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PERFORMANCE AUDIT REPORT

**BOLIVIA MAJOR CITIES WATER AND SEWERAGE REHABILITATION PROJECT
(Credit 2187-BO)**

June 1, 2000

*Sector and Thematic Studies Group
Operations Evaluation Department*

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Currency Equivalents (annual averages)

Currency Name: Boliviano, *Currency Unit:* Bs.

1987	US\$1.00 Bs2.05	1994	US\$1.00 Bs 4.62
1988	US\$1.00 Bs 2.35	1995	US\$1.00 Bs 4.80
1989	US\$1.00 Bs 2.69	1996	US\$1.00 Bs 5.07
1990	US\$1.00 Bs 3.17	1997	US\$1.00 Bs 5.25
1991	US\$1.00 Bs 3.58	1998	US\$1.00 Bs. 5.51
1992	US\$1.00 Bs 3.90	1999	US\$1.00 Bs 5.80
1993	US\$1.00 Bs 4.27		

Abbreviations and Acronyms

ANESAPA	National Association of Water Supply and Sanitation Institutions (Asociación Nacional de Empresas de Agua Potable y Alcantarillado)
FIS	Social Investment Fund (Fondo de Inversión Social)
FNDR	National Fund for Regional Development (Fondo Nacional de Desarrollo Regional)
GOB	Government of Bolivia
ICR	Implementation Completion Report
IDA	International Development Association
IDB	Inter-American Development Bank
IFC	International Finance Corporation
KfW	Kreditanstalt für Wiederaufbau
OED	Operations Evaluation Department
PPF	Project Preparation Facility
PROFISE	Institutional Strengthening Program (Programa de Fortalecimiento Institucional)
PROSABAR	Basic Rural Sanitation Project (Proyecto de Saneamiento Básico Rural)
SAGUAPAC	Santa Cruz Public Utilities Cooperative Limited (Cooperativa de Servicios Públicos Santa Cruz Limitada)
SAMAPA	La Paz Municipal Water and Sewerage Services Company (Servicio Autónomo Municipal de Agua Potable y Alcantarillado de la Paz)
SAR	Staff Appraisal Report
SEMAPA	Cochabamba Municipal Water and Sewerage Services Company (Servicio Autónomo Municipal de Agua Potable y Alcantarillado de Cochabamba)
SIRESE	Sector Regulation System (Sistema de Regulación Sectorial), Law No. 1600 of October 28, 1994
UNDP	United Nations Development Programme

Fiscal Year

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The World Bank
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Office of the Director-General
Operations Evaluation

June 1, 2000

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Performance Audit Report on Bolivia Major Cities Water and Sewerage Rehabilitation Project (Credit 2187-BO)

The Bolivia Major Cities Water and Sewerage Rehabilitation Project (Credit 2187-BO) was approved on December 4, 1990. The credit was closed on December 31, 1997, 18 months after the original closing date. Cofinancing for the project was provided by: (a) the beneficiary water and sewerage companies in three cities (La Paz, Cochabamba, and Santa Cruz de la Sierra); and (b) KfW of Germany for sewerage in the city of El Alto de la Paz, through a grant of DM 23 million or US\$13.37 million equivalent. The credit was closed on December 31, 1997, 18 months after the original closing date (June 30, 1996). Final disbursement took place on May 6, 1998, at which time a balance of US\$139,320.47 was canceled.

The project financed works in water supply and sewerage that helped extend coverage and improve the quality of service in La Paz and Santa Cruz. Service in the third project city, Cochabamba, improved much less. More important, the project was paralleled by significant reforms in the sector that produced a comprehensive legislative and regulatory framework. As a result of the project, a private concession was signed for La Paz and the adjacent municipality of El Alto. The cooperative SAGUAPAC in Santa Cruz improved further its good performance to become one of the best-managed utilities in the region. Cochabamba lagged the other two cities in institutional development and was unsuccessful on two occasions to attract a private operator. Cochabamba's second attempt to attract a private concessionaire ended in April 2000 in an abrogated concession in the aftermath of wide opposition to tariff increases.

Given that the successful experience in La Paz and Santa Cruz more than compensates for the negative experience in Cochabamba, OED rates the outcome of the project as satisfactory, its institutional development impact as high, and sustainability as likely. Bank performance is rated as satisfactory as is borrower performance.

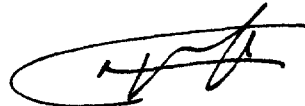
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There are three lessons from the project. The first is that it is necessary to create appropriate incentives for the project implementing agencies to focus their efforts and make them accountable for results. In the three project cities it was not until the La Paz/El Alto system contracted with the private operator, Aguas de Illimani, that service improved. Similarly, it was not until the Cochabamba public operator, SEMAPA, faced the reality of being replaced by a private operator that its performance improved. SAGUAPAC continued as a highly efficient operator, but its highly satisfactory project implementation was likely stimulated by the possibility of gaining access to additional funding of the unallocated project funds. The lesson is relevant both for the preparation of future projects and for proactive supervision.

The second lesson is that private sector participation must demonstrate tangible benefits to be a viable alternative to public sector management as the aborted concession in Cochabamba demonstrates. In that city, the increase in tariffs before improving service quality triggered riots and the subsequent cancellation of the concession contract. Private operators are more vulnerable to public scrutiny than public operators since expectations of performance from them are higher than from public service providers. The latter will often operate with little or no regulation and without a contract with explicit performance targets.

The third lesson is that sustainability of sector reforms can never be taken for granted. The Bolivian water supply and sanitation sector has made great strides since 1994 through the adoption of a Water Supply and Sanitation Law in October 1999 and the establishment of a national regulatory system under the Superintendencia de Saneamiento Básico. The rapid development could be further cemented through continued Bank financial assistance to the sector. The experience from other countries, such as Colombia and Perú, teaches that the mere establishment of a legislative and regulatory system is not a sufficient guarantee for efficient and sustainable service for all segments of the population. The regulatory system can become subject to undue political influence that might undo the advances made.

Attachment

A handwritten signature in black ink, consisting of a large, stylized 'S' followed by a series of loops and a final vertical stroke.

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<p>This report was prepared by Klas Ringskog (Task Manager). William Hurlbut edited the report. Helen Phillip provided administrative support.</p>
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Bolivia Major Cities Water and Sewerage Rehabilitation Project (Credit 2187-BO)

Principal Ratings

	<i>ICR</i>	<i>ICR review</i>	<i>Audit</i>
Outcome	Satisfactory	Marginally Satisfactory	Satisfactory
Institutional Development Impact	Substantial	Substantial	High
Sustainability	Likely	Likely	Likely
Borrower Performance	Satisfactory	Satisfactory	Satisfactory
Bank Performance	Satisfactory	Satisfactory	Satisfactory

Key Staff Responsible

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Preface

This is a Performance Audit Report (PAR) of the Bolivia Major Cities Water and Sewerage Rehabilitation Project (Credit 2187-BO) for which IDA Credit 2187-BO of SDR 25 million (US\$35 million equivalent) was approved on December 4, 1990. The Credit Agreement was signed on December 17, 1990, and became effective on September 17, 1991. The credit was closed on December 31, 1997, 18 months after the original closing date (June 30, 1996). Final disbursement took place on May 6, 1998, at which time a balance of US\$139,320 was canceled.

The PAR was prepared by the Operations Evaluation Department (OED). The Implementation Completion Report (ICR) was prepared by the Latin America and the Caribbean Regional Office on June 12, 1998 (Report No. 18009). The PAR is based on the ICR, the President's Report, the project legal documents, and the Staff Appraisal Report (SAR). The report also benefited substantially from discussions with the borrower and sub-borrowers, a review of relevant project files, and other background material collected during an audit mission to Bolivia October 18-27, 1999.

Following customary procedures, copies of the draft audit report were sent to the relevant government officials and agencies for their review and comments. Comments from Aguas del Illimani (La Paz) have been reproduced as an attachment.

Background

The Water Supply and Sanitation Sector

1.1 In 1998 Bolivia had an estimated population of 7.9 million on a geographical area of 1.1 million square kilometers. In the same year, the urban share of the population reached 63%, up from about 31% in 1977. In 1998, about 76% of the urban population were estimated to be connected to potable water, up from 26% in 1976. Over the same period, the share of the urban population with sewerage connections rose to 32% from 30%. The higher coverage of water supply and sanitation services helps explain in part the sharp reduction in infant mortality from 158 per thousand live births in 1977 to 66 in 1999. Over the same period child (under five years-of-age) mortality dropped from 180 per thousand to 96.

The Project

1.2 The project audited is the last of a series of four water supply and sanitation credits totaling US\$68.7 million that the World Bank approved since 1980. In addition, the World Bank provided technical assistance to prepare and chart the sector reforms pursued by the Government of Bolivia. At present there is no active loan to the urban water supply and sanitation sector, although the World Bank Group is financing rural water and sanitation under the PROSABAR project, expected to close at the end of calendar year 2000.

1.3 The project objectives were to: (i) improve and expand water and sanitation services in Bolivia's three major cities, La Paz/El Alto, Santa Cruz and Cochabamba; (ii) improve the operational efficiency and management systems of the water utilities in the three cities; (iii) introduce a framework of sector policies and institutional arrangements to accelerate sector development; (iv) improve the institutional capabilities of the central water sector agencies; and (v) improve co-ordination between the Bolivian authorities and donors in preparing and financing projects.

1.4 The project components comprised: (i) institutional strengthening of the La Paz Municipal Water and Sewerage Services Company (SAMAPA), the Santa Cruz Public Utilities Co-operative (SAGUAPAC) and the Cochabamba Municipal Water Supply and Sewerage Services Company (SEMAPA); (ii) construction and rehabilitation of water production, storage and distribution facilities in the three project cities, as well as construction of a sewerage system and sewage treatment plant in La Paz and a sanitation system in Santa Cruz; and, (iii) institutional development of the Bolivian water supply and sanitation sector

1.5 The total project costs were US\$71.1 million (US\$57.0 million at appraisal); for which a Development Credit of US\$35.0 million was approved in FY91. Kreditanstalt für Wiederaufbau (KfW) co-financed US\$13.4 million of sewerage investments in El Alto. The loan was closed on December 31, 1997, or 18 months after the original closing date of June 30, 1996. A balance of US\$139,320 was cancelled.

Institutional Framework

1.6 The loan was channeled through the Fondo Nacional de Desarrollo Regional (FNDR) to the three sub-borrowers SAMAPA, SEMAPA and SAGUAPAC. As a result of the project, SAMAPA

was replaced by a private concessionaire, Aguas de Illimani, and a new legal and regulatory system was implemented for the sector.

2. Implementation and Results

ICR Findings

2.1 The ICR (Report 18009) provides an accurate account of the achievements of the project at the time of closing on December 31, 1997. The ICR noted the widely divergent performance of the three sub-borrowers. SAGUAPAC had completed all *physical works* satisfactorily by the original closing date and was able to utilize additional funding provided with the result that 125% of the original work program was completed. SAGUAPAC in Santa Cruz continued to operate as one of the best-managed utilities in Latin America. SAMAPA in La Paz/El Alto required an extension of 18 months to complete its works. SAMAPA was effectively privatized since a private operator, Aguas de Illimani, signed a 30-year concession and took over operations on August 1, 1997. SEMAPA in Cochabamba had implemented less than 80% of the works originally planned at closing date. This was mainly due to resistance from farmers opposed to the drilling of new wells and diversion of irrigation water for the benefit of the rationed population in Cochabamba. At the loan closing date SEMAPA had achieved only modest institutional improvements under its PROFISE technical assistance. The national program of improving the institutional capacity of the central water agencies was only partially accomplished.

PAR Findings

2.2 In its review of the ICR on August 25, 1998, OED recommended an audit of the project because of the major institutional changes that had taken place and because of the apparently successful privatization of municipal public utilities under the project. Given the reasons for conducting the audit it concentrates on the institutional and legal changes before and after the closing of the credit and analyzes and rates the results over the medium and long term.

2.3 The audit analyzed the five project objectives and concludes that the project objectives were of priority and well-focused. The objectives are equivalent to the two results-oriented objectives of providing *service for all* in the most *efficient* fashion at least cost; and to three instrumental objectives of improving the sector policies and institutional arrangements, improving the capability of the sector institutions, and improving co-ordination between the government and donors. The three instrumental objectives in turn aim at laying the foundation for *sustainable* and *efficient* service.

2.4 The findings of the PAR focus on the achievement of the project's key objectives of achieving concrete results of efficient and sustainable service for all since implementing a project's components has limited value unless their achievement results in improved service to the population. The objectives center around three key targets: *the provision of efficient and sustainable service to all*, which are all necessary and inter-related. The provision of *efficient* service is important since least-cost service is more likely to be affordable to consumers. Affordable service with costs paid from user charges in turn makes it more probable that the project benefits will be *sustainable* over the lifetime of the facilities. Finally, the ultimate objectives of providing *service for all* with complete coverage and satisfactory service quality is central not only because of social equity but also because the external benefits from water supply and sanitation investments are large and frequently even larger than the

individually perceived benefits. In particular, providing service to the poor population strata becomes key to judge whether the project has been a success. By focusing on results on the ground it becomes clear that implementing the project components and attaining institutional development or reforms are not ends in themselves but only means to achieve the ultimate objectives.

Results on the Ground

2.5 Table 1 summarizes eight indicators over the 1990–99 period for the three project cities. The evolution of the indicators is encouraging. *Service coverage* has steadily risen in La Paz and Santa Cruz, both the share of households connected to public water supply and to public sewerage. The picture is mixed for Cochabamba, although the trend is upward from the low point at closing date in 1997. *Service quality* has risen in all cities. Santa Cruz remains in first place with no rationing and with all supplies from SAGUAPAC disinfected. The disappointment is the continued rationing in Cochabamba, which is explained by insufficient water production due to the yield of the sources. The *efficiency* of service has kept improving in all three cities after loan closing: both La Paz and Santa Cruz now account for 75 percent of all water produced and metered and Cochabamba has raised the accounted water from 48 percent in 1997 to 58 percent in 1999 with the help of a determined campaign to meter more and to cut off service to non-paying customers. The utility management in all three cities has become leaner with the number of staff dropping from 10 per thousand water connections in 1988 to 1999 levels of 2.2 for La Paz and 5.4 for Cochabamba. Santa Cruz has decreased the staff per thousand water connections from 7.0 in 1988 to 3.7 in 1999. *Service sustainability* appears promising with the working ratios for the three cities hovering around 0.65, leaving a margin for depreciation, debt service and investment financing. The *environmental sustainability* is better in Cochabamba and Santa Cruz, which now treat some 80 percent and 48 percent, respectively of sewage generated and in La Paz with the share rising to 15 percent from nil in 1997. It is noteworthy that improvements have continued after the loan closed in 1997. In the case of La Paz the improvement is largely explained by the arrival of the private concessionaire, Aguas de Illimani. In Santa Cruz the independent consumer cooperative SAGUAPAC, has managed to sustain its steady performance of augmenting coverage, quality and efficiency year after year. In Cochabamba, a new energetic general manager took over the municipal company SEMAPA in 1997 and managed to turn around many of the indicators. The improvements in Cochabamba are uncertain in the aftermath of the departure of the private concessionaire, Aguas del Tunari, whose concession in Cochabamba was cancelled on April 5, 2000.

Table 1. Indicators of Achievement of "Efficient" and "Sustainable" "Service for All"

Service for All	La Paz 1988	La Paz 1997	La Paz 1999	Cochabamba 1988	Cochabamba 1997	Cochabamba 1999	Santa Cruz 1988	Santa Cruz 1997	Santa Cruz 1999
Water In-House	75%	84%	92%	70%	57%	60%	70%	80%	94%
Sewerage	50%	56%	60%	57%	54%	53%	29%	33%	40%
Continuity of Supply in Area	N.A.	82%	93%	0%	0%	0%	100%	100%	100%
Disinfected Supplies	N.A.	100%	100%	N.A.	90%	99%	100%	100%	100%
Efficient Service									
Accounted Water	68%	67%	75%	66%	48%	58%	70%	77%	75%
Staff per 000 Connections	10.0	3.6	2.2	10.0	6.5	5.4	7.0	4.0	3.7
Sustainable Service									
Working Ratio	0.55	0.69	0.64	0.71	0.71	0.66	0.73	0.72	0.65
Share of Sewage Treated	0%	0%	15%	N.A.	80%	80%	33%	39%	48%

Explanations of Project Performance

2.6 The positive performance of the two sub-borrowers, SAGAUPAC, Aguas de Illimani (formerly SAMAPA.) and, to a lesser degree, SEMAPA, is most of all due to the deep sector reforms that have taken place during the 1990s. The reforms have changed the incentives and regulation in the sector to promote higher service coverage and quality, efficiency and sustainability.

The Legislative and Regulatory Framework in the Sector

2.7 The Water Supply and Sanitary Sewerage Law (Proyecto de Ley No. 1905/98-99), approved by the Bolivian parliament on October 21, 1999, is the centerpiece of the reforms. The law incorporates Law No.1600 of October 28, 1994, under which the System of Sectoral Regulation (SIRESE) was created. In this sense, the new law codifies the practice of the recent years where the objectives have been to provide universal access in an efficient, sustainable and transparent manner. The Water Supply and Sanitary Sewerage Law establishes the principle of regulation at the *national* level through the renamed Superintendencia de Saneamiento Básico (formerly Superintendencia de Aguas). The Superintendencia is attached to the Ministry of Housing and Basic Services that has the responsibility to set policy and draft sector development plans. The Superintendencia will also co-ordinate with the Ministry of Sustainable Development and Planning in its allocation of raw water to the concessionaires.

2.8 The assumption is that all communities with more than 10,000 inhabitants should sign financially self-sustaining concession contracts with water supply and sewerage providers (Entidades de Servicios de Agua Potable y Alcantarillado Sanitario, EPSA). The communities of less than 10,000 inhabitants are assumed to be grouped to increase the chances for efficient, sustainable services.

Currently, the two major cities, La Paz/El Alto and Santa Cruz have concessions for a combined population of about 2.5 million. The remaining 40 smaller communities, each above 10,000 inhabitants, have an aggregate population of about 1.4 million and are only now starting to prepare for concessions with EPSAs. Cochabamba with a population of some 0.5 million is a special case after the failed concession of Aguas del Tunari.

2.9 The Superintendencia is the key to accelerated and more efficient sector development. Among its many duties, it prepares, bids, evaluates and signs concession contracts with EPSAs. In the process, it will decide on service targets and quality and will set tariffs and other charges for consecutive five-year periods. As a basis for its decisions, it will review and approve targets and investment plans. The Superintendencia will sign and supervise the concession contracts on behalf of the host municipality. The Superintendencia can directly intervene in the face of lack of compliance with the concession contract and order a rebid of the concession. The many critical responsibilities of the Superintendencia demands impartial and knowledgeable staff and most of all, an experienced Superintendente. The present incumbent is there in an acting capacity and the formal appointment of an apolitical and professional Superintendente will be pivotal for the continued orderly sector development.

The Concession in La Paz

2.10 The two adjacent municipalities of La Paz and El Alto were the first to be conceded in 1997. The bidding process, features of the concession contract, and the experience of the first two years of operations are described in some detail in Annex B. In summary, the concession was bid in record time of four months from the call for bids to the take-over by the private operator, Aguas de Illimani. The concession has developed efficiently and its sustainability is highly likely.

The Water Supply Project in Cochabamba

2.11 The Cochabamba sub-project and its municipal water utility, SEMAPA, faced the greatest difficulties during the project implementation. The original project objectives were to end the severe rationing of supplies in Cochabamba through the drilling of four deep wells and to rehabilitate existing production facilities. French bilateral assistance was planned to finance the groundwater studies and the subsequent drilling and equipment of the deep wells. The World Bank project financed the rehabilitation of the existing production system.

2.12 In the event, the project was only partially implemented as planned. Significantly, the four deep wells that had offered the promise of bringing more sufficient water to end rationing were not constructed because of significantly higher costs than estimated at appraisal and because of opposition from farmers who felt their supply of irrigation water would be jeopardized if groundwater would have been diverted to satisfy demand in Cochabamba. At the same time, water losses in the Cochabamba distribution system continued at a high 40 percent since the World Bank project did not include any funding to replace leaking pipe sections. Rationing continued with the concomitants of unsafe supplies and consumer resistance to higher tariffs.

The First Failed Attempt to Bring a Private Concessionaire to Cochabamba

2.13 SEMAPA's Board of Directors agreed in March 1996 to bring in a private operator. This decision had been prompted by the transformation of SEMAPA from a municipal water supply and sewerage company to a State Corporation (Empresa del Estado), and by the World Bank's decision to

condition the extension of the loan closing date on the privatization of SEMAPA. The first attempt to privatize services was bid in mid-1997 and was based on bringing in more water from the Corani bulk-water project under a take-or-pay contract. The bidding process was declared void by the Bolivian Supreme Court in response to a legal challenge filed by the Municipality of Cochabamba against the transformation of the municipal SEMAPA to a State Corporation. A coalition of municipal and regional interests was also opposed to basing future supplies on the Corani project. The same coalition was in favor of the alternative Misicuni project with its promise of bringing in more raw water although at a higher cost than Corani (The Misicuni and Corani projects are described in Annex B of this report).

The Second Failed Attempt to Bring a Private Operator to Cochabamba

2.14 Subsequent to the new government taking office in August 1997, an unsolicited offer was received from Aguas del Tunari to negotiate a concession based on bringing in and treating water from the Misicuni project. After negotiations, the Superintendencia de Agua signed a 40-year concession with Aguas del Tunari on September 2, 1999. The concessionaire was a consortium comprising United Utilities/International Water (Northwest Water from the UK) (55 percent of shares), the Spanish firm Abengoa (25 percent) and four Bolivian firms, ICE, SOBOCE, CBI and COPESA, with 5 percent each.

2.15 Aguas del Tunari took over from SEMAPA on November 1, 1999. Practically all 300 SEMAPA employees transferred. The new operator could take advantage of increases in production capacity of 250 liters/second that SEMAPA had commissioned through the drilling of additional wells in the years 1998–99. The concession contract obliged Aguas del Tunari to pay an annual concession fee sufficient to service the debt of SEMAPA from past French, Japanese, IDB and World Bank financing. The contract also obliged the concessionaire to undertake the works that would enable it to bring water from the Misicuni scheme.

2.16 The concessionaire took over with the understanding that tariffs would be raised by an average 35%, effective January 1, 2000. Opposition to the Cochabamba concession and to the national water legislation rallied against the tariff increase and serious rioting resulted in Cochabamba and in other towns. As matters deteriorated, the Superintendente first rolled back the tariffs to the previous levels and subsequently terminated the concession contract on April 5, 2000. For the time being, the Cochabamba water supply and sewerage system will again be operated by SEMAPA.

SAGUAPAC, the Cooperative Operator in Santa Cruz

2.17 SAGUAPAC celebrated its 20th anniversary in 1999. It has developed along with the city of Santa Cruz, which has grown at an annual rate of 6 percent or more. SAGUAPAC is a consumer cooperative governed by a General Delegate Assembly that appoints nine members of the Management Board and different members to a Supervisory Board. The SAGUAPAC by-laws are designed to perpetuate stability: the Supervisory Board has veto rights over the decisions of the Management Board. The result has been great stability under its present General Manager who has been there since 1984. The SAGUAPAC Board and its General Manager take justifiable pride in an efficient and transparent administration that appears to have virtually eliminated corruption. In a similar vein, SAGUAPAC expends great energy to increasing the share of accounted water by combating illegal connections.

2.18 SAGUAPAC has been the beneficiary of two World Bank loans (the first, Water and Sewerage for Santa Cruz de la Sierra, Credit 948-BO, was approved in 1979) and has used World Bank financing to great advantage through efficient implementation and operation. The ICR notes, and the audit confirmed, that SAGUAPAC was the only one of the three sub-borrowers that had completed all project investments by the original closing date. As a result, it gained access to additional loan funds and was able to implement the larger investment program by the extended closing date. It also used technical assistance funds efficiently by employing individual consultants to assist and train its own staff. This cautious and economical utilization of funding has no doubt produced a greater impact on the quality of the institution than had a larger technical assistance contract been signed with a consulting firm.

The Sustainability and Future Development of SAGUAPAC

2.19 As impressive as SAGUAPAC's accomplishments have been, their long-term sustainability remains to be seen. It is unclear whether SAGUAPAC's present institutional arrangement as a user co-operative can evolve with the rapidly growing size of Santa Cruz. The environmental sustainability raises particular concerns. SAGUAPAC draws its drinking water from the aquifer directly below, yet, the very aquifer is being contaminated with fecal coliforms due to the low coverage of sewerage that lags water supply coverage by a wide margin. The investment needs are large and are costed at some US\$300 million. GOB has signaled clearly its intention not to allow SAGUAPAC access to government-guaranteed funds such as those from multilateral development banks. One solution that has been discussed would be to transform the SAGUAPAC co-operative into a holding company of which a sizable minority stake would be sold to a strategic investor with operational capacity willing to take a long-term equity position. The proceeds of the share flotation could then be invested in additional sewerage and sewage treatment works. Such a flotation would be a local variation of the Bolivian capitalization model where strategic investors acquire 50 percent of the shares of privatized publicly owned companies with the public pension funds retaining the other 50 percent.

Outstanding Reforms: A Financial System for the Water Supply and Wastewater Sector

2.20 The three sub-projects in La Paz/El Alto, Cochabamba and Santa Cruz accounted for about 98 percent of the loan proceeds with the balance used for augmenting the institutional capacity of central agencies, in charge of planning and overseeing the water sector. The Fondo Nacional de Desarrollo Regional was used as the on-lending conduit. The FNDR received the credit proceeds under IDA terms of 40-year maturity with 10 years grace and an annual service charge of 0.75 percent. It then on-lent the proceeds to the three sub-borrowers at a 20-year maturity, five years of grace and a floating interest rate of 100 basis points above LIBOR. The more onerous on-lending conditions make it possible for the FNDR to produce a substantial and growing cash surplus as long as it controls its administrative expenditure tightly.

2.21 However, the sector lacks a set of financial policies that would specify the use of such surpluses to the benefit of an orderly and balanced development of the whole sector. One implicit assumption is that all systems with private operators, or their equivalent such as co-operatives, would be ineligible for government-guaranteed financing. This implicit policy has held up additional financing of SAGUAPAC's remaining sewerage investments. Similarly, the financing of investments of private operators in low-income areas will likely have to come from cross-subsidies within the systems and possibly from sources such as the International Finance Corporation.

2.22 The extension and improvement of services to the smaller communities poses particular difficulties. It is reasonable – as seems to be the policy of the Superintendencia de Saneamiento Básico – to continue promoting private operators to enable operations to become more efficient and finance needed investments from the internal cash generation. However, this policy has its limits in the smallest urban systems or those with large needs for rehabilitation. Private operators may not enter unless provided with some level of longer-term financing to be used for rehabilitation. A sector financial policy is needed for this purpose. For instance, at the present time the FNDR is actually excluded from financing private operators, yet it is unclear from where private operators in the remaining 40 cities and towns above 10,000 inhabitants would finance investments, particularly during the crucial early years of their contracts.

3. Assessment of Performance

Project Outcome

3.1 The project outcome rating is an aggregate of the ratings for the relevance of the project (i.e., how well it fits with the country's development strategy and the Bank's statutory requirements); for its efficacy (i.e., how well it achieved its originally stated and subsequently amended objectives); and for its efficiency (i.e., that measures the relation between the project benefits and costs). Relevance is rated highly satisfactory for the three project cities in the end; efficacy is rated highly satisfactory for Santa Cruz, satisfactory for La Paz, and unsatisfactory for Cochabamba; and efficiency is rated satisfactory for La Paz; unsatisfactory for Cochabamba, and highly satisfactory for Santa Cruz. The aggregate rating for project outcome is *satisfactory*.

Project Institutional Development

3.2 The project institutional development is rated *high* since a concession contract were signed in La Paz, and since the private cooperative SAGUAPAC continued to improve. The fall-out from the two failed efforts to implement a lasting concession in Cochabamba is unclear since the abrogation of the Aguas del Tunari concession contract is so recent. However, at first reading the impact is high and may make the government, the Superintendencia and the municipalities cautious in their effort to attract further private operators.

Project Sustainability

3.3 The project sustainability is rated highly likely for the La Paz and Santa Cruz sub-projects given that an experienced private concessionaire is now operating the system of La Paz, and given that SAGUAPAC continues improving its already efficient operations. The abrogated concession in Cochabamba makes the project sustainability uncertain for that sub-project. In consideration of the variations, the overall project sustainability is rated *likely*.

Borrower Performance

3.4 The borrower, the Fondo Nacional de Desarrollo Regional (FNDR), fulfilled its role as the financial intermediary to the three sub-borrowers, SAMAPA, SEMAPA, and SAGUAPAC. Its role was quite limited and it does not seem to have monitored the use of the loan proceeds, nor taken on a

leadership role in the sector and provided technical assistance. Partly, the modest role of FNDR was due to the fact that it had only just been created in 1988, or two years before the IDA credit was approved. The FNDR performance is rated as *satisfactory* during project implementation.

3.5 SAMAPA, the sub-borrower for the La Paz/El Alto investments (42 percent of total investments), is rated *unsatisfactory* during project execution. Its unsatisfactory and unsustainable performance was the reason for replacing it with a private operator, Aguas de Illimani, whose performance since taking over has been *highly satisfactory*.

3.6 SEMAPA, the sub-borrower for the Cochabamba project (29 percent of total investments), is rated *unsatisfactory* during project execution and *satisfactory* during the 1997–99 period, subsequent to project closing. Subsequent to the arrival of the private operator, Aguas del Tunari, on November 1 the performance must be rated unsatisfactory.

3.7 SAGUAPAC, the sub-borrower for the Santa Cruz project (27 percent of total investments), is rated *highly satisfactory* throughout and beyond project implementation.

3.8 The aggregate borrower performance is rated *satisfactory*.

Bank Performance

3.9 Bank performance during preparation is rated *satisfactory*. The weakest performance during preparation was for the Cochabamba project where the Bank relied excessively on the presumed availability of groundwater and failed to include sufficient funds to increase the efficiency in distribution, through reduction of leakage. As a result, when sufficient additional groundwater did not arrive, Cochabamba continued suffering the consequences of severe rationing.

3.10 The ratings for Bank performance during supervision are mixed. For the early years of project implementation it is rated *unsatisfactory* and from 1996 onwards it is rated *satisfactory*. The key decision on the Bank's part was to condition the extension of the loan closing date beyond June 30, 1996, on private sector participation for La Paz/El Alto and Cochabamba.

3.11 The Bank's latest Country Assistance Strategy provides for no follow-up in the water supply and sanitation sector. Although the Performance Audit Report has no role or sufficient information to rate the CAS the absence of a follow-up operation may be considered inopportune since the water supply and sanitation regulator, the Superintendencia de Saneamiento Básico, could still benefit from the financing and technical support that a World Bank sector operation would bring. It is also unfortunate that no follow-up operation has been programmed to support the deepening and broadening of private management and investment in the remaining 40 cities and towns that are less attractive to private operators given their smaller size and weaker financial situation. Many of these towns, ranging in size from 10,000 to 200,000 population, will require much technical assistance and possibly concessionary investment financing to attract private operators and/or investors. In hindsight, an Adjustable Program Loan (APL) might have proved the most appropriate lending instrument.

4. Lessons Learned

4.1 Three lessons stand out:

Incentives are important. In order to achieve the project objectives it is necessary to create appropriate incentives for the project implementing agencies to work towards them. In the three project cities it was not until the La Paz/El Alto system contracted with the private operator, Aguas de Illimani, that service coverage and quality, efficiency and sustainability improved. Similarly, it was not until the Cochabamba public operator, SEMAPA, faced the reality of being replaced by a private operator that its performance improved. SAGUAPAC continued as a highly efficient operator, but its highly satisfactory project implementation might have been spurred on by the possibility of gaining access to additional funding of the unallocated project funds. The lesson is relevant both for the preparation of future projects and for proactive supervision.

Private sector participation in the sector must demonstrate tangible benefits to be a viable alternative to public sector management as the aborted concession in Cochabamba demonstrates. In Cochabamba, the increase in tariffs before improving service quality triggered riots and the subsequent cancellation of the concession contract. Private operators are more vulnerable to public scrutiny than public operators since expectations of performance from them are higher than from public service providers. The latter will often operate with little or no regulation and in the absence of an explicit contract with performance targets.

Sustainability of sector reforms needs to be ensured. The Bolivian water supply and sanitation sector has made great strides since 1994 through the adoption of a Water Supply and Sanitation Law in October, 1999 and the establishment of a national regulatory system under the Superintendencia de Saneamiento Básico. The rapid development could be further cemented through continued Bank financial assistance to the sector. The experience from other countries, such as Colombia and Perú, teaches that the mere establishment of a legislative and regulatory system is not a sufficient guarantee for efficient and sustainable service for all segments of the population. The regulatory system can become subject to undue political influence that can undo the advances made.

Annex A. Basic Data Sheet

BOLIVIA MAJOR CITIES WATER AND SEWERAGE REHABILITATION PROJECT (CREDIT 2187-BO)

Key Project Data (Amounts in US\$ million)

	<i>Appraisal Estimate</i>	<i>Actual or current estimate</i>	<i>Actual as percent of Appraisal estimate</i>
Total project costs	57.00	71.11	124
Loan amount	35.00	35.75	102

Cumulative Estimated and Actual Disbursements

	<i>FY91</i>	<i>FY92</i>	<i>FY93</i>	<i>FY94</i>	<i>FY95</i>	<i>FY96</i>	<i>FY97</i>	<i>FY98</i>
Appraisal estimate	6.1	15.1	25.1	31.8	34.2	35.0	35.0	35.0
Actual (US\$M)	0.7	2.3	8.6	13.3	17.2	29.1	35.0	35.7
Actual as percent of appraisal	11	15	34	42	50	83	100	102

Date of final disbursement: May 6, 1998

Project Dates

	<i>Original</i>	<i>Actual</i>
Identification	April 23, 1987	October 11, 1989
Preparation	March 1, 1988	March 4, 1989
Appraisal	November 1988	October 7 1989
Negotiations		April 30, 1990 and September 24, 1990
Board Presentation	March 27, 1990	December 4, 1990
Signing		December 17, 1990
Effectiveness	March 18, 1991	September 17, 1991
Project Completion	December 31, 1996	December 31, 1997
Closing date	June 30, 1996	December 31, 1997

Staff Inputs (staff weeks)

	<i>Actual Weeks</i>	<i>Actual US\$000</i>
Through appraisal	20	37,500
Appraisal/Board	2	3,750
Board/Effectiveness	0	~
Supervision	27	70,950
Completion		9,000
Total	49 ¹	121,200

¹ excluding time for preparation of ICR

Mission Data

	Date (month/year)	No. of persons	Staff days in field	Specialization represented ¹	Performance rating ²		Types of Problems ³
					Implementation Status	Development objectives	
Through appraisal	5/87	2	10	SE/FA			
	9/87	2	10	SE/FA			
	2/88	2	10	SE/FA			
	4/89	2	10	SE/FA			
	9/89	2	10	SE/FA			
Appraisal through Board approval	4/90	1	10	FA			
Board approval through effectiveness			158				
Supervision 1	9/91	1	19	SE	1	1	CLC, PM
Supervision 2	3/92	1	19	SE	1	1	CLC, PM
Supervision 3	7/92	1	12	FA	1	1	CLC
Supervision 4	11/92	1	12	SE	2	1	CLC, PM
Supervision 5	7/93	1	15	SE	2	1	PM
Supervision 6	2/94	2	6	E/FA	N.A.	N.A.	PM
Supervision 7	11/94	1	10	SE	U	U	PM/AF
Supervision 8	3/95	1	10	LY	U	U	CLC
Supervision 9	7/95	1	10	SE	U	U	PM/AF
Supervision 10	11/95	2	10	SE/EN	U	U	PM
Supervision 11	2/96	1	5	SE	S	S	PM
Supervision 12	10/96	1	12	SE	S	S	PM/AF/C/LC
Supervision 13	4/97	1	7	SE	S	S	PM
Supervision 14	7/97	2	11	SE	S	S	P
Supervision 15 and ICR	12/97	2	10	SE	S	S	P
Total			315				

¹ SE = Sanitary Engineer; EN = Engineer; C = Consultant; FA = Financial analyst; LY = Lawyer

² 1 = No significant problems, 2 = Moderate problems, S = Satisfactory, U = Unsatisfactory

³ AF = Availability of Funds; PM = Project Management Performance; CLC = Compliance Legal Covenants; P = Privatization

Other Project Data

FOLLOW-ON OPERATIONS			
Operation	Loan no.	Amount (US\$ million)	Board date
None			

Annex B. A Tale of Two Concessions: Aguas de Illimani (La Paz) and Aguas del Tunari (Cochabamba)

The Concession in La Paz: Aguas de Illimani

1. The two adjacent municipalities of La Paz and El Alto were the first to be conceded in 1997. The bidding process had been prepared by the engineering consultant firm Halcrow and by the investment bank Paribas. Invitations for bids were issued in April 1997, a pre-award was announced on June 30, 1997, and the concession contract was signed on July 24, 1997. The private concessionaire, Aguas de Illimani, took over operations on August 1, 1997, just six days before the newly elected government took office on August 6, 1997. The first two years of the concession have been tranquil and successful as illustrated by the rising productivity, efficiency and service.

2. The speed and successful implementation of the La Paz/El Alto concession can be explained by a number of factors. First, the selection criterion was selected to be simple and respond to the socio-economic sensitivities: the bidder who would offer the highest number of additional water supply connections in the El Alto area was awarded the contract. The winning bid from Aguas de Illimani was the only bid and undertook to install close to 72,000 additional water supply connections by December 31, 2001. Second, the tariff during the first five years is specified in the concession contract. The tariff is charged in U.S. dollars that are converted into bolivianos at the exchange rate prevailing each month. The arrangement represents a substantial reduction of risk to the private operator since it eliminates the exchange rate risk that arises whenever the tariff is set in local currency but funding is in foreign currency. Third, the pre-concession tariff was increased an average 35 percent prior to the private operator's assumption of operations. This average tariff increase was designed in such a fashion that about one third of the consumers actually had their tariffs reduced. Fourth, the transition from the public operator, SAMAPA, to the private Aguas de Illimani did not cause major problems in part because the private operator initially absorbed all SAMAPA employees. Over time, the number of staff has been reduced, resulting in substantially higher productivity.

3. The La Paz/El Alto concession has developed normally. There is a risk that Aguas de Illimani will not be able to provide the stipulated additional 72,000 water supply connections for the simple fact that it will have connected the entire El Alto population with fewer additional connections. This surprising development is due to over-estimated population growth projections and will likely prompt a review of the concession terms and possibly a substitution of additional sanitary sewerage connections for additional water supply connections.

4. Universal metering, better control of consumption and higher tariffs have combined to reduce per capita consumption levels from 110 lcd in the early months of the concession to 87 lcd in September 1999. This reduction is of concern to the concessionaire since it reduces the gross operating revenue and the internal cash generation proportionately more. The concessionaire is now considering a campaign to promote and possibly finance artifacts that would stimulate water use. This would be in line with the innovative use of Juntas Vecinales (neighborhood associations) to stimulate demand for new connections and encourage contributions in kind from future beneficiaries. The choice of low-cost technology through condominial systems has also been made through the Juntas Vecinales in an effort to make service affordable to all. An added advantage to the concessionaire is the lower investment cost and risk.

5. There are a number of additional risk factors in the concession. One is the fact that Aguas de Illimani is not responsible for stormwater drainage under the concession contract – yet the municipalities of La Paz and El Alto are weak financially and institutionally to improve and expand their stormwater drainage systems. The lack of good stormwater drainage has tempted some consumers to drain their rainwater via the sanitary sewerage. The result is difficulties in operating the sanitary sewerage system and overloaded treatment facilities in the case of El Alto. Better control of such illegal cross-connections may reduce the environmental hazard but the only lasting solution may be to incorporate stormwater drainage into the concession at the time of the first renegotiation of the contract. The second risk factor is the complete absence of sewage treatment for La Paz that continues to pose a serious environmental hazard. The provision of wastewater treatment in La Paz has been costed at US\$100 million and will necessarily have an impact on the water supply and wastewater tariff at the time of the renegotiation of the concession contract, effective January 1, 2002. The present contract does not oblige the concessionaire to provide any wastewater treatment for La Paz.

The (Failed) Concession in Cochabamba: Aguas del Tunari

6. The Cochabamba sub-project and its municipal water utility, SEMAPA, faced the greatest difficulties during the project implementation. The original project objectives were to end the severe rationing of supplies in Cochabamba through the drilling of four deep wells and to rehabilitate existing production facilities. French bilateral assistance was planned to finance the groundwater studies and the subsequent drilling and equipment of the deep wells. The Bank-supported project financed the rehabilitation of the existing production system.

7. In the event, the project was only partially implemented as planned. Significantly, the four deep wells that had offered the promise of bringing more sufficient water to end rationing were not constructed because of significantly higher costs and because of opposition from farmers who felt their supply of irrigation water would be jeopardized if groundwater would have been diverted to satisfy demand in Cochabamba. At the same time, water losses in the Cochabamba distribution system continued high at some 40 percent since the Bank-financed project did not include any funding to replace leaking pipe sections. Rationing continued with the concomitants of unsafe supplies and consumer resistance to higher tariffs.

The First Failed Attempt to Bring a Private Operator to Cochabamba

8. SEMAPA's Board of Directors agreed in March 1996 to bring in a private operator. This decision had been prompted by the transformation of SEMAPA from a municipal water supply and sewerage company to a State Corporation (Empresa del Estado), and by the World Bank's decision to condition the extension of the loan closing date on the privatization of SEMAPA. The first attempt to privatize services was bid in mid-1997 and was based on bringing in more water from the Corani bulk-water project under a take-or-pay contract. The bidding process was declared void by the Bolivian Supreme Court in response to a legal challenge filed by the Municipality of Cochabamba against the transformation of the municipal SEMAPA to a State Corporation. A coalition of municipal and regional interests was also opposed to basing future supplies on the Corani project. The same coalition was in favor of the alternative Misicuni project with its promise of bringing in more raw water although at a higher cost than Corani.

9. The regional and national interests in favor of building the Misicuni multi-purpose project prevailed and a contract was signed with a contracting consortium of the Italian firm Astaldi and the

Bolivian firm ICE. The first stage contract sum of US\$75 million is financed with an Italian bilateral credit of US\$18 million and the balance of US\$57 million financed by Empresa Nacional de Electricidad (ENDE) with a loan of US\$15 million and equity of US\$28 million, US\$5 million from the Cochabamba Municipality and US\$9 million from the Cochabamba regional Prefectura. Work was started on the 20 km-long tunnel that will bring water from the Misicuni basin into the Cochabamba basin. As of mid-October 1999 the tunnel contractor had excavated about 2 km of tunnel. Once the tunnel is completed, a dam and treatment works are planned to be constructed in a staged fashion to eventually bring in up to 6.6 cubic meters per second from the Misicuni project.

The Second Failed Attempt to Bring a Private Operator to Cochabamba

10. Subsequent to the new government taking office in August 1997 there was a renewed effort to contract with a private operator that would bring in water from Misicuni and operate the Cochabamba production and distribution systems. The closing date for submitting bids in this second attempt was January 14, 1999. No bids were received possibly because the first attempt to bring in a private operator had failed.

11. Later still, an unsolicited offer was received from a consortium, Aguas del Tunari, to negotiate a concession based on bringing in and treating water from the Misicuni project. After negotiations, the Superintendencia de Agua with Aguas del Tunari signed a 40-year concession on September 2, 1999. The concessionaire is a consortium comprising United Utilities/International Water (Northwest Water from the UK) (55 percent of shares), the Spanish firm Abengoa (25 percent) and the Bolivian firms ICE, SOBOCE, CBI and COPESA with 5 percent each. The contract was predicated on a tariff increase of 38 percent, effective late 1999, and with a subsequent increase of 20 percent once the Misicuni project brings additional water. In return, Aguas del Tunari was committed to investing US\$85 million in production and distribution facilities during the first five years of the concession and an additional US\$129 million during the subsequent 35 years of the concession. The concessionaire was also obliged to providing 24 hours service from the second year onwards compared to the present average of some 4 hours. Ending rationing would be facilitated by the requirement that all connections should be metered within three years of take-over.

12. Aguas del Tunari took over from SEMAPA on November 1, 1999. Practically all 300 SEMAPA employees transferred. The new operator could take advantage of increases in production capacity of 250 liters/second that SEMAPA had commissioned through the drilling of additional wells in the years 1998–99. The concessionaire was also committed to drilling additional wells while preparing for the arrival of more water from Misicuni. The concession contract obliged Aguas del Tunari to pay an annual concession fee sufficient to servicing the debt of SEMAPA from past French, Japanese, IDB and World Bank financing.

13. On January 1, 2000 Aguas del Tunari increased the tariff that had previously been authorized by the Superintendencia. The average tariff increase was in the order of 35% and was implemented without any perceptible improvements in the poor quality of service in Cochabamba. Opposition to the tariff increase quickly arose and led to rioting that spread to other towns. The serious situation prompted the Government to roll back the previously authorized tariff increase and subsequently cancel the concession of Aguas del Tunari.

14. The previous public water supply and sewerage provider, SEMAPA, assumed operations once the concessionaire had left. A commission has now been formed to explore ways to bring more water to Cochabamba and end rationing. The options include both the Misicuni and the Corani schemes.

Comments from the Borrower

**Aguas del Illimani**

La Paz, 28 de Janvier 2000

AC/el. GG/021

Gregory Ingram
Manager
Sector and Thematic Evaluations Group
Operations Evaluations Department
THE WORLD BANK
1818 H Street N.W.
Washington D.C. 20433
USA.-

Ref.: **MAJOR CITIES WATER AND SEWERAGE REHABILITATION
PROJECT. BOLIVIA PERFORMANCE AUDIT REPORT**

Dear Gregory,

I have received the draft PAR and I would like to congratulate the author, Klas Ringskog, for the accuracy of his analysis.

I have only two comments to this draft:

Page 10: point 2.14. Four Bolivian firms are shareholders of Aguas del Tunari, and not three.

Page 19: point 5. AGUAS DEL ILLIMANI is responsible for the the maintenance and improvement for the stormwater drainage network existing at the beginning of the concession in La Paz City, and is not responsible for the expansion of the stormwater drainage network in La Paz City. In El Alto City we are not responsible for existing stormwater drainage network (very few exist actually), nor for the expansion of this system.

Sincerely yours,



Alain Carbonel
General Manager
AGUAS DEL ILLIMANI