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**STAFF APPRAISAL REPORT**

**REPUBLIC OF TURKEY**

**CESME - ALACATI WATER SUPPLY AND SEWERAGE PROJECT**

**March 19, 1998**

**Infrastructure Sector Unit  
Europe and Central Asia Region**

### CURRENCY EQUIVALENTS

(as of December 1997)

Currency Unit = Turkish Lira (TL)  
TL1 = US\$0.000005  
US\$1 = TL199,051

### AVERAGE EXCHANGE RATES

TL per US\$1

<u>CY 1993</u>	<u>CY 1994</u>	<u>CY 1995</u>	<u>CY 1996</u>	<u>CY 1997</u>
10,965	29,770	45,678	81,048	151,239

### WEIGHTS AND MEASURES

Metric System

### ABBREVIATIONS AND ACRONYMS

CALBIR - Cesme - Alacati Union  
CAS - Country Assistance Strategy  
CPAR - Country Procurement Assessment Review  
CIF - Cost, Insurance and Freight  
DSI - State Hydraulic Agency  
EU - European Union  
GDRS - General Directorate of Rural Services  
GNP - Gross National Product  
IB - Iller Bank (Provinces Bank)  
ICB - International Competitive Bidding  
IRR - Internal Rate of Return  
IS - International Shopping  
LIBOR - London InterBank Rate  
MOE - Ministry of Environment  
MOT - Ministry of Tourism  
NBF - Not Bank Financed  
NCB - National Competitive Bidding  
NGO - Non Governmental Organization  
NS - National Shopping  
OED - Operations Evaluation Department  
PIS - Project Implementation Schedule  
PIU - Project Implementation Unit  
QCBS - Quality and Cost Based Selection  
SPO - State Planning Organization

### TURKEY - FISCAL YEAR

January 1 - December 31

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# STAFF APPRAISAL REPORT

## REPUBLIC OF TURKEY

### CESME-ALACATI WATER SUPPLY AND SEWERAGE PROJECT

#### CONTENTS

EXECUTIVE LOAN AND PROJECT SUMMARY .....	i
I. COUNTRY AND SECTOR BACKGROUND .....	1
A. Country Profile .....	1
B. Municipal Governance.....	2
C. Water Supply and Sewerage Sector.....	2
D. Government's Sector Objectives .....	3
E. Bank's Previous Experience in the Sector in Turkey.....	4
F. Bank's Sector Strategy.....	5
G. Worldwide Bank Experience in the Sector and Lessons Learned.....	6
H. Water Supply & Sewerage Services in Cesme and Alacati .....	6
II. THE PROJECT .....	10
A. Background .....	10
B. Project Development Objective & Components .....	10
C. Project Cost .....	11
D. Financing Plan.....	12
E. Environmental Issues.....	13
F. Project Implementation Schedule.....	14
G. Institutional Arrangements .....	15
H. Procurement.....	18
I. Loan Disbursements.....	19
J. Accounts, Audit and Reporting .....	20
K. Supervision and Annual/Mid-term Review.....	21
III. FINANCE .....	22
A. Financial Management and Performance.....	22
B. Projected Financial Performance.....	23
IV. PROJECT BENEFITS AND RISKS .....	25
A. Project Benefits.....	25
B. Project Risks.....	28
V. AGREEMENTS AND RECOMMENDATIONS.....	32

**TABLES**

1.	Project Cost Estimates.....	12
2.	Project Financing Plan .....	13
3.	Proposed Procurement Arrangements .....	19
4.	Allocation of Bank Loan Proceeds.....	20
5.	Estimated Loan Disbursements .....	20
6.	Water Consumption and Tariffs .....	27

**ANNEXES**

1.	Bank's Experience in Turkey's Water and Wastewater Sector
2.	Project Implementation Plan
3.	Project Cost
4.	Environmental Analysis of Sea Water Discharge
5.	Quarterly Loan Disbursement Estimates
6.	Water and Sewerage Services - Financial Performance
7.	Annual Water Demand
8.	Water Supply and Sewerage Balance Sheet
9.	Economic Analysis
10.	Calculation of Average Incremental Cost of Consumption During Peak Bi-mester
11.	Affordability of Tariffs by Residents
12.	Cost Comparison of Wells and the CALBIR system

**MAPS**

1.	IBRD Map 29345: Wastewater Component
2.	IBRD Map 29346: Water Supply Component

# CESME - ALACATI WATER SUPPLY AND SEWERAGE PROJECT

## Executive Loan and Project Summary

- Borrower and Implementing Agency:** Cesme-Alacati Union (CALBIR)
- Total Project Cost:** US\$24.0 million
- IBRD Loan Amount:** US\$13.1 million
- Lending Terms:** Seventeen years, including five years grace period, at the IBRD standard variable interest rate for LIBOR-based US Dollar Single Currency loan.
- Project Objectives:** This project along with other Bank's lending and non-lending services to Turkey will: (i) bring about institutional development of the Union of municipalities to promote municipal services; (ii) increase efficiency of delivering infrastructure services through the introduction of a private operation; and (iii) improve water quality, sewerage service, and environmental conditions. The improved infrastructure services will help to promote the tourism industry in the area.
- Project Description:** To achieve these objectives, the project would comprise the following components:
- (a) Institutional Development (21% of base cost) consisting of strengthening the CALBIR by:
    - (i) setting up of the Union's technical and financial management systems, including auditing, staff training and office equipment;
    - (ii) hiring and monitoring the performance of a private operator for improved water and sewerage services;
    - (iii) providing technical assistance for a high level of project supervision; and
    - (iv) technical assistance on environmental issues, including the protection of sea water quality.

(b) Improving the Operational Condition of the Water Supply System (15% of base cost) consisting of:

- (i) hydrogeological investigation to increase water production of the wells in the Ildir area; district metering to reduce commercial loss; and chlorination for safer water quality;
- (ii) relocation of wells in the Ildir area and rehabilitation of the pumping stations, to improve their operational conditions;
- (iii) construction of a water barrier (about 500m long) to protect the aquifer in the Ildir area from sea water intrusion;
- (iv) provision of operational equipment to improve water and wastewater services; and
- (v) provision for urgent repairs and upgrading of the water supply system to reduce losses (Urgent Repairs and Upgrading).

(c) Completion of Sewerage System (64% of base cost)

- (i) development and improvement of the sewerage network, consisting of the upgrading and expansion of the sewerage network through the construction of the main sewer pipes from the Cesme area to Ilica, and the construction of the sewerage networks including house-discharges in the areas of: Cesme, Alacati, and Ilica;
- (ii) acquisition and installation of mechanical and electrical equipment, and pipes for pumping stations (TM2, TM6, TM17, and TM18); and
- (iii) construction of a pre-treatment plant for the combined waste water flow from Cesme and Alacati to discharge into the sea through the already constructed sea outfall in Alacati.

**Project Benefits:**

The Project along with other Bank's lending and non-lending services identified as priority in the Bank's Country Assistance Strategy to Turkey (CAS of August 6, 1997) will create an institutionally strengthened Union of municipalities, introduce

private sector participation in the provision of services, contribute to improved water and sewerage services, environmental conditions, and protect the tourism industry. The creation of the Cesme-Alacati Union is an important institutional achievement, with potential for replication in other small municipalities in Turkey, to help remove the diseconomies of scale present in each individual municipality. The Project would generate economic benefits because:

- (a) more water can be consumed through increased production, reduced losses, and improved quality;
- (b) the risk of water wastewater-related diseases will drop since water will be chlorinated; and
- (c) the environmental situation will improve since the present spills of raw septic sludge in areas adjacent to Ilica and Alacati will be discontinued.

**Environmental  
Impact:**

The project has been classified as a category 'B' project. An environmental review has been carried out consistent with the provisions of the World Bank's OD 4.01 Environmental Assessment and the applicable environmental procedures of the Government of the Republic of Turkey. The Project brings about positive environmental impacts due to increased efficiency in the use of water, improved water quality, and provisions for collecting and pre-treating wastewater. There are no significant environmental effects due to the discharge of wastewater from the sea outfall.

**Project Risks:** There are four types of risks, all of which will influence the project's economic return. The four kinds of risk are institutional, technical, financial, and market. The institutional risks refer to the likelihood that no private operator will be attracted to bid for the management contract or that a private operator will abandon the contract. The risk that there will be no private operator bidding is judged to be small, given that potential bidders have already expressed interest in using the Cesme/Alacati management contract as a low-risk option of gaining a foothold in the potentially large Turkish water supply and wastewater market. In addition, the Project will cover the fixed and start-up costs of the operator through the Bank loan, creating an incentive for private sector participation. The institutional risk of putting the inexperienced CALBIR at a disadvantage of dealing with an experienced private operator should also be mitigated by hiring consultants to assist the CALBIR in supervising the private operator. The technical risks center around the possibility that water quality, water production and water consumption will not increase as

projected. In order to mitigate this risk, investments aiming at increasing water quantity and quality are programmed early in the project implementation period, in 1998 and 1999. Further, system losses will be reduced through the investments for urgent repairs and upgrading of existing infrastructure. The financial risks comprise the failure of the CALBIR generating a sufficient level of cash to finance its share of investments, and the possible reluctance of consumers to paying the higher tariffs forecasted under the Project. The risk would materialize if consumers perceived water quality to be no better with the project. This risk should be mitigated through a public information campaign where the expected benefits of the safer and more plentiful future water supply and of the sewerage system are explained to all consumers. Such a campaign is planned by the mayors of Cesme and Alacati to coincide with the start-up of the Project. In addition there is a financial risk due to cost overruns. This risk, however, is not a major one as the cost estimates include adequate provisions for unforeseen events. In addition, there is no risk of a lumpy investment not being completed as all project investments are small and, thus, there is enough flexibility in the project design to delay some small investments if necessary without compromising the achievement of the project objectives. Also, the CALBIR should be in a position to finance any cost overruns with the cash surpluses expected for the year 2002 and thereafter. The market risk centers around the possibility that consumers will prefer to use private wells over the CALBIR system because of the cost of the services. For new customers, this is not a major risk as the cost of services is similar under the two alternatives. For the existing users, the CALBIR system will be more expensive and as a result there could be reluctance to give up the use of private wells. This risk will have to be mitigated by the implementation of a plan to phase out the use of private wells; many of which cannot guarantee a safe or sufficient water supply and also result in an inefficient use of water resources.

**Project Cost:**

Project Components	-----US\$ Million-----			
	Local	Foreign	Total	% Foreign
A. Institutional Capacity Building	1.0	2.5	3.5	70
B. Improvement of Water Supply Quality	1.3	1.3	2.6	50
C. Completion of Sewerage System	<u>4.4</u>	<u>6.5</u>	<u>10.9</u>	<u>60</u>
Base Cost	<u>6.7</u>	<u>10.3</u>	<u>17.0</u>	<u>61</u>
D. Physical Contingencies	0.7	1.0	1.7	59
E. Price Contingencies	<u>0.9</u>	<u>1.3</u>	<u>2.2</u>	<u>59</u>
Total Project Cost	<u>8.3</u>	<u>12.6</u>	<u>20.9</u>	<u>60</u>
F. Taxes & Duties	3.1	--	3.1	0
<b>Total Cost</b>	<b>11.4</b>	<b>12.6</b>	<b>24.0</b>	<b>53</b>

**Financing Plan:**

	-----US\$ Million-----			
	Local	Foreign	Total	% Total
IBRD	0.4	12.7	13.1	54
Cesme Alacati Union	5.4	0.0	5.4	23
Ministry of Tourism	5.5	0.0	5.5	23
<b>Total Financiers</b>	<b>11.3</b>	<b>12.7</b>	<b>24.0</b>	<b>100</b>

**Estimated Disbursements:**

Bank Fiscal Year	FY99	FY00	FY01	FY02	FY03
Annual	1.0	2.4	3.6	3.5	2.6
Cumulative	1.0	3.4	7.0	10.5	13.1

**Internal Rate of Return:** 23%  
**Poverty Category:** n/a  
**Project ID Number:** TR-PA-8985



**REPUBLIC OF TURKEY**  
**CESME-ALACATI WATER SUPPLY AND SEWERAGE**  
**STAFF APPRAISAL REPORT**

**I. COUNTRY AND SECTOR BACKGROUND**

**A. Country Profile**

1.1 Turkey currently has a population of about 63 million which has grown at an average annual rate of about 2.3 percent during the last decade. About 60 percent of the total population lives in urban centers. The per capita income was about US\$2,900 in 1997. Although there is little absolute poverty, inequality is high, with considerable differences in income between regions and between rural and urban areas. Most health indicators, including infant mortality rates, have shown substantial improvement over the same period, but regional disparities remain significant.

1.2 The recent performance of the Turkish economy has been mixed. Following the financial crisis of 1994, there has been a strong sustained recovery of growth. However, the public finances remain weak, and inflation and interest rates persist at very high levels. Real GNP increased by an estimated 6.5 percent in 1997 thanks largely to the 1996 customs union with the EU and the rapid expansion of business opportunities in the countries of the former Soviet Union. Exports increased by 15 percent in volume terms, helping to build a relatively comfortable level of foreign exchange reserves (4 months of imports). Although financial markets in Turkey were not too badly affected by the recent Asian currency crisis, the increasing volatility of the international environment highlights the vulnerability of the Turkish economy due to its long-standing financial and structural imbalances. The government has been working since late 1997 to introduce a package of measures aimed at correcting the fiscal deficit on a sustainable basis and reducing inflation. A number of steps have already been taken, including sizable cuts in agricultural subsidies. There appear to be improved prospects for an acceleration of the long-delayed privatization program as well. Reform legislation and other changes are also envisaged in critical areas such as social security, the tax system and banking sector. However, action has been delayed. It remains to be seen whether Turkey's coalition government can build the necessary consensus to accelerate and expand the pace and scope of economic adjustment and reform.

1.3 Tourism is an important element of Turkey's economy. According to Turkey's 1996-2000 Seventh Five-year Development Plan, the number of tourists increased from about 4.5 million in 1989 to about 9.7 million in 1997, generating net tourism revenue of about US\$7.0 billion. Over the same period the tourism sector accounted for around 2.0% of total fixed capital investment, and total bed capacity increased from about 150,000 to about 300,000. Current plans call for a continuous expansion with the following targets for the year 2000: reaching a total bed capacity of about 800,000, attracting about 13 million visitors, and generating a net tourism revenue of

about US\$8.5 billion. However, as recognized by the Seventh Plan, achievement of these targets is put at risk by the persistence of severe deficiencies in tourism-related infrastructure and services. These, together with growing deterioration of environmental conditions in the main tourism host areas, risk the loss of Turkey's competitiveness vis-à-vis other Mediterranean countries.

## **B. Municipal Governance**

1.4 Turkey's system of municipal administration differs depending on the size of the jurisdictions. Currently, sixteen large cities of populations of 400,000 or more are administered, in accordance with the Metropolitan Law (Law 3030), under a regime of so-called "metropolitan municipalities" which provides for specific fiscal arrangements and mandates specific organizational structures for the delivery of local services. Medium-size cities and small towns with a population of at least 2,000 have a lesser degree of administrative autonomy and are administered in accordance with the Municipal Law (Law 1580). Localities of less than 2,000 inhabitants and rural areas have no administrative autonomy and come under the direct administration of the Provincial Governor. Municipal revenues are, to a large extent, derived from the redistribution of central government tax revenues channeled through Iller Bank and, to a lesser extent, from an array of taxes, fees and contributions defined by the Municipal Revenue Law (Law 2464).

1.5 All municipal authorities are elected for a mandate of five years. Municipalities are administered by a mayor who presides over an executive committee, as the executive body, and the municipal assembly, as the legislative body. Municipal administrations have little autonomy as they are constrained by a wide range of legal and administrative problems including: (a) lack of transparency of the role of central organizations like Iller Bank; (b) rigidity of the legislation on municipal administrative structure; (c) Government control of municipalities' authority to mobilize local resources; and (d) inappropriateness of salary structures which, in accordance with prevailing laws, are fixed at the central government level.

## **C. Water Supply and Sewerage Sector**

1.6 Throughout Turkey, service coverage for water supply is, on average, relatively high but quality of water delivered is often poor. Average consumption is about 80 liters/day/consumer (l/d/c). Sewerage coverage is low. The low sewerage coverage, together with uncontrolled sewage discharges, often result in environmental hazards, especially in coastal areas. Water and sewerage service revenues typically only cover operating costs (though not always). Capital investments are funded on a grant basis by the central government through Iller Bank or occasionally from external sources. Authority for setting water and sewerage tariffs rests with municipal authorities.

1.7 Responsibility for water supply and sewerage in Turkey is shared by institutions of both the central and the local governments. At the central government level the six main institutions involved are:

- the State Planning Organization (SPO), which reviews and approves investment plans;
- the State Hydraulic Agency (DSI), which administers national water resources, develops major water sources, and provides bulk water supply to cities with populations greater than 100,000;
- the Bank of the Provinces (Iller Bank), which administers central government fiscal transfers to local governments and designs, funds, and executes works for water supply, sewerage, and solid waste collection and disposal for small cities;
- the General Directorate of Rural Services (GDRS), which provides water supply and sanitation in rural areas;
- the Ministry of Health, which sets standards of quality for water sources and water supply to consumers and monitors compliance; and
- the Ministry of Environment (MOE), which monitors and enforces environmental legislation through its branch offices at the provincial government level.

1.8 In the sixteen largest cities designated as metropolitan municipalities (para. 1.4), water supply and sewerage services are the responsibility of autonomous utilities owned by the metropolitan and district municipalities. The first of these utilities, the Istanbul Water and Sewerage Company (ISKI) was established in 1981 at the time of the Bank approval of the loan for the third Istanbul Project. In smaller municipalities, water supply and sewerage services are provided by municipal departments.

1.9 Some municipalities which are too small to effectively operate services or carry out required investments have established multi- or single-purpose municipal Unions for the joint provision of services. Under Law 1580, Unions have the legal status and the prerogatives of a local authority in all matters concerning the delivery of the services for which they have been established; that is, they have full ownership of assets, are authorized to set tariffs, fees, and other charges related to service activities and collect corresponding revenues, and are allowed to borrow from domestic or external sources for investments to execute works. They are also permitted to subcontract the provision of services to private operators through lease or management contracts or participate in joint ventures.

#### **D. Government's Sector Objectives**

1.10 As outlined in Turkey's 1996-2000 Seventh Five-Year Development Plan, the objectives of the central government and its different agencies responsible for the water supply and sewerage sector are to:

- satisfy the drinking water needs of the population not currently served;
- promote the construction of sewerage networks and treatment facilities; and
- promote the development of new management systems for water supply and sewerage operations, including the encouragement of private sector participation.

1.11 The above objectives are all the more challenging as, due to population growth, services will need to be provided to an estimated additional 16 million inhabitants over the next decade, while simultaneously improving the quality of the services and rehabilitating dilapidated infrastructure. The 10-year total investment program for the construction of new facilities and upgrading of existing urban water supply and sewerage systems and waste water treatment facilities during the 1990s requires financing resources of US\$10.0 billion equivalent.

1.12 A government's policy objective is the preservation and improvement of the environment. Water pollution is an acute problem in urban and industrial zones in major metropolitan municipalities and is also beginning to become an issue in the tourism areas of the Aegean and Mediterranean coasts, which are the backbone of Turkey's tourism industry. There is a growing concern regarding the need to better protect groundwater and surface water resources, as well as to safeguard natural tourism attractions such as beaches and coastal sea waters. Legislation and regulations adopted in the 1980s and early 1990s have permitted the central government and the municipalities to take a more aggressive stance toward environmental protection. The enforcement of environmental laws and regulations is generally the responsibility of the municipalities and the provincial governments. While the enforcement capability of the provincial and local authorities is still developing, they are making progress in monitoring water quality, and in planning for substantial investments in water and sewerage facilities to mitigate incipient problems. In keeping with government's intention to eventually join the European Union (EU), and as a general target for water quality standards, the central government is seeking to progressively improve norms for effluent discharges to EU levels.

#### **E. Bank's Previous Experience in the Sector in Turkey**

1.13 The Bank started assisting the water and sewerage sector in Turkey in 1972 through a combination of lending and non-lending services. The lending services are made up of nine loans amounting to US\$1,046 million (Annex 1). The non-lending services are made up a variety of activities, including a sector report (1993), seminars on alternative institutional arrangements for the provision of water and sewerage services, and study tours to other countries to observe these arrangements in practice.

1.14 The results of the Bank's assistance, as measured by the rating of the five projects already closed, are very similar to the Bank-wide result of its interventions in the sector. Three projects were rated satisfactory, while two projects were rated unsatisfactory. The financial and institutional strengthening achievements under the five projects were below appraisal expectations. The two unsatisfactory projects did not achieve their physical targets.

1.15 Three of the four ongoing projects have been in execution for several years, and the borrowers are making good progress toward the achievement of their physical objectives, although with delays. Progress in the institutional and financial areas is, as in the case of the closed loans, less satisfactory. The fourth ongoing project, Antalya Water and Sewerage Project, was designed taking into account the less than satisfactory experience with the municipal water and sewerage companies and thus introduces a major institutional change by incorporating the provision of services by a private firm rather than by a traditional water and sewerage company. The private firm, competitively selected, took over the water and sewerage systems in early 1997.

1.16 Some indicators of the less than satisfactory performance are the following: first, the water and sewerage companies have been unable to attain full cost recovery levels despite substantial real tariff increases. The main reason for this disappointing result is that the companies are generating revenues equivalent only to 40% to 60% of potential revenues at the prevailing tariff levels. The remaining revenues are lost as a consequence of water leakages in the system and of inadequate billing and collection practices. And, second, the financial relationships between the water and sewerage companies and other public sector entities lack transparency and discipline: the municipalities and many public sector agencies often do not pay their water bills, and the water companies reciprocate by not paying their financial obligations to the Government and other public sector agencies.

1.17 The net result of weaknesses like the ones above is that: (i) customers continue receiving unsatisfactory services due to the financial constraints and lack of commercial orientation of the water and sewerage companies; (ii) unfair treatment to customers paying their bills as they subsidize non-payers; and (iii) the fiscal implications of the provision of the services are not fully known.

#### **F. Bank's Sector Strategy**

1.18 The Bank's strategy in the sector has changed emphasis over time. In the first operation in 1972 the focus was on soundly designed and well implemented physical facilities. Later, in the 1980s, increased attention was placed on institutional arrangements and, within this context, the Bank encouraged the Government to establish municipal water and sewerage utilities with the expectation that they would adopt a commercial orientation, and would be free from political interference. These expectations were not fully realized (para. 1.14). More recently, and as a way to overcome the weaknesses of the municipal water and sewerage companies, the Bank's strategy has sought to promote private participation in the provision of water and sanitation services (para. 1.15). In addition, the Bank's current strategy aims at providing support to sector development in medium and small municipalities. The proposed Project is consistent with current Bank's strategy as it promotes private sector participation in the provision of services and also provides assistance to small municipalities.

## **G. Worldwide Bank Experience in the Sector and Lessons Learned**

1.19 Several OED reports as well as other Bank surveys have concluded that although water and sewerage projects have often been successful in achieving their physical objectives, the success in improving the institutional performance of the water utilities has been limited. Some of the reasons for the less than expected results were:

- inadequate linkages between physical and institutional objectives;
- lack of qualified management and financial autonomy of local utilities;
- staff inexperience in project implementation and institutional problem solving;
- project complexity;
- lack of reliable information on production and consumption patterns that prevented the design of well-focused unaccounted-for-water reduction programs and adequate tariff structures; and
- problems related to cost recovery and timely provision of counterpart funds.

1.20 These lessons have been incorporated into the design of the proposed project by:

- hiring a private firm to provide water and sewerage services on behalf of the CALBIR;
- strengthening the institutional capacity of CALBIR to implement the Project and to hire and monitor the performance of the private provider of services;
- securing strong support for the project from the local authorities, civil society and central government;
- defining the scope of the project within the financial capability of the CALBIR; and
- simplicity in project design and limiting the physical investments to critical infrastructure required to provide clean water, without rationing and improved sewerage service.

## **H. Water Supply and Sewerage Services in Cesme and Alacati**

1.21 Beneficiary Cities. Cesme and Alacati municipalities are located on Turkey's Aegean coast on the Cesme peninsula, about 80 km west of Izmir the capital of the Izmir Province and Turkey's third largest city. Cesme and Alacati, which until the 1960's were small fishing and agricultural communities, have become the main tourism centers of the Cesme peninsula, and have currently a total permanent resident population of about 20,000 (13,000 in Cesme and 7,000 in

Alacati). In the Summer period from May to October, about 80,000 temporary residents and tourists visit the area. This creates a need to design the infrastructure services in the area for a population size which is almost five times the size of the resident population. The resident population is projected to increase to about 50,000 by the year 2010 while the tourist and temporary summer population is expected to reach about 120,000, with a total peak population of 170,000 during the summer period. In the longer term, growth is expected to decrease rapidly with the area's population capacity peaking at about 220,000 due to restrictions on land development because of environmental considerations.

1.22 Water and Sewerage Services. Rapid growth in the Aegean coastal region in Turkey in the last two decades has transformed the Cesme-Alacati area from small fishing and agricultural communities into an important tourism center. This growth has resulted in rapidly increasing demand for infrastructure and municipal services, which has exceeded the limited financial and technical capacity of the municipalities to respond.

1.23 For many years, the only sources of water in the Cesme-Alacati area were private wells drilled by households, hotels, pensions and other businesses. The first municipal water supply system entered into operation less than twenty years ago (1979), but it had a short life, as the size of the water mains was insufficient to satisfy the growing water demand and had to be replaced by larger mains. The replacement of the mains and the expansion of the water system were started in 1989 by Iller Bank and, as of today, two thirds of the total resident and summer population is connected to the municipal water supply system (approximately 70% in Cesme, and 50% in Alacati). The remaining population (35,000 people) continues to obtain water from private wells.

1.24 The water supply services are unsatisfactory. First, there are frequent service interruptions and low pressures especially during the summer period when demand is at its peak. Second, water quality frequently does not meet Turkish standards because of high salinity and excessively high or low concentrations of chlorine with the resulting high odor and bad flavor, and the risk of bacteriological contamination. Third, system's operation and maintenance practices are unsatisfactory: the production from the main water source (Ildir wells) drops during periods of peak demand because the abstraction wells are not properly located; control devices for the pumping stations and reservoirs are lacking; there are no pressure zones; water chlorination procedures are inadequate; and the buildings for the pumping stations and their electrical and control panels are deteriorated. And, fourth, although most water connections are metered, physical and commercial water losses are high at around 68% of the production.

1.25 About 4% of the population is currently connected to the municipal sewerage system. Wastewater generated by about 80% of the population is discharged in septic tanks, and the remaining population have private sewage treatment plants. This situation is no longer sustainable as poorly constructed septic tanks and poorly operated private sewage treatment plants (43 in total) are infiltrating the groundwater and posing health risks to the population, particularly the users of private water wells.

1.26 The first municipal waterborne sewerage systems, covering limited areas, were installed by the Cesme and Alacati municipalities and Iller Bank in the early 1950's, and relatively minor extensions were made in the 1970's. Later, in 1987, Iller Bank developed plans for further

expansion of the sewerage system so as to meet increased demand for services resulting from the rapid growth of summer population. The contract for the construction of the new sewerage system was tendered in 1988 and it is expected to be completed in 1998. This contract includes: main collectors, civil works for pumping stations, two sewers to the treatment plants sites and two sea outfalls (one of the outfalls has been already constructed and the construction of the second one has been postponed until there is sufficient effluent). The contract, however, does not include essential elements to make the sewerage system operational. The treatment plant has not yet been constructed, the mechanical and electrical equipment for the pumping stations do not exist, and most of the secondary sewerage networks do not exist.

1.27 Plans for Further Developing Water and Sewerage Services. The plans of the Cesme and Alacati authorities to further develop the water and sewerage services between 1998 and 2003 are well conceived and should result in substantial improvements in both the coverage and the quality of the services. The plans include:

- improving management and operations of the water and sewerage services;
- improving the operational conditions of the current groundwater sources;
- upgrading and expanding the water distribution network;
- completing ongoing sewerage works, and adding the elements to make it operational (preliminary sewage treatment plant and mechanical and electrical equipment for the pumping stations);
- expanding the sewerage network and rehabilitating its older sections; and
- monitoring the water quality near the sea outfall already constructed.

1.28 The above plan has a total cost of about US\$26.0 million and would be carried out with the help of Iller Bank and the proposed Bank-financed project. Iller Bank will invest about US\$2 million in the completion of ongoing sewerage works and water distribution networks. The physical investment in the proposed Bank-financed project (US\$24.0 million) would focus on:

- providing equipment and materials for improving the operation of the water and sewerage systems;
- completing the missing major elements of the sewerage system (preliminary treatment plant, and mechanical and electrical equipment for the pumping stations); and
- constructing secondary sewerage networks.

1.29 On the institutional side the plan includes the establishment of a special entity, the Cesme-Alacati Union (CALBIR), with responsibility for providing water, sewerage and solid waste management services. The CALBIR, established by Decree 97/9933 of September 8, 1997 would have a small staff with responsibility for the implementation of the Bank-financed Project and for

overseeing the implementation of the investments to be carried out by Iller Bank. The CALBIR will hire a private firm to provide the water and sewerage services (para 2.19). The creation of the CALBIR, the introduction of the private operator, and the technical assistance provided to the CALBIR will help implement the water and wastewater service improvement plans in the Cesme-Alacati area.

## II. THE PROJECT

### A. Background

2.1 The Project was prepared by Cesme and Alacati municipalities and the MOT with assistance from consultants financed through a Japanese Grant (TF026610-TU) for the preparation of projects along the Turkish Aegean and Western Mediterranean coasts. Consultants financed through the Dutch Trust Fund assisted in the environmental analysis of the Project. The Project was discussed on several occasions in public meetings, with participation of the municipal councils, the general public, business leaders, academics, civil servants, and NGOs.

### B. Project Development Objective and Components

2.2 This project along with other Bank's lending and non-lending services to Turkey will: i) bring about institutional development in the Union of municipalities; ii) increase efficiency of delivering infrastructure services through the introduction of a private operation; and iii) improve water quality, sewerage service, and environmental conditions. The improved infrastructure services will help to promote the tourism industry in the area. The Project's objectives are consistent with the objectives of the Bank's Country Assistance Strategy of August 6, 1997.

2.3 The key indicators of development outcome are shown in para. 22 of the Project Implementation Guidelines (Annex 2).

2.4 The project development objectives are to be achieved through the following project components:

- (a) Institutional Development (21% of base cost) consisting of strengthening the CALBIR by:
  - (i) setting up of the Union's technical and financial management systems, including auditing, staff training and office equipment;
  - (ii) hiring and monitoring the performance of a private operator for improved water and sewerage services;
  - (iii) providing technical assistance for a high level of project supervision; and
  - (iv) providing technical assistance on environmental issues, including the protection of the sea water quality.

- (b) Improving the Operational Condition of the Water Supply System (15% of base cost) consisting of:
- (i) hydrogeological investigation to increase water production of the wells in the Ildir area; district metering to reduce commercial loss; and chlorination for safer water quality;
  - (ii) relocation of wells in the Ildir area and rehabilitation of the pumping stations, to improve their operational conditions;
  - (iii) construction of a water barrier (about 500m long) to protect the Ildir aquifer from sea water intrusion;
  - (iv) provision of operational equipment to improve water and wastewater services; and
  - (v) provision for urgent repairs and upgrading of the water supply system to reduce losses (Urgent Repairs and Upgrading).
- (c) Completion of Sewerage System (64% of base cost)
- (i) development and improvement of the sewerage network, consisting of the upgrading and expansion of the sewerage network through the construction of the main sewer pipes from the Cesme area to Ilica, and the construction of the sewerage networks including house-discharges in the areas of: Cesme, Alacati, and Ilica;
  - (ii) acquisition and installation of mechanical and electrical equipment, and pipes for pumping stations (TM2, TM6, TM17, and TM18); and
  - (iii) construction of a pre-treatment plant for the combined waste water flow from Cesme and Alacati to discharge into the sea through the already constructed sea outfall in Alacati.

### **C. Project Cost**

2.5 The proposed project is estimated to cost about US\$24.0 million equivalent (including taxes and duties and excluding interest during construction) with a foreign component of about US\$12.7 million equivalent or about 53% of total project cost. Cost estimates were prepared by the MOT with the help of consultants, on the basis of quantity estimates from preliminary design studies, and using unit prices from similar projects under implementation in Turkey. All project costs have been estimated in Turkish Lira on the basis of November 1997 prices and converted into US Dollar prices at the November 1997 exchange rate of TL190,000 per US\$1. Physical contingencies (10%) have been added for unforeseen increases in quantities or supply costs. Price contingencies have been applied to base costs in accordance with the Bank's rates for expected

international price escalation as per O.P. 6.50 of November 1997, with the assumption that the exchange rate will adjust to the evolution of domestic prices and external inflation.

2.6 Summary cost estimates are shown in Table 1 below. A detailed description of project components and corresponding costs is shown in Annex 3.

<b>Table 1: Project Cost Estimates</b>							
<b>Components</b>	<b>Local TL (million)</b>	<b>Foreign TL (million)</b>	<b>Total TL (million)</b>	<b>Local US\$ (million)</b>	<b>Foreign US\$ (million)</b>	<b>Total US\$ (million)</b>	<b>% Foreign</b>
Capacity Building	190,000	475,000	665,000	1.0	2.5	3.5	70
Water Supply	247,000	247,000	494,000	1.3	1.3	2.6	50
Sewerage	836,000	1,235,000	2,071,000	4.4	6.5	10.9	60
<b>Base Cost</b>	<b>1,273,000</b>	<b>1,957,000</b>	<b>3,230,000</b>	<b>6.7</b>	<b>10.3</b>	<b>17.0</b>	<b>61</b>
Physical Contingent.	133,000	190,000	323,000	0.7	1.0	.17	59
Price Contingencies	171,000	247,000	418,000	0.9	1.3	2.2	59
<b>Total Project Cost</b>	<b>1,577,000</b>	<b>2,394,000</b>	<b>3,971,000</b>	<b>8.3</b>	<b>12.6</b>	<b>20.9</b>	<b>60</b>
Taxes & Duties	589,000	0.0	589,000	3.1	0.0	3.1	0
<b>Total Cost</b>	<b>2,166,000</b>	<b>2,394,000</b>	<b>4,560,000</b>	<b>11.4</b>	<b>12.6</b>	<b>24.0</b>	<b>53</b>

#### **D. Financing Plan**

2.7 The proposed Bank loan of US\$13.1 million equivalent would finance about 54% of the total project cost which is slightly higher than the foreign exchange component (53%). The Bank loan will be a LIBOR-based single currency loan in US Dollars, as shown in the financing plan (Annex 3). Counterpart funding would be provided for about US\$5.5 million equivalent as a grant from MOT, and US\$5.4 million equivalent by the CALBIR from its own resources (operating surpluses). The proposed financing sources and their respective amounts are summarized in Table 2 below.

<b>Table 2: Project Financing Plan (US\$ Million Equivalent)</b>				
<b>Source</b>	<b>Local</b>	<b>Foreign</b>	<b>Total</b>	<b>% Total</b>
IBRD	0.4	12.7	13.1	54
Union	5.5	0.0	5.5	23
MOT	5.4	0.0	5.4	23
<b>TOTAL</b>	<b>11.3</b>	<b>12.7</b>	<b>24.0</b>	<b>100</b>

2.8 Water investments, with a base cost amounting to US\$2.6 million would be financed by the Bank loan (85%) and a grant from the MOT amounting to US\$5.4 million (Annex 3). The Bank loan would also finance 100% of the institutional capacity building component, with a base cost amounting to US\$3.5 million. The financing of high priority water investments and institution capacity building with MOT grants and 85-100% loan financing would allow the CALBIR to promptly implement these project components, improve the quality of water services, strengthen its financial performance, and provide resources to monitor the quality of the water near the sea outfall. These improvements would, in turn, facilitate the implementation of the overall project and would provide the basis for further development of the services after completion of the Bank-financed project.

2.9 *To ensure the timely availability of the required counterpart funds for the Project, agreement was reached at negotiations (para. 5.1 (a)) that the CALBIR will open, before December 31, 1998, a bank account with a deposit of US\$100,000 (approximately one quarter of estimated CALBIR's counterpart to the Project and taxes in 1999) to be used only to finance its contribution to project investments. Before December 31, 1999 the CALBIR will increase the deposit in the local counterpart account to US\$300,000. This increase would allow the financing of a higher level of investments starting in 2000. The Bank account should be replenished at the end of each quarter to the level of the first day of the quarter.*

#### **E. Environmental Issues**

2.10 For the purposes of O.D. 4.01 on Environmental Analysis, the Project has been classified as Category B, which requires limited environmental review to determine potential negative environmental impacts and mitigation measures as needed. Such a review has been carried out as part of project preparation. The Project will not raise any resettlement issues since the work on the water distribution is related to upgrading the existing infrastructure, provision of equipment, and relocating wells and constructing a barrier wall in areas which do not have settlements. For the wastewater system, most of the construction is already completed and for the proposed network, local construction procedures will be followed. As part of the Environmental Analysis, a detailed study was performed to ensure that the discharge of wastewater from the sea outfall did not affect International Waterways as defined in Bank's O.D. 7.50. The study concluded that due to the high dilution and low wastewater flow, the International Waterways would not be affected. As a result, there is no need to notify riparian states. Contractors will seek appropriate permits to ensure that the construction will not affect any archeological or historical site. Also during

construction, the contractors will be responsible for minimizing dust and noise and returning the site to its original condition.

2.11 The Project brings about positive environmental and health effects through the reduction of water losses in the distribution system, provision of better quality water, reliability of water supply, and wastewater collection and pre-treatment. The creation of the CALBIR and the services of the private sector will also ensure better institutional controls on environmental aspects of the Project. During implementation, as per the Project Implementation Guidelines (Annex 2), the CALBIR will be responsible to monitor residual chlorine and fecal coliform as indicators of water quality.

2.12 The effect of the pre-treated wastewater discharged into the sea through an existing sea outfall was extensively studied (Annex 4). Although, there will be some minimal local effect due to the discharge of the effluent, the Project does not threaten the marine ecology. Extensive modeling of the area has shown that relevant Turkish and EU standards regarding sea water outfall and water quality will be met. The effect to the marine ecology in and around the outfall is negligible due to the high level of dilution with magnitudes in order of  $10^4$  within a few kilometers of the outfall. In addition, the pre-treated wastewater would be chlorinated, if necessary, to reduce any bacteriological impacts. In the future, as the wastewater flow increases, options of treating the wastewater through land infiltration or upgrading the wastewater treatment and reusing the treated effluent will be considered.

2.13 It is important to monitor the quality of the seawater outfall and the outfall itself to ensure that the marine species are not being affected. *During negotiations, agreement was reached on the monitoring program, as per the Project Implementation Guidelines (Annex 2). The CALBIR will be responsible for the monitoring which will include sampling the water for specific parameters, determining the physical condition of the outfall, and taking appropriate corrective actions, if required (para 5.1(b)).*

## **F. Project Implementation Schedule**

2.14 According to the Project Implementation Guidelines, the proposed project would be executed over a five-year period, starting in June 1998 and ending in June 2003. The implementation period could be accelerated if the Union implements financial policies which allow it to generate funds in amounts exceeding the ones estimated at appraisal. The loan will close on December 31, 2003, six months after project completion.

2.15 The implementation schedule is guided by the need to generate economic benefits and financial revenue as quickly as possible. In this vein:

- an experienced private firm will be hired to provide water and sewerage services on behalf of the CALBIR;

- US\$0.8 million from the Loan will be allocated for urgent repairs and upgrading of the water and sewerage systems so as to allow the private operator to improve the quality of the services in consultation with municipal authorities;
- investments in water production and district metering are programmed early on to better satisfy water demand and provide data on which to base a leak detection program by the private operator;
- the grout curtain will be constructed early on to reduce sharply the intrusion of sea water to the aquifer from which the wells draw water so that the chemical quality of the drinking water will improve. The hydrogeological investigations for the grant curtain is already well underway and the barrier is expected to be in place by 1999 to prevent sea water intrusion;
- the chlorination system will be rehabilitated early on to ensure residual chlorine in the system and eliminate the risk of fecal contamination of drinking water;
- production wells will be relocated early on to improve and boost the quality and quantity of the drinking water;
- pumps will be purchased over the total project implementation period and installed to make the existing trunk wastewater system operational so that the wastewater from the Alacati town center and Ilica could be pumped away by the time of project completion;
- the effect of the wastewater discharge through the sea outfall will be monitored to ensure that there are no negative environmental impacts due to the Project (Annex 4); and
- septic tanks will be replaced by sanitary sewerage in the Cesme town center where the risk for contamination of groundwater and epidemics is the greatest.

### **G. Institutional Arrangements**

2.16 The Borrower and project implementation agency would be the CALBIR. At the Borrower's request the loan would be made at the Bank's standard rates for a LIBOR-based single currency loan in US Dollars. The term will be seventeen years with five years of grace. The CALBIR would bear the foreign exchange risk. The MOT contributions would be made through annual appropriations in accordance with Government budgetary procedures.

2.17 The CALBIR is responsible under its By-laws for the development, management and operation of water supply, wastewater and solid waste services in Cesme and Alacati. The CALBIR also has the authority to set tariffs for water and wastewater services. The CALBIR is administered by a Council comprised of the mayors of Cesme and Alacati, and by representatives of the Municipal Councils. One of the mayors is the president and chief executive officer of the

CALBIR and the other is his/her deputy. The presidency rotates every year between the two mayors. The president is assisted by two full-time employees: the Secretary General and the Treasurer. The Secretary General and the Treasurer are expected to be appointed in June 1998 once the Council of Ministers approves the positions in March 1998 during the annual review of requests for new positions in public entities. In the meantime the CALBIR will be run by the President assisted by staff from the municipalities detached to the CALBIR.

2.18 In addition to the Secretary General, Treasurer, and support staff, the CALBIR has hired two individual consultants to assist in the management of the engineering and financial aspects of project implementation. The two consultants are financed by the Japanese grant (para. 2.1) until the closing date of the Grant at the end of 1998. After this date, the consultants would be financed out of the proceeds of the loan.

2.19 **Private Operator for the Water Supply and Sewerage System.** The CALBIR will sign a management contract with a qualified water supply and sewerage operator to provide services on its behalf under a performance-based remuneration. Expressions of interest from private operators were sought through the publication of a notice in the Development Forum (Issue of November 15, 1996) and Turkish media with satisfactory response from potential bidders. To ensure that the CALBIR take timely action for the hiring of the private operator, *agreement was reached at negotiations (para. 5.1 (c)) that the CALBIR will select the private operator in accordance with the following schedule:*

Action	Date
• Inviting firms to prequalify	July 31, 1998
• Inviting prequalified firms to submit bids	October 1, 1998
• Selecting the private firm	February 1, 1999
• Signing the contract with the private firm	March 31, 1999

2.20 The cost of the services of the private operator would be covered by the tariffs and other operational revenues of the water and sewerage services. The private operator will be paid on the basis of volume of water sold and the bill collection ratio. In addition, the Bank loan includes US\$1.0 million to cover fees to the private operator during the project implementation period. This allocation is expected to enhance the incentives for private sector involvement in Cesme-Alacati. It would also facilitate to Cesme-Alacati the financing of the private operator's start-up costs, which are expected to be high relative to the revenue generation potential of the water and sewerage system during the initial years of the contract. The CALBIR payments to the operator will cover start-up costs, operating expenses, minor repairs, and profit margin. Investments in system's upgrading and expansion will be financed by the CALBIR and carried out in consultation and with the cooperation of the private firms providing the services.

2.21 **Transitional Arrangements for Operating the Water Supply and Sewerage System.** The Cesme and Alacati municipalities formally turned over the water supply and sewerage system to the CALBIR in February 1998, but the municipalities will continue operating the system under contract until the private operator takes over in March 1999. The water and sewerage revenues

will be deposited by the municipalities in the CALBIR's bank account, and the CALBIR will pay from this account the operating costs (such as personnel, energy and materials) incurred by the municipalities in providing the services.

**2.22 Selecting the Private Operator and Managing the Contract.** The CALBIR would seek assistance of consultants in the process of selecting and hiring the private operator and managing the resulting contract during the project implementation period. The consultant to assist the CALBIR in selecting and supervising the private operator is expected to be hired in April 1998. This consultant will be financed by the ongoing Japanese Grant during the initial months of the contract, and by the Bank loan starting in January 1999. This technical assistance will ensure the hiring of a qualified private operator under suitable institutional arrangements. Adequate supervision of the operator through institutional strengthening at CALBIR will be key to meeting the Project objectives. *During negotiations, agreement was reached on the CALBIR employing, before loan effectiveness, the consultant which will help secure and supervise the private operator as a condition of effectiveness (para 5.2).*

**2.23 Implementing the Capital Expenditures Program.** The CALBIR will be responsible for the implementation of the capital expenditures program under the Project. The CALBIR, however, will coordinate closely with the private operator to ensure that the sequencing and specific characteristics of the investments yield the highest possible return.

*2.24 To ensure the sought cooperation, agreement was reached at negotiations (para. 5.1 (d)) that the CALBIR, after discussion and agreement with the private operator, would submit to the Bank for its review, not later than October 31 of each calendar year, the investment plan for the project for the next calendar year, together with a tentative investment plan until project completion. The annual investment plan for the utilization of the US\$0.8 million allocated to investments in urgent repairs and upgrading of the water supply and sewerage system should be clearly separated from other project components. To ensure that the CALBIR benefits from the private operator experience in improving the services, agreement was reached at negotiations that the utilization of the loan allocation for urgent repairs and upgrading will start only after the contract with the private operator is executed (para. 5.1 (e)).*

**2.25** The CALBIR would also be responsible for organizing the mid-term review and for preparing and submitting quarterly reports on project implementation performance and other required documentation to the Bank and the Turkish authorities according to an agreed Reporting Plan included in the Project Implementation Guidelines (Annex 2). As part of Project implementation, the CALBIR will consult with the private operator to develop a plan for the protection of the aquifer which is currently being used. This is important since more water will be drawn from the Ildir Springs creating a need to reduce the consumption from the aquifer currently being used for efficient use of water resources in the area.

## H. Procurement

2.26 All Bank-financed project elements would be procured in accordance with the Bank's Guidelines for Procurement (January 1995/ revised January 1996, August 1996, and September 1997), including amendments as of the Loan signing date, and using World Bank Standard Bidding Documents. The detailed procurement plan is included in the Project Implementation Guidelines (Annex 2). Table 3 summarizes the project components, their estimated costs including taxes and duties, and proposed methods of procurement. A Project launch workshop is expected to be held before December 1998 to provide procurement training to the CALBIR. Procurement information will be included in the periodic progress implementation reports to be submitted by the CALBIR.

2.27 **Works.** An estimated US\$13.0 million equivalent of water and sewerage contracts, consisting of the supply and installation of equipment for pumping stations, and for rehabilitation and extension of the networks would be procured through International Competitive Bidding (ICB), National Competitive Bidding (NCB) and Small Works. ICB procedures will be followed for contracts above US\$3.5 million, whereas NCB procedures will be followed for contracts less than US\$3.5 million up to an aggregate value of US\$ 4,000,000. For contract less than \$100,000, Bank's Small Works procedures will be followed which requires lumpsum fixed price contracts awarded on the basis of quotations from three qualified domestic contractors. The Small Works process will be applicable for urgent repairs and upgrading.

2.28 **Goods.** An estimated US\$1.0 million equivalent of goods and equipment will be procured in the Project. These goods would comprise small diameter water and sewer pipes, water meters, chlorination equipment, construction materials, and office equipment. Goods for urgent repair and maintenance are also included in this category. For contracts below US\$400,000 (aggregate not to exceed US\$ 500,000) and US\$100,000 (aggregate not to exceed US\$ 500,000), International Shopping and National Shopping procedures will be followed, respectively.

2.29 **Consultant Services.** Consultant contracts worth US\$4.3 million equivalent (see Annex 2, Attachment 3) would be executed under the project for implementation support, construction and private operator supervision, fixed fees for the private operator, and auditing. Procedures followed would be in accordance with the Guidelines for the Use of Consultants by World Bank Borrowers and the World Bank as Executing Agency (January 1997/ revised September 1997) including amendments as of the Loan signing date.

2.30 Individual consultants for contracts less than \$200,000 (Contract C1) will be selected based on Section V of the Bank's Consultant Guidelines. A Quality and Cost Based Selection (QCBS) process will be followed for the consultants performing construction supervision (Contract C2). For auditing requirements under the Project, for contracts less than US\$ 200,000, consultants will be selected through a Least Cost Process (Contract C4). The contract for the private operator (Contract C5), the consultant for supervision of the private operator (Contract C3) and for monitoring the sea outfall (Contract C7) will be selected through a QCBS process. It is likely that the same consultant assisting the CALBIR in securing the private operator will be employed to supervise the private operator during project implementation.

<b>Table 3: Proposed Procurement Arrangements (US\$ million equivalent) <sup>a)</sup></b>					
Project Element	Procurement Method			NBF	Total Cost
	ICB	NCB	Other <sup>b)</sup>		
<b>1. Works</b>					
Water Supply <sup>d)</sup>	-	0.33 (0.28)	0.66 (0.56)	1.10 (0.0)	2.09 (0.84)
Sewerage	7.96 (4.64)	4.06 (2.37)	-	4.00 (0.0)	16.02 (7.01)
<b>2. Goods</b>					
Water Supply <sup>d)</sup>			0.95 (0.81)		0.95 (0.81)
Office Equipment			0.20 (0.17)		0.20 (0.17)
<b>3. Consultancies</b>					
Consultant Services <sup>e)</sup>			4.27 (4.27)	0.47	4.74 (4.27)
<b>TOTAL</b>	<b>7.96 (4.64)</b>	<b>4.39 (2.65)</b>	<b>6.08 (5.81)</b>	<b>5.57 (0.0)</b>	<b>24.00 (13.10)</b>
<p>NOTE: Figures in parentheses are the respective amounts financed by the Bank Loan</p> <p>a) Cost estimates include taxes &amp; duties</p> <p>b) Includes National Shopping, International Shopping and Consultancy</p> <p>d) Includes urgent repairs and upgrading (US\$460,000).</p> <p>e) Includes fixed fees for private operator.</p>					

2.31 **Bank's Prior Review.** Bank's prior review of procurement documents would be required for: a) all ICB contracts; b) first NCB contract and all NCB contracts greater than US\$1.0 million; c) first Small Works; and d) consultant contracts with firms and individual consultant contracts exceeding US\$50,000. All other contracts for lesser amount would be subject to ex-post review.

### I. Loan Disbursements

2.32 The proceeds of the proposed loan would be disbursed, net of taxes and duties, against the categories shown below (Table 4). Loan withdrawal applications would be prepared and fully documented by the CALBIR. Withdrawals on the loan can be made on the basis of statement of expenditures for: a) goods and works not exceeding US\$100,000 equivalent; b) contracts with consulting firms not exceeding US\$100,000 equivalent; and c) contracts with individual consultants not exceeding US\$50,000 equivalent. Documentation supporting these expenditures would be retained by CALBIR during the whole project implementation period and it would be audited by external auditors (para. 2.35).

<b>Table 4</b> <b>Allocation of Bank Loan Proceeds</b>		
Category	Amount (US\$ mln.)	% of Expenditures to be Financed
Civil Works - Water Supply	0.4	85% of expenditures
Civil Works - Sewerage	7.3	61% of expenditures
Civil Works - Urgent Repairs and Upgrading	0.4	85% of expenditures
Goods - Water Supply	0.6	100% of foreign or ex-factory costs and 85% of other local expenditures
Goods - Urgent Repairs and Upgrading	0.4	100% of foreign or ex-factory costs and 85% of other local expenditures
Consulting Services	4.0	100% of expenditures
<b>TOTAL</b>	<b>13.1</b>	

2.33 A Special Account would be opened by CALBIR in a commercial bank acceptable to the Bank, or in the Central Bank, with an authorized allocation of US\$1.0 million (approximately four months of estimated disbursements at the peak period). The authorized allocation will be limited to an amount equivalent to US\$500,000 until the aggregate amount of withdrawals from the loan plus the total of outstanding commitments equals or exceeds US\$2,000,000 equivalent. Applications for replenishment of the Special Account would be submitted every three months, or when two third of the amount deposited has been withdrawn, which ever occurs first. All applications for direct payment or special commitments must be for an amount not less than 20% of the authorized allocation to the Special Account. Monthly bank statements of the Special Account would be attached to all replenishment applications.

2.34 Estimated disbursements by Bank fiscal year are summarized in Table 5 below. The schedule of Quarterly Disbursements is shown in Annex 5.

<b>Table 5</b> <b>Estimated Loan Disbursement</b> <b>(US\$ million)</b>					
World Bank Fiscal Year	FY99	FY00	FY01	FY02	FY03
Annual	1.0	2.4	3.6	3.5	2.6
Cumulative	1.0	3.4	7.0	10.5	13.1

## J. Accounts, Audit and Reporting

2.35 The Project Implementation Guidelines (para. 20) includes details of the accounting system, financial controls and reports to be implemented by the CALBIR with the help of a

financial consultant (para. 2.18) hired under the Project. The CALBIR's accounts, including the project account and the Special Account, will be audited annually by private independent auditors acceptable to the Bank. The audit reports will contain a separate opinion on the use of Statement of Expenditures, when applicable. Audit reports in English will be forwarded to the Bank not later than six months after the end of each fiscal year.

2.36 The CALBIR will provide quarterly and yearly reports to the Bank on the progress of project implementation. These reports should include a summary of implementation status, the financial statements of the CALBIR and the project, including the Special Account, and performance indicators data. Included in these reports will also be procurement information such as: (a) contract award information; (b) revised cost estimates for individual contracts and the total project cost; (c) revised implementation schedule; and (d) compliance with aggregate limits on specified methods of procurement. The Project Implementation Guidelines includes the chart of accounts to be used and models of the reports to be submitted to the Bank.

2.37 The CALBIR will prepare an Implementation Completion Report and submit it to the Bank within six months after the closing date of the loan.

#### **K. Supervision and Annual/Mid-term Review**

2.38 About 20 staff/weeks per year of staff input will be required over the life of the project. Supervision staff should include a water sector specialist, a financial analyst and private sector development specialist. Project implementation reviews, involving the Bank, the CALBIR and the private operator will be held before October 31 of each year to assess progress and problems in pursuing project objectives and to consider any corrective actions. *During negotiations, agreement was reached that the CALBIR will submit to the Bank before October 31 of each year the following: a) the tariff policy to be implemented in the following year; b) plans and schedule for project completion; and c) corrective actions necessary to secure timely completion of the project (para 5.1(f)). During negotiations an agreement was reached on conducting a Mid-term Review of project implementation to be held in mid-2000 to examine implementation progress, all major problems encountered, the continued relevance of the project as appraised and any changes to be proposed to the CALBIR, Government and the Bank (para. 5.1 (f)).*

### III. FINANCE

#### A. Financial Management and Performance

3.1 **Financial Management.** As up to now the water and sewerage services have been directly provided by Cesme and Alacati municipalities, the financial management of the services has been part of the overall municipal financial management. The revenues from the provision of the services are deposited in the general municipal cash and bank accounts. The expenditures are financed from these accounts. The revenues and expenses are controlled through the municipal budgetary system on cash rather than accrual basis. The budgetary system includes specific accounts for water and sewerage related revenues and expenditures.

3.2 **Financial Performance.** In line with prevailing financing practices in small and medium sized municipalities in Turkey, the water and sewerage services in Cesme-Alacati have generated revenues sufficient to cover their cash expenditures and also surpluses to help support the overall municipal budget. The services are not expected to generate funds for investments as these are traditionally financed through grants and concessional loans from DSI and Iller Bank. Presently, the tariff<sup>1</sup> level for the CALBIR is around US\$0.74/m<sup>3</sup> and the officials of the CALBIR are planning to revise the tariffs to levels around US\$1.00/m<sup>3</sup> by the middle of 1998. This will help to keep up with inflation and generate a surplus required for financing initial operating costs related to paying the private operator. The cash surpluses in recent years for the combined Cesme-Alacati system has been as follows: 1995 - US\$244,000; 1996 - US\$32,000; and 1997- US\$296,000 (Annex 6). In the case of Cesme, this budgetary support from the water and sewerage services was equivalent to 7% of municipal revenues in 1995, and 12% in 1997. The support in 1996 was less significant (less than 1%). In Alacati, the budgetary support was equivalent to 5% in 1995, 2% in 1996; and 1% in 1997.

3.3 It should be noted, however, that the operational surpluses of the Cesme-Alacati water supply and sewerage services are due to a large extent to the practice of maintaining the current expenditures at a minimal technical level to keep operations ongoing and limiting maintenance to indispensable interventions. This policy has been one of the factors contributing to the unsatisfactory quality of the services. Due to the deficiencies in the operation and maintenance of the water and sewerage system as well as inadequate commercial practices, the municipalities are not fully benefiting from the revenue generating potential of the services. In fact, only about 32% of the water produced is billed as a result of physical losses, water provided free of charge, and inadequate consumption metering (see para 1.24).

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<sup>1</sup> Tariffs refer to average equivalent water tariff, calculated on the basis of all CALBIR's operational revenues divided by the volume of water sold.

## B. Projected Financial Performance

3.4 In the proposed Project, there will be a fundamental change in the financial policies regarding the provision of services by the CALBIR. For the first time, the CALBIR will take on a loan (the proposed Bank loan) and also will make a contribution towards investments. To support this change in policy, the CALBIR plans to take specific measures regarding improving operations and increasing tariffs.

3.5 **Operations.** The private operator is expected to increase the percentage of water billed against production, reduce physical losses, and improve commercial practices - mainly through improved bill collection. Improvements in the operational efficiency are shown in Annex 7. It is planned that by the year 2005, the losses, as a percentage of production, will be reduced from the current level of 68% to about 44%. The annual volume of water billed is expected to increase from the current level of 1.2 million m<sup>3</sup> to about 3.2 million m<sup>3</sup>. This realistic increase can be attributed to increased production and connections and a reduction in losses. The per capita consumption of water was assumed to be constant, which is most likely a conservative estimate given that better service and water quality in the future would encourage increased consumption, in spite of higher tariffs (para 4.9). The number of water connections is expected to increase from around 15,000 in 1997 to around 24,000 in 2003. During the same period, the wastewater connections are expected to increase from less than 1,000 to around 4,000. If the per capita consumption increases along with the projected increase in connections, funds available to the CALBIR will be more than the projected values.

3.6 **Tariffs** To assure financial viability of the Project, the average yearly tariff levels should reach around US\$1.2/m<sup>3</sup> in 1999 and US\$1.50/m<sup>3</sup> in 2000. Thereafter, the tariff should peak around US\$1.60/m<sup>3</sup> by the year 2001 in current prices (Annex 8). The planned tariff levels are realistic and affordable (para 4.11), but would require political willingness for the rates to be in effect. This willingness has been expressed by the Cesme and Alacati officials. *During negotiations agreement was reached on the CALBIR implementing monthly tariff adjustments to ensure that tariffs are sufficient to cover: (a) payments to the private operator; (b) the required contribution to project investments; (c) debt service payments; and (d) CALBIR operating costs (para 5.1(g)).* The Consumer Price Index or any other price index satisfactory to the Bank should be used as a basis for the adjustment.

3.7 **Financial Projections.** Through the above operational and financial measures, the revenues of around US\$0.9 million in 1997 are expected to increase gradually to US\$1.3 million in 1998; US\$2.6 million in 2000; and US\$4.4 million by the year 2003. The financial projections are shown in Annex 8. The increase in revenues and operating expenses between 1998 and 2003 is around 3.7 and 1.4 times, respectively. The operating expenses do not rise as much since the incremental cost of producing additional water is not as high and it is expected that the private operator will seek efficient operations to minimize costs.

3.8 The projections show that there will be an increasing operational surplus needed by CALBIR to service debts and finance their portion of the investments. The year end cash in hand for CALBIR is expected to increase from the 1997 level of US\$82,000 to about US\$226,000 by

the year 2003, which is the last year of the project. The tariff levels and efficient improvements envisaged under the Project should enable the CALBIR to continue carrying out investments in system expansion and upgrading in addition to those under the Project. In fact, it is estimated that the CALBIR would be able to contribute around US\$4.2 million for investments other than the Project between 2002 and 2005. The balance sheet shows that the current level of indebtedness of CALBIR is low allowing them to take on loans from the Bank and Iller Bank, resulting in an acceptable maximum debt to asset ratio of around 40% in 2002.

3.9 **Monitoring:** To monitor progress in improvement in operations the following parameters will be used: i) tariffs; ii) number of water and wastewater connections; iii) volume of water billed; iv) working ratio defined as operating expenses divided by revenues; and v) cost per cubic meter of water billed. The monitoring goals are specified in the Project Implementation Guidelines (Annex 2).

## IV. PROJECT BENEFITS AND RISKS

### A. Project Benefits

4.1 The project would generate economic benefits because:

- (a) more water can be consumed since the production capacity will be increased and the quality improved;
- (b) the risk of water and wastewater-related diseases will drop since water will be chlorinated, and rationing will cease from 1999 onwards; and
- (c) the environmental situation will improve since the present spills of raw septic sludge in areas adjacent to Ilica and Alacati will be discontinued.

4.2 The economic evaluation analyzes first whether project demand is satisfied at the least economic cost. Second, an analysis is made whether discounted net economic benefits are greater than zero. And third, a calculation is made of the tariff level that reflect the economic costs of consumption.

4.3 **Least Cost Analysis.** The project components represent the least-cost solution since the focus is to make the minimum complementary investments to pump wastewater through an existing but unused trunk sewer, and to upgrade existing water supply facilities. At present there is water rationing during the period of peak consumption. As a consequence, the water distribution system is periodically empty during the period of peak consumption and runs the risk of being contaminated by fecal seepage from the ubiquitous septic tanks. This health hazard could at any one time trigger a water and sanitation-related epidemic. The consequences of such an epidemic would likely be considerable in human suffering and economic losses.

4.4 The project is then designed to restore water supply and wastewater service to safe and reliable standards through boosting water production in order to provide continuous service from the summer of 1999 onwards, and to make operational the existing trunk sewer and submarine outfall which have never been used. The investments are all small. For instance, the project will simply make the sewerage system operational through installing the ancillary pumps and preliminary treatment. The balance between water demand and supply will be restored through:

- (i) better commercial management, including tariffs that approach economic efficiency;
- (ii) adding more wells to extract water from the Ildir aquifer; and
- (iii) reducing the amount of water that is lost through leakage.

4.5 **Cost-Benefit Analysis.** The cost-benefit analysis compares the level of economic benefits and costs *with* and *without* the project. Benefits *with* the project are assumed to rise because the present rationing will cease and because the expected improvements in water quality will stimulate demand from the public water supply at the expense of demand from private wells, many of which cannot guarantee a safe or sufficient water supply. The annual consumption from private wells is expected to decline to 33,000 m<sup>3</sup> by 2005 compared to the 1997 consumption level of 735,000 m<sup>3</sup> (Annex 7).

4.6 Costs *with* the project are those project investments and the operations and maintenance costs. Benefits *without* the project are assumed to decrease gradually from their present level since system breakdowns are likely to become more frequent and since the deteriorating quality of service will increase consumer resistance to paying the same tariff in constant prices.

4.7 The incremental benefits and costs are shown in Annex 9. Costs and benefits are expressed in constant prices. Prices for foreign exchange and unskilled labor have not been adjusted since market prices are estimated to reflect economic prices well. Import duties and domestic taxes have been excluded in the economic analysis. The economic rate-of-return is calculated as 23% over the 1998-2020 period. The rate-of-return is high given the nature of the project, which is to take maximum advantage of existing unused facilities through better operations and maintenance, and to improve the quality of service through contracting with an efficient private operator.

4.8 **Economic Tariffs.** The tariffs for water supply and wastewater should reflect the long-run marginal cost (LRMC) of service to consumers. The LRMC is usually approximated by the average incremental cost (AIC) i.e. the ratio between discounted incremental costs and the discounted incremental water consumption. A discount rate of 10% was used for the calculations. The AIC for the project can be calculated to about US\$1.01 per cubic meter, allocating costs to the *annual* incremental consumption (Annex 10). This average AIC fails, however, to account for the substantial seasonal variations in demand. Due to the influx of tourists and apartment owners, the consumption rate during the peak bimester, July-August, is double the annual average. The principle to signaling costs through tariffs dictates that all capital expansion costs be allocated to the peak bimester consumption. In addition, the average operations and maintenance costs should be added. During the rest of the year off-peak consumption should in this fashion be charged only the unit operations and maintenance costs. The peak bimester cost has been computed as US\$4.71 per cubic meter (US\$4.56 for incremental capacity cost and US\$0.15 for incremental operation and maintenance cost). The marginal incremental cost during the rest of the year would then be US\$0.15 per cubic meter.

4.9 As in practice, such extreme variations between tariffs during the peak bimester and the off-peak bimesters would likely meet with considerable opposition a second best solution should be sought. *In this context agreement was reached at negotiations that the CALBIR will implement starting in 2000, peak July-August tariffs that are two times the tariffs, charged in preceding June month (para. 5.1 (h)).* The planned tariffs are shown below (Table 6).

Year	Total Volume billed (1000 m <sup>3</sup> )	Peak Bimester Consumption (1000 m <sup>3</sup> )	TARIFFS (US\$/m <sup>3</sup> )		
			Yearly Average	Peak Tariff, July-August	Off-peak, rest of year
1998	1,321	220	1.00	1.00	1.00
1999	1,467	435	1.20	1.20	1.20
2000	1,759	525	1.50	2.31	1.16
2001	2,098	626	1.60	2.46	1.23
2002	2,482	745	1.60	2.46	1.23
2003	2,756	827	1.60	2.46	1.23
2004	3,021	911	1.60	2.46	1.23
2005	3,270	992	1.60	2.46	1.23

4.10 Peak and off-peak tariffs have also a positive distributional effect since they shift the relative tariff burden away from the all-year-round population that consumes a higher share of the water during off-peak bimesters and on to the higher-income peak bimester population that accounts for the major share of the water consumed during the two-month peak.

4.11 **Affordability of Tariff.** The affordability of the recommended peak tariff can be estimated from data on household income. Average per capita consumption has been estimated at 97 liters per day, and average household size at 4 persons. The affordability test has been made for the year 2001 when the tariff will have reached the maximum level of an annual average of US\$1.60 per cubic meter. It has been assumed that the average household income levels are similar to those in Antalya for which a 1992 household income survey exists.

4.12 In order to make the prices of 2001 comparable to the 1992 income data in the survey it has been assumed that average household income will have grown by 2% per year and that dollar inflation will average 3%. A rule-of-thumb is that the combined water supply and wastewater bill should not be allowed to exceed 4% of the household income. The first quintile of the resident population, representing the poorest group, is below this 4% rule of thumb (Annex 11). A notable feature of the tariff is that it represents equivalent tariff (i.e. total water and wastewater revenues divided by the volume of water sold). Thus, if a household is not connected to the wastewater system, its water tariffs will be lower than what is shown in Table 6. Since the poorer section of the Cesme-Alacati area are not connected to the wastewater system, the tariffs will be lesser than the ones used to calculate affordability (Annex 11). This implies that in the year 2001 the first quintile will pay about 4.0% of their household income on water tariffs, making the investments under the Project more affordable for the residents. To alleviate the financial burden to the residents resulting from peak bimester tariffs, the CALBIR would provide the option of billing the residents at a rate which will average the payment over the six bimester billing cycles of the year.

4.13 In reality, it is likely that the water and wastewater bill's share of household income will be lower than shown in Annex 11 for the lowest income quintile and higher for the higher income quintiles. This follows from the fact that per capita water consumption increases with income. As

a result, the lowest income households may probably consume less than 97 liters per capita and day. In contrast, the highest income quintile will likely consume more than 97 liters per capita and day. The net result will be to make the combined water supply and wastewater bill more affordable for the lowest income quintile.

4.14 **Fiscal Impact.** The project financing plan includes a US\$5.5 million government grant through the MOT (para. 2.7). This grant is part of the government's overall program to ensure the sustainability of the economic benefits from tourism. It also takes into account the externalities related to the project health benefits. The government grant for the project is partially offset by the taxes (US\$3.1 million) to be paid by the CALBIR as a result of project investments. Another important indirect and long term fiscal impact of the project is the shift from investments carried out and financed by Iller Bank and DSI to investments directly financed by the water and sewerage services internal cash generation.

4.15 The Project through the establishment of the CALBIR impacts also the municipal finances, as the surpluses to be generated by the services will be reinvested in the same services rather than going to the general cash of the municipalities (para 3.2). This change in the allocation of resources will require the municipalities to make some downward adjustments in their expenditures. Although the adjustments are manageable, it is important to ensure that the municipal authorities have the right incentives to make the necessary adjustments rather than to borrow from the CALBIR. *To this effect, agreement was reached at negotiations that the CALBIR will not provide any loans to other entities, including the municipalities, or incur additional long term borrowings without consultation with the Bank (para. 5.1(i)).*

4.16 The present value of quantified externalities discounted at 10% is US\$2.2 million, which correspond to import duties and domestic taxes. This is the only difference between the net economic and financial benefits as: (i) prices for foreign exchange and unskilled labor have not been adjusted (para. 4.7); and (ii) other project externalities such as health benefits have not been quantified.

## B. Project Risks

4.17 There are four types of project risks, all of which will influence the project's economic return. The four risks are institutional, technical, financial, and market.

4.18 **Institutional Risks.** The institutional risks refer to the likelihood that no private operator will be attracted to bid for the management contract or that a private operator will abandon the contract. Either situation will present a serious dilemma since at present the Cesme and Alacati systems are poorly managed and the CALBIR has no ready institutional alternative to an aborted private operator contract. However, the risk that there will be no private operator bidding is judged to be small, given that potential bidders have already expressed interest in using the Cesme/Alacati management contract as a low-risk option of gaining a foothold in the potentially large Turkish water supply and wastewater market. In addition, the Project will cover the fixed and start-up costs of the operator through the Bank loan, creating an incentive for private sector participation (para. 2.20).

4.19 The risk of the CALBIR suffering the negative consequences from a management contractor abandoning a contract should be mitigated by requiring the management contractor to keep careful technical, operating and commercial data bases on the Cesme and Alacati systems and share data continuously with the CALBIR or its designated representatives. In this way, the CALBIR will reduce the risk that it will be at a competitive disadvantage in negotiations with a management contractor that might use an information asymmetry in renegotiating a contract in his own favor. Similarly, the CALBIR would be in a better position to rebid competitively a management contract or to bid competitively a concession in case it has an up-to-date system statistics.

4.20 The institutional risk of putting the inexperienced CALBIR at a disadvantage of dealing with an experienced private operator should also be mitigated by hiring consultants to assist the CALBIR in the dealings with the Private Operator.

4.21 **Technical Risks.** The technical risks center around the possibility that water quality, water production and water consumption will not increase as projected. The risk that water quality will not improve as projected depends on how fast the salt water intrusion into the Ildir aquifer can be reduced. This hinges on the effectiveness of the project grout curtain in sealing off the flow from the sea into the aquifer. The decision to install a grout curtain was taken after extensive hydrogeological studies by DSI. In order to mitigate this risk, the grout curtain is programmed early in the project period, in 1998. The works should be finished well before the 1999 peak bimester which is when production from additional wells should be increased. In case improvements in water quality lag expectations the possibility should be considered to use the waters in the existing Alacati surface reservoir and mix them with the Ildir groundwater in order to reduce salinity. However, using the Alacati reservoir is only the second-best solution since it would require the completion and operation of a potable water treatment plant currently under construction. This would take longer than the investments under the Project.

4.22 A second type of technical risk is the possible failure of the private operator to improve service to a point where consumers will switch from using their private wells to using the public water supply. This risk is mitigated through the process of selecting a highly qualified and reliable operator, by establishing adequate performance criteria under the contract, and ensuring adequate monitoring of the contractor's performance. Further, system losses will be reduced through investments for urgent repairs and upgrading envisaged under the Project (para. 2.4).

4.23 **Market Risks.** The market risk centers around the possibility that consumers will prefer to use private wells over the CALBIR system because of the cost of the services. For new customers, this is not a major risk as the cost of services is similar, a net present value of around \$ 1,100, under the two alternatives<sup>2</sup> (Annex 12). Moreover, the high investment costs and the burden of installation and maintenance of the wells, will make connection to the CALBIR system more attractive. A total of 11, 000 new users are expected to join the CALBIR system between 1998 and 2005. For the 15,000 existing users, the CALBIR system will be more expensive (net

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<sup>2</sup> The cost for wells assumes an average investment cost of around \$ 900 for wells 25 to 50 meters deep and an annual operating cost of US\$50 per household. An economic life of 15 years for a well and a 10% discount factor has been assumed for the calculations.

present value of around US\$ 842 for wells compared to US\$ 1,144 for the CALBIR system) and as a result there could be reluctance to give up the use of private wells (Annex 12). This risk will have to be mitigated by DSI, the Ministry of Health, and the municipalities. On grounds of efficient use of water resources, DSI has the authority to close illegal wells, which are prevalent in the region. The Ministry of Health and the municipalities can also close down the wells on public health grounds. To ensure that necessary steps are taken by the relevant agencies, *during negotiations an agreement was reached on the CALBIR preparing by November 30, 1998 a plan to phase-out the use of private wells (para 5.1(j)).*

**4.24 Sensitivity Tests of Technical Risks on the Economic Rate-of-Return.** The technical risks, if they materialize, will reduce the level of water consumption. In order to test for the sensitivity of the rate-of-return calculation to this scenario, water consumption with the project has been capped at 4.5 million cubic meters per year from the year 2001 and onwards implying consumer resistance to consuming poor-quality water or inability to consume more water because of production and distribution problems. The effect of this capping would be to reduce the economic-rate-of-return from 23% in the base scenario to 15%.

**4.25 Financial Risks.** The financial risks comprise the failure of generating a sufficient level of internal cash generation to enable the CALBIR to finance its share of investments, and the possible reluctance of consumers to paying the higher tariffs forecast under the project. These two risks are interrelated since the level of internal cash generation depends directly on the success of increasing tariffs. The risk would materialize if consumers perceived water quality to be no better with the project. This risk should be mitigated through a public information campaign where the expected benefits of the safer and more plentiful future water supply and sewerage system are explained to all consumers. Such a campaign is planned by the mayors of Cesme and Alacati to coincide with the start-up of the project. In addition there is a financial risk due to cost overruns. This risk, however, is not a major one as the cost estimates include adequate provisions for unforeseen events. In addition, there is no risk of a lumpy investment not being completed as all project investments are small and, thus, there is enough flexibility in the project design to delay some small investments if necessary without compromising the achievement of the project objectives. Also, the CALBIR should be in a position to finance any cost overruns with the cash surpluses expected for the year 2002 and thereafter (para. 3.8).

**4.26** The financial risk of lagging water sales should also be mitigated by having the Ministry of Tourism and the Bank loan finance 100% of the early works that aim at boosting water production and improving water quality. These works are critical to the success of ending rationing during the peak bimester July-August in 2000. For the same reason the peak bimester tariff is recommended to be in effect for the peak bimester in 2000 since the sharply higher tariff should help reduce wasteful consumption and bring about balance between supply and demand. The reasons for implementing a peak tariff should also be carefully explained in the public information campaign. The better quality and service of the public water supply are also expected to enable higher tariffs to be charged. If a household is connected to the sewerage system, CALBIR has the authority to charge for wastewater even if a private well is being used as a water source. This will also facilitate the charge of higher tariffs

4.27 In order to test for the sensitivity of the rate-of-return calculation to the financial risks, tariffs under this scenario have been capped at US\$1.20 per cubic meter from the year 1999 onwards and throughout the project period. Under these conditions the project's economic rate-of-return would drop from 23% in the base scenario to 14%. More seriously, such reduced tariffs would severely reduce the project's internal cash generation and make the assumed financing plan unfeasible.

## V. AGREEMENTS AND RECOMMENDATIONS

5.1 During negotiations, agreement was reached on the following:

- (a) the CALBIR will open a bank account to deposit local counterpart funding to the project (para. 2.9);
- (b) the CALBIR will monitor water quality near the sea outfall which will include sampling the water for specific parameters, determining the physical condition of the outfall, and taking appropriate corrective actions, if required as specified in the Project Implementation Guidelines (para 2.13);
- (c) the CALBIR will hire the private operator of the water and sewerage system, according to the proposed schedule (para. 2.19);
- (d) the CALBIR will implement the investment plan for each calendar year after discussion and agreement with the private operator (para. 2.24);
- (e) the CALBIR will utilize the loan allocation for urgent repairs and upgrading only after the contract with the private operator is executed (para. 2.24);
- (f) the CALBIR will furnish to the Bank before October 31 of each year a report on the following: a) the tariff policy to be implemented in the following year; b) plans and schedule for project completion; and c) corrective actions necessary to secure timely completion of the project (para 2.38). The CALBIR will conduct a Mid-term Review of project implementation in mid-2000 to examine implementation progress, all major problems encountered, the continued relevance of the project as appraised and any changes to be proposed to the Government and the Bank (para. 2.38);
- (g) the CALBIR will put into effect tariff adjustments to ensure that the tariffs and other operating revenues are sufficient to cover (i) payments to the private operator; (ii) the required contribution to investment; (iii) debt service payments; and (iv) CALBIR operating costs (para 3.6);
- (h) the CALBIR will implement peak-bimester tariffs in July and August that are two times the preceding June tariffs (para. 4.9);
- (i) the CALBIR will not extend loans to other entities, including the municipalities, not incur additional long term borrowings without consultation with the Bank (para. 4.15); and
- (j) the CALBIR will prepare a plan on the phase-out of use of private wells (para. 4.23).

5.2 As a condition of effectiveness, the CALBIR will employ the consultants who will help secure the private operator (para. 2.22).

5.3 With the above assurances and conditions, the project is suitable for a Bank loan of US\$13.1 million to the CALBIR, repayable in seventeen years, including five years of grace, at the standard variable interest rate for LIBOR-based US Dollars Single Currency loans.

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March 19, 1998



<b>Bank's Experience in Turkey's Water and Wastewater Sector</b>			
<b>Loan Title</b>	<b>Loan Amount (US\$ million)</b>	<b>Approval Year</b>	<b>Purpose of Project</b>
844-TU Istanbul Water Supply	37.0	1972	Expansion of water supply sytem for Istanbul
2159-TU Istanbul Sewerage	88.1	1982	Expansion of sewerage services, sewerage treatment and disposal for Istanbul
2537-TU Cukurova Region Urban Engineering Project	9.2	1985	Preparation studies for the Cukurova Urban Development Project
2818-TU Izmir Water Supply and Sewerage Project	184.0	1987	Water supply, sewerage, and sewage treatment facilities for Izmir
2819-TU Cukurova Urban Development Project	120.0	1987	Urban infrastructure, improvement of policies, institutional and financing arrangements for the Cukurova region
2888-TU Istanbul Water Supply and Sewerage Project	218.0	1987	Additional water supply, sewerage and sewage treatment facilities for Istanbul
3151-TU Ankara Sewerage Project	173.0	1989	Sewerage and sewage treatment works for Ankara
3565-TU Bursa Water and Sanitation (Water supply and sewerage component)	117.0	1993	Water supply, sewerage including sewage treatment
38936-TU Antalya Water Supply and Sanitation Project	100.0	1995	Expansion of water supply, wastewater, and drainage system, institutional strenghtening, private operator participation, and changes in municipal financial policies for Antalya
<b>Total</b>	<b>1,046.3</b>	-	-



# **Cesme - Alacati Water Supply and Sewerage Project**

## **Project Implementation Guidelines**

**March 19, 1998**

**Cesme - Alacati Water Supply and Sewerage Project**  
**Project Implementation Guidelines**

**TABLE OF CONTENTS**

**The Project**

**The Borrower and Implementing Agency**

**Implementation Arrangements**

**Project Implementation Schedule**

**Financial Management and Auditing**

**Monitoring and Evaluation**

**LIST OF ATTACHMENTS**

- 1. Making the CALBIR Operative**
- 2. Timetable for Hiring Consultants to the CALBIR Contract a Private Operator**
- 3. Terms-of Reference for Consultants for the Contracting with an Operator**
- 4. Monitoring Sea Water Quality at Sea Outfall**
- 5. Procurement Plan**
- 6. Chart of Accounts and Reporting System**

## Cesme -Alacati - Water Supply and Sewerage Project

### Project Implementation Guidelines

#### The Project

1. **Project Objectives:** The Project has three objectives:

- To build an effective institution, the CALBIR, that would contract with a Private Operator for the operation and maintenance of the water supply and wastewater system in Cesme and Alacati;
- to make the minimum investments that would enable the substantial underutilized water and wastewater infrastructure of past years to yield an economic and financial return; and
- to price water supply and wastewater services along principles of peak seasonal pricing and at the same time alleviate the financial burden on low-income consumers.

2. The Project would:

- increase annual water production from the present 3.9 million cubic meters to 5.6 million cubic meters by the year 2003;
- make the drinking water bacteriologically safe through chlorination;
- reduce the present high salinity of the drinking water through the construction of a grout curtain and relocation of some production wells;
- rehabilitate sections of the existing water supply system;
- increase the coverage of sanitary sewerage from the present 4 percent to 15 percent by the year 2003; and
- and put the presently unused sanitary sewerage pumping scheme into operation through the purchase and installation of pumps.

3. The project cost is estimated at US\$24.0 million, of which US\$2.6 million for water supply; US\$10.9 million for wastewater, and the balance of US\$10.5 million for design and supervision consultancy, physical and price contingencies, and audit. The World Bank would finance US\$13.1 million, the Ministry of Tourism US\$5.5 million, the CALBIR, US\$5.4 million.

4. **Economic Analysis:** The economic benefits of the project are measured by the value of the incremental revenue of the project. In addition, although they have not been quantified, the project would reduce the risks of water and wastewater related epidemics that could endanger the important summer tourism. The economic rate-of-return is estimated at 23 percent over the 1998-2020 period.

5. **Tariffs** The CALBIR will implement seasonal peak prices for the July-August peak period when consumption is double the annual average monthly consumption. In this way, off-peak tariffs could be reduced and in this way alleviate the financial burden of the lower-income, all-year-round population. Tariffs proposed are equivalent tariffs which is the ratio of revenues (from water and wastewater services, connection charge, contribution to investments, etc.) and volume of water sold. For instance, the proposed peak bimester tariff for the year 2001 is estimated at US\$2.46 per cubic meter, the off-peak season tariff at US\$1.23 per cubic meter, which yields an annual average of US\$1.60 per cubic meter. The peak bimester tariff is still below the Average Incremental Cost of the peak bimester consumption which has been calculated to be US\$4.71 per cubic meter over the 1998-2020 period.

6. **Project Risks.** The project risks are institutional, technical, and financial. The institutional risks refer to the likelihood that no private operator will be attracted to bid for the management contract or that a private operator will abandon the contract. The risk that there will be no private operator bidding is judged to be small, given that potential bidders have already expressed interest in using the Cesme/Alacati management contract as a low-risk option of gaining a foothold in the potentially large Turkish water supply and wastewater market. In addition, the Project will cover the fixed and start-up costs of the operator through the Bank loan, creating an incentive for private sector participation. The risk of the CALBIR suffering the negative consequences from a management contractor abandoning a contract should be mitigated by requiring the management contractor to keep careful technical, operating and commercial data bases on the water and wastewater systems and share data continuously with the CALBIR. The institutional risk of putting the inexperienced CALBIR at a disadvantage of dealing with an experienced private operator should also be mitigated by hiring consultants to assist the CALBIR in supervising the private operator.

7. The technical risks center around the possibility that water quality, water production and water consumption will not increase as projected. In order to mitigate this risk, investments aiming at increasing water quantity and quality are programmed early in the project implementation period, in 1998 and 1999. Further, system losses will be reduced through the fund for urgent repairs and maintenance. These measures to improve quality and increase quantity of water will be re-evaluated when the private operator is in place in 1999. Additional measures may be taken after consulting with the private operator, who will be responsible for improving the service.

8. The financial risks comprise the failure of the CALBIR generating a sufficient level of cash to enable it to finance its share of investments, and the possible reluctance of consumers to paying the higher tariffs forecast under the project. These two risks are interrelated since the level of internal cash generation depends directly on the success of increasing tariffs. The risk would

materialize if consumers perceived water quality to be no better with the project. This risk should be mitigated through a public information campaign where the expected benefits of the safer and more plentiful future water supply and of the sewerage system are explained to all consumers. Such a campaign is planned by the mayors of Cesme and Alacati to coincide with the start-up of the project. In addition there is a financial risk due to cost overruns. This risk, however, is not a major one as the cost estimates include adequate provisions for unforeseen events. In addition, there is no risk of a lumpy investment not being completed as all project investments are small and, thus, there is enough flexibility in the project design to delay some small investments if necessary without compromising the achievement of the project objectives. Also, the CALBIR should be in a position to finance any cost overruns with the cash surpluses expected for the year 2002 and thereafter.

### **Borrower and Implementing Agency**

9. The borrower and project implementing agency would be the CALBIR established by Decree of the Council of Ministers (No. 97/9933 of September 08, 1997).

10. In addition to its regular staff (Secretary General, Treasurer and support staff), the CALBIR has hired consultants to assist in the engineering and financial aspects of project implementation.

### **Implementation Arrangements**

11. Under its By-laws, the CALBIR is responsible for the development, management and operation of water supply, wastewater and solid waste services in Cesme and Alacati. The CALBIR will contract with a private operator the provision of water supply and sewerage services and will concentrate its administrative and technical resources on: (i) managing the contract with the private operator and monitoring its performance; (ii) carrying out the necessary investments through contractors; and (iii) supervising investment implementation through consultants.

12. **Private Operator for the Water Supply and Sewerage System.** The CALBIR will sign a management contract with a qualified water supply and sewerage operator to provide services on behalf of the CALBIR under a performance-based remuneration. The contract is expected to be signed in March 1999.

13. **Selecting the Private Operator.** The CALBIR would seek assistance of consultants in the process of hiring the private operator. The timetable for hiring the consultants and the draft terms of reference for the assignment are shown in Attachment 1. This consultant will be financed by the ongoing Japanese grant until the closing date of December 31, 1998. After this date, the consultants will be financed from the Bank loan.

14. **Managing the Contract with the Private Operator.** The CALBIR will seek assistance from consultants to manage the contract with the private operator and to supervise the performance during the first two years of the contract. For this assistance, the CALBIR may

decide to hire on a sole source basis, the consultant firm assisting in the selection of the private operator. This consultant is expected to be financed through technical assistance under the proposed Bank loan.

15. **Transitional Arrangements for Operating the System.** The Cesme and Alacati municipalities formally turned over the water supply and sewerage system to the CALBIR in February 1998, but the municipalities will continue operating the system under contract until the private operator takes over in March 1999. The water and sewerage revenues will be deposited by the municipalities in the CALBIR's bank account, and the CALBIR will pay from this account the costs (such as personnel, energy and materials) incurred by the municipalities in providing the services.

16. **Implementing the Capital Expenditures Program.** The CALBIR will be responsible for the implementation of the capital expenditures program under the Project. In implementing the program, the CALBIR will coordinate closely with the private operator to ensure that the sequencing and specific characteristics of the investments yield the highest possible return. Options to delegate to the private operator the execution of investments under the Project will be considered during the bidding for the private operator.

17. **Investments in Urgent Repairs and Upgrading.** The Project includes an allocation of US\$1.0 million for urgent repairs and upgrading of the water supply and sewerage system. This amount is scheduled to be used in a three-year period subject to previous agreement among the CALBIR, the private operator and the Bank on annual investment programs. The implementation of this project component could be accelerated by agreement among the three parties.

### **Project Implementation Schedule**

18. The implementation schedule is guided by the need to generate economic benefits and financial revenue as quickly as possible. In this vein, investments in water production and district metering are programmed early to better satisfy water demand and provide data on which to base the leak detection program; a grout curtain will be constructed to reduce sharply the intrusion of sea water to the aquifer from which the wells draw water so that the chemical quality of the drinking water will improve; the chlorination system will be rehabilitated to ensure residual chlorine in the system and eliminate the risk of fecal contamination of drinking water; production wells will be relocated early on to improve and boost the quality and quantity of the drinking water in order to improve services; pumps will be purchased and installed to make the existing trunk wastewater system operational so that the wastewater from the Alacati town center and Ilica could be pumped away; the effect of the wastewater discharge through the sea outfall monitored (Attachment 2); and septic tanks will be replaced by sanitary sewerage in the Cesme town center where the risk for contamination of groundwater and epidemics is the greatest.

19. During project implementation, the CALBIR will submit to the Bank before October 31 of each year the following: a) the tariff policy to be implemented the next year; b) plans and schedule for project completion; and c) corrective actions necessary to secure timely completion of the project. In addition, a mid-term review of the project implementation will be held in mid-

2000 to examine implementation progress, address problems encountered, the continued relevance of the project as appraised and address any changes. The procurement plan of the project is shown in Attachment 3.

### **Financial Management, Accounting, and Auditing**

20. The financial consultant to be hired by the CALBIR will assist in the detailed design and implementation of the accounting system for the CALBIR and for the Project, on the basis of the attached draft chart of accounts and reporting system (Attachment 4). The Bank procedures (OP/BP 10.02) on financial management will be followed to ensure that adequate financial management systems are in place.

21. The accounts of the CALBIR and of the Project and the Special Account will be audited annually by private independent auditors. The CALBIR will hire by September 30, 1998 private auditors acceptable to the Bank to audit its 1998-2000 accounts, and by June 30, 2000 auditors for its 2001-2003 accounts.

### **Monitoring and Evaluation**

22. The parameters to be used to monitor and evaluate the project are summarized below. The projections reflect the increased efficiency in the delivery of water and wastewater services. The CALBIR will be responsible for the monitoring and reporting of information. Corrective actions, as required, will be discussed with the Bank prior to its implementation. The development objectives of the project will be monitored through indicators which are summarized below.

<b>Development Objectives</b>	<b>Verifiable Indicators</b>	<b>Means of Verification</b>
Institutional Strengthening	<ul style="list-style-type: none"><li>• legal creation of the CALBIR</li><li>• CALBIR staffed and operational</li></ul>	already created reports from the CALBIR
Provision of Private Services	<ul style="list-style-type: none"><li>• private operator in place</li><li>• private operator meeting contract performance standards</li></ul>	contract signed periodic reports from CALBIR
Improving efficiency in water and wastewater services	<ul style="list-style-type: none"><li>• performance Indicators (below)</li></ul>	Periodic reports

**PERFORMANCE INDICATORS**

INDICATORS	Actual			Projections			
	1997	1998	1999	2000	2001	2002	2003
Water produced in Ildir wells (million m <sup>3</sup> )	3.9	4.0	4.0	4.3	4.7	5.2	5.5
Conductivity (micro mhos/cm)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Residual Chlorine <sup>1</sup> (mg/l)	0	0.5	1.0	1.0	1.0	1.0	1.0
Fecal Coliform <sup>2</sup> (FC/100 ml)	pos	TBD	0	0	0	0	0
Fecal Coliform <sup>3</sup> (FC/100 ml)	NA	TBD	200	200	200	200	200
Water Billed (million m <sup>3</sup> )	1.3	1.3	1.5	1.8	2.1	2.5	2.8
Loss (% of production)	68%	67%	63%	59%	56%	53%	50%
Number of water connections	15,625	16,158	17,159	18,921	20,781	22,757	24,080
Number of wastewater connections	862	891	923	2,388	2,470	2,556	3,969
Bill Collection (% of water billed)	85	85	85	87	90	92	95
Tariff Levels <sup>4</sup> (\$/m <sup>3</sup> )							
Peak bi-mester (July-August)	0.74	1.00	1.20	2.31	2.46	2.46	2.46
Off-peak	0.74	1.00	1.20	1.16	1.23	1.23	1.23
Yearly average	0.74	1.00	1.20	1.50	1.60	1.60	1.60
Operating Expense/unit of water billed (\$/m <sup>3</sup> )	0.52	0.52	0.50	0.45	0.42	0.39	0.40
Working Ratio <sup>5</sup>	0.71	0.52	0.41	0.30	0.26	0.24	0.23

TBD - To be determined by  
December 1999

<sup>1</sup> In the distribution system and inside dwellings

<sup>2</sup> In dwellings and public buildings

<sup>3</sup> At beaches

<sup>4</sup> Equivalent tariff which is calculated by dividing total operating revenues (water and sewerage tariffs, connection fees, contribution to investments, etc.) by water billed. The tariff is shown in current prices.

<sup>5</sup> Operating Expenses divided by revenues. The low working ratio is due to the need to establish tariffs high enough to cover contribution to investments and debt service.

23. As part of Project Implementation, the CALBIR in consultation with the private operator will develop a plan by December 1999 to protect the existing aquifer to ensure efficient use of water resources from the aquifer and Ilder Springs. The plan will be implemented starting in 2000.

**REPUBLIC OF TURKEY**  
**CESME-ALACATI WATER SUPPLY AND WASTEWATER PROJECT**

**Draft Terms of Reference for Consultancy Services**  
**For Preparing and Procuring a Contract**  
**For the Provision of Water Supply and Wastewater Services**

**BACKGROUND**

1. Tourism is developing rapidly in the eastern Mediterranean basin. Turkey's tourism development is relatively new compared to other Mediterranean countries, which provides an opportunity to make precautions against potential negative environmental effects of tourism. The Cesme-Alacati Water Supply and Sewerage Project is one of the priority projects on the Aegean coastline. The Cesme-Alacati municipalities' resident population numbers about 20,000 (13,000 and 7,000, respectively). During the peak months of July/August the population rises to about 100,000 due to local and foreign tourists.

2. The feasibility studies for the Cesme-Alacati Project were recently completed and the first stage of the Project is expected to be carried out in the 1998-2002 period, and funded by the CALBIR of the Cesme-Alacati municipalities (CALBIR), the World Bank, and the Ministry of Tourism. The cost of the consultancy services to be procured under these terms of reference will be financed by a Japanese Grant to the Turkish Government.

**CURRENT EXPERIENCE IN WATER AND SANITATION SERVICES**

3. The Cesme and Alacati municipalities are adjacent. They use the same water supply source and will share a wastewater collection and disposal system. The water supply and sanitation services were until late 1997 provided separately by the two municipalities. Both services are rated unsatisfactory by both the municipal authorities and the customers. In view of this situation, the municipal authorities decided to create a single local authority (the CALBIR) to provide water supply and wastewater services. This cooperation would allow the municipalities to benefit from economies-of-scale in the provision of services.

**INSTITUTIONAL ARRANGEMENTS**

4. **Municipal CALBIR** The CALBIR was approved by the Council of Ministers on September 08, 1997 and published in the Official Gazette on September 30, 1997. The CALBIR was established in accordance with the provisions of Articles 133-148 of Municipal Law 1580. Under the CALBIR By-laws, the CALBIR is responsible for the development, management and operation of water supply, wastewater and solid waste services in Cesme and Alacati.

5. The CALBIR has decided to contract with a private operator the provision of water supply and wastewater services, and concentrate on financing new investments, and employing contractors and consultants to undertake and supervise the necessary investments.

6. **Ministry of Tourism (MOT)** MOT played an important role in preparing the Cesme-Alacati project in coordination with the municipal authorities. MOT will continue to play a central role during the duration of this consultant study and will continue to advise the CALBIR.

7. **Private Operator** A single private operator would be responsible for (a) managing, operating and maintaining all the water supply and wastewater service; (b) for billing and collecting water and wastewater charges on behalf of the CALBIR; (c) for maintaining detailed operating records and accounts which will be duly audited annually by private auditors; and (d) for monitoring the water supply quality and effluent quality in the planned pre-treatment wastewater plant. The CALBIR expects to benefit from the experience of the private sector participation in water supply and wastewater services in Antalya and in Bursa.

#### **OBJECTIVE AND APPROACH OF THE CONSULTING SERVICES**

8. The objective of this consulting services contract is to assist the CALBIR in preparing for and contracting with a private operator in the provision of water supply and wastewater services. The contractual arrangement to be implemented shall be technically, legally, financially and politically viable. A technically viable arrangement would be one that is: (i) well-targeted to resolve existing problems, as perceived by municipal authorities, customers, and other stakeholders; and (ii) compatible with existing legislative framework. A legally viable arrangement would be one where no new legislation is required for implementation. A financially viable arrangement would be one that could be financed at tariffs that consumers are willing to pay. And, a politically viable arrangement would be one that has political support, both within the formal authorities and other relevant stakeholders.

9. The consultants shall take the recently awarded private operator contract in Antalya Municipality and the one under preparation for the Bursa Municipality as the models for a similar private operator contract for the CALBIR. The consultants shall assess the differences in conditions between Antalya and Bursa on one hand and on the other hand, and allow for the impact that these differences may have on the bidding process and conditions of the contract.

10. The consultants should ensure that the cost of engaging the private operator is reasonable in light of the relatively small size of the water supply and wastewater systems. The consultants shall use to the maximum extent the recently completed studies for Antalya and Bursa while preparing similar bidding documentation and contracts for the CALBIR. The Cesme-Alacati contract is expected to serve as model documents for small and medium-sized municipalities in Turkey.

## **SCOPE OF WORK**

11. The consultants' work will be divided into four phases. The CALBIR will review and approve the completion of each phase before instructing the consultants to proceed to the following phase.

### **Phase 1: Preparation and Documentation Phase ( Estimated time: 2 months)**

12. In Phase One the consultant should undertake the following tasks:

- analyzing and recommending changes to the Antalya and Bursa documents for use by the CALBIR. The consultants should, among other things, analyze the staff employed by the municipalities of Cesme and Alacati in the present operation of the water supply and wastewater systems and how the Private Operator could offer them employment to ensure continuity and transfer of knowledge;
- designing and proposing a bidding process, which involves decisions such as:
  - ◇ the criteria to prequalify bidders, taking into account the need to promote wide competition, while at the same time ensuring that the prequalified firms have the capacity to provide services acceptable to the CALBIR and the municipalities;
  - ◇ the information to be provided to bidders, such as the necessary technical, financial, legal and regulatory information, inventory of existing facilities, and current tariffs;
  - ◇ the extent to which there are discussions with bidders before the formal bidding process begins, and the form of these discussions;
  - ◇ the instructions to bidders on what their proposals should contain;
  - ◇ the methods that will be used to evaluate bids; and
  - ◇ the procedures for handling complaints and appeals from the bidders.
- preparing the necessary bidding documents, including prequalification documents, request for bid proposals, and draft contract.

### **Phase 2: Prequalification ( Estimated time: 2 months)**

13. In phase 2 the consultant should assist the CALBIR in prequalifying bidders, which includes activities such as providing information to bidders, as appropriate, and evaluating the

requests for prequalification. All the bidders meeting the prequalification criteria shall be allowed to bid

**Phase 3: Bidding ( Estimated time: 4 months).**

14. In phase 3 the consultant should assist the CALBIR in carrying out the bidding process, including providing information to bidders, as appropriate, and evaluating bids.

**Phase 4: Contracting and Transfer of Operating Responsibility (Estimated time: 2 months)**

15. In phase 4 the consultant should assist the CALBIR in negotiating the contract with the selected bidder, and in turning over the water and sewerage services to the private operator. Due attention should be paid to the transfer conditions for those municipal staff that will be retained by the Private Operator.

**COST OF CONSULTING SERVICES**

16. In view of the expected substantial economies from using the Antalya and Bursa experiences and documentation as models the entire cost of the consulting services is estimated at US\$200,000. In addition, a US\$50,000 success fee will be paid to the consultants upon the successful transfer of services to the private operator.

**INVOLVEMENT OF LOCAL CONSULTANTS**

17. Due to the nature of the consulting assignment and the need to have familiarity with the Turkish business and legal environment, the consultants are recommended to work in cooperation with local consultants.

**TECHNICAL ASSISTANCE FOR MONITORING THE PRIVATE OPERATOR**

18. The CALBIR will most likely hire on a sole source basis the consultant working under these terms of reference (TOR) to assist in the next stage to supervise the contract with the private operator and monitoring its performance.

**Cesme-Alacati Water Supply and Wastewater Project**  
**Monitoring Sea Water Quality at Sea Outfall**

The CALBIR will monitor sea outfall conditions and will take once a year measurements to assess the quality of the water during peak flow in summer (July/August). The following parameters will be monitored:

**Physio-chemical**

- temperature
- dissolved oxygen
- salinity
- turbidity
- conductivity
- pH

**Chemical and biochemical**

- total nitrogen
- total phosphorus
- biochemical oxygen demand
- chemical oxygen demand
- silicates
- chlorophyll-alpha

**Bacteriological quality**

- $T_{90}$  (decay rate)
- fecal coliform
- total coliform

The cost of monitoring the above parameters is expected to be around \$6,000 per sample including all the above tests. The measurements are to be carried out at different distances from the coastal line and at different depths following a grid pattern of which the center line follows the axis of the sea outfall and two parallel lines are located at 1,000m distance from and at both sides of the center line. Distances from the coast line as follows: 1, 650, 1300, and 2300m. In total at 12 locations at a depth of 0 (at the surface), 5, 10, and 20m. The total cost of the above Physio-chemical, Chemical and biochemical and Bacteriological monitoring during the project period is expected to be US\$100,000.

The physical condition of the sea outfall will be monitored by divers. The total cost for the monitoring of the physical condition is expected to be around US\$10,000.

Cesme - Alacati - Water Supply and Sewerage Project									
Procurement Plan									
Component	Contract Identification	Nature of Package	Cost Estimate <sup>a)</sup> US\$1000	Procurement Method	Deadlines				
					Document Preparation	Invitation Prequalification	Invitation Tendering	Contract Signature	Contract Completion
<b>BANK FINANCED COMPONENTS</b>									
<b>A - Water Supply</b>									
District Metering - Chlorination and Minor Extensions	A1 (multiple contracts)	Goods and Minor Works <sup>c)</sup>	688	IS/NS	05/30/99		07/01/99	09/01/99	12/30/99
Relocation of Ildir Wells	A2	Works	332	NCB	07/30/98	07/01/98	09/01/98	11/01/98	04/30/99
Urgent Repairs and Upgrading	A3	Goods and Minor Works <sup>b)</sup>	920	IS/NS/MW	Ongoing process during initial period of the Project Implementation				
<b>B - Wastewater</b>									
Wastewater Pumping Stations	B1	Works	4,064	NCB	07/30/98	10/30/98	01/01/99	03/30/99	03/30/00
Wastewater Network	B2	Works	7,958	ICB	07/30/98	08/01/00	09/30/00	01/01/01	02/28/03
<b>C - Consultants and Auditors</b>									
Implementation Supervision	C1 (multiple contracts)	Individual Consultancy	436	Section V of Guidelines	01/15/98			02/26/98	02/28/03
Construction Supervision	C2	Consultancy	1,402	QCBS	07/30/98	06/01/98	09/01/98	11/01/98	03/31/03
Private Operator Supervision	C3	Consultancy	859	QCBS <sup>d)</sup>	01/01/99		01/15/99	03/31/99	03/31/03
Private Auditors	C4	Consultancy	278	Least Cost	05/30/98	06/01/98	07/01/98	09/30/98	03/31/01
Private Operator Fixed Fees	C5	Consultancy	1,150 <sup>e)</sup>	QCBS	06/30/98	07/31/98	10/1/98	03/12/99	TBD
Office Equipment	C6	Goods	197	NS					
Monitoring Sea Outfall	C7		143	QCBS	03/30/99	05/31/99	06/30/99	10/31/99	TBD
<b>MOT FINANCED COMPONENTS</b>									
Hydrogeological Survey	D1	Consultancy	470	GOT <sup>f)</sup>				1997	03/30/98
Ilica Sewer Network, Bulk Meter	D2	Works	4,000	GOT				1997	12/31/99
Grout Curtain	D3	Works	1,103	GOT	05/30/98		07/01/98	09/01/98	06/31/99

- a) Includes contingencies, taxes and duties. Wastewater Pumping Stations comprises 2 contracts.
- b) About \$460,000 each is expected to be spent on Goods and Minor Works. Does not include contingencies but includes taxes.
- c) It will be continuation of a contract where the consultants will help in securing and supervising a private operator. A QCBS process, under Project preparation, is being followed for selecting the consultant which will help secure and supervise the private operator.
- d) Does not include contingencies and but includes taxes.
- e) It includes US\$200,000 for minor works and US\$488,000 for goods.
- f) Government of Turkey procurement procedures will be followed.

## SCHEDULE OF CONSULTING SERVICES

Item	Objective	Possible Provider	Contracting Method
C1 Implementation Supervision	Assist CALBIR in the supervision of Project execution	Individual Consultants with specific expertise	Section V of Guidelines
C2 Construction Supervision	Assist CALBIR in the supervision of project execution	Consulting Firm with experience in Technical Assistance for Bank project implementation supervision	QCBS
C3 Supervision of Private Operator	Assist CALBIR in the supervision of Private Operator	Consulting Firm preparing bid documents for Private Operator	QCBS
C4 Auditing of CALBIR Accounts	Audit	Consulting Firm	Least Cost Method
C5 Private Operator Fees	To cover the fixed costs of the operator	A private water company, working under a management contract	QCBS
C7 Monitoring Sea Outfall	Enable CALBIR to take action, as appropriate, to ensure seawater quality	Consulting firm	QCBS

IS: International Shopping; NS: National Shopping; NCB: National Competitive Bidding; ICB: International Competitive Bidding; MW: Minor Works  
 QCBS: Quality and Cost Based Selection; QBS: Quality Based Selection

**CESME - ALACATI WATER SUPPLY AND SEWERAGE PROJECT**

**CHART OF ACCOUNTS**

<b>Account</b>	<b>Loan Agreement Category</b>	<b>SAR Component/ Subcomponent</b>	<b>Funding Source</b>	<b>Account Description</b>
				<b>CASH ACCOUNTS</b>
1100		000	0	Cash - IBRD Special Account
1200		000	0	Cash - Union Account
				<b>FUNDING SOURCES</b>
2110		000	1	Union Funding
2120		000	2	World Bank Funding
2130		000	3	Ministry of Tourism Funding
				<b>WATER SUPPLY</b>
3310		110		District Metering
3320		120		Chlorination
3330				Ilder Springs
3340				Urgent Repairs and Upgrading
3350				Hydrogeological Study
3360				Bulk Water Meter
3370				Ildir Grout Curtain
				<b>WASTEWATER</b>
3410				Pumping
3420				Grit Removal
3430				Sewage Collection (Cesme)
3440				Sewage Collection (Ilica)
				<b>CONSULTANTS AND OFFICE EQUIPMENT</b>
3510				Implementation Supervision
3520				Construction Supervision
3530				Private Operator (Selection and Supervision)
3540				Private Auditors
3550				Office Equipment

**CESME-ALACATI WATER SUPPLY AND SEWERAGE PROJECT  
SUMMARY OF SOURCES AND USES OF FUNDS**

As of.....  
Current Quarter:.....  
Currency.....

	Actual			Budget			Variance		
	Year-to date	Current Quarter	Cumulative To-Date	Current Quarter	Year-to date	Cumulative To-Date	Current Quarter	Year-to date	Cumulative To-Date
Project Financing									
1 Union Funding									
2 World Bank Funding									
3 Ministry of Tourism									
Total Financing									
Project Expenditures									
1. Works Water Supply									
2. Works Sewerage									
3. Goods									
4. Urgent Repairs & Upgrading									
5. Consultancy Services/Audits									

**CESME-ALACATI WATER SUPPLY AND SEWERAGE PROJECT**

**COST VARIANCE REPORT**

As of.....  
 Current Quarter:.....  
 Currency.....

Project Expenditures	Funding Source	Loan Agreement Category	Actual			Budget			Variance		
			Current Quarter	Year-to-Date	Cumulative To-Date	Current Quarter	Year-to-Date	Cumulative To-Date	Current Quarter	Year-to-Date	Cumulative To-Date
1. Works Water Supply 2. Works Sewerage 3. Goods 4. Urgent Repairs and Upgrading 5. Consultancy Services/Audits											



**CESME-ALACATI WATER SUPPLY AND SEWERAGE PROJECT**

**EXPENDITURE BY DISBURSEMENT CATEGORY**

As of.....  
Current Quarter:.....  
Currency.....

Disbursement Category (Per Loan Agreement)	Eligible %	Actual Current Quarter		Forecast Next Quarter	
		(b) Project Expenditure <sup>1</sup>	(c) IBRD Eligible Expenditures Payable from Special Account	(d) Project Expenditure <sup>1</sup>	(e) IBRD Eligible Expenditures Payable from Special Account
<b>Project Expenditures</b>					
1. Works Water Supply					
2. Works Sewerage					
3. Goods					
4. Urgent Repairs and Upgrading					
5. Consultancy Services/Audits					
<b>Total Expenditure</b>					
<b>Less: Amount paid from Special Account</b>			<input type="text"/>		
<b>Balance not yet paid from Special Account</b>			<input type="text"/>		<input type="text"/>
<b>Total eligible to be paid</b>					<input type="text"/>
<b>Balance in Special Account (excluding adjustments)</b>					<input type="text"/>
<b>IBRD Disbursement Requested</b>					<input type="text"/>

**CESME-ALACATI WATER SUPPLY AND SEWERAGE PROJECT**

**CONTRACT EXPENDITURE REPORT  
GOODS AND WORKS (FOR CONTRACTS ABOVE PRIOR REVIEW THRESHOLD)  
PRIOR REVIEW THRESHOLD: > US \$.....PER LOAN AGREEMENT**

As of.....(cumulative)  
Currency.....

<b>Contract Description</b>	<b>Contract Number</b>	<b>Supplier/ Contract or</b>	<b>Nationality</b>	<b>Zip Code if US</b>	<b>Contract Value</b>	<b>Amount Invoiced to date</b>	<b>Amount Paid to date</b>
<b>Goods</b>							
<i>International Competitive Bidding</i>							
<i>National Competitive Bidding</i>							
<i>National Shopping</i>							
<i>To be determined</i>							
<b>Total Goods</b>							
<b>Works</b>							
<i>National Shopping</i>							
<i>National Competitive Bidding</i>							
<i>Direct Contracting</i>							
<b>Total Works</b>							

**TURKEY CESME - ALCATI WATER SUPPLY AND SEWERAGE PROJECT (IBRD LOAN \_\_\_\_ - TR)**

**CONTRACT EXPENDITURE REPORT (A)**

**CONSULTANTS (FOR CONTRACTS ABOVE PRIOR REVIEW THRESHOLD)**

**PRIOR REVIEW THRESHOLD: >= U.S. \$... (INDIVIDUAL) OR U.S. \$... (FIRM)**

As of: \_\_\_\_\_ (cumulative)

Applicable currency: \_\_\_\_\_

<b>Contract Description (b)</b>	<b>Contract Number</b>	<b>Consultant</b>	<b>Nationality</b>	<b>Zip Code if U.S.</b>	<b>Contract Value</b>	<b>Amount Invoiced to date</b>	<b>Amount Paid to date</b>
<i>Quality and Cost Based Selection</i>							
<i>Quality Based Selection</i>							
<i>Fixed Budget Selection</i>							
<i>Least Cost Selection</i>							
<i>Single Source Selection</i>							
<i>Commercial Practices</i>							
<b>Total</b>							

Notes:

- (a) In order to run this report, the following will need to be input: type of currency (i.e., local or loan) and applicable quarter (e.g. Q197, Q297, 397, Q497).
- (b) Amendments that are subjected to Bank no objection should be included as an additional line with the same contract number and amendment number.

TURKEY CESME - ALCATI WATER SUPPLY AND SEWERAGE PROJECT (IBRD LOAN \_\_\_\_ - TR)

PROCUREMENT MANAGEMENT REPORT (A)

GOODS AND WORKS (FOR CONTRACTS ABOVE REVIEW THRESHOLD)

PRIOR REVIEW THRESHOLD: >= \$... (OR EQUIVALENT IN OTHER CURRENCIES) PER LOAN AGREEMENT (SCHEDULE 4, PART D.2.)

As of: \_\_\_\_\_ (cumulative)

		Bidding Process Dates (DD/MM/YY)																Supplier/ Contractor
Contract Description (b)	Tender Number	Bid Docs Ready		No Objection		Call for Bids (c)		Bid Open		No Objection		Contract Signature		Contract Start		Contract End		
		Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	
<b>Goods</b>																		
<i>International Competitive Bidding</i>																		
<i>National Competitive Bidding</i>																		
<i>National Shopping</i>																		
<i>To be determined</i>																		
<b>Works</b>																		
<i>National Shopping</i>																		
<i>National Competitive Bidding</i>																		
<i>Direct Contracting</i>																		

- (a) In order to run this report, the following will need to be input: applicable date.  
This report has been designed for the LACI pilot phase. It duplicates information already captured in form 384.  
The information contained in the report will be integrated and the format revised under the Procurement Information System already under development.
- (b) For Contracts with pre-qualification, the date of submission of pre-qualification documents and the date of no objection should be provided.
- (c) Call for Bids is the date of publication for specific procurement notices.

**TURKEY CESME - ALACATI WATER SUPPLY AND SEWERAGE PROJECT (IBRD LOAN \_\_\_\_-TR)**

**PROCUREMENT MANAGEMENT REPORT (A)  
CONSULTANTS (FOR CONTRACTS ABOVE PRIOR REVIEW THRESHOLD)  
PRIOR REVIEW: >= U.S. \$... (INDIVIDUAL) OR U.S. \$... (FIRM)**

As of: \_\_\_\_\_ (cumulative)

Contract Description (b)	Proposal Number	Proposal Process Dates (DD/MM/YY)																								Supplier/Contractor
		Advertising		RFP Final Draft		No Objection		Invitation to Firms		Proposal Receipt		Tech Eval No Obj		Final No Obj		Contract No Obj		Contract Signature		Contract Start		Contract End				
		Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	
<i>Quality and Cost Based Selection</i>																										
<i>Quality Based Selection</i>																										
<i>Fixed Budget Selection</i>																										
<i>Lean Cost Selection</i>																										
<i>Single Source Selection</i>																										
<i>Commercial Practices</i>																										

Notes:

- (a) In order to run this report, the following will need to be input: applicable date.  
This report has been designed for the LACI pilot phase. It duplicates information already captured in form 384.  
The information contained in the report will be integrated and the format revised under the Procurement Information System already under development.
- (b) Amendments that are subjected to Bank no objection should be included as an additional line with the same contract number and amendment number.

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	PROJECT COST						
	(in current US\$1000)						
	1998	1999	2000	2001	2002	2003	TOTAL
<b>Institutional Strengthening</b>							
Audit/Consultants and Office Equipment <sup>a</sup>	50	250	250	250	250	100	1,150
Fees to Private Operator	0	300	300	200	200	0	1,000
Design and Supervision	307	195	220	330	200	100	1,352
<b>Sub-total</b>	<b>357</b>	<b>745</b>	<b>770</b>	<b>780</b>	<b>650</b>	<b>200</b>	<b>3,502</b>
<b>Water</b>							
District Metering and Extensions	-	350	-	-	-	-	350
Chlorination	-	150	-	-	-	-	150
Relocation of Ildir wells	-	250	-	-	-	-	250
Urgent Repairs and Upgrading	-	-	300	500	-	-	800
Hydrogeological Study - MOT	300	-	-	-	-	-	300
Bulk Water Meter - MOT	20	-	-	-	-	-	20
Ildir Grout Curtain - MOT	750	-	-	-	-	-	750
<b>Sub-total</b>	<b>1,070</b>	<b>750</b>	<b>300</b>	<b>500</b>	<b>-</b>	<b>-</b>	<b>2,620</b>
<b>Wastewater</b>							
Pumping Stations	-	400	800	600	500	500	2,800
Wastewater Network (Cesme)	-	-	1,100	2,200	1,500	500	5,300
Sewage Collection (Ilica) - MOT	2,000	800	-	-	-	-	2,800
<b>Sub-total</b>	<b>2,000</b>	<b>1,200</b>	<b>1,900</b>	<b>2,800</b>	<b>2,000</b>	<b>1,000</b>	<b>10,900</b>
<b>Basic Cost</b>	<b>3,427</b>	<b>2,695</b>	<b>2,970</b>	<b>4,080</b>	<b>2,650</b>	<b>1,200</b>	<b>17,022</b>
Physical Contingency (10%)	342.7	269.5	297	408	265	120	1,702
Price Contingency	38	150	352	697	595	335	2,166
<b>Project Cost</b>	<b>3,807</b>	<b>3,115</b>	<b>3,619</b>	<b>5,185</b>	<b>3,510</b>	<b>1,655</b>	<b>20,890</b>
Taxes (15%)	571	467	543	778	526	248	3,134
<b>TOTAL PROJECT COST</b>	<b>4,379</b>	<b>3,582</b>	<b>4,162</b>	<b>5,963</b>	<b>4,036</b>	<b>1,903</b>	<b>24,024</b>
Index of Unit Value of MUV <sup>b</sup>	100%	102%	106%	109%	112%	115%	118%
Price Adjustment factor	101%	105%	111%	116%	120%	125%	
District metering and extension (US\$150,000) and service extension (US\$200,000)							
a: Ind cons (US\$300,000), superv priv operator (US\$500,000), auditors (US\$200,000) & office equip (US\$150,000)							
b: Index for manufactured exports from G-5 countries, expressed in US dollars							
Source: World Bank Operational Manual (OP 6.50 - Annex B1), November 1997							

<b>FINANCING PLAN</b>							
<b>(in current US\$ 1000)</b>							
	1998	1999	2000	2001	2002	2003	TOTAL
<b>Union</b>							
Contribution to Investments	0	135	675	1,037	772	402	3,021
Taxes	8	315	543	778	526	248	2,418
<b>Total Union</b>	<b>8</b>	<b>449</b>	<b>1,218</b>	<b>1,815</b>	<b>1,299</b>	<b>650</b>	<b>5,439</b>
<b>MOT</b>							
Investments	3,752	1,017	-	-	-	-	4,769
Taxes	563	153	-	-	-	-	715
<b>Total MOT</b>	<b>4,315</b>	<b>1,170</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>5,484</b>
<b>Bank Loan<sup>a</sup></b>	<b>56</b>	<b>1,963</b>	<b>2,944</b>	<b>4,148</b>	<b>2,737</b>	<b>1,253</b>	<b>13,100</b>
<b>Total Financing</b>	<b>4,379</b>	<b>3,582</b>	<b>4,162</b>	<b>5,963</b>	<b>4,036</b>	<b>1,903</b>	<b>24,024</b>
a: 54.5% of total project cost							

## ENVIRONMENTAL ANALYSIS OF SEA WATER DISCHARGE

### 1.0 Introduction

1.1 The Project proposes the expansion of sewer networks and disposal of wastewater through a sea outfall, south of Alacati (Figure 1). The effects of discharge on the sea water quality and marine ecology as well as compliance of the resulting water quality with relevant Turkish and EU standards were analyzed, as part of the environmental assessment. The wastewater flow considered was as follows:

PERIOD	FLOW (l/s)	BOD (kg/d)
<b>Summer</b>		
1995	0	0
2000	73	1,994
2005	130	3,448
2010	224	5,768
2015	334	8,513
2020	477	11,933
<b>Winter</b>		
1995	0	0
2000	28	698
2005	49	1,330
2010	83	2,126
2015	122	2,873
2020	176	3,925

1.2 The Alacati sea outfall is located 1,300 meters from the coast south of Alacati (Figure 2). There is little development in the area but plans exist for a marina for Alacati Bay, a few kilometers away from the outfall. The Greek island Samos is located at about 80km south east, whereas another Greek island Khios is at 20km west of the sea outfall.

### 2.0 Environmental Assessment

2.1 The effect of the discharge on the sea was simulated using a model that incorporates dilution. The main conclusions are as follows:

#### Effects on Trophic State

2.2 Nutrients (nitrogen and phosphorus) contained in untreated domestic wastewater that are discharged to the sea may affect the trophic state of coastal waters and increase the primary productivity. Domestic wastewater contains typically 50 mg/l of total N and 10-15mg/l of total P. Simulations show that dilutions are typically in the order of magnitude of 1,000-10,000 in an area that is 3-4 km away from the diffuser. This means that the concentrations of N and P will be reduced to 0.35-3.5 micromole per liter ( $\mu\text{mol/l}$ ) and 0.04-0.4  $\mu\text{mol/l}$  respectively. Superposed

upon the existing nutrient concentrations in the Sea, the nutrient inputs may trigger an elevated level of productivity in a region within 3km diameter around the outfall. In the farfield the effect of additional nutrients fades away and has no impact on the marine biology. Analysis shows that at discharge level of 200-300l/s it will be necessary to control the nutrient inputs. These flow levels are expected to be reached around 2010. By that time, the Cesme-Alacati municipality Union (CALBIR) should consider upgrading the treatment and seek means to re-use the treated wastewater.

### Effect on Fish Species

2.3 A survey of the region was conducted which showed that the region has about 17 species of flora, 129 species of benthic invertebrates and 13 species of fish. When the sewage discharge starts, there will be minor effects on the flora and fauna around the diffuser. The resistant species will remain and probably will increase their population while others will evacuate the region of influence. With regard to free swimming pelagic fishes, they are generally attracted to areas around municipal outfalls because they find abundant food in these areas. In the specific case of the Alacati outfall, there is no risk of bio-accumulation of heavy metals or persistent organics that may be toxic to the fish species because there are no industries operating in the region.

2.4 It is also unlikely that even the immediate region around the diffuser structure will suffer from oxygen depletion. The initial dilutions calculated in the simulations have all been found to be greater than 100. This means that the biochemical oxygen demand (BOD<sub>5</sub>) of domestic wastewater (typically up to 300mg/l) will exert an oxygen demand of less than 0.3mg/l on the sea water. Since it has been measured that the dissolved oxygen concentrations at the outfall location are at near saturation levels (8-10mg/l), BOD<sub>5</sub> will not lower the oxygen concentration at critical level for the survival of the fish. Thus, the impact on the flora and fauna will be limited and no significant impact on commercial fisheries should be expected.

### Compliance with Laws and Regulations

2.5 The water quality standards due to the discharge was compared with EU Bathing Water directives<sup>1</sup> and Turkish laws<sup>2</sup>. From the analysis it can be concluded that:

- compliance with mandatory European Union Bathing Standards is achieved for T<sub>90</sub><sup>3</sup> values of less than or equal to 1.5 h up to the year 2020. At flow rates exceeding 300l/s and at wind speeds less than 3.0 m/s, EU Bathing Water standards will be met 1,300 m away from the diffuser;
- compliance with mandatory European Bathing Standards may not be achieved for T<sub>90</sub> value of 2h and at a wind velocity exceeding 4m/s. However, since northerly winds are predominant in the project area throughout the year and persistent in summer, discharged wastewater will be

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<sup>1</sup> Microbiological standards: i) Mandatory - 2,000 E. coli per 100 ml; 10,000 total coliform per 100 ml; ii) Recommended - 100 E. coli per 100 ml; 500 total coliform per 100 ml

<sup>2</sup> Microbiological standards: 200 E.coli per 100 ml; 1,000 total coliform per 100 ml

<sup>3</sup> Decay rate measures on the basis of the time required for inactivation of 90% of coliform bacteria

carried away from the shore towards the open sea. This minimizes the possibility of the beaches not meeting the standards; and

- compliance with Turkish laws are reached under the following conditions: a) for  $T_{90}$  of 1.0 h throughout the project period for wind velocities not exceeding 4 m/s; b) for  $T_{90}$  of 1.5 h throughout the project period for wind velocities not exceeding 3 m/s; c) for  $T_{90}$  of 2.0 h throughout the project period for wind velocities not exceeding 2 m/s. This implies that at approximately 2,000 meters from the coast line and at a decay rate of 1.5 hours, and wind speeds less than 3.0 m/s, the sea water will meet Turkish Bathing water standards until the year 2020. Since the distance between the outfall and the nearby Greek island is around 20 kilometers, the effect of the discharge on the island is negligible.

### 3.0 Recommendations

3.1 The analysis performed shows that there is no significant environmental effects due to the discharge of the wastewater. However, certain measures are recommended to ensure a long term solution to the discharge of the wastewater without affecting the environment.

#### Chlorination

3.2 To remove any concerns about bacteriological content in the wastewater discharge, chlorination of the wastewater before it is discharged into the sea is recommended. An optimum dosage, depending on the wastewater flow, will be evaluated and used. Chlorination is not an expensive option and would remove any risks associated with coliform contamination.

#### Monitoring

3.3 The simulation on the dilution of wastewater has been based on project design flows. However, it could be possible that during operations, the actual wastewater flow and BOD load exceeds design values. Hence, it is recommended that from date of initial operations, sea water quality be carefully monitored. For this purpose an action program is proposed comprising annual measurements to assess physio-chemical, chemical and biochemical and bacteriological parameter of the sea water during peak and off-peak flows. Also monitoring of physical condition of sea outfall should be performed which would require special equipment to determine the quality underwater. The CALBIR will be responsible for the monitoring and taking any corrective actions, if required.

#### Future Plans

3.4 The analysis shows that up to the year 2015 European Union and Turkish standards on water quality will most likely be met (para. 2.5). After that, given the increase in the population, the CALBIR would have to take additional steps such as upgrading the treatment of the wastewater through the construction of a treatment plant and using the effluent for land use purposes. The wastewater treatment plant will not be required until the year 2015 and consequently construction should start around 2012. As an alternative to delaying the construction of the wastewater treatment beyond 2012, land infiltration techniques may also be considered.

3.5 The CALBIR should consider the re-use of treated effluent from the treatment plant since there is a shortage of water for agricultural purposes during summer months. The treated

wastewater may be used for irrigation purposes or even used to water a golf course which is expected to be built in the vicinity of the outfall. Golf courses require abundant water to maintain the greens and fairways. Since rainfall during summer is low in the area, developers of the future golf course may have a strong interest in using the effluent and contributing towards the construction of the wastewater treatment plant. The Bank during Project implementation will provide technical assistance to the CALBIR in determining options for future wastewater treatment and re-use of the effluent.

**TURKEY**  
**CESME - ALACATI WATER SUPPLY AND SEWERAGE PROJECT**

**QUARTERLY LOAN DISBURSEMENT ESTIMATES**

<b>Bank Fiscal Year</b>	<b>Date End Quarter</b>	<b>Quarterly Disbursement (US\$ million)</b>	<b>Cumulative Disbursement (US\$ million)</b>	<b>Cumulative Disbursement (in %)</b>
FY99	September 30	0.1*	0.1	1
	December 31	0.0	0.1	1
	March 31	0.2	0.3	2
	June 30	0.7	1.0	8
FY00	September 30	0.6	1.6	13
	December 31	0.6	2.2	16
	March 31	0.7	2.9	22
	June 30	0.7	3.6	27
FY01	September 30	0.8	4.4	33
	December 31	0.8	5.2	40
	March 31	0.8	6.0	46
	June 30	1.0	7.0	53
FY02	September 30	1.0	8.0	62
	December 31	0.9	8.9	70
	March 31	0.8	9.7	76
	June 30	0.8	10.5	81
FY03	September 30	0.6	11.1	84
	December 31	0.6	11.7	89
	March 31	0.6	12.3	94
	June 30	0.8	13.1	100

\* Initial Deposit in Special Account

**TURKEY**  
**CESME - ALACATI WATER SUPPLY AND SEWERAGE PROJECT**

**WATER AND SEWERAGE SERVICES**  
**FINANCIAL PERFORMANCE\***  
**(Current US\$000)**

	1995			1996			1997		
	Cesme	Alacati	Combined	Cesme	Alacati	Combined	Cesme	Alacati	Combined
<b>Operating Revenues</b>									
Water tariffs	481.5	36.9	518.4	471.8	73.1	545.0	700.0	118.0	817.9
Wastewater/Tanks	51.6	-	51.6	40.0	-	40.0	66.1	0.0	66.1
Contr. to Water Inv.	0.2	25.5	25.7	0.1	52.1	52.2	-	8.4	8.4
Contr. to Waste/Tanks	19.8	53.8	73.6	5.7	35.0	40.7	16.7	28.6	45.3
Penalties**	26.2	5.2	31.5	27.2	0.4	27.7	29.3	0.9	30.1
<b>Total Operating Rev.</b>	<b>579.3</b>	<b>121.4</b>	<b>700.7</b>	<b>544.9</b>	<b>160.7</b>	<b>705.6</b>	<b>812.1</b>	<b>155.9</b>	<b>967.9</b>
<b>Operating Expenditures</b>									
Personnel (Water)	60.5	53.4	113.9	76.3	60.8	137.1	115.2	71.7	186.9
Personnel (Wastewater)	23.9	-	23.9	37.1	-	37.1	52.3	0.0	52.3
Other Current Exp. (Water)	237.4	6.4	243.8	306.4	7.1	313.5	253.9	0.6	254.5
Other Current Exp. (Wastewater)	57.8	-	57.8	57.8	-	57.8	80.3	0.0	80.3
Repairs (Water)	1.3	6.4	7.7	17.9	30.1	48.0	21.2	77.0	98.2
Repairs (Wastewater)	9.6	-	9.6	35.9	44.0	79.9	-	0.0	-
<b>Total Operating Expenditure</b>	<b>390.4</b>	<b>66.3</b>	<b>456.7</b>	<b>531.4</b>	<b>142.0</b>	<b>673.4</b>	<b>522.9</b>	<b>149.3</b>	<b>672.2</b>
<b>Operational Surplus (Deficit)</b>	<b>188.9</b>	<b>55.1</b>	<b>244.0</b>	<b>13.5</b>	<b>18.7</b>	<b>32.2</b>	<b>289.2</b>	<b>6.6</b>	<b>295.7</b>
<b>Payments to Iller Bank</b>	<b>85.2</b>	<b>-</b>	<b>85.2</b>	<b>139.4</b>	<b>-</b>	<b>139.4</b>	<b>159.7</b>	<b>39.8</b>	<b>199.4</b>
<b>Cash Surplus (Deficit)</b>	<b>103.7</b>	<b>55.1</b>	<b>158.9</b>	<b>(129.9)</b>	<b>18.7</b>	<b>(107.2)</b>	<b>129.5</b>	<b>(33.2)</b>	<b>96.3</b>

\* Cash Accounting

\*\* Assuming 25% of total penalties collected by the Municipality correspond to water and wastewater/tanks.

## ANNUAL WATER AND WASTEWATER DEMAND

	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Population</b>									
Resident	20,886	22,138	23,467	24,875	26,455	28,136	29,924	31,826	33,850
Summer house	65,793	67,406	69,059	70,754	72,307	73,896	75,520	77,180	78,878
Tourist	14,768	15,675	16,693	17,857	18,947	20,132	21,423	22,835	24,386
<b>Total population</b>	<b>101,447</b>	<b>105,219</b>	<b>109,219</b>	<b>113,486</b>	<b>117,709</b>	<b>122,164</b>	<b>126,867</b>	<b>131,841</b>	<b>137,114</b>
<b>Water Demand (liters/capita/day)</b>									
Resident	97	97	97	97	97	97	97	97	97
Summer house	115	115	115	115	115	115	115	115	115
Tourist	247	247	250	250	250	250	250	250	250
Water Production (1000m <sup>3</sup> )	3,934	4,045	4,012	4,329	4,768	5,231	5,467	5,647	5,828
Water Billed (1000m <sup>3</sup> )	1,267	1,321	1,467	1,759	2,098	2,482	2,756	3,021	3,270
Annual billings increase (%)		4.3%	11.1%	19.8%	19.3%	18.3%	11.0%	9.6%	8.2%
Losses (% of production) <sup>a</sup>	68%	67%	63%	59%	56%	53%	50%	47%	44%
Consumption from Private Wells (1000m <sup>3</sup> )	735	647	559	471	382	291	211	113	33
<b>Water Connections</b>									
<b>Service Ratio</b>									
Residents	73%	73%	75%	80%	85%	90%	92%	93%	94%
Summer House	73%	73%	75%	80%	85%	90%	92%	93%	94%
<b>Population Connected</b>									
Residents	15,247	16,161	17,600	19,900	22,487	25,322	27,530	29,598	31,819
Summer house	48,029	49,206	51,794	56,603	61,461	66,506	69,478	71,777	74,145
Tourist	5,412	5,687	6,197	7,000	7,988	9,041	9,825	10,523	11,244
<b>Number of Connections</b>									
Residents	4,066	4,310	4,693	5,307	5,996	6,753	7,341	7,893	8,485
Summer house	11,301	11,578	12,187	13,318	14,461	15,649	16,348	16,889	17,446
Tourist/Commercial	258	270	279	296	323	356	391	417	440
<b>Total</b>	<b>15,625</b>	<b>16,158</b>	<b>17,159</b>	<b>18,921</b>	<b>20,781</b>	<b>22,757</b>	<b>24,080</b>	<b>25,199</b>	<b>26,371</b>
<b>Volume of Water billed (1000m<sup>3</sup>)</b>									
Resident Population	351	372	418	507	613	735	828	922	1,014
Summer house population	528	541	587	690	801	923	1,000	1,069	1,130
Tourists	317	333	379	460	561	677	762	845	923
Commercial	70	74	84	101	123	147	166	184	203
<b>Total</b>	<b>1,267</b>	<b>1,321</b>	<b>1,467</b>	<b>1,759</b>	<b>2,098</b>	<b>2,482</b>	<b>2,756</b>	<b>3,021</b>	<b>3,270</b>
<b>Wastewater Connections</b>									
<b>Service Ratio</b>									
	4%	4%	4%	10%	10%	10%	15%	20%	30%
<b>Population Connected</b>									
Residents	223	236	250	663	705	750	1,197	1,697	2,708
Summer House	619	634	650	1,665	1,701	1,739	2,665	3,632	5,568
Tourist/Commercial	20	21	22	60	63	67	107	152	244
<b>Total</b>	<b>862</b>	<b>891</b>	<b>923</b>	<b>2,388</b>	<b>2,470</b>	<b>2,556</b>	<b>3,969</b>	<b>5,482</b>	<b>8,520</b>
<b>Volume Billed (1000m<sup>3</sup>)</b>									
Residents	23	23	24	66	73	83	134	190	307
Summer house	33	32	33	88	96	104	164	225	343
Tourist	19	19	20	56	64	74	120	173	279
Commercial	5	5	5	13	15	17	27	38	62
<b>Total</b>	<b>80</b>	<b>79</b>	<b>81</b>	<b>223</b>	<b>248</b>	<b>277</b>	<b>445</b>	<b>627</b>	<b>991</b>

a: Includes physical losses, water provided free of charge, and inadequate consumption metering

WATER SUPPLY & SEWERAGE BALANCE SHEET											
(in current 1000 USD)											
	CESME	1997 ALACATI	UNION	1998	1999	2000	2001 UNION	2002	2003	2004	2005
<b>ASSETS</b>											
Cash	1	80	82	343	457	437	180	352	226	219	353
Accounts Receivable	135	122	257	224	298	382	486	579	649	713	773
Inventories	32	25	56	54	67	79	97	109	116	118	120
Total Current Assets	168	227	394	620	821	898	763	1,041	991	1,049	1,245
Fixed Assets (water/ww/iller)	8,089	5,859	13,947	19,126	23,507	27,669	33,632	38,068	40,971	42,271	43,771
Accumulated Depreciation	1,756	954	2,710	3,041	3,467	3,979	4,592	5,309	6,099	6,932	7,792
Total Fixed Assets	6,332	4,905	11,237	16,085	20,040	23,690	29,040	32,759	34,872	35,339	35,979
Total Assets	6,500	5,132	11,632	16,705	20,861	24,588	29,803	33,800	35,863	36,389	37,224
<b>EQUITY AND LIABILITIES</b>											
Ilker Bank Long Term Debt	493	1,004	1,497	2,017	2,677	2,537	2,397	2,257	2,117	1,977	1,837
World Bank Long Term Debt	-	-	-	56	2,018	4,962	9,110	11,302	11,463	10,371	7,642
Ilker Bank Current Portion of Long Term Debt	67	43	110	140	140	140	140	140	140	140	140
World Bank Current Portion of Long Term Debt	-	-	-	-	-	-	-	546	1,092	1,092	2,729
Other Payables	12	7	19	19	20	23	26	30	31	32	33
Equity	5,928	4,078	10,006	14,473	16,005	16,925	18,129	19,526	21,020	22,776	24,843
Total Equity and Liability	6,500	5,132	11,632	16,705	20,861	24,587	29,803	33,800	35,862	36,388	37,224
Debt/Asset Ratio			12.9%	12.4%	22.5%	30.5%	38.6%	40.1%	37.9%	33.9%	25.5%

<b>INCOME STATEMENT</b> (in current 1000 \$)									
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Water Billed (1000 m <sup>3</sup> )	1,267	1,321	1,467	1,759	2,098	2,482	2,756	3,021	3,270
Average Equivalent Water Tariff (\$/m <sup>3</sup> )	0.74	1.00	1.20	1.50	1.60	1.60	1.60	1.60	1.60
<b>TOTAL REVENUES</b>	937	1,321	1,761	2,638	3,357	3,971	4,410	4,833	5,232
<b>OPERATING EXPENSES<sup>a</sup></b>									
Energy	236	249	254	283	320	361	387	410	434
Personnel <sup>b</sup>	228	234	241	248	255	262	369	478	591
Operation/Repair & Maintenance	156	161	200	237	290	328	349	353	360
Septic Tanks	44	40	35	30	25	20	15	10	5
Total Operating Expense	665	683	731	798	890	970	1,119	1,252	1,390
<b>INCOME BEFORE INTEREST AND DEPRECIATION</b>	272	638	1,030	1,840	2,466	3,001	3,290	3,582	3,842
Depreciation	225	331	426	512	613	717	790	832	860
<b>INCOME BEFORE INTEREST</b>	47	307	604	1,328	1,853	2,284	2,500	2,749	2,981
Interest payments to Iller Bank <sup>c</sup>	213	140	140	140	140	140	140	140	140
World Bank Commitment Fee	-	33	28	20	10	3	-	-	-
World Bank Interest	-	2	74	248	500	744	866	853	775
Total Debt Service	213	175	241	408	650	887	1,006	993	915
<b>NET INCOME</b>	(166)	132	362	920	1,204	1,397	1,494	1,757	2,066
<b>Performance Indicators</b>									
Working Ratio (operating expense/revenues)		0.52	0.42	0.30	0.27	0.24	0.25	0.26	0.27
Operating Expense per cubic meter of water billed (\$)		0.52	0.50	0.45	0.42	0.39	0.41	0.41	0.43

a: The fees to the private operator during the initial years of the contract (1999-2002) are included as part of project investments and not shown in the income statement

b: An additional \$ 100,000 of personnel costs are included from 2003 since the fees to the private operator from investments will cease in 2002.

c: Iller Bank loan repayment and interest expense were maintained constant from 1998, due to uncertainties about exact investments and debt repayment schedule

<b>SOURCES AND USES OF FUNDS</b>									
(in current 1000 \$)									
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Income before Depreciation	272	638	1,030	1,840	2,466	3,001	3,290	3,582	3,842
Loans and Grants		5,170	3,932	2,944	4,148	2,737	1,253	-	-
IBRD Disbursement	-	56	1,963	2,944	4,148	2,737	1,253	-	-
Iller Bank Disbursements	-	800	800					-	-
MOT Disbursements	-	4,315	1,170					-	-
<b>TOTAL SOURCES OF FUNDS</b>	<b>272</b>	<b>5,808</b>	<b>4,962</b>	<b>4,784</b>	<b>6,615</b>	<b>5,738</b>	<b>4,543</b>	<b>3,582</b>	<b>3,842</b>
Investments		5,179	4,382	4,162	5,963	4,436	2,903	1,300	1,500
Water and Sewerage (Iller Bank)		800	800						
Investment Cost - IBRD project		4,379	3,582	4,162	5,963	4,036	1,903	-	-
Investments by Union - non IBRD project						400	1,000	1,300	1,500
World Bank Loan Repayment	-	-	-	-	-	-	546	1,092	1,092
Interest Expense		2	74	248	500	744	866	853	775
World Bank Commitment Fee		33	28	20	10	3	-	-	-
Working Capital Needs	-	54	85	94	119	103	74	65	61
Iller Bank Loan Repayment <sup>a</sup>		140	140	140	140	140	140	140	140
Iller Bank Interest Expense <sup>a</sup>	213	140	140	140	140	140	140	140	140
<b>TOTAL USES OF FUNDS</b>	<b>213</b>	<b>5,547</b>	<b>4,848</b>	<b>4,803</b>	<b>6,871</b>	<b>5,566</b>	<b>4,669</b>	<b>3,589</b>	<b>3,708</b>
Change in Cash	59	261	114	(20)	(257)	172	(126)	(7)	134
Initial Cash	23	82	343	457	437	180	352	226	219
Final Cash	82	343	457	437	180	352	226	219	353

**ECONOMIC ANALYSIS**

	1997	1998	1999	2000	2001	2002	2003	2004-2020 <sup>b</sup>
<b>BENEFITS WITH PROJECT</b>								
Water Production (1000 m <sup>3</sup> )	3,934	4,045	4,012	4,329	4,768	5,231	5,467	5,647
Water Losses (1000 m <sup>3</sup> )	1,574	1,618	1,404	1,429	1,526	1,622	1,640	1,638
Water Consumption (1000 m <sup>3</sup> ) <sup>a</sup>	2,361	2,427	2,608	2,900	3,242	3,609	3,827	4,009
Average Economic Tariffs (\$/m <sup>3</sup> )	0.74	0.99	1.14	1.35	1.38	1.33	1.28	1.23
Total With Project Benefits, \$ 1000	1,747	2,403	2,978	3,928	4,490	4,797	4,885	4,920
<b>BENEFITS WITHOUT PROJECT</b>								
Water Production (1000 m <sup>3</sup> )	3,934	3,810	3,700	3,590	3,480	3,370	3,270	3,270
Water Losses (1000 m <sup>3</sup> )	1,574	1,590	1,600	1,620	1,630	1,650	1,670	1,670
Water Consumption (1000 m <sup>3</sup> ) <sup>a</sup>	2,361	2,220	2,100	1,970	1,850	1,720	1,600	1,600
Average Economic Tariffs (\$/m <sup>3</sup> )	0.72	0.7	0.68	0.66	0.64	0.62	0.6	0.6
Total Without Project Benefits, \$ 1000	1,700	1,554	1,428	1,300	1,184	1,066	960	960
<b>INCREMENTAL PROJECT BENEFITS, \$ 1000</b>	<b>47</b>	<b>849</b>	<b>1,550</b>	<b>2,627</b>	<b>3,306</b>	<b>3,730</b>	<b>3,925</b>	<b>3,960</b>
<b>COSTS WITH PROJECT</b>								
Investment Costs, \$1000	3,770	2,965	3,267	4,488	2,915	1,320	0	
Operating and Maintenance Costs, \$ 1,000	677	696	720	771	806	893	960	
Total With Project Costs, \$ 1000	4,446	3,660	3,987	5,259	3,721	2,213	960	
<b>COSTS WITHOUT PROJECT</b>								
Investment Costs								
Operations and Maintenance Costs @ 0.12/m <sup>3</sup>	457	444	431	418	404	392	392	
<b>COSTS WITHOUT PROJECT</b>	<b>457</b>	<b>444</b>	<b>431</b>	<b>418</b>	<b>404</b>	<b>392</b>	<b>392</b>	
<b>INCREMENTAL PROJECT COSTS, \$ 1000</b>	<b>3,989</b>	<b>3,216</b>	<b>3,557</b>	<b>4,841</b>	<b>3,316</b>	<b>1,820</b>	<b>567</b>	
<b>NET ANNUAL BENEFITS, \$ Million</b>	<b>-3140</b>	<b>-1666</b>	<b>-929</b>	<b>-1535</b>	<b>414</b>	<b>2105</b>	<b>3392</b>	
<b><u>ECONOMIC RATE OF RETURN: 23%</u></b>								

a: Includes water billed and free of charge of water

b: Production figures are assumed to be constant

**CALCULATION OF AVERAGE INCREMENTAL COST OF CONSUMPTION DURING PEAK BI-MESTER**

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 to 2020
<b>WITH PROJECT</b>																		
Annual Avg. Production, (1000 m <sup>3</sup> )	3,934	4,045	4,012	4,329	4,768	5,231	5,467	5,647	5,830	6,280	6,490	6,700	6,910	7,120	7,450	7,580	7,850	8,000
Annual Avg. billed consumption (1000 m <sup>3</sup> )	1,267	1,321	1,467	1,759	2,098	2,482	2,756	3,021	3,270	3,500	3,750	3,950	4,150	4,360	4,570	4,790	5,030	5,200
Peak Bimester Factor As Percent of Average Bimester Consumption,(1000 m <sup>3</sup> )	1.74	1.76	1.78	1.79	1.79	1.80	1.80	1.81	1.82	1.83	1.84	1.85	1.86	1.86	1.86	1.86	1.86	1.86
Peak Bimester Consumption,(1000 m <sup>3</sup> )	211	220	245	293	350	414	459	503	545	583	625	658	692	727	762	798	838	867
Annual Project Investment (US\$ 1000) <sup>a</sup>		3,770	2,965	3,267	4,488	2,915	1,320	2,110	1,440	1,540	2,800	2,740	3,250	2,880	3,790	6,770	4,000	3000
Present Value Project Investments (US\$ 1000)			26,233															
Present Value of annual Avg. billed consumption (1000 m <sup>3</sup> )			25,975															
<b>Average Incremental Cost (US\$/m<sup>3</sup>)</b>			<b>1.01</b>															
<b>WITHOUT PROJECT</b>																		
Peak Bimester Billed Consumption, (1000 m <sup>3</sup> )	211	220	200	180	160	150	150	150	150	150	150	150	150	150	150	150	150	150
Incremental Peak Bimester Consumption (1000 m <sup>3</sup> )	-	-	235	345	466	595	677	761	842	918	1,000	1,068	1,137	1,202	1,267	1,335	1,409	1,462
Present Value Peak Bimester Incremental Consumption (1000 m <sup>3</sup> )			5,756															
<b>Average Incremental Capacity Cost of Peak Bimester Consumption (US\$ per cubic meter)</b>			<b>4.56</b>															
<b>Average Incremental Operations and Maintenance Cost(US\$ per cubic meter)</b>			<b>0.15</b>															
<b>Total incremental cost of peak bimester consumption (US\$ per cubic meter)</b>			<b>4.71</b>															

a: Investments necessary to increase the annual water production to 8 million m<sup>3</sup> by the year 2014 and maintain it at that level until 2020

**AFFORDABILITY OF TARIFFS BY RESIDENTS**

	1998	1999	2000	2001	2002	2003	2004	2005
Total Volume billed (1000 m <sup>3</sup> )	1,321	1,467	1,759	2,098	2,482	2,756	3,021	3,270
Peak (July/August) Consumption (1000 m <sup>3</sup> )		435	525	626	745	827	911	992
Off Peak Consumption (1000 m <sup>3</sup> )	1,321	1,032	1,234	1,472	1,737	1,929	2,110	2,278
Ratio: Peak to Off-peak monthly consumption		2.1	2.1	2.1	2.1	2.1	2.2	2.2
Resident/Commercial Consumption (1000 m <sup>3</sup> )	446	501	609	736	882	994	1,107	1,217
Summer house/tourist cons. (1000 m <sup>3</sup> )	875	966	1,150	1,362	1,600	1,762	1,914	2,053
<b>TARIFF RATIO: Peak/Off-peak</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
Total Revenues	\$ 1,321,003	\$ 1,760,813	\$ 2,637,819	\$ 3,356,861	\$ 3,971,056	\$ 4,409,585	\$ 4,833,369	\$ 5,231,543
Average Tariff (\$/m <sup>3</sup> )	1.00	1.20	1.50	1.60	1.60	1.60	1.60	1.60
Off Peak Tariff (\$/m <sup>3</sup> )	1.00	1.20	1.16	1.23	1.23	1.23	1.23	1.23
Peak Tariff (\$/m <sup>3</sup> )	1.00	1.20	2.31	2.46	2.46	2.46	2.46	2.46
Number of Residents Connected	16,161	17,600	19,900	22,487	25,322	27,530	29,598	31,819
Number of Houses Connected (3.75 people/house)	4,310	4,693	5,307	5,996	6,753	7,341	7,893	8,485
Revenues from Residents	\$ 446,293	\$ 601,202	\$ 820,509	\$ 1,057,655	\$ 1,266,741	\$ 1,427,564	\$ 1,586,940	\$ 1,742,554
Revenues from non-Residents	\$ 874,709	\$ 1,159,610	\$ 1,817,310	\$ 2,299,207	\$ 2,704,314	\$ 2,982,021	\$ 3,246,429	\$ 3,488,989
Average Monthly Bill per Residence	\$ 8.63	\$ 10.67	\$ 12.88	\$ 14.70	\$ 15.63	\$ 16.20	\$ 16.76	\$ 17.11
<b>Household Income Distribution by Quintile<sup>a</sup></b>								
First	\$ 327	\$ 342	\$ 357	\$ 373	\$ 390	\$ 408	\$ 426	\$ 445
Second	\$ 504	\$ 527	\$ 550	\$ 575	\$ 601	\$ 628	\$ 656	\$ 686
Third	\$ 646	\$ 675	\$ 705	\$ 737	\$ 770	\$ 805	\$ 841	\$ 879
Fourth	\$ 896	\$ 936	\$ 978	\$ 1,022	\$ 1,068	\$ 1,117	\$ 1,167	\$ 1,219
Fifth	\$ 1,953	\$ 2,041	\$ 2,133	\$ 2,229	\$ 2,329	\$ 2,434	\$ 2,543	\$ 2,658
<b>Average Share of Tariffs on Household Income by Quintile</b>								
First	2.6%	3.1%	3.6%	3.9%	4.0%	4.0%	3.9%	3.8%
Second	1.7%	2.0%	2.3%	2.6%	2.6%	2.6%	2.6%	2.5%
Third	1.3%	1.6%	1.8%	2.0%	2.0%	2.0%	2.0%	1.9%
Fourth	1.0%	1.1%	1.3%	1.4%	1.5%	1.5%	1.4%	1.4%
Fifth	0.4%	0.5%	0.6%	0.7%	0.7%	0.7%	0.7%	0.6%

a: The income is assumed to grow at the rate of 4.5% annually

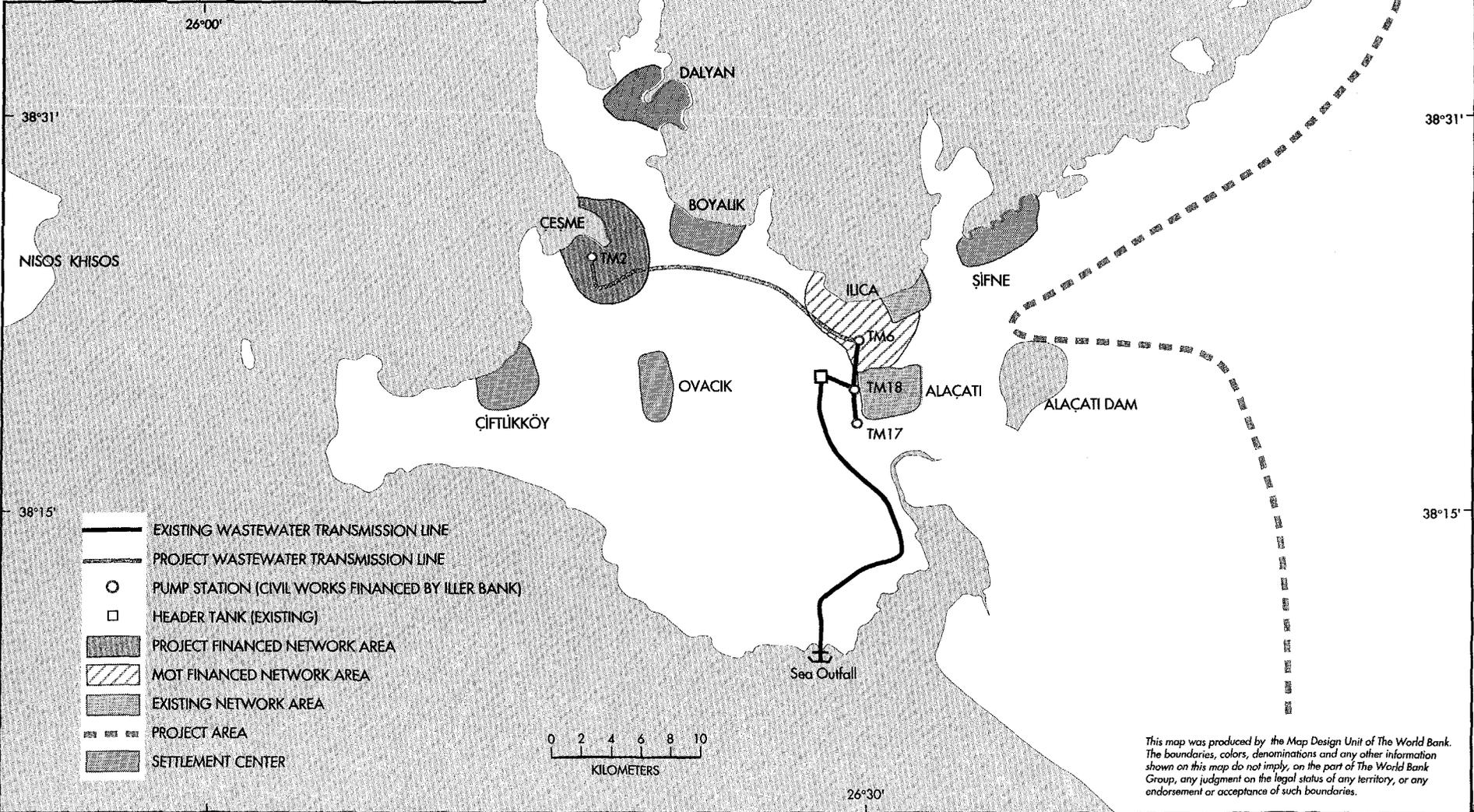
COST COMPARISON OF WELLS AND CALBIR SYSTEM							
Year	PRIVATE WELLS		CALBIR SYSTEM				
	Total Costs <sup>a</sup>		Average	Average	Inflation	Annual	
	New User <sup>b</sup>	Existing User <sup>c</sup>	Monthly	Annual	Factor <sup>e</sup>	Tariff in	
			Tariff <sup>d</sup>	Tariff		1998 prices	
1998	\$ 950	\$ 50	\$ 10.67	\$ 128	1.05	\$ 122	
1999	\$ 50	\$ 50	\$ 12.88	\$ 155	1.11	\$ 139	
2000	\$ 50	\$ 50	\$ 14.70	\$ 176	1.16	\$ 152	
2001	\$ 50	\$ 50	\$ 15.63	\$ 188	1.20	\$ 156	
2002	\$ 50	\$ 50	\$ 16.20	\$ 194	1.25	\$ 156	
2003	\$ 50	\$ 50	\$ 16.76	\$ 201	1.30	\$ 155	
2004	\$ 50	\$ 950	\$ 17.11	\$ 205	1.30	\$ 158	
2005	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
2006	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
2007	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
2008	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
2009	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
2010	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
2011	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
2012	\$ 50	\$ 50	\$ 17.11	\$ 205	1.30	\$ 158	
<b>Net Present Value</b>	<b>\$1,198</b>	<b>\$842</b>				<b>\$1,144</b>	

a: In 1998 prices  
b: A \$ 900 investment cost and \$ 50 annual operation/maintenance cost is assumed  
c: An investment of \$ 900 is assumed in 2004 to replace the existing system and for added maintenance costs for older wells  
d: In current costs, until the year 2003. Thereafter in 2004 prices  
e: Using Index for manufactured exports from G-5 countries; World Bank Operational Manual (OP 6.50 - Annex B1), November 1997

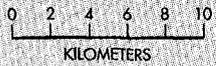
**MAP SECTION**



# TURKEY CESME-ALACATI WATER SUPPLY AND SEWERAGE PROJECT WASTEWATER COMPONENT

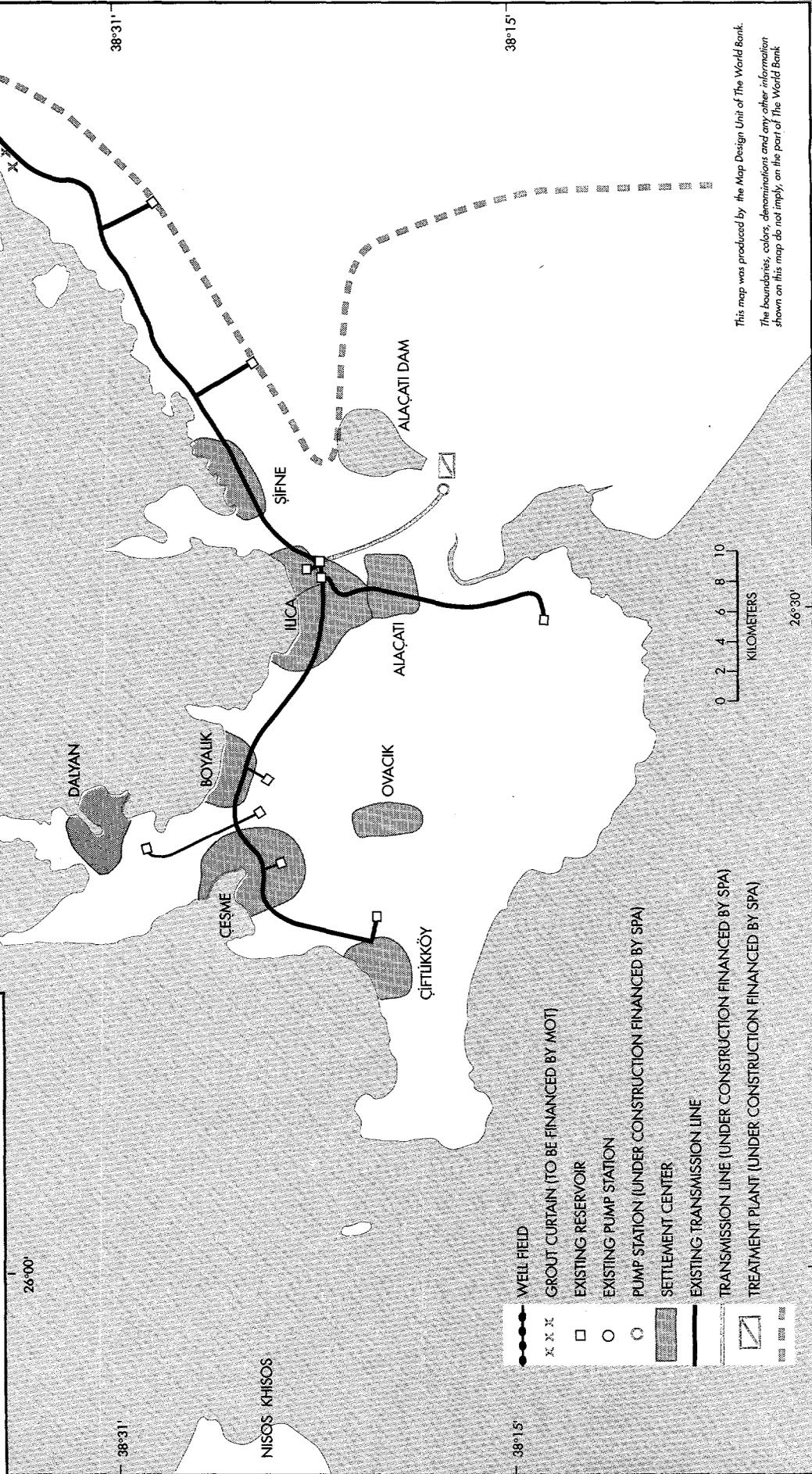
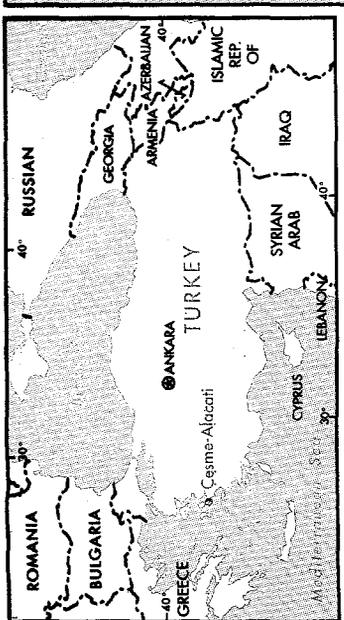


- EXISTING WASTEWATER TRANSMISSION LINE
- PROJECT WASTEWATER TRANSMISSION LINE
- PUMP STATION (CIVIL WORKS FINANCED BY İLLER BANK)
- HEADER TANK (EXISTING)
- PROJECT FINANCED NETWORK AREA
- MOT FINANCED NETWORK AREA
- EXISTING NETWORK AREA
- PROJECT AREA
- SETTLEMENT CENTER



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# TURKEY CESME-ALACATI WATER SUPPLY AND SEWERAGE PROJECT



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