONSTRUCTION MANAGEMENT AREA

TRAINING/SEMINAR	DATE	NUMBER OF PARTICIPANTS	TRAINING HOURS	OFFICE
4. CONSTRUCTION PROJECT INSPECTION	Feb. 12 - 22	Engineers (18)	68	NWSRP II
	May 7 - 11	Project Inspectors/ Engineers (20)	40	NWSRP II
	Sep. 17 - 27	Technical Personnel (24)	40	NWSRP II
5. CONTRACT ADMINISTRATION	Jul. 30 - Aug. 3	Project Personnel (24)	40	NWSRP II
6. ABRASIVE PIPE CUTTING	Sep. 10 -11	Project Personnel (16)	16	NWSRP II
	Dec. 17 -18	Team Leader (10)	16	NWSRP II
7. DEFENSIVE DRIVING	May 21 - 25	Project Engineers Authorized to Drive (21)	40	Different Projects
8. VALVES & HYDRANTS INSTALLATION, REPAIR AND MAINTENANCE	Aug. 12 - 14	Project Personnel (16)	24	NWSRP II
	Dec. 26 - 28	Team Leader (10)	24	NWSRP II
9. PERT/CPM	Oct. 1 - 8	Engineers (17)	40	AWSOP
10. PROJECT MONITORING AND EVALUATION	Dec. 3 - 7	Project Engineers (17)	40	Different Projects

APPENDIX D

WATER DEMAND PROJECTION FOR BP799 AREA (UPDATED RPWSIP PROJECTION)

LIST OF TABLES

PAGE

APPENDIX D WATER DEMAND PROJECTION FOR BP799 AREA

1. PROJECTED WATER DEMAND IN BP799 AREA D-1
2. GROWTH RATE MODIFICATION FOR BP799 AREA D-2
3. PROJECTED SERVED POPULATION FOR BP799 AREA D-3
4. PROJECTED DOMESTIC CONSUMPTION BY SERVED POPULATION IN BP799 AREA D-4
5. PROJECTED DOMESTIC CONSUMPTION BY UNSERVED POPULATION IN BP799 AREA D-5
6. PROJECTED COMMERCIAL CONSUMPTION IN BP799 AREA D-6
7. PROJECTED INDUSTRIAL CONSUMPTION IN BP799 AREA D-7

TABLE PROJECTED WATER DEMAND IN BP799 AREA

MUNICIPALITY	DEMAND TYPE	SERVED WATER DEMAND (M3/DAY)				UNSERVED WATER DEMAND (M3/DAY)				TOTAL WATER DEMAND (M3/DAY)			
		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ANGONO	DOMESTIC	3,115	5,138	7,927	11,583	1,156	1,124	1,022	848	4,271	6,262	8,949	12,432
	COMMERCIAL	623	1,028	1,585	2,317	0	0	0	0	623	1,028	1,585	2,317
	INDUSTRIAL	196	555	1,284	2,502	925	1,295	1,570	1,668	1,121	1,850	2,854	4,170
	LOSSES	590	1,008	1,620	2,460	0	0	0	0	590	1,008	1,620	2,460
	TOTAL	4,524	7,728	12,416	18,862	2,081	2,419	2,591	2,516	6,606	10,147	15,008	21,379
BARAS	DOMESTIC	127	189	401	699	558	610	629	630	685	799	1,030	1,329
	COMMERCIAL	25	38	80	140	0	0	0	0	25	38	80	140
	INDUSTRIAL	8	20	65	151	38	48	79	101	46	68	144	252
	LOSSES	24	37	82	148	0	0	0	0	24	37	82	148
	TOTAL	184	285	628	1,138	596	658	708	731	780	943	1,336	1,869
BINANGONAN	DOMESTIC	7,008	10,902	15,915	22,135	3,109	2,873	2,520	2,063	10,117	13,774	18,435	24,198
	COMMERCIAL	1,402	2,180	3,183	4,427	0	0	0	0	1,402	2,180	3,183	4,427
	INDUSTRIAL	442	1,177	2,578	4,781	2,081	2,747	3,151	3,187	2,523	3,925	5,729	7,969
	LOSSES	1,328	2,139	3,251	4,701	0	0	0	0	1,328	2,139	3,251	4,701
	TOTAL	10,179	16,398	24,927	36,045	5,190	5,620	5,672	5,251	15,369	22,018	30,599	41,295
CARDONA	DOMESTIC	490	631	841	1,095	966	1,005	1,021	1,020	1,456	1,636	1,862	2,115
	COMMERCIAL	98	126	168	219	0	0	0	0	98	126	168	219
	INDUSTRIAL	31	68	136	237	146	159	167	158	176	227	303	394
	LOSSES	93	124	172	233	0	0	0	0	93	124	172	233
	TOTAL	712	949	1,317	1,784	1,112	1,164	1,188	1,177	1,823	2,113	2,505	2,961
JARA-JARA	DOMESTIC	73	269	568	988	542	542	526	490	615	811	1,093	1,478
	COMMERCIAL	15	54	114	198	0	0	0	0	15	54	114	198
	INDUSTRIAL	5	29	92	213	22	68	112	142	26	97	204	356
	LOSSES	14	53	116	210	0	0	0	0	14	53	116	210
	TOTAL	106	405	890	1,608	564	610	638	633	670	1,015	1,527	2,241
MORONG	DOMESTIC	955	1,253	1,768	2,447	861	900	940	966	1,816	2,153	2,708	3,413
	COMMERCIAL	191	251	354	489	0	0	0	0	191	251	354	489
	INDUSTRIAL	60	135	286	529	284	316	350	352	344	451	636	881
	LOSSES	181	246	361	520	0	0	0	0	181	246	361	520
	TOTAL	1,387	1,885	2,769	3,985	1,144	1,216	1,290	1,319	2,531	3,101	4,059	5,304
PILILLA	DOMESTIC	703	1,161	2,161	3,067	993	1,010	928	882	1,696	2,171	3,089	3,949
	COMMERCIAL	141	232	432	613	0	0	0	0	141	232	432	613
	INDUSTRIAL	44	125	350	662	209	292	428	442	253	418	778	1,104
	LOSSES	133	228	441	651	0	0	0	0	133	228	441	651
	TOTAL	1,021	1,746	3,384	4,993	1,202	1,303	1,356	1,324	2,222	3,049	4,740	6,317
TANAY	DOMESTIC	2,170	3,924	5,882	8,385	1,656	1,570	1,497	1,366	3,827	5,494	7,379	9,751
	COMMERCIAL	434	785	1,176	1,677	0	0	0	0	434	785	1,176	1,677
	INDUSTRIAL	137	424	953	1,811	645	989	1,165	1,208	781	1,413	2,117	3,019
	LOSSES	411	770	1,202	1,781	0	0	0	0	411	770	1,202	1,781
	TOTAL	3,152	5,903	9,212	13,655	2,301	2,559	2,662	2,573	5,453	8,461	11,874	16,228
TERESA	DOMESTIC	480	792	1,143	1,581	575	539	504	458	1,055	1,332	1,647	2,040
	COMMERCIAL	96	158	229	316	0	0	0	0	96	158	229	316
	INDUSTRIAL	30	86	185	342	143	200	226	228	173	285	412	569
	LOSSES	91	155	234	336	0	0	0	0	91	155	234	336
	TOTAL	697	1,192	1,791	2,575	717	739	730	686	1,415	1,931	2,521	3,261
TOTAL	DOMESTIC	15,121	24,259	36,605	51,981	10,417	10,173	9,587	8,724	25,537	34,433	46,192	60,705
	COMMERCIAL	3,024	4,852	7,321	10,396	0	0	0	0	3,024	4,852	7,321	10,396
	INDUSTRIAL	953	2,620	5,930	11,228	4,491	6,113	7,248	7,485	5,443	8,733	13,178	18,713
	LOSSES	2,865	4,760	7,478	11,041	0	0	0	0	2,865	4,760	7,478	11,041
	TOTAL	21,962	36,491	57,334	84,645	14,908	16,287	16,835	16,209	36,870	52,778	74,169	100,855

FILE:BP799DEM

TABLE GROWTH RATE MODIFICATION FOR BP799 AREA

MUNICIPALITY	POPULATION TYPE	POPULATION 1980 (CENSUS)	POPULATION 1990 (CENSUS)	PROPORTION 1980	PROPORTION 1990	GROWTH RATE 1980-1990	GROWTH RATE RPWSIP 1990-2000	GROWTH RATE RPWSIP 2000-2010	GROWTH RATE MODIFIED 1990-2000	GROWTH RATE MODIFIED 2000-2010
ANGONO	URBAN	27,136	46,014	100.00	100.00	5.42	6.00	4.54	4.98	4.54
	RURAL	0	0	0.00	0.00	ERR	-	-	-	-
	TOTAL	27,136	46,014	100.00	100.00	5.42				
BARAS	URBAN	2,403	3,204	21.02	18.98	2.92	2.50	3.50	3.21	3.50
	RURAL	9,031	13,676	78.98	81.02	4.24	2.55	2.55	3.39	2.55
	TOTAL	11,434	16,880	100.00	100.00	3.97				
BINANGONAN	URBAN	68,188	110,346	82.45	86.50	4.93	4.31	4.31	4.62	4.31
	RURAL	14,514	17,215	17.55	13.50	1.72	2.00	2.00	1.86	2.00
	TOTAL	82,702	127,561	100.00	100.00	4.43				
CARDONA	URBAN	5,117	5,943	20.45	18.03	1.51	3.80	3.80	2.65	3.80
	RURAL	19,907	27,019	79.55	81.97	3.10	2.55	2.55	2.83	2.55
	TOTAL	25,024	32,962	100.00	100.00	2.79				
JALA-JALA	URBAN	3,818	4,693	31.30	28.76	2.08	3.94	3.94	2.94	3.80
	RURAL	8,381	11,625	68.70	71.24	3.33	2.20	2.00	2.66	2.00
	TOTAL	12,199	16,318	100.00	100.00	2.95				
MORONG	URBAN	10,368	11,505	40.84	35.77	1.05	3.20	3.80	2.42	3.80
	RURAL	15,019	20,660	59.16	64.23	3.24	2.00	2.00	2.62	2.00
	TOTAL	25,387	32,165	100.00	100.00	2.39				
PILILLA	URBAN	10,954	14,845	46.19	45.30	3.09	4.00	3.80	3.44	3.80
	RURAL	12,762	17,926	53.81	54.70	3.46	2.00	2.55	3.00	2.55
	TOTAL	23,716	32,771	100.00	100.00	3.29				
TANAY	URBAN	27,000	38,456	65.37	65.84	3.60	3.80	3.80	3.70	3.80
	RURAL	14,303	19,954	34.63	34.16	3.39	2.55	2.55	2.97	2.55
	TOTAL	41,303	58,410	100.00	100.00	3.53				
TERESA	URBAN	7,685	9,367	50.91	45.37	2.00	3.80	3.80	2.90	3.80
	RURAL	7,410	11,278	49.09	54.63	4.29	2.00	2.00	3.14	2.00
	TOTAL	15,095	20,645	100.00	100.00	3.18				
TOTAL	URBAN	162,670	244,373	61.62	63.68	4.15				
	RURAL	101,326	139,353	38.38	36.32	3.24				
	TOTAL	263,996	383,726	100.00	100.00	3.81				

FILE: BP799GR

TABLE PROJECTED SERVED POPULATION FOR BP199 AREA

MUNICIPALITY	POPULATION TYPE	PROJECTED POPULATION					GROWTH RATE		SERVICE RATIO FOR URBAN (%)				SERVED POPULATION			
		1990 (CENSUS)	1995	2000	2005	2010	1990-2000	2000-2010	1995	2000	2005	2010	1995	2000	2005	2010
ANGONO	URBAN	46,014	55,062	64,219	72,979	80,788	3.39	2.32	40	50	60	70	22,025	32,110	43,787	56,552
	RURAL	0	0	0	0	0	0.00	0.00	-	-	-	-	0	0	0	0
	TOTAL	46,014	55,062	64,219	72,979	80,788	3.39	2.32					22,025	32,110	43,787	56,552
BARAS	URBAN	3,204	3,591	3,942	4,431	4,875	2.09	2.15	25	30	50	70	898	1,183	2,216	3,412
	RURAL	13,676	15,460	17,121	18,377	19,307	2.27	1.21	-	-	-	-	0	0	0	0
	TOTAL	16,880	19,051	21,063	22,808	24,182	2.24	1.39					898	1,183	2,216	3,412
BINANGONAN	URBAN	110,346	123,882	136,262	146,513	154,381	2.13	1.26	40	50	60	70	49,553	68,131	87,908	108,067
	RURAL	17,215	16,309	16,271	15,642	14,736	-0.56	-0.99	-	-	-	-	0	0	0	0
	TOTAL	127,561	140,191	152,533	162,155	169,117	1.80	1.04					49,553	68,131	87,908	108,067
CARDONA	URBAN	5,943	6,300	6,575	7,147	7,639	1.02	1.51	55	60	65	70	3,465	3,945	4,645	5,348
	RURAL	27,019	28,894	30,420	31,123	31,313	1.19	0.29	-	-	-	-	0	0	0	0
	TOTAL	32,962	35,194	36,995	38,270	38,952	1.16	0.52					3,465	3,945	4,645	5,348
JALA-JALA	URBAN	4,693	5,173	5,603	6,274	6,888	1.79	2.09	10	30	50	70	517	1,681	3,137	4,821
	RURAL	11,625	12,641	13,506	13,857	13,938	1.51	0.32	-	-	-	-	0	0	0	0
	TOTAL	16,318	17,814	19,109	20,131	20,826	1.59	0.86					517	1,681	3,137	4,821
MORONG	URBAN	11,505	12,273	13,054	15,021	17,067	1.27	2.72	55	60	65	70	6,750	7,832	9,763	11,947
	RURAL	20,660	22,255	23,903	25,201	26,237	1.47	0.94	-	-	-	-	0	0	0	0
	TOTAL	32,165	34,528	36,957	40,222	43,304	1.40	1.60					6,750	7,832	9,763	11,947
PILILLA	URBAN	14,845	16,561	18,135	19,891	21,387	2.02	1.66	30	40	60	70	4,968	7,254	11,935	14,971
	RURAL	17,926	19,576	20,984	21,665	21,925	1.59	0.44	-	-	-	-	0	0	0	0
	TOTAL	32,771	36,137	39,119	41,556	43,312	1.79	1.02					4,968	7,254	11,935	14,971
TANAY	URBAN	38,456	43,848	49,049	54,148	58,485	2.46	1.77	35	50	60	70	15,347	24,525	32,489	40,939
	RURAL	19,954	21,362	23,715	24,641	25,050	1.74	0.55	-	-	-	-	0	0	0	0
	TOTAL	58,410	65,210	72,764	78,789	83,535	2.22	1.39					15,347	24,525	32,489	40,939
TERESA	URBAN	9,367	9,696	9,902	10,525	11,030	0.56	1.08	35	50	60	70	3,394	4,951	6,315	7,721
	RURAL	11,278	11,811	12,204	11,885	11,411	0.79	-0.67	-	-	-	-	0	0	0	0
	TOTAL	20,645	21,507	22,106	22,410	22,441	0.69	0.15					3,394	4,951	6,315	7,721
TOTAL	URBAN	244,373	276,386	306,741	336,929	362,540	2.30	1.69	39	49	60	70	106,916	151,611	202,195	253,778
	RURAL	139,353	149,508	158,124	162,391	163,917	1.27	0.36	-	-	-	-	0	0	0	0
	TOTAL	383,726	425,894	464,865	499,320	526,457	1.94	1.25					106,916	151,611	202,195	253,778

FILE:BP199POP

TABLE PROJECTED DOMESTIC CONSUMPTION BY SERVED POPULATION IN BP799 AREA

MUNICIPALITY	POPULATION TYPE	SERVED POPULATION				PER CAPITA CONSUMPTION (CONNECTED, LPCD)				DOMESTIC CONSUMPTION (M3/DAY)			
		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ANGONO	URBAN	22,025	32,110	43,787	56,552	141	160	181	205	3,115	5,138	7,927	11,583
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	22,025	32,110	43,787	56,552	141	160	181	205	3,115	5,138	7,927	11,583
BARAS	URBAN	898	1,183	2,215	3,412	141	160	181	205	127	189	401	699
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	898	1,183	2,215	3,412	141	160	181	205	127	189	401	699
BINANGONAN	URBAN	49,553	68,131	87,908	108,067	141	160	181	205	7,008	10,902	15,915	22,135
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	49,553	68,131	87,908	108,067	141	160	181	205	7,008	10,902	15,915	22,135
CARDONA	URBAN	3,465	3,945	4,645	5,348	141	160	181	205	490	631	841	1,095
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	3,465	3,945	4,645	5,348	141	160	181	205	490	631	841	1,095
JARA-JARA	URBAN	517	1,681	3,137	4,821	141	160	181	205	73	269	568	988
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	517	1,681	3,137	4,821	141	160	181	205	73	269	568	988
MORONG	URBAN	6,750	7,832	9,763	11,947	141	160	181	205	955	1,253	1,768	2,447
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	6,750	7,832	9,763	11,947	141	160	181	205	955	1,253	1,768	2,447
PILILLA	URBAN	4,968	7,254	11,935	14,971	141	160	181	205	703	1,161	2,161	3,067
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	4,968	7,254	11,935	14,971	141	160	181	205	703	1,161	2,161	3,067
TANAY	URBAN	15,347	24,525	32,489	40,939	141	160	181	205	2,170	3,924	5,882	8,385
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	15,347	24,525	32,489	40,939	141	160	181	205	2,170	3,924	5,882	8,385
TERESA	URBAN	3,394	4,951	6,315	7,721	141	160	181	205	480	792	1,143	1,581
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	3,394	4,951	6,315	7,721	141	160	181	205	480	792	1,143	1,581
TOTAL	URBAN	106,916	151,611	202,195	253,778	141	160	181	205	15,121	24,259	36,605	51,981
	RURAL	0	0	0	0	141	160	181	205	0	0	0	0
	TOTAL	106,916	151,611	202,195	253,778	141	160	181	205	15,121	24,259	36,605	51,981

TABLE PROJECTED DOMESTIC CONSUMPTION BY UNSERVED POPULATION IN BP799 AREA

MUNICIPALITY	POPULATION TYPE	UNSERVED POPULATION				PER CAPITA CONSUMPTION (UNCONNECTED, LPCD)				DOMESTIC CONSUMPTION (M3/DAY)			
		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ANGONO	URBAN	33,037	32,110	29,192	24,236	35	35	35	35	1,156	1,124	1,022	848
	RURAL	0	0	0	0	30	30	30	30	0	0	0	0
	TOTAL	33,037	32,110	29,192	24,236					1,156	1,124	1,022	848
BARAS	URBAN	2,693	2,759	2,215	1,462	35	35	35	35	94	97	78	51
	RURAL	15,460	17,121	18,377	19,307	30	30	30	30	464	514	551	579
	TOTAL	18,153	19,880	20,593	20,770					558	610	629	630
BINANGONAN	URBAN	74,329	68,131	58,605	46,314	35	35	35	35	2,602	2,385	2,051	1,621
	RURAL	16,909	16,271	15,642	14,736	30	30	30	30	507	488	469	442
	TOTAL	91,238	84,402	74,247	61,050					3,109	2,873	2,520	2,063
CARDONA	URBAN	2,835	2,630	2,501	2,292	35	35	35	35	99	92	88	80
	RURAL	28,894	30,420	31,123	31,313	30	30	30	30	867	913	934	939
	TOTAL	31,729	33,050	33,625	33,604					966	1,005	1,021	1,020
JALA-JALA	URBAN	4,656	3,922	3,137	2,066	35	35	35	35	163	137	110	72
	RURAL	12,641	13,506	13,857	13,938	30	30	30	30	379	405	416	418
	TOTAL	17,297	17,428	16,994	16,005					542	542	526	490
MORONG	URBAN	5,523	5,222	5,257	5,120	35	35	35	35	193	183	184	179
	RURAL	22,255	23,903	25,201	26,237	30	30	30	30	668	717	756	787
	TOTAL	27,778	29,125	30,459	31,357					861	900	940	966
PILILLA	URBAN	11,593	10,881	7,957	6,416	35	35	35	35	406	381	278	225
	RURAL	19,576	20,984	21,665	21,925	30	30	30	30	587	630	650	658
	TOTAL	31,169	31,865	29,621	28,341					993	1,010	928	882
TANAY	URBAN	28,501	24,525	21,659	17,545	35	35	35	35	998	858	758	614
	RURAL	21,962	23,715	24,641	25,050	30	30	30	30	659	711	739	752
	TOTAL	50,463	48,239	46,300	42,596					1,656	1,570	1,497	1,366
TERESA	URBAN	6,302	4,951	4,210	3,309	35	35	35	35	221	173	147	116
	RURAL	11,811	12,204	11,885	11,411	30	30	30	30	354	366	357	342
	TOTAL	18,113	17,155	16,095	14,720					575	539	504	458
TOTAL	URBAN	169,469	155,130	134,734	108,762	35	35	35	35	5,931	5,430	4,716	3,807
	RURAL	149,508	158,124	162,391	163,917	30	30	30	30	4,485	4,744	4,872	4,918
	TOTAL	318,978	313,254	297,125	272,679					10,417	10,173	9,587	8,724

FILE:BP799DCU

TABLE PROJECTED COMMERCIAL CONSUMPTION IN BP799 AREA

MUNICIPALITY	SERVED POPULATION				PER CAPITA CONSUMPTION (CONNECTED, LPCD)				COMMERCIAL CONSUMPTION (M3/DAY)			
	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ANGONO	22,025	32,110	43,787	56,552	28	32	36	41	623	1,028	1,585	2,317
BARAS	898	1,183	2,215	3,412	28	32	36	41	25	38	80	140
BINANGONAN	49,553	68,131	87,908	108,067	28	32	36	41	1,402	2,180	3,183	4,427
CARDONA	3,465	3,945	4,645	5,348	28	32	36	41	98	126	168	219
JARA-JARA	517	1,681	3,137	4,821	28	32	36	41	15	54	114	198
MORONG	6,750	7,832	9,763	11,947	28	32	36	41	191	251	354	489
PILILLA	4,968	7,254	11,935	14,971	28	32	36	41	141	232	432	613
TANAY	15,347	24,525	32,489	40,939	28	32	36	41	434	785	1,176	1,677
TERESA	3,394	4,951	6,315	7,721	28	32	36	41	96	158	229	316
TOTAL	106,916	151,611	202,195	253,778	28	32	36	41	3,024	4,852	7,321	10,396

FILE:BP799CMS

TABLE PROJECTED INDUSTRIAL CONSUMPTION IN SPT99 AREA

MUNICIPALITY	SERVED POPULATION				PER CAPITA CONSUMPTION (CONNECTED, LPCD)				MWSS SERVICE RATIO (%)				CONNECTED (M3/DAY)				INDUSTRIAL CONSUMPTION PRIVATE (M3/DAY)				TOTAL (M3/DAY)			
	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ANGONO	22,025	33,110	43,187	56,552	51	58	65	74	17.5	30	45	60	196	555	1,284	2,502	925	1,295	1,570	1,668	1,121	1,850	2,854	4,170
BARAS	898	1,183	2,215	3,412	51	58	65	74	17.5	30	45	60	8	20	65	151	38	48	79	101	46	68	144	252
BINANGONAN	49,553	68,131	87,908	108,067	51	58	65	74	17.5	30	45	60	442	1,177	2,578	4,781	2,081	2,747	3,151	3,187	2,523	3,925	5,729	7,969
CARDONA	3,465	3,945	4,645	5,348	51	58	65	74	17.5	30	45	60	31	68	136	237	146	159	167	158	176	227	303	394
JALA-JALA	517	1,681	3,137	4,821	51	58	65	74	17.5	30	45	60	5	29	92	213	22	68	112	142	26	97	204	355
MORONG	6,750	7,832	9,763	11,947	51	58	65	74	17.5	30	45	60	60	135	286	529	284	316	350	352	344	451	636	881
PILILLA	4,968	7,254	11,935	14,971	51	58	65	74	17.5	30	45	60	44	125	350	662	209	292	428	442	253	418	778	1,104
TANAY	15,347	24,525	32,489	40,939	51	58	65	74	17.5	30	45	60	137	424	953	1,811	645	989	1,165	1,208	781	1,413	2,117	3,019
TERESA	3,394	4,951	6,315	7,721	51	58	65	74	17.5	30	45	60	30	86	185	342	143	200	226	228	173	285	412	569
TOTAL	106,916	151,611	202,195	253,778	51	58	65	74	17.5	30	45	60	953	2,620	5,930	11,228	4,491	6,113	7,248	7,485	5,443	8,733	13,178	18,713

FILE:SPT99IDS

APPENDIX E

WATER DEMAND PROJECTION FOR FRINGE AREA (UPDATED FAWSP PROJECTION)

LIST OF TABLES

PAGE

APPENDIX E WATER DEMAND PROJECTION FOR FRINGE AREA

1. WATER DEMAND SUMMARY (BACOOR) E-1
2. WATER DEMAND SUMMARY (CAVITE CITY) E-1
3. WATER DEMAND SUMMARY (KAWIT) E-2
4. WATER DEMAND SUMMARY (ROSARIO) E-2
5. POPULATION PROJECTION FOR CAVITE AREA E-3
6. POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 1995) E-4
7. POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 2000) E-4
8. POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 2005) E-5
9. POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 2010) E-5
10. DOMESTIC WATER DEMAND (CAVITE AREA, 1995) E-6
11. DOMESTIC WATER DEMAND (CAVITE AREA, 2000) E-6
12. DOMESTIC WATER DEMAND (CAVITE AREA, 2005) E-7
13. DOMESTIC WATER DEMAND (CAVITE AREA, 2010) E-7
14. COMMERCIAL WATER DEMAND (CAVITE AREA) E-8
15. INDUSTRIAL WATER DEMAND (CAVITE AREA) E-8
16. INSTITUTIONAL WATER DEMAND (CAVITE AREA) E-9
17. WATER DEMAND SUMMARY (IMUS) E-10
18. POPULATION PROJECTION FOR IMUS E-11
19. POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 1995) E-12
20. POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 2000) E-13
21. POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 2005) E-14
22. POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 2010)..... E-15
23. DOMESTIC WATER DEMAND (IMUS, 1995) E-16
24. DOMESTIC WATER DEMAND (IMUS, 2000) E-17
25. DOMESTIC WATER DEMAND (IMUS, 2005) E-18

26. DOMESTIC WATER DEMAND (IMUS, 2010) E-19
27. COMMERCIAL WATER DEMAND (IMUS) E-20
28. INDUSTRIAL WATER DEMAND (IMUS) E-21
29. INSTITUTIONAL WATER DEMAND (IMUS) E-22
30. WATER DEMAND SUMMARY (ANTIPOLO) E-23
31. POPULATION PROJECTION FOR ANTIPOLO E-24
32. POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 1995) E-25
33. POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 2000) E-26
34. POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 2005) E-27
35. POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 2010) E-28
36. DOMESTIC WATER DEMAND (ANTIPOLO, 1995) E-29
37. DOMESTIC WATER DEMAND (ANTIPOLO, 2000) E-30
38. DOMESTIC WATER DEMAND (ANTIPOLO, 2005) E-31
39. DOMESTIC WATER DEMAND (ANTIPOLO, 2010) E-32
40. COMMERCIAL WATER DEMAND (ANTIPOLO) E-33
41. INDUSTRIAL WATER DEMAND (ANTIPOLO) E-34
42. INSTITUTIONAL WATER DEMAND (ANTIPOLO) E-35
43. WATER DEMAND SUMMARY (SAN MATEO) E-36
44. POPULATION PROJECTION FOR SAN MATEO E-37
45. POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 1995) E-38
46. POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 2000) E-39
47. POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 2005) E-40
48. POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 2010) E-41
49. DOMESTIC WATER DEMAND (SAN MATEO, 1995) E-42
50. DOMESTIC WATER DEMAND (SAN MATEO, 2000) E-43
51. DOMESTIC WATER DEMAND (SAN MATEO, 2005) E-44
52. DOMESTIC WATER DEMAND (SAN MATEO, 2010) E-45
53. COMMERCIAL WATER DEMAND (SAN MATEO) E-46
54. INDUSTRIAL WATER DEMAND (SAN MATEO) E-47
55. INSTITUTIONAL WATER DEMAND (SAN MATEO) E-48
56. WATER DEMAND SUMMARY (MONTALBAN) E-49

57. POPULATION PROJECTION FOR MONTALBAN E-50
58. POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 1995) E-51
59. POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 2000) E-52
60. POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 2005) E-53
61. POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 2010) E-54
62. DOMESTIC WATER DEMAND (MONTALBAN, 1995) E-55
63. DOMESTIC WATER DEMAND (MONTALBAN, 2000) E-56
64. DOMESTIC WATER DEMAND (MONTALBAN, 2005) E-57
65. DOMESTIC WATER DEMAND (MONTALBAN, 2010) E-58
66. COMMERCIAL WATER DEMAND (MONTALBAN) E-59
67. INDUSTRIAL WATER DEMAND (MONTALBAN) E-60
68. INSTITUTIONAL WATER DEMAND (MONTALBANO) E-61

TABLE WATER DEMAND SUMMARY (BACOOR)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	18,355	30,971	48,193	70,986
COMMERCIAL	1,342	2,549	4,294	6,742
INDUSTRIAL	12	24	42	78
INSTITUTIONAL	257	426	695	1,058
SUB TOTAL	19,967	33,969	53,224	78,863
UNACCOUNTED-FOR WATER	8,557	14,558	17,741	26,288
(%)	30	30	25	25
TOTAL WATER DEMAND	28,524	48,527	70,965	105,151
SERVED POPULATION	87,503	136,023	201,203	282,454
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.210	0.228	0.240	0.251
TOTAL C.	0.228	0.250	0.265	0.279

TABLE WATER DEMAND SUMMARY (CAVITE CITY)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	13,264	18,843	25,031	28,877
COMMERCIAL	2,082	3,266	5,010	6,713
INDUSTRIAL	14	22	32	40
INSTITUTIONAL	184	252	351	420
SUB TOTAL	15,543	22,384	30,424	36,050
UNACCOUNTED-FOR WATER	6,661	9,593	10,141	12,017
(%)	30	30	25	25
TOTAL WATER DEMAND	22,205	31,977	40,566	48,066
SERVED POPULATION	61,689	80,998	102,324	112,628
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.215	0.233	0.245	0.256
TOTAL C.	0.252	0.276	0.297	0.320

FILE: DEMSUMCA

TABLE WATER DEMAND SUMMARY (KAWIT)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	7,813	11,609	15,379	18,352
COMMERCIAL	1,315	2,065	3,010	3,959
INDUSTRIAL	10	17	26	38
INSTITUTIONAL	116	168	236	285
SUB TOTAL	9,253	13,860	18,652	22,635
UNACCOUNTED-FOR WATER	3,966	5,940	6,217	7,545
(%)	30	30	25	25
TOTAL WATER DEMAND	13,219	19,800	24,869	30,180
SERVED POPULATION	38,144	52,408	66,138	75,407
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.205	0.222	0.233	0.243
TOTAL C.	0.243	0.264	0.282	0.300

TABLE WATER DEMAND SUMMARY (ROSARIO)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	2,620	4,677	7,087	10,371
COMMERCIAL	353	665	1,101	1,753
INDUSTRIAL	4	9	15	28
INSTITUTIONAL	42	72	115	165
SUB TOTAL	3,020	5,423	8,318	12,316
UNACCOUNTED-FOR WATER	1,294	2,324	2,773	4,105
(%)	30	30	25	25
TOTAL WATER DEMAND	4,314	7,747	11,091	16,422
SERVED POPULATION	13,786	22,473	32,310	44,829
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.190	0.208	0.219	0.231
TOTAL C.	0.219	0.241	0.257	0.275

FILE: DEMSUMCA

TABLE POPULATION PROJECTION FOR CAVITE AREA

BARANGAY	MUNICIPALITY POPULATION -CENSUS- 1990	MUNICIPALITY POPULATION -PROJECTED- 1995	2000	2005	2010	SERVICE AREA % 1995	2000	2005	2010	SERVICE AREA POPULATION 1995	2000	2005	2010
BACOOL	159,685	196,636	235,538	275,150	313,838	50	60	75	90	98,318	141,323	206,363	282,454
CAVITE CITY	91,641	98,576	104,379	109,908	112,628	70	80	95	100	69,003	83,503	104,413	112,628
KAWIT	47,755	55,217	62,446	69,254	75,407	80	90	100	100	44,174	56,201	69,254	75,407
ROSARIO	45,405	53,127	60,737	68,022	74,715	30	40	50	60	15,938	24,295	34,011	44,829
CAVITE AREA TOTAL	344,486	403,556	463,100	522,334	576,588	56	66	79	89	227,433	305,322	414,040	515,318

FILE: CAVPOP

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 1995)

MUNICIPALITY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW-DIRECT	LOW-PUB.F.	LOW-SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	98,318	5	25	50	20	4,916	24,580	49,159	19,664	50	80	90	95	2,458	2,458	4,916	19,664	44,243	18,680	87,503
CAVITE CITY	69,003	3	20	55	22	2,070	13,801	37,952	15,181	50	80	90	95	1,035	1,035	2,070	11,041	34,157	14,422	61,689
KAWIT	44,174	2	45	40	13	883	19,878	17,669	5,743	50	80	90	95	442	442	883	15,902	15,902	5,455	38,144
ROSARIO	15,938	10	50	30	10	1,594	7,969	4,781	1,594	50	80	90	95	797	797	1,594	6,375	4,303	1,514	13,786
CAVITE AREA TOTAL	227,433	4	29	48	19	9,463	66,227	109,562	42,181	50	80	90	95	4,732	4,732	9,463	52,982	98,605	40,072	201,122

FILE: CAVPOP95

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 2000)

MUNICIPALITY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP.						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW-DIRECT	LOW-PUB.F.	LOW-SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	141,323	5	25	50	20	7,066	35,331	70,661	28,265	65	85	100	100	4,593	2,473	7,066	30,031	70,661	28,265	136,023
CAVITE CITY	83,503	3	20	55	22	2,505	16,701	45,927	18,371	65	85	100	100	1,628	877	2,505	14,196	45,927	18,371	80,998
KAWIT	56,201	2	45	40	13	1,124	25,291	22,481	7,306	65	85	100	100	731	393	1,124	21,497	22,481	7,306	52,408
ROSARIO	24,295	10	50	30	10	2,429	12,147	7,288	2,429	65	85	100	100	1,579	850	2,429	10,325	7,288	2,429	22,473
CAVITE AREA TOTAL	305,322	4	29	48	18	13,125	89,469	146,357	56,371	65	85	100	100	8,531	4,594	13,125	76,049	146,357	56,371	291,902

FILE: CAVPOP00

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 2005)

MUNICIPALITY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW DIRECT	LOW PUB.F.	LOW SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	206,363	5	25	50	20	10,318	51,591	103,181	41,273	70	90	100	100	7,223	3,095	10,318	46,432	103,181	41,273	201,203
CAVITE CITY	104,413	3	20	55	22	3,132	20,883	57,427	22,971	70	90	100	100	2,193	940	3,132	18,794	57,427	22,971	102,324
KAWIT	69,254	2	45	40	13	1,385	31,164	27,702	9,003	70	90	100	100	970	416	1,385	28,048	27,702	9,003	66,138
ROSARIO	34,011	10	50	30	10	3,401	17,006	10,203	3,401	70	90	100	100	2,381	1,020	3,401	15,305	10,203	3,401	32,310
CAVITE AREA TOTAL	414,040	4	29	48	19	18,237	120,643	198,513	76,647	70	90	100	100	12,766	5,471	18,237	108,579	198,513	76,647	401,976

FILE: CAVPOP05

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (CAVITE AREA, 2010)

MUNICIPALITY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW DIRECT	LOW PUB.F.	LOW SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	282,454	5	25	50	20	14,123	70,614	141,227	56,491	80	100	100	100	11,298	2,825	14,123	70,614	141,227	56,491	282,454
CAVITE CITY	112,628	3	20	55	22	3,379	22,526	61,945	24,778	80	100	100	100	2,703	676	3,379	22,526	61,945	24,778	112,628
KAWIT	75,407	2	45	40	13	1,508	33,933	30,163	9,803	80	100	100	100	1,207	302	1,508	33,933	30,163	9,803	75,407
ROSARIO	44,829	10	50	30	10	4,483	22,415	13,449	4,483	80	100	100	100	3,586	897	4,483	22,415	13,449	4,483	44,829
CAVITE AREA TOTAL	515,318	5	29	48	19	23,493	149,487	246,784	95,555	80	100	100	100	18,794	4,699	23,493	149,487	246,784	95,555	515,318

FILE: CAVPOP10

TABLE DOMESTIC WATER DEMAND (CAVITE AREA, 1995)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	2,458	2,458	4,916	19,664	44,243	18,680	87,503	151	22	183	215	258	371	54	425	3,598	9,512	4,820	18,355
CAVITE CITY	1,035	1,035	2,070	11,041	34,157	14,422	61,689	151	22	183	215	258	156	23	179	2,020	7,344	3,721	13,264
KAWIT	442	442	883	15,902	15,902	5,455	38,144	151	22	183	215	258	67	10	76	2,910	3,419	1,408	7,813
ROSARIO	797	797	1,594	6,375	4,303	1,514	13,786	151	22	183	215	258	120	18	138	1,167	925	391	2,620
CAVITE AREA TOTAL	4,732	4,732	9,463	52,982	98,605	40,072	201,122	151	22	183	215	258	714	104	819	9,696	21,200	10,338	42,053

FILE: CAVDOM95

TABLE DOMESTIC WATER DEMAND (CAVITE AREA, 2000)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	4,593	2,473	7,066	30,031	70,661	28,265	136,023	162	24	197	232	278	744	59	803	5,916	16,393	7,858	30,971
CAVITE CITY	1,628	877	2,505	14,196	45,927	18,371	80,998	162	24	197	232	278	264	21	285	2,797	10,655	5,107	18,843
KAWIT	731	393	1,124	21,497	22,481	7,306	52,408	162	24	197	232	278	118	9	128	4,235	5,215	2,031	11,609
ROSARIO	1,579	850	2,429	10,325	7,288	2,429	22,473	162	24	197	232	278	256	20	276	2,034	1,691	675	4,677
CAVITE AREA TOTAL	8,531	4,594	13,125	76,049	146,357	56,371	291,902	162	24	197	232	278	1,382	110	1,492	14,982	33,955	15,671	66,100

FILE: CAVDOM00

TABLE DOMESTIC WATER DEMAND (CAVITE AREA, 2005)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	7,223	3,095	10,318	46,432	103,181	41,273	201,203	171	25	207	244	293	1,235	77	1,312	9,611	25,176	12,093	48,193
CAVITE CITY	2,193	940	3,132	18,794	57,427	22,971	102,324	171	25	207	244	293	375	23	398	3,890	14,012	6,730	25,031
KAWIT	970	416	1,385	28,048	27,702	9,003	66,138	171	25	207	244	293	166	10	176	5,806	6,759	2,638	15,379
ROSARIO	2,381	1,020	3,401	15,305	10,203	3,401	32,310	171	25	207	244	293	407	26	433	3,168	2,490	997	7,087
CAVITE AREA TOTAL	12,766	5,471	18,237	108,579	198,513	76,647	401,976	171	25	207	244	293	2,183	137	2,320	22,476	48,437	22,458	95,690

FILE: CAVDOM05

TABLE DOMESTIC WATER DEMAND (CAVITE AREA, 2010)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BACOOR	11,298	2,825	14,123	70,614	141,227	56,491	282,454	179	26	218	256	307	2,022	73	2,096	15,394	36,154	17,343	70,986
CAVITE CITY	2,703	676	3,379	22,526	61,945	24,778	112,628	179	26	218	256	307	484	18	501	4,911	15,858	7,607	28,877
KAWIT	1,207	302	1,508	33,933	30,163	9,803	75,407	179	26	218	256	307	216	8	224	7,397	7,722	3,009	18,352
ROSARIO	3,586	897	4,483	22,415	13,449	4,483	44,829	179	26	218	256	307	642	23	665	4,886	3,443	1,376	10,371
CAVITE AREA TOTAL	18,794	4,699	23,493	149,487	246,784	95,555	515,318	179	26	218	256	307	3,364	122	3,486	32,588	63,177	29,335	128,586

FILE: CAVDOM10

TABLE COMMERCIAL WATER DEMAND (CAVITE AREA)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				COMMERCIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BACOOR	98,318	141,323	206,363	282,454	256	2.00	2.50	2.75	3.00	767	1,378	2,213	3,305	1.75	1.85	1.94	2.04	1,342	2,549	4,294	6,742
CAVITE CITY	69,003	83,503	104,413	112,628	67	1.25	1.50	1.75	2.00	1,285	1,666	2,723	3,356	1.62	1.75	1.84	2.00	2,082	3,266	5,010	6,713
KAWIT	44,174	56,201	69,254	75,407	95	1.75	2.00	2.25	2.50	812	1,180	1,636	1,979	1.62	1.75	1.84	2.00	1,315	2,065	3,010	3,959
ROSARIO	15,938	24,295	34,011	44,829	128	1.75	2.00	2.25	2.50	218	380	598	876	1.62	1.75	1.84	2.00	353	665	1,101	1,753
CAVITE AREA TOTAL	227,433	305,322	414,040	515,318	-	-	-	-	-	3,082	4,804	7,170	9,517	1.65	1.78	1.87	2.01	5,092	8,545	13,415	19,166

FILE: CAVCOMAL

TABLE INDUSTRIAL WATER DEMAND (CAVITE AREA)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INDUSTRIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BACOOR	98,318	141,323	206,363	282,454	21,739	2.00	2.50	2.75	3.00	9	16	26	39	1.30	1.45	1.60	2.00	12	24	42	78
CAVITE CITY	69,003	83,503	104,413	112,628	19,231	2.00	2.50	2.75	3.00	7	11	15	18	1.91	2.06	2.17	2.28	14	22	32	40
KAWIT	44,174	56,201	69,254	75,407	11,765	2.00	2.50	2.75	3.00	8	12	16	19	1.30	1.45	1.60	2.00	10	17	26	38
ROSARIO	15,938	24,295	34,011	44,829	9,709	2.00	2.50	2.75	3.00	3	6	10	14	1.30	1.45	1.60	2.00	4	9	15	28
CAVITE AREA TOTAL	227,433	305,322	414,040	515,318	-	2.00	2.50	2.75	3.00	27	45	67	90	1.46	1.60	1.73	2.05	39	72	115	184

FILE: CAVINDAL

TABLE INSTITUTIONAL WATER DEMAND (CAVITE AREA)

MUNICIPALITY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INSTITUTIONAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BACOOR	98,318	141,323	206,363	282,454	2,000	49	71	103	141	5.25	6.00	6.75	7.50	257	426	695	1,058
CAVITE CITY	69,003	83,503	104,413	112,628	2,000	35	42	52	56	5.25	6.00	6.75	7.50	184	252	351	420
KAWIT	44,174	56,201	69,254	75,407	2,000	22	28	35	38	5.25	6.00	6.75	7.50	116	168	236	285
ROSARIO	15,938	24,295	34,011	44,829	2,000	8	12	17	22	5.25	6.00	6.75	7.50	42	72	115	165
CAVITE AREA TOTAL	227,433	305,322	414,040	515,318	2,000	114	153	207	257	5.25	6.00	6.75	7.50	599	918	1,397	1,928

FILE: CAVINSAL

TABLE WATER DEMAND SUMMARY (IMUS)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	9,344	15,764	22,571	33,219
COMMERCIAL	788	1,378	2,285	5,010
INDUSTRIAL	492	954	1,904	3,758
INSTITUTIONAL	359	652	888	1,206
SUB TOTAL	10,983	18,748	27,648	43,193
UNACCOUNTED-FOR WATER	4,707	8,035	9,216	14,398
(%)	30	30	25	25
TOTAL WATER DEMAND	15,690	26,783	36,864	57,591
SERVED POPULATION	43,982	68,928	91,544	125,253
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.212	0.229	0.247	0.265
TOTAL C.	0.250	0.272	0.302	0.345

FILE: DEMSUMIM

TABLE POPULATION PROJECTION FOR IMUS

BARANGAY	BARANGAY POPULATION CENSUS 1990	(%)	PROJECTED 1995	2000	2005	2010	SERVICE AREA % 1995	2000	2005	2010	SERVICE AREA POPULATION 1995	2000	2005	2010
ALAPAN I	3,674	3.99	4,274	4,860	5,417	5,924	-	30	40	60	0	1,458	2,167	3,554
ALAPAN II	791	0.86	920	1,046	1,166	1,275	-	20	35	50	0	209	408	638
ANABU I	7,524	8.17	8,752	9,953	11,092	12,132	35	50	70	80	3,063	4,976	7,765	9,705
ANABU II	5,062	5.49	5,888	6,696	7,463	8,162	30	45	65	80	1,766	3,013	4,851	6,530
BAYAN LUMA	10,363	11.25	12,054	13,708	15,278	16,709	60	65	75	90	7,233	8,910	11,458	15,038
BUCANDALA	4,230	4.59	4,920	5,595	6,236	6,820	60	75	85	100	2,952	4,196	5,301	6,820
CALSADANG BAGO	2,740	2.97	3,187	3,624	4,040	4,418	35	40	50	75	1,116	1,450	2,020	3,313
MALAGASANG I	6,075	6.59	7,067	8,036	8,956	9,795	15	65	75	85	1,060	5,223	6,717	8,326
MALAGASANG II	6,805	7.39	7,916	9,001	10,032	10,972	45	50	60	75	3,562	4,501	6,019	8,229
MEDICION I	4,282	4.65	4,981	5,664	6,313	6,904	55	75	85	90	2,740	4,248	5,366	6,214
MEDICION II	6,237	6.77	7,255	8,250	9,195	10,057	60	65	70	80	4,353	5,363	6,437	8,045
PALICO	4,688	5.09	5,453	6,201	6,911	7,559	50	55	60	100	2,727	3,411	4,147	7,559
PAG-ASA	2,552	2.77	2,969	3,376	3,762	4,115	-	20	40	50	0	675	1,505	2,057
PASONG BUAYA	1,983	2.15	2,307	2,623	2,923	3,197	-	-	-	-	0	0	0	0
POBLACION	7,770	8.43	9,038	10,278	11,455	12,528	80	85	90	100	7,231	8,736	10,310	12,528
TANZANG LUMA	12,748	13.84	14,829	16,863	18,794	20,555	70	80	85	100	10,380	13,490	15,975	20,555
TOCLONG I	2,935	3.19	3,414	3,882	4,327	4,732	45	50	70	90	1,536	1,941	3,029	4,259
TOCLONG II	1,666	1.81	1,938	2,204	2,456	2,686	40	60	70	70	775	1,322	1,719	1,880
IMUS TOTAL	92,125	100.00	107,162	121,860	135,818	148,542	47	60	70	84	50,494	73,123	95,193	125,253

FILE: IMUSPOP

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 1995)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														-----LOW-----						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
ALAPAN I	0	2	39	53	6	0	0	0	0	50	80	90	95	0	0	0	0	0	0	0
ALAPAN II	0	2	8	60	30	0	0	0	0	50	80	90	95	0	0	0	0	0	0	0
ANABU I	3,063	2	50	45	3	61	1,532	1,378	92	50	80	90	95	31	31	61	1,225	1,241	87	2,614
ANABU II	1,766	1	35	55	9	18	618	972	159	50	80	90	95	9	9	18	495	874	151	1,538
BAYAN LUMA	7,233	5	40	42	13	362	2,893	3,038	940	50	80	90	95	181	181	362	2,314	2,734	893	6,303
BUCANDALA	2,952	5	29	47	19	148	856	1,388	561	50	80	90	95	74	74	148	685	1,249	533	2,614
CALSADANG BAGO	1,116	4	31	60	5	45	346	669	56	50	80	90	95	22	22	45	277	602	53	977
MALAGASANG I	1,060	13	36	42	9	138	382	445	95	50	80	90	95	69	69	138	305	401	91	934
MALAGASANG II	3,562	5	35	48	12	178	1,247	1,710	427	50	80	90	95	89	89	178	997	1,539	406	3,120
MEDICION I	2,740	6	38	48	8	164	1,041	1,315	219	50	80	90	95	82	82	164	833	1,183	208	2,389
MEDICION II	4,353	0	17	63	20	0	740	2,742	871	50	80	90	95	0	0	0	592	2,468	827	3,887
PALICO	2,727	1	33	56	10	27	900	1,527	273	50	80	90	95	14	14	27	720	1,374	259	2,380
PAG-ASA	0	0	55	45	0	0	0	0	0	50	80	90	95	0	0	0	0	0	0	0
PASONG BUAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
POBLACION	7,231	1	43	49	7	72	3,109	3,543	506	50	80	90	95	36	36	72	2,487	3,189	481	6,229
TANZANG LUMA	10,380	6	47	35	12	623	4,879	3,633	1,246	50	80	90	95	311	311	623	3,903	3,270	1,183	8,979
TOCLONG I	1,536	2	30	63	5	31	461	968	77	50	80	90	95	15	15	31	369	871	73	1,344
TOCLONG II	775	1	34	62	3	8	264	481	23	50	80	90	95	4	4	8	211	433	22	673
IMUS TOTAL	50,494	4	38	47	11	1,874	19,266	23,808	5,545	50	80	90	95	937	937	1,874	15,413	21,428	5,268	43,982

FILE: IMSPOP95

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 2000)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW			MID	MID-HI	HI	TOTAL
														DIRECT	PUB.F.	SUB.T.				
ALAPAN I	1,458	2	39	53	6	29	569	773	87	60	85	100	100	17	12	29	483	773	87	1,373
ALAPAN II	209	2	8	60	30	4	17	126	63	60	85	100	100	3	2	4	14	126	63	207
ANABU I	4,976	2	50	45	3	100	2,488	2,239	149	60	85	100	100	60	40	100	2,115	2,239	149	4,603
ANABU II	3,013	1	35	55	9	30	1,055	1,657	271	60	85	100	100	18	12	30	896	1,657	271	2,855
BAYAN LUMA	8,910	5	40	42	13	446	3,564	3,742	1,158	60	85	100	100	267	178	446	3,029	3,742	1,158	8,375
BUCANDALA	4,196	5	29	47	19	210	1,217	1,972	797	60	85	100	100	126	84	210	1,034	1,972	797	4,014
CALSADANG BAGO	1,450	4	31	60	5	58	449	870	72	60	85	100	100	35	23	58	382	870	72	1,382
MALAGASANG I	5,223	13	36	42	9	679	1,880	2,194	470	60	85	100	100	407	272	679	1,598	2,194	470	4,941
MALAGASANG II	4,501	5	35	48	12	225	1,575	2,160	540	60	85	100	100	135	90	225	1,339	2,160	540	4,264
MEDICION I	4,248	6	38	48	8	255	1,614	2,039	340	60	85	100	100	153	102	255	1,372	2,039	340	4,006
MEDICION II	5,363	0	17	63	20	0	912	3,378	1,073	60	85	100	100	0	0	0	775	3,378	1,073	5,226
PALICO	3,411	1	33	56	10	34	1,126	1,910	341	60	85	100	100	20	14	34	957	1,910	341	3,242
PAG-ASA	675	0	55	45	0	0	371	304	0	60	85	100	100	0	0	0	316	304	0	619
PASONG BUAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
POBLACION	8,736	1	43	49	7	87	3,757	4,281	612	60	85	100	100	52	35	87	3,193	4,281	612	8,173
TANZANG LUMA	13,490	6	47	35	12	809	6,340	4,722	1,619	60	85	100	100	486	324	809	5,389	4,722	1,619	12,539
TOCLONG I	1,941	2	30	63	5	39	582	1,223	97	60	85	100	100	23	16	39	495	1,223	97	1,854
TOCLONG II	1,322	1	34	62	3	13	450	820	40	60	85	100	100	8	5	13	382	820	40	1,255
IMUS TOTAL	73,123	4	38	47	11	3,018	27,966	34,410	7,730	60	85	100	100	1,811	1,207	3,018	23,771	34,410	7,730	68,928

FILE: IMSPOP00

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 2005)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														-----LOW-----						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
ALAPAN I	2,167	2	39	53	6	43	845	1,148	130	70	90	100	100	30	13	43	760	1,148	130	2,082
ALAPAN II	408	2	8	60	30	8	33	245	122	70	90	100	100	6	2	8	29	245	122	405
ANABU I	7,765	2	50	45	3	155	3,882	3,494	233	70	90	100	100	109	47	155	3,494	3,494	233	7,376
ANABU II	4,851	1	35	55	9	49	1,698	2,668	437	70	90	100	100	34	15	49	1,528	2,668	437	4,681
BAYAN LUMA	11,458	5	40	42	13	573	4,583	4,813	1,490	70	90	100	100	401	172	573	4,125	4,813	1,490	11,000
BUCANDALA	5,301	5	29	47	19	265	1,537	2,491	1,007	70	90	100	100	186	80	265	1,384	2,491	1,007	5,147
CALSADANG BAGO	2,020	4	31	60	5	81	626	1,212	101	70	90	100	100	57	24	81	564	1,212	101	1,957
MALAGASANG I	6,717	13	36	42	9	873	2,418	2,821	605	70	90	100	100	611	262	873	2,176	2,821	605	6,475
MALAGASANG II	6,019	5	35	48	12	301	2,107	2,889	722	70	90	100	100	211	90	301	1,896	2,889	722	5,809
MEDICION I	5,366	8	38	48	8	322	2,039	2,576	429	70	90	100	100	225	97	322	1,835	2,576	429	5,162
MEDICION II	6,437	0	17	63	20	0	1,094	4,055	1,287	70	90	100	100	0	0	0	985	4,055	1,287	6,327
PALICO	4,147	1	33	56	10	41	1,368	2,322	415	70	90	100	100	29	12	41	1,232	2,322	415	4,010
PAG-ASA	1,505	0	55	45	0	0	828	677	0	70	90	100	100	0	0	0	745	677	0	1,422
PASONG BUAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
POBLACION	10,310	1	43	49	7	103	4,433	5,052	722	70	90	100	100	72	31	103	3,990	5,052	722	9,866
TANZANG LUMA	15,975	6	47	35	12	958	7,508	5,591	1,917	70	90	100	100	671	288	958	6,757	5,591	1,917	15,224
TOCLONG I	3,029	2	30	63	5	61	909	1,908	151	70	90	100	100	42	18	61	818	1,908	151	2,938
TOCLONG II	1,719	1	34	62	3	17	585	1,066	52	70	90	100	100	12	5	17	526	1,066	52	1,661
IMUS TOTAL	95,193	4	38	47	10	3,851	36,494	45,029	9,820	70	90	100	100	2,696	1,155	3,851	32,844	45,029	9,820	91,544

FILE: IMSPOP05

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (IMUS, 2010)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW			MID	MID-HI	HI	TOTAL
														DIRECT	PUB.F.	SUB.T.				
ALAPAN I	3,554	2	39	53	6	71	1,386	1,884	213	80	100	100	100	57	14	71	1,386	1,884	213	3,554
ALAPAN II	638	2	8	60	30	13	51	383	191	80	100	100	100	10	3	13	51	383	191	638
ANABU I	9,705	2	50	45	3	194	4,853	4,367	291	80	100	100	100	155	39	194	4,853	4,367	291	9,705
ANABU II	6,530	1	35	55	9	65	2,285	3,591	588	80	100	100	100	52	13	65	2,285	3,591	588	6,530
BAYAN LUMA	15,038	5	40	42	13	752	6,015	6,316	1,955	80	100	100	100	602	150	752	6,015	6,316	1,955	15,038
BUCANDALA	6,820	5	29	47	19	341	1,978	3,206	1,296	80	100	100	100	273	68	341	1,978	3,206	1,296	6,820
CALSADANG BAGO	3,313	4	31	60	5	133	1,027	1,988	166	80	100	100	100	106	27	133	1,027	1,988	166	3,313
MALAGASANG I	8,326	13	36	42	9	1,082	2,997	3,497	749	80	100	100	100	866	216	1,082	2,997	3,497	749	8,326
MALAGASANG II	8,229	5	35	48	12	411	2,880	3,950	988	80	100	100	100	329	82	411	2,880	3,950	988	8,229
MEDICION I	6,214	6	38	48	8	373	2,361	2,983	497	80	100	100	100	298	75	373	2,361	2,983	497	6,214
MEDICION II	8,045	0	17	63	20	0	1,368	5,068	1,609	80	100	100	100	0	0	0	1,368	5,068	1,609	8,045
PALICO	7,559	1	33	56	10	76	2,494	4,233	756	80	100	100	100	60	15	76	2,494	4,233	756	7,559
PAG-ASA	2,057	0	55	45	0	0	1,132	926	0	80	100	100	100	0	0	0	1,132	926	0	2,057
PASONG BUAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
POBLACION	12,528	1	43	49	7	125	5,387	6,139	877	80	100	100	100	100	25	125	5,387	6,139	877	12,528
TANZANG LUMA	20,555	6	47	35	12	1,233	9,661	7,194	2,467	80	100	100	100	987	247	1,233	9,661	7,194	2,467	20,555
TOCLONG I	4,259	2	30	63	5	85	1,278	2,683	213	80	100	100	100	68	17	85	1,278	2,683	213	4,259
TOCLONG II	1,880	1	34	62	3	19	639	1,166	56	80	100	100	100	15	4	19	639	1,166	56	1,880
IMUS TOTAL	125,253	4	38	48	10	4,974	47,793	59,574	12,912	80	100	100	100	3,979	995	4,974	47,793	59,574	12,912	125,253

FILE: IMSPOP10

TABLE DOMESTIC WATER DEMAND (IMUS, 1995)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
ALAPAN I	0	0	0	0	0	0	0	157	39	191	224	269	0	0	0	0	0	0	0
ALAPAN II	0	0	0	0	0	0	0	157	39	191	224	269	0	0	0	0	0	0	0
ANABU I	31	31	61	1,225	1,241	87	2,614	157	39	191	224	269	5	1	6	234	278	23	541
ANABU II	9	9	18	495	874	151	1,538	157	39	191	224	269	1	0	2	94	196	41	333
BAYAN LUMA	181	181	362	2,314	2,734	893	6,303	157	39	191	224	269	28	7	35	442	612	240	1,330
BUCANDALA	74	74	148	685	1,249	533	2,614	157	39	191	224	269	12	3	14	131	280	143	568
CALSADANG BAGO	22	22	45	277	602	53	977	157	39	191	224	269	4	1	4	53	135	14	206
MALAGASANG I	69	69	138	305	401	91	934	157	39	191	224	269	11	3	14	58	90	24	186
MALAGASANG II	89	89	178	997	1,539	406	3,120	157	39	191	224	269	14	3	17	191	345	109	662
MEDICION I	82	82	164	833	1,183	208	2,389	157	39	191	224	269	13	3	16	159	265	56	496
MEDICION II	0	0	0	592	2,468	827	3,887	157	39	191	224	269	0	0	0	113	553	222	888
PALICO	14	14	27	720	1,374	259	2,380	157	39	191	224	269	2	1	3	137	308	70	518
PAG-ASA	0	0	0	0	0	0	0	157	39	191	224	269	0	0	0	0	0	0	0
PASONG BUAYA	0	0	0	0	0	0	0	157	39	191	224	269	0	0	0	0	0	0	0
POBLACION	36	36	72	2,487	3,189	481	6,229	157	39	191	224	269	6	1	7	475	714	129	1,326
TANZANG LUMA	311	311	623	3,903	3,270	1,183	8,979	157	39	191	224	269	49	12	61	745	732	318	1,857
TOCLONG I	15	15	31	369	871	73	1,344	157	39	191	224	269	2	1	3	70	195	20	288
TOCLONG II	4	4	8	211	433	22	673	157	39	191	224	269	1	0	1	40	97	6	144
IMUS TOTAL	937	937	1,874	15,413	21,428	5,268	43,982	157	39	191	224	269	147	37	184	2,944	4,800	1,417	9,344

FILE: IMSDOM95

TABLE DOMESTIC WATER DEMAND (IMUS, 2000)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW			MID	MID-HI	HI	TOTAL	LOW			MID	MID-HI	HI	LOW			MID	MID-HI	HI	TOTAL
	DIRECT	PUB.F.	SUB.T.					DIRECT	PUB.F.	MID				DIRECT	PUB.F.	SUB.T.				
ALAPAN I	17	12	29	483	773	87	1,373	169	42	205	241	290		3	0	3	99	186	25	314
ALAPAN II	3	2	4	14	126	63	207	169	42	205	241	290		0	0	0	3	30	18	52
ANABU I	60	40	100	2,115	2,239	149	4,603	169	42	205	241	290		10	2	12	434	540	43	1,028
ANABU II	18	12	30	896	1,657	271	2,855	169	42	205	241	290		3	1	4	184	399	79	665
BAYAN LUMA	267	178	446	3,029	3,742	1,158	8,375	169	42	205	241	290		45	7	53	621	902	336	1,911
BUCANDALA	126	84	210	1,034	1,972	797	4,014	169	42	205	241	290		21	4	25	212	475	231	943
CALSADANG BAGO	35	23	58	382	870	72	1,382	169	42	205	241	290		6	1	7	78	210	21	316
MALAGASANG I	407	272	679	1,598	2,194	470	4,941	169	42	205	241	290		69	11	80	328	529	136	1,073
MALAGASANG II	135	90	225	1,339	2,160	540	4,264	169	42	205	241	290		23	4	27	274	521	157	978
MEDICION I	153	102	255	1,372	2,039	340	4,006	169	42	205	241	290		26	4	30	281	491	99	901
MEDICION II	0	0	0	775	3,378	1,073	5,226	169	42	205	241	290		0	0	0	159	814	311	1,284
PALICO	20	14	34	957	1,910	341	3,242	169	42	205	241	290		3	1	4	196	460	99	759
PAG-ASA	0	0	0	316	304	0	619	169	42	205	241	290		0	0	0	65	73	0	138
PASONG BUAYA	0	0	0	0	0	0	0	169	42	205	241	290		0	0	0	0	0	0	0
POBLACION	52	35	87	3,193	4,281	612	8,173	169	42	205	241	290		9	1	10	655	1,032	177	1,874
TANZANG LUMA	486	324	809	5,389	4,722	1,619	12,539	169	42	205	241	290		82	14	96	1,105	1,138	469	2,808
TOCLONG I	23	16	39	495	1,223	97	1,854	169	42	205	241	290		4	1	5	101	295	28	429
TOCLONG II	8	5	13	382	820	40	1,255	169	42	205	241	290		1	0	2	78	198	12	289
IMUS TOTAL	1,811	1,207	3,018	23,771	34,410	7,730	68,928	169	42	205	241	290		306	51	357	4,873	8,293	2,242	15,764

FILE: IMSDOM00

TABLE DOMESTIC WATER DEMAND (IMUS, 2005)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
ALAPAN I	30	13	43	760	1,148	130	2,082	182	44	221	260	312	6	1	6	168	299	41	513
ALAPAN II	6	2	8	29	245	122	405	182	44	221	260	312	1	0	1	6	64	38	110
ANABU I	109	47	155	3,494	3,494	233	7,376	182	44	221	260	312	20	2	22	772	908	73	1,775
ANABU II	34	15	49	1,528	2,668	437	4,681	182	44	221	260	312	6	1	7	338	694	136	1,174
BAYAN LUMA	401	172	573	4,125	4,813	1,490	11,000	182	44	221	260	312	73	8	81	912	1,251	465	2,708
BUCANDALA	186	80	265	1,384	2,491	1,007	5,147	182	44	221	260	312	34	3	37	306	648	314	1,305
CALSADANG BAGO	57	24	81	564	1,212	101	1,957	182	44	221	260	312	10	1	11	125	315	32	482
MALAGASANG I	611	262	873	2,176	2,821	605	6,475	182	44	221	260	312	111	12	123	481	734	189	1,526
MALAGASANG II	211	90	301	1,896	2,889	722	5,809	182	44	221	260	312	38	4	42	419	751	225	1,438
MEDICION I	225	97	322	1,835	2,576	429	5,162	182	44	221	260	312	41	4	45	406	670	134	1,254
MEDICION II	0	0	0	985	4,055	1,287	6,327	182	44	221	260	312	0	0	0	218	1,054	402	1,674
PALICO	29	12	41	1,232	2,322	415	4,010	182	44	221	260	312	5	1	6	272	604	129	1,011
PAG-ASA	0	0	0	745	677	0	1,422	182	44	221	260	312	0	0	0	165	176	0	341
PASONG BUAYA	0	0	0	0	0	0	0	182	44	221	260	312	0	0	0	0	0	0	0
POBLACION	72	31	103	3,990	5,052	722	9,866	182	44	221	260	312	13	1	14	882	1,313	225	2,435
TANZANG LUMA	671	288	958	6,757	5,591	1,917	15,224	182	44	221	260	312	122	13	135	1,493	1,454	598	3,680
TOCLONG I	42	18	61	818	1,908	151	2,938	182	44	221	260	312	8	1	9	181	496	47	733
TOCLONG II	12	5	17	526	1,066	52	1,661	182	44	221	260	312	2	0	2	116	277	16	412
IMUS TOTAL	2,696	1,155	3,851	32,844	45,029	9,820	91,544	182	44	221	260	312	491	51	541	7,259	11,708	3,064	22,571

FILE: IMSDOM05

TABLE DOMESTIC WATER DEMAND (IMUS, 2010)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
ALAPAN I	57	14	71	1,386	1,884	213	3,554	196	46	238	280	336	11	1	12	330	527	72	941
ALAPAN II	10	3	13	51	383	191	638	196	46	238	280	336	2	0	2	12	107	64	186
ANABU I	155	39	194	4,853	4,367	291	9,705	196	46	238	280	336	30	2	32	1,155	1,223	98	2,508
ANABU II	52	13	65	2,285	3,591	588	6,530	196	46	238	280	336	10	1	11	544	1,006	197	1,758
BAYAN LUMA	602	150	752	6,015	6,316	1,955	15,038	196	46	238	280	336	118	7	125	1,432	1,769	657	3,982
BUCANDALA	273	68	341	1,978	3,206	1,296	6,820	196	46	238	280	336	53	3	57	471	898	435	1,860
CALSADANG BAGO	106	27	133	1,027	1,988	166	3,313	196	46	238	280	336	21	1	22	244	557	56	879
MALAGASANG I	866	216	1,082	2,997	3,497	749	8,326	196	46	238	280	336	170	10	180	713	979	252	2,124
MALAGASANG II	329	82	411	2,880	3,950	988	8,229	196	46	238	280	336	65	4	68	685	1,106	332	2,192
MEDICION I	298	75	373	2,361	2,983	497	6,214	196	46	238	280	336	58	3	62	562	835	167	1,626
MEDICION II	0	0	0	1,368	5,068	1,609	8,045	196	46	238	280	336	0	0	0	326	1,419	541	2,285
PALICO	60	15	76	2,494	4,233	756	7,559	196	46	238	280	336	12	1	13	594	1,185	254	2,045
PAG-ASA	0	0	0	1,132	926	0	2,057	196	46	238	280	336	0	0	0	269	259	0	529
PASONG BUAYA	0	0	0	0	0	0	0	196	46	238	280	336	0	0	0	0	0	0	0
POBLACION	100	25	125	5,387	6,139	877	12,528	196	46	238	280	336	20	1	21	1,282	1,719	295	3,316
TANZANG LUMA	987	247	1,233	9,661	7,194	2,467	20,555	196	46	238	280	336	193	11	205	2,299	2,014	829	5,347
TOCLONG I	68	17	85	1,278	2,683	213	4,259	196	46	238	280	336	13	1	14	304	751	72	1,141
TOCLONG II	15	4	19	639	1,166	56	1,880	196	46	238	280	336	3	0	3	152	326	19	501
IMUS TOTAL	3,979	995	4,974	47,793	59,574	12,912	125,253	196	46	238	280	336	780	46	826	11,375	16,681	4,338	33,219

FILE: IMSDOM10

TABLE COMMERCIAL WATER DEMAND (IMUS)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				COMMERCIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ALAPAN I	0	1,458	2,167	3,554	100	1.2	1.3	1.5	2.0	0	19	32	71	1.30	1.45	1.60	2.00	0	27	52	142
ALAPAN II	0	209	408	638	100	1.2	1.3	1.5	2.0	0	3	6	13	1.30	1.45	1.60	2.00	0	4	10	26
ANABU I	3,063	4,976	7,765	9,705	100	1.2	1.3	1.5	2.0	37	65	116	194	1.30	1.45	1.60	2.00	48	94	186	388
ANABU II	1,766	3,013	4,851	6,530	100	1.2	1.3	1.5	2.0	21	39	73	131	1.30	1.45	1.60	2.00	28	57	116	261
BAYAN LUMA	7,233	8,910	11,458	15,038	100	1.2	1.3	1.5	2.0	87	116	172	301	1.30	1.45	1.60	2.00	113	168	275	602
BUCANDALA	2,952	4,196	5,301	6,820	100	1.2	1.3	1.5	2.0	35	55	80	136	1.30	1.45	1.60	2.00	46	79	127	273
CALSADANG BAGO	1,116	1,450	2,020	3,313	100	1.2	1.3	1.5	2.0	13	19	30	66	1.30	1.45	1.60	2.00	17	27	48	133
MALAGASANG I	1,060	5,223	6,717	8,326	100	1.2	1.3	1.5	2.0	13	68	101	167	1.30	1.45	1.60	2.00	17	98	161	333
MALAGASANG II	3,562	4,501	6,019	8,229	100	1.2	1.3	1.5	2.0	43	59	90	165	1.30	1.45	1.60	2.00	56	85	144	329
MEDICION I	2,740	4,248	5,366	6,214	100	1.2	1.3	1.5	2.0	33	55	80	124	1.30	1.45	1.60	2.00	43	80	129	249
MEDICION II	4,353	5,363	6,437	8,045	100	1.2	1.3	1.5	2.0	52	70	97	161	1.30	1.45	1.60	2.00	68	101	154	322
PALICO	2,727	3,411	4,147	7,559	100	1.2	1.3	1.5	2.0	33	44	62	151	1.30	1.45	1.60	2.00	43	64	100	302
PAG-ASA	0	675	1,505	2,057	100	1.2	1.3	1.5	2.0	0	9	23	41	1.30	1.45	1.60	2.00	0	13	36	82
PASONG BUAYA	0	0	0	0	100	1.2	1.3	1.5	2.0	0	0	0	0	1.30	1.45	1.60	2.00	0	0	0	0
POBLACION	7,231	8,736	10,310	12,528	100	1.2	1.3	1.5	2.0	87	114	155	251	1.30	1.45	1.60	2.00	113	165	247	501
TANZANG LUMA	10,380	13,490	15,975	20,555	100	1.2	1.3	1.5	2.0	125	175	240	411	1.30	1.45	1.60	2.00	162	254	383	822
TOCLONG I	1,536	1,941	3,029	4,259	100	1.2	1.3	1.5	2.0	18	25	45	85	1.30	1.45	1.60	2.00	24	37	73	170
TOCLONG II	775	1,322	1,719	1,880	100	1.2	1.3	1.5	2.0	9	17	26	38	1.30	1.45	1.60	2.00	12	25	41	75
IMUS TOTAL	50,494	73,123	95,193	125,253	100	1.2	1.3	1.5	2.0	606	951	1,428	2,505	1.30	1.45	1.60	2.00	788	1,378	2,285	5,010

FILE: IMSCOMAL

TABLE INDUSTRIAL WATER DEMAND (IMUS)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INDUSTRIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ALAPAN I	0	1,458	2,167	3,554	200	1.5	1.8	2.5	3.0	0	13	27	53	1.30	1.45	1.60	2.00	0	19	43	107
ALAPAN II	0	209	408	638	200	1.5	1.8	2.5	3.0	0	2	5	10	1.30	1.45	1.60	2.00	0	3	8	19
ANABU I	3,063	4,976	7,765	9,705	200	1.5	1.8	2.5	3.0	23	45	97	146	1.30	1.45	1.60	2.00	30	65	155	291
ANABU II	1,766	3,013	4,851	6,530	200	1.5	1.8	2.5	3.0	13	27	61	98	1.30	1.45	1.60	2.00	17	39	97	196
BAYAN LUMA	7,233	8,910	11,458	15,038	200	1.5	1.8	2.5	3.0	54	80	143	226	1.30	1.45	1.60	2.00	71	116	229	451
BUCANDALA	2,952	4,196	5,301	6,820	200	1.5	1.8	2.5	3.0	22	38	66	102	1.30	1.45	1.60	2.00	29	55	106	205
CALSADANG BAGO	1,116	1,450	2,020	3,313	200	1.5	1.8	2.5	3.0	8	13	25	50	1.30	1.45	1.60	2.00	11	19	40	99
MALAGASANG I	1,060	5,223	6,717	8,326	200	1.5	1.8	2.5	3.0	8	47	84	125	1.30	1.45	1.60	2.00	10	68	134	250
MALAGASANG II	3,562	4,501	6,019	8,229	200	1.5	1.8	2.5	3.0	27	41	75	123	1.30	1.45	1.60	2.00	35	59	120	247
MEDICION I	2,740	4,248	5,366	6,214	200	1.5	1.8	2.5	3.0	21	38	67	93	1.30	1.45	1.60	2.00	27	55	107	186
MEDICION II	4,353	5,363	6,437	8,045	200	1.5	1.8	2.5	3.0	33	48	80	121	1.30	1.45	1.60	2.00	42	70	129	241
PALICO	2,727	3,411	4,147	7,559	200	1.5	1.8	2.5	3.0	20	31	52	113	1.30	1.45	1.60	2.00	27	45	83	227
PAG-ASA	0	675	1,505	2,057	200	1.5	1.8	2.5	3.0	0	6	19	31	1.30	1.45	1.60	2.00	0	9	30	62
PASONG BUAYA	0	0	0	0	200	1.5	1.8	2.5	3.0	0	0	0	0	1.30	1.45	1.60	2.00	0	0	0	0
POBLACION	7,231	8,736	10,310	12,528	200	1.5	1.8	2.5	3.0	54	79	129	188	1.30	1.45	1.60	2.00	70	114	206	376
TANZANG LUMA	10,380	13,490	15,975	20,555	200	1.5	1.8	2.5	3.0	78	121	200	308	1.30	1.45	1.60	2.00	101	176	319	617
TOCLONG I	1,536	1,941	3,029	4,259	200	1.5	1.8	2.5	3.0	12	17	38	64	1.30	1.45	1.60	2.00	15	25	61	128
TOCLONG II	775	1,322	1,719	1,880	200	1.5	1.8	2.5	3.0	6	12	21	28	1.30	1.45	1.60	2.00	8	17	34	56
IMUS TOTAL	50,494	73,123	95,193	125,253	200	1.5	1.8	2.5	3.0	379	658	1,190	1,879	1.30	1.45	1.60	2.00	492	954	1,904	3,758

FILE: IMSINDAL

TABLE INSTITUTIONAL WATER DEMAND (IMUS)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INSTITUTIONAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
ALAPAN I	0	1,458	2,167	3,554	2,000	0	1	1	2	13.80	17.61	18.51	19.45	0	18	19	39
ALAPAN II	0	209	408	638	2,000	0	0	0	0	13.80	17.61	18.51	19.45	0	0	0	0
ANABU I	3,063	4,976	7,765	9,705	2,000	2	2	4	5	13.80	17.61	18.51	19.45	28	35	74	97
ANABU II	1,766	3,013	4,851	6,530	2,000	1	2	2	3	13.80	17.61	18.51	19.45	14	35	37	58
BAYAN LUMA	7,233	8,910	11,458	15,038	2,000	4	4	6	8	13.80	17.61	18.51	19.45	55	70	111	156
BUCANDALA	2,952	4,196	5,301	6,820	2,000	1	2	3	3	13.80	17.61	18.51	19.45	14	35	56	58
CALSADANG BAGO	1,116	1,450	2,020	3,313	2,000	1	1	1	2	13.80	17.61	18.51	19.45	14	18	19	39
MALAGASANG I	1,060	5,223	6,717	8,326	2,000	1	3	3	4	13.80	17.61	18.51	19.45	14	53	56	78
MALAGASANG II	3,562	4,501	6,019	8,229	2,000	2	2	3	4	13.80	17.61	18.51	19.45	28	35	56	78
MEDICION I	2,740	4,248	5,366	6,214	2,000	1	2	3	3	13.80	17.61	18.51	19.45	14	35	56	58
MEDICION II	4,353	5,363	6,437	8,045	2,000	2	3	3	4	13.80	17.61	18.51	19.45	28	53	56	78
PALICO	2,727	3,411	4,147	7,559	2,000	1	2	2	4	13.80	17.61	18.51	19.45	14	35	37	78
PAG-ASA	0	675	1,505	2,057	2,000	0	0	1	1	13.80	17.61	18.51	19.45	0	0	19	19
PASONG BUAYA	0	0	0	0	2,000	0	0	0	0	13.80	17.61	18.51	19.45	0	0	0	0
POBLACION	7,231	8,736	10,310	12,528	2,000	4	4	5	6	13.80	17.61	18.51	19.45	55	70	93	117
TANZANG LUMA	10,380	13,490	15,975	20,555	2,000	5	7	8	10	13.80	17.61	18.51	19.45	69	123	148	195
TOCLONG I	1,536	1,941	3,029	4,259	2,000	1	1	2	2	13.80	17.61	18.51	19.45	14	18	37	39
TOCLONG II	775	1,322	1,719	1,880	2,000	0	1	1	1	13.80	17.61	18.51	19.45	0	18	19	19
IMUS TOTAL	50,494	73,123	95,193	125,253	2,000	26	37	48	62	13.80	17.61	18.51	19.45	359	652	888	1,206

FILE: IMSINSAL

TABLE WATER DEMAND SUMMARY (ANTIPOLO)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	11,090	17,690	25,514	35,948
COMMERCIAL	2,265	3,800	5,960	8,922
INDUSTRIAL	317	541	823	1,202
INSTITUTIONAL	257	408	614	863
SUB TOTAL	13,929	22,439	32,911	46,935
UNACCOUNTED-FOR WATER	5,970	9,617	10,970	15,645
(%)	30	30	25	25
TOTAL WATER DEMAND	19,899	32,056	43,881	62,580
SERVED POPULATION	89,241	128,403	174,175	230,254
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.124	0.138	0.146	0.156
TOTAL C.	0.156	0.175	0.189	0.204

FILE: DEMSUMAN

TABLE POPULATION PROJECTION FOR ANTIPOLO

BARANGAY	BARANGAY POPULATION						SERVICE AREA %				SERVICE AREA POPULATION			
	CENSUS		PROJECTED											
	1990	(%)	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BAGONG NAYON	18,002	8.66	22,644	27,647	32,752	37,637	75	80	90	100	16,983	22,118	29,477	37,637
BEVERLY HILLS	1,034	0.50	1,385	1,767	2,161	2,532	55	60	70	80	762	1,060	1,513	2,026
CALAWIS	1,662	0.80	2,172	2,725	3,293	3,831	-	-	-	-	0	0	0	0
CUPANG	25,696	12.36	32,283	39,380	46,620	53,551	0	5	8	10	0	1,969	3,730	5,355
DALIG	20,344	9.79	25,566	31,204	36,956	42,461	-	-	-	-	0	0	0	0
DE LA PAZ(POB.)	21,033	10.12	26,441	32,269	38,215	43,906	75	80	90	100	19,831	25,815	34,394	43,906
INARAWAN	4,965	2.39	6,312	7,767	9,254	10,673	-	-	-	-	0	0	0	0
MAMBUGAN	15,636	7.52	19,680	24,039	28,487	32,743	0	10	25	35	0	2,404	7,122	11,460
MAYAMOT	15,887	7.64	19,995	24,423	28,941	33,264	75	77	78	80	14,996	18,806	22,574	26,611
SAN ISIDRO	19,260	9.27	24,220	29,566	35,020	40,240	60	63	65	70	14,532	18,627	22,763	28,168
SAN JOSE	26,121	12.57	32,815	40,028	47,385	54,428	65	75	80	85	21,330	30,021	37,908	46,264
SAN JUAN	1,394	0.67	1,838	2,319	2,813	3,280	-	-	-	-	0	0	0	0
SAN LUIS	6,241	3.00	7,910	9,712	11,553	13,311	-	-	-	-	0	0	0	0
SAN ROQUE	17,227	8.29	21,673	26,465	31,355	36,034	55	60	70	80	11,920	15,879	21,949	28,827
STA. CRUZ	13,340	6.42	16,804	20,538	24,349	27,995	-	-	-	-	0	0	0	0
ANTIPOLO TOTAL	207,842	100.00	261,738	319,849	379,154	435,886	38	43	48	53	100,354	136,698	181,428	230,254

FILE: ANTPOP

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 1995)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														LOW						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BAGONG NAYON	16,983	28	43	20	9	4,755	7,303	3,397	1,528	50	80	90	95	2,378	2,378	4,755	5,842	3,057	1,452	15,106
BEVERLY HILLS	762	25	37	28	10	190	282	213	76	50	80	90	95	95	95	190	225	192	72	680
CALAWIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
CUPANG	0	24	36	32	8	0	0	0	0	50	80	90	95	0	0	0	0	0	0	0
DALIG	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DE LA PAZ(POB.)	19,831	28	43	20	9	5,553	8,527	3,966	1,785	50	80	90	95	2,776	2,776	5,553	6,822	3,570	1,696	17,639
INARAWAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MAMBUGAN	0	19	18	42	21	0	0	0	0	50	80	90	95	0	0	0	0	0	0	0
MAYAMOT	14,996	19	34	28	19	2,849	5,099	4,199	2,849	50	80	90	95	1,425	1,425	2,849	4,079	3,779	2,707	13,414
SAN ISIDRO	14,532	30	38	20	12	4,360	5,522	2,906	1,744	50	80	90	95	2,180	2,180	4,360	4,418	2,616	1,657	13,050
SAN JOSE	21,330	19	46	27	8	4,053	9,812	5,759	1,706	50	80	90	95	2,026	2,026	4,053	7,849	5,183	1,621	18,706
SAN JUAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN LUIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN ROQUE	11,920	25	37	28	10	2,980	4,410	3,338	1,192	50	80	90	95	1,490	1,490	2,980	3,528	3,004	1,132	10,645
STA. CRUZ	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
ANTIPOLO TOTAL	100,354	25	41	24	11	24,740	40,955	23,778	10,881	50	80	90	95	12,370	12,370	24,740	32,764	21,400	10,337	89,241

FILE: ANTPOP95

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 2000)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														LOW						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BAGONG NAYON	22,118	28	43	20	9	6,193	9,511	4,424	1,991	30	85	100	100	3,716	2,477	6,193	8,084	4,424	1,991	20,691
BEVERLY HILLS	1,060	25	37	28	10	265	392	297	106	60	85	100	100	159	106	265	333	297	106	1,001
CALAWIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
CUPANG	1,969	24	36	32	8	473	709	630	158	60	85	100	100	284	189	473	603	630	158	1,863
DALIG	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DE LA PAZ(POB.)	25,815	28	43	20	9	7,228	11,101	5,163	2,323	60	85	100	100	4,337	2,891	7,228	9,435	5,163	2,323	24,150
INARAMAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MAMBUGAN	2,404	19	18	42	21	457	433	1,010	505	60	85	100	100	274	183	457	368	1,010	505	2,339
MAYAMOT	18,806	19	34	28	19	3,573	6,394	5,266	3,573	60	85	100	100	2,144	1,429	3,573	5,435	5,266	3,573	17,847
SAN ISIDRO	18,627	30	38	20	12	5,588	7,078	3,725	2,235	60	85	100	100	3,353	2,235	5,588	6,016	3,725	2,235	17,565
SAN JOSE	30,021	19	46	27	8	5,704	13,810	8,106	2,402	60	85	100	100	3,422	2,282	5,704	11,738	8,106	2,402	27,950
SAN JUAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN LUIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN ROQUE	15,879	25	37	28	10	3,970	5,875	4,446	1,588	60	85	100	100	2,382	1,588	3,970	4,994	4,446	1,588	14,998
STA. CRUZ	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
ANTIPOLO TOTAL	136,698	24	40	24	11	33,450	55,302	33,066	14,880	60	85	100	100	20,070	13,380	33,450	47,007	33,066	14,880	128,403

FILE: ANTPOP00

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 2005)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														LOW						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BAGONG NAYON	29,477	28	43	20	9	8,254	12,675	5,895	2,653	70	90	100	100	5,777	2,476	8,254	11,408	5,895	2,653	28,209
BEVERLY HILLS	1,513	25	37	28	10	378	560	424	151	70	90	100	100	265	113	378	504	424	151	1,457
CALAWIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
CUPANG	3,730	24	36	32	8	895	1,343	1,193	298	70	90	100	100	627	269	895	1,208	1,193	298	3,595
DALIG	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DE LA PAZ(POB.)	34,394	28	43	20	9	9,630	14,789	6,879	3,095	70	90	100	100	6,741	2,889	9,630	13,310	6,879	3,095	32,915
INARAWAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MAMBUGAN	7,122	19	18	42	21	1,353	1,282	2,991	1,496	70	90	100	100	947	406	1,353	1,154	2,991	1,496	6,994
MAYAMOT	22,574	19	34	28	19	4,289	7,675	6,321	4,289	70	90	100	100	3,002	1,287	4,289	6,908	6,321	4,289	21,806
SAN ISIDRO	22,763	30	38	20	12	6,829	8,650	4,553	2,732	70	90	100	100	4,780	2,049	6,829	7,785	4,553	2,732	21,898
SAN JOSE	37,908	19	46	27	8	7,203	17,438	10,235	3,033	70	90	100	100	5,042	2,161	7,203	15,694	10,235	3,033	36,164
SAN JUAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN LUIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN ROQUE	21,949	25	37	28	10	5,487	8,121	6,146	2,195	70	90	100	100	3,841	1,646	5,487	7,309	6,146	2,195	21,136
STA. CRUZ	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
ANTIPOLO TOTAL	181,428	24	40	25	11	44,318	72,532	44,636	19,942	70	90	100	100	31,022	13,295	44,318	65,279	44,636	19,942	174,175

FILE: ANTPOP05

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (ANTIPOLO, 2010)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW			MID	MID-HI	HI	TOTAL
														DIRECT	PUB.F.	SUB.T.				
BAGONG NAYON	37,637	28	43	20	9	10,538	16,184	7,527	3,387	80	100	100	100	8,431	2,108	10,538	16,184	7,527	3,387	37,637
BEVERLY HILLS	2,026	25	37	28	10	506	749	567	203	80	100	100	100	405	101	506	749	567	203	2,026
CALAWIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
CUPANG	5,355	24	36	32	8	1,285	1,928	1,714	428	80	100	100	100	1,028	257	1,285	1,928	1,714	428	5,355
DALIG	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DE LA PAZ(POB.)	43,906	28	43	20	9	12,294	18,880	8,781	3,952	80	100	100	100	9,835	2,459	12,294	18,880	8,781	3,952	43,906
INARAWAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MAMBUGAN	11,460	19	18	42	21	2,177	2,063	4,813	2,407	80	100	100	100	1,742	435	2,177	2,063	4,813	2,407	11,460
MAYAMOT	26,611	19	34	28	19	5,056	9,048	7,451	5,056	80	100	100	100	4,045	1,011	5,056	9,048	7,451	5,056	26,611
SAN ISIDRO	28,168	30	38	20	12	8,450	10,704	5,634	3,380	80	100	100	100	6,760	1,690	8,450	10,704	5,634	3,380	28,168
SAN JOSE	46,264	19	46	27	8	8,790	21,281	12,491	3,701	80	100	100	100	7,032	1,758	8,790	21,281	12,491	3,701	46,264
SAN JUAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN LUIS	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN ROQUE	28,827	25	37	28	10	7,207	10,666	8,072	2,883	80	100	100	100	5,765	1,441	7,207	10,666	8,072	2,883	28,827
STA. CRUZ	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
ANTIPOLO TOTAL	230,254	24	40	25	11	56,305	91,503	57,050	25,397	80	100	100	100	45,044	11,261	56,305	91,503	57,050	25,397	230,254

FILE: ANTPOP10

TABLE DOMESTIC WATER DEMAND (ANTIPOLO, 1995)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW							LOW					LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BAGONG NAYON	2,378	2,378	4,755	5,842	3,057	1,452	15,106	106	39	128	151	181	252	93	345	748	462	263	1,817
BEVERLY HILLS	95	95	190	225	192	72	680	106	39	128	151	181	10	4	14	29	29	13	65
CALAWIS	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
CUPANG	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
DALIG	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
DE LA PAZ(POB.	2,776	2,776	5,553	6,822	3,570	1,696	17,639	106	39	128	151	181	294	108	403	873	539	307	2,122
INARAWAN	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
MAMBUGAN	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
MAYAMOT	1,425	1,425	2,849	4,079	3,779	2,707	13,414	106	39	128	151	181	151	56	207	522	571	490	1,789
SAN ISIDRO	2,180	2,180	4,360	4,418	2,616	1,657	13,050	106	39	128	151	181	231	85	316	565	395	300	1,576
SAN JOSE	2,026	2,026	4,053	7,849	5,183	1,621	18,706	106	39	128	151	181	215	79	294	1,005	783	293	2,375
SAN JUAN	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
SAN LUIS	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
SAN ROQUE	1,490	1,490	2,980	3,528	3,004	1,132	10,645	106	39	128	151	181	158	58	216	452	454	205	1,326
STA. CRUZ	0	0	0	0	0	0	0	106	39	128	151	181	0	0	0	0	0	0	0
ANTIPOLO TOTAL	12,370	12,370	24,740	32,764	21,400	10,337	89,241	106	39	128	151	181	1,311	482	1,794	4,194	3,231	1,871	11,090

FILE: ANTDOM95

TABLE DOMESTIC WATER DEMAND (ANTIPOLO, 2000)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW							LOW					LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BAGONG NAYON	3,716	2,477	6,193	8,084	4,424	1,991	20,691	114	42	139	163	196	424	104	528	1,124	721	390	2,762
BEVERLY HILLS	159	106	265	333	297	106	1,001	114	42	139	163	196	18	4	23	46	48	21	138
CALAWIS	0	0	0	0	0	0	0	114	42	139	163	196	0	0	0	0	0	0	0
CUPANG	284	189	473	603	630	158	1,863	114	42	139	163	196	32	8	40	84	103	31	258
DALIG	0	0	0	0	0	0	0	114	42	139	163	196	0	0	0	0	0	0	0
DE LA PAZ(POB.	4,337	2,891	7,228	9,435	5,163	2,323	24,150	114	42	139	163	196	494	121	616	1,312	842	455	3,224
INARAWAN	0	0	0	0	0	0	0	114	42	139	163	196	0	0	0	0	0	0	0
MAMBUGAN	274	183	457	368	1,010	505	2,339	114	42	139	163	196	31	8	39	51	165	99	354
MAYAMOT	2,144	1,429	3,573	5,435	5,266	3,573	17,847	114	42	139	163	196	244	60	304	755	858	700	2,618
SAN ISIDRO	3,353	2,235	5,588	6,016	3,725	2,235	17,565	114	42	139	163	196	382	94	476	836	607	438	2,358
SAN JOSE	3,422	2,282	5,704	11,738	8,106	2,402	27,950	114	42	139	163	196	390	96	486	1,632	1,321	471	3,910
SAN JUAN	0	0	0	0	0	0	0	114	42	139	163	196	0	0	0	0	0	0	0
SAN LUIS	0	0	0	0	0	0	0	114	42	139	163	196	0	0	0	0	0	0	0
SAN ROQUE	2,382	1,568	3,970	4,994	4,446	1,588	14,998	114	42	139	163	196	272	67	338	694	725	311	2,068
STA. CRUZ	0	0	0	0	0	0	0	114	42	139	163	196	0	0	0	0	0	0	0
ANTIPOLO TOTAL	20,070	13,380	33,450	47,007	33,066	14,880	128,403	114	42	139	163	196	2,288	562	2,850	6,534	5,390	2,917	17,690

FILE: ANTDOMOO

TABLE DOMESTIC WATER DEMAND (ANTIPOLO, 2005)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BAGONG NAYON	5,777	2,476	8,254	11,408	5,895	2,653	28,209	120	44	145	171	206	693	109	802	1,654	1,008	546	4,011
BEVERLY HILLS	265	113	378	504	424	151	1,457	120	44	145	171	206	32	5	37	73	72	31	213
CALAWIS	0	0	0	0	0	0	0	120	44	145	171	206	0	0	0	0	0	0	0
CUPANG	627	269	895	1,208	1,193	298	3,595	120	44	145	171	206	75	12	87	175	204	61	528
DALIG	0	0	0	0	0	0	0	120	44	145	171	206	0	0	0	0	0	0	0
DE LA PAZ(POB.)	6,741	2,889	9,630	13,310	6,879	3,095	32,915	120	44	145	171	206	809	127	936	1,930	1,176	638	4,680
INARAWAN	0	0	0	0	0	0	0	120	44	145	171	206	0	0	0	0	0	0	0
MAMBUGAN	947	406	1,353	1,154	2,991	1,496	6,994	120	44	145	171	206	114	18	132	167	511	308	1,118
MAYAMOT	3,002	1,287	4,289	6,908	6,321	4,289	21,806	120	44	145	171	206	360	57	417	1,002	1,081	884	3,383
SAN ISIDRO	4,780	2,049	6,829	7,785	4,553	2,732	21,898	120	44	145	171	206	574	90	664	1,129	778	563	3,134
SAN JOSE	5,042	2,161	7,203	15,694	10,235	3,033	36,164	120	44	145	171	206	605	95	700	2,276	1,750	625	5,351
SAN JUAN	0	0	0	0	0	0	0	120	44	145	171	206	0	0	0	0	0	0	0
SAN LUIS	0	0	0	0	0	0	0	120	44	145	171	206	0	0	0	0	0	0	0
SAN ROQUE	3,841	1,646	5,487	7,309	6,146	2,195	21,136	120	44	145	171	206	461	72	533	1,060	1,051	452	3,096
STA. CRUZ	0	0	0	0	0	0	0	120	44	145	171	206	0	0	0	0	0	0	0
ANTIPOLO TOTAL	31,022	13,295	44,318	65,279	44,636	19,942	174,175	120	44	145	171	206	3,723	585	4,308	9,465	7,633	4,108	25,514

FILE: ANTDOM05

TABLE DOMESTIC WATER DEMAND (ANTIPOLO, 2010)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BAGONG NAYON	8,431	2,108	10,538	16,184	7,527	3,387	37,637	126	46	153	180	216	1,062	97	1,159	2,476	1,355	732	5,722
BEVERLY HILLS	405	101	506	749	567	203	2,026	126	46	153	180	216	51	5	56	115	102	44	316
CALAWIS	0	0	0	0	0	0	0	126	46	153	180	216	0	0	0	0	0	0	0
CUPANG	1,028	257	1,285	1,928	1,714	428	5,355	126	46	153	180	216	130	12	141	295	308	93	837
DALIG	0	0	0	0	0	0	0	126	46	153	180	216	0	0	0	0	0	0	0
DE LA PAZ(POB.	9,835	2,459	12,294	18,880	8,781	3,952	43,906	126	46	153	180	216	1,239	113	1,352	2,889	1,581	854	6,675
INARAWAN	0	0	0	0	0	0	0	126	46	153	180	216	0	0	0	0	0	0	0
MAMBUGAN	1,742	435	2,177	2,063	4,813	2,407	11,460	126	46	153	180	216	219	20	240	316	866	520	1,941
MAYAMOT	4,045	1,011	5,056	9,048	7,451	5,056	26,611	126	46	153	180	216	510	47	556	1,384	1,341	1,092	4,374
SAN ISIDRO	6,760	1,690	8,450	10,704	5,634	3,380	28,168	126	46	153	180	216	852	78	930	1,638	1,014	730	4,311
SAN JOSE	7,032	1,758	8,790	21,281	12,491	3,701	46,264	126	46	153	180	216	886	81	967	3,256	2,248	799	7,271
SAN JUAN	0	0	0	0	0	0	0	126	46	153	180	216	0	0	0	0	0	0	0
SAN LUIS	0	0	0	0	0	0	0	126	46	153	180	216	0	0	0	0	0	0	0
SAN ROQUE	5,765	1,441	7,207	10,666	8,072	2,883	28,827	126	46	153	180	216	726	66	793	1,632	1,453	623	4,500
STA. CRUZ	0	0	0	0	0	0	0	126	46	153	180	216	0	0	0	0	0	0	0
ANTIPOLO TOTAL	45,044	11,261	56,305	91,503	57,050	25,397	230,254	126	46	153	180	216	5,675	518	6,193	14,000	10,269	5,486	35,948

FILE: ANTDOM10

TABLE COMMERCIAL WATER DEMAND (ANTIPOLO)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				COMMERCIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BAGONG NAYON	16,983	22,118	29,477	37,637	200	1.8	2.0	2.3	2.5	149	221	332	470	2.58	2.78	2.92	3.10	383	615	968	1458
BEVERLY HILLS	762	1,060	1,513	2,026	200	1.8	2.0	2.3	2.5	7	11	17	25	2.58	2.78	2.92	3.10	17	29	50	78
CALAWIS	0	0	0	0	200	1.8	2.0	2.3	2.5	0	0	0	0	2.58	2.78	2.92	3.10	0	0	0	0
CUPANG	0	1,969	3,730	5,355	200	1.8	2.0	2.3	2.5	0	20	42	67	2.58	2.78	2.92	3.10	0	55	123	208
DALIG	0	0	0	0	200	1.8	2.0	2.3	2.5	0	0	0	0	2.58	2.78	2.92	3.10	0	0	0	0
DE LA PAZ(POB.)	19,831	25,815	34,394	43,906	200	1.8	2.0	2.3	2.5	174	258	387	549	2.58	2.78	2.92	3.10	448	718	1130	1701
INARAWAN	0	0	0	0	200	1.8	2.0	2.3	2.5	0	0	0	0	2.58	2.78	2.92	3.10	0	0	0	0
MAMBUGAN	0	2,404	7,122	11,460	200	1.8	2.0	2.3	2.5	0	24	80	143	2.58	2.78	2.92	3.10	0	67	234	444
MAYAMOT	14,996	18,806	22,574	26,611	200	1.8	2.0	2.3	2.5	131	188	254	333	2.58	2.78	2.92	3.10	339	523	742	1031
SAN ISIDRO	14,532	18,627	22,763	28,168	200	1.8	2.0	2.3	2.5	127	186	256	352	2.58	2.78	2.92	3.10	328	518	748	1092
SAN JOSE	21,330	30,021	37,908	46,264	200	1.8	2.0	2.3	2.5	187	300	426	578	2.58	2.78	2.92	3.10	482	835	1245	1793
SAN JUAN	0	0	0	0	200	1.8	2.0	2.3	2.5	0	0	0	0	2.58	2.78	2.92	3.10	0	0	0	0
SAN LUIS	0	0	0	0	200	1.8	2.0	2.3	2.5	0	0	0	0	2.58	2.78	2.92	3.10	0	0	0	0
SAN ROQUE	11,920	15,879	21,949	28,827	200	1.8	2.0	2.3	2.5	104	159	247	360	2.58	2.78	2.92	3.10	269	441	721	1117
STA. CRUZ	0	0	0	0	200	1.8	2.0	2.3	2.5	0	0	0	0	2.58	2.78	2.92	3.10	0	0	0	0
ANTIPOLO TOTAL	100,354	136,698	181,428	230,254	200	1.8	2.0	2.3	2.5	678	1,367	2,041	2,878	2.58	2.78	2.92	3.10	2,265	3,800	5,960	8,922

FILE: ANTCOMAL

TABLE INDUSTRIAL WATER DEMAND (ANTIPOLO)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INDUSTRIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BAGONG NAYON	16,983	22,118	29,477	37,637	1,667	2.15	2.50	2.75	3.00	22	33	49	68	2.45	2.64	2.75	2.90	54	88	134	196
BEVERLY HILLS	762	1,060	1,513	2,026	1,667	2.15	2.50	2.75	3.00	1	2	2	4	2.45	2.64	2.75	2.90	2	4	7	11
CALAWIS	0	0	0	0	1,667	2.15	2.50	2.75	3.00	0	0	0	0	2.45	2.64	2.75	2.90	0	0	0	0
CUPANG	0	1,969	3,730	5,355	1,667	2.15	2.50	2.75	3.00	0	3	6	10	2.45	2.64	2.75	2.90	0	8	17	28
DALIG	0	0	0	0	1,667	2.15	2.50	2.75	3.00	0	0	0	0	2.45	2.64	2.75	2.90	0	0	0	0
DE LA PAZ(POB.)	19,831	25,815	34,394	43,906	1,667	2.15	2.50	2.75	3.00	26	39	57	79	2.45	2.64	2.75	2.90	63	102	156	229
INARAWAN	0	0	0	0	1,667	2.15	2.50	2.75	3.00	0	0	0	0	2.45	2.64	2.75	2.90	0	0	0	0
MAMBUGAN	0	2,404	7,122	11,460	1,667	2.15	2.50	2.75	3.00	0	4	12	21	2.45	2.64	2.75	2.90	0	10	32	60
MAYAMOT	14,996	18,806	22,574	26,611	1,667	2.15	2.50	2.75	3.00	19	28	37	48	2.45	2.64	2.75	2.90	47	74	102	139
SAN ISIDRO	14,532	18,627	22,763	28,168	1,667	2.15	2.50	2.75	3.00	19	28	38	51	2.45	2.64	2.75	2.90	46	74	103	147
SAN JOSE	21,330	30,021	37,908	46,264	1,667	2.15	2.50	2.75	3.00	28	45	63	83	2.45	2.64	2.75	2.90	67	119	172	241
SAN JUAN	0	0	0	0	1,667	2.15	2.50	2.75	3.00	0	0	0	0	2.45	2.64	2.75	2.90	0	0	0	0
SAN LUIS	0	0	0	0	1,667	2.15	2.50	2.75	3.00	0	0	0	0	2.45	2.64	2.75	2.90	0	0	0	0
SAN ROQUE	11,920	15,879	21,949	28,827	1,667	2.15	2.50	2.75	3.00	15	24	36	52	2.45	2.64	2.75	2.90	38	63	100	150
STA. CRUZ	0	0	0	0	1,667	2.15	2.50	2.75	3.00	0	0	0	0	2.45	2.64	2.75	2.90	0	0	0	0
ANTIPOLO TOTAL	100,354	136,698	181,428	230,254	1,667	2.15	2.50	2.75	3.00	129	205	299	414	2.45	2.64	2.75	2.90	317	541	823	1,202

FILE: ANTINDAL

TABLE INSTITUTIONAL WATER DEMAND (ANTIPOLO)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INSTITUTIONAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BAGONG NAYON	16,983	22,118	29,477	37,637	2,000	8	11	15	19	5.25	6.00	6.75	7.50	42	66	101	143
BEVERLY HILLS	762	1,060	1,513	2,026	2,000	0	1	1	1	5.25	6.00	6.75	7.50	0	6	7	8
CALAWIS	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
CUPANG	0	1,969	3,730	5,355	2,000	0	1	2	3	5.25	6.00	6.75	7.50	0	6	14	23
DALIG	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
DE LA PAZ(POB.)	19,831	25,815	34,394	43,906	2,000	10	13	17	22	5.25	6.00	6.75	7.50	53	78	115	165
INARAWAN	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
MAMBUGAN	0	2,404	7,122	11,460	2,000	0	1	4	6	5.25	6.00	6.75	7.50	0	6	27	45
MAYAMOT	14,996	18,806	22,574	26,611	2,000	7	9	11	13	5.25	6.00	6.75	7.50	37	54	74	98
SAN ISIDRO	14,532	18,627	22,763	28,168	2,000	7	9	11	14	5.25	6.00	6.75	7.50	37	54	74	105
SAN JOSE	21,330	30,021	37,908	46,264	2,000	11	15	19	23	5.25	6.00	6.75	7.50	58	90	128	173
SAN JUAN	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
SAN LUIS	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
SAN ROQUE	11,920	15,879	21,949	28,827	2,000	6	8	11	14	5.25	6.00	6.75	7.50	32	48	74	105
STA. CRUZ	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
ANTIPOLO TOTAL	100,354	136,698	181,428	230,254	2,000	49	68	91	115	5.25	6.00	6.75	7.50	257	408	614	863

FILE: ANTINSAL

TABLE WATER DEMAND SUMMARY (SAN MATEO)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	4,352	6,883	10,166	14,476
COMMERCIAL	896	1,427	2,385	4,562
INDUSTRIAL	175	302	476	695
INSTITUTIONAL	84	144	203	270
SUB TOTAL	5,506	8,756	13,229	20,003
UNACCOUNTED-FOR WATER	2,360	3,753	4,410	6,668
(%)	30	30	25	25
TOTAL WATER DEMAND	7,866	12,508	17,639	26,670
SERVED POPULATION	32,138	44,392	57,739	72,489
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.135	0.155	0.176	0.200
TOTAL C.	0.171	0.197	0.229	0.276

FILE: DEMSUMSM

TABLE POPULATION PROJECTION FOR SAN MATEO

BARANGAY	BARANGAY POPULATION						SERVICE AREA %				SERVICE AREA POPULATION			
	CENSUS		PROJECTED											
	1990	(%)	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
AMPID I, II	13,948	16.95	15,658	17,230	18,576	19,618	50	55	70	80	7,829	9,477	13,003	15,694
BANABA	7,554	9.18	8,480	9,332	10,060	10,625	0	0	0	0	0	0	0	0
DULONG BAYAN 1	3,308	4.02	3,714	4,086	4,406	4,653	70	75	80	90	2,599	3,065	3,524	4,187
DULONG BAYAN 2	4,691	5.70	5,266	5,795	6,247	6,598	68	85	80	90	3,581	4,926	4,998	5,938
GUINAYANG	4,843	5.88	5,437	5,983	6,450	6,812	50	60	65	70	2,718	3,590	4,192	4,768
GUITNANG BAYAN 1(POB.)	5,960	7.24	6,691	7,362	7,937	8,383	50	70	85	100	3,345	5,154	6,747	8,383
GUITNANG BAYAN 2(POB.)	5,490	6.67	6,163	6,782	7,312	7,722	47	65	85	100	2,897	4,408	6,215	7,722
GULOD MALAYA	2,995	3.64	3,362	3,700	3,989	4,212	0	0	0	0	0	0	0	0
MALANDAY	9,169	11.14	10,293	11,327	12,211	12,896	45	55	65	70	4,632	6,230	7,937	9,027
MALY	6,350	7.71	7,128	7,844	8,457	8,931	40	50	60	70	2,851	3,922	5,074	6,252
PINTONG BOCAWE	617	0.75	693	762	822	868	0	0	0	0	0	0	0	0
SANTA ANA	7,418	9.01	8,327	9,164	9,879	10,433	55	70	85	100	4,580	6,415	8,397	10,433
SANTO NINO	4,955	6.02	5,562	6,121	6,599	6,969	0	0	0	0	0	0	0	0
SILANGAN	5,012	6.09	5,626	6,191	6,675	7,049	0	0	0	0	0	0	0	0
SAN MATEO TOTAL	82,310	100	92,401	101,679	109,620	115,769	38	46	55	63	35,033	47,185	60,088	72,405

FILE: SMTPOP

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 1995)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	-----LOW----- DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	7,829	57	40	2	1	4,463	3,132	157	78	50	80	90	95	2,231	2,231	4,463	2,505	141	74	7,183
BANABA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN 1	2,599	64	34	2	0	1,664	884	52	0	50	80	90	95	832	832	1,664	707	47	0	2,418
DULONG BAYAN 2	3,581	54	43	3	0	1,934	1,540	107	0	50	80	90	95	967	967	1,934	1,232	97	0	3,262
GUINAYANG	2,718	56	40	4	0	1,522	1,087	109	0	50	80	90	95	761	761	1,522	870	98	0	2,490
GUITNANG BAYAN 1(POB.)	3,345	49	45	6	1	1,639	1,505	201	33	50	80	90	95	820	820	1,639	1,204	181	32	3,056
GUITNANG BAYAN 2(POB.)	2,897	44	50	5	1	1,275	1,448	145	29	50	80	90	95	637	637	1,275	1,159	130	28	2,591
GULOD MALAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	4,632	52	45	3	0	2,409	2,084	139	0	50	80	90	95	1,204	1,204	2,409	1,667	125	0	4,201
MALY	2,851	58	37	4	1	1,654	1,055	114	29	50	80	90	95	827	827	1,654	844	103	27	2,628
PINTONG BOCAWE	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	4,580	69	28	3	0	3,160	1,282	137	0	50	80	90	95	1,580	1,580	3,160	1,026	124	0	4,310
SANTO NINO	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	35,033	56	40	3	0	19,719	14,018	1,161	169	50	80	90	95	9,859	9,859	19,719	11,214	1,045	161	32,138

FILE: SMTPOP95

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 2000)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW DIRECT	LOW PUB.F.	LOW SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	9,477	57	40	2	1	5,402	3,791	190	95	60	85	100	100	3,241	2,161	5,402	3,222	190	95	8,908
BANABA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN 1	3,065	64	34	2	0	1,961	1,042	61	0	60	85	100	100	1,177	785	1,961	886	61	0	2,909
DULONG BAYAN 2	4,926	54	43	3	0	2,660	2,118	148	0	60	85	100	100	1,596	1,064	2,660	1,800	148	0	4,608
GUINAYANG	3,590	56	40	4	0	2,010	1,436	144	0	60	85	100	100	1,206	804	2,010	1,220	144	0	3,374
GUITNANG BAYAN 1(POB.)	5,154	49	45	6	1	2,525	2,319	309	52	60	85	100	100	1,515	1,010	2,525	1,971	309	52	4,857
GUITNANG BAYAN 2(POB.)	4,408	44	50	5	1	1,940	2,204	220	44	60	85	100	100	1,164	776	1,940	1,873	220	44	4,078
GULOD MALAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	6,230	52	45	3	0	3,239	2,803	187	0	60	85	100	100	1,944	1,296	3,239	2,383	187	0	5,809
MALY	3,922	58	37	4	1	2,275	1,451	157	39	60	85	100	100	1,365	910	2,275	1,234	157	39	3,704
PINTONG BOCAWE	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	6,415	69	28	3	0	4,426	1,796	192	0	60	85	100	100	2,656	1,770	4,426	1,527	192	0	6,145
SANTO NINO	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	47,185	56	40	3	0	26,438	18,960	1,608	230	60	85	100	100	15,863	10,575	26,438	16,116	1,608	230	44,392

FILE: SMTPOP00

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 2005)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW DIRECT	LOW PUB.F.	LOW SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	13,003	57	40	2	1	7,412	5,201	260	130	70	90	100	100	5,188	2,224	7,412	4,681	260	130	12,483
BANABA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN 1	3,524	64	34	2	0	2,256	1,198	70	0	70	90	100	100	1,579	677	2,256	1,078	70	0	3,405
DULONG BAYAN 2	4,998	54	43	3	0	2,699	2,149	150	0	70	90	100	100	1,889	810	2,699	1,934	150	0	4,783
GUINAYANG	4,192	56	40	4	0	2,348	1,677	168	0	70	90	100	100	1,643	704	2,348	1,509	168	0	4,025
GUITNANG BAYAN 1(POB.)	6,747	49	45	6	1	3,306	3,036	405	67	70	90	100	100	2,314	992	3,306	2,732	405	67	6,511
GUITNANG BAYAN 2(POB.)	5,215	44	50	5	1	2,735	3,107	311	62	70	90	100	100	1,914	820	2,735	2,797	311	62	5,904
GULOD MALAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	7,937	52	45	3	0	4,127	3,572	238	0	70	90	100	100	2,889	1,238	4,127	3,215	238	0	7,580
MALY	5,074	58	37	4	1	2,943	1,877	203	51	70	90	100	100	2,060	883	2,943	1,690	203	51	4,886
PINTONG BOCAWE	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	8,397	69	28	3	0	5,794	2,351	252	0	70	90	100	100	4,056	1,738	5,794	2,116	252	0	8,162
SANTO NINO	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	60,088	56	40	3	1	33,619	24,170	2,057	310	70	90	100	100	23,533	10,086	33,619	21,753	2,057	310	57,739

FILE: SMTPOP05

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (SAN MATEO, 2010)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														-----LOW-----						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	15,694	57	40	2	1	8,946	6,278	314	157	80	100	100	100	7,157	1,789	8,946	6,278	314	157	15,694
BANABA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN I	4,187	64	34	2	0	2,680	1,424	84	0	80	100	100	100	2,144	536	2,680	1,424	84	0	4,187
DULONG BAYAN 2	5,938	54	43	3	0	3,207	2,553	178	0	80	100	100	100	2,565	641	3,207	2,553	178	0	5,938
GUINAYANG	4,768	56	40	4	0	2,670	1,907	191	0	80	100	100	100	2,136	534	2,670	1,907	191	0	4,768
GUITNANG BAYAN 1(POB.)	8,383	49	45	6	1	4,108	3,772	503	84	80	100	100	100	3,286	822	4,108	3,772	503	84	8,467
GUITNANG BAYAN 2(POB.)	7,722	44	50	5	1	3,398	3,861	386	77	80	100	100	100	2,718	680	3,398	3,861	386	77	7,722
GULOD MALAYA	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	9,027	52	45	3	0	4,694	4,062	271	0	80	100	100	100	3,755	939	4,694	4,062	271	0	9,027
MALY	6,252	58	37	4	1	3,626	2,313	250	63	80	100	100	100	2,901	725	3,626	2,313	250	63	6,252
PINTONG BOCAWE	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	10,433	69	28	3	0	7,199	2,921	313	0	80	100	100	100	5,759	1,440	7,199	2,921	313	0	10,433
SANTO NINO	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	72,405	56	40	3	1	40,527	29,092	2,489	381	80	100	100	100	32,422	8,105	40,527	29,092	2,489	381	72,489

FILE: SMTPOP10

TABLE DOMESTIC WATER DEMAND (SAN MATEO, 1995)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW							LOW					LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	2,231	2,231	4,463	2,505	141	74	7,183	157	39	191	224	269	350	87	437	479	32	20	967
BANABA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN 1	832	832	1,664	707	47	0	2,418	157	39	191	224	269	131	32	163	135	10	0	309
DULONG BAYAN 2	967	967	1,934	1,232	97	0	3,262	157	39	191	224	269	152	38	190	235	22	0	446
GUINAYANG	761	761	1,522	870	98	0	2,490	157	39	191	224	269	119	30	149	166	22	0	337
GUITNANG BAYAN	820	820	1,639	1,204	181	32	3,056	157	39	191	224	269	129	32	161	230	40	9	440
GUITNANG BAYAN	637	637	1,275	1,159	130	28	2,591	157	39	191	224	269	100	25	125	221	29	7	383
GULOD MALAYA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	1,204	1,204	2,409	1,667	125	0	4,201	157	39	191	224	269	189	47	236	318	28	0	583
MALY	827	827	1,654	844	103	27	2,628	157	39	191	224	269	130	32	162	161	23	7	354
PINTONG BOCAWE	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	1,580	1,580	3,160	1,026	124	0	4,310	157	39	191	224	269	248	62	310	196	28	0	533
SANTO NINO	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	9,859	9,859	19,719	11,214	1,045	161	32,138	157	39	191	224	269	1,548	385	1,932	2,142	234	43	4,352

FILE: SMTDOM95

TABLE DOMESTIC WATER DEMAND (SAN MATEO, 2000)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	3,241	2,161	5,402	3,222	190	95	8,908	169	42	205	241	290	548	91	638	661	46	27	1,372
BANABA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN 1	1,177	785	1,961	886	61	0	2,909	169	42	205	241	290	199	33	232	182	15	0	428
DULONG BAYAN 2	1,596	1,064	2,660	1,800	148	0	4,608	169	42	205	241	290	270	45	314	369	36	0	719
GUINAYANG	1,206	804	2,010	1,220	144	0	3,374	169	42	205	241	290	204	34	238	250	35	0	522
GUITNANG BAYAN	1,515	1,010	2,525	1,971	309	52	4,857	169	42	205	241	290	256	42	298	404	75	15	792
GUITNANG BAYAN	1,164	776	1,940	1,873	220	44	4,078	169	42	205	241	290	197	33	229	384	53	13	679
GULOD MALAYA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	1,944	1,296	3,239	2,383	187	0	5,809	169	42	205	241	290	328	54	383	488	45	0	916
MALY	1,365	910	2,275	1,234	157	39	3,704	169	42	205	241	290	231	38	269	253	38	11	571
PINTONG BOCAWE	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	2,656	1,770	4,426	1,527	192	0	6,145	169	42	205	241	290	449	74	523	313	46	0	882
SANTO NINO	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	15,863	10,575	26,438	16,116	1,608	230	44,392	169	42	205	241	290	2,681	444	3,125	3,304	388	67	6,883

FILE: SMTDOM00

TABLE DOMESTIC WATER DEMAND (SAN MATEO, 2005)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	5,188	2,224	7,412	4,681	260	130	12,483	182	44	221	260	312	944	98	1,042	1,035	68	41	2,185
BANABA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN 1	1,579	677	2,256	1,078	70	0	3,405	182	44	221	260	312	287	30	317	238	18	0	574
DULONG BAYAN 2	1,889	810	2,699	1,934	150	0	4,783	182	44	221	260	312	344	36	379	427	39	0	846
GUINAYANG	1,643	704	2,348	1,509	168	0	4,025	182	44	221	260	312	299	31	330	334	44	0	707
GUITNANG BAYAN	2,314	992	3,306	2,732	405	67	6,511	182	44	221	260	312	421	44	465	604	105	21	1,195
GUITNANG BAYAN	1,914	820	2,735	2,797	311	62	5,904	182	44	221	260	312	348	36	384	618	81	19	1,103
GULOD MALAYA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	2,889	1,238	4,127	3,215	239	0	7,580	182	44	221	260	312	526	54	580	710	62	0	1,353
MALY	2,060	883	2,943	1,690	203	51	4,886	182	44	221	260	312	375	39	414	373	53	16	856
PINTONG BOCAWE	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	4,056	1,738	5,794	2,116	252	0	8,162	182	44	221	260	312	738	76	815	468	65	0	1,348
SANTO NINO	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	23,533	10,086	33,619	21,753	2,057	310	57,739	182	44	221	260	312	4,283	444	4,727	4,807	535	97	10,166

FILE: SMTDOM05

TABLE DOMESTIC WATER DEMAND (SAN MATEO, 2010)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
AMPID I, II	7,157	1,789	8,946	6,278	314	157	15,694	196	46	238	280	336	1,403	82	1,485	1,494	88	53	3,120
BANABA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
DULONG BAYAN 1	2,144	536	2,680	1,424	84	0	4,187	196	46	238	280	336	420	25	445	339	23	0	807
DULONG BAYAN 2	2,565	641	3,207	2,553	178	0	5,938	196	46	238	280	336	503	30	532	608	50	0	1,190
GUINAYANG	2,136	534	2,670	1,907	191	0	4,768	196	46	238	280	336	419	25	443	454	53	0	951
GUITNANG BAYAN	3,286	822	4,108	3,772	503	84	8,467	196	46	238	280	336	644	38	682	898	141	28	1,749
GUITNANG BAYAN	2,718	680	3,398	3,861	386	77	7,722	196	46	238	280	336	533	31	564	919	108	26	1,617
GULOD MALAYA	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
MALANDAY	3,755	939	4,694	4,062	271	0	9,027	196	46	238	280	336	736	43	779	967	76	0	1,822
MALY	2,901	725	3,626	2,313	250	63	6,252	196	46	238	280	336	569	33	602	551	70	21	1,244
PINTONG BOCAWE	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SANTA ANA	5,759	1,440	7,199	2,921	313	0	10,433	196	46	238	280	336	1,129	66	1,195	695	88	0	1,978
SANTO NINO	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SILANGAN	0	0	0	0	0	0	0	-	-	-	-	-	0	0	0	0	0	0	0
SAN MATEO TOTAL	32,422	8,105	40,527	29,092	2,489	381	72,489	196	46	238	280	336	6,355	373	6,727	6,924	697	128	14,476

FILE: SMTDOM10

TABLE COMMERCIAL WATER DEMAND (SAN MATEO)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				COMMERCIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
AMPID I, II	7,629	9,477	13,003	15,694	79	1.40	1.50	1.75	2.50	138	179	287	494	1.45	1.60	1.80	2.00	200	287	516	989
BANABA	0	0	0	0	79	1.40	1.50	1.75	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
DULONG BAYAN 1	2,599	3,065	3,524	4,187	79	1.40	1.50	1.75	2.50	46	58	78	132	1.45	1.60	1.80	2.00	66	93	140	264
DULONG BAYAN 2	3,581	4,926	4,998	5,938	79	1.40	1.50	1.75	2.50	63	93	110	187	1.45	1.60	1.80	2.00	92	149	198	374
GUINAYANG	2,718	3,590	4,192	4,768	79	1.40	1.50	1.75	2.50	48	68	92	150	1.45	1.60	1.80	2.00	70	109	166	300
GUITNANG BAYAN	3,345	5,154	6,747	8,383	79	1.40	1.50	1.75	2.50	59	97	149	264	1.45	1.60	1.80	2.00	86	156	268	528
GUITNANG BAYAN	2,897	4,408	6,215	7,722	79	1.40	1.50	1.75	2.50	51	83	137	243	1.45	1.60	1.80	2.00	74	133	247	486
GULOD MALAYA	0	0	0	0	79	1.40	1.50	1.75	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
MALANDAY	4,632	6,230	7,937	9,027	79	1.40	1.50	1.75	2.50	82	118	175	284	1.45	1.60	1.80	2.00	118	188	315	569
MALY	2,851	3,922	5,074	6,252	79	1.40	1.50	1.75	2.50	50	74	112	197	1.45	1.60	1.80	2.00	73	119	201	394
PINTONG BOCAWE	0	0	0	0	79	1.40	1.50	1.75	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
SANTA ANA	4,580	6,415	8,397	10,433	79	1.40	1.50	1.75	2.50	81	121	185	329	1.45	1.60	1.80	2.00	117	194	333	657
SANTO NINO	0	0	0	0	79	1.40	1.50	1.75	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
SILANGAN	0	0	0	0	79	1.40	1.50	1.75	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
SAN MATEO TOTAL	35,033	47,185	60,088	72,405	79	1.40	1.50	1.75	2.50	618	892	1,325	2,281	1.45	1.60	1.80	2.00	896	1,427	2,385	4,562

FILE: SMTCOMAL

TABLE INDUSTRIAL WATER DEMAND (SAN MATEO)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INDUSTRIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
AMPID I, II	7,829	9,477	13,003	15,694	625	2.15	2.50	2.75	3.00	27	38	57	75	1.45	1.60	1.80	2.00	39	61	103	151
BANABA	0	0	0	0	625	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
DULONG BAYAN 1	2,599	3,065	3,524	4,187	625	2.15	2.50	2.75	3.00	9	12	16	20	1.45	1.60	1.80	2.00	13	20	28	40
DULONG BAYAN 2	3,581	4,926	4,998	5,938	625	2.15	2.50	2.75	3.00	12	20	22	29	1.45	1.60	1.80	2.00	18	32	40	57
GUINAYANG	2,718	3,590	4,192	4,768	625	2.15	2.50	2.75	3.00	9	14	18	23	1.45	1.60	1.80	2.00	14	23	33	46
GUITNANG BAYAN	3,345	5,154	6,747	8,383	625	2.15	2.50	2.75	3.00	12	21	30	40	1.45	1.60	1.80	2.00	17	33	53	80
GUITNANG BAYAN	2,897	4,408	6,215	7,722	625	2.15	2.50	2.75	3.00	10	18	27	37	1.45	1.60	1.80	2.00	14	28	49	74
GULOD MALAYA	0	0	0	0	625	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
MALANDAY	4,632	6,230	7,937	9,027	625	2.15	2.50	2.75	3.00	16	25	35	43	1.45	1.60	1.80	2.00	23	40	63	87
MALY	2,851	3,922	5,074	6,252	625	2.15	2.50	2.75	3.00	10	16	22	30	1.45	1.60	1.80	2.00	14	25	40	60
PINTONG BOCAWE	0	0	0	0	625	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
SANTA ANA	4,580	6,415	8,397	10,433	625	2.15	2.50	2.75	3.00	16	26	37	50	1.45	1.60	1.80	2.00	23	41	67	100
SANTO NINO	0	0	0	0	625	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
SILANGAN	0	0	0	0	625	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
SAN MATEO TOTAL	35,033	47,185	60,088	72,405	625	2.15	2.50	2.75	3.00	121	189	264	348	1.45	1.60	1.80	2.00	175	302	476	695

FILE: SMTINDAL

TABLE INSTITUTIONAL WATER DEMAND (SAN MATEO)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INSTITUTIONAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
AMPID I, II	7,829	9,477	13,003	15,694	2,000	4	5	7	8	5.25	6.00	6.75	7.50	21	30	47	60
BANABA	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
DULONG BAYAN 1	2,599	3,065	3,524	4,187	2,000	1	2	2	2	5.25	6.00	6.75	7.50	5	12	14	15
DULONG BAYAN 2	3,581	4,926	4,998	5,938	2,000	2	2	2	3	5.25	6.00	6.75	7.50	11	12	14	23
GUINAYANG	2,718	3,590	4,192	4,768	2,000	1	2	2	2	5.25	6.00	6.75	7.50	5	12	14	15
GUITNANG BAYAN	3,345	5,154	6,747	8,383	2,000	2	3	3	4	5.25	6.00	6.75	7.50	11	18	20	30
GUITNANG BAYAN	2,897	4,408	6,215	7,722	2,000	1	2	3	4	5.25	6.00	6.75	7.50	5	12	20	30
GULOD MALAYA	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
MALANDAY	4,632	6,230	7,937	9,027	2,000	2	3	4	5	5.25	6.00	6.75	7.50	11	18	27	38
MALY	2,851	3,922	5,074	6,252	2,000	1	2	3	3	5.25	6.00	6.75	7.50	5	12	20	23
PINTONG BOCAWE	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
SANTA ANA	4,580	6,415	8,397	10,433	2,000	2	3	4	5	5.25	6.00	6.75	7.50	11	18	27	38
SANTO NINO	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
SILANGAN	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.50	0	0	0	0
SAN MATEO TOTAL	35,033	47,185	60,088	72,405	2,000	16	24	30	36	5.25	6.00	6.75	7.50	84	144	203	270

FILE: SMTINSAL

TABLE WATER DEMAND SUMMARY (MONTALBAN)

(UNIT: M3/D)

SECTORS	1995	2000	2005	2010
DOMESTIC	3,903	5,644	7,538	9,288
COMMERCIAL	570	903	1,402	1,933
INDUSTRIAL	69	111	168	227
INSTITUTIONAL	121	168	223	259
SUB TOTAL	4,662	6,826	9,331	11,708
UNACCOUNTED-FOR WATER	1,998	2,925	3,110	3,903
(%)	30	30	25	25
TOTAL WATER DEMAND	6,660	9,751	12,442	15,610
SERVED POPULATION	39,620	52,145	65,145	75,318
PER CAPITA CONSUMPTION				
DOMESTIC C.	0.098	0.108	0.116	0.123
TOTAL C.	0.118	0.131	0.143	0.155

FILE: DEMSUMMO

TABLE POPULATION PROJECTION FOR MONTALBAN

BARANGAY	BARANGAY POPULATION						SERVICE AREA %				SERVICE AREA POPULATION			
	CENSUS		PROJECTED											
	1990	(%)	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BALITE (POB.)	6,182	9.22	6,983	7,727	8,373	8,877	80	90	95	100	5,586	6,954	7,954	8,877
BURGOS	15,483	23.08	17,489	19,352	20,970	22,234	70	80	90	90	12,243	15,482	18,873	20,010
GERONIMO	3,365	5.02	3,801	4,206	4,558	4,832	90	100	100	100	3,421	4,206	4,558	4,832
MACABUD	2,021	3.01	2,283	2,526	2,737	2,902	0	0	0	0	0	0	0	0
MANGGAHAN	5,862	8.74	6,622	7,327	7,939	8,418	50	60	70	80	3,311	4,396	5,558	6,734
MASCAP	1,645	2.45	1,858	2,056	2,228	2,362	0	0	0	0	0	0	0	0
PURAY	1,311	1.95	1,481	1,639	1,776	1,883	0	0	0	0	0	0	0	0
ROSARIO	3,530	5.26	3,987	4,412	4,781	5,069	60	70	80	100	2,392	3,089	3,825	5,069
SAN ISIDRO	1,905	2.84	2,152	2,381	2,580	2,736	70	70	80	80	1,506	1,667	2,064	2,188
SAN JOSE	15,222	22.69	17,195	19,026	20,617	21,859	70	75	80	80	12,036	14,270	16,493	17,487
SAN RAFAEL	10,548	15.73	11,915	13,184	14,286	15,147	30	40	60	70	3,574	5,274	8,572	10,603
MONTALBAN TOTAL	67,074	100	75,766	83,837	90,845	96,318	58	66	75	79	44,070	55,337	67,897	75,801

FILE: MONPOP

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 1995)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														-----LOW-----						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BALITE (POB.)	5,586	23	25	35	17	1,285	1,397	1,955	950	50	80	90	95	642	642	1,285	1,117	1,760	902	5,064
BURGOS	12,243	34	45	18	3	4,162	5,509	2,204	367	50	80	90	95	2,081	2,081	4,162	4,407	1,983	349	10,902
GERONIMO	3,421	35	22	24	9	1,197	753	821	308	50	80	90	95	599	599	1,197	602	739	292	2,831
MACABUD	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MANGGAHAN	3,311	40	35	18	7	1,324	1,159	596	232	50	80	90	95	662	662	1,324	927	536	220	3,008
MASCAP	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
PURAY	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
ROSARIO	2,392	35	40	20	5	837	957	478	120	70	80	90	95	586	251	837	766	431	114	2,147
SAN ISIDRO	1,506	41	30	24	5	618	452	362	75	70	80	90	95	432	185	618	362	325	72	1,376
SAN JOSE	12,036	31	25	30	14	3,731	3,009	3,611	1,685	50	80	90	95	1,866	1,866	3,731	2,407	3,250	1,601	10,989
SAN RAFAEL	3,574	31	38	18	13	1,108	1,358	643	465	50	80	100	100	554	554	1,108	1,087	643	465	3,303
MONTALBAN TOTAL	44,070	32	33	24	10	14,263	14,593	10,670	4,201	52	80	91	96	7,423	6,841	14,263	11,675	9,668	4,014	39,620

FILE: MONPOP95

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 2000)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW DIRECT	LOW PUB.F.	LOW SUB.T.	MID	MID-HI	HI	TOTAL
BALITE (POB.)	6,954	23	25	35	17	1,599	1,739	2,434	1,182	60	85	100	100	960	640	1,599	1,478	2,434	1,182	6,694
BURGOS	15,482	34	45	18	3	5,264	6,967	2,787	464	60	85	100	100	3,158	2,106	5,264	5,922	2,787	464	14,437
GERONIMO	4,206	35	22	24	9	1,472	925	1,009	379	60	85	100	100	883	589	1,472	787	1,009	379	3,647
MACABUD	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MANGGAHAN	4,396	40	35	18	7	1,758	1,539	791	308	60	85	100	100	1,055	703	1,758	1,308	791	308	4,165
MASCAP	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
PURAY	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
ROSARIO	3,089	35	40	20	5	1,081	1,235	618	154	75	85	100	100	811	270	1,081	1,050	618	154	2,903
SAN ISIDRO	1,667	41	30	24	5	683	500	400	83	75	85	100	100	513	171	683	425	400	83	1,592
SAN JOSE	14,270	31	25	30	14	4,424	3,567	4,281	1,998	60	85	100	100	2,654	1,769	4,424	3,032	4,281	1,998	13,735
SAN RAFAEL	5,274	31	38	18	13	1,635	2,004	949	686	60	85	100	100	981	654	1,635	1,703	949	686	4,973
MONTALBAN TOTAL	55,337	32	33	24	9	17,917	18,476	13,269	5,254	61	85	100	100	11,015	6,902	17,917	15,705	13,269	5,254	52,145

FILE: MONPOP00

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 2005)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW			MID	MID-HI	HI	TOTAL
														DIRECT	PUB.F.	SUB.T.				
BALITE (POB.)	7,954	23	25	35	17	1,829	1,989	2,784	1,352	70	90	100	100	1,281	549	1,829	1,790	2,784	1,352	7,755
BURGOS	18,873	34	45	18	3	6,417	8,493	3,397	566	70	90	100	100	4,492	1,925	6,417	7,644	3,397	566	18,024
GERONIMO	4,558	35	22	24	9	1,595	1,003	1,094	410	70	90	100	100	1,117	479	1,595	902	1,094	410	4,002
MACABUD	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MANGGAHAN	5,558	40	35	18	7	2,223	1,945	1,000	389	70	90	100	100	1,556	667	2,223	1,751	1,000	389	5,363
MASCAP	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
PURAY	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	.0
ROSARIO	3,625	35	40	20	5	1,339	1,530	765	191	80	90	100	100	1,071	268	1,339	1,377	765	191	3,672
SAN ISIDRO	2,064	41	30	24	5	846	619	495	103	80	90	100	100	677	169	846	557	495	103	2,002
SAN JOSE	16,493	31	25	30	14	5,113	4,123	4,948	2,309	70	90	100	100	3,579	1,534	5,113	3,711	4,948	2,309	16,081
SAN RAFAEL	8,572	31	38	18	13	2,657	3,257	1,543	1,114	70	90	100	100	1,860	797	2,657	2,932	1,543	1,114	8,246
MONTALBAN TOTAL	67,897	32	34	24	9	22,020	22,959	16,027	6,435	71	90	100	100	15,632	6,387	22,020	20,663	16,027	6,435	65,145

FILE: MONPOP05

TABLE POPULATION IN SERVICE AREA AND SERVED POPULATION (MONTALBAN, 2010)

BARANGAY	POP'N IN SERVICE AREA	INCOME GROUP DISTRIBUTION (%)				POPULATION IN SERVICE AREA BY INCOME GROUP				WILLINGNESS TO CONNECT FACTOR (%)				SERVED POPULATION BY INCOME GROUP						
														-----------LOW---------						
		LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	LOW	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BALITE (POB.)	8,877	23	25	35	17	2,042	2,219	3,107	1,509	80	100	100	100	1,633	408	2,042	2,219	3,107	1,509	8,877
BURGOS	20,010	34	45	18	3	6,803	9,005	3,602	600	80	100	100	100	5,443	1,361	6,803	9,005	3,602	600	20,010
GERONIMO	4,832	35	22	24	9	1,691	1,063	1,160	435	80	100	100	100	1,353	338	1,691	1,063	1,160	435	4,349
MACABUD	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
MANGGAHAN	6,734	40	35	18	7	2,694	2,357	1,212	471	80	100	100	100	2,155	539	2,694	2,357	1,212	471	6,734
MASCAP	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
PURAY	0	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0
ROSARIO	5,069	35	40	20	5	1,774	2,028	1,014	253	85	100	100	100	1,508	266	1,774	2,028	1,014	253	5,069
SAN ISIDRO	2,188	41	30	24	5	897	657	525	109	85	100	100	100	763	135	897	657	525	109	2,188
SAN JOSE	17,487	31	25	30	14	5,421	4,372	5,246	2,448	80	100	100	100	4,337	1,084	5,421	4,372	5,246	2,448	17,487
SAN RAFAEL	10,603	31	38	18	13	3,287	4,029	1,909	1,378	80	100	100	100	2,629	657	3,287	4,029	1,909	1,378	10,603
MONTALBAN TOTAL	75,801	32	34	23	10	24,609	25,729	17,774	7,205	81	100	100	100	19,821	4,788	24,609	25,729	17,774	7,205	75,318

FILE: MONPOP10

TABLE DOMESTIC WATER DEMAND (MONTALBAN, 1995)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW			MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	LOW			MID	MID-HI	HI	TOTAL
	DIRECT	PUB.F.	SUB.T.										DIRECT	PUB.F.	SUB.T.				
BALITE (POB.)	642	642	1,285	1,117	1,760	902	5,064	86	39	104	123	148	55	25	80	116	216	134	546
BURGOS	2,081	2,081	4,162	4,407	1,983	349	10,902	86	39	104	123	148	179	81	260	458	244	52	1,014
GERONIMO	599	599	1,197	602	739	292	2,831	86	39	104	123	148	51	23	75	63	91	43	272
MACABUD	0	0	0	0	0	0	0	86	39	104	123	148	0	0	0	0	0	0	0
MANGGAHAN	662	662	1,324	927	536	220	3,008	86	39	104	123	148	57	26	83	96	66	33	278
MASCAP	0	0	0	0	0	0	0	86	39	104	123	148	0	0	0	0	0	0	0
PURAY	0	0	0	0	0	0	0	86	39	104	123	148	0	0	0	0	0	0	0
ROSARIO	586	251	837	766	431	114	2,147	86	39	104	123	148	50	10	60	80	53	17	210
SAN ISIDRO	432	185	618	362	325	72	1,376	86	39	104	123	148	37	7	44	38	40	11	133
SAN JOSE	1,866	1,866	3,731	2,407	3,250	1,601	10,989	86	39	104	123	148	160	73	233	250	400	237	1,120
SAN RAFAEL	554	554	1,108	1,087	643	465	3,303	86	39	104	123	148	48	22	69	113	79	69	330
MONTALBAN TOTAL	7,423	6,841	14,263	11,675	9,668	4,014	39,620	86	39	104	123	148	638	267	905	1,214	1,189	594	3,903

FILE: MONDOM95

TABLE DOMESTIC WATER DEMAND (MONTALBAN, 2000)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BALITE (POB.)	960	640	1,599	1,478	2,434	1,182	6,694	92	42	112	132	158	88	27	115	166	321	187	789
BURGOS	3,158	2,106	5,264	5,922	2,787	464	14,437	92	42	112	132	158	291	88	379	663	368	73	1,483
GERONIMO	883	589	1,472	787	1,009	379	3,647	92	42	112	132	158	81	25	106	88	133	60	387
MACABUD	0	0	0	0	0	0	0	92	42	112	132	158	0	0	0	0	0	0	0
MANGGAHAN	1,055	703	1,758	1,308	791	308	4,165	92	42	112	132	158	97	30	127	146	104	49	426
MASCAP	0	0	0	0	0	0	0	92	42	112	132	158	0	0	0	0	0	0	0
PURAY	0	0	0	0	0	0	0	92	42	112	132	158	0	0	0	0	0	0	0
ROSARIO	811	270	1,081	1,050	618	154	2,903	92	42	112	132	158	75	11	86	118	82	24	309
SAN ISIDRO	513	171	683	425	400	83	1,592	92	42	112	132	158	47	7	54	48	53	13	168
SAN JOSE	2,654	1,769	4,424	3,032	4,281	1,998	13,735	92	42	112	132	158	244	74	318	340	565	316	1,539
SAN RAFAEL	981	654	1,635	1,703	949	686	4,973	92	42	112	132	158	90	27	118	191	125	108	542
MONTALBAN TOTAL	11,015	6,902	17,917	15,705	13,269	5,254	52,145	92	42	112	132	158	1,013	290	1,303	1,759	1,752	830	5,644

FILE: MONDOM00

TABLE DOMESTIC WATER DEMAND (MONTALBAN, 2005)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BALITE (POB.)	1,281	549	1,829	1,790	2,784	1,352	7,755	97	44	118	139	167	124	24	148	211	387	226	972
BURGOS	4,492	1,925	6,417	7,644	3,397	566	18,024	97	44	118	139	167	436	85	520	902	472	95	1,989
GERONIMO	1,117	479	1,595	902	1,094	410	4,002	97	44	118	139	167	108	21	129	106	152	69	456
MACABUD	0	0	0	0	0	0	0	97	44	118	139	167	0	0	0	0	0	0	0
MANGGAHAN	1,556	667	2,223	1,751	1,000	389	5,363	97	44	118	139	167	151	29	180	207	139	65	591
MASCAP	0	0	0	0	0	0	0	97	44	118	139	167	0	0	0	0	0	0	0
PURAY	0	0	0	0	0	0	0	97	44	118	139	167	0	0	0	0	0	0	0
ROSARIO	1,071	268	1,339	1,377	765	191	3,672	97	44	118	139	167	104	12	116	162	106	32	416
SAN ISIDRO	677	169	846	557	495	103	2,002	97	44	118	139	167	66	7	73	66	69	17	225
SAN JOSE	3,579	1,534	5,113	3,711	4,948	2,309	16,081	97	44	118	139	167	347	67	415	438	688	386	1,926
SAN RAFAEL	1,860	797	2,657	2,932	1,543	1,114	8,246	97	44	118	139	167	180	35	216	346	214	186	962
MONTALBAN TOTAL	15,632	6,387	22,020	20,663	16,027	6,435	65,145	97	44	118	139	167	1,516	281	1,797	2,438	2,228	1,075	7,538

FILE: MONDOM05

TABLE DOMESTIC WATER DEMAND (MONTALBAN, 2010)

BARANGAY	SERVED POPULATION BY INCOME GROUP							UNIT CONSUMPTION (LPCD)					WATER DEMAND BY INCOME GROUP (M3/D)						
	LOW												LOW						
	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL	DIRECT	PUB.F.	MID	MID-HI	HI	DIRECT	PUB.F.	SUB.T.	MID	MID-HI	HI	TOTAL
BALITE (POB.)	1,633	408	2,042	2,219	3,107	1,509	8,877	102	46	124	146	175	167	19	185	275	454	264	1,178
BURGOS	5,443	1,361	6,803	9,005	3,602	600	20,010	102	46	124	146	175	555	63	618	1,117	526	105	2,365
GERONIMO	1,353	338	1,691	1,063	1,160	435	4,349	102	46	124	146	175	138	16	154	132	169	76	531
MACABUD	0	0	0	0	0	0	0	102	46	124	146	175	0	0	0	0	0	0	0
MANGGAHAN	2,155	539	2,694	2,357	1,212	471	6,734	102	46	124	146	175	220	25	245	292	177	82	796
MASCAP	0	0	0	0	0	0	0	102	46	124	146	175	0	0	0	0	0	0	0
PURAY	0	0	0	0	0	0	0	102	46	124	146	175	0	0	0	0	0	0	0
ROSARIO	1,508	266	1,774	2,028	1,014	253	5,069	102	46	124	146	175	154	12	166	251	148	44	610
SAN ISIDRO	763	135	897	657	525	109	2,188	102	46	124	146	175	78	6	84	81	77	19	261
SAN JOSE	4,337	1,084	5,421	4,372	5,246	2,448	17,487	102	46	124	146	175	442	50	492	542	766	428	2,229
SAN RAFAEL	2,629	657	3,287	4,029	1,909	1,378	10,603	102	46	124	146	175	268	30	298	500	279	241	1,318
MONTALBAN TOTAL	19,821	4,788	24,609	25,729	17,774	7,205	75,318	102	46	124	146	175	2,022	220	2,242	3,190	2,595	1,261	9,288

FILE: MONDOM10

TABLE COMMERCIAL WATER DEMAND (MONTALBAN)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				COMMERCIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BALITE (POB.)	5,586	6,954	7,954	8,877	196	1.75	2.00	2.25	2.50	50	71	91	113	1.45	1.60	1.80	2.00	72	113	164	226
BURGOS	12,243	15,482	18,873	20,010	196	1.75	2.00	2.25	2.50	109	158	217	255	1.45	1.60	1.80	2.00	158	253	390	510
GERONIMO	3,421	4,206	4,558	4,832	196	1.75	2.00	2.25	2.50	31	43	52	62	1.45	1.60	1.80	2.00	44	69	94	123
MACABUD	0	0	0	0	196	1.75	2.00	2.25	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
MANGGAHAN	3,311	4,396	5,558	6,734	196	1.75	2.00	2.25	2.50	30	45	64	86	1.45	1.60	1.80	2.00	43	72	115	172
MASCAP	0	0	0	0	196	1.75	2.00	2.25	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
PURAY	0	0	0	0	196	1.75	2.00	2.25	2.50	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
ROSARIO	2,392	3,089	3,825	5,069	196	1.75	2.00	2.25	2.50	21	32	44	65	1.45	1.60	1.80	2.00	31	50	79	129
SAN ISIDRO	1,506	1,667	2,064	2,188	196	1.75	2.00	2.25	2.50	13	17	24	28	1.45	1.60	1.80	2.00	19	27	43	56
SAN JOSE	12,036	14,270	16,493	17,487	196	1.75	2.00	2.25	2.50	107	146	189	223	1.45	1.60	1.80	2.00	156	233	341	446
SAN RAFAEL	3,574	5,274	8,572	10,603	196	1.75	2.00	2.25	2.50	32	54	98	135	1.45	1.60	1.80	2.00	46	86	177	270
MONTALBAN TOTAL	44,070	55,337	67,897	75,801	196	1.75	2.00	2.25	2.50	393	564	779	966	1.45	1.60	1.80	2.00	570	903	1,402	1,933

FILE: MONCOMAL

TABLE INDUSTRIAL WATER DEMAND (MONTALBAN)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER	DENSITY INCREASE COEFFICIENT				NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INDUSTRIAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010	CONN'N	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BALITE (POB.)	5,586	6,954	7,954	8,877	2,000	2.15	2.50	2.75	3.00	6	9	11	13	1.45	1.60	1.80	2.00	9	14	20	27
BURGOS	12,243	15,482	18,873	20,010	2,000	2.15	2.50	2.75	3.00	13	19	26	30	1.45	1.60	1.80	2.00	19	31	47	60
GERONIMO	3,421	4,206	4,558	4,832	2,000	2.15	2.50	2.75	3.00	4	5	6	7	1.45	1.60	1.80	2.00	5	8	11	14
MACABUD	0	0	0	0	2,000	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
MANGGAHAN	3,311	4,396	5,558	6,734	2,000	2.15	2.50	2.75	3.00	4	5	8	10	1.45	1.60	1.80	2.00	5	9	14	20
MASCAP	0	0	0	0	2,000	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
PURAY	0	0	0	0	2,000	2.15	2.50	2.75	3.00	0	0	0	0	1.45	1.60	1.80	2.00	0	0	0	0
ROSARIO	2,392	3,089	3,825	5,069	2,000	2.15	2.50	2.75	3.00	3	4	5	8	1.45	1.60	1.80	2.00	4	6	9	15
SAN ISIDRO	1,506	1,667	2,064	2,188	2,000	2.15	2.50	2.75	3.00	2	2	3	3	1.45	1.60	1.80	2.00	2	3	5	7
SAN JOSE	12,036	14,270	16,493	17,487	2,000	2.15	2.50	2.75	3.00	13	18	23	26	1.45	1.60	1.80	2.00	19	29	41	52
SAN RAFAEL	3,574	5,274	8,572	10,603	2,000	2.15	2.50	2.75	3.00	4	7	12	16	1.45	1.60	1.80	2.00	6	11	21	32
MONTALBAN TOTAL	44,070	55,337	67,897	75,801	2,000	2.15	2.50	2.75	3.00	47	69	93	114	1.45	1.60	1.80	2.00	69	111	168	227

FILE: MONINDAL

TABLE INSTITUTIONAL WATER DEMAND (MONTALBAN)

BARANGAY	POPULATION IN SERVICE AREA				DENSITY PER CONN'N	NUMBER OF CONNECTIONS				UNIT CONSUMPTION (M3/D)				INSTITUTIONAL WATER DEMAND (M3/D)			
	1995	2000	2005	2010		1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
BALITE (POB.)	5,586	6,954	7,954	8,877	2,000	3	3	4	4	5.25	6.00	6.75	7.00	16	18	27	28
BURGOS	12,243	15,482	18,873	20,010	2,000	6	8	9	10	5.25	6.00	6.75	7.00	32	48	61	70
GERONIMO	3,421	4,206	4,558	4,832	2,000	2	2	2	2	5.25	6.00	6.75	7.00	11	12	14	14
MACABUD	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.00	0	0	0	0
MANGGAHAN	3,311	4,396	5,558	6,734	2,000	2	2	3	3	5.25	6.00	6.75	7.00	11	12	20	21
MASCAP	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.00	0	0	0	0
PURAY	0	0	0	0	2,000	0	0	0	0	5.25	6.00	6.75	7.00	0	0	0	0
ROSARIO	2,392	3,089	3,825	5,069	2,000	1	2	2	3	5.25	6.00	6.75	7.00	5	12	14	21
SAN ISIDRO	1,506	1,667	2,064	2,188	2,000	1	1	1	1	5.25	6.00	6.75	7.00	5	6	7	7
SAN JOSE	12,036	14,270	16,493	17,487	2,000	6	7	8	9	5.25	6.00	6.75	7.00	32	42	54	63
SAN RAFAEL	3,574	5,274	8,572	10,603	2,000	2	3	4	5	5.25	6.00	6.75	7.00	11	18	27	35
MONTALBAN TOTAL	44,070	55,337	67,897	75,801	2,000	23	28	33	37	5.25	6.00	6.75	7.00	121	168	223	259

FILE: MONINSAL

APPENDIX F

HYDRAULIC ANALYSIS ON DISTRIBUTION NETWORK

LIST OF TABLE

PAGE

APPENDIX F HYDRAULIC ANALYSIS ON DISTRIBUTION NETWORK

1. NOTE F-1
2. PHASE 1 ..... F-2
3. PHASE 2 MAIN SYSTEM F-6
4. PHASE 2 SUB SYSTEM F-11

HYDRAWLIC ANALYSIS ON DISTRIBUTION NETWORK

NOTE:

PHASE 1

Title: 2000ANTI

Pipes with No. 9101 to 9143 are dummy pipes for deepwells.
Nodes with No. 101 to 143 are deepwells.
Node with No. 100 is a Distribution Reservoir.

PHASE 2

Title: 2010ANTI (Main System)

Pipes with No. 9101 to 9143 are dummy pipes for deepwells.
Nodes with No. 101 to 143 are deepwells.
Node with No. 100 is a Distribution Reservoir (Phase 1 + Phase 2).
Pipes with No. 2001 to 2017 are newly installed pipes in Phase 2.
Pipes with No. 2201 to 2260 are pipes installed parallelly with the one installed in Phase 1.
Pipes with No. 1001 to 1064 are installed in Phase 1.

Title: 2010ANTB (Sub System)

Node with No. 200 is a Distribution Reservoir.
Node with No. 208 is a dummy node located at node No. 8 in the Main System.

T I T L E : ANTIPOLO, 2000
NO. OF PIPES : 78
NO. OF NODES : 62
PEAK FACTOR : 2
MAX HEADLOSS/Km : 12
MAX UNBAL(LPS) : .009

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
9100	100	5	900.00	600	130	247.77	0.88	1.19	1.07
9101	101	1	50.00	200	100	23.83	0.76	5.35	0.27
1001	2	1	380.00	300	110	83.80	1.19	6.38	2.43
1002	1	9	650.00	150	100	8.19	0.46	3.01	1.96
1003	1	10	310.00	200	100	25.50	0.81	6.07	1.88
1004	1	13	380.00	250	110	59.72	1.22	8.29	3.15
1005	3	2	350.00	350	110	110.74	1.15	5.05	1.77
1006	2	14	460.00	150	100	14.52	0.82	8.69	4.00
1007	4	3	180.00	350	110	132.30	1.38	7.01	1.26
1008	3	15	330.00	150	100	16.26	0.92	10.72	3.54
9104	104	4	50.00	150	100	9.61	0.54	4.05	0.20
1009	5	4	370.00	500	120	207.87	1.06	2.42	0.90
1010	4	17	390.00	400	120	79.87	0.64	1.22	0.48
9105	105	5	50.00	150	100	9.61	0.54	4.05	0.20
1011	5	6	340.00	300	110	39.89	0.56	1.62	0.55
1012	6	7	410.00	200	100	30.27	0.96	8.34	3.42
1013	7	8	800.00	200	100	20.65	0.66	4.11	3.29
1014	8	9	580.00	150	100	6.23	0.35	1.82	1.05
1015	10	11	780.00	100	100	3.96	0.50	5.67	4.42
1016	12	11	270.00	250	110	50.84	1.04	6.15	1.66
1017	11	43	200.00	250	110	44.14	0.90	4.74	0.95
1018	13	12	210.00	250	110	54.97	1.12	7.11	1.49
1019	24	12	90.00	100	100	1.21	0.15LO	0.63	0.06
1020	14	13	400.00	150	100	9.47	0.54	3.94	1.58
9114	114	14	50.00	100	100	4.84	0.62	8.21	0.41
1021	15	14	190.00	150	100	17.03	0.96	11.68	2.22
1022	14	23	200.00	150	100	14.51	0.82	8.68	1.74
1023	16	15	70.00	100	100	6.07	0.77	12.49HI	0.87
1024	17	16	430.00	150	100	13.88	0.79	8.00	3.44
1025	16	21	260.00	100	100	2.50	0.32	2.42	0.63
9117	117	17	50.00	250	110	41.22	0.84	4.17	0.21
1026	17	18	700.00	200	100	9.62	0.31	1.00	0.70
1027	17	19	210.00	350	110	86.98	0.90	3.23	0.68
1028	19	20	420.00	150	100	13.63	0.77	7.73	3.25
1029	19	21	460.00	200	100	28.31	0.90	7.36	3.39
1030	19	28	880.00	300	110	31.42	0.44	1.04	0.91
9121	121	21	50.00	150	100	10.24	0.58	4.56	0.23
1031	21	22	260.00	150	100	19.22	1.09	14.61HI	3.80
1032	21	27	200.00	150	100	8.20	0.46	3.02	0.60
1033	22	23	120.00	100	100	2.96	0.38	3.29	0.40
1034	22	26	220.00	100	100	0.86	0.11LO	0.34	0.07

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1035	23	24	320.00	100	100	3.27	0.42	3.97	1.27
1036	25	24	400.00	100	100	3.28	0.42	3.99	1.60
9125	125	25	50.00	200	100	21.84	0.70	4.56	0.23
1037	25	26	280.00	100	100	0.17	0.02LO	0.02	0.00
1038	25	41	480.00	150	100	11.27	0.64	5.44	2.61
1039	27	26	310.00	100	100	5.54	0.71	10.53	3.26
1040	35	26	420.00	100	100	5.30	0.67	9.71	4.08
9127	127	27	50.00	150	100	9.61	0.54	4.05	0.20
1041	28	27	450.00	100	100	4.38	0.56	6.82	3.07
9128	128	28	50.00	150	100	14.90	0.84	9.11	0.46
1042	28	29	190.00	150	100	8.91	0.50	3.52	0.67
1043	28	35	430.00	200	100	23.58	0.75	5.25	2.26
1044	30	29	450.00	100	100	9.59	1.22	29.10HI	13.10
1045	29	32	660.00	150	100	9.05	0.51	3.62	2.39
9130	130	30	50.00	200	100	28.82	0.92	7.61	0.38
1046	30	31	410.00	150	100	16.96	0.96	11.59	4.75
1047	31	33	650.00	100	100	7.04	0.90	16.43HI	10.68
1048	31	37	680.00	100	100	7.66	0.98	19.18HI	13.04
1049	33	32	670.00	100	100	0.40	0.05LO	0.08	0.06
1050	33	34	570.00	100	100	4.38	0.56	6.82	3.89
1051	34	39	730.00	100	100	2.12	0.27LO	1.78	1.30
9135	135	35	50.00	150	100	12.35	0.70	6.44	0.32
1052	35	36	410.00	150	100	10.18	0.58	4.51	1.85
1053	35	40	390.00	150	100	7.43	0.42	2.52	0.98
1054	36	37	880.00	150	100	5.49	0.31	1.44	1.27
1055	37	38	720.00	150	100	8.47	0.48	3.21	2.31
1056	38	39	720.00	150	100	3.78	0.21LO	0.72	0.52
9140	140	40	50.00	100	100	5.01	0.64	8.76	0.44
1057	40	41	580.00	100	100	5.34	0.68	9.82	5.70
1058	41	42	80.00	150	100	13.05	0.74	7.14	0.57
1059	42	43	270.00	150	100	9.50	0.54	3.96	1.07
9143	143	43	50.00	150	100	12.87	0.73	6.96	0.35
1060	43	44	1130.00	250	100	55.84	1.14	8.73	9.87
1061	44	45	390.00	200	100	44.69	1.42	17.14HI	6.68
1062	45	46	820.00	150	100	27.95	1.58	29.20HI	23.94
1063	46	47	240.00	150	100	16.77	0.95	11.35	2.72
1064	47	48	900.00	100	100	11.18	1.42	38.61HI	34.75

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
100 R	247.771	240.00	240.00	0.00
101	23.828	176.00	232.85	56.85
1	-14.224	176.00	232.58	56.58
2	-12.416	186.00	235.00	49.00
3	-5.304	190.00	236.77	46.77
104	9.606	190.00	238.23	48.23

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
4	-5.304	190.00	238.03	48.03
105	9.606	212.00	239.13	27.13
5	-9.620	212.00	238.93	26.93
6	-9.620	229.00	238.38	9.38
7	-9.620	215.00	234.96	19.96
8	-14.420	192.00	231.67	39.67
9	-14.420	186.00	230.62	44.62
10	-21.532	175.00	230.70	55.70
11	-10.668	188.00	226.27	38.27
12	-5.334	189.00	227.94	38.94
13	-14.224	184.00	229.43	45.43
114	4.842	185.00	231.42	46.42
14	-12.416	185.00	231.01	46.01
15	-5.304	185.00	233.23	48.23
16	-5.304	185.00	234.12	49.12
117	41.218	190.00	237.76	47.76
17	-10.608	190.00	237.55	47.55
18	-9.620	222.00	236.85	14.85
19	-13.626	205.00	236.88	31.88
20	-13.626	202.00	233.63	31.63
121	10.241	195.00	233.72	38.72
21	-13.626	195.00	233.49	38.49
22	-15.404	192.00	229.69	37.69
23	-14.194	194.00	229.27	35.27
24	-5.334	189.00	228.00	39.00
125	21.837	195.00	229.82	34.82
25	-7.112	195.00	229.60	34.60
26	-11.878	190.00	229.61	39.61
127	9.606	199.00	233.09	34.09
27	-16.646	199.00	232.88	33.88
128	14.896	204.00	236.42	32.42
28	-9.452	204.00	235.96	31.96
29	-9.452	202.00	235.29	33.29
130	28.819	202.00	248.77	46.77
30	-2.260	202.00	248.39	46.39
31	-2.260	196.00	243.64	47.64
32	-9.452	212.00	232.90	20.90
33	-2.260	200.00	232.96	32.96
34	-2.260	210.00	229.07	19.07
135	12.347	199.00	234.03	35.03
35	-13.008	199.00	233.70	34.70
36	-4.686	195.00	231.86	36.86
37	-4.686	214.00	230.59	16.59
38	-4.686	210.00	228.28	18.28
39	-5.902	220.00	227.76	7.76
140	5.013	194.00	233.16	39.16
40	-7.112	194.00	232.72	38.72
41	-3.556	197.00	227.02	30.02

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
42	-3.556	198.00	226.40	28.40
143	12.874	186.00	225.67	39.67
43	-10.668	186.00	225.33	39.33
44	-11.152	140.00	215.46	75.46
45	-16.742	118.00	208.78	90.78
46	-11.180	80.00	184.83	104.83
47	-5.590	65.00	182.11	117.11
48	-11.180	40.00	147.36	107.36

T I T L E : ANTIPOLO, 2010, MAIN SYSTEM
NO. OF PIPES : 127
NO. OF NODES : 77
PEAK FACTOR : 2
MAX HEADLOSS/Km : 14
MAX UNBAL(LPS) : .009

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
9100	100	5	900.00	600	130	233.30	0.83	1.07	0.96
9200	100	5	900.00	700	130	350.07	0.91	1.07	0.96
9101	101	1	50.00	200	100	23.83	0.76	5.35	0.27
1001	2	1	380.00	300	110	78.15	1.11	5.61	2.13
2201	2	1	380.00	300	110	78.15	1.11	5.61	2.13
1002	1	9	650.00	150	100	6.47	0.37	1.95	1.27
1003	1	10	310.00	200	100	22.81	0.73	4.94	1.53
2203	1	10	310.00	250	110	45.15	0.92	4.94	1.53
1004	1	13	380.00	250	110	44.60	0.91	4.83	1.83
2204	1	13	380.00	250	110	44.60	0.91	4.83	1.83
1005	3	2	350.00	350	110	119.98	1.25	5.85	2.05
2205	3	2	350.00	300	110	79.96	1.13	5.85	2.05
1006	2	14	460.00	150	100	12.86	0.73	6.95	3.20
2206	2	14	460.00	150	100	12.86	0.73	6.95	3.20
1007	4	3	180.00	350	110	122.19	1.27	6.05	1.09
2207	4	3	180.00	350	110	122.19	1.27	6.05	1.09
1008	3	15	330.00	150	100	11.09	0.63	5.28	1.74
2208	3	15	330.00	200	100	23.66	0.75	5.28	1.74
9104	104	4	50.00	150	100	9.61	0.54	4.05	0.20
1009	5	4	370.00	500	120	259.81	1.32	3.66	1.36
2209	5	4	370.00	500	120	259.81	1.32	3.66	1.36
1010	4	17	390.00	400	110	92.87	0.74	1.90	0.74
2210	4	17	390.00	500	120	182.29	0.93	1.90	0.74
9105	105	5	50.00	150	100	9.61	0.54	4.05	0.20
1011	5	6	340.00	300	110	55.58	0.79	2.99	1.02
1012	6	7	410.00	200	100	25.74	0.82	6.18	2.53
2212	6	7	410.00	150	100	12.07	0.68	6.18	2.53
1013	7	8	800.00	200	100	20.04	0.64	3.89	3.11
1014	8	9	580.00	150	100	6.78	0.38	2.13	1.23
1015	10	11	780.00	100	100	2.87	0.37	3.13	2.44
1016	12	11	270.00	250	110	44.93	0.92	4.90	1.32
2216	12	11	270.00	200	100	22.70	0.72	4.90	1.32
1017	11	43	200.00	250	110	38.05	0.78	3.60	0.72
2217	11	43	200.00	200	100	19.23	0.61	3.60	0.72
1018	13	12	210.00	250	110	39.57	0.81	3.87	0.81
2218	13	12	210.00	250	110	39.57	0.81	3.87	0.81
1019	12	24	90.00	100	100	4.89	0.62	8.37	0.75
1020	14	13	400.00	150	100	6.42	0.36	1.92	0.77
9114	114	14	50.00	100	100	4.84	0.62	8.21	0.41
1021	15	14	190.00	150	100	21.78	1.23	18.40HI	3.50
1022	14	23	200.00	150	100	14.00	0.79	8.12	1.62

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	(M)
2222	14	23	200.00	150	100	14.00	0.79	8.12	1.62
1023	15	16	70.00	100	100	3.29	0.42	4.02	0.28
1024	17	16	430.00	150	100	11.34	0.64	5.50	2.37
1025	16	21	260.00	100	100	4.95	0.63	8.54	2.22
9117	117	17	50.00	250	110	41.22	0.84	4.17	0.21
1026	17	18	700.00	200	100	17.77	0.57	3.11	2.18
1027	17	19	210.00	350	110	86.03	0.89	3.16	0.66
2227	17	19	210.00	450	120	181.86	1.14	3.16	0.66
1028	19	20	420.00	150	100	9.59	0.54	4.03	1.69
2228	19	20	420.00	200	100	20.45	0.65	4.03	1.69
1029	19	21	460.00	200	100	30.64	0.98	8.52	3.92
2229	19	21	460.00	100	100	4.94	0.63	8.52	3.92
1030	19	28	880.00	300	110	43.72	0.62	1.92	1.69
2230	19	28	880.00	450	120	138.69	0.87	1.92	1.69
9121	121	21	50.00	150	100	10.24	0.58	4.56	0.23
1031	21	22	260.00	150	100	19.03	1.08	14.34HI	3.73
1032	21	27	200.00	150	100	8.84	0.50	3.47	0.69
2232	21	27	200.00	100	100	3.04	0.39	3.47	0.69
1033	23	22	120.00	100	100	5.19	0.66	9.35	1.12
1034	22	26	220.00	100	100	0.94	0.12LO	0.39	0.09
2234	22	26	220.00	100	100	0.94	0.12LO	0.39	0.09
1035	23	24	320.00	100	100	2.38	0.30	2.21	0.71
1036	24	25	400.00	100	100	0.66	0.08LO	0.21	0.08
9125	125	25	50.00	200	100	21.84	0.70	4.56	0.23
1037	25	26	280.00	100	100	1.93	0.25LO	1.50	0.42
1038	25	41	480.00	150	100	10.61	0.60	4.86	2.33
1039	27	26	310.00	100	100	5.40	0.69	10.05	3.11
1040	35	26	420.00	100	100	5.94	0.76	12.00	5.04
9127	127	27	50.00	150	100	9.61	0.54	4.05	0.20
1041	28	27	450.00	100	100	4.26	0.54	6.49	2.92
9128	128	28	50.00	150	100	14.90	0.84	9.11	0.46
1042	28	29	190.00	150	100	7.63	0.43	2.64	0.50
2242	28	29	190.00	300	110	52.03	0.74	2.64	0.50
1043	28	35	430.00	200	100	15.14	0.48	2.31	0.99
2243	28	35	430.00	400	110	103.24	0.82	2.31	0.99
1044	30	29	450.00	100	100	3.74	0.48	5.09	2.29
1045	29	32	660.00	150	100	9.27	0.52	3.79	2.50
2245	29	32	660.00	250	110	39.12	0.80	3.79	2.50
9130	130	30	50.00	200	100	28.82	0.92	7.61	0.38
1046	30	31	410.00	150	100	15.41	0.87	9.71	3.98
1047	31	33	650.00	100	100	3.21	0.41	3.83	2.49
1048	31	37	680.00	100	100	2.53	0.32	2.48	1.68
1049	32	33	670.00	100	100	2.55	0.32	2.51	1.68
2249	32	33	670.00	200	100	15.82	0.50	2.51	1.68
1050	33	34	570.00	100	100	3.05	0.39	3.49	1.99
2250	33	34	570.00	150	100	8.86	0.50	3.49	1.99
1051	34	39	730.00	100	100	2.24	0.29LO	1.97	1.44
9135	135	35	50.00	150	100	12.35	0.70	6.44	0.32

PIPE NO.	FROM Node	TO Node	LENGTH (M)	DIA (MM)	HWC	FLOW (LPS)	VELOCITY (MPS)	HEADLOSS (M/KM)	HEADLOSS (M)
1052	35	36	410.00	150	100	8.20	0.46	3.02	1.24
2252	35	36	410.00	250	110	34.61	0.71	3.02	1.24
1053	35	40	390.00	150	100	7.93	0.45	2.84	1.11
2253	35	40	390.00	300	110	54.06	0.76	2.84	1.11
1054	36	37	880.00	150	100	6.32	0.36	1.87	1.64
2254	36	37	880.00	250	110	26.68	0.54	1.87	1.64
1055	37	38	720.00	150	100	8.21	0.46	3.03	2.18
2255	37	38	720.00	200	100	17.51	0.56	3.03	2.18
1056	38	39	720.00	150	100	7.95	0.45	2.85	2.05
2256	38	39	720.00	150	100	7.95	0.45	2.85	2.05
9140	140	40	50.00	100	100	5.01	0.64	8.76	0.44
1057	40	41	580.00	100	100	5.40	0.69	10.06	5.84
1058	41	42	80.00	150	100	11.04	0.62	5.23	0.42
1059	43	42	270.00	150	100	11.62	0.66	5.76	1.55
9143	143	43	50.00	150	100	12.87	0.73	6.96	0.35
1060	43	44	1130.00	250	100	35.95	0.73	3.86	4.37
2260	43	44	1130.00	150	100	9.37	0.53	3.86	4.37
1061	44	45	390.00	200	100	30.59	0.97	8.50	3.31
1062	45	46	820.00	150	100	22.07	1.25	18.86HI	15.47
1063	46	47	240.00	150	100	13.24	0.75	7.33	1.76
1064	47	48	900.00	100	100	8.83	1.12	24.94HI	22.45
2001	20	50	390.00	150	100	10.17	0.58	4.50	1.76
2002	32	51	460.00	150	100	15.01	0.85	9.24	4.25
2003	39	52	470.00	200	100	16.28	0.52	2.65	1.24
2004	52	53	650.00	200	100	14.42	0.46	2.11	1.37
2005	53	54	430.00	150	100	11.53	0.65	5.67	2.44
2006	56	55	1230.00	100	100	1.86	0.24LO	1.40	1.72
2007	56	57	1300.00	200	100	17.66	0.56	3.08	4.00
2008	59	56	520.00	200	100	29.48	0.94	7.94	4.13
2009	57	58	1680.00	150	100	8.83	0.50	3.46	5.82
2010	40	59	720.00	250	110	51.63	1.05	6.33	4.56
2011	59	60	600.00	150	100	12.20	0.69	6.30	3.78
2012	60	61	970.00	100	100	2.24	0.29LO	1.97	1.91
2013	62	61	750.00	150	100	7.72	0.44	2.70	2.03
2014	42	62	640.00	200	100	17.68	0.56	3.08	1.97
2015	10	63	970.00	250	110	43.59	0.89	4.63	4.49
2016	63	64	490.00	200	100	27.10	0.86	6.80	3.33
2017	64	45	620.00	150	100	10.62	0.60	4.87	3.02

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
100 R	583.365	240.00	240.00	0.00
101	23.828	176.00	232.69	56.69
1	-16.486	176.00	232.42	56.42
2	-17.930	186.00	234.55	48.55
3	-9.686	190.00	236.60	46.60

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
104	9.606	190.00	237.89	47.89
4	-9.686	190.00	237.69	47.69
105	9.606	212.00	239.24	27.24
5	-17.772	212.00	239.04	27.04
6	-17.772	229.00	238.03	9.03
7	-17.772	215.00	235.49	20.49
8	-13.256	192.00	232.38	40.38
9	-13.256	186.00	231.15	45.15
10	-21.500	175.00	230.89	55.89
11	-13.222	188.00	228.45	40.45
12	-6.610	189.00	229.77	40.77
13	-16.486	184.00	230.58	46.58
114	4.842	185.00	231.76	46.76
14	-17.930	185.00	231.35	46.35
15	-9.686	185.00	234.85	49.85
16	-9.686	185.00	234.58	49.58
117	41.218	190.00	237.15	47.15
17	-19.374	190.00	236.94	46.94
18	-17.772	222.00	234.77	12.77
19	-19.860	205.00	236.28	31.28
20	-19.860	202.00	234.59	32.59
121	10.241	195.00	232.59	37.59
21	-19.860	195.00	232.36	37.36
22	-22.348	192.00	228.63	36.63
23	-20.420	194.00	229.73	35.73
24	-6.610	189.00	229.02	40.02
125	21.837	195.00	229.17	34.17
25	-9.958	195.00	228.94	33.94
26	-15.152	190.00	228.54	38.54
127	9.606	199.00	231.87	32.87
27	-20.346	199.00	231.66	32.66
128	14.896	204.00	235.05	31.05
28	-15.008	204.00	234.60	30.60
29	-15.008	202.00	234.09	32.09
130	28.819	202.00	236.76	34.76
30	-9.670	202.00	236.38	34.38
31	-9.670	196.00	232.40	36.40
32	-15.008	212.00	231.59	19.59
33	-9.670	200.00	229.91	29.91
34	-9.670	210.00	227.92	17.92
135	12.347	199.00	233.92	34.92
35	-19.986	199.00	233.60	34.60
36	-9.814	195.00	232.36	37.36
37	-9.814	214.00	230.72	16.72
38	-9.814	210.00	228.54	18.54
39	-1.862	220.00	226.49	6.49
140	5.013	194.00	232.93	38.93
40	-9.958	194.00	232.49	38.49

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
41	-4.978	197.00	226.66	29.66
42	-4.978	198.00	226.17	28.17
143	12.874	186.00	228.07	42.07
43	-13.222	186.00	227.73	41.73
44	-14.724	140.00	223.36	83.36
45	-19.138	118.00	220.04	102.04
46	-8.828	80.00	204.58	124.58
47	-4.414	65.00	202.82	137.82
48	-8.828	40.00	180.37	140.37
50	-10.172	220.00	232.83	12.83
51	-15.008	226.00	227.34	1.34
52	-1.862	197.00	225.24	28.24
53	-2.892	192.00	223.87	31.87
54	-11.526	205.00	221.43	16.43
55	-1.862	220.00	222.09	2.09
56	-9.958	201.00	223.81	22.81
57	-8.828	152.00	219.81	67.81
58	-8.828	125.00	213.99	88.99
59	-9.958	205.00	227.94	22.94
60	-9.958	206.00	224.16	18.16
61	-9.958	185.00	222.24	37.24
62	-9.958	183.00	224.20	41.20
63	-16.486	160.00	226.40	66.40
64	-16.486	137.00	223.07	86.07

T I T L E : ANTIPOLO, 2010, SUB SYSTEM
NO. OF PIPES : 8
NO. OF NODES : 9
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)
9300	200	66	50.00	200	110	50.13	1.60	17.77HI	0.89
3001	65	208	530.00	100	100	2.60	0.33	2.60	1.38
3002	66	65	430.00	100	100	5.01	0.64	8.76	3.77
3003	66	67	430.00	200	100	35.09	1.12	10.96HI	4.71
3004	67	68	640.00	200	100	25.07	0.80	5.88	3.76
3005	68	69	400.00	150	100	15.04	0.85	9.28	3.71
3006	69	70	1040.00	150	100	10.03	0.57	4.38	4.56
3007	70	71	370.00	100	100	5.01	0.64	8.76	3.24

NODE NO.	FLOW (LPS)	ELEVATION (M)	H G L (M)	PRESSURE (M)
200 R	50.132	235.00	240.00	5.00
208	-2.600	192.00	233.97	41.97
65	-2.414	212.00	235.34	23.34
66	-10.026	230.00	239.11	9.11
67	-10.026	208.00	234.40	26.40
68	-10.026	188.00	230.64	42.64
69	-5.014	212.00	226.92	14.92
70	-5.012	180.00	222.37	42.37
71	-5.014	158.00	219.13	61.13

APPENDIX G

COST ESTIMATES FOR THE PROJECT

LIST OF TABLE

PAGE

APPENDIX G COST ESTIMATES FOR THE PROJECT

1. PROJECT COST FOR PHASE 1 ..... G-1
2. PHASE 1 TRANSMISSION PIPELINE G-2
3. PHASE 1 BOOSTER PUMPING STATION NO.1 ..... G-3
4. PHASE 1 BOOSTER PUMPING STATION NO.2 ..... G-4
5. PHASE 1 DISTRIBUTION RESERVOIR G-5
6. PHASE 1 DISTRIBUTION PIPELINE (MAIN) G-6
7. PHASE 1 DISTRIBUTION PIPELINE (INTERNAL) G-7
8. REPLACEMENT OF HOUSE SERVICE CONNECTION G-7
9. INSTALLATION OF HOUSE SERVICE CONNECTION G-7
10. PROJECT COST FOR PHASE 2 ..... G-8
11. PHASE 2 TRANSMISSION PIPELINE G-9
12. PHASE 2 BOOSTER PUMPING STATION NO.1 ..... G-10
13. PHASE 2 BOOSTER PUMPING STATION NO.2 ..... G-11
14. PHASE 2 DISTRIBUTION RESERVOIR (MAIN) G-12
15. PHASE 2 DISTRIBUTION RESERVOIR (SUB) G-13
16. PHASE 1 DISTRIBUTION PIPELINE G-14
17. PHASE 2 BOOSTER PUMPING STATION NO.3 ..... G-15
18. PHASE 2 BOOSTER PUMPING STATION NO.4 ..... G-16
19. DISTRIBUTION PIPELINE (INTERNAL) G-17
20. INSTALLATION OF HOUSE SERVICE CONNECTION G-17
21. ELEVATED WATER TANK G-18

TABLE PROJECT COST FOR PHASE 1

(in Thousand Pesos)

Construction Cost			
1. Transmission Pipeline			58,343
2. Booster Pumping Station No.1			
	Civil & Arch. Work	8,227	
	Mechanical Work	14,976	
	Electrical Work	19,020	
	Sub Total		42,223
3. Booster Pumping Station No.2			
	Civil & Arch. Work	7,249	
	Mechanical Work	19,104	
	Electrical Work	22,848	
	Sub Total		49,201
4. Communication Wiring (for telecontrol system)			5,383
5. Distribution Reservoir			
	Civil & Arch. Work	11,412	
	Mechanical Work	2,896	
	Sub Total		14,308
6. Distribution System			
	Distribution Main	65,355	
	Inner Network	23,761	
	Fire Hydrant	3,461	
	Service Connection	58,570	
	Sub Total		151,147
Construction Cost Total			320,605
Engineering Cost	(D/D 8%, C/S 4%)		38,473
Land Acquisition	(B.P.S. 1 & 2, Reservoir)		9,585
Total			368,663
Physical Contingency	10%		36,866
GRAND TOTAL			405,529

TABLE PHASE 1 TRANSMISSION PIPELINE

TRANSMISSION LINE	DIA.	NO.	UNIT	UNIT C.	AMOUNT
PIPE LAYING	450	12,650	M	4,040	51,106,000
	SUB TOTAL				51,106,000
GATE VALVES	450	1	SET	147,700	147,700
	SUB TOTAL				147,700
AIR RELIEF VALVES	75	12	SETS	45,800	549,600
	SUB TOTAL				549,600
DRAIN VALVES	100	3	SETS	28,000	84,000
	SUB TOTAL				84,000
PIPE BRIDGE	450	3	LOT	384,000	1,152,000
	SUB TOTAL				1,152,000
SUB TOTAL					53,039,300
MISCELLANEOUS WORKS			10%		5,303,930
TOTAL					58,343,230

TABLE PHASE 1 BOOSTER PUMPING STATION NO.1

B.P.S NO.1 PHASE 1		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	4,650	m3	17.25	80,213
	MANUAL	150	m3	65.00	9,750
BACKFILLING	MACHINE	2,050	m3	22.45	46,023
	MANUAL	100	m3	22.45	2,245
SOIL DISPOSAL	OUT OF SITE	2,650	m3	25.00	66,250
CONCRETING	240kg/cm2	910	m3	1,724.00	1,568,840
	120kg/cm2	40	m3	1,187.00	47,480
FORMWORK	TIMBER	2,000	m2	409.50	819,000
SCAFFOLDING		3,600	m3	15.00	54,000
RE-BAR	DEFORMED	72,800	kg	25.00	1,820,000
FOUNDATION	CRASHER RUN	80	m3	360.00	28,800
DRAINAGE	POWER COST	1	lot		150,000
PILING	PC PILE 10M	92	SETS	6,000.00	552,000
WATER PROOF	ASPHALT ROOFING	368	m2	90.00	33,120
	COVERING CONCRETE	37	m3	1,187.00	43,919
PAINTING	OUTSIDE	420	m2	60.00	25,200
	C.ROOM INSIDE	281	m2	40.00	11,240
	PUMP WELL	627	m2	235.00	147,345
SASH & FIXTURE		1	lot		300,000
	SUB TOTAL				5,805,424
MISCELLANEOUS WORK				10%	580,542
BUILDING	TOTAL				6,385,966
FENCE	1.5mH x 202mL	202	m	770.21	155,582
GATE		1	lot		40,000
B.P.S.	TOTAL				6,581,549
OVERHEAD OF CONTRACTOR				x 0.25	1,645,387
	GRAND TOTAL				8,226,936
				SAY	8,227,000

Mech. & Elec. Equipment		NO.	UNIT	UNIT C.	AMOUNT
MECHANICAL EQUIPMENT		1	lot		9,360,000
INSTALLATION	w/materials	1	lot	60%	5,616,000
ELECTRICAL EQUIPMENT		1	lot		11,888,000
INSTALLATION	w/materials	1	lot	60%	7,132,800
	SUB TOTAL				33,996,800
	(Overhead is already included in above)				33,996,800
Mech. & Elec. Equipment	TOTAL			SAY	33,997,000
B.P.S NO.1 PHASE 1	GRAND TOTAL				42,224,000

TABLE PHASE 1 BOOSTER PUMPING STATION NO.2

B.P.S NO.2 PHASE 1		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	4,650	m3	17.25	80,213
	MANUAL	150	m3	65.00	9,750
BACKFILLING	MACHINE	2,050	m3	22.45	46,023
	MANUAL	100	m3	22.45	2,245
SOIL DISPOSAL	OUT OF SITE	2,650	m3	25.00	66,250
CONCRETING	240kg/cm2	910	m3	1,724.00	1,568,840
	120kg/cm2	40	m3	1,187.00	47,480
FORMWORK	TIMBER	2,000	m2	409.50	819,000
SCAFFOLDING		3,600	m3	15.00	54,000
RE-BAR	DEFORMED	72,800	kg	25.00	1,820,000
FOUNDATION	CRASHER RUN	80	m3	360.00	28,800
WATER PROOF	ASPHALT ROOFING	368	m2	90.00	33,120
	COVERING CONCRETE	37	m3	1,187.00	43,919
PAINTING	OUTSIDE	265	m2	60.00	15,900
	C.ROOM INSIDE	281	m2	40.00	11,240
	PUMP WELL	627	m2	235.00	147,345
SASH & FIXTURE		1	lot		300,000
	SUB TOTAL				5,094,124
MISCELLANEOUS WORK				10%	509,412
BUILDING	TOTAL				5,603,536
FENCE	1.5mH x 202mL	202	m	770	155,582
GATE		1	lot		40,000
B.P.S.	TOTAL				5,799,119
OVERHEAD OF CONTRACTOR				x 0.25	1,449,780
	GRAND TOTAL				7,248,899
				SAY	7,249,000

Mech. & Elec. Equipment		NO.	UNIT	UNIT C.	AMOUNT
MECHANICAL EQUIPMENT		1	lot		11,940,000
INSTALLATION	w/materials	1	lot	60%	7,164,000
ELECTRICAL EQUIPMENT		1	lot		14,280,000
INSTALLATION	w/materials	1	lot	60%	8,568,000
	SUB TOTAL				41,952,000
	(Overhead is already included in above)				41,952,000
Mech. & Elec. Equipment	TOTAL			SAY	41,952,000
B.P.S NO.2 PHASE 1	GRAND TOTAL				49,201,000

TABLE PHASE 1 DISTRIBUTION RESERVOIR

DIST. RESERVOIR PHASE 1		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	5,985	m3	17.25	103,241
	MANUAL	288	m3	65.00	18,720
BACKFILLING	MACHINE	1,995	m3	22.45	44,788
	MANUAL	131	m3	22.45	2,941
SOIL DISPOSAL	OUT OF SITE	4,147	m3	25.00	103,675
CONCRETING	240kg/cm2	1,314	m3	1,724.00	2,265,336
	120kg/cm2	82	m3	1,187.00	97,334
FORMWORK	TIMBER	3,568	m2	409.50	1,461,096
SCAFFOLDING		3,715	m3	15.00	55,725
RE-BAR	DEFORMED	118,260	kg	25.00	2,956,500
FOUNDATION	CRASHER RUN	165	m3	360.00	59,400
WATER PROOF	ASPHALT ROOFING	724	m2	90.00	65,160
	COVERING CONCRETE	73	m3	1,187.00	86,651
PAINTING	INSIDE	3,450	m2	235.00	810,750
	SUB TOTAL				8,131,317
MISCELLANEOUS WORK				10%	813,132
MAIN BODY	TOTAL				8,944,449
FENCE	1.5mH x 160mL	188	m	770.21	144,799
GATE		1	lot		40,000
B.P.S.	TOTAL				9,129,248
OVERHEAD OF CONTRACTOR				x 0.25	2,282,312
	GRAND TOTAL				11,411,560
				SAY	11,412,000

PIPE FITTINGS		NO.	UNIT	UNIT C.	AMOUNT
GATE VALVES	INFLOW 350mm	2	SETS	72,500	145,000
	OUTFLOW 450mm	2	SETS	147,700	295,400
DRAIN VALVES	300mm	2	SETS	54,300	108,600
BYPASS VALVES	450mm	1	SET	147,700	147,700
BYPASS PIPE	DRAIN VALVE 100mm	1	SET	13,400	13,400
FLEX. JOINT	INFLOW 350mm	2	SETS	119,600	239,200
	OUTFLOW 450mm	2	SETS	156,400	312,800
	DARIN 300mm	2	SETS	104,300	208,600
	OVERFLOW 350mm	2	SETS	119,600	239,200
FLOW METER	INFLOW 450mm	1	SET	199,200	199,200
	OUTFLOW 600mm	1	SET	271,000	271,000
PIPING	INFLOW 450mm	24	m	4,040	96,960
	INFLOW 350mm	6	m	3,340	20,040
	OUTFLOW 450mm	6	m	4,040	24,240
	OUTFLOW 600mm	23	m	6,540	150,420
	BYPASS 450mm	34	m	4,040	137,360
	DRAIN 300mm	100	m	2,870	287,000
	SUB TOTAL				2,896,120
OVERHEAD OF CONTRACTOR		INCLUDED IN ABOVE			0
	GRAND TOTAL				2,896,120
				SAY	2,896,000

DIST. RESERVOIR PHASE 1 TOTAL	14,308,000

TABLE PHASE 1 DISTRIBUTION PIPELINE (MAIN)

MAIN PIPELINE	DIA.	NO.	UNIT	UNIT C.	AMOUNT
PIPE LAYING	100	8,950	M	870	7,786,500
	150	10,390	M	1,430	14,857,700
	200	3,500	M	2,500	8,750,000
	250	2,190	M	3,760	8,234,400
	300	1,600	M	2,870	4,592,000
	350	740	M	3,340	2,471,600
	400	390	M	3,750	1,462,500
	500	370	M	4,460	1,650,200
	600	900	M	6,540	5,886,000
	SUB TOTAL				55,690,900
GATE VALVES	100	9	SETS	13,400	120,600
	150	10	SETS	20,600	206,000
	200	4	SETS	29,400	117,600
	250	2	SETS	43,200	86,400
	300	2	SETS	54,300	108,600
	350	1	SETS	72,500	72,500
	400	1	SETS	117,000	117,000
	500	1	SETS	184,900	184,900
	600	1	SETS	399,600	399,600
	SUB TOTAL				1,413,200
AIR RELIEF VALVES	25	27	SETS	30,100	812,700
	75	2	SETS	45,800	91,600
	SUB TOTAL				904,300
DRAIN VALVES	100	27	SETS	28,000	756,000
	150	2	SETS	46,500	93,000
	SUB TOTAL				849,000
PRESSURE REDUCTION VALVES	150	1	SETS	163,300	163,300
	250	1	SETS	392,500	392,500
	SUB TOTAL				555,800
FIRE HYDRANT	100	145	SETS	21,700	3,146,500
	SUB TOTAL				3,146,500
MAIN PIPELINE SUB TOTAL					62,559,700
MISCELLANEOUS WORK				10%	6,255,970
MAIN PIPELINE TOTAL					68,815,670

TABLE PHASE 1 DISTRIBUTION PIPELINE (INTERNAL)

BRANCH LINE	DIA.	NO.	UNIT	UNIT C.	AMOUNT
PIPE LAYING	75	14,515	M	570	8,273,550
	100	14,515	M	870	12,628,050
	SUB TOTAL				20,901,600
GATE VALVES	75	29	SETS	10,700	310,621
	100	29	SETS	13,400	389,002
	SUB TOTAL				699,623
BRANCH LINE SUB TOTAL					21,601,223
MISCELLANEOUS WORK				10%	2,160,122
BRANCH LINE TOTAL					23,761,345

TABLE D.8 REPLACEMENT OF HOUSE SERVICE CONNECTION

	DIA.	NO.	UNIT	UNIT C.	AMOUNT
H.S.C. L=5M CONCRETE	25	3,535	SETS	1,895	6,698,825
W/METER	32	203	SETS	2,590	525,770
H.S.C REPLACEMENT TOTAL					7,224,595

TABLE D.9 INSTALLATION OF HOUSE SERVICE CONNECTION

	DIA.	NO.	UNIT	UNIT C.	AMOUNT
H.S.C. L=5M CONCRETE	25	13,016	SETS	3,790	49,330,640
W/METER	32	389	SETS	5,180	2,015,020
H.S.C REPLACEMENT TOTAL					51,345,660

TABLE PROJECT COST FOR PHASE 2

(in Thousand Pesos)

Construction Cost			
1. Transmission Pipeline			95,862
2. Booster Pumping Station No.1			
	Civil and Arch. Work	7,652	
	Mechanical Work	14,492	
	Electrical Work	19,020	
	Sub Total		41,164
3. Booster Pumping Station No.2			
	Civil and Arch. Work	6,583	
	Mechanical Work	18,620	
	Electrical Work	22,848	
	Sub Total		48,051
4. Distribution Reservoir No.1			
	Civil and Arch. Work	11,412	
	Mechanical Work	3,795	
	Sub Total		15,207
5. Distribution Reservoir No.2			
	Civil and Arch. Work	3,494	
	Mechanical Work	1,168	
	Sub Total		4,662
6. Booster Pumping Station No.3			
	Pump House	826	
	Mech. and Elec. Work	273	
	Sub Total		1,099
7. Booster Pumping Station No.4			
	Pump House	560	
	Mech. and Elec. Work	190	
	Sub Total		750
8. Distribution System			
	Distribution Main	88,168	
	Inner Network	25,603	
	Fire Hydrant	2,005	
	Service Connection	45,192	
	Sub Total		160,968
Construction Cost Total			367,763
Engineering Cost	(D/D 8%, C/S 4%)		44,132
Land Acquisition	(Reservoir 1 & 2)		1,760
Total			413,655
Physical Contingency	10%		41,365
GRAND TOTAL			455,020

TABLE PHASE 2 TRANSMISSION PIPELINE

TRANSMISSION LINE	DIA.	NO.	UNIT	UNIT C.	AMOUNT
PIPE LAYING	600	12,650	M	6,540	82,731,000
	150	450	M	4,040	1,818,000
	SUB TOTAL				84,549,000
GATE VALVES	600	1	SET	399,600	399,600
	150	1	SET	20,600	20,600
	SUB TOTAL				420,200
AIR RELIEF VALVES	75	12	SETS	45,800	549,600
	25	1	SET	30,100	30,100
	SUB TOTAL				579,700
DRAIN VALVES	150	3	SETS	46,500	139,500
	100	1	SETS	28,000	28,000
	SUB TOTAL				167,500
PIPE BRIDGE	600	3	LOT	477,000	1,431,000
	SUB TOTAL				1,431,000
SUB TOTAL					87,147,400
MISCELLANEOUS WORKS			10%		8,714,740
TOTAL					95,862,140

TABLE PHASE 2 BOOSTER PUMPING STATION NO.1

B.P.S NO.1 PHASE 2		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	4,600	m3	17.25	79,350
	MANUAL	150	m3	65.00	9,750
BACKFILLING	MACHINE	2,030	m3	22.45	45,574
	MANUAL	70	m3	22.45	1,572
SOIL DISPOSAL	OUT OF SITE	2,675	m3	25.00	66,875
CONCRETE DEMOLISHING		25	m3	400.00	10,000
CONCRETING	240kg/cm2	910	m3	1,724.00	1,568,840
	120kg/cm2	40	m3	1,187.00	47,480
FORMWORK	TIMBER	1,420	m2	409.50	581,490
SCAFFOLDING		2,500	m3	15.00	37,500
RE-BAR	DEFORMED	72,800	kg	25.00	1,820,000
FOUNDATION	CRASHER RUN	80	m3	360.00	28,800
DRAINAGE	POWER COST	1	lot		150,000
PILING	PC PILE 10M	103	SETS	6,000.00	618,000
WATER PROOF	ASPHALT ROOFING	392	m2	90.00	35,280
	COVERING CONCRETE	39	m3	1,187.00	46,293
PAINTING	OUTSIDE	420	m2	60.00	25,200
	C.ROOM INSIDE	228	m2	40.00	9,120
	PUMP WELL	638	m2	235.00	149,930
SASH & FIXTURE		1	lot		150,000
	SUB TOTAL				5,481,053
MISCELLANEOUS WORK				10%	548,105
BUILDING	TOTAL				6,029,158
FENCE REPAIR	1.5mH x 120mL	120	m	770.21	92,425
B.P.S.	TOTAL				6,121,584
OVERHEAD OF CONTRACTOR				x 0.25	1,530,396
	GRAND TOTAL				7,651,979
				SAY	7,652,000

Mech. & Elec. Equipment		NO.	UNIT	UNIT C.	AMOUNT
MECHANICAL EQUIPMENT		1	lot		9,058,000
INSTALLATION	w/materials	1	lot	60%	5,434,800
ELECTRICAL EQUIPMENT		1	lot		11,888,000
INSTALLATION	w/materials	1	lot	60%	7,132,800
	SUB TOTAL				33,513,600
	(Overhead is already included in above)				33,513,600
Mech. & Elec. Equipment	TOTAL			SAY	33,514,000
B.P.S NO.1 PHASE 2	GRAND TOTAL				41,166,000

TABLE PHASE 2 BOOSTER PUMPING STATION NO.2

B.P.S NO.2 PHASE 2		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	4,600	m3	17.25	79,350
	MANUAL	150	m3	65.00	9,750
BACKFILLING	MACHINE	2,030	m3	22.45	45,574
	MANUAL	70	m3	22.45	1,572
SOIL DISPOSAL	OUT OF SITE	2,675	m3	25.00	66,875
CONCRETE DEMOLISHING		25	m3	400.00	10,000
CONCRETING	240kg/cm2	910	m3	1,724.00	1,568,840
	120kg/cm2	40	m3	1,187.00	47,480
FORMWORK	TIMBER	1,420	m2	409.50	581,490
SCAFFOLDING		2,500	m3	15.00	37,500
RE-BAR	DEFORMED	72,800	kg	25.00	1,820,000
FOUNDATION	CRASHER RUN	80	m3	360.00	28,800
WATER PROOF	ASPHALT ROOFING	392	m2	90.00	35,280
	COVERING CONCRETE	39	m3	1,187.00	46,293
PAINTING	OUTSIDE	265	m2	60.00	15,900
	C.ROOM INSIDE	228	m2	40.00	9,120
	PUMP WELL	638	m2	235.00	149,930
SASH & FIXTURE		1	lot		150,000
	SUB TOTAL				4,703,753
MISCELLANEOUS WORK				10%	470,375
BUILDING	TOTAL				5,174,128
FENCE REPAIR	1.5mH x 120mL	120	m	770.21	92,425
B.P.S.	TOTAL				5,266,554
OVERHEAD OF CONTRACTOR				x 0.25	1,316,638
	GRAND TOTAL				6,583,192
				SAY	6,583,000

Mech. & Elec. Equipment		NO.	UNIT	UNIT C.	AMOUNT
MECHANICAL EQUIPMENT		1	lot		11,638,000
INSTALLATION	w/materials	1	lot	60%	6,982,800
ELECTRICAL EQUIPMENT		1	lot		14,280,000
INSTALLATION	w/materials	1	lot	60%	8,568,000
	SUB TOTAL				41,468,800
	(Overhead is already included in above)				41,468,800
Mech. & Elec. Equipment	TOTAL			SAY	41,469,000
B.P.S NO.2 PHASE 2	GRAND TOTAL				48,052,000

TABLE PHASE 2 DISTRIBUTION RESERVOIR (MAIN)

DIST. RESERVOIR (MAIN) PHASE 2		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	5,985	m3	17.25	103,241
	MANUAL	288	m3	65.00	18,720
BACKFILLING	MACHINE	1,995	m3	22.45	44,788
	MANUAL	131	m3	22.45	2,941
SOIL DISPOSAL	OUT OF SITE	4,147	m3	25.00	103,675
CONCRETING	240kg/cm2	1,314	m3	1,724.00	2,265,336
	120kg/cm2	82	m3	1,187.00	97,334
FORMWORK	TIMBER	3,568	m2	409.50	1,461,096
SCAFFOLDING		3,715	m3	15.00	55,725
RE-BAR	DEFORMED	118,260	kg	25.00	2,956,500
FOUNDATION	CRASHER RUN	165	m3	360.00	59,400
WATER PROOF	ASPHALT ROOFING	724	m2	90.00	65,160
	COVERING CONCRETE	73	m3	1,187.00	86,651
PAINTING	INSIDE	3,450	m2	235.00	810,750
	SUB TOTAL				8,131,317
MISCELLANEOUS WORK				10%	813,132
MAIN BODY	TOTAL				8,944,449
FENCE	1.5mH x 160mL	188	m	770.21	144,799
GATE		1	lot		40,000
B.P.S.	TOTAL				9,129,248
OVERHEAD OF CONTRACTOR				x 0.25	2,282,312
	GRAND TOTAL				11,411,560
				SAY	11,412,000

PIPE FITTINGS		NO.	UNIT	UNIT C.	AMOUNT
GATE VALVES	INFLOW 450mm	2	SETS	147,700	295,400
	OUTFLOW 500mm	2	SETS	184,900	369,800
DRAIN VALVES	300mm	2	SETS	54,300	108,600
BYPASS VALVES	600mm	1	SET	399,600	399,600
BYPASS PIPE DRAIN VALVE	150mm	1	SET	20,600	20,600
FLEX. JOINT	INFLOW 450mm	2	SETS	156,400	312,800
	OUTFLOW 500mm	2	SETS	177,800	355,600
	DARIN 300mm	2	SETS	104,300	208,600
	OVERFLOW 350mm	2	SETS	119,600	239,200
FLOW METER	INFLOW 600mm	1	SET	271,000	271,000
	OUTFLOW 700mm	1	SET	293,400	293,400
PIPING	INFLOW 600mm	24	m	6,540	156,960
	INFLOW 450mm	6	m	4,040	24,240
	OUTFLOW 500mm	6	m	4,460	26,760
	OUTFLOW 700mm	23	m	8,820	202,860
	BYPASS 600mm	34	m	6,540	222,360
	DRAIN 300mm	100	m	2,870	287,000
	SUB TOTAL				3,794,780
OVERHEAD OF CONTRACTOR		INCLUDED IN ABOVE			0
					3,794,780
PIPING	TOTAL			SAY	3,795,000
DIST. RESERVOIR (MAIN) PHASE 2	TOTAL				15,207,000

TABLE PHASE 2 DISTRIBUTION RESERVOIR (SUB)

DIST. RESERVOIR (SUB) PHASE 2		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	2,034	m3	17.25	35,087
	MANUAL	90	m3	65.00	5,850
BACKFILLING	MACHINE	1,120	m3	22.45	25,144
	MANUAL	75	m3	22.45	1,684
SOIL DISPOSAL	OUT OF SITE	929	m3	25.00	23,225
CONCRETING	240kg/cm2	399	m3	1,724.00	687,876
	120kg/cm2	21	m3	1,187.00	24,927
FORMWORK	TIMBER	1,079	m2	409.50	441,851
SCAFFOLDING		762	m3	15.00	11,430
RE-BAR	DEFORMED	35,910	kg	25.00	897,750
FOUNDATION	CRASHER RUN	42	m3	360.00	15,120
WATER PROOF	ASPHALT ROOFING	187	m2	90.00	16,830
	COVERING CONCRETE	19	m3	1,187.00	22,553
PAINTING	INSIDE	780	m2	235.00	183,300
	SUB TOTAL				2,392,626
MISCELLANEOUS WORK				10%	239,263
MAIN BODY	TOTAL				2,631,888
FENCE	1.5mH x 138mL	160	m	770.21	123,234
GATE		1	lot		40,000
B.P.S.	TOTAL				2,795,122
OVERHEAD OF CONTRACTER				x 0.25	698,780
	GRAND TOTAL				3,493,902
				SAY	3,494,000

PIPE FITTINGS		NO.	UNIT	UNIT C.	AMOUNT
GATE VALVES	INFLOW 150mm	2	SETS	20,600	41,200
	OUTFLOW 200mm	2	SETS	29,400	58,800
DRAIN VALVES	100mm	2	SETS	13,400	26,800
BYPASS VALVES	150mm	2	SETS	20,600	41,200
BYPASS PIPE DRAIN VALVE	75mm	1	SET	10,700	10,700
FLEX. JOINT	INFLOW 150mm	2	SETS	73,200	146,400
	OUTFLOW 200mm	2	SETS	79,100	158,200
	DARIN 100mm	2	SETS	59,500	119,000
	OVERFLOW 150mm	2	SETS	73,200	146,400
FLOW METER	INFLOW 150mm	1	SET	81,800	81,800
	OUTFLOW 200mm	1	SET	88,800	88,800
PIPING	INFLOW 150mm	26	m	1,430	37,180
	OUTFLOW 200mm	26	m	2,500	65,000
	BYPASS 150mm	15	m	1,430	21,450
	DRAIN 200mm	50	m	2,500	125,000
	SUB TOTAL				1,167,930
OVERHEAD OF CONTRACTER		INCLUDED IN ABOVE			0
	GRAND TOTAL				1,167,930
				SAY	1,168,000
DIST. RESERVOIR (SUB) PHASE 2	TOTAL				4,662,000

TABLE PHASE 2 DISTRIBUTION PIPELINE

MAIN PIPELINE	DIA.	NO.	UNIT	UNIT C.	AMOUNT
PIPE LAYING	100	4,410	M	870	3,836,700
	150	9,860	M	1,430	14,099,800
	200	7,800	M	2,500	19,500,000
	250	4,540	M	3,760	17,070,400
	300	1,310	M	2,870	3,759,700
	350	180	M	3,340	601,200
	400	430	M	3,750	1,612,500
	450	1,090	M	4,040	4,403,600
	500	760	M	4,460	3,389,600
	700	900	M	8,820	7,938,000
	SUB TOTAL				76,211,500
GATE VALVES	100	4	SETS	13,400	53,600
	150	10	SETS	20,600	206,000
	200	8	SETS	29,400	235,200
	250	5	SETS	43,200	216,000
	300	1	SETS	54,300	54,300
	350	1	SETS	72,500	72,500
	400	1	SETS	117,000	117,000
	450	1	SETS	147,700	147,700
	500	1	SETS	184,900	184,900
	700	1	SETS	506,300	506,300
	SUB TOTAL				1,793,500
AIR RELIEF VALVES	25	28	SETS	30,100	842,800
	75	3	SETS	45,800	137,400
	SUB TOTAL				980,200
DRAIN VALVES	100	28	SETS	28,000	784,000
	150	3	SETS	46,500	139,500
	SUB TOTAL				923,500
PRESSURE REDUCTION VALVES	100	1	SETS	80,500	80,500
	150	1	SETS	163,300	163,300
	SUB TOTAL				243,800
FIRE HYDRANT	100	84	SETS	21,700	1,822,800
	SUB TOTAL				1,822,800
MAIN PIPELINE SUB TOTAL					81,975,300
MISCELLANEOUS WORK				10%	8,197,530
MAIN PIPELINE TOTAL					90,172,830

TABLE PHASE 2 BOOSTER PUMPING STATION NO.3

Civil & Arch.		NO.	UNIT	UNIT C.	AMOUNT
PUMP HOUSE		30	m2	19,090	572,700
	SUB TOTAL				572,700
MISCELLANEOUS WORK				10%	57,270
PUMP HOUSE	TOTAL				629,970
FENCE	1.5mH x 34mL	40	m	770.21	30,808
GATE		1	lot		40,000
	TOTAL				660,778
OVERHEAD OF CONTRACTER				x 0.25	165,195
Civil & Arch. GRAND TOTAL					825,973
				SAY	826,000

Mech. & Elec. Equipment		NO.	UNIT	UNIT C.	AMOUNT
PUMPS	80x65x0.9m3/m.x10m	2	units	56,000	112,000
GATE VALVES	100mm	4	SETS	6,500	26,000
CHECK VALVES	100mm	2	SETS	6,100	12,200
PRESSURE METER		2	SETS	1,000	2,000
PLUMBING	w/materials	1	lot		50,000
CONTROL PANEL	w/installation work	1	lot		46,000
	SUB TOTAL				248,200
MISCELLANEOUS WORK				10%	24,820
	(Overhead is already included in above)				273,020
Mech. & Elec. Equipment	TOTAL			SAY	273,000

B.P.S NO.3 PHASE 2	GRAND TOTAL	1,099,000

TABLE PHASE 2 BOOSTER PUMPING STATION NO.4

Civil & Arch.		NO.	UNIT	UNIT C.	AMOUNT
PUMP HOUSE		20	m2	19,090	381,800
	SUB TOTAL				381,800
MISCELLANEOUS WORK				10%	38,180
PUMP HOUSE	TOTAL				419,980
FENCE	1.5mH x 30mL	36	m	770.21	27,728
GATE		1	lot		40,000
B.P.S.	TOTAL				447,708
OVERHEAD OF CONTRACTER				x 0.25	111,927
Civil & Arch. GRAND TOTAL					559,634
				SAY	560,000

Mech. & Elec. Equipment		NO.	UNIT	UNIT C.	AMOUNT
PUMPS	32x32x0.11m3/m.x10m	2	units	27,100	54,200
GATE VALVES	100mm	4	SETS	6,500	26,000
CHECK VALVES	100mm	2	SETS	6,100	12,200
PRESSURE METER		2	SETS	1,000	2,000
PLUMBING	w/materials	1	lot		40,000
CONTROL PANEL	w/installation work	1	lot		38,000
	SUB TOTAL				172,400
MISCELLANEOUS WORK				10%	17,240
	(Overhead is already included in above)				189,640
Mech. & Elec. Equipment	TOTAL			SAY	190,000
B.P.S NO.4 PHASE 2	GRAND TOTAL				750,000

TABLE PHASE 2 DISTRIBUTION PIPELINE (INTERNAL)

BRANCH LINE	DIA.	NO.	UNIT	UNIT C.	AMOUNT
PIPE LAYING	75	15,640	M	570	8,914,800
	100	15,640	M	870	13,606,800
	SUB TOTAL				22,521,600
GATE VALVES	75	31	SETS	10,700	334,696
	100	31	SETS	13,400	419,152
	SUB TOTAL				753,848
BRANCH LINE SUB TOTAL					23,275,448
MISCELLANEOUS WORK				10%	2,327,545
BRANCH LINE TOTAL					25,602,993

TABLE INSTALLATION OF HOUSE SERVICE CONNECTION

	DIA.	NO.	UNIT	UNIT C.	AMOUNT
H.S.C. L=5M CONCRETE	25	11,368	SETS	3,790	43,084,720
W/METER	32	407	SETS	5,180	2,108,260
H.S.C REPLACEMENT TOTAL					45,192,980

TABLE ELEVATED WATER TANK

		NO.	UNIT	UNIT C.	AMOUNT
EXCAVATION	MACHINE	655	m3	17.25	11,299
	MANUAL	47	m3	65.00	3,055
BACKFILLING	MACHINE	388	m3	22.45	8,711
SOIL DISPOSAL	OUT OF SITE	314	m3	25.00	7,850
CONCRETING	240kg/cm2	557	m3	1,724.00	960,268
	120kg/cm2	7	m3	1,187.00	8,309
FORMWORK	TIMBER	942	m2	409.50	385,749
SCAFFOLDING		2,080	m3	15.00	31,200
RE-BAR	DEFORMED	50,107	kg	25.00	1,252,675
FOUNDATION	CRASHER RUN	22	m3	360.00	7,920
INSIDE COATING	EPOXY RESIN	402	m2	235.00	94,470
	SUB TOTAL				2,771,505
MISCELLANEOUS WORK				10%	277,151
ELEV. W. TANK TOTAL					3,048,656
FENCE	1.5mH x 80mL	88	m	770.21	67,778
GATE		1	lot		10,000
	TOTAL				3,126,434
OVERHEAD OF CONTRACTOR				x 0.25	781,609
	GRAND TOTAL				3,908,043
				SAY	3,908,000