Metropolitan Waterworks and Sewerage System
Manila Water Company, Inc.

E94
Volume 5

Initial Environmental Examination

of the

Community Sanitation Project
Manila Second Sewerage Project
IBRD 4019

Project No. 3
Makati Bagong Lipunan Sites and Services
(BLISS)
Makati City, Philippines

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ANNEXES

1	Manila Water Company STARRT Card for Monitoring Construction Works
2	Wastewater Quality Monitoring Schedule
3	Environmental Compliance Certificate (ECC) NCR-2000-10-04-0221-120
4	Manila Water PCO Report Format
5	Sample Monitoring Sheet for Effluent Quality
6	Endorsement from the Mayor of Makati City
7	Endorsement from the Barangay Captain
8	Endorsement from the Home Guaranty Corporation (HGC)
9	Letters of Agreement by individual unit dwellers
10	Memorandum of Agreement (MOA) among HGC, MWCI and the individual Associations in Makati BLISS

EXECUTIVE SUMMARY

The proposed project for Makati BLISS is one of twenty three (23) sub-projects of the Community Sanitation Project Phase I, which is a component of the World Bank-assisted Manila Second Sewerage Project (MSSP).

The project is intended to reduce the current wastewater pollution discharged to the Pasig River by the one hundred fifty-four (154) residential units and ground floor commercial establishments within the Makati BLISS compound. The project involves the improvement and rehabilitation of the sewerage system in the compound. Specifically, the project includes the construction of sewer lines to intercept sewage flows from existing communal septic tanks. An underground centralized sewage treatment plant (STP) will be constructed to treat the wastewater flows.

Approvals for the project were obtained through a community consultation process. Endorsement letters from the Mayor of Makati and the Home Guaranty Corporation (HGC) were obtained to facilitate the process. A Memorandum of Agreement (MOA) among HGC, Manila Water Company and the individual Homeowners' Associations in Makati BLISS is currently being processed.

In conformity with the requirements of the Department of Environment and Natural Resources (DENR), an Environmental Compliance Certificate (ECC) NCR-2000-10-04-0221-120 issued pursuant to P.D. 1586 was secured for the project.

I. BASELINE ENVIRONMENTAL CONDITIONS

Makati BLISS is a housing project implemented by the local government and the former Ministry of Human Settlements in 1981 to provide homes for the less fortunate in the area whose houses were burned down. The housing project is located between Vito Cruz Extension in the south and Davila Street in the north, near Pasong Tamo in the west. Surrounding the area are commercial establishments.

The Makati BLISS compound has a total land area of 4,631 m^2, 36% of which are residential areas and the rest are parking spaces, playgrounds and common areas.

Floral population within the compound constitutes ornamental plants planted by the residents and a few trees preserved during the site development. Faunal population is limited to household pets and stray animals. The area is characterized by a relatively even distribution of precipitation during the year. Like in most parts of Metro Manila, the community has two distinct seasons: the dry season during the months of November to May and the wet season during the months of June to October.

Existing Sewerage System

The Makati BLISS has existing sewer lines which collect wastewater from the buildings to undergo preliminary treatment in two (2) large septic tanks. Effluent from the septic tanks flows to the public storm drainage lines in Davila St. and is eventually discharged to Pasig River.

At present, Pasig River does not meet the Class C standards (i.e., suitable for propagation and growth of fishes, recreational uses and industrial water supply) especially during the summer months when there are no sufficient inflows. At these times, the BOD in Pasig River reaches 120 mg/L, which is 12 times higher than the permitted level for Class C water; DO drops to zero; and total coliforms exceed the MPN/100 ml standard by up to several thousand degrees.

The sewerage system of Makati BLISS serving a population of 1,078 has not been maintained. Sewer manholes have been permanently covered and most of the sewer lines are clogged. The communal septic tanks are filled with accumulated scum and sludge resulting in the clogging of the storm drainage lines. As a result, the units located in the ground level frequently experience sewage backflows in their toilets. Most of these unit owners created bypass lines to connect to the nearest drainage line and are discharging raw wastewater to the drainage.

II. ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

Potential Environmental Impact	Mitigating Measures
CONSTRUCTION PHASE	
1. Poor quality of construction	• Manila Water Company will monitor the supply and installation contract to assure quality of equipment and construction. Site Managers and Engineers with experience in construction management shall approve all materials and equipment to be used and installed at the site. • The contractor will be required to post a performance bond for the Design and Construction Contract of the sewerage system.

2. Air pollution (suspended particulates, odor and fumes, vehicle emissions eg. CO_2, CO NO_x)	• Efficient construction planning and work scheduling • Formulation of appropriate work plans, work scheduling, work specifications and work methodologies • Provision of properly maintained storage area for keeping stocks of construction materials and equipment • Prompt and fast removal of excavated materials or dredges spoils from construction site • Sprinkling of water on dust-generating mounds resulting from earthmoving activities and civil works. • Control of motor vehicle emissions • Dust accumulation will also be prevented through proper washing of the vehicles prior to its departure from the site • Development and enforcement of strict health and safety pollution control regulations specific for the project site - Good housekeeping of workplace and construction affected areas - Use of Protective Gear by all workers
3. Water pollution due to wastewater , oil leakage/spills	• Provide temporary drain systems and storage facilities for excavation soils, fuel and oils needed for equipment • Cautious and sensible planning for construction and post-construction phases of the project • Provision of a routine chemical and oil spill clean-up plan • Formulation of a monitoring program • Quality of civil work on the STP facility shall be enforced during construction to avoid seepage
4. Noise pollution from operation of construction equipment	• Establish temporary sound barriers around the work site • Proper scheduling and phasing of high-noise activities • Use of appropriate mufflers and sound proofing for construction machinery, equipment and engines • Use of Personnel Protective Equipment by all workers
5. Temporary disruption of traffic flow within the compound	• Public information campaign posting schedule of construction • Provision of a liaison officer from the residents of the compound to assist the information dissemination regarding inevitable changes in schedule of vehicular operations • Provision of temporary alternative routes, including visible traffic warning signals • To the extent possible, sewer lines, manholes and lift station will be constructed in common areas not used for pedestrian or vehicular traffic • Scheduling of delivery materials and removal of excavated material during non-rush hour periods.
OPERATIONAL PHASE	
1.Environmental hazards due to accidents, man-made natural disasters eg. accidental spills, fire, seismic activity, earthquakes, heavy rain/flooding and design failure	• Carefully designed post-construction maintenance, contingency and monitoring programs • Well designed plan for detection of accident or natural events including precautionary and remedial measures to be observed • Provision of preventive and remedial procedural manuals at workplace • Adequate plans for environmental rehabilitation and restoration of site and removal of temporary structures and facilities installed during construction phase

2. Water Pollution (effluent discharge)	• Wastewater discharged by the STP shall conform with the Effluent Standards set forth in DENR Administrative Order 34 and 35 for Class C waters • Regular monitoring of wastewater effluent by the Manila Water Company Central Laboratory • Regular check on sewer lines to prevent discharge/seepage of untreated wastewater to the environment • Quality of civil work on the STP facility shall be enforced during construction to avoid seepage
3. Noise Pollution (STP equipment, lift station)	• Use of appropriate mounting for machinery to minimize vibration • All mechanical/electrical equipment shall be installed inside enclosures • If appropriate, motors shall be provided with soundproofing devices • Maintenance of greenbelt zones and vegetation with appropriate tree species
4. Solid Waste (generated within the facility and by the facility)	• Solid waste generated within the STP facility will be minimal but provision will be made for garbage collection • Disposal of sludge generated will be in accordance with established procedures of relevant authorities (disposal of sludge for use as soil conditioner)
5. Odors (organic and sulfur compounds coming from raw wastewater and during desludging of septic tanks)	• Maintenance of greenbelt zones and vegetation with appropriate tree species • Provision of landscape which will improve the aesthetic of the area by planting green strips using appropriate plant or tree species • Provision of odor control mechanisms (deodorizer/adsorbent/masking agent) to prevent malodorous emissions)
6, Maintenance and Operation of the System • Poor maintenance of mechanical equipment (pumps and motors) • Connections	• Regular asset condition monitoring by Manila Water Company personnel • Regular maintenance works for STP equipment (pumps and motors), sewer network and septic tanks • Adequate training of STP operators • A liaison officer from the Community will assist the STP operator in assuring the facility's efficiency in operation • Provision of adequate maintenance equipment and spares for the sewerage system facility

III. ENVIRONMENTAL MONITORING PLAN

Environmental monitoring will be the responsibility of Manila Water Company.

Parameter	Location	Frequency
Construction Phase		
Compliance with Manila Water Company health and safety policies (dust emissions, good housekeeping, noise, odors)	• At STP site and its perimeter • Pipe laying area • Equipment and materials storage area	• On-the-spot daily inspection and monitoring will be implemented by the Health and Safety Dept. and/or Site Manager of Manila Water Company using the STARRT Card (Annex 1)
Traffic	• Ingress and egress to the construction site	• Daily
Operational Phase		
Effluent Water Quality for parameters like pH, 5-day BOD, COD, Total coliform, suspended solids, and oil and grease.	• Influent • Effluent/Discharge Point	• Annex 2 describes in detail the schedule of wastewater quality monitoring.
Odor	• STP site and perimeter	• Daily
Sludge accumulation/Clogging	• At STP site • Sewer network • Communal septic tanks	• Weekly

1.0 PROJECT DESCRIPTION

1.1 Basic Project Information

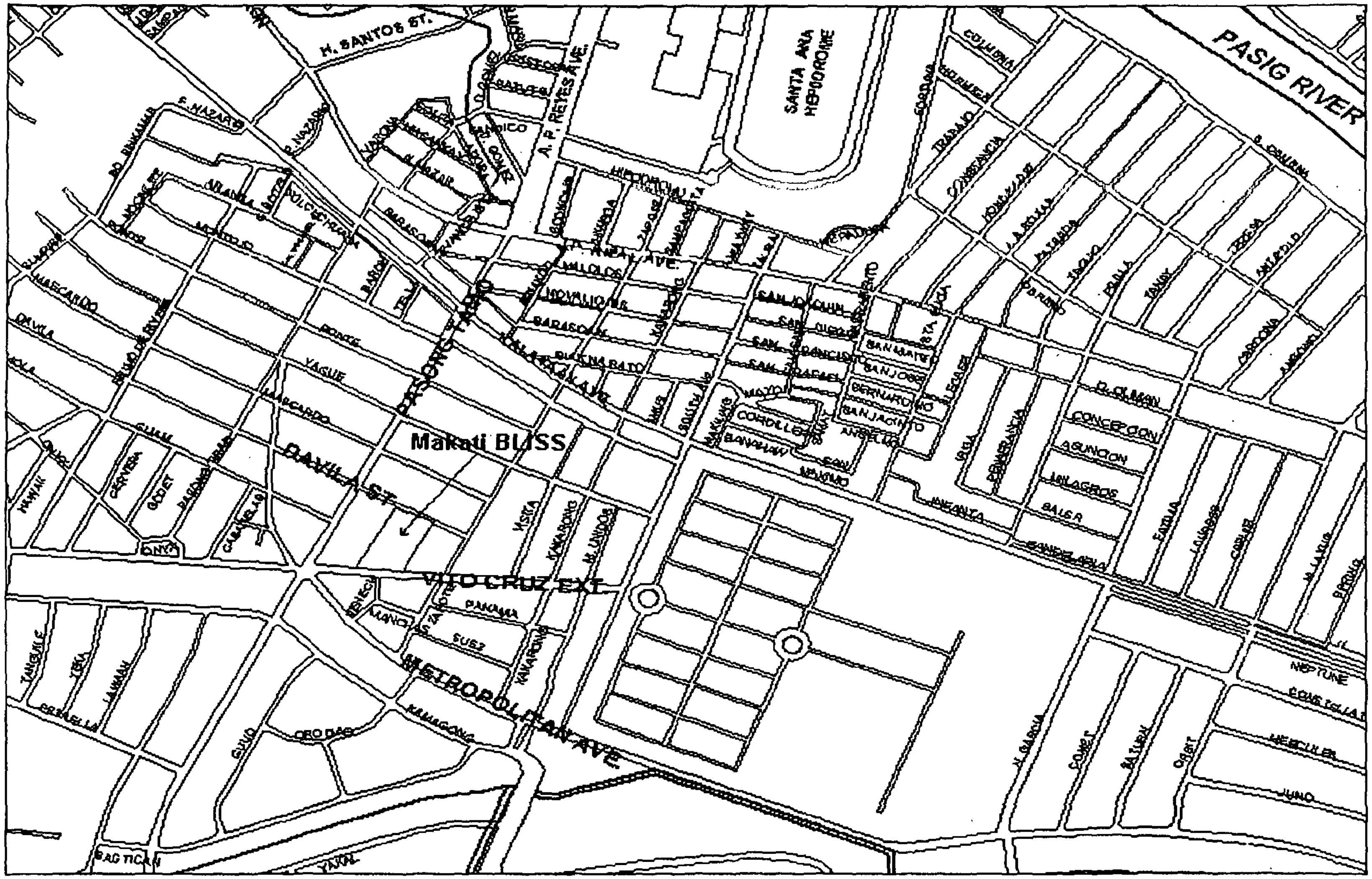
Name of Project	:	**MAKATI BLISS MAKATI COMMUNITY SANITATION PROJECT MANILA SECOND SEWERAGE PROJECT**
Address	:	Makati BLISS, Davila St., Barangay Sta. Cruz, Makati City, Philippines
Contact Persons	:	Leonor C. Cleofas Manager, Engineering and Project Management Office Metropolitan Waterworks and Sewerage System Ground Floor, Engineering Building, MWSS Complex, Katipunan Road, Balara, Quezon City 1105 Tel No. (632) 920-5413; (632) 920-5521 to 40 locals 3570/3569 Telefax: (632) 922-2568 Ma. Fiorella De Los Reyes-Fabella Wastewater Project Development Manager Manila Water Company, Inc. 489 Katipunan Road, 1105 Balara, Quezon City, Philippines Tel No. (632)981-8147; (632)926-7999 loc2032 Fax (632) 981-8106

1.2 PROJECT LOCATION

The proposed project for Makati BLISS is a sub-project of the Community Sanitation Project which is a component of the World Bank-assisted Manila Second Sewerage Project.

The service area is the entire Makati BLISS. The project site is in Davila St., Makati City which is easily accessible from either the Vito Cruz Extension or the Pasong Tamo Avenue. Figure 1 presents the vicinity map of the project.

Figure 1
Location Map of Makati BLISS



1.3 PROJECT RATIONALE

In Metro Manila, untreated/partially treated domestic wastewater is the major source of pollution of inland waters. Most residential houses in Metro Manila treat their wastewater by means of septic tanks, which do not provide adequate treatment to satisfy the DENR requirements for wastewater effluent standards. Moreover, majority of septic tanks in Metro Manila is not properly maintained. This situation has led to the deterioration of the inland waters and especially Pasig River. The DENR has estimated that around 60% of the pollution load to Pasig River come from domestic discharges.

There is therefore an urgent need to establish collection and treatment methods that will help reduce the pollution load to inland waters. The provision of an efficient and cost-effective sewage collection, treatment and disposal is the primary objective of the Community Sanitation Project under the MSSP.

This project specifically aims to address the problems of inadequate wastewater treatment and disposal in Makati BLISS as shown by the analysis of the effluent of one of the septic tanks in the area (see Table 1 below). The project will help reduce public health risks and environmental pollution from untreated/partially treated domestic wastewater by providing a sustainable sanitation and sewerage facility. It will also serve as a good illustration of proper sanitation especially to the neighboring communities near Pasig River. Figure 2 shows the existing sewer network in Makati BLISS.

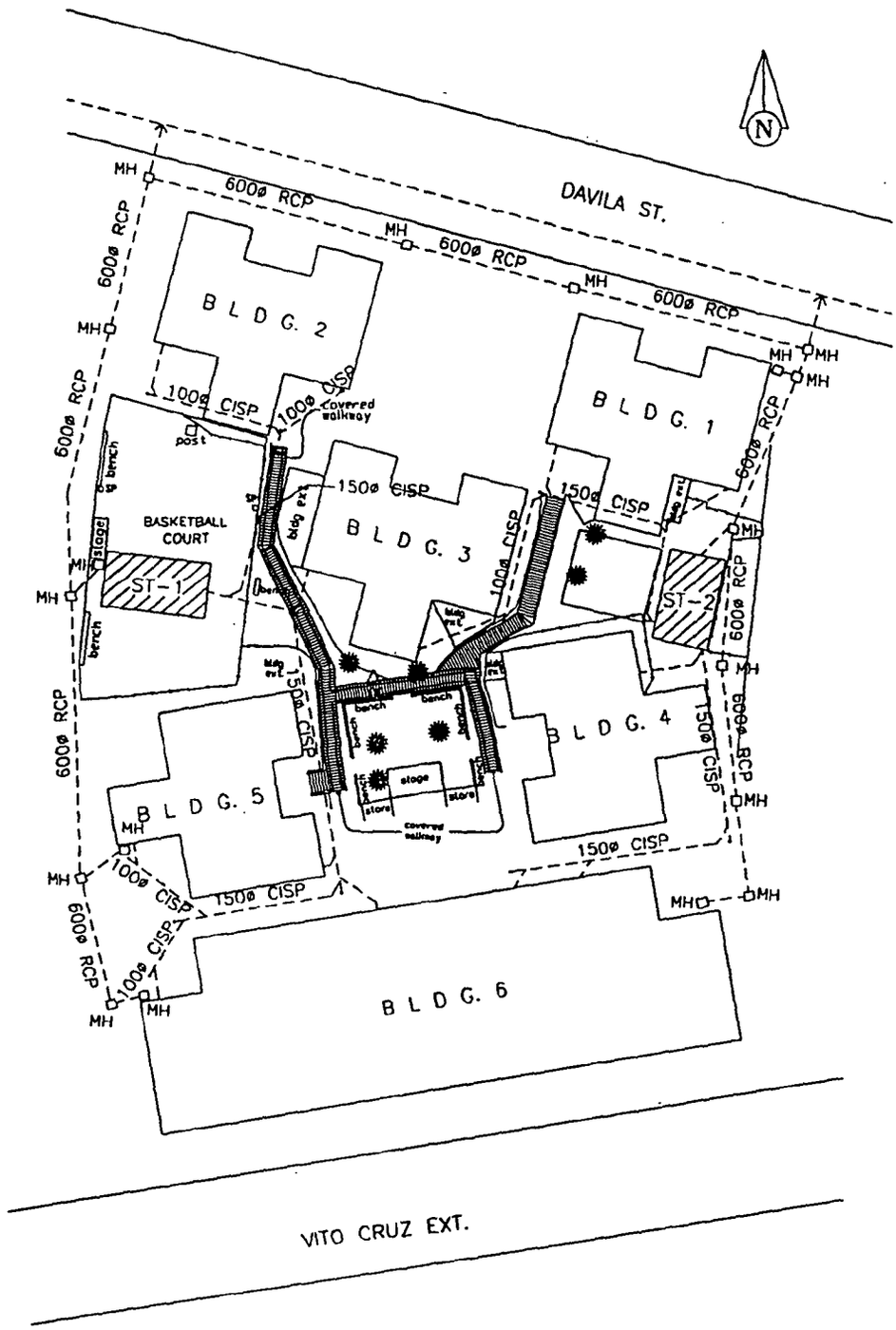
Table 1
Analysis of Septic Tank Effluent Quality from Makati BLISS

Parameter	Limit(s) DENR-EMB	Makati Bliss Effluent Sample
Ph	6.5-9	7.3@27.9°C
Suspended solids, mg/L	70	92.00
Dissolved Oxygen, mg/L	-	86.00
Biochemical Oxygen Demand (BOD_5), mg/L	50	200.00
Chemical Oxygen Demand, mg/L	100	264.20
Total Coliform Count, MPN/100 ml	10,000	900×10^5
Fecal Coliform Count, MPN/100 ml	-	900×10^5

**Water analysis conducted on May 24, 2000*

Manila Water

Figure 2
Existing Sewer Collection System in Makati BLISS



1.4 DESCRIPTION OF PROJECT PHASES

1.4.1 Pre-Operational / Construction Phases

1.4.1.1 Construction Plan

The project is scheduled for bidding in December 2001. Construction is expected to commence in April 2002 and project completion is targeted in August 2002 (150 calendar days).

Figure 3 shows the implementation schedule for the project. Manila Water Company will undertake the project implementation.

1.4.1.2 Total Surface Development Block

The service area is approximately 4,631 m^2 and is estimated to have a current population of 1,078. The project will serve all residential and commercial establishments within Makati BLISS. Any increase in population is not considered because there are no further planned development within the compound that would significantly affect the quality and/or quantity of wastewater discharges.

Makati BLISS consists of five (5) four-story walk-up buildings, each with 20 residential units and a four-story walk-up building with 18 residential units and some commercial establishments.

1.4.1.3 Estimate of Total Land Area to be Opened for Civil Works

Civil Works will include the STP construction and the laying of sewer lines to connect existing communal septic tanks to the STP. The STP will be located underground in a 120 square-meter lot. Sewer lines totaling 95 meters will be opened for civil works. Figure 4 shows the sewer network layout plan for the project.

1.4.1.4 Major Openings and Construction Activities

The complete sewerage system will include the following components:

- Collection sewers (diameter=100 to 150 mm) with a total estimated length of 95 meters to connect the communal septic tanks to the STP
- Eight (8) sewer manholes and junction boxes with depth less than 1.5 meters
- Underground STP with a design capacity of 172 m^3/day and land requirement of 120 m^2
- Sewer line (diameter=150 mm) with a total estimated length of 4 meters from STP discharge point to existing storm drainage

Figure 3
Proposed Implementation Schedule
for Makati BLISS Community Sanitation Project

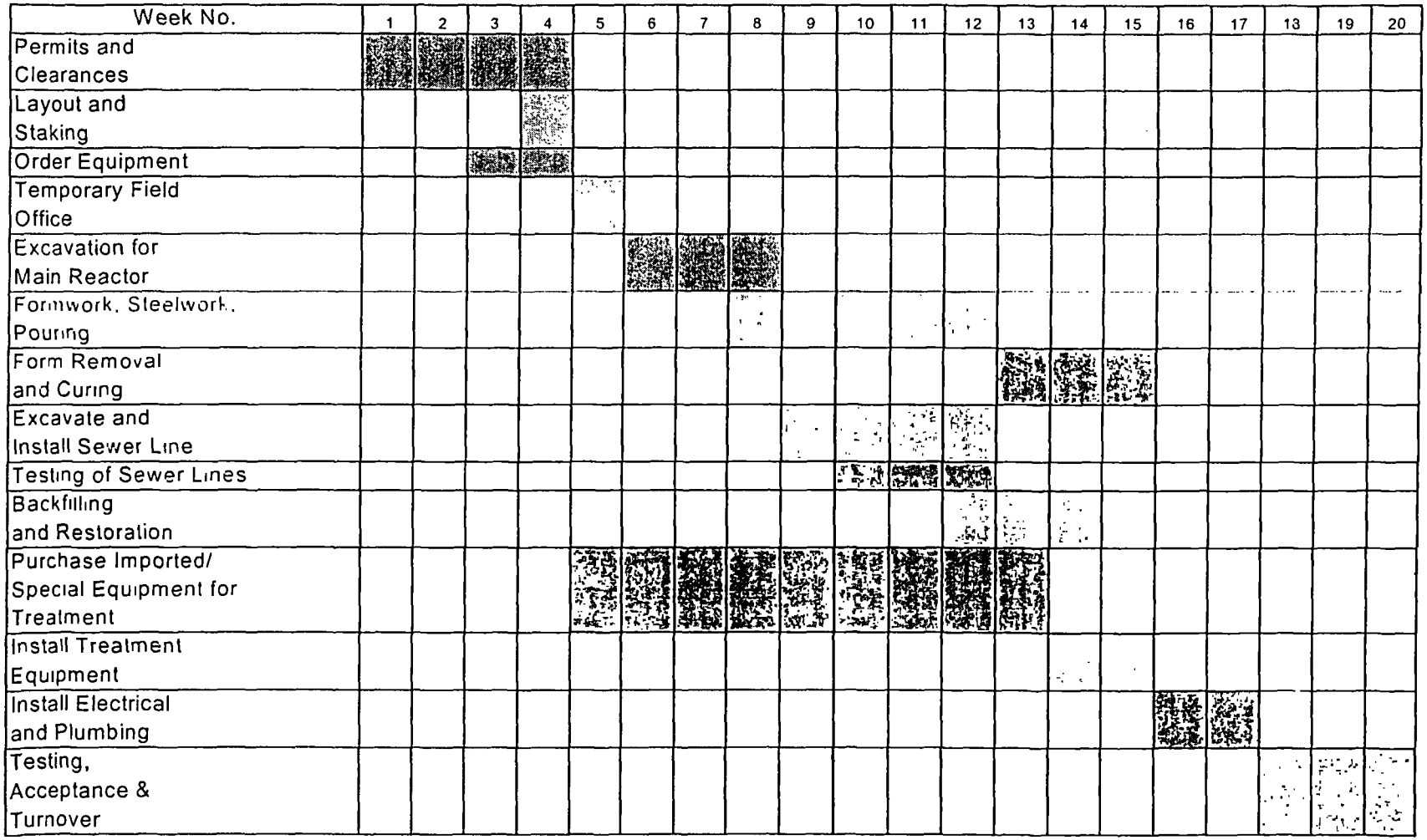
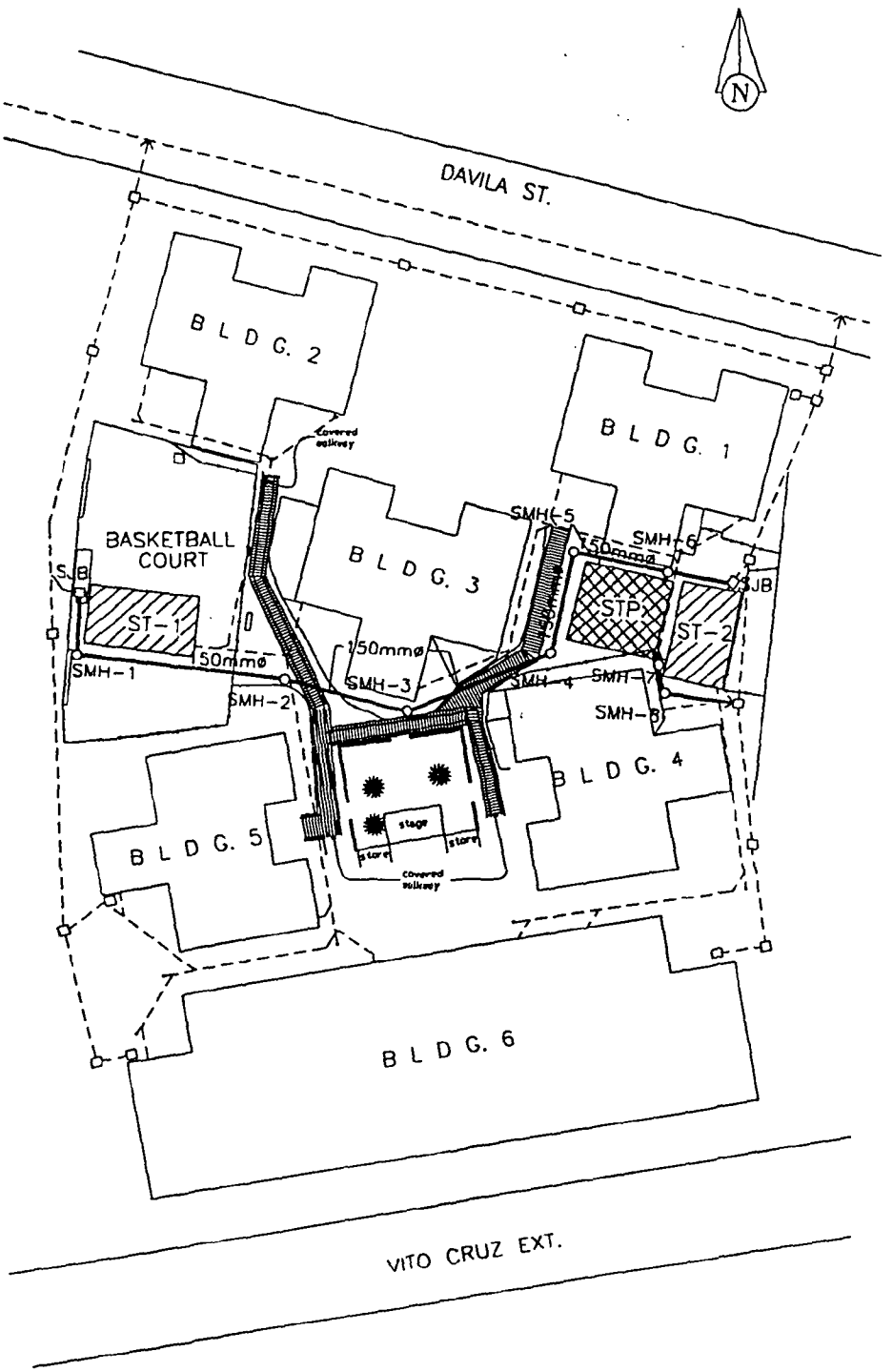


Figure 4
Proposed Sewer Collection System Layout for Makati BLISS

Manila Water



Civil works to be implemented are as follows:

For STP

- Site clearing
- Earthworks
  - Excavation and handling
  - Dewatering
  - Backfill and compaction
  - Lean concrete/ gravel bedding
- Concrete Works
  - Shoring and soil protection
  - Formworks
  - Concreting
- Electro-mechanical
  - Internal and external pipeworks
  - Mechanical installation
  - Electrical installation
- Site restoration
- Clearing/ miscellaneous activities

For Pipelaying

- Pavement cutting
- Shoring and removal
- Excavation and handling
- Dewatering
- Pipelaying
- Backfill and compaction
- Testing pavement restoration
- Clearing / miscellaneous activities

1.4.1.5 Types of Equipment to be Used

The civil works contractor will provide equipment which include, but is not limited to, the following:

- backhoe/loader
- dewatering equipment
- concrete mixer/concrete pump
- welding machine
- compactor
- jackhammer and air compressor
- generator
- dump trucks

1.4.1.6 Source of Construction Materials and Facilities

The following alternative type of pipe materials will be permitted for sewer mains:

- UPVC Pipe
- Polyethylene
- Fiberglass Pipe
- Ductile Iron Pipe
- Cast Iron Soil Pipe

The contractor can choose from the above pipe materials.

1.4.1.7 Support Services and Facilities Requirements and Availability

Support services and facilities will be tapped from the available utilities on site. Arrangements with Makati BLISS locators and/or any other party will be made by the contractor.

1.4.1.8 Estimate Total Cut Soil Volume(for pipelaying)

Table 2 presents the total system length, average excavation depth of the sewer pipes and area of the project.

Table 2
Estimates of Soil Excavation Volumes

	Estimated Dimensions (sq.m)	Average Excavation Depth (m)	Average Excavation Volume (cu. m.)
STP site	120	5	600
Sewer line 100mmØ	0.400 x 10*	1.0-1.2	4.8
Sewer line 150mmØ	0.450 x 85*	1.5	57.4
		TOTAL	**662.2**

*Estimated dimension of sewer pipe excavation (sq.m.)= [(pipe diameter +0.3) x total length of pipe required]

1.4.1.9 Total Manpower Requirement

The project will be bid out based on World Bank procedures. The winning bidder will provide contractual work for a period of around 150 calendar days. The contractor will provide skilled and unskilled workers to carry out the scope of works as detailed in the bid documents. The scope of works includes:

- site clearing
- installation works for the sewer network
- detailed engineering design and construction/installation works for the STP and its appurtenances
- landscaping of the STP site and the vicinity
- abandonment activities (road restoration, etc.)
- STP start-up operations

1.4.2 Operational Phase

1.4.2.1 Project Operation Schedule and Duration

Completion of construction is expected by August 2002. Start-up operations will begin immediately after project completion.

1.4.2.2 Process Technology and Activities

The project will be bid on the basis of performance specifications for the STP Treatment Process:

- Wastewater flows were computed on the basis of a per capita water demand of 200 liters per day and a 70% wastewater discharge. Storm infiltration was estimated at 10% of the total flows. A peak factor of 1.5 was added in the computation of design flows to determine pipes sizes and capacity of STP.

- The influent flow characteristics were based on random laboratory analyses of septic tank effluent in Makati BLISS and the other project sites. The influent quality assumptions are shown in Table 3 below:

Table 3
Influent Flow Characteristics

TSS (mg/l)	BOD_5 (mg/l)	COD (mg/l)	Oil and Grease (mg/l)	pH
100	200	350	50	6-9

TSS = Total Suspended Solids
BOD_5 = 5-day biochemical oxygen demand at 20°C
COD = chemical oxygen demand

- Wastewater treatment will reduce the BOD_5 from 200 mg/L to 50 mg/L, at the minimum. This illustrates an STP treatment efficiency of at least 75%.

- Wastewater discharged by the STP shall conform with the Effluent Standards set forth in DENR Administrative Order 34 and 35 for Class C waters as shown in Table 4 below:

Table 4
DENR Effluent Parameters for Class C Waters

Parameters	Units	Concentration
Color	PCU	150
PH		6-9
COD	mg/L	100
Settleable solids	mg/L	0.5
5-day 20°C BOD	mg/L	50
Total Suspended Solids	mg/L	70
Total Dissolved Solids	mg/L	7
Oil and Grease	mg/L	5
Phenolic Substances	mg/L	0.10
Total Coliforms	MPN/100 ml	10,000

Process Scheme of STP

The STP to be constructed in Makati BLISS will be below ground. The only aboveground structures will be the control room/panel.

The STP treatment process will provide secondary treatment to septic tank effluent. It is expected that bidders will propose different process technologies based on the performance specifications in the bid documents. Some factors which will be considered in selecting the STP treatment process are:

- Suitability in project site
- Performance/Treatment efficiency
- Capital and Replacement costs
- Operations and Maintenance costs
- Complexity of operations
- Flexibility of treatment process

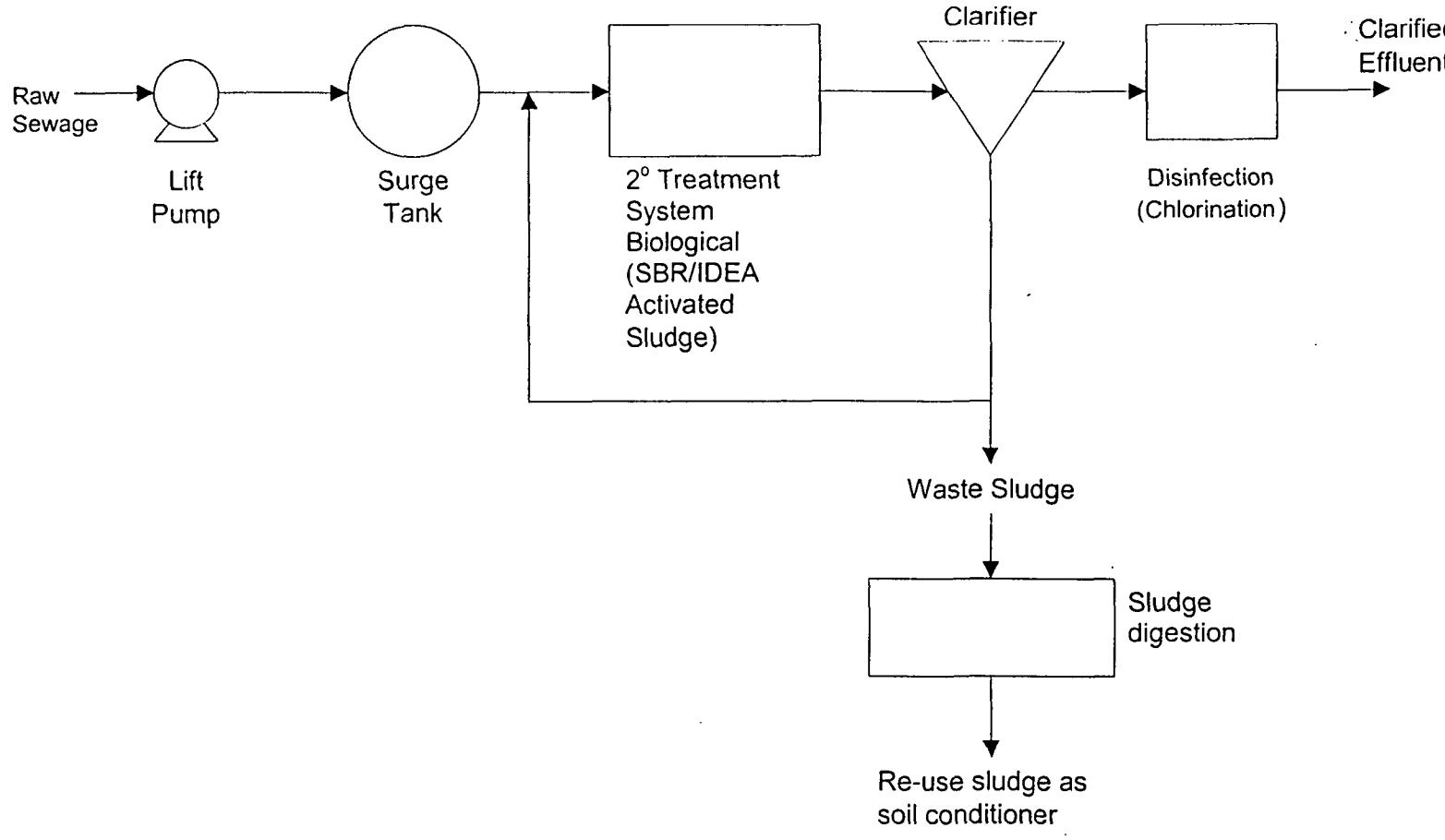
A general scheme for the treatment process is illustrated in Figure 5.

1.4.2.3 Waste Production Scheme

Up to 2005, sludge produced in the treatment process will be transported to a centralized Septage Sea Disposal Station located in J.P. Rizal St, Brgy, West Rembo, Makati City. Mobile vacuum tankers will collect the sludge produced in the STP.

Figure 5

General Treatment Process Scheme
Makati BLISS Community Sanitation Project



A long-term disposal scheme for biosolids from the STP will be as soil conditioner for sugarcane and corn in Pampanga. *Experiments done in coordination with the Sugar Regulatory Administration on the use of sludge in enhancing the soil quality of lahar-covered areas and the growth of crops such as sugarcane, corn and bittergourd resulted in the issuance of a temporary license issued by the Fertilizer and Pesticide Authority. The license allows the use of sludge in growing similar crops.*

Sludge generated from the STP can also be treated in the 600 cum/day septage treatment facility which is expected to be operational by 2004. This facility is part of the Sanitation Component of the Pasig River Rehabilitation Project. The facility will be operated by Manila Water Company.

1.4.2.4 Manpower Requirement

Manila Water Company will assign an LLDA and DENR-accredited Pollution Control Officer (PCO) who will be responsible for the compliance of the STP with government regulations. The PCO will have trained operators/crews who will monitor and manage the operation of the sewer network.

Since the STP operations will be operated largely by automation, regular maintenance works will include declogging of sewer lines and removal of sludge from the STP site and the communal septic tanks. The STP operator will visit the project site daily. Monitoring of the effluent quality will be the joint responsibility of the PCO and the Central Laboratory of Manila Water Company.

The community has also agreed to provide a liaison officer who will coordinate with Manila Water Company personnel on the proper operations of the STP and the sewer network. A 24-hour Customer Service Hotline (1627) is available to accept complaints and other emergency reports. Manila Water Company has sewer network repair crews who work in regular round-the-clock 8-hour shifts and who are readily available for any emergency work.

1.4.3 Abandonment Phase

Upon completion of the project scope, the contractor will remove all temporary structures and facilities installed during the construction phase. All pavements will be restored. The cost of abandonment will be incorporated in the overall cost of the project. Manila Water Company will issue a certificate of final acceptance only upon completion of all abandonment works by the contractor and upon turnover of the STP operations.

2.0 BASELINE ENVIRONMENTAL CONDITIONS

2.1 STUDY METHODOLOGY

This Initial Environmental Examination (IEE) was prepared in compliance with the World Bank's Operational Directive 4.01 on Environmental Assessment. An IEE was previously carried out according to the DENR Administrative Order No. 96-37, for which an Environmental Compliance Certificate (ECC) dated Oct. 4, 2001 has been issued by the DENR-Regional Office (Annex 3).

2.2 LAND

2.2.1 Land Resource Utilization

Makati BLISS has an estimated land area of 4,631 m^2. Approximately 36% of the total area is devoted to residential use, 6% to roadways and parking area and 58% to parks, playgrounds and open spaces.

2.2.2 Physiography and Geology

Makati BLISS is on a relatively flat plain sloping downward to Davila Street in the north, and to Vito Cruz Extension in the south.

The soil/rock is made up of Guadalupe Formation which is characterized by thin to medium-bedded, fine-grained vitric tuffs and welded volcanic bresias with subordinate amount of tuffaceous, fine to medium-grained sandstone.

2.2.3 Vegetation and Wildlife

The proposed site for the STP is in a 200-square meter lot beside the septic tank in the Northeast. Figure 6 shows photographs of the proposed site.

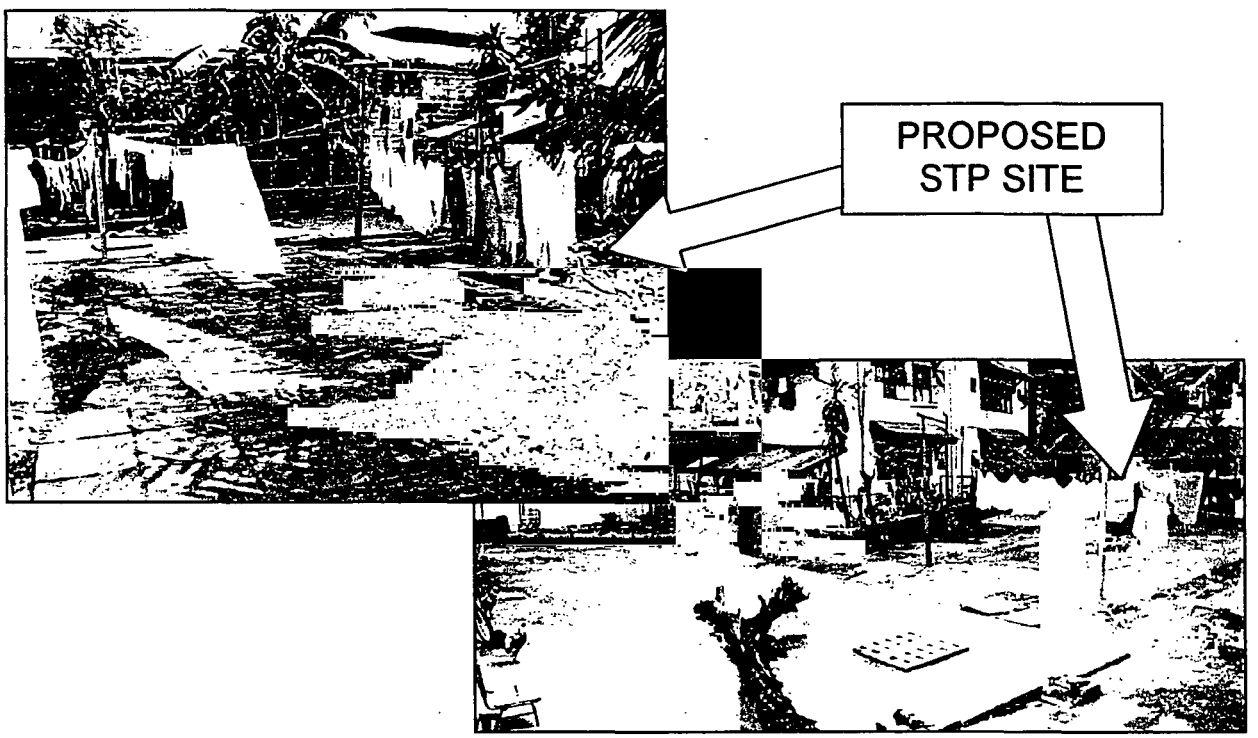
The site is predominantly covered with concrete except for a small section with vegetative cover. The plant species that can be found in the site and which will be uprooted during construction are:

Table 5
List of Plant Species to be Uprooted

No.	Common Name	Scientific Name
19		*Setcreasia purpurea*
3		*Sida* sp.
1	Calamansi	*Citrus microcarpa Bunge*
1	Coconut	*Cocos nucifera*
1	Malunggay	*Moringa oleifera*
1	Kamias	*Averrhoa bilimbi*
2	Fortune Plant	*Dracaena fragrans*
2	Atis	*Annona squamosa*

Faunal population is limited to household pets and stray animals.

Figure 6
PHOTOGRAPHS OF MAKATI BLISS COMMUNITY SANITATION PROJECT



EXSISTING
SEWERAGE
SYSTEM

2.2.4 Land Acquisition Assessment

Manila Water will be allowed to use a parcel of land for the STP by way of a grant of perpetual easement from the owner/developer of the community, which in this case is the Home Guaranty Corporation (HGC). The STP site is free from informal settlers.

2.3 Water

2.3.1 Inventory of Water Bodies

There is no inland body of water in the immediate vicinity of Makati BLISS. Wastewater from the compound enters the communal septic tanks then the drainage system before discharge to the public drainage. Public drainage is eventually discharged to Pasig River.

At present, Pasig River does not meet the Class C standards (i.e., suitable for propagation and growth of fishes, recreational uses and industrial water supply) especially during the summer months when there are no sufficient inflows. At these times, the BOD in Pasig River reaches 120 mg/L, which is 12 times higher than the permitted level for Class C water; DO drops to zero; and total coliforms exceed the MPN/100 ml standard by up to several thousand degrees.

The current BOD loading entering the Pasig River is estimated at 242 tons/day which is 21% above the river's estimated maximum assimilative capacity. Domestic wastewater contributes 168 tons/day of BOD. Without any sewerage or sanitation interventions, the pollution load entering the river is expected to increase to 269 tons/day in year 2005, which is expected to come from domestic sewage.

2.3.2 Water Quality (Surface/Ground)

Surface Water Quality. Pollution loading to the Pasig River will be reduced since septic tanks and raw wastewater from the project area will no longer be discharged to the river. Effluent from the plant will comply with DENR Effluent Quality standards sufficient for Class C waters.

Ground Water Quality. Since septic tank effluent will undergo further treatment in the plant, the possibility of contaminating the aquifers due to leachate from septic tank discharge or from raw wastewater will be eliminated. Seepage from plant operations will be non-existent.

2.4 AIR

Makati City experiences only two types of weather conditions, rainy season and the dry season. Rainy season occurs between the months of July and October, while the dry season occurs between November and June. Mean annual temperature is 27.4°C and average annual relative humidity is 77% for Metro Manila.

Air quality within Makati BLISS is moderately unpolluted. However, outside the premise are national roads where public and private vehicles exhaust vehicle fumes contributing to the air pollution in the vicinity.

2.5 PEOPLE

2.5.1 Population/Beneficiary

All the units are occupied. Assuming 7 persons per unit, the projected population is 1,078 at full occupancy of the BLISS. Social status of the families range from Class B to Class D based on the classification of the National Statistics Office (NSO).

2.5.2 Project Affected Persons

During construction, the project will cause noise and traffic nuisance to the community, its neighboring communities and pedestrians. Once operational, the project will directly affect the residents of the BLISS. The sanitation of the community will be improved when the new sewer system is operational.

Manila Water will assign skilled personnel to operate and maintain the system up to approved standards.

3.0 ALTERNATIVES

Makati BLISS is considered a priority area for the improvement of sanitation conditions based on the following factors:

- It has a relatively high population density.
- The existing sanitation facilities are inadequate to comply with the DENR effluent standards.
- The communal sanitation and drainage systems in the compound are not maintained.
- Some buildings are directly discharging raw wastewater to the public storm drainage.

Among potential sites identified for the STP are as follows:

1. open space beside Buildings 1, 3 and 4 (beside the Northeast septic tank)
2. basketball court, beside the Northwest septic tank
3. open space near Buildings 5 and 6

None of the sites will require relocation of inhabitants during construction.

Among the sites listed above, site number 1 is the area for the STP that has been agreed with the residents. The construction and operation of the STP will obstruct the residents' use of the basketball court in site number 2. Site number 3 is near the pump house for the elevated water tank.

4.0 IMPACT ASSESSMENT

4.1 IMPACT IDENTIFICATION

Table 6
Sources and List of Potential Environmental Impacts

Source of Impacts	Potential Environmental Impact
CONSTRUCTION PHASE	
Air Pollution 1. Dust emission will occur due to civil works such as excavation, disposal of excess soil, etc. 2. Emission of dust and other air pollutants by vehicles.	The impact on the air quality will only occur during the construction phase, but could be controlled through proper measures. Among the potential air impacts are: • Ground level concentration of suspended solids will increase • Air pollutants such as CO_2, CO_1 and NO_x will occur from vehicle emissions.
Water Pollution 1. Domestic waste made by the construction workers and staff. 2. Wastewater will be produced due to the washing of vehicles. 3. Spillage of oil might occur through improper handling.	• Improper disposal of the wastewater produced could lead to contamination of ground water. • Uncontrolled wastewater discharge, construction debris and oil leakage / spill will increase the sedimentation/contribute to the pollution of the nearest body of water
Noise Pollution 1. Noise pollution from the operation of construction equipment and vehicles.	• Noise level will increase due to the usage of noise generating equipment.
OPERATIONAL PHASE	
Water Pollution 1. Improper operation and maintenance of the STP will result to water pollution.	• The project will reduce the wastewater load into the Pasig River and will constitute a positive impact. However, improper operations/maintenance of the STP will result to the discharge of untreated or partially treated effluent.

Odor Pollution 1. Unpleasant odor will result from the anaerobic conditions and improper operation and maintenance of the STP.	• The whole BLISS, especially the buildings near the STP, will experience unpleasant odor during periods of odor emission.
Noise Pollution 1. Noise generating engines and equipment that are necessary for the operation of STP will be used. Added noise will be created during its operation.	• Impact will be insignificant and can easily be controlled through proper preventive measures.
Socio-Economic 1. The project will result to proper treatment of wastewater. 2. Value of land will increase.	• The STP will result to a positive impact since the domestic wastewater will be treated and will help decrease the pollution load into Pasig River. Also, the treated water could be re-used.
Residual and Unavoidable Impacts 1. Accidents and man-made disasters might occur due to design failure and improper construction practices. 2. Environmental hazards might occur due to natural disasters like earthquakes, typhoon, etc.	• Proper precautionary and preventive measures to avoid these kinds of impacts.

4.1.1 Impacts During Construction Phase

A. Air Quality

During the implementation of the project, an increase in emission of dust and suspended particulates will occur in the vicinity of the STP site and excavations for the sewer pipes. This can be attributed to civil works such as excavation, disposal of excess soil and other related construction activities. Another cause will be emission of fumes and other air pollutants of the vehicles to be used.

B. Water Quality

Excavation activities in the project site could loosen soils and transport of these materials to the public drainage will result in siltation or increase in turbidity. Inappropriate disposal of human waste by construction workers, excessive use of water for washing of equipment and spillage of oil might also occur.

C. Noise

Noise will be generated during the construction of the project due to the operation of equipment and construction activities. Considering that the proposed site for the project is near the residential buildings, proper mitigating measures will be done to ensure that the equipment and activities will cause little or no disturbance to the residents.

Heavy equipment will be monitored to operate only in short periods of time to avoid sustained high level of noise. The operator of heavy equipment will be required to pause work for 10-15 minutes after every two (2) hours of operation. The use of heavy equipment will be strictly prohibited from 6:00 P.M. until 8:00 A.M. on weekdays. Residents will be given prior notice at least one (1) day before use of any heavy equipment on Saturdays. Use of heavy equipment will be prohibited during Sundays except for special or emergency activities that need immediate action.

Table 7 shows the typical noise emissions of common construction equipment used at various distances from source.

Table 7
Typical Noise Emissions of Construction Equipment at Various Distances from Source in dB(A)

Equipment	15 meters	30 meters	60 meters
Air Compressor	75-87	69-81	63-75
Backhoe	71-92	65-87	59-81
Compactor	72	66	60
Concrete Mixer	75-88	69-82	63-76
Pumps	70-90	64-84	56-78
Tractors, Bulldozers	78-95	72-89	66-83
Trucks	83-93	77-87	71-81
Jack Hammer	81-97	75-91	69-85

D. Ecological Effects

Since there are no rare, endemic species of flora and fauna in the project area, project implementation has minimal impact on the overall terrestrial ecology of the Makati BLISS. Some plants will be unavoidably cleared during civil works.

4.1.2 Impacts During Operation Phase

A. Air Quality

There will be minimal effect on the air quality during the operational phase of the STP. Aside from the occasional odor nuisance, there will be no adverse effect on the air quality. The performance specifications for the STP treatment process specifically state that the facility should have odor control mechanisms (eg., deodorizer, masking agent, adsorbent, etc.). Manila Water Company will not accept the turnover of the STP by the contractor if the facility emits unpleasant odors. Permanent solution(s) to address any odor nuisance will be the responsibility of the contractor

B. Water Quality

Without wastewater treatment, Makati BLISS accounts for an estimated total of 34.4 kg/day BOD_5 loading to the Pasig River. The implementation of the project will contribute to the improvement of the quality of water in Pasig River by reducing discharge of untreated/partially treated wastewater. From a pollution loading of 34.4 kg/day BOD_5, loading will be reduced to 5.2-8.6 kg BOD_5/day, or a 75-84.8% BOD reduction, when the STP becomes operational.

C. Socio-Economic

A flat sewer charge equivalent to 50% of the water charge will be included in the water bill once the STP is commissioned. This fee will help cover the costs of the operations and maintenance of the STP and the sewer network. This arrangement was clearly explained to the community during the consultation process and the residents' agreement to the project includes their acceptance of the additional fees. The consultation done with the community is explained in Chapter 6.0.

The general sanitation conditions in the project area will significantly improve. The project will reduce, if not eliminate the threat of water borne diseases such as diarrhea and typhoid, which are more costly to manage.

D. Sludge Disposal and Management

The existing septic tanks in the area produce an estimated 7.28 kg of sludge per year not including raw waste disposed directly to Pasig River. The table below illustrates the sludge production averages for various wastewater treatment processes. Also indicated is the estimated sludge production of the STP considering each type of treatment.

Table 8
Sludge Production of Various Wastewater Treatment Processes

Treatment Process	Typical Dry Solids Production (kg/m^3)	Estimated STP Sludge Production (kg/day)
Activated sludge	85	115,600
Trickling filtration	70	95,200
Extended aeration	100*	136,000
Aerated lagoon	100*	136,000

**assumes no primary treatment*

The bidders for the project may propose any of the above wastewater treatment process or their modifications. Cost and operational efficiency are among the considerations for awarding the bid.

In the interim (i.e. up to 2005), sludge produced in the treatment process and collected from the communal septic tanks will be transported to a Septage Sea Disposal Station located in J.P. Rizal Ave., Brgy, West Rembo, Makati City. Vacuum tankers will collect the sludge produced in the STP and the septage from septic tanks.

A long-term alternative is the disposal of sludge and septage to the lahar areas in Pamapanga. The sludge can be used as soil conditioner for sugarcane and corn. Experiments done in coordination with the Sugar Regulatory Administration on the use of sludge in enhancing the soil quality of lahar-covered areas and the growth of crops such as sugarcane, corn and bittergourd resulted in the issuance of a temporary license issued by the Fertilizer and Pesticide Authority. The license allows the use of sludge in growing similar crops.

Starting 2004, a septage treatment facility will also be available to treat sludge and septage from the STP. This facility is part of the Sanitation Component of the Pasig River Rehabilitation Project. Manila Water Company will operate the septage treatment facility. Stabilized sludge may also be used as filling material.

4.2 IMPACT PREDICTION AND EVALUATION

Table 9 below presents a summary of the assessment of the impacts of the project.

Table 9
SUMMARY OF ASSESSMENT OF ENVIRONMENTAL ISSUES/IMPACTS

Environmental Issues/Impacts	Impact Assessment				
	Classification	Probability	Reversibility	Time Scale	Magnitude
1. Construction Phase					
Air/Dust Pollution	-	●	↑	<	♣
Noise	-	●	↑	<	♥
Traffic	-	●	↑	<	♣
Soil Erosion	-	□	↓	<	♣
Water Pollution	-	□	↑	<	♣
Increased Employment	+	●	↑	<	♥
2. Operational Phase					
Water Pollution	-	□	↑	>	♣
Contamination of drinking Water supply	-	□	↓	>	♣
Odor Pollution	-	□	↑	<	♥
Noise	-	□	↑	<	♣
Accidents/hazards	-	□	↑	<	♣
Health benefits	+	●	↓	>	♠
Property Value and Commercial Attractiveness	+	●	↓	>	♠
Environmental sanitation enhancement	+	●	↓	>	♠

+ Positive **□ Unlikely to occur** **↑ Reversible** **< Short term** **♣ Insignificant**
- Negative **● likely to occur** **↓ Irreversible** **> Long term** **♥ Moderate**
♠ Severe

The implementation of the project is projected to produce minimal adverse effect environmental impacts. Moreover, the long-term benefits from the project such as improved sanitation conditions within the compound and its immediate environs, lesser risk of waterborne diseases, and reduction in pollution will more than compensate for the negative effects that this project will cause during construction and operation.

Mitigating measures will be implemented to minimize, if not eliminate any adverse impact that the project may cause. Measures to enhance the existing environmental conditions in the project site shall be implemented, as needed.

4.3 UNAVOIDABLE AND RESIDUAL IMPACTS

Unavoidable and residual impacts are those that occur as a result of natural calamities such as floods caused by typhoons or heavy rains, earthquakes and the like. Appropriate measures will be done to anticipate these impacts and to implement contingency action plans.

5.0 ENVIRONMENTAL MANAGEMENT PLAN

5.1 IMPACTS MITIGATION / ENHANCEMENT PLAN

Table 10 below is a matrix on the environmental management plan of the proposed project.

Table 10
ENVIRONMENTAL MANAGEMENT PLAN

CONSTRUCTION PHASE			
Potential Environmental Impact	**Mitigating Measures**	**Manner of Implementation**	**Schedule**
1. Poor quality of construction	• Manila Water Company will monitor the supply and installation contract to assure quality of equipment and construction. Site Managers and Engineers with experience in construction management shall approve all materials and equipment to be used and installed at the site. • The contractor will be required to post a performance bond for the Design and Construction Contract of the sewerage system.	To be included in the contractor's scope of work, under the supervision of Manila Water Company.*	Daily

2. Air pollution (suspended particulates, odor and fumes, vehicle emissions eg. CO_2, CO NO_x)	• Efficient construction planning and work scheduling • Formulation of appropriate work plans, work scheduling, work specifications and work methodologies • Provision of properly maintained storage area for keeping stocks of construction materials and equipment • Prompt and fast removal of excavated materials or dredges spoils from construction site • Sprinkling of water on dust-generating mounds of resulting from earthmoving activities and civil works. • Control of motor vehicle emissions • Dust accumulation will also be prevented through proper washing of the vehicles prior to its departure from the site • Development and enforcement of strict health and safety pollution control regulations specific for the project site – Good housekeeping of workplace and construction affected areas • Use of Protective Gear by all workers	To be included in the contractor's scope of work, under the supervision of Manila Water Company.*	Start of construction and daily
3. Water pollution due to wastewater, oil leakage/spills, toxic and hazardous substances	• Provide temporary drain systems and storage facilities for excavation soils, fuel and oils needed for equipment • Cautious and sensible planning for construction and post-construction phases of the project • Provision of a routine chemical and oil spill clean-up plan • Formulation of a monitoring program	To be included in the contractor's scope of work, under the supervision of Manila Water Company.*	During construction

4. Noise pollution from operation of construction equipment	• Establish temporary sound barriers around the work site • Proper scheduling and phasing of high-noise activities • Use of appropriate mufflers and sound proofing for construction machinery, equipment and engines • Use of Personnel Protective Equipment by all workers	To be included in the contractor's scope of work, under the supervision of Manila Water Company.*	Daily
5. Temporary disruption of traffic flow within the compound	• Public information campaign posting schedule of construction • Provision of a liaison officer from the residents of the compound to assist the information dissemination regarding inevitable changes in schedule of operations • Provision of temporary alternative routes, including visible traffic warning signals	To be included in the contractor's scope of work, under the supervision of Manila Water Company.*	Daily
	• To the extent possible, sewer lines, manholes and lift station will be constructed in common areas not used for pedestrian or vehicular traffic • Scheduling of delivery materials and removal of excavated material during non-rush hour periods.		
6. Accumulation of solid waste in construction site	• Hauling and proper disposal of waste construction materials by contractor, supervised by Manila Water Company • Provision of temporary toilet facilities for workers	To be included in the contractor's scope of work, under the supervision of Manila Water Company.*	Daily

*Manila Water Company's contractor shall comply with all the conditions stipulated in the scope of work. Any violation by the contractor will be penalized by a performance security incorporated in the bid. The performance security will be in the form of an unconditional bank guarantee in the amount of 10% of the contract price.

OPERATIONAL PHASE			
Potential Environmental Impact	**Mitigating Measures**	**Manner of Implementation**	**Schedule**
1.Environmental hazards due to accidents, man-made natural disasters eg. Accidental spills, fire, seismic activity, earthquakes, heavy rain/flooding and design failure	• Carefully designed post-construction maintenance, contingency and monitoring programs • Well designed plan for detection of accident or natural events including precautionary and remedial measures to be observed • Provision of preventive and remedial procedural manuals at workplace • Adequate plans for environmental rehabilitation and restoration of site and removal of temporary structures and facilities installed during construction phase	Manila Water Company	Observance of guidelines will be done daily.
2. Water Pollution	• Wastewater discharged by the STP shall conform with the Effluent Standards set forth in DENR Administrative Order 34 and 35 for Class C waters. Annex 2 describes in detail the schedule of wastewater quality monitoring • Regular monitoring of wastewater effluent by the Manila Water Company Central Laboratory • Regular check on sewer lines to prevent discharge/seepage of untreated wastewater to the environment • Quality of civil work on the STP facility shall be enforced during construction to avoid seepage	Manila Water Company	Refer to Annex 2

3. Noise Pollution	• Use of appropriate mounting for machinery to minimize vibration • All mechanical/electrical equipment shall be installed inside enclosures • If appropriate, motors shall be provided with soundproofing devices • Maintenance of greenbelt zones and vegetation with appropriate tree species	Manila Water Company	Observance shall be done daily.
4. Solid Waste (generated within the facility and by the facility)	• Solid waste generated within the STP facility will be minimal but provision will be made for garbage collection • Disposal of sludge generated will be in accordance with established procedures of relevant authorities (disposal of sludge for use as soil conditioner)	Manila Water Company	Weekly
5. Odors (organic and sulfur compounds coming from raw wastewater and during desludging of septage)	• Maintenance of greenbelt zones and vegetation with appropriate tree species • Provision of landscape which will improve the aesthetic of the area by planting green strips using appropriate plant or tree species • Provision of odor control mechanisms (deodorizer/adsorbent/masking agent) to prevent malodorous emissions)	Manila Water Company	This shall be inspected daily.
6, Maintenance and Operation of the System • Poor maintenance of mechanical equipment (pumps and motors)	• Regular asset condition monitoring by Manila Water Company personnel • Regular maintenance works for STP equipment (pumps and motors), sewer network and septic tanks • Adequate training of STP operators • A liaison officer from the Community will assist the STP operator in assuring the facility's efficiency in operation • Provision of adequate maintenance equipment and spares for the sewerage system facility	Manila Water Company	This shall be done daily.

5.2 ENVIRONMENTAL MONITORING ACTION PLAN

Tables 11 and 12 below present the action plan for environmental monitoring for the proposed project. Manila Water Company will be responsible for the monitoring of the STP, the sewer network, and communal septic tanks.

Table 11
Environmental Monitoring Action Plan

Parameter	Location	Frequency
Construction Phase		
Compliance with Manila Water Company health and safety policies (dust emissions, good housekeeping, noise, odors)	• At STP site and its perimeter • Pipe laying area • Equipment and materials storage area	• On-the-spot daily inspection and monitoring will be implemented by the Health and Safety Dept. and/or the Site Manager of Manila Water Company using the STARRT Card (Annex 1)
Traffic	• Ingress and egress to the construction site	• Daily
Operational Phase		
Effluent Water Quality for parameters like pH, 5-day BOD, COD, Total coliform, suspended solids, and oil and grease.	• Influent • Effluent/Discharge Point	◆ Annex 2 describes in detail the schedule of wastewater quality monitoring.
Odor	• STP site and perimeter	• Daily
Sludge accumulation/Clogging	• At STP site • Sewer network • Communal septic tanks	• Weekly

Table 12
Institutional Monitoring

Item	Reporting Scheme		
	Reporter	Recipient	Frequency
Pre-Construction Phase			
Confined Space Permit	Contractor	Manila Water	every entry into a confined space
Welding Accreditation	Contractor	Manila Water	once
Construction Phase			
STARRT Card	Contractor	Manila Water	daily
Progress Report	Manila Water	MWSS	quarterly
	MWSS	World Bank	
Operation Phase			
PCO Report (See Annex 4 for the PCO Report Format)	Manila Water PCO	DENR/LLDA MWSS	quarterly

The procedures to be used during the sampling and analysis will be based on the standard methods prescribed in DENR Administrative Order No. 34 and 35. Annex 5 presents a sample-monitoring sheet of effluent quality used by Manila Water Company.

6.0 COMMUNITY CONSULTATION PROCESS

The development of the project included a community consultation process, which followed the procedures listed below:

1. Endorsements were obtained for the project from the Makati City Mayor (Annex 6), the Barangay Captain (Annex 7), and the Home Guaranty Corporation (HGC), which owns and maintains the common areas in Makati BLISS (Annex 8).

2. The project was explained to the leaders of the Homeowners' Association in Makati BLISS in their meetings. The Association requested the Project Development Officers (PDOs) to do an educational campaign to educate their members on the benefits of the project.

3. The PDOs did a series of meetings with the community members. These meetings were done either per building, or per unit. At the end of each meeting, the PDOs requested the attendees/unit owners to vote on the project. Those who agreed to the project signed a letter of agreement. Annex 9 presents signed letters of agreement.

4. Based on the individual letters of agreement signed by the residents, majority (~60%) of the community agrees to the project. A Memorandum of Agreement (MOA) among Manila Water Company, HGC, and the Homeowners' Association is currently being processed. The MOA specifies the responsibility of each of the parties (see Annex 10).

ANNEX 1

ANNEX 1. MANILA WATER COMPANY STARRT CARD FOR MONITORING CONSTRUCTION WORKS

SAFETY TASK ANALYSIS RISK REDUCTION TALK (STARRT) CARD

NAME OF CONTRACTOR : _____ DATE: _ _ _ _

SUPERVISOR/FOREMAN : _____

JOB DESCRIPTION : _____ NIGHT ☐

LOCATION : _____ DAY ☐

TODAY ACTIVITIES: _____

_____

PRIMARY HAZARDS INVOLVED: _____

SAFETY PRECAUTIONS TAKEN:

PUBLIC SAFETY			
BARRICADES	N/A	YES	NO
TRENCH PLATE	N/A	YES	NO
SIGNS	N/A	YES	NO
BARRIERS	N/A	YES	NO
FLASHERS	N/A	YES	NO
GUARDS	N/A	YES	NO
NOTICES	N/A	YES	NO
OTHER	N/A	YES	NO
HAZARDS (BODY)			
FALL POTENTIAL	N/A	YES	NO
PINCH POINTS	N/A	YES	NO
ELECTRICAL SHOCK	N/A	YES	NO
SLIP-TRIP	N/A	YES	NO
FLYING PARTICLES	N/A	YES	NO
THERMAL BURNS	N/A	YES	NO
MANUAL LIFTING	N/A	YES	NO
SHARP OBJECT	N/A	YES	NO
HOUSEKEEPING			
AREA TIDY		YES	NO
FREE OF WASTE		YES	NO
PPE			
HARD HAT		YES	NO
SAFETY GLASSES		YES	NO
WORK GLOVES		YES	NO
SAFETY BOOTS		YES	NO
CHEMICAL GLOVES	N/A	YES	NO
RUBBER BOOTS	N/A	YES	NO
MONO GOGGLES	N/A	YES	NO
FOOT GUARDS	N/A	YES	NO
EXCAVATION			
EXCAVATION PERMIT		YES	NO
DAILY INSPECTION		YES	NO
BENCHED/SLOPED/STEPPED		YES	NO
LADDER PROVIDED		YES	NO
SIGNS & BARRICADES IN PLACE		YES	NO
ELECTRICAL			
CORDS IN GOOD CONDITION	N/A	YES	NO
PLUGS & RECEPTORS NOT - BROKEN	N/A	YES	NO
CORRECT VOLTAGE RATING	N/A	YES	NO
STRUNG ABOVE GROUND	N/A	YES	NO
NOT THROUGH WATER	N/A	YES	NO

HAZARDS (ENVIRONMENTAL)			
NOISE	N/A	YES	NO
HEAT STRESS	N/A	YES	NO
GROUND CONTAMINATION	N/A	YES	NO
WORKING AT HEIGHT			
FULL BODY HARNESS		YES	NO
SHOCK ABSORBING LANYARD		YES	NO
ACCESS LADDERS		YES	NO
TIE OFF POINTS	N/A	YES	NO
HORIZONTAL SAFETY LINE	N/A	YES	NO
ENERTIA REAL	N/A	YES	NO
SLIP GRIPS	N/A	YES	NO
SAFETY NETS	N/A	YES	NO
MAN BASKETS	N/A	YES	NO
SUSPENDED PLATFORM	N/A	YES	NO
DROP AREA PROTECTION	N/A	YES	NO
BARRICADES	N/A	YES	NO
SCAFFOLD			
GREEN TAG UP TO DATE	N/A	YES	NO
HANDRAILS, LADDERS, BOARDS	N/A	YES	NO
FULL WIDTH PLANKING	N/A	YES	NO
ALL PLANKS IN GOOD CONDITION	N/A	YES	NO
CONFINED SPACE			
CONFINED SPACE PERMIT ISSUED		YES	NO
CONFINED SPACE STANDBY PERSON		YES	NO
ATMOSPHERE TESTED		YES	NO
WORKERS TOLD OF HAZARDS		YES	NO
ENTRY PERMIT COMPLETED		YES	NO
WELDING			
HOT WORK PERMIT		YES	NO
FIRE WATCH MAN		YES	NO
FIRE EXTINGUISHERS		YES	NO
FIRE BLANKET		YES	NO
SHIELDS	N/A	YES	NO
CYLINDERS SECURED...			
... & MOVED FROM SPARK AREA	N/A	YES	NO
SPARKS CONTAINED	N/A	YES	NO
COMBUSTIBLES CLEARED	N/A	YES	NO
FACE SHIELD	N/A	YES	NO
BURNING GOGGLES	N/A	YES	NO
FRESH AIR	N/A	YES	NO
RESPIRATOR	N/A	YES	NO
EAR PROTECTION	N/A	YES	NO
SAFETY HARNESS	N/A	YES	NO
OTHERS: _ _ _ _ _ _ _ _ _ _ _ _ _ _			

LIFTING			
RIGGING IN GOOD CONDITION		YES	NO
PROPER RIGGING		YES	NO
LIFTING ZONE BARRICADED		YES	NO
CURRENT INSPECTION ON CRANE		YES	NO
OVERHEAD POWER		YES	NO
LINES CLEARANCE (10'+)		YES	NO
OVERHEAD WORK OR FLOOR OPENING			
FIXED BARRICADES		YES	NO
(TAPE) DANGER	N/A	YES	NO
(TAPE) CAUTION	N/A	YES	NO
BARRIERS	N/A	YES	NO
SIGNS	N/A	YES	NO
TRENCH & HOLE COVER IN PLACE	N/A	YES	NO
HANDRAILS/TOEBOARD	N/A	YES	NO

EMERGENCY EQUIPMENT			
FIRE EXTINGUISHER	N/A	YES	NO
SAFETY SHOWER	N/A	YES	NO
EYEWASH	N/A	YES	NO
REPAIR PROCESS EQUIPMENT			
VALVES LOCKED	N/A	YES	NO
TAGS HUNG	N/A	YES	NO
PROPER EQUIPMENT			
MANLIFT	N/A	YES	NO
FORKLIFT	N/A	YES	NO
TRUCKS, TRACTOR ETC.	N/A	YES	NO
HAND TOOLS	N/A	YES	NO
HAND POWER TOOLS	N/A	YES	NO
GENERAL			
TRAFFIC WATCH	N/A	YES	NO
PERMIT & STARRT CARD DISPLAYED	N/A	YES	NO

REMARKS:

SUPERVISOR: _____ SIGNATURE: _____

FOREMAN: _____ SIGNATURE: _____

	EMPLOYEE NAME:	ID #	EMPLOYEE SIGNATURE:
1			
2			
3			
4			
5			
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8			
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11			
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14			
15			

ANNEX 2

ANNEX 2. WASTEWATER QUALITY MONITORING SCHEDULE

Parameters	Sample Identity	Frequency	Agency	Total Costs for Manila Water (PhP/month)
				TOT=46,961.00
pH Suspended solids Dissolved Oxygen BOD_5 COD Oil & grease Residual Chlorine Total Coliform Fecal Coliform	Influent, effluent	quarterly	DENR	14,696.00
		monthly	MWSS Regulatory Office	
		weekly	Manila Water	
30-Minute settling test	Sample from Aeration tank	daily	Manila Water	25,080.00
COD	effluent			
Residual Chlorine	effluent			
Dissolved oxygen Sludge Volume Index Settleable Matter Suspended Solids Total Solids	Return activated sludge, Mixed liquor tanks	weekly	Manila Water	2,640.00
pH Suspended solids Cyanide Cadmium Chromium Copper Iron Manganese Lead Zinc	Raw sludge, Digested sludge	monthly	Manila Water	4,545.00

ANNEX 3

ANNEX 3 .ENVIRONMENTAL COMPLIANCE CERTIFICATE (ECC)

Republic of the Philippines
Department of Environment and Natural Resources
NATIONAL CAPITAL REGION

NCR-2000-10-04 0221 120
2008-212-MK-120

ENVIRONMENTAL COMPLIANCE CERTIFICATE

DENR-NCR hereby grants **Environmental Compliance Certificate (ECC)** for the construction and operation of the **Sewage Treatment Plant** project of **Manila Water Compay Inc. (MWCI)** located in Makati BLISS, Davila Street, Bgy. Sta. Cruz, Makati City after complying with the Environmental Impact Statement (EIS) system requirements as prescribed in the guidelines of the implementing Rules and Regulations of Presidential Decree 1586

This Certificate is issued suoject to the following conditions.

I. PRE-CONSTRUCTION AND CONSTRUCTION STAGE:

1. That all amenities/utilities (e.g. recreational areas, parking areas, drainage lines, paved areas, etc.) affected by the project shall be immediately restored and rehabilitated;

2. That the proponent shall conduct orientation for resident engineers and contractor who will undertake and implement the project to apprise them of the conditions/stipulations of this ECC and the necessary measures that will mitigate adverse environmental impacts and submit report within fifteen (15) days from date of orientation;

3. That a billboard measuring 0.5 meter by 1.0 meter bearing "**NCR-2000-10-04-0221-120 issued pursuant to P.D. 1586**" shall be displayed in a conspicuous location at the project site for identification and guidance;

II. OPERATION STAGE:

4. That this Certificate covers the operation of a 215 cu.m. per day capacity, below ground mounted Sewage Treatment Plant to exclusively serve the existing buildings of Makati BLISS;

5. That adequate maintenance procedures shall be undertaken to avoid emission of objectionable odor from said facility;

II. OTHERS

6. That all the proposed environmental management measures contained in the Environmental Management Plan shall be effected;

7 That should adverse impacts occur as a result of project operations, all the activities causing the same shall be immediately stopped and remedial measures shall be effected and all damages to life and property shall be properly compensated to all aggrieved parties;

Manila Water Company Inc
NCR-2000-IC 64-0221-120
2008-212-MK 120

8. That in case of abandonment or indefinite work stoppage, the project proponent shall submit a written notification thirty (30) days before the scheduled abandonment/work stoppage and to restore the site to its original condition or provide safety and protective measures to prevent adverse environmental impacts that may be caused by the project.

9 That restoration works/grading of the exposed grounds shall be immediately undertaken for safety , enhancement and ecological purposes.

10 That this Certificate shall be posted in a conspicuous place in the Administration's Office for easy reference and guidance;

11. That the proposed Environmental Monitoring Program must be implemented, the report and/or result under oath of said monitoring and on the compliance with each of the conditions of the ECC shall be submitted to this Office annually ;

12 That a written notification shall be made to the DENR-NCR for approval, in case the project proponent cannot comply with any of the conditions for technical reasons, and

13 That the project proponent shall allow DENR-NCR personnel with proper identification card and travel/mission order to conduct inspection/monitoring of the project without prior notice to oversee compliance to ECC conditions.

Non-compliance with any of the above stipulations and/or misrepresentations in the IEE submitted by the proponent will be sufficient cause for the suspension or cancellation of this Certificate and/or imposition of a fine in an amount not to exceed **Fifty Thousand Pesos (P50,000.00) for every violation** thereof pursuant to Article IX, Section 6.0. DENR Administrative Order No 37 Series of 1996 This ECC is not a permit rather it is a certification that the proponent has committed to undertake or implement mitigation measures to reduce the negative impacts to acceptable level.

Given this _____ day of _____2000.

CORAZON C. DAVIS
OIC. Regional Executive Director

Recommending Approval:

SIXTO E. TOLENTINO,JR.
Regional Director for Environment

ANNEX 4

ANNEX 4. MANILA WATER PCO REPORT FORMAT

Pollution Control Officer's Report

Period Covered: ___ Quarter of 200_

General Information

Name of Firm: MANILA WATER COMPANY

Plant Address:

Nature of Business: Utility

Plant Category: 1. **Air Pollutive** 2. **Water Pollutive** 3. **Air & Water Pollutive**

NOTE: Sections To Be Filled-up. For Category1, Sections A & C; For Category 2, Sections B & C
And For Category 3, Sections A, B & C.

A. Air Pollution Aspect

A.1. Process Equipment

* 1	2	3	4	5	6	7	8
Air Pollution Source Installations	Hrs. per Qtr.	Material Processed	Air Pollution Control Facilities	Hrs. per Qtr.	Air Pollutants Monitored	Cont. of Air Cont.	Disposal of Collected Solid Wastes

1 – Name of Air Pollution Installations

2 – Number of Hours of Operation of the Installations During the Quarter

3 – Name of Materials Processed by the Source Installations

4 – Name of the Pollution Control Device of the Installations

5 – Number of Hours of Operation of the Devices During the Quarter

6 – Name of Air Contaminants Monitored

7 – Concentration of Air Contaminants Emitted by the Installations

8 – Name the Collected Solid Wastes and Means of Disposal

A.2. Fuel Burning

* 1	2	3	4	5	6	7	8
Air Pollution Source Installations	Hrs. per Qtr.	Material Processed	Air Pollution Control Facilities	Hrs. per Qtr.	Air Pollutants Monitored	Cont. of Air Cont.	Disposal of Collected Solid Wastes

1 – Name of Air Pollution Installations

2 – Number of Hours of Operation of the Installation During the Quarter

3 – Name of Materials Processed by the Source Installations

4 – Name of the Pollution Control Device of the Installations

5 – Number of Hours of Operation of the Devices During the Quarter

6 – Name of Air Contaminants by the Installations

7 - Concentration of Air Contaminants Emitted by the Installations

8 – Name the Collected Solid Wastes and Means of Disposal

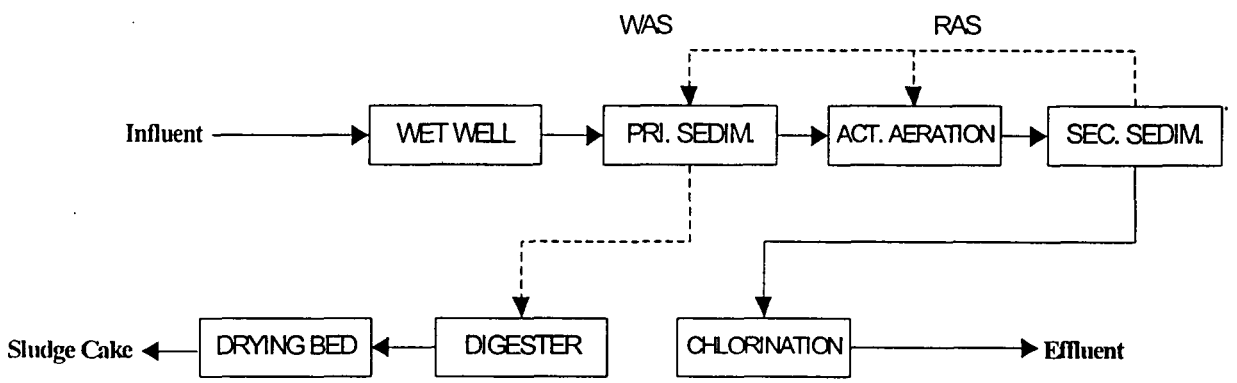
B.1. Sources of Wastewater

Sources	Quantity
1. **Domestic**	**19,820 m^3 / day**
2. **Process**	**200.0 m^3 / day**
3. **Cooling**	**m^3 / day**
4. **Washings: Equipment**	**2.6 m^3 / day**
Floor	**2.0 m^3 / day**

B.2. Wastewater Treatment Process

- **Treatment Scheme**

Indicate wastewater flow directions and rates and the different units involved in the process.



- **Design Capacity of the Wastewater Treatment Facilities** _____m^3 / day

- **Operation of the Treatment Facilities:**

Average Hours/Day	24
Number of Days During the Quarter	92

- **Sludge Management :**

Quantity Produce: _____ m^3 / day

Method Used for Sludge Thickening _____
Method Used for Sludge Treatment _____
Method Used for Sludge Disposal _____
Frequency of Disposal _____

B.3. Wastewater Characteristics

Attach results of the monthly physical and chemical laboratory analysis on the WTP effluent.

Physical & Chemical Analysis include the following:

Parameters	Results
Color	Color Units
Temperature	°C
pH	
Suspended Solids	mg/L
BOD_5	mg/L
Oil/Grease	mg/L

C. Maintenance & Repairs Works *(Indicate any breakdown on the air & water pollution installations problems encountered in the operation; repair & maintenance works undertaken & improvements made on the control devices.)*

Submitted by:

Attested by:

_____
Pollution Control Officer

ANTONINO T. AQUINO
President

Quality and Regulation
Laboratory Services
Analytical Services

RESULT OF ANALYSIS

AC-01-03-012
AT-01-03-013

Source of Sample :
Submitted by :
Collected by :
Date/Time Collected :
Date/ Time Submitted :
Analyzed by : Analytical Services Personnel

PARAMETER(S)		LIMIT(S)	RESULT(S)	
			INFLUENT	EFFLUENT
Color	TCU	150.00		
Turbidity	NTU	-		
Settleable Matter	mL/L	0.50		
Suspended Solids, 103°C	mg/L	70.00		
Dissolved Solids , 180°C	mg/L	-		
PH		6.50-9.00		
Dissolved Oxygen (DO)	mg/L	-		
Biochemical Oxygen Demand $(BOD)_5$	mg/L	50.00		
Chemical Oxygen Demand	mg/L	100.00		
Surfactants (MBAS)	mg/L	5.00		
Oil and Grease	mg/L	5.00		
Phenols	mg/L	0.10		
Cadmium	mg/L	0.05		
Chromium (Cr^{+6})	mg/L	0.10		
Copper	mg/L	-		
Cyanide*	mg/L	0.20		
Iron	mg/L	-		
Lead	mg/L	0.30		
Manganese	mg/L	-		
Zinc	mg/L	-		
Residual Chlorine	mg/L	-		
BACTERIOLOGICAL EXAMINATION				
Total Coliform	MPN/100 ml	10,000		
Fecal Coliform	MPN/100 ml	-		

Sample analyzed as submitted   eur-equipment under repair   * Analyzed qualitatively

Certified Correct : *Orig. Sgd.*
ELIZABETH P. SEVILLENO
Sr. Quality & Regulation Officer

Date Test Report Issued :

ANNEX 5

ANNEX 5. SAMPLE MONITORING SHEET FOR EFFLUENT QUALITY

Quality and Regulation
Laboratory Services
Analytical Services

Ctrl. # : LE-00-06-004

RESULT OF ANALYSIS

Source of Sample :
Submitted by :
Collected by :
Date/Time Collected :
Date/ Time Submitted :
Date Analyzed :
Analyzed by : Analytical Services Personnel
Analytical Methods Used : [1]Electrometric, [2]Cobalt-Platinum Scale, [3]Gravimetric, [4]Azide Modification, [5]Open Reflux Dichromate, [6]Multiple Tube Fermentation Technique

PARAMETER(S)		LIMIT(S)	RESULT(S)
pH [1]	Units	6.50-9.00	
Color [2]	TCU	150.00	
Suspended Solids[3]	mg/L	70.00	
Dissolved Oxygen[4]	mg/L	-	
Biochemical Oxygen Demand [4]$(BOD)_5$	mg/L	50.00	
Chemical Oxygen Demand[5]	mg/L	100.00	
BACTERIOLOGICAL EXAMINATION[6]			
Total Coliform	MPN/100 mL	10,000	
Fecal Coliform	MPN/100mL	-	

REMARKS : Sample analyzed as submitted

Submitted by:

Original Signed
MA VIRGINIA B. PINEDA
Sr. Analyst

Certified Correct :

Original Signed
ELIZABETH P. SEVILLENO
Unit Head, Analytical Services

Date Test Report Issued :

ANNEX 6

ANNEX 6. ENDORSEMENT FROM THE MAYOR OF MAKATI CITY

LUNGSOD NG MAKATI
PILIPINAS

TANGGAPAN NG PUNONG LUNGSOD

July 26, 2000

MR. ARTHUR S. GARCIA
Director, DENR-NCR

Dear Mr. Garcia:

As the sole provider of sewerage services in the Eastern part of Metro Manila, Manila Water Company will undertake projects that will improve the sewerage and sanitation system for certain residential households in Makati City, namely the BLISS Housing Projects. MWC will assume responsibility of operating, maintaining and improving the existing sewerage system of these communities.

For that reason, the City of Makati gives its support and permission to Manila Water Company to undertake their projects for the preservation of the environment and the protection of the health of the residents.

Very truly yours,

ELENITA S. BINAY
City Mayor

MAKATI . . . . MAHALIN NATIN . . . . ATIN ITO.

ANNEX 7

ANNEX 7. ENDORSEM ENT FROM THE BARANGAY CAPTAIN

Republic of the Philippines
CITY OF MAKATI
BARANGAY STA. CRUZ
OFFICE OF THE BARANGAY COUNCIL

May 26, 2000

THE MAKATI BLISS
HOMEOWNERS' ASSOCIATION
Makati BLISS, Davila Street,
Barangay Sta. Cruz, Makati City

As the sole provider of sewerage services in the Eastern part of Metro Manila, Manila Water Company will undertake projects that will improve the sewerage and sanitation system in Makati City, more specifically the Makati BLISS Homes. For the preservation of the environment and protection of the health of the residents of this community, I, **Severino Victorino**, give my all-out support and permission to this undertaking. With the community's cooperation, ***MWC will assume the responsibility of operating, maintaining and improving the existing sewerage system of Makati BLISS.***

In recognition of the impact of this project in reducing the pollution load to the Pasig River as well as its advantages to the community, I hereby give my favorable endorsement for the said project.

Respectfully yours,

SEVERINO O. VICTORINO
Punong Barangay

ANNEX 8

ANNEX 8. ENDORSEM ENT FROM THE HOME GUARANTY CORPORATION (HGC)

Republic of the Philippines
HOME INSURANCE AND GUARANTY CORPORATION

September 14, 2000

BLISS Homeowners and Residents
Makati BLISS
Makati City, Metro Manila

Attention: BLISS Homeowners' Association

Dear Homeowners and Residents:

With the pollution of Pasig River, Manila Bay, and Laguna Lake, it is now incumbent on our part to do our own share in improving the conditions of our waters. Since a significant portion of the pollution load in these waters comes from wastewater from households (i.e. water that has been used in the toilets, kitchen, etc.), we enjoin you to participate in the upgrade of the wastewater system in your area.

As the sole provider of wastewater services in the Eastern part of Metro Manila, Manila Water Company will upgrade the sewerage and sanitation systems in Makati BLISS. Specifically, Manila Water will construct an underground wastewater treatment plant that will collect and treat wastewater from households. The treated wastewater that will come out from the treatment plant will be environmental-friendly and will meet the standards of the DENR. The system proposed by Manila Water will eliminate the need for you to maintain your communal septic tanks and the pipes that collect wastewater from the buildings. The whole wastewater system will be operated and managed by trained personnel of Manila Water.

We at the Home Guaranty Corporation believe that a proper wastewater system is essential to the preservation of our waters and of the health of our communities. Let us work together for these worthwhile objectives!

Very truly yours,

WILFREDO HERNANDEZ
President
Home Guaranty Corporation

349 Sen. Gil J. Puyat Avenue
Makati, Metro Manila

Tel. Nos. 895-60-11 to 18
897-32-29 to 35

ANNEX 9

ANNEX 9. LETTERS OF AGREEMENT BY INDIVIDUAL UNIT OWNERS

LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of Makati **BLISS**, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System (MWSS).

We the undersigned, constituting the unit owners and/or leases of the units in of Building 1 hereby give our conformity to the project of Manila Water Company.

	Present Occupant	*Unit #*	*Signature*	*Date*
1	JOJO VILLANUEVA	1301	[illegible]	[illegible]
2	RAFFY VIERA	1302	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible] ROSALES	1201	[illegible]	[illegible]
6	[illegible]	1305	[illegible]	[illegible]
7	MARINA BALMONTE	1104	[illegible]	[illegible]
8	MIA [illegible]	1103	[illegible]	[illegible]
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LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of Makati **BLISS**, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System (MWSS).

We the undersigned, constituting the unit owners and/or leases of the units in of **Building 2** hereby give our conformity to the project of Manila Water Company.

	Present Occupant	*Unit #*	*Signature*	*Date*
1		2401		
2	~~[illegible]~~ George Flores	2402	[signature]	March 11, 2001
3	Liana P. Victorino	2403	L. P. Victorino	March 11
4	Cyrian Michael Regalado	2404	[signature]	"
5		2405		March 11, 2001
6	Elmer B. Yritus	2301	[signature]	"
7	Noel E. Yu	2302	[signature]	March 11, 2001
8	Edna P. Vizconde	2303	[signature]	March 11, 2001
9		2304		
10		2305		
11	Cirleen M. Cordova	2201	[signature]	March 11, 2001
12	M. R. Villaberri	2202	[signature]	3/11/2001
13	Jake Yuzon	2203	[signature] Yuzon	3/11/2001
14	Thelma Y. Paloma	2204	[signature]	3/11/01
15	RENATO A. TURA	2205	[signature]	03/11/01
16	NATIVIDAD A. EVARISTO	2101	N. A. Evaristo	3/11/01
17		2102		
18	Ramon Villacorta	2103	[signature] Villacorta	3/11/01
19		2104		
20		2105		

LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of **Makati BLISS**, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System (MWSS).

We the undersigned, constituting the unit owners and/or leases of the units in **Building 3** hereby give our conformity to the project of Manila Water Company.

	Present Occupant	*Unit #*	*Signature*	*Date*
1	Eli S. Asence	3102	[signature]	2-20-01
2	B. Akufesta	3101	[signature]	2-20-01
3	Elmer Castaño	3402	[signature]	2-20-01
4	Rules J. Velazquez	3404	[signature]	2-20-01
5	Jean Del Rosario	3405	[signature]	2-20-01
6	Wendy P. Narita	3303	[signature]	2-20-01
7	Honest Service Providers	3105	[signature]	2/21/01
8	Virginia Alasa	3205	[signature]	2/21/01
9	Mila San Buenaventura	3403	[signature]	2/21/01
10	Rosito Presentacion	3203	[signature]	2/21/01
11	Rogelio S. Adina	3204	[signature]	2/21/01
12	Annabelle B. Reyes	3202	[signature]	02-26-01
13	Florante M. Martinez	3103	[signature]	2/26/01
14	Lilibe			
15	Amiko Jomimah Q. Villaroza	3302	[signature]	3/1/01
16	Annabelle Tongohan	3305	[signature]	3/1/01
17	Milagros E. Malalad	3301	[signature]	3-26-01
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LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of Makati **BLISS**, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System (MWSS).

We the undersigned, constituting the unit owners and/or leases of the units in of **Building 4** hereby give our conformity to the project of Manila Water Company.

	Present Occupant	*Unit #*	*Signature*	*Date*
1	Natata Carillo	4102	[illegible]	3/1/01
2	Evelyn A. Abitria	4402	E. Abitria	2/26/01
3	PRUDENCIA HADRAZO	4403	[illegible]	2/26/01
4	CARLITO C. MANGCALABHAL	UNIT 4	[illegible]	2/20/01
5	Adoracion Valiaceon	4401	[illegible]	2/20/2001
6	Juanito A. Zacarias	4304	[illegible]	2/20/01
7	Milagros Cruz	4105	[illegible]	2/20/2001
8	[illegible]	4201	[illegible]	2/20/2001
9	Rafael Verano	4305	[illegible]	2/20/2001
10	Elizabeth Talion	4205	[illegible]	2/20/2001
11	Marilyn V. Diaz	4102	[illegible]	2/26/2001
12	[illegible]	4202	[illegible]	2/26/01
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LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of **Makati BLISS**, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System.

We the undersigned, constituting the unit owners and/or leases of the units in of **Building 5** hereby give our conformity to the project of Manila Water Company.

	Present Occupant	*Unit #*	*Signature*	*Date*
1	Jun Pasumbal	5202		3-1-2001
2	INGERSOL ZARATE	5401		3/1/2001
3	Pablo Campomanes	5104		3/1/2001
4	Erlinda Antonio	5105		3/1/2001
5	Lilibeth Antonio	5103		3/6/2001
6	VOLTAIRE QUEVEDO	5301		3/14/01
7	VIRGILIO DIMACULANGAN	5204		4/26/01
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LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of Makati BLISS, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System.

We the undersigned, constituting all the unit owners and/or leases of the units in of the **Second Floor of Building 6** hereby give our conformity to the project of Manila Water Company.

	Present Occupant	Unit #	Signature	Date
1	MR. PROCESO PACHECO	6205	[signature]	02-27-01
2	VIRGINIA R. RODRIGUEZ	6207	[signature]	02-27-01
3	DUNIA I. DASMARIÑAS	6208	[signature]	02-27-01
4	[illegible] SILLA	6203	[signature]	02-28-01
5	URSO J ADONAS	6210	[signature]	03/1/01
6	BIENVENIDO ATUTUBO	6204	[signature]	03/1/2001
7	MRS. MARIBETH BALBOA	6218	[signature]	03/1/01
8	[illegible]	6202	[signature]	3-13-01
9	MERLIN L. [illegible]	6216	[signature]	3-13-01
10	LILIA SAAVEDRA	6217	[signature]	3-13-2001
11	EMMA D. GOSOBAN	6201	[signature]	3-13-2001
12	Ma Remedios Gapandan	6211	[signature]	3-13-2001
13	MELANIE [illegible]	6218	[signature]	3-14-2001
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LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of **Makati BLISS**, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System.

We the undersigned, constituting all the unit owners and/or leases of the units in of the **Third Floor of Building 6** hereby give our conformity to the project of Manila Water Company.

	Present Occupant	*Unit #*	*Signature*	*Date*
1	Lydia Ch. Guillen	6316	[illegible]	2-27-01
2	Chitty Cuyugan	6301	[illegible]	2-27-01
3	LARRY B. OSO	6302	[illegible]	2-27-01
4	MA. CONCEPCION LISING	[illegible]	[illegible]	3-01-01
5		6314		
6	CONCHITA AMBAY	6306	[illegible]	3-01-01
7	[illegible]	6308	[illegible]	3-01-01
8	[illegible]	6311	[illegible]	3-14-01
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LETTER OF AGREEMENT

To whom it may concern:

The existing sewerage system in Metro Manila primarily uses individual septic tanks as wastewater treatment before discharging effluent to our waterways. This system promotes health and environmental hazards that should be addressed without delay. To provide improved sewerage services to the Eastern part of Metro Manila, Manila Water Company, Inc. will coordinate with various communities/developers for the turnover and upgrade of the existing sewerage systems.

As part of this undertaking, Manila Water Company proposes to improve the sewerage system of **Makati BLISS**, Barangay Sta. Cruz, Makati City. In particular, the company will be responsible for the operation, maintenance and upgrade of the existing sewerage system upon turnover. Manila Water Company Inc. will rehabilitate sewer lines and put up a package sewage treatment plant in the compound at their expense. For the operation and maintenance of the system, Manila Water Company will collect sewer charge accordingly with rates allowed by Concession Agreement with Metropolitan Waterworks and Sewerage System.

We the undersigned, constituting all the unit owners and/or leases of the units in of the **Fourth Floor of Building 6** hereby give our conformity to the project of Manila Water Company.

	Prosont Occupant	*Unit #*	*Signature*	*Date*
1	EDNA J. PARRENO	6407	[signature]	02-27-01
2	VIRGILIO B. DULTON	6409	[signature]	02-27-01
3	[illegible]	6401	[signature]	3-13-01
4	[illegible]	6405	[signature]	2-13-2001
5	Jimmy PARDILLET	6412	[signature]	3-13-01
6	DANILO Y. FLORIDA	6413	[signature]	3-8-01
7	Imelito Diego	6417	[signature]	2-9-01
8	ALWIN GREGG AGAMATA	6416	[signature]	
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MINUTES OF THE MEETING

The meeting of Makati Bliss I Car Owners BOARD held on Sunday, November 5, 2000 at 7:45pm, at the BLCA/Computer Room Bldg. 6. Mr. Manolo Prado being in the chair.

PRESENT: Phillip Camacho, Jimmy David, Rolly Refrea, Vangie Valdez, Cora David, Manolo Prado, Peter Gullen, Peping Mangulabnan, Florante Martinez, Romeo Diego, Sonia Flores, Evangeline Matibag and Ben Velasco.

I. Ms. Evangeline Matibag and Mr. Ben Velasco of Manila Water Co. Inc., presented to the BLCA Board the proposed package sewer treatment for entire Makati Bliss I.

The package is that Manila Water Company Inc., being the exclusive provider of sewerage is proposing to take over the operation and maintenance of the sewer systems of MAKATI BLISS. As operator, Manila Water Co. Inc., shall be responsible for ensuring that the wastewater effluent coming from the Makati Bliss sewerage system shall comply with all national and local environmental laws and standards. Currently, wastewater from the Makati Bliss sewerage system is directly discharged to the street drainage without undergoing the DENR-required treatment processes. To ensure compliance with DENR standards, Manila Water Co. Inc., will assume the responsibility for the addition, modification and/or improvement of parts, equipment, and civil works used in or related to the proper and efficient functioning of the sewerage system. The project will include the construction of an underground sewerage treatment plant (STP) which will treat the discharge from each of the communal septic tanks in Makati Bliss. Manila Water Co. Inc., assume all costs related to this responsibility, including all manpower, electrical and mechanical operation maintenance. For the operation and maintenance of the system, Manila Water will add a sewer charge roughly equivalent, but will not exceed 50% of the water bill of each Bliss unit owners.

Everybody was in favor of the project. Mr. Manolo Prado requested the Manila Water Co. Inc. representatives to provide the Board the proper documentation of the said project before doing the proposed per Bldg. meeting. It was agreed that the MWCI will provide the requirements and willing to meet each unit owners to discuss the project, if ever agreed, to let them sign as means of formal agreement.

II. The proposed guidelines to be followed inside the parking area of Makati Bliss along Davila and Vito Cruz Ext. Streets were approved but with some changes.

No. 2: For authentication, interested beneficiaries should submit their car registration (only one) to their Bldg. Administrators and forward to Mr. Romeo Diego, Chairman Committee in charge of parking areas.

ANNEX 10

ANNEX 10. MEMORANDUM OF AGREEMENT (MOA) AMONG HGC, MANILA WATER COMPANY, AND THE INDIVIDUAL ASSOCIATIONS IN MAKATI BLISS

MEMORANDUM OF AGREEMENT
For the Transfer of Operation and Maintenance of the Sewerage System of Makati Bliss, Makati City to the Manila Water Company, Inc. and the construction of a Sewage Treatment Plant (STP) Inside the Project Area

KNOW ALL MEN BY THESE PRESENTS:

This Memorandum of Agreement (the "Agreement"), made and entered into this ___day of _____ 2001, at Makati City, Metro Manila, by and between:

MANILA WATER COMPANY, INC., hereinafter referred to as "MWCI", a corporation duly organized and existing under Philippine laws, acting as concessionaire/contractor/agent of the Metropolitan Waterworks and Sewerage System (the "MWSS") with principal office address at MWSS Administration Building 489 Katipunan Road, Balara, Quezon City, represented herein by its President, Mr. Antonino T. Aquino, thereunto duly authorized;

-and-

HOME GUARANTY CORPORATION, formerly Home Insurance and Guaranty Corporation hereinafter referred to as "HGC" , a government owned and controlled corporation duly organized and existing under and by virtue of Republic Act No. 8763, with principal office address at Morning Star Building, 347 Sen. Gil J. Puyat Avenue, Makati City, represented herein by its President, Hon. Wilfredo F. Hernandez thereunto duly authorized;

-and-

MAKATI BAGONG LIPUNAN COMMUNITY ASSOCIATION, INC. hereinafter referred to as "Makati BLCA", a duly registered corporation with the HGC pursuant with Section 2(a) of Executive Order No. 535, with address at Davila St., Barangay Sta. Cruz, Makati City, represented herein by its President, Mr. Emmanuel Prado, thereunto duly authorized;

WITNESSETH THAT –

WHEREAS, under its Charter (Republic Act No. 6234, as amended), the MWSS has jurisdiction, supervision and control over all waterworks and sewerage systems within its franchise which includes, among others, Makati City;

WHEREAS, by virtue of and pursuant to a Concession Agreement dated February 21, 1997 (the "Concession Agreement") executed by and between the MWSS and MWCI, MWSS granted to MWCI, as concessionaire/contractor/agent, the sole right to manage, operate and maintain all fixed and movable assets required to provide water delivery and sewerage services in the East Service Area (which includes Makati City) of the franchise area of MWSS;

WHEREAS, HGC owns and holds title to the common areas in the Makati Bliss Project ("Makati Bliss"), consisting of areas which include the septic vaults and sewer lines from each building to the septic vaults (the "Sewerage System") located within the compound of the Makati Bliss, Davila St., Brgy. Sta Cruz, Makati City, Metro Manila;

WHEREAS, in line with a program initiated by MWCI in pursuance of the Concession Agreement, MWCI has offered to take over the operation and maintenance of the Sewerage System, and HGC and Makati BLCA have accepted said offer, upon and subject to the terms, conditions and stipulations hereinafter set forth;

NOW THEREFORE, for and in consideration of the foregoing premises and of the terms, conditions and stipulations herein contained, the parties hereto have mutually agreed to the following:

ARTICLE I

RIGHTS AND RESPONSIBILITIES OF MWCI

1.1 MWCI shall, at its expense operate, manage and maintain the Sewerage System, including the Sewage Treatment Plant (the "STP"), referred to in Article 2.1 hereof, which shall be constructed by MWCI, at its expense. The ownership of the STP shall pertain to MWCI during the effectivity of the Concession Agreement.

1.2 MWCI shall provide HGC and the Makati BLCA with the details of the sewerage plan, including the location and the size/area of the land requirement for STP.

1.3 As operator of the Sewerage System, MWCI shall be responsible for ensuring that the wastewater effluent from the Sewerage System and treated at the STP shall comply with all national and local environmental laws and standards. Commencing from the date of commissioning of the STP, MWCI shall have the sole liability for any charges or fines that may be assessed in case of any violation of the said environmental laws and standards, which are not the result of or due to the acts, fault or negligence of HGC and/or any locator/homeowner of Makati Bliss.

1.4 If deemed necessary by MWCI for the proper and efficient functioning of the Sewerage System and the STP, MWCI shall, at its expense and after due consultation with the Makati BLCA, make any addition and/or modification on the Sewerage System and/or the STP.

1.5 Any loss and / or damage to any person or property, or any other cases or suits that may be filed against HGC which may be caused by the construction of the STP will be the responsibility of MWCI and MWCI hereby holds HGC free and harmfree from any liability or responsibility therefor.

1.6 MWCI shall provide HGC and/or the locator / homeowner of Makati Bliss with information related to the treatment performance of the STP as HGC and/or any locator / homeowner may request in writing.

1.7 MWCI shall bill, collect and receive payments from the locators/homeowners of sewer charges in accordance with the rates allowed under the Concession Agreement. The sewer charges shall be incorporated in the MWCI water bill commencing from the date of commissioning of the STP.

ARTICLE II

RIGHTS AND RESPONSIBILITIES OF HGC

2.1 HGC shall provide a gratuitous perpetual easement on an appropriate piece of land in the common areas as determined in the sewerage plan referred to in Art. 1.2 hereof, on which the STP will be constructed.

2.2 HGC shall retain ownership of the land whereon the STP is constructed until turnover to the proper party in accordance to the law.

2.3 HGC shall grant to any authorized representative(s) of MWCI, its contractor, and assigns the right-of-way (ingress to and egress from) to the premises of Makati Bliss for the construction/installation, operation, management and maintenance, as the case may be, of the Sewerage System and/or the STP and for the execution/performance of all necessary and related works/activities in connection therewith.

ARTICLE III

RIGHTS AND RESPONSIBILITIES OF THE MAKATI BLCA

3.1 The Makati BLCA shall ensure and guarantee to the authorized personnel/representative(s) of MWCI, its contractors, successors, and assigns, free ingress to and egress from the Sewerage System for the execution/performance of all works and activities in connection with the installation/construction, operation, management and maintenance of the Sewerage System.

3.2 The Makati BLCA shall provide a liaison personnel who shall coordinate with the MWCI and/or its contractors during the construction activities.

DURATION OF AGREEMENT

This Memorandum of Agreement, which shall take effect on the date of its execution by both parties, shall be co-terminus with the Concession Agreement and be binding also to the successors, assigns and transferees of the parties.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their respective officers, thereunto duly authorized, on the date and at the place above stated.

MANILA WATER COMPANY, INC.

By:

ANTONINO T. AQUINO
President

HOME GUARANTY CORPORATION

By:

WILFREDO F. HERNANDEZ
President

MAKATI-I BAGONG LIPUNAN COMMUNITY ASSOCIATION, INC.

By:

EMMANUEL PRADO
President

SIGNED IN THE PRESENCE OF:

ALBERTO L. JUGO
Senior Director-Business Group
Manila Water Company

LISA G. SOLIVEN-CABALUNA
Asst. Manager, Legal Department
Home Guaranty Corporation

ACKNOWLEDGMENT

REPUBLIC OF THE PHILIPPINES)
CITY OF MAKATI) S.S
x----------x

On this _____day of _____, 2001 before me, a Notary Public in and for Makati City, personally appeared the following:

Name	Comm. Tax Cer. No.	Date/Place Issued
Antonino T. Aquino	05959685	Jan. 12, 2001/ Quezon City
Wilfredo F. Hernandez	04133955	Jan. 30, 2001/ Makati City
Emmanuel Prado		

all known to me and to me known to be the same persons who executed the foregoing Agreement, and they acknowledged to me that the same is their free and voluntary act and deed as well as the free and voluntary act and deed of their respective principals.

I certify that Agreement, which consists of four (4) pages including this page wherein this acknowledgement is written, has been signed by the parties executing the same and their witnesses on the signature page hereof.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my notarial seal on the date and at the place hereinabove stated.

Doc. No. _____;
Page No. _____;
Book No _____;
Series of 2001

ACCOUNTABILITY STATEMENT OF THE PROJECT PROPONENT

This is to certify that all the information in the enclosed Initial Environmental Examination (IEE) are true, accurate, and complete. Should we learn of any information which would make the enclosed IEE inaccurate, we shall bring the said information to the attention of the Environmental Management Bureau (EMB) of the appropriate DENR Regional Office and the Environmental Department of World Bank.

We hereby bind ourselves jointly and in solidarity with the preparers for any penalties that may be imposed arising from any misinterpretations or failure to state material information in the enclosed IEE.

In witness whereof, we hereby set our hands this 21st day of December 2001 at Quezon City.

Manila Water Company
Project Proponent

by:

Antonino T. Aquino
President

SUBSCRIBED AND SWORN to before me this 21st day of December 2001, affiant exhibiting to me his Community Tax Certificate No. 05959688 issued on January 12, 2001 at Quezon City.

Notary Public

Doc. No. 407
Page No. 82
Book No. XL
Series of 2001

PTR NO A 1973800 QC 1-03-01