

Updated Project Information Document (PID)

Report No: AB570

Project Name	CHINA - Guangdong Pearl River Delta Urban Environment Project		
Region	East Asia and Pacific Region		
Sector	Sewerage (70%); Solid waste management (20%); Sub-national government administration (10%)		
Theme	Water resource management (P); Environmental policies and institutions (P); Pollution management and environmental health (P); Infrastructure services for private sector development (S)		
Project	P075728		
Supplemental Project	P084003		
Borrower(s)	PEOPLE'S REPUBLIC OF CHINA		
Implementing Agency(ies)	GUANGDONG PROVINCE, through the Guangdong Provincial Finance Bureau's World Bank Project Management Office Address: 26 Cang Bian Road, Guangzhou, China Contact Person: Mr. GU Dongfang Tel: (86 20) 833 36405 Fax: (86 20) 833 30007 Email:		
Environment Category	A (Full Assessment)		
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1. Country and Sector Background

Background. The Pearl River Delta (PRD) is one of the most complex urban systems in Asia; it holds over 40 million people in 25 administratively-defined cities and three counties in Guangdong Province, and in two Special Administrative Regions (Hong Kong and Macau). In Guangdong Province there are 534 towns, townships and sub-municipal districts which, after more than 15 years of rapid decentralization, have significant functional responsibilities for the delivery of public services. The PRD has ranked at or near the top nationwide in economic growth rates over the past decade (averaging 14.7% per annum during 1990-2000), mostly due to large inflows of direct foreign investment initially in low value-added manufacturing, and more recently in higher value-added manufacturing and, in a few cities, in services. Much of the growth has been powered by large inflows of low-cost migrant workers from peripheral areas in Guangdong and from poor provinces. Many parts of the PRD are largely devoted to export processing.

The Delta is also complex geographically. There are three major branches of the Pearl River (Zhu Jiang) which join at the city of Guangzhou, the political, economic and cultural hub of the PRD. The Pearl River is China's third longest river, and is second only to the Yangtze in terms of annual average flow. The Pearl River discharges into the South China Sea through eight principal tributaries. The close proximity of these tributaries, the flat terrain of the delta, the very large number of canals and streams interconnecting tributaries, and tidal flows and surges makes difficult an accurate hydrological definition of "sub-basins" within the PRD.

Sector Issues. The high economic growth in the PRD has come at a heavy environmental cost. Investment in environmental protection has not kept pace with the rapid economic advances, which is evident in the serious deterioration in river water quality during the period. Today many of the reaches of the Pearl River, especially in the vicinity of Guangzhou are at Class V or worse, and therefore unfit as a

drinking water source. Except for wastewater collection and simple landfills for solid wastes, most cities in the PRD have limited experience with planning, designing, financing, managing, and operating wastewater and solid and hazardous waste treatment facilities. This contributes to the differing extent and quality of infrastructure services between towns. Many cities in the PRD face major waste management planning and management capacity gaps.

Domestic and industrial wastewater discharges, urban stormwater runoff, and non-point source pollution from agricultural and livestock farm run-off are the main pollution sources within the PRD. Generally, collected municipal wastewater is discharged to the river systems without treatment, except in the larger municipalities of Guangzhou, Shenzhen and Zhuhai, where only a portion of the wastewater is treated. Environmentally safe disposal of sludge from wastewater treatment plants is only just beginning in the PRD, with a first plant under construction to serve Guangzhou city. Treatment of sludge from the expanding wastewater treatment plant capacity now being installed presents a growing challenge to PRD cities. This deteriorating situation poses a serious threat to area drinking water sources, including the drinking water supply to Hong Kong. The government strategy has been to move drinking water intakes upstream to avoid the worst contamination, which is not sustainable. Pollution also renders the river system unsuitable for irrigation, aquaculture and potential recreational uses and, by damaging fish breeding grounds, it harms other states that border on the South China Sea.

The growing volumes of hazardous wastes present considerable risks to health, surface and ground water sources. Measures are now planned to address this problem in the larger municipalities. Regional facilities are required that proceed in an integrated fashion alongside complementary activities such as waste minimization and improved transportation of dangerous goods.

Lack of demand management, and under-pricing of urban services result in a drain on municipal resources, curtailing funds available for other developmental activities. Charges for water supply and wastewater are a fraction of the true cost of providing the services. Aside from a charge for collecting wastes from households to collection points and a recently-introduced garbage fee in Guangzhou, there is no cost recovery for transfer and disposal of municipal solid waste. Up to now, the strategy of the provincial and municipal governments has been to address environmental issues on a highly-localized approach.

Some cities in the PRD are facing growing social and human pressures from vulnerable populations. These are people who are at or very close to levels that trigger formal urban poverty relief for residents entitled to municipal government support (i.e., permanent, nonagricultural registered residents). However, large numbers of PRD's vulnerable population are not eligible for formal support, largely because they do not meet urban residency (hukou) requirements or are not fully employed. While the popular perception is that unemployed factory workers return to their home towns, evidence suggests that a growing number are staying in the PRD and entering informal labor markets. It is this segment of the population--the informal migrants--that are particularly vulnerable, as they are often do not have access to basic environmental infrastructure services, or are provided access at higher prices through intermediaries (e.g., landlords). Ensuring affordable access to services for all segments of the PRD's vulnerable population is becoming a major challenge for cities.

Experience with private sector participation in infrastructure investments and service provision is relatively new in China, but is beginning to take place in the larger cities. In Guangdong Province, private sector involvement includes: one concession for a water supply (in Tanzhou); production and transmission of water; wastewater treatment (in Guangzhou); operation of a hazardous waste landfill for Guangzhou; and a Build-Operate-Transfer (BOT) operation for a sludge treatment plant for Guangzhou. So far, no initiatives have been taken to facilitate entry of private service providers for the distribution of drinking and

wastewater collection, where the greatest gains in efficiency and service levels are possible. Considerable opportunities exist for more private sector participation, which could result in greater efficiencies, and greater financial flows to cities in the PRD.

At present, every town builds and manages its own urban utility system and economies of scale and other potential benefits are not being realized. The recently announced Provincial program of constructing more than 160 wastewater treatment plants to clean up the PRD river system perpetuates this fragmented approach to planning. However, opportunities exist for cooperation and shared provision of environmental infrastructure services among cities in the PRD. The Guangdong Provincial Government (GPG) and municipalities recognize that regional planning approaches present opportunities for inter-municipal cooperation, jointly managed facilities, reduced costs, and economies of scale for provision of environmental infrastructure. They have not yet, however, addressed the institutional challenges inherent in this approach. The problem is compounded by the lack of a strategic framework at the provincial, metropolitan and city levels for planning and implementing least-cost priority investments and policy and institutional reforms.

Guangdong Provincial Government Strategy. Guangdong Province (GP), through its provincial Environmental Protection Bureau (GDEPB), announced a plan to clean-up the PRD through an eight-year, US\$5 billion program of investments in wastewater treatment facilities. Details of this program are still being developed in consultation with cities, which would consider incorporating the proposals in their wastewater master plans. The program, however, reflects the old, fragmented approach to infrastructure planning, contains too many treatment plants, is ambitious and costly, and needs further detailed analysis to develop rational and least-cost options, and to achieve economies of scale. The Province is also preparing waste management master plans for municipal and industrial solid waste. Nevertheless, the GPG is committed to achieving sustainable development in the PRD and expanding provision of urban environmental services, including use of innovative forms of non-state involvement. It recognizes that regional environmental infrastructure investment will need to be guided by a regional development strategy that is anchored on commitment by the multiple cities and towns in the PRD towards the common goal of economic growth, sound environmental management and fiscal sustainability across PRD as a whole.

2. Objectives

The project development objective is to improve the quality of the urban environment in key cities in the Pearl River Delta (PRD) by implementing an integrated regional pollution management planning and action approach, in order to facilitate continued economic and social development.

Progress toward this objective would be measured in terms of: (a) reduction of pollution from the urban sector through selective high-impact wastewater, stormwater and hazardous waste management improvements; (b) increase in the number of jointly-owned and managed inter-municipal environmental infrastructure investments and operations in other PRD towns, (c) a parallel program for reducing industrial pollution control, through an Industrial Pollution Control Action Plan (IPCAP) in the PRD, (d) promotion of public-private partnerships in wastewater and solid waste management, (e) development and implementation of policies and measures to reduce pollution from livestock and agriculture, (f) enhancement of provincial capacity for river basin management, water quality monitoring, data collection and decision support systems, (g) increased collaboration with Hong Kong to improve air and water quality in the PRD and the South China Sea, and (h) technical assistance to support formulation of the strategic framework for investment decision-making, program implementation, and capacity building.

3. Rationale for Bank's Involvement

Both Guangdong Province and Guangzhou city have been sub-borrowers of the Bank for major infrastructure projects. They appreciate the savings that have accrued to them by virtue of the Bank's international competitive bidding procedures. Even if almost all contracts go to Chinese suppliers, Bank procedures are recognized as imposing demanding standards of transparency and bidders respond accordingly. It is also recognized that Bank-imposed contract supervision ensures a high standard of compliance with conditions of the contract. This risk of political interference is minimized. The Bank is also seen as adding value in its probing of project alternatives to ensure adoption of the most cost-effective option, and in the window it opens on international experience regarding complex project management and matters of public policy such as cost recovery and institutional arrangements for the delivery of environmental infrastructure services.

As mentioned previously, before the Bank started project preparation and GEF support was mobilized, there was no strategic framework at the provincial, metropolitan and city levels for planning and implementing least-cost priority investments, and for policy and institutional reforms for wastewater services. Now that the strategic framework is being prepared, it can be used to guide future investments and developments in the PRD, through the implementation of the proposed project. This framework will also identify opportunities and benefits of having local governments cooperate in the operation of shared wastewater treatment (and possibly solid and hazardous waste) facilities and more actively promote private sector involvement. Such cooperation will be piloted under the proposed project, thereby providing a model for cities throughout Guangdong Province and elsewhere in China.

4. Description

The project would support infrastructure investments as well as institutional strengthening and training (IST) at both provincial and city levels, as follows:

- (a) Wastewater Management in Guangzhou City, would include investments to increase wastewater treatment capacity by about 400,000 m³/day in two plants, construction and rehabilitation of sewerage networks, interception of wastewater entering creeks and rivers, and stormwater management.
- (b) Hazardous Waste Management in Guangzhou City: construction of a treatment center and associated management program landfill.
- (c) Incentive-based Lending for Inter-Municipal Environmental Infrastructure in PRD Municipalities and Towns, would fund wastewater treatment and solid waste investments for groups of two or more contiguous municipalities or towns willing to plan, construct and manage shared facilities. Candidate towns will be identified by appraisal, along with proposed investments, and institutional arrangements for construction and management of the facilities. Possible candidates for such collaboration include Guangzhou-Fushan and Shenzhen-Dongguan. Funds will be notionally allocated for this component and possible initiatives will be identified and appraised during the first year of implementation.
- (d) Water Quality Monitoring and Information Systems, would include investments in 18 new provincial stations, rehabilitation of 3 existing stations, a range of laboratory and field equipment (including automatic water quality monitors), development of a management information system to enhance the capacity of the Guangdong Provincial Environmental Protection Bureau to improve its efficiency and effectiveness for pollution control and information sharing with Hong Kong and Macau and with neighboring countries through the UNEP/GEF South China Sea and Gulf of Thailand Project.
- (e) Institutional Strengthening & Training, would include (i) financial/institutional support, equipment

and training for project implementing agencies; (ii) project implementation support for detailed design and construction supervision; (iii) launch of public awareness campaigns to inform citizens about the government's plans to clean up the river system, water quality objectives, and potential benefits and citizen support to detect and report polluters; (iv) strategic studies for urban development, air and water resource and environment management, wastewater and storm run-off management, agricultural and animal waste management, public-private partnerships in funding and managing environmental infrastructure, and financial policies and instruments for mobilizing long-term resources for environmental investments; and (v) training in urban development, wastewater, hazardous waste management and water quality monitoring.

- (a) Urban Wastewater Management in Guangzhou City
- (b) Hazardous Waste Management
- (c) Inter-Municipal Environmental Infrastructure
- (d) Water Quality Monitoring and Information Systems
- (e) Institutional Strengthening and Training
- (f) Public-Private Partnership Enhancement

5. Financing

Source (Total (US\$m))

BORROWER (\$400.80)

IBRD (\$200.00)

GLOBAL ENVIRONMENT FACILITY (\$10.00)

Total Project Cost: \$610.80

6. Implementation

The Guangdong Provincial Finance Bureau is responsible for the overall coordination of the project. The Guangdong Provincial Government Office for World Bank Projects (GDPMO), which has been established within the Provincial Finance Bureau, has already successfully coordinated implementation of several World Bank-financed projects. Guangzhou city has also set-up its own Project Management Office (GZPMO) to oversee preparation and implementation of its component. Other cities intending to participate in the project would be required to establish their own project management offices in accordance with national practice. Individual components will be implemented by the respective sector agencies. In Guangzhou city, (a) the wastewater treatment component will be implemented by the Guangzhou Tunnel Development Company (GTDC), as the agent of the GWTC. The hazardous waste management component will be implemented by the Guangzhou Waste Management Department (GZWMD). The Guangdong Provincial Environmental Protection Bureau (GDEPB) will be responsible for implementation of the water quality monitoring component, through its Guangdong Environmental Monitoring Center. GDPMO will implement the institutional strengthening and training component.

GDPMO's responsibilities include: (a) implementation of the institutional strengthening and training component; (b) overall project coordination, management and monitoring; (c) annual budget preparation; (d) project-wide quality assurance; (e) progress reporting to GPG and the Bank, including cost management, project impact and environmental improvement assessment; (f) interagency coordination and procurement support; and (g) sectional training facilitation. The personnel skill mix of the GDPMO and GZPMO would be adjusted from time to time to reflect the needs of the various phases of the project, including completion of preparation and implementation.

The ----- Tendering Company Limited (-----) would be retained as the procurement agency for all aspects of civil and electrical and mechanical works requiring bidding.

Onlending Arrangements: The proposed loan of \$210 million would be made to the People's Republic of China. The loan would be for 20 years, including 5 years of grace, at the Bank's standard interest rate for LIBOR-based US dollar single currency loans. The proceeds of the loan would be onlent to Guangzhou Municipality (any other municipalities to be determined) through GP on the same terms and conditions as the Bank loan to China. Guangzhou Municipality would onlend the proceeds of the Bank loan to Guangzhou Wastewater Treatment Company for 15 years including 5 years of grace, at an interest rate and a commitment charge not less than the rate and charge applicable to the Bank loan to China.

Financial Management: Guangdong Province has the requisite systems and staff to carry out the financial management of the project. GP already has ongoing Bank-financed projects in other sectors and the Guangdong Finance Bureau (GDFB) is familiar with the Bank's disbursement procedures. Guangdong prepared a Financial Management Systems (FMS) Manual, satisfactory to the Bank, which would be the basis for financial management during project implementation. To facilitate disbursements, a Special Account would be opened with an authorized allocation of \$15.0 million, equivalent to the estimated average expenditures to be financed by the Bank over about a four-month period; the account would be opened in US dollars in a bank acceptable to the Bank and be managed by GDFB.

Auditing Arrangements: As with other Bank-financed projects in China, the Foreign Investment Audit Bureau of the China National Audit Office (CNAO), established in 1983 under the name of State Audit Administration, would have overall responsibility for auditing the accounts of the project. The actual auditing work would be conducted by the Guangdong Provincial Audit Department under CNAO's supervision. The Bank currently accepts audits performed under the responsibility of CNAO. Audits of the financial statements of implementing agencies and audit of the Special Account would be submitted to the Bank within six months after the end of the financial year. The audit reports of the implementing agencies would include opinions on whether the agencies were in compliance with their respective financial covenants, and whether these agencies had taken out adequate insurance on goods and works financed from loan and credit proceeds.

Monitoring and Evaluation Arrangements: The project would be supervised through Bank missions scheduled for twice a year. Headquarters and resident mission staff would cooperate in this activity. During implementation, project performance, including the achievement of project outputs and progress towards the attainment of development objectives, would be monitored through the use of semiannual progress reports prepared by the GDPMO. The first such monitoring report would be submitted by January 31, 2005, and the last by January 31, 2010. In addition, an implementation completion report, reviewing the planned objectives and the achievements of the project, including costs and benefits derived, and performance and contribution of all parties associated with project execution, would be prepared by the GDPMO and submitted to the Bank within six months of the closing date.

7. Sustainability

The project is expected to be sustainable in three respects: (a) financially; (b) institutionally; and (c) in achieving its development objectives. Tariff reforms would enhance the financial viability of municipal service providers. Institutionally, the creation of a financially autonomous wastewater company and continued technical assistance for the participating institutions would strengthen utility management and water quality monitoring capacity. The hazardous waste facility is not expected to be financially viable from the beginning, because the culture has to be first developed for hazardous waste producers to bring their wastes to the facility. Therefore charges would be kept low initially, and will be increased in time when the practice is well established. Finally, the project addresses an issue of high priority to both the local and the national governments: vital self-interest in achieving environmental conditions necessary for sustained economic growth, which would be a strong motivation to continue implementing the long-term water resource strategy.

8. Lessons learned from past operations in the country/sector

Since its first loan in 1985, the Bank has committed US\$2.2 billion under 22 projects for water supply and wastewater operations in China. A 2002 Operations Evaluation Department (OED) Report (China: Review of the Bank's Assistance to the Urban Water Supply and Wastewater Sector, Report No. 24979) rates the **outcome** of the Bank's assistance **moderately satisfactory**, its **sustainability** as **likely**, and its **institutional impact** as **modest**. OED also rates both **Bank performance** and **borrower performance** **satisfactory**. The key lessons learned and recommendations are:

- the least-cost analysis of future Bank-financed projects should always include improved incentives and support for demand management of water consumption and treatment;
- tariffs in future Bank-financed projects should be set by the level of average incremental costs, which signals future costs;
- the recent policy of conditioning future Bank financing on the establishment of autonomous wastewater companies be continued;
- future Bank financing should give priority to cities and provinces that are willing to contribute a larger share of planned investments from internal cash generation; and
- the next generation of Bank sector projects should include private sector participation where there is political support in favor of private sector participation.

All of these lessons and recommendations have been taken into account in conceptualizing the proposed project.

9. Environment Aspects (including any public consultation)

Issues :

An extensive environmental assessment (EA) has been carried out for GPRDUEP. During its preparation and evaluation Chinese national procedures and those required by the Bank Group were diligently followed. Comprehensive EA documents comprising an Environmental Assessment Report and an Executive Summary have been prepared, incorporating Bank comments, reviewed and found satisfactory. An Environmental Management plan (EMP) is an integral part of the EA process. A detailed annex covering environmental assessment and impact, together with mitigation measures, has been prepared (Annex **). This summarizes the findings of the Chinese EAs on the various components and reflects the preparation and appraisal mission findings.

Potential Impacts: The environmental impact of the project is on balance substantially positive and the benefits greatly outweigh the negative impacts. The Guangzhou wastewater component will greatly

increase wastewater collection and treatment rates within the municipality area and will improve considerably water quality both in the main Pearl River reaches in the Guangzhou urban areas and in the urban tributaries. The Hazardous Waste component will substantially increase the regional availability of facilities for hazardous wastes management and provide a new environmentally secure disposal route for the categories of waste treated.

The principal potential impacts during construction include excavation, spoil disposal, noise and disruption of urban services. Operational phase impacts of wastewater treatment include the need to dispose safely of the increasing quantities of wastewater treatment plant sludge and possible poor water quality in the mixing zones of treated wastewater outfalls. The principal hazardous waste impacts are the road transport of hazardous materials and possible generation of leachate at the landfill..

Mitigation Measures: The EA specified the appropriate mitigation measures, environmental monitoring plans, institutional arrangements and training and equipment requirements together with cost estimates for implementation of the mitigation measures and monitoring plans. Major mitigation measures for the hazardous waste management component include provision of an impermeable site liner and the facility to treat any leachate in the waste treatment plant.

The long-term proposals for sludge disposal for Guangzhou are based on centralised treatment of dewatered sludge with possible uses of the treated sludge product in agriculture/horticulture and/or for brick manufacture. Until such time as the markets to support these uses are sufficiently developed, disposal will be primarily by environmentally secure landfill. Water quality impacts of treated wastewater discharges are minimised by the location of treatment plants in relation to critical river water uses. Construction phase impacts will be minimized through controls on working practices and operational impacts through careful siting of facilities with appropriate buffer zones and controls on noise.

Public Consultation and Feedback: Local people were consulted during the EA preparation. The approaches used for public consultation were: consultation meetings with local government representatives and questionnaire analysis of public opinion supplemented by interviews. Consultations were carried out at various stages in accordance with the requirements of OP 4.01. Details of these activities with dates, participants, public notifications and locations are provided in tabular form in Annex 12.

Information Disclosure: The EA Report and Executive Summary were submitted to the Bank in November 2003, as were draft Resettlement Action Plans (RAPs). Both reports were reviewed and found to be satisfactory. Copies were submitted to the Bank Group Information Center in December 5, 2004 and in the Project files (Annex 12). Notice of availability of these reports was publicized in the project cities before appraisal (Appraisal completion date: December 17, 2003). Details of documents, disclosure dates and locations are provided in tabular form in Annex 12.

10. List of factual technical documents:

11. Contact Point:

Task Manager
Thomas L. Zearley
The World Bank
1818 H Street, NW
Washington D.C. 20433
Telephone: 5788+3380 or 202 458-4731
Fax: 86-10 6554-1686 or 202 522-1787

12. For information on other project related documents contact:

The InfoShop
The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 458-5454
Fax: (202) 522-1500
Web: [http:// www.worldbank.org/infoshop](http://www.worldbank.org/infoshop)

Note: This is information on an evolving project. Certain components may not be necessarily included in the final project.