

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

BRAZIL

**INTEGRATED SOCIOENVIRONMENTAL PROGRAM FOR PORTO
ALEGRE**

(BR-L1081)

LOAN PROPOSAL

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Proposed resolution

Electronic Links and References	
Basic socioeconomic data	http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata
Status of loan in execution	http://portal.iadb.org/approvals/pdfs/BRsp.pdf
Tentative lending program	http://opsgs1/ABSPRJ/tentativelending.ASP?S=BR&L=EN
Environmental and Social Management Report	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1275133
Basic Environmental Management Plan	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1196322
Involuntary Resettlement Plan	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1241048
Procurement table	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1400609
Other technical files	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1274189

ABBREVIATIONS

CEF	Caixa Econômica Federal [Federal Savings Bank]
DEMHAB	Departamento Municipal de Habitação [Municipal Department of Housing]
DEP	Departamento Municipal de Esgotos Pluviais [Municipal Department of Storm Sewers]
DMAE	Departamento Municipal de Água e Esgotos [Municipal Department of Water and Sewerage]
FEPAM	Fundação Estadual de Proteção Ambiental [Environmental Authority of the State of Rio Grande do Sul]
PECU	Program execution and coordination unit
PMPA	Prefeitura Municipal de Porto Alegre [Municipal Prefecture of Porto Alegre]
SMAM	Secretaria Municipal do Meio Ambiente [Municipal Department of the Environment]
SMCPGL	Secretaria Municipal Coordenação Política e Governança Local [Municipal Department of Policy Coordination and Local Governance]
SMGAE	Secretaria Municipal de Gestão e Acompanhamento Estratégico [Municipal Department of Management and Strategic Support]
SMOV	Secretaria Municipal de Obras e Viação [Municipal Department of Works and Roads]

PROJECT SUMMARY
BRAZIL
INTEGRATED SOCIOENVIRONMENTAL PROGRAM FOR PORTO ALEGRE (BR-L1081)

Financial Terms and Conditions ¹				
Borrower: Municipal Prefecture of Porto Alegre (PMPA) Executing agency: Municipal Department of Management and Strategic Support (SMGAE)			Amortization period:	25 years
			Grace period:	5 years
			Disbursement period:	5 years
Source	Amount	%	Interest rate:	Adjustable
IDB (Ordinary Capital)	US\$ 83,270,000	49.3	Inspection and supervision fee:	(1)
Local	US\$ 85,804,000	50.7	Credit fee:	(1)
Total	US\$169,074,000	100.0	Currency:	U.S. dollars from the Single Currency Facility
Project at a glance				
<p>Project objective: The objective of the program is to improve the quality of life of the population of Porto Alegre. The purpose of the program is to improve the water quality in Lake Guaíba, reduce the flood risk, and improve the urban environment. With its works in the Cavahada River watershed and the Lake Guaíba basin, the program will be contributing to the objectives of the Bank's Water Initiative (document GN-2446-2), and specifically the Water Defenders program for the protection of water sources, elimination of water-related pollution, and sewage treatment.</p> <p>Special contractual conditions: Conditions precedent to the first disbursement: (a) Legalization and formation of the PECU (paragraph 3.2); (b) Designation of the PECU bidding committee (paragraph 3.2); (c) Signature of the agreements or terms of cooperation for program execution between the SMGAE and the DMAE, the DEMHAB, the DEP, the SMOV, the SMAM, and the SMCPGL (paragraph 3.4); (d) Approval of the program operations manual (paragraph 3.4); (e) Legal establishment and formation of the DMAE's decentralized executive coordinating unit (paragraph 3.5).</p> <p>Execution conditions: (a) Hiring of the support firm for program administration (paragraph 3.3) and the support firm for works inspection and supervision (paragraph 3.3); (b) The contractual conditions precedent to initiation of the works construction will be: evidence that the families have actually been relocated or compensated and that the affected property and business owners have been compensated (paragraph 3.7); (c) The startup of work on the Serraria sewage treatment plant will be a condition precedent to recognition under the program of work on the final treated-effluents outfall of the Ponta da Cadeia system (paragraph 3.10); (d) Conduct a midterm program review and present the corresponding midterm report (paragraph 3.20); and Conduct a final review and present the final report (paragraph 3.20).</p>				
<p>Exceptions to Bank policies: None.</p> <p>Project consistent with country strategy: Yes [X] No []</p> <p>Project qualifies as: SEQ [X] PTI [] Sector [] Geographic [] Headcount []</p> <p>Procurement: There are no exceptions to policy (See paragraphs 3.8, 3.9, and 3.10)</p> <p>Verified by ESR on: 18 January 2008</p>				

¹ The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable provisions of the Bank's policy on lending rate methodology for Ordinary Capital loans. In no case will the credit fee exceed 0.75% or the inspection and supervision fee 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

- 1.1 The objective of this operation is to improve the quality of life of the population of Porto Alegre, and its purpose is to enhance the urban environment by improving the water quality in Lake Guaíba and reducing the flood risk to the city along the Cavalhada River. The project is expected to restore the water quality along the left side of the lake and directly benefit over 700,000 residents through expanded public sanitation service and urban environmental restoration. With its works in the Cavalhada River watershed and the Lake Guaíba basin, the program will be contributing to the objectives of the Bank's Water Initiative (document GN-2446-2), and specifically the Water Defenders program for the protection of water sources, elimination of water-related pollution, and sewage treatment.

A. Features of the municipality and the sanitation and drainage sector

1. The Municipality of Porto Alegre

- 1.2 The Municipality of Porto Alegre, capital of the state of Rio Grande do Sul, is situated in the extreme southern tip of Brazil. Its population of approximately 1.45 million inhabitants forms part of the Porto Alegre metropolitan area that is home to over 3.5 million residents.
- 1.3 Robust economic activity in the metropolitan area has put pressure on the area's natural resources and created a number of environmental problems in Porto Alegre. As a result, the city is experiencing problems typical of rapid urban development, including in particular the pollution of Lake Guaíba, inadequate storm drainage, and settlement by low-income population groups in flood risk areas.

2. Water quality and sanitation

- 1.4 The city of Porto Alegre is located on the left side of Lake Guaíba and includes the Guaíba Hydrographic Region consisting of nine watersheds, of which one pertains to Lake Guaíba. The quality of the lake water has been monitored since the 1970s through a network of 76 stations. Physical, chemical, and bacteriological analyses show good-to-excellent water quality (Class 1 and Class 2)¹ in the delta area and along the left side of the lake. The quality of the lake water between the left side adjacent to the city of Porto Alegre and the shipping channel is poor to extremely poor (Class 4). As a result, the channel is limited to shipping and other uses that do not demand good water quality. At the present time several of Porto Alegre's water systems are supplied from this portion of the lake.

¹ The standard of the Consejo Nacional de Medio Ambiente [National Council for the Environment] (CONAMA Resolution 357) classifies water resources according to their level of pollution (Classes 1 to 4, from low to high) based on a number of physical, chemical, and bacteriological parameters. Class 2 permits such uses as primary contact recreation, protection of aquatic communities, and potable water supply. The CONAMA standard uses the following principal parameters for these uses: (i) Biochemical oxygen demand (BOD) equal to or less than 5mg/l; (ii) Fecal coliforms (FC) less than 1,000/100 ml; and (iii) dissolved oxygen (DD) equal to or greater than 5 mg/l.

- 1.5 Sewage discharged directly into the lake by the local population represents its main source of pollution. Eighty-five percent of the population of Porto Alegre is served by the city's sewer system, but 29% of the sewage is taken in by the storm drainage system, thereby polluting most of the streams that flow into the lake. Most of the effluents collected by the sewer system do not receive secondary treatment. The largest single discharge source is the Ponta da Cadeia sewer system, which conveys 40% of the city's sewage directly into the lake by way of an underwater outfall. These discharges constitute the principal source of pollution in the lake. At the present time only 27% of the city's effluents receive secondary treatment.
- 1.6 The impacts of the pollution are felt by most of the population, which used the lake for recreation purposes until recently. It is for this reason that the people cited the elimination of lake water pollution as a priority in the recent municipal participatory budgets.

3. Drainage and flood protection

- 1.7 Porto Alegre has experienced frequent flooding from overflows of Lake Guaíba and its tributaries as a result of heavy rainfall. As a solution to this problem, a flood protection system was planned and implemented in the 1950s with the objective of protecting the city's low-lying areas. Since that time the Municipal Department of Storm Sewers (DEP), which operates and maintains the city's drainage system, has been building and implementing drainage works that interconnect with the planned overall system.
- 1.8 The flood protection system is incomplete, and some of the streams that flow into the lake will require internal dikes on both sides. The Cavahada River subbasin, which has a total area of 24.61 km² and a population of 113,000, experiences the most frequent flooding from river channel overflow, especially during the long, moderate rainfalls of winter. In the areas near the mouth of the Cavahada River, the drainage problem is aggravated by silting and a high water table, which pose a major risk of pollution to the ecosystem and problems caused by geological erosion. In view of these problems, the people living in the watershed have set the construction of internal dikes and flood control works as a priority item in the participatory budget.

B. Institutional framework

- 1.9 Responsibility for the delivery of sanitation and drainage services for the municipality is shared by the Municipal Department of Water and Sewerage (DMAE) and the Department of Storm Sewers (DEP).

4. The DMAE

- 1.10 The DMAE is a municipal agency with administrative, financial and accounting autonomy. It is responsible for delivery of the city's water supply, operation and maintenance of the sewer systems, and sewage treatment and final disposal. Water and sanitation services in Porto Alegre cover 99% and 85% of the population, respectively. The DMAE has a micro measurement index of 96% and an unmetered water index of 37%, the latter indicator having decreased steadily from 41% in

2003. The work productivity index is 3.5 employees per 1,000 water and sanitation customers, which represents a 20% improvement over year 2000 levels.
- 1.11 Since its creation in 1961, the DMAE has implemented the sanitation guidelines contained in the successive sewerage master plans that the city began drawing up in 1960. In the late 1960s, the first outfall was completed for the disposal of effluents in Lake Guaíba, and effluent treatment plants were built in the 1990s. Today 27% of effluents undergo secondary treatment.
- 1.12 In financial terms, the average water and sanitation tariffs for 2006 are R\$2.22/m³ and R\$1.70/m³, respectively, ⁽²⁾ with a collection rate of about 96%. The DMAE has generated a significant cash surplus in past years. For the 2002-2006 period, the annual surplus averaged 13% of current revenues. In 2006 the cost coverage ratio of revenues to O&M + debt service was 134%.⁽³⁾ The DMAE has drawn mainly on its own resources to finance investments in recent years.
- 1.13 Although it has a solid operating and financial foundation and generates tariff revenues regarded as sufficient for sustainability in the medium and long term, the DMAE will need to update its market analysis and the tariff-setting mechanism to reflect a medium- and long-term approach. The agency's current tariff-setting process centers on the budget; it does not take a long-range view of services in light of changing demand and cost analysis. As a result, the tariff structure does not properly reflect costs and is no longer aligned with consumption patterns, which have changed over time. The DMAE has identified the need to draw up and implement an appropriate methodological framework to study market trends and revise the tariff structure for services in the medium term. The program will finance the design of a tariff reform for water and sanitation services, as well as the implementation of a cost accounting system in the DMAE.
- 1.14 The DMAE has a system of service quality and management. This system was developed in recent years in the context of the urban development program financed by the Bank (1095/OC-BR). At the present time, however, the Municipal Prefecture of Porto Alegre (PMPA) does not separate the water and sanitation service delivery functions from the tariff and quality monitoring functions, and therefore the DMAE currently performs both functions. The program will finance the design of the municipal regulatory framework for water and sanitary and storm sewer services. The framework will be implemented during project execution and will include reform of the DMAE's tariff system.

5. The DEP

- 1.15 The Department of Storm Drains (DEP), created in 1973, is an administrative unit of the municipal prefecture and has no administrative or financial autonomy. The department's finances are managed directly by the Municipal Department of

² Equivalent to US\$1.23 and US\$0.94 per m³ at the December 2007 exchange rate of 1.80.

³ This is the "cash flow adequacy indicator" used by the Ministry of Cities to monitor the water and sanitation services that receive funds from the CEF. For the DMAE this amount corresponds to an O&M cost coverage of 166%, and O&M + depreciation coverage of 149%.

Finance. The purpose of the DEP is to centralize operations related to the municipal storm sewer system, in particular the design, execution, operation, and maintenance of storm-sewer infrastructure.

- 1.16 The DEP has a permanent staff of 315 employees. Most of its staff works in the Conservation Division, which operates and maintains the networks. The municipal storm sewer system currently has 2,536 km of drainage networks, including 800 km of mixed networks, or storm sewer networks that receive effluents from sanitary sewers.
- 1.17 The municipality has no formal storm sewer fee to recover system costs. However, the DEP's operating budget, by agreement between the DMAE and the PMPA, is largely financing the cost with revenues from the sanitation tariff charged to users who dump effluents into the mixed networks maintained by the DEP.⁴
- 1.18 This mechanism is not designed on the basis of the actual costs of the storm sewer system and will therefore require reformulation. The program, in conjunction with the design of the DMAE tariff reform, will finance the design of a system to recover storm drainage costs and the implementation of a cost accounting system in the DEP. The storm drainage service will be included in the design of the regulatory framework for municipal water and sanitary and storm sewer services to be financed by the program and implemented during the execution stage.

C. State and municipal strategy in the sector

- 1.19 To reverse environmental deterioration in the Guaíba Hydrographic Region and improve the quality of life of the population, the Government of the State of Rio Grande do Sul implemented a Guaíba watershed environmental management program (Pró-Guaíba) with the participation of the Municipality of Porto Alegre and Bank financing.
- 1.20 The Pró-Guaíba program was designed in phases; the main objective in the first phase was to strengthen the institutional capacity of the government entities in the Guaíba watershed and create the conditions for more-ambitious activities in the future. In this phase, significant efforts were aimed at developing the information systems that would identify and prioritize future investments. The resulting principal output is the Guaíba Hydrographic Region Master Plan.
- 1.21 The Urban Development and Environmental Master Plan, developed by the Department of Planning and the Prefecture of Porto Alegre and in force since 1999, provides guidelines for the city's development programs. Using this integrated planning approach, the Porto Alegre Sanitary Sewerage Master Plan (DMAE, 1999) has become the planning and prioritization tool for all works necessary to eliminate pollution in the water bodies around Porto Alegre. The municipality is working in conjunction with other spheres of government to invest in restoration of the city's natural resources, and in particular its water sources, through increased collection and treatment of sewage.

⁴ The DMAE acts as a collection agent. These revenues do not affect its accounting.

- 1.22 The Porto Alegre Urban Drainage Master Plan, implemented in 1998, embraces a new management policy for the urban drainage system aimed at reducing the negative impacts of flooding. The plan examined drainage issues and proposed methods of controlling the problems caused by urban development on the city's watershed.

D. Bank strategy in the sector and lessons learned

1. Bank strategy

- 1.23 The Bank's strategy with Brazil gives priority to government activities to: (i) support efforts to reduce social inequalities and poverty; and (ii) address the problems of environmental management and natural resources, with an emphasis on protection of vulnerable ecosystems. The proposed operation is consistent with the activities presently supported by the Bank in the water and sanitation sector under this strategy. In the past decade, the Bank approved projects and technical-cooperation operations in Brazil's water and sanitation sector that totaled approximately US\$1.7 billion. Most of that amount went to projects having a major sewerage and sewage treatment component.
- 1.24 Loans 776/OC-BR and 911/SF-BR were approved in 1993 for the Pró-Guaíba program in the state of Rio Grande do Sul, and the last disbursement occurred in late 2002. Of the resources specifically allocated to the Pró-Guaíba program, 44.7% financed sewage collection and treatment systems in an effort to address the pollution problem in the Gravataí River and Lake Guaíba. This had been clearly identified as a major problem for the watershed owing to its negative impact on water supply intake points and water quality along the beaches of Lake Guaíba.
- 1.25 The major sanitation works under the Pró-Guaíba program were completed in 1999, but there were significant delays in the execution of the other components. In addition to the complex nature and preliminary design status of some of the components before the operation was approved, the institutional development activities were delayed in particular by inter- and intra-agency coordination issues and the lack of a state counterpart. Through the DMAE, the PMPA has participated in the Pró-Guaíba program as a co-executing agency through its efforts to eliminate urban pollution. Under the program, 7.3 km of principal collectors, 37 km of sewer network, three pumping stations, and a sewage treatment plant were built.
- 1.26 More recently, the PMPA arranged a US\$76.5 million loan (1095/OC-BR) with the Bank in 1998 for the Porto Alegre municipal development program. At a total cost of US\$153 million, the program completed 14.4 km of road infrastructure, drainage works for the Cascatinha River, and a storm drainage penstock; resettled low-income families; improved basic infrastructure (65.8 km of paving to benefit 15,000 families); and carried out administrative modernization and institutional development activities. The initial execution period of five years was extended by 4.5 years to January 2008, and the loan has been fully disbursed. The execution was delayed when program targets were extended (2.1 km of perimeter road, penstock, 8,000 beneficiary families) in order to utilize the resources that remained as a result of exchange rate fluctuations during the execution period. The program execution

was rated “satisfactory”, and the attainment of development objectives was rated “probable”.

2. Lessons learned

- 1.27 The Bank’s prior experience with water and sanitation system implementation projects, particularly in Brazil, have provided the following lessons:

(i) water and sanitation improvement projects for urban streams should include the installation of public use areas and scenic restoration of the urban environment, to foster community participation sustainability efforts. In this operation, *municipal public-use facilities, roads, parks, and recreation areas will be included in the drainage projects.*

(ii) detailed designs, or alternatively, advanced basic designs, are needed in order to avoid problems at the bidding stage and during project execution, and to streamline costs and execution time. In this operation, the Bank will *require final designs and plan for environmental mitigation to cover at least the works to be executed in the first year of the program;*

(iii) environmental and sanitation educational activities should be included in the works execution, so as to encourage citizen participation and cooperation in accepting the tariffs and fees that will finance the operations. These activities will also promote proper use of public areas in parks and green spaces constructed under the program. In this operation, it was agreed with the executing agency to *conduct an ongoing program awareness and promotional campaign that will include an environmental education component.*

(iv) in family resettlement projects, it is essential to have a properly delineated plan of action for land expropriation, new property acquisition, and designs for new housing solutions, with complete urban infrastructure, in the interest of streamlining project execution timetables. This operation will *require that the Involuntary Resettlement Plan be completed before the work begins, and that the plan delineate the responsibilities and commitment of the participating entities, as well as a mechanism for monitoring and social control.*

(v) interagency participation and coordination of the local entities in the program should be fully delineated. This is an especially important lesson for this program because of the number of participating entities. This operation includes *as a condition precedent to the first disbursement that the agreements or terms of cooperation with the subexecuting agencies are to be signed (paragraph 3.4).*

E. Program strategy

- 1.28 Continuing urban environmental degradation in the Porto Alegre metropolitan region has led the state and municipal governments to develop and coordinate a long-term plan to solve this problem (paragraph 1.19). The state-implemented Pró-Guaíba program identified the decontamination of Lake Guaíba as the top priority (paragraph 1.24). At the same time, the PMPA developed the Porto Alegre Sanitary Sewerage Master Plan (paragraph 1.21) with the ultimate goal of intercepting and treating all sewage collected in the city, and the Porto Alegre Urban Drainage

Master Plan (paragraph 1.22), aimed at completing the drainage and flood protection system. This program gives continuity to Pró-Guaíba to solve the pollution problem in Lake Guaíba by providing for actions to complete the environmental restoration of the lake. The actions specifically target the left side adjacent to Porto Alegre, where the treatment of effluents generated by the city was identified as a priority for the restoration of the watershed. Under the guidelines of the municipal master plans, the program will put up sanitation infrastructure to restore water quality in the lake and establish safe conditions along its beaches. Urban drainage infrastructure will be instrumental in protecting the city against flooding and, in conjunction with municipal management activities, preserving the environment. To promote efficiency and maintain the long-term sustainability of the water and sanitary and storm sewer services, the program will implement municipal regulation of these services and reform of the tariff and cost recovery systems.

II. THE PROGRAM

A. Objectives and description

1. Objectives

- 2.1 The general objective of the program is to improve the socioeconomic conditions of the population of Porto Alegre, and its overall purpose is to restore the urban environment.
- 2.2 To achieve these objectives, four components will be carried out with these specific purposes: (i) improvement of the water quality in Lake Guaíba and the Cavalhada River through the construction of collectors and interceptors for sewage treatment and final disposal; (ii) development of urban infrastructures to reduce the flood risk along the Cavalhada River, through the construction of dikes, drainage channels and flood protection measures; (iii) improvement of the quality of environmental management in the Municipality of Porto Alegre, through the installation of new environmental protection and management tools, and (iv) promotion of efficient municipal water, sanitation, and storm drainage services.
- 2.3 The specific goals of the program's urban environmental quality improvement components are: (i) to reduce the current level of pollution along the left edge of the lake and restore safe water quality conditions on the city's major beaches; (ii) to reduce the flood-prone area along the Cavalhada River by 0.85 km²; and (iii) to expand the environmental protection and recreation areas for the city's population.

2. Components

a. Improvement of water quality (US\$82.6 million)

- 2.4 Through the execution of the four project components, 50% of the sewage generated in the municipality will be collected, conveyed, and delivered for final disposal, thereby raising Porto Alegre's secondary sewage treatment rate from the current 27% to 77%. The following works are to be constructed: (i) **collection and conveyance works**: 63.5 km of collectors; three new pumping stations and

upgrading of one; two surge tanks; 8.4 km of land outfalls; 10.4 km of underwater outfalls; and (ii) **Final disposal works**: 1.0 km of underwater outfalls for final disposal in the lake. The Serraria sewage treatment plant with average capacity of 2,710 l/s, an integral part of the program's technical system, will be built using resources from the Caixa Econômica Federal [Federal Savings Bank] (CEF) that will not be recorded as program resources. In any event, the expenditures for the final outfall may be recognized only when it is demonstrated that work has begun on the Serraria sewage treatment plant (paragraph 3.10).

b. Urban development (US\$58.7 million)

- 2.5 This component will be executed in the watershed and subbasins of the Cavallhada River. Provision is made for the following investments: (i) **drainage works**: construction of 4.3 km of main stormwater interceptors and collectors; one new and one upgraded pumping station; channeling of 1.9 km of the Cavallhada River; and construction of 1.2 km of flood dikes; (ii) **road works**: Construction of 1.52 km of roads alongside the Cavallhada riverbed and a 14,800 m² paved area, to be integrated into the urban road system; (iii) **relocation of families living in hazardous conditions**: resettling of 1,680 low-income families who live in unsanitary conditions in risk areas along the banks of the Cavallhada River and Lake Guaíba, construction or acquisition of 1,680 housing units, and expropriation of 100 properties; and (iv) **job creation and income generation**: training and economic development program for employment creation in order to integrate resettled persons socially and economically.

c. Environmental management and protection (US\$4.2 million)

- 2.6 This component is intended to ensure the sustainability of the urban environmental improvements by consolidating the handling of sanitation and environmental problems and improving the PMPA's urban environmental management capacity. The component includes: (i) **implementation of green areas for public use** along the banks of the Cavallhada River: eight hectares of public use areas; (ii) **urban and environmental management tools**, four headwater protection areas covered by protection policies and rules; 12% of the municipal territory (51 km²) with identified environmental risk areas, mapped and evaluated; (iii) an **environmental conservation unit**: land acquisition, establishment of a supervision and administration unit, and preparation of the management plan for the Morro São Pedro conservation unit; (iv) an **Environmental Management Plan** that encompasses the environmental impact compensation and mitigation programs established in compliance with environmental permit requirements, including environmental education for 20% of the population in the program intervention area.

d. Institution strengthening (US\$2.0 million)

- 2.7 To promote efficiency and maintain the long-term sustainability of water, sanitation, and drainage services, this component will finance (i) the implementation of cost accounting systems in the DMAE and the DEP, (ii) the study and the design of reforms for the DMAE tariff system (paragraph 1.14) and

the DEP cost recovery system (paragraph 1.18); (iii) design of the regulatory framework for a municipal agency to regulate municipal water and sanitary and storm sewer services, (iv) training of municipal employees in regulatory accounting; and (v) support for operating efficiency in the municipal entities that participate in the program as subexecuting agencies (the DEP, the Municipal Department of Housing (DEMHAB), the Municipal Department of the Environment (SMAM), the Municipal Department of Policy Coordination and Local Governance (SMCPGL), and the Municipal Department of Works and Roads (SMOV)) through the acquisition of operating equipment, information systems, and technical training.

B. Cost and financing

- 2.8 The estimated total cost of the program, to be executed over a five-year period, is US\$169,074,000, of which the Bank will finance US\$83,270,000. The remaining US\$85,804,000 pertains to the counterpart contribution from the PMPA. The water quality improvement component will be financed exclusively out of the proceeds of the CEF loans.
- 2.9 The loan resources will be drawn from Ordinary Capital (OC) on the following terms: (i) adjustable interest rate, (ii) five-year disbursement period, (iii) five-year grace period, and (iv) 25-year amortization period. The credit fee and the inspection and supervision fee will be set from time to time by the Board of Executive Directors during its review of the Bank's lending charges, in accordance with Bank policy on the methodology for calculating the Ordinary Capital loan charges.

Cost and Financing (US\$000s)

	Description	IDB	Local	Total	%
I.	Engineering and administration	7,470	812	8,282	4.9
I.1	Management	4,470	812	5,282	
I.2	Works supervision	2,367		2,367	
I.3	Technology control	633		633	
II.	Direct costs	64,871	82,569	147,440	87.2
II.1	Water quality		82,569	82,569	48.8
II.1.1	Ponta da Cadeia system		64,268	64,268	
II.1.2	Cavallhada system		18,301	18,301	
II.2	Urban development	58,658		58,658	34.7
II.2.1	Storm interceptors and collectors	17,305		17,305	
II.2.2	Road works	2,557		2,557	
II.2.3	Resettlement	37,296		37,296	
II.2.4	Job creation and income generation	1,500		1,500	
II.3	Environmental management and protection	4,213		4,213	2.5
II.4	Institution strengthening	2,000		2,000	1.2

Description		IDB	Local	Total	%
III	Associated costs	1,311		1,311	0.8
III.1	Audits and evaluation	1,311		1,311	
IV.	Unallocated costs	9,618	2,423	12,041	7.1
IV.1	Contingencies and cost escalation	9,618	2,423	12,041	
V.	Financial costs^(*)	0	0	0	0
V.1	Inspection and supervision fee		0	0	
	TOTAL	83,270	85,804	169,074	100
	%	49.3	50.7	100.0	
(*) The interest and credit fee will be paid by PMPA outside the program.					

III. PROGRAM EXECUTION

A. Borrower, guarantor, and executing agency

- 3.1 The borrower will be the Municipal Prefecture of Porto Alegre (PMPA), and the guarantor will be the Government of the Federative Republic of Brazil. The executing agency will be the Municipal Department of Management and Strategic Support (SMGAE), supported by the following subexecuting agencies: the Municipal Department of Water and Sewerage (DMAE); the Municipal Department of Works and Roads (SMOV); the Department of Storm Sewers (DEP); the Municipal Department of Housing (DEMHAB); the Municipal Department of the Environment (SMAM), and the Municipal Department of Policy Coordination and Local Governance (SMCPGL).

B. Project execution and administration

1. The executing unit

- 3.2 The program will be carried out by the SMGAE through the program execution and coordination unit (PECU), which is to be created by municipal decree. As the program's liaison with the Bank, the PECU will have the following responsibilities: (i) program planning and scheduling, and coordination with the subexecuting agencies; (ii) preparation and monitoring of the bidding and procurement processes for works, goods, and consulting services; (iii) control and monitoring of works supervision and inspection; (iv) verification of the implementation of environmental mitigation measures and the Resettlement Plan; (v) program accounting, record-keeping, presentation of disbursement requests, and rendering of accounts; (vi) presentation of proof of compliance with contractual clauses; (vii) monitoring and evaluation of outcomes and preparation of progress reports. The PECU will consist of: a general coordinator to be designated by the head of the SMGAE, four advisory support groups (planning, programming, and monitoring; technical; administration and finance; and bidding and contracting), a communications section, and a bidding committee to evaluate and award contracts financed in part or in full with Bank resources. *The legalization and formation of the PECU will*

be a condition precedent to the first disbursement, as will the creation of the PECU bidding committee.

- 3.3 The PECU will draw on the program resources to hire: (i) a management support firm to administer the program, (ii) a firm to provide support for works inspection and supervision, and (iii) a technology control support firm. The management support firm will prepare documents and implement all processes, procedures, and information systems pertinent to program administration. It will assist the PECU and the subexecuting agencies with annual programming, contracting, physical and financial execution, monitoring and oversight, verification of contract compliance, and program evaluation. The inspection support firm will act as a representative of the PECU in the administrative and technical activities involved in works inspection. The technology control support firm will carry out various trials and tests such as concrete technology, soil and paving technology, soldering and resurfacing tests, spot checks, materials inspections, etc. In addition to the specialized personnel to be provided by the management support and inspection firms, the PECU will have a counterpart specialist in each advisory support group. ***The hiring of the support firms for (i) program administration and (ii) works inspection and supervision will be a condition precedent to program execution.***

2. Plan of execution

- 3.4 As the core executing unit under the SMGAE, the PECU will be responsible for overall program supervision and guidance towards timely achievement of targets and objectives. These efforts will be coordinated with the six sector-based municipal entities that participate as subexecuting agencies to carry out the program (DMAE, SMOV, DEP, DEMHAB, SMAM, and MCPGL). To frame institutional coordination matters, the SMGAE will sign agreements or terms of cooperation with these entities to establish each one's area of expertise and obligations within the overall program execution plan, in accordance with the operations manual. ***Signature of the agreements or terms of cooperation for program execution between the SMGAE and the DMAE, the DEMHAB, the DEP, the SMOV, the SMAM, and the MCPGL will be a condition precedent to the first disbursement. The approval of the program operations manual will be a further condition precedent to the first disbursement.***
- 3.5 The subexecuting agencies, each in its respective area of expertise and guided by the PECU, will provide support primarily for preparation of the specifications or terms of reference for technical and environmental works inspection and supervision, and for the contracted studies and services. The DMAE will carry out these works in its role as the executing agency (Promotor) specified in the loan contracts signed with the CEF, which will finance all of the component 1 sanitation works. The PECU will provide general program coordination. A program support group set up in each subexecuting agency will consist of a coordinator, an administrative manager, and technical personnel to monitor and support the program execution. The DMAE will create a decentralized executive coordinating unit consisting of a coordinator, a financial specialist, and technical specialists. The unit will also use the DMAE's central bidding office to handle the bidding process.

The legal establishment and formation of the DMAE's decentralized executive coordinating unit will be a condition precedent to the first disbursement.

- 3.6 The resettlement of 1,680 families and 99 small businesses situated on the banks of the Cavallhada River will be carried out according to the Involuntary Resettlement Plan that was drawn up with the participation of the affected parties and in accordance with the applicable policy (see electronic references).
- 3.7 The SMGAE through the PECU will assist with the relocation of homes, resettlement of families, and reactivation of affected businesses, using the options available in the Involuntary Resettlement Plan: (i) assisted relocation to a home acquired in the local/regional market, or resettlement in new homes in housing complexes for families with homes having a market value of less than 40,000 reais; (ii) cash compensation for homes with a value of more than 40,000 reais; (iii) for productive activities (99 cases mainly in conjunction with housing), reincorporating economic activities in the new homes or in housing complexes in a specific area. The component 2 (urban development) employment and income generation activities will provide technical assistance to ensure the economic sustainability and performance of these activities as well as training to help the unemployed and underemployed members of the resettled population to become socially integrated and to join or rejoin the workforce. The resettlement process will be carried out in accordance with Involuntary Resettlement Plan procedures and criteria and the program Operations Manual. ***The contractual conditions precedent to initiation of works construction will be evidence that the families have actually been relocated or compensated and that the affected property and business owners have been compensated.***

C. Procurement of works, goods, and services

- 3.8 Works and goods will be procured in accordance with the Bank's Policies for the Procurement of Goods and Works (document GN-2349-7). Consulting services will be selected and procured in accordance with the policies for the Selection and Contracting of Consultants (document GN-2350-7). When the estimated cost of the works is equal to, or greater than, US\$10 million, or the cost of the goods and services is equal to, or greater than, US\$500,000, the works or goods and services will be subject to international competitive bidding procedures. When the cost of consulting services exceeds US\$200,000, the notices will be published internationally in *UN Development Business (UNDB)*. When the cost of consulting services is under US\$500,000, the short list may consist entirely of Brazilian consultants. All procurement of goods and services will be consistent with the Procurement Plan (see electronic references).
- 3.9 All procurement and contracting under the program financed in full or in part with proceeds from the Bank's loan will be subject to ex ante review. One year into the project, the Bank will evaluate the PECU's capacity for managing the bidding processes. Depending on the outcome of the evaluation, the Bank may or may not authorize certain bidding processes for ex post supervision by the Bank of the procurement of works and goods whose cost is below the threshold set for

international competitive bidding. In either case, the authority to carry out procurement and contracting under the ex post supervision modality on a general or partial basis may be revoked by the Bank at any time, if so indicated by the outcome of the reviews and evaluations. Depending on the circumstances, the financing of ineligible procurement with the loan proceeds or the local counterpart resources may be disallowed.

- 3.10 Procurement financed solely with local counterpart resources must be included in the Procurement Plan to be recognized under the program. The following documents are to be submitted ex post: (i) the evaluation report for all proposals received, and (ii) the contracts signed with the firms awarded the contracts. ***The startup of work on the Serraria sewage treatment plant will be a condition precedent to recognition under the program of work on the final treated-effluents outfall of the Ponta da Cadeia system.***

D. Recognition of expenses

- 3.11 The borrower has asked the Bank to recognize as local counterpart funding expenses or obligations assumed during program preparation to a maximum of US\$8,247,000 equivalent. Such expenses will be recognized once the Bank has verified that the resources were used for activities eligible for financing under the program. Procurement procedures materially similar to those subsequently set out in the IDB loan contract must have been used throughout the 18-month period prior to approval of the loan by the Bank's Board of Executive Directors.
- 3.12 The borrower has asked the Bank to recognize in addition as part of the financing expenses to a maximum of US\$1 million in the form of payments to the management support firm for the program incurred within the 18-month period prior to approval of the loan by the Board of Executive Directors. The borrower will abide by the rules of the Bank's procurement policy (document GN-2350-7) to hire the firm.

E. Execution period and disbursement schedule

- 3.13 The program will be executed over a five-year period according to the disbursement schedule shown in the table below, which may be revised during the execution period by agreement of the parties.

Disbursement schedule
(US\$ millions)

Source	Year I	Year II	Year III	Year IV	Year V	Total
IDB	9.069	25.595	28.226	15.263	5.117	83.270
Local	11.520	27.583	30.668	15.494	539	85.804
Total	20.589	53.178	58.894	30.757	5.656	169.074
% / Year	12	31	35	8	3	100

F. Revolving fund

- 3.14 A revolving fund for the program will be set up to provide advance resources for the activities financed with the loan proceeds. The amount in the revolving fund will be limited to 5% of the amount of the Bank financing. The executing agency will be responsible for submission of semiannual reports on the revolving fund status within 60 (sixty) days after the end of each six-month period.

G. Program auditing

- 3.15 The executing agency will be required to: (i) maintain separate bank accounts specifically intended for managing the Bank and the local counterpart resources, (ii) present timely disbursement requests and supporting documents for eligible expenditures; (iii) implement and maintain proper financial information and internal control systems for managing the resources of the IDB and the local counterpart, in accordance with Bank requirements; (iv) prepare and present the financial reports for the project and the revolving fund on a semiannual basis, and any other financial reports required by the Bank, including the audited financial statements; and (v) maintain a suitable record-keeping system for the documentation in support of procurement and eligible expenditures, for auditing by the Bank and external auditors.
- 3.16 During the execution period, the executing agency will present the audited financial statements for the program on an annual basis. External audits will be performed by a firm of independent auditors acceptable to the Bank, in accordance with the requirements (documents AF-100 and AF-300) and terms of reference (document AF-400) previously approved by the Bank. The Bidding Procedures for External Auditing Firms (Document AF-200) will be used to select and hire the auditing firm. The annual financial statements for the program will be presented within 120 days after the close of the fiscal year, and the final statements will be presented within 120 days after the last disbursement. The auditing costs will be part of the program cost and will be financed with the loan proceeds.

H. Monitoring and evaluation

- 3.17 The program will have a monitoring and evaluation system under the responsibility of the PECU, with a database for monitoring the performance and impact indicators defined in the logical framework (see Annex I). The system will include environmental quality indicators for evaluating the impact of the components and activities financed. The system will facilitate: (i) control and monitoring of sanitation, drainage, urban development, and road projects; (ii) impact evaluation and environmental control of project execution; and (iii) evaluation of the program's effectiveness. The Resettlement Plan and the Environmental and Social Management Plan will be included in the monitoring and evaluation system.
- 3.18 Program execution will be monitored by way of semiannual progress reports to be prepared by the PECU and presented to the Bank within 60 days after the end of each six-month period. The commitments established in the logical framework will serve as reference points in the reports. The reports for the second six-month calendar period will include the annual work plan for the next year, which will

present the budget appropriations and the activities and targets for that period, as well as the respective projections up to program completion.

- 3.19 On an annual basis, the executing agency will present the Procurement Plan to the Bank for review and approval. The plan will include the estimated cost of contracts and projects, grouping of processes, sources of financing, applicable selection methods and criteria, and the method of Bank review. The plan will be updated for the next 18 months of execution, and submitted each time to the Bank for review and approval. Further updates will be required whenever significant changes are made to this planning tool.
- 3.20 The program evaluation tools will be: (i) an independent midterm evaluation 30 months after the date on which the loan contract entered into force or 50% of the funds have been disbursed, whichever comes first, (ii) an independent final evaluation, six months after the last disbursement, and (iii) the Project Completion Report to be prepared by the Bank. The independent midterm and final evaluations may be outsourced using program resources. **The midterm review, the midterm report, and the final review and reports will be a contractual condition.**

IV. VIABILITY AND RISKS

A. Technical viability

- 4.1 The works to be financed under the program present no particular technical challenges in regard to construction or operation. The technologies are widely used in the construction of works for sewage collection and treatment, storm drainage, road paving, urban development, and natural parks implementation. The technologies and materials used will be suited to the region and will offer advantages of economy and construction. The housing to be provided to the resettled population meets international best practices for housing for low-income groups and offers cost-efficient solutions that satisfy the policy requirements of the municipality and the Bank.
- 4.2 The program encompasses specific investment projects that were prepared in accordance with generally accepted engineering standards and principles. The projects offer low-cost, technically viable options that are widely proven under similar conditions in Brazil. The project budgets contain appropriate detail and supporting documentation. Advanced basic designs are available for the projects to be executed at the beginning of the program.
- 4.3 The project execution timetable properly reflects the timeframes needed to carry out the proposed activities. The timetable takes into consideration the features of the works, the processing time needed for prequalification and bidding, and the PMPA's experience in the execution of similar projects.

B. Institutional viability

- 4.4 The Institutional Capacity Evaluation System (SECI) rates the PMPA's institutional capacity as "satisfactory" and the risk level as "low". The PMPA gained experience with Bank policies and procedures through its role as executing agency of the Porto

- Alegre municipal development program (paragraph 1.26). Nevertheless, the complexity of the program, which involves six municipal entities in the execution, led to the decision to adopt a centralized execution plan and create a program execution and coordination unit (PECU) under the SMGAE, which has no direct experience in project management under Bank policies and procedures. To support the SMGAE in the implementation of the PECU and program management, resources from the program will be used to hire a management support firm, which will prepare documents and implement all processes, procedures, and information systems pertinent to program administration. It will assist the PECU and the subexecuting agencies with annual programming, contracting, physical and financial execution, monitoring and oversight, verification of contract compliance, and program evaluation. In addition, an inspection support firm will be hired to assist and strengthen the PECU in administrative activities and works inspection procedures and a technology control support firm to carry out tests, spot checks, and materials inspections. To ensure that the PMPA will gain know-how and experience, the PECU will have counterpart specialists in the areas of planning, programming, and monitoring; technical matters; administration and finance; and procurement.
- 4.5 In accordance with the Bank's analysis of PECU procurement processes, seminars will be offered with Bank support to train the members of the PECU bidding committee in IDB-financed procurement policies and procedures, and in PECU record-keeping systems and practices.
- 4.6 An IDB analysis of sanitation procurement to be carried out by the DMAE and financed by the counterpart found that the DMAE has sufficient capacity. The SECI analysis of the DMAE rates its institutional capacity as "satisfactory" and the risk level as "low". The analysis identified the need to implement an integrated accounting system that can identify resources and DMAE transactions, in accordance with the Bank-approved chart of accounts. The PECU integrated project management system, now in the final development stage, will implement a module in the DMAE to monitor execution and consolidate the relevant PECU accounting records.
- 4.7 The perceived-risk analysis performed by the Bank during the project preparation stage identified a moderate overall risk distributed uniformly across the areas of fiduciary and operational performance, development effectiveness, and quality safeguards. The following principal sources of risk were identified: the municipal elections could cause a change in project execution priorities or personnel; project execution may be affected by bureaucratic procedures; and there may be varying levels of interest among the stakeholders. These risks will be properly mitigated by the features of the proposed execution plan. Centralized project execution, in which each participating entity's areas of expertise and obligations are clearly identified, will have a streamlining effect and will reduce the chances for changes in direction or disputes. The presence of external support for program management and inspection will also limit the potential impact of personnel changes.

C. Socioeconomic viability

- 4.8 A socioeconomic evaluation was carried out for the investment projects under the water quality and urban development components to be financed by the program. The evaluation was based on a comparison of the economic costs and benefits under scenarios with and without the program. The urban development component includes investments in storm drainage and transportation on the Cavanhada River, macrodrainage works, and a perimeter road. The analysis included investment in Cavanhada Park, an integral part of the river drainage system design and part of the environmental management and protection component. The water quality component investments included in the analysis were collection, conveyance, treatment, and final disposal of effluents in the Ponta da Cadeia, Cavanhada, Restinga, and Ponta Grossa systems.
- 4.9 The evaluation included the costs of investment, operation, maintenance, and resettlement, valued at efficiency prices. The benefits were estimated on the basis of direct surveys as well as information from other, similar projects. Of particular interest were the projects carried out by the city of Porto Alegre with the Pró-Guaíba program implemented by the State of Rio Grande do Sul, and the Álvaro Chávez penstock project in downtown Porto Alegre as part of the municipal development program, both financed with Bank resources.
- 4.10 The urban development component will provide benefits through the reduction of flooding that causes property devaluation. The beneficiaries will be 2,082 properties in a 0.545 km² flood-prone area that has seen an average devaluation of 11.4% of actual value, or R\$61.7 million in monetary terms. The project will reduce flooding in the region and stop monetary losses through damage prevention. The benefit generated by the Cavanhada Park is expected to come in the form of increased well-being of the beneficiary population, which is willing to pay R\$15.20/month to use the recreational and sports equipment that the park will offer. To estimate the economic benefits of the resettlement plan associated with the Cavanhada River drainage works, 30% of monthly family income was used as a proxy for willingness to pay. This criterion is based on the rules of the Home Financing System, in which a maximum contribution of approximately 30% of family income is allowed for a home loan. For the families included in this analysis, the estimated contribution is R\$165.00 per family / month. Also expected to prove beneficial are the road works along the perimeter of the Cavanhada River, which will reduce transportation time and operating costs.
- 4.11 Under the water quality component, the Serraria sewage treatment plant was analyzed using the cost-efficiency indicator to check its efficiency in reducing the biochemical oxygen demand and total phosphorus concentration in the effluents discharged from the plant, against the cost of investment, operation, and maintenance. A comparative analysis of treatment options showed that the selected option (UASB reactors and assisted decantation) is the lowest-cost choice; it will provide for phased implementation and will meet the water quality requirement specified by the environmental permit. The benefits are expected to stem from the DMAE's reduced costs for treating potable water, and from the project

beneficiaries' willingness to pay. For the Ponta da Cadeia sewer system, the benefits will result from the restoration of Ipanema beach, for which families are willing to pay R\$21.97/month. For the Cavahada and Restinga systems sewerage projects, per-family willingness to pay for implementation of the sewer networks comes to R\$36.19 and R\$34.20 per month for the Cavahada and Restinga systems, respectively.

- 4.12 The findings demonstrate that the projects are economically viable with internal economic rates of return above 12% per annum.

Economic Cost-Benefit Analysis

Project	Economic net present value (millions of R\$)					EIRR	B/C
	Benefit	Investment	O&M	Household connections	Net benefit		
Ponta Cadeia system	127.3	68.5	14.6	-	44.1	22.4	1.53
Cavahada system	41.4	18.7	1.4	3.0	18.6	26.9	1.82
Restinga system	42.4	23.3	1.1	2.3	15.6	20.2	1.59
Water quality improvement	211.1	132.7*	-	-	78.4	22.6	1.59
Urban development	76.4	68.2	5.6	-	2.6	14.1	1.03

* Total cost of investment, operation, and maintenance of the Ponta da Cadeia, Cavahada, and Restinga systems

- 4.13 A sensitivity analysis simulated variations in expected benefits and costs incurred to obtain the 12% rate. The findings showed that the water quality projects are viable with benefit reductions up to more than 35% or cost increases up to more than 60%. The urban development component is sensitive to 5% variations in benefits or costs.

D. Financial viability

a. Financial capacity of the DMAE

- 4.14 The DMAE will invest R\$272 million in the program for the 2008-2012 period. This investment program includes in particular the Serraria treatment plant and the construction of sewage collectors and interceptors in the Salso River basin. Both of these works were excluded from the program for budgetary constraints. The DMAE will carry out all of the investments with CEF financing, for which the DMAE has already signed contracts and agreements totaling R\$212 million, or 78% of the cost of the works. Debt service will account for R\$23.3 million per year from 2012 to 2031.
- 4.15 The table below presents a projection of the financial stability of the DMAE based on the following assumptions: (i) the current levels of operating and financial efficiency are maintained, (ii) the natural growth trend of water and sanitation connections seen in the past five years continues, and (iii) program-generated revenues and costs are as expected, resulting in a net cost increase of approximately R\$10 million per year (2007 value) beginning in 2012. The findings indicate that

the DMAE will have the capacity to meet its financial obligations without the need for an increase in average water and sanitation revenue per m3 billed. The tariff reform provided under the program (paragraph 1.13) will make the required adjustments to the tariff structure (revision of service prices and subsidies) so as to ensure the long-term sustainability of the current level of revenues. The implementation of the regulatory system will provide the required framework to monitor and control the efficiency, quality, and cost of services.

DMAE financial projections

Millions of constant 2007 R\$

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Revenues collected	296	300	304	308	313	327	331	336	341	346	350
Operating costs	211	214	217	219	222	246	249	252	255	258	261
Operating cash flow	85	86	88	89	91	81	82	84	86	88	90
Financial income	9	9	9	10	10	10	10	10	11	11	12
Financial costs CEF (this program)	0	2	8	14	18	19	19	18	18	17	17
Other financial costs	5	5	4	4	4	3	3	2	2	2	2
Financial cash flow	4	1	-3	-8	-12	-12	-11	-10	-9	-7	-6
Investments (this program)	4	65	78	65	36						
Other investments & transf.	56	56	56	56	56	56	56	56	56	56	56
Amortiz. CEF (this program)				0	2	4	5	5	6	6	7
Amortiz. Other debts	5	5	5	4	4	4	4	4	4	3	3
Disbursement CEF (this program)	4	51	62	50	27						
Capital cash flow	-61	-75	-77	-75	-71	-64	-65	-65	-65	-65	-65
Changes in cash flow for the year	27	12	8	6	8	5	7	9	12	16	19
Cash balance end of year	99	107	111	112	116	116	119	123	130	141	154
Rev. coll./Op. costs.+Debt service		132%	130%	128%	125%	118%	119%	119%	120%	121%	122%

Reference exchange rate: 1 US\$ = 1.80 R\$

4.16 The CEF is monitoring improvements in DMAE operating and financial efficiency under the financing of its investment

Indicator \ Target	2007	2008	2009	2010
Cash flow adequacy ⁽⁵⁾	111.6%	112.6%	113.1%	115.0%
Uncollected revenues ⁽⁶⁾	11.4%	10.4%	9.4%	8.4%
Unmetered water ⁽⁷⁾	37.4%	34.4%	31.4%	28.4%
Employee productivity ⁽⁸⁾	176.8	180.8	184.8	188.8

⁵ Cash flow adequacy indicator: Revenues / Operating costs + Debt service.

⁶ Uncollected revenues ratio: Uncollected billings for the year / Billings (does not include annual active debt recovery).

⁷ Billing losses ratio: Unmetered water / Water produced.

⁸ Total employee productivity ratio: Number of water + sanitation connections / Number of employees and equivalent outsourced personnel.

plan, through a performance improvement agreement signed in November 2006 between the DMAE and the Ministry of Cities. The agreement sets targets to the year 2010 for eight operating and financial indicators from the SNIS⁹ used by the Ministry to monitor the entities that receive federal funds. The adjoining table presents the targets for the four main indicators. The new targets for 2008-2011 are presently being determined by the Ministry as part of the annual review process provided for in the agreement.

b. Financial capacity of the municipality

- 4.17 The PMPA had a financial deficit in the 2002-2004 period and posted a negative primary result. This situation resulted from unfavorable changes in both revenues and costs. A cost-cutting plan implemented in 2004 was aimed at personnel costs in particular, and in 2005 municipal revenue collection returned to efficient levels. After returning to financial equilibrium beginning in 2005 as demonstrated by positive primary and financial results for 2005 and 2006, in May 2007 the PMPA regained the rating required by the National Treasury Ministry for credit operations.
- 4.18 The PMPA meets all requirements of the Fiscal Responsibility Act and has a low level of indebtedness. The municipality's net debt (Net Consolidated Debt) as of 31 December 2006 was R\$431 million—a reduction compared to prior years—which represents 20.9% of current revenues. This level of indebtedness qualifies the PMPA to undertake the loan for this operation.

Financial projections for the Municipal Prefecture of Porto Alegre **Millions of constant 2007 R\$**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Current revenues	2,402	2,492	2,435	2,496	2,500	2,505	2,510	2,515	2,520	2,526	2,532
Current costs	2,240	2,210	2,208	2,230	2,231	2,231	2,231	2,230	2,230	2,230	2,229
Operating costs	2,204	2,163	2,159	2,174	2,174	2,174	2,174	2,174	2,174	2,174	2,174
Interest IDB (this program)		1	3	5	6	6	6	6	5	5	5
Interest other debts	36	46	47	51	50	50	50	50	50	50	50
Capital revenues	113	108	113	112	91	83	74	74	74	74	74
IDB loan		27	42	38	17	8					
Other loans	99	70	59	62	62	62	62	62	62	62	62
Other revenues	14	12	12	12	12	12	12	12	12	12	12
Capital expenditures	267	264	276	296	274	264	268	268	267	267	267
Investments own resources	186	152	144	164	164	164	164	164	164	164	164
Investments IDB (this program)		27	41	34	11	2					
Amortiz. IDB debt (this program)							6	6	5	5	5
Amortiz. other debts	81	86	91	98	98	98	98	98	98	98	98
Financial revenue	8	126	64	81	87	92	85	91	97	103	110

Reference exchange rate: 1 USD = 1.80 R\$; Projected inflation rate: 4% p.a.

⁹ National Sanitation Information System (i.e., water and sanitation).

- 4.19 The projection of the municipality's fiscal position presented in the table below indicates that it will have sufficient financial capacity to assume the program obligations. This projection takes into consideration the Municipal Budget Act for 2008-2010, and beginning in 2012 a real increase in own revenues of 1% per annum and an increase in transfers of 1% below the inflation rate.

E. Environmental and social impacts

1. Social and environmental viability

- 4.20 *Environmental impacts:* As always occurs in civil works, project execution and operation may produce a number of negative environmental impacts. The construction work may inconvenience the beneficiary communities and surrounding area as a result of noise, transportation problems, pollution of the local environment, worksite accidents, and impacts from transport and improper final disposal of construction debris. The most significant environmental impacts, to which special attention has been directed, are associated with the Serraria sewage treatment plant owing to its location in a naturally humid area with little anthropogenic interference, and discharges of treated sewage into Lake Guaíba.
- 4.21 The environmental studies were consolidated into an environmental impact assessment (EIA) and the related Environmental Impact Report, based on current national and state standards. The EIA was submitted to the environmental authority of the State of Rio Grande do Sul (FEPAM) and the Municipal Department of the Environment (SMAM). The first preliminary permit was granted on 11 January 2002. In 2003 the EIA was updated and expanded in compliance with the Bank's requirements, placing special focus on broader assessment of the affected natural areas, description of the options for the outfalls and the sewage treatment plant, and impact evaluation updates on the basis of design revisions. The mitigation programs and the monitoring and oversight plans, which are delineated according to the requirements of the preliminary permit and the Bank's recommendations, are consistent with the Environmental Management Plan. As a result, FEPAM renewed the preliminary permit in May 2003, and it contains the requirements for obtaining the installation permit.
- 4.22 Technical revisions, discussions with the state environmental authority, and broad-based community participation led the PMPA in 2006 to revise the design of the conveyance system, the location of the pumping stations, surge tanks, and the technical option for the treatment system. These changes minimize impacts on urban areas, disputes with residents, and inconvenience during the construction work. In addition, the technical solution chosen for sewage treatment prevents the impact on the existing natural areas by reducing the area dedicated to the sewage treatment plant from 220 to 15 hectares. This solution ensures compliance with the standards for nitrogen and phosphorus emissions and maintains the ultimate water quality objectives for the lake. The mitigation programs and monitoring and evaluation plans based on LP requirements and the Bank's recommendations conform to the Basic Environmental Plan. The technical reviews of the project designs and the Basic Environmental Plan were submitted to

FEPAM, which issued the installation permit in February 2008. The permit will cover the recommendations on building and operating the planned construction works, including treatment and final disposal of sludge generated at the Serraria sewage treatment plant.¹⁰

- 4.23 The mitigation programs and the monitoring and oversight plans, which are delineated according to the requirements of the preliminary permit and the Bank's recommendations, are consistent with the Environmental Management Plan. The procedures and specifications for environmental protection and control will be incorporated into the bidding documents for the construction works.
- 4.24 *Social impacts:* The program will offer a number of socioeconomic benefits, although it will require the resettlement of approximately 1,680 families living in environmental conservation areas or areas prone to natural risks along the Cavallhada River. The project will rapidly improve the quality of life of the affected population by moving these families to safer, risk-free areas and creating conditions that generate jobs and facilitate re-entry into the labor force. In keeping with policy document OP-710, the PMPA updated the 2003 resettlement plan to include revision of the census and property information for the affected families, and options for compensation of losses, which include: (i) for at-risk families,¹¹ resettlement to new homes in residential units, and assisted relocation to a home purchased on the local market; (ii) for families not at risk,¹² cash compensation (for an estimated 50 affected dwellings); (iii) for productive activities (99 cases, most of them home-based), reinstallation in a designated space in the residential units, adjustments to housing designs, or compensation and training support for small business owners. A system for ex post monitoring and evaluation of the resettlement process is also included. The program provides for community awareness activities, support for job creation, and sanitation and environmental education for the resettled population.
- 4.25 *Community consultation:* The program has been widely discussed in community consultations, which began in 2000 with discussion of the Urban Drainage Master Plan and played a part in the design proposal for the present program. Beginning in 2001 the PMPA promoted a series of meetings with the communities in the program areas and with civil society groups such as universities, institutes, NGOs, and agencies of the municipal and state governments. A public hearing held in December 2003 in connection with completion of the EIA provided input for design modifications to sanitation system components. Beginning in October 2007, additional meetings were held in each affected neighborhood for the purpose of updating the resettlement plan and to inform civil society groups about the program design changes. These meetings, attended by approximately 660 families, provided the forum to begin preliminary discussions of their preferences among the proposed

¹⁰ Under the existing solution approved by FEPAM, the sludge is transported and dumped into the Porto Alegre Metropolitan Region sanitary landfill.

¹¹ Defined as families living in dwelling units that are substandard and/or valued below R\$40,000.

¹² Defined as families living in standard dwelling units valued above R\$40,000.

compensation solutions. Annex II to the plan presents the records and minutes of all such meetings.

- 4.26 *Socioenvironmental viability*: The social and environmental strategy for the program was included in an update of the existing EIA, Environmental Impact Report, and Environmental Management Plan, in light of changes to the technical design solutions for the Ponta da Cadeia and Serraria system, the Involuntary Resettlement Plan, and the project consultation and assessment procedures. The revised studies and plans took into account the requirements of the Environment and Safeguards Compliance Policy (document OP-703). The Environmental and Social Impact Report summarizes the findings of the evaluations and programs contemplated in the Environmental Management Plan, as well as recommendations for implementation. After analysis of these documents and studies, the project team concluded that the program is environmentally and socially sustainable in light of the Bank's respective operating policies. The positive aspects of the program were optimized, and the negative impacts were judged to have been minimized or mitigated through appropriate measures that were extensively discussed with the affected community and included in the Environmental Management Plan and the Resettlement Plan.
- 4.27 The strengthening of urban and environmental management procedures in the Municipal Department of the Environment will result in more efficient services, particularly in regard to conservation of environmental resources, management of natural areas, and protection of headwaters, all of which will be instrumental in program sustainability.

F. Beneficiaries and benefits

1. Beneficiaries

- 4.28 The program beneficiaries will be communities along the edges of the Cavanhada River most of which are low income and users of roads on both sides of the river; the Porto Alegre residents who benefit directly from the Ponta da Cadeia and Cavanhada sanitation infrastructure; beachgoing Porto Alegre residents; and all residents of the city in general, whose quality of life will improve owing to the urban and environmental improvements to be financed through this operation. The beneficiary analysis was based primarily on socioeconomic surveys in the program areas to calculate willingness to pay.

2. Expected outcomes and outputs

- 4.29 The principal expected outcomes of the program will be improved water quality in Lake Guaíba, reduced risk of flooding in the Cavanhada River watershed and along the edges of the lake, and improved environmental quality for the city. The specific outcomes will be: (i) reduction of water pollution on the left margin of the lake: a 50% reduction of COD, to less than 15 mg/l; a 99.99% reduction in the fecal coliform count, to less than 150/100ml; BOD lower than 5 mg/l; and dissolved oxygen greater than 5 mg/l; (ii) reducing the current flood plain along the Cavanhada River from 0.85 km² in 2006 to 0 km² in 2012 for a 10-year event; (iii) resettlement of 1,680 families outside the risk areas along the Cavanhada River

and Lake Guaíba; and (iv) creation of 30 hectares of environmental conservation and recreation areas in the city.

- 4.30 The principal outputs include: (i) 63.5 km of collectors and secondary networks for the Cavahada system; three new pumping stations and the upgrading of one existing one; two surge tanks; 18.9 km of land and underwater outfalls; (ii) 4.3 km of main stormwater interceptors and collectors; two stormwater pumping stations; 1.9 km of the Cavahada River channeled; and 1.2 km of dikes; (iii) 51 km² of the municipality evaluated for environmental risk; eight hectares of public use areas; an environmental conservation unit in Morro São Pedro; and 1,500 people served by the Environmental Education Program; and (iv) DMAE tariff reform and a cost recovery mechanism put into place at the DEP; cost accounting systems implemented at the DMAE and the DEP; and a regulatory system for municipal water and sanitary and storm sewer systems.

G. Risks

- 4.31 The following risks were identified in the institutional analysis: (i) reoccupation of areas along the Cavahada River. This risk will be mitigated by the implementation of road infrastructures, green spaces, and recreation areas on unoccupied portions of the river banks, and ongoing public awareness efforts; (ii) failure to hook up household connections to the sanitation system. This risk will be mitigated by the incentive mechanism provided by the DMAE, whereby users may request connection by the building contractor and pay the cost in installments. Users not choosing this option who fail to connect to the system within the specified time will be subject to a fine; (iii) inefficient project coordination. This risk will be mitigated by centralized project execution, and clear identification of each participating entity's area of expertise and contractual obligations.

INTEGRATED SOCIOENVIRONMENTAL PROGRAM FOR PORTO ALEGRE (BR-L1081)
LOGICAL FRAMEWORK

Objectives	Indicators	Means of verification	Assumptions
Goal:			
Improve the quality of life of the population in the municipality.	<p>Two years into the program:</p> <ol style="list-style-type: none"> 1. The IDESE¹ increases by 5% on average in the city of Porto Alegre, from 0.747 in 2006 to 0.784 in 2014. 2. A 20% reduction in the overall number of cases of leptospirosis and type A viral hepatitis in Porto Alegre, from 225 in 2006 to 180 in 2014. 	<p>Foundation for Economics and Statistics of Rio Grande do Sul (FEE).</p> <p>Public health indicators of the Municipal Department of Health (the department's statistical system).</p>	Continuing municipal priority given to environmental programs.
Purpose:			
Improve the water quality in Lake Guaíba, reduce the risk of flooding, and improve the urban environment.	<p>At the end of the program (2012):</p> <ol style="list-style-type: none"> 1. Improved water quality along the left bank of Lake Guaíba downstream from Punta da Cadeia: BOD lower than 5 mg/l; COD less than 15 mg/l (now 31mg/l); fecal coliform count less than 150/100ml (now 36,000/100ml); dissolved oxygen equal to or greater than 5 mg/l. 	<ol style="list-style-type: none"> 1. Mathematical model of Lake Guaíba and DMAE monitoring of water quality. 	<ol style="list-style-type: none"> 1. (a) Current policy for control and management of the natural resources upstream from Porto Alegre remains unchanged; (b) Serraria sewage treatment plant constructed and in operation.

¹ Socioeconomic development index calculated by the Foundation for Economics and Statistics of Rio Grande do Sul (FEE). The IDESE, an indicator of quality of life in socioeconomic terms, was created to replace the HDI in some cases, since the HDI is heavily affected by data on education, health, and income—areas not covered by the project.

Objectives	Indicators	Means of verification	Assumptions
	<p>2. The flood plain along the Cavahada River for a 10-year event is reduced from 0.85 km² in 2006 to 0 km² in 2012.</p> <p>3. Families resettled outside risk area along the Cavahada River and Lake Guafba: first year (2008): 713; second year (2009): 1,385; third year (2010): 1,680.</p> <p>4. A 30-hectare increase in environmental conservation and recreation areas.</p>	<p>2. Program monitoring and evaluation system</p> <p>3. Program monitoring and evaluation system</p> <p>4. Program monitoring and evaluation system</p>	<p>2. The work is not delayed by any natural disaster.</p>
Components			
Component I: Water quality	<p>1.1 At the end of year three, 63.5km of collectors and secondary sewer networks built for the Cavahada system.</p> <p>1.2 At the end of year three, 18.9 km of land and offshore outfalls built.</p>	<p>1.1 Program monitoring and evaluation system.</p> <p>1.2 Program monitoring and evaluation system.</p>	<p>1.1 Serraria sewage treatment plant in operation.</p> <p>1.2 The work is not delayed by any natural disaster.</p>
Component II: Reduction of flood risk	<p>2.1 At the end of year four, 4.3 km of main interceptors and collectors built, one pumping station built, and one station upgraded.</p> <p>2.2 At the end of year five, 1.9 km of the Cavahada River channeled, and 1.2 km of dikes built.</p>	<p>2.1 Program monitoring and evaluation system.</p> <p>2.2 Program monitoring and evaluation system.</p>	<p>2.2 The work is not delayed by any natural disaster.</p>
Component III: Urban management and environmental protection	<p>3.1 At the end of year three, 12% of municipal land (51 km²) subject to environmental risk identified, mapped, and evaluated.</p>	<p>3.1 Findings of the studies to be procured.</p>	

Objectives	Indicators	Means of verification	Assumptions
	<p>3.2 At the end of the fifth year, eight hectares of public use area, and the Morro São Pedro conservation unit implemented.</p> <p>3.3 Entire population in the program area served by the environmental education program: first year: 300; second year: 600; third year: 900; fourth year: 1,200; program completion: 1,500.</p>	<p>3.2 Program monitoring and evaluation system.</p> <p>3.3 Program monitoring and evaluation system.</p>	
Component IV: Institution-strengthening	<p>4.1 At the end of year three, DMAE tariff reform and a DEP cost recovery system in progress.</p> <p>4.2 At the end of year three, DMAE and DEP cost accounting systems in place.</p> <p>4.3 At the end of year five, regulatory system for municipal water and sanitary and storm sewer services in place.</p> <p>4.4 At the end of year two, operational strengthening plan for the DEP, DEMHAB, SMOV, SMAM, and SMCPGL completed.</p>	<p>4.1 Final consultants' report and tariff transition plan approved</p> <p>4.2 Final consultants' report approved; cost accounting reports</p> <p>4.3 Legal framework, implementation plan, organization manual of regulatory services approved, staff assigned and in place</p> <p>4.4 Program monitoring and evaluation system.</p>	<p>4.1 Approval by the municipal legislature</p> <p>4.3 Approval by the municipal legislature.</p>

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION

Brazil. Loan /OC-BR to the Prefeitura Municipal of Porto Alegre
Porto Alegre Integrated Social and Environmental Program

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 Prefeitura Municipal of Porto Alegre, as Borrower, and the Federative Republic of Brazil, as Guarantor, for the purpose of granting the former a financing aimed at cooperating in the execution of an integrated social and environmental program in Porto Alegre. Such financing will be in the amount of up to US\$83,270,000, from 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.