

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

**BOLIVIA**

**PROGRAM FOR COMPREHENSIVE SOLID WASTE MANAGEMENT  
IMPLEMENTATION IN BOLIVIA**

**(BO-L1073)**

**LOAN PROPOSAL**

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2.	Monitoring and evaluation plan <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250613">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250613</a>
3.	Itemized procurement plan <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250615">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250615</a>
4.	Environmental and social management report <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250656">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250656</a>
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1.	Technical analysis <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250600">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250600</a>
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4.	Institutional Capacity Assessment System (ICAS) analysis <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250604">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37250604</a>
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## ABBREVIATIONS

DGAA	Dirección General de Asuntos Administrativos [Directorate General of Administrative Affairs]
DGAJ	Dirección General de Asuntos Jurídicos [Directorate General of Legal Affairs]
DGGIRS	Dirección General de Gestión Integral de Residuos Sólidos [Directorate General of Comprehensive Solid Waste Management]
EIA	Environmental impact assessment
EMA	Entidad municipal de aseo [municipal trash collection service]
EMAUR	Empresa Municipal de Aseo Urbano de Riberalta
ESA	Environmental and social analysis
ESMP	Environmental and social management plan
ESMR	Environmental and social management report
FSO	Fund for Special Operations
GCI-9	Ninth General Increase in the Resources of the Inter-American Development Bank
ICAS	Institutional capacity assessment system
ISWA	International Solid Waste Association
MEFP	Ministry of Economic Affairs and Public Finance
MMAyA	Ministry of Environment and Water
OC	Ordinary Capital
PCU	Program coordination unit for the Periurban Water and Sewerage Program, Phase I
SIGMA	Integrated administrative management and modernization system
VAPSB	Office of the Deputy Minister for Water and Sanitation

## PROJECT SUMMARY

### BOLIVIA PROGRAM FOR COMPREHENSIVE SOLID WASTE MANAGEMENT IMPLEMENTATION IN BOLIVIA (BO-L1073)

Financial Terms and Conditions					
Borrower: Plurinational State of Bolivia Executing agency: Ministry of Environment and Water (MMAyA), through the program coordination unit for the Periurban Water and Sewerage Program I (PCU)				<b>OC</b>	<b>FSO</b>
			Amortization period:	30 years	40 years
			Disbursement period:	5 years	5 years
			Grace period:	6 years	40 years
<b>Source</b>	<b>Amount</b>	<b>%</b>	Interest rate:	(Single Currency Facility) LIBOR	0.25%
IDB (Ordinary Capital)	US\$16 million	80	Inspection and supervision fee:	*	n/a
IDB (FSO)	US\$4 million	20	Credit fee:	*	n/a
Total	US\$20 million	100	Currency:	U.S. dollars	U.S. dollars

Project at a Glance	
<b>Objective</b> The general objective is to improve municipal solid waste management in Bolivia's municipios by implementing comprehensive approaches that include street sweeping and the collection, transport, reuse, and final disposal of solid waste. The program is expected to benefit about 190,000 households with municipal solid waste collection and final disposal services and increase the coverage of waste disposed of in sanitary landfills from 37% to 51%. The executing agency will be the Ministry of Environment and Water (MMAyA), acting through the PCU.	
<b>Special conditions precedent to the first disbursement:</b> (i) evidence will be presented that the core staff of the PCU has been selected in accordance with terms of reference agreed upon with the Bank (paragraph 3.1); and (ii) the executing agency will approve the program Operating Regulations in accordance with terms previously agreed upon with the Bank, and with the Bank's nonobjection (paragraph 3.8).	
<b>Special execution conditions:</b> Prior to awarding contracts for works financed by the program: (i) the executing agency and the corresponding municipal autonomous government will sign an agreement determining, <i>inter alia</i> , how the municipal autonomous government will maintain and operate its sanitary landfill (paragraph 3.5); (ii) the corresponding municipal autonomous government must own or be entitled to use the land where the landfill will be located and the sites must have roads suitable for the transport of municipal solid waste (paragraph 3.5); and (iii) prior to the start of the works for a given sanitary landfill, the executing agency will prepare an environmental impact assessment (EIA) and an environmental and social management plan (ESMP) in accordance with national standards and present them to the Bank (paragraph 3.5).	
<b>Exceptions to Bank policies:</b> None	
<b>Project consistent with country strategy:</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
<b>Project qualifies as:</b> SEQ <input checked="" type="checkbox"/> PTI <input type="checkbox"/> Sector <input type="checkbox"/> Geographic <input type="checkbox"/> Headcount <input type="checkbox"/>	
<b>Procurement:</b> Program procurements will be made in accordance with Bank policies (documents GN-2349-9 and GN-2350-9).	

\* 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 policies.

## I. DESCRIPTION AND RESULTS MONITORING

### A. Background, problem addressed, and rationale

- 1.1 According to estimates by its National Statistics Bureau, Bolivia has a population of 10.4 million, with 6.9 million (66.4%) living in urban areas and 3.5 million (33.6%) in rural ones. Estimates by the Social and Economic Policy Analysis Unit<sup>1</sup> indicate that 59.3% of the population was living below the poverty line in 2008 (51.2% in cities and 74.3% in the countryside).
- 1.2 According to the Ministry of Environment and Water (MMAyA), total municipal solid waste generated in the country is 1,745,280 tons (87% in urban areas and 13% in rural ones), with per capita household generation that ranges between 0.53 kg/person/day (metropolitan capitals) and 0.2 kg/person/day (rural).<sup>2</sup> Thirty-four percent of Bolivians have trash collection services with average coverage in capital cities of 86%. Of this, 45%<sup>3</sup> (785,376 tons) is disposed of in sanitary landfills (3.1% of municipios), 18% (314,150 tons) in controlled dumps (6.1% of municipios), and 37% (645,754 tons) in open-air dumps (90.8% of municipios) with 30% of those dumps close to bodies of water used for human consumption and irrigation.
- 1.3 Demand for waste management services has outstripped technical and financial capacity, leading to recurring shortfalls that sometimes give rise to environmental collapses, particularly in the capital cities. With respect to financial sustainability, just 54 (17%) of the country's 327 municipios charge for the service through trash collection fees, which cover between 40% and 60% of operating costs. The difference between income and operating costs is generally subsidized through the municipal budget. In most cases, there are problems associated with trash collection and transport service including poor service and a lack of sufficient quality equipment (e.g. containers).<sup>4</sup> As for final disposal, in cities such as El Alto and Cochabamba,<sup>5</sup> disposal sites have exceeded their useful life or are approaching it (one to three years of useful life remaining).
- 1.4 Nationwide, 4.6% of municipal solid waste is recovered (3.7% recyclables and 0.9% organic). This is performed mainly by waste pickers who either collect trash door-to-door or work at trash holding facilities. Just 1.5% of municipios have

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<sup>1</sup> A decentralized public institution that is under the organizational and administrative structure of the Ministry of Development Planning.

<sup>2</sup> MMAyA/VAPSB/DGGIRS. (2012). Diagnóstico de la Gestión de Residuos Sólidos en Bolivia/2010 [Analysis of Solid Waste Management in Bolivia/2010].

<sup>3</sup> This figure from the Analysis of Solid Waste Management in Bolivia has been corrected for the purposes of the program to 37% since the facility for the final disposal of solid waste in El Alto cannot be classified as a sanitary landfill (2010).

<sup>4</sup> <http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37271409>

<sup>5</sup> MMAyA/VAPSB/DGGIRS. (2012). Analysis of Solid Waste Management in Bolivia/2010.

- regulations on the reuse of municipal solid waste, and only 15 (4.6%) are implementing pilot reuse projects.<sup>6</sup>
- 1.5 Waste pickers are vulnerable individuals (migrants, the unemployed, widows, people with disabilities, the elderly, children, all of whom are unskilled and have little education) who work in the streets and at final disposal sites. There are about 10,000 people around the country who work permanently as waste pickers, with 80% to 85% of them being women (concentrated in the cities of La Paz, Santa Cruz, Cochabamba, and El Alto), as well as 10,160 occasional pickers. Their incomes range from 600 bolivianos to 1,200 bolivianos.<sup>7</sup> By way of example, the demographic breakdown in Cochabamba is: adolescents (13 to 18 years) 5%; youth adults (19 to 25 years) 11%; adults (24 to 64 years) 77%; and older adults (65 years and over) 7%.<sup>8</sup>
- 1.6 **Intervention area and analytical sample.** The program intervention area will be based on the priority ranking by the Directorate General of Comprehensive Solid Waste Management (DGGIRS) of the municipios of Riberalta (department of Beni) and Potosí (department of Potosí).<sup>9</sup> Complementarily, the DGGIRS has identified a list of municipios that could participate in the program, from which the third beneficiary will be chosen.<sup>10</sup> The municipio of Riberalta was selected as the analytical sample in function of the institutional and engineering headway made there to date. The municipio has a population of 91,089 people who generate 43.4 tons/day of waste. Collection and transport service coverage is 84%, but conditions are substandard. Final disposal is in an open-air dump where 40 waste pickers work.
- 1.7 In 2011, Riberalta's municipal trash collection service Empresa Municipal de Aseo Urbano Riberalta (EMAUR) had income of US\$501,336, with 49% coming from service fees, 47% from municipal transfers, and 4% from other sources. In the same year, its total costs were US\$518,253, with US\$480,628 for administrative and operating costs and US\$37,625 for depreciation.<sup>11</sup>
- 1.8 **Institutional and legal framework.** Bolivia's Constitution (2009) establishes that solid waste treatment projects are a joint responsibility of the central government

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<sup>6</sup> MMAyA/VAPSB/DGGIRS. (2012). Analysis of Solid Waste Management in Bolivia/2010.

<sup>7</sup> MMAyA/VAPSB/DGGIRS. (2012). Analysis of Solid Waste Management in Bolivia/2010 (between about US\$85 and US\$170).

<sup>8</sup> Ciudades Focales (2008). Estudio de Diagnóstico y Mapeo de la Cadena de Materiales Reciclables en Cochabamba [Focus cities (2008). Analysis and mapping of the recyclables chain in Cochabamba].

<sup>9</sup> According to the Analysis of Solid Waste Management in Bolivia/2010 (which includes several other municipios), Riberalta, Potosí, El Alto, and Cochabamba have been identified as priorities, and the first two are part of the program since they meet the eligibility criteria. The third city to be incorporated will be the first one whose feasibility is demonstrated.

<sup>10</sup> The list includes El Alto, Cobija, Oruro, Sucre, and Trinidad and the municipios in Cochabamba department.

<sup>11</sup> Consulting contract to prepare comprehensive waste management plans, basic engineering for sanitary landfills, and environmental impact evaluation. (2012). Consorcio Gestión Integral, Riberalta.

and the subnational governments. Municipal sanitation and solid waste management and treatment are the exclusive responsibility of the municipal autonomous governments in their jurisdictions.

- 1.9 The Andrés Bónafre Framework Law on Self-Government and Decentralization (2010) assigns the following responsibilities: at the central level, establishment of a plan and policies for managing residential, industrial, and toxic waste; at the departmental autonomous government level, regulation and implementation within their jurisdictions of the plan and policies for managing residential, industrial, and toxic waste approved by the central level; at the municipal autonomous government level, regulation and implementation of the plan and policies for managing residential, industrial and toxic waste within their jurisdictions.
- 1.10 The DGGIRS was created under Supreme Decree 29894 of February 2009, which made it responsible for comprehensive solid waste management in Bolivia. It reports to the Office of the Deputy Minister for Water and Sanitation (VAPSB) of the MMAyA.
- 1.11 **Provision of municipal solid waste services.** The municipal autonomous governments are responsible for the services. There are two modalities for service delivery: direct administration and autonomous decentralized administration. Services provided under direct administration are managed in two ways: (i) directly by the municipal autonomous governments through a government office or unit, which applies to mid-sized and smaller municipios. Low-wage sanitation workers are hired to perform the work; and (ii) outsourced to private companies or sole-proprietor microenterprises to provide collection, transport, and final disposal services. This autonomous modality is set up through a specialized organizational structure that is generally decentralized and independent from the central municipal autonomous government. It includes three forms of management: (i) direct when the municipal waste collection company performs the service; (ii) outsourced to private companies or microenterprises, generally for service in periurban areas of the cities; and (iii) under concessions to private companies.
- 1.12 In the capitals and larger municipios, the services are managed through municipal trash collection services (EMAs), some of which are decentralized and others deconcentrated (13 municipios). In the remaining municipios, solid waste is managed directly by the municipal autonomous governments.
- 1.13 **Bank support for the sector.** The Bank supports Bolivia in the water and sanitation sector through the following projects: (i) the La Paz storm drainage program (1926/BL-BO); (ii) the small community water program (1927/BL-BO); (iii) the water and sewerage program in periurban areas, phase I (2199/BL-BO) and the urban grant from the Spanish Cooperation Fund for Water and Sanitation (GRT/WS-11830-BO); (iv) the drainage program for La Paz and El Alto (2440/BL-BO); and (v) the water and sanitation program for small towns and rural communities (2597/BL-BO) and the corresponding grant (GRT/WS-12956-BO). The Bank also participates in the Water and Sanitation Group, which is a sector



working group for discussion and coordination between donors, borrowers, and the Bolivian government. For preparation of the proposed operation, the Bolivian government obtained US\$400,000 in technical cooperation funding to support the preparation and initial implementation of solid waste projects in Bolivia (ATN/OC-12963-BO), executed by the Bank to strengthen the DGGIRS, and to prepare comprehensive solid waste management plans and preinvestment projects on technical, economic, social, and environmental considerations for at least two municipios in the program's area of intervention.

- 1.14 **Lessons learned.** Based on experience in other municipal solid waste projects financed by the Bank in Guatemala, the Dominican Republic, and Peru, the municipal autonomous governments have a very important role to play in the planning and operation of comprehensive municipal solid waste management systems. Training and strengthening of actors on all levels (community, service provider, and municipio) is crucial for project sustainability. Several technically and legally suitable locations (municipal property or right-of-way) for siting sanitary landfills are needed, and consultations should be held with population living close to the sites. With regard to the proposed technical solutions, the wisdom of using sanitary landfills as the key component for the safe elimination of municipal solid waste has been confirmed by institutions such as the International Solid Waste Association (ISWA) and by national policy, such as Brazil's National Solid Waste Policy, which endorses landfill development as part of long-term policies for comprehensive waste management, with a crosscutting improvement in services (collection and transport), in which recovery (separation) will be increased gradually and rationally, alongside institutional consolidation.<sup>12</sup>
- 1.15 **Bolivia's strategy.** The National Development Plan (PND 2006-2011),<sup>13</sup> and the Basic Sanitation Sector Development Plan (PSD-SB, 2011-2015)<sup>14</sup> highlight the importance of solid waste management for improving the quality of life, public health, and preservation of water sources and the environment, through the implementation of comprehensive municipal solid waste management programs. In this context, the MMAyA has prepared: (i) an analysis of solid waste management in Bolivia (2010) to obtain, analyze, and disseminate information on comprehensive municipal solid waste management and guide the different actors in decision-making; (ii) a national comprehensive solid waste management program (PNGIRS, 2011-2015), which seeks the sustainability of comprehensive solid waste management through policies for prevention, reuse, treatment, and sanitary and

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<sup>12</sup> This is reaffirmed in the following references: OECD *Environmental Statistics*, 2005; World Bank: *What a Waste: A Global Review of Solid Waste Management*, 2012; IDB: *Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean*, 2010; ISWA: *Landfill Operational Guidelines*, 2010; Brazil: National Solid Waste Policy (Law 12305, of 2 August 2010); Chile: Solid Waste Policy, 2005; Chile: Waste Bill (2011).

<sup>13</sup> Ministry of Development Planning, National Development Plan 2006-2010, Bolivia.

<sup>14</sup> MMAyA, Basic Sanitation Sector Development Plan, 2011-2015, Bolivia.

environmentally safe final disposal, with citizen participation;<sup>15</sup> and (iii) a comprehensive solid waste management bill,<sup>16</sup> which is in the public consultation stage, to establish a general policy and laws and regulations on comprehensive solid waste management and the application thereof, giving priority to solid waste prevention and reuse under the rights of Mother Earth and the right to a healthy and balanced environment.

- 1.16 **The Bank's country strategy and the GCI-9.** The program is consistent with the Bank's country strategy with Bolivia 2011-2015 (document GN-2631-1), since it will help to expand services for the collection and proper final disposal of solid waste through the strengthening of municipal collection, equipment, public awareness campaigns, and the construction of adequate sanitary landfills, for a positive social and environmental impact, with significant increases in the coverage of solid waste services. The operation is included in the 2012 Operational Program Report (document GN-2661-4). The program is aligned with strategic objective 2 of the Ninth General Capital Increase (GCI-9) to promote social development with inclusion, and with financing for small and vulnerable countries, and poverty reduction and equity enhancement, since it will help increase the coverage of basic services in regions where poverty rates are higher than the national average. It will also contribute to the achievement of results linked to growth in the number of municipios that provide comprehensive solid waste management and financing for projects that contribute to climate change mitigation and environmental sustainability, considering the reduction in uncontrolled emissions, pollution, and health vectors, and the promotion of waste recovery.
- 1.17 **The Bank's sector policies.** This program is aligned with the objectives of the Bank's Public Utilities Policy (OP-708) inasmuch as it promotes the use of cost recovery mechanisms to contribute to the sustainability, economic efficiency, and quality of services. In the legal and institutional framework, the strengthening of the DGGIRS and the municipal autonomous governments promotes the separation of regulatory and service roles.

## **B. Objectives, components, and cost**

- 1.18 **Objectives.** The general objective is to improve municipal solid waste management in Bolivia's municipios by implementing comprehensive approaches that include street sweeping and the collection, transport, reuse, and final disposal of solid waste. The specific objectives are to: (i) increase the coverage of solid waste collection and sweeping services in public areas; (ii) increase final waste disposal in sanitary landfills; (iii) integrate waste pickers working at existing dumps into the formal sector; and (iv) improve the efficiency and operational management of service providers and the DGGIRS to achieve sustainable services. This is a demand-driven multiple works program that is expected to benefit about

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<sup>15</sup> MMAyA. (2011). National comprehensive solid waste management program. La Paz.

<sup>16</sup> Published by the MMAyA in the second half of 2012, which promotes the objectives and goals of the project proposed here.

one million people, drawing on success stories in improvements and proper management of municipal solid waste in other cities in Bolivia such as La Paz.<sup>17</sup> To attain these objectives, the program has three components.

- 1.19 **Component 1. Infrastructure (US\$16,677,665).** Financing will be provided for: (i) feasibility and design studies to support the proposed works and actions; (ii) the shutdown of final disposal sites currently in operation; (iii) construction of mechanized sanitary landfills at suitable sites and procurement of equipment and/or teams to provide services, depending on the needs of the operating/institutional plan to be implemented; and (iv) works supervision.
  - 1.20 **Component 2. Reuse of municipal solid waste and integration of waste pickers into the formal sector (US\$1,340,823).** Financing will be provided for: (i) construction of basic infrastructure and procurement of equipment for the reuse of municipal solid waste (separation at source, recycling, and composting); and (ii) preparation and implementation of training plans for waste pickers and their organizations, and community awareness activities.
  - 1.21 **Component 3. Development of instruments for sustainability of the services (US\$772,126).** Financing will be provided for: (i) development and implementation of comprehensive municipal solid waste management plans by the beneficiary municipios, through updates to regulatory frameworks, studies on costs and rates, development of systems for planning and execution, management information systems, training for key personnel, studies on waste generation and the composition of municipal solid waste, and development of communication strategies; and (ii) monitoring and control of comprehensive municipal solid waste management by the DGGIRS, through the development of sector planning, monitoring, and information systems.
- C. Key results indicators**
- 1.22 The program is expected to benefit about 190,000 households with municipal solid waste collection and transport services, and increase the coverage of waste disposed in sanitary landfills from 37% to 51%. The most relevant indicators and expected targets are shown in Table 1.

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<sup>17</sup> According to statistics from the municipal regulation and supervision system (SIREMU), La Paz, 2004-2007, the Nuevo Jardín de Alpacoma and Mallasa sanitary landfills have been operating continuously since 2004 and 1991, respectively, receiving municipal solid waste from a population of about one million. The Mallasa landfill is in the process of being shut down (to be completed in 2016) according to the Analysis of Solid Waste Management in Bolivia/2010, MMAyA/VAPSB/DGGIRS/ 2011.

**Table 1. Key results indicators**

Indicator	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5
Municipal solid waste disposed in sanitary landfills nationwide	37%	0	0	0	0	51%
Dumps currently in operation that are shut down	0	0	0	0	1	2
Sanitary landfills constructed	0	0	0	0	1	2
Solid waste recycling plants built	0	0	0	0	1	2

## II. FINANCING STRUCTURE AND RISKS

### A. Financing instruments

- 2.1 **Financing structure.** The borrower will be the Plurinational State of Bolivia. The operation is designed as a global multiple-works program given that there is a representative sample and the additional municipios will be selected on the basis of planned investments and activities that are similar in nature but independent of each other. The program will have a total cost of US\$20 million, with US\$16 million in the form of an investment loan from the Single Currency Facility of the Bank's Ordinary Capital with an amortization period of 30 years and a grace period of 6 years, and US\$4 million from the Fund for Special Operations (FSO), with an amortization period of 40 years and a grace period of 40 years (see Table 2).

**Table 2. Program costs and sources of financing (US\$)**

Description	IDB	%
Component I: Infrastructure	16,677,665	83.4%
Component II: Reuse of municipal solid waste and integration of waste pickers into the formal sector	1,340,823	6.7%
Component III: Sustainability of comprehensive municipal solid waste management services	772,126	3.9%
Administration, audits, and evaluation	1,209,386	6.0%
<b>Total</b>	<b>20,000,000</b>	<b>100.0%</b>

- 2.2 **Disbursement schedule.** A five-year disbursement period is planned.

**Table 3. Disbursement schedule (US\$ thousands)**

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB	200	800	6,000	8,500	4,500	20,000

### B. Environmental and social risks

- 2.3 The program is expected to have a net positive environmental and social impact since it will improve environmental quality in its area of intervention, inasmuch as

it will increase coverage of municipal solid waste collection, transport, and disposal, and will improve the working conditions of waste pickers. However, the construction of sanitary landfills will have local, short-term negative impacts for which effective mitigation measures exist. Construction of the civil works will generate noise, dust, solid and liquid waste, traffic interruptions, and the risk of work-related accidents. Effective mitigation measures are available. The potential impacts and risks during operation are related to poor management of the systems for treating leachates and gases from the sanitary landfills. In the social sphere, the potential negative impacts are related to curtailment of the source of income for informal waste pickers as a result of the shutdown of dumps currently in operation. The program calls for specific activities to mitigate this risk and include pickers in the new municipal solid waste management system. The program will not involve resettlements.

- 2.4 In accordance with the Environment and Safeguards Compliance Policy (OP-703), the proposed program has been classified as a category “B” operation (see the Environmental and Social Management Report—ESMR). The most important policies and guidelines applicable to the program are OP-703, directives B.2 (Country laws and regulations); B.4 (Other risk factors); B.6 (Consultations); B.7 (Supervision and compliance); B.10 (Hazardous materials); B.11 (Pollution prevention and abatement); and OP-710 (Involuntary Resettlement) owing to actions to compensate for the loss of income of waste pickers; OP-761 (Women in Development); and OP-765 (Indigenous Peoples Policy). As part of the preparation process and following the guidelines established in policy OP-703 for category “B” operations, an environmental and social analysis (ESA) and an environmental and social management plan (ESMP) were prepared for the program, based on the selected projects in the sample. The ESMR ([see required link 4](#)), prepared on the basis of the ESA and the ESMP, gives a detailed description of the impacts, measures, and special environmental and social conditions of the projects. A specific environmental impact assessment (EIA) and ESMP will be prepared for each project involving the construction of a sanitary landfill.

### **C. Fiduciary risks**

- 2.5 The institutional capacity of the executing agency for program implementation was assessed during preparation of the operation, using the Institutional Capacity Assessment System (ICAS). The analysis concluded that the MMAyA has a medium level of development and medium risk. This is the same rating that the institution received in the last ICAS in 2011, but improvements were found in the programming, organization, and control subsystems. The project risk management analysis concludes that the fiduciary risks of the operation are low and the residual risks will be mitigated by incorporating fiduciary staff (at least two people for the procurement and financial management areas) and continuing training for the fiduciary, legal, and administrative staff of the MMAyA, directed to the program coordination unit for the Periurban Water and Sewerage Program, Phase I (PCU) and the DGGIRS. To ensure that the investments, particularly the heavy machinery

to be delivered to the municipal autonomous governments, are sustainable, interagency agreements will be drawn up to regulate responsibilities. To ensure coordination between the PCU and the MMAyA directorates involved in the operation, the PCU will provide an operational liaison.

- 2.6 The possibility was identified that there may not be a sufficient number of bidders specializing in municipal solid waste projects, and therefore it is recommended that limited international bidding be used to attract more interest. Also, a market survey will be conducted, and the program will be disseminated and publicized in national and international media. As well, the works to be tendered will be grouped in lots to make them more attractive to bidders.

#### **D. Other risks**

- 2.7 Other risks include: (i) the lack of suitable land with clear title for the sanitary landfills; and (ii) the lack of debt repayment capacity by the municipal autonomous government. These will be mitigated by: (i) including as a condition for program eligibility that the municipio demonstrate that it is in legal possession of the land and that it has adequate road access; and (ii) requiring the municipio to sign the respective legal instrument for repayment of the debt as a condition for inclusion in the program.
- 2.8 **Social risks.** Projects for the final disposal of solid waste typically encounter social opposition to building the infrastructure (the not-in-my-backyard, or “NIMBY,” effect). Among other variables, the program’s disposal sites will be selected, through a process of public consultation with the adjacent community to minimize this aspect. The site in the city of Riberalta was selected in that way, with the municipal autonomous government holding consultations with the community living near the site. The same condition is to be met by the projects to be included in the program, and the program has set aside funding to prepare communication plans and community participation events as part of the mitigation effort. This will be an eligibility condition to be included in the program Operating Regulations.

#### **E. Feasibility analysis**

- 2.9 **Technical feasibility.** The technical feasibility analysis was performed through a study on the scale and costs of the project in the city of Riberalta, which constitutes the program sample. Technical alternatives based on different collection, reuse, and/or final disposal systems were analyzed, and the best alternatives were selected on the basis of a minimum-cost analysis. Studies to select final disposal sites were conducted, which compared climate, geology, and topography, and the social, economic, physical, hydrological, biological, scenic, and cultural features of different alternatives and chose the best places for each site. The project has met the technical criteria established in Bolivia’s Solid Waste Management Regulations (NB 742–760), Bolivia’s Rules governing Waste from Health Establishments (NB 69001–69007), and other regulations associated with the Environmental Act (Law 1333). This project has been designed to consider the specifics of the locality and has formulated technically feasible alternatives based on an analysis of the

specific problem, considering geography and climate, the amount and composition of solid waste, the habits, customs, and culture of the population, environmental conditions, and the economic situation of the local government.

- 2.10 **Socioeconomic feasibility.** Following the usual practice in projects of this kind, an analysis was performed of the different technological alternatives for the waste collection, transport, and final disposal phases in Riberalta. In each case, the alternative selected for project financing meets the cost-effectiveness criteria (least cost for proper disposal in US\$/tons, including a present value of 12% of the investment, reinvestment, operating, and maintenance costs). A sensitivity analysis was also performed to observe possible differences in the selected alternatives in response to changes in the initial investment and operating and maintenance costs. In the first scenario, an increase of 30% changes the selection of the final disposal alternative. A cost-benefit analysis will be performed at the start of program execution. The benefits will be estimated using the contingent valuation method for which 3,000 socioeconomic surveys will be conducted in the three participating cities (1,000 in each locality comprising 500 surveys on collection and transport, and 500 on final disposal). The detailed economic analysis is presented at [optional link 2](#).
- 2.11 **Institutional feasibility.** Institutional feasibility was evaluated on the basis of an analysis of the legal and institutional framework and the results of the ICAS ([see optional link 4](#)). The analysis indicates that the MMAyA has the necessary powers to carry out its responsibilities as executing agency. The PCU's executive personnel has the professional technical capacity necessary to carry out their functions and will be provided with due independence in their spheres of responsibility. The program will provide the DGGIRS with the necessary technical team. The MMAyA's PCU reports a medium level of risk, given that it is adequately executing the periurban water and sewerage program (2199/BO-BL) and is receiving strengthening as part of execution of that loan. The capacity of the DGGIRS will be fortified with the support of technical human resources and equipment under the technical cooperation project to support preparation and initial execution of solid waste projects in Bolivia (ATN/OC-12963-BO).<sup>18</sup> Strategic planning and the structural and operational organization of these institutions is expected to provide effective coordination between senior and middle management and line staff for proper execution of projects and achievement of targets. The management instruments used by the Bank will be adapted to that purpose. The systems for the administration of goods and procurements, finance (budget, treasury, and accounting), and internal and external control comply with current regulations and are reliable. Institutional strengthening will be directed mainly to strengthening the managerial capacity of the MMAyA's PCU and the DGGIRS and training their staff in the Bank's procurement and financial control procedures. The immediate strengthening activities that the MMAyA has committed to carrying out

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<sup>18</sup> This technical cooperation project, financed by AquaFund and approved in October 2011, has provided support for the preparation of the proposed operation.

before execution of this program begins will mainly focus on: (i) the PCU's organizational systems and methods, which includes development and implementation of manuals on organization, functions, positions, and procedures that cover all the processes, from planning to reporting on the use of resources; and (ii) development of information management systems.

- 2.12 **Financial feasibility.** The municipios participating in the program will contribute their own resources for the initial investment. The remaining investment costs will be covered with proceeds from the Bank loan, which is to be repaid by the municipal autonomous governments on the decision of the Bolivian government. An eligibility condition for the program is that the participating municipal autonomous governments commit to the financial sustainability of the services through an agreement to be signed with the Bolivian government. The agreement will specify that in the event the municipal autonomous governments decide not to adjust their rate structures to cover the costs of the new system, they will contribute the difference to ensure operation and maintenance of the system and the necessary reinvestment.
- 2.13 The financial sustainability analysis of the sample project presented at the electronic link on socioeconomic and financial feasibility studied the financial situation of EMAUR. Based on the company's financial information, an analysis was conducted of its evolution in recent years and its projections. At present, income from the rates charged for the service is insufficient to cover costs (operating and maintenance and investment replacement).<sup>19</sup> For the company to achieve an operating balance with implementation of the new waste management system, i.e. coverage of operating costs from its own income, it will be necessary to adjust the rate structure. The financial sustainability analysis also studied the current and projected municipal situation to see whether it would be able to shoulder the costs of the new service in the event that rates are not adjusted to the necessary extent and new users are incorporated slowly. The analysis, which represents the maximum demand that could be placed on municipal resources, showed that although the municipal autonomous government could cover the operating and maintenance costs, it ought to promote an increase in EMAUR's rates, given that in years when reinvestment is required to build new cells in the sanitary landfill, the demand by the new system for resources coupled with the loan repayment obligations would take up a large part of the balances available in the budget. When talking about actual values rather than specific years, the percentage of income to be used to operate and maintain the system would rise from 4.2% to 5.1% when the investment requirement is added, and to 5.8% when repayment of the loan is included. During project execution, a detailed study will be conducted to determine the rate structure that should be applied to cover the cost of providing the service. The study will recommend targeted or cross subsidy levels and the rate

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<sup>19</sup> In 2011, 47% of EMAUR's income came from municipal transfers. For the municipio this meant 0.93% of its revenues.



increase for the population with the ability to pay. Other activities are also planned to improve municipal fiscal revenues and the operating efficiency of the company.

- 2.14 **Incorporation of waste pickers.** As part of program preparation, a socioeconomic inclusion plan is being drafted for the waste pickers who separate and sort waste at the open-air dumps currently in operation, who will see their source of work and income affected as a consequence of the program. To identify the waste pickers affected by the program, a census will be conducted to identify their exact number and distribution by gender and age, their socioeconomic status, their income level, and the types of materials they separate and sell, among other variables. On the basis of the census, the total universe of pickers to benefit from the technical and economic options included in the plan will be identified. The options will be presented to the recyclers through consultations that will allow them to choose one of several options for inclusion. For the sample project (Riberalta), which will work with a universe of approximately 40 pickers, the options identified range from job retraining to the installation of waste recycling plants operated by the recyclers themselves. The training will cover technical aspects (separation and sorting of materials), occupational safety, and organizing. The waste pickers will benefit from cross-cutting actions such as the provision of I.D. cards and general training in labor issues. Health assistance will also be arranged through the Ministry of Health's local health posts to provide immunization for the pickers thereby reducing the health risks associated with the separation and sorting of recyclables. In Riberalta, children also work in the dump. Between six and ten children regularly work alongside their families at separating materials. All the inclusion alternatives do away with child labor. For the social inclusion of children working in the dumps, support will be sought from government institutions such as Child Advocacy Offices or Comprehensive Municipal Legal Services, and opportunities will be sought to enable them to attend school.

### III. IMPLEMENTATION AND ACTION PLAN

- 3.1 **Execution mechanism.** The MMAyA will be the executing agency and will manage the program through the PCU (which reports directly to the MMAyA) that is currently executing the periurban water and sewerage program, phase I, and the water and sanitation program for rural communities in Bolivia. The PCU will receive technical support from the DGGIRS and the MMAyA. **As a special condition precedent to the first disbursement, evidence will be presented that the core staff of the PCU has been selected (paragraph 3.4) in accordance with terms of reference agreed upon with the Bank.**
- 3.2 The PCU will be responsible for fiduciary management, including planning, budget management, procurement, financial management, disbursements, accounting, reporting, general monitoring, and program evaluation. The PCU will have the capacity for budgetary, administrative, procurement, financing, and legal self-management. It will have a technical liaison officer to coordinate with the DGGIRS all activities, procedures, and documentation to ensure that the technical

- inputs needed for program execution are available in due time and form. The PCU will be responsible for the following functions, among others: (i) consolidating the information required by the Bank, specifically the procurement plan, the program execution plan, and the annual work plans; (ii) submitting disbursement requests to the Bank; (iii) requesting the Bank's nonobjection as stipulated in the Operating Regulations; and (iv) contracting the external auditor to carry out the audits and evaluations of the entire program and deliver the audited reports to the Bank.
- 3.3 The DGGIRS will be responsible for the technical aspects of the program's three components and for implementation of the necessary environmental and social measures and those planned for program evaluation. It will have a technical unit to provide operational support for the head of the DGGIRS for technical management of the program and coordination with the PCU and other sections of the MMAyA involved in program execution.
- 3.4 The program will have the following key positions: for the DGGIRS: (i) a technical coordinator; (ii) a solid waste specialist; (iii) an environmental specialist; (iv) an institutional specialist for comprehensive municipal solid waste management sustainability; and (v) a social specialist, all of whom will work full time for the program; and for the PCU: (i) a technical liaison officer for the program; (ii) a procurement specialist; (iii) a planning and control specialist; and (iv) a financial administration specialist, all of whom will work full time for the program. The PCU also has coordinators in the procurement and financial administration areas and technical and support staff for efficient program execution.
- 3.5 **Special execution conditions.** Prior to awarding contracts for works financed by the program: (i) the executing agency and the corresponding municipal autonomous government will sign an agreement determining, *inter alia*, how the municipal autonomous government will maintain and operate its sanitary landfill; (ii) the corresponding municipal autonomous government must own or be entitled to use the land where the landfill will be located and the sites must have roads suitable for the transport of municipal solid waste; and (iii) prior to the start of the works for a given sanitary landfill, the executing agency will prepare an EIA and an ESMP in accordance with national standards and present them to the Bank.
- 3.6 **Eligibility and prioritization criteria.** All comprehensive solid waste management projects and activities directly related to attaining program results will be eligible for financing under the program. Eligible projects will be those in which the municipal autonomous government demonstrates that it has ownership and use rights (in accordance with Bolivian law) over the land where the sanitary landfills and other program works are to be built, that it has the necessary permits and rights-of-way, and that the municipal autonomous government or the municipal trash collection service has made a written commitment to provide the financing required for the project. For cases in which the Bolivian government decides that a requesting municipal autonomous government will be required to repay the debt, the respective legal instrument will be signed in which the municipal autonomous government also commits to covering the operating, maintenance, and reinvestment

costs using income from service fees or other sources, to which end it will have to approve and apply the studies conducted during program execution (the eligibility criteria were already used to rank the municipios, see footnote 9 on page 2).

- 3.7 **Operation and maintenance of works.** The works financed under the program will be operated and maintained by the municipal trash collection services (EMAs) directly or through delegation to third parties in accordance with generally accepted technical standards. The municipal autonomous governments will monitor and control the systems operated by the EMAs as stipulated in the agreements mentioned in paragraph 3.3, for which purpose each municipal autonomous government will have a core team to control the quality of the services. Training will be provided for the team's technical specialists.
- 3.8 **Operating Regulations.** Program execution will be governed by the Operating Regulations, on the understanding that they may be modified during program execution provided the Bank's written nonobjection is obtained. The Operating Regulations will include all the mechanisms and procedures to be used in program execution and will contain a detailed description of the project cycle. The Operating Regulations will pay specific attention to the following aspects, among others: (i) the eligibility criteria for projects to receive program financing; (ii) aspects related to coordination between the PCU, the DGGIRS, and other program participants (municipal autonomous governments and EMAs); and (iii) the technical and financial information that the borrower is required to submit to the Bank. The Operating Regulations will also include details on the methods for calculating rates for collection services and other aspects such as requisites for accounting records and training for the municipal autonomous governments and EMAs, etc. The Operating Regulations will contain the ESMP and the model agreement mentioned in point (i) of the special execution conditions as an annex. **As a special condition precedent to the first disbursement, the executing agency will approve the program Operating Regulations in accordance with the terms previously agreed upon with the Bank and with the Bank's nonobjection.**
- 3.9 **Procurement of works, goods, and consulting services.** Procurements will be carried out under the Policies for the procurement of goods and works financed by the IDB (document GN-2349-9) and the Policies for the selection and contracting of consultants financed by the IDB (document GN-2350-9), and no exceptions to those policies are anticipated. For straightforward works, goods, and nonconsulting services readily available on the market, with simple or uncomplicated technical specifications, shopping may be used up to the threshold for international competitive bidding, if so indicated in the procurement plan. Individual expenditures under US\$500 and blocks of expenditures not exceeding US\$5,000 may be contracted directly in the interests of efficiency and speed in execution and must be approved by the Project Team Leader in the procurement plan. To maintain the continuity of the work, consultants currently working on loan 2199/BL-BO executed by the PCU may be contracted directly in accordance with the policy

established in document GN-2350-9, paragraph 5.4 (a), unless otherwise indicated in the procurement plan. Works costing less than US\$1,950,000, goods and nonconsulting services costing less than US\$130,000, and contracts with individual consultants regardless of the amount will be reviewed ex post.

- 3.10 **Monitoring and evaluation.** The program will be monitored using the Bank's supervision instruments, based on the annual work plan, the program execution plan, the procurement plan, and the plan to compile information for the results matrix prepared by the PCU and accepted by the Bank. The PCU will present semiannual progress reports, which will be used as the basis for preparing the project monitoring reports and project completion reports. The costs of these activities have been included in the program's budget. Two independent evaluations will be conducted, the first at 18 months after the loan has been declared eligible for disbursement or when 20% of the loan has been disbursed, whichever comes first, and the second when 80% of the loan has been disbursed. The final evaluation will include an ex post socioeconomic evaluation whose content is defined at the electronic link [monitoring and evaluation arrangements](#).
- 3.11 **Audits.** During execution, annual audited financial statements for the program will be presented to the Bank, including other related outputs previously agreed upon with the Bank, within 120 days after the close of the fiscal year. The audits will be performed by an independent firm of auditors acceptable to the Bank, whose selection and contracting will follow the procedures established in document AF-200 on the procurement of external audit services (AF-200). The scope and other aspects of the audits will be governed by the financial management policy for Bank-financed projects (document OP-273-2) and the guidelines for financial reports and external audits. The costs of the audits will be covered by the program.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives	Aligned		
Lending Program	(i) Lending to small and vulnerable countries, and (ii) Lending to support climate chance initiatives, renewable energy and environmental sustainability.		
Regional Development Goals	Stabilization of CO2 equivalent emissions (metric tons per habitant).		
Bank Output Contribution (as defined in Results Framework of IDB-9)			
2. Country Strategy Development Objectives	Aligned		
Country Strategy Results Matrix	GN-2631-1	Increase the coverage of adequate disposal of solid wastes in the large cities.	
Country Program Results Matrix	GN-2661-4	The project is included in the 2012 Country Program Document.	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability	Highly Evaluable	Weight	Maximum Score
	8.7		10
3. Evidence-based Assessment & Solution	7.2	25%	10
4. Ex ante Economic Analysis	10.0	25%	10
5. Monitoring and Evaluation	7.5	25%	10
6. Risks & Mitigation Monitoring Matrix	10.0	25%	10
Overall risks rate = magnitude of risks*likelihood	Low		
Environmental & social risk classification	B		
III. IDB's Role - Additionality			
The project relies on the use of country systems (VPC/PDP criteria)	Yes	Financial Management: Budget, Treasury and Accounting and Reporting. Procurement: Information systems.	
The project uses another country system different from the ones above for implementing the program			
The IDB's involvement promotes improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality	Yes	The project will promote the development of alternatives to include the population that separates solid wastes, a large percentage of which are women.	
Labor			
Environment	Yes	The landfills will include systems that will capture the gases emitted by the solid waste. This will significantly improve the current environmental situation in which solid wastes are discharged into inadequate open pits or burned.	
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	Yes	For the preparation of the operation a technical cooperation ( ATN/OC-12963-BO) was approved with the objective of advancing in the preparation of the projects included in the sample.	
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan.			

The POD presents the problems to be addressed by the project as well as its beneficiaries and the factors which have contributed to the problems. The proposed interventions are linked to the problems identified in the diagnosis and the magnitude of deficiencies are presented. The results matrix has vertical logic. The outcomes and outputs are clearly presented and each has its indicator. All indicators are SMART, have baselines, targets and sources of information. With regards to the data required for the PMR, the annual outputs are presented and the project costs are broken down by product and year.

The project was analyzed using a cost-effectiveness analysis. Different alternative were analyzed using economic costs. Additionally, a sensitivity analysis was undertaken using the assumptions utilized. The project has a monitoring and evaluation plan. The evaluation plan follows the DEM guidelines. The operation will be evaluated using an ex-post cost-benefit analysis.

Finally, the risk matrix presents the projects risks which are rated for magnitude and probability. Mitigation measures are presented for each risk as well as indicators to monitor its implementation.

## RESULTS MATRIX

### PROGRAM FOR COMPREHENSIVE SOLID WASTE MANAGEMENT IMPLEMENTATION IN BOLIVIA

Program objective	The general objective is to improve the delivery of municipal solid waste services in Bolivia’s municipios by implementing comprehensive management approaches that include street sweeping and the collection, transport, reuse, and final disposal of solid waste. The specific objectives are to: (i) increase the coverage of solid waste collection and sweeping services in public areas; (ii) increase final waste disposal in sanitary landfills; (iii) integrate waste pickers working at existing dumps into the formal sector; and (iv) improve the efficiency and operational management of service providers and the DGGIRS to achieve sustainable services.										
Impact indicators (includes the country strategy indicators to which this operation contributes)											
Indicator	Unit of measure	Baseline	Baseline year	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	End of project	Means of verification	Comments
Municipal solid waste disposed of in sanitary landfills nationwide	Ton/day	1,748,600	2010					2,698	2,698	Annual average weights recorded on weigh scales at the project’s sanitary landfills	The national diagnostic analysis of comprehensive solid waste management gives a figure of 45% of municipal solid waste disposed of in sanitary landfills; however final disposal in El Alto cannot be classified as such and therefore the amount of municipal solid waste disposed of in sanitary landfills is really 37% countrywide.
	%	37%	2010					51%	51%		
Outcomes											
Indicator	Unit of measure	Baseline	Baseline year	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	End of project	Means of verification	Comments
Outcome 1: Increased trash collection coverage											
Municipal solid waste collection coverage in the intervention zone	%	84% Riberalta	2012				87%	90%	90%	Annual average weights recorded on weigh scales at the project’s sanitary landfills	The baseline corresponds to the preinvestment studies* conducted during preparation of the project for the cities of Riberalta and Potosí, which constitute the intervention zone. The third city will be determined later, which (once decided upon) will be incorporated into the results matrix and the program monitoring report.
	%	75% Potosí	2012				78%	80%	80%		
Households with collection service in the intervention zone	Households	16,682 Riberalta	2012				18,716	19,262	19,262	Records of the beneficiary municipal trash collection services (EMAs)	
	Households	29,004 Potosí	2012				31,410	32,544	32,544		

Outcome 2: Increased street sweeping coverage											
Street sweeping coverage in the intervention zone	%	61% Riberalta	2011				72%	75%	75%	Records of the beneficiary EMAs	The baseline corresponds to the preinvestment studies* conducted during preparation of the project for the cities of Riberalta and Potosí, which constitute the intervention zone. The third city will be determined later, which (once decided upon) will be incorporated into the results matrix and the program monitoring report.
	%	41% Potosí	2012				52%	57%	57%		
Outcome 3: Increased disposal of municipal solid waste in sanitary landfills											
Municipal solid waste disposed of in sanitary landfills in the intervention zone	Ton/day	0 Riberalta	2012	-	-	-	43.0	46.3	46.3	Annual average weights recorded on weigh scales at the project's sanitary landfills	The baseline corresponds to the preinvestment studies* conducted during preparation of the project for the cities of Riberalta and Potosí, which constitute the intervention zone. The third city will be determined later, which (once decided upon) will be incorporated into the results matrix and the program monitoring report.
	Ton/day	0 Potosí	2012				103.4	112.2	112.2		
Outcome 4: Increased recycling of municipal solid waste											
Municipal solid waste recycled in the intervention zone	Ton/day	0 Riberalta	2012				3.5	4.7	4.7	Annual average weights recorded on weigh scales at the project's sanitary landfills	Recycling is defined as waste separation and sorting at urban sanitary landfills and compost production.
	Ton/day	0 Potosí	2012				9.1	12.3	12.3		
Outcome 5: Increased business efficiency											
Collection efficiency (collected/billed) in the intervention zone	%	83% Riberalta	2011					85%	85%	Records of the beneficiary EMAs	The baseline corresponds to information provided by Riberalta and Potosí which constitute the intervention zone. The third city will be determined later, which (once decided upon) will be incorporated into the results matrix and the program monitoring report.
	%	90.4% Potosí	2010					92.4%	92.4%		

Outcome 6: Incorporation of trash pickers into the formal sector											
Trash pickers working at activities included in the plan for integration into the formal sector	Trash pickers	0 Riberalta	2012					40	40	Semiannual reports approved by the DGGIRS	It is expected that 80% of the trash pickers who receive training will continue to work at one of the proposed integration alternatives.
	Trash pickers	0 Potosí	2012					10	10		
% of women working in recycling	Trash pickers	0 Riberalta	2012					66%	66%	Semiannual reports approved by the DGGIRS	According to preliminary census information, about 66% of trash pickers are female.
	Trash pickers	0 Potosí	2012					66%	66%		

Outputs	Unit of measure	Associated outcomes	Total cost (IDB)	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	End of project	Means of verification	Comments
<b>Component I. Infrastructure</b>			<b>16,677,665</b>	<b>-</b>	<b>198,466</b>	<b>5,393,120</b>	<b>7,643,128</b>	<b>3,442,951</b>	<b>16,677,665</b>		
Dumps currently in operation that are shut down	Dumps	O3					1	2	3	Works acceptance certificates	
	US\$		3,195,908			1,024,491	1,311,222	860,195	3,195,908		
Sanitary landfills built	Sanitary landfills	O3					1	2	3	Works acceptance certificates	
	US\$		10,546,814			3,961,572	4,617,489	1,967,752	10,546,814		
Lots of heavy machinery procured to operate the sanitary landfills	Lots of machinery	O3					1	2	3	Records of assets in EMAs/municipal autonomous government accounts	Lots of heavy machinery are defined as bulldozers and backhoes
	US\$		1,292,049				733,750	558,299	1,292,049		
Lots of vehicles procured for collection and sweeping	Lots of vehicles	O1, O2				1	2		3	Records of assets in EMAs/municipal autonomous government accounts	Lots of vehicles are defined as compactor trucks for sanitary landfills, dump trucks, and trucks with sweeping equipment. Also includes containers and garbage cans.
	US\$		609,053			322,000	287,053		609,053		
Transfer stations built	Stations	O1					1		1	Works acceptance certificates	
	US\$		523,500				523,500		523,500		



Studies and designs prepared	Studies	O1,O2, O3, and O4			2	3	3	1	9	Technical reports by the DGGIRS approving the studies	Studies include environmental impact studies, preinvestment studies on comprehensive solid waste management, etc. Designs refer to the recycling plants, transfer stations, and other civil works.
	US\$		510,342		198,466	85,057	170,114	56,705	510,342		
Component II: Reuse of municipal solid waste and integration of waste pickers into the formal sector			1,340,823	-	-	60,000	610,412	670,412	1,340,823		
Recycling plants built	Plants	O4					1	2	3	Works acceptance certificates	Recycling plants include civil works, equipment, and tools for composting, sorting, and recycling of municipal solid waste.
	US\$		1,100,823				550,412	550,412	1,100,823		
Trash pickers trained	Individuals	O4 and O6				40	40	80	160	Technical reports on the workshops approved by the DGGIRS	Trash pickers will be trained in labor, organizational, and environmental issues.
	US\$		240,000			60,000	60,000	120,000	240,000		
Component III: Development of instruments for sustainability of the services			772,126	57,500	247,250	467,376	-	-	772,126		
Subcomponent: Instruments for monitoring and control of comprehensive municipal solid waste management			402,000	57,500	172,250	172,250	-	-	402,000		
Studies prepared	Studies	O1 and O5		2	3	3			8	Technical reports approved by the DGGIRS	Studies include guidelines on comprehensive solid waste management, cost structure and rates, urban trash collection, and presentation of projects, manuals on organization and functions, procedures and processes for the DGGRIS.
	US\$		230,000	57,500	86,250	86,250			230,000		
Sector planning, monitoring, and information system developed	System	O5			1				1	Technical report by the DGGIRS approving the study	
	US\$		172,000		86,000	86,000			172,000		

Subcomponent: Instruments for execution of the comprehensive municipal solid waste management plans			370,126	-	75,000	295,126	-	-	370,126		
Planning, management, and management information system for comprehensive solid waste management developed for municipal entities	System	O5				1			1	Technical report by the DGGIRS and EMAs approving the studies	
	US\$		295,126			295,126			295,126		
Studies prepared on solid waste generation and composition	Studies	O3 and O4			2				2	Technical reports by the DGGIRS approving the studies	
	US\$		45,000		45,000				45,000		
Communication and public awareness plan prepared on comprehensive solid waste management	Studies	O1, O2, and O4			1				1	Technical report by the DGGIRS approving the plan	
	US\$		30,000		30,000				30,000		

\* Funds from technical cooperation project ATN/OC-12963-BO (BO-T1154) were used to contract Consorcio Integral to prepare the preinvestment studies for the cities of Riberalta and Potosí. The results of these consulting services were used to obtain some of the values for the program baseline.

## FIDUCIARY AGREEMENTS AND REQUIREMENTS

<b>Country:</b>	Plurinational State of Bolivia
<b>Project number and name:</b>	BO-L1073 – Program for Comprehensive Solid Waste Management Implementation in Bolivia
<b>Executing agency:</b>	Ministry of Environment and Water (MMAyA)
<b>Prepared by:</b>	Roberto Laguado (FMP/CBO) and Abel Cuba (FMP/CBO)

### I. EXECUTIVE SUMMARY

- 1.1 During program design, an institutional capacity assessment was performed of the Ministry of Environment and Water (MMAyA) following the Bank's methodology. Institutional capacity is medium with a medium level of risk. The risk analysis classified the fiduciary risk as low, although it will be necessary to mitigate a possible fiduciary work overload in procurement that might be encountered initially by the program coordination unit (PCU), which is participating in two Bank-financed operations,<sup>1</sup> and a possible lack of interest among potential bidders on account of the specialty and amount of the contracts. To address these risks, the personnel currently working on the periurban water and sewerage program, phase I, will be retained through direct contracting (document GN-2350-9, paragraph 5.4 (a)), and more fiduciary specialists will be included. To make the bidding more competitive, in cases where there is lack of interest, limited bidding will be used (document GN-2349-9, paragraph 3.2). The ex post procurement review level assigned to the MMAyA will be high (65%). For financial transactions, the ex post review level will cover 100% of payments.
- 1.2 The execution mechanism involves the Directorate General of Comprehensive Solid Waste Management (DGGIRS) as the program's technical arm and the coordination unit of the periurban water and sewerage program (PCU/PAAP) as the executing agency.
- 1.3 The most complex procurements are the works for the sanitary landfills and the closing of dumps, and heavy machinery for the landfills. The Fiduciary Sector recommends that the program take into account the subsequent costs for maintenance and safekeeping of the heavy machinery financed by the loan, the responsibility for taking proper care of and maintaining these assets, which would necessitate a review of the possibility that the beneficiaries could carry out these activities. Since the institutional capacity assessment concluded that the MMAyA's monitoring and evaluation system requires strengthening, it is recommended that it should be supplemented by a special study financed by the program to be

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<sup>1</sup> Periurban, Phase I: 2199 BL-BO; and Rural Communities: 2597BL-BO.

coordinated in advance between the Project Team and the executing agency's team, including its timing and frequency. The conditions for procuring the heavy machinery should establish responsibilities for its storage, delivery schedules, and payments that are flexible enough to permit the timely and effective receipt of the goods by the municipal autonomous governments. The project will not include other external financing.

## II. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

- 2.1 As a public institution, the MMAyA is governed by Law 1178 on Government Administration and Control of 20 July 1990, which regulates the systems for the administration and control of government resources and their relationship with the national planning and public investment systems.
- 2.2 The ministry uses the integrated administrative management and modernization system (SIGMA) for all its financial records, which produces secure and reliable financial information on budget execution. The system does not provide information in foreign currencies or on the investment categories established in the project's cost table. However, with Bank support, the MEFP<sup>2</sup> is currently developing a project administration module that will surmount these limitations. Therefore, it has been agreed that the MMAyA's PCU will use the SIAP-IDB<sup>3</sup> in the meanwhile to supplement accounting and reporting for the purpose of rendering accounts and financial reporting. As a government institution, the MMAyA is supervised by the Office of the Controller General and by the Internal Audit Unit.
- 2.3 **Procurement.** With regard to application of the country's system of basic rules for procurement of goods and services, the SICOES information system is the only system used in all operations with the Bank. The fiduciary capacity of the MMAyA for procurement is satisfactory and will continue to be strengthened through mitigation and support measures. Accordingly, its fiduciary capacity for procurement justifies opting for a high ex post review level.

## III. FIDUCIARY RISK EVALUATION AND MITIGATION MEASURES

- 3.1 The institutional capacity assessment of the MMAyA found that it has a medium level of institutional capacity and a medium level of risk. In 2011 an institutional capacity assessment was prepared for a different operation and when its findings are compared with the current assessment, it is apparent that significant, positive progress has been made in the overall level of institutional capacity.
- 3.2 **Coordination.** To optimize coordination and linkages between the Directorate General of Administrative Matters (DGAA), the Directorate General of Legal Affairs (DGAJ), and the PCU, which all form part of the MMAyA, the Operating Regulations will establish flow charts with autonomous, exclusive functions (administrative and legal) and the coordination mechanism to which the parties will be subject for the program. The recommendation is to continue to move ahead with

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<sup>2</sup> Ministry of Economic Affairs and Public Finance.

<sup>3</sup> SIAP-IDB: Integrated Project Management System – IDB, developed by CAN/CBO.

execution arrangements that provide greater autonomy and delegation of powers to the head of the PCU through deconcentration and delegation.

- 3.3 **Government procurement.** Although in general there is considerable turnover in the country of local authorities, which affects the transmission and entrenchment of knowledge relating to procurement, this does not hold true of the PCU. Efforts to retain its current personnel, train new staff, and monitor their progress along the learning curve should continue.
- 3.4 **Internal proceedings and processes in legal and administrative matters.** The staff of the legal and administrative offices should continue to be strengthened in fiduciary management under Bank rules, with the objective of keeping up the good pace in Bank-financed projects. The Bank will continue to provide training for MMAyA personnel (PCU and DGGIRS). The pace of procurements should also be controlled and monitored to comply with procurement planning.
- 3.5 **Public financial management.** The MMAyA's PCU will have access to SIGMA for timely reporting of payment and financial record requirements. Until such time as the project administration module becomes operational in SIGMA, SIAP-IDB will be used for complementary reporting of program transactions.
- 3.6 **Strengthening of the PCU.** Over the next three years, the PCU will execute three Bank-financed operations and therefore it is advisable to strengthen its fiduciary and technical team to ensure compliance with the fiduciary standards expected by the Bank.
- 3.7 **Debt repayment.** In principle, the loan proceeds received by the beneficiary municipal autonomous governments will be repaid by them, and therefore the MEFP's Government Credit Bureau should evaluate the municipal autonomous governments applying to be included in the program to determine their borrowing capacity and define the terms of the legal instruments to be signed with them, in which event a series of legal and administrative procedures are to be followed that will establish the critical path so that effective execution of the project of a given municipio can begin. The procedures are mainly related to approvals by the municipal council, inclusion of the debt in the budget, and the budgetary transfer to the executing agency. To that end, actions with the municipal autonomous governments that involve the Ministry of Development Planning will be coordinated to enable timely availability of the budget prior to beginning financial execution of the program. Once the loan is approved, actions will begin with the sample municipal autonomous government. However, if the Bolivian government decides to repay the debt, the executing agency will need to ensure its timely inclusion in the budget, a procedure that is not complicated, which will facilitate the start of execution for any beneficiary municipio under the program.

#### **IV. CONSIDERATIONS FOR THE SPECIAL CONDITIONS OF THE CONTRACT**

- 4.1 **Program Operating Regulations.** The Operating Regulations should include the execution mechanism, procedures, and flows of information, particularly when the

DGAA and the DGAJ are involved, to be previously agreed upon between the parties and the Bank.

- 4.2 **Exchange rate agreed upon with the executing agency for accounting purposes.** The exchange rate in effect in the country of the borrower on the effective date of conversion of the resources disbursed in foreign currency into local currency into the accounts of the executing agency will be used.
- 4.3 **Financial statements and other audited reports.** Within 120 after the end of each of the executing agency's fiscal years during the disbursement period, the program's financial statements will be submitted to the Bank, duly audited by a firm of independent auditors acceptable to the Bank. The last of these reports will be delivered within 120 days after the date stipulated for the last disbursement of the loan.
- 4.4 The terms of reference for contracting the firm of independent auditors must be previously approved by the Bank, which may include outputs required under International Standards for Auditing, related to the financial audits of the program and related audits.
- 4.5 **Use of standard bidding documents.** The Bank's standard bidding documents will be used for works, goods, and consulting contracts, with no changes in the Instructions to Bidders or the General Conditions of Contract.

## **V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION**

- 5.1 **Procurement execution.** Procurements will be carried out in accordance with the policies set forth in documents GN-2349-9 and GN-2350-9, and no exceptions to the policies are anticipated. Local regulations will not apply.
- 5.2 **Procurement of works, goods, and nonconsulting services.** Contracts for works, goods, and nonconsulting services generated under the program that are subject to international competitive bidding (ICB) will be executed using the Bank's standard bidding documents and the documents authorized by the Bank's Country Office in Bolivia. Contracts subject to national competitive bidding (NCB) will be executed using national bidding documents agreed upon with the Bank (or satisfactory to it if not agreed upon as of the date). For shopping, model documents prepared by the Bank's Country Office in Bolivia will be used, which will form part of the Operating Regulations. Changes to those documents will require the Bank's nonobjection. For straightforward works, goods, and nonconsulting services readily available on the market, with simple or uncomplicated technical specifications, shopping may be used up to the threshold for international competitive bidding, if so indicated in the procurement plan.
- 5.3 **Selection and contracting of consultants.** Consulting service contracts generated under the program are listed in the initial procurement plan and will be executed using the standard request for proposals issued by or agreed upon with the Bank (or satisfactory to the Bank if not agreed upon as of the date).
  - a. **Selection of consulting firms.** The standard request for proposals issued by the Bank will be used for the project.

- b. **Short list of consulting firms.** The list may consist 100% of Bolivian firms<sup>4</sup> for contracts below the thresholds established by the Bank for the country. For Bolivia, the threshold is US\$200,000.
  - c. **Selection of individual consultants.** Selection will take account of the consultants' qualifications for performing the work, based on a comparison of at least three candidates. As a rule, interviews will not be used. When the work involves additional persons to provide support or specific advisory services, consulting firms should normally be used, except where the support involves two or three people. In such situations, a case-by-case study will be made of the relevance of using individual consultants with complementary services.
- 5.4 The program's sector specialist is responsible for reviewing the terms of reference for consulting services. The specialist will also determine whether external support should be made available to help the PCU with evaluation of the bids, considering the nature and technical complexity of the procurements being processed.
- 5.5 **Recurrent expenditures.** These are operating and maintenance costs required for the program to function, which will be agreed upon with the Project Team Leader and included in the procurement plan. Recurrent expenditures will be contracted following the executing agency's administrative procedures described in the Operating Regulations.
- 5.6 **Direct contracting.** Individual expenditures under US\$500 and expenditures in lots not exceeding US\$5,000 may be contracted directly in the interests of efficiency and speed in execution. They will be approved by the Project Team Leader in the procurement plan. The plan will also determine which cases will be reviewed ex post. To maintain the continuity of the work, consultants currently working on the periurban water program executed by the PCU may be contracted directly in accordance with document GN-2350-9, paragraph 5.4 (a).

# 1. Table of thresholds (US\$)<sup>5</sup>

Works			Goods <sup>6</sup>			Consulting	
International competitive bidding	National competitive bidding	Shopping	International competitive bidding	National competitive bidding	Shopping	International publicity	Shortlist 100% national
Over 3,000,000	3,000,000 and under	Under 250,000	Over 200,000	200,000 and under	Under 50,000	Over 200,000	200,000 and under

<sup>4</sup> Includes nonconsulting services.

<sup>5</sup> To determine the selection method, the nature and specifications of the goods, services, or works to be contracted will be taken into account, in addition to the thresholds. If straightforward readily available goods with standardized technical specifications or simple works are involved, shopping may be used even if the threshold for NCB is exceeded. (document GN-2349-9, paragraph 3.5)

<sup>6</sup> Includes nonconsulting services.

## 2. Main procurements

Table 2. Main procurements (US\$ thousands)

Description	Estimated amount	Selection method
<b>Goods</b>		
Machinery and equipment for sanitary landfills, P1 (Riberalta) and P2	1,174	ICB
Garbage trucks, P1 (Riberalta) and P2	556,063	ICB
Light vehicles for trash collection, P1 and P2	50	Shopping
Equipment for transfer stations and the composting plant, P3	603,101	ICB
<b>Works</b>		
Shutdown of municipal dumps, P1 (Riberalta)	1,138,863	NCB
Construction company to shut down municipal dumps, P2	812,690	NCB
Shutdown of municipal dumps, P3	1,092,311	NCB
Construction and equipment for the sanitary landfill and the composting and sorting plant, P1 (Riberalta)	3,962,488	ICB
Construction and equipment for the sanitary landfill and the composting and sorting plant, P2	3,985,005	ICB
Construction and equipment for the sanitary landfill and the composting and sorting plant, P3	2,911,855	ICB
Construction company for the transfer station, P3	280	Shopping
<b>Firms</b>		
Consulting firm to prepare and disseminate regulations for the provision of trash collection services; regulations for trash collection cost and rate structuring; regulations for project presentation	50	CQS
Consulting firm for the organizational development of the DGGIRS, including manuals of organization, functions, processes, and procedures	100	CQS
Consulting firm to design, develop, and implement the solid waste sector planning, monitoring, and information system	150	CQS
Consulting firm to design, develop, and implement the comprehensive solid waste planning, management, and information system for municipal institutions	275,326	QCBS
Consulting firm to develop standard procedural guides for solid waste management for EMAs according to classification by population size: under 2,000 people; between 2,000 and 10,000; between 10,000 and 100,000; and over 100,000. Includes the development and dissemination of strategies to optimize collection, costs, and rates.	60	CQS
Studies to describe the composition of solid waste	45	CQS
Consulting firm to supervise the shutdown of dumps, P1 (Riberalta)	56,794	CQS
Consulting firm to supervise the shutdown of dumps, P2	40,635	CQS
Consulting firm to supervise the shutdown of dumps, P3	54,616	CQS
Consulting firm to supervise the works for the sanitary landfill and composting and classification plant, P1 (Riberalta)	208,552	CQS
Consulting firm to supervise the works for the sanitary landfill and composting and classification plant, P2	199,249	CQS
Consulting firm to supervise the works for the sanitary landfill, P3	124,937	CQS
Firm/nongovernment organization to provide technical assistance for the workshops to train and formally integrate trash pickers, P3	60	CQS
Firm for external program audits	75	QCBS
Firm for the midterm program evaluation	42,5	CQS
Firm for the final program evaluation	42,5	CQS
Investment studies for project 1	70,114	CQS
Investment studies for project 2	170,114	CQS
Investment studies for project 3	170,114	CQS

5.7 **Files.** The MMAyA will be responsible for establishing the supporting documents, procedures, and controls necessary for program execution, and for their safekeeping, as established in the loan contract and local legislation. Steps should be taken to improve file management at the MMAyA and help establish supporting documentation for financial and accounting transactions and procurements.



## VI. FINANCIAL MANAGEMENT

- 6.1 **Programming and budget.** The MMAyA's PCU, which is already operating, has established an Administrative Directorate<sup>7</sup> that will create the project so that for budgetary control purposes, the sources of financing and the resources used in project execution can be recorded and individually identified. Both the record entries and future changes to the budget (requiring a Ministerial Directive) must be reviewed by the DGAA, based on the annual work plan and the program execution plan, and approved jointly with the Bank, thereby ensuring availability of the funds necessary for each year of project execution. Changes to the budget must also be presented to the Office of the Deputy Minister for Public Investment and External Financing, for approval under a Ministerial Directive of the Ministry of Development Planning.
- 6.2 **Accounting and information systems.** The MMAyA's PCU will record program transactions using the SIGMA. Currently, the PCU is empowered to prioritize payments<sup>8</sup> under a Ministerial Directive that also authorizes the coordinator to sign contracts. This system integrates the following into a master record in their various accounting phases: budget records (budget execution), financial records (assets, liabilities, equity, and income) and treasury records (cash transfers), through accrual-basis accounting. In addition, a chart of accounts will be prepared for the project that will make it possible to identify expenditures for each activity on a cash basis, reconciling the program's investment categories with the budget categories, and respective accounting records. With respect to accounting for program expenditures, SIAP-IDB will be used temporarily as a supplemental accounting system for the production of financial reports until such time as the project administration module of SIGEP (currently SIGMA) becomes operational.
- 6.3 **Disbursements and cash flow.** The loan will be disbursed in the form of advances, with the frequency determined as a function of the financial programming, to be periodically updated by the PCU. The Bank may issue a new advance of funds when at least 80% of the previous advance has been justified. The loan proceeds will be deposited into an independent account in U.S. dollars and then transferred to another account in local currency, both in the CUT.<sup>9</sup> The MMAyA is responsible for administration of the resources.
- 6.4 **Internal control and internal audit.** The PCU is subject each year to reliability reviews by the Internal Audit Unit because of the levels of execution reported within the MMAyA's structure, and it is expected that the program will be included in those reviews.

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<sup>7</sup> In SIGMA's programmatic budget structure, an administrative directorate permits a number of projects to be incorporated into the system, which are recorded and controlled independently.

<sup>8</sup> Prioritization consists of the electronic transfer of resources through SIGMA and is the last step in the cycle envisaged in the system (committed, due, paid, and prioritized).

<sup>9</sup> CUT: Master Treasury Account.

- 6.5 **External control and reports.** A firm of independent auditors will be contracted within the framework of the new approach to external audits being promoted by the Bank's Country Office in Bolivia, which means that the Bank will select the firm and the MMAyA's PCU will contract it. The cost of the external audits will be financed from the loan.
- 6.6 **Financial supervision plan.** The supervision plans and frequencies will be based on the fiduciary risks identified. The following will be performed at least once a year: (i) a comprehensive visit (procurements and disbursements) by the external auditor contracted to review the program's financial statements; (ii) a field visit to the investment sites; and (iii) a visit to verify compliance with the internal control recommendations made by the program's external auditor.
- 6.7 **Execution mechanism.** The MMAyA will execute the program through the PCU established to execute projects in periurban areas and rural communities, which will be referred to as the PCU and will have administrative, financial, and managerial independence, extending to legal reviews. These powers will be formalized in a Ministerial Directive. The technical aspects will be coordinated by the DGGIRS.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/12

Bolivia. Loan \_\_\_\_/BL-BO to the Plurinational State of Bolivia  
Program for Comprehensive Solid Waste Management Implementation in Bolivia

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 Plurinational State of Bolivia, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a program for comprehensive solid waste management implementation in Bolivia. Such financing will be for the amount of up to US\$16,000,000 from the resources of the Single Currency Facility of the Bank's Ordinary Capital, corresponds to a parallel loan within the framework of the multilateral debt relief and concessional finance reform of the Bank, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

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

CAN/BO/IDBDOCS#37264617  
BO-L1073

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/12

Bolivia. Loan \_\_\_\_/BL-BO to the Plurinational State of Bolivia  
Program for Comprehensive Solid Waste Management Implementation in Bolivia

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 Plurinational State of Bolivia, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a program for comprehensive solid waste management implementation in Bolivia. Such financing will be for the amount of up to US\$4,000,000 from the resources of the Bank's Fund for Special Operations, corresponds to a parallel loan within the framework of the multilateral debt relief and concessional finance reform of the Bank, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

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

CAN/BO/IDBDOCS#37264609  
BO-L1073