



## Simplified Procedure

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Original: Spanish

**To:** The Board of Executive Directors  
**From:** The Secretary  
**Subject:** Panama. Proposal for a loan for the Panama City and Bay sanitation project (I)

**Basic Information:** Borrower ..... Republic of Panama  
Amount ..... Up to US\$45 million  
Source ..... Single Currency Facility of the Ordinary Capital

**Inquiries to:** Mr. Camilo Garzón (extension 1945)

**Remarks:** This operation was included in the country strategy approved by the Board of Executive Directors on 26 October 2005 (document GN-2385-1), and its amount does not exceed the ceiling established for Group C countries.

**References:** DR-398-5(5/03), GN-1838-1(7/94), GN-2136-1(4/01), GN-2385-1(10/05)

**Other distribution:** Representative in Panama

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

## **PANAMA**

### **PANAMA CITY AND BAY SANITATION PROJECT (I)**

**(PN-0062)**

### **LOAN PROPOSAL**

This document was prepared by the project team consisting of Sergio Ardila (RE2/EN2); Ricardo Reyes (COF/CPN); Ana María Linares (RE2/EN2); Carlos Díaz (Consultant); Coral Fernández (RE2/EN2); Javier Jiménez (LEG/OPR2); Eliana Smith (RE2/EN2); and Camilo Garzón (RE2/EN2), Project Team Leader.

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## ANNEXES

### Annex I      Logical Framework

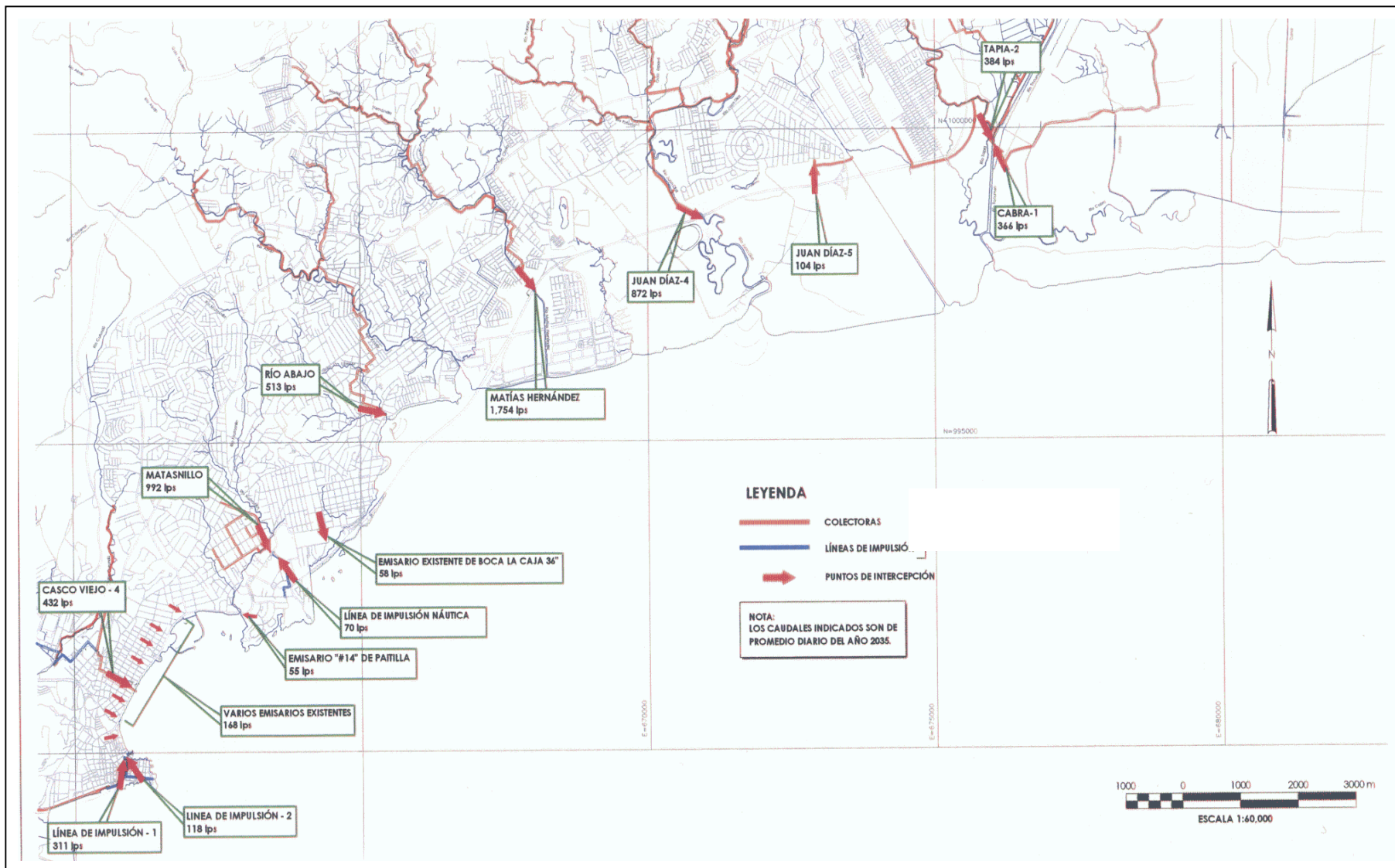
### Proposed resolution

Electronic Links and References	
Basic socioeconomic data	<a href="http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata">http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata</a>
Status of loans in execution	<a href="http://ops.iadb.org/approvals/pdfs/PNen.pdf">http://ops.iadb.org/approvals/pdfs/PNen.pdf</a>
Tentative lending program	<a href="http://opsgsl/ABSPRJ/tentativelending.ASP?S=PN&amp;L=EN">http://opsgsl/ABSPRJ/tentativelending.ASP?S=PN&amp;L=EN</a>
Information available in the RE2/EN2 technical files	<a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=646787">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=646787</a>
Annex II. Procurement plan / Means of verification	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=677264">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=677264</a>
Annex III. Recent operations and experience	<a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=642310">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=642310</a>

## **ABBREVIATIONS**

ANAM	National Environmental Authority
ERSP	Ente Regulador de los Servicios Públicos [Public Utilities Regulatory Agency]
ESIA	Environmental and Social Impact Assessment
GIS	Geographic information system
ICB	International competitive bidding
IDAAN	Instituto de Acueductos y Alcantarillados Nacionales [National Water and Sewer Systems Institute]
MEF	Ministry of Economy and Finance
MINSA	Ministry of Health
NCB	National competitive bidding
PCA	Panama Canal Authority
PCU	Project coordination unit for the Panama City and Bay Sanitation Project
PSCB	Panama City and Bay Sanitation Project
UGAF	Administrative and Financial Management Unit
UNDP	United Nations Development Programme

# Mapa de la Zona del Proyecto



## PROJECT SUMMARY

### PANAMA PANAMA CITY AND BAY SANITATION PROJECT (I) (PN-0062)

Financial Terms and Conditions <sup>1</sup>														
<b>Borrower:</b> Republic of Panama			Amortization period:		20 years									
<b>Executing agency:</b> Ministry of Health, acting through the project coordinating unit (PCU), with the participation of the National Water and Sewer Systems Institute (IDAAN)			Grace period:		5 years									
			Disbursement period:		5 years									
<b>Source</b>	<b>Amount US\$</b>	<b>%</b>	Interest rate:		Variable									
IDB (Ordinary Capital)	45.00 million	89.7	Inspection and supervision fee:		0%									
Local	5.15 million	10.3	Credit fee:		0.25%									
Total	50.15 million	100.0	Currency:		U.S. dollars									
Project at a Glance														
<p><b>Project objective:</b> The project seeks to improve sanitation in low-income districts and reduce pollution of urban rivers and tributaries in the Panama City metropolitan area by expanding the sewer system. This objective will be achieved within a framework that promotes the financial sustainability and efficiency of the institution responsible for providing the service.</p> <p><b>Special contractual conditions:</b> For the first disbursement: (i) presentation of the cooperation agreement entered into between the Ministry of Health and IDAAN (paragraph 3.5); and (ii) entry into effect of the project Operations Manual (paragraph 3.6).</p> <p><b>Conditions met in advance:</b> Creation of the project coordination unit (paragraphs 3.1 and 3.2).</p> <p><b>Conditions on execution:</b> (i) The bidding processes for collectors involving the redirecting of current wastewater flow will be contingent on it being shown that financing is available for stage two of the sanitation project (paragraph 3.8); (ii) the technical/economic analysis of the options for transporting wastewater from upper San Miguelito must be approved by the Bank prior to opening bidding on related works (paragraph 3.9); (iii) the Ministry must ensure that the PCU has the specialized staff necessary to perform its functions throughout the project execution period (paragraphs 2.3 and 3.3); and (iv) IDAAN is committed to taking institutional strengthening measures, so that it can comply with annual institutional performance indicators (paragraphs 3.10 and 3.11).</p> <p><b>Exceptions to Bank policies:</b> None.</p>														
<p><b>Project consistent with country strategy:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; text-align: right;">Yes <input checked="" type="checkbox"/></td> <td style="width: 33%; text-align: right;">No <input type="checkbox"/></td> <td colspan="2"></td> </tr> </table> <p><b>Project qualifies as:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%; text-align: right;">SEQ <input checked="" type="checkbox"/></td> <td style="width: 25%; text-align: right;">PTI <input checked="" type="checkbox"/></td> <td style="width: 25%; text-align: right;">Sector <input type="checkbox"/></td> <td style="width: 25%; text-align: right;">Geographic <input checked="" type="checkbox"/></td> <td style="width: 20%; text-align: right;">Headcount <input type="checkbox"/></td> </tr> </table> <p><b>Procurement:</b> Goods, services, and works will be procured in accordance with Bank policies (documents GN-2349-4 and GN-2350-4) (paragraphs 3.16 to 3.21).</p> <p><b>Verified by CESI on:</b> 9 December 2005</p>						Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			SEQ <input checked="" type="checkbox"/>	PTI <input checked="" type="checkbox"/>	Sector <input type="checkbox"/>	Geographic <input checked="" type="checkbox"/>	Headcount <input type="checkbox"/>
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<sup>1</sup> The interest rate, credit fee, and inspection and supervision fee mentioned in this document are established pursuant to document FN-568-3 Rev. and may be changed by the Board of Executive Directors, taking into account the available background information, as well as the respective Finance Department recommendation. In no case will the credit fee exceed 0.75%, or the inspection and supervision fee exceed 1%, of the loan amount.\*

\* With regard to the inspection and supervision fee, in no case will the charge exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.



## I. FRAME OF REFERENCE

### A. Overview

- 1.1 Panama City is located on the country's Pacific coastline at the entrance to the Panama Canal. The metropolitan area, comprised of the districts of Panamá and San Miguelito, is home to nearly 950,000 residents, representing approximately one third of the country's total population. The city's economy depends to a large extent on the financial sector and vessel traffic through the canal, although other industries also have a smaller presence, including beverages, soap, textiles, and furniture. The city has a historic district that dates from its founding in 1519. This district was designated a UNESCO World Heritage site in 1997. Over the last 40 years and through the 1990s, the city experienced rapid growth due primarily to migration from the countryside to the urban centers. This process has slowed significantly in recent years, as shown in Table I-1.

**Table I-1. Growth of the Metropolitan Area**

Year	Population (inhabitants)	Growth rate over last 10 years (%)
1960	266,000	-
1970	412,000	3.1
1980	558,000	1.59
1990	715,000	1.62
2000	804,000	0.78

### B. Potable water and sanitary sewer services in the Panama City metropolitan area

- 1.2 The local population and the city's industrial and commercial establishments generate a daily volume of approximately 280,000 m<sup>3</sup> of wastewater. Virtually all of it flows untreated into the rivers running through the city, or directly into Panama Bay. It is currently estimated that the city has nearly 60 septic tanks and other small-scale treatment systems, but most are not operating satisfactorily due to lack of maintenance or capacity. As a result, the city's main rivers (Curundú, Matasnillo, Río Abajo, Matías Hernández, Juan Díaz, Tapias, and Tocumen) have excessively high levels of organic and bacterial contamination.<sup>1</sup> These rivers and their tributaries flow through densely populated urban areas, which in some cases also undergo periodic flooding. The level of contamination in the rivers worsens during the dry season when the urban tributaries are less diluted. As a result of these

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<sup>1</sup> The Tapias and Matías Hernández Rivers, for example, show high levels of organic contamination in their final stretches, with observed biochemical oxygen demand (BOD) values close to 60 mg/l. This value is normally below 10 mg/l in uncontaminated rivers.

conditions, the parts of the bay closest to the rivers' mouths have low dissolved oxygen levels and high concentrations of coliform bacteria.<sup>2</sup>

- 1.3 These sanitation conditions have been of constant concern in the city with the odors, evident environmental damage, and the potential risks to public health. Consequently, cleanup of the bay has become a national priority, as demonstrated by the support that proposed initiatives have garnered from every government administration in recent years. In an attempt to respond to public pressure, regulations now require the construction of small treatment plants in new buildings and real estate developments, but such a solution is of limited scope, not cost-effective, and unproductive in the medium term. The treatment plants that have been built generally are not operated properly and are difficult to control and monitor.
- 1.4 The current sanitary sewer system covers approximately 75% of homes, leaving nearly 200,000 inhabitants of marginal and low-income districts without this service. Of the unserved population, it is estimated that approximately one third have septic tanks, and the rest use latrines or discharge directly into small gullies or ditches along public roads. The population of the affected areas is continuously complaining about the lack of service and rejects the existing sanitation conditions.
- 1.5 The drinking water networks, on the other hand, have relatively high coverage. It is currently estimated that they supply over 98% of the urban population with approximately 348 liters per day per inhabitant. This figure is considered high, however, and together with the high level of unmetered water (estimated at 44%), it prevents the more remote sectors of the network from receiving continuous, reliable service. The high consumption is due to a number of factors, including most importantly: (i) insufficient house metering coverage (52%); (ii) the relatively high minimum consumption charge (30.3 m<sup>3</sup>/month); (iii) the high pressure in some network sectors; and (iv) the relatively low charge for the service.

## **C. Sector legal and institutional framework**

- 1.6 In 1997 the government established a new institutional and regulatory framework for water and sewer service in Panama (Executive Order 2), which seeks among other things: (i) to institutionally separate the planning, regulation, and service delivery functions; (ii) to provide the sector with a transparent, efficient institutional structure, with clear allocation of duties and responsibilities; (iii) to improve the quality of service provided to users; (iv) to establish a rate and subsidy framework that promotes rational, efficient water use; and (v) to facilitate private sector participation in service delivery. One year earlier, the government created the

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<sup>2</sup> The bay areas closest to the mouths of the rivers have dissolved oxygen levels below 1.0 mg/l. Under normal conditions, this value should be above 5 mg/l. High concentrations of fecal coliform organisms have also been observed near the river discharge, ranging between 1,000 and 100,000 MPN/100 ml. Acceptable values for recreation and activities involving human contact are generally below 1,000 MPN/100 ml.

Public Utilities Regulatory Agency (ERSP) to control and oversee electricity, telecommunications, water, and sewer services (Law 26 of 1996).

- 1.7 Under Law 2 of 1997, the Ministry of Health is the entity responsible for policy development, coordination, and long-term planning in the water and sewer sector. Its functions include: (i) coordinating and guiding sector activities in accordance with sector objectives for public utilities, water resources, public health, and the environment; (ii) framing and implementing development strategies and policies for the service; (iii) framing financing policies in coordination with the Ministry of Economy and Finance; and (iv) establishing mechanisms that encourage service providers to operate professionally and efficiently. To perform these functions, the Ministry created the Potable Water and Sanitary Sewer Subsector Directorate (DNAPAS). In addition to the functions listed above, which follow from its capacity as the sector's governing body, the Ministry executes national sanitation projects in the country's technical and administrative interest.<sup>3</sup> In rural matters, the Ministry is responsible for: (i) making development plans for this segment of the population; (ii) encouraging rural community organization as a support mechanism for system management and administration; (iii) expanding and improving existing services; and (iv) preparing technical engineering standards for the construction, operation, and maintenance of rural systems. In addition to the work of the Ministry of Health, the Public Policy Technical Unit (UTPP) of the Ministry of Economy and Finance (MEF) also plays a significant coordination role in the sector.
- 1.8 The Public Utilities Regulatory Agency (ERSP) is responsible for enforcing sector laws, granting concessions and authorizations for service delivery, verifying compliance with quality requirements, promoting efficiency, and supervising application of the rate framework. ERSP performs its functions independently, and is subject to oversight solely by Panama's Government Accounting Office. The Potable Water and Sanitary Sewer Directorate is the unit within ERSP responsible for oversight and control of the ten enterprises or institutions authorized to provide water and sewer service in the country.<sup>4</sup> However, ERSP has focused primarily on compliance verification of: (i) the technical, business, legal, and environmental aspects of service-quality rules and decisions; and (ii) contract clauses pertaining to user rights and obligations. ESRP oversees such aspects of service quality as continuity, processing of user claims, network pressure, drinking water quality, and wastewater quality. Thus, its actions with respect to the main service provider, the National Water and Sewer Systems Institute (IDAAN), have been limited and of little impact since IDAAN is a public agency. To cover operating expenses, ERSP charges a regulatory fee to providers, equivalent to 0.79% of their gross annual revenues. ERSP is required to report annually to the President of the Republic and

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<sup>3</sup> Article 27 of Decree 75 of 1969, establishing the Bylaws of the Ministry of Health.

<sup>4</sup> The authorized providers are: IDAAN, the Panama Canal Authority (production), Aguas de Panamá, S.A. (production), the Municipality of Boquete, and six smaller private enterprises.

the Legislative Assembly on the state of the public utilities and recommend the measures it deems necessary to improve them.

- 1.9 ERSP's function in relation to user charges is to establish the methodologies and procedures for calculating them, hold public consultations, approve rate levels, and verify compliance. Pursuant to Law 2, rates must allow the provider to earn sufficient revenue to cover the costs of operation, maintenance, and expansion of the services provided, service its debt, and earn a reasonable profit margin. The user charge for sewer services can be calculated as a percentage of the amount billed for drinking water—up to 50% of that amount—or as a unit price for the operation and maintenance of the sewer systems. Law 2 also allows an additional fee to be charged for wastewater treatment to cover at least operation and maintenance costs and part of the investment costs. To date, no sewer or treatment charges have been introduced. Law 2 also allows the federal and local governments to grant exemptions or subsidies when deemed to be in the public interest.
- 1.10 Potable water and sanitary sewer services in the Panama City metropolitan area are provided by IDAAN, an independent government entity created by Law 98 of 1961 to serve the nation's urban populations of more than 1,500 inhabitants. IDAAN is currently responsible for providing service to nearly 2 million people, or 67% of Panama's total population. As already noted, the Ministry of Health is responsible for rural populations and communities with fewer than 1,500 inhabitants.
- 1.11 In December 2001, after two years of intense dialogue on reform strategies for IDAAN, Panama's Legislative Assembly approved a new charter for the agency (Law 77) to supercede Law 98 of 1961. The most noteworthy aspect of the new legislation is the increased number of representatives of civil society on IDAAN's board (from three to five) and a parallel reduction in the number of cabinet ministers (from four to one). The only cabinet member remaining on the board is the Minister of Health, accompanied by one representative of the executive branch and five representatives of civil society. The civil society representatives are appointed by the executive branch and approved by the legislature based on short lists submitted by the participating organizations.<sup>5</sup>

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<sup>5</sup> The old board of directors was comprised of four ministers (Health, Housing, Public Works, and Economic Planning and Policy) and three representatives of civil society organizations (Asociación de Propietarios de Inmuebles de Panamá [Panamanian Association of Real Property Owners], Asociación de Propietarios de Inmuebles de Colón [Colón Association of Real Property Owners], and Sociedad Panameña de Ingenieros y Arquitectos [Panamanian Society of Engineers and Architects]). The new board is made up of the Minister of Health, one representative of the executive branch, and five members from the following organizations: Asociación Panameña de Ejecutivos de Empresas [Panamanian Association of Business Executives], Sociedad Panameña de Ingenieros y Arquitectos [Panamanian Society of Engineers and Architects], Asociación de Propietarios de Inmuebles [Real Property Owners Association], Cámara Panameña de la Construcción [Panamanian Chamber of Construction], and the Consejo Nacional de Trabajadores Organizados [National Council of Organized Labor] (CONATO).

- 1.12 Also relevant to the proposed operation, on 20 June 2001 the Panamanian government issued Executive Decree 144, establishing the project coordination unit (PCU) for the Panama City and Bay sanitation project, to promote improvement of the collection system for the wastewater generated in the metropolitan area, and reduce the amount of pollutants released into the bay. This unit, attached to the Ministry of Health, is responsible for the coordination, preparation, and execution of the proposed project through its completion. The PCU has been performing these functions during the project's preparation phase, in coordination with IDAAN and UTPP.

#### **D. The service provider**

- 1.13 IDAAN currently supplies drinking water to Panama's largest cities through 133 independent water supply systems, which in turn include 577 wells and 42 purification plants. These systems produce nearly 335 million gallons daily (14.7 m<sup>3</sup>/s), broken down as follows: 224 come from surface sources, 22.5 from groundwater sources, and the remaining 88.5 million gallons from bulk water purchases. These volumes are delivered to the country's urban population through 4,900 km of pipe and 456,200 connections. IDAAN also supplies drinking water, free of charge using tanker trucks, to nearly 2,500 homes without running water or whose supply is temporarily interrupted. Nonetheless, this service is being reconsidered due to its high cost. The sewer service, for its part, serves 1.26 million Panamanians with 20 sanitary sewer systems and 1,130 km of pipe. The metropolitan area's sewer network is approximately 650 km long.
- 1.14 For this work, IDAAN has a staff of 2,828 employees (2,265 non-unionized and 563 unionized), which is relatively large (6.2 employees/1,000 connections) compared to other companies of similar characteristics.<sup>6</sup> Table I-2 shows levels of service coverage for both urban and rural populations. It is important to note that the percentages of coverage in the urban areas are among the highest in the region. There is no accurate estimate of the percentage of wastewater treated nationally, although some cities, such as David, Santiago, Chitré, and Las Tablas, have stabilization ponds that treat a significant portion of wastewater.

**Table I-2. Potable Water and Sewer Service Coverage**

Area	Population (inhabitants)	Coverage (%)	
		Drinking water	Sewer*
Urban	1,967,000	98	67
Rural	1,205,000	84	2
<b>National Total</b>	<b>3,172,000</b>	<b>92</b>	<b>36</b>

\* The sewer coverage values presented do not include individual sanitation systems.

<sup>6</sup> The number of employees per 1,000 drinking water connections could be on the order of 3 or 4 for an enterprise with national (urban) coverage.

- 1.15 IDAAN currently faces major financial and operational constraints as its expenditures have outpaced revenues, thereby reducing its operating profits and increasing book losses. Its 2004 income statement shows revenues on the order of US\$71.8 million, barely sufficient to cover operating and maintenance costs and interest on its debt, but not the depreciation of its assets (US\$15.8 million). Chapter IV presents a more detailed analysis of the institution's financial management over the last three years (see paragraphs 4.13 to 4.19).
- 1.16 The average rate charged to users (US\$0.26/m<sup>3</sup>) does not cover the operating costs of the water supply service and does not include an explicit charge for operation and maintenance of the sewer system where this service is provided, though the company does recover part of this service's capital costs through a betterment levy known as the "valorization charge." In addition, the volumes billed and collection rates are lower than desired (58% and 78.5%, respectively). As a result, cash flow is insufficient to finance expenditures and investments, IDAAN does not pay for the bulk water purchased from the Panama Canal Authority (PCA), purchases for the January to December 2004 period were US\$17.1 million, and infrastructure investments made in recent years in both the metropolitan area and the rest of the country have been financed with tax contributions.

#### **E. Bank participation**

- 1.17 The Bank has sought to support the government's efforts to strengthen or restructure IDAAN and stimulate private sector participation in service delivery since 1992 with the approval of two multisector operations (loans 688/OC-PN and 689/OC-PN for a public enterprise reform program, and loans 969/OC-PN and 970/OC-PN for a basic infrastructure sector reform program) and one operation exclusively targeting the potable water sector (loan 1029/OC-PN for a program to support the restructuring of IDAAN). However, these three operations failed to move forward and meet the objectives proposed for the sector due to changes in government or modifications to the initially established objectives or institutional targets turned out to be overly ambitious. As such, the resources allocated to investments and/or strengthening IDAAN were canceled in the first two cases, and significantly reduced in the third, so neither works nor specific institutional reform or strengthening actions were financed through these three operations.
- 1.18 Given this situation, the central government has used tax revenues to finance a significant portion of the institutional and operational enhancement actions at IDAAN recommended by the studies, as explained in Section F. Annex III also presents a summary of the objectives and difficulties encountered in the three abovementioned operations, and summarizes the lessons learned. These lessons were taken into account in designing the proposed operation.

## **F. Recent institutional enhancement and service expansion projects**

- 1.19 With the support of a private international operator, IDAAN has been executing an ambitious operational enhancement program, called the Optimización de los Sistemas de Acueducto de Panamá, Colón, Chorrera y Arraiján [Optimization of the Panama City, Colón, Chorrera, and Arraiján Water Systems], since June 2003 at a cost of US\$20.9 million.<sup>7</sup> The program includes: (i) the supply and installation of geographic information systems (GIS) and business management systems, (ii) the creation and updating of the registries of users and potable water networks in the four cities, (iii) programs dividing the potable water networks into sectors, (iv) leak control and detection programs, and (v) the installation of 105,000 house meters and 90 master meters. The program is expected to reduce business and physical losses and include 100% of metropolitan area users in the GIS. The program will be completed in June 2006, including a final consulting and support period.
- 1.20 In order to make the institution self-sufficient, the IDAAN authorities, who took over management at the end of 2004, have supported the Optimization Project activities and taken steps to increase the enterprise's billing, reduce its past-due portfolio, incorporate unregistered users, and improve customer service. Following the actions taken to date, changes have been noted in the entity's management, particularly in the business area, where performance is now being monitored by the recently installed computer systems. In terms of leak detection and control, for example, 7,700 leaks have been identified and 3,340 have been repaired. The volume of water recovered with these repairs is estimated at 10.3 million gallons per day (MGD), equivalent to an annual savings of over US\$2 million. To help consolidate these actions and ensure that improvements in procedures, materials, and equipment will be lasting, they must be complemented by institutional strengthening activities in the administrative, business, and financial areas, and the operational enhancement program expanded to the remaining systems operated by IDAAN. The new administration has also taken steps to restructure the entity, enhance its performance, and establish regional cost centers.
- 1.21 In parallel with the efforts in the institutional area, in recent years IDAAN has been developing an investment program of approximately US\$13 million in sanitary sewer networks in the San Miguelito sector, financed with resources from the government's trust fund. This sector is part of the Panama City metropolitan area, and its development is part of the objectives for the proposed project.

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<sup>7</sup> This program was originally structured using a study financed through technical cooperation operation ATN/SF-4043-PN, completed in 1995.

## **G. Design and development of the proposed project**

### **1. Implementation stages of the complete sanitation project**

- 1.22 The Government of Panama has prepared a sanitation project with Bank support to improve sanitary and environmental conditions in the metropolitan area and reduce pollution in urban rivers and coastal areas of Panama Bay. Initially, a master plan was prepared for the Panama City wastewater collection, treatment, and disposal system with financing from loan 1029/OC-PN. This master plan, prepared by a consortium of specialized firms between 1998 and 2000, analyzed the feasibility of a comprehensive project with an estimated total cost of US\$320 million. Later, from 2001 to 2003, the proposed technological alternatives were reconsidered for compliance with a new national standard on liquid waste, issued in 2000, and both the geographic scope of the proposed solution and the form of treatment and final disposal were redefined. The components making up the entire program, whose cost is now estimated at US\$360 million, are: (i) sewer networks in outlying districts with completed engineering plans (US\$18.5 million); (ii) collectors along urban rivers to intercept current and future discharges (US\$51.2 million); (iii) an interception system along the coast to transport discharges from the collectors to the treatment facility (US\$54.4 million); and (iv) a treatment plant near the mouth of the Juan Díaz River with a capacity of 6.89 m<sup>3</sup>/s (US\$235.8 million).
- 1.23 Considering the high cost of the project in its entirety and the country's fiscal constraints, the government has decided to execute it in three stages. Stage one, estimated at US\$50 million, represented by this proposed operation, will include the installation of sewer networks in the most densely populated low-income districts and the highest-priority collectors based on social and environmental criteria. To complement this activity, the operation will include institutional and financial enhancement actions for IDAAN to support continuity of the strengthening program in which it has been engaged for the last two years.
- 1.24 Stage two, valued at US\$150 million, will include the first phase of the treatment plant (capacity: 3.68 m<sup>3</sup>/s) and the portions of the interception system serving the western part of the city. Stage three, valued at US\$160 million, would expand the treatment plant to its final capacity (6.89 m<sup>3</sup>/s) and would build the collectors and interceptors necessary to channel all wastewater to the plant. Government authorities are considering various financing options for the last two stages, which may include: (i) private sector participation by means of a concession or BOT; (ii) a loan from the Japan Bank for International Cooperation, which has shown interest in financing construction of the treatment plant; (iii) additional financing from the IDB, which may include complementary strengthening activities for IDAAN in addition to civil engineering works; and (iv) a combination of the above. The government authorities are also considering various ways to recover the costs of the works in these two stages, including valorization charge and rate systems.



## **2. Rationale for stage one**

- 1.25 The following criteria were to define the scope of stage one (i.e. this proposed operation): (i) the sequential implementation of works in the three stages of the project must make technical sense, such that the facilities built in each stage can be used immediately, and the subsequent stages properly executed; (ii) investments with the best cost-benefit ratios will have priority; (iii) the proposed works must produce social and environmental benefits, regardless of whether or not the subsequent stages are executed; and (iv) the institutional and financial enhancement actions for IDAAN must be consistent with the optimization program undertaken in recent years. These criteria will ensure that stage one will produce the expected benefits, even if subsequent stages are delayed.
- 1.26 The works proposed for stage one are technically simple and give priority to the sewer networks of the most densely populated districts and the collectors protecting the city's most polluted rivers. The amount of the proposed investment is just one seventh of the total cost of the program. In addition, there is no question that IDAAN has the technical capacity to operate the proposed facilities without difficulty once they are built. But to ensure continuity with the ongoing efforts of the institution and the government to make IDAAN more efficient and self-sustaining, a set of actions should also be included to strengthen its operational, business, and financial management.
- 1.27 Given the importance of introducing a sewer charge in the metropolitan area to cover the system's operating costs, and of reconsidering the current rate structure for potable water, the operation will include actions to ensure progress toward an equitable, efficient rate system that will gradually lead to IDAAN's financial sustainability. Three issues have been identified that must be considered together: (i) the importance of improving company's operating efficiency to avoid passing excessive costs onto users; (ii) the need for reliable information for the calculation of rate adjustments; and (iii) the importance of social acceptance of the measures, given their political sensitivity.

## **3. Studies**

- 1.28 Since 2003, in preparation for stage one of the sanitation program, the PCU developed an action plan with financing from loan 1029/OC-PN, comprised of several studies and activities, including the following three studies:
- a. Designs for priority networks and collectors, done by a specialized international firm (June 2003 to September 2005).
  - b. Analysis of IDAAN's administrative, business, and financial areas, with support from a specialized international firm hired for this purpose (May 2004 to September 2005).

- c. Environmental and social impact assessments (ESIA), community consultations, and public forums, with the participation of a specialized local firm (June 2004 to August 2005).
- 1.29 To move forward with the preparation of program stage two, the interception system along the cost and the Juan Díaz treatment plant is being designed. This study, financed through technical cooperation operation ATN/JC-8687-PN, will establish the specifications and scope of the works and will specify the investment, operating, and maintenance costs.<sup>8</sup>

#### **H. Compliance with the Bank's public utilities policy**

- 1.30 The proposed operation satisfies the objectives of the Bank's public utilities policy (OP-708) and adheres to the operational guidelines its implementation. Specifically: (i) the project seeks to make the service more sustainable and efficient in the medium term, balancing the need for institutional strengthening against the urgent need for expanded access to the services for the most disadvantaged sectors and the need to take environmental protection measures; (ii) the level of Bank participation in future stages will match progress on the institutional enhancement measures; and (iii) the institutional structure of the sector in Panama separates the functions of policy-making, independent regulation, and service delivery. This will continue to be the case, even though the Ministry of Health, acting through a special unit, will execute the proposed project in coordination with the service provider for reasons of operational and institutional expediency (see paragraph 4.1).

#### **I. Strategy and rationale for Bank participation**

- 1.31 The chief objective of the Bank's country strategy with Panama for the 2005-2009 period is to support sustainable economic growth and poverty reduction.<sup>9</sup> The country strategy focuses Bank programs on two strategic objectives: (i) boosting the economy's competitiveness; and (ii) building human and productive capital. It also incorporates the crosscutting objective of strengthening governance and transparency. The strategy also cites basic infrastructure development as a precondition for a more competitive economy. The proposed operation is consistent with this strategy in that: (i) it promotes the expansion of a public utility with a high social impact; (ii) it contributes to the protection of regional natural resources, such as the rivers and tributaries that flow through the city; and (iii) it supports the institutional development of the entity responsible for providing the water and sanitation service.

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<sup>8</sup> The study, "Diseño Básico del Sistema de Intercepción, Tratamiento y Disposición Final de las Aguas Residuales de la Ciudad de Panamá [Basic Design of the Panama City System for Wastewater Interception, Treatment, and Final Disposal]," commenced in April 2005 with the hiring of a specialized international firm. It is expected to be completed in January 2006.

<sup>9</sup> See document GN-2385-1 of 13 October 2005.

**J. Coordination with other donors**

- 1.32 The operation was prepared in close coordination with the Japan Bank for International Cooperation (JBIC), which has shown great interest in financing the future treatment plant. Coordination meetings have also been held with the World Bank, which has had limited involvement in the sector in recent years, but has recently started to evaluate an operation to support the country's rural and urban fringe communities.

## II. THE PROJECT

### A. Objectives and description

- 2.1 The project seeks to improve sanitation in low-income districts and reduce pollution of urban rivers and tributaries in the Panama City metropolitan area by expanding the sewer system. This objective will be achieved within a framework that promotes the financial sustainability and efficiency of the institution responsible for providing the service.

#### 1. Component 1: Priority investments (US\$38.9 million)

- 2.2 The project will finance the works required to expand the sewer networks to low-income districts currently without such service, and to stop the current discharges into the main urban rivers. The investments included in the financing are:
- a. The sanitary sewer networks in the following five neighborhoods: 9 de Enero, Santa Marta, Nueva Libia, Vallecito, and Barriada 2000 in the San Miguelito District, whose total construction cost is estimated at US\$5.8 million based on the engineering designs already completed. The number of families benefiting from these works will be 9,600.
  - b. The sanitary sewer networks in metropolitan area neighborhoods to be determined that meet the technical and economic criteria established in the Operations Manual and according to the design criteria used in the five abovementioned neighborhoods. An amount of US\$4.2 million has been allocated to this line item, which is expected to benefit an additional 6,900 families.<sup>10</sup>
  - c. The construction of approximately 47 km of collectors along the urban rivers and tributaries in the most densely populated areas to intercept discharges from the sanitary sewer system. The primary collectors to be included are: the Casco Viejo historic district (CV4), Curundú (CU2), Monte Oscuro (MO), Río Abajo (RA), Matías Hernández (MH), Quebrada Palomo (QP), Santa Rita (SR), Espabé (ES1), Río Palomo (PA), Juan Díaz (JD2 and JD4), and Matasnillo (BE and TR). The construction cost of the collectors is estimated at US\$21 million.

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<sup>10</sup> The expansion of the sewer system coverage resulting from the proposed works, estimated as an increase of 4% with respect to the country's urban population, will contribute to meeting the Millennium Development Goals (MDG) in sanitation.

- d. The construction of nine pump stations and the installation of approximately 8 km of pressure mains to extract wastewater from those urban sectors where the topography does not permit the use of gravity systems, or where it is not technically desirable to transfer wastewater to neighboring watersheds for subsequent removal. The pump and pressure main systems to be financed are: Náutica 1 and 2, Curundú (EB-9), Albbrook (EB-8), Balboa (EB-7), La Boca (EB-6), 9 de Enero (EB-9N), Santa Rita (EB-3A), and Rogelio Sinán (EB-RS). The construction cost of the pump stations, along with their electromechanical equipment and pressure mains, is estimated at US\$5 million.
  - e. The priority restoration and improvement works for the existing collector system, so that the tributary streams can be kept clean, and the existing infrastructure integrated into the new wastewater collection and interception system. The estimated cost is US\$550,000.
- 2.3 This component also includes works supervision, the designs required for points (b) and (e) above, and any necessary adjustments to the existing designs in points (c) and (d). It also includes the technical/economic comparison of the alternatives for wastewater removal from the San Miguelito area (see paragraph 3.9). The cost of these activities is estimated at US\$2.35 million.

## **2. Component 2: Institutional and financial strengthening (US\$5 million)**

- 2.4 This component represents the next step in the medium-term plan for institutional strengthening of IDAAN. The activities to be financed by the project are:
- a. The sewer network and service user registry for the Panama City metropolitan area and the entry of collected information into the recently developed GIS. This information will lay the foundation for improving the existing infrastructure maintenance and replacement system and for identifying the users who receive this service. The estimated cost of this activity is US\$1 million.
  - b. The purchase and installation of house meters in the Panama City metropolitan area, giving preference to high consumers. The city's house metering coverage will be increased from 59% to 75% by installing 30,500 meters of various diameters (from  $\frac{5}{8}$ " to 6").<sup>11</sup> The estimated cost of this activity is US\$2.4 million.
  - c. A program to sectorize the metropolitan area networks, including: pressure reduction, master metering, leak detection and repair, hydraulic modeling, and

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<sup>11</sup> When complete, the optimization program will have completed the installation of a total of 70,000 meters in new connections and will have replaced 35,000 existing meters, increasing current coverage to 62% by mid- 2006.

integration of the GIS. The actions to divide the metropolitan area into sectors will be undertaken in two of the new water sectors into which the city is divided.<sup>12</sup> The estimated cost of this activity is US\$1 million.

- d. A study on rate policy setting, the adjustment of drinking water rates, the introduction of a user charge for sanitary sewer service, and preparation of the rate schedule to be presented by IDAAN to ESRP. Considerations include: the long-run marginal cost of the services, a minimum consumption charge, consumption ranges or brackets, differentiation among types of customers, regional differences, the subsidy system, a periodic update method, the mechanism for recovering the investment cost of works financed by the project, the estimation of operation and maintenance costs for the sewer and wastewater treatment service. The estimated cost of the study is US\$150,000.
- e. Training of administrative and operations staff in business and financial management, geographic information systems, customer service, the operation and maintenance of networks and collectors, and other areas. The estimated cost of this activity is US\$100,000.
- f. Communication and educational activities with users on water conservation, service costs, and measures required for institutional enhancement. The estimated cost of this activity is US\$300,000.
- g. Technical support for the administrative reorganization plan whereby eleven regional management offices will be grouped into five geographic zones, and other measures will be taken to restructure IDAAN. The estimated cost of this consulting project is US\$50,000.

### **3. Component 3: Studies and supporting activities (US\$1.35 million)**

- 2.5 This component seeks to facilitate preparation of the future stages of the sanitation program. The studies identified for financing are: (i) an evaluation of the alternatives for private sector participation in construction and operation of the interceptor and treatment plant, and development of the relevant procurement instruments; and (ii) the designs and supporting studies for the wastewater interception, treatment, and final disposal system, including sludge disposal. This also includes activities related to environmental monitoring and education.

#### **B. Cost and financing**

- 2.6 The total project cost will be US\$50.15 million with the following proposed financing: (i) US\$45 million from IDB Ordinary Capital resources; and (ii) US\$5.15 million in local counterpart resources. The following table shows the

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<sup>12</sup> The city will be divided into five water sectors under the optimization program.

distribution of the estimated costs and the source of financing required for each project component. The costs were established based on the engineering designs completed. The table assumes that the interest accrued on the loan over the disbursement period will be covered separately by the Government of Panama.

**Table II-1. Cost and Financing (in thousands of US\$)**

<b>Category or Component</b>	<b>IDB</b>	<b>Local counterpart</b>	<b>Total</b>	<b>%</b>
<b>1. Project administration</b>	<b>2,150</b>		<b>2,150</b>	<b>4.3</b>
1.1 Administration and monitoring	2,000		2,000	4.0
1.2 Audits and evaluation	150		150	0.3
<b>2. Direct costs</b>	<b>40,350</b>	<b>4,900</b>	<b>45,250</b>	<b>90.2</b>
<i>Component 1</i>				
2.1 Sewer networks	10,000		10,000	19.9
2.2 Collectors and pump systems	21,650	4,900	26,550	52.9
2.3 Design and supervision of works	2,350		2,350	4.7
<i>Component 2</i>				
2.4 Institutional strengthening of IDAAN	5,000		5,000	10.0
<i>Component 3</i>				
2.5 Supporting studies	1,150		1,150	2.3
2.6 Environmental monitoring and education	200		200	0.4
<b>3. Contingencies</b>	<b>2,500</b>		<b>2,500</b>	<b>5.0</b>
<b>4. Commitment fee</b>		<b>250</b>	<b>250</b>	<b>0.5</b>
<b>5. Total costs</b>	<b>45,000</b>	<b>5,150</b>	<b>50,150</b>	<b>100</b>
<b>Percentage</b>	<b>89.7</b>	<b>10.3</b>	<b>100</b>	

### **III. PROJECT EXECUTION**

#### **A. Borrower and executing agency**

- 3.1 The borrower will be the Republic of Panama. Project execution will be the responsibility of the Ministry of Health, which will act through the project coordination unit (PCU) formally established in 2001 (see paragraph 1.12).

#### **B. Project execution and management**

- 3.2 **Project coordination unit (PCU).** The PCU comprises a technical coordinator, two engineers, an environmental specialist, a financial specialist, an attorney, and an accountant. It therefore has sufficient human resources to manage the technical coordination and monitoring of the project. It has also gained experience through its active involvement in the preparation of this operation. The PCU's primary functions include: (i) planning, monitoring, and control of project activities; (ii) procurement of all works, goods, and services required for project execution, with the initial support of the Administrative and Financial Management Unit (UGAF) (see paragraph 3.3); (iii) coordination of activities with the National Water and Sewer Systems Institute (IDAAN), the Ministry of Economy and Finance (MEF), and any other institution related to the project; (iv) submission of disbursement requests to the Bank; and (v) delivery of reports and other information required by the Bank.
- 3.3 **Administrative and Financial Management Unit (UGAF).** The PCU will be supported initially in project administrative, accounting, and financial management by the Administrative and Financial Management Unit (UGAF), created by the Ministry of Health under the Bank's multiphase program for institutional transformation in the health sector (PO-1350/OC-PN). The UGAF has a trained staff and the equipment, systems, and procedures to perform its work in a highly satisfactory manner. So as not to overburden the UGAF, this operation will fund the hiring of a specialist for the administrative area, and another for the financial area. The mechanisms for the PCU and UGAF to coordinate and work together are established in the project Operations Manual.
- 3.4 **National Water and Sewer Systems Institute (IDAAN).** The Ministry of Health will coordinate and facilitate IDAAN's involvement in the execution of project activities. IDAAN will participate in the procurement of goods, works, and consulting services, reviewing the terms of reference and bid documents, serving on review and selection committees, monitoring activities undertaken within IDAAN, and taking final delivery of the works, reports, and other outputs of project-financed activities, as a prerequisite to their final acceptance by the Ministry of Health. IDAAN will be responsible for the operation and maintenance of project works.



- 3.5 **Cooperation agreement.** The Ministry of Health and IDAAN will enter into an cooperation agreement that, in addition to establishing the terms and conditions under which each will participate in project execution, will include the performance indicators and annual targets that IDAAN must meet within the framework of the project (see paragraph 3.10). This contract was initially drafted by the national authorities and is currently being negotiated. It is expected to be signed prior to approval of this operation. As such, **the submission of this contract signed by both institutions will be a condition precedent to disbursement of loan proceeds.**
- 3.6 **Operations Manual.** The PCU has prepared an Operations Manual in consultation with the Bank. They establish institutional responsibilities, including those of the Ministry of Public Works and other government agencies, and detail the following procedures: (i) production of the final versions of bid documents and terms of reference for the procurement of works and consulting services; (ii) establishment of selection committees for bid and procurement processes; (iii) participation of IDAAN in the procurement processes and mechanisms for coordination with the Ministry of Health; (iv) transfer of works upon completion; (v) processing of disbursements, preparation of activity reports, annual work plans, and national budget appropriations; and (vi) selection of sewer network subprojects not yet identified, and the analysis requirements to justify changes in the selection of works already identified. **The entry into effect of the Operations Manual will be a condition precedent to the first disbursement of loan proceeds.**

## C. Execution of project components

### 1. Component 1: Priority investments

- 3.7 The sewer networks will be executed under a multiple-works modality, in order to benefit a larger number of families than those with networks designed and eligible at the time of the analysis. The technical/economic analysis was based on existing studies for six neighborhoods, for which the construction cost was equivalent to 58% of the total resources allocated to this subcomponent. The studies necessary to prepare the designs for the additional networks will be conducted during project execution and may be financed with resources allocated to the design and supervision of works component (see paragraph 2.2).
- 3.8 The collectors and pump and pressure main systems have been identified, and the technical, economic, and environmental studies necessary for their immediate construction have been done. However, in order to avoid potential environmental problems, **the bid processes for the collectors in Casco Viejo (CU2, CV4, EB-8, EB-9, LI-8, LI-9) and the pump and pressure main systems in San Miguelito (EB-3A y LI-3A) will be contingent on it being shown that financing is available for stage two of the sanitation project.** This will prevent the presence of wastewater at points in the bay that, while temporary and already showing an

appreciable level of pollution, do represent a redirection of the current wastewater flow.

- 3.9 A more in-depth technical/economic analysis will be done of the alternatives for removal of wastewater from the upper San Miguelito District, in order to compare the two existing options: (i) a pump system to the collector at the Matías Hernández River with high operating costs due to higher energy consumption; and (ii) a gravity-based system connected to the collectors at the Las Lajas and Juan Díaz Rivers with high investment costs due to the greater length of the collectors. **This analysis must evaluate the advantages and disadvantages of both alternatives and will be reviewed and approved by the Bank prior to making the corresponding adjustments to the design and the request for proposals.** If the gravity solution is selected, the cost table will be adjusted, and the necessary resources transferred from contingencies to the collector line item.

## **2. Component 2: Institutional and financial strengthening**

- 3.10 Considering the importance of institutional strengthening, and given that it is part of a larger program to strengthen IDAAN in the medium and long term, it was considered important to define a limited set of critical management indicators and annual compliance targets to be used as guidelines for the institution's operational, business, and financial enhancement. Targets were also established for the rate adjustments that will have to be adopted to reach the agreed values. The annual targets will also allow the institution's progress to be monitored during project execution, and will constitute an essential part of the cooperation agreement to be entered into between the Ministry of Health and IDAAN. The five agreed indicators or measures are: (i) collection efficiency, defined as operational receipts over net billings; (ii) coverage of costs and debt service, defined as total receipts over disburseable operating, maintenance, and administrative costs, plus debt service; (iii) metered water in the metropolitan area, understood as the volume of water billed over the volume produced; (iv) introduction of the user charge for sewer service in the metropolitan area; and (v) adjustment of the current potable water rate structure (see Table III-1).<sup>13</sup> For these last two measures, the relevant studies must be commissioned, the sewer system network and user registry created, and the user education and communication program initiated. These activities are part of the strengthening program described in paragraph 2.4).

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<sup>13</sup> The analysis of the feasibility of achieving these targets is presented in paragraph 4.27.

<b>Table 111-1. IDAAN Performance indicators/Strengthening Measures</b>				
<b>Indicator</b>	<b>Annual targets</b>			
	2006	2007	2008	2009
Collection efficiency (%)	86.3	88.7	91.3	91.2
Coverage of disburseable costs	0.794	0.879	0.974	1.044
Metered water in metropolitan area (%)	60.0	62.0	64.0	66.0
Introduction of the user charge for sewer service	Commission and complete study.			
Restructuring of potable water rate	Commission and complete study.			

- 3.11 In addition to compliance with the above indicators, the commitments assumed by IDAAN under the cooperation agreement include the delivery of: (i) midyear reports on progress during the first six months in adopting measures that will lead to compliance with the indicators and the action plan for the rest of the year; and (ii) annual reports indicating the level of compliance with the established targets or the reasons for noncompliance, if the agreed targets are not met. In such case, corrective measures must be presented to remedy the situation. The midyear reports will also be used to confirm compliance with the performance indicators for the immediately preceding year, based on audited financial statements.
- 3.12 Logical framework. The logical framework for the operation presents the indicators associated with the project objective and components (see Annex I).
- 3.13 Cost recovery. The investments in networks and collectors will be recovered, making allowances for equity and affordability. The details of the cost recovery mechanism will be worked out during the first year of project execution through a study to be commissioned by the PCU using project resources (see paragraph 2.4.d) with support from IDAAN and the MEF. The consulting assignment will reflect the following: (i) the costs may be recovered through user charges (rates), a valorization charge, a real estate surtax, or a combination of these; (ii) exemptions will be granted for poor users identified using poverty indices to be agreed upon with the MEF; and (iii) valorization or user charges will be collected by IDAAN, commencing no more than three months after completion of each work.

#### **D. Accounting, financial management, and audits**

- 3.14 The Ministry of Health, acting through the PCU with initial support from the UGAF, will be responsible for project accounting and financial management, for which it must: (i) maintain specific accounting and budget accounts for management of the loan proceeds and local counterpart funds; (ii) possess effective internal control structures; (iii) possess an itemized accounting and reporting system

for the administration, recording, and payment of works, goods, and consulting services procurement contracts; (iv) deliver timely consolidated financial statements for the project and make the accounting information and other documentation required by the Bank available to the Bank and external auditors; (v) keep proper records of disbursement requests; and (vi) maintain an effective filing system for supporting documentation on eligible expenditures for verification by the Bank and the external auditors. A revolving fund of 5% will be established.

- 3.15 The Ministry of Health will deliver project financial statements to the Bank annually within 120 days after the close of the fiscal year. The Ministry will also deliver a final report within 120 days after the date of the last disbursement. These financial statements will be audited by an independent external auditing firm acceptable to the Bank, based on the terms of reference previously approved by the Bank (AF-400), and using the Bank's standard procedures for the selection of external auditing services (document AF-200).

## **E. Procurement**

- 3.16 **Works and goods.** Works and goods will be procured in accordance with Bank policies as set forth in document GN-2349-4 of January 2005, "Policies for the procurement of works and goods financed by the IDB." The borrower has requested that payments under works contracts be made directly to the contractors by the Bank.
- 3.17 **Consulting services.** Consultants will be selected and contracted in accordance with the Bank policies as set forth in document GN-2350-4 of January 2005, "Policies for selection and contracting of consultants financed by the IDB." For purposes of paragraph 2.7 of the policy on consultants, the short list of consultants for studies with an estimated cost of less than US\$200,000 equivalent per contract may be made up entirely of national consultants, with the exception of the procurement of the rate adjustment study, for which international competitive bidding will be required.
- 3.18 The table below summarizes the procurement methods to be used in the project.

**Table III-2. Project Procurement Thresholds (US\$)**

	<b>ICB</b>	<b>NCB</b>	<b>Shopping</b>
<b>Works and related services</b>	> 3,000,000	250,000 ≤ 3,000,000	< 250,000
<b>Goods</b>	> 250,000	50,000 ≤ 250,000	< 50,000
<b>Consulting services</b>	≥ 200,000		

- 3.19 **Procurement plan.** In accordance with Bank policies on goods and service procurement and consultant selection, the borrower has agreed with the Bank on a procurement plan that details: (i) the individual contracts for works, goods, and consulting services required to carry out the project; (ii) the methods for consultant

selection; (iii) the proposed methods for procurement of goods and works; and (iv) the process of procurement review by the Bank. The procurement plan appears in the project's technical files. The borrower must update the procurement plan annually as required or whenever significant changes arise. Any proposal to revise the procurement plan must be submitted to the Bank for its approval. The current version of the procurement plan must be available at all times.

- 3.20 **Procurement review.** The supporting documentation for procurements of goods, works, and consulting services and the respective disbursements will be subject to prior review in accordance with Annex I of document GN-2349-4 and Annex I of document GN-2350-4.
- 3.21 **UNDP participation.** The Government of Panama has expressed its intent to contract with the United Nations Development Programme (UNDP), using its own resources independent of the project, to support the PCU in the issuance of consulting contracts and the respective payments. UNDP participation, while not strictly necessary, will streamline procurement processes. Significantly, this same system continues to be used in executing the health sector loan, under which UGAF was created. The specific services to be rendered by UNDP will be governed by an administrative agreement between the Ministry of Health and the UNDP, the terms and conditions of which must be compatible with the master agreement between the Bank and the UNDP dated 20 June 2003.

## **F. Execution period and disbursement schedule**

- 3.22 Given the nature of the works and the institutional strengthening program, an execution period of five years is planned. The tentative disbursement schedule is presented in Table III-3.

**Table III-3. Tentative Disbursement Schedule (US\$)**

Source	Year 1	Year 2	Year 3	Year 4	Year 5
IDB	6,200,000	13,570,000	12,280,000	10,700,000	2,250,000
Counterpart	700,000	1,500,000	1,350,000	1,200,000	400,000
Total	6,900,000	15,070,000	13,630,000	11,900,000	2,650,000
Percentage	14%	30%	27%	24%	5%

## **G. Monitoring and evaluation**

- 3.23 The project will include a final evaluation to be done once 90% of the financing resources have been committed, based on the targets and indicators agreed upon with the Bank in the logical framework. The areas to be addressed include: (i) the number of new connections to the sewer network; (ii) the water quality in the urban rivers and tributaries; (iii) the outcomes of the institutional strengthening measures; and (iv) IDAAN compliance with the operational, business, and financial

indicators. The evaluation will be done by an independent consulting firm acceptable to the Bank. The terms of reference and the selection process will be approved in advance by the Bank.

- 3.24 The Bank will conduct a midterm review once 50% of project resources have been committed, or upon completion of two years of execution, in order to assess project progress, the introduction of strengthening measures, compliance with annual management indicators, and progress toward the next stage of the sanitation program.
- 3.25 The Ministry will produce semiannual progress reports. Upon delivery of each year-end report, a meeting will be held with all relevant stakeholders to review the extent to which project objectives have been met, analyze problems that have arisen in execution, and agree on adjustments to the Operations Manual.

## **IV. VIABILITY AND RISKS**

### **A. Institutional viability**

- 4.1 The decision to assign responsibility for execution of the operation to the Ministry of Health is based on: (i) its legal standing, according to the legal opinion issued jointly by the Ministry and IDAAN; (ii) its execution capacity demonstrated in recent years by budget implementations of nearly 98% annually; (iii) the positive results of the institutional evaluation of the PCU and UGAF, the final report of which appears in the project's technical files; (iv) the appropriateness of focusing IDAAN senior management on institutional strengthening activities; and (v) the way the Ministry has managed to establish effective coordination mechanisms with IDAAN during project preparation.
- 4.2 The PCU, since its inception, has participated actively in the design of the project, and has had the support of the highest national authorities. Its staff includes specialists in sanitation engineering, the environment, legal/institutional matters, and financial management with experience in project execution. With its knowledge of Bank procedures and national legislation, UGAF's initial support of the PCU will streamline bidding processes.

### **B. Technical viability**

- 4.3 From a technical point of view, the project is considered feasible and has a strong rationale since it responds to the urgent need to expand Panama City's system of sewer networks and collectors. The project also seeks to support the operational strengthening of IDAAN, the institution responsible for the system's operation and maintenance. The main reasons supporting this position are:
- a. The studies and designs have been prepared by specialized firms following internationally accepted engineering principles and seeking to develop the most technically and economically appropriate alternatives. The estimated costs are considered reasonable.
  - b. The PCU has the support of IDAAN and a qualified technical staff to perform the tasks of bidding and awarding the works and consulting services considered in the project. For the works, the PCU will have the support of specialized firms for the technical and environmental supervision of the construction. The execution period is considered adequate.
  - c. The improvement of IDAAN's operating capacity will contribute to ensuring that once built, the works will be adequately operated and maintained.

## **C. Socioeconomic viability**

- 4.4 During the project preparation, an economic analysis was performed to verify the economic feasibility of the Panama City and Bay Sanitation Project (PSCB) as a whole, to define an execution plan, and to identify in detail the investments to be made in the first stage.

### **1. The Panama City and Bay Sanitation Project**

- 4.5 The economic analysis of the PSCB examined the feasibility of a program including the expansion of sewer networks and a collection and interception system along the bay, following a pattern quite similar to the one subsequently adopted in the final design, but the treatment and final disposal were handled separately for the western<sup>14</sup> (using preliminary treatment and an offshore outfall) and eastern (secondary treatment plant and disposal in the Juan Díaz River) portions of the city. A least-cost analysis was done during this part of the studies, to identify the best combination of: (i) watercourse groupings and configuration of the system of main collectors and interceptors; (ii) treatment/disposal technologies; and (iii) location, size, and number of treatment plants. A sensitivity analysis was done of the least-cost solution, to identify the earliest date when the investments should be made (i.e. internal rate of return (IRR) greater than 12%).<sup>15</sup>
- 4.6 To evaluate the benefits, the contingent valuation procedure was used, and the benefits from expanding the sewer network, the cleanup of the rivers resulting from investments in collectors, and the cleanup of the bay resulting from investments in treatment and disposal were estimated separately.<sup>16</sup> The expected average value of the monthly benefits per home was US\$7.25 for sewer networks, and US\$7.0 for cleaning up the bay to make it suitable for recreation without direct contact. The estimated benefits of the reduction of odors and health problems in neighborhoods with collectors were statistically unstable, so a value equivalent to 90% of the benefits from sewer networks was adopted and applied to the population residing in a 500 m strip along the rivers to be benefited.
- 4.7 The results of the analysis of the master plan, which evaluated investments by type of work, assuming the divisibility thereof (networks, collectors, treatment, and collector groups/treatment per zone) indicated that a program including an initial stage of investments in sewer networks in several neighborhoods, collectors, preliminary treatment, and final disposal for the western portion of the city (zones 3

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<sup>14</sup> The western portion includes zones 3, 4, and part of zone 2.

<sup>15</sup> See "Plan Maestro y Estudio de Factibilidad [Master Plan and Feasibility Study]" for the cleanup of Panama City and Panama Bay. CESOC. May 2001.

<sup>16</sup> Three surveys were conducted with the following sizes: 411 for possible beneficiaries of new sewer networks, 397 for beneficiaries of the investments in collectors, and 780 in the entire city to estimate the benefits of cleaning up the bay.



and 4) yielded a positive net present value and internal rates of return above 12% beginning in 2003. The investments in collectors, treatment, and disposal for zones 2 and 1 did not yield positive results, considered as a whole and individually, and therefore, they should be given more time since their economic feasibility clearly improves as the population density of the areas to be benefited increases.

## **2. Stage one**

- 4.8 At the beginning of the design studies, the execution plan was divided into three phases, as presented in chapter one. Phase one, to be financed with this project, includes expansions of the sewer networks and collector system for the zones recommended in the master plan, but does not consider investments in the coastal interceptor, treatment or disposal. The selected alternative for treatment and final disposal of liquid waste is different from the one considered in the master plan since the environmental standards adopted in Panama after the master plan was completed do not allow solutions using offshore outfalls with preliminary treatment. The economic analysis for stage one sought to optimize the project by refining the selection of the set of investments in sewer networks and collections to maximize net present value. The analysis assumes that the collector subprojects will not have negative environmental impacts, since the vast majority of them run parallel to rivers with current pollutant levels similar to the those that would be deposited at the end of the collector if it is not immediately connected to the system planned for stage two of the project, or the project will include temporary solutions to mitigate the incremental environmental impacts that would exist if the start of stage two of the PSCB is delayed.
- 4.9 The results obtained are presented in Table IV-1 for all subprojects included in stage one. The analysis identified two spans of collectors in zone 2 (Juan Díaz 4-Quebrada Palomo-Espavé and Santa Rita-Rogelio Sinán-Matías Hernández-Río Palomo) that may be included in stage one if they show positive economic indicators. The net present values obtained suggest that the projects will continue to be attractive even with cost increases that may be expected given the level of detail of the final designs, or with benefit reductions due to the uncertainty typical of such estimates.
- 4.10 During the analysis it was verified that in neighborhoods that have benefited from sewer networks recently built by IDAAN in the same zones considered for this project, there is considerable interest in these types of works, and users have made rapid connections to the network. In some cases homes require a small investment to adapt the existing internal network, and in others, it already drains into the public network to be built, and thus connections represent no significant problem.

**Table IV-1. Economic Analysis**

<b>Collectors</b>	<b>Invest. (US\$000)</b>	<b>Homes</b>	<b>Inv./Home (US\$)</b>	<b>O&amp;M (US\$000/ year)</b>	<b>IRR (%)</b>	<b>B/C</b>	<b>NPV (US\$000)</b>
CU2-CV4	2,752	21,294	129	71.8	59.4	4.6	12,041
Matasnillo	195.7	676	289.4	1.07	28.7	2.5	293.1
Náutica	429.8	1,440	298.4	1.85	28.0	2.46	615.6
LI6-CV1	2,620	9,480	129.2	46.7	28.4	2.32	3,889.7
RA-CMO	4,102	11,084	370	21.3	22.7	1.96	3,925
JD4-QPA-ES	4,040	9,759	414	18.3	20.5	1.77	3,054.4
SR-RS-MH-PA	10,776.7	21,292	506	201.9	15.3	1.26	3,165.9
<b>Networks</b>							
9 de Enero	800.9	1,580	507	12.8	20.7	1.6	526.6
Sta. Marta	1,870.7	3,280	570	28.6	18.2	1.44	878.6
Nueva Libia	1,082.7	1,920	564	21.1	17.9	1.4	487.8
Vallecito	876.6	1,320	664	14.2	15.1	1.22	212.9
Barriada 2000	1,199.2	1,510	794	27.2	11.6	0.98	-38

4.11 Since there are more neighborhoods in the city that do not have sewer service, the project includes resources to address them provided construction costs do not exceed US\$795/connection, corresponding to the marginal project with complete designs accepted in stage one. Projects of this type to be included in this stage of the project should preferably be located in areas to be benefited with collector systems to be built, or in areas that already have a collector system operating under acceptable conditions.

4.12 The analysis conducted showed that collectors located in the eastern end of the city would generate insufficient benefits to warrant their inclusion in stage one, and their construction should be postponed. Sewer network systems to be located in this zone should also be postponed until the construction of the collectors that would carry the discharge outside the populated areas or to the treatment plant is warranted.

#### **D. Financial viability**

4.13 Although the project's executing agency will be the Ministry of Health, IDAAN will operate the works, and therefore their sustainability depends on this institution's financial position. The works included in this stage and the proper operation of the existing networks, collectors, and pump stations directly related to them will involve a moderate increase in IDAAN's annual operating costs, estimated at US\$1 million. However, the operation of the subsequent stages of the Panama City and Bay Sanitation Project, if allocated to IDAAN, will imply further increases in operation and maintenance costs, particularly due to the inclusion of significant pump stations and the coastal interceptor, as well as the operation of the planned treatment plant.

- 4.14 Given the foregoing, the financial viability analysis<sup>17</sup> aimed to clearly identify IDAAN's weaknesses in order to establish minimum measures that would allow it to cover the additional expenses produced by stage one, and to prepare the institution to undertake subsequent stages of the sanitation program in the event the government decides to entrust IDAAN with their operation.

### **1. Financial position of IDAAN**

- 4.15 IDAAN's financial position as of 31 December 2004 shows notable weaknesses as can be seen in the income (Table IV-2) and cash flow (Table IV-3) statements for the last three years. The net cash flow generated by operations in these years has been insufficient to cover the works program, forcing it to turn to government contributions and short-term debt. Its liquidity has been deteriorating, falling below 1 in 2004, implying that IDAAN has had notable difficulties in meeting its payment commitments. However, long-term debt has been kept at acceptable levels.

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<sup>17</sup> A complete version of this analysis is available for consultation in the project technical files.

**Table IV-2. Income Statement – IDAAN (in thousands of US\$)**

Item				% variation	
	2002	2003	2004	2003/2002	2004/2003
<b>Operating revenues</b>	<b>66,135</b>	<b>67,337</b>	<b>71,276</b>	1.8%	5.8%
Sale of water	63,329	64,553	67,357	1.9%	4.3%
Other operating revenues	2,806	2,784	3,919	-0.8%	40.8%
<b>Operating expenses</b>	<b>62,623</b>	<b>63,748</b>	<b>69,303</b>	1.8%	8.7%
<i>Operation and maintenance</i>	<i>28,840</i>	<i>27,223</i>	<i>28,754</i>	<i>-5.6%</i>	<i>5.6%</i>
Personnel	6,991	6,541	6,625	-6.4%	1.3%
Electricity	14,615	14,861	16,671	1.7%	12.2%
Chemicals	1,881	1,828	1,398	-2.8%	-23.5%
Pipe and accessories	620	645	505	4.0%	-21.7%
Fuel and lubricants	120	189	191	57.5%	1.1%
Other	4,613	3,158	3,364	-31.5%	6.5%
<i>Administration</i>	<i>14,679</i>	<i>13,276</i>	<i>16,774</i>	<i>-9.6%</i>	<i>26.3%</i>
Personnel	9,405	9,944	10,369	5.7%	4.3%
Electricity	274	290	297	5.8%	2.4%
Other	5,000	3,042	6,108	-39.2%	100.8%
<i>Purchase of water</i>	<i>19,104</i>	<i>23,249</i>	<i>23,775</i>	<i>21.7%</i>	<i>2.3%</i>
Panama Canal Authority	18,091	17,621	17,080	-2.6%	-3.1%
Aguas de Panamá	1,013	5,628	6,695	455.6%	19.0%
<b>Operating margin (EBITDA)</b>	<b>3,512</b>	<b>3,589</b>	<b>1,973</b>	2.2%	-45.0%
Plus: Other revenues/expenditures	480	487	517	1.5%	6.2%
<b>Internal cash generation</b>	<b>3,992</b>	<b>4,076</b>	<b>2,490</b>	2.1%	-38.9%
Less: Interest and fees	1,253	1,291	1,266	3.0%	-1.9%
<b>Revenues before provisions</b>	<b>2,739</b>	<b>2,785</b>	<b>1,224</b>	1.7%	-56.1%
Less: Depreciation	14,129	14,529	15,771	2.8%	8.5%
Exchange fluctuation	963	1,006	543	4.5%	-46.0%
Provision for bad debt	611	997	676	63.2%	-32.2%
<b>Loss for fiscal year</b>	<b>-12,964</b>	<b>-13,747</b>	<b>-15,766</b>	-6.0%	-14.7%

- 4.16 The operating margin before depreciation (EBITDA), although positive in each of the last three years, is insufficient to cover depreciation. This margin is equivalent to 2.8% of revenues, which is far below similar enterprises with efficient management.
- 4.17 The operating margin for 2004 dropped US\$1.6 million with respect to 2003,<sup>18</sup> despite the fact that operating revenues rose US\$3.9 million, due to the US\$5.5 million increase in operating expenses. This increase is largely explained by cost increases in the optimization program currently underway, and the increased expense for electricity and water purchases.
- 4.18 IDAAN's total receipts (see Table IV-3) fell over the last three years from US\$64.8 million in 2002 to US\$58.4 million in 2004. It is important to note that the 2002 receipts included US\$4.2 million in delinquent payments from 1989 to 1998 offset

<sup>18</sup> As of 31 July 2005 an additional drop has been noted, bringing the margin into negative territory.

by the government. The US\$3.5 million drop in 2004 can be broken down into US\$2.5 million in receipts from private customers and US\$1.1 million from public sector clients. Total receipts over billings have dropped from 91.6% in 2003 to 80.2% in 2004, and to 78.6% in July 2005.

**Table IV-3. Cash Flow Statement – IDAAN (in thousands of US\$)**

ITEM	2002	2003	2004	Totals
Collections from customers	64,854	61,923	58,424	185,201
Less: Payments to suppliers and others	-44,184	-46,764	-24,526	-115,474
Cash flow from operations	20,670	15,159	33,898	69,727
Investments	-23,902	-29,109	-72,192	-125,203
<b>Cash flow before financing</b>	<b>-3,232</b>	<b>-13,950</b>	<b>-38,294</b>	<b>-55,476</b>
Plus: Government contributions	10,425	23,851	51,160	85,436
Less: Amortization of loans	-7,358	-7,709	-5,607	-20,674
Net financing	3,067	16,142	45,553	64,762
<b>Cash flow for the period</b>	<b>-165</b>	<b>2,192</b>	<b>7,259</b>	<b>9,286</b>
Beginning cash balance	5,817	5,652	7,844	
Ending cash balance	5,652	7,844	15,103	

- 4.19 The current rate structure has been in effect since 1982, but rate levels have been increased twice: by 24% in 1977 and 27% in 1982. The average rate for 2003 and 2004 was US\$0.26/m<sup>3</sup>. The enterprise has been collecting a valuation fee to recover part of its investment in sewer network construction, which has generated average receipts of US\$1.1 million in 2003 and 2004.
- 4.20 At end-2004, IDAAN had total assets of US\$552.2 million, current assets of US\$90.4 million, net fixed assets of US\$460 million, and US\$1.8 million in other assets. Total assets were up US\$74 million from 2003, with US\$60 million of that growth in net fixed assets and US\$14 million in current assets. Current liabilities rose by US\$43.3 million, with US\$17.1 million of that amount in accounts payable to the central government for water bought from the Panama Canal Authority (PCA), and US\$26.3 million in contracts and retention money payable. Significantly, the central government is IDAAN's principal creditor, owing US\$70.8 million, broken down as US\$62.4 million in short-term debt and US\$8.4 million in long-term debt. Analysis of recent balance sheets is presented in the detailed analysis provided in the technical files.

## **2. Viability of meeting the agreed targets**

- 4.21 The viability of meeting the financial targets (see paragraph 3.10) is subject to the implementation of the following actions, whose financial impact on IDAAN's financial expenditures and revenues is presented in Table IV-4. This was taken into account when establishing the values adopted for the indicators:

- a. **Improvement of collections.** Although receipts have been falling in recent years, IDAAN's administration has already adopted some measures and is evaluating the use of others, to reverse this situation. In particular, the process of outsourcing the meter reading and receipt distribution service has begun, and the best way of outsourcing the collections service is being studied. These measures are expected to increase receipts from private customers by at least 5% annually beginning in 2006. In the case of the public sector, although IDAAN has a limited ability to enforce payment, it is expected that through an agreement with the Ministry of Economy and Finance, payments from clients who are agencies of the central government will be normalized. Talks are underway to offset the public sector's debt for water consumption of nearly US\$11 million during 2005 with part of IDAAN's debt to the PCA. Beginning in 2006 the government has agreed to pay for billed consumption, and IDAAN has agreed to pay for water purchased from PCA. Public sector consumption has an impact of more than US\$9 million on annual receipts (15% of all receipts), and thus, *nonpayment by the government would affect compliance with the collections efficiency and cost coverage targets.*
- b. **Inclusion of the user charge for sewer services.** There is a consensus that a fee should be charged for sewer service in areas where this service is provided. For this reason a study is planned for 2006 to determine the rates to be charged for this service, as well as the development of a registry of sewer users. The introduction of this rate is planned for mid-2007, and it is estimated that this would increase revenues by more than 10% beginning in 2008.
- c. **Reduction or maintenance of costs.** Three components of the operating costs together represent over 80% of this cost (not including depreciation), and it is considered feasible to reduce and/or maintain them at levels similar to 2005. These components are: personnel (representing 24.5% of the cost), water purchases (33.3%), and electricity (24.5%). It is estimated that the personnel cost can be easily maintained close to 2005 levels, since there is excess staff with respect to the number of customers (6.2 employees/1,000 customers as of 31 December 2004). The cost of bulk water may drop, since negotiations are underway with the Panama Canal Authority to reduce the price by nearly 7%, which could mean a reduction of approximately 5% in the total cost of water purchases. Something similar should happen with electricity, since the rate level at which purchased medium to high-voltage energy is billed may change, and this could reduce the cost by approximately 10%. The Chilibre plant could also be powered by a nearby electric substation owned by the Panama Canal Authority under more attractive price conditions than those currently paid, which could yield an additional reduction in electricity costs of approximately 20%.
- d. **Adjustment of the potable water rate.** Since the rate currently collected from users for the potable water service does not cover all the service's costs

and is not economically efficient, the introduction of adjustments and the establishment of a price revision formula based on the most relevant cost parameters are considered essential. For such purposes, as part of the strengthening actions considered in the project, a study is planned for 2006 to determine a new rate framework. This new rate framework must also contribute to streamlining high water consumption and collecting based on consumption from the vast majority of customers who are able to pay a rate that is representative of the cost of investment, operation, and maintenance.

**Table IV-4. Projected Impact of Measures on IDAAN Revenues and Expenditures**  
(in thousands of US\$)

	2003	2004	2005	2006	2007	2008	2009
New billing for water and other operating items	67,336	71,276	70,617	71,276	72,702	74,156	77,863
Sewer billing					2,880	9,000	9,180
<b>Total operating revenues</b>	67,336	71,276	70,617	71,276	75,582	83,156	87,043
Receipts for water and other operating items	60,752	55,981	58,216	61,507	64,583	67,812	73,993
Sewer receipts					2,448	8,100	8,721
Total operating receipts	60,752	55,981	58,216	61,507	67,031	75,912	82,714
Receipts for valuation rate and other nonoperating items	2,038	2,160	2,160	2,268	2,381	2,500	2,625
<b>Total receipts</b>	62,790	58,141	60,376	63,775	69,412	78,412	85,340
<b>Expenditures</b>							
Operation and maintenance	27,223	28,754	34,433	35,122	35,824	36,541	37,272
Administrative expenses	13,276	16,774	13,276	13,276	13,276	13,276	13,276
Water purchases	23,249	23,775	24,267	24,753	25,248	25,753	26,268
Total operating expenses	63,748	69,303	71,977	73,151	74,348	75,570	76,815
Service of debt	7,709	5,607	4,944	7,197	4,600	4,900	4,900
<b>Total expenditures</b>	71,457	74,910	76,920	80,348	78,948	80,470	81,715

## E. Environmental viability

- 4.22 While preparing the master plan for the Panama City and Bay Sanitation Project, between 1998 and 2000, a detailed appraisal was done of the environmental and social situation in the area of influence of the complete sanitation program, as well as a complete characterization of the system of marine currents, including an analysis of the environmental viability of the various alternatives proposed. This information has been used and updated during the environmental and social impact assessments conducted beginning in June 2004 (see paragraph 1.28).
- 4.23 As a whole, the program seeks to correct undesirable environmental and social situations resulting from the lack of sanitary sewer networks in Panama City's lowest income urban sectors, and from the direct discharge of wastewater into urban rivers and the coastal area of Panama Bay. Stage one, represented by the operation proposed herein, will finance: (i) sewer networks in neighborhoods where

the sanitary conditions are most urgent; and (ii) collectors along the urban rivers that flow through densely populated areas and thus have highest priority. Therefore, the proposed operation itself will produce significant social and environmental benefits, including improved health conditions, the concomitant reduction of medical expenses among the low-income population benefiting from the new sanitary network system, improved water quality in urban rivers, and the reduction of unpleasant odors. The project will also finance an environmental education program aimed at raising the population's awareness of the importance of environmental protection and the factors affecting it, the costs and benefits associated with an unpolluted environment, and the need for them to participate in resolving the city's environmental problems.

- 4.24 Despite the indicated positive effects, the sewer networks and collectors to be constructed may cause temporary, reversible negative impacts during construction, such as high noise and vibration levels, dust, construction waste, disruption of vehicle and pedestrian traffic, risks of accidents, and breaches in service lines.
- 4.25 During project preparation, an environmental and social impact assessment (ESIA) was conducted for the program, and it identified all of the impacts of the works, and recommended environmental mitigation measures (Environmental Management Plan), in accordance with Bank policies and with the provisions of the General Environmental Act (Law 41) and Executive Decree 59 dated 16 March 2000 governing the environmental impact assessment process in Panama. Panama's National Environmental Authority reviewed the ESIA and issued a resolution approving it on 31 August 2005 (Resolution IA-067-2005).
- 4.26 The Operations Manual (see paragraph 3.6) include the required environmental measures and rules for their implementation, as will the bid documents for the works. It is also important to note that the project does not foresee any need for population resettlement due to the planned works. In addition, those works that will redirect the current flow of wastewater, even if temporarily, will be put out to bid only when financing is confirmed for the second stage of the project (see paragraph 3.8).
- 4.27 Public participation in the environmental assessment process was ensured by the holding of five consultation workshops between August and September 2004 and one public forum on the ESIA held 9 March 2005. The ESIA was made available to the public in Panama City on 17 February 2005 and at the Public Information Center on 17 October 2005.
- 4.28 The PCU and IDAAN will be responsible for environmental management. The project will finance a fulltime environmental expert in the PCU and an enterprise to supervise the works, whose contract will include environmental oversight of the works, including the authority necessary to carry out the environmental monitoring.



The PCU's environmental expert will coordinate the actions necessary for the Environmental Management Plan.

**F. Benefits and beneficiaries**

- 4.29 The sewer networks that have already been designed will benefit an estimated 9,610 low-income households. An additional 6,900 households are expected to benefit from the construction of networks in low-income neighborhoods that lack this service, but still do not have the respective designs. The proposed collector works will benefit approximately 75,000 families directly, but a significant portion of the city's residents will receive some added benefit.
- 4.30 IDAAN, as the service provider, will benefit from the operational, business, and financial strengthening program. This program is a continuation of efforts underway for the past two years to improve IDAAN's administrative management.

**G. Risks**

- 4.31 **Timely execution of the next stage of the program.** The Government of Panama established the PCU for the promotion and execution of all three stages of the sanitation program. However, it has not yet been determined how the program's second and third stages are to be financed, inasmuch as the government is considering several options, including private sector participation. Successful execution of at least the first two stages will ensure that most of the program's environmental benefits are obtained by controlling the majority of the pollutants discharged into the bay. With this in mind, stage one seeks to support the government's decision-making process, including resources for the financing of financial and technical studies to evaluate the existing financial options for construction of the treatment plant, including coverage of operating and maintenance costs, and to support and facilitate the timely execution of stage two.
- 4.32 **Financial sustainability of the operator of the works.** The planned business and financial strengthening measures, particularly the rate and subsidy system to be implemented to ensure the service's sustainability in the medium term, may be difficult to put in practice in the short term due to their complexity and political sensitivity. To mitigate this risk, the operation will finance studies to analyze and effectively supporting such measures, and communication and education activities targeting users in order to clearly explain the need and scope of the measures, and to facilitate their implementation.

**PANAMA CITY AND BAY SANITATION PROJECT (I) (PN-0062)**  
**LOGICAL FRAMEWORK**

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<b>Goal</b>			
To improve the quality of life and environmental conditions in the Panama City metropolitan area.	<ul style="list-style-type: none"> <li>Contribution to meeting the Millennium Development Goals in sanitation and reduction of pollution in urban rivers.</li> </ul>	<ul style="list-style-type: none"> <li>Reports and statistics from the Ministry of Health (MINSa), National Environmental Authority (ANAM), and the National Water and Sewer Systems Institute (IDAAN).</li> </ul>	All stages of the project are executed.
<b>Purpose</b>			
To improve sanitation in low-income districts and reduce pollution of urban rivers and tributaries in the Panama City metropolitan area by expanding the sewer system within a framework that promotes the financial sustainability and efficiency of the institution responsible for providing the service.	<p><b>Investments in infrastructure:</b></p> <ul style="list-style-type: none"> <li>Low-income housing actually connected to the sanitary sewer network (new connections): 2006: 4,125; 2007: 4,125; 2008: 4,125; 2009: 4,125</li> <li>Reduction of pollutants in affected rivers and tributaries (80% reduction in kg BOD/day).</li> </ul> <p><b>IDAAN management:</b></p> <ul style="list-style-type: none"> <li>Increase in collections efficiency (%): 2006: 86.3; 2007: 88.7; 2008: 91.3; 2009: 91.2</li> <li>Increase coverage of costs and debt service: 2006: 0.794; 2007: 0.879; 2008: 0.974; 2009: 1.044</li> <li>Increase in metered water (%): 2006: 60.0; 2007: 62.0; 2008: 64.0; 2009: 66.0</li> </ul>	<ul style="list-style-type: none"> <li>Comparison with baseline.</li> <li>Periodic reports from ANAM, IDAAN, and ERSP.</li> <li>Reports from the PCU.</li> <li>Approval of final reports and documents by the Bank.</li> <li>Evaluation of IDAAN's compliance with management targets.</li> <li>IDAAN's audited financial statements.</li> </ul>	<p>National authorities and IDAAN support measures for IDAAN's institutional and financial strengthening.</p> <p>Local counterpart funds are available.</p> <p>Other sources of pollution are intercepted and treated.</p>

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
	<ul style="list-style-type: none"> <li>• Introduction of user charge for sewer service: 2006: Prepare proposal 2007: Introduce user charge</li> <li>• Restructuring of potable water rate: 2006: Prepare proposal 2007: Introduce rate</li> </ul>		
<b>Stage I Components</b>			
<b>Component I – Priority investments</b>			
<b>1.</b> Sewer networks built, and dwellings connected in San Miguelito area neighborhoods.	<ul style="list-style-type: none"> <li>• 58 km of sanitary sewer network built in low-income neighborhoods.  2006: 13; 2007: 15; 2008: 15; 2009: 15</li> </ul>	<ul style="list-style-type: none"> <li>• Reports from the PCU and IDAAN.</li> <li>• Approval of final reports and documents by the Bank.</li> </ul>	Dwellings adapt their internal plumbing for connection to the public network.
<b>2.</b> Collectors along the Curundú, Matasnillo, Monte Oscuro, Abajo, Matías Hernández, Palomo, Santa Rita, Espabé, and Juan Díaz Rivers are built, and sewer system discharges are intercepted.	<ul style="list-style-type: none"> <li>• 47 km of urban rivers are cleaned up (direct discharges from the sanitary sewer system are intercepted):  2006: 5; 2007: 15; 2008: 13; 2009: 14</li> </ul>	<ul style="list-style-type: none"> <li>• Reports from the PCU and IDAAN.</li> <li>• Approval of final reports and documents by the Bank.</li> </ul>	
<b>3.</b> Pump and pressure main systems are built, equipped, and in operation.	<ul style="list-style-type: none"> <li>• Nine pump stations and six pressure mains (8 km) are built:  2007: 3; 2008: 3; 2009: 3</li> </ul>	<ul style="list-style-type: none"> <li>• Reports from the PCU and IDAAN.</li> <li>• Approval of final reports and documents by the Bank.</li> </ul>	Financing for stage two of the program is defined (for four pump systems depending on this definition)

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Component II – Institutional and financial strengthening of IDAAN			
1. Sewer system network and user registries are completed and incorporated into the GIS.	<ul style="list-style-type: none"><li>132,000 sewer users incorporated into the geographic information system in the first two years.</li></ul>	<ul style="list-style-type: none"><li>Reports from the PCU and IDAAN.</li><li>Approval of final reports and documents by the Bank</li></ul>	
2. House metering of medium and high consumption users is completed.	<ul style="list-style-type: none"><li>7,625 house meters (5/8" to 6") installed annually and integrated into the meter-reading routes.</li></ul>		
3. Potable water networks divided into sectors, and leaks controlled.	<ul style="list-style-type: none"><li>Two water circuits divided into sectors in the first two years.</li><li>40 leaks repaired/month in the first two years.</li></ul>		
4. Rate adjustment study completed.	<ul style="list-style-type: none"><li>Proposal to adapt the rate structure and level is developed, discussed, and accepted.</li></ul>		
5. Training completed for IDAAN staff.	<ul style="list-style-type: none"><li>200 administrative and operations officials are trained annually.</li></ul>		
6. User communication and education activities undertaken.	<ul style="list-style-type: none"><li>(Communication and education activities and events are undertaken according to a plan to be determined).</li></ul>		
7. Organizational restructuring executed.	<ul style="list-style-type: none"><li>(Activities to support the restructuring plan to be determined).</li></ul>		
Component III – Supporting studies			
1. Study on alternatives for private sector participation in future stages	<ul style="list-style-type: none"><li>Financing strategy for stage two of the program defined.</li></ul>	Consulting reports. Designs and bidding documents. Reports from the PCU and IDAAN.	Specialized consulting firms participate in the bidding processes.
2. Sewer network designs	<ul style="list-style-type: none"><li>Neighborhoods selected and designs completed.</li></ul>		
3. Interceptor construction design	<ul style="list-style-type: none"><li>Design completed and accepted.</li></ul>		
4. Study on alternatives for San Miguelito water transport	<ul style="list-style-type: none"><li>Alternative selected and accepted.</li></ul>		
5. Designs for restoration works	<ul style="list-style-type: none"><li>Designs completed and accepted.</li></ul>		

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/\_\_\_

Panama. Loan \_\_\_/OC-PN to the Republic of Panama.  
Panama City and Bay Sanitation Project (I)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Panama, as Borrower, for the purpose of granting it a financing to cooperate in the execution of the City of Panama and Bay sanitation project. Such financing shall be in the amount of up to US\$45,000,000, which is part of the resources of the Single Currency Facility of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on \_\_ \_\_\_\_\_ 200\_)

LEG/OPR/RGII/IDBDOCS#670210  
PN-0062