Report and Recommendation of the President to the Board of Directors

Project Number: 44019
October 2012

Proposed Loan
People’s Republic of China: Hubei Huangshi Urban Pollution Control and Environmental Management Project

Asian Development Bank
CURRENCY EQUIVALENTS
(as of 11 October 2012)

Currency unit – yuan (CNY)
CNY1.00 = $0.1589
$1.00 = CNY6.2933

ABBREVIATIONS

ADB – Asian Development Bank
EIRR – economic internal rate of return
FIRR – financial internal rate of return
HMG – Huangshi municipal government
HUCIDC – Huangshi Urban Construction Investment and Development Company
PAM – project administration manual
PMO – project management office
PRC – People’s Republic of China

WEIGHTS AND MEASURES

ha – hectare
m² – square meter
m³ – cubic meter
mu – 666.7 m²
km – kilometer

NOTE

In this report, "$" refers to US dollars.

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1. Design and Monitoring Framework
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### PROJECT AT A GLANCE

**1. Project Name:** Hubei Huangshi Urban Pollution Control and Environmental Management    
**2. Project Number:** 44019

**3. Country:** People's Republic of China

**4. Department/Division:** East Asia Department/Urban and Social Sectors Division

**5. Sector Classification:**

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Primary</th>
<th>Subsectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multisector</td>
<td></td>
<td>Water supply and sanitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste management</td>
</tr>
<tr>
<td>√</td>
<td></td>
<td>Water-based natural resource management</td>
</tr>
</tbody>
</table>

**6. Thematic Classification:**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Primary</th>
<th>Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental sustainability</td>
<td>√</td>
<td>Urban environmental improvement</td>
</tr>
<tr>
<td>Economic growth</td>
<td></td>
<td>Promoting economic efficiency and enabling business environment</td>
</tr>
<tr>
<td>Social development</td>
<td></td>
<td>Human development</td>
</tr>
<tr>
<td>Capacity development</td>
<td></td>
<td>Institutional development</td>
</tr>
</tbody>
</table>

**6a. Climate Change Impact**

- Climate Change adaptation = low
- Climate Change mitigation = low

**6b. Gender Mainstreaming**

- Effective gender mainstreaming (EGM) = √
- Gender equity theme (GEN) =
- No gender elements (NGE) =
- Some gender benefits (SGB) =

**7. Targeting Classification:**

<table>
<thead>
<tr>
<th>General Intervention</th>
<th>Targeted Intervention</th>
<th>8. Location Impact:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Geographic dimensions of inclusive growth</td>
<td>Income poverty at household level</td>
</tr>
<tr>
<td></td>
<td>Millennium development goals</td>
<td>Urban</td>
</tr>
<tr>
<td>√</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**9. Project Risk Categorization:** Complex

**10. Safeguards Categorization:**

| Environment                              | A                     |
| Involuntary resettlement                 | A                     |
| Indigenous peoples                       | C                     |

**11. ADB Financing:**

<table>
<thead>
<tr>
<th>Sovereign/Nonsovereign</th>
<th>Modality</th>
<th>Source</th>
<th>Amount ($ Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sovereign</td>
<td>Project loan</td>
<td>Ordinary capital resources</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

**12. Cofinancing:** None

**13. Counterpart Financing:**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount ($ Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huangshi Municipal Government</td>
<td>50.79</td>
</tr>
<tr>
<td>Communication Bank of China</td>
<td>94.84</td>
</tr>
<tr>
<td>Total</td>
<td>145.63</td>
</tr>
</tbody>
</table>

**14. Aid Effectiveness:**

| Parallel project implementation unit | No |
| Program-based approach              | No |
I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the People’s Republic of China (PRC) for the Hubei Huangshi Urban Pollution Control and Environmental Management Project.¹

2. The project aims to promote environmentally sustainable and socioeconomically inclusive urban development in Huangshi, Hubei Province, by upgrading urban environmental infrastructure and services. The project will support wastewater management, lake rehabilitation, sludge treatment, solid waste management, and related urban environmental services.²

II. THE PROJECT

A. Rationale

3. The project is located in Huangshi, southeastern Hubei Province, 80 kilometers (km) southeast of Wuhan, the provincial capital.³ The city is spread over floodplain on the south bank of the Yangtze River, having developed around three lakes: Cihu, Qingshan, and Qinggang. In 2010, the population of the municipality was 2.43 million, with 765,000 living in the urban area.⁴ Huangshi’s initial development was based on mining, and its associated secondary industries have driven the city’s economic development. Resource depletion and the need for more balanced and sustainable development prompted the Huangshi municipal government (HMG) to renew the city by upgrading its industry, relocating polluting industries outside of the central urban area, and developing tertiary industries and an enabling investment environment. This will help Huangshi strengthen its development potential as a core secondary city in Hubei Province, supporting balanced regional development in the province. Huangshi is a part of the “Wuhan+8 megacity cluster,” which the government promotes as a pilot administrative zone for balanced, environment-friendly economic development within the cluster.

4. Challenges. Huangshi faces environmental and urban development challenges reflecting its historical reliance on heavy industry and inadequate investment in urban infrastructure. General neglect of urban pollution allowed untreated industrial and domestic wastewater to flow into urban lakes. The city's solid waste management is inadequate and the sludge from wastewater treatment plants is untreated. Urban channels and lakes are blocked by polluted sediments and accumulated solid waste. The three lakes in the city became polluted and degraded, endangering public health and safety, particularly for the poor who often live near polluted inland waterways and in areas with deficient urban services. Inadequate urban infrastructure constrains sustainable urban development and limits Huangshi’s ability to promote investment and support balanced regional development in Hubei.

5. Wastewater. An estimated 131,000 cubic meters (m³) of untreated urban wastewater is discharged daily into the city’s three lakes and the Yangtze River.⁵ The project will support the

¹ The design and monitoring framework is in Appendix 1.
³ Huangshi is the 11th largest municipality in Hubei Province by population and 9th by gross domestic product.
⁴ Huangshi municipality has five urban districts (Huangshigang, Tieshan, Xialu, Xisaihshan, and a development zone), one county-level city (Daye), and one county (Yangxin).
⁵ The reported coverage rate of wastewater collection and treatment differs depending on the data source and calculation method. It is 71% based on the ratio of wastewater flowing into existing wastewater treatment plants (167,000 m³ per day) to total wastewater generation in the catchment (234,000 m³ per day). However, this does
rehabilitation and extension of the existing wastewater network system to remove misconnections and intercept urban wastewater more effectively, thereby improving collection efficiency and mitigating pollution loads into water bodies downstream. The project will also support the construction of a new wastewater collection and treatment system to serve the newly developed urban area of Hexi.

6. **Lake.** Water quality in Huangshi’s three lakes is severely polluted, to class V or worse. The lakes are affected by organic pollution, nutrients, and heavy metals. Sediments are highly contaminated with heavy metals, particularly near discharge points into lakes. The project will support an integrated multifunctional approach to lake improvement that removes contaminated sediments, constructs engineered wetlands and lake embankments, and interconnects urban water bodies. These interventions are designed to (i) improve water quality, (ii) restore lake ecology and healthy hydraulic circulation, (iii) improve the lakes’ retention capacity and resilience under climate change, and (iv) enhance public amenity.

7. **Sludge.** The project will tackle the emerging environmental challenge of handling the sludge generated in greater quantities as wastewater collection and treatment expands. At present, untreated sludge is dumped directly to the municipal landfill. While supporting the treatment system for contaminated sludge in the short term, the project will help the HMG develop a mid- and long-term strategic plan to reduce sludge production, stabilize its content, and find beneficial uses for it.

8. **Solid waste.** Challenges facing solid waste management in Huangshi are (i) inefficient collection and transfer facilities, (ii) excessive waste generated without sorting or recycling, and (iii) inadequate disposal capacity for the volume. While the HMG will expand the capacity of disposal facilities to meet future demand, the project will upgrade the existing collection and transfer system to enhance collection efficiency to comply with environmental standards, build new collection and transfer stations to serve an expanded urban area, and pilot a sorting and recycling scheme with community participation to reduce, reuse, and recycle waste.

9. **Strategic fit and lessons learned.** The project will help Huangshi (i) promote environmentally sustainable urban development; (ii) improve living conditions by providing better urban services and a cleaner environment to urban residents, including the poor; and (iii) enhance inclusive socioeconomic growth with expanded tertiary industries, an attractive investment environment, and more employment. By promoting sustainable and environment-friendly urban development, the project aligns with the PRC’s Twelfth Five-Year Plan, 2011–2015 and ADB’s country partnership strategy for the PRC. It promotes economic growth that is environmentally sustainable and inclusive, in line with ADB’s Strategy 2020. It contributes to

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not indicate actual connectivity and collection in Huangshi, where many sewer networks are combined with storm water and misconnection and infiltration are common. A more representative method based on pollution loads indicates a collection rate of 44%.

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6 PRC water quality standards have five classes covering 24 basic quality parameters. Class I is pristine; class II is for high-value fish production areas and spawning habitats; class III is suitable for urban water supply; class IV is suitable for irrigation and recreation; and class V is polluted and not recommended for human consumption or agricultural use.

7 About 250 tons of sewage sludge will be generated daily in 2015, based on the projected increase of wastewater quantity and its pollution loads.

8 Two sampling tests during project preparation found sewage sludge to be contaminated with high concentrations of heavy metals from industry, which limits options for its disposal and reuse. Sludge quality is expected to improve in the long term as a result of the project, which will enable other solutions for disposal and beneficial reuse.


Millennium Development Goal 7 by improving sanitation. It conforms with ADB’s Water Operational Plan, which encourages expanded wastewater management and integrated water resource management. It builds on ADB’s experience and lessons from previous projects in Hubei and other projects for urban development, water resource management, and development in small and medium-sized cities, as well as from knowledge generated in policy-oriented studies on lake rehabilitation and sludge treatment.

10. **Demonstration features.** The project will (i) demonstrate an integrated approach to urban pollution control and environmental management that combines reducing upstream pollution loads by rehabilitating and extending wastewater and solid waste systems with improving downstream water quality by rehabilitating lake ecology and hydraulic circulation, which will significantly improve water quality in the three lakes; (ii) analyze the cumulative impact of pollution loads and modeling of surface water circulation to support the design of the project; and (iii) pilot a scheme for solid waste sorting and recycling with community participation that will show, albeit on a small scale, the reduce–reuse–recycle approach. The pilot scheme will be replicated in other communities in Huangshi. The project also has great potential to become a model of integrated pollution control and ecological rehabilitation applicable to polluted and blocked urban lakes in other small and medium-sized cities along the Yangtze and elsewhere in the PRC.

B. **Impact and Outcome**

11. The impact will be environmentally sustainable and socioeconomically inclusive urban development in Huangshi. The outcome will be improved urban environmental infrastructure and management services in Huangshi.

C. **Outputs**

12. The project will have five outputs:

   (i) **Wastewater collection and treatment.** It will (a) comprehensively survey the urban wastewater network and develop a geographic information system database and online monitoring system for asset management, (b) rehabilitate or construct 33 km of sewer network in the existing urban area, and (c) construct a wastewater treatment plant with a capacity of 30,000 m$^3$ per day, 27 km of sewer network, and two associated pumping stations in the expanded urban area.

   (ii) **Lake rehabilitation and hydraulic circulation restoration.** It will (a) remove 1.55 million m$^3$ of contaminated sediments from the lakes Cihu, Qingshan, and Qinggang; (b) construct two engineered wetlands measuring 20 hectares (ha) each in Cihu; (c) construct 15 km of ecological embankments with 26.3 ha of vegetated buffer strips, 4.5 ha of wetlands, and 63.5 ha of aquatic vegetation;

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and (d) construct two pumping stations and 7.5 km of channels connecting the three lakes and the Yangtze River.

(iii) **Sludge treatment.** It will construct sludge treatment facilities with a capacity of 150 tons per day.

(iv) **Solid waste management.** It will (a) upgrade three existing collection stations and construct 21 new collection and transfer stations; (b) purchase vehicles to collect, transport, and compact waste, as well as rubbish bins; and (c) pilot a sorting and recycling scheme with community participation.

(v) **Capacity development and institutional strengthening.** It will provide (a) support to executing and implementing agencies toward project implementation in line with ADB procedures and guidelines; (b) institutional strengthening in the HMG on urban environmental management services and public awareness campaigns on lake ecosystems, environmental protection, public health, and solid waste sorting and recycling; and (c) technical support to executing and implementing agencies for external resettlement and environmental monitoring.

### D. Investment and Financing Plans

13. The project is estimated to cost $245.63 million (Table 1).

#### Table 1: Project Investment Plan ($ million)

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Base Cost</strong></td>
<td></td>
</tr>
<tr>
<td>1. Wastewater collection and treatment</td>
<td>44.57</td>
</tr>
<tr>
<td>2. Lake rehabilitation and hydraulic circulation restoration</td>
<td>121.75</td>
</tr>
<tr>
<td>3. Sludge treatment</td>
<td>5.20</td>
</tr>
<tr>
<td>4. Solid waste management</td>
<td>21.32</td>
</tr>
<tr>
<td>5. Capacity development and institutional strengthening</td>
<td>3.04</td>
</tr>
<tr>
<td><strong>Subtotal (A)</strong></td>
<td><strong>195.87</strong></td>
</tr>
<tr>
<td><strong>B. Contingencies</strong></td>
<td><strong>32.02</strong></td>
</tr>
<tr>
<td><strong>C. Financing Charges During Implementation</strong></td>
<td><strong>17.74</strong></td>
</tr>
<tr>
<td><strong>Total (A+B+C)</strong></td>
<td><strong>245.63</strong></td>
</tr>
</tbody>
</table>

Note: Numbers may not sum precisely because of rounding.

a Includes taxes and duties of $16.8 million, $8.5 million to be financed by government and $8.3 million using ADB resources. The following principles were followed in determining the amount of taxes and duties to be financed by ADB: (i) the amount is within reasonable country thresholds, (ii) the amount does not represent an excessive share of the project investment plan, (iii) taxes and duties apply only to ADB-financed expenditures, and (iv) the financing of the taxes and duties is material and relevant to the success of the project.

b In mid-2011 prices.

c Physical contingencies are computed at 10%. Price contingencies are computed at 0% for 2012, 0.3% for 2013, and 0.5% thereafter on foreign exchange costs and at 4.2% for 2012, 4.0% for 2013, and 3.8% thereafter on local currency costs. Contingencies include provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

d Includes interest and commitment charges. Interest during construction for the ADB loan has been computed at the 5-year forward London interbank offered rate plus a spread of 0.4% and maturity premium of 0.1%. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount. Interest during construction for the domestic bank loan from the Communication Bank of China is computed at 7.05% per year.

Source: Asian Development Bank estimates.

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15 Detailed cost estimates are in the Project Administration Manual (accessible from the list of linked documents in Appendix 2).
14. The government has requested a loan of $100 million from ADB’s ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB’s London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan and project agreements. The loan will finance 40.7% of the project cost, including works, goods, and consulting services and training. The loan will also finance taxes and duties for eligible ADB-financed expenditures, and transportation and insurance costs. The HMG will provide counterpart funding equivalent to $50.79 million, which will finance 20.7% of the project cost. It has also requested a loan of about $94.84 million from the Communication Bank of China to cover 38.6% of the project cost. The domestic bank loan will have a 6-year term and an interest rate of 7.05% per year.

15. The financing plan is in Table 2. The PRC is the borrower of the loan. The PRC will re lend the entire loan to the Hubei provincial government, which will on lend the loan proceeds to the HMG on the same terms and conditions as those of the ADB loan. As the end-borrower, the HMG will assume foreign exchange and interest rate variation risks for the ADB loan. The PRC, Hubei provincial government and the HMG have assured ADB that counterpart funding and domestic bank loan proceeds will be provided in a timely manner, including any additional counterpart funding required for any shortfall of funds or cost overruns.

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount ($ million)</th>
<th>Share of Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian Development Bank</td>
<td>100.00</td>
<td>40.70</td>
</tr>
<tr>
<td>Communication Bank of China</td>
<td>94.84</td>
<td>38.60</td>
</tr>
<tr>
<td>Huangshi municipal government</td>
<td>50.79</td>
<td>20.70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>245.63</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Source: Asian Development Bank estimates.

E. Implementation Arrangements

16. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual (PAM).

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation period</td>
<td>January 2013–December 2017</td>
</tr>
<tr>
<td>Estimated completion date</td>
<td>31 December 2017 ((loan closing date 30 June 2018))</td>
</tr>
<tr>
<td>Management (i) Oversight body</td>
<td>Project leading group (policy guidance during preparation and implementation) Mayor of Huangshi (chair) Huangshi Development and Reform Commission, Huangshi Finance Bureau, Huangshi Transportation Bureau, Huangshi Planning Bureau, Huangshi Construction Commission, Huangshi Management Bureau, Huangshi Environmental Protection Bureau, Huangshi Land Resources Bureau, Huangshi Gardening Bureau, Huangshi Water Resources Bureau, Huangshi Public Utilities Bureau, HUCIDC, Huangshi Civil Affairs Bureau, Huangshi</td>
</tr>
</tbody>
</table>

16 The interest includes a maturity premium of 10 basis points. This is based on the loan terms above and the government’s choice of repayment option and dates.

17 PAM (accessible from the list of linked documents in Appendix 2).
<table>
<thead>
<tr>
<th>Aspects</th>
<th>Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ii) Executing agency</td>
<td>HMG (overall project implementation, including finance and administration, technical and procurement matters, monitoring and evaluation, and safeguard compliance)</td>
</tr>
<tr>
<td>(iii) Implementing agency</td>
<td>HUCIDC (day-to-day project implementation of all infrastructure components, to be supported by a tendering agent)</td>
</tr>
<tr>
<td>(iv) Implementation unit</td>
<td>Project management office in the HMG, with 15 proposed staff, to be supported by project implementation consultants.</td>
</tr>
<tr>
<td>Procurement</td>
<td>International competitive bidding 10 contracts $83.6 million National competitive bidding 18 contracts $100.0 million Consulting services Quality- and cost-based selection 230 person-months $3.9 million Consultants’ qualifications selection 28 person-months $0.4 million Individual consultant selection 10 person-months $0.1 million Retroactive financing and advance contracting 7 works, 3 goods, and 8 consulting services will be procured through advance contracting. Retroactive financing will finance eligible expenditures up to $20 million (not exceeding 20% of the ADB loan) incurred for works, goods, and consulting services before loan effectiveness, but not earlier than 12 months before the loan agreement is signed. Disbursement The loan proceeds will be disbursed in accordance with ADB’s Loan Disbursement Handbook (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.</td>
</tr>
</tbody>
</table>


### III. DUE DILIGENCE

17. The project will benefit 765,000 urban residents in Huangshi, improving environmental and socioeconomic conditions by (i) reducing pollution and improving the management of surface water bodies, (ii) expanding and improving urban services for wastewater, sludge, and solid waste, (iii) making the urban environment more environmentally and ecologically friendly, and (iv) improving the investment environment and employment.

#### A. Technical

18. Project design accommodates local conditions and accords with PRC design guidelines and local regulations. Moderate design for wastewater and sludge treatment and for solid waste transfer suit the natural environment and are adequate to attract market competition. Lake rehabilitation is well integrated and sequenced with other project components. Detailed engineering design will comply with up-to-date urban design standards and specifications and adopt international best practices. A capacity-building program for related urban services is included in the project. A detailed description of components is in the PAM.

#### B. Economic and Financial

19. Economic. The economic analysis evaluated technical options and confirmed that project components use least-cost options to support Huangshi’s long-term urban development plans. Cost–benefit analysis reveals the project’s overall economic internal rate of return (EIRR) at 12.6% and the overall economic net present value at CNY45.2 million. The EIRR for each
component is computed at 12.5% for wastewater, 12.2% for lake rehabilitation and hydraulic circulation, 22.1% for sludge, and 15.2% for solid waste, each exceeding the economic opportunity cost of capital of 12.0%. The project is sensitive to changes in either costs or benefits, as switching values show the project remaining viable only with a 4.0% cost increase or a 3.9% benefit decrease. However, all EIRRs are considered substantially underestimated, as all project components have significant benefits not easily quantified. Economic costs include capital costs for five components, physical contingencies, and operation and maintenance costs. Economic benefits are largely based on estimates of willingness-to-pay as derived from the contingent valuation survey conducted during project preparation.

20. **Financial.** The analysis of the financial viability of revenue-generating components—wastewater, sludge, and solid waste—finds a financial internal rate of return (FIRR) for the combined wastewater and sludge components at 2.9% and for the solid waste component at 3.2%, which compares favorably with the 1.9% weighted average costs of capital. A tariff increase is proposed for both wastewater and solid waste to recover operation and maintenance costs and debt servicing by 2020. The analysis of existing tariffs and cost-recovery arrangements shows full cost recovery to be unrealistic in the short term without government subsidy. However, the project will facilitate progressive tariff increases through the capacity-development component, following the PRC process for public participation in water tariff reform. Sensitivity analysis indicates that the FIRR for wastewater and sludge is generally robust but sensitive to revenue decrease, and the FIRR for solid waste robust to adverse changes. The wastewater tariff will equal 0.5% of an average household’s income, and the solid waste tariff 0.2%, or 1.5% and 0.5% of a poor household’s income—far below the benchmark of 4.0%. The proposed tariff increase is within the amount beneficiaries are willing to pay. Financial sustainability analysis indicates that the HMG presents acceptable fiscal risk regarding its ability to provide counterpart funds and service project debts. Its contributions to the project will be less than 0.5% of its fiscal revenue over the project construction period, and debt service will not exceed 1.1% of fiscal revenue during the operation period. The nonrevenue-generating component—river rehabilitation—is therefore considered both financially sustainable and affordable.

C. **Governance**

21. ADB’s Anticorruption Policy (1998, as amended to date) was explained to and discussed with the Hubei provincial government, the HMG, and Huangshi Urban Construction Investment and Development Company (HUCIDC). Specific policy requirements and supplementary measures are described in the PAM, including providing support and training on ADB policies and procedures, engaging a tendering agent and project implementation consultant to strengthen procurement, and involving the Huangshi Discipline Investigation Bureau in procurement. The financial management assessment concludes that, although the project management office (PMO) and HUCIDC have sufficient financial management capacity and project management experience, they lack sufficient experience in managing ADB projects and require a component to build their capacity to implement the project in line with ADB policies and procedures.

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18 The use of dredged materials and increased economic activity and employment from the project are not counted in economic analysis. Improved water quality and urban environment are probably not fully reflected in the willingness-to-pay survey because of their intangibility.

19 Additional benefits from the tertiary treatment of wastewater and primary treatment of storm water by engineered wetlands were quantified and added into the lake rehabilitation and hydraulic circulation component.
D. Poverty and Social

22. Poverty and social assessment during project preparation included a household survey, community and focus group discussions, and key informant interviews. The project will directly benefit over 765,000 urban residents, of whom 4.7% are poor, by improving living conditions, urban services, public health, and the urban environment. The poor in particular will benefit from the improved wastewater and solid waste services and lake environment as they tend to live in areas with deficient urban services. The project will create 1,823 jobs during construction and 593 jobs during operation. Employment targets for vulnerable groups and women are included in the design and monitoring framework and loan covenants. A social development action plan has been prepared and will be implemented by the HMG and HUCIDC. A labor reemployment plan for sanitation workers affected by the mechanization of solid waste management and its transfer from the HMG to local companies has been prepared with extensive consultation. It is supported by a loan covenant and will be implemented by the HMG.

23. The project is classified as effective gender mainstreaming, and a gender action plan has been prepared with agreed activities and indicators. The analysis of the social survey and focus group discussions reveals that women are primarily responsible for disposing of domestic wastewater and solid waste, paying utility bills, and caring for the sick and elderly. Improving sanitary conditions through more effective wastewater, sludge, and solid waste management will benefit women through improved productivity and reduced illness, with its associated time and cost burdens. The improved lake environment and green space will provide recreational areas for women and children. Women’s participation in (i) public consultations for strategic planning and facility design, (ii) public awareness activities for environmental protection and public health, (iii) public hearings on wastewater and solid waste tariff increases, and (iv) pilot solid waste sorting and recycling will strengthen the activities and enhance project sustainability, as women are directly affected. The gender action plan has targets for women’s employment, participation, and capacity building supported by loan covenants and consulting support for implementation and monitoring.

E. Safeguards

24. Environment. The project is environment category A, the classification mainly triggered by the lake rehabilitation and hydraulic circulation component. An environmental impact assessment—prepared in compliance with ADB’s Safeguard Policy Statement (2009), circulated to ADB’s Board of Directors, and posted on the ADB website—concluded that the project would have substantial environmental benefits and that its potential adverse environmental impacts could be mitigated through the environmental management plan. Significant environmental benefits are (i) improved water quality in the three lakes in terms of organic pollutants and nutrient levels, (ii) restored lake ecology, and (iii) improved sanitation and public health through the improved and expanded management of urban wastewater, sludge, and solid waste.

25. Major potential environment issues relate to (i) lake sediment dredging, noise and air pollution, surface water pollution, and occupational and community health and safety during construction; (ii) noise and air quality impacts from solid waste transfer stations, wastewater and sludge treatment facilities, and pumping stations at some sensitive areas during operation; (iii) possible impacts on the Yangtze River from the discharge of effluent from the wastewater treatment plant; and (iv) health and safety concerns during the operation of wastewater and

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20 The resettlement plan includes the labor reemployment plan and will be monitored by an external monitor.
sludge treatment plants and solid waste transfer stations. Mitigation to reduce these impacts will, as spelled out in the environmental management plan, reduce and control the contamination of the aquatic ecosystem with sediments, adopt performance standards for dredging, and regularly monitor the project’s environmental performance during construction and operation. The Huangshi Environmental Protection Bureau will guide and monitor the PMO, HUCIDC, and contractors in implementing the plan. Environmental management is supported by loan covenants and capacity development under the project. The HMG disclosed relevant environmental information to affected people, and the results and findings of the consultation were used to modify the environmental impact assessment and project design. Consultation and public participation will continue throughout project implementation, and any environmental complaints or disputes will be handled in accordance with the grievance redress mechanism established for the project.

26. **Resettlement.** The project is resettlement category A. It will affect 5 districts, 11 towns, and 26 villages and communities of Huangshi city. A total of 898 *mu* of land will be permanently acquired, including 309 *mu* of collective land and 589 *mu* of state-owned land. A further 1,450 *mu* will be temporarily occupied during project implementation. Land acquisition will affect 193 households with 766 persons. A total of 44,050 square meters (m²) of residences and 8,208 m² of nonresidential structures will be demolished, affecting 228 households with 853 persons and three enterprises with 26 employees. A resettlement plan prepared in line with ADB’s Safeguard Policy Statement (2009) and endorsed by the HMG, was disclosed to affected people in the local language. The resettlement plan will be finalized in line with the detailed engineering design and detailed measurement survey, disclosed to affected people in the local language, and submitted to ADB for approval prior to the awarding of civil works contracts. Compensation for lost assets and resettlement allowances will be paid to affected people, and livelihood rehabilitation will be arranged in accordance with the resettlement plan prior to the commencement of the related civil works. The PMO and HUCIDC will assume responsibility for planning, implementing, financing, and reporting on land acquisition and resettlement. A grievance redress mechanism was established.

27. **Indigenous peoples.** The project is indigenous peoples category C. In Huangshi, ethnic minorities represent about 0.1% of the total population. They are socially and economically well integrated and do not congregate in any particular residential area. No ethnic minorities are affected by land acquisition and resettlement.

F. **Risks and Mitigating Measures**

28. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan. The project has no unusual technical risks. The project’s integrated benefits and impacts are expected to outweigh costs and risks.

**Table 4: Summary of Risks and Mitigating Measures**

<table>
<thead>
<tr>
<th>Risks</th>
<th>Mitigating Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation delays due to the limited experience of the project management office and HUCIDC in projects financed by multilateral</td>
<td>Early mobilization of a tendering agent and implementation consultants to provide technical support in procurement, contract management, disbursement, and financial management</td>
</tr>
</tbody>
</table>

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21 A *mu* is a Chinese unit of measurement (1 *mu* = 666.67 m²).
22 In addition, a resettlement due diligence report was prepared for five existing wastewater treatment plants associated with the project.
23 Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).
<table>
<thead>
<tr>
<th>Risks</th>
<th>Mitigating Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>agencies</td>
<td>Training on ADB guidelines and procedures</td>
</tr>
<tr>
<td>Underachievement of wastewater collection efficiency due to delay in other government projects</td>
<td>Implementation of works after the comprehensive network survey Assurances on synchronized implementation under the project and other government projects, and regular reporting on progress</td>
</tr>
<tr>
<td>Weak coordination and synchronization between agencies</td>
<td>Coordination mechanism between agencies Close project monitoring, frequent site inspections, and regular coordination meetings Coordination support from implementation consultants</td>
</tr>
<tr>
<td>Delay in land acquisition approvals and implementation</td>
<td>Expeditious implementation of detailed design and detailed measurement surveys, and finalization of the resettlement plan Early availability of compensation funding for affected people Strict operational compliance with the resettlement plan</td>
</tr>
<tr>
<td>Unsustainable operation and maintenance of infrastructure components for lack of capacity or budget, and delay in tariff increase</td>
<td>Support for management improvement such as wastewater asset management and online monitoring system Capacity building and institutional strengthening support Assurances on operation and maintenance budget provisions and tariff increase for cost recovery Support for annual tariff reviews and public awareness program</td>
</tr>
</tbody>
</table>

ADB = Asian Development Bank, HUCIDC = Huangshi Urban Construction and Investment Development Company.

IV. ASSURANCES

29. The government has assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents. The government has also agreed with ADB on certain covenants for the project, which are set forth in the loan and project agreements.

V. RECOMMENDATION

30. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $100,000,000 to the People’s Republic of China for the Hubei Huangshi Urban Pollution Control and Environmental Management Project, from ADB’s ordinary capital resources, with interest to be determined in accordance with ADB’s London interbank offered rate (LIBOR)-based lending facility; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Haruhiko Kuroda
President
23 October 2012
## DESIGN AND MONITORING FRAMEWORK

<table>
<thead>
<tr>
<th>Design Summary</th>
<th>Performance Targets and Indicators with Baselines</th>
<th>Data Sources and Reporting Mechanisms</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact</strong></td>
<td>By 2020 (baseline 2010) Water quality is improved from class V to class IV in the lakes Cihu, Qingshan, and Qinggang for organic pollutants. Average annual per capita income of urban households is increased by 10% per annum from CNY15,460. Unemployment is reduced by 0.2% and maintained at no more than 5.0%.</td>
<td>Annual environmental monitoring report of the Huangshi Environmental Protection Bureau Annual statistics from the Huangshi Statistics Bureau</td>
<td>Environmental protection plan and other urban plans under the Twelfth Five-Year Plan are effectively implemented as scheduled.</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>By 2018 (baseline 2010) In Cihu, average annual discharge of chemical oxygen demand is reduced from 6,300 tons to 3,400 tons and discharge of phosphorus is reduced from 120 tons to 70 tons. Wastewater collection coverage is increased from 71% to 85%, and the collection rate is increased from 44% to 80%. Sewage sludge treatment is increased from 0% to 100%. Solid waste collection is increased from 79% to 95%. 1,823 jobs are created during project implementation, and 593 jobs during operation, with 30% targeted for women and 30% for the poor.</td>
<td>Annual environmental monitoring report of the Huangshi Environmental Protection Bureau Annual report of the Huangshi Public Utilities Bureau Annual report of the Huangshi Municipal Management Bureau PCC issued by the Huangshi MCC</td>
<td>Government commitment and support for infrastructure development continues. Applicable national and local environmental laws are effectively enforced. 100 tons/day of sewage sludge is treated in the Huaxin cement factory.</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>By 2017 (baseline 2010) 700 km of urban wastewater network is surveyed, and the geographic information system database and online monitoring system are developed. 33 km of new and rehabilitated sewers are operating in the existing urban area.</td>
<td>PCC issued by the Huangshi MCC</td>
<td>Actual development in Hexi is in line with city master plan.</td>
</tr>
</tbody>
</table>

### Assumptions
- Environmentally sustainable and socioeconomically inclusive urban development in Huangshi
- Annual environmental monitoring report of the Huangshi Environmental Protection Bureau
- Environmental protection plan and other urban plans under the Twelfth Five-Year Plan are effectively implemented as scheduled.
- Annual statistics from the Huangshi Statistics Bureau
- Government commitment and support for infrastructure development continues.
- Applicable national and local environmental laws are effectively enforced.
- 100 tons/day of sewage sludge is treated in the Huaxin cement factory.
- Wastewater network rehabilitation and extension works financed by other government projects are delayed.
- Project facilities are not sustainably operated and maintained.

### Risks
- Agency coordination is lacking on monitoring environmental protection and management.
- Wastewater network rehabilitation and extension works financed by other government projects are delayed.
- Project facilities are not sustainably operated and maintained.
- Limitied experience of the
<table>
<thead>
<tr>
<th>Design Summary</th>
<th>Performance Targets and Indicators with Baselines</th>
<th>Data Sources and Reporting Mechanisms</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A new wastewater treatment plant with a capacity of 30,000 m$^3$ per day, 27 km of sewers, and two associated pumping stations are operating in the expanded urban area of Hexi. At least 30% of participants in public hearings on wastewater tariff increases are women.</td>
<td>PCC issued by the Huangshi MCC</td>
<td>project management office and HUCIDC in projects financed by multilateral agencies delays project implementation.</td>
<td></td>
</tr>
<tr>
<td>2. Lakes rehabilitated and hydraulic circulation restored</td>
<td>1.55 million m$^3$ of contaminated sediments are removed from the three lakes. 15 km of ecological lake embankments are established. 40 ha of engineered wetlands are operating. Two pumping stations and 7.5 km of channels connecting the three lakes and the Yangtze River are operating.</td>
<td>PCC issued by the Huangshi MCC</td>
<td>Assumption Lake rehabilitation works are implemented in proper sequence considering the interrelated effects of each subcomponent.</td>
</tr>
<tr>
<td>3. Sludge treatment system operating</td>
<td>Sludge treatment facilities with a capacity of 150 tons per day are operating.</td>
<td>PCC issued by the Huangshi MCC</td>
<td>Assumption The quantity and quality of sewage sludge generated from wastewater treatment plants do not significantly change during the project period.</td>
</tr>
<tr>
<td>4. Solid waste collection and transfer facilities operating</td>
<td>21 new and 3 rehabilitated solid waste collection and transfer stations are operating. A pilot sorting and recycling system in Yaguang community operates with community participation. At least 50% of participants in the solid waste sorting pilot are women.</td>
<td>PCC issued by the Huangshi MCC</td>
<td>Assumption Community participation is active as foreseen. Risk Land acquisition and resettlement approvals and implementation are delayed.</td>
</tr>
<tr>
<td>5. Capacity developed and institutions strengthened</td>
<td>15 training workshops are held and 75 staff are trained, with 30% female participation. 20 public awareness campaigns are held, with 30% female participation.</td>
<td>PCC issued by the Huangshi MCC</td>
<td>Assumption Relevant authorities provide strong support for capacity development. Loan implementation consultants are recruited in a timely manner.</td>
</tr>
</tbody>
</table>

### Activities with Milestones

1. **Wastewater Collection and Treatment**
   1.1 Undertake wastewater network survey by Q4 2013.
   1.2 Develop geographic information system for sewerage system by Q2 2014.

### Inputs
Activities with Milestones

1.3 Undertake detailed design and engineering by Q3 2014.
1.4 Acquire land and implement resettlement by Q4 2014.
1.5 Procure works and goods by Q1 2015.
1.6 Construct and commission the project facilities by Q2 2017.

2. Lake Rehabilitation and Hydraulic Circulation Restoration
2.1 Undertake detailed design and engineering by Q3 2015.
2.2 Acquire land and implement resettlement by Q4 2015.
2.3 Procure works and goods by Q4 2015.
2.4 Dredge sediments from 3 lakes by Q1 2017.
2.5 Construct and commission project facilities by Q3 2017.

3. Sludge Treatment
3.1 Undertake detailed design and engineering by Q2 2013.
3.2 Procure works and goods by Q1 2014.
3.3 Construct and commission the project facilities by Q2 2015.

4. Solid Waste Management
4.1 Complete detailed design and engineering by Q1 2015.
4.2 Acquire land and implement resettlement by Q3 2015.
4.3 Procure works and goods by Q3 2015.
4.4 Construct and commission the project facilities by Q1 2017.
4.5 Operate community-based pilot sorting and recycling scheme in Yaguang community by 2017.

5. Capacity Development and Institutional Strengthening
5.1 Complete organizational arrangements for executing and implementing agencies and the project management office by Q1 2013.
5.2 Recruit and mobilize implementation support consultants by Q3 2013.
5.3 Refine the project performance management system and establish targets and procedures by Q4 2013.
5.4 Develop wastewater strategic plan and asset management system, pollution control program, integrated water resources management and environmental monitoring plan, strategic sludge treatment and disposal plan, strategic solid waste management plan by Q4 2016.
5.5 Undertake training on ADB procedures and capacity development programs until Q4 2017.
5.6 Implement environmental monitoring plan, resettlement plan, social and gender action plans, and labor reemployment plan, and conduct safeguards monitoring until Q4 2017.
5.7 Conduct public awareness campaign on environmental protection, public health, the reduce–reuse–recycle approach to solid waste management, and the lake ecosystem until Q4 2017.
5.8 Conduct project-specific surveys to measure results for the midterm review in 2015 and project completion in 2017.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Amount ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADB: $100 million</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Item</strong></td>
<td><strong>Amount</strong></td>
</tr>
<tr>
<td>Investment cost</td>
<td>100.00</td>
</tr>
<tr>
<td>Contingencies</td>
<td>0.00</td>
</tr>
<tr>
<td>Financing charges during implementation</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Huangshi Municipal Government: $50.79 million**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment cost</td>
<td>32.96</td>
</tr>
<tr>
<td>Contingencies</td>
<td>0.09</td>
</tr>
<tr>
<td>Financing charges during implementation</td>
<td>17.74</td>
</tr>
<tr>
<td>Total</td>
<td>50.79</td>
</tr>
</tbody>
</table>

**Communication Bank of China: $94.84 million**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment cost</td>
<td>62.92</td>
</tr>
<tr>
<td>Contingencies</td>
<td>31.92</td>
</tr>
<tr>
<td>Financing charges during implementation</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>94.84</td>
</tr>
</tbody>
</table>

ADB = Asian Development Bank, ha = hectare, HMG = Huangshi municipal government, HUCIDC = Huangshi Urban Construction Investment and Development Company, MCC = municipal construction commission, m³ = cubic meter, PCC = project completion certificate, PRC = People’s Republic of China.

LIST OF LINKED DOCUMENTS

1. Loan Agreement
2. Project Agreement
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Gender Action Plan
12. Environmental Impact Assessment
13. Resettlement Plan
14. Risk Assessment and Risk Management Plan