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Report No. P-6697-CHA

MEMORANDUM AND RECOMMENDATION

OF THE

PRESIDENT OF THE

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

TO THE

EXECUTIVE DIRECTORS

ON A

PROPOSED LOAN

IN AN AMOUNT OF \$250 MILLION

TO

THE PEOPLE'S REPUBLIC OF CHINA

FOR A

SECOND SHANGHAI SEWERAGE PROJECT

FEBRUARY 21, 1996

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CURRENCY EQUIVALENTS

(As of January 1, 1996)

Currency	=	Renminbi
Currency Unit	=	Yuan (Y)
Y 1.00	=	\$0.12
\$1.00	=	Y 8.4

WEIGHTS AND MEASURES

Metric System

ACRONYMS AND ABBREVIATIONS

EA	-	Environmental Assessment
ICB	-	International Competitive Bidding
LIBOR	-	London Interbank Borrowing Rate
NCB	-	National Competitive Bidding
SM	-	Shanghai Municipality
SMG	-	Shanghai Municipal Government
SMSC	-	Shanghai Municipal Sewerage Company, Ltd.
SPC	-	State Planning Commission
SSC	-	Shanghai Sewerage Company
SSPCC	-	Shanghai Sewerage Project Construction Company

FISCAL YEAR

January 1 - December 31

CHINA
SECOND SHANGHAI SEWERAGE PROJECT
LOAN AND PROJECT SUMMARY

Borrower: The People's Republic of China.

Implementing Agency: Shanghai Municipal Sewerage Company, Ltd. (SMSC).

Beneficiary: Shanghai Municipality (SM) and SMSC.

Poverty: Not applicable.

Amount: \$250 million.

Terms: 20 years, including 5 years of grace, at the standard interest rate for LIBOR-based US dollar single currency loans.

Commitment Fee: 0.75 percent on undisbursed loan balances, beginning 60 days after signing, less any waiver.

Onlending Terms: From the Government of China to SM: on the same terms, with SM bearing the foreign exchange risk.

From SM to SMSC: 15 years including 5 years of grace at the standard interest rate for LIBOR-based US dollar single currency loans, and a commitment charge at the Bank's standard rate, with SMSC bearing the foreign exchange risk.

Financing Plan: See Schedule A.

Economic Rate of Return: An economic analysis of the least-cost options was carried out.

Staff Appraisal Report: Report No. 14973-CHA

Map: IBRD 27376

Project ID Number: CN-PE-3648

**MEMORANDUM AND RECOMMENDATION OF THE PRESIDENT OF THE
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
TO THE EXECUTIVE DIRECTORS
ON A PROPOSED LOAN
TO THE PEOPLE'S REPUBLIC OF CHINA
FOR A SECOND SHANGHAI SEWERAGE PROJECT**

1. I submit for your approval the following memorandum and recommendation on a proposed loan to the People's Republic of China for \$250 million to help finance the Second Shanghai Sewerage Project. The loan would be a US dollar loan at the standard interest rate for LIBOR-based single currency loans, with a maturity of 20 years, including 5 years of grace. The proceeds of the loan would be onlent to the Shanghai Municipality (SM) on the same terms and conditions, and a commitment charge at the Bank's standard rate on the outstanding balance. SM would bear the foreign exchange risk. SM would onlend the proceeds to the Shanghai Municipal Sewerage Company, Ltd. (SMSC) for 15 years including 5 years of grace at the standard interest rate for LIBOR-based US dollar single currency loans, and a commitment charge at the Bank's standard rate, with SMSC bearing the foreign exchange risk.

2. **Sector and Project Background.** Shanghai, China's largest metropolitan area, has a population of about 14 million. The city is located on the lower delta of the Changjiang (Yangtze) River, where it meets the East China Sea. Numerous watercourses flow through the municipal area, mainly draining to the Huangpu River, which passes through the city center and flows into the Changjiang. These watercourses are interconnected and tidal, experiencing several hours a day of reverse flows during high tides. The waterways serve many functions, including receiving stormwater, and industrial and domestic wastewater flows. Currently, due to a lack of basic urban infrastructure, only about 48 percent of wastewater flows [2.6 million (M) m³/day] can be collected, the remainder discharging directly into streams or the Huangpu. Prior to the commissioning in 1993 of the main interceptor financed under the first Shanghai Sewerage Project [Loan 2794/Credit 1779-CHA (SSPI)], only about 0.5 Mm³/day of the 5.4 Mm³/day of wastewater flows was collected by combined (wastewater and stormwater) sewers.

3. Less than two thirds of wastewater collected receives treatment, this being restricted mainly to pretreatment of industrial wastes, or through septic tanks from which the effluents are discharged into nearby waterways. Low collection and treatment levels result in substantial pollutant loads entering surrounding waterways, causing major environmental and ecological damage to the water resources, posing significant health risks, and restricting economic growth. The river system tides drive pollutants upstream as far as Shanghai's drinking water treatment plant intakes, and this has required large investments to relocate these intakes to safer areas, considerably increased water treatment costs, and given rise to a high and costly risk of emergency shutdowns.

4. As living standards rise, the 50 percent of Shanghai's citizens who currently rely on nightsoil buckets (emptied daily to holding tanks) for indoor sanitation and shared yard taps are relocating to housing with flush toilets, and indoor taps that enable the use of washing machines and other modern conveniences. Domestic sources of pollutants would therefore steadily increase over the next few years, further overloading wastewater facilities. The proposed project would aim to put in place strategies and mechanisms to address the urban environmental management problems highlighted above.

5. **Shanghai's Wastewater Management Strategy.** In the mid-1980s, both the State and the Shanghai Municipal Government (SMG) recognized Shanghai's serious backlog in the provision of basic and essential urban environmental services and the long-term economic and environmental damage that this would cause to Eastern China. Ultimately, these deficiencies would increase the cost of achieving sustainable development. The various government levels therefore began to identify strategies for city wastewater and for environmental protection of the whole East China area. SMG completed and adopted a study in 1986 identifying an optimal wastewater management strategy for the city, comprising a phased investment program supporting the construction of combined wastewater collection systems with treatment phased in over time, managed by a financially sustainable urban wastewater utility that would charge for services.

6. SMG commenced its medium-term wastewater investment program with World Bank Group support. The FY87 Shanghai Sewerage Project—SSPI—(Credit 1779-CHA and Loan 2794-CHA) supported the program's first phase (Phase I), serving the northern part of the city. The Shanghai Sewerage Company (SSC) was established through that first project as an autonomous public enterprise under the Municipal Government, to manage part of Shanghai's wastewater systems, and wastewater tariffs were introduced. Construction of these systems is now substantially complete, with the new system currently handling an average dry-weather flow of 1.2 Mm³/day. The program's second phase (Phase II), serving the southern part of the city, would be supported in part under this proposed Second Shanghai Sewerage Project (SSPII), which would also consolidate and extend the institutional development and policy objectives of the first project.

7. Complementing these initiatives are: (a) a water quality protection program being supported under the recently approved Shanghai Environment Project (SEP, Loan 3711-CHA), which supports investments in water supply (through the Shanghai Municipal Waterworks Company) and related environmental management; (b) the ongoing, Japanese Government-assisted Hangzhou Bay Study, which is formulating an environmental management strategy for the Hangzhou Bay, the most heavily polluted receiving water body in Eastern China; and (c) institutional development measures including wastewater tariff enhancements, organizational and management upgrading initiatives and selective reduction of point source pollution, undertaken to support the program. As a major step in strengthening institutional and sector management capacity, SMG formed the Shanghai Municipal Sewerage Company, Ltd. (SMSC), merging SSC and related bureaus to form a major autonomous public enterprise with enlarged

wastewater management responsibilities, which would undertake all aspects of wastewater services provision for Shanghai.

8. Phase I of the Shanghai Wastewater Strategy was designed to remove about 20 percent of the total urban pollution load in the Huangpu River, leaving about 70 percent of the pollution load and approximately 2.8 Mm³/day of dry-weather flow discharging directly to surface waters. Phase II would, with the assistance of the proposed project, aim to collect parts of these pollution loads, contributing to a significant reduction in pollution of the lower Huangpu and the long-run protection of Shanghai's principal drinking water resources. The project would facilitate collection of wastewater flows from an area covering some 240 km² in the rapidly developing Pudong and Puxi areas of the city. It would have an initial capacity of 1.7 Mm³/day of dry-weather flow and be sized to capture projected flows of 5.0 Mm³/day for the year 2020; the system would also collect wastewater flows from the first stage of the Wujing/Minhang conveyor system funded under SEP, discharging at a point with sufficient assimilative capacity for the flows and pollution loads expected to occur during the next two decades.

9. Approximately two thirds of the wastewater collected receives some form of treatment. The Phase I conveyor discharges to the Changjiang (Yangtze) River at Zhuyuan, where the assimilative capacity ensures no adverse effect to downstream users. Phase II flows would discharge into the Changjiang through a submerged outfall 20 km downstream of Zhuyuan at Bailonggang where the freshwater/saltwater interface and high-turbidity mixing zone occurs, some 25 km downstream of the point where the Huangpu enters the Changjiang. Extensive modeling of the Bailonggang area has confirmed that the Changjiang has considerable assimilative capacity at this point, and that the environmental impact of these discharges at Bailonggang and in the adjacent Hangzhou Bay would be acceptable. SMG has also allocated land for the future construction of a chemically-assisted primary wastewater treatment plant, with an initial treatment capacity of about 0.8 Mm³/day. Engineering studies for the treatment plant for Phase II flows are underway, ensuring that the plant could be constructed in stages as pollution loads and flows increase over time (commencing in about the year 2000). The environmental objective would be to ensure that phosphorus levels discharged do not reach levels that would cause eutrophication in the vicinity, and that dissolved oxygen levels are such as not to endanger marine life; the discharge studies found these criteria to be acceptable. This phased strategy is also the least-cost approach to environmental management.

10. **Institutional Strategies.** SMSC would implement the project. The first project (Phase I) assisted the then SSC in beginning to organize sector operations, commencing development of appropriate financial and management policies, and introducing limited wastewater charges. The charges aim to provide sufficient revenues to cover operating and maintenance expenses, and the greater of either debt service or depreciation. Revenues from tariffs currently meet operating and maintenance expenses (excluding depreciation); however, to meet stormwater drainage and all debt service costs, SMG allocated construction taxes and public utility levies (principally on water supply) to SSC to ensure financial viability. These allocations were just sufficient to sustain the financial viability of

SSC during Phase I. The implementation of wastewater tariff increases has been shown to require considerable time and widespread consultations in order for SMG to build community support for enhancements. However, SMG has confirmed that it would ensure the long-term financial sustainability of wastewater service provision; further, SMG approved a 100 percent increase in average wastewater tariffs in July 1995, just prior to project appraisal, which are scheduled for implementation from March 1996.

11. In addition, the pace of institution strengthening and implementing contemporary operational work and business practices in SSC has been slower, and more difficult than both the Bank and SMG had estimated when preparing SSPI. The newly-created SMSC must continue to develop its capacity if it is to effectively manage the very large wastewater utility enterprise that would be required to operate and maintain the assets, and sustain the services that would be financed under the project. The proposed project would build on the initial institutional development efforts through supporting the reorganization of SMSC, enabling it to meet increased demands in connection with new government accounting requirements, enhancing management accounting and customer data base recording, improved billing and collection including joint billing with the Shanghai Municipal Waterworks Company, and advanced training in utility operations.

12. **Bank Group Assistance Strategy and Rationale for Involvement.** The Bank's Country Assistance Strategy presented to the Board on June 1, 1995 highlighted infrastructure service level deficit alleviation and environmental protection improvement as being two of the four identified areas of focus. The proposed project would directly support both these objectives. Specifically the project would support the infrastructure development and environmental management priorities emphasized in the recent Bank sector study, *China: Urban Environmental Service Management* (Report 13073-CHA), which identified completion of urban wastewater networks and the introduction of appropriate wastewater tariffs as the next key steps in water pollution control. The proposed project, the third in a series targeted towards improved water resource protection in Shanghai, would enable SMG to complete a major portion of its wastewater management program. On completion of the proposed and ongoing Bank-assisted projects in Shanghai, the following main outcomes would be achieved: (a) economically sustainable and financially viable wastewater and water supply pricing policies and institutions would be in place; (b) Shanghai's long-term wastewater management strategy would be operational, and the principal components for providing essential and affordable water and wastewater services would be functional; and (c) a strategy would be under implementation for arresting environmental degradation of the Huangpu River, and the surrounding watercourses, enabling regional economic growth consistent with the vision of the Shanghai Government.

13. The Bank's assistance to Shanghai in addressing these problems is particularly important because of Shanghai's role as a leader in urban environmental management and protection throughout China. Shanghai's environmental problems typify those in Chinese metropolises, and the city is a development model for other Chinese urban areas. Successful completion of the wastewater system would give impetus to that aspect of our sector policy dialogue, a crucial element of which seeks adequate pricing for urban services,

supported by a willingness to ensure connection to the new systems. Though a difficult issue for SMG, positive response to the pricing issue in the water sector (a 30 percent water tariff increase was implemented through SEP) signals willingness to deal effectively with this challenge. The agreed implementation from March 1996 of average wastewater tariff increases of 100 percent support this further. Higher effluent discharge fees would further moderate water demand and hence sewage flows, increase revenue, and enable more efficient urban services management. Success in increasing wastewater service charges in Shanghai would promote Bank and government efforts to introduce this practice in other cities; Bank strategy provides for replication of these objectives in projects inland (the recently approved Hubei Urban Environmental Project—Loan 3966/Credit 2799-CHA) and planned for poorer provinces (Guangxi and Yunnan).

14. **Lessons Learned from Previous Bank Group Assistance.** Three principal lessons learned have been incorporated into the present project. These lessons relate to: the provision and management of urban environmental services; effective environmental management and pollution control; and project preparation and implementation.

- (a) **Provision and Management of Urban Environmental Services.** The review by the Bank's Operations Evaluation Department of Bank-supported water and wastewater projects (*Water Supply and Sanitation Projects: The Bank Experience 1967-1989*) concluded that to meet borrower and Bank development objectives, project design should incorporate institution building, financial viability, and poverty alleviation as core conceptual elements. Bank municipal management sector work in connection with incentives for urban service delivery emphasizes the need to properly assign functional responsibilities and link revenues to expenditures. In China, environmental services are provided at the municipal level, where a high percentage of government revenue is also captured. Recent sector work (*China: Urban Environmental Service Management*, Report 13073-CHA) concluded that the major failing in environmental services has been dependence on municipal budget transfers to fund services, while greater reliance on user charges would be affordable, induce resource conservation, and create a more dependable income stream. To address the issues highlighted above, in the proposed project our dialogue has focused on the challenges of financial sustainability (including tariff enhancement) and institutional management issues.
- (b) **Effective Environmental Management and Pollution Control.** Reviewing recent Bank experience in pollution control, including projects in China, Asia, Latin America and Africa, has highlighted the importance of facilitating the means for all polluters to connect to wastewater systems, thereby expanding system coverage and the numbers of paying consumers, and ensuring the cost-effective capture of all polluting wastewaters. The project design draws on these lessons and those in two recent sector studies (*Environmental Strategy Paper*, Report 9669-CHA, and the report on urban

environmental services). The latter stresses issues of political commitment, especially with respect to pricing matters, appropriate environmental standards and management incentives, and monitoring and enforcement capabilities. The ongoing Bank-supported Shanghai Environment Project (Loan 3711-CHA) begins to address these challenges. This project would address them further through time-bound Action Plans to: (i) enhance capturing wastewater flows through system connections while promoting linkages to community awareness to water conservation; and (ii) strengthen wastewater utility operations and management.

- (c) **Project Preparation and Implementation.** The ongoing support from international and Chinese expertise, with a focus on strong project management backed by high-level political commitment to project goals, has proved effective, and would be repeated for project implementation. The extensive involvement of the local design bureaus during preparation is also expected to ensure a high degree of borrower ownership. The importance of sustained technical assistance for the challenging engineering works during project implementation was demonstrated in the first Sewerage Project where, for example, technical problems encountered during construction caused flooding and loss of one of two outfall tunnels. This underscores the need for the proposed project to support technical assistance expertise in the areas of construction management, financial and institutional systems development, and a technical review panel.

15. **Project Objectives.** The principal project objective would be to provide a safe environmental setting for the long-term growth of Shanghai, enabling sustained economic and industrial growth. Specific objectives of the project are to: (a) enhance wastewater and stormwater management through expanding wastewater collection, pretreatment and disposal capacity and stormwater drainage facilities; (b) reduce urban pollution impact, while facilitating pollution control; (c) improve wastewater utility financial and operational management; and (d) strengthen sector institutions through training, feasibility studies, and future investment project preparation in the environment area.

16. **Project Description.** The project would comprise (a) financial and policy initiatives, planning, institutional and management reforms, supported by (b) an investment program of environmentally-oriented capital works and institutional measures to support management and operational capacity-building of the Shanghai Municipal Sewerage Company, Ltd. The investment program would comprise the following components: (a) *Sewerage and Sanitation Improvements* comprising trunk conveyor and secondary sewers, and pumping facilities, with a supporting program of wastewater flow management and connection and collection for domestic, industrial and enterprise systems, and enhancements to stormwater drainage, nightsoil and septic tank systems management; (b) *Wastewater Treatment and Disposal Systems* at Bailonggang comprising pretreatment, effluent pumping facilities and a marine outfall with a flow capacity of about 1.7 Mm³/d, and rehabilitation of existing sewerage systems; and (c) *Institutional Development and*

Training for supporting and strengthening project management, wastewater organizational, financial and urban utility operations and management systems; wastewater system rehabilitation, monitoring technology and data management; wastewater pollution control; and training, feasibility studies and future project preparation.

17. The institutional, financial, utility and environmental management policy initiatives would focus on action plans for: (a) institutional strengthening of SMSC including steps towards improving operational efficiency, resource mobilization and cost recovery; and (b) control of industrial and domestic wastewater discharges for environmental protection and safeguarding the SMSC assets.

18. **Project Costs and Financing.** The total project cost is estimated to be \$633.3 million (excluding interest during construction), with a foreign exchange component of \$200.2 million (32 percent); financing would comprise \$250 million from the Bank (39 percent of project costs or about 37 percent of total financing required) and the balance from the Shanghai Municipality. A breakdown of project costs and the financing plan are shown in Schedule A. Amounts and methods of procurement and disbursements, and the disbursement schedule are shown in Schedule B. A timetable of key project processing events and the status of Bank Group operations in China are given in Schedules C and D, respectively. A map (IBRD 27376) is also attached. The Staff Appraisal Report, Report No. 14973-CHA, dated February 21, 1996, is being distributed separately. To assist the early start expected to be made by SMG on some works, it is recommended that retroactive financing of up to \$5.0 million be provided for expenditures incurred from August 1, 1995, covering initial civil works, goods and services contracts.

19. China is eligible for single currency loans under the Bank's expanded program. The Government of China and SM have selected LIBOR-based US dollar single currency loan terms for the project in order to facilitate management of the foreign exchange risk of their borrowings, by more closely matching the currency of their liabilities with that of their net trade flows, about 75 percent of which are US dollar denominated. The Government selected the LIBOR-based product in order to preserve the full maturity of the loan, compared to the fixed rate option that would have resulted in a 15-year term, and judges that it can manage the interest rate risk. This loan represents about 8 percent of the fiscal year 1996 IBRD expected lending to China, and is well within the 50 percent volume guideline approved by the Board.

20. **Project Implementation.** SMG has appointed a Leading Group headed by a Deputy Mayor, with members from the concerned commissions, departments and bureaus, to direct the preparation and execution of all major urban projects in Shanghai. SMSC is responsible for wastewater management in Shanghai, and has formulated the proposed policies and investment program, and completed financial, institutional and engineering design studies. SMSC would implement and manage the project, with appropriate direction from the SMG Leading Group. Environmental oversight would be provided by the Shanghai Environmental Protection Bureau. A comprehensive review of this work was undertaken during preparation, supported by detailed feasibility studies of the existing and

projected wastewater needs, in order to prioritize the identified investments, and complete detailed project preparation actions to a suitable level. Project design and implementation has drawn on the lessons learned jointly from other Bank-supported operations in the region (see para. 14 above). The Norwegian, French, Danish and Canadian Governments have provided technical expertise and financial support to supplement SMG resources, and assist SMSC in project preparation. The project would be carried out over a period of about six years.

21. **Sustainability.** The revenue and service charge enhancements proposed under the project, together with the investments to improve the quality of the urban environment and reduce the risks of contamination of the potable water supply of Shanghai would provide a framework for the sustained delivery of urban wastewater management services. SMG financial policy for urban utilities requires that tariffs and service charges recover costs, and aims to phase in over time a contribution to future investments. The incremental operations and maintenance costs would be recovered through increased tariffs and charges, and streamlining existing revenue collection arrangements as part of the project.

22. **Agreed Actions.** During negotiations, agreements were reached regarding onlending and project organizational requirements, and assurances obtained that: (a) resettlement would be carried out in a manner and according to a schedule satisfactory to the Bank, and in accordance with a time-bound Action Plan; (b) SMSC would adjust its wastewater tariffs as necessary to (i) generate revenues from its wastewater operations commencing in fiscal year 1997, sufficient to cover its operating and maintenance costs (before depreciation), increases in working capital, debt service requirements, and the following percentages of its three years' average capital expenditures: 5 percent in 1997 through 2000, and 10 percent thereafter; and (ii) have a debt service coverage of at least 1.3 times; (c) wastewater treatment facilities to remove phosphorus, limiting Shanghai's total phosphorus discharge to 18 tons per day, would be constructed and operational at Bailonggang on the Changjiang not later than January 2005; and (d) time-bound Action Plans would be implemented through SMG for (i) institutional development and training in SMSC; and (ii) enhancing wastewater connections including connecting existing septic tank and nightsoil facilities to the city and county sewerage systems, and related water conservation and public information measures.

23. The execution of a subsidiary loan agreement satisfactory to the Bank between the Shanghai Municipality and SMSC, and the implementation of the agreed increased wastewater tariffs, are conditions of loan effectiveness.

24. **Environmental Aspects.** The project is a Category A. SMSC, through its consultants, has prepared a detailed Environmental Assessment (EA) in accordance with Bank requirements. This has been extensively reviewed within China, and was approved by China's National Environmental Protection Agency. The EA incorporates assessment of possible impacts on local water and land, and on environmental quality in the Changjiang estuary. The EA concludes that the project would have a positive environmental impact. Detailed mathematical computer modeling studies have determined the optimal discharge

location, the assimilative capacity of the Changjiang at the proposed outfall location, and the wastewater treatment strategy and phasing requirements. Phosphorus loads that could cause eutrophication in the Changjiang and red tides in the East China Sea are of particular concern. These studies concluded that, initially, pretreatment would be required; chemically-assisted primary treatment would be phased in over time as flows and phosphorus loads build up, aiming to keep the average total phosphorus discharges from Shanghai as a whole to less than 18 tons per day (this is expected to occur in about the year 2000, after which time chemically-assisted primary treatment would be commissioned). At that time, considerable quantities of sludge would be generated; feasibility studies for the future treatment requirements and plans for sludge disposal have been undertaken, and preliminary design of the future treatment plant has been completed.

25. **Resettlement.** The Shanghai authorities have in place responsive practices and procedures for land acquisition and resettlement, and have a proven track record for their effective implementation. Substantial efforts have been made during project preparation to minimize the extent of the land acquisition and/or resettlement required. Most project facilities would be constructed along existing urban service alignments, thereby minimizing disruption. Some 7,426 persons would be affected due to land acquisition and relocation, resulting in resettlement costs representing about 25 percent of project costs. This is substantial, primarily due to the high unit costs of urban land, and levels of resettlement compensation. Some 188 hectares of land would need to be permanently acquired, and 114 hectares would need to be temporarily leased during construction. An estimated 4,924 persons would be affected by land acquisition, and about 4,018 would need house relocation; of these, some 1,516 would be affected by both land acquisition and resettlement. Nonagriculture-based employment would need to be provided for some 2,814 persons. Of these, 2,143 would be provided new jobs and 671 would be eligible for old-age pensions and special rehabilitation measures. The project would also affect 173 enterprises (including shops and small businesses), out of which 21 would be relocated to new sites. A comprehensive Resettlement Action Plan (RAP) describing the framework for resettlement implementation has been prepared by SMG, reviewed by the Bank, and found to be acceptable. SMSC would implement the RAP, with support from the local level.

26. **Project Benefits.** The provision of a safe wastewater disposal facility for Shanghai is a prerequisite for the sustained economic growth and public health of the eastern Changjiang river basin and adjacent hinterland, since the latter is a center of trade contributing significantly to the economy and development of China. The project would enhance the Government's efforts to reform the economy, through the implementation of fiscally rational charges for the management of urban wastewater services. Studies have indicated that environmental degradation in Shanghai, principally in terms of water pollution and development delay costs incurred due to inadequate urban services, is already causing substantial economic losses (in the order of hundreds of millions of dollars annually). Failure to control water pollution would exacerbate these losses.

27. The project is expected to improve water quality in the Huangpu, as a result of diversion of wastewater discharges away from the catchment, at least from Class V

(suitable for industrial cooling water and irrigation use) to Class IV (suitable for industrial water supply, boating and fishing use—the long-term water quality goal) and possibly to Class III (suitable as a drinking water source after treatment). This would lessen the risk of contamination of water abstracted from the Huangpu for potable supply, and reduce the cost of water treatment. Improved water quality is also expected in the area of existing discharges to the Changjiang as these are intercepted and discharged offshore. The project's institutional strengthening in wastewater monitoring and development of systems for the increased collection of wastewater discharges to sewerage systems would reduce the discharge of toxic chemicals to the water environment. Economic analysis has been based on least-cost analysis of options. A comprehensive set of monitoring indicators addressing resettlement, finance, institutional development and environmental impact were agreed during negotiations.

28. **Risks.** The main project risks are the following: (a) delays by SMG in regularly adjusting tariffs and service charges, due to the concerns of the city and central authorities with respect to (i) inflation, (ii) sensitivity to negative consumer response to utility price increases and (iii) consumer affordability of financially-priced service charges. Bank experience to date in Shanghai confirms the ability and willingness of SMG to take action in this connection, while proceeding with extreme caution, aiming to minimize political risk and avoid disrupting consumer opinion. This commitment has been confirmed by the agreed implementation from March 1996 of 100 percent wastewater tariff increases and by the formation of SMSC as an autonomous state-owned enterprise with broad sector responsibilities, incorporating the two previous wastewater sector operational entities; (b) encountering construction difficulties at the proposed outfall site at Bailonggang, due to unstable ground conditions. This risk would be responded to in part by ensuring rigorous engineering standards, and the appointment of a technical review panel; and (c) possible delays by SMG in implementing the institutional development and training components. Project formulation and design have been structured to minimize these risks, and to maintain a focus on the overall policy framework of effective cost recovery, and promoting efficient urban utility management. The risks have been discussed in detail with SMG, and would form the core of our dialogue with Shanghai during project implementation and supervision.

29. **Recommendation.** I am satisfied that the proposed loan would comply with the Articles of Agreement of the Bank and recommend that the Executive Directors approve the proposed loan.

James D. Wolfensohn
President

Attachments

Washington, D.C.
February 21, 1996

CHINA

SECOND SHANGHAI SEWERAGE PROJECT

ESTIMATED COSTS AND FINANCING PLAN
(\$ million)

	Local	Foreign	Total
<u>ESTIMATED PROJECT COST /a</u>			
Sewerage & Sanitation Improvements	329.4	130.0	459.3
Wastewater Treatment & Disposal	43.2	26.0	69.1
Institution Development & Training	3.4	12.4	15.8
<u>Total Base Cost /b /c</u>	<u>376.0</u>	<u>168.3</u>	<u>544.3</u>
Physical Contingencies	39.6	19.2	58.8
Price Contingencies	17.5	12.7	30.2
<u>Total Project Cost</u>	<u>433.1</u>	<u>200.2</u>	<u>633.3</u>
<u>Interest during construction /d</u>	0.0	34.6	34.6
<u>Total Financing Required</u>	<u>433.1</u>	<u>234.8</u>	<u>667.9</u>
<u>FINANCING PLAN</u>			
Shanghai Municipality	383.3	34.6	417.9
IBRD	49.8	200.2	250.0
<u>Total</u>	<u>433.1</u>	<u>234.8</u>	<u>667.9</u>

/a Includes \$21.3 million of import duties and taxes.

/b Minor errors due to rounding.

/c Includes cost of land (\$153.6 million).

/d Interest during construction is based on lending rates for projected disbursements of loan proceeds, and payment of commitment charges.

CHINA

SECOND SHANGHAI SEWERAGE PROJECT

SUMMARY OF PROPOSED PROCUREMENT ARRANGEMENTS

(\$ million, including contingencies)

Project Component	Procurement method			NBF/ <u>b</u>	Total
	ICB	NCB	Other/ <u>a</u>		
Civil Works	167.9 (91.9)	90.6 (49.6)	-	9.9 (0.0)	268.4 (141.5)
Equipment & Materials	104.2 (74.4)	7.8 (7.0)	0.8 (0.7)	15.4 (0.0)	128.2 (82.1)
<u>Other</u>					
Land Acquisition	-	-	-	153.6 (0.0)	153.6 (0.0)
Institutional Development & Training	-	-	18.9 (18.9)	-	18.9 (18.9)
Construction Management Services	-	-	7.5 (7.5)		7.5 (7.5)
Supervision & Project Management	-	-		56.7 (0.0)	56.7 (0.0)
<u>Total</u>	<u>272.1</u> <u>(166.3)</u>	<u>98.4</u> <u>(56.6)</u>	<u>27.2</u> <u>(27.1)</u>	<u>235.6</u> <u>(0.0)</u>	<u>633.3</u> <u>(250.0)</u>

/a Other procurement methods include national shopping, consultant services (recruited in accordance with the Bank's Guidelines) and training.

/b NBF = Not Bank financed.

Note: Figures in parenthesis are amounts to be financed by the Bank.

DISBURSEMENT ARRANGEMENTS

Category	Amount (\$ million)	% of expenditures to be financed
Civil Works	135.0	56 percent of expenditures
Materials and Equipment	80.0	100 percent of foreign expenditures, 100 percent of local expenditures (ex-factory cost) and 75 percent of local expenditures for other items procured locally
Construction Management Services	6.5	100 percent of expenditures
Institutional Development and Training	16.0	100 percent of expenditures
Unallocated	12.5	
<u>Total</u>	<u>250.0</u>	

ESTIMATED DISBURSEMENTS
(\$ million)

Bank FY	1997	1998	1999	2000	2001	2002
Annual	49.0	68.6	67.6	44.5	14.1	6.2
Cumulative	49.0	117.6	185.2	229.7	243.8	250.0

CHINA

SECOND SHANGHAI SEWERAGE PROJECT

TIMETABLE OF KEY PROJECT PROCESSING EVENTS

(a)	Time taken to prepare:	18 months
(b)	Prepared by:	Shanghai Municipal Government
(c)	First Bank Mission:	January 1994
(d)	Appraisal mission departure:	June 29, 1995
(e)	Date of negotiations:	December 14, 1995
(f)	Planned date of effectiveness:	June 15, 1996
(g)	List of relevant PCRs and PPARs:	None

This report is based on the findings of an appraisal mission that visited China in June/July 1995. Project team members included Mr. Geoffrey Read (Municipal Engineer and Task Manager), Mr. Lee Travers (Environmental Economist), Miss Linda Mih (Program Assistant), Mr. Terry Hall (Sanitary Engineering Consultant), Mr. Patrick McCarthy (Financial Consultant), Dr. George Taylor (Environmental Consultant), and Mr. Zhang Zhun (Institutional Consultant). Assistance was also provided by Miss Meredith Dearborn and Mrs. Socorro Manila (Report Preparation) and Mr. You Ji (Interpreter). Peer reviewers for the project were Messrs./Mmes. Harvey Garn (TWUWS), Wiebe Moes (SA3EI), Selina Shum (EC3IV) and Lars Rasmusson (MN2IN). The managing division is EA2EM. The Division Chief is Ms. Katherine Sierra and the Department Director is Mr. Nicholas C. Hope.

STATUS OF BANK GROUP OPERATIONS IN THE PEOPLE'S REPUBLIC OF CHINA

A. STATEMENT OF BANK LOANS AND IDA CREDITS
(As of December 31, 1995)

Loan/ Credit Number	FY	Bor- rower	Purpose	Amount (US\$ million) (net of cancellations)		
				Bank	IDA	Undisb. (a)
38 loans and 47 credits have been fully disbursed.				3,831.7	2,819.0	-
Of which SECAL:						
2967/1932	88	PRC	Rural Sector Adj.	200.0	93.2	-
2678/1680	86	PRC	Third Railway	160.0	(70.0) (b)	1.3
2723/1713	86	PRC	Rural Health & Preventive Med.	15.0	65.0	6.8
2794/1779	87	PRC	Shanghai Sewerage	45.0	(100.0) (b)	0.6
2811/1792	87	PRC	Beijing-Tianjin-Tanggu Expressway	25.0	(125.0) (b)	3.2
2812/1793	87	PRC	Gansu Provincial Dev.	(20.0) (b)	150.5	9.3
1885	88	PRC	Northern Irrigation	-	103.0	4.3
2951/1917	88	PRC	Sichuan Highway	75.0	(50.0) (b)	6.7
2955	88	PRC	Beilungang II	165.0	-	0.1
2958	88	PRC	Phosphate Dev.	62.7	-	4.9
2968	88	PRC	Railway IV	200.0	-	3.7
1984	89	PRC	Jiangxi Provincial Highway	-	61.0	0.7
1997	89	PRC	Shaanxi Agricultural Dev.	-	106.0	5.8
2009	89	PRC	Integrated Reg. Health	-	52.0	9.2
3006	89	PRC	Ningbo & Shanghai Ports	76.4	-	2.1
3022	89	PRC	Tianjin Light Industry	154.0	-	10.7
3060/2014	89	PRC	Inner Mongolia Railway	70.0	(80.0) (b)	0.8
3066	89	PRC	Hubei Phosphate	137.0	-	13.2
3073/2025	89	PRC	Shandong Prov. Highway	60.0	(50.0) (b)	18.3
2097	90	PRC	Jiangxi Agric. Dev.	-	60.0	0.5
2114	90	PRC	Vocational & Tech. Educ.	-	50.0	2.1
2145	90	PRC	National Afforestation	-	300.0	49.0
2159	90	PRC	Hebei Agricultural Dev.	-	150.0	30.3
2172	91	PRC	Mid-Yangtze Agricultural Dev.	-	64.0	5.7
3265/2182	91	PRC	Rural Credit IV	75.0	200.0	10.0
3274/2186	91	PRC	Rural Indust Tech (SPARK)	50.0	64.3	11.8
3286/2201	91	PRC	Medium-Sized Cities Dev.	79.4	52.9	17.1
2210	91	PRC	Key Studies Development	-	131.2	18.0
2219	91	PRC	Liaoning Urban Infrastructure	-	77.8	7.8
3316/2226	91	PRC	Jiangsu Provl. Transport	100.0	(53.6) (b)	15.9
2242	91	PRC	Henan Agricul. Dev.	-	110.0	44.9
3337/2256	91	PRC	Irrig. Agricul. Intensif.	147.1	187.9	49.4
3387	92	PRC	Ertan Hydroelectric	380.0	-	5.2
2294	92	PRC	Tarim Basin	-	125.0	36.4
2296	92	PRC	Shanghai Metro Transport	-	60.0	13.3
3406	92	PRC	Railways V	330.0	-	45.3
3412/2305	92	PRC	Daquangba Multipurpose	30.0	37.0	8.0
2307	92	PRC	Guangdong ADP	-	162.0	72.8
3415/2312	92	PRC	Beijing Environment	45.0	80.0	69.1
2317	92	PRC	Infectious and Endemic Disease Cont	-	129.6	91.3
3433	92	PRC	Yanshi Thermal Power	180.0	-	14.6
2336	92	PRC	Rural Water Supply and Sanitation	-	110.0	61.3
2339	92	PRC	Educ. Development in Poor Provs.	-	130.0	46.1
3443	92	PRC	Regional Cement Industry	82.7	-	14.7
3462	92	PRC	Zouxian Thermal Power	310.0	-	120.4
3471	92	PRC	Zhejiang Provincial Highway	220.0	-	107.7
2387	92	PRC	Tianjin Urban Devt. & Envir.	-	100.0	65.9
2391	92	PRC	Ship Waste Disposal	-	15.0	16.4
2411	93	PRC	Sichuan Agricultural Devt.	-	147.0	77.2
3515	93	PRC	Shuikou Hydroelectric II	100.0	-	64.4
2423	93	PRC	Financial Sector TA	-	60.0	51.1
3530	93	PRC	Guangdong Provincial Transport	240.0	-	125.5

B. STATEMENT OF IFC INVESTMENTS
(As of December 31, 1995)

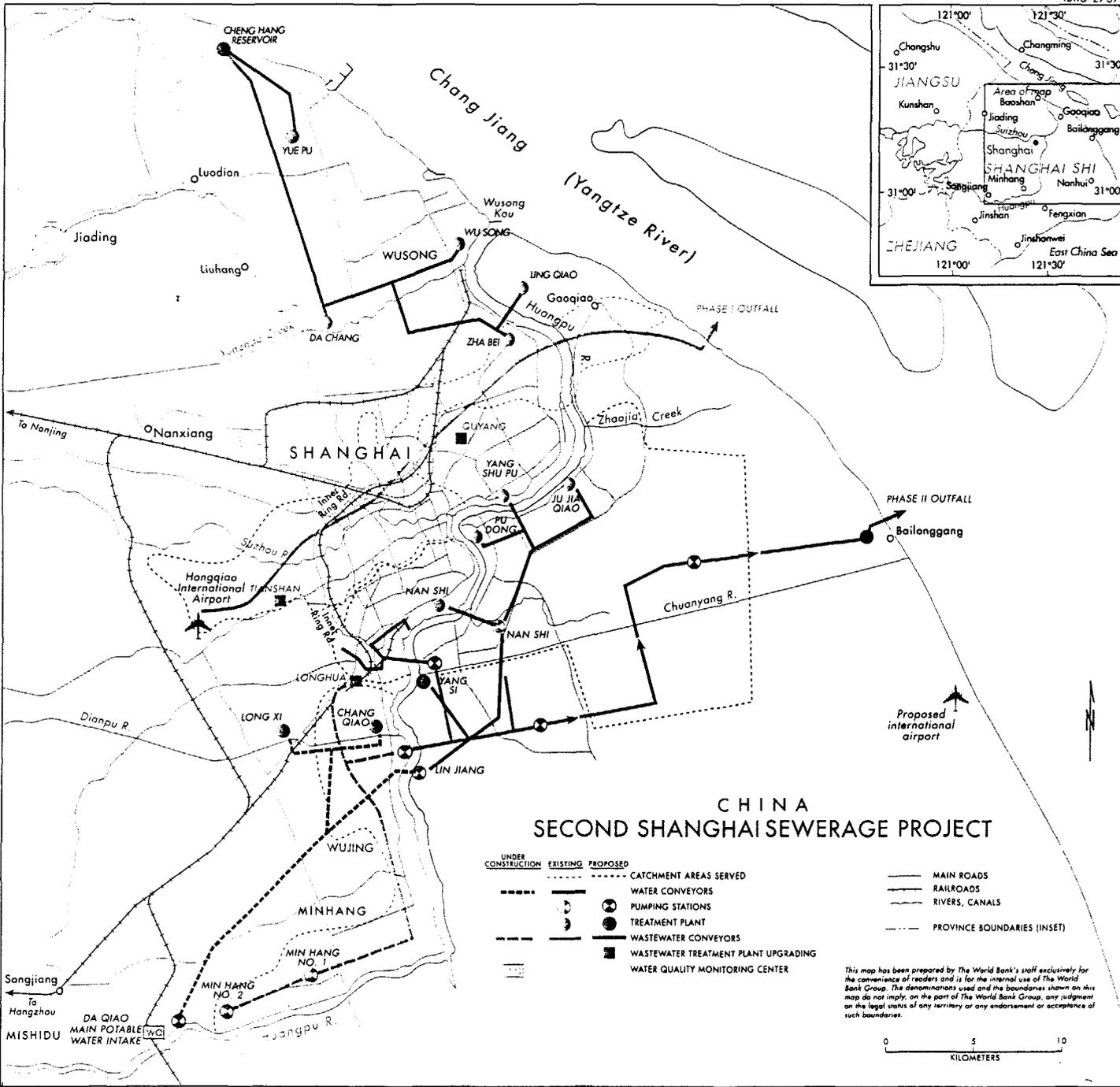
Invest- ment No.	FY	Borrower	Type of Business	Loan -----	Equity (US\$ Million)	Syndicate -----	Total -----
813/2178	85/92	Guangzhou Peugeot Auto	Automobile	15.0	4.5	-	19.5
974	88	China Investment Co.*	Venture Capital	3.0	-	-	3.0
1020	88/ 92/94	Shenzhen China Bicycles Co. Ltd.	Bicycle Manufacture	17.5	3.4	-	20.9
1066	89	Crown Electronics	Manufacturing	15.0	-	-	15.0
1119	89	Shenzhen-YK Solar Energy	Electric Light/Power	2.0	1.0	-	3.0
3423	93	Shenzhen Tai-Yang PCCP	Construction Material	4.0	1.0	-	5.0
3150	93	Yantai Mitsubishi Cement	Cement	28.7	2.0	-	30.7
3746	94	Dalian Glass	Glass	30.5	2.4	30.5	32.9
3881	94	China Walden Investors	Venture Capital	-	7.5	-	7.5
4470	94	Dynamic Growth Fund	Venture Capital	-	20.0	-	20.0
4534	95	Newbridge Investment	Venture Capital	-	10.0	-	10.0
4755	95	Nantong Wanfu (EEL)	Agribusiness	6.9	3.0	8.9	9.9
2853	96	Dupont Suzhou Polyester	Textiles	24.9	3.8	52.0	28.7
4486	96	Plantation Timber Product	Timber, Pulp	10.0	1.0	20.0	11.0
Total Gross Commitments				157.5	59.6	111.4	328.5
Less cancellations, terminations, repayments, write-offs, and sales				53.2	0.0	0.0	53.2
Total Commitments now Held by Syndicates				-	-	-11.2	-11.2
Total Commitments now Held by IFC				104.3	59.6	122.5	286.4
Total Undisbursed				40.5	32.0	66.3	138.8

* Subsequently canceled.

B. STATEMENT OF IFC INVESTMENTS
(As of December 31, 1995)

Invest- ment No.	FY	Borrower	Type of Business	Loan -----	Equity (US\$ Million)	Syndicate -----	Total -----
813/2178	85/92	Guangzhou Peugeot Auto	Automobile	15.0	4.5	-	19.5
974	88	China Investment Co.*	Venture Capital	3.0	-	-	3.0
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1066	89	Crown Electronics	Manufacturing	15.0	-	-	15.0
1119	89	Shenzhen-YK Solar Energy	Electric Light/Power	2.0	1.0	-	3.0
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3746	94	Dalian Glass	Glass	30.5	2.4	30.5	32.9
3881	94	China Walden Investors	Venture Capital	-	7.5	-	7.5
4470	94	Dynamic Growth Fund	Venture Capital	-	20.0	-	20.0
4534	95	Newbridge Investment	Venture Capital	-	10.0	-	10.0
4755	95	Nantong Wanfu (EEL)	Agribusiness	6.9	3.0	8.9	9.9
2853	96	Dupont Suzhou Polyester	Textiles	24.9	3.8	52.0	28.7
4486	96	Plantation Timber Product	Timber, Pulp	10.0	1.0	20.0	11.0
		Total Gross Commitments		157.5	59.6	111.4	328.5
		Less cancellations, terminations, repayments, write-offs, and sales		53.2	0.0	0.0	53.2
		Total Commitments now Held by Syndicates		-	-	-11.2	-11.2
		Total Commitments now Held by IFC		104.3	59.6	122.5	286.4
		Total Undisbursed		40.5	32.0	66.3	138.8

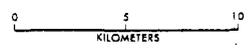
* Subsequently canceled.



CHINA
SECOND SHANGHAI SEWERAGE PROJECT

- | | |
|--|---|
| <p>--- UNDER CONSTRUCTION</p> <p>--- EXISTING</p> <p>--- PROPOSED</p> <p>--- CATCHMENT AREAS SERVED</p> <p>--- WATER CONVEYORS</p> <p>○ PUMPING STATIONS</p> <p>● TREATMENT PLANT</p> <p>■ WASTEWATER CONVEYORS</p> <p>■ WASTEWATER TREATMENT PLANT UPGRADING</p> <p>■ WATER QUALITY MONITORING CENTER</p> | <p>— MAIN ROADS</p> <p>— RAILROADS</p> <p>— RIVERS, CANALS</p> <p>--- PROVINCE BOUNDARIES (INSET)</p> |
|--|---|

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IMAGING

Report No: P- 6697 CHA
Type: MOP