

**PROJECT INFORMATION DOCUMENT (PID)  
APPRAISAL STAGE**

Report No.: PIDA33044

<b>Project Name</b>	Zhuzhou Brownfield Remediation Project (P147381)
<b>Region</b>	EAST ASIA AND PACIFIC
<b>Country</b>	China
<b>Sector(s)</b>	General industry and trade sector (50%), General agriculture, fishing and forestry sector (20%), Solid waste management (30%)
<b>Theme(s)</b>	Pollution management and environmental health (70%), Urban Economic Development (20%), Environmental policies and institutions (10%)
<b>Lending Instrument</b>	Investment Project Financing
<b>Project ID</b>	P147381
<b>Borrower(s)</b>	People's Republic of China
<b>Implementing Agency</b>	Zhuzhou PMO
<b>Environmental Category</b>	A-Full Assessment
<b>Date PID Prepared/Updated</b>	15-Oct-2015
<b>Date PID Approved/Disclosed</b>	16-Oct-2015
<b>Estimated Date of Appraisal Completion</b>	16-Nov-2015
<b>Estimated Date of Board Approval</b>	15-Dec-2015
<b>Appraisal Review Decision (from Decision Note)</b>	

**I. Project Context**

**Country Context**

1. China's socio-economic development since the 1980s has been remarkable, making the country the second largest economy in the world. However, China's growth has been capital and resource-intensive with significant environmental consequences. To achieve a more sustainable growth going forward, China faces a tough challenge in shifting the economy onto a more balanced path, which requires the country to address among other strategic issues, natural resource depletion and environmental degradation. These topics are placed high on the government's agenda.

2. China's industrialization and modernization process started in the 1950s and has left a legacy of vast contaminated sites, often referred to as "brownfields". Contaminated brownfields pose two categories of problems: firstly, pollutants in soil, water, groundwater and disposed waste cause environmental and public health risks; and secondly, they form obstacles to urban and local economic development. In the past decade, industrial restructuring, urban upgrading, and rising environmental awareness have made brownfield remediation and redevelopment increasingly an

urgent need for China. Thousands of old industrial polluting enterprises have been shut down, their production suspended, or their facilities relocated out of urban areas due to cities' needs for building modern and greener metropolises, meeting public demand for a cleaner environment, and obtaining land for high-return development. In recent years, the Chinese government has begun to take actions to remediate brownfields to improve environmental and public health conditions and support sustainable urban development.

### **Sectoral and institutional Context**

3. Zhuzhou Municipality is located at the mid-low reach of the Xiang River in the eastern part of China's Hunan Province. It has a population of 3.99 million, with an urban population of 2.37 million, a GDP of RMB 19.48 billion, and a public fiscal revenue of RMB26.4 billion in 2014. The city was one of the eight heavy industry bases developed since the First Five-Year Period of the Peoples Republic of China in the 1950s. Its industrial zone Qingshuitang has held major national industries and has been exposed to industrial emissions since then, particularly from nonferrous metallurgical and chemical activities. Environmental site surveys show that heavy metal pollution is the major environmental issue in the area. This poses both environmental and development concerns, since the Qingshuitang area is lying in the heart of the Zhuzhou build-up area and the Changsha-Zhuzhou-Xiangtan city cluster, and neighboring the largest rail transport hub in mid-south China is a strategic location with strong opportunities for economic development.

4. Since 2007, the central government has launched several national programs to promote industrial restructuring, the "circular" (resource efficient) economy and contaminated land remediation, including in the Qingshuitang Industrial Zone (QIZ). These programs intend to tackle the environmental, social and economic issues posed by older industries and contaminated industrial sites by providing policy incentives or direct financing, including state level grant funding. In 2011, the State Council approved the Implementation Plan for Heavy Metal Contamination in Xiang River Basin, which listed the QIZ as a priority remediation area. Under this plan, registered remediation projects are eligible to receive partial financial support from the central and provincial governments. In response, the Zhuzhou municipal government has under the Zhuzhou Recycling Economic Investment & Development Group Co., Ltd. (ZREIDC) initiated several small scale remediation activities in QIZ.

5. While the management of contaminated sites has gained momentum in QIZ, several challenges remain in dealing with the often complicated and costly brownfield remediation activities. China has adopted a risk-based approach for brownfield remediation, which is widely accepted in most countries. Risk-based approaches tailor remediation interventions to control potential current and future exposure risks that are posed by contaminants in soils and groundwater to human health and the environment, rather than merely removing or reducing pollutants to reach pre-set limits. These approaches can substantially reduce costs compared to traditional concepts (often based on "excavate and remove") but require comprehensive information on site contamination, exposure paths between contamination and the public, applicable remediation techniques, proper monitoring and oversight schemes, and very importantly, strategic land use and urban development plans that allow for certain flexibility to respond to changing conditions. Yet, in QIZ and elsewhere in China, capacity and experiences on managing brownfield remediation in such an integrated manner are lacking.

6. Brownfield remediation and redevelopment encompass a range of issues that necessitate

broad stakeholder and public engagement. The QIZ currently contributes to a considerable portion of Zhuzhou's industrial GDP. Its core area that has a mix of land uses and holds a majority of QIZ's industrial enterprises, has been earmarked for redevelopment. Aligning differing interests and defining responsibilities and rights among government agencies, enterprises and the public, are critical for achieving remediation and redevelopment objectives. A transparent decision making process is essential to reach consensus among stakeholders and overcome various obstacles in the brownfield restoration and redevelopment process.

7. China's brownfield management is characterized by the fact that often land contamination is caused by state-owned enterprises. As such, there is a greater responsibility on central and local governments to finance remediation efforts. The Zhuzhou Municipality has built a leading agency (Zhuzhou Recycling Economic Investment & Development Group Co., Ltd., ZREIDC) and obtained funds from central and provincial governments for brownfield remediation in QIZ. Nevertheless, there are still considerable financing gaps to fill. Without compromising the objective of protecting human health and environmental quality for the future, adequate funds have to be secured to support a well-designed remediation program that applies to the most cost-effective and best-suited remediation techniques. This concept and further investigating sustainable financing mechanism for brownfield remediation should draw upon good international experiences.

8. The strategy of the government is to make use of a World Bank loan and mobilize international know-how for risk-based brownfield remediation of QIZ's core area. A strategic planning for the core area has been in place, which foresees redevelopment of the area with mixed industrial, commercial and residential land uses. An 8.48 km<sup>2</sup> portion of the core area was selected as the project area because some large industries, such as a major lead-zinc smelter complex will probably remain active in the core area during the next decade. The government expects that the project will bring international best practices in the remediation of brownfields, which can be replicated in other parts of QIZ and elsewhere in China.

9. During project preparation, extensive environmental site investigation and risk assessment for the project area were carried out following national technical guidelines as well as internationally acknowledged tools and data sources developed by USEPA and ASTM. The project area has a mix of land uses and has been exposed to industrial pollution since 1950's. The analysis results indicate the exposure paths have been airborne emissions, waste disposal, and wastewater discharge. The primary pollutants of concerns are heavy metals including Pb, As and Cd, with depth of contamination up to 50cm (some locations over 60cm) in soils, pond and channel sediments and waste piles. Some localized groundwater contamination were detected as well.

10. Based on the site investigation results and planned land uses, with the main objective of protecting human health, the risk levels were calculated. As result, the project area is categorized into 3 parts, i.e. 2.02 km<sup>2</sup> risk acceptable area, 3.73 km<sup>2</sup> risk controllable area, and 2.73 km<sup>2</sup> remediation area that presents unacceptable risk levels and requires immediate remediation actions. A set of cleanup and remediation actions were designed, including various in-situ and off-site technologies, reuse of materials and post-cleanup rehabilitation. Treatment facilities will be used to treat sediments, contaminated soils and industrial solid wastes. A landfill will be built on an abandoned quarry in the project area will be built for receiving treated residues and structure demolition wastes. The remediation technologies and treatment/disposal works were selected through careful alternative analysis, tailored to site specific contamination risk levels, land use plan and cost effectiveness considerations.

## II. Proposed Development Objectives

The project development objective is to reduce public exposure to contaminated land in the project area using risk-based remediation approaches.

## III. Project Description

### Component Name

Component 1: Remediation of contaminated plots

### Comments (optional)

(total cost US\$163.5 million, of which IBRD loan US\$131.1 million). The component will support cleanup and remediation of 2.73km<sup>2</sup> contaminated plots and 0.11 km<sup>2</sup> of dispersed open soils plots in residential areas: (a) site preparation, including demolition and removal of structures of households in remediation area and closed plants, and land clearance in a 2.30km<sup>2</sup> remediation area; (b) materials transport, including road construction for this, as needed; (c) soil and sediment treatment in closed plants; (d) remediation of contaminated soil plots; (e) cleanup of industrial waste piles; (f) remediation of contaminated ponds and channels, including water treatment; (g) soil exchange program for open soil plots in residential areas.

### Component Name

Component 2: Associated treatment and disposal works

### Comments (optional)

(total cost US\$22.4 million, of which IBRD loan US\$16.0 million). This component will support investments in associated remediation and disposal facilities that are required to treat contaminated materials and thus enable the remediation of certain plots or to make sure that the remediation is sustainable under Component 1, including: (a) Xinqiao dewatering site; (b) Xinqiao Stabilization/Solidification (S/S) Facility; (c) wastewater treatment facilities; and (d) the development of an industrial solid waste landfill in the project area.

### Component Name

Component 3: Capacity building and knowledge management

### Comments (optional)

(total cost US\$8.3 million, of which IBRD loan US\$1.0 million). The project will support Zhuzhou City's and Shifeng District's capacity to build and operationalize the technical and management knowledge gained from the project implementation, to engage the public, to manage remediation and redevelopment strategic planning, including: (a) an environmental information and demonstration center; (b) study on Qingshuitang brownfield remediation and strategic planning; and (c) study on the compliance framework for Qingshuitang environmental quality and industrial pollution control.

### Component Name

Component 4: Project Management, Monitoring and Evaluation

### Comments (optional)

(total cost US\$11.1 million, of which IBRD loan US\$1.5 million). The project will support the Project Management Office (PMO) and Project Implementation Unit (PIU) to enhance management capacity through training, study tours and outsourcing of consulting services, including contracts for: (a) project management capacity building; (b) project management; and (c) external environmental and social monitoring.

## IV. Financing (in USD Million)

Total Project Cost:	235.40	Total Bank Financing:	150.00
Financing Gap:	0.00		
<b>For Loans/Credits/Others</b>			<b>Amount</b>
Borrower			85.40
International Bank for Reconstruction and Development			150.00
Total			235.40

## V. Implementation

## VI. Safeguard Policies (including public consultation)

<b>Safeguard Policies Triggered by the Project</b>	<b>Yes</b>	<b>No</b>
Environmental Assessment OP/BP 4.01	x	
Natural Habitats OP/BP 4.04	x	
Forests OP/BP 4.36		x
Pest Management OP 4.09		x
Physical Cultural Resources OP/BP 4.11	x	
Indigenous Peoples OP/BP 4.10		x
Involuntary Resettlement OP/BP 4.12	x	
Safety of Dams OP/BP 4.37		x
Projects on International Waterways OP/BP 7.50		x
Projects in Disputed Areas OP/BP 7.60		x

### Comments (optional)

## VII. Contact point

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